

# 2017 Avionics Marketplace

There's **never been a better time** for an avionics upgrade. And the new stuff in the works will **blow your socks off**.



BY **MAL GORMLEY** mgormley@gmail.com

**Bombardier Global 7000 vision flight deck**

According to the Aircraft Electronics Association's (AEA) year-end market report, total worldwide business and general aviation electronics sales for 2016 amounted to some \$2.2 billion, which was down 6.4% from 2015 figures. That was the lowest annual total since 2012, the first year the association began tracking sales. A little more than half of last year's billings came from "forward fit," that is installations in new production aircraft. And new aircraft deliveries were down in every category with the exception of an ever-so-slight uptick in turboprops.

By contrast, avionics retrofit sales reached new heights in 2016, continuing a positive four-year trend. Roughly two-thirds of all avionics were sold in North America.

So, although overall sales of new business and general aviation aircraft are soft, operators are finding plenty of new technology reasons to retrofit their fleets. The following summary of news and developments among avionics manufacturers provides a surfeit of examples of why this is so.

## Aspen Avionics

Albuquerque, New Mexico-based Aspen Avionics has earned a supplemental type certificate (STC) to interface its Evolution primary and multifunction displays (PFDs and MFDs) with Garmin's GTX 345 all-in-one transponder. Installing the GTX 345 with an Aspen EFD1000 PFD will allow aircraft owners to take full advantage of viewing ADS-B weather and traffic information directly in their line of sight, which is a good thing.

The 1090 MHz ADS-B Out feature provides users with access to dual-band ADS-B In traffic and subscription-free weather on Aspen Avionics' PFDs and MFDs, and combines a Mode S Extended Squitter (ES) transponder with an optional WAAS/GPS position source. The \$795 upgrade can be installed by any Aspen Avionics authorized dealer.

Aspen has also earned certification to interface its Evolution 1000 Pro PFD with the System 55X autopilot by Genesis Aerosystems. The STC will cover hundreds of light-single and twin-piston

aircraft. When installed, multiple altimeter setting adjustments are no longer required. The upgrade replaces separate monochrome displays, push buttons and panel knobs with a full-color display directly in the pilot's line of sight, saves panel space and can provide smooth, automatic level-offs with no altitude overshoot — just set the desired vertical speed and altitude on the PFD.

Integrating the System 55X autopilot with Aspen displays requires a software unlock and Analog Converter Unit 2 (ACU2). The software unlock is priced at \$1,995 for customers who already have an ACU2 installed. For those customers who require the unit, bundled pricing for the ACU2 and System 55X unlock is \$2,995.

## Astronautics Corporation

Last year, the FAA selected Astronautics Corporation of America to research and develop a comprehensive approach to identify and assess potential cybersecurity threats as they relate to aircraft certification and continued operational



**Astronautics Roadrunner**

safety. The contract covers research to improve ways to identify and resolve such cyberthreats.

The project will include the development of an efficient process that identifies system security vulnerabilities and safety risks, including risk-mitigation information. The researched approach will support the FAA's development of aviation policies, regulations and training requirements to ensure flight safety and secure aircraft network systems from cyberattacks.

Astronautics will adapt its preexisting cybersecurity processes to support the implementation of the FAA aircraft system information security/protection and safety risk assessment (SRA) framework. That framework will then be used to model aircraft communications addressing and reporting systems (ACARS), a digital data-link for transmission of short messages between aircraft and ground stations via air-band radio or satellite.

All work will be performed at the Astronautics headquarters in Milwaukee, using systems and software engineers from the current cyber team and in-house development and cybersecurity labs.

As part of the process, Astronautics will collaborate with the FAA, FAA-designated organizations, and aviation and information security partners with whom the company has established relationships.

The company's product areas include electronic PFDs, engine displays, mission computers, electronic flight bags (EFBs) and servers for airborne applications.

## Astronautics Max-Viz

East Aurora, New York-based Astronautics Corp., through its subsidiary Astronautics Max-Viz, recently announced that its Max-Viz 1200 EVS (enhanced vision system) for fixed- and rotary-wing aircraft has been certified to DO-160G environmental testing standards by the Radio

Technical Commission for Aeronautics (RTCA).

The solid-state \$9,000 Max-Viz 1200 EVS requires no routine maintenance and features a low-power, uncooled thermal camera. The sensor image can be presented on any video-capable display that accepts composite video (RS-170) NTSC or PAL/analog signals. The 1.2-lb. unit is compatible with a variety of display systems including Garmin's G500, 600 and 1000; Avidyne's R9; Bendix King's KMD-850; AvMap's EKP-V; Flight Displays' Flipper; various Rosen monitors; and EFBs.



**Astronautics Max-Viz 1200 EVS**

With its infrared enhanced-vision thermal imaging system, the EVS enables pilots to see when flying day or night in smoke, haze and light fog. The EVS can work as an alternative to, or in tandem with, light-based night-vision goggles (NVG) technologies.

The Max-Viz 1200 EVS complements synthetic-vision displays, allowing pilots to see transient obstructions, like wildlife and construction barriers not in synthetic-vision databases. The system gives real-time confirmation of the operating environment, as well as supporting the approach-to-landing transition from IFR to VFR in marginal visual conditions. Astronautics Max-Viz is an EVS supplier to aircraft manufacturers and to the retrofit market with over 40 STCs in fixed- and rotary-wing aircraft.

## Avidyne

Melbourne, Florida-based Avidyne has been granted an Approved Model List-Supplemental Type Certificate (AML-STC) for its new IFD550 Navigator with integrated Attitude Reference Sensor (ARS).

The certification also includes FAA approval of Release 10.2 software that includes a host of new features including synthetic vision and two-way wireless connectivity with Avidyne's new IFD100 iPad app. Avidyne has also received approval for its new IFD545, IFD510 and IFD410 FMS/GPS systems.

The IFD550 is a full-featured FMS/GPS/Nav/Com with all the same

functionality of Avidyne's current IFD540 but with the addition of an integrated ARS. This detects pitch-and-roll motion and enables the display of dynamic synthetic vision with full-motion 3-D "out-the-window" views as well as exocentric "in-trail" views of the aircraft and nearby terrain, obstacles and traffic. The IFD550 also gives pilots the ability to toggle synthetic vision off and view a traditional blue-over-brown attitude display, as well as an overlay of horizontal and vertical deviation indicators, a total velocity vector (TVV)/flight path marker, and adjustable field of regard. The IFD550 has a list price starting at \$21,999.

Avidyne's Release 10.2 software is available as a field-loadable upgrade for existing IFD540 and IFD440 systems, giving these customers the ability to display synthetic vision views of the host aircraft, along with overlay of flight-plan, color-contoured terrain, obstacles, full-color 3-D traffic and terrain warnings. R10.2 also includes two-way wireless connection to Avidyne's IFD100 iPad app, wireless flight-plan transfer into the IFD, non-TSO TAWS functionality and support for European VFR (Bottlang) charts. In addition, it enables a 16-watt power output option on the



**Avidyne IFD550**

IFD440, incorporates improvements to Australian Published Holds, orbit-around-a-point circular holds, software enablement for the RDR2000 radar display on the IFD 5-Series, and more.

All new-production IFD 5-series and 4-series models are available now and will begin shipping immediately with R10.2 functionality. The 10.2 software upgrade for existing IFD540 and IFD440 units is available for download directly from the Avidyne website at no charge. Optionally, the software is available on a USB memory stick for \$150 from Avidyne. Costs do not include dealer labor to upgrade existing systems. Pricing for IFD models with synthetic vision starts at \$9,499.

## Esterline CMC Electronics

Esterline Corp.'s latest cockpit avionics displays include a new overhead panel



with touch-screen technology for the Gulfstream G500/G600 — the first of its kind — as well as Mason primary and secondary flight controls.

The Montreal-based company's utility control system touch-screen display technology is part of the Korry line of cockpit controls and displays, and is the first touch-screen control for overhead panels in civilian aviation. It replaces a number of separate display and switching components, while increasing flexibility and reliability. After pioneering this application for the business jet market, Esterline is making the technology available in a format easily adapted to a wider range of aircraft.

Meanwhile, Esterline's new CMA-6024 GPS sensor is a satellite-based augmentation system and ground-based augmentation system (SBAS/GBAS) CAT-I/II/III precision approach system. The sensor is an upgrade to the existing CMA-5024, with an embedded VHF data broadcast (VDB) receiver. It is also fully compliant with ADS-B and required navigation performance (RNP).

Moreover, according to CMC, the CMA-6024 is a plug-and-play, stand-alone unit requiring no specialized installation or integration support. It's available for forward-fit installation or as a retrofit, occupying the same space as the CMA-5024 it replaces.

The company's new PilotView CMA-1310 EFB and compact CMA-1525 aircraft information server work with CMC's new CMA-1310 or other tablets to secure connectivity with aircraft systems and wireless and satcom aircraft-ground communications. It's a tool that bridges the aircraft and the outside world.

The PilotView is offered as a standard option on the Bombardier Challenger 600 series; Dassault Falcon 900, 2000, 7X and 8X; Embraer Legacy 600/650; and Boeing Next-Generation 737s and BBJs.

## FreeFlight Systems

CMD Flight Solutions, an engineering and certification company, recently obtained European Aviation Safety Agency (EASA) validation of FreeFlight Systems' AML-STC for the integration of the Waco, Texas, manufacturer's 1203C SBAS/GNSS sensor paired with Rockwell Collins TDR-94/94D transponders. The pairing is a cost-effective way to help aircraft owners meet any ADS-B mandate worldwide.



**Freeflight AML-STC**

Meanwhile, Signature TECHNICAir has purchased FreeFlight's ADS-B STC for turboprops for ADS-B compliance on Beechcraft King Air C90 models. This transfer of ownership will allow TECHNICAir to modify and enhance the STC to meet the diverse needs of the King Air fleet while also expanding the offering to include the light jet market. The



**Garmin G500H**

STC provides a fully compliant ADS-B solution to C90 operators.

## Garmin International

The G1000 NXi, Garmin's successor to its popular G1000 integrated flight deck, features wireless cockpit connectivity, wireless aviation database updates using Garmin Flight Stream, enhanced situational awareness with SurfaceWatch, visual approaches and map overlay on the horizontal situation indicator (HSI). The FAA has granted STC approval for the G1000 NXi in the King Air 200 and 300/350. EASA approval is expected later this year.

Building on the G1000's success — some 16,000 are in use worldwide — the

G1000 NXi is a faster, modernized and lighter avionics suite with expanded capabilities.

On the surface, the G1000 NXi's physical enhancements and display advancements incorporate faster processing power to support faster map rendering and smoother panning throughout the displays. The Olathe, Kansas, manufacturer says the displays initialize within seconds after start-up, providing immediate access to frequencies, flight-plan data and more. The system also incorporates contemporary animations and modernized design for improved readability. New LED backlighting increases display brightness and clarity, reduces power consumption and has improved dimming performance.

Garmin's Connex wireless cockpit

connectivity unlocks more capabilities. Available as an option, Flight Stream 510 enables Database Concierge, the wireless transfer of aviation databases from the Garmin Pilot app on a mobile device to the G1000 NXi system. Flight Stream 510 also supports two-way flight



**Garmin 5000 in Citation Longitude**



### Garmin G1000 NXi Hero

plan transfer — the sharing of traffic, weather, GPS information, backup attitude information and more — between the G1000 NXi and compatible mobile devices running Garmin Pilot or ForeFlight mobile. Garmin's D2 Bravo and D2 Bravo Titanium aviator watches even sync with the app.

G1000 NXi equipped-aircraft are rule-compliant to meet FAA and EASA ADS-B requirements. The G1000 NXi also supports the display of various ADS-B In benefits, including traffic and subscription-free weather. FIS-B weather products include: NEXRAD, METARs, TAFs, PIREPs, winds, temps, NOTAMs, AIRMETs and SIGMETs, as well as exclusive traffic features such as Garmin's patented TargetTrend and TerminalTraffic features, and many more.

For new installations, the G1000 NXi is estimated to provide a weight savings of 250 lb. or more in King Air aircraft. New G1000 NXi installations also utilize a new, fully integrated and lightweight air data and attitude heading reference system (ADAHRS), streamlining the upgrade process. Garmin reports that King Air operators with an existing G1000 system can upgrade to the G1000 NXi with minimal aircraft downtime and disruption of the panel as the displays preserve the same footprint and connector, so panel modifications are not required. New G1000 NXi installations and display upgrades all come with a two-year warranty.

### Genesys Aerosystems

MD Helicopters has selected Genesys' Integrated Display Units (IDUs) for three of its new helicopter models, the MD 902 Explorer, the MD 530G Scout Attack Helicopter and the all-new MD 6XX concept aircraft.

#### Genesys IDU 680 (left) and IDU450 PFD (below)



Meanwhile, the Mineral Wells, Texas, avionics manufacturer also joined with its Russian distributor, Heliatica, to announce validation by the Aviation Register of the Russian Federation for its FAA STC to install the Genesys HeliSAS stability augmentation system and autopilot onboard the Robinson Helicopter R44 and R66, and the Airbus Helicopters H125 family.

In addition to that validation, Heliatica also announced that it had recently completed the first HeliSAS installation on an Airbus H1300 helicopter. This work was done in cooperation with Heliswiss Iberica, a maintenance provider based in Barcelona, Spain, and a Genesys Aerosystems authorized distributor and service center.

Meanwhile, customers who purchase a new Genesys Aerosystems S-TEC 2100 digital flight control system by June 30, 2017, will receive a free (installation separate) Lynx NGT-9000 ADS-B transponder as well. The limited-time offer is meant to encourage twin-piston and turboprop aircraft owners to upgrade to an advanced digital autopilot and meet the upcoming ADS-B mandate at the same time.

Popular with operators of high-performance twins and turboprops, the S-TEC 2100's features include a solid-state three-axis digital flight control system, control wheel steering, IAS hold, GPS steering, heading preselect and hold PFD integration, altitude preselect and hold with autotrim.

The Lynx NGT-9000 touch-screen 1090ES/ADS-B transponder's features include a 978/1090 MHz dual-band receiver, L3 Lynx Tail patented flight ID, aircraft type and ground speed of other ADS-B traffic, a full-color, resistive touch-screen interface, full-color moving maps including TFRs, airports and NOTAMs, full-color graphical and textual weather displays, and a built-in WAAS/GPS requiring no external GPS connections. An embedded NextGen Active Traffic option eliminates the need for a separate box.

### Honeywell Aerospace

Operators of several major business jet types will soon have an opportunity to replace outdated Laseref II and III navigation systems with the all-digital Laseref IV ring laser gyro-based inertial reference system (IRS).

This is significant because Honeywell will soon be ending aftermarket product support for Laseref II and III, both of





## Honeywell Primus Epic in Gulfstream G500

which have been out of production for several years.

Aircraft eligible for the upgrade include the Hawker 800, 800XP and 1000; Bombardier Challenger 600, 601-3A/-3R and Global Express; Cessna Citation X; Dassault Falcon 900A/B/C/EX; and Gulfstream GIV and GV.

The Phoenix manufacturer estimates that, depending on the platform, the upgrade will reduce aircraft weight by 25-75 lb. and mean time between failures (MTBFs) will show a 30% increase, thanks to Laserref IV's demonstrated 30,000 hr. This is the fourth-generation ring laser gyro-based IRS in the lightest 4 MCU rack-mountable package. Pricing for the replacement will be announced in the near future.

Meanwhile, the new Cessna Citation Hemisphere large-cabin business jet will feature Honeywell's Primus Epic integrated cockpit system. Honeywell says its transoceanic FMS, including SmartView for lower minimums, and precision inertial reference sensors should enable Hemisphere operators to reach destinations at reduced costs. In addition, the system will provide pilots with a conformal 3-D view of the outside world to improve situational awareness in any weather. And Honeywell's Connected Aircraft feature includes satcom connectivity as well as cockpit, cabin, and maintenance apps and services.

Other Primus Epic features for the Hemisphere include a SmartView synthetic vision system (SVS), IntuVue volumetric weather radar, airport 2-D and 3-D moving maps integrated with SmartView SVS for an "out-the-window, gate-to-gate" view of the airport, RNP, advanced LED large-format, high-resolution displays, touch-screen controls, and Aspire 300 satellite communications enabling simultaneous cockpit voice and data connectivity via the Iridium satellite system for safety services.

Optional JetWave cabin satellite communications deliver high-bandwidth global connectivity for passengers.

And Honeywell is offering the latest cockpit safety technologies to Gulfstream operators to modernize their aircraft and enhance safety. STCs for enhanced features were recently received from the FAA for Gulfstream PlaneDeck cockpits on the GIV and GV. The latest suite of upgrades will increase crew situational awareness through the integration of synthetic vision with charts and maps, video capability and the XM ground-based weather displayed on PlaneDeck LCDs.

The suite of upgrades also adds TCAS symbology and XM weather information to PlaneDeck SV's enhanced moving map display as an additional overlay improving the flight crew's situational awareness. The Gulfstream GIV and GV join the GIV-SP, which was certified earlier, to be eligible for the latest cockpit upgrades.

## L3 Technologies

To better reflect the company's breadth of offerings and scale, L-3 Communications has changed its name to L3 Technologies Inc. As part of its name change, L3 changed its email and website to <http://www.L3T.com>

Headquartered in New York City, L3 employs some 38,000 people worldwide as a provider of communication and electronic systems and products used on military, homeland security and commercial platforms. The company is also a prime contractor in aerospace sys-



## L3 ACSS NXT

tems, security and detection systems, and pilot training. L3 reported 2015 sales of \$10.5 billion.

Meanwhile, ACSS, an L3 and Thales company, has developed the NXT-700, an ADS-B transponder for legacy corporate aircraft. This next-generation Mode S transponder will satisfy the DO-260B mandate for ADS-B on many legacy aircraft models. ACSS says it will reduce owner/operator costs, as well as downtime, because it is a 1/4 ATR short form-fit installation.

The NXT-700 is designed for use on the following legacy aircraft models: Hawker 125-400, -600 and -700, and Beechcraft Hawker 400 SP/Beechjet; Bombardier CL-601-3A and 3R; Cessna CitationJet, Ultra, V, VII and 550; Dassault Falcon 10, 20, 50, 200, 900 and 900B; Gulfstream IIB, III and V; IAI Westwind 1124; and Learjet 35, 35A, 36 and 36A.

The transponder's configuration is compatible with current retrofit TCAS II 7.1 systems and may be able to leverage the aircraft's existing mounting rack and connectors for quick installation. Since no additional control heads are needed, the cockpit configuration will remain the same.

## Rockwell Collins

The Cedar Rapids, Iowa-based manufacturer reports a number of recent Pro Line Fusion-related developments, including FAA certification for upgrades to King Air B200 and 350, and Citation CJ3 cockpits.

The King Air B200 series upgrade



## Rockwell Collins Pro Line Fusion for B200

provides turnkey compliance with airspace modernization deadlines and transforms the panel with the first touch-screen PFD to be certified for operational use, as well as the largest wide-screen PFDs available. Rockwell Collins is promoting the upgrade as enhancing aircraft since it involves the same icon-based, touch-screen technology found on new-production King Airs.

The avionics upgrade for King Air 350s has been expanded to include Rockwell Collins FMS navigation database updates and coverage under its Corporate Aircraft Service Program (CASP) at no additional charge for three years. Pro Line Fusion is designed to be easily updated with software upgrades, and to accommodate future technology enhancements, including the company's HGS-3500 head-up guidance system, EVS-3000 EVS and airport moving map.

Pro Line Fusion made its flying debut on the Citation CJ3 last August



**Rockwell Collins Citation CJ3 flight deck**

following implementation of the system in conjunction with Duncan Aviation. That upgrade also provides turnkey compliance with airspace modernization deadlines and transforms the panel with widescreen displays, high-resolution synthetic vision and touch-screen navigation.

The upgrades are FAA-certified and EASA-validated, and include ADS-B Out, synthetic vision, an updated FMS with localizer performance and approach procedures with vertical guidance (LPV/APV) and radius-to-fix (RF) legs, and the latest version of the Integrated Flight Information System (IFIS). Similar Pro Line 21 upgrade packages are in development for numerous other aircraft types, including Hawkers, Premiers and more.

Keys component of the Pro Line Fusion avionics system are the HGS-3500, the industry's first HGS developed for midsize and light business aircraft, and multi-spectral EVS-3000, which were certified on the Embraer Legacy 450 and Legacy 500 executive jets — the first such certification for both technologies. The systems bring transformative flight deck technology to the business aviation market segment to enhance pilot situational awareness and increased safety.

The HGS-3500 is designed with waveguide optics that couple with the Legacy 450's and 500's Pro Line Fusion avionics system. It comes standard with synthetic vision for even greater situational awareness, and can be upgraded with an enhanced vision option, enabled through the EVS-3000.

The manufacturer maintains that having synthetic and enhanced vision on the HGS sets the stage for a combined head-up vision system in the

future, which will make for a full-time, augmented view of the outside world for enhanced situational awareness and approval for lower operating minima.

## Universal Avionics

In an effort to help operators equip their aircraft for the FAA's NextGen mandate, Universal Avionics is extending three of its pricing incentive programs that had been set to expire at the end of 2016. The company's ADS-B Out incentive package program, and the SBAS-FMS upgrade incentive program for the Learjet 40/45/40XR/45XR and Citation Excel/XLS are now available through Dec. 31, 2017.

The ADS-B Out Incentive Package pairs Universal's SBAS-FMS with the



**Universal family ADS-B**

Rockwell Collins TDR-94(D) Mode S transponder to meet the upcoming NextGen ADS-B Out mandate. Unlike other standalone solutions, Universal's solution includes a TSO C146c-certified FMS, allowing operators to gain LPV as well as provide the necessary sensor requirements to meet data-link mandates like FANS 1/A+, Link 2000+ and FAA Data Comm. The Tucson, Arizona, manufacturer says it has taken a "building-block" approach to meeting mandates while adding real, long-term value to the aircraft.

Universal Avionics forward-fit FM-Ses have been featured on Learjets for

over 30 years and Citations for more than two decades. Now, those aircraft operators can trade-in their existing FMS for a significant credit toward the purchase of a new, advanced capability SBAS-FMS. SBAS approach procedures like LPV offer several benefits over traditional GPS or ILS procedures.

The NextGen SBAS-FMS upgrade incentive program provides trade-in credit for competitor FMS or GPS systems, and the technology is the foundation for PBN requirements and ADS-B Out compliance.

## On the Horizon

Avionics sales may be off temporarily, but avionics makers continue to advance the art and science of their products. The capabilities of near- and long-term forthcoming avionics underscore breakthrough advances in technology. Some examples:

► Rockwell Collins sees combined synthetic-infrared vision, blending weather information, personalized information displays, voice recognition, even pilot posture recognition as almost foregone conclusions.

► The NTSB is examining which of the many parameters recorded by flight recorders might most usefully be streamed back via satellite to ATC and flight operations.

► Teledyne Controls and GE Aviation have signed a strategic partnership that should simplify the flow of flight data off

aircraft, and expand its value through GE's cloud-based platform.

► EFBs are beginning to offer real-time updates of operational information.

► Thales sees the convergence of big data, machine learning and connectivity in industry on the near horizon. And there are plenty more examples out there.

As we detailed in last December's special report, "The Internet of Airborne Things," the interrelation and interactivity of the digital cabin, flight deck, service providers and ATC are steadily increasing. Still, all the geowizardry must be tempered with the realization that ultimately, the flight crew must be ready to demonstrate fundamental control under any circumstances because the "F" in MTBF is there for a reason. **BCA**



The ACJ logo is rendered in a large, bold, white sans-serif font against a dark blue background. The letters are closely spaced and have a slight shadow effect.

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**\*The ACJ Service Centre Network comes in addition to the Airbus worldwide support network**

The Airbus logo is displayed in a bold, white, sans-serif font. It is positioned in the bottom right corner of the image, set against a background of a city skyline at night.

VHF PANEL-MOUNT TRANSCEIVERS

Manufacturer	Model	Channels	Power Output (peak W)	Units/Weight (lb.)	Price	Remarks
	TSO	Channel Display	Power Required	Size (in.)		
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GTR 225</b>	760 w/25 kHz spacing; 2280 w/8.33 kHz spacing	10W or 16W	1/2.30	Not provided by OEM	
	C34e, C36e Class A: C40c, C128a, C169a Class 3, 4, 5, 6, C, E, H1, H2	LCD	9 - 33 V	6.25 x 1.65 x 10.4		
	<b>GNC 255</b>	760 w/25 kHz spacing; 2280 w/8.33 kHz spacing	10W or 16W	1/3.02	Not provided by OEM	
	C37c C38c	LCD	9 - 33 V	6.25 x 1.65 x 10.4		
<b>Honeywell Aerospace</b> <b>BendixKing</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>	<b>BendixKing KY 196A</b>	760	16 nominal	1/3.2	\$5,364	Active/standby frequency; stored channels; LED, 28 V.
	C37c C38c	LED	28 VDC	6.3 x 1.35 x 10.8		
	<b>BendixKing KY 197A</b>	760	10 nominal	1/3.2	\$5,323	LED, NVM
	C37c C38c	LED; nvm	14 VDC	6.3 x 1.35 x 10.8		
	<b>BendixKing KY 196B</b>	2280	18 nominal	1/3.2	\$7,298	Active/standby frequency; stored channels; LED 28 VDC.
	C37c C38c	LED; nvm	28 VDC	6.3 x 1.35 x 10.8		



## VHF PANEL-MOUNT TRANSCEIVERS

Manufacturer	Model	Channels	Power Output (peak W)	Units/Weight (lb.)	Price	Remarks
	TSO	Channel Display	Power Required	Size (in.)		
<b>Honeywell Aerospace BendixKing</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>					\$6,214	Nav/Com/GS/VR/LC CV 14V 760 freq.
	<b>BendixKing KX 165-21</b>	760 com; 200 nav	10 nominal	1/5.65		
	C37b C38c	LCD; non-volatile	28 VDC	6.25 x 2.05 x 10.16		
	<b>BendixKing KX 165A-01</b>	760 com; 200 nav	10 nominal	1/4.0	\$5,981	Nav/com, 25 kHz; 28V
	C37d; JTSO-2C37e; C38d; JTSO-2C38e	LCD; non-volatile	28 VDC	6.25 x 2.05 x 10.16		
	<b>BendixKing KX 165A-02</b>	760 com; 200 nav	10 nominal	1/4.0	\$6,015	Nav/Com, 25 and 8.33 kHz; 28V
	C37d; JTSO-2C37E; C38d; JTSO-2C38E	LCD; non-volatile	28 VDC	6.25 x 2.05 x 10.16		

## VHF REMOTE-MOUNT TRANSCEIVERS

Manufacturer	Model	Frequency Display	Xmit Power (W)	Units/Weight (lb.)	Price	Remarks
	TSO	Frequency Storage		Size or Form Factor	Power Required	
<b>Aspen Avionics</b> 5001 Indian School Rd. NE Albuquerque, NM 87110 (505) 856-5034 Fax: (505) 314-5440 <b>www.aspenavionics.com</b>	<b>ATX100</b>	978 MHz In/Out	10-40 VDC	0.95 lb.	\$3,495	Includes installation kit; single-band; meets ADS-B mandate below 18,000 ft.; ADS-B transceiver provides an ADS-B solution for aircraft equipped with a Mode A/C transponder and a WAAS GPS nav receiver.
	TSO Rule Compliant ADS-B In/Out	—		5.0 x 5.75 x 1.7	—	
	<b>ATX100G</b>	978 MHz In/Out	10-40 VDC	0.95 lb.	N/A	Includes installation kit; single-band; meets ADS-B mandate below 18,000 ft.; ADS-B transceiver provides an ADS-B solution for aircraft equipped with a Mode A/C transponder without a WAAS GPS nav receiver.
	TSO Rule Compliant ADS-B In/Out	—		5.0 x 5.75 x 1.7	—	
<b>Honeywell Aerospace BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>	<b>BendixKing KTR 908</b>	gas discharge	20	2/4.3	\$16,291	Does not include KFS 598 control head. 152 MHz and SECAL options available.
	C37c C38c	2 (9 channels); 118.0 - 151.975 MHz opt.		1.8 x 5.0 x 11.8	28 VDC	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <b>www.rockwellcollins.com</b>	<b>VHF-4000</b>	CTL-22 gas discharge	20	2/4.7	see remarks	Built-in diagnostics; compatible only with CSDB or ARINC 429 controls. Options: 001 baseline; includes CTL-22, 101 adds 8.33; includes CTL-22C, 201 adds Mode A/2 data; includes CTL-22, 301 adds 8.33 and Mode A/2 data; includes CTL-22C. Prices range from \$13,976 to \$21,892 (BCA estimate).
	C37d C38d	8 frequencies; nvm		2.5 MCU	28 VDC	
	<b>VHF-4000E</b>	CTL-22C gas discharge	20	2/4.7	\$21,892-\$26,264*	Built-in diagnostics; compatible only with CSDB or ARINC 429 controls. Options: 101 adds 118.0-151.975 + 8.33; includes CTL-22C. 301 adds Mode A/2 data; includes CTL-22C. *BCA estimate.
	C37d C38d	8 frequencies; nvm		2.5 MCU	\$21,892-\$26,264*	
	<b>VHF-4000 Transceiver</b>	gas discharge	20	24.7	\$68,620*	*BCA estimate.
		8.33/25 kHz		2/5 MCU	N/A	

## HF TRANSCEIVERS

Manufacturer	Model	Frequency Range	Xmit Power (W)	Units/Weight (lb.)	Price	Remarks
	TSO	Channels		Size or Form Factor	Power Required	
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.aerospace.honeywell.com">www.aerospace.honeywell.com</a>	<b>HF-1050</b>	2-29.999	200 PEP (SSB)	4/29.9	\$77,680	Delivers 200 W PEP transmitter power and four squelch options. "Once tuned, always tuned" coupler capability provides <20 millisecond response. PS-440 controller provides 99 user-programmable channels, clarifier functional and coupler tune status.
	C31d C32d	280,000		KRX 1053 Receiver/Exciter: 5.56 lb; 10.8 x 3.1 x 5.0  KPA 1052 Power Amplifier: 6.67 lb; 12.7 x 7.2 x 1.8  KAC antenna coupler: 9.87 lb; 13.0 x 4.7 x 9.87	28 VDC	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <a href="http://www.rockwellcollins.com">www.rockwellcollins.com</a>	<b>HF 9000 System</b>	2 - 29.9999 SSB/AM AM data	selectable power output 10.50, 175 PEP	3/27.5	\$99,980*	Fiberoptic interface; rapid-tune antenna coupler (40 millisecond computer training); BITE. Includes HF receiver/transmitter antenna coupler and radio-tuning unit. *Special order price and delivery.
	C31d C32d	280,000; 99 operator programmable; 176 ITU r/t programmed		controller: 2.625 x 5.75 x 5.85  transceiver: 7.625 x 5.55 x 12.60  antenna coupler: 7.6 x 3.8 x 13.0	28 VDC	

## HORIZONTAL SITUATION INDICATORS/COMPASS SYSTEMS

Manufacturer	Model	Gyro	Autopilot Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Slave Rate		Form Factor	Power Required	
<b>Astronautics</b> 4115 N.Teutonia Ave. Milwaukee, WI 53209-6731 (414) 449-4000 <a href="http://www.astronautics.com">www.astronautics.com</a>	Roadrunner Electronic Flight Instrument (EFI) /none	see remarks	N/A	1/ 8.0 lb. / 4.65 x 4.98 x 1.65 in. electronics unit, 5.0 x 9.67 x 6.96 in. display head	—  28 VDC <50 Watts - optional 115 VAC 400 Hz primary power	Provides an upgrade for existing HSI/ADI primary flight instruments. Capable of displaying weather, synthetic vision, terrain awareness and traffic information. interfaces with ARINC 429 input and output, differential analog, discrete interfaces, RS232 (bi-directional), synchro and resolver, direct output for TAWS aural alerts. Options include ARINC 453 and ARINC 568 inputs, and connectors matching legacy instruments. TSO approvals are planned.
	N/A	N/A		N/A	N/A	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>GI 106B</b>	—	14/28V	1/1.4	\$2,599	Course deviation indicator (CDI) with needle and glideslope.
	TSO C34e, C36e, C40c	—		3.25/3.25/4.75	—	



## HORIZONTAL SITUATION INDICATORS/COMPASS SYSTEMS

Manufacturer	Model	Gyro	Autopilot Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Slave Rate		Form Factor	Power Required	
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 (855) 250-7027 <b>www.aerospace.honeywell.com</b>	<b>KCS 55A Slaved Compass System</b>	remote/3-deg. per minute	magnetic heading	4/8	\$27,937	Includes KG 102A directional gyro, KMT 112 flux valve and KA 51B slaving unit and installation kits.
				3.375 in. x 3.375 in.	14-28 VDC	
	<b>KI 825 Color EHSI/MFD</b>	remote	extensive outputs; GPS selected discretes, EHSI-ready discretes	1/3.0	\$17,638	Integrated EHSI, AMLCD; arc mode; 360 mode; course map; interfaces with numerous navigation systems and WX500 Stormscope. Priced for a new installation and a KCM 100.
	C113, C6d, C34e, C36e, C40c, C11a	—		3 ATI	14 - 28 VDC	
<b>Sandel Avionics</b> 2401 Dogwood Way Vista, CA 92081 (877) 726-3357 (760) 727-4900 Fax: (760) 727-4899 <b>www.sandel.com</b>	<b>SN3500 Primary Navigation Display</b>	remote	N/A	1/2.9	\$14,113	3-ATI Primary Navigation Display. Sunlight readable LED backlit display with 180 degree viewing angle and over 10,000 hour MTBF. Combines HSI, RMI, color moving map and other features. Accepts synchro, stepper motor and ARINC 429 gyro inputs. Designed to work with a wide variety of digital and analog NAV, GPS/WAAS, DME, ADF and marker beacon receivers. Built-in LNAV roll-steering interface. Compatible with the WX-500 Stormscope. TACAN interface available. Optional interfaces for traffic (\$980), WSI datalink weather (\$980), Reversionary Attitude (\$980). High-vibration version \$17,714. NVIS compatible version \$21,895.
	C113, C6d, C34e, C35d, C36e, C40e, C41d, C118, C119B	N/A		3 ATI	11-33 VDC; 33 W	
	<b>SN4500 Primary Navigation Display</b>	remote		1/3.5	\$20,950	
	C113, C6d, C34e, C36e, C40e, C41D, C118, C119B	N/A	analog	4 ATI	22-33 VDC; 40 W	4-ATI Primary Navigation Display. Sunlight readable LED backlit display with 180 degree viewing angle and over 10,000 hour MTBF. Combines HSI, RMI, color moving map and other features. Accepts synchro, stepper motor and ARINC 429 gyro inputs. Designed to work with a wide variety of digital and analog NAV, GPS/WAAS, DME, ADF and marker beacon receivers. Built-in LNAV roll-steering interface. Compatible with the WX-500 Stormscope. TACAN interface available. Optional interfaces for traffic (\$980), WSI datalink weather (\$980), Reversionary Attitude (\$980). High-vibration version \$23,800. NVIS compatible version \$27,050.

## AUTOMATIC DIRECTION FINDERS

Manufacturer	Model	Frequencies	Nav Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Frequency Storage		Size or Form Factor	Power Required	
		Display				
<b>Honeywell Aerospace BendixKing</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>	<b>Bendix/King KR 87</b>	200-1799 kHz	analog	1/6.7 P/M	\$5,395	Times flight and approaches; slaved indicator and RMIs available as options. Includes KA 44B antenna.
	C41c	nvm gas discharge		6.25 x 1.3 x 11.23	11-33 VDC	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <b>www.rockwellcollins.com</b>	<b>ADF-4000</b>	190-1799 kHz 2182 kHz emergency freq.	CSDB ARINC 429	3/6.4	\$18,272*	Built-in diagnostics; compatible only with CSDB or ARINC 429 controls; digital signal processing; dual antenna optional. Includes ANT-462A. *Dual system, \$36,728.
	C41d	6 frequencies; nvm		2 MCU	28 VDC	
		gas discharge				

## NAVIGATION RECEIVERS (PANEL- AND REMOTE-MOUNT)

Manufacturer	Model	Channel Display	Nav Outputs	Units/Weight (lb)	Price	Remarks
	TSO	Channel Storage	GS/MB	Size or Form Factor	Power Required	
<b>Honeywell Aerospace</b> <b>BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>BendixKing KNR 634A</b>	gas discharge	ARINC 429 CDI, HSI, RMI	2/6.5	\$42,317	Synchro-interface KNI 582 RMI optional. Digital display of active/standby frequencies.
	C40a, C36c, C34c, C35d	2 nav; nvm	—	3.0 x 5.0 x 10.0	28 VDC	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>GNC 255</b>	LCD	ARINC 429	1/3.02	\$4,495	10W or 16W comm and 200 channel nav with VOR/LOC and G/S receiver.
	C34e, C36e Class A; C40c, C128a, C169a Class 3, 4, 5, 6, C, E, H1, H2	Recall of frequency from database by facility name and type. Stores/recalls 15 user defined frequencies. Stores/recalls previous 20 frequencies used	CDI/HSI/EHSI/EFIS	6.25 x 1.65 x 10.4	9 - 33V	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <a href="http://www.rockwellcollins.com">www.rockwellcollins.com</a>	<b>VIR-4000</b>	CTL-32 gas discharge	CSDB ARINC 429	2/3.9	See remarks	Special order item and pricing. Combines ADF and VOR/ILS/MKR receivers in a single package. Internal diagnostics capability.
	C34e, C36e, C40c, C35d	6 frequencies; nvm	NA	2.5 MCU	28 VDC	
	<b>NAV-4500</b>	CTL-32 gas discharge	CSDB ARINC 429	2/4.1	\$23,560*	Built-in diagnostics; compatible only with CSDB or ARINC 429 controls; digital signal processing; includes CTL-32 (\$4,904); meets Eurocontrol FM immunity standards only. RTU 4200, \$23,880. *BCA estimate.
	C34e, C36e, C40c, C35d	6 frequencies; nvm	NA	2.5 MCU	28 VDC	
	<b>NAV-4000</b>	CTL-32 gas discharge	CSDB ARINC 429	2/4.7	\$32,532*	Built-in ADF; built-in diagnostics; compatible only with CSDB or ARINC 429 controls; digital signal processing; Eurocontrol FM immunity standards.*Configuration will determine price.
	C34e, C36e, C40c, C35d, C41d	6 frequencies; nvm	NA	2.5 MCU	28 VDC	

## DISTANCE MEASURING EQUIPMENT

Manufacturer	Model	Channel Display	Nav Outputs	Units/Weight (lb.)	Price	Remarks
	TSO		Power Outputs (peak W)	Size or Form Factor	Power Required	
<b>Honeywell Aerospace</b> <b>BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>BendixKing KN62A</b>	gas discharge	serial data	1/2.6 P/M	\$8,617	Includes antenna and installation kit; accepts remote channeling. Distance accuracy: ±0.1 nm nominal to 99 nm, ±1.0 nm, 100 to 389 nm.
	—		100	6.3 x 1.3 x 12.3	11-33 VDC	
	<b>BendixKing KN63</b>	gas discharge	serial data	2/3.6	\$13,760	Includes KDI 572 indicator, optional slaved indicator. Distance accuracy: ±0.1 nm nominal to 99 nm, ±1.0 nm, 100 to 389 nm.
	C66a		100	6.5 x 1.1 x 11.55	11-33 VDC	
	<b>BendixKing KDM 706A</b>	gas discharge, slaved indicators	ARINC 429 ARINC 568	2/6.3	\$24,093	Includes KDI 572 indicator; optional slaved indicator; kits/mounts not included.
C66b	250		3.0 x 5.25 x 12.8	28 VDC		
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <a href="http://www.rockwellcollins.com">www.rockwellcollins.com</a>	<b>DME-4000</b>	gas discharge	CSDB ARINC 429	2/4.4	\$20,100*	Tracks three channels simultaneously when linked to CTL-32, IND-42; decodes and displays station ident; digital signal processing; echo monitor; built-in diagnostics; includes IND-42. *BCA estimate.
	C66c		300	2.5 MCU	28 VDC	



LONG-RANGE NAV/COMS

Manufacturer	Model	Inputs	Units/Weight (lb.)	Price	Remarks
	System Type	Outputs	Size or Form Factor	Power Required	
	TSO				
<b>Avidyne</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 (800) AVIDYNE Fax: (781) 402-7599 <a href="http://www.avidyne.com">www.avidyne.com</a>	<b>IFD 550</b>	VHF Com; VOR-LOC-ILS; GPS; SBAS-WAAS, Attitude, WiFi, Bluetooth	1/8.5	\$21,999	FMS/GPS/NAV/COM system with integrated Attitude Reference Sensor (ARS). Egocentric and Exocentric Synthetic Vision capability. Designed as a drop-in replacement for the GNS530/W series navigators, but with a larger display and touch-screen interface. 5.7-in. VGA (640 x 480) LED. 16 channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flightplans. Includes Forward Looking Terrain Alerting (FLTA), Includes built In Bluetooth/WiFi capability. Optional TAWS-B, \$7,995; optional 16 W VHF transceiver, \$4,995 (28vdc aircraft only). Optional RS-170 Video input (\$1,499). Optional Wx Radar Interface -BendixKing RDR2000/2100 (\$3,999). Release 10.2 Software Upgrade for existing IFD540 and IFD440 units is available for download directly from the Avidyne website at no charge. Optionally, the software is available on USB memory stick for \$150 from Avidyne. Costs do not include dealer labor to upgrade existing systems. All new-production IFD 5-Series and 4-Series models are available now and will begin shipping immediately with R10.2 functionality.
	GPS receiver with WASS (SBAS) capability, VOR/ILS/ LOC receiver, VHF com, ARS				
	C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a	--	4.60 x 6.3 x 11.0	11-33 VDC 10-watt VHF Com (16-watt option available)	
	<b>IFD545</b>	GPS; SBAS-WAAS	2.66 x 6.3 x 11.0	\$19,999	FMS/GPS Navigator with integrated Attitude Reference Sensor (ARS). Egocentric and Exocentric Synthetic Vision capability. Designed as a drop-in replacement for GNS500 navigators. 16 channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flightplans. Includes Forward Looking Terrain Alerting (FLTA). Includes built In Bluetooth/WiFi capability. Optional TAWS-B, \$7,995; optional 16 W VHF transceiver, \$4,995 (28vdc aircraft only).
GPS receiver with WASS (SBAS) capability, VOR/ILS/ LOC receiver, ARS	--		11-33 VDC		
C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a					
	<b>IFD 540</b>	VHF Com; VOR-LOC-ILS; GPS SBAS-WAAS	1/8.5	\$15,999	FMS/GPS/NAV/COM system. Also designed as a drop-in replacement for the GNS530 and 530W navigators but with a larger display and touchscreen interface. 5.7-in. VGA (640 x 480) LED. 16-channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flight plans. Includes Forward Looking Terrain Alerting (FLTA) and built-in Bluetooth/Wi-Fi capability. Optional certified TAWS-B, \$7,995; optional 16 W VHF transceiver, \$4,995 (28VDC aircraft only).
GPS receiver with WASS (SBAS) capability, VOR/ILS/LOC receiver, VHF com	—	4.60 x 6.3 x 11.0	11-33 VDC 10W VHF Com (16W option available)		
C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a					
	<b>IFD 510</b>	GPS; SBAS-WAAS	1/8.0	\$15,995	FMS GPS Navigator. Also designed as a drop-in replacement for GNS500 navigators. 16-channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flight plans. Includes Forward Looking Terrain Alerting (FLTA) and built-in Bluetooth/Wi-Fi capability. Optional certified TAWS-B, \$7,995; optional 16 W VHF transceiver, \$4,995 (28VDC aircraft only).
GPS receiver with WASS (SBAS) capability, VOR/ILS/LOC receiver	—	2.66 x 6.3 x 11.0	11-33 VDC		
C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a					

