GARMIN®

AVIONICS AND FLIGHT TECHNOLOGY

»» SETTING THE COURSE FOR NEXTGEN AIR NAVIGATION ««

There's a new wave of innovation sweeping through the avionics world. And Garmin systems are at the forefront. We're continually introducing new products and creative technologies that reduce complexity, enhance efficiency, underscore safety, shorten learning curves, and vastly simplify cockpit management in all phases of flight.

AVIONICS DESIGNED WITH TOMORROW IN MIND

From the industry's first IFR approach-certified GPS to today's newest touchscreen interfaces and advanced SBAS/WAAS systems that let pilots fly GPS LPV glidepath approaches into airports with no on-field electronic navaids of any kind – Garmin avionics are setting the pace and building toward a future that will take us from today's ground-controlled and radar-limited ATC system to a more space-based, satellite-derived NextGen air traffic management environment.

As this vision takes shape, you can count on Garmin to keep building ever-higher levels of reliability, integration and pilot situational awareness into every panel- and remote-mount avionics system we offer. Our products are designed for pilots by pilots. And when you combine that with our uncompromising quality and leadership in manufacturing and service, it's easy to see why pilots have made us the #1 avionics company serving today's owner-flown aircraft market.

Garmin Avionics. Onboard with the future of flight.

TOUCHSCREEN AVIONICS: THE FUTURE AT YOUR FINGERTIPS

Once again, Garmin breakthroughs in GPS/Nav/Comm technology are taking aviation in a whole new direction with the GTN 650/750 series of integrated touchscreen avionics.

With ongoing innovation, a growing array of controls, functions and capabilities are placed at your fingertips for easy touchscreen access. Everything from available onboard digital color radar to ADS-B enhanced traffic alerting to worldwide connectivity links for weather, phone calls, text/email messaging, and more – all are options that can now be incorporated, viewed and controlled right from your GTN display.

Combining the latest in multi-function display (MFD) features with high-resolution TFT optics, detailed mapping and a new graphical pilot interface, the GTN design makes everything easy to locate and access. Page navigation is more intuitive, with a "shallow" menu structure and helpful HOME and BACK keys to simplify orientation. In fact, you're rarely more than two taps away from all primary pages and functions. You can quickly pan across the map display by simply swiping your finger across the screen. 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.

This is the future of "all-in-one" avionics design as we know it. With every model in the new GTN product lineup, graphical flight planning capabilities allow you to preview your route on the map screen and easily enter new waypoints or modify existing ones. Victor Airways and high-altitude Jet Routes can be overlaid on the moving map. And for easy IFR route navigation, airway segments can be selected onscreen for instant entry into one's flight plan. What's more, a handy "rubber band" feature lets you grab a flight plan leg on the screen, and then stretch or move it to accommodate a deviation or ATC amendment to your flight plan.

You can simply tap on waypoints, airports, etc., on the display to get more information about each location. And a new data "crossfill" function enables your GTN series navigation system to automatically synch flight plan and waypoint information with any earlier-generation GNS 430W/530W series navigators you may have in your panel. Thus, there's no duplication of effort between your GTN and your GNS. On both the GTN 650 and 750, the built-in GPS is TSO C146c certified for primary navigation in all phases of flight – enroute, terminal and approach – and can also qualify as an ADS-B compliant position source for NextGen airspace. For added safety, a built-in terrain elevation database provides color-coded display overlays when potential terrain conflicts loom ahead. And full Class B TAWS alerting is also available as an option. Standard SBAS/WAAS navigation enables pilots to fly GPS-guided LPV glidepath approaches down to ILS-comparable minimums, where suitable conditions exist. Also, precise course deviation and roll steering outputs can be coupled to select autopilots, enabling virtually

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all IFR flight procedures to be flown automatically. Then, once you've landed, geo-referenced SafeTaxi® diagrams automatically provide easy directional orientation on over 1,000 U.S. airports and approximately 700 in Europe.

Offered in two sizes and a variety of configurations, the GTN product family gives you plenty of stack-maximizing options. The more compact GTN 650 series is contained in a 2.64-inch tall package that mimics the in-stack form factor of its popular GNS 430W predecessor – while the larger GTN 750 series bezel stands 6 inches tall and offers a screen that's nearly 100 percent larger than the previous GNS 530W design. There's room in the MFD-capable, 6.9-inch diagonal GTN 750 frame to display your geo-referenced approach plates and procedures – which come standard with a free initial trial of Garmin FliteCharts®[1] on these products. Or, if you prefer the Jeppesen format, you can elect to go with optional Garmin ChartView™ electronic charts on your big-screen GTN instead[2].

Moreover, all the GTN series products can support a wide array of optional weather, lightning and traffic system inputs for overlay on the moving map. If your flying calls for onboard radar, the larger-format GTN 750 series can now double as a display for Garmin's GWX 68 or the new Doppler-capable GWX 70 digital weather radars[3]. So, there's no need to install a separate radar display or MFD in your panel. Similarly, a variety of datalink weather solutions can be used to access graphical NEXRAD, METARs, TAFs, and more. These options include Sirius XM™ satellite weather coverage for North America (using the GDL 69 datalink receiver, sold separately)[4], as well as worldwide weather datalink coverage via the GSR 56 satellite receiver[3]. Another GTN weather option is Garmin's GDL 88 Series ADS-B[3]. This dual-link (1090/978 Mhz) transceiver not only satisfies the FAA's 2020 requirement for ADS-B "Out" compliance (on aircraft operating below 18,000 feet), but it also lets you take advantage of ADS-B datalink traffic and subscription-free weather services now available through the FAA's ground-based U.S. network. Even better, the GTN series is capable of advanced ADS-B traffic display features like TargetTrend™ relative motion tracking, which offers a faster, more intuitive way of judging target trajectories and closure rates in relation to your aircraft's flight path. On the ground, Garmin's Surface Feature (or SURF, for short) works with SafeTaxi® to enhance pilot awareness of the on-surface traffic situation. And then, for expanded traffic monitoring and alerting inflight, the GTN series is compatible with active traffic systems such as Garmin's GTS™ TAS/TCAS line[3]. To save space in your avionics stack, any GTN can provide onscreen control/display for optional remote-mount Garmin transponders[3]. And the larger-format GTN 750 screen can also be used as your control panel for an optional Garmin remote audio/intercom system[3]. Thus, with GTN you're able to accommodate more screen area in less total stack height.

The Garmin GTN series: It's what being a touch smarter in avionics is all about.

[1] Initial U.S. FliteCharts® will disable when data is over 6 months out-of-date. Updates available on single-cycle or annual basis.
[2] Jeppesen subscription required for use with optional Garmin ChartView™ (sold separately).
[3] Sold separately
[4] Sirius XM™ subscription required (sold separately).

Onscreen graphical flight plan editing makes it easy to add waypoints or modify your route. Handy "rubber band" feature lets you stretch a flight plan leg to divert or amend your routing.

Geo-referenced Garmin FliteCharts® come standard with a free initial trial on the large-format GTN 750 series[2]. Optional Jeppesen-format electronic charts are also available with Garmin ChartView™[3]. These charts enable graphical overlay of geo-referenced approach plate procedures on your moving map.

Victor Airways and high-altitude Jet Routes can be overlaid on the moving map – and airway segments can be selected onscreen for easy entry into a flight plan.

Advanced ADS-B display capability can be provided via Garmin's GDL 88 dual-link transceiver (sold separately), allowing pilots to access the FAA's free uplink of aviation weather and traffic information. On the traffic display, Garmin's patent-pending TargetTrend™ relative motion feature offers a faster, more intuitive way to judge direction and closure rate of targets in relation to your flight path.

Garmin SafeTaxi® airport diagrams come pre-installed on all GTN series products, providing geo-referenced aircraft guidance on over 1,000 U.S. airports and approximately 700 European ones.

Your GTN's built-in elevation database provides an extra margin of safety in visualizing terrain/obstacle conflict situations. For even more comprehensive audible/visual alerting capability, optional TAWS-B functionality is also supported.

A wide range of optional weather solutions can be displayed on your GTN touchscreen – everything from onboard digital radar to Sirius XM™ or worldwide satellite datalink products – as well as the subscription-free uplink of graphical and textual weather data via the U.S. ADS-B ground network.

To save vital inches in your stack, any GTN touchscreen can serve as a digital control head for compatible Garmin remote-mount ATC transponders. In addition, the larger GTN 750 can also provide onscreen control for Garmin's remote GMA 35 audio/intercom system (sold separately), which features 3-D audio sourcing and Telligence™ voice command.

