

Physical		GPS/WAAS receiver performance	
Height:	7.42 inches (18.84 cm)	TSO Compliance:	TSO-C145a (RTCA/DO-229C)
Width:	3.54 inches (8.97 cm)	Number of Channels:	15 (12 GPS and 3 GPS/WAAS/SBAS)
Depth:	12.64 inches (32.11 cm)	Frequency:	1575.42 MHz L1, C/A code
Weight:		Sensitivity (acquisition):	-116 dBm to -134.5 dBm GPS -116 dBm to -135.5 dBm WAAS
(with mounting tray):	6.4 lb (2.9 kg)	Sensitivity (drop lock):	-144 dBm
(mounting tray only):	1.2 lb (0.54 kg)	Dynamic Range:	> 20 dB
Electrical		Lat/Long Position	
Power:	20 Watts	Accuracy:	<1 meter RMS typical with WAAS (horizontal/vertical)
Voltage:	10-40 VDC	Velocity:	1000 knots maximum (above 60,000 ft)
Input Current (typical):	1.5 A @ 14 VDC 750 mA @ 28 VDC	TTFF (time to first fix):	1:45 min. typical with current almanac, position, and time
UAT performance		Reacquisition:	10 seconds typical
TSO Compliance:	TSO-C154	Position Update	
Frequency:	978.00 MHz	Interval:	0.2 sec (5 Hz)
TX Power:	50 W	1 pps (pulse per second):	±275 nsec of UTC second
Frequency Tolerance:	+/- 20 PPM	Datum:	WGS-84
Modulation:	Continuous Phase FSK, h = 0.6, Raised Cosine shaping, a = 0.5	SATCOM	
Data Rate:	1.04 Mbps	Compatibility:	Compatible on aircraft equipped with SATCOM Antenna Power Supply 35 mA typical, 40 mA max at 4.7 VDC
99% Power			
Bandwidth:	1.3 MHz		
60 dB Bandwidth:	3.3 MHz (estimated)		
Receiver Sensitivity:	-96 dBm for 90% MSR		



The future of interactive
airspace is now arriving
with ADS-B datalink
technology from Garmin.



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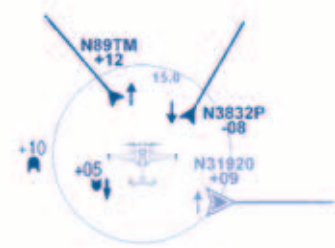
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GENERAL AVIATION'S FIRST
CERTIFIED ADS-B DATALINK IS THE
GARMIN GDL 90.

The "building blocks" of tomorrow's
airspace are coming together at Garmin
today. They include:

- (1) ultra-precise GPS satellite navigation,
- (2) datalink communications, and
- (3) enhanced situational awareness made



[ADS-B is the datalink of Free Flight.]

possible by interactive traffic and hazard
surveillance. These are the key technology
components in the FAA's vision for a 21st
century air traffic management concept
known as "Free Flight."

Now, with the introduction of general
aviation's first certified ADS-B datalink
transceiver, Garmin brings this more
flexible (yet higher-capacity) airspace
environment one step closer to reality.

The Garmin GDL 90 is a remote-mount
broadband transceiver designed to
transmit, receive and decode Automatic
Dependent Surveillance–Broadcast (ADS-B)
messages via onboard datalink. The GDL
90 broadcasts your aircraft's position,
velocity, projected track, altitude and flight
identification to other equipped aircraft in
your vicinity, as well as to ground-based
transceivers maintained by the FAA.

With ADS-B, aircraft are now able to
automatically report, and receive, more complete
and more useful surveillance data than can be
accomplished with existing ground-based radar
systems. Instead of just seeing isolated targets
on a cockpit display, flight crews now have useful
trend and intended flight path data to give them
a clearer tactical picture of the current air traffic
situation. Other benefits to the pilot include the
ability to receive continuous graphical and textual
weather, as well as uplinked TIS-B traffic/conflict
information from transponder-equipped aircraft
being tracked on ground-based radar. Being able
to see and react to the same traffic picture that
ground controllers are watching on their scopes
provides pilots with a vital extra margin of safety
in the air. Likewise, on the ground, ADS-B can
provide an important overall picture of ramp
and taxiway activity at busy airports.