LONG-RANGE NAV/COMS

Manufacturer	Model	Inputs	Units/Weight (lb.)	Remarks
	System Type		Size or Form Factor	
	TSO	Outputs		
<b>Avidyne</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 (800) AVIDYNE Fax: (781) 402-7599 <a href="http://www.avidyne.com">www.avidyne.com</a>	<b>IFD 410</b>	GPS; SBAS-WAAS	1/6.0	FMS GPS Navigator. Also designed as a drop-in replacement for GNS400 navigators. 16-channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flightplans. Optional Blue-tooth and WIFI capability \$1,300. Optional Forward-Looking Terrain Alerting (FLTA) \$1,300 (\$2,000 for both) Optional certified TAWS-B \$7,995; optional 16 W VHF transceiver, \$4,995 (28VDC aircraft only).
	GPS receiver with WASS (SBAS) capability, VOR/ILS/LOC receive			
	C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a	—	2.66 x 6.3 x 11.0	
<b>Esterline CMC Electronics</b> 600 Dr. Frederik Philips Blvd. Montreal, Quebec Canada H4M 2S9 (514) 748-3184 Fax: (514) 748-3100 <a href="http://www.cmcelectronics.ca">www.cmcelectronics.ca</a>	<b>CMA-5024</b>	ARINC 429 (complies with ARINC 743B/ARINC 429)	1/5.5	Certified SBAS/LPV receiver, Certified SBAS/LPV receiver, fully compliant as an ADS-B and RNP navigation source; provides LP/LPV and SBAS LNAV/VNAV, growth to GBAS with built-in VDB currently in development, LPV/GBAS stand-alone approach capability with CMA-5025 control head, Options include: Have Quick and Doppler velocity radar emulation, meets or exceeds all FAR Part 25 requirements, operation from -55c to +70C.
	GPS receiver with SBAS and LPV			
	C145c Beta-3 C146c Delta-4	ARINC 429	9.5 x 8.5 x 2.5	
	CMA-3024 GPS Receiver	ARINC 429	1/5.5	Low cost certified SBAS Receiver, fully compliant as an ADS-B and RNP navigation source. Extremely reliable, MTBF > 48,000 hrs. Meets and exceeds all Part 25 requirements.
	C145b Beta -3	ARINC 429	9.5 x 8.5 x 2.5	
<b>Garmin</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: ((913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>GNC 255</b>	RS-232	1/3.02	10W or 16W com and 200 channel nav with VOR/Localizer and Guideslope receiver
	VOR/ILS/LOC receiver, VHF com			
	C34e, C36e Class A, C40c, C128a, C169a Class 3, 4, 5, 6, C, E, H1, H2	ARINC 429, RS-232	6.25 x 1.65 x 10.4	
	<b>GTN 750</b>	HSDB, ARINC 429, ARINC 453/708, RS-232, RS-422	1/9.3	Fully integrated GPS/NAV/COM/MFD system. The unit's 6-in. high touchscreen provides access to high-resolution terrain mapping, graphical flight planning, geo-referenced charting, traffic display, multiple weather options, connectivity and more.
VOR/ILS/LOC receiver, VHF com				
C34e, C35d Class A; C36e Class A, C40c, C63d Class BC, C74d Class A, C110a, C112c, C113 Class I, II, C118, C128a, C139, C146c Class 3, C147; among others	HSDB, ARINC 429, RS-232, RS-422	6.25 x 6.00 x 11.25		
	<b>GTN 650</b>	HSDB, ARNC 429, ARINC 453/708, RS-232, RS-422	1/7.0	Full integrated system combines GPS, COM and NAV functions with MFD capabilities.
VOR/ILS/LOC receiver, VHF com				
C34e, C36e Class A, C40c, C74d Class A, C110a, C112c, C113 Class I, II, III, C118, C128a, C146c Class 3, among others	HSDB, ARINC 429	6.25 x 2.65 x 11.25		
	<b>GSR 56</b>	RS-232	1/2.51	The GSR 56 gives access to on-demand global weather information and text/voice communication through the Iridium satellite network.
	Iridium weather datalink, text/voice communications	RS-232	2.08 x 6.96 x 12.96	TSO: 139



LONG-RANGE NAV/COMS

Manufacturer	Model	Inputs	Units/Weight (lb.)	Price	Remarks
	System Type	Outputs	Size or Form Factor	Power Required	
	TSO				
<b>Avidyne</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 (800) AVIDYNE Fax: (781) 402-7599 <b>www.avidyne.com</b>	<b>IFD 440</b>	VHF com; VOR-LOC-ILS; GPS; SBAS-WAAS	1/6.6	\$11,999	FMS/GPS/NAV/COM system. Also designed as a drop-in replacement for the GNS430 and 430W navigators but with a larger display and touchscreen interface. 16-channel GPS/SBAS receiver with 1,000 user-defined waypoints/99 flight plans. Optional Bluetooth and Wi-Fi capability \$1,300. Optional Forward-Looking Terrain Alerting (FLTA), \$1,300 (\$2,000 for both). Optional certified TAWS-B \$7,995. Optional 16 W VHF transceiver, \$4,995 (28VDC aircraft only).
	GPS receiver with WASS (SBAS) capability, VOR/ILS/LOC receiver, VHF com	—	2.66 x 6.3 x 11.0	11-33 VDC 10W VHF Com (16W option)	
	C34e, C36e, C40c, C110a, C113, C118, C146c, C147, C151b, C157, C165, C169a				
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <b>www.honeywell.com</b>	<b>Laseref IV</b>	ARINC 419/429	2/16.9	\$265,361*	All digital; 4 MCU, ARINC 704. *BCA estimate.
	Laser Gyro IRS	ARINC 429/ASCB	4.9 x 7.6 x 13.1	28 VDC or 115 VAC	
	C4c, C5e, C6d				
	<b>Laseref VI Micro IRS</b>	ARINC 429	2/3.2	\$355,992*	Laseref VI Inertial Reference Unit with updated microprocessor, on-aircraft data load capability; HIGH Step II software for 100% available RNP. *BCA estimate.
	Laser Gyro IRS	ARINC 429	6.5 x 6.4 x 6.4	28 VDC	
	C4c, C5e, C6d, C129a				
	<b>AH-1000 Attitude Header Reference Unit</b>	ARINC 429 and discrete I/O	2/3.2	\$33,334*	
	MEMS AHRS	ARINC 429	2.5 x 5.0 x 7.8	28 VDC	AH-1000 is a Microelectromechanical System (MEMS) attitude and heading reference system (AHRS) designed to serve as the AHRS for commercial aerospace primary and secondary attitude and heading systems. *BCA estimate.
C3e, C4c, C5f, C6e (ETSO C3d, C4c, C5e, C6e)					
KTR 2280 Multi-Mode Digital Radio C37d, C38d, C40c, C36e, C34e, C41d		ARINC 429 Interface	—	—	Functionality consists of a VHF communication transceiver that can monitor two frequencies simultaneously, a VHF navigation receiver and an ADF receiver is an option enabled via software.
			—	27.5 VDC	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <b>www.rockwellcollins.com</b>	<b>NxtLink ICS-120A Satcom Terminal</b>	ARINC 429; audio tip/ring; audio 4 wire; RS-232; Discretes: RF, USB; maintenance port; remote SIM and configuration	Single 2 MCU rack/6.3 lb.	\$38,022	Dual-transceiver device that combines a single channel of global voice and 2400 bps data service with a second Short Burst Data (SBD) channel in a single 2MCU LRU. The system provides the flight crew with an exclusive global voice channel and a dedicated data link channel to support ACARS, FANS messaging, ADS-C and CPDLC.
			15.98 x 2.33 x 7.75	28 VDC	
	<b>NxtLink ICS-220A Satcom Terminal</b>	ARINC 429; audio tip/ring; audio 4 wire; RS-232; Discretes: RF, USB; maintenance port; remote SIM and configuration	Single 2 MCU rack/6.3 lb.	\$48,714	
			15.98 x 2.33 x 7.75	28 VC	
<b>GPS-4000S</b> GPS receiver w SBAS (WAAS) capability C145A Class Beta-3		ARINC 429 (complies with ARINC 743A)	N/A	\$32,576*	*BCA estimate.
		ARINC 429	2 MCU	28 VDC	

TRANSPONDERS

Manufacturer	Model	Modes	Units/Weight (lb.)	Price	Remarks
	TSO	Power Output (W)	Size or Form Factor	Power Required	
<b>ACSS, an L3 and Thales Company</b> 19810 N. 7th Ave. Phoenix, AZ 85027 (623) 445-7001 Fax: (623) 445-7000 <b>www.acss.com</b>	<b>Mode S RCZ-852</b>	TCAS/Mode S/Fit ID control panel; RMU (Primus II radios)	5.0	\$78,409	Elementary and Enhanced Surveillance (ELS/EHS) and DO 260 compliant. Certified on many regional and business jets.
	C112	CTL92A/T/E	3.4 x 4.1 x 14.01	28 VDC	
	<b>Mode S ATDL XS-950</b>	TCAS/Mode S/Fit ID control panel; CTL92A/T/E	1/11.5	\$99,474	DO-260B and DO-181E compliant. Elementary and enhanced surveillance (ELLS/EHS).
	C112		4 MCU	28 VDC	
	<b>NTX-600 Mode S</b>	TCAS/Mode S/Fit ID; control panel; RMU (Primus II radios)	1/5.0	\$51,418	DO-260B and DO-181E compliant. Elementary and Enhanced Surveillance (ELS/EHS). Selected for the Bombardier Q400.
	C112d, C116b	115 VAC, 400 Hz or 28 VDC	3.4 x 4.1 14.01	NA	
	NXT-700	TCAS/Mode S/Fit ID; control panel	5.5	\$38,975	DO-2608 compliant; Elementary and Enhanced surveillance (ELS/EHS)
	C112d, C166b	500w max, 250W min	1/2 ATR Short	N/A	
	<b>NXT-800 Mode S</b>	TCAS/Mode S/Fit ID; control panel	1/8.6 (AC); 7.8 lb. (DC)	\$101,900	
	C112d, C166b	115 VAC, 400 Hz or 28 VDC	4 MCU	NA	
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 (800) AVIDYNE Info: (781) 402-7599 Info @avidyne.com <b>www.avidyne.com</b>	<b>AXP340</b>	Mode A/C/S with extended squitter; ADS-B OUT	1/2.98	N/A	Panel-mounted Class 1 Mode S Level 2 data-link transponder, with 1090 MHz Extended Squitter (ES). Meets requirements for Mode S elementary surveillance transponders. Slide-in replacement for existing KT76A/KT78A transponders. Designed to upgrade existing Mode A/C equipment to Mode S, while adding additional functionality such as direct-entry numeric keypad, pressure altitude and GPS Lat/Long readout, Flight ID entry, one-touch VFR code entry, a stopwatch timer/flight timer, and altitude alerter. Supports the latest Version 2 1090 MHz Automatic Dependent Surveillance Broadcast (ADS-B) Extended Squitter (ADS-B out).
	C166b, ETSO 2C112b, ETSO C166b	240	6.3 x 1.57 x 9.4	10 -33 VDC	
	<b>AXP322</b>	Remote-mounted Mode A/C/S with extended squitter; TIS & ADS-B OUT	1/0.97	\$2,999	Remote-mounted Class 1 Mode S Level 2 data-link transponder, with 1090 MHz Extended Squitter (ES). Meets requirements for Mode S elementary surveillance transponders and supports legacy Traffic Information Service (TIS). Supports the latest Version 2 1090 MHz Automatic Dependent Surveillance Broadcast (ADS-B) Extended Squitter (ADS-B out). Designed to work with Avidyne's panel-mounted IFD540 & IFD440 panel-mounted FMS/GPS/NAV/COMs for display and control.
	ETSOC112b, ETSO C166a, FAA TSO C112c, C166b	250	2.68 x 1.90 x 6.30	10-33 VDC	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GTX 327</b>	A, C	1/3.1	\$2,036	IFR-certified panel-mounted Mode C transponder.
	C74c Class 1A	200	6.25 x 1.65 x 8.73	11-33 VDC	
	<b>GTX 330 ES</b>	A, C, S, ES	1/4.2	\$8,636	IFR-certified panel-mounted Mode C transponder with ADS-B compliant ES capability.
	C112d Level 2ens Class 1, C 166b Class B1S	250	6.25 x 1.65 x 11.25	11-22 VDC	
	<b>GTX 3000</b>	A, C, S, ES	1/5.2	\$24,226	The GTX 3000 Mode S ES remote transponder features ADS-B OUT transmission and TCAS II/ACAS II compatibility.
	C112d Level 2adens, Class 1c, C166b Class B1	250 minimum, 300 nominal	2.58 x 6.47 x 10.94	14-28 VDC	

TRANSPONDERS

Manufacturer	Model	Modes	Units/Weight (lb.)	Price	Remarks
	TSO	Power Output (W)	Size or Form Factor	Power Required	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 www.garmin.com	<b>GTX 335</b>	A, C, S, ES	1/2.83	\$2,995	IFR-certified 250W panel-mounted Mode S transponder with ADS-B compliant ES capability.
	TSO-C88b, TSO-C112e Level 2es Class 1	250	6.25 x 1.65 x 10.07	9-33V	
	<b>GTX 335 w/GPS</b>	A, C, S, ES	1/2.94	\$3,795	IFR-certified 250W panel-mounted Mode S transponder with ADS-B compliant ES capability and built-in WAAS.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C145d Class B2	250	6.25x 1.65 x 10.07	9-33V	
	<b>GTX 335R</b>	A, C, S, ES	1/2.5	\$2,995	IFR-certified 250W remote-mounted Mode S transponder with ADS-B compliant ES capability.
	TSO-C88b, TSO-C112e Level 2es Class 1	250	6.25 x 1.65 x 10.07	9-33V	
	<b>GTX 335R w/GPS</b>	A, C, S, ES	1/2.6	\$3,795	IFR-certified 250W remote-mounted Mode S transponder with ADS-B compliant ES capability and built-in WAAS.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C145d Class B2	250	6.25 x 1.65 x 10.07	9-33V	
	<b>GTX 345</b>	A, C, S, ES	1/3.09	\$4,995	IFR-certified 250W panel-mounted Mode S transponder with ADS-B compliant ES capability and ADS-B In benefits.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C154c Class A1S, TSO-C157a Class 1, TSO-C166b Class A1S/B1S, TSO-C195a Class C1, C2, C3, C4	250	6.25 x 1.65 x 10.07	9-33V	



TRANSPONDERS

Manufacturer	Model	Modes	Units/Weight (lb.)	Price	Remarks
	TSO	Power Output (W)	Size or Form Factor	Power Required	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GTX 345 w/GPS</b>	A, C, S, ES	1/3.20	\$5,795	IFR-certified 250W panel-mounted Mode S transponder with ADS-B compliant ES capability, built-in WAAS and ADS-B In benefits.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C145d Class B2, TSO-C154c Class A1S, TSO-C157a Class 1, TSO-C166b Class A1S/B1S, TSO-C195a Class C1, C2, C3, C4	250	6.25 x 1.65 x 10.07	9-33V	
	<b>GTX 345R</b>	A, C, S, ES	1/2.8	\$4,995	IFR-certified 250W remote-mounted Mode S transponder with ADS-B compliant ES capability and ADS-B In benefits.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C154c Class A1S, TSO-C157a Class 1, TSO-C166b Class A1S/B1S, TSO-C195a Class C1, C2, C3, C4	250	6.25 x 1.65 x 10.07	9-33V	
	<b>GTX 345R w/GPS</b>	A, C, S, ES	1/2.9	\$5,795	IFR-certified 250W remote-mounted Mode S transponder with ADS-B compliant ES capability, built-in WAAS, and ADS-B In benefits.
	TSO-C88b, TSO-C112e Level 2es Class 1, TSO-C145d Class B2, TSO-C154c Class A1S, TSO-C157a Class 1, TSO-C166b Class A1S/B1S, TSO-C195a Class C1, C2, C3, C4	250	6.25 x 1.65 x 10.07	9-33V	
<b>Honeywell Aerospace BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>	<b>BendixKing KT 74</b>	NA	1/2.8	\$3,278	Mode S ADS-B capable.
	ETSO C112d, ETSO C166b, TSO C112d and TSO C166b	240 W nominal; 125 W minimum	1.7 x 6.30 x 10.7	11 or 33 VDC	
	<b>BendixKing KT 76A</b>	A, C	1/3.1	\$2,265	Automatic reply-light dimmer; system test; remote ident capability adapter available.
	C47c; Class 1B	250	6.25 x 1.6 x 10.0	14 or 28 VDC	
	<b>BendixKing KT 76C</b>	A, C	1/3.1	\$3,278	Slide-in replacement for KT 76A. Programmable VFR code; remote ident capability; gas-discharge digital display; pushbutton code entry.
	C47c	250	6.25 x 1.63 x 10.73	11-33 VDC	
	<b>BendixKing KT 73</b>	A, C, S, TIS	1/3.6	\$6,719	Mode S data link with TIS. Meets European Elementary Surveillance mandate (non-diversity).
	C112	200	6.25 x 1.63 x 10.82	10-32 VDC	
	<b>BendixKing MST 67A</b>	A, C, S	2/8.5	\$46,143	Mode S diversity transponder.
	C37c/C38c C74c; Class 3A	250-625	14.0 x 3.0 x 8.9	115 VAC; 400 Hz	

TRANSPONDERS

Manufacturer	Model	Modes	Units/Weight (lb.)	Price	Remarks
	TSO	Power Output (W)	Size or Form Factor	Power Required	
<b>L-3 Aviation Products</b> 5353 52nd St. SE Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 977-6898 <b>www.L-3Lynx.com</b>	<b>Lynx NGT-9000</b>	A, C, S, ADS-B	1/2.96	\$5,495	Touchscreen ADS-B transponder and MFD display. 1090ES (Mode s ES) ADS-B Out, 1090 MHz and 978 MHz (UAT) ADS-B In. ADS-B traffic (1090 and 978 ADS-B, ADS-R and TIS-B) and 978 FIS-B input. WiFi interface module available for connectivity to PED (iPad). Embedded rule compliant position source (WAAS GPS). Embedded options include Class B TAWS and ADS-B aural traffic alerting for the verbal positioning of traffic conflicts.
	C112d, C113a, C145c, C147, C154c, C157a, C166b, C195a	25W minimum/250W maximum	1.8 x x 6.25	14 or 28 VDC	
	<b>Lynx NGT-9000+</b>	A, C, S, ADS-B	1/2.96	\$9,555	Same features as the NGT-9000, but with the added feature of the L-3 NextGen Active Traffic. Active traffic is embedded into the same LRU, requiring no separate boxes. Current SkyWatch owners can re-use existing antenna.
	C112d, C113a, C145c, C147, C154c, C157a, C166b, C195a	25W minimum/250W maximum	1.8 x x 6.25	14 or 28 VDC	
	<b>Lynx NGT-9000D</b>	A, C, S, ADS-B	1/2.96	\$6,915	Same features as NGT-9000 but with Antenna Diversity for the top and bottom of the aircraft.
	C112d, C113a, C145c, C147, C154c, C157a, C166b, C195a	25W minimum/250W maximum	1.8 x 6.25	14 or 28 VDC	
	<b>Lynx NGT-9000D+</b>	A, C, S, ADS-B	1/2.96	\$10,935	Same features as NGT-9000, but with the added feature of the L-3 NextGen Active Traffic and Antenna Diversity.
	C112d, C113a, C145c, C147, C154c, C157a, C166b, C195a	25W minimum/250W maximum	1.8 x 6.25	14 or 28 VDC	
	<b>Lynx NGT-9000R</b>	A, C, S, ADS-B	1/2.96	\$5,445	Remote version of the NGT-9000 that integrates and is controlled by newer aircraft outfitted with glass panels.
	C112d, C113a, C145c, C147, C154c, C157a, C166b, C195a	25W minimum/250W maximum	1.8 x 6.25		
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <b>www.rockwellcollins.com</b>	<b>TDR-94D</b>	S	2/8.5	\$56,656	Mode S transponder; DO-260B ADS-B Out compliant. European Elementary and Enhanced Surveillance compliant. Compatible with TCAS II Change 6.04, Change 7.0 and Change 7.1 systems. TDR-94 transponder also available for non-diversity applications. Flight ID capable CTL-92E controller available
	C112; Class 3A	250-625	4.9 x 3.3 x 12.5	28 VDC	

WEATHER RADAR

Manufacturer	Model	Ranges	Dish Size & Beam Width (in./deg.)	Scan	Stablztn.	Display Interface	Scope (dia./in.)	Units/Weight	Price	Remarks
	TSO			Pulse Width	Stabl. Sig.					
	Circuits	Power Output (Peak KW)		Looks/Min.	Ant. Tilt	Colors	Indicator Size	RT. Size	Power	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GWX 70</b>	Selectable: 2.5, 5, 10, 20, 40, 60, 80, 100, 120, 160, 240, and 320 nm (HSDB interface)	10/9.0 12/7.8 18/5.6	20, 40, 60, 90, or 120 (HSDB interface); 20 or 120 (ARINC interface)	±30°	HSDB ARINC 429/453	NA	10 in. - 9.3 12-in. - 9.5 18-in. - 11.0	\$21,995	Designed for use in a variety of aircraft. Available antenna sizes include 10, 12, and 18 in. Circuits: horizontal and vertical scan; tile, bearing, sector san, gain, stabilization, ex attenuated color highlight, alt. compensated tile and ground clutter suppression control; turbulence detection.
	C63D Class B and C	2.5, 5, 10, 20, 40, 80, 160 and 320 nm (ARINC interface)		1.6, 3.2, 6.4 or 13.6	—					
	See remarks	40 W nominal		12 (Range 20 nm or below) 9 (Range 20 nm or above)	±15°					
	<b>GWX 70R</b>	Selectable: 2.5, 5, 10, 20, 40, 60, 80, 100, 120, 160, 240, and 320 nm (HSDB interface)	10/9.0 12/7.8 18/5.6	20, 40, 60, 90, or 120 (HSDB interface); 20 or 120 (ARINC interface)	±30°	HSDB ARINC 429/453	NA	10 in. - 9.3 12-in. - 9.5 18-in. - 11.0	\$21,995	Designed for use in a variety of aircraft. Available antenna sizes include 10, 12, and 18 in. Circuits: horizontal and vertical scan; tile, bearing, sector san, gain, stabilization, ex attenuated color highlight, alt. compensated tile and ground clutter suppression control; turbulence detection.
	C63D Class B and C	2.5, 5, 10, 20, 40, 80, 160 and 320 nm (ARINC interface)		1.6, 3.2, 6.4 or 13.6	—					
	See remarks	40 W nominal		12 (Range 20 nm or below) 9 (Range 20 nm or above)	±15°					
	<b>GWX 70H</b>	Selectable: 2.5, 5, 10, 20, 40, 60, 80, 100, 120, 160, 240, and 320 nm (HSDB interface)	10/9.0 12/7.8 18/5.6	20, 40, 60, 90, or 120 (HSDB interface); 20 or 120 (ARINC interface)	±30°	HSDB ARINC 429/453	NA	10 in. - 9.3 12-in. - 9.5 18-in. - 11.0	\$31,995	The helicopter-optimized GWX 70H combines range and adjustable scanning profiles with precision target definition for real-time weather analysis in the cockpit. The GWX 70H offers horizontal scan angles of up to 120 deg. and pilot-adjustable sector scanning from 20 deg. to 120 deg. Circuits: ; tile, bearing, sector san, gain, stabilization, ex attenuated color highlight, alt. compensated tile and ground clutter suppression control; turbulence detection.
	C63D Class B and C	2.5, 5, 10, 20, 40, 80, 160 and 320 nm (ARINC interface)		1.6, 3.2, 6.4 or 13.6	—					
	See remarks	40 W nominal		2 (Range 20 nm or below) 9 (Range 20 nm or above)	±15°					



WEATHER RADAR

Manufacturer	Model	Ranges	Dish Size & Beam Width (in./deg.)	Scan	Stablztn.	Display Interface	Scope (dia./in.)	Units/Weight	Price	Remarks
	TSO			Pulse Width	Stabl. Sig.	Colors	Indicator Size	RT. Size	Power	
	Circuits	Power Output (Peak KW)		Looks/Min.	Ant. Tilt					
<b>Honeywell Aerospace</b> <b>BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>BendixKing ADR 2000</b>	10, 20, 40, 80, 160	10/10 12/8 15	90° or 100°	30°	KMD 850 EFIS	N/A	1/9.9	\$20,799	Vertical profile feature: scans horizontally or vertically on track line selected by pilot. Alpha-numeric display of range, function and tilt angle.
	C63c	4		4	20-220 mv/det.	4	N/A	10.28 dia.	28 VDC; 10, 26, 115 VAC, 400 Hz	
	Vertical profile, ext. STC, tgt., wx alert, atten., comp., variable gain-map mode			ARINC 429	±15°					
	<b>BendixKing RDR 2100</b>	5, 10, 20, 40, 80, 160, 240, 320	12/8 10/10	90°, 100°, 120°	±30° pitch & roll	KMD 850 EFIS	N/A	1/9.9	\$21,181	Vertical profile feature: scans horizontally or vertically on track line selected by pilot; Alpha-numeric display of range, function and tilt angle. KMD 850 MFD, \$13,440.
	C63c	6.0		range dependent	20/220 mv/deg. ARINC 429	5	N/A	10.28 dia.	28 VDC; 10, 26, 115 VAC, 400 Hz	
	Vertical profile; extended STC; wx attenuation compensation; variable gain in map mode; wx alert; autotilt			15	±15°					
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.honeywell.com">www.honeywell.com</a>	<b>Primus 660</b>	2.5, 5, 10, 25, 50, 100, 200, 300	12/7.9 18/5.6	60° or 120°	±30°	ARINC 453/708 checklist, data nav, EFIS, MFD, LSZ-860	4	2/15.8	\$99,531	Single receiver/transmitter/antenna pedestal.
	C83c	10		2	50 or 200 mv/deg. or ARINC 429	4	4.81 x 6.25 x 12.24	5.0 x 7.6 x 15.0	28 VDC	
	REACT; GMAP target alert, preset & variable gain			12/24	±15°					
	<b>Primus 880</b>	2.5, 5, 10, 25, 50, 100, 200, 300	12/7.9 18/5.6 24/4	60° or 120°	±30°	ARINC 453/708 checklist, data nav, EFIS, MFD, LSZ-860	5	2/15.8	\$139,101	Single receiver/transmitter/antenna pedestal.
	C63c	10		2	50 or 200 mv/deg. or ARINC 429	5	4.8 x 6.25 x 12.24	5.0 x 7.6 x 15.0	28 VDC	
	Doppler turb. detec., compensated, tilt, REACT, GMAP target alert, preset & variable gain			12/24	±15°					
<b>Primus 700A</b>	½, 1, 2.5, 5, 10, 25, 50, 100, 200, 300	10/10, 12/7.9, 10 x 14/ 10 x 7.1, 18/5.6, 24/4	60° or 120°	±30	ARINC 429/708 checklist, data nav, EFIS, lightning sensor LSZ-860	5	4/37	\$119,703	Short-range and high-resolution system for special search and surveillance missions, displayed menus. Minimum detect range at 450 ft. Allows full dual-mode operation for pilot and copilot. Price reflects receiver/transmitter and pedestal.	
C63c	10		6	50 or 200 mv/deg. or ARINC 429	5	4.81 x 6.25 x 12.24	5.0 x 7.6 x 15.0	28 VDC; 400 Hz		
REACT; ground & sea clutter red.; turb. detect-preset & variable gain			12/24	±15°						
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.honeywell.com">www.honeywell.com</a>	<b>Primus 701A</b>	½, 1, 2.5, 5, 10, 25, 50, 100, 200, 300	10/10, 12/7.9, 10 x 14/ 10 x 7.1, 18/5.6, 24/4	60° or 120°	±30°	ARINC 429/709 checklist, data nav, EFIS, lightning sensor	5	4/39	\$125,254	Short-range and high-resolution system for special search and surveillance missions, displayed menus and AC 90-80A specified clear zones. Allows full dual-mode operation for pilot and copilot. Price reflects receiver/transmitter and pedestal.
	C63c, C102	10		6	50 or 200 mv/deg. or ARINC 429	6	4.81 x 6.25 x 12.24	5.0 x 7.6 x 15.0	28 VDC; 115 VAC, 400 Hz	
	REACT; ground clutter reduction; turbulence detect-preset & variable gain			12/24	±15°					

WEATHER RADAR

Manufacturer	Model	Ranges	Dish Size & Beam Width (in./deg.)	Scan	Stablztn.	Display Interface	Scope (dia./in.)	Units/Weight	Price	Remarks
	TSO			Pulse Width	Stabl. Sig.					
	Circuits	Power Output (Peak KW)		Looks/Min.	Ant. Tilt	Colors	Indicator Size	RT. Size	Power	
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 www.honeywell.com	IntuVue 3D weather radar RDR 4000	5 to 320 nm	30/3.2; 24/4.2; 18/5.6	Up to 90 deg/sec 1 to 275 sec uncompressed 1 to 12 compressed (Non-Linear FM)	ARINC 429	ARINC 453	N/A	RP-1 - 10.5 TR-1 - 5.1 Antenna+ Drive: 30 in. - 32.0 24 in. 24.0 18 in. 20.8 RP Size: 3 MCU	Call dealer	IntuVue radar with volumetric buffer processing, automatic ground return elimination, automatic weather mode, altitude-based manual wx mode, REACT, predictive windshear, turbulence and optional hail and lightning prediction.
	TSO C63c	40W Peak				4			28 VDC or 115 VAC 400 Hz (depending on part number)	
	See remarks									
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 www.rockwellcollins.com	RTA-4112	5-320 nm	12/7.4	±60°	stabilized to ±30 degrees in Pitch/Roll, Tilt adjustment is ±15° tilt	ARINC 708A	N/A	1/15.1	\$180,976	Price BCA estimate.
	C63c	38-75 W				3.44-55usec			—	
	—					—			—	
	RTS-4114	5-320 nm	14/6.7	±60°	stabilized to ±30 degrees in Pitch/Roll, Tilt adjustment is ±15° tilt	ARINC 708A	N/A	1/15.4	\$184,150	Price BCA estimate.
	C63c	38-75 W				3.44-55usec			—	
	—					13			—	
	RTA-4118	5-320 nm	18/5.2	±60°	stabilized to ±30 degrees in Pitch/Roll, Tilt adjustment is ±15° tilt	ARINC 708A	N/A	1/17.0	\$188,000	Price BCA estimate
	C63c	38-75 W				3.43-55usec			—	
	RTA-4218	5-320 nm	18/5.2	±60° WX modes and ±45° in PWS	stabilized to ±30 degrees in Pitch/Roll, Tilt adjustment is ±15° tilt	ARINC 708A	—	18 in	\$198,000	Price BCA estimate
	C63d	38-75 W				3.43-55usec in WX modes and 2.11-3.43usec in PWS			4	

**RADAR ALTIMETERS**

Manufacturer	Model	Alt. Range	Accuracy	Display	Units/ Weight (lb.)	Price	Remarks
	TSO	Pitch/Roll Limits				Power Required	
<b>FreeFlight Systems</b> 3700 Interstate 35 S. Waco, TX 76706 (254) 662-0000 Fax: (254) 662-9450 <b>www.freeflightsystems.com</b>	<b>RA-4000 and RA-4500</b>	-20-2,500 ft.	0 to 100 ft. ±3%. 100 to 500 ft. ±3% 500 to 2,000 ft. ±5%	RAD-40 Radar Altimeter display compatible with the RA-4000 and RA-4500	1/2.37	N/A	RA-4000 provides RS 485/422 and RS 232C outputs; RA-4500 provides ARINC 429, RS 485/422 and RS 232 outputs. Two-year warranty. Optional night vision goggle (NVG) compatible display and round faceplate adapter for display. Optional 1/2 ATI (TSO'd) RAD-40 indicator, \$3,055; when purchased with RA-4000, \$11,190. RAD-40/RA 4500 w/installation kit, \$12,699.
	C87	±20°/±30°				28 VDC	
	<b>FRA-5500</b>	-20-2,500 ft.	0 to 100 ft. ±3%. 100 to 500 ft. ±3% 500 to 2,000 ft. ±5%	RAD-40 Radar Altimeter display compatible with the RA-4000 and RA-4500	1/2.37	N/A	Provides compliance for FAR Part 29 operators who need to satisfy the Feb. 21, 2014 Final Rule (RIN 2120-AJ53) requiring installation of radar altimeters. Integrates with electronic flight information systems (EFIS, flight director(s), and integrated flight decks via available RS-232 or ARINC 429. Options include the night-vision compatible RAD-40 panel-mounted diisplay for altitude pre-select and altimeter readout, and FTG-410 Tone Generator audio alert calls for flight crew attention to critical altitudes and other aircraft conditions.
	C87	0 - 2,500 ft.				28 VDC	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GRA 55</b>	-20 - 2,550 ft. AGL	±1.5 ft. (3 - 100 ft. AGL) ±2% (>100 - 2,500 Ft. AGL)	GI 205 and/or GIFD	1/3.5	\$6,300	All-digital design. Developed for use in helicopters and general aviation aircraft.
	C87a Functional Class A ETSO-2C87 Functional Category B/L/C (A1)/A	±20°/±30°	—	—	3.02 x 3.99 x 11.62	14-28 VDC 13.75 W max	
	<b>GRA 5500</b>	-20 - 2,550 ft. AGL	±1.5 ft. (3 - 100 ft. AGL) ±2% (>100 - 2,500 Ft. AGL)	GI 205 and/or GIFD	1/3.5	\$13,3000	All-digital design. Developed for helicopter, business jet, transport category and general aviation applications. Can integrate with Class A TAWS, TCAS II or CAT II ILS avionics.
	C87a Functional Class A ETSO-2C87 Functional Category B/L/C (A1)/A	±20°/±30°	—	—	3.02 x 3.99 x 11.62	14-28 VDC 13.75 W max	



**RADAR ALTIMETERS**

Manufacturer	Model	Alt. Range	Accuracy	Display	Units/Weight (lb.)	Price	Remarks
	TSO	Pitch/Roll Limits				Power Required	
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 www.honeywell.com	<b>AA-300 Radio Altimeter System</b>	0-2,500 ft.	N/A	N/A	4.56 x 4.09 x 11.07	N/A	Pilot Activated Self Test (PAST) input available to verify system operation.
	RT300 C-87, RTCA DO-160A	N/A				21.32 VDC, 0.7 amp max	
	<b>Radar Altimeter KRA 405B</b>	0-2,500 ft.	±2 ft (0.61 m) below 100 ft., ±3% at 100 ft. to 500 ft., and ±5% at 500 to 2,500 ft.	KNI 415 / 416 5V or 28V Black or Gray 28V Black Night Vision	3.0 x 3.5 x 11.0	N/A	Internal 2,500 ft. capability for use with ground proximity systems. Used with KNI-415 or KNI-416 indicators. Used with two KA-54 or KA-54A antennas. Provides analog and ARINC 429 outputs for increased interface capability including GPWS, TCAS, autopilot. Option available with ARINC 552 auxiliary output (-0202 version) Option available that can accept DH input from EFIS or KNI-415 or KNI-416 indicator to generate audio signal (-0202 version).
	C87/ETSO-2C87	N/A				27.5 VDC	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 www.rockwellcollins.com	<b>ALT-1000</b> C87	0-2,500 ft ±40°/±50°	±2 ft or 2%	Analog only outputs*	2/6.8	\$17,988 28 VDC	*Requires separate converter for use with ARINC 429 systems.
	<b>ALT-4000</b> C87	0-2,500 ft. ±40°/±50°	±2 ft or 2%	EFIS (analog version available)	2/6.8	\$30,728 28 VDC	Interfaces to EFIS high-intensity monitor for Cat II/III certification. Includes two ANT-52 antennas.