SPECIFICATIONS

Awareness

Emergency Search:	Emergency Search: 25 nearest airports, VORs, NDBs, intersections, and user waypoints; 5 nearest ARTCC and FSS frequencies
Alarms:	TAWS-B (optional); airspace messages at 10 minutes, 2nm, and inside airspace; arrival timers

Pilot Customization

Waypoints:	1000 user-defined
Flight Plans:	99 reversible; up to 100 waypoints each

Physical

Unit Size:	
GTN 650	2.65"h x 6.25"w x 11.25"d (6.7 x 15.9 x 28.6 cm)
GTN 750	6.00"h x 6.25"w x 11.25"d (15.2 x 15.9 x 28.6 cm) Depth is behind panel with connectors
Unit Weight:	
GTN 650	7.0 lb
GTN 750	9.3 lb
Display:	Color TFT LCD; sunlight readable
Power:	11-33 VDC
Data Storage:	Flash and non-volatile memory (augmented by separate internal battery) protects stored data

Performance

GPS:	TSO-C146c, Class 3
VOR:	TSO-C40c
LOC:	TSO C36e
GS:	TSO-C34e
VHF COMM:	25 kHz and 8.33 kHz channel spacing Transmitter TSO C169a, Class 3, 4, 5 and 6 Receiver TSO C169a, Class C and E
GPS Receiver:	15 channel, including 3 WAAS
Acquisition Time:	TTFF 1:45 minute typical (cold), 10sec reacquisition
Update Rate:	5 per second
Accuracy:	<2 meters RMS typical with WAAS (horizontal/vertical)
Dynamics:	1000 knots max
Nav Features:	Navigation with flight plans and direct-to waypoints, Airway navigation, approach navigation using published approaches stored in flash memory, terminal navigation using DPs and STARs, closest point of flight plan, arrival and departure frequencies, turn advisories and arrival annunciations
Planning Features:	Trip and fuel planning, true air speed, density altitude, winds aloft, flight timers, trip statistics, sunrise and sunset, RAIM availability, advisory vertical navigation (VNAV)
Interfaces:	ARINC 429, RS-232, RD-422, RS-485, HSDB, CDI/HSI, RMI (digital), altitude input (serial: Icarus, Shadin- Rosetta; fuel sensor, fuel / air data, GDL 69/69A XM, GTX 32/33/33D/330/330D, GTS 800/820/850, GDL 88, GWX 68/70, GSR 56, G500/G600, L-3 Stormscope, L-3 Skywatch, Avidyne TAS, GAD 42, and others.
Map Datums:	WGS-84

Series comparison:	GTN 625	GTN 635	GTN 650	GTN 725	GTN 750
Unit size (height)	2.64"	2.64"	2.64"	6"	6"
Display resolution (pixels)	650 x 266	650 x 266	650 x 266	650 x 708	650 x 708
10-watt Comm radio	No	Yes	Yes	No	Yes
16-watt Comm radio	No	Optional	Optional	No	Optional
VOR/ILS/GS Nav radio	No	No	Yes	No	Yes
Gamma 3 WAAS GPS	Yes	Yes	Yes	Yes	Yes
Hi-res Terrain graphics	Yes	Yes	Yes	Yes	Yes
Internal TAWS-B terrain alerting	Optional	Optional	Optional	Optional	Optional
Free trial of geo-referenced U.S. FliteCharts®	NA	NA	NA	Yes	Yes
Jeppesen ChartView™	No	No	No	Optional	Optional
Preloaded U.S. and European SafeTaxi®	Yes	Yes	Yes	Yes	Yes
Sirius XM Satellite Weather capable[1]	Yes	Yes	Yes	Yes	Yes
Can control remote transponder[2]	Yes	Yes	Yes	Yes	Yes
GWX68/70 Radar interface[3]	No	No	No	Yes	Yes
Third-party digital radar support	Optional	Optional	Optional	Optional	Optional
Can control remote audio processor[4]	No	No	No	Yes	Yes
Traffic System capable[5]	Yes	Yes	Yes	Yes	Yes

[1] Requires GDL 69 antenna (sold separately); Sirius XM subscription required.
[2] GTX 32/33 series remote transponders sold separately
[3] Radar LRU sold separately
[4] GMA 35 remote audio panel sold separately
[5] Requires GTS 800/820/850 or compatible 3rd party traffic alerting systems

A scaled version of Garmin's SVT™ 3-D synthetic vision renders terrain-alerting data into a realistic virtual landscape, showing obstacles, traffic, airports and more. SVT is standard on G600; optional on G500.

RETROFIT GLASS IS NOW WITHIN YOUR GRASP

If you love the idea of flying a glass cockpit – but hate to think of parting with your current aircraft – this is clearly the retrofit option you've been waiting for: The Garmin G600. Or its lookalike version for lighter aircraft, the G500.

Leveraging our industry-leading G1000™ integrated cockpit technology, these twin-screen Garmin units combine primary flight (PFD) and multifunction (MFD) display capabilities in one easy-to-install, 10-inch wide bezel – providing a perfect-fit replacement for the standard gyro cluster in your panel. The PFD's attitude display is over 50% larger than those of traditional 3-inch flight instruments. And for easier scanning, both the PFD and MFD are paired directly in the pilot's field of view.

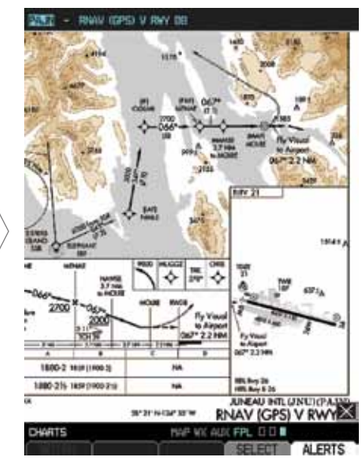
Instrument data comes from ultra-reliable digital AHRS and Air Data Computer reference, while built-in terrain and mapping databases add graphic navigation detail. Garmin FliteCharts® and SafeTaxi® come pre-installed as standard. Or, if you prefer, optional geo-referenced ChartView™ instrument approach plates and airport surface charts are also available (JeppView™ subscription required). All onscreen navigation functions are easily integrated with the WAAS-certified GTN 650/750 or GNS 430W/530W units in your stack. And optional inputs let you overlay Sirius XM™ satellite weather[1], TAWS-B terrain alerting, onboard radar, traffic alerts or other data. Support for optional radar altimeter control/display is provided. And there's also a video input option that will even let the G500/G600 MFD function as a live-cam video monitor. ARINC 708 interface support for many popular GA weather radars is optionally available on both units. And for those flying outside the U.S., Garmin's Iridium-based worldwide weather service – via the optional GSR 56 datalink system – can also provide satellite voice/data communications from virtually anywhere your aircraft might take you.

To further augment the units' growth capabilities, interface support is offered for select autopilots and flight directors. A Garmin GAD 43 adapter unit (standard on G600; optional on G500), provides enhanced autopilot interface – allowing AHRS to drive your autopilot in place of a gyro-mechanical ADI (such as the familiar KI-256). The GAD 43 can emulate many existing gyro interfaces, using more accurate and reliable AHRS data to provide the required attitude, heading, yaw input, baro correction, and alerting information to the autopilot. This typically enables the system's costly ADI to be replaced on the panel with a far more affordable (and space-saving) attitude indicator as one's backup instrumentation.

Best of all, a scaled version of Garmin's SVT™ Synthetic Vision Technology also comes standard on the G600 – or as an option on the G500. With SVT, pilots are offered a realistic 3-D virtual reality display of terrain, obstacles, runways and traffic information, all shown in context on the PFD. It's like having a clear-day "out-the-window" view in any weather or flight situation. And it promises to bring a whole new level of situational awareness to your Garmin retrofit glass cockpit.

[1]XM subscription required (sold separately).

Garmin SafeTaxi® U.S. and European airport diagrams depict the current aircraft position in relation to runways, taxiways, hangars, etc.



Standard Garmin FliteCharts® provide over 14,000 AeroNav-format approach plates, which can be viewed on the G600's 6.5-inch MFD.

SPECIFICATIONS

Display Features

Dual 6.5 inch diagonal color AMLCDs
RGB backlighting technology
High resolution 640x480 VGA (921,600 RGB dots)
65,536 simultaneous colors
Direct sunlight readable
Auto, manual or lighting bus inputs for dimming
Field upgradeable software

Physical – GDU 620 display

6.7 inches high
10.0 inches wide
3.25 inches deep
6.4 lbs.