Ultimately, the aim of ADS-B implementation is
to combine the freedom of point-to-point visual
(VFR) navigation, while maintaining the safe
traffic separation afforded under radar-controlled
instrument (IFR) flight. Under this evolution,
pilots would use their ADS-B displays in the
cockpit to "see and avoid" other aircraft just as
they now do by looking out the window when
flying VFR.



ADS-B traffic images.

The infrastructure is growing

The ground-based portion of the ADS-B uplink
network is already well under development. The
FAA's Safe Flight 21 Program calls for the
installation of ADS-B ground transmitters at 36
sites along the U.S. East Coast, with 4 additional
sites in Arizona. Most of these sites are
scheduled to be operational in the near future.
Additional installations are targeted for selected
areas, such as Alaska for the FAA's Capstone
program and the Gulf of Mexico for offshore
helicopter operators. Within a few years, the
agency hopes to be rolling out the ADS-B
ground infrastructure nationwide. The Garmin
GDL 90 design team has been working closely
with the FAA for years on the development of
ADS-B technology and compliance with its
related service offerings (such as TIS-B traffic,
FIS-B weather, and TFR updates), which the
government plans to make available free of
charge to general aviation and commercial
operators. With no monthly subscription fees
or usage charges, pilots can fly in greater safety
while saving thousands of dollars in fees and
equipment costs for similar commercial
uplink services.

Advanced performance, affordable price

As the first company to bring a certified ADS-B
datalink to the light aircraft market, Garmin has
clearly taken a leadership role in making ADS-B
economically viable for general aviation use.

The Garmin GDL 90 is designed to interface
with the popular MX20 color Multi-Function
Display (MFD) or other approved cockpit screen
presentation. Included in the GDL 90 remote unit
is a TSO-C145a WAAS GPS sensor, used to
provide the system with highly accurate
positioning information.

The datalink itself operates on 978 MHz and
is based on the Universal Access Transceiver
(or UAT) technology developed by the MITRE
Corporation for the FAA. This link is capable
of data rates close to 1 megabit per second,
providing sufficient bandwidth to transfer
large graphical files (such as uplinked weather,
TFRs and traffic displays) in real time. Additional
ADS-B benefits that will be developed over time
include improvements in separation standards,
approaches in low-visibility conditions,
airport surface navigation and ground
vehicle monitoring, and asset tracking
for fleet operators.

So, if you're a pilot who believes in planning
ahead, check out the Garmin GDL 90. It's the
affordable data link that can take you into
tomorrow's airspace and beyond.

GDL 90 FEATURES
AT A GLANCE.

- UAT TSO'd to C154
- Datalink operates on 978 MHz
- WAAS certified GPS sensor TSO'd to C145a
- Interfaces with Garmin MX20 color LCD display
- 40 watts of transmit power
- 1.04 Mbps data rate
- Supplied with top and bottom mount datalink antennas, plus WAAS GPS antenna
- 10-40 VDC Power Capability



Using the ADS-B datalink, pilots can view graphical NEXRAD weather and nationwide weather summary charts uplinked from the ground to their cockpit display.



Foreshadowing developments in tomorrow's National Airspace System, ADS-B technology is currently proving its effectiveness in the Alaska "Capstone" Program – a joint FAA/industry initiative to provide radar-like IFR traffic control services, via datalink, in remote areas where ground radar coverage is limited or nonexistent.



Airborne ADS-B broadcasts aircraft position, altitude, vector and other information for enhanced air traffic management.



In the future, ADS-B will enable better monitoring of surface traffic on airport taxiways and runways.