**THUNDERSTORM DETECTION SYSTEMS**

Manufacturer	Model	Search Arc	Information Display	Display Size	Price	Remarks
	TSO	Max Range		Units/Weight	Power Required	
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01733 (781) 402-7400 Fax: (781) 402-7599 www.avidyne.com info@avidyne.com	<b>TWX670</b>	N/A	lightning strikes are displayed with range bearing and intensity (color). TWXCell mode highlights the most intense regions of thunderstorm activity, presenting a visually contoured color display with dynamic sectors.	see Avidyne MHD300, EX600, EX5000, R9, IFD540, IFD440 specifications. TWX670 has 7 RS 323 ports and is compatible for monochrome strikes on many legacy RS232-capable lightning displays.	\$11,990	Third-generation lightning detection system with digital signal processing and noise immunity. Shows lightning from 0 nm - 200 nm including critical 0 nm - 25 nm range for added tactical benefit. Eliminates radial spread associated with older technology systems. Exclusive TWXCell display provides a dynamic map of the lightning discharge rate and density.
	C110	200 nm		16-35 VDC		
<b>L3 Aviation Products</b> 5353 52nd St. SE Grand Rapids, MI 45912 (616) 949-6600 Fax: (616) 285-4224 www.L3aviationproducts.com	<b>WX-500</b>	pilot-selectable 120° & 360°	graphical depiction of real-time lightning information in cell or strike modes	see remarks 2.5	\$6,656*	Remote-mount sensor interfaces with MFDs for graphical depiction of real-time lightning information Features 360° and 120° views, selectable ranges of 25-200 nm, input for heading stabilization and options for cell or strike mode data selection. Interfaces to MFDs via RS-422. A separate radar graphics computer (Model RGC-350) is needed for display on dedicated radar indicators. *Processor only.
	C110a	200 nm		Processor: 5.6 x 2.2 12.0	11-32 VDC	
	<b>WX-1000E</b> (429 EFIS)	360°	—	depends on EFIS system	\$19,113*	Provides output on EFIS display or radar indicator when paired with RGC35C (sold separately); includes three levels of activity, bearing and distance; optional displays for checklists. *Processor only. Price BCA estimate.
	C110a	200 nm	1/6.67	10-32 VDC		
	<b>WX-1000E</b> (429 Navaid)	360°	—	3 ATI	\$19,509	ARINC 429 interface allows simultaneous display of thunderstorm info and course line to waypoints. Presentation of six user-selectable nav items. Course deviation indicator display. Consult manufacturer for approved interfaces.
	C110a	200 nm	2/10.95	10-32 VDC		

INTEGRATED FLIGHT CONTROL SYSTEMS

Manufacturer	Model	Air Data	Autopilot	Power	Weight	Price	Remarks
		Attitude Sensors	Flight Director		AP Only	AP Only	
					IFCS	IFCS	
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 (800) AVIDYNE Fax: (781) 402-7599 <a href="http://www.avidyne.com">www.avidyne.com</a> <a href="mailto:info@avidyne.com">info@avidyne.com</a>	<b>DFC 90</b>	digital ADHARS from Avidyne Entegra PFD or Aspen EFD1000 Pro	combined	28 VDC	1/2.02 NA	See remarks	Attitude-based digital autopilot interfaces with Entegra PFD or Aspen EFD Pro. Is slide-in replacement for STEC55X, using existing servos. STEC30/50/60-2/65 series autopilots may also be replaced by a DFC90. Currently certified in Cirrus, Beech Bonanza Series and Cessna 182 series. Price is \$9,995 for piston singles and \$14,995 for twins and turbine-powered aircraft.
	<b>DFC 100</b>	digital ADAHRS from Avidyne Entegra Release 9 PDF	combined	28 VDC	1/2.02 NA	\$9,995 piston singles \$14,995 twins and turbine-powered aircraft	Attitude-based digital autopilot includes Straight & Level button, Envelope Protection, and full-time Envelope Alerting. DFC100 interfaces with Entegra Release 9 Integrated Flight Deck as a slide-in replacement for STEC55X, using existing servos. Certified in Cirrus SR20/22 and Piper Matrix & Mirage with Entegra R9. Price is \$9,995 for piston singles and \$14,995 for twins and turbine-powered aircraft.
<b>Genesys Aerosystems</b> One S-TEC Way, Municipal Airport Mineral Wells, TX 76067 (817) 215-7600 <a href="http://genesys-aerosystems.com">genesys-aerosystems.com</a> <b>Formerly Cobham (S-TEC)</b>	<b>IntelliFlight DFCS</b>	digital ADAHARS	Magic EFIS N/A	14 or 28 VDC	14.5 N/A	See remarks	Designed for piston twins, turbine twins, and light jets. Features include Indicated air speed (IAS) hold; control wheel steering (CWS); GPS steering; heading preselect and hold PFD integration; altitude preselect and hold w/autotrim; digital vertical speed command.
	<b>S-TEC 5000 Digital Autopilot</b>	N/A	N/A	28 VDC	2.6 lb. /N/A	NA/NA	An RVSM-compatible system offers full capabilities of a top-tier DFCS designed for high-performance jets and turboprops. Straight and level button provides fast recovery from unusual attitudes with an annunciated alert. GPS Steering (GPSS) mode integrates the autopilot with the aircraft's GPS NAV receiver during precision approaches/missed approaches. Features include heading preselect and hold; PFD integration; altitude preselect and hold w/autotrim; digital vertical speed command; course intercept capability; dual mode - HDG/NAV and HDG/APR, VOR/LOC/GS/REV/GPS course; NAV flag warnings; control wheel steering; GPS steering (GPSS); envelope protection and alerting; autopilot mode annunciations; voice annunciations; all-axis trim control and more.
		N/A	N/A				
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (913) 397-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>GFC 700</b>	GDC 74 (B) DADC	combined	28 VDC	varies by installation	varies by installation	Digital, dual-channel fail-passive system for Cessna Mustang, Caravan, C-172, -182, -206, -350, -400, CJ525, C680 and C750; Cirrus SR20 and SR22; Diamond DA40 and DA42; Embraer Phenom 100 and 300; HBC G36 and G58; Learjet 40/45 and 70/75; Mooney M20R and M20S; Piper Seminole, Seneca, Matrix, Mirage and Meridian; Socata TBM 850; HondaJet.
GRS 77, GRS 7800							
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.honeywell.com">www.honeywell.com</a>	<b>Primus 1000</b>  (in remarks)	micro DADC	IC-600	28 VDC	varies by installation	varies by version	Digital fail-passive system. CAT II-capable; ARINC 429 interfaces, two-, three-, four- or five-tube, 8 in. x 7 in. EFIS. Bombardier Learjet 40, 45 and 45XR; Embraer ERJ-135, 140 and 145; Cessna Bravo, Encore, Excel and Ultra.
digital AHRS or IRS		combined	varies by installation		varies by version		

INTEGRATED FLIGHT CONTROL SYSTEMS

Manufacturer	Model	Air Data		Autopilot		Power	Weight		Price		Remarks
		Attitude Sensors	Flight Director	AP Only	AP Only		AP Only	AP Only			
				IFCS	IFCS		IFCS	IFCS			
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.honeywell.com">www.honeywell.com</a>	<b>Primus 1000</b>	micro DADC	IC-600	28 VDC	varies by installation	varies by version	Digital fail-passive system. CAT II-capable; ARINC 429 interfaces, two-, three-, four- or five-tube, 8 in. x 7 in. EFIS. Bombardier Learjet 40, 45 and 45XR; Embraer ERJ-135, 140 and 145; Cessna Bravo, Encore, Excel and Ultra.				
	(in remarks)	digital AHRS or IRS	combined		varies by installation	varies by version					
	<b>Primus 1000 CDS</b>	micro DADC	IC-615	28 VDC	varies by installation	varies by installation	Digital fail-passive system. CAT II-capable; ARINC 429 interfaces; two- to five-tube 10 in. x 8 in. LCD EFIS. Cessna Citation XLS.				
		digital AHARS	combined		varies by installation	varies by installation					
	<b>Primus 2000</b>	micro DADC	IC-800	28 VDC	varies by installation	varies by version	Digital, dual-channel fail-passive system. CAT II-capable w/optional auto-throttle, dual-sensor monitoring; five- or six-tube 8 in. x 7 in. CRT EFIS. Global Express and Global 5000; Cessna Citation X; Dassault Falcon 900EX/C.				
		digital AHRS or IRS	combined		varies by installation	varies by version					
	<b>Primus Epic CDS</b>	micro DADC	FZ-800	28 VDC	varies by installation	varies by installation	Digital fail-passive system. CAT II-capable, ARINC 429 interfaces. Two-, three-, four- or five-tube 10 in. x 8 in. EFIS. SyberJet SJ30-2.				
		digital AHRS or IRS	combined		varies by installation	varies by installation					
	<b>Primus Epic</b>	air data module and micro IRS	integrated modular avionics unit	28 VDC	varies by installation	varies by installation	Integrates all traditional avionics into modular avionics unit. Digital, dual-channel; fail operational system. CAT II-capable w/optional auto-throttle and envelope protection. Includes two- to five-tube 10 in. x 8 in. LCD EFIS or four 13 in. LCDs. Agusta/Bell AB139; Citation Sovereign; Dassault Falcon 900EX, 2000EX and 7X; Embraer 170, 175, 190 and 195; Gulfstream G350, G450, G500 and G550; Hawker 4000.				
		air data module and micro IRS			varies by installation	varies by installation					
	<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 <a href="http://www.rockwellcollins.com">www.rockwellcollins.com</a>	<b>APS 4000</b>	ADC-3000/3010 AHC-3000/4000	integrated	28 VDC	varies by installation	varies by installation	Available only as part of integrated Pro Line 21 system. Built-in diagnostics, dual channel, fail-passive, digital CAT-II certified autopilot and flight director.			
			—	—		varies by installation	see remarks				
<b>APS-65</b>		AHC-3000	APS-65	28 VDC	varies by installation	varies by installation	Built-in diagnostics; digital Cat II certified autopilot. Optional EFIS and AHRS. STC kit installer fabricated. Compatible with EFIS-84. *Typical configuration, \$155,976.				
		remote vertical gyro or dual AHRS	EFIS-84 (two tube)		50.6	*					
<b>APS-85</b>		ADS-86	APS-85	28 VDC, 115 VAC, 400 Hz	varies by installation	varies by installation	Available only as full, dual-channel, fail-passive, digital system; digital Cat II autopilot, 4- or 5-tube EFIS optional; ARINC 429 IRS interface available; includes yaw damper; extensive built-in diagnostics. STC kit installer fabricated. Compatible with EFIS-84. *Typical configuration, \$290,388.				
		dual AHRS AHC-3000	EFIS-85 (three tube)		varies by installation	*					

**COLLISION AVOIDANCE SYSTEMS**

Manufacturer	Model	Display Interface Options	Processor Size	Price	Remarks
	TSO		Weight (lb.)		
<b>ACSS an L3 &amp; Thales Company</b> 19810 N. 7th Ave. Phoenix, AZ 85023 (623) 445-7000 Fax: (623) 445-7001 <b>www.acss.com</b>	<b>TAWS+</b>	MFD, EFIS, weather wadar wisplay	2 MCU	\$149,593	Terrain Advisory Line and Avoid Terrain features. With GPS version alerts based on aircraft climb capability.
	C151B Class A, C129b2		7.5		
	<b>TCAS 2000 RT-950/951</b>	MFD, EFIS, VSI/TCAS display	4 MCU - 14.7 6 MCU - 15.8	\$245,367	Change 7.1 compliant. Standard positions on many regional and business jets. Bombardier, Cessna, Dassault, Embraer, Gulfstream, Hawker Beechcraft. (SFE selectable on all Airbus and Boeing aircraft.)
	C119b		—		
	<b>TCAS 3000SP</b>	MFD, EFIS, weather radar display	4 MCU - 13.85 6 MCU - 16.08	\$254,271	Change 7.1 compliant. Flexible to add certified ADS-B in applications combined with TCAS.
	C119b		—		
	<b>T<sup>2</sup>CAS</b>	MFD, EFIS, weather radar display, VSI/TCAS display	6 MCU - 15.8	\$343,058	Combined TCAS and TAWS in one box. Change 7.1 compliant. ADS-B IN/Out capable. Certified on Airbus A320 family.
	C119b, C151b Class A, C129b2		—		
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01773 (800) 284-3963 Fax: (614) 885-8307 <b>www.avidyne.com</b>	<b>TAS600</b>	MFD, EFIS, weather displays, GPS map displays	7.25 x 11.67 x 3.10	\$9,749	Detects and interrogates other aircraft transponders within range, displaying the surrounding traffic on a host of compatible display systems and provides audible and visual alerts in the event of a potential traffic conflict. Provides 30-second decision time at a closure rate of up to 1,200 kt. Head-Up Audible Position Alerting verbally indicates the conflicting aircraft's bearing, range and relative altitude for rapid visual acquisition of traffic. Includes Patented directional top and bottom antennas. Recommended for entry-level, single-engine piston aircraft. Features a 7-nm range, 3,500 ft. vertical separation maximum and 18,500-ft. service ceiling.
	C-147		8.71 (includes processor, dual antennas and coupler)		
	<b>TAS605A</b>	MFD, EFIS, weather displays, GPS map displays	7.25 x 11.67 x 3.10	\$10,999	Recommended for mid-performance aircraft and helicopters. Features 13-nm range, 5,500-ft. vertical separation maximum and a 55,000-ft. service ceiling. Accepts ARINC 429 heading input, permitting rapid repositioning of targets during high-rate turns. VeriTAS correlates active-surveillance targets along with 1090 MHz ADS-B IN targets and provides ADS-B collision avoidance logic.
	C-147		8.71 (includes processor, dual antennas and coupler)		
	<b>TAS615A</b>	MFD, EFIS, weather displays, GPS map displays	7.25 x 11.67 x 3.10	\$14,990	Recommended for high-performance aircraft and helicopters, the TAS615 features 17-nm range, 10,000-ft. vertical separation maximum and 55,000-ft. service ceiling. Accepts ARINC 429 heading, permitting rapid repositioning of targets during high-rate turns. VeriTAS correlates active-surveillance targets along with 1090 MHz ADS-B IN targets and provides ADS-B collision avoidance logic.
	C-147		8.71 (includes processor, dual antennas and coupler)		
	<b>TAS620A</b>	MFD, EFIS, weather displays, GPS map displays	7.25 x 11.67 x 3.10	\$20,990	Features 21-nm range, a 10,000-ft. vertical separation maximum and a 55,000-ft. service ceiling. Accepts ARINC 429 heading inut, permitting rapid repositioning of targets during high-rate turns. VeriTAS correlates active-surveillance targets along with 1090 MHz ADS-B IN targets and provides ADS-B collision avoidance logic.
	C-147		8.71 (includes processor, dual antennas and coupler)		



**COLLISION AVOIDANCE SYSTEMS**

Manufacturer	Model	Display Interface Options	Processor Size	Price	Remarks
	TSO		Weight (lb.)		
<b>Garmin</b> 1200 E. 151st. St. Olathe, KS 66062 (800)800-1020 (800)357-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>TAWS-B</b>	GNS 400(W) series, 500(W) series GTN 600 series, GTN 700 series G600, G950,	—	varies with installation	
	C151 ETSO-C151	G900X, G950, G1000, G1000 NXi G2000, G3000, G5000	—		
	<b>TAWS-A</b>	GTN 600/700 series, G900X, G950, G1000, G2000, G3000, G5000	—	varies with installation	
	C151 ETSO-C151		—		
	<b>HTAWS</b>	GNS 400 (W) series, GNS 500 (W) series, GTN 600/700 series, G1000H, G5000H	N/A	varies with installation	Available as an option on GTN series touchscreen avionics, as well as legacy GNS 430W/530W navigators, HTAWS (Helicopter Terrain Awareness and Warning System) offers “forward looking” terrain and obstacle avoidance (FLTA) capability to alert in advance where potential hazards may exist.
	C194 ETSO-C194		N/A		
	<b>GTS 800</b>	GNS 400(W) series, 500(W) series, GTN 600 series, GTN 700 series GNS 480, GMX 200 G500, G600 G900X, G950, G1000(H), G1000 NXi G2000, G3000, G5000(H) Third-party controller and display	2.66 x 6.25 x 14.78	\$9,995	TAS traffic surveillance system able to track up to 45 targets up to a 22-nm interrogation range
	C147 Class A ETSO C147 Class A C166b		1/8.92		
	<b>GTS 825</b>	GNS 400(W) series, 500(W) series GTN 600 series, GTN 700 series GNS 480, GMX 200 G500, G600 G900X, G950, G1000(H), G1000 NXi G2000, G3000, G5000(H) Third-party controller and display	6.2 x 3.0 x 12.1	\$19,995	Affordable TAS Traffic surveillance system able to track up to 75 targets up to a 40-nm interrogation range.
	C147 Class A ETSO C147 Class A C166b ETSO C166b		1/11.3		
	<b>GTS 855</b>	GNS 400(W) series, 500(W) series GTN 600 series, GTN 700 series GNS 480, GMX 200 G500, G600 G900X, G950, G1000(H), G1000 NXi G2000, G3000, G5000(H) Third-party controller and display	3.42 x 6.25 x 14.78	\$24,995	TCAS I collision avoidance system able to track up to 75 targets within an 80-nm forward interrogation range
	C118 ETSO C118 C166b ETSO 166b		1/11.3		
	<b>GTS 8000</b>	GNS 400(W) series, 500(W) series GTN 600 series, GTN 700 series G900X, G950, G1000(H), G1000 NXi G2000, G3000, G5000(H) Third-party controller and display	3.42 x 6.25 x 14.78	\$89,995	TCAS II Change 7.1 system, includes GTS 8000 TCAS processor and two GTX 3000 TCAS transponder.
	C119c ETSO C119c C116b ETSO C166b		1/11.3		

**COLLISION AVOIDANCE SYSTEMS**

Manufacturer	Model	Display Interface Options	Processor Size	Price	Remarks
	TSO		Weight (lb.)		
<b>Honeywell Aerospace BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>BendixKing KGP 560</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	2.2 x 4.15 x 6.25	\$12,865	EGPWS exceeds Class B requirements. Provides aural and visual warnings; internal GPS; worldwide database by region.
	C151 Class B		1.5		
	<b>BendixKing KGP 860</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	2.2 x 4.15 x 6.25	\$15,615	EGPWS exceeds Class B requirements. Provides aural and visual warnings; internal GPS; worldwide database by region. EFIS displays additional warning modes.
	C151 Class B		1.5		
	<b>Mark XXI</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	4.5 x 7.0 x N/A	\$19,011	Helicopter EGPWS.
	C118 Class B		1.5		
	<b>BendixKing KTA 870</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	4.5 x 7.0 x 13.8	\$27,982	Traffic Advisory System (TAS) is an active system providing aural and visual advisories. Single or dual directional antennas.
	C147		8.75		
	<b>KTA 970</b>	dual-color, flat-panel LCD combined IVSI/TA display, KMD 550, EFIS, KMD 850 or weather radar	4.5 x 7.0 x 13.8	\$36,767	TCAS I system.
	C118		8.75		
	<b>BendixKing KMH 880</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	4.5 x 7.0 x 13.8	\$43,730	Traffic Advisory System (TAS) and EGPWS in one box. Active traffic system providing aural and visual advisories. Single or dual directional antennas.
	C147, C151, Class B		8.75		
	<b>BendixKing KMH 980</b>	KMD 550 MFD, KMD 850 MFD and most MFDs	4.5 x 7.0 x 13.8	\$56,723	TCAS I and GA-EGPWS.
	C118, C151 Class B		9.68		
	<b>CAS 66A System</b>	dual-color, flat-panel LCD combined IVSI/TA/RA display KTA 870, KMH 880, EFIS or weather radar	1/2 ATR-S (4 MCU)	\$136,934	TCAS I system. Includes processor, control panel, directional antenna and IVSI/TA display. Does not include installation kits. Upgradable to TCAS II.
	C118		17.0		
<b>CAS 67A System</b>	CAS-67A systems includes one TPU-67A ; TCAS Antenna; Mode S Transponder; TA/RA/VSI IVA 81D	1/2 ATR-S (4 MCU)	\$231,799		
C118		NA			
<b>CAS 67B System</b>	CAS-67A systems includes one TPU-67A ; TCAS Antenna; Mode S Transponder; TA/RA/VSI IVA 81D	1/2 ATR-S (4 MCU)	\$225,203		
<b>CAS-100 System C119c</b>	Dual-color, flat-panel LCD combined IVSI/TA/RA display (included in price show). Also can interface with KMD 550 MFD, KMD 850 MFD, EFIS or weather radar	1/2 ATR (4 MCU)	\$219,179*	CAS-100 system includes one TPA-100B with Change 7.1; one ANT-81A; one IVA-81D VSI display; one CTA-100A control panel. *BCA estimate.	
C119c		1/13.5			
<b>EGPWS MK V-A</b>	EFIS, MFD and radar indicators	7.9 x 2.4 x 12.8	\$115,858 (without internal GPS)	MK V-A is for turbofan aircraft equipped with analog avionics.	
		1/6.5			
<b>EGPWS MK XXI</b>	See remarks	3.95 x 2.20 x 3.25		Helicopter EGPWS enhanced features: detailed terrain database, obstacle database, airports and heliports, look-ahead algorithms, terrain alerting, obstacle alerting, en route terrain display (peaks), pop-up feature, auto ranging feature, geometric altitude, enhanced envelope modulation, speed expansion, internal GPS card.	

**COLLISION AVOIDANCE SYSTEMS**

Manufacturer	Model	Display Interface Options	Processor Size	Price	Remarks
	TSO		Weight (lb.)		
<b>Honeywell Aerospace</b> <b>BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <b>www.bendixking.com</b>	<b>KGX 150T ADS-B UAT Transceiver</b>	Mode A/C and Mode S transponder interface 2 ARINC 429; 1 RS 485 and 4 discrete inputs 1 ARINC 429; 4 RS 232/422 and 2 discrete outputs 10-40 VDC input voltage .02 A @ 12 VDC Input current 6.5 VDC output voltage 350 mA output	5 x 5.75 x 1.7	\$2,849	ADS-B receiver and UAT transmitter with optional Wi-Fi, best optimized for the those who fly below 18,000 ft. Also includes an integrated ADS-B OUT Compliant WAAS GPS. The KGX 150T provides the ADS-B traffic and weather services to non-certified wireless tablet or certified compatible panel display. An optional control head is available for additional ADS-B required information and annunciations.
	TSO-C157A (FISB) TSO-C195A (TIS-B) TSO-C154C (UAT) TSO-C145C (for GNSS) DO-160G DO-178B level C DO-254 Level C STC Approved in accordance with AC20-165A				
	<b>KGX 150R ADS-B UAT Receiver with Integrated WAAS</b>	Mode A/C and Mode S transponder interface 2 ARINC 429; 1 RS 485 and 4 discrete inputs 1 ARINC 429; 4 RS 232/422 and 2 discrete outputs 10-40 VDC input voltage .02 A @ 12 VDC Input current 6.5 VDC output voltage 350 mA output	5 x 5.75 x 1.7	\$2,648	ADS-B receiver with optional Wi-Fi, best optimized for those who fly above and below 18,000 ft. or want to replace their existing transponder with the KT 74 1090 extended squitter transponder. Also includes an integrated ADS-BOUT Compliant WAAS GPS. The KGX 150R provides the ADS-B traffic and weather services to non-certified wireless tablet or certified compatible panel display. No external controller is needed.
	TSO-C157A (FISB) TSO-C195A (TIS-B) TSO-C154C (UAT) TSO-C145C (for GNSS) DO-160G DO-178B level C DO-254 Level C STC Approved in accordance with AC20-165A				
	<b>KGX 130R ADS-B UAT Receiver</b>	Mode A/C and Mode S transponder interface 2 ARINC 429; 1 RS 485 and 4 discrete inputs 1 ARINC 429; 4 RS 232/422 and 2 discrete outputs 10-40 VDC input voltage .02 A @ 12 VDC input current 6.5 VDC output voltage 350 mA output	5 x 5.75 x 1.7	\$1,699	ADS-B receiver with optional Wi-Fi, best optimized for those who fly above and below 18,000 ft. and want to replace their existing transponder with the KT 74 1090 extended squitter transponder. The KGX 130R uses your existing WAAS Garmin GNS 430W/530W GPS and provides the ADS-B traffic and weather services to non-certified wireless tablet or certified compatible panel display.
	TSO-C157A (FISB) TSO-C195A (TIS-B) TSO-C154C (UAT) DO-160G DO-178B level C DO-254 Level C STC Approved in accordance with AC20-165A				
<b>L3 Aviation Products</b> 5353 52nd St. S.W. Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 285-4224 <b>www.L3aviationproducts.com</b>	<b>LandMark TAWS 8000</b>	TAWS compatible Arinc 453 EFIS, Arinc 453 weather radar indicators and compatible MFDs. Display on non-Arinc 453 radar indicators requires the RGC 350 Radar Graphics Computer (sold separately)	7.0 x 2.25 x 9.0	\$14,120	Remote processor that offers predictive warning functions using position data from a GPS receiver, flight configuration and an internal terrain and obstacle database. Both aural and visual warnings are issued whenever CFIT situations arise. LandMark is designed to meet or exceed Class B requirements of TSO C151a. Baro-corrected altitude input required.
	C151a Class B		3.35		
	<b>LandMark TAWS 8100</b>	AWS compatible Arinc 453 EFIS, Arinc 453 weather radar indicators and compatible MFDs. Display on non-Arinc 453 radar indicators requires the RGC 350 Radar Graphics Computer (sold separately)	7.0 x 2.25 x 9.0	\$15,230*	Features a WAAS GPS Sensor. With its accurate positioning information, the LandMark 8100 eliminates the need for multiple inputs from other aircraft sensors, simplifying the installation. The 8100 provides the highest integrity terrain data without complicated GPS, ADC or OAT inputs. 320 nm range. *BCA estimate.
	C151b Class B		3.40		

**COLLISION AVOIDANCE SYSTEMS**

Manufacturer	Model	Display Interface Options	Processor Size	Price	Remarks
	TSO		Weight (lb.)		
<b>L3 Aviation Products</b> 5353 52nd St. SW Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 285-4224 <b>www.L3aviationproducts.com</b>	<b>Lynx NGT-9000+</b>	see remarks	6.25 x 1.8 x 10.75	\$9,555	Panel-mounted touchscreen transponder that also displays traffic information onto compatible flight displays and iPad and Android apps. Can be configured to view ADS-B and active traffic on the same screen without the need for additional boxes. Aural traffic alerting is an available option.
			5.2		
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-1000 Fax: (319) 295-2297 <b>www.rockwellcollins.com</b>	<b>TCAS 4000</b>	Collins EFIS, MFD TCAS compatible VSI (RA)	4 MCU	\$422,064* (typical installation)	TCAS II system. European ACAS compatible Mode S Level III. AC/DC in one part number includes control panel and two TRE antennas. Displays range/alt. separation from traffic. Max range 3 mi. Two surveillance volumes and MSL of traffic. Top/bottom antennas to optimize coverage. Upgrades to 8800 Gold. *BCA estimate.
	C119 (C119a when issued)	Collins TVI-920 (RA, TA)	17.0		
<b>Sandel Avionics</b> 2401 Dogwood Way Vista, CA 92081 (877) 726-3357 ((760) 727-4900 Fax: (760) 727-4899 <b>www.sandel.com</b>	<b>ST3400H HelITAWS</b>	Integrated rear projection LCD with LED backlighting	3 ATI panel-mount	\$18,950	3-ATI helicopter TAWS with integrated display. Can replace existing radar altimeter indicator. Sunlight readable LED backlit display with 180 deg. viewing angle and over 10,000-hr. MTBF. NVIS compatible version \$22,200.
	C87, C113, C151b, C194		2.9		
	<b>ST3400 TAWS</b>	Integrated rear projection LCD with LED backlighting	3 ATI panel-mount	\$24,250	3-ATI Class A or Class B TAWS with integrated display. Sunlight readable LED backlit display with 180-deg. viewing angle and over 10,000 hr. MTBF. Optional interface for traffic, \$980. Class A version, \$38,600.
	C113, C151b		2.9		
<b>Universal Avionics Systems Corp.</b> 3260 E. Universal Way Tucson, AZ 85756 (520) 295-2300 (800) 321-5253 Fax: (520) 295-2395 <b>www.uasc.com</b>	<b>TAWS A TAWS B</b>	<i>Universal Avionics</i> EFI-890R, MFD-640, UNS FMS (5-in. display)	2 MCU LRU	TAWS A \$40,700  TAWS B \$26,200	Worldwide terrain database with 480+ MB data. High-resolution analog video views; 3-D perspective view; profile view; map view. Map view of terrain can be output using ARINC 708 or WXP formats for interface with various existing weather radars. Both version include obstacle database.
	C151b, C92c	<i>Honeywell</i> numerous weather radar, MFD and EFIS displays  <i>Rockwell Collins</i> numerous weather radar, MFD and EFIS displays  <i>Smiths</i> BAE ATP EFIS additional display options available	9.6		



**COCKPIT VOICE RECORDERS (CVR)/FLIGHT DATA RECORDERS (FDR)**

Manufacturer	Type	Recording Medium	Size	Price	Remarks
	Model	Duration	Weight (lb.)	Power Required	
	TSO				
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 www.honeywell.com	<b>Business Aviation</b>	solid-state	7.45 x 5.92 x 4.0	N/A	A fully compliant recorder developed for business aviation. *BCA estimate.
	<b>LW-CVR (429)</b>	120 min.	<7.0 with AR for factor mounting adapter	28 VDC	
	980-6044-002				
	<b>Air Transport</b>	solid-state	½ ATR Short	N/A	A fully compliant recorder developed for business aviation.
	<b>HFR5-CVR</b>	120 min.	8.6	28 VDC 115 AC	
	980-6032-003				
	<b>Business Aviation</b>	solid-state	7.45 x 5.92 x 4.0	N/A	A fully compliant recorder developed for business aviation.
	<b>LW-FDR (717)</b>	25 hr. @ 512 wps	<7.0 with AR form factor mounting adapter	28 VDC	
	980-4131-002				
	<b>Air Transport</b>	solid-state	½ ATR Long or Short	N/A	A fully compliant recorder developed for business aviation.
	<b>HFR5-FDR</b>	25 hr. @ 1,024 wps	10.0	115 VAC 28 VDC	
	½ ATR Long only				
	<b>Business Aviation</b>	solid-state	7.45 x 5.92 x 4.0	N/A	A fully compliant recorder developed for business aviation.
	<b>LWCVR/FDR</b>	120 min. CVR 25 hr. @512 wps FDR	<7.0 with AR form factor mounting adapter	28 VDC	
980-6050-042 (429 input) 980-6050-072 (717 input)					
—	—	solid state, digital	8.8	N/A	Non-ARINC size with underwater locator beacon; control panel and mounting tray not required. ARINC 557 and ARINC 757.
<b>CVR AR 120 CVR</b>	980-6023-002 ED 56A, C123a	120-min. CVR	9.5 x 5.88 x 5.75	28 VDC	
—	—	solid-state, digital	8.8	N/A	Non-ARINC FDR, ARINC 717, 429. Mounting tray not required.
<b>AR FDR</b>	980-4710-00X ED 55, C124e	25 hr. @ 64, 128, 256 wps	9.5 x 5.88 x 5.75	28 VDC	

**COCKPIT VOICE RECORDERS (CVR)/FLIGHT DATA RECORDERS (FDR)**

Manufacturer	Type	Recording Medium	Size	Price	Remarks
	Model	Duration	Weight (lb.)	Power Required	
	TSO				
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 www.honeywell.com	<b>CVR</b>	solid-state, digital	9.5 x 5.88 x 5.75	N/A	Non-ARINC size with underwater locator beacon; control panel and mounting tray not required. ARINC 557 and ARINC 757.
	<b>AR 120 CVR 980-6023-002</b>	120 min.	8.8	28 VDC	
	ED 56A, C123a				
	<b>CVR</b>	solid-state, digital	½ ATR Short	N/A	Solid-state CVR with underwater locator beacon. ARINC 557 and ARINC 757.
	<b>SSCVR 980-6022-011</b>	120 min.	11.5	28 VDC 115 AC	
	ED 56A, C123				
	<b>DVDR/FDR</b>	solid-state, digital	½ ATR Short	N/A	Combination CVR/FDR; ARINC Form Factor. Mounting tray not required. Data download through front access PCMCIA.
<b>AR Combi 980-6021-06X</b>	120-min. voice; 25-hr. data @ 64, 128, 256 wps	11.5	28 VDC		
ED 56A, C123a					
<b>L3 Aviation Recorders</b> 100 Cattlemen Rd. Sarasota, FL 34232 (941) 371-0811 www.L3aviationproducts.com	<b>CVR/FDR</b>	solid-state	1 ½ ATR Short CVR; 1/2 ATR Short or Long FDR	\$32,719, CVR \$39,261 FDR	Includes underwater locator beacon, mounting tray required. ARINC 757 connector CVR, ARINC 747 connector FDR, GMT or FSK time-signaling source for CVR. Separate RIPS module available for CVR for helicopter applications; CPDLC data link recording for CVR; minimum 25-hr. 64 wps up to 1024 wps recording rate for FDR; ramp (portable) and shop (bench) GSE hardware and software diagnostics and readout tools optional.
	<b>FA2100</b>	2-hr. min. CVR; 25-hr. min. FDR	CVR/FDR Short: 12.6 x 5.0 x 5.5 FDR Long: 19.6 x 5.0 x 5.5	10.0	
	C123b, C124b, EUROCAE ED-112				
	<b>CVDR</b>	solid-state	½ ATR Short 12.6 x 5.0 x 5.5	\$54,575	Includes underwater locator beacon, mounting tray required. ARINC 757 connector, GMT or FSK time-signaling source for CVR. Separate RIPS module available for CVR, rotor-speed input for CVR for helicopter applications; CPDLC data link recording for CVR, OMS output for CVR, minimum 2-hr. 4-channel high-quality audio recording for CVR, minimum 25-hr., 128 wps up to 1024 wps recording rate for FDR; rap (portable) and shop (bench) GSE hardware and software diagnostics and readout tools available.
	<b>FA2100</b>	2-hr. min. CVR; 25-hr. min. FDR	10.0	115 VAC 400 Hz or 28 VDC	
	C123b, C124b, EUROCAE ED-112				
	<b>CVR/FDR</b>	solid-state	½ ATR Short 12.6 x 4.8 x 6.5	\$50,703	Includes underwater locator beacon, mounting tray required. MIL-C-38999 connector, GMT or FSK time-signaling source for CVR. Separate RIPS module available for CVR, rotor-speed input for CVR for helicopter applications; CPDLC data link recording for CVR, OMS output for CVR, minimum 2-hr. 4-channel high-quality audio recording for CVR, minimum 25-hr., 128 wps up to 1024 wps recording rate for FDR; rap (portable) and shop (bench) GSE hardware and software diagnostics and readout tools available. Ethernet data output.
<b>CVDR Model FA5000</b>	2-hr. min. CVR; 25-hr. min. FDR	7.9	115 VAC 400 Hz or 28 VDC		
C123b — CVR C124b — FDR EUROCAE ED-112 — CVR and FDR					

**COCKPIT VOICE RECORDERS (CVR)/FLIGHT DATA RECORDERS (FDR)**

Manufacturer	Type	Recording Medium	Size	Price	Remarks
	Model			Power Required	
	TSO	Duration	Weight (lb.)		
<b>L3 Aviation Recorders</b> 100 Cattlemen Rd. Sarasota, FL 34232 (941) 371-0811 <a href="http://www.L3aviationproducts.com">www.L3aviationproducts.com</a>	<b>CVDR/SRVIVR</b>	solid-state	6.55 x 5.55 x 3.25	\$40,675	Same as FA5000
	—				
	C123b, C124b EUROCAE Ed-112	2 hr. CVR 25 hr. FDR	6.75	28 VDC	
	<b>Lightweight Data Recorder</b>	solid-state	8.0 x 3.9 x 4.9	\$21,370	No mounting tray required; 2-hr. 2-channel voice recording; 25-hr. GPS data recording; 5-hr. ARINC 717 data recording; 2-hr. analog video recording at 5 fps. Ethernet data output.
	<b>LDR</b>				
	C197, EUROCAE ED-155	2 hr. CVR 25 hr. FDR 2-hr. video	5.0	28 VDC	
	<b>Micro Quick Access Recorder</b>	Minimum 2 GB compact flash memory	2.7 x 2.2 x 1.8	\$8,513	ARINC 573/717/747 compatible; data rates 64 wps up to 1024 wps; USB or Ethernet data output. Fixed or removable flash card media. Data download software utility optional.
—					
—	—	6 oz.	115 VAC 400 Hz or 28 VDC		
<b>Universal Avionics Systems Corp.</b> 3260 E. Universal Way Tucson, AZ 85756 (520) 295-2300 Fax: (520) 295-2395 <a href="http://www.uasc.com">www.uasc.com</a>	<b>Combi CVR/FDR</b>	solid-state flash memory	6.0 x 4.9 x 8.0	\$19,500	No internal batteries. No periodic maintenance. Four channels of cockpit audio data, UTC from ARINC 429 bus, UTC from a Frequency Shift Keying (FSK) signaling source, Rotor Speed for helicopter application. ARINC 717 Flight Data Recording, analog/digital sensor signals via FDAU, ARINC 758 data link information. PC-based ramp testing/diagnostics.
	<b>CVFDR-145</b>				
	C123b, C124b, C177, C123a, C124a, EUROCAE ED-112	120-min. voice & ambient audio +25 hr. (min.) Flight data +120 minute data link messaging	7.0	28 VDC	
	<b>Combi CVR/FDR w/ embedded Recorded Independent Power Supply (RIPS)</b>	solid-state flash memory	6.0 x 4.9 x 8.0	\$27,500	Embedded RIPS. Solid state memory. No internal batteries. No periodic maintenance. Four channels of cockpit audio data, UTC from ARINC 429 bus, UTC from a Frequency Shift Keying (FSK) signaling source, Rotor Speed for helicopter application. ARINC 717 Flight Data Recording, analog/digital sensor signals via FDAU, ARINC 758 data link information. PC-based ramp testing/diagnostics.
	<b>CVFDR-145R</b>				
	C123b, C124b, C155, C177, C123a, C124a, EUROCAE ED-112	120-min. voice & ambient audio +25 hr. (min.) Flight data +120 minute data link messaging	8.68	28 VDC	
	<b>CVR</b>	solid-state flash memory	6.0 x 4.9 x 8.0	\$16,500	No internal batteries. No periodic maintenance. Four channels of cockpit audio data, UTC from ARINC 429 bus, UTC from a Frequency Shift Keying (FSK) signaling source, rotor Speed for helicopter applications, ARINC 758 data link information. PC-based ramp testing/diagnostics.
	<b>CVR-120A</b>				
	C123b, C177, C123a, EUROCAE ED-112	120-min. voice & ambient audio	7.9	28 VDC	

## COCKPIT VOICE RECORDERS (CVR)/FLIGHT DATA RECORDERS (FDR)

Manufacturer	Type	Recording Medium	Size	Price	Remarks
	Model	Duration	Weight (lb.)	Power Required	
	TSO				
<b>Universal Avionics Systems Corp.</b> 3260 E. Universal Way Tucson, AZ 85756 (520) 295-2300 Fax: (520) 295-2395 www.uasc.com	CVR w/embedded Recorded Independent Power Supply (RIPS)	solid-state flash memory	6.0 x 4.9 x 8.0	\$24,500	Embedded RIPS. Solid-state memory. No internal batteries. No periodic maintenance. Four channels of cockpit audio data, UTC from ARINC 429 bus, UTC from a Frequency Shift Keying (FSK) signaling source, rotor speed for helicopter applications. ARINC 758 data link information. PC-based ramp testing/diagonistics.
	<b>CVR-120R</b>	120 min. voice & ambient audio	8.68	28 VDC	
	C123b, C155, C177, C123a, EUROCAE ED-112				
	<b>FDR</b>	solid-state flash memory	6.0 x 4.9 x 8.0	\$16,500	No internal batteries. No periodic maintenance. ARINC 717 Flight Data Recording. Additional data storage beyond 25 hr., analog/digital sensor signals via FDAU. PC-based ramp testing/diagonistics.
	<b>FDR-25</b>	25 hr. (min) Flight data + 120 min. data link messaging	7.9	28 VDC	
	C124b, C124a, EUROCAE ED-112				

## HEAD-UP DISPLAYS

Manufacturer	Model	Inputs & Outputs	Units/Weight (lb.)	Price	Remarks
			Size or Form Factor	Power Required	
<b>Elbit Systems of America-Fort Worth Operations</b> 4700 Marine Creek Pkwy. Fort Worth, TX 76179 www.elbitsystems-us.com	Advanced Technology HUD (AT-HUD)	ARINC 429, ARINC 615 discretes, Enhanced Vision (EVS) video, Synthetic Vision (SVS) video	3/35.0	\$356,000*	Fully digital EFVS video ready LCD HUD that is compact and lightweight. *Contact manufacturer for specific pricing.
			14.0 x 6.0 x 5.0	28 VDC	
<b>Rockwell Collins (Head Up Guidance Systems)</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 www.rockwellcollins.com	<b>HGS-4000</b>	ARINC 429, various discretes, enhanced vision, synthetic vision	48.0 - 55.0	\$409,405*	Provides Cat III landing and Low Visibility Takeoff capability. *BCA estimate
			3 LRUs	N/A	
	<b>HGS-3500</b>	ARINC 429, various discretes, enhanced vision, synthetic vision	varies by configuration/less than 15 lb.	Price not provided	Compact wave-guide Head-Up Display developed for light to midsize business aircraft applications.
			3 LRUs		
	<b>HGS-5000</b>	ARINC 429, various discretes, enhanced vision, synthetic vision	48.0 - 53.0	Price not provided	First-generation digital Head-Up Display developed for numerous commercial and business aircraft platforms.
3 LRUs					
<b>HGS-6000</b>	ARINC 429, various discretes, enhanced vision, synthetic vision	40.0 - 46.0	Price not provided	Second-generation digital Head-Up Display developed for numerous commercial and business aircraft platforms.	
		3 LRUs			



## AIRCRAFT SITUATION DISPLAYS

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks	
	TSO	Display Size			Size or Form Factor	Power Required		
<b>Aspen Avionics</b> 5001 Indian School Rd. NE Albuquerque, NM 87110 (505) 856-5034 Fax: (505) 314-5440 <a href="http://www.aspenavionics.com">www.aspenavionics.com</a>	<b>1000 MFD</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5)	ARINC 429 (1) RS-232 (3)	display: 2.6 lb w/mounting bracket remote sensor: 0.2 lb	\$8,995*	Includes integral ADAHRS backup battery and emergency GPS, integral altitude alterter/preselect, GPS flight plan map views: 360° and arc, slaved directional gyro with heading bug.	
	C2d, C3d, C4c, C6d, C8d, C10b, C106, C113	6.0-in diag.	Pitot/static quick connect		display: 3.50 x 7.0 x 4.15 depth: 6.35 in. remote sensor: 2.65 x 4.40 x 1.0 in.	14-28 VDC (provided by PFD)		
	<b>1000C3 Pro</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5)	ARINC 429 (1) RS-232 (3)	display: 2.6 lb w/mounting bracket remote sensor: 0.2 lb	\$8,995		Same as EFD 1000, plus full EHSI with dual bearing pointers; dual GPS, dual VHF nav support; auto-pilot and flight director integration; integral GPS steering; base map with curved flight paths; (optional) traffic, weather overlays.
	C2d, C3d, C4c, C6d, C8d, C10b, C106, C113	6.0-in. diag.	Pitot/static quick connect		display: 3.50 x 7.0 x 4.15 depth: 6.35 in. remote sensor: 2.65 x 4.40 x 1.0 in.	14-28 VDC (provided by PFD)		
	<b>EFD1000 Pro Primary Flight Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/ static quick connect		Display: 2.6 lbs w/ mounting bracket remote sensor: 2.65.4.40 x 1.0	\$10,995	Economical full-feature glass primary flight display for GA retrofit; EFIS six-pack replacement; Compatible with many avionics.	
	C2D, C3D, C4C, C6D, C8D, C10B, C106, C113	6.0-in. diag.			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. remote sensor: 2.65 x 4.40 x 1.0 in.	8 to 32 VDC		
	<b>EFD1000 Multifunction Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/ static quick connect		Display: 2.6 lb. w/ mounting bracket remote sensor: 2.65. x 4.40 x 1.0 in.	\$8,995	Duplicate sensor set providing full PFD redundancy; may eliminate requirement for backup instruments; sectional-style moving maps with hazard awareness overlays; charts and geo-referenced airport diagrams; customizable screen layouts; built-in back-up battery and emergency GPS.	
	C2D, C3D, C4C, C6D, C8D, C10B, C106, C113	6.0-in. diag.			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. remote sensor: 2.65 x 4.40 x 1.0 in.	8 to 32 VDC		
	<b>EFD1000 Pro Plus Primary Flight Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/ static quick connect		Display: 2.6 lb. w/ mounting bracket remote sensor: 2.65.4.40 x 1.0 in.	\$13,995	EFD1000 PFD with Evolution Synthetic Vision and angle of attack indicator; Lowest price full-featured glass panels for GA retrofit; advanced EFIS six-pack replacement; works with your panel's existing avionics — nearly every GPS or nav radio; broadest autopilot/flight director support.	
		6.0-in. diag.			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. remote sensor: 2.65 x 4.40 x 1.0 in.	8 to 32 VDC		
	<b>EFD500 Multifunction Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/ static quick connect		Display: 2.6 lb. w/ mounting bracket remote sensor: 2.65.4.40 x 1.0 in.	\$5,495		
		C113			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. remote sensor: 2.65 x 4.40 x 1.0 in.	8 to 32 VDC	Sectional-style moving maps with hazard awareness overlays; customizable screen layouts; dharts and geo-referenced airport diagrams; built-in backup battery; broadest autopilot/flight director support.	
	<b>EFD1000 VFR Primary Flight Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/ static quick connect		Display: 2.6 lbs w/ mounting bracket Remote Sensor: 2.65.4.40 x 1.0 in.	\$4,995	Consolidates traditional six-pack instrument information plus CDI into a single display with a back battery and emergency GPS; Lowest price, full-featured PFD for GA aircraft; works with your panel's existing avionics; unique PFD design slides into existing panel cutouts; Options include autopilot interface, (GPS steering); weather and traffic; Affordable upgrades include HSI; bearing pointer and IFR features with easy software upgrade.	
	C2D, C3D, C4C, C6D, C8D, C10B, C106, C113	6.0-in. diag.			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. Remote sensor: 2.65 x 4.40 x 1.0-in.	8 to 32 VDC		

**AIRCRAFT SITUATION DISPLAYS**

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Display Size			Size or Form Factor	Power Required	
<b>Aspen Avionics</b> 5001 Indian School Rd. NE Albuquerque, NM 87110 (505) 856-5034 Fax: (505) 314-5440 <a href="http://www.aspenavionics.com">www.aspenavionics.com</a>	<b>EFD1000H Helicopter Primary Flight Display</b>	TFT AMLCD (400 x 760)	ARINC 429 (5) RS-232 (5) Pitot/static quick connect		Display: 2.6 lb. w/ mounting bracket Remote Sensor: 2.65, 4.40 x 1.0 in.	\$15,195	Special vibration mount meets DO-160F helicopter vibration standards; airspeed and altitude tapes, with altitude alerter; built-in GPS steering; full electronic HSI with dual bearing pointers; base map with flight plan legs and waypoints; integral air data computer and attitude heading reference system; built-in back-up battery; optional evolution hazard awareness provides traffic and weather displays; lowest price, full-featured glass panels; works with your panel's existing avionics.
	C2D, C3D, C4C, C6D, C8D, C10B, C106, C11	6.0-in. diag.			Display: 3.50 x 7.0 x 4.15, depth: 6.35-in. Remote Sensor: 2.65 x 4.40 x 1.0-in.	8 to 32 VDC	
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01773 (800) 284-3963 Fax: (614) 885-8307 <a href="http://www.avidyne.com">www.avidyne.com</a>	<b>EX600</b>	AMLCD	RS-232 ARINC 429 ARINC568 DME	ARINC 429	4.75	\$8,995 without radar; starting at \$12,990 w/radar	Full overlay of GPS flight plan along with traffic, wx radar, data-linked wx, and special-use airspace. Features include full vector-based moving map and interfaces for traffic and lightning, CMax approach charts and airport diagrams, plus 20 different radar models. Many optional radar interfaces and acts as a display replacement for many older CRT radar displays. Dedicated knobs for radar control of tilt and bearing, plus second set of context-sensitive knobs for range and other functions. Features map panning keys and allows pilot to toggle between the present position and a panned-to position — such as destination airport — with a single button push. Many options available.
	C63c, C110a, C113, C118, C147, C157, C43c, C106	5.7-inch diagonal 640 x 480 pixels (VGA)			6.25 x 4.93 x 11.0	28VDC	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (800) 357-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>TAWS -B</b>	GNS 400 (W) series, 500 (W) series	Not provided by manufacturer	N/A	N/A	Varies	
	C151 ETSO-C151	—			N/A	N/A	
	<b>TAWS-A</b>	GTN 600 series, GTN 700 series, G900X, G950	Not provided by manufacturer	N/A	N/A	Varies	
	C151 ETSO-C151	—			N/A	N/A	