System Architecture

- Position source: Requires external SBAS/WAAS GPS, such as GTN 650/750, GNS 480 or 400W/500W series unit.
- Supported interfaces include GDL 69/69A XM datalink weather, GSR 56 for global connectivity/WX, GWX 68 digital weather radar, GTX 330 Mode S transponder, various traffic sensors, and more
- Supported AHRS: GRS 77 (supplied)
- Supported Air Data Computer: GDC 74 (supplied)

Electrical

10-40 VDC, reverse polarity protected
55 watts typical

Environmental

-20C to +55C operating temp
-55C to +85C storage temp
2 degrees C per minute temp variation
95% at 50C humidity
35,000 feet max altitude
internal cooling, external cooling not required

Certification Candidates

STC via Approved Model List (AML) for over 785 airframes
TSO-C2d, TSO-C3d, TSO-C4c, TSO-C6d, TSO-C8d, TSO-C10b, TSO-C34e, TSO-C36e, TSO-C40c, TSO-C41d, TSO-C43c, TSO-C52b, TSO-C63c, TSO-C118, TSO-C113, TSO-C147, TSO-C151b

HOW THE UNITS COMPARE

	G500	G600
Approved for Class 1 Aircraft (typically piston singles under 6,000 lbs.)	Yes	Yes
Approved for Class 2 Aircraft (typically piston twins and turbine aircraft under 6,000 lbs.)	Yes	Yes
Approved for Class 3 Aircraft (typically piston or turbine aircraft between 6,000 lbs. and 12,500 lbs)	No	Yes
Garmin SVT Synthetic Vision Technology	Optional	Standard
GAD 43 to replace select A/P attitude gyro, bootstrap heading, yaw, baro and other cues with AHRS reference	Optional	Standard
GWX 68 Radar interface (radar LRU sold separately)	Optional	Standard
ARINC 708 interface support for select GA radar units	Optional	Optional
RVSM compliance kits available for select aircraft	No	Optional
Internal TAWS-B terrain alerting	No	Optional
Video input	Optional	Optional
Radar altimeter interface (digital)	Optional	Optional

TECHNOLOGY EVERYONE CAN IDENTIFY WITH

With all solid-state designs and powerful 200- to 250-watt transmitters, the Garmin family of GTX series transponders brings ATC aircraft surveillance to new levels of precision, reliability, and performance.

What's more, with optional TSO-C166b authorization for 1090 MHz Extended Squitter (ES) transmission capabilities, Garmin has taken a leading role in providing an affordable pathway to ADS-B compliance for the FAA's proposed Next Generation airspace system – as well as fulfilling the needs of other international ADS-B initiatives. The latest TSO certification will allow the GTX 330 and GTX 33 transponders to meet ADS-B compliance standards as a certified 1090 MHz ADS-B "Out" solution, when paired with a compatible WAAS position source. Automatically transmitting aircraft flight ID, position, altitude, velocity, climb/descent, and heading information, Garmin's ES capable transponders provide precise dynamic reference to Air Traffic Control, as well as to other ADS-B equipped aircraft sharing the airspace.

The optional 1090 MHz ES upgrade preserves all of the existing GTX 330 and GTX 33 features, including a Mode S Traffic Information Services (TIS) interface that allows you to keep an eye on traffic in or near some of the busiest airports in the U.S. For customers who have already purchased a GTX 330/33 series, there's a factory upgrade available to add the TSO C166b compliant ES functionality.

The Garmin GTX 33 is a remote-mount unit designed for use with the GTN 650/750 series, which allow for built-in transponder mode and code selection. The GTX 330 is a panel-mount unit. For experimental aircraft equipped with Garmin's G3X system, a GTX 23 ES model is also available to provide a lower-cost path to compliance. Another transponder-only option, the Garmin GTX 328 is similar to the GTX 330, but is designed to satisfy the European mandate for a VFR/Class 2 Mode S solution. It does not offer TIS traffic or ADS-B datalink functionality.

For Mode C operation, Garmin offers the affordable GTX 327 panel-mount transponder with dedicated pushbutton keys for code selection. A remote-mount version, the GTX 32, is also available for use with the GTN 650/750 touchscreen series, which allow for built-in transponder mode and code selection

SPECIFICATIONS

GTX 330 / GTX 328 / GTX 33

TSO compliance:	C112; C166b (optional)
Temperature Range:	-20°C to +55°C
Altitude:	55,000 Feet
Transmitter Freq.:	1090 MHz
Transmitter Power:	250 watts Nominal at unit
Receiver Frequency:	1030 MHz
Receiver Sensitivity:	-74dBm nominal for 90% replies
Mode A Capability:	4096 ident codes
Mode S Capability:	25 foot resolution with suitable serial data from -1000 to 62,700 feet
Ext. Suppression Input:	Lo < 0.5V; High > 8V
Weight (GTX 330):	4.2 lbs. (1.9 kg) installed with rack and connectors
Dimensions (GTX 330):	Bezel Width = 6.25" (159 mm) Bezel Height = 1.65" (42mm) Depth = 11.25" (286 mm) behind panel, with connectors

GTX 327 / GTX 32

TSO compliance:	C74c Class 1A
Temperature Range:	-20° C to +55oC (Continuous Operation)
Power Requirements:	11-33 VDC; Max Power Input: 15 Watts
Humidity:	95% @ +55°C for 16 Hours; 85% @ +38°C for 32 Hours
Altitude:	50,000 Feet
Transmitter Freq.:	1090 MHz
Transmitter Power:	200 Watts Nominal
Receiver Frequency:	1030 MHz
Receiver Sensitivity:	-74dBm Nominal for 90% replies
Mode A Capability:	4096 ident codes
Mode C Capability:	100 Foot Increments from -1000 to 63,000 feet
Ext. Suppression Input:	Lo<0.5V; High > 8V
Weight:	3.1 lbs (1.4 kg) installed with rack & connectors
Dimensions:	Bezel Width = 6.25" (159 mm) Bezel Height = 1.65" (42mm) Depth = 8.73" (222 mm)

THINK SLIM

When panel space is at a premium, these Slimline comm and nav/comm transceivers fit a lot of capability into a surprisingly small package.

The Garmin SL30 is a full-function nav/comm, featuring a 760-channel VHF comm transceiver and 200-channel VOR/LOC/GS nav receiver with DME display. Its handy standby frequency monitoring feature essentially provides the utility of two nav/comms in one. With the primary VOR/LOC frequency providing guidance to your HSI or CDI, the standby frequency can be tuned to a second VOR to display the current radial on which your aircraft is flying. This allows the pilot to cross check position fixes with just one receiver.

The companion SL40 comm transceiver is packed with innovative features not found on competitive units, including: active and standby flip-flop frequency tuning, direct sunlight-readable alphanumeric display, easy access to NWS broadcasts, a two-place intercom, and more. Its frequency monitor function allows you to monitor ATIS or emergency frequencies – without leaving your assigned ATC channel.
So you never miss a transmission. With 8 watts of transmit power and only 35-watt DC input, the SL40 is cool and efficient. Maximum sophistication in minimum space: that's the Garmin Slimline series.

SPECIFICATIONS

Navigation Radio Features

(SL30 NAV/COMM)

200 channel Nav with solid state DSP technology.
With VOR/Localizer and Glideslope receivers.
Built-in VOR/Localizer converter.
VOR receiver displays to/from and radial.
Digitally decoded OBS setting.
Sunlight readable full alphanumeric display.
User selectable back course approach mode that provides "chase the needle" operation.
Automatic display of station ID by decoding Morse code.
Interfaces to most CDI (w/resolver), HSI, and autopilot systems.
TSO: C34e; C36e; C40c.
Accepts 10 to 40 VDC input.

Physical Specifications

Size:	1.3"(H) x 6.25" (W) x 10.5" (D)
Weight:	2 lbs., SL40; 3.3 lbs., SL30

Comm Radio Features

(SL30 and SL40)

760 Communications channels.
Frequency Range 118 to 136.975 MHz.
Active and Standby Flip/Flop Frequencies.
Volume Control.
Tunes to National Weather Service Broadcasts.
Transmit Status Indicator.
Back-lit Keypad Control.
Automatic Display Intensity Control.
2X8 Frequency Memory and Recall:
Stores/Recalls 8 User Defined Frequencies
Stores/Recalls Previous 8 Frequencies Used
Frequency Monitor Function (listens to standby while monitoring active).
Dedicated Emergency Channel Selector.
Squelch Test Function.
Stuck Mic Time-out.
12 Watt Audio Amplifier.
Includes Two Place VOX intercom.

Comm Radio Performance Specifications

(SL30 and SL40)

Transmit Power: 8 Watts (Carrier Power).
Input Voltage Range: 10 to 40 VDC.
Operating Temperature Range: –20°C to +55°C.
Certified TSO C37d (transmitting).
Certified TSO C38d (receiving).
Certified TSO C128 (stuck mic).

BETTER COMMUNICATION STARTS HERE

The Garmin family of innovative audio panels offer the latest in digital features to help streamline cockpit management, enhance safety of flight, and improve communications between flight crews, ground controllers and passengers.

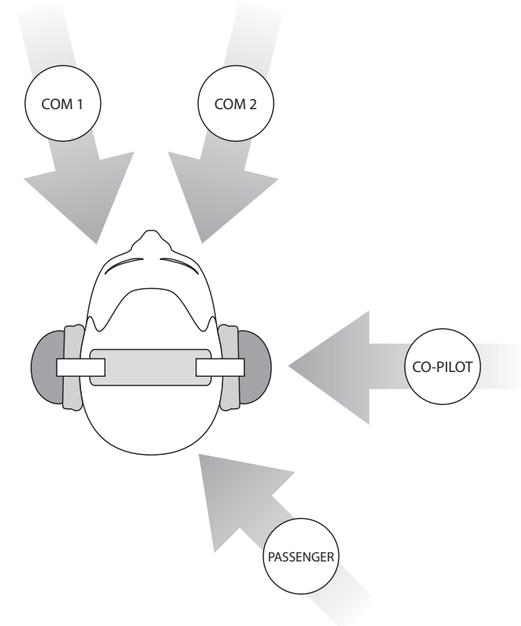
Our newest top-of-the-line model, the GMA 350, is the most technologically advanced audio switching system we've ever introduced. Featuring breakthrough 3-D audio technology, this all-digital unit adjusts audio in the pilot's stereo headset so that it mirrors how the human ear naturally "locates" sound in space. Thus, it's easier to identify, focus on, and understand one particular source from among many in a busy cockpit. Other first-in-class features available with the GMA 350 include ambient noise level sensing for automatic volume adjustment, enhanced auto-squelch capability, clearance recorder, and – to top it all off – our patented Telligence™ voice control feature that can activate audio panel functions in response to spoken commands. For example, by simply pressing a push-to-command button on the yoke or flight control and saying "Comm One," the new Telligence™ technology selects the radio you want, so you don't need to lift a finger from the controls during those busy times in flight.

All the same features of the GMA 350 are also incorporated in a remote-mount version, called the GMA 35, which is designed to interface with the Garmin GTN 750 series. The large GTN touchscreen, when doubling as the control panel for your GMA 35 audio system, serves to reduce the total stack height of the avionics in your panel, while streamlining all your cockpit communications. Both the GMA 350 and GMA 35, as well as our lower-cost GMA 340 (without the 3-D audio or clearance recorder), come equipped with convenient, LED- illuminated button controls for audio selection – as well as split comm capability for pilot and co-pilot.

For helicopter cockpits or others that need to address multiple-comm installations, Garmin also offers the GMA 350H. It includes the same core features as the standard GMA 350, plus it offers night vision goggle (NVG) compatibility with green annunciation and backlighting – as well as three-com radio support and corresponding split-comm modes (1/3 and 2/3) to accommodate a third transceiver.

And finally, for pilots of experimental and light sport (LSA) aircraft, there's our lowest-cost option: the GMA 240. It's a non-TSO'd unit that will support dual COMM, dual NAV, dual AUX receivers, and dual music audio inputs – plus up to three unswitched inputs for telephone ringers or other alerts. A multifunction phone/audio mini jack on the front allows cellphone calls or iPod®/MP3/XM Radio players to be routed through the pilot's headset – with selectable instant muting when radio transmissions are received from ATC.

With Garmin 3-D audio processing, sound reception in your stereo headset can have a directional effect. For example, Comm 1 may sound as if it's coming from your 11 o'clock position; Comm 2 from your 1 o'clock, copilot intercom from 3 o'clock, and so on. (GMA 350/350H systems only.) The 3-D feature can be enabled/disabled to suit pilot's preference.



SPECIFICATIONS

General

TSO Compliance:	GMA 350/350H, GMA 340: TSO-C50c, TSO-C35d GMA 240: Non-TSO'd
Power Requirements:	
Supply voltage:	11V-33V
Vdc Operating current:	
GMA 350/350H:	3.75A max (13.75V, spkr on)
GMA 340:	2.2A max (13.8V, spkr on);
GMA 240:	0.54A max (13.8V)
Temp. range:	
GMA 350/350H:	-45°C to +70°C (normal operation)
GMA 340:	-20°C to +55°C (normal operation)
GMA 240:	-20°C to +55°C (normal operation)
Altitude:	
GMA 350/350H:	55,000 MSL unpressurized
GMA 340:	50,000 MSL unpressurized
GMA 240:	55,000 MSL unpressurized

Physical

Weight:	
GMA 350/350H:	2.4 lbs. installed
GMA 340:	1.7 lbs. Installed
GMA 240:	15.5 oz
Depth behind panel:	
GMA 350/350H:	7.80" (with connectors)
GMA 340:	7.12" (with connectors)
GMA 240:	7.12" (with connectors)
Bezel width:	6.25"
Bezel height:	1.3"

Audio Panel

Transceiver inputs:	GMA 350: 2; GMA 350H: 3; GMA 340 3; GMA 240: 2
Additional Receiver inputs:	**Unswitched inputs:**
GMA 350: 5	GMA 350: 5
GMA 340: 5	GMA 340: 2
GMA 240: 4	GMA 240: 3
Input impedance:	500 ohms
Input isolation:	60 dB min

Intercom

Positions:	
GMA 350:	6-7 (pilot, copilot, passengers)
GMA 340:	6 (pilot, copilot, 4 passengers)
GMA 240:	4 (pilot, copilot, 2 passengers)
Volume controls:	
GMA 350 with volume indicator: 3 (pilot, copilot, passengers)	
GMA 340:	3 (pilot, copilot, passengers)
GMA 240:	3 (pilot, copilot/passengers, music)
VOX level controls:	2 (pilot, copilot/passengers)
VOX level controls:	2 (pilot, copilot/passengers)
VOX circuits:	
GMA 350:	6-7, (one per mic input)
GMA 340:	6 (one per mic input)
GMA 240:	4 (one per mic input)
Music inputs (stereo):	2 (one input mutable)
Intercom isolation modes:	
GMA 350:	5 (all, pilot, copilot, crew/pass, none)
GMA 340:	3 (pilot, crew, all)
GMA 240:	2 (pilot, all; or crew,all)

Headphone Outputs

Output amplifiers:	GMA 350, 340: 3, stereo (pilot, copilot, passengers) GMA 240: 2, stereo (pilot, copilot/passengers)
Power:	GMA 350, 340: 100 mW per stereo channel, each headset, into 150 ohms with not more than 5% distortion, any normal supply voltage. GMA 240: 100 mW per stereo channel, each headset, into 150 ohms with not more than 7% distortion, any normal supply voltage.
Frequency response:	
Music:	
GMA 350:	50 Hz to 20 kHz nom
GMA 340:	100 Hz to 15kHz nom;
A/C radio:	
GMA 350:	200 Hz to 6 kHz nom
GMA 340:	100 Hz to 6 kHz nom
MASQ™:	Processing for noise reduction
Special functions:	PA Mode, pilot selectable

Speaker Outputs (GMA 350, 340 only)

Outputs selectable:	One, pilot selectable
Output power:	10 Watts into 4 or 8 ohms, any normal supply voltage.
Freq. response:	350 Hz to 6kHz nom
Special functions:	PA Mode, pilot selectable

Marker Beacon Receiver (GMA 350, 340 only)

Frequency:	75 MHz
Sensitivity:	LO: 1000 uV hard HI: 200 uV hard
Selectivity:	6 dB @ +/- 10kHz min. 40 dB @ +/- 200kHz max.
Input impedance:	50 ohms
External lamp drive:	125 mA max each output
SmartMute™:	Marker audio muting
Other outputs:	Middle MKR sense

GI 106A

MD200

GI 102A

LEADING INDICATORS TO KEEP YOU ON COURSE

These high-quality Course Deviation Indicators (CDIs) display rectilinear needle movements and contain integral GPS, NAV and VLOC mode annunciators. The Garmin GI 102A boasts a VOR/LOC/GPS needle, TO/FROM indicator and NAV warning flag. The GI 106A and MD 200 units build on these capabiities by adding a Glideslope needle and flag.

The GI 102A/106A can be used for GNS 430/530 and GTN 650/750 system certification. The MD 200 is designed for use with Garmin SL 30 nav/comm installations.