**AIRCRAFT SITUATION DISPLAYS**

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Display Size			Size or Form Factor	Power Required	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (800) 800-1020 (800) 357-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>GTS 800</b>	GNS 400 (W) series, 500 (W) series, GTN 600 series, GTN 700 series, GNS 480, GMX	Not provided by manufacturer	—	1/8.92	\$9,995	TAS traffic surveillance system able to track up to 45 targets up to a 22-nm interrogation range.
	C147 Class A ETSO 147 Class A C166B	—			2.66 x 6.25 x 14.78	2.6A @ 14 VDC 1.5A @ 28 VDC	
	<b>GTS 825</b>	GNS 400 (W) series, 500 (W) series, GTN 600 series, GTN 700 series, GNS 480, GMS 200	Not provided by manufacturer	—	1/11.3	\$19,995	TAS traffic surveillance system able to track up to 75 targets up to a 40-nm interrogation range.
	C147 Class A ETSO 147 Class A C166B ETSO C166b	—			3.42 x 6.25 x 14.78	3.5A @ 14 VDC 1.7A @ 28 VDC	
	<b>GTS 855</b>	GNS 400 (W) series, 500 (W) series, GTN 600 series, GTN 700 series, GNS 480, GMX	Not provided by manufacturer	—	1/11.3	\$24,995	High-performance TCAS I collision avoidance solution able to track up to 75 targets within an 80-nm forward interrogation range.
	C118 ETSO C118 C116b ETSO C166b	—			3.42 x 6.25 x 14.78	3.5A @ 14 VDC 1.7A @ 28 VDC	
	<b>GTS 8000</b>	GNS 400 (W) series, 500 (W) series, GTN 600 series, GTN 700 series, G900X, G950	Not provided by manufacturer	—	1/11.3	\$89,995	TCAS II Change 7.1 system, includes GTS 8000 TCAS processor and two GTX 3000 TCAS transponders.
	C119c ETSO C119c C166b ETSO C166b	—			3.42 x 6.25 x 14.78	3.5A @ 14 VDC 1.7A @ 28 VDC	

**AIRCRAFT SITUATION DISPLAYS**

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Display Size			Size or Form Factor	Power Required	
<b>Honeywell Aerospace</b> <b>BendixKing</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>BendixKing KDR 610 XM Weather Receiver</b>	see remarks	weather displays via XM satellite	weather displays via XM satellite interfaced to Bendix/King KMD 250, KMD 550 and KMD 850 MFDs	1/1.5	\$6,888	Part of an MFD system; data link weather receiver provides high-speed textual and graphical weather to the cockpit. Available weather products include composite NEXRAD radar, graphical METARs, AIRMETS and SIGMETS. The active flight plan can be overlaid on all graphical weather images. System enables user to pan, zoom and interrogate areas of interest via joystick.
	C157	see remarks			see remarks	10-32 VDC	
	<b>BendixKing KSN 770/765 Integrated Navigator WAAS/GPS/NAV (KSN 770 only)/COMM (KSN 770 only)/MFD</b>	Active Matrix LCD, 40 x 480 pixels (Full VGA) / 5.7 in. diagonal	see remarks	ARINC 429 input; 10 ARINC 429 output; 2 RS-232 input; 4 RS-232 output; 4 RS-222 input; 3 RS-222 output; 28 discrete input; 20 discrete output	N/A	1 / (770/765) 9.9/ 8.1 / 6.25" x 5.25" x 10"	List Price Starting at \$10,995
N/A	see remarks	11-33 VDC					
<b>Honeywell Aerospace</b> 1944 East Sky Harbor Circle Phoenix, AZ 85034 (800) 601-3099 Fax: (602) 365-3343 <a href="http://www.honeywell.com">www.honeywell.com</a>	<b>Honeywell MFRD</b>	LCD	RS-232 ARINC 429, radar, datalink, EGPWS, traffic, NTSC video	display	1/7.5	\$64,525	Multi-function display of weather radar, traffic, terrain, navigation maps, checklists.
	C63c, C110a, C113, C196	6 in. diag.			6.24 (w) x 4.82 (h) x 8.38 (panel depth)	28 VDC or 115 VAC 400 Hz	
<b>Innovative Solutions &amp; Support (IS&amp;S)</b> 720 Pennsylvania Dr. Exton, PA 19341 (610) 646-9800 <a href="http://www.innovative-ss.com">www.innovative-ss.com</a>	<b>Integrated Standby Unit (ISU)</b>	10-, 15-, 17-, 20-in. flat panel displays	RS 422/232: 3 channels Input/Output ARINC 429: Optional 6 inputs (configurable for VOR, ILS, DME, FMS, GPS)	2 outputs, high speed/low speed (software configurable)	N/A	N/A	Calculates and displays altitude, attitude, airspeed, slip/skid and navigation display information.
	NA	N/A			3 ATI clamp mount, optional panel mount	28 VDC 9.8 W	
<b>L3 Aviation Products</b> 5353 52nd St. SW Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 285-4224 <a href="http://www.L3aviationproducts.com">www.L3aviationproducts.com</a>	<b>Trilogy ESI-1000</b>	AMLCD: optional NVG compatibility	N/A	N/A	1/2.22	\$14,995	Electronic standby instrument designed to level "A" software and hardware compliances, the Trilogy ESI replaces traditional standby instruments and combines attitude, altitude and airspeed information into a compact 3.8-in. diagonal display while maintaining a 3-ATI chassis design. Heading is available when coupled with the optional magnetometer. For fixed-wing and helicopter applications.
	C2d, C3e, C4c, C6e, C10b, C46a, C113, C179	4.0 x 3.0			3-ATI chassis 4.0 x 3.35 x 7.66	14-28 VDC	

AIRCRAFT SITUATION DISPLAYS

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Display Size			Size or Form Factor	Power Required	
<b>L3 Aviation Products</b> 5353 52nd St. SW Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 285-4224 <b>www.L3aviationproducts.com</b>	<b>Trilogy ESI-2000</b>	AMLCD; optional NVG compatibility	NA	NA	1/2.56	\$15,700	Electronic standby instrument incorporates an internal battery to meet the requirements for independent, dedicated back-up power for aircraft without dual electrical system. The lithium ion battery is integrated into the ESI-2000 hardware with a triple redundant safety design and provides a minimum of 1 hr. and up to 4 hr. of standby power. Heading is available when coupled with the optional magnetometer. For fixed-wing and helicopter applications.
	C2d, C3e, C4c, C6e, C10b, C46a, C113, C179	4.0 x 3.0			3-ATI chassis 4.0 x 3.00 x 6.7	14-28 VDC	
	<b>GH-3900 ESIS</b>	Active matrix LCD	ARINC 429, RS-232, discrete and analog	ARINC 429, RS-232, discrete and analog	1/3.0	\$38,000	Features a lighter and shorter chassis than previous models and allows the installer to define multiple I/O interfaces., SSEC and VMO values. An Aircraft configuration PC Software Tool simplifies the setup of the unit, allowing installers to define and customize the presentation of colors, flight cues and navigation data. Designed for FAR Part 25, Part 23 (Class III & IV), Part 27 and Part 29. Variety of air data and heading input options as well as built-in accelerometers. Classified as Non-ITAR.
	C2d, C3e, C4c, C6e, C8e, C10b, C34e, C35d, C36e, C40c, C46a, C66c, C95a, C106, C113, C115b, C145c	3 ATI			8.33 x 3.19 x 3.19	Dual 28 VDC inputs (18 VDC emergency power)	
	<b>GH-39RSU ESIS</b>	DU-42 Display Acitve Matrix LCD	DU-42 Display: 3 ARINC 429; 1 USB Serial Bus; 1 RS-232 Serial Bus; 12C Serial Bus; 1 Analog Remote Sensor Unit; 7 ARINC 429; 1 RS-232 Serial Bus; 6 Discrete Pneumatic pressure ports	DU-42 Display: 1 ARINC 429  Remote Sensor Unit: 3 ARINC 429; 2 Discrete; 2 Analog	DU-42 Display: 1.5 Remote Sensor Unit: 3.0	N/A	Features a 4.2-in. diagonal igh-resolution display (DU-42) and a separate Remote Sensor Unit (RSU). 1.5-in.-deep display allows installation in aircraft with limited space behind the panel. Configurable I/O interfaces and SSEC and VMO values, as well as display parameters. Designed for FAR Part 25 and Part 23 (Class III & IV aircraft, and Part 27 and Part 29 helicopters.
	DU-42 Display: C2d, C3e, C4c, C6e, C8e, C10b, C34e, C35d, C36e, C40c, C46a, C66c, C95a, C106, C113a Remote Sensor Unit: C2d, C3e, C4c, C6e, C8e, C10b, C46a, C95a, C106	1.50 (l) x 5.25 (w) x 3.0 (h) null			—	+28 VDC nominal	
	<b>ESI-500</b>	24-bit color LCD; optional NVG compatibility	Inputs: - discrete pneumatic pressure ports — ARINC 429 GPS or VLOC input or both (navigation) - MAG-500 magnetometer or an ARINC-429 (heading) - GPS (aircraft track) — OAT to compensate baro-corrected altitudes for temperature		—	\$5,600	Standby system designed for piston and turboprop aircraft and helicopters. Comes standard with altitude, attitude, slip/skid, vertical speed and aircraft track. Options available for display of navigation information and synthetic vision inputs, including terrain and obstacles. Magnetic heading optional when coupled with MAG-500 magnetometer. ESI-500 is compatible with existing NAV radios and GPS hardware. An internal lithium-ion battery pack automatically powers the system without interruption upon loss of main input power.
C2d (Type B) C8e (Type B) C10b (Type 1, Range: -1,500 to +35,000 ft.) C34e C35d C36e C40c C46a (Range: 20 to 300 kt.) C106 C113a C179a C201 C2d (Type B) C8e (Type B) C10b (Type 1, Range: -1,500 To +35,000 ft.)	3.0 x 3.0	2.75 3.25 x 3.25 in. bezel; 3.0 x 3.0 display			14-28 VDC		



**AIRCRAFT SITUATION DISPLAYS**

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Price	Remarks
	TSO	Display Size			Size or Form Factor	Power Required	
<b>Rogerson Aircraft</b> 2201 Alton Pkwy. Irvine, CA 92606 (949) 660-0666 <a href="http://www.rogersonaircraft.com">www.rogersonaircraft.com</a>	<b>5 ATI EFIS</b>  C3d, C4c, C5e, C6d, C8d, C9c, C34e, C35d, C36e, C40c, C41d, C52b, C63c, C66c, C67, C87, C92c, C113, C117a, C118, C119b, C129a, C147, C161a	AMLCD flat panel  5 ATI or 6.4-in. diagonal	analog synchro (XYZ, Sin/Cos) variable AC/DC discretes & digital ARINC 429, 419, 453, 735, RS-232	analog synchro (XYZ, Sin/Cos) variable AC/DC discretes & digital ARINC 429, 419, 453, 735, RS-232	1/7.75  5 ATI or 6.4 dia.	\$42,000*  28 VDC 44 W max	One, two or four programmable, self-contained flat-panel AMLCD EADI and EHSIs. Radio altimeter functions such as DH, expanded scale for landing helicopter operations, TCAS I and II, and EGPWS display capability, in addition to standard ADI, HSI, bearing pointers, CDI, autopilot annunciation, flight director cross bars or 'V' bars. Upgrade packages available. *BCA estimate.
<b>Sandel Avionics</b> 2401 Dogwood Way Vista, CA 92081 (877) 726-3357 (760) 727-4900 Fax: (760) 727-4899 <a href="http://www.sandel.com">www.sandel.com</a>	<b>SA4550 Primary Attitude Display</b>	rear projection LCD w/LED backlighting	analog: attitude glideslope, localizer, flight director command inputs, radar altimeter mode annunciators	NA	1/3.4	\$20,950*	Designed to upgrade legacy ADIs. Incorporates flight director command bars, glideslope/localizer deviation scale, fast/ slow indicator and mode annunciations. Selectable single-cue/split-cue display option. Sunlight readable LED backlit display with 180-degree viewing angle and over 10,000-hour MTBF. *High-vibration version, \$23,800. NVIS compatible version, \$27,050
	C113, C3d, C4c, C34e, C36e, C52b	4 ATI			4 ATI	28 VDC 40 W	
<b>Universal Avionics Systems Corp.</b> 3260 E. Universal Way Tucson, AZ 85756 (520) 295-2300 Fax: (520) 295-2395 <a href="http://www.uasc.com">www.uasc.com</a>	<b>EFI-890R</b>	active matrix color LCD	Analog: 6 - ARINC 429 5 - CSDB 2 - ARINC708 3 - Manchester bus ports 2 - VGA or 1-RDR.1E/F & 1 -VGS; 2 - RS-170 or 2 - NTSC comp. or 18:1 1 - RS-232 (maint.) Digital: 28 GND/OPN discretes 14 - 28 VDC/opn 4 - ARINC 407 with 2 ref. inputs 15 - analog DC	Analog: 2 - ARINC 429 2 - CSDB 1 - Manchester bus port  Digital: 5 - GND/OPN discretes 3 - 28 VDC/OPN discretes 6 - analog resolvers 2 - DC differential 2 - DC single ended	1/ 12.0	\$62,000*	Horizontal viewing angle +60°/-60°, vertical viewing angle +45°/-10°; resolution: 780 x 780 pixels; 124.5 color groups per inch (CGPI); sunlight readability with greater than 10,000/1 dimming range. *Depending on configuration.
	C2d, C3d, C4c, C52, C6d, C8d, C10b, C34e, C35d, C36c, C40c, C41d, C52b, C63c, C66c, C87, C92c, C95, C105, C113, C115b, C118, C119a, C129a, C151a	6.3 c 63 (8.0-om. dia.)			Bezel: 7.84 h x 7.42 w  Depth: 9.79 (back of bezel to read of connector)	28 VDC	

**ELECTRONIC FLIGHT BAGS**

Manufacturer	Model	Display	Inputs and Outputs	Units/Weight (lb.)	Price	Remarks
	Class	Display Size		Size	Power Required	
<b>Esterline CMC Electronics</b> 600 Dr. Frederik Phillips Blvd. Montreal, Quebec, Canada 4HM2S9 (514) 748-3184 Fax: (514) 748-3100 <b>www.cmcelectronics.ca</b>	<b>PilotView CMA-1100 (8.4 in.)</b> or <b>CMA-1410 (10.4 in.)</b> or <b>CMA-1612 (12.1 in.)</b>	touchscreen XGA AMLCD 8.4-in. or 10.4-in. diagonal	Ethernet, ARINC 429, discrete, RS422/232, USB 2.0, ARINC 717, ARINC 615, ARINC 619	EDU 8.4 in.: 3.5 EDU 10.4 in.: 4.0 EDU 12.1 in.: 5.1 EEMU: 2.0	\$20,000- \$25,000	CMC's Aircraft Information Server acts as an integrated aircraft information management server and aircraft interface device, enabling a wide range of applications and interfaces with any display or tablet solution.
	Class 2 and Portable	8.4-in. or 10.4-in. diagonal			N/A	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062 (913) 397-6200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>aera 796</b>	NA	RS 232, USB, Bluetooth	1/26.4 oz.	\$1,899	Portable GPS with EFB, charting, terrain, moving map, weather, XM and other capabilities. New 3-D vision technology shows a virtual 3-D behind-the-aircraft perspective of surrounding terrain derived from GPS and the onboard terrain database. With 2 serial ports, aera 796 allows for simultaneous connectivity with other hardware. With optional GTX 330 Mode S transponder interface, can access Traffic Information Service (TIS) alerts, where available, right on the device while also sending frequencies to a GTR 225 comm radio or GNC 255 nav/comm. Can also relay position reports to other devices.
	Class 1 or Class 2	7-in. diagonal				
	<b>aera 660</b>	5" Diagonal	RS-232, USB, Bluetooth, Wi-Fi	1/8.64 oz.	\$799	Portable GPS/EFB with charting, terrain, moving map, weather, wire-strike avoidance, wireless database updating and more.
	Class 1 or Class 2					

ENHANCED/SYNTHETIC VISION SYSTEMS

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Remarks
	TSO				Size	
<b>Esterline CMC Electronics</b> 600 Dr. Frederik Phillips Blvd. Montreal, Quebec, Canada H4M2S9 (514) 748-3184 Fax: (514) 748-3100 <b>www.cmcelectronics.ca</b>	<b>CMA-2600</b> <b>SureSight</b> <b>I-series</b> <b>EVS-IR Sensor</b>	HUD/HDD	single, dual-band sensor operating in the short to medium wavelengths, 1-5 microns	2-ANSI/SMPTE 170M  ARINC 429 RS 422 discretes	1/LRU 21.0  NA	Certified as part of an EFVS which provides operational landing credits as well as enhanced situational awareness to pilots in low-visibility conditions.
	—					
	<b>CMA-2700</b> <b>SureSight</b> <b>I-Series</b> <b>EVS-IR sensor</b>	HUD/HDD	single, dual-band sensor operating in the short to medium wavelengths, 1-5 microns	2-ANSI/SMPTE 170M  ARINC 429 RS 422 discretes  2 ARINC 818	1/LRU 21.0  —	Certified as part of an EFVS for operational landing credits by three leading Airworthiness Authorities (EASA, TCCA, and the FAA). Fully compliant for FAR 91.176
<b>Elbit Systems of America</b> <b>Fort Worth Operations</b> 4700 Marine Creek Pkwy. Fort Worth, TX 76179 <b>www.elbitsystems-us.com</b>	<b>EVS II</b>	HUD/HDD	1-5 micron infrared sensor	RS-170/SMPTE 170M; SMPTE 259; RS 232/RS 422; ARINC 429 discretes	3/22.0  1/2 ATR	EFVS certified for FAR 91.175 (l) and (m) operational credit. EFVS certified for Part 91, 135 and 121 operations on fixed- and rotary-wing applications. Contact manufacturer for specific application pricing.
	—	—				
	<b>GAVIS</b>	any RS-170/SMPTE, 170M analog video capable display	8-14 micron infrared sensor	RS-170/SMPTE 170M, analog video	1/3.5  3.0 x 6.0 x 11.0	EVS certified for situational awareness in all weather conditions. Certified for fixed- and rotary-wing aircraft. Contact manufacturer for specific application pricing.
	see remarks					
<b>L3 Aviation Products</b> 5353 52nd St. SW Grand Rapids, MI 49512 (616) 949-6600 Fax: (616) 285-4224 <b>www.L3aviationproducts.com</b>	<b>IRIS A100</b>	any RS-10 compatible displays	7-14 micron, uncooled ferroelectric sensor	RS-170, NTSC compatible video or PAL	1/1.7  5.4 x 5.4 x 3.4	Uses uncooled BST technology, IRIS provides enhanced visibility of almost any object, day or night, by measuring variations in heat signatures. A real-time, black and white image of people, animals, aircraft and terrain is displayed on any compatible RS-170 cockpit display. King Air, Bell 206 and Twin Commander STC kits additional.
	see remarks					

ENHANCED/SYNTHETIC VISION SYSTEMS

Manufacturer	Model	Display	Inputs	Outputs	Units/Weight (lb.)	Remarks
	TSO				Size	
<b>Astronics/MAX-VIZ, Inc.</b> 11241 SE Hwy 212 Clackamas, OR 97015 (503)968-3036 sales@mv.com	<b>Max-Viz 1500</b>	MFD or EFB	long-wave uncooled 320 x 240	RS-170 video FOV discreet	sensor 2 lb.; PWS module 2.5 lb.	Multiple STCs for fixed- and rotary-wing aircraft. Turbine helicopter, high-performance turboprop and jet fixed-wing aircraft.
	—				3.75 x 5.0 x 2.25	
	<b>Max-Viz 1400</b>	MFD or EFB	long-wave uncooled 640 x 480	RS-170 video FOV digital zoom polarity select	1.2 lb.	The Max-Viz 1400 is a general aviation enhanced vision sensor using a 640 x 480 pixel resolution long-wave infrared thermal imager with electronic zoom.
	—				3.07 x 6.16 x 2.09	
	<b>Max-Viz 1200</b>	MFD or EFB	long-wave uncooled 320 x 240	RS-170 video	1.2 lb.	Developed for general aviation piston aircraft, helicopters, and slower single-engine turboprop fixed-wing aircraft.
	—				3.07 x 6.16 x 2.09	
	<b>Max-Viz 600</b>	MFD or EFB	long-wave uncooled CMOS blended with IR 320 x 240	RS-170 video	1.2 lb.	Developed for general aviation piston aircraft, helicopters, and slower single-engine turboprop fixed-wing aircraft.
	—				3.77 x 8.69 x 2.21	
<b>Lexavia</b> 4020 52nd Ave Ct. NW Gig Harbor, WA 98335 (850) 343-1147 www.Lexavia.com	<b>LFS-3500 Long-Wave Infrared Sensor</b>	any NTSC RS-170 or PAL compatible display device (PFD, PND, MFD or dedicated display)	12: 28VDC input power, NTSC-RS-170	PAL video output; serial control interface — RS-232, RS-422, RS-485	1.0 lb.	Price: \$29,250 (640 x 512 resolution), \$22,933 (336 x 256)/28 VDC. High-performance rugged sensor design provides an increased level of situational awareness for improved safety of operations. Optional controller and stowable video displays also available.
	—				2.5 x 2.8 x 6.3	
	<b>LFS-6000 Long-Wave Infrared Sensor</b>	any NTSC RS-170 or PAL compatible display device (PFD, PND, MFD or dedicated display)	12: 28VDC input power, NTSC-RS-170	PAL video output Serial Control Interface — RS-232, RS-422, RS-485	0.4 lb.	Price: \$39,495 (640 x 512 resolution), \$31,913 (336 x 256)/28 VDC. Compact, lightweight and aerodynamically shaped EVS sensor provides an increased level of situational awareness for improved safety of operations. Optional controller and stowable video displays also available.
	—				2.42 x 2.32 x 5.31	
	<b>LFX-2010 Long-Wave Infrared Sensor</b>	any NTSC RS-170 or PAL compatible display device (PFD, PND, MFD or dedicated display)	12: 28VDC input power, NTSC-RS-170	PAL video output Serial Control Interface — RS-232, RS-422, RS-485	1.4 lb	Price: \$33,424 (640 x 512 resolution) 28 VDC. High-performance ruggedized sensor designed for special operations (hoist, fast rope and external operations) to provide an increased level of situational awareness for mission critical applications and improved safety of operations. Optional controller and stowable video displays also available.
	—				2.5 x 2.58 x 5.1	
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-1000 Fax: (319) 295-2297 www.rockwellcollins.com	<b>EVS-3000</b>	HUD/HDD	uncooled multi-spectral infrared sensor, ARINC 429		9.2 lb.	Provides situational awareness at night and in low-visibility conditions. When displayed head up, operational approval for landing minima under FAR Part 91.175 is available. Contact OEM for specific application pricing.
	—				1 LRU	

FLIGHT MANAGEMENT SYSTEMS

Manufacturer	Model	CDU Type	# Available ARINC 429 (In/Out)	Vertical Nav Modes	Performance Management	Air Data In (# types)	Specific Interfaces ARINC 429 (Out)	Weight (lb.)	Price / Remarks
	TSOs	Display Type	TSO'd Nav Sensors	# Available ARINC 429 Procedure Legs	Remote Radio Tuning			CDU Dimensions	
	RNP Certification				ARINC Radar (In)			Power	
<b>Esterline CMC Electronics</b> 600 Dr. Frederik Phillips Blvd. Montreal, Quebec, Canada H4M2S9 (514) 748-3184 Fax: (514) 748-3100 <a href="http://www.cmcelectronics.ca">www.cmcelectronics.ca</a>	<b>CMA-9000</b>	full alpha keyborad	24/8	fully coupled performance VNAV	Yes	ARINC 429/ ARINC 575	429 DME std.; 429 VOR std.	8.0	Price varies by installation. Coupled, performance optimized and advisory VNAV for climb, cruise, descent, approach. Performance table based. FANS-1 capable LPV Approach capable. Optional NVG display.
	C129	AMLCD,color			GPS, WAAS, VOR, DME, INS, IRS, TACAN			Yes	
	RNP 0.3, -10, BRNAV, PRNAV		No	—					



FLIGHT MANAGEMENT SYSTEMS

Manufacturer	Model	CDU Type	# Available ARINC 429 (In/Out)	Vertical Nav Modes	Performance Management	Air Data In (# types)	Specific Interfaces ARINC 429 (Out)	Weight (lb.)	Price / Remarks						
	TSOs	Display Type	TSO'd Nav Sensors	# Available ARINC 429 Procedure Legs	Remote Radio Tuning			CDU Dimensions							
	RNP Certification				ARINC Radar (In)			Power							
<b>FreeFlight Systems</b> 3700 Interstate 35 S. Waco, TX 76706 (254) 662-0000 Fax: (254) 662-9450 www.freeflightsystems.com	<b>2101 Approach Plus</b>	Dzus	4/0	Advisory	No	ARINC 565, ARINC 575; Coarse/ Fine A407 Synchro, ARINC 545, TAS, ARINC 429 ADC, RS-232 ADC	ARINC 429  GPS RS-232	3.65	\$7,245. Price includes receiver, data card, installation kit (with antenna), installation manual and pilot guide, Unit also available with NVG capability.						
	—	LED	GPS, WAAS	4	No			3.0 x 5.75 x 7.68							
	BRNAV				None			10- 40 VDC							
	<b>2101 I/O Approach Plus</b>	Dzus	4/0	Advisory	No	ARINC 565, ARINC 575; Coarse/ Fine A407 Synchro, ARINC 545, TAS, ARINC 429 ADC, RS-232 ADC	ARINC 429  GPS RS-232	3.65		\$11,500. Price includes receiver, datacard, installation kit (with antenna), installation manual and pilot guide. Sole means oceanic approval; interfaces with EGPWS.					
	—	LED	GPS, WAAS	4	No			3.0 x 5.75 x 7.68							
	BRNAV				None			10- 40 VDC							
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 www.rockwellcollins.com	<b>FMS 3000/5000</b>	full alpha keyboard	4/3	multi-waypoint	Yes	see remarks	see remarks	8.9	LPV approach capability and RF legs are available on some aircraft types. *FMS I/O provided by four redundant concentrators. Remote computer dimensions 1.7 x 8.84 x 6.06 in.; FMS 5000 requires radio tuning unit; FMS 3000 radio tuning is internal.						
	C129 GPS, C146 WAAS-B1, -C1	color LCD			Yes			6.375 x 5.75 x 6.33							
			RNP 0.3, -10, BRNAV	GPS, WAAS, DME, INC, Loran C	23			see remarks			20- 40 VDC				
	<b>FMS 4200/6000</b>	full alpha keyboard	4/3	multi-waypoint	Yes			see remarks		see remarks	4	LPV approach capability and RF legs are available on some aircraft types. *FMS I/O provided by four redundant concentrators. See FMS3000 remarks for remote computer; FMS4200 has advisory VNAV but not FMS-to-ILS auto transfer; Coupled VNAV available on FMS6000.			
	C129 GPS, C146 WAAS-B1, -C1	color LCD			Yes						6.375 x 5.75 x 6.33				
			RNP 0.3, -10 BRNAV	GPS, WAAS, DME, INC, Loran C	23						see remarks		20- 40 VDC		
	<b>FMS 6100</b>	full alpha keyboard	4/3	multi-waypoint	Yes						see remarks		see remarks	4	FMS I/O provided by four redundant concentrators. See FMS 3000 remarks for remote computer. WAAS/ SBAS capable.
	C129 GPS, C146 WAAS-B1, -C1	color LCD	VOR< GPS, WAAS, DME, INS, Loran C	23	Yes									6.375 x 5.75 x 6.33	
					RNP 0.3, -10 BRNAV									see remarks	

FLIGHT MANAGEMENT SYSTEMS

Manufacturer	Model	CDU Type	# Available ARINC 429 (In/Out)	Vertical Nav Modes	Performance Management	Air Data In (# types)	Specific Interfaces ARINC 429 (Out)	Weight (lb.)	Price / Remarks
	TSOs	Display Type	TSO'd Nav Sensors	# Available ARINC 429 Procedure Legs	Remote Radio Tuning			CDU Dimensions	
	RNP Certification				ARINC Radar (In)			Power	
<b>Universal Avionics Systems Corp.</b> 3260 E. Universal Way Tucson, AZ 85756 (520) 295-2300 (800) 321-5253 Fax: (520) 295-2395 <b>www.uasc.com</b>	<b>UNS-1Lw</b>	Full alpha keyboard	8/5	23	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	2.9	\$54,500. Air data converter unit available; 3-D coupled approach mode; PC program for remote/ oceanic ops.; Uni-Link text compatible; WAAS/SBAS capable.
	C129 GPS, C146B Gamma	color LCD	GPS, WAAS, Optional: VOR, DME, INS, IRS, Loran, TACAN	multi-waypoint	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	4.5 x 5.75 x 6.33; remote computer: 2 MCU, 7.7 lb.	
	RNP 0.3, -5, -10				std.			20- 40 VDC	
	<b>UNS-1LEw</b>	full alpha keyboard	8/5	23	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	7.86	\$69,000. 3-D coupled approach mode; PC program for remote/ oceanic ops.; Uni-Link text compatible; WAAS/SBAS capable.
	C129 GPS, C146B Gamma	color LCD	GPS, WAAS, Optional: VOR, DME, INS, IRS, Loran, TACAN	multi-waypoint	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	6.38 x 5.75 x 8.96	
					std.			20- 40 VDC	
	<b>UNS-1Espw</b>	full alpha keyboard	8/5	23	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	7.25	\$68,000. 3-D coupled approach mode; PC program for remote/ oceanic ops.; Uni-Link text compatible; WAAS/SBAS capable.
	C129 GPS, C146B	color LCD	GPS, WAAS, Optional: VOR, DME, INS, IRS, Loran, TACAN	multi-waypoint	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt. See remarks	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	6.38 x 5.75 x 7.62	
	RNP 0.3, 5, 10				std.			20- 40 VDC	
	<b>UNS-1Fw</b>	full alpha keyboard	8/5	23	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt.	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	4.1	\$81,500. 3-D coupled approach mode; PC program for remote/ oceanic ops.; Uni-Link text compatible; WAAS/SBAS capable.
	C129 GPS, C146B Gamma	color LCD	GPS, WAAS, Optional: VOR, DME, INS, IRS, Loran, TACAN	multi-waypoint	opt.	ARINC 575, ARINC 429 ADC std.; ARINC 565, Course/ Fine A407 Sncro, ARINC 545 TAS opt.	ARINC 429 GPS, S422A CSDB DME, Arinc 429 DME, Bendix 429 VOR, ARINC 429 VOR, ARINC 429 INS	6.38 x 7.5 x 3.5; remote computer: 2.0 lb.	
	RNP 0.3, 5, 10				std.			20- 40 VDC	

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks
				Dimensions		Dimensions	
						Power Required	
<b>Avidyne Corp.</b> 55 Old Bedford Rd. Lincoln, MA 01773 (781) 402-7400 <a href="http://www.avidyne.com">www.avidyne.com</a>	<b>Entegra Release 8</b>	see remarks	see remarks	see remarks	FMS, PFD/ MFD, AP/ IFCS, EFIS, TAWS, RMU, SVS, CAS/ TAWS	18.75	Integrates primary flight information, navigation, terrain, weather, traffic on two or three large-format displays. Selectable IAS and V-speed ranges to suit aircraft installations. Dual-PFD version features CCS Cross Compare System that monitors cross-side PDF and ADAHARS signals 30 times per second. Works with DFC90 or STEC 55 X autopilot and 3rd party GPS/NAV/Coms for position information.
						two 10.4 in. diagonal, color active matrix displays	
	<b>Entegra Release 9</b>	see remarks	see remarks	see remarks	FMS, PFD/ MFD, AP/ IFCS, EFIS, TAWS, RMU, SVS, CAS/ TAWS	18.75	Cirrus starting at \$90,000; Piper Matrix starting at \$105,800. Integrates primary flight information, navigation, weather and traffic on 2 or 3 large-format displays. Includes dual VHF nav/com, dual WAAS, GPS, dual FMS 900w dual ADAHARS, remote transponder tuning, ACD 215 alpha-numeric FMS keypad with display. Works with DFC100 digital autopilot. Optional SVS.
						two 10.4 in. diagonal, color active matrix displays	
<b>Genesys Aerosystems</b> One S-TEC Way Municipal Airport Mineral Wells, TX 76067  <b>Formerly: Cobham Commercial Systems</b>	<b>Chelton Flight Systems EFIS</b>	WX500, ADF, TCASI/II, TCAD, ADS-B, TIS-B, radar altimeter, ARINC 429, RS-232, RS-422, 10 discretes	ARINC 429, RS-232, RS-422, 10 discretes, autopilot	color LCD	FMS, PFD/ MFD, AP/ IFCS, EFIS, TAWS, SVVS, CAS/TAWS	two screen: 2.0 four screen: 50.0	Two screens: \$95,000; Four screens: \$150,000.
				6.25 x 5.5 in. NVG compatible		10-32 VDC	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062-3426 (913) 397-8200 Fax: (913) 397-8282 <a href="http://www.garmin.com">www.garmin.com</a>	<b>G1000 NXI</b>	TCAS i/II, RS 232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	ARINC 429; HSDB, CD/HIS, RMI, air data, RS-232, RS 422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	Varies by installation	See remarks	N/A	Price varies by installation. An all-glass avionics suite designed for OEM or custom retrofit installation on a wide range of aircraft. Integrates primary flight information, navigation, communication, weather, terrain and traffic data on two or three large format displays. Tailored to specific OEM requirements. Features include 3-axis, all-digital flight control system; Synthetic Vision Pathway navigation; dual AHRs; dual radio modules with WAAS certified IFR Oceanic-approved GPS, VHF Nav with ILS and VHF Com; dual RVSM compliant DADC; EICAS; ADS-B In and Out Transponder(s); Class B TAWS; Digital weather radar. Optional Bluetooth connectivity to select mobile devices. Retrofit system also available for King Air 300/350 and 200.
				Varies by installation			
	<b>G1000H (helicopter version)</b>	TCAS i/II, RS 232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	ARINC 429; HSDB, CD/HIS, RMI, air data, RS-232, RS 422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	Varies by installation  Varies by installation	see remarks	N/A	Price varies by installation. An all-glass avionics suite designed for OEM or custom retrofit installation on a wide range of aircraft. Integrates primary flight information, navigation, communication, weather, terrain and traffic data on two or three large format displays. Tailored to specific OEM requirements. Features include 3-axis, all-digital flight control system; Synthetic Vision Pathway navigation; dual AHRs; dual radio modules with WAAS certified IFR Oceanic-approved GPS, VHF Nav with ILS and VHF Com; dual RVSM compliant DADC; EICAS; ADS-B In & Out Transponder(s); Class B TAWS; Digital weather radar. Optional Bluetooth connectivity to select mobile devices.

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks	
				Dimensions		Dimensions		
						Power Required		
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062-3426 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>G2000</b> (piston engine aircraft version)	TCAS I/II, RS-232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	TCAS I/II, RS-232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	12- or 14-in. backlit LED	See remarks	N/A	Price varies by installation. Integrates primary flight information, navigation, communication, weather, terrain and traffic data on large format displays. Tailored to specific OEM requirements. Features include three-axis, all-digital automatic flight control system; Synthetic Vision Pathway navigation; dual solid-state AHRS; dual integrated radio modules with WAAS certified IFR Oceanic-approved GPS, VHF Nav with ILS and VHF Com with 16-W transceivers and 8.33-kHz spacing; dual RVSM compliant DADC; EICAS; Class B TAWS; digital weather radar; Garmin FliteCharts; and Garmin SafeTaxi.	
				See remarks		N/A		
						N/A		
	<b>G3000</b> (light turbine aircraft version)	TCAS I/II, RS-232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	TCAS I/II, RS-232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	14.1-in. diagonal WXGA	See remarks	N/A		
				See remarks		N/A		
						N/A		
	<b>G5000H</b> (helicopter version)	TCAS I/II, RS-232, RS-422, RS-485; ARINC 429; HSDB, CD/HIS, RMI, air data	RS 232, RS 422, RS 485, ARINC 429; HSDB, CD/HIS, RMI, discretes, air data	varies by installation	See remarks	N/A		Price varies by installation. Advanced flight deck designed for OEM installation on medium-lift turbine helicopters. Bright high-resolution displays with Helicopter Synthetic Vision Technology (HSVT) let you see clearly even in IFR conditions. Displays divide into 2 pages to help display multiple systems and sensors. Intuitive touchscreen interface with shallow menus and audible feedback. Graphical synoptics. Weather, charts, traffic, terrain and Global connectivity options. TOLD, performance planning and paperless cockpit support. Digital document display for electronic charts, flight manual data and more.
				See remarks		N/A		
						N/A		

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks
				Dimensions		Dimensions	
						Power Required	
<b>Garmin International</b> 1200 E. 151st St. Olathe, KS 66062-3426 (913) 397-8200 Fax: (913) 397-8282 <b>www.garmin.com</b>	<b>G5000</b>	TCAS i/II, RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	four backlit LED XGA 1280 x 800 pixels touch-screen displays	see remarks	NA	Price varies by installation. Intended for use aboard a broad range of professionally flown air transport category aircraft, ranging from light jets to large-cabin, transoceanic aircraft. Integrates primary flight information, navigation, communication, weather, terrain and traffic data on large-format displays. Features include three-axis, all-digital automatic flight control system; Synthetic Vision Pathway navigation; dual solid state AHRS; dual integrated radio modules with WAAS certified IFR oceanic approved GPS, VHF navigation with ILS and VHF communication with 16-watt
						NA	
				see remarks		NA	
	<b>G500</b>	TCAS i/II, RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	dual 6.5-in. VGA LCDs	see remarks	NA	\$15,995. Includes CDU, digital AHRS, ADC, magnetometer, temperature probe. Also certified to C2d, C10b and C34c. Replaces standard six-pack instruments. Features 6.5-in. PFD and MFD plus AHRS. SVT is standard with G600 and optional for G500. Optional TAWS-B for G600 only. GWX70 radar sold separately. Includes CDU (dual 6.5-in. VGA LCD), digital AHRS, ADC, magnetometer, temperature probe. Enhanced autopilot interface capabilities using the optional GAD 43
				—		NA	
						NA	
	<b>G600</b>	TCAS i/II, RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	RS 232, RS 422, RS 485; ARINC 429; HSDB, CD/HIS, RMI, air data	dual 6.5-in. VGA LCDs	see remarks	NA	\$29,995. Includes CDU, digital AHRS, ADC, magnetometer, temperature probe. Also certified to C2d, C10b and C34c. Replaces standard six-pack instruments. Features 6.5-in. PFD and MFD plus AHRS. SVT is standard with G600 and optional for G500. Optional TAWS-B for G600 only. GWX70 radar sold separately. Includes CDU (dual 6.5-in. VGA LCD), digital AHRS, ADC, magnetometer, temperature probe. Enhanced autopilot interface capabilities using the GAD 43.
				—		NA	
						NA	



INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks
				Dimensions		Dimensions	
						Power Required	
<b>Honeywell Aerospace BendixKing</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 <a href="http://www.bendixking.com">www.bendixking.com</a>	<b>Primus Apex AeroVue</b> (C106 in progress) C115b, C198 Class A1, B, C	TCAS/II RS-232, RS-422, ARINC 429, ARINC 453, ethernet air data, video, dis- cretes, analogs	ARINC 429, ARINC 453, RS-232, RS- 422, discretes, analogs	12.0-in. color LCDs	FMS with Flight Director; Dual ADAHRS; Graphi- cal flight planning; SmartView SVS; Digital 3-axis autopil- ot; Electronic checklist; XM Weather; Vertical nav profile; Video inputs; Dual WAAS GPS receivers; Integrated EIS; Mode S transponder; Dual audio panels with Bluetooth	see remarks	Integrated flight deck with three or four 12" LCDs, depending upon the aircraft installation. Includes a variety of advanced features: digital autopilot capable of coupled VNAV, Smart- View™ Synthetic Vision System, Interactive Navigation (INAVTM) for graphical flight planning, and both a Cursor Control Device (CCD) and Multifunction Control- ler for a more ergonomic user ex- perience. Weather radar, TCAS I, EGPWS, and radar altimeter also available. Price and weight are dependent upon installation. Announced programs include the Beechcraft King Air C90, 200, B200, and Cessna Citation V, Ultra, and Encore.
						see remarks	
						see remarks	

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks	
				Dimensions		Dimensions		
						Power Required		
<b>Honeywell Aerospace BendixKing Avionics</b> 9201 San Mateo Blvd. NE Albuquerque, NM 87113 (855) 250-7027 www.bendixking.com	<b>Bendix King KSN 770/765 Integrated Navigator WAAS/ GPS/ NAV (KSN 770 only)/ COMM (KSN 770 only)/ MFD</b>	RS-422 Interface; Weather Radar; Traffic; Terrain; EGPWS; XM Weather; Air data/ Heading Interface; Fuel Flow Air Data Computer and others.	AARINC 429 input; 10 ARINC 429 output; 2 RS-232 input; 4 RS-232 output; 4 RS-222 input; 3 RS-222 output; 28 discrete input; 20 discrete output	5.7 in.	WAAS, LPV. Can displays safety systems information including On-board weather radar, Enhanced Ground Proximity Warning System (EGPWS), XM Datalink Weather, Terrain awareness and warning System (TAWS) and Traffic Collision Avoidance System (TCAS). Split-screen capabilities.	8.5 lb.	Combines GPS navigation, Nav/ Com, terrain mapping, charting and safety sensor displays. Also displays XM Datalink Weather, radar-based weather, traffic and terrain. The KSN offers many ways of interfacing with your information with a combination of hard buttons, cursor control and touchscreen.	
				Active Matrix LCD		N/A		
<b>Innovative Solutions &amp; Support (IS&amp;S)</b> 70 Pennsylvania Dr. Exton, PA 19341 (610) 646-9800 Fax: (610) 646-0149 www.innovative-ss.com	<b>Cessna Citation Adviz Flat Panel Display</b>	ARINC 429, A453/708, Ethernet, Descretes, Analog, Synchro, RS-422, CSDB, USB	ARINC 429, A453/708, Ethernet, Descretes, Analog, Synchro, RS-422, CSDB, USB	AMLCD	See remarks	7.0	Price varies by installation. Designed to replace existing instruments, including the EADI and EHSI displays, altimeter, airspeed and vertical speed indicators. Retrofitting existing aircraft requires minimal changes to existing aircraft wiring while reducing power consumption and weight. Options include satellite weather, e-charts, video and remote radio control.	
				10.4 in.		NA		
	10.4 in. (2) MFD: 15.4 in.	NA						
	<b>Eclipse Avio NG</b>	ARINC 429, ARNC 453, RS 232, RS 42, Byteflite, Ethernet, discretes	ARINC 429, ARNC 453, RS 232, RS 42, Byteflite, USB, Ethernet, discretes	ARINC 429, ARNC 453, RS 232, RS 42, Byteflite, USB, Ethernet, discretes	AMLCD	See remarks	PFD: 8.5 MFD: 12.5	Price varies by installation. FMS options include either integrated WAAS-based FMS, exterior WAAS-based FMS or non-WAAS-based FMS; system provides PFD/ND with MFD functions and engine instruments; system interfaces with new or existing AP/FD/IFCS; TAWS display provided and connects directly with TAWS; remote tuned radios optional; e-charts, moving maps, radar display, satellite weather, TCAS-I, fuel management and aircraft systems pages.
					PFD: 10.4 in. (2) MFD: 15.4 in.		PFD: 10.4 in. (2) MFD: 15.4 in.	
	PFD: 50 W MFD: 75 W							
<b>Pilatus PC-12 FPDS System</b>	Contact OEM for details	Contact OEM for details	Contact OEM for details	AMLCD	See remarks	15 in. IPFD, 14 lb., 70 W;	Price varies by installation. FMS options include either WAAS-based FMS, exterior WAAS-based FMS or non-WAAS-based FMS; systems provides PFD/ND with MFD functions; coupled WAAS LPV approach; system interfaces with new or existing AP/FD/IFCS; RVSM certified, options include RS 170 or DVI video input on 5.15-in. IPFD; TAWS terrain display provided and connects directly with TAWS; e-charts certified.	
				10.4; 15.0		10 in. IFPD, 8 lb., 35 W;		
						DCP, 3.0 lb., 8 W		