SPECIFICATIONS

Performance

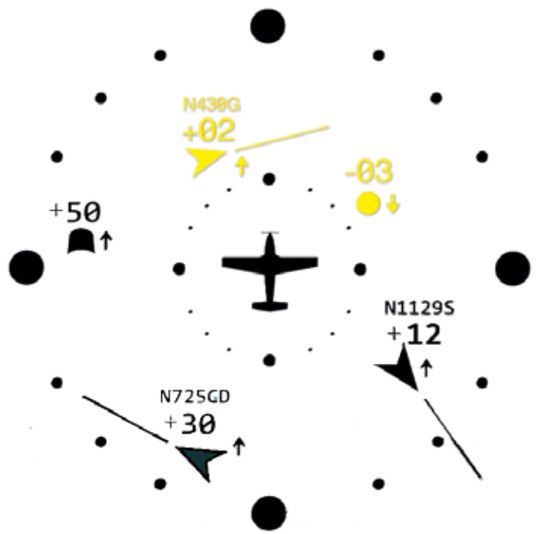
To/From Flag Input:	±40 mV flag in view; load resistance 200 ohms ±10%
NAV Flag Input:	In view at 125 mV, out of view at 260 mV; load resistance 1,000 ohms ±10%
Annunciation:	Green for "GPS" course deviation; white for "VLOC" or "NAV" course deviation; yellow for "SC"
Deviation Indications:	Rectilinear movements for ease of interpretation
VOR Deviation Input:	±150 mV for 5 dot deflection; meter resistance 1,000 ohms ±10%
OBS Resolver:	30Hz, ORZ'd at 300
Glideslope Deviation Input:	±150 mV for 5 dot deflection; meter resistance 1,000 ohms ±10% (GI 106A only)
Glideslope Flag Input:	In view at 125 mV, out of view at 260 mV; load resistance 1,000 ohms ±10% (GI 106A only)

Physical

Size:	3.25"Wx3.25"Hx4.75"L (82.6 mm x 82.6 mm x 120.7 mm)
Weight:	GI 102A —1.4 lbs (0.64 kg) GI 106A —1.4 lbs (0.64 kg)
Display Lighting:	4.3 W at max intensity, 14 VDC at 0.31 A (typical) or 28 VDC at 0.155 A (typical)
Operating Current:	0.1 A (with one annunciator illuminated)

Environmental

Temperature:	–55°C to +70°C (–67°F to +158°F)
Altitude:	16,764 m (55,000 ft) operating
Cooling:	Convection
Relative Humidity:	95% non-condensing
Shock: Operational:	6 g (11 ms duration)
Crash safety:	15 g (11 ms duration)



SEPARATION SOLUTIONS FOR HIGH-TRAFFIC AIRSPACE

In busy, high-density airspace, pilots need every possible advantage when it comes to "seeing and avoiding" traffic conflicts. That's why Garmin developed the GTS™ family of ADS-B enhanced Traffic Advisory (TAS) and Traffic Collision Avoidance (TCAS I) Systems. Featuring exclusive Garmin CLEAR CAS™ technology, these attractively priced systems provide accurate, dynamic surveillance of nearby transponder-equipped aircraft – with spoken audio alerts similar to those given by ATC to help pilots quickly respond to potential flight path encroachments.

The GTS systems use a synthesis of both active and passive surveillance (including 1090 MHz ADS-B "In") to correlate target data and pinpoint traffic threats. Thus, they're able to provide advanced real-time traffic information to the cockpit – and augment reports from radar-based air traffic control.

The systems can display traffic symbols and advisories on a variety of compatible navigation or multi-function display products. Passive surveillance with ADS-B "In" capability is available with installation of Garmin's GTX 33 ES or GTX 330 ES transponders (sold separately) or other compliant ADS-B equipment, such as Garmin's GDL 88 Dual-Link (1090/978 Mhz) Transceiver[1]. On compatible displays, the system is able receive and display the target aircraft's flight ID, GPS position, relative altitude and direction of flight. Also, display of course trend vectors and vertical climb or descent information (if available) can be accommodated. Thus, instead of just seeing random targets, pilots will ultimately be able to identify and track specific aircraft flight trajectories with much greater precision. So, in busy airspace, they'll be able to fly with a much clearer tactical picture of their immediate traffic situation.

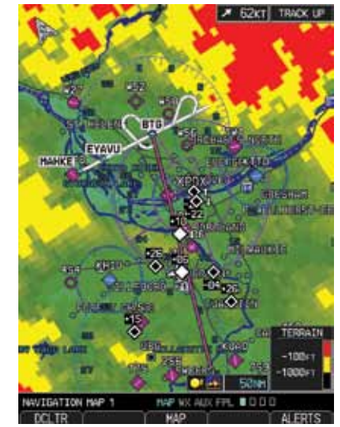
All GTS 800/820/850 units will operate to 55,000 feet – so they're not constrained by the much lower altitude limits imposed on some competitive TAS/TCAS systems. The Garmin GTS equipment can track up to 60 traffic targets simultaneously – and display up to 30 intruder threats at a time, depending on the specific capabilities of the display system being used. (There is no dedicated panel instrument for Garmin TAS; it interfaces with your existing navigation displays.) Targets are depicted using familiar TCAS-defined symbology. And selectable horizontal display ranges let pilots configure the presentation to their specific flight requirements.

Instead of the generic "Traffic, traffic" voice alerts of some earlier-generation systems, the GTS series' exclusive CLEAR CAS technology provides for expanded audio messaging in an ATC-like verbal format: "Traffic. One o'clock. High (or Low or Same Altitude). Two miles." If surveillance bearing information is not available on the intruder, "Traffic, No Bearing" is annunciated.

By vocalizing more specific traffic-spotting information, the GTS 800 series lets pilots know instantly where to look – keeping their "eyes-out" to scan for traffic instead of looking down at a cockpit display. This can save vital split-seconds in a fast-converging situation. And sometimes split-seconds can mean all the difference.

[1]NOTE: ADS-B correlated traffic target symbology and flight data shown in our brochures may not be available on certain display products. Our compatibility for these features is growing, however some products will not be upgradeable. See our website (garmin.com/traffic) or your Garmin dealer for details on display requirements and compatibility.

With Garmin's SVT-capable flight displays, traffic can be depicted in a 3-D format. As targets get closer, the symbols get larger.



Integration of traffic, terrain and obstacle alerting on a Garmin moving-map display gives pilots a comprehensive picture of potential flight path conflicts.

GTS series traffic alerts can be displayed on Garmin's GTN 650/750 and 430W/530W series avionics.

SPECIFICATIONS

GTS 800/820/850 Processor LRU

Unit Size:	6.25"W x 2.7"H x 12.7"D (15.87 x 6.86 x 32.25 cm)
Weight:	9 lb (4.08 kg) LRU; Vert. Rack 1.05 lb (0.48 kg); Horiz. Rack 1.94 lb (0.88 kg); excludes connectors
Temperature:	-55°C to +70°C
Operating Altitude:	To 55,000 feet
Power Input:	14 or 28 VDC 40 watts max. (GTS 800); 45 watts max. (GTS 820, 850)
Cooling Input:	Integrated
Environmental Compliance:	RTCA DO-160E
Software Compliance:	RTCA DO-178B Level C
Hardware Compliance:	RTCA DO-254, Level C
TSO Compliance:	GTS 800,820 TAS: TSO-C147, TSO-C166a, DO-197A, DO-260A GTS 850 TCAS I: TSO-C118, TSO-C166a, DO-197A, DO-260A

GA 58 Directional Antenna

Unit Size:	4.03"W x 2.97"H x 5.63"D (10.24 x 7.54 x 14.30 cm)
Weight:	0.82 lb (0.37 kg) excludes connectors 0.85 lb (0.39 kg) with TNC connectors

Omni-Directional Antenna (optional)

Unit Size:	0.98"W x 3.30"H x 4.00"D (2.49 x 8.38 x 10.16 cm)
Weight:	0.24 lb (0.10 kg); excludes connectors

GPA 65 PA/LNA Module (GTS 820/850 only)

Unit Size:	4.25"W x 1.00"H x 8.00"D (10.8 x 2.54 x 20.32 cm)
Weight:	1.75 lb (0.79 kg); excludes connectors

Garmin TAS/TCAS Comparison

	GTS 800	GTS 820	GTS 850
Traffic system type	TAS	TAS	TCAS 1
Transmitter power output	40 watt	200 watt	200 watt
Active surveillance range (typical)	12 nm	40 nm	40 nm
Number of targets tracked	60	60	60
Number of targets displayed (dependent on display system capability)	30	30	30
Display range	2/6/12	2/6/12/24/40	2/6/12/24/40
Range accuracy	+/- .05 nm	+/- .05 nm	+/- .05 nm
Bearing accuracy	5° RMS	5° RMS	5° RMS
Altitude accuracy	+/- 200 ft	+/- 200 ft	+/- 200 ft
Altitude resolution	+/- 100 ft	+/- 100 ft	+/- 100 ft
Max vertical separation	+/- 10,000 ft	+/- 10,000 ft	+/- 10,000 ft
Audible target threat position callouts	Yes	Yes	Yes
1090ES ADS-B receiver*	Yes	Yes	Yes
Correlated display capability	Yes	Yes	Yes
Selective Mode-S interrogation	No	Yes	Yes
Maximum Operating Altitude	55,000 ft	55,000 ft	55,000 ft

*Requires ADS-B "Out" capability

Integration of traffic, terrain and obstacle alerting on a Garmin moving-map display gives pilots a comprehensive picture of potential flight path conflicts.