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks
				Dimensions		Dimensions	
						Power Required	
<b>Innovative Solutions &amp; Support (IS&amp;S)</b> 70 Pennsylvania Dr. Exton, PA 19341 (610) 646-9800 Fax: (610) 646-0149 <a href="http://www.innovative-ss.com">www.innovative-ss.com</a>	<b>Vantage Cockpit/IP Flat Panel Display System</b>	Contact OEM for details	Contact OEM for details	AMLCD	See remarks	FPD: 6.0 lb., 30 watts RNCU: 9.75 lb., 25 watts; ECSU: 25 watts	Price varies by installation. FMS options include either WAAS-based FMS, exterior WAAS-based FMS or non-WAAS-based FMS; systems provides PFD/ND with MFD functions and engine instruments; system interfaces with new or existing AP/FD/IFCS; EVS input can be input from EVS camera or other video camera via RS-170; TAWS terrain display provided and connect directly with TAWS; remote tuned radios optional. e-charts, moving maps (worldwide terrain 3-arc/second, radar display, satellite weather, TCAS-I/II, fuel management exceedance recording and video.
				10.4			
<b>Rockwell Collins</b> 400 Collins Rd. NE Cedar Rapids, IA 52498 (319) 295-4085 Fax: (319) 295-2297 <a href="http://www.rockwellcollins.com">www.rockwellcollins.com</a>	<b>Pro Line Fusion</b>	See Remarks	See Remarks	Color LCD	FMS, PFD/Adapts to 3, 4 or 5 LCD graphic display configuration integrating PFD/MFD flight information	Various, depending on installation	Features include dual comm/nav, single, dual or triple FMS, GPS WAAS, single or dual integrated Flight Information system (IFIS), weather radar with turbulence detection, data link communication, onboard maintenance system, information management system, surface management, surveillance video, enhanced vision, synthetic vision, head-up guidance and functionality to meet Next Gen airspace requirements. Display systems available with touch screen capability. Customized to OEM requirements. Price varies by installation.
				15.1-in. color LCD SXGA: 14.1-in. color LCD WXGA			
	<b>Pro Line 21</b>	Numerous	Numerous	Color LCD	FMS, PDF/MFD, EFIS, TAWS, RMU, EVS, SVS pending	Various, depending on installation	Price varies by installation. The typical Pro Line 21 major retrofit package includes three-four 8 x 10 in. LCDs with advanced graphics, all digital CNS radios with dual comm/navs, dual transponders with enhanced surveillance, dual DME, single or dual FMS GPS WAAAS, Digital Flight Control System (DFCS) with coupled VNAV, single or dual Integrated Flight Information Systems (IFIS), dual channel radar altimeter, dual solid-state Attitude Heading Reference Systems (AHRS), dual air data systems (RVSM compliant), solid-state radar with turbulence detection, Engine indications on PFD or MFD, 2nd or 3rd FMS, 3rd FMS, 3rd AHR, 3rd VHF-4000, 2nd ALT-4000, TCAS 4000, ADS-B transponders, single or dual HF-9000 radio, Satcom, CMU-4000 data link system, XM weather, maintenance diagnostics system, DBU-5000 data loader and all-new wiring and connectors.
				6.375 (h) x 5.75 (w) x 6.33 (l)			

INTEGRATED AVIONICS SYSTEMS

Manufacturer	Model	Inputs	Outputs	CDU Type	Operational Capabilities	Weight (lb.)	Price/Remarks
				Dimensions		Dimensions	
						Power Required	
<b>Rogerson Aircraft</b> 2201 Alton Pkwy. Irvine, CA 92606 (949) 660-0666 <a href="http://www.rogersonaircraft.com">www.rogersonaircraft.com</a>	<b>Series 700 Integrated Avionics System</b> for Bell 412 and Bell 429; TC on Bell 429 and STC on Bell 412 using 6 x 8 ALMD displays	ARINC 429, Synchro, Discretes, RGB, NTSC, PAL video capability	ARINC 429, variable DC, Discretes	Course Heading Select Panel (CHSP)	PFD, MFD, EICAS Mission functions: FLIR, RS-170 video, fuel and hydraulics	Each display unit: 13.5	Prices based on quantity; dependent on engine type.
				6 x 8 ALMD displays			
	<b>Series 600 Integrated Avionics System</b> using 6 x 8 AMLCD displays	ARINC 429, Synchro, Discretes, RGB, NTSC, PAL video capability	ARINC 429, Synchro, Discretes, RGB, NTSC, PAL video capability	Course Heading Select Panel (CHSP)	PFD, MFD Mission functions: FLIR, RS-170 video, fuel and hydraulics	Each display unit: 13.5	Prices based on quantity.
				6 x 8 ALMD displays			
<b>Sandel Avionics</b> 2401 Dogwood Way Vista, CA 92081 (877) 726-3357 (760) 727-4900 Fax: (760) 727-4899 <a href="http://www.sandel.com">www.sandel.com</a>	<b>Avilon</b>	see capabilities	see capabilities	6 touchscreen displays*	ADS-B, ADC, AHRS, autopilot, audio, engine instruments, flight director, FMS, GPS, Mode S transponder, Nav, Com, TAWS, weather radar display	weight savings of 100-150 lb.	\$175,000 installed price. Delivered as a prewired assembly allowing for a five-day installation time. Initial STC for King Air 200 with additional models to follow. Designed for performance-based navigation with an emphasis on safety. *Existing panel is removed and replaced with Avilon.
				—			

# 2017 Business Airplanes



Business jet operators are flying more than **4.3 million missions per year**, the highest since 2009 and even more than in 2008 prior to the Great Recession.

BY **FRED GEORGE** fred.george@penton.com

**T**he U.S. economy has shown steady improvement as indicated by the 0.2%, 0.5% and 0.6% increases for November and December 2016 and January 2017, respectively, in the Conference Board Leading Economic Index, a composite measure of manufacturing activity, consumer and business demand for goods and services, stock prices and new building permits, among other factors. But you'd never know there was any improvement from looking at the general aviation market.

New aircraft sales revenues plunged by nearly \$5 billion in 2016 from one year earlier, according to the General Aviation Manufacturers Association (GAMA). Business jet deliveries fell from 718 units in 2015 to 661 units in 2016, the industry's lowest figure since 2004. Activity was strongest in North America and Europe, but a prolonged and pronounced slump in Latin America, Asia-Pacific, the Middle East and Africa dragged down total sales. North America and Europe accounted for more than 80% of turbofan deliveries and more than two-thirds of the turboprop deliveries.

GAMA reports that turboprops

fared slightly better than in the previous year, with a slight uptick in deliveries from 557 units in 2015 to 582 deliveries in 2016. North America, Asia-Pacific and Europe saw slight increases, while Latin America witnessed a minor decline. Overall, turbine aircraft deliveries have remained flat since 2009 and actually declined since 2013. More telling, turbine aircraft sales revenues fell nearly 15% in 2016 compared to the previous year.

Piston aircraft deliveries also fell by nearly 5% in 2016, although North America had a slight increase, accounting for nearly 70% of the sales.

Yet, the size of the world's turbofan and turboprop fleet increased slightly to 36,674 aircraft, according to GAMA citing data published by Jetnet LLC.

Sales and deliveries of new aircraft historically have tracked with global economic activity. But that's no longer the case in the business aircraft industry, says Rolland Vincent of his eponymous Aviation Consulting firm in Plano, Texas. His firm surveys 500 business aircraft owners and operators every 90 days.

In collaboration with Utica, New York-based Jetnet, Vincent publishes

quarterly history and forecast reports used for planning purposes by the business aircraft industry.

The Jetnet IQ report for first quarter 2017, for instance, says that 80% of North American respondents believe the economy there will grow faster in the next 12 months than in the previous year. More than 80% of North Americans believe the Donald Trump administration will be beneficial to aviation during the next year. And business jet operators are flying more than 4.3 million missions per year, the highest since 2009 and even more than in 2008 prior to the Great Recession.

Robert Stallard of Vertical Research Partners also notes that business aircraft operations grew at 2.9% in early 2017 year-over-year. For early 2016, year-over-year growth was only 1.1% versus 2015.

The economies of China and India should continue to expand, but the average GDP growth of 18 other nations, including the U.S., will hover near 2.0% in 2017, according to Vincent. These 20 nations account for most of the world's business aircraft.

Still, potential buyers are not rushing to new aircraft sales offices and asking for demo flights. In fact, Vincent projects that new turbofan aircraft



deliveries will drop again this year to 640 units, accompanied by a slight decline in sales revenues. And he forecasts another 5.5% decrease to 605 units in 2018.

The reason? Oversupply. Book-to-bill ratios for Bombardier, Dassault, Embraer, Gulfstream and Textron all are below 1:1, meaning that the manufacturers are taking fewer orders for new equipment than the number of units they ship from their plants. Dassault, for example, had a book-to-bill ratio of less than 0.5 to 1 in 2015 and 2016.

Asking prices for turboprop aircraft are soft in 2017. Compare list prices in *BCA's May 2016 Handbook* with prices this year. Most turboprops are priced the same as last year, though a few Falcon and Gulfstream models show modest increases. To increase competitiveness, Embraer dropped the Legacy 600 in favor of the new Legacy 650E that is priced \$5.7 million less than last year's Legacy 650. And Gulfstream dropped the G150 from its lineup due to low demand.

There also is a widening gap between list prices and sale prices. For

instance, Vincent says Bombardier is selling some models at a 33% discount, forcing other manufacturers to sacrifice profit margins or lose sales. While the Canadian manufacturer garnered the largest number of business aircraft deliveries in 2016 among business jet makers, any such discounting would likely result in razor-thin margins.

Textron Aviation is faring better than most others. CEO Scott Ernest's capacity discipline resulted in the best book-to-bill ratio of any of the five jet makers from 2013 through 2016. But last year it still was hovering at slightly less than 1:1, according to Vincent, hardly a banner year for business jets.

This year, the FAA revised its general aviation fleet forecast, lowering growth of the general aviation fleet to 0.1% per year for the next two decades, with new turbine aircraft deliveries offsetting a projected contraction of the piston aircraft fleet, according to its *Aerospace Forecast Report Fiscal Years 2017 to 2037*. GAMA also notes that the general aviation pilot population is shrinking, although there was a slight uptick in

student starts in 2015. While the general aviation fleet growth is lackluster, the FAA estimates that business jet operations will increase 3.0% from 2017 to 2037 in its latest forecast.

The report also says "there is uncertainty regarding the impact of the new U.S. administration's policies on economic growth." And with both U.S. Rep. Bill Shuster (R-Penn.), chairman of the House Transportation and Infrastructure Committee, and President Trump pushing to spin off FAA ATC into to a private corporation with a board of directors dominated by the airlines, business aircraft operators potentially could face substantial airspace and airport user fees.

On a more positive note, the FAA believes that the price for turbine fuel will increase only modestly in 2017 because the price of crude oil should stabilize at about \$47 per barrel, up from \$39 per barrel in 2016. Crude oil shouldn't again reach its 2013 price of \$100 per barrel until 2026, according to the FAA Forecast.

Regardless of the price of fuel or user fees, the FAA estimates that piston

DEDICATED TO HELPING BUSINESS ACHIEVE ITS HIGHEST GOALS.



## CROSSING THE ATLANTIC WAS EASY COMPARED TO NAVIGATING CONGRESS.

When "Lucky" Lindy made his transatlantic crossing, he didn't have to deal with an ocean of congressional wrangling (maybe that's why they called him "Lucky"). The prevailing winds blew in his favor. But today, those winds have changed. Flying for business is more scrutinized than ever. Luckily, there's NBAA. We've made a home on the Hill, so that our members can make a living in the sky. Because business aviation enables economic growth. And at NBAA, we enable business aviation.

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aircraft deliveries will continue to decline. In 2016, piston-engine aircraft deliveries from U.S. manufacturers were down 4.2% from 2015, according to GAMA. The FAA estimates that the piston aircraft fleet will atrophy at 0.8% per year from 2017 to 2036, due to “unfavorable pilot demographics, overall increased cost of aircraft ownership” and “new aircraft deliveries not keeping pace with retirements of the aging fleet.”

Nonetheless, most piston aircraft manufacturers are hiking prices this

HTF7700L turboprops, features Garmin G5000 avionics and offers double-club seating for eight passengers.

Vincent foresees a sweet spot in the business jet market for 3,000-nm to 4,000-nm super-mids, such as the Longitude. Textron's new model could spur Bombardier, Embraer and Gulfstream to look at derivatives or new models in this segment. He's also bullish on the Falcon 5X because of its cabin size, range and fuel efficiency. But ongoing problems with its Snecma Silvercrest turboprops have slowed Dassault's de-

Daher is replacing the TBM 900 with the TBM 910, a derivative upgraded with Garmin G1000 NXi avionics and other modifications. Both Daher and Pilatus increased prices in response to strong order books.

While most new piston and turboprop aircraft deliveries remain stubbornly stagnant, several developments are buoying spirits in the business aircraft industry. The European Aviation Safety Agency (EASA) issued final regulations permitting commercial single-engine turbine aircraft operations in instrument meteorological conditions (IMC). Notably, Europe is the last large business aircraft market that, with few exceptions, did not permit commercial single-engine operations in IMC.

After seven years, the 36-state International Civil Aviation Organization (ICAO) council adopted uniform CO<sub>2</sub> emission standards for aircraft. Such standardization facilitates creation of market-based measures to move toward carbon-neutral growth of aircraft operations by 2020. Reduction in CO<sub>2</sub> will be made possible by more-efficient air traffic management, use of sustainable alternative fuels, replanting rain forests and developing more-fuel-efficient aircraft.

The FAA also continues to progress through Phase II of its Piston Aviation Fuels Initiative by developing a drop-in replacement unleaded avgas by 2018. Shell Oil and Swift Fuels have been selected to partner with the FAA to develop ASTM standards for unleaded avgas that will have the least technical and financial impact on general aviation aircraft operators and establish a fuel distribution infrastructure. However, it's still not clear how much the price of that fuel will change from the cost per gallon of 100LL gasoline.

So, in the short term, look for single-engine and multiengine turboprops to be solid sellers. The piston-engine market is in for a rough ride because of aging pilot demographics, increasing direct operating costs and tougher local airport authority rules, regulations and restrictions, particularly in California. The turboprop aircraft market will remain relatively flat because of oversupply in almost all segments. But a new generation of roomy, fuel-efficient and fast U.S. transcontinental-range and transatlantic-range super-midsize to large-cabin aircraft hold the promise to lift the turboprop sector out of its doldrums. **BCA**

BOMBARDIER



Bombardier's Global 7000 did not make it into the tables this year because performance details were not released by the manufacturer. Look for its debut in the 2018 edition.

year. That includes Cirrus Aircraft, Piper and Textron Aviation, but Mooney, whose future seems uncertain, is holding 2016 pricing for its M20 models. Notably, GAMA reports Mooney delivered just seven aircraft in 2016, and there is very little activity at the factory in Kerrville, Texas. However, the M20U Ovation Ultra and M20V Acclaim Ultra, models featuring left- and right-side doors, received certification in March, and development of the diesel-powered models was still pending as we closed this issue.

Not all the news for 2017 is bad, however. This year, Textron Aviation's 3,500-nm range super-midsize Cessna CE-700 Citation Longitude makes its debut in the Purchase Planning Handbook. Due for certification late this year, the Longitude's evolutionary design combines a stretched and strengthened Citation Latitude fuselage mated to proven wing and empennage structures that were modified and adapted for the mission. The aircraft is powered by well-proven Honeywell

development program by several years.

Gulfstream's 6,200-nm range, Mach 0.85 cruise G600 also is making its debut in this year's Handbook. A longer cabin, wider wingspan and longer-range derivative of the G500, it features active side-sticks, fly-by-wire (FBW) flight controls and Gulfstream's signature Symmetry flight deck. It's slated for certification late next year.

Bombardier's Global 7000 was due to make its debut in this year's *Handbook*. But the manufacturer declined to release performance details despite having two aircraft in flight testing. A third test aircraft, slated for first flight later this year, should be fully production conforming, Vincent believes. Look for the Global 7000 to appear in the 2018 *Handbook*.

The single-engine turboprop sector also remains stable to strong. Epic, Piper, Mahindra, Quest and Textron held prices unchanged or close to 2016 levels. Epic Aircraft is making changes to the E1000 to ensure it complies with upcoming certification requirements.



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# How to Use the Airplane Charts



BOMBARDIER

**F**or an aircraft to be listed in the *Purchase Planning Handbook*, a production conforming article must have flown by May 1 of this year. The dimensions, weights and performance characteristics of each model listed are representative of the current production aircraft being built or for which a type certificate application has been filed. The basic operating weights we publish should be representative of actual production turboprop and turboprop aircraft because we ask manufacturers to supply us with the average weights of the last 10 commercial aircraft that have been delivered. However, spot checks of some manufacturers' BOW numbers reveal anomalies. We reserve the right to make adjustments to weights, dimensions and performance data. These data adjustments will be noted in the Remarks

section for specific models as "BCA Estimated Data."

The takeoff field length distances are based on maximum takeoff weight for maximum range missions.

Please note that "all data preliminary" in the Remarks section indicates that actual aircraft weight, dimension and performance numbers may vary considerably after the model is certified and delivery of completed aircraft begins. \*\*\*All data for these aircraft is highlighted with a blue tint.\*\*\*

## Manufacturer, Model and Type Designation

In some cases, the airplane manufacturer's name is abbreviated. The model name and the type designation also are included in this group.

## BCA Equipped Price

► Price *estimates* are first quarter, current year dollars for the next available delivery. Some aircraft have long lead times, thus the actual price will be higher than our published price because of block point changes and inflation adjustments. Note well, manufacturers may change prices without notification.

► **Piston-powered airplanes** – Computed retail price with at least the level of equipment specified in the "BCA Required Equipment List."

► **Turbine-powered airplanes** – Computed retail price with at least the level of equipment specified in the "BCA Required Equipment List," if available. Some manufacturers decline to provide us with actual prices of delivered aircraft, so we may estimate them. The aircraft serial numbers aren't necessarily



consecutive because of variations in completion time and because some aircraft may be configured for non-commercial, special missions.

## Characteristics

► **Seating:** Crew + Typical Executive Seating/High-Density Seating/Max Certification Seating — For example, 2+8/13/19 indicates that the aircraft requires two pilots, there are eight seats in the typical executive configuration, 13 seats with optional high-density seating and up to 19 passenger seats based upon FAA and/or EASA certification limits. A four-place single-engine aircraft is shown as 1+3/3, indicating that one pilot is required and there are three other seats available for passengers. We require two pilots for all turboprop airplanes, except for single-pilot certified aircraft such as the Cirrus Vision SF-50, Eclipse 550, Cessna Citation CJ series, HondaJet and Syberjet SJ30-2, which have, or will have, a large percentage of single-pilot operators. Four crewmembers are specified for ultra-long-range aircraft — three pilots and one flight attendant. However, Dassault only provides data with three crewmembers aboard for its ultra-long-range aircraft, thus the notations for the Falcon 8X.

Each occupant of a turbine-powered airplane is assumed to weigh 200 lb., thereby allowing for stowed luggage and carry-on items. In the case of piston-engine airplanes, we assume each occupant weighs 170 lb. There is no luggage allowance for piston-engine airplanes.

► **Wing Loading** — MTOW divided by total wing area.

► **Power Loading** — MTOW divided by total rated takeoff horsepower or total rated takeoff thrust.

► **FAR Part 36 Certified Noise Levels** — Flyover noise in A-weighted decibels (dBA) for small and turboprop aircraft. For turboprop-powered aircraft, we provide Part 36 EPNdB (effective perceived noise levels) for Lateral, Flyover and Approach.

## Dimensions

► **External Length, Height and Span** dimensions are provided for use in determining hangar and/or tie-down space requirements.

Internal Length, Height and Width are based on a completed interior, including insulation, upholstery, carpet, carpet padding and fixtures. Note well: These dimensions are not intended to be



based upon green aircraft dimensions. They must reflect the actual net dimensions with all soft goods installed. Some manufacturers provide optimistic measurements, thus prospective buyers are advised to measure aircraft themselves.

As shown in the Cabin Interior Dimensions illustration, for small airplanes other than “cabin-class” models, the length is measured from the forward bulkhead ahead of the rudder pedals to the back of the rear-most passenger seat in its normal, upright position. The upright position of the aft seat backs allows room for luggage in the cabin.

For so-called cabin-class and larger aircraft, we show two or three dimensions, depending on aircraft class. **The first** is the overall length of the passenger cabin, measured from the aft side of the forward cockpit/cabin divider to the aft-most bulkhead of the cabin. The aft-most point is defined by the rear side of a baggage compartment that is accessible to passengers in flight or the aft pressure bulkhead. The overall length is reduced by the length of any permanent mounted system or structure that is installed in the fuselage ahead of the aft bulkhead. For example, some aircraft have full fuselage cross-section fuel tanks mounted ahead of the aft pressure bulkhead.

**The second length number** is the net length of the cabin that routinely is occupied by passengers. It’s measured from the aft side of the forward cockpit/cabin divider to an aft point defined by the rear of the cabin floor capable of supporting passenger seats, the rear wall of an aft galley or lavatory, an auxiliary pressure bulkhead or the front wall of the pressurized baggage compartment. Some aircraft have the same net and overall interior length because the

manufacturer offers at least one interior configuration with the aft-most passenger seat located next to the front wall of the aft luggage compartment.

**The third length dimension** is the main seating area of the cabin, including all passenger seats in the standard aircraft configuration that are certified for full-time occupancy. Some manufacturers may fit their aircraft with forward, side-facing divans, ahead of areas with individual fore-aft facing chairs. The main seating length dimension may include such forward cabin side-facing divans at the discretion of the manufacturer. The length of the lavatory, even though it may have a seat certified for full-time occupancy, may not be included in the main seating length dimension.

Interior height is measured at the center of the cabin cross-section. If the aircraft has a dropped aisle, the maximum depth below the adjacent cabin floor is shown. Some aircraft have dropped aisles of varying depths, resulting in less available interior net height in certain sections of the cabin.

**Two width dimensions** are shown for multiengine turbine airplanes — one at the widest part of the cabin and the other at floor level. The dimensions, however, are not completely indicative of the usable space in a specific aircraft because of individual variances in interior furnishings.

## Power

Number of engines, if greater than one, and the abbreviated name of the manufacturer: GE — General Electric; GE/Honda — General Electric and Honda; Honeywell; CFMI — CFM International; IAE — International Aero Engines; Lyc — Textron Lycoming; P&WC — Pratt

# Purchase Planning Handbook

& Whitney Canada; RR — Rolls-Royce; Snecma; TCM — Teledyne Continental; and Wms — Williams International.

► **Output** — Takeoff rated horsepower for propeller-driven aircraft or pounds thrust for turbofan aircraft. If an engine is flat rated, enabling it to produce takeoff rated output at a higher than ISA (standard day) ambient temperature, the flat rating limit is shown as ISA+XXC. Highly flat-rated engines, i.e. engines that can produce takeoff rated thrust at a much higher than standard ambient temperature, typically provide substantially improved high density altitude, climb and high-altitude cruise performance.

► **Inspection Interval** is the longest scheduled hourly major maintenance interval for the engine, either “t” for TBO or “c” for compressor zone inspection. In some

fuel required to fly 1.5 hr. at high-speed cruise.

► **Max ramp, max takeoff and max landing weights** may be the same for light aircraft that may only have a certified max takeoff weight.

► **EOW/BOW** — Empty Operating Weight is shown for piston-powered airplanes. EOW is based on the factory standard weight, plus items specified in the “BCA Required Equipment List,” less fuel, loose equipment and cabin stores.

Basic Operating Weight is shown for turbine-powered airplanes. BOW is based on the average EOW weight of the last 10 commercial deliveries, plus 200 lb. for each required crewmember. Three flight crewmembers and one cabin crewmember are required for ultra-long-range aircraft, unless otherwise noted.

► **Available Fuel With Max Payload** — Max Ramp weight minus Zero Fuel weight, not to exceed maximum fuel capacity.

## Limits

BCA lists V speeds and other limits as appropriate to the class of airplane. These are the abbreviations used on the charts:

► **VNE** — Never exceed speed (redline for piston-engine airplanes).

► **VNO** — Normal operating speed (top of the green arc for piston-engine airplanes).

► **VMO** — Maximum operating speed (redline for turbine-powered airplanes).

► **MMO** — Maximum operating Mach number (redline for turbofan-powered airplanes and a few turboprop airplanes).

► **FL/VMO** — Transition altitude at which VMO equals MMO (large turboprop and turbofan aircraft).

► **VA** — Maneuvering speed (except for certain large turboprop and all turbofan aircraft).

► **VDEC** — Accelerate/stop decision speed (multiengine piston and light multiengine turboprop airplanes).

► **VMCA** — Minimum control airspeed, airborne (multiengine piston and light multiengine turboprop airplanes).

► **VSO** — Maximum stalling speed, landing configuration (single-engine airplanes).

► **Vx** — Best angle-of-climb speed (single-engine airplanes).

► **VxSE** — Best angle-of-climb speed, one-engine inoperative (multiengine piston and multiengine turboprop airplanes under 12,500 lb.).

► **Vy** — Best rate-of-climb speed (single-engine airplanes).

► **Vyse** — Best rate-of-climb speed, one-engine inoperative (multiengine piston and multiengine turboprop airplanes under 12,500 lb.).

► **V2** — Takeoff safety speed (large turboprops and turbofan airplanes).

► **VREF** — Reference landing approach speed (large turboprops and turbofan airplanes, four passengers, NBAA IFR reserves; eight passengers for ultra-long-range aircraft).

► **PSI** — Cabin pressure differential (all pressurized airplanes).

## Airport Performance

Airplane Flight Manual takeoff runway performance is shown for sea level, standard day and for 5,000-ft. elevation/25C



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cases, we show a second number if the engine manufacturer has obtained an extended maintenance interval, provided that the engines are enrolled in the manufacturer’s service program. OC is shown only for engines that have “on condition” repair or replace parts maintenance.

## Weights (lb.)

Weight categories are listed as appropriate to each class of aircraft.

► **Max Ramp** — Maximum ramp weight for taxi.

► **Max Takeoff** — Maximum takeoff weight as determined by structural limits.

► **Max Landing** — Maximum landing weight as determined by structural limits.

► **Zero Fuel** — Maximum zero fuel weight, shown by “c,” indicating the certified MZFW or “b,” a BCA-computed weight based on MTOW minus the weight of

While there is no requirement to add in the weight of cabin stores, some manufacturers choose to include galley stores and passenger supplies as part of the BOW build-up. Life vests, life rafts and appropriate deep-water survival equipment are included in the weight buildup of the 80,000+ lb., ultra-long-range aircraft.

► **Max Payload** — Zero Fuel weight minus EOW or BOW, as appropriate. For piston-engine airplanes, Max Payload frequently is a computed value because it is based on the BCA (“b”) computed maximum ZFW.

► **Max Fuel** — Usable fuel weight based on 6.0 lb. per U.S. gallon for avgas or 6.7 lb. per U.S. gallon for jet fuel. Fuel quantity is based upon the largest capacity tanks that are available as standard equipment.

► **Available Payload With Max Fuel** — Max Ramp weight minus the tanks-full weight, not to exceed Zero Fuel weight minus EOW or BOW.



day density altitude. All-engine takeoff distance (TO) is shown for single-engine and multiengine piston, and turboprop airplanes with an MTOW of less than 12,500 lb. Takeoff distances and speeds assume MTOW, unless otherwise noted.

► **Accelerate/Stop distance (A/S)** is shown for small multiengine piston and small turboprop airplanes.

► **Takeoff Field Length (TOFL)**, the greater of the one-engine inoperative (OEI) takeoff distance or the accelerate/stop distance, is shown for FAR Part 23 Commuter Category and FAR Part 25 airplanes. If the accelerate/stop and accelerate/stop distances are equal, the TOFL is the balanced field length.

► **Landing distance (LD)** is shown for FAR Part 23 Commuter Category and FAR Part 25 Transport Category airplanes. The landing weight is BOW plus four passengers and NBAA IFR fuel reserves. We assume that 80,000+ lb. ultra-long-range aircraft will have eight passengers on board.

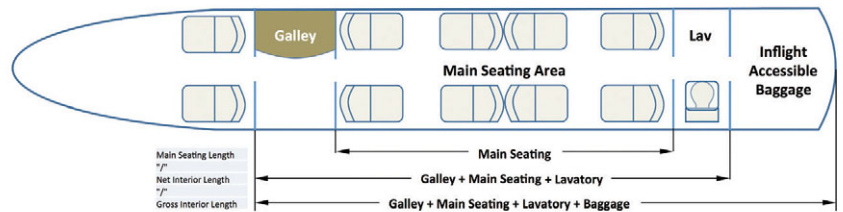
► **V2 and VREF** speeds are useful for reference when comparing the TOFL and LD numbers because they provide an indication of potential minimum-length runway performance when low RCR or runway gradient is a factor.

BCA lists two additional warm day airport performance numbers for large turboprop- and turbofan-powered airplanes. First, we publish the Mission Weight, which is the maximum allowable takeoff weight when departing a 5,000-ft. elevation/ISA+20C airport with at least four passengers aboard.

Mission Weight, when departing from a 5,000-ft./ISA+20C airport, may be less than the MTOW at sea level on a standard day because of FAR Part 25 second-segment, one-engine-inoperative, climb performance requirements. If maximum allowable mission weight at takeoff is restricted under said conditions, it's flagged with a "p." Aircraft with highly flat-rated engines are less likely to have a performance limited mission weight when departing under said warm day conditions.

Second, we publish the NBAA IFR range for said warm day conditions, assuming a transition into standard-day, ISA flight conditions after takeoff. For purposes of computing NBAA IFR range, the aircraft is flown at the long-range cruise speed shown in the "Cruise" block or at the same speed as shown in the "Range" block. Notably, some aircraft may actually have slightly better range performance when departing from said warm day airport because

## Cabin Length



they have a 5,000-ft. head start on the climb to cruise altitude.

## Climb

The all-engine time to climb provides an indication of overall climb performance, especially if the aircraft has an all-engine service ceiling well above our sample time-to-climb altitudes. We provide the all-engine time to climb to one of three specific altitudes, based on type of aircraft departing at MTOW from a sea-level, standard-day airport: (1) FL 100 (10,000 ft.) for normally aspirated single-engine and multiengine piston aircraft, plus pressurized single-engine piston aircraft and unpressurized turboprop aircraft; (2) FL 250 for pressurized single-engine and multiengine turboprop aircraft; or (3) FL 370 for turbofan-powered aircraft. These data are published as time-to-climb in minutes/climb altitude. For example, if a non-pressurized twin-engine piston aircraft can depart from a sea-level airport at MTOW and climb to 10,000 ft. in 8 min., the time to climb is expressed as 8/FL 100.

We also publish the initial all-engine climb feet per nautical mile gradient, plus initial engine-out climb rate and gradient, for single-engine and

multiengine pistons and turboprops with MTOWs of 12,500 lb. or less.

The one-engine-inoperative (OEI) climb rate for multiengine aircraft at MTOW is derived from the Airplane Flight Manual. OEI climb rate and gradient are based on landing gear retracted and wing flaps in the takeoff configuration used to compute the published takeoff distance. The climb gradient for such airplanes is obtained by dividing the product of the climb rate (fpm) in the Airplane Flight Manual times 60 by the VY or VYSE climb speed, as appropriate.

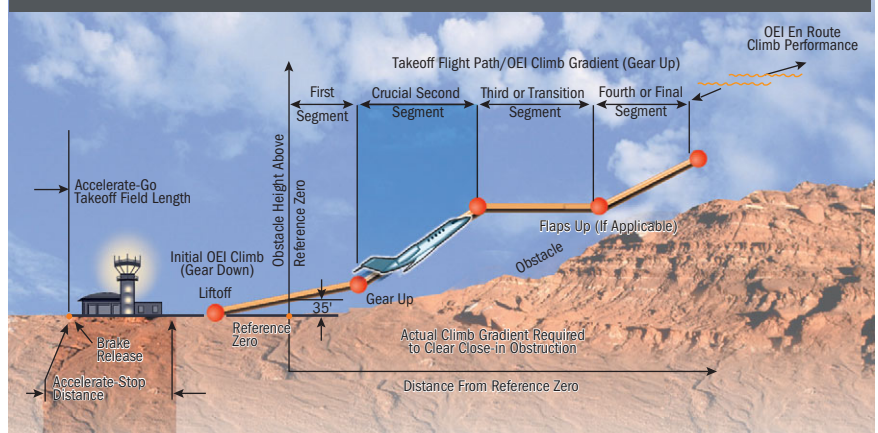
The OEI climb gradients we show for FAR Part 23 Commuter Category and FAR Part 25 Transport Category aircraft are the second-segment net climb performance numbers published in the AFMs. Please note: The AFM net second-segment climb performance numbers are adjusted downward by 0.8% to compensate for variations in pilot technique and ambient conditions.

The OEI climb gradient is computed at the same flap configuration used to calculate the takeoff field length.

## Ceilings (ft.)

► **Maximum Certificated Altitude** – Maximum allowable operating altitude

## FAR Part 25 and Part 23 Commuter Category OEI Climb Performance



determined by airworthiness authorities.

► **All-Engine Service Ceiling** – For turboprop aircraft: maximum altitude at which at least a 300-fpm rate of climb can be attained, assuming the aircraft departed a sea-level, standard-day airport at MTOW and climbed directly to altitude. For piston and turboprop aircraft: 100 fpm rate of climb.

► **OEI (Engine Out) Service Ceiling**

► **Sea-Level Cabin (SLC) Altitude** – Maximum cruise altitude at which a 14.7-psi, sea-level cabin altitude can be maintained in a pressurized airplane.

## Cruise

Cruise performance is computed using EOW with four occupants or BOW with four passengers and one-half fuel load. Ultra-long-range aircraft carry eight passengers for purposes of computing cruise performance.

Assume 170 lb. for each occupant of a piston-engine airplane and 200 lb. for each occupant of a turbine-powered aircraft.

► **Long Range** – True air speed (TAS), fuel flow in pounds/hour, flight level (FL) cruise altitude and specific range for long-range cruise by the manufacturer.

► **Recommended (Piston-Engine Airplanes)** – TAS, fuel flow in pounds/hour, FL cruise altitude and specific range for normal cruise performance specified by the manufacturer.

► **High Speed** – TAS, fuel flow in pounds/hour, FL cruise altitude and specific range for short-range, high-speed performance specified by the aircraft manufacturer.

Speed, fuel flow, specific range and altitude in each category are based on one mid-weight cruise point and these data reflect standard-day conditions. They are not an average for the overall mission and they are not representative of the above standard-day temperatures at cruise altitudes commonly encountered in everyday operations.

BCA imposes a 12,000-ft. maximum cabin altitude requirement on CAR3/FAR Part 23 normally aspirated aircraft. Non-pressurized turbocharged piston-engine airplanes are limited to FL 250, providing they are fitted with supplemental oxygen systems having sufficient capacity for all occupants for the entire duration of the mission. Pressurized CAR3/FAR Part 23 aircraft are limited to a maximum cabin altitude of 10,000 ft. For FAR Part 23 Commuter Category and FAR Part 25 aircraft, the maximum cabin altitude for computing

cruise performance is 8,000 ft.

To conserve space, we use flight levels (FL) for all cruise altitudes, which is appropriate considering that we assume standard-day ambient temperature and pressure conditions. Cruise performance is subject to BCA's verification.

## Range

BCA shows various paper missions for each aircraft that illustrate range versus payload tradeoffs, runway and cruise performance, plus fuel efficiency. Similar to the cruise profile calculations, BCA limits the maximum altitude to 12,000 ft. for normally aspirated, non-pressurized CAR3/FAR Part 23 aircraft, 25,000 ft. for turbocharged non-pressurized airplanes with supplemental oxygen, 10,000 ft. cabin altitude for pressurized CAR 3/FAR Part 23 airplanes and 8,000 ft. cabin altitude for FAR Part 23 Commuter Category or FAR Part 25 aircraft.

► **Seats-Full Range (Single-Engine Piston Airplanes)** – Based on typical executive configuration with all seats filled with 170-lb. occupants, with maximum available fuel less 45-min. IFR fuel reserves. We use the lower of seats full or maximum payload.

► **Tanks-Full Range (Single-Engine Piston Airplanes)** – Based on one 170-lb. pilot, full fuel less 45-min. IFR fuel reserves.

► **Max Fuel With Available Payload (Single-Engine Turboprops)** – Based on BOW, plus full fuel and the maximum available payload up to maximum ramp weight. Range is based on arriving at

destination with NBAA IFR fuel reserves, but only a 100-mi. alternate is required.

► **Ferry (Multiengine Piston Airplanes and Single-Engine Turboprops)** – Based on one 170-lb. pilot, maximum fuel less 45-min. IFR fuel reserves.

**Please note:** None of the missions for piston-engine aircraft includes fuel for diverting to an alternate. However, single-engine turboprops are required to have NBAA IFR fuel reserves, but only a 100-mi. alternate is required.

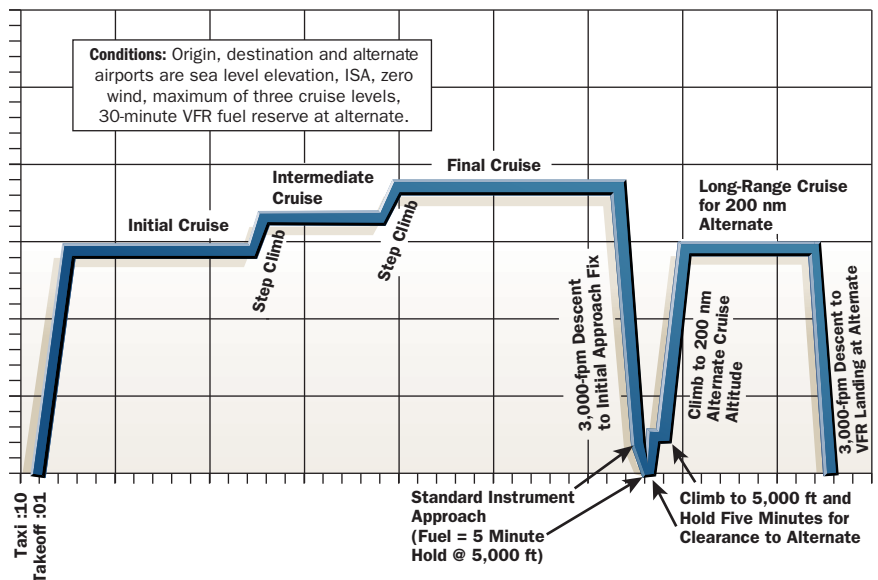
NBAA IFR range format cruise profiles, having a 200-mi. alternate, are used for turbine-powered aircraft with MTOWs equal to, or greater than, 22,000 lb. Turbine aircraft having MTOWs less than 22,000 lb. only need a 100-mi. NBAA alternate. The difference in alternate requirements should be kept in mind when comparing range performance of various classes of aircraft.

► **Available Fuel With Max Payload (Multiengine Turbine Airplanes)** – Based on aircraft loaded to maximum zero fuel weight with maximum available fuel up to maximum ramp weight, less NBAA IFR fuel reserves at destination.

► **Available Payload With Max Fuel (Multiengine Turbine Airplanes)** – Based on BOW plus full fuel and maximum available payload up to maximum ramp weight. Range based on NBAA IFR reserves at destination.

► **Full/Max Fuel With Four Passengers (Multiengine Turbine Airplanes)** – Based on BOW plus four 200-lb. passengers and the lesser of full fuel or maximum available fuel up to maximum ramp

## NBAA IFR RANGE PROFILE



weight. Ultra-long-range aircraft must have eight passengers on board.

► **Ferry (Multiengine Turbine Airplanes)** – Based on BOW, required crew and full fuel, arriving at destination with NBAA IFR fuel reserves.

We allow 2,000-ft. increment step climbs above the initial cruise altitude to improve specific range performance, even though current air traffic rules in North America provide for 4,000-ft. altitude semicircular directional traffic separation above FL 290. The altitude shown in the range section is the highest cruise altitude for the trip — not the initial cruise or mid-mission altitude.

The range profiles are in nautical miles, and the average speed is computed by dividing that distance by the total flight time or weight-off-wheels time en route. The Fuel Used or Trip Fuel includes the fuel consumed for start, taxi, takeoff, cruise, descent and landing approach but not after-landing taxi or reserves.

The Specific Range is obtained by



TEXTRON AVIATION/CITATION LONGITUDE FIRST FLIGHT

dividing the distance flown by the total fuel burn. The Altitude is the highest cruise altitude achieved on the specific mission profile shown.

### Missions

Various paper missions are computed to illustrate the runway requirements, speeds, fuel burns and specific range, plus cruise altitudes. The mission ranges are chosen to be representative

for the airplane category. All fixed-distance missions are flown with four passengers on board, except for ultra-long-range airplanes, which have eight passengers on board. The pilot is counted as a passenger on board piston-engine airplanes. If an airplane cannot complete a specific fixed distance mission with the appropriate payload, *BCA* shows a reduction of payload in the remarks section or marks the fields NP (Not Possible) at our option.