YOUR INTEGRATED DATALINK SOLUTION TO ADS-B COMPLIANCE.

The world of air traffic control is poised to undergo significant change over the next few years. Instead of relying on ground-based radar as the primary technology for maintaining flight separation in ATC airspace, the FAA's Next Generation Air Transportation System (or NextGen, for short) will use a system of GPS-based datalinks to more accurately and reliably perform this tracking function. Called ADS-B (an acronym for "Automatic Dependent Surveillance – Broadcast") the new space-based, satellite-derived system will require aircraft operating in controlled U.S. airspace to automatically transmit, via datalink, their position, track, speed, altitude, climb/descent rate, and more to air traffic controllers and other nearby aircraft using the network. Thus, everyone in the ADS-B loop will be able to share, see and react to the same tactical air traffic scenarios. The intended benefits of ADS-B only become available if all aircraft participate in the exchange of data. So, to make that happen, FAA regulations have stipulated that all aircraft operating in controlled airspace where a Mode C or Mode S transponder is now required must have an FAA-approved ADS-B system onboard by January 1, 2020. To help aircraft operators meet this requirement as easily and affordably as possible, Garmin has developed the GDL 88 Series of ADS-B datalinks. Not only can these be used to satisfy the FAA's regulatory criteria for ADS-B "Out" transmission capability (on 978 MHz), but they also provide the optional ADS-B "In" link, which enables pilots to view, on a compatible cockpit display, the same dynamic traffic data that ATC ground controllers are monitoring on their scopes. Spoken audio alerts ("Traffic. Two o'clock. High. Two miles.") provide vital target specifics, so pilots know immediately where to look – and can stay "eyes out" to scan for potential traffic conflicts. Plus, the GDL 88's support for ADS-B "In" also enables use of the FAA's free uplink of aviation weather reports, graphical NEXRAD imagery, and various other flight information services. The weather content available on this subscription-free "FIS-B" link (Flight Information Service – Broadcast) is comparable to the basic subscription services offered by leading commercial satellite weather providers. Which means there's a real economic advantage to be gained with the Garmin GDL 88 Series as your choice for ADS-B compliance on aircraft that operate solely below 18,000 feet. The FAA's ADS-B traffic and subscription-free weather products are available and operational right now throughout much of the U.S. So, there's no need to wait until 2020 to start benefitting from a Garmin ADS-B decision today.

SPECIFICATIONS

GDL 88 Series Processor LRU

Unit Size:	1.75"W x 6.17"H x 7.12"D (4.44 x 15.67 x 18.08 cm) Includes mounting rack and connectors
Weight:	GDL 88, 3.75 lb (1.70 kg); GDL 88 Diversity, 3.87 lb (1.76 kg); GDL 88 with WAAAS GPS, 4.13 lb (1.87 kg); GDL 88 Diversity with WAAS GPS, 4.25 lb (1.93 kg). Includes mounting rack and connectors
Temperature:	-55°C to +70°C
Operating Altitude:	To 55,000 feet
Power Input:	14 or 28 VDC 20 watts max.
Cooling Input:	Integrated
Environmental Compliance:	DO-160F
Software Compliance:	DO-178 Level C and Level B
Hardware Compliance:	DO-254 Level C
TSO Compliance:	GDL 88: TSO-C145c (B2), TSO-C154c (A1S/A1H), TSO-157A, TSO-C166b (A1/A1S), TSO-C195a (C1,C2,C3,C4)

Garmin's Surface Feature (or SURF, for short) is available with SafeTaxi® to enhance the pilot's traffic situational awareness in the airport environment by displaying the taxiways and runways.

Garmin's TargetTrend™ relative motion display helps simplify pilot decision-making with a more dynamic view of one's traffic situation. Compared to the traditional, or absolute, view of traffic (pictured at left), which shows how targets are moving relative to the ground, the TargetTrend™ display shows how other aircraft are moving in relation to your aircraft's flight path – and which trajectories are most likely to converge with your own.

When multiple traffic targets appear in the same area on Garmin's GTN touchscreen display, an asterisk next to the traffic symbol indicates that these targets have been "grouped" to minimize clutter on the display. A tap on the grouped symbol will de-cluster the image to show individual target returns.

GWX 70. Combining an all solid-state transmitter with high-sensitivity receiver and digital signal processing, the Garmin GWX 70 offers superior weather detection technology compared to earlier magnetron-based radars. A variety of compatible MFDs, including Garmin's GTN 750 series touchscreens, can double as your radar display – providing an overlay of the weather picture on your graphical moving map.

REDEFINING WEATHER RADAR PERFORMANCE.

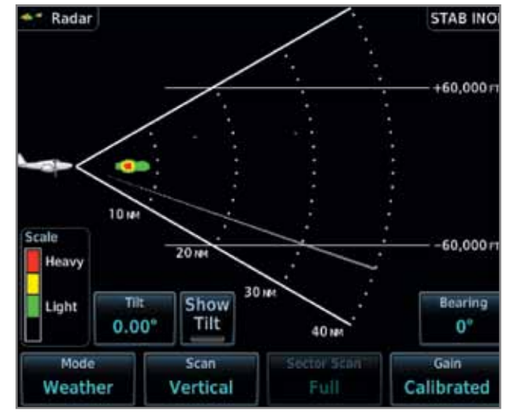
With its advanced solid-state transmitter design eliminating the need for life-limited magetron tubes, the Garmin GWX 70 comprises the very latest and most reliable technology in onboard weather radar.

Bringing full-color storm cell tracking to your compatible Garmin multifunction display, this Doppler-capable weather avoidance tool combines excellent range and adjustable scanning profiles with precision target definition – for accurate, easy-to-interpret, real-time weather analysis in the cockpit. Optional advanced features, enabled via software, include turbulence detection and ground clutter suppression.

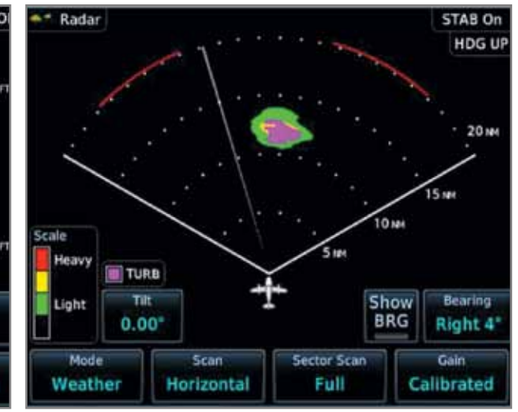
Compared to earlier-generation magnetron-based systems, the digital GWX 70 offers significant improvements in reliability, operational safety, and cost of ownership. The lightweight 40-watt transmitter and high-sensitivity receiver combine to optimize the use of radar energy in weather detection. Also, unlike conventional magnetron tubes, which degenerate over time, the solid-state technology used in the GWX 70 will maintain a consistent weather picture over a much longer interval – with no periodic maintenance required. The net result: Longer life and higher efficiency with no compromise in radar performance.

The GWX 70's compact, all-in-one antenna/receiver/transmitter unit is designed for easy installation in a wide variety of aircraft radome configurations. You can choose from 10-, 12-, or 18-inch antenna sizes to fit your requirements. What's more, a new feature called "Altitude Compensated Tilt" helps streamline your cockpit workload by eliminating the need to reset the antenna tilt with any altitude change. You simply set it once to the tilt angle you want, and the radar will automatically adjust to that level after any climb or other change in altitude. Also, when interfaced with your aircraft's analog gyro or AHRS system, the GWX 70 offers full radar stabilization to 30 degrees of pitch and roll.

To focus radar scanning on the areas you want to watch, the GWX 70 offers pilot-adjustable horizontal scan angles of up to 120 degrees (compared to 90 degrees for its predecessor). A handy Ground Mapping mode lets you use the GWX 70 to scan terrain features for visual navigation. And the system also includes a vertical scanning function to help you analyze storm tops, gradients and cell buildup activity at various altitudes.



A vertical scanning function on the GWX 70 lets pilots analyze cloud tops and storm gradients to see a more complete weather picture. The touchscreen interface with Garmin's GTN 750 series makes adjusting the tilt or sector scan is as simple as swiping your finger across the display.



Garmin's WATCH™ weather attenuation feature highlights areas where radar energy may be partially absorbed by precipitation and, thus, not fully reflect storm intensity. The optional turbulence detection function on the GWX 70 uses a magenta shade to indicate areas of turbulence associated with particles such as heavy rain or hail.

SPECIFICATIONS

General

Operational Mode: Weather (WX): Green, Yellow, Red (Magenta is reserved for display of the optional turbulence detection function)
Ground Mapping (MAP): Cyan, Yellow, Magenta, Blue

Display Ranges: Selectable 2.5, 5, 10, 20, 40, 80, 160, and 320 nm (MX 20; GMX 200).
Selectable 2.5, 5, 10, 20, 40, 60, 80, 100, 120, 160, 240 and 320 nm (G1000, G600/G500, GTN 750 series).
NOTE: Software updates for radar display are required to take advantage of all the advanced capabilities of the GWX 70 – such as Doppler turbulence detection and ground clutter suppression. These features may not be available or supported on all products. Check with your Garmin dealer for compatibility options.

Performance Index: 18-Inch Antenna: 227 dB
12-Inch Antenna: 221 dB
10-Inch Antenna: 218 dB

Weather Avoidance: 18-Inch Antenna: 320 nm max.
12-Inch Antenna: 320 nm max.
10-Inch Antenna: 285 nm max.

Rx Sensitivity: -126 dBm MDS

Manual Gain: +12 to - 64 dB (G1000; G600/G500; GTN 750 series)
+3.5 to - 28 dB (MX 20; GMX 200)

Antenna Beamwidth: 18-Inch Antenna: 5.3 degrees
12-Inch Antenna: 7.8 degrees
10-Inch Antenna: 9.0 degrees

Horizontal Scan Angle: Pilot adjustable;
20, 40, 60 or 120 degrees (G1000; G600/G500; GTN 750 series);
20 or 120 degrees (MX 20; GMX 200)

Scan Centerline: Pilot adjustable

Scan Rate: 12 looks per minute

Manual Tilt: +/- 15 degrees

Vertical Scan Angle: 60 degrees (G1000; G600/G500; GTN 750 series);
10 – 60 degrees (MX 20, GMX 200)

Antenna/Receiver/Transmitter

Mechanical Size: Width: 8.0 in. (20.3 cm.) diameter at base
Depth: 6.3 in. (16.0 cm.)
Antenna: 10 in. or 12 in. diameter flat-plate

Unit Weight: 18-Inch Antenna: 12.7 lbs. (4.31 kg)
12-Inch Antenna: 9.5 lbs. (4.31 kg)
10-Inch Antenna: 9.3 lbs. (4.22 kg)

Environmental: Operating temperature range: -55 Degrees C to +70 Degrees C
Humidity: 95% non-condensing
Altitude Range: -1,500 feet to 55,000 feet
TSO Compliance: C63d, Class 7
Environmental Category: RTCA DO-160F

Electrical: Power Requirements: 28 VDC; 2.0 amps
Transmitter Power: 40 Watts nominal, 38 Watts minimum
Output Frequency Range: X-Band (9.3 to 9.5 GHz)
Pulse Width: 1.6, 3.2, 6.4 or 13.6 Microseconds
STC Logic: Effective to 80 nm
Extended STC: 80 nm to 320 nm (Modifies targets from end of STC to maximum range)
Stabilization: +/- 30 degrees combined pitch, roll and manual tilt
Max. Altitude: 55,000 feet (unpressurized)
Target Alert: (G1000, G600/G500 and GTN 750 series only) Annunciates targets (between 80 and 320 nm) that are beyond displayed range on radar screen
Interface: Garmin HSDB (G1000, G600/G500 and GTN 750 installations); ARINC 429/453 (MX 20, GMX 200 installations)

TAKING WEATHER AWARENESS TO NEW HEIGHTS

You can't control the weather. But at least you can stay on top of it – with the help of satellite updates from Garmin's GDL 69 datalink receiver.

Supplying graphical and textual weather information to Garmin's panel-mount GTN 650/750 series avionics, as well as the G500/G600 and G1000 multifunction displays, the GDL 69 helps pilots make timelier, safer, and more strategic weather avoidance decisions.

Data uplink service is provided through Sirius XM™ Satellite Radio's XM WX Weather Service, using location-specific WxWorx information. XM's powerful S-band geostationary satellites deliver seamless, near real-time coverage at any altitude across the continental United States and parts of Canada[1]. Thus, you're able to receive and view high-resolution color graphics offering detailed NEXRAD and METARs data, as well as current reports on precipitation, lightning, winds-aloft, echo tops, TFRs and more.

For pilots who want the latest in XM Satellite Radio capability, Garmin offers the sound-enabled GDL 69A. This receiver combines XM WX's weather link with a complete XM digital audio package – so passengers can enjoy over 170 channels of continuous news, sports, music and entertainment, while flying anywhere in the XM coverage area[2]. The GDL 69A will interface through a variety of Garmin panel-mount cockpit displays. And for even more flexibility, Garmin's optional GRC 10/GRT 10 wireless remote system lets listeners control XM Radio channels and volume from anywhere in the cabin.

SPECIFICATIONS

Physical

Unit Size:	6.15"W 1.05"H x 7.20"D (15.62 x 2.67 x 18.29 cm)
Mounting:	Mounting rack and hardware supplied
Weight:	1.86 lbs. unit (.84 kg), 2.81 lbs. (1.27 kg) unit and rack

Environmental

Temperature:	-55° C to +70° C (Operating) -55° C to +85° C (Storage)
Humidity:	95% non-condensing
Altitude range:	-15,000 ft. to +55,000 ft
Power requirements:	9 to 33 VDC input; 4.2 watts maximum

Other Specifications

Satellite receiver frequency:	2332.5 to 2345 MHz
Downlink data rate:	38.4K bits per second
Software Certification:	RTCA DO-178B Levels B and D
Environmental Certification:	RTCA DO-160D

[1]Display compatibility for Canadian WX support varies by unit. See display product configuration for details.
[2]GPS 400W, GNC 420W, GNS 430W, GPS 500W and GNS 530W units will only display products with Aviator Light Package of XM Subscription and Music.

IRIDIUM: YOUR LINK TO WEATHER AND COMMUNICATIONS WORLDWIDE

Datalink weather has quickly changed the way pilots fly in North America. And now, with Garmin's GSR 56 transceiver, those operating throughout the world can enjoy the safety-enhancing benefits of on-demand satellite weather data – as well as onboard text/voice communications, aircraft position tracking and more – via the Iridium satellite network.

Available weather products include Meteorological Aviation Reports (METARs) that provide current temperature, dew point, precipitation, wind speed and more, as well as Terminal Aerodrome Forecasts (TAFs) that show predicted weather for up to 30 hours in advance. Throughout most of Europe, Canada, Australia and the U.S., the GSR 56 can also receive high-resolution radar imagery, which displays in full color on the G1000, G600/G500, and GTN 750 series of displays. Additional radar coverage areas are being added continuously.

Moreover, for pilots and passengers who want to stay in touch from the far-reaching corners of the earth, Garmin offers a full range of phone and messaging options with the GSR 56. The Iridium datalink can be used to provide two-way text messaging via Short Message Service (SMS) to any compatible phone or e-mail address (currently available on select systems only). In addition, it's easy to make and take voice calls while in flight: The GSR 56 integrates into your aircraft's audio/intercom system, enabling you and your passengers to speak and listen directly through a headset.

To further enhance the safety and security of global operations, the GSR 56 can also serve as an affordable asset tracking solution that continuously monitors your aircraft's status enroute. In this mode, the GSR 56 automatically provides GPS-referenced position reports at predetermined intervals – so those on the ground can easily track your mission's progress.

Efficient and cost effective, Garmin's GSR 56 Iridium transceiver provides the messaging and voice solutions you need to do business in today's non-stop, globally connected world.

SPECIFICATIONS

Physical

Unit Size:	6.96"h x 2.08"w x 12.96"d Depth is with connectors
Mounting:	Mounting rack and hardware supplied
Unit Weight:	2.45 lb.

Environmental

Temperature:	-15° C to +70° C (Operating) 55° C to +85° C (Storage)
Humidity:	95% non-condensing
Altitude range:	-1,500 ft. to +55,000 ft
Power requirements:	14 or 28 VDC input; 16 watts maximum

Other Specifications

Satellite receiver frequency:	1616 to 1626.5 MHz
Downlink data rate:	2.4K bits per second
Software Certification:	RTCA DO-178B Level E
Environmental Certification:	RTCA DO-160E

ChartView also depicts airport surface diagrams and Jepp enroute charts on the GTN 750 display.