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# Purchase Planning Handbook

## BCA Required Equipment List

	Jets ≥20,000 lb.					Jets <20,000 lb.				
	Turboprops >12,500 lb.					Turboprops ≤12,500 lb.				
	Single-Engine Turboprops					Multiengine Pistons, Turbocharged				
	Multiengine Pistons					Single-Engine Pistons, Pressurized				
	Single-Engine Pistons, Turbocharged					Single-Engine Pistons				
<b>POWERPLANT SYSTEMS</b>										
Batt temp indicator (nicad only, for each battery)					●					●
Engine synchronization										●
Fire detection, each engine					●					●
Fire extinguishing, each engine					●					●
Propeller, reversible pitch					●					●
Propellers, synchronization					●					●
Thrust reversers										●
<b>AVIONICS</b>										
ADF receiver (non U.S. deliveries)					●					●
Altitude alerter					●					●
Altitude encoder					●					●
Audio control panel	●	●	●	●	●	●	●	●	●	●
Automatic flight guidance, 2-axis, alt hold	●	●	●	●	●					●
Automatic flight guidance, 3-axis, alt hold					●					●
Digital air data computer					●					●
DME or approved GPS distance indication	●	●	●	●	●	●	●	●	●	●
EFIS/large-format flat-panel displays	●	●	●	●	●	●	●	●	●	●
ELT	●	●	●	●	●	●	●	●	●	●
FMS (TSO C115) or GPS (TSO C129/145/146)					●					●
Marker beacon receiver	●	●	●	●	●	●	●	●	●	●
Radio altimeter					●					●
RVSM certification					●					●
Satcom, Iridium, or Inmarsat					●					●
TAS or TCAS I					●					●
TAWS					●					●
TCAS I/II					●					●
Transponder, Mode S 1090ES	●	●	●	●	●	●	●	●	●	●
VHF comm transceiver, 25-KHz spacing	●	●	●	●	●	●	●	●	●	●
VHF comm transceiver, 8.33-kHz spacing					●					●
VOR/ILS	●	●	●	●	●	●	●	●	●	●
Weather data link					●					●
Weather radar					●					●
<b>GENERAL</b>										
Air conditioning, vapor cycle (not required with APU)					●					●
Anti-skid brakes (not required MTOW <10,000 lb.)					●					●
APU (required for air-start engines, ACM air conditioning)					●					●
Cabin/cockpit bulkhead divider					●					●
Corrosion-proofing	●	●	●	●	●	●	●	●	●	●
Exterior paint, tinted windows	●	●	●	●	●	●	●	●	●	●
Fire extinguisher, cabin					●					●
Fire extinguisher, cockpit	●	●	●	●	●	●	●	●	●	●
Fuel tanks, long-range	●	●	●	●	●	●	●	●	●	●
Ground power jack					●					●
Headrests, air vents at all seats	●	●	●	●	●	●	●	●	●	●
Lavatory					●					●
Lights, external — nav/beacon/strobe/landing/taxi	●	●	●	●	●	●	●	●	●	●
Lights, internally illuminated instrument/cockpit floor	●	●	●	●	●	●	●	●	●	●
Oxygen, supplemental — all seats					●					●
Refreshment center					●					●
Seats, crew, articulating	●	●	●	●	●	●	●	●	●	●
Seats, passenger, reclining	●	●	●	●	●	●	●	●	●	●
Shoulder harness, all seats/crew with inertial reel	●	●	●	●	●	●	●	●	●	●
Tables, cabin work					●					●
<b>ICE AND RAIN PROTECTION</b>										
Alternate static pressure source (not required with dual DADC)	●	●	●	●	●					●
Flight Into Known Icing (FIKI) approval					●					●
Ice protection plates					●					●
Pitot heat	●	●	●	●	●					●
Windshield rain removal, mechanical/pneumatic/hygroscopic					●					●
<b>INSTRUMENTATION</b>										
Angle-of-attack stall margin indicator					●					●
EGT	●	●	●	●	●	●	●	●	●	●
IVSI (or equivalent DADC function)	●	●	●	●	●	●	●	●	●	●
OAT	●	●	●	●	●	●	●	●	●	●
Primary flight instruments	●	●	●	●	●	●	●	●	●	●

Runway performance is obtained from the Approved Airplane Flight Manual. Takeoff distance is listed for single-engine airplanes; accelerate/stop distance is listed for piston twins and light turboprops; and takeoff field length, which often corresponds to balanced field length, is used for FAR Part 23 Commuter Category and FAR Part 25 large Transport Category airplanes.

Flight Time (takeoff to touchdown, or weight-off-wheels, time) is shown for turbine airplanes. Some piston-engine manufacturers also include taxi time, resulting in a chock-to-chock, Block Time measurement. Fuel Used, though, is the actual block fuel burn for each type of aircraft, but it does not include fuel reserves. The cruise altitude shown is that which is specified by the manufacturer for fixed-distance missions.

- ▶ 200 nm – (Piston-engine airplanes).
- ▶ 500 nm – (Piston-engine airplanes).
- ▶ 300 nm – (Turbine-engine airplanes, except ultra-long-range).
- ▶ 600 nm – (Turbine-engine airplanes, except ultra-long-range).
- ▶ 1,000 nm – (All turbine-engine airplanes).
- ▶ 3,000 nm – (Ultra-long-range turbine-engine airplanes).
- ▶ 6,000 nm – (Ultra-long-range turbine-engine airplanes).

## Remarks

In this section, *BCA* generally includes the base price, if it is available or applicable; the certification basis and year; and any notes about estimations, limitations or qualifications regarding specifications, performance or price. All prices are in 2017 dollars, FOB at a U.S. delivery point, unless otherwise noted. The certification basis includes the regulation under which the airplane was originally type certified, the year in which it was originally certified and, if applicable, subsequent years during which the airplane was re-certified. “*BCA Estimated Data*” indicates that we made adjustments to data provided by manufacturers.

## General

The following abbreviations are used throughout the tables: “**NA**” means not available; “**—**” indicates the information is not applicable and “**NP**” signifies that specific performance is not possible. **BCA**

## Single-Engine Pistons normally aspirated

Manufacturer		Cirrus Design	Piper	Textron Aviation	Cirrus Design	
Model		SR20	Arrow PA-28R-201	Cessna Skylane CE-182T	SR22	
BCA Equipped Price		\$389,900	\$466,880	\$480,000	\$539,900	
Characteristics	Seating	1+3/4	1+3/3	1+3/3	1+3/4	
	Wing Loading	21.7	16.2	17.8	23.5	
	Power Loading	14.65	13.75	13.48	11.61	
	Noise (dBA)	83.4	77.7	77.7	83.7	
External Dimensions (ft.)	Length	26.0	24.7	29.0	26.0	
	Height	8.9	7.9	9.3	8.9	
	Span	38.3	35.4	36.0	38.3	
Internal Dimensions (ft.)	Length	8.0	7.7	7.2	8.0	
	Height	4.1	3.7	4.0	4.1	
	Width	4.1	3.5	3.5	4.1	
Power	Engine	Lyc IO-390-C3B6	Lyc IO-360-C1C6	Lyc IO-540-AB1A5	Cont IO-550-N	
	Output (hp)	215	200	230	310	
	Inspection Interval	2,000t	2,000t	2,000t	2,000t	
Weights (lb.)	Max Ramp	3,160	2,758	3,110	3,610	
	Max Takeoff	3,150	2,750	3,100	3,600	
	Max Landing	3,150	2,750	2,950	3,600	
	Zero Fuel	3,043b	2,636b	2,976b	3,400c	
	EOW	2,120	1,798	1,965	2,260	
	Max Payload	923	838	1,011	1,140	
	Useful Load	1,040	960	1,145	1,350	
	Max Baggage	130	200	200	130	
	Max Fuel	336	432	522	552	
	Available Payload w/Max Fuel	704	528	623	798	
Limits	Available Fuel w/Max Payload	117	122	135	210	
	V <sub>NE</sub>	201	183	175	205	
	V <sub>NO</sub>	164	146	140	176	
Airport Performance	V <sub>A</sub>	133	118	110	140	
	TO (SL elev./ISA temp.)	2,530	1,600	1,514	1,756	
	TO (5,000-ft. elev.@25C)	4,305	3,250	2,708	3,016	
	V <sub>SO</sub>	62	55	49	64	
	V <sub>X</sub>	81	78	65	88	
Climb	V <sub>Y</sub>	88	90	80	108	
	Time to Climb (min.)/Altitude	20/FL 100	16/FL 100	15/FL 100	11/FL 100	
Ceiling (ft.)	Initial Gradient (ft./nm)	540	560	694	775	
	Service	17,500	16,200	18,100	17,500	
Cruise	Long Range	TAS	135	124	125	160
		Fuel Flow	53	51	61	68
		Altitude	FL 080	FL 100	FL 100	FL 080
		Specific Range	2.547	2.431	2.049	2.353
	Recommended	TAS	145	130	135	171
		Fuel Flow	61	68	69	92
		Altitude	FL 080	FL 090	FL 100	FL 080
		Specific Range	2.369	1.912	1.957	1.859
	High Speed	TAS	152	137	144	180
		Fuel Flow	71	76	83	107
		Altitude	FL 080	FL 060	FL 060	FL 080
		Specific Range	2.129	1.803	1.735	1.682
Ranges	Seats Full	Nautical Miles	672	537	795	1,118
		Average Speed	135	121	131	162
		Fuel Used	275	156	414	492
		Specific Range/Altitude	2.444/FL 080	3.442/FL 070	1.920/FL 120	2.272/FL 080
	Tanks Full	Nautical Miles	672	926	912	1,118
		Average Speed	135	121	131	162
		Fuel Used	275	408	471	492
		Specific Range/Altitude	2.444/FL 080	2.270/FL 070	1.936/FL 120	2.272/FL 080
Missions (4 occupants)	200 nm	Runway	1,685	1,600	1,216	1,303
		Block Time	1+26	1+29	1+37	1+09
		Fuel Used	112	125	123	127
		Specific Range/Altitude	1.786/FL 080	1.600/FL 070	1.626/FL 120	1.575/FL 080
	500 nm	Runway	1,685	1,600	1,369	1,519
		Block Time	3+30	3+50	3+52	2+49
		Fuel Used	245	278	269	305
		Specific Range/Altitude	2.041/FL 080	1.799/FL 090	1.859/FL 120	1.639/FL 080
Remarks	Suggested Base Price	\$389,900	\$466,880	\$480,000	\$539,900	
	Certification Basis	FAR 23, 1999/2017 Includes Garmin Perspective+ avionics.	CAR 3, 1976/2001 Garmin G500 standard.	FAR 23, 1996/2001 A 23-6 Garmin G1000 NXi with GFC 700 autopilot.	FAR 23, 2000 Includes Garmin Perspective+ avionics.	

**Single-Engine Pistons** normally aspirated

Manufacturer		Mooney	GippsAero	Textron Aviation	
Model		Ovation Ultra M20U	Airvan GA-8	Beechcraft Bonanza G36 G36	
BCA Equipped Price		\$689,000	\$726,960	\$815,000	
Characteristics	Seating	1+3/4	1+6/7	1+4/5	
	Wing Loading	19.3	20.7	20.2	
	Power Loading	10.86	13.33	12.17	
	Noise (dBA)	NA	84.9	76.7	
External Dimensions (ft.)	Length	26.9	29.3	27.5	
	Height	8.3	12.8	8.6	
	Span	36.1	40.7	33.5	
Internal Dimensions (ft.)	Length	8.1	11.6	12.6	
	Height	3.7	3.7	4.2	
	Width	3.6	4.2	3.5	
Power	Engine	Cont IO-550-G-AP	Lyc IO-540-K1A5	Cont IO-550-B	
	Output (hp)	310	300	300	
	Inspection Interval	2,200t	2,000t	1,900t	
Weights (lb.)	Max Ramp	3,374	4,014	3,663	
	Max Takeoff	3,368	4,000	3,650	
	Max Landing	3,200	4,000	3,650	
	Zero Fuel	3,197b	3,849b	3,509b	
	EOW	2,260	2,241	2,600	
	Max Payload	937	1,608	909	
	Useful Load	1,114	1,773	1,063	
	Max Baggage	120	180	670	
	Max Fuel	600	540	444	
	Available Payload w/Max Fuel	514	1,233	619	
Limits	Available Fuel w/Max Payload	177	166	154	
	V <sub>NE</sub>	195	185	203	
Airport Performance	V <sub>NO</sub>	174	143	165	
	V <sub>A</sub>	127	121	139	
	TO (SL elev./ISA temp.)	2,300	1,860	1,913	
	TO (5,000-ft. elev.@25C)	3,400	3,670	3,450	
	V <sub>SO</sub>	59	57	59	
Climb	V <sub>X</sub>	75	70	84	
	V <sub>Y</sub>	105	86	100	
	Time to Climb (min.)/Altitude	10/FL 100	15/FL 100	14/FL 100	
	Initial Gradient (ft./nm)	NA	787	730	
Ceiling (ft.)	Service	NA	20,000	18,500	
Cruise	Long Range	TAS	163	127	160
		Fuel Flow	50	78	71
		Altitude	FL 120	FL 120	FL 080
		Specific Range	3.260	1.628	2.254
	Recommended	TAS	186	135	167
		Fuel Flow	84	88	86
		Altitude	FL 121	FL 080	FL 080
		Specific Range	2.214	1.534	1.942
	High Speed	TAS	196	142	174
		Fuel Flow	114	101	94
		Altitude	FL 080	FL 060	FL 080
		Specific Range	1.719	1.406	1.851
Ranges	Seats Full	Nautical Miles	1,075	487	217
		Average Speed	161	124	153
		Fuel Used	438	339	115
		Specific Range/Altitude	2.454/FL 121	1.437/FL 120	1.887/FL 040
	Tanks Full	Nautical Miles	1,465	690	859
		Average Speed	173	125	159
		Fuel Used	558	464	403
		Specific Range/Altitude	2.625/FL 121	1.487/FL 120	2.132/FL 080
Missions (4 occupants)	200 nm	Runway	1,230	1,860	1,664
		Block Time	1+13	1+38	1+11
		Fuel Used	115	157	130
		Specific Range/Altitude	1.739/FL 050	1.274/FL 120	1.538/FL 060
	500 nm	Runway	1,290	1,860	1,870
		Block Time	2+58	3+55	2+54
		Fuel Used	221	339	304
		Specific Range/Altitude	2.262/FL 100	1.475/FL 120	1.645/FL 060
Remarks	Suggested Base Price	\$689,000	\$726,960	\$815,000	
Remarks	Certification Basis	CAR 3/FAR 23, 1955/94; STC SA02483CH Includes Garmin G1000; composite fuselage shell with left and right doors.			
		FAR 23 A 54 Includes Garmin G500. All data preliminary. 2016 data.			
		CAR 3, 1956/69/83/2005 A/C system standard; Garmin G1000 NXI.			



Single-Engine Pistons turbocharged

Manufacturer		Cirrus	Textron Aviation	Textron Aviation	GippsAero	Mooney	
Model		SR22T SR 22	Cessna Turbo Stationair HD CE-T206H	Cessna TTx CE-T240	GAS Airvan TC GAS-320 TC	Acclaim Ultra MO20V	
BCA Equipped Price		\$639,900	\$665,000	\$715,000	\$761,030	\$769,000	
Characteristics	Seating	1+3/4	1+5/5	1+3/3	1+6/7	1+3/3	
	Wing Loading	23.5	21.8	25.5	20.7	19.2	
	Power Loading	11.43	12.22	11.61	13.13	12.03	
	Noise (dBA)	80.3	82.6	81.4	85.4	78.0	
External Dimensions (ft.)	Length	26.0	28.3	25.2	28.3	26.9	
	Height	8.9	9.3	9.0	9.3	8.3	
	Span	38.3	36.0	36.0	36.0	36.4	
Internal Dimensions (ft.)	Length	8.0	9.3	7.9	11.6	8.1	
	Height	4.1	4.1	4.1	3.7	3.7	
	Width	4.1	3.7	4.0	4.2	3.6	
Power	Engine	Cont TSIO-550-K	Lyc TIO-540-AJ1A	Cont TSIO-550-C	Lyc TIO-540-AH1A	Cont TSIO-550-G	
	Output (hp)	315	310	310	320	280	
	Inspection Interval	2,000t	2,000t	2,000t	1,800t	2,200t	
Weights (lb.)	Max Ramp	3,610	3,806	3,600	4,214	3,374	
	Max Takeoff	3,600	3,789	3,600	4,200	3,368	
	Max Landing	3,600	3,600	3,420	4,000	3,200	
	Zero Fuel	3,400c	3,618b	3,300c	4,053b	3,173b	
	EOW	2,342	2,336	2,535	2,349	2,378	
	Max Payload	1,058	1,282	765	1,704	795	
	Useful Load	1,268	1,470	1,065	1,865	996	
	Max Baggage	130	180	120	180	120	
	Max Fuel	552	522	612	540	612	
	Available Payload w/Max Fuel	716	948	453	1,325	384	
Available Fuel w/Max Payload	210	188	300	161	201		
Limits	V <sub>NE</sub>	205	182	230	185	195	
	V <sub>NO</sub>	176	149	181	143	174	
	V <sub>A</sub>	140	125	158	121	127	
Airport Performance	TO (SL elev./ISA Temp.)	1,517	1,970	1,900	1,840	1,900	
	TO (5,000-ft. elev.@25C)	2,268	2,845	2,460	2,788	3,300	
	V <sub>SO</sub>	64	59	61	61	60	
	V <sub>X</sub>	88	70	82	71	80	
	V <sub>Y</sub>	103	88	110	81	105	
Climb	Time to Climb (min.)/Altitude	7/FL 100	12/FL 100	7/FL 100	13/FL 100	7/FL 100	
	Initial Gradient (ft./nm)	782	724	701	825	770	
Ceilings (ft.)	Certificated	25,000	25,000	25,000	20,000	25,000	
	Service	25,000	27,000	25,000	20,000	25,000	
Cruise	Long Range	TAS	171	137	208	125	215
		Fuel Flow	76	85	78	68	99
		Altitude	FL 250	FL 240	FL 250	FL 200	FL 250
		Specific Range	2.250	1.612	2.667	1.838	2.172
	Recommended	TAS	201	155	227	130	227
		Fuel Flow	98	99	130	78	128
		Altitude	FL 250	FL 240	FL 250	FL 200	FL 180
		Specific Range	2.051	1.566	1.746	1.667	1.773
	High Speed	TAS	213	164	235	135	242
		Fuel Flow	110	114	152	98	130
		Altitude	FL 250	FL 200	FL 250	FL 200	FL 250
		Specific Range	1.936	1.439	1.546	1.378	1.862
Ranges	Seats Full	Nautical Miles	1,021	512	666	233	500
		Average Speed	171	137	202	125	178
		Fuel Used	486	387	345	220	259
		Specific Range/Altitude	2.101/FL 250	1.323/FL 200	1.930/FL 250	1.059/FL 200	1.931/FL 160
	Tanks Full	Nautical Miles	1,021	655	1,270	618	1,122
		Average Speed	171	138	204	125	200
		Fuel Used	486	459	572	459	539
		Specific Range/Altitude	2.101/FL 250	1.427/FL 240	2.220/FL 250	1.346/FL 200	2.082/FL 250
Missions (4 occupants)	200 nm	Runway	1,405	1,396	1,730	1,743	1,300
		Block Time	1+08	1+23	1+03	1+35	1+05
		Fuel Used	197	163	159	125	139
		Specific Range/Altitude	1.015/FL 100	1.227/FL 150	1.258/FL 150	1.600/FL 120	1.439/FL 120
	500 nm	Runway	1,699	1,597	1,880	1,743	1,380
		Block Time	2+28	3+22	2+24	3+30	2+54
		Fuel Used	360	385	338	373	259
		Specific Range/Altitude	1.389/FL 180	1.299/FL 240	1.479/FL 250	1.340/FL 200	1.931/FL 250
		Suggested Base Price	\$639,900	\$665,000	\$715,000	\$597,500	\$769,000
		Remarks	FAR 23, 2010 Includes Garmin Perspective+ Global avionics.	FAR 23, 1998 Utility version w/2,183-lb. EOW, \$658,650; Garmin G1000 NXi w/GFC 700 a/p; new interior.	FAR 23 Includes Garmin G2000, SVT, AP, TAWS, TAS, ESP, A/C, Ti LE, leather.	FAR 23, 1998 Garmin G500; KC 225 All data preliminary. 2016 data.	CAR 3, 1955/89/2006 Includes Garmin G1000; new composite fuselage shell with left and right doors.

Single-Engine Pistons pressurized

Manufacturer		Piper Aircraft	Piper Aircraft		
Model		Matrix PA-46R-350	M350 PA-46-350P		
BCA Equipped Price		\$916,680	\$1,178,610		
Characteristics	Seating	1+4/5	1+4/5		
	Wing Loading	24.8	24.8		
	Power Loading	12.40	12.40		
	Noise (dBA)	81.0	81.0		
External Dimensions (ft.)	Length	28.9	28.9		
	Height	11.3	11.3		
	Span	43.0	43.0		
Internal Dimensions (ft.)	Length	12.4	12.4		
	Height	3.9	3.9		
	Width	4.2	4.2		
Power	Engine	Lyc TIO-540-AE2A	Lyc TIO-540-AE2A		
	Output (hp)	350	350		
	Inspection Interval	2,000t	2,000t		
Weights (lb.)	Max Ramp	4,358	4,358		
	Max Takeoff	4,340	4,340		
	Max Landing	4,123	4,123		
	Zero Fuel	4,123c	4,123c		
	EOW	2,969	3,146		
	Max Payload	1,154	977		
	Useful Load	1,389	1,212		
	Max Baggage	200	200		
	Max Fuel	720	720		
	Available Payload w/Max Fuel	669	492		
Limits	Available Fuel w/Max Payload	235	235		
	V <sub>NE</sub>	198	198		
	V <sub>NO</sub>	168	168		
	V <sub>A</sub>	133	133		
	PSI	5.5	5.5		
Airport Performance	TO (SL elev./ISA Temp.)	2,090	2,090		
	TO (5,000-ft. elev.@25C)	2,977	2,977		
	V <sub>SO</sub>	58	58		
	V <sub>X</sub>	81	81		
Climb	V <sub>R</sub>	110	110		
	Time to Climb (min./Altitude)	8/FL 100	8/FL 100		
Ceilings (ft.)	Initial Gradient (ft./nm)	703	703		
	Certificated	25,000	25,000		
	Service	25,000	25,000		
Cruise	Long Range	Sea-Level Cabin	—	12,300	
		TAS	156	156	
		Fuel Flow	66	66	
	Recommended	Altitude	FL 250	FL 250	
		Specific Range	2.364	2.364	
		TAS	203	203	
	High Speed	Fuel Flow	108	108	
		Altitude	FL 250	FL 250	
		Specific Range	1.880	1.880	
	Ranges	Seats Full	TAS	213	213
			Fuel Flow	120	120
			Altitude	FL 250	FL 250
Tanks Full		Specific Range	1.775	1.775	
		Nautical Miles	867	535	
		Average Speed	151	138	
Missions (4 occupants)	200 nm	Fuel Used	457	312	
		Specific Range/Altitude	1.897/FL 200	1.715/FL 120	
		Nautical Miles	1,343	1,343	
	500 nm	Average Speed	158	159	
		Fuel Used	658	670	
		Specific Range/Altitude	2.041/FL 250	2.004/FL 250	
	Remarks	Certification Basis	Runway	2,090	2,090
			Block Time	1+07	1+06
			Fuel Used	168	167
			Specific Range/Altitude	1.190/FL 120	1.198/FL 200
Suggested Base Price			\$916,680	\$1,178,610	
		FAR 23, 1983/88 Garmin G1000; FIKI optional.	FAR 23, 1983/88 Garmin G1000; FIKI optional.		

Multiengine Pistons normally aspirated

Manufacturer		Vulcanair SpA	Vulcanair SpA		
Model		P.68C P 68C	Victor P 68R		
BCA Equipped Price		\$830,800	\$848,200		
Characteristics	Seating	1+5/6	1+5/6		
	Wing Loading	22.9	22.7		
	Power Loading	11.49	11.37		
	Noise (dBA)	74.7	78.8		
External Dimensions (ft.)	Length	31.3	31.3		
	Height	11.2	11.2		
	Span	39.4	39.4		
Internal Dimensions (ft.)	Length	10.6	10.6		
	Height	3.9	3.9		
	Width	3.8	3.8		
Power	Engines	2 Lyc IO-360-A1B6	2 Lyc IO-360-A1B6		
	Output (hp each)	200	200		
	Inspection Interval	2,000t	2,000t		
Weights (lb.)	Max Ramp	4,630	4,548		
	Max Takeoff	4,594	4,548		
	Max Landing	4,365	4,321		
	Zero Fuel	4,167c	4,374b		
	EOW	3,153	3,197		
	Max Payload	1,014	1,177		
	Useful Load	1,477	1,351		
Limits	Max Fuel	1,063	1,063		
	Available Payload w/Max Fuel	415	289		
	Available Fuel w/Max Payload	463	174		
	V <sub>NE</sub>	194	197		
	V <sub>NO</sub>	154	157		
Airport Performance	V <sub>A</sub>	132	127		
	TO (SL elev./ISA Temp.)	1,312	1,260		
	TO (5,000-ft. elev.@25C)	4,000	4,000		
	A/S (SL elev./ISA)	2,150	1,410		
	A/S (5,000-ft. elev.@25C)	2,950	2,370		
	V <sub>MC<sub>A</sub></sub>	60	60		
Climb	V <sub>OC</sub>	70	70		
	V <sub>XSE</sub>	82	82		
	V <sub>XSE</sub>	88	88		
	Time to Climb (min.)/Altitude	12/FL 100	12/FL 100		
	Initial Engine-Out Rate (fpm)	217	217		
Ceilings (ft.)	Initial All-Engine Gradient (ft./nm)	1,100	920		
	Initial Engine-Out Gradient (ft./nm)	147	147		
	Certificated	—	—		
Cruise	Long Range	All-Engine Service	18,000	20,000	
		Engine-Out Service	5,000	5,650	
		TAS	144	144	
	Recommended	Fuel Flow	94	94	
		Altitude	FL 080	FL 080	
		Specific Range	1.532	1.532	
	High Speed	TAS	155	155	
		Fuel Flow	108	108	
		Altitude	FL 080	FL 080	
	Ranges	Max Payload	Specific Range	1.435	1.435
			TAS	162	162
			Fuel Flow	116	116
Ferry		Altitude	FL 080	FL 080	
		Specific Range	1.397	1.397	
		Nautical Miles	300	300	
Missions (4 occupants)	200 nm	Average Speed	140	140	
		Trip Fuel	315	315	
		Specific Range/Altitude	0.952/FL 080	0.952/FL 080	
	500 nm	Nautical Miles	1,000	1,000	
		Average Speed	145	145	
		Trip Fuel	975	975	
	Remarks	Certification Basis	Specific Range/Altitude	1.026/FL 080	1.026/FL 080
			Runway	1,450	1,450
			Block Time	1+28	1+28
			Fuel Used	140	140
Specific Range/Altitude			1.429/FL 080	1.429/FL 080	
		Runway	1,500	1,500	
		Block Time	3+25	3+25	
		Fuel Used	375	375	
		Specific Range/Altitude	1.333/FL 080	1.333/FL 080	
		Suggested Base Price	\$830,800	\$848,200	
		FAR 23, 1976/80 Garmin G950; STEC 55X DFCS. BCA estimated data.	EASA 23, 2009 Garmin G950; STEC 55X DFCS. BCA estimated data.		

**Multiengine Pistons normally aspirated**

Manufacturer		Textron Aviation		
Model		Beechcraft Baron G58 G58		
BCA Equipped Price		\$1,400,000		
Characteristics	Seating	1+4/5		
	Wing Loading	27.6		
	Power Loading	9.17		
	Noise (dBA)	77.6		
External Dimensions (ft.)	Length	29.8		
	Height	9.8		
	Span	37.8		
Internal Dimensions (ft.)	Length	12.6		
	Height	4.2		
	Width	3.5		
Power	Engines	2 Cont IO-550-C		
	Output (hp each)	300		
	Inspection Interval	1,900t		
Weights (lb.)	Max Ramp	5,524		
	Max Takeoff	5,500		
	Max Landing	5,400		
	Zero Fuel	5,215b		
	EOW	3,970		
	Max Payload	1,245		
	Useful Load	1,554		
	Max Fuel	1,164		
	Available Payload w/Max Fuel	390		
	Available Fuel w/Max Payload	309		
Limits	VNE	223		
	VNO	195		
	VA	165		
Airport Performance	TO (SL elev./ISA Temp.)	2,345		
	TO (5,000-ft. elev.@25C)	4,144		
	A/S (SL elev./ISA)	3,009		
	A/S (5,000-ft. elev.@25C)	4,335		
	V <sub>MC</sub> A	84		
	V <sub>DEC</sub>	85		
	V <sub>XSE</sub>	100		
Climb	Time to Climb (min.)/Altitude	10/FL 100		
	Initial Engine-Out Rate (fpm)	390		
	Initial All-Engine Gradient (ft./nm)	988		
	Initial Engine-Out Gradient (ft./nm)	232		
Ceilings (ft.)	Certificated	—		
	All-Engine Service	20,688		
	Engine-Out Service	7,284		
Cruise	Long Range	TAS	185	
		Fuel Flow	144	
		Altitude	FL 080	
		Specific Range	1.285	
	Recommended	TAS	192	
		Fuel Flow	174	
		Altitude	FL 080	
		Specific Range	1.103	
	High Speed	TAS	200	
		Fuel Flow	190	
		Altitude	FL 080	
		Specific Range	1.053	
Ranges	Max Payload	Nautical Miles	333	
		Average Speed	178	
		Trip Fuel	293	
	Specific Range/Altitude	1.137/FL 040		
	Ferry	Nautical Miles	1,480	
		Average Speed	180	
Trip Fuel		1,081		
Specific Range/Altitude	1.369/FL 120			
Missions (4 occupants)	200 nm	Runway	2,862	
		Block Time	1+02	
		Fuel Used	226	
		Specific Range/Altitude	0.885/FL 060	
		Runway	2,941	
	500 nm	Block Time	2+31	
		Fuel Used	531	
		Specific Range/Altitude	0.942/FL 060	
		Suggested Base Price	\$1,400,000	
		Remarks	Certification Basis	
Remarks	CAR 3, 1957/69/83/2005 A/C system standard; Garmin G1000.			

**Multiengine Pistons turbocharged**

Manufacturer		Vulcanair SpA		Piper Aircraft	
Model		P 68C-TC P 68C-TC		Seneca V PA-34-220T	
BCA Equipped Price		\$877,500		\$999,900	
Characteristics	Seating	1+5/5		1+4/5	
	Wing Loading	20.7		22.8	
	Power Loading	10.94		10.80	
	Noise (dBA)	74.7		75.6	
External Dimensions (ft.)	Length	31.3		28.6	
	Height	11.2		9.9	
	Span	39.4		38.9	
Internal Dimensions (ft.)	Length	10.6		10.4	
	Height	3.9		3.6	
	Width	3.8		4.1	
Power	Engines	2 Lyc TIO-360-C1A6D		2 Cont TSIO-360-RB	
	Output (hp each)	210		220	
	Inspection Interval	2,000t		1,800t	
Weights (lb.)	Max Ramp	4,630		4,773	
	Max Takeoff	4,594		4,750	
	Max Landing	4,365		4,513	
	Zero Fuel	4,140b		4,479c	
	EOW	3,197		3,491	
	Max Payload	943		988	
	Useful Load	1,433		1,282	
	Max Fuel	1,062		732	
	Available Payload w/Max Fuel	371		550	
	Available Fuel w/Max Payload	490		294	
Limits	VNE	194		204	
	VNO	154		164	
	VA	132		139	
Airport Performance	TO (SL elev./ISA temp.)	1,260		1,707	
	TO (5,000-ft. elev.@25C)	2,200		2,435	
	A/S (SL elev./ISA)	1,800		2,510	
	A/S (5,000-ft. elev.@25C)	2,400		3,117	
	V <sub>MC</sub> A	66		66	
	V <sub>DEC</sub>	NA		73	
	V <sub>XSE</sub>	78		83	
Climb	Time to Climb (min.)/Altitude	10/FL 100		7/FL 100	
	Initial Engine-Out Rate (fpm)	240		253	
	Initial All-Engine Gradient (ft./nm)	1,400		996	
	Initial Engine-Out Gradient (ft./nm)	NA		173	
Ceilings (ft.)	Certificated	20,000		25,000	
	All-Engine Service	20,000		25,000	
	Engine-Out Service	10,000		16,500	
Cruise	Long Range	TAS	144	167	
		Fuel Flow	104	108	
		Altitude	FL 080	FL 230	
		Specific Range	1.385	1.546	
	Recommended	TAS	155	196	
		Fuel Flow	125	144	
		Altitude	FL 080	FL 250	
		Specific Range	1.240	1.361	
	High Speed	TAS	162	200	
		Fuel Flow	150	156	
		Altitude	FL 080	FL 230	
		Specific Range	1.080	1.282	
Range	Ferry	Nautical Miles	1,100	866	
		Average Speed	145	160	
		Trip Fuel	960	648	
	Specific Range/Altitude	1.146/FL 080		1.336/FL 180	
	Missions (4 occupants)	200 nm	Runway	NA	1,520
			Block Time	1+28	1+10
Fuel Used			260	213	
Specific Range/Altitude		0.769/FL 080		0.939/FL 120	
500 nm		Runway	NA	1,610	
	Block Time	3+25	2+41		
	Fuel Used	485	476		
Specific Range/Altitude	1.031/FL 080		1.050/FL 200		
Suggested Base Price	\$877,500		\$999,900		
Remarks	Certification Basis	FAR 23, 1982 Garmin G950 glass cockpit; STEC 55X DFGS. BCA estimated data.		FAR 23, 1971/80/97 Garmin G1000 standard.	

Single-Engine Turboprops

Manufacturer		Mahindra Aerospace	Textron Aviation	Piper Aircraft	Quest Aircraft	Textron Aviation	
Model		Airvan 10 GA-10	Cessna Caravan CE-208	M500 PA-46-500TP	Kodiak Kodiak 100	Cessna Grand Caravan EX CE-208B	
BCA Equipped Price		\$999,500*	\$1,950,000	\$1,999,900	\$2,454,725	\$2,527,900	
Characteristics	Seating	1+9/—	1+9/13*	1+4/5	1+6/9	1+9/13*	
	Wing Loading	28.6	28.6	27.8	30.2	31.3	
	Power Loading	10.56	11.85	10.18	9.67	10.16	
	Noise (dBA)	79.0	79.0	76.8	84.4	84.1	
External Dimensions (ft.)	Length	33.5	37.6	29.6	33.8	41.6	
	Height	12.7	14.9	11.3	15.3	14.8	
	Span	40.6	52.1	43.0	45.0	52.1	
Internal Dimensions (ft.)	Length	16.1	12.7	12.3	15.8	16.7	
	Height	3.8	4.5	3.9	4.8	4.5	
	Width	4.2	5.3	4.1	4.5	5.3	
Power	Engine	RR M250 B-17F/2	P&WC PT6A-114A	P&WC PT6A-42A	P&WC PT6A-34	P&WC PT6A-140	
	Output (shp)/Flat Rating	450/ISA+31C	675/ISA+31C	500/ISA+55C	750/ISA+7C	867/ISA+24C	
	Inspection Interval	3,500t	3,600t	3,600t	4,000t	3,600t	
	Max Ramp	4,775	8,035	5,134	7,305	8,842	
Weights (lb.)	Max Takeoff	4,750	8,000	5,092	7,255	8,807	
	Max Landing	4,750	7,800	4,850	7,255	8,500	
	Zero Fuel	4,182b	7,432b	4,850c	6,490c	8,152b	
	BOW	2,475	4,930	3,634	4,417	5,510	
	Max Payload	1,707	2,502	1,216	2,073	2,642	
	Useful Load	2,300	3,105	1,500	2,888	3,332	
	Max Fuel	1,025	2,224	1,160	2,144	2,246	
	Available Payload w/Max Fuel	1,275	881	340	744	1,086	
	Available Fuel w/Max Payload	594	604	284	815	691	
	Limits	V <sub>mo</sub>	175	175	188	180	175
V <sub>a</sub>		150	150	127	143	148	
PSI		—	—	5.6	—	—	
TO (SL elev./ISA temp.)		1,600	2,055	2,438	1,468	2,160	
Airport Performance	TO (5,000-ft. elev.@25C)	2,973	2,973	3,691	2,396	3,661	
	V <sub>so</sub>	61	61	69	60	61	
	V <sub>x</sub>	90	90	95	73	86	
	V <sub>r</sub>	107	107	125	101	108	
	Time to Climb (min.)/Altitude	9/FL 100	9/FL 100	19/FL 250	9/FL 100	9/FL 100	
Climb	Initial Gradient (ft./nm)	771	771	753	915	816	
	Certificated	20,000	25,000	30,000	25,000	25,000	
	Service	25,000	25,000	30,000	25,000	25,000	
Ceilings (ft.)	Sea-Level Cabin	—	—	12,600	—	—	
	TAS	157	157	179	164	156	
Cruise	Long Range	Fuel Flow	281	281	135	251	328
		Altitude	FL 100	FL 100	FL 280	220	FL 100
		Specific Range	0.559	0.559	1.326	0.653	0.476
	High Speed	TAS	186	186	258	175	185
		Fuel Flow	379	379	242	335	437
		Altitude	FL 100	FL 100	FL 280	FL 120	FL 100
NBAA IFR Ranges (100-nm alternate)	Full Fuel (with available payload)	Specific Range	0.491	0.491	1.066	0.522	0.423
		Nautical Miles	965	288	834	1,005	291
		Average Speed	156	153	171	175	155
		Trip Fuel	1,795	581	748	2,130	676
	Ferry	Specific Range/Altitude	0.538/FL 100	0.496/FL 100	1.115/FL 280	0.472/120	0.430/FL 100
		Nautical Miles	970	970	834	1,236	816
		Average Speed	156	156	171	164	156
		Trip Fuel	1,800	1,800	748	2,130	1,772
		Specific Range/Altitude	0.539/FL 100	0.539/FL 100	1.115/FL 280	0.580/FL 200	0.460/FL 100
		Runway	1,468	1,468	1,550	1,468	1,428
Missions (4 passengers)	300 nm	Flight Time	1+40	1+40	1+22	1+47	1+41
		Fuel Used	648	648	379	587	750
		Specific Range/Altitude	0.463/FL 100	0.463/FL 100	0.792/FL 280	0.511/FL 120	0.400/FL 100
		Runway	1,675	1,675	1,625	1,468	1,792
	600 nm	Flight Time	3+17	3+17	2+32	3+30	3+19
		Fuel Used	1,260	1,260	660	1,140	1,462
		Specific Range/Altitude	0.476/FL 100	0.476/FL 100	0.909/FL 280	0.526/FL 120	0.410/FL 100
		Runway	NP	NP	1,700	1,467	NP
	1,000 nm	Flight Time	NP	NP	4+18	5+47	NP
		Fuel Used	NP	NP	985	1,878	NP
		Specific Range/Altitude	NP	NP	1.015/FL 280	0.532/FL 120	NP
		Suggested Base Price	NA	NA	\$1,999,900	\$2,075,000	NA
Remarks	Certification Basis	FAR 23, 1984/98 *BCA estimated price. Garmin G1000 with GFC700 autopilot. 2016 data.	FAR 23, 1984/98 *Export only. Garmin G1000 with GFC700 autopilot.	FAR 23 A 52 *1,000 nm, 3 passengers. Garmin G1000 with SVS.	FAR 23, 2007 Normal category Includes Garmin G1000; GFC700 with coupled GA; Summit interior option.	FAR 23, 1986/2012 *Export only. Includes cargo pod, Garmin G1000 with GFC700 autopilot.	

Single-Engine Turboprops

Manufacturer		Piper Aircraft	Epic Aircraft	Daher	Daher	Pilatus	
Model		M600 PA-46-600TP	Epic E1000	TBM 910 TBM 700 N	TBM 930 TBM 700 N	PC-12 NG PC-12/47E	
BCA Equipped Price		\$2,899,000	\$2,995,000	\$3,683,260	\$3,979,750	\$4,923,000	
Characteristics	Seating	1+4/5	1+5/6	1+5/6	1+5/6	1+7/10	
	Wing Loading	28.7	36.9	38.2	38.2	37.6	
	Power Loading	10.00	6.25	8.70	8.70	8.71	
	Noise (dBA)	76.8	76.0	76.2	76.2	77.0	
External Dimensions (ft.)	Length	29.6	35.8	35.2	35.2	47.3	
	Height	11.3	12.5	14.3	14.3	14.0	
	Span	43.2	43.0	42.1	42.1	53.3	
Internal Dimensions (ft.)	Length	12.3	10.5	15.0	15.0	16.9	
	Height	3.9	4.9	4.1	4.1	4.8	
	Width	4.1	4.6	4.0	4.0	5.0	
Power	Engine	P&WC PT6A-42A	P&WC PT6A-67A	P&WC PT6A-66D	P&WC PT6A-66D	P&WC PT6A-67P	
	Output (shp)/Flat Rating	600/ISA+55C	1,200/ISA+35C	850/ISA+49C	850/ISA+49C	1,200/ISA+35C	
	Inspection Interval	3,600t	3,500t	3,500t	3,500t	3,500t	
Weights (lb.)	Max Ramp	6,050	7,500	7,430	7,430	10,495	
	Max Takeoff	6,000	7,500	7,394	7,394	10,450	
	Max Landing	5,800	7,500	7,024	7,024	9,921	
	Zero Fuel	4,850c	5,400c	6,032c	6,032c	9,039c	
	BOW	3,850	4,600	4,829	4,829	6,782	
	Max Payload	1,000	800	1,203	1,203	2,257	
	Useful Load	2,200	2,900	2,601	2,601	3,713	
	Max Fuel	1,742	1,876	2,017	2,017	2,704	
	Available Payload w/Max Fuel	458	1,024	584	584	1,009	
	Available Fuel w/Max Payload	1,200	2,100	1,398	1,398	1,456	
Limits	V <sub>mo</sub>	250	280	266	266	240	
	V <sub>a</sub>	151	170	160	160	163	
	PSI	5.6	6.7	6.2	6.2	5.8	
Airport Performance	TO (SL elev./ISA temp.)	2,635	1,600	2,380	2,380	2,600	
	TO (5,000-ft. elev.@25C)	3,998	NA	3,475	3,475	4,270	
	V <sub>so</sub>	62	65	65	65	67	
	V <sub>x</sub>	95	124	100	100	120	
	V <sub>r</sub>	122	144	124	124	130	
Climb	Time to Climb (min.)/Altitude	21/FL 250	10/FL 250	13/FL 250	13/FL 250	20/FL 250	
	Initial Gradient (ft./nm)	785	1,500	1,000	1,000	860	
Ceilings (ft.)	Certificated	30,000	34,000	31,000	31,000	30,000	
	Service	30,000	34,000	31,000	31,000	30,000	
	Sea-Level Cabin	12,600	18,000	14,390	14,390	13,100	
Cruise	Long Range	TAS	184	265	252	252	225
		Fuel Flow	155	268	241	241	268
		Altitude	FL 280	FL 280	FL 310	FL 310	FL 300
	High Speed	Specific Range	1.187	0.989	1.046	1.046	0.840
		TAS	274	330	330	330	285
		Fuel Flow	324	402	412	412	497
NBAA IFR Ranges (100-nm alternate)	Full Fuel (with available payload)	Altitude	FL 280	FL 280	FL 260	FL 260	FL 200
		Specific Range	0.846	0.821	0.801	0.801	0.573
		Nautical Miles	1,406	1,650	1,514	1,514	1,608
		Average Speed	179	265	252	252	261
	Ferry	Trip Fuel	1,324	1,599	1,599	1,599	2,282
		Specific Range/Altitude	1.062/FL 280	1.032/FL 310	0.947/FL 310	0.947/FL 310	0.705/FL 300
		Nautical Miles	1,406	1,594	1,594	1,594	1,650
		Average Speed	179	252	252	252	264
		Trip Fuel	1,324	1,598	1,598	1,598	2,294
		Specific Range/Altitude	1.062/FL 280	0.997/FL 310	0.997/FL 310	0.997/FL 310	0.719/FL 300
Missions (4 passengers)	300 nm	Runway	1,593	1,765	1,765	1,765	1,563
		Flight Time	1+21	1+00	1+00	1+00	1+10
		Fuel Used	429	440	440	440	549
		Specific Range/Altitude	0.699/FL 280	0.682/FL 280	0.682/FL 280	0.682/FL 280	0.546/FL 260
	600 nm	Runway	1,687	2,005	2,005	2,005	1,753
		Flight Time	2+31	1+55	1+55	1+55	2+16
		Fuel Used	735	830	830	830	975
		Specific Range/Altitude	0.816/FL 280	0.723/FL 280	0.723/FL 280	0.723/FL 280	0.615/FL 270
	1,000 nm	Runway	1,812	2,380	2,380	2,380	2,026
		Flight Time	4+06	3+10	3+10	3+10	3+46
		Fuel Used	1,142	1,320	1,320	1,320	1,520
		Specific Range/Altitude	0.876/FL 280	0.758/FL 290	0.758/FL 290	0.758/FL 290	0.658/FL 280
Suggested Base Price		\$2,899,000	NA	\$3,658,336	\$3,899,887	\$4,095,000	
Remarks	Certification Basis	FAR 23 A 62, 2016 Garmin G3000 with SVS and enhanced AFCS.	FAR 23 pending Garmin G1000 Nxi.	FAR 23, 1990/2006/07/14 Pilot door standard; 5-blade propeller; G1000 Nxi; AoA-ESP-USP; satcom; weather; 5-year system warranty.	FAR 23, 1990/2006/07/14 All features of TBM 900 plus advanced interior; Garmin G3000; 5-year system warranty.	FAR 23, 1996/2005/08 Honeywell APEX avionics; SmartView; ADS-B Out; BMW executive interior; Hartzell 5-blade propeller.	

**Multiengine Turboprops ≤12,500-LB. MTOW**

Manufacturer		Vulcanair SpA	Nextant Aerospace	Evktor	Textron Aviation	
Model		Viator AP68TP-600	G90XT C90	Outback EV-55	Beechcraft King Air C90GTi	
BCA Equipped Price		\$2,485,900	\$2,750,000	\$3,000,000	\$3,595,000	
Characteristics	Seating	1+7/10	1+7/10	1+9/14	1+7/8	
	Wing Loading	33.0	34.4	37.4	34.4	
	Power Loading	10.08	9.55	9.46	9.53	
	Noise (dBA)	71.7	71.7	NA	74.8	
External Dimensions (ft.)	Length	37.0	35.5	46.6	35.5	
	Height	11.9	14.3	16.8	14.3	
	Span	39.4	NA	53.2	50.3	
Internal Dimensions (ft.)	Length: OA/Net	11.9/17.2	12.4/12.4	16.5/20.0	12.4/12.4	
	Height	4.1	4.8	4.5	4.8	
	Width: Max/Floor	3.7/3.7	4.5/4.1	5.3/4.7	4.5/4.1	
Power	Engines	2 RR 250 B17C	2 GE Czech H75-100	2 P&WC PT6A-21	2 P&WC PT6A-135A	
	Output (shp each)/Flat Rating	328/ISA+25C	550/ISA+8C	536/ISA+15C	550/ISA+30C	
	Inspection Interval	3,500t	4,000t	3,600t	3,600t	
Weights (lb.)	Max Ramp	6,669	10,560	10,207	10,545	
	Max Takeoff	6,613	10,500	10,141	10,485	
	Max Landing	6,283	9,700	10,141	9,832	
	Zero Fuel	5,621c	9,650c	9,810c	9,378c	
	BOW	3,850	7,200	5,965	7,265	
	Max Payload	1,771	2,450	3,845	2,113	
	Useful Load	2,819	3,360	4,242	3,280	
	Max Fuel	1,487	2,573	3,413	2,573	
	Available Payload w/Max Fuel	1,332	787	829	707	
Limits	Available Fuel w/Max Payload	1,048	910	397	1,167	
	V <sub>mo</sub>	200	208	205	226	
	V <sub>a</sub>	141	169	140	169	
Airport Performance	PSI	—	5.0	—	5.0	
	TO (SL elev./ISA temp.)	2,034	2,100	1,378	1,984	
	TO (5,000-ft. elev.@25C)	2,950	2,800	1,837	3,375	
	A/S (SL elev./ISA temp.)	2,034	3,800	1,722	3,690	
	A/S (5,000-ft. elev.@25C)	2,953	5,100	2,395	5,855	
	V <sub>mcA</sub>	77	92	66	80	
	V <sub>rec</sub>	85	97	79	97	
Climb	V <sub>ise</sub>	90	101	92	100	
	V <sub>rse</sub>	105	111	95	108	
	Time to Climb (min.)/Altitude	7/FL 100	18/FL 250	6/FL 010	18/FL 250	
	Initial Engine-Out Rate (fpm)	270	460	290	460	
Ceilings (ft.)	Initial All-Engine Gradient (ft./nm)	1,500	1,900	1,107	1,900	
	Initial Engine-Out Gradient (ft./nm)	180	260	219	260	
	Certificated	25,000	30,000	24,000	30,000	
	All-Engine Service	25,000	30,000	24,000	30,000	
Cruise	Engine-Out Service	8,050	22,000	15,420	19,230	
	Sea-Level Cabin	—	11,065	—	11,065	
	Long Range	TAS	169	213	180	208
		Fuel Flow	261	292	432	332
		Altitude	FL 100	FL 280	FL 010	FL 260
	High Speed	Specific Range	0.648	0.729	0.417	0.627
		TAS	214	283	220	270
		Fuel Flow	375	578	610	612
	NBAA IFR Ranges (100-nm alternate)	Altitude	FL 100	FL 240	FL 200	FL 200
		Specific Range	0.571	0.490	0.361	0.441
Max Payload (with available fuel)		Nautical Miles	543	324	NP	260
		Average Speed	180	203	NP	229
		Trip Fuel	781	600	NP	620
Max Fuel (with available payload)		Specific Range/Altitude	0.695/FL 100	0.540/FL 220	NP/—	0.419/FL 270
	Nautical Miles	837	1,300	1,046	1,026	
	Average Speed	179	207	217	252	
Ferry (with 4 passengers)	Trip Fuel	1,220	1,782	3,008	2,044	
	Specific Range/Altitude	0.686/FL 100	0.730/FL 280	0.348/FL 100	0.502/FL 270	
	Nautical Miles	837	1,290	1,046	975	
	Average Speed	179	207	217	252	
	Trip Fuel	1,220	1,769	3,008	1,949	
	Specific Range/Altitude	0.686/FL 100	0.729/FL 280	0.348/FL 100	0.500/FL 270	
Missions (4 passengers)	300 nm	Nautical Miles	837	1,369	1,051	1,045
		Average Speed	179	203	218	255
		Trip Fuel	1,220	1,850	3,008	2,053
		Specific Range/Altitude	0.686/FL 100	0.740/FL 280	0.349/FL 100	0.509/FL 270
	600 nm	Runway	1,247	3,010	3,163	3,004
		Flight Time	1+35	1+06	1+26	1+13
		Fuel Used	419	584	943	748
		Specific Range/Altitude	0.716/FL 100	0.514/FL 220	0.318/FL 100	0.401/FL 210
	1,000 nm	Runway	1,558	3,350	1,289	3,347
		Flight Time	3+18	2+12	2+22	2+22
Fuel Used		866	1,162	1,773	1,353	
Specific Range/Altitude		0.693/FL 100	0.516/FL 280	0.338/FL 100	0.443/FL 230	
Remarks	Runway	NP	3,500	1,565	3,690	
	Flight Time	NP	3+39	4+ 36	3+57	
	Fuel Used	NP	1,938	2,881	1,990	
Suggested Base Price	\$2,485,900	NA	NA	NA		
Certification Basis	FAR 23, 1986 Garmin G950; STEC 2100 autopilot. BCA estimated data.	STO1902CH; SA3593NM; SA4010NM; SA3593NM; SAO1902CH; SAO1456WI-D; SAO2133SE.	EASA/FAR 23 pending 2016 data.	Pro Line Fusion standard.; STC SA107475C weight increase; SAO2054SE winglets; SA3593NM swept props; SA4010NM dual aft strakes; , 1,000-nm mission, 755-lb. pid.		



# Multiengine Turboprops ≤12,500-LB. MTOW

Manufacturer		Textron Aviation	Viking Air	Piaggio Aero Industries	
Model		Beechcraft King Air 250 B200GT	400 Series DHC-6-400	Avanti Evo P180	
BCA Equipped Price		\$5,995,000	\$6,500,000	\$7,695,000	
Characteristics	Seating	1+8/10	1+11/19	1+7/9	
	Wing Loading	40.3	29.8	70.3	
	Power Loading	7.35	10.08	7.12	
	Noise (dBA)	TBD	85.6	75.0	
External Dimensions (ft.)	Length	43.8	51.8	47.3	
	Height	14.8	19.5	13.0	
	Span	57.9	65.0	46.0	
Internal Dimensions (ft.)	Length: OA/Net	16.7/16.7	18.4/24.5	17.5/17.5	
	Width: Max/Floor	4.5/4.1	5.4/4.4	6.1/3.5	
Power	Engines	2 P&WC PT6A-52	2 P&WC PT6A-34	2 P&WC PT6A-66B	
	Output (shp each)/Flat Rating	850/ISA+37C	620/ISA+27C	850/ISA+28C	
	Inspection Interval	3,600t	3,600t	3,600t	
Weights (lb.)	Max Ramp	12,590	12,525	12,150	
	Max Takeoff	12,500	12,500	12,100	
	Max Landing	12,500	12,300	11,500	
	Zero Fuel	11,000c	11,655b	9,800c	
	BOW	8,830	8,100	8,375	
	Max Payload	2,170	3,555	1,425	
	Useful Load	3,760	4,425	3,775	
	Max Fuel	3,645	3,549	2,802	
	Available Payload w/Max Fuel	115	876	973	
	Available Fuel w/Max Payload	1,590	870	2,350	
Limits	V <sub>wo</sub>	260	170	260	
	V <sub>A</sub>	182	136	202	
	PSI	6.5	—	9.0	
Airport Performance	TO (SL elev./ISA temp.)	2,111	1,490	3,262	
	TO (5,000-ft. elev.@25C)	3,099	NA	4,700	
	A/S (SL elev./ISA temp.)	3,687	2,220	5,750	
	A/S (5,000-ft. elev.@25C)	4,859	NA	7,400	
	V <sub>mcA</sub>	86	66	100	
	V <sub>rec</sub>	94	NA	106	
	V <sub>lse</sub>	115	NA	132	
	V <sub>lse</sub>	121	NA	140	
Climb	Time to Climb (min.)/Altitude	13/FL 250	NA/FL 100	10/FL 250	
	Initial Engine-Out Rate (fpm)	682	340	670	
	Initial All-Engine Gradient (ft./nm)	1,170	NA	1,106	
	Initial Engine-Out Gradient (ft./nm)	364	NA	287	
Ceilings (ft.)	Certificated	35,000	25,000	41,000	
	All-Engine Service	35,000	26,700	39,400	
	Engine-Out Service	26,000	11,600	23,800	
	Sea-Level Cabin	15,293	—	24,000	
Cruise	Long Range	TAS	256	NA	318
		Fuel Flow	430	NA	408
		Altitude	FL 350	FL 100	FL 410
	High Speed	Specific Range	0.595	NA	0.779
		TAS	310	180	400
		Fuel Flow	750	580	792
NBAA IFR Ranges (100-nm alternate)	Max Payload (with available fuel)	Altitude	FL 260	FL 100	FL 310
		Specific Range	0.413	0.310	0.505
		Nautical Miles	321	NP	1,070
		Average Speed	267	NP	315
	Max Fuel (with available payload)	Trip Fuel	870	NP	1,715
		Specific Range/Altitude	0.369/FL 330	NP	0.624/FL 390
		Nautical Miles	1,403	NA	1,450
		Average Speed	291	NA	311
	Full Fuel (with 4 passengers)	Trip Fuel	2,941	NA	2,167
		Specific Range/Altitude	0.477/FL 330	NA/FL 100	0.669/FL 410
Nautical Miles		1,038	NA	1,510	
Average Speed		288	NA	317	
Ferry	Trip Fuel	2,225	NA	2,167	
	Specific Range/Altitude	0.467/FL 330	NA/FL 100	0.697/FL 410	
	Nautical Miles	1,420	NA	1,530	
	Average Speed	293	NA	318	
Missions (4 passengers)	300 nm	Trip Fuel	2,942	NA	2,167
		Specific Range/Altitude	0.483/FL 330	NA/FL 100	0.706/FL 410
		Runway	3,504	NA	2,350
		Flight Time	1+03	NA	0+53
	600 nm	Fuel Used	869	NA	688
		Specific Range/Altitude	0.345/FL 250	NA/FL 100	0.436/FL 310
		Runway	3,587	NA	2,550
		Flight Time	2+03	NA	1+44
	1,000 nm	Fuel Used	1,494	NA	1,144
		Specific Range/Altitude	0.402/FL 290	NA/FL 100	0.524/FL 350
		Runway	3,677	NA	2,700
		Flight Time	3+28	NA	3+02
Remarks	Certification Basis	Fuel Used	2,147	NA	1,603
		Specific Range/Altitude	0.466/FL 330	NA/FL 100	0.624/FL 390
		Suggested Base Price	NA	NA	\$7,395,000
		FAR 23, 1973/80/2008/11 Rockwell Collins Pro Line Fusion standard; Wi-Fi optional; STC SA02131SE.	EASA/FAR 23 A 57, 2010 2016 data.	EASA 23, 2014; FAR 23, 2015 Includes Rockwell Collins Pro Line 21 avionics; TCAS I; Iridium satcom; RVSM approved; optional 390-lb. capacity internal tank; \$275,000.	

**Multiengine Turboprops >12,500-LB. MTOW**

Manufacturer		Textron Aviation		Textron Aviation		Textron Aviation		Textron Aviation		
Model		Beechcraft King Air 250 EP B200GT		Beechcraft King Air 350i B300		Beechcraft King Air 350HW B300		Beechcraft King Air 350iER B300ER		
<b>BCA Equipped Price</b>		\$6,231,025		\$6,995,000		\$7,329,055		\$8,445,625		
Characteristics	Seating	1+8/10		1+9/11		1+9/14		1+9/11		
	Wing Loading	43.3		48.4		53.2		53.2		
	Power Loading	7.89		7.14		7.86		7.86		
	Noise (dBA)	85.3		72.1		81.5		81.5		
External Dimensions (ft.)	Length	43.8		46.7		46.7		46.7		
	Height	14.8		14.3		14.3		14.3		
	Span	57.9		57.9		57.9		57.9		
Internal Dimensions (ft.)	Length: OA/Net	16.7/16.7		19.5/19.5		19.5/19.5		19.5/19.5		
	Height	4.8		4.8		4.8		4.8		
	Width: Max/Floor	4.5/4.1		4.5/4.1		4.5/4.1		4.5/4.1		
Power	Engines	2 P&WC PT6A-52		2 P&WC PT6A-60A		2 P&WC PT6A-60A		2 P&WC PT6A-60A		
	Output (shp each)/Flat Rating	850/ISA+37C		1,050/ISA+10C		1,050/ISA+10C		1,050/ISA+10C		
	Inspection Interval	3,600t		3,600t		3,600t		3,600t		
Weights (lb.)	Max Ramp	13,510		15,100		16,600		16,600		
	Max Takeoff	13,420		15,000		16,500		16,500		
	Max Landing	12,500		15,000		15,675		15,675		
	Zero Fuel	11,000c		12,500c		13,000c		13,000c		
	BOW	8,865		9,955		9,290		10,215		
	Max Payload	2,135		2,545		3,710		2,785		
	Useful Load	4,645		5,145		7,310		6,385		
	Max Fuel	3,645		3,611		3,611		5,192		
Limits	Available Payload w/Max Fuel	1,000		1,534		3,699		1,193		
	Available Fuel w/Max Payload	2,510		2,600		3,600		3,600		
	Mmo	0.58		0.58		0.58		0.58		
	Trans. Alt. FL/Wmo	FL 210/259		FL 210/263		FL 240/245		FL 240/245		
Airport Performance	Va	182		182		182		182		
	PSI	6.5		6.6		6.6		6.5		
	TO (SL elev./ISA temp.)	4,005		3,300		4,057		4,057		
	TOFL (5,000-ft. elev.@25C)	5,780		5,376		5,140		7,675		
	Mission Weight	13,220		14,196		13,686		16,100		
	NBAA IFR Range	1,430		1,549		1,445		2,257		
	V2	109		109		111		111		
	Vref	97		100		104		104		
Climb	Landing Distance	2,780		2,390		2,720		2,728		
	Time to Climb (min.)/Altitude	15/FL 250		15/FL 250		23/FL 250		18/FL 250		
	*FAR 25 Initial Engine-Out Rate (fpm)	580		552		274		337		
Ceilings (ft.)	FAR 25 Initial Engine-Out Gradient (ft./nm)	255		304		172		182		
	Certificated	35,000		35,000		35,000		35,000		
	All-Engine Service	35,000		35,000		35,000		35,000		
Cruise	Engine-Out Service	24,400		21,500		17,100		17,100		
	Sea-Level Cabin	15,293		15,293		15,293		15,293		
	Long Range	TAS	233		235		232		238	
		Fuel Flow	369		362		392		402	
		Altitude	FL 350		FL 330		FL 330		FL 330	
		Specific Range	0.631		0.649		0.592		0.592	
	High Speed	TAS	308		312		303		303	
		Fuel Flow	750		773		766		764	
Altitude		FL 260		FL 240		FL 240		FL 240		
Specific Range		0.411		0.404		0.396		0.397		
NBAA IFR Ranges (100-nm alternate)	Max Payload (with available fuel)	Nautical Miles	802		896		1,254		1,316	
		Average Speed	275		273		258		261	
		Trip Fuel	1,802		1,891		2,838		2,880	
		Specific Range/Altitude	0.445/FL 330		0.474/FL 350		0.442/FL 350		0.457/FL 350	
	Max Fuel (with available payload)	Nautical Miles	1,393		1,485		1,260		2,223	
		Average Speed	283		280		258		269	
		Trip Fuel	2,947		2,944		2,884		4,528	
		Specific Range/Altitude	0.473/FL 330		0.504/FL 350		0.437/FL 350		0.491/FL 350	
Full Fuel (with 4 passengers)	Nautical Miles	1,414		1,533		1,437		2,271		
	Average Speed	285		285		276		271		
	Trip Fuel	2,950		2,951		2,930		4,533		
	Specific Range/Altitude	0.479/FL 330		0.519/FL 350		0.490/FL 350		0.501/FL 350		
Ferry	Nautical Miles	1,442		1,560		1,473		2,338		
	Average Speed	289		289		282		276		
	Trip Fuel	2,956		2,958		2,942		4,543		
	Specific Range/Altitude	0.488/FL 330		0.527/FL 350		0.501/FL 350		0.515/FL 350		
Missions (4 passengers)	300 nm	Runway	3,524		2,586		2,634		2,795	
		Flight Time	1+05		1+02		1+06		1+05	
		Fuel Used	848		881		954		919	
		Specific Range/Altitude	0.354/FL 250		0.341/FL 250		0.314/FL 250		0.326/FL 250	
	600 nm	Runway	3,611		2,702		2,746		2,927	
		Flight Time	2+05		2+02		2+07		2+07	
		Fuel Used	1,472		1,470		1,561		1,529	
		Specific Range/Altitude	0.408/FL 290		0.408/FL 290		0.384/FL 290		0.392/FL 290	
1,000 nm	Runway	3,702		2,827		2,883		3,048		
	Flight Time	3+31		3+27		3+33		3+35		
	Fuel Used	2,123		2,102		2,227		2,195		
	Specific Range/Altitude	0.471/FL 330		0.476/FL 330		0.449/FL 330		0.456/FL 330		
Remarks	Suggested Base Price	NA		NA		NA		NA		
	Certification Basis	FAR 23, 1973/80/2008/11 Commuter category Rockwell Collins Pro Line Fusion; Wi-Fi optional; STC SA111033C for IGW; 14,000-lb. MTOW also available.		FAR 23, 1989 Commuter category Rockwell Collins Pro Line Fusion; Wi-Fi standard; RVSM approved.		FAR 23, 1989/2007 Commuter category 17,500-lb. MTOW optional; Rockwell Collins Pro Line Fusion; Wi-Fi standard; factory-installed Slick interior available for special missions; RVSM approved.		FAR 23, 1989/2007 Commuter category Rockwell Collins Pro Line Fusion; Wi-Fi standard; RVSM approved.		

Jets <10,000-LB. MTOW

Manufacturer		Cirrus Design	Eclipse Aerospace	
Model		Vision SF-50	Eclipse 550 EA-500	
BCA Equipped Price		\$1,960,000	\$2,995,000	
Characteristics	Seating	1+4/6	1+4/5	
	Wing Loading	30.7	41.0	
	Power Loading	1.67	3.33	
	Noise (EPNdB): Lateral/Flyover/Approach	NA/NA/NA	69.2/78.9/81.9	
External Dimensions (ft.)	Length	30.7	33.5	
	Height	10.9	11.0	
	Span	38.7	37.9	
Internal Dimensions (ft.)	Length: OA/Net	11.5/9.8	12.3/10.0	
	Height/Dropped Aisle Depth	4.1/NA	4.2/NA	
	Width: Max/Floor	5.1/3.1	4.7/3.0	
Baggage	Internal: Cu. ft./lb.	24/NA	16/260	
	External: Cu. ft./lb.	30/NA	NA/NA	
Power	Engine(s)	1 Wms Intl FJ33-5A	2 P&WC PW610F	
	Output (lb. each)/Flat Rating	1,800/ISA+10C	900/ISA+10C	
	Inspection Interval/Manu. Service Plan Interval	3,500t/—	3,500t/—	
Weights (lb.)	Max Ramp	6,040	6,034	
	Max Takeoff	6,000	6,000	
	Max Landing	5,550	5,600	
	Zero Fuel	4,900c	4,922c	
	BOW	3,772	3,923	
	Max Payload	1,128	999	
	Useful Load	2,268	2,111	
	Max Fuel	2,000	1,680	
	Available Payload w/Max Fuel	268	431	
	Available Fuel w/Max Payload	1,140	1,112	
Limits	Mmo	0.530	0.640	
	Trans. Alt. FL/Vmo	FL 183/250	FL 200/285	
Airport Performance	PSI	6.4	8.7	
	TOFL (SL elev./ISA temp.)	2,036	2,394	
	TOFL (5,000-ft. elev.@25C)	3,679	4,171	
	Mission Weight	6,000	5,893	
	NBAA IFR Range	1,125	1,015	
	V2	90	102*	
	VREF	87	89	
	Landing Distance	1,628	2,340	
Climb	Time to Climb/Altitude	NA/FL 370	25/FL 370	
	FAR 25 Engine-Out Rate (fpm)	NA	500	
	FAR 25 Engine-Out Gradient (ft./nm)	NA	294	
Ceilings (ft.)	Certificated	28,000	41,000	
	All-Engine Service	28,000	41,000	
	Engine-Out Service	NA	25,000	
	Sea-Level Cabin	NA	21,500	
	TAS	256	334	
Cruise	Long Range	Fuel Flow	358	321
		Altitude	FL 280	FL 410
		Specific Range	0.715	1.040
	High Speed	TAS	300	369
		Fuel Flow	466	462
		Altitude	FL 280	FL 350
NBAA IFR Ranges (100-nm alternate)	Max Payload (with available fuel)	Nautical Miles	550	530
		Average Speed	251	307
		Trip Fuel	845	677
		Specific Range/Altitude	0.651/FL 280	0.783/FL 410
	Max Fuel (with available payload)	Nautical Miles	1,167	1,125
		Average Speed	248	319
		Trip Fuel	1,602	1,254
		Specific Range/Altitude	0.728/FL 280	0.897/FL 410
	Four Passengers (with available fuel)	Nautical Miles	796	825
		Average Speed	250	317
		Trip Fuel	1,076	965
		Specific Range/Altitude	0.740/FL 280	0.855/FL 410
Ferry	Nautical Miles	1,219	1,190	
	Average Speed	218	312	
	Trip Fuel	1,680	1,263	
	Specific Range/Altitude	0.726/FL 280	0.942/FL 410	
Missions (4 passengers)	300 nm	Runway	1,857	2,038
		Flight Time	1+10	0+58
		Fuel Used	568	456
		Specific Range/Altitude	0.528/FL 280	0.658/FL 350
	600 nm	Runway	2,171	2,258
		Flight Time	2+15	1+46
		Fuel Used	1,033	837
		Specific Range/Altitude	0.581/FL 280	0.717/FL 390
	1,000 nm	Runway	2,437	2,318
		Flight Time	3+36	3+04
		Fuel Used	1,642	1,137
		Specific Range/Altitude	0.609/FL 280	0.880/FL 410
Remarks	Certification Basis	FAR 23, 2016 Some data preliminary.	FAR 23, 2006/15 1,000-nm mission flown with 3 passengers. *V50 used in lieu of V2. 2016 data.	

## Jets <20,000-LB. MTOW

Manufacturer		Textron Aviation	Embraer	Textron Aviation	Honda Aircraft Co.	Nextant Aerospace	
Model		Cessna Citation Mustang CE-510	Phenom 100 EV EMB-500	Cessna Citation M2 CE-525	HondaJet HA-420	Nextant 400 XTi BE 400A	
BCA Equipped Price		\$3,350,000	\$4,495,000	\$4,500,000	\$4,850,000	\$5,304,500	
Characteristics	Seating	1+5/5/—	1+5/7/7	1+7/7/—	1+5/6/6	2+7/9/—	
	Wing Loading/Power Loading	41.2/2.96	53.1/3.09	44.6/2.72	60.0/2.60	67.6/2.67	
	Noise (EPNdB): Lateral/Flyover/Approach	73.9/85.0/86.0	70.4/81.4/86.1	85.9/73.2/88.5	85.4/72.9/87.5	76.9/91.5/88.8	
External Dimensions (ft.)	Length	40.6	42.1	42.6	42.6	48.4	
	Height	13.4	14.3	13.9	14.9	13.9	
	Span	43.2	40.4	47.3	39.8	43.5	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross	6.7/9.8/9.8	9.0/11.0/11.0	8.8/11.0/11.0	12.1/12.1/NA	15.5/15.5/—	
	Height/Dropped Aisle Depth	4.5/0.3	4.9/0.3	4.8/0.4	4.8/NA	4.8/flat floor	
	Width: Max/Floor	4.6/3.1	5.1/3.6	4.8/3.1	5.0/NA	4.9/4.0	
Baggage	Internal: Cu. ft./lb.	6/98	10/99	—/—	NA/NA	27/410	
	External: Cu. ft./lb.	57/620	60/418	46/725	66/500	26/450	
Power	Engines	2 P&WC PW615F	2 P&WC PW 617F-E	2 Wms Intl FJ44-1AP-21	2 GE Honda HF-120-H1A	2 Wms Intl FJ44-3AP	
	Output (lb. each)/Flat Rating	1,460/ISA+10C	1,730/ISA+8C	1,965/ISA+7C	2,037/ISA+10C	3,052/ISA+7C	
	Inspection Interval/Manu. Service Plan Interval	3,500t/—	3,500t/—	3,500t/5,000	NA/—	5,000t/—	
Weights (lb.)	Max Ramp	8,730	10,748	10,800	10,680	16,500	
	Max Takeoff	8,645	10,703	10,700	10,600	16,300	
	Max Landing	8,000	9,877	9,900	9,860	15,700	
	Zero Fuel	6,750c	9,072c	8,400c	8,800c	13,000c	
	BOW	5,600	7,298	6,990	7,279	10,950	
	Max Payload	1,150	1,774	1,410	1,521	2,050	
	Useful Load	3,130	3,450	3,810	3,401	5,550	
	Max Fuel	2,580	2,804	3,296	2,845	4,912	
	Available Payload w/Max Fuel	550	646	514	556	638	
	Available Fuel w/Max Payload	1,980	1,676	2,400	1,880	3,500	
Limits	Mmo	0.630	0.700	0.710	0.720	0.780	
	Trans. Alt. FL/Wno	FL 271/250	280/275	FL 305/263	FL 302/270	FL 290/320	
	PSI/Sea-Level Cabin	8.3/21,280	8.3/21,280	8.5/22,027	8.8/23,060	9.1/24,000	
Airport Performance	TOFL (SL elev./ISA temp.)	3,110	3,199	3,210	3,934	3,821	
	TOFL (5,000-ft. elev.@25C)	6,600	5,663	5,580	6,108	5,088	
	Mission Weight	8,645	10,703	10,700	10,600	14,500p	
	NBAA IFR Range	984	1,092	1,204	1,223	1,197	
	V <sub>2</sub>	97	99	111	120	116	
	V <sub>ASX</sub>	88	95	101	105	105	
Climb	Landing Distance	2,137	2,473	2,340	2,795	2,960	
	Time to Climb/Altitude	20/FL 370	19/FL 370	18/FL 370	15/FL 370	16/FL 370	
	FAR 25 Engine-Out Rate (fpm)	432	597	618	933	305	
Ceilings (ft.)	FAR 25 Engine-Out Gradient (ft./nm)	267	316	334	400	158	
	Certificated	41,000	41,000	41,000	43,000	45,000	
Cruise	All-Engine Service	41,000	41,000	41,000	43,000	45,000	
	Engine-Out Service	26,900	24,045	26,800	27,000	27,500	
	Long Range	TAS/Fuel Flow (lb./hr.)	319/498	340/543	323/516	360/558	406/740
	Altitude/Specific Range	FL 390/0.641	FL 410/0.626	FL 410/0.626	FL 430/0.645	FL 450/0.549	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	High Speed	TAS/Fuel Flow (lb./hr.)	339/609	406/955	401/920	420/972	
	Altitude/Specific Range	FL 350/0.557	FL 330/0.425	FL 350/0.436	FL 330/0.432	FL 430/0.462	
	Max Payload (with available fuel)	Nautical Miles	716	466	812	600	1,024
	Average Speed	294	325	361	347	367	
Missions (4 passengers)	Trip Fuel	1,300	1,036	1,706	1,230	2,411	
	Specific Range/Altitude	0.551/FL 410	0.450/FL 410	0.476/FL 410	0.488/FL 430	0.425/FL 450	
	Max Fuel (with available payload)	Nautical Miles	1,141	1,194	1,357	1,282	1,895
	Average Speed	304	333	372	361	384	
	Trip Fuel	1,947	2,196	2,675	2,273	3,953	
	Specific Range/Altitude	0.586/FL 410	0.544/FL 410	0.507/FL 410	0.564/FL 430	0.479/FL 450	
Ferry	Nautical Miles	963	1,092	1,183	1,065	1,801	
	Average Speed	301	333	370	361	383	
	Trip Fuel	1,664	2,038	2,352	1,976	3,706	
	Specific Range/Altitude	0.579/FL 410	0.536/FL 410	0.503/FL 410	0.539/FL 430	0.486/FL 450	
Remarks	Nautical Miles	1,204	1,254	1,400	1,358	1,981	
	Average Speed	315	329	378	358	381	
	Trip Fuel	1,965	2,220	2,705	2,290	3,986	
	Specific Range/Altitude	0.613/FL 410	0.565/FL 410	0.518/FL 410	0.593/FL 430	0.497/FL 450	
	300 nm	Runway	2,498	2,909	2,625	3,564	3,015
	Flight Time	1+00	0+53	0+52	0+53	0+48	
	Fuel Used	670	753	804	676	786	
	Specific Range/Altitude	0.448/FL 370	0.398/FL 390	0.373/FL 370	0.444/FL 430	0.382/FL 390	
	600 nm	Runway	2,700	3,121	2,692	3,732	3,044
	Flight Time	1+56	1+45	1+38	1+38	1+30	
Fuel Used	1,135	1,236	1,362	1,179	1,323		
Specific Range/Altitude	0.529/FL 390	0.485/FL 390	0.441/FL 390	0.509/FL 430	0.454/FL 430		
1,000 nm	Runway	3,110	3,179	3,009	3,909	3,101	
	Flight Time	3+19	2+54	2+42	2+40	2+28	
	Fuel Used	1,754	1,919	2,018	1,863	2,145	
Specific Range/Altitude	0.570/FL 410	0.521/FL 410	0.496/FL 410	0.537/FL 430	0.466/FL 450		
Remarks	Certification Basis	FAR 23, 2006 1,000-nm mission flown with 713-lb. payload.	FAR 23, 2008	FAR 23, 2013	FAR 23, 2015	FAR 25, 1981/85 STC 023711A; STC 10959SC; STC 03960AT	

## Jets <20,000-LB. MTOW

Manufacturer		Textron Aviation	Syberjet	Pilatus Aircraft	Embraer	Textron Aviation	
Model		Cessna Citation CJ3+ CE-525B	SJ30i SJ30-2	SVJ PC-24	Phenom 300 EMB-505	Cessna Citation CJ4 CE-525C	
BCA Equipped Price		\$7,995,000	\$8,306,452	\$8,900,000	\$8,995,000	\$8,995,000	
Characteristics	Seating	1+8/9/—	1+5/6/—	1+8/11/NA	1+7/10/10	2+8/9/—	
	Wing Loading/Power Loading	47.2/2.46	73.2/3.03	53.1/2.60	60.0/2.74	51.8/2.36	
	Noise (EPNdB): Lateral/Flyover/Approach	88.7/74.0/88.6	78.5/86.2/91.8	NA/NA/NA	69.9/88.8/88.5	92.8/75.6/89.5	
External Dimensions (ft.)	Length	51.2	46.8	55.2	51.2	53.3	
	Height	15.2	14.2	17.3	16.7	15.3	
	Span	53.3	42.3	55.8	52.2	50.8	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross Height/Dropped Aisle Depth	12.3/15.7/—	12.5/12.5/—	NA/NA/23.0	14.8/17.2/17.2	12.9/17.3/17.3	
	Width: Max/Floor	4.8/3.1	4.8/2.8	5.1/flat floor	4.9/0.3	4.8/0.4	
Baggage	Internal: Cu. ft./lb.	—/—	6/100	90/NA	10/77	7/40	
	External: Cu. ft./lb.	65/1,000	53/500	NA/NA	74/573	71/1,000	
Power	Engines	2 Wms Intl FJ44-3A	2 Wms Intl FJ44-2A	2 Wms Intl FJ44-4A	2 Wms Intl FJ44-4A	2 Wms Intl FJ44-4A	
	Output (lb. each)/Flat Rating	2,820/ISA+11C	2,300/ISA+8C	3,400/NA	3,360/ISA+15C	3,621/ISA+11C	
	Inspection Interval/Manu. Service Plan Interval	4,000t/5,000	3,500t/—	5,000t/NA	5,000t/—	5,000t/5,000	
Weights (lb.)	Max Ramp	14,070	14,050	17,750	18,497	17,230	
	Max Takeoff	13,870	13,950	17,650	18,387	17,110	
	Max Landing	12,750	12,725	16,250	17,042	15,660	
	Zero Fuel	10,510c	10,500c	NA	14,220c	12,500c	
	BOW	8,540	8,917	NA	11,583	10,280	
	Max Payload	1,970	1,583	2,500	2,637	2,220	
	Useful Load	5,530	5,133	NA	6,914	6,950	
	Max Fuel	4,710	4,850	5,965	5,353	5,828	
Limits	Available Payload w/Max Fuel	820	283	915	1,561	1,122	
	Available Fuel w/Max Payload	3,560	3,550	NA	4,277	4,730	
	Muo	0.737	0.830	NA	0.780	0.770	
Airport Performance	Trans. Alt. FL/Wo	FL 293/278	FL 295/320	NA/NA	FL 263/320	FL 279/305	
	PSI/Sea-Level Cabin	8.9/23,586	12.0/41,000	NA/23,500	9.4/25,560	9.0/24,005	
	TOFL (SL elev./ISA temp.)	3,180	3,939	2,690	2,354	3,140	
	TOFL (5,000-ft. elev.@25C)	4,750	8,784	4,430	5,400	5,180	
	Mission Weight	13,870	13,125	17,750	18,387	16,788	
Climb	NBAA IFR Range	1,827	1,915	NA	2,019	1,948	
	V2	114	112	NA	113	117	
	Vxsr	99	104	NA	104	99	
	Landing Distance	2,422	2,657	NA	2,220	2,281	
Ceilings (ft.)	Time to Climb/Altitude	15/FL 370	16/FL 370	NA/FL 370	15/FL 370	14/FL 370	
	FAR 25 Engine-Out Rate (fpm)	808	312	NA	872	839	
	FAR 25 Engine-Out Gradient (ft./nm)	425	167	NA	437	430	
Cruise	Certificated	45,000	49,000	45,000	45,000	45,000	
	All-Engine Service	45,000	44,000	45,000	45,000	45,000	
	Engine-Out Service	26,250	25,800	26,000	30,137	28,200	
Long Range	TAS/Fuel Flow (lb./hr.)	352/624	436/684	NA/NA	383/757	377/812	
	Altitude/Specific Range	FL 450/0.564	FL 450/0.637	NA/NA	FL 450/0.506	FL 450/0.464	
High Speed	TAS/Fuel Flow (lb./hr.)	415/1,197	475/1,188	NA/NA	444/1,312	442/1,470	
	Altitude/Specific Range	FL 350/0.347	FL 360/0.400	FL 300/NA	FL 350/0.338	FL 370/0.301	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	Nautical Miles	1,172	1,635	NA	1,351	1,425	
	Max Payload (with available fuel)	Average Speed	368	402	NA	397	407
	Trip Fuel	2,552	2,908	NA	3,362	3,753	
	Specific Range/Altitude	0.459/FL 450	0.562/FL 470	NA/NA	0.402/FL 450	0.380/FL 450	
	Nautical Miles	1,814	2,598	NA	1,883	1,913	
	Max Fuel (with available payload)	Average Speed	377	410	NA	406	413
	Trip Fuel	3,846	4,241	NA	4,469	4,904	
	Specific Range/Altitude	0.472/FL 450	0.613/FL 490	NA/NA	0.421/FL 450	0.390/FL 450	
	Nautical Miles	1,825	2,205	NA	1,936	1,927	
	Four Passengers (with available fuel)	Average Speed	276	408	NA	411	416
	Trip Fuel	3,767	3,713	NA	4,510	4,920	
	Specific Range/Altitude	0.484/FL 450	0.594/FL 490	NA/NA	0.429/FL 450	0.392/FL 450	
Ferry	Nautical Miles	1,900	2,667	NA	1,985	1,955	
	Average Speed	383	411	NA	417	420	
	Trip Fuel	3,872	4,246	NA	4,473	4,955	
	Specific Range/Altitude	0.491/FL 450	0.628/FL 490	NA/NA	0.444/FL 450	0.395/FL 450	
Missions (4 passengers)	300 nm	Runway	2,608	2,822	NA	2,613	2,429
		Flight Time	0+49	0+45	NA	0+47	0+46
		Fuel Used	969	846	NA	1,058	1,087
	Specific Range/Altitude	0.310/FL 370	0.355/FL 410	NA/NA	0.284/FL 390	0.276/FL 390	
	600 nm	Runway	2,609	3,025	NA	2,747	2,444
		Flight Time	1+35	1+26	NA	1+29	1+27
Fuel Used		1,571	1,313	NA	1,735	1,865	
Specific Range/Altitude	0.382/FL 410	0.457/FL 450	NA/NA	0.346/FL 410	0.322/FL 410		
1,000 nm	Runway	2,720	3,336	NA	2,808	2,490	
	Flight Time	2+36	2+21	NA	2+26	2+23	
	Fuel Used	2,315	1,980	NA	2,471	2,823	
Specific Range/Altitude	0.432/FL 430	0.505/FL 450	NA/NA	0.405/FL 450	0.354/FL 430		
Remarks	Certification Basis	FAR 23, 2004/14 Commuter category Garmin G3000.	FAR 23 Commuter category	EASA CS 23, FAR 23 Commuter category pending Pricing in 2017 dollars; FJ44-4 with quiet power mode APU function.	FAR 23, 2009 Commuter category Performance-based upon optional increased weights.	FAR 23, 2010 Commuter category	

## Jets ≥20,000-LB. MTOW

Manufacturer		Textron Aviation	Bombardier	Textron Aviation	Bombardier	Textron Aviation	
Model		Cessna Citation X Elite CE-750	Learjet 70 Model 45	Cessna Citation XLS+ CE-560XL	Learjet 75 Model 45	Cessna Citation Latitude CE-680A	
<b>BCA Equipped Price</b>		\$6,500,000	\$11,300,000	\$12,750,000	\$13,800,000	\$16,350,000	
Characteristics	Seating	2+8/11/—	2+6/7/7	2+9/12/—	2+8/9/9	2+9/9/10	
	Wing Loading/Power Loading	68.5/2.67	69.6/2.79	54.6/2.45	69.6/2.79	56.8/2.61	
External Dimensions (ft.)	Length	72.3	56.0	52.5	58.0	62.3	
	Height	19.3	14.0	17.2	14.0	20.9	
	Span	63.9	50.9	56.3	50.9	72.3	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross Height/Dropped Aisle Depth	17.0/23.9/23.9 5.7/0.7	10.6/17.7/17.7 4.9/flat floor	14.3/18.5/18.5 5.7/0.7	13.4/19.8/19.8 4.9/flat floor	15.9/21.8/21.8 6.0/flat floor	
	Width: Max/Floor	5.5/3.9	5.1/3.2	5.5/3.9	5.1/3.2	6.4/4.1	
Baggage	Internal: Cu. ft./lb.	variable/variable	15/150	10/100	15/150	26/NA	
	External: Cu. ft./lb.	82/775	50/500	80/700	50/500	100/1,000	
Power	Engines	2 RR AE3007C1	2 Hon TFE731-40BR	2 P&WC PW545C	2 Hon TFE731-40BR	2 P&WC PW306D	
	Output (lb. each)/Flat Rating Inspection Interval/Manu. Service Plan Interval	6,764/ISA+15C 4,500t*/—	3,850/ISA+23C 6,000t*/—	4,119/ISA+10C 5,000t*/—	3,850/ISA+23C 6,000t*/—	5,907/ISA+16C 6,000t*/—	
Weights (lb.)	Max Ramp	36,400	21,750	20,400	21,750	31,050	
	Max Takeoff	36,100	21,500	20,200	21,500	30,800	
	Max Landing	31,800	19,200	18,700	19,200	27,575	
	Zero Fuel	24,400c	16,000c	15,100c	16,000c	21,200c	
	BOW	22,100	13,900	12,860	14,050	18,656	
	Max Payload	2,300	2,100	2,240	1,950	2,544	
	Useful Load	14,300	7,850	7,540	7,700	12,394	
Limits	Max Fuel	12,931	6,062	6,740	6,062	11,394	
	Available Payload w/Max Fuel	1,369	1,788	800	1,638	1,000	
	Available Fuel w/Max Payload	12,000	5,750	5,300	5,750	9,850	
	Mmo	0.920	0.810	0.750	0.810	0.800	
Airport Performance	Trans. Alt. FL/Wno	FL 307/350	FL 270/330	FL 265/305	FL 270/330	FL 298/305	
	PSI/Sea-Level Cabin	9.3/25,230	9.4/25,700	9.3/25,230	9.4/25,700	9.7/25,400	
	TOFL (SL elev./ISA temp.)	5,140	4,440	3,560	4,440	3,580	
	TOFL (5,000-ft. elev.@25C)	7,350	5,191	5,430	5,272	5,070	
Climb	Mission Weight	34,980p	20,632	20,200	20,782	30,675	
	NBAA IFR Range	2,980	2,045	1,740	2,026	2,700	
	V <sub>2</sub>	137	125	118	125	115	
	V <sub>ASX</sub>	112	112	106	113	95	
Ceilings (ft.)	Landing Distance	2,730	2,326	2,740	2,338	2,085	
	Time to Climb/Altitude	18/FL 370	15/FL 370	15/FL 370	15/FL 370	15/FL 370	
	FAR 25 Engine-Out Rate (fpm)	486	430	765	430	652	
Cruise	FAR 25 Engine-Out Gradient (ft./nm)	213	207	389	207	340	
	Certificated	51,000	51,000	45,000	51,000	45,000	
	All-Engine Service Engine-Out Service	43,000 26,000	45,200 28,400	45,000 28,600	44,700 27,900	43,000 26,260	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	<b>Long Range</b>	TAS/Fuel Flow (lb./hr.) Altitude/Specific Range	470/1,529 FL 470/0.307	437/970 FL 470/0.451	353/865 FL 450/0.408	437/977 FL 470/0.447	368/1,114 FL 430/0.330
	<b>High Speed</b>	TAS/Fuel Flow (lb./hr.) Altitude/Specific Range	513/2,229 FL 410/0.230	452/1,080 FL 470/0.419	431/1,238 FL 410/0.348	451/1,079 470/0.418	432/1,765 FL 390/0.245
Missions (4 passengers)	<b>Max Payload</b> (with available fuel)	Nautical Miles	2,703	1,728	1,150	1,728	2,135
		Average Speed	462	425	385	425	394
		Trip Fuel	9,973	4,575	3,663	4,575	7,901
	<b>Max Fuel</b> (with available payload)	Specific Range/Altitude	0.271/FL 470	0.378/FL 470	0.314/FL 450	0.378/FL 470	0.270/FL 450
		Nautical Miles	3,070	1,881	1,719	1,881	2,645
		Average Speed	462	426	395	426	401
	<b>Four Passengers</b> (with available fuel)	Trip Fuel	11,055	4,901	5,233	4,901	9,586
		Specific Range/Altitude	0.278/FL 490	0.384/FL 470	0.328/FL 450	0.384/FL 470	0.276/FL 450
		Nautical Miles	3,125	2,045	1,719	2,026	2,678
	<b>Ferry</b>	Average Speed	463	426	395	427	401
Trip Fuel		11,078	5,064	5,168	5,058	9,594	
Specific Range/Altitude		0.282/FL 490	0.404/FL 470	0.333/FL 450	0.401/FL 470	0.279/FL 450	
Remarks	<b>300 nm</b>	Nautical Miles	3,221	2,150	1,785	2,129	2,731
		Average Speed	463	427	403	427	405
		Trip Fuel	11,118	5,099	5,268	5,093	9,628
	<b>600 nm</b>	Specific Range/Altitude	0.290/FL 490	0.422/FL 490	0.339/FL 450	0.418/FL 490	0.284/FL 450
		Runway	3,536	3,588	2,734	3,598	2,760
		Flight Time	0+41	0+45	0+46	0+45	0+46
	<b>1,000 nm</b>	Fuel Used	1,837	1,072	1,246	1,075	1,610
		Specific Range/Altitude	0.163/FL 370	0.280/FL 470	0.241/FL 390	0.279/FL 470	0.186/FL 390
		Runway	3,580	3,632	2,758	3,642	2,845
Certification Basis	Flight Time	1+16	1+24	1+29	1+23	1+29	
	Fuel Used	2,855	1,805	2,094	1,810	2,573	
	Specific Range/Altitude	0.210/FL 430	0.332/FL 470	0.287/FL 410	0.331/FL 470	0.233/FL 430	
FAR 25, 1996/2002; JAR 25 1999/2002 *Engine flight hour inspection interval.	Runway	3,672	3,691	3,028	3,701	2,951	
	Flight Time	2+03	2+18	2+26	2+18	2+25	
	Fuel Used	4,469	2,787	3,211	2,792	3,989	
FAR 25, 2015 Garmin G5000.	Specific Range/Altitude	0.224/FL 430	0.359/FL 470	0.311/FL 430	0.358/FL 470	0.251/FL 430	
	FAR 25, 1996/2002; JAR 25 1999/2002 *Engine flight hour inspection interval.						
	FAR/EASA CS 25						
FAR 25, 2008							
FAR/EASA CS 25							
FAR 25, 2015 Garmin G5000.							



## Jets ≥20,000-LB. MTOW

Manufacturer		Embraer	Textron Aviation	Embraer	Textron Aviation	Textron Aviation	
Model		Legacy 450 EMB-545	Cessna Citation Sovereign+ CE-680	Legacy 500 EMB-550	Cessna Citation X+ CE-750	Cessna Citation Longitude CE-700	
BCA Equipped Price		\$16,570,000	\$17,895,000	\$19,995,000	\$23,995,000	\$23,995,000	
Characteristics	Seating	2+7/9/9	2+9/12/12	2+8/12/12	2+9/12/—	2+8/12/12	
	Wing Loading/Power Loading	74.0/2.73	56.7/2.60	79.4/2.73	69.4/2.60	NA/NA	
External Dimensions (ft.)	Noise (EPNdB): Lateral/Flyover/Approach	84.2/72.8/89.9	87.8/71.9/87.9	85.5/73.1/89.9	87.7/72.4/89.3	NA/NA/NA	
	Length	64.6	63.5	68.1	73.6	73.2	
	Height	21.1	20.3	21.2	19.2	19.4	
Internal Dimensions (ft.)	Span	66.4	72.3	66.4	69.2	68.9	
	Length: Main Seating/Net/Gross Height/Dropped Aisle Depth	17.4/20.6/24.0	17.4/25.3/25.3	21.3/24.1/27.5	18.3/25.2/25.2	16.5/25.2/28.1	
Baggage	6.0/flat floor		5.7/0.7	6.0/flat floor	5.7/0.7	6.0/flat floor	
	Width: Max/Floor	6.8/4.7	5.5/3.9	6.8/4.7	5.5/3.9	6.4/4.1	
Power	Internal: Cu. ft./lb.	40/330	35/415	45/330	22/NA	112/1,115	
	External: Cu. ft./lb.	110/882	100/1,000	110/882	82/775	NA/NA	
Engines	2 Hon HTF7500E		2 P&WC PW306D	2 Hon HTF7500E	2 RR AE3007C2	2 Hon HTF7700L	
	Output (lb. each)/Flat Rating	6,540/ISA+18C	5,907/ISA+16C	7,036/ISA+18C	7,034/ISA+15C	7,600/ISA+19C	
Weights (lb.)	Inspection Interval/Manu. Service Plan Interval	OC/—	6,000t/—	OC/—	4,500t*/—	OC/—	
	Max Ramp	35,891	31,025	38,537	36,900	NA	
	Max Takeoff	35,759	30,775	38,360	36,600	NA	
	Max Landing	32,518	27,575	34,524	32,000	NA	
	Zero Fuel	25,904c	21,000c	26,499	24,978c	NA	
	BOW	22,983	18,235	23,699	22,114	NA	
	Max Payload	2,921	2,765	2,800	2,864	2,725	
	Useful Load	12,908	12,790	14,838	14,786	NA	
	Max Fuel	12,108	11,390	13,058	12,931	NA	
	Available Payload w/Max Fuel	800	1,400	1,780	1,855	1,600	
Limits	Available Fuel w/Max Payload	9,987	10,025	12,038	11,922	NA	
	Mmo	0.830	0.800	0.830	0.935	0.840	
Airport Performance	Trans. Alt. FL/Wo	FL 395/320	FL 298/305	FL 295/320	FL 307/350	NA/NA	
	PSI/Sea-Level Cabin	9.7/26,520	9.3/25,230	9.7/26,520	9.3/25,230	9.7/25,400	
	TOFL (SL elev./ISA temp.)	3,907	3,530	4,084	5,250	4,900	
Climb	TOFL (5,000-ft. elev @25°C)	5,189	4,760	5,523	7,317	NA	
	Mission Weight	35,759	30,250	38,360	35,645	NA	
	NBAA IFR Range	2,919	3,093	3,131	3,396	3,520	
	V <sub>2</sub>	117	117	129	139	NA	
	V <sub>ASX</sub>	101	96	102	116	NA	
Ceilings (ft.)	Landing Distance	2,090	2,144	2,114	2,727	NA	
	Time to Climb/Altitude	14/FL 370	13/FL 370	14/FL 370	13/FL 370	13/FL 370	
	FAR 25 Engine-Out Rate (fpm)	634	735	856	614	NA	
Cruise	FAR 25 Engine-Out Gradient (ft./nm)	324	377	387	267	NA	
	Certificated	45,000	47,000	45,000	51,000	45,000	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	All-Engine Service	44,000	45,000	44,000	47,000	45,000	
	Engine-Out Service	24,476	29,740	28,189	25,900	27,500	
	Long Range	TAS/Fuel Flow (lb./hr.)	438/1,404	368/1,059	440/1,441	470/1,470	457/1,591
		Altitude/Specific Range	FL 450/0.312	FL 450/0.347	FL 450/0.305	FL 470/0.320	FL 450/0.287
High Speed	TAS/Fuel Flow (lb./hr.)	462/1,621	448/1,756	467/1,741	520/2,453	476/1,933	
	Altitude/Specific Range	FL 430/0.285	FL 390/0.255	FL 430/0.268	FL 410/0.212	FL 430/0.246	
Missions (4 passengers)	Max Payload (with available fuel)	Nautical Miles	2,170	2,484	2,603	2,838	3,074
		Average Speed	428	396	438	463	452
		Trip Fuel	8,084	8,170	9,908	9,952	11,600
		Specific Range/Altitude	0.268/FL 450	0.304/FL 470	0.263/450	0.285/FL 490	0.265/FL 450
	Max Fuel (with available payload)	Nautical Miles	2,904	2,996	2,998	3,241	3,422
		Average Speed	431	400	440	464	453
		Trip Fuel	10,285	9,658	11,151	11,108	12,763
		Specific Range/Altitude	0.282/FL 450	0.310/FL 470	0.269/FL 450	0.292/FL 490	0.268/FL 450
	Four Passengers (with available fuel)	Nautical Miles	2,904	3,069	3,125	3,372	3,500
		Average Speed	431	402	433	465	454
		Trip Fuel	10,285	9,679	11,222	11,157	12,787
		Specific Range/Altitude	0.282/FL 450	0.317/FL 470	0.278/FL 450	0.302/FL 490	0.274/FL 450
Ferry	Nautical Miles	2,973	3,138	3,153	3,463	3,568	
	Average Speed	430	405	440	465	454	
	Trip Fuel	10,313	9,708	11,250	11,195	12,810	
	Specific Range/Altitude	0.288/FL 450	0.323/FL 470	0.280/FL 450	0.309/FL 490	0.279/FL 450	
Remarks	300 nm	Runway	3,674	2,591	2,822	3,725	2,744
		Flight Time	0+45	0+45	0+45	0+41	0+44
		Fuel Used	1,543	1,506	1,545	1,827	1,516
		Specific Range/Altitude	0.194/FL 450	0.199/FL 390	0.194/FL 450	0.164/FL 370	0.198/FL 450
	600 nm	Runway	2,696	2,600	2,817	3,775	2,880
		Flight Time	1+26	1+26	1+26	1+16	1+23
		Fuel Used	2,478	2,404	2,478	2,937	2,457
		Specific Range/Altitude	0.242/FL 450	0.250/FL 430	0.242/FL 450	0.204/FL 430	0.244/FL 450
	1,000 nm	Runway	2,873	2,650	2,963	3,849	3,025
		Flight Time	2+21	2+21	2+21	2+02	2+16
		Fuel Used	3,710	3,750	3,750	4,680	3,746
		Specific Range/Altitude	0.270/FL 450	0.267/FL 430	0.267/FL 450	0.214/FL 430	0.267/FL 450
Certification Basis		RBAC/FAR/EASA CS 25, 2015	FAR 25, 2013 Garmin G5000.	RBAC/FAR/EASA CS 25, 2014	FAR 25, 2014 Garmin G5000. *Engine flight hour inspection interval.	FAR 25 pending Garmin G5000.	

## Jets ≥20,000-LB. MTOW

Manufacturer		Gulfstream Aerospace	Embraer	Bombardier	Dassault	Bombardier	
Model		Gulfstream 280 G280	Legacy 650E EMB-135BJ*	Challenger 350 BD-100-1A10	Falcon 2000S Falcon 2000EX	Challenger 650 CL-600-2B16	
BCA Equipped Price		\$24,500,000	\$25,900,000	\$26,673,000	\$29,550,000	\$32,350,000	
Characteristics	Seating	2+9/10/19	2+13/14/19	2+10/11/19	2+10/10/19	2+12/13/19	
	Wing Loading/Power Loading	80.0/2.60	97.2/2.97	77.6/2.77	77.7/2.93	98.6/2.61	
External Dimensions (ft.)	Length	66.8	86.4	68.7	66.3	68.4	
	Height	21.3	21.8	20.0	23.2	20.7	
	Span	63.0	69.5	69.0	70.2	64.3	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross Height/Dropped Aisle Depth	17.7/25.8/32.3	30.3/42.4/49.1	16.6/25.2/28.6	17.1/26.2/31.0	15.4/25.6/28.3	
	Width: Max/Floor	6.9/5.4	6.9/5.2	7.2/5.1	6.2/flat floor	6.0/flat floor	
Baggage	Internal: Cu. ft./lb.	154/1,980	286/1,441	106/750	131/1,600	112/900	
	External: Cu. ft./lb.	—/—	—/—	—/—	8/92	—/—	
Power	Engines	2 Hon HTF7250G	2 RR AE 3007A2	2 Hon HTF 7350	2 P&WC PW308C	2 GE CF34-3B	
	Output (lb. each)/Flat Rating Inspection Interval/Manu. Service Plan Interval	7,624/ISA+17C	9,020/ISA+15C	7,323/ISA+15C	7,000/ISA+15C	9,220*/ISA+15C	
Weights (lb.)	Max Ramp	39,750	53,727	40,750	41,200	48,300	
	Max Takeoff	39,600	53,572	40,600	41,000	48,200	
	Max Landing	32,700	44,092	34,150	39,300	38,000	
	Zero Fuel	28,200c	36,156c	28,200c	29,700c	32,000c	
	BOW	24,200	31,217	24,800	24,750	27,250	
	Max Payload	4,000	4,939	3,400	4,950	4,750	
	Useful Load	15,550	22,510	15,950	16,450	21,050	
	Max Fuel	14,600	20,600	14,045	14,600	19,852	
Limits	Available Payload w/Max Fuel	950	1,910	1,905	1,850	1,198	
	Available Fuel w/Max Payload	11,550	17,571	12,550	11,500	16,300	
Airport Performance	Muo	0.850	0.800	0.830	0.862	0.850	
	Trans. Alt. FL/Wto	FL 280/340	FL 276/320	FL 290/320	FL 250/370	FL 222/348	
	PSI/Sea-Level Cabin	9.2/25,000	8.4/21,650	8.8/23,338	9.3/25,300	8.8/23,000	
	TOFL (SL elev./ISA temp.)	4,750	5,741	4,829	4,325	5,640	
	TOFL (5,000-ft. elev.@25C)	7,320	7,979	6,451	6,055	9,233	
Climb	Mission Weight	39,600	53,572	39,495	39,950	47,802	
	NBAA IFR Range	3,600	3,953	3,250	3,600	4,011	
	V2	137	144	133	123	147	
	Vxsr	115	115	111	106	117	
	Landing Distance	2,373	2,346	2,302	2,295	2,365	
Ceilings (ft.)	Time to Climb/Altitude	14/FL 370	21/FL 370	14/FL 370	16/FL 370	21/FL 370	
	FAR 25 Engine-Out Rate (fpm)	845	633	552	528	581	
	FAR 25 Engine-Out Gradient (ft./nm)	371	259	249	257	237	
Cruise	Certificated	45,000	41,000	45,000	47,000	41,000	
	All-Engine Service Engine-Out Service	45,000	41,000	44,000	43,265	38,250	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	Long Range	TAS/Fuel Flow (lb./hr.)	459/1,488	425/1,901	459/1,590	437/1,400	
	High Speed	Altitude/Specific Range	FL 450/0.308	FL 410/0.224	FL 450/0.289	FL 470/0.312	FL 410/0.231
		TAS/Fuel Flow (lb./hr.)	482/1,925	459/2,570	470/1,832	482/2,075	470/2,448
	Max Payload (with available fuel)	Altitude/Specific Range	FL 430/0.250	FL 370/0.179	FL 430/0.257	FL 410/0.232	FL 370/0.192
Nautical Miles		2,577	3,076	2,719	2,450	3,011	
Ferry	Average Speed	448	417	447	426	417	
	Trip Fuel	9,591	15,238	10,689	9,640	14,256	
	Specific Range/Altitude	0.269/FL 450	0.202/FL 410	0.254/FL 450	0.254/FL 450	0.211/FL 410	
	Nautical Miles	3,636	3,839	3,235	3,445	3,974	
300 nm	Average Speed	452	417	449	429	419	
	Trip Fuel	12,757	18,380	12,206	12,740	17,939	
	Specific Range/Altitude	0.285/FL 450	0.209/FL 410	0.265/FL 450	0.270/FL 470	0.222/FL 410	
	Nautical Miles	3,646	3,919	3,250	3,540	4,011	
600 nm	Average Speed	451	415	448	430	419	
	Trip Fuel	12,761	18,422	12,212	12,740	17,953	
	Specific Range/Altitude	0.286/FL 450	0.213/FL 410	0.266/FL 450	0.278/FL 470	0.223/FL 410	
	Nautical Miles	3,724	3,980	3,307	3,615	4,085	
1,000 nm	Average Speed	452	414	450	430	419	
	Trip Fuel	12,789	18,450	12,236	12,740	17,982	
	Specific Range/Altitude	0.291/FL 450	0.216/FL 410	0.270/FL 450	0.284/FL 470	0.227/FL 410	
	Nautical Miles	3,977	4,242	3,583	3,895	4,366	
Missions (4 passengers)	Runway	2,957	3,346	3,611	2,795	3,389	
	Flight Time	0+47	0+49	0+47	0+47	0+47	
	Fuel Used	1,505	1,773	1,583	1,525	1,595	
	Specific Range/Altitude	0.199/FL 450	0.169/FL 410	0.190/FL 450	0.197/FL 470	0.188/FL 410	
	Runway	2,997	3,518	3,656	2,855	3,421	
	Flight Time	1+26	1+34	1+26	1+27	1+27	
	Fuel Used	2,412	3,146	2,577	2,465	2,835	
	Specific Range/Altitude	0.249/FL 450	0.191/FL 410	0.233/FL 450	0.243/FL 470	0.212/FL 410	
Remarks	Runway	3,136	3,573	3,718	2,920	3,483	
	Flight Time	2+18	2+33	2+18	2+20	2+19	
	Fuel Used	3,645	4,815	3,925	3,755	4,532	
	Specific Range/Altitude	0.274/FL 450	0.208/FL 410	0.255/FL 450	0.266/FL 470	0.221/FL 410	
Certification Basis		FAR 25, 2012; EASA CS 25, 2013	FAR 25, 2011 *Factory modification DCA 145-000-00020/2008	FAR 25 A 98; JAR 25 Chg 15 Rockwell Collins Pro Line 21 Advanced.	FAR/EASA CS 25, 2013 EASY II flight deck; 2017 delivery price.	FAR 25, 1980/83/87/95/2006/15 Rockwell Collins Pro Line 21 Advanced. *9,220-lb. max takeoff; 8,729-lb. normal takeoff	

## Jets ≥20,000-LB. MTOW

Manufacturer		Dassault	Gulfstream Aerospace	Dassault	Gulfstream Aerospace	
Model		Falcon 2000LXS Falcon 2000EX	Gulfstream 450 GIV-X	Falcon 900LX Falcon 900EX	Gulfstream 500 GVII-G500	
BCA Equipped Price		\$34,700,000	\$43,150,000	\$44,300,000	\$44,650,000	
Characteristics	Seating	2+8/10/19	2+14/16/19	2+12/12/19	2+13/19/19	
	Wing Loading/Power Loading	81.2/3.06	78.4/2.69	92.9/3.27	80.9/2.54	
	Noise (EPNdB): Lateral/Flyover/Approach	76.4/91.7/90.5	76.2/89.5/92.3	78.2/90.3/92.1	NA/NA/NA	
External Dimensions (ft.)	Length	66.3	89.3	66.3	91.2	
	Height	23.2	25.2	24.8	25.5	
	Span	70.2	77.8	70.2	86.3	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross	17.1/26.2/31.0	25.8/37.0/45.1	23.5/33.2/39.3	26.3/41.5/47.6	
	Height/Dropped Aisle Depth	6.2/flat floor	6.0/flat floor	6.2/flat floor	6.2/flat floor	
	Width: Max/Floor	7.7/6.3	7.0/5.4	7.7/6.3	7.6/6.1	
Baggage	Internal: Cu. ft./lb.	131/1,600	169/2,000	127/2,866	230/2,250	
	External: Cu. ft./lb.	8/92	—/—	—/—	—/—	
Power	Engines	2 P&WC PW308C	2 RR Tay Mk 611-8C	3 Hon TFE731-60	2 P&WC PW814GA	
	Output (lb. each)/Flat Rating	7,000/ISA+15C	13,850/ISA+15C	5,000/ISA+17C	15,144/ISA+15C	
	Inspection Interval/Manu. Service Plan Interval	7,000c/—	12,000t or 0C/—	6,000c/—	0C/—	
Weights (lb.)	Max Ramp	43,000	75,000	49,200	77,250	
	Max Takeoff	42,800	74,600	49,000	76,850	
	Max Landing	39,300	66,000	44,500	64,350	
	Zero Fuel	29,700c	49,000c	30,864c	52,100c	
	BOW	24,750	43,200	26,750	46,600	
	Max Payload	4,950	5,800	4,114	5,500	
	Useful Load	18,250	31,800	22,450	30,650	
	Max Fuel	16,660	29,281	20,905	28,850	
	Available Payload w/Max Fuel	1,590	2,519	1,545	1,800	
	Available Fuel w/Max Payload	13,300	26,000	18,336	25,150	
Limits	Muo	0.862	0.880	0.870	0.925	
	Trans. Alt. FL/Wno	FL 250/370	FL 280/340	FL 250/370	NA/NA	
	PSI/Sea-Level Cabin	9.3/25,300	9.6/26,700	9.6/25,300	10.7/31,900	
Airport Performance	TOFL (SL elev./ISA temp.)	4,675	5,600	5,360	5,200	
	TOFL (5,000-ft. elev.@25C)	6,840	8,200	7,615	7,930	
	Mission Weight	42,010	74,600	48,255	76,850	
	NBAA IFR Range	4,100	4,328	4,685	5,000	
	V2	126	150	134	NA	
	Vasr	106	123	111	NA	
	Landing Distance	2,295	2,663	2,455	NA	
Climb	Time to Climb/Altitude	17/FL 370	16/FL 370	19/FL 370	15/FL 370	
	FAR 25 Engine-Out Rate (fpm)	463	712	723	NA	
	FAR 25 Engine-Out Gradient (ft./nm)	221	285	324	NA	
Ceilings (ft.)	Certificated	47,000	45,000	51,000	51,000	
	All-Engine Service	42,315	42,400	39,630	NA	
	Engine-Out Service	21,010	25,000	24,980	NA	
Cruise	Long Range	TAS/Fuel Flow (lb./hr.) 437/1,485 Altitude/Specific Range FL 450/0.294	459/2,585 FL 450/0.178	431/1,665 FL 430/0.259	488/2,440 FL 450/0.200	
	High Speed	TAS/Fuel Flow (lb./hr.) 483/2,325 Altitude/Specific Range FL 390/0.208	476/3,055 FL 410/0.156	474/2,225 FL 390/0.213	516/3,467 FL 410/0.149	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	Max Payload (with available fuel)	Nautical Miles	2,915	3,549	3,790	4,129
		Average Speed	427	452	422	478
		Trip Fuel	11,438	22,622	16,340	22,365
	Max Fuel (with available payload)	Specific Range/Altitude	0.255/FL 450	0.157/FL 450	0.232/FL 430	0.185/FL 470
		Nautical Miles	3,990	4,216	4,565	5,000
		Average Speed	430	453	421	480
	Four Passengers (with available fuel)	Trip Fuel	14,798	26,023	18,909	26,172
		Specific Range/Altitude	0.270/FL 470	0.162/FL 450	0.241/FL 430	0.191/FL 490
		Nautical Miles	4,065	4,328	4,650	5,075
	Ferry	Average Speed	430	452	420	480
Trip Fuel		14,798	26,087	18,909	26,200	
Specific Range/Altitude		0.275/FL 470	0.166/FL 450	0.246/FL 430	0.194/FL 490	
Missions (4 passengers)	300 nm	Nautical Miles	4,155	4,382	4,740	5,137
		Average Speed	431	453	419	480
		Trip Fuel	14,798	26,116	18,909	26,222
	600 nm	Specific Range/Altitude	0.281/FL 470	0.168/FL 450	0.251/FL 430	0.196/FL 490
		Runway	2,795	3,225	2,730	NA
		Flight Time	0+47	0+46	0+47	0+45
	1,000 nm	Fuel Used	1,525	2,599	1,595	2,274
		Specific Range/Altitude	0.197/FL 470	0.115/FL 450	0.188/FL 470	0.132/FL 490
		Runway	2,855	3,258	2,865	NA
	Remarks	Certification Basis	Flight Time	1+27	1+25	1+27
Fuel Used			2,465	4,113	2,625	3,561
Specific Range/Altitude			0.243/FL 470	0.146/FL 450	0.229/FL 470	0.168/FL 490
Remarks	Certification Basis	Runway	2,920	3,304	2,880	NA
		Flight Time	2+20	2+18	2+20	2+12
		Fuel Used	3,755	6,176	4,070	5,313
Remarks	Certification Basis	Specific Range/Altitude	0.266/FL 470	0.162/FL 450	0.246/FL 450	0.188/FL 490
		FAR/EASA CS 25, 2013 EASy II flight deck; 2017 delivery price.	FAR/EASA CS 25, 2004	FAR/EASA 25, 1979/2010 EASy II flight deck; 2017 delivery price.	FAR/EASA 25 pending	

## Jets ≥20,000-LB. MTOW

Manufacturer		Bombardier	Embraer	Dassault	Airbus	
Model		Global 5000 BD-700-1A11	Lineage 1000E ERJ 190-100 ECJ	Falcon 7X Falcon 7X	A320 Prestige A320-214	
BCA Equipped Price		\$50,441,000	\$53,800,000	\$53,800,000	\$95,000,000	
Characteristics	Seating	3+13/15/19	3+13/19/19	3+12/14/19	4+18/179/—	
	Wing Loading/Power Loading	90.6/3.14	120.7/3.25	92.0/3.64	130.3/3.18	
	Noise (EPNdB): Lateral/Flyover/Approach	88.7/83.5/89.7	92.7/86.4/92.5	82.3/90.1/92.6	85.5/93.4/95.5	
External Dimensions (ft.)	Length	96.8	118.9	76.7	123.3	
	Height	25.5	34.7	25.7	38.6	
	Span	94.0	94.2	86.0	111.8	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross Height/Dropped Aisle Depth	27.2/40.7/45.7	67.2/76.6/84.3	26.2/39.1/46.5	90.3/90.3/—	
	Width: Max/Floor	7.9/6.5	8.8/8.0	7.7/6.3	7.4/flat floor	
Baggage	Internal: Cu. ft./lb.	195/1,000	323/2,293	140/2,004	NA/NA	
	External: Cu. ft./lb.	—/—	120/705	—/—	985/NA	
Power	Engines	2 RR BR700-710A2-20	2 GE CF34-10E7-B	3 P&WC PW307A	2 CFMI CFM56-5B4/3*	
	Output (lb. each)/Flat Rating Inspection Interval/Manu. Service Plan Interval	14,750/ISA+20C 0C/—	18,500/ISA+15C 0C/—	6,402/ISA+17C 7,200c/—	27,000/ISA+29C 0C/—	
Weights (lb.)	Max Ramp	92,750	120,593	70,200	172,850	
	Max Takeoff	92,500	120,152	70,000	171,950	
	Max Landing	78,600	100,972	62,400	145,500	
	Zero Fuel	58,000c	80,469c	41,000c	137,800c	
	BOW	50,861	70,548	36,600	109,000	
	Max Payload	7,139	9,921	4,400	28,800	
	Useful Load	41,889	50,045	33,600	63,850	
	Max Fuel	38,959	48,217	31,940	53,450	
Limits	Available Payload w/Max Fuel	2,930	1,828	1,660	10,400	
	Available Fuel w/Max Payload	34,750	40,124	29,200	35,050	
Airport Performance	Muo	0.890	0.820	0.900	0.820	
	Trans. Alt. FL/Wno	FL 303/340	FL 289/320	FL 270/370	FL 250/350	
	PSI/Sea-Level Cabin	10.3/30,125	8.8/23,190	10.2/29,200	8.3/NA	
Climb	TOFL (SL elev./ISA temp.)	5,540	6,076	5,710	6,920	
	TOFL (5,000-ft. elev.@25C)	7,223	9,500	8,045	9,355	
	Mission Weight	90,370	112,038	69,140	171,950	
	NBAA IFR Range	5,475	3,965	5,795	4,300	
	V2	133	140	133	NA	
	Vxsr	107	110	106	NA	
Ceilings (ft.)	Landing Distance	2,189	2,038	2,120	2,400	
	Time to Climb/Altitude	18/FL 370	29/FL 350	19/FL 370	23/FL 360	
	FAR 25 Engine-Out Rate (fpm)	704	NA	597	NA	
Cruise	FAR 25 Engine-Out Gradient (ft./nm)	318	NA	269	NA	
	Certificated	51,000	41,000	51,000	39,000	
	All-Engine Service Engine-Out Service	44,600 20,600	35,000 19,178	40,215 25,480	NA NA	
NBAA IFR Ranges (FAR Part 23, 100-nm alternate; FAR Part 25, 200-nm alternate)	Long Range	TAS/Fuel Flow (lb./hr.) Altitude/Specific Range	470/2,856 FL 450/0.165	454/4,184 FL 380/0.109	459/2,260 FL 430/0.203	451/4,730 FL 370/0.095
	High Speed	TAS/Fuel Flow (lb./hr.) Altitude/Specific Range	499/3,582 FL 410/0.139	471/5,033 FL 350/0.094	497/3,205 FL 390/0.155	473/5,860 350/0.081
Missions (4 passengers)	Max Payload (with available fuel)	Nautical Miles	4,920	3,493	5,000	2,100
		Average Speed	463	442	453	428
		Trip Fuel	33,374	35,569	26,820	27,936
	Max Fuel (with available payload)	Specific Range/Altitude	0.147/FL 470	0.098/FL 400	0.186/FL 450	0.075/FL 350
		Nautical Miles	5,486	4,532	5,670	3,852
		Average Speed	464	446	454	438
	Four Passengers (with available fuel)	Trip Fuel	35,723	43,962	29,560	46,930
		Specific Range/Altitude	0.154/FL 470	0.103/FL 410	0.192/FL 470	0.082/FL 390
		Nautical Miles	5,475	4,602	5,760	4,330
	Ferry	Average Speed	463	446	454	438
		Trip Fuel	35,719	44,240	29,560	48,057
		Specific Range/Altitude	0.153/FL 470	0.104/FL 410	0.195/FL 470	0.090/FL 390
Remarks	300 nm	Nautical Miles	5,526	4,640	5,840	4,380
		Average Speed	464	446	454	438
		Trip Fuel	35,743	44,264	29,560	48,108
	600 nm	Specific Range/Altitude	0.155/FL 470	0.105/FL 410	0.198/FL 470	0.091/FL 390
		Runway	2,487	3,002	2,500	3,670
		Flight Time	0+46	0+48	0+46	0+55
	1,000 nm	Fuel Used	2,773	3,426	2,075	4,265
		Specific Range/Altitude	0.108/FL 450	0.088/FL 390	0.145/FL 450	0.070/FL 350
		Runway	2,575	3,133	2,515	3,700
Certification Basis	Flight Time	1+23	1+26	1+25	1+34	
	Fuel Used	4,445	5,862	3,285	7,080	
	Specific Range/Altitude	0.135/FL 490	0.102/FL 410	0.183/FL 470	0.085/FL 390	
Remarks	Runway	2,697	3,251	2,640	3,760	
	Flight Time	2+13	2+20	2+17	2+28	
	Fuel Used	6,752	9,063	4,945	10,970	
Remarks	Specific Range/Altitude	0.148/FL 470	0.110/FL 410	0.202/FL 470	0.091/FL 390	
	FAR 25, 1998/2004; EASA 25, 2004 Global Vision flight deck		FAR/EASA 25, 2008	FAR/EASA 25, 2007 EASy II flight deck; DFCS; 2017 delivery price.	FAR 25, 1999 *Also available with 26,500-lbf IAEV2527M-A5 engines; includes 2 additional center tanks and VIP cabin. BCA estimated data.	

Ultra-Long-Range Jets

Manufacturer		Gulfstream Aerospace	Dassault	Gulfstream Aerospace	Bombardier	Gulfstream Aerospace		
Model		Gulfstream 600 GVII-600	Falcon 8X Falcon 7X	Gulfstream 550 GV-SP	Global 6000 BD-700-1A10	Gulfstream 650 GVI		
<b>BCA Equipped Price</b>		\$56,200,000	\$58,400,000	\$61,500,000	\$62,310,000	\$67,400,000		
Characteristics	Seating	4+16/19/19	3+12/14/19	4+16/18/19	4+13/15/19	4+16/19/19		
	Wing Loading/Power Loading	78.9/2.92	95.9/3.62	80.1/2.96	97.5/3.37	77.6/2.95		
	Noise (EPNdB): Lateral/Flyover/Approach	NA/NA/NA	81.5/88.9/90.6	79.3/90.2/90.8	88.7/83.5/89.7	77.5/89.8/88.3		
External Dimensions (ft.)	Length	96.1	80.2	96.4	99.4	99.8		
	Height	25.3	26.1	25.8	25.5	25.7		
	Span	94.1	86.3	93.5	94.0	99.6		
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross	30.2/45.2/51.3	29.8/42.7/50.1	30.3/42.6/50.1	27.3/43.3/48.3	32.7/46.8/53.6		
	Height/Dropped Aisle Depth	6.2/flat floor	6.2/flat floor	6.0/flat floor	6.2/flat floor	6.3/flat floor		
	Width: Max/Floor	7.6/6.1	7.7/6.3	7.0/5.4	7.9/6.5	8.2/6.7		
Baggage	Internal: Cu. ft./lb.	230/2,250	140/2,004	226/2,500	195/1,000	235/2,500		
	External: Cu. ft./lb.	—/—	—/—	—/—	—/—	—/—		
Power	Engines	2 P&WC PW815GA	3 P&WC PW307D	2 RR BR700-710C4-11	2 RR BR700-710A2-20	2 RR BR700-725A1-12		
	Output (lb. each)/Flat Rating	15,680/ISA+15C	6,722/ISA+17C	15,385/ISA+15C	14,750/ISA+20C	16,900/ISA+15C		
	Inspection Interval/Manu. Service Plan Interval	0C/—	7,200c/—	8,000t or 0C/—	0C/—	10,000t/—		
Weights (lb.)	Max Ramp	92,000	73,200	91,400	99,750	100,000		
	Max Takeoff	91,600	73,000	91,000	99,500	99,600		
	Max Landing	76,800	62,400	75,300	78,600	83,500		
	Zero Fuel	57,440c	41,000c	54,500c	58,000c	60,500c		
	BOW	51,440	36,800	48,700	52,560	54,500		
	Max Payload	6,000	4,200	5,800	5,440	6,000		
	Useful Load	40,560	36,400	42,700	47,190	45,500		
	Max Fuel	38,760	35,141	40,994	44,716	44,200		
Limits	Available Payload w/Max Fuel	1,800	1,259	1,706	2,474	1,300		
	Available Fuel w/Max Payload	34,560	32,200	36,900	41,750	39,500		
	MWO	0.925	0.900	0.885	0.890	0.925		
Airport Performance	Trans. Alt. FL/Wto	NA/NA	FL 270/370	FL 270/340	FL 303/340	FL 290/340		
	PSI/Sea-Level Cabin	10.7/31,900	10.4/30,300	10.2/29,200	10.3/30,125	10.7/31,900		
Climb	TOFL (SL elev./ISA temp.)	5,700	5,880	5,910	6,476	5,858		
	TOFL (5,000-ft. elev.@25C)	NA	8,555	9,070	7,880	9,000		
	Mission Weight	91,600	72,591	91,000	94,513p	99,600		
	NBAA IFR Range	6,200	6,415	6,738	5,594	6,912		
	V <sub>2</sub>	NA	138	147	142	146		
	V <sub>REF</sub>	NA	107	112	110	114		
	Landing Distance	NA	2,245	2,240	2,243	2,680		
Ceiling (ft.)	Time to Climb/Altitude	17/FL 370	20/FL 370	18/FL 370	21/FL 370	19/FL 370		
	FAR 25 Engine-Out Rate (fpm)	NA	774	594	474	NA		
	FAR 25 Engine-Out Gradient (ft./nm)	NA	339	242	200	NA		
Cruise	Certificated	51,000	51,000	51,000	51,000	51,000		
	All-Engine Service	42,700	40,075	42,700	42,400	42,700		
	Engine-Out Service	25,000	26,645	25,820	18,000	25,000		
	Long Range	TAS	488	459	459	470	488	
Fuel Flow		2,769	2,254	2,563	3,046	2,825		
Altitude		FL 450	FL 430	FL 450	FL 450	FL 450		
Specific Range		0.176	0.204	0.179	0.154	0.173		
High Speed	TAS	516	480	488	499	516		
	Fuel Flow	3,891	2,508	3,228	3,796	3,136		
	Altitude	FL 410	FL 430	FL 430	FL 410	FL 450		
	Specific Range	0.133	0.191	0.151	0.131	0.165		
NBAA IFR Ranges (200-nm alternate)	Max Payload (with available fuel)	Nautical Miles	5,286	5,555	5,767	5,882	5,934	
		Average Speed	481	452	452	464	481	
		Trip Fuel	31,622	29,507	33,993	40,415	36,285	
	Max Fuel (with available payload)	Specific Range/Altitude	0.167/FL 450	0.188/FL 470	0.170/FL 490	0.146/FL 470	0.164/FL 490	
		Nautical Miles	6,200	6,325	6,698	6,200	6,981	
		Average Speed	481	453	454	464	482	
	Eight Passengers (with available fuel)	Trip Fuel	35,918	32,558	38,202	41,472	41,129	
		Specific Range/Altitude	0.173/FL 490	0.194/FL 470	0.175/FL 490	0.149/FL 470	0.170/FL 510	
		Nautical Miles	6,217	6,235	6,708	6,124	6,912	
	Ferry	Average Speed	481	453	453	464	481	
		Trip Fuel	35,924	32,204	38,205	41,437	40,820	
		Specific Range/Altitude	0.173/FL 490	0.194/FL 470	0.176/FL 490	0.148/FL 470	0.169/FL 510	
Missions (8 passengers)	1,000 nm	Nautical Miles	6,353	6,475	6,853	6,233	7,105	
		Average Speed	481	454	454	464	482	
		Trip Fuel	35,966	32,653	38,251	41,487	41,168	
	3,000 nm	Specific Range/Altitude	0.177/FL 490	0.198/FL 470	0.179/FL 510	0.150/FL 470	0.173/FL 510	
		Runway	NA	2,685	3,436	2,852	3,241	
		Flight Time	2+12	2+17	2+20	2+13	2+10	
	6,000 nm	Fuel Used	5,728	4,994	5,599	6,842	5,942	
		Specific Range/Altitude	0.175/FL 490	0.200/FL 470	0.179/FL 490	0.146/FL 470	0.168/FL 510	
		Runway	NA	3,540	3,599	3,858	3,591	
	Remarks	Certification Basis	Flight Time	6+19	6+39	6+42	6+20	6+17
			Fuel Used	16,060	14,122	15,474	19,538	16,280
			Specific Range/Altitude	0.187/FL 490	0.212/FL 470	0.194/FL 490	0.154/FL 470	0.184/FL 510
Remarks	Certification Basis	Runway	NA	5,645	5,277	6,293	5,241	
		Flight Time	12+29	13+12	13+15	12+39	12+28	
		Fuel Used	34,432	30,729	33,428	41,053	34,622	
Remarks	Certification Basis	Specific Range/Altitude	0.174/FL 490	0.195/FL 470	0.179/FL 490	0.146/FL 490	0.173/FL 510	
		FAR, EASA CS 25 pending	FAR/EASA 25, 2016 EASy III flight deck; DFCS; 2017 delivery price.	FAR 25, 1997/2003; EASA 25 CS, 2004	FAR 25, 1998/2003; FAR 25 BEVS and new Global Vision flight deck standard.	FAR, EASA CS 25, 2012		



Ultra-Long-Range Jets

Manufacturer		Gulfstream Aerospace	Boeing	Airbus	Boeing	Boeing	