COCKPIT EFFICIENCY GOES OFF THE CHARTS

A valuable feature of the Garmin G600, G500, GTN 750 and other compatible MFD screens is the ability to display approach plates and airport surface diagrams. Affordable Garmin FliteCharts®, which feature electronic versions of AeroNav™ (formerly NACO) terminal procedures charts, come standard with many Garmin navigators. In addition, Garmin SafeTaxi® airport diagrams are included to help pilots navigate over 1,000 U.S. airports and approximately 700 European ones with confidence – by clearly depicting their aircraft's exact location on the field. As an alternative, pilots can select optional ChartView® instrument approach plates and airport surface charts powered by Jeppesen (subscription required). Both Garmin FliteCharts® and ChartView® have the ability to overlay a geo-referenced aircraft symbol on the electronic approach chart, providing a visual crosscheck of your progress inbound. With the Garmin GTN 750 series navigation displays, FliteCharts® and ChartView® take geo-referencing even further – enabling a graphical view of your approach plate to be overlaid on the MFD moving map for integrated guidance cues throughout the procedure. Based on the active flight plan, each compatible Garmin MFD automatically loads the approach plates for the destination airport, allowing the pilot to quickly select the ATC-assigned approach procedure. ChartView can also display the destination airport's surface diagram – a real help at unfamiliar airports. In addition to the airport and approach charts, Standard Instrument Arrival and Departure charts (STARs or DPs) are also incorporated. ChartView functions and updates for the G600, G500 and GTN 750 are available through Jeppesen's JeppView® subscription service.

Airport surface diagrams are automatically displayed prior to takeoff and after touchdown at the flight's destination.

ChartView overlays aircraft position on Jeppesen approach charts.

PilotPaks	Garmin Obstacles	Garmin SafeTaxi	Garmin Terrain	Garmin Airport Directory	Garmin FliteCharts	Navigation Data	Jeppesen JeppView
Lite	■	■	■	■	■		
Standard	■	■	■	■	■	■	
Standard w/Garmin FliteCharts	■	■	■	■	■	■	
Standard w/Jeppesen JeppView	■	■	■	■		■	■

Save and simplify with PilotPak™: For a single annual price, PilotPak provides all the databases within a selected package to be used with any combination of GTN™, G600, and G500 series systems installed in one aircraft. Initially, only the Lite, Standard, and Standard + Garmin FliteCharts packages will be available for purchase and downloaded at flygarmin.com. However, Lite, Standard and Standard + Jeppesen JeppView may also be purchased and downloaded from Jeppesen's website, www.Jeppesen.com/GTN.
Note: Airport Directory available for select displays.

What could be easier?
Computer geniuses and net novices alike will appreciate online database updates. Whether you opt for an annual subscription or individual updates, Garmin offers the system resources you need – to assure the latest and best in navigation from your GPS. And it all comes to you with the speed and convenience of the Internet. Check it out at fly.garmin.com.

KEEP YOUR DATA CURRENT WITH EASY ONLINE UPDATES

Your Garmin panel-mount GPS comes complete with an extensive navigation database, powered by Jeppesen®, that serves as the mainstay of your product's moving map capabilities. In addition, other databases found on select Garmin units include: Garmin FliteCharts® (electronic terminal procedures charts) and Garmin SafeTaxi® (airport taxiway diagrams), plus terrain alerting and towers/obstacles databases.

Over time, as information changes, your databases will require updating.

Fortunately, Garmin makes the process easy – by offering online updates via our website: fly.garmin.com.

And now, to make updating even more affordable, Garmin and Jeppesen have teamed up to create PilotPak™: A new bundled pricing option for GTN 650/750 series and G500/G600 equipped cockpits. With PilotPak, all the databases within a selected package are provided for a single annual price. Each PilotPak option includes Garmin's popular SafeTaxi®, Obstacle, Terrain and AOPA or AC-U-KWIK Airport Directories – with additional combo choices that may encompass Navigation Data, Jeppesen JeppView™ and/or Garmin FliteCharts®. Initially, only the Lite, Standard, and Standard + Garmin FliteCharts packages can be purchased and downloaded at flygarmin.com. Additionally, Lite, Standard and Standard + Jeppesen JeppView can be purchased and downloaded from Jeppesen's website, www.Jeppesen.com/GTN.

Using the Internet connection from your home computer and a compatible datacard programmer, you can easily select and update your database by following the online prompts. After logging onto fly.Garmin.com, the home page will give you a quick synopsis of your registered products and whether or not the databases are current. If a database needs updating, you can purchase and download directly from the site in a matter of minutes. Simply follow the online prompts.

SPECIFICATIONS

Navigation Data

Coverage:	Varies by product; Navigation Database includes Jeppesen® NavData™
Airports:	Identifier, city/state, country, facility name, lat/long, elevation, fuel service, control, approach information
VORs:	Identifier, city/state, country, facility name, lat/long, frequency, co-located DME/TACAN, magnetic variation, weather broadcast
NDBs:	Identifier, city/state, country, facility name, lat/long, frequency, weather broadcast
Intersections:	Identifier, country, lat/long, nearest VOR
Runways:	Designation, length, width, surface, lighting, pilot-controlled lighting freq.
FSS:	Identifier, reference VOR, freq. usage
Frequencies:	Approach, arrival, control area, departure, Class B, Class C, TMA, TRSA with sector, altitude and text usage info; also, ASOS, ATIS, AWOS, center, clearance delivery, ground, pre-taxi, tower, unicom, localizer and ILS
ARTCC:	Identifier, freq. usage
MSA:	Minimum safe altitude along and in proximity to active flight plan
Approaches:	Non-precision and precision approaches from FAF to MAP
Airspaces:	Class B and C with sectors, International CTA and TMA with sectors; all special-use airspace, including MOA's, prohibited and restricted areas with controlling agency and airport

FLITELEVEL EXTENDED WARRANTY™ PROTECTION

ADD EXTRA PEACE OF MIND TO YOUR LONG-TERM PRIDE OF OWNERSHIP

Your Garmin avionics products represent a significant investment in your aircraft and its operation. They're built to bring the highest possible levels of safety, simplicity and value to your long-term ownership experience. Yet, even the most reliable avionics can sometimes need attention. And when the unexpected does happen, it's great to have the reassurance that you won't face hundreds or thousands of dollars in unplanned expenses – thanks to the total system safety net offered by Garmin's factory-backed FlightLevel Extended Warranty™ program.

All Garmin equipment in current production is eligible for coverage under the FliteLevel coverage plan. It picks up where your standard 2-year factory warranty leaves off – allowing you to extend that industry-leading Garmin peace-of-mind protection for an additional 2-3 years (up to a total of 5 years in all).

Just like your original factory warranty, the Garmin FliteLevel Extended Warranty plan assures you of comprehensive "no hassle" protection against unexpected service issues or failures. Within the applicable coverage period, Garmin will either replace any components that fail in normal use – or will repair them, upon the owner's request. Garmin retains the exclusive right to choose whether to repair or replace the affected unit. Thus, you're assured of the fastest possible service response to get you back in the air right away. And wherever you fly, Garmin's acclaimed network of Authorized Sales & Service outlets provides easy access to priority field support at hundreds of locations around the globe. For the protection you need – at a price you can afford – Garmin FliteLevel has the long-term warranty plan to keep you flying with confidence.

When you fly with Garmin avionics, you never fly alone.

We're committed to making sure you have a terrific experience with any and every Garmin product you select – whether it's a single component or a complete avionics stack.

That's why you can count on us not just to support you, but to embrace you: With comprehensive service and technical expertise in virtually every corner of the globe.

LOOKING AHEAD, REACHING BEYOND

After all, we know that it's the total support we put behind every product in our lineup – and every pilot using our equipment – that turns first-time Garmin buyers into loyal, long-term Garmin customers.

So, we back every product in our avionics lineup with a rock-solid Garmin warranty. Then, we make that warranty mean even more by attracting and hiring some of the industry's brightest technical minds to serve in our factory support positions. Their troubleshooting expertise is available by phone, fax or online – whenever you have a question or service issue that demands the right answer, right now!

These experts work as a team with hundreds of Garmin Authorized Service Centers around the world. Individually, they are the top shops in the business. Collectively, they form the most professional, most comprehensive avionics service network available to support you anywhere you fly.

And we never stop looking for ways to make our team even better.

To see for yourself, we invite you to call or visit your nearby Garmin dealer. You'll be doing your future a favor.

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Specifications and descriptions are preliminary and subject to change without notice.
Most updated features are expected to be available via free software release in fourth quarter of 2012.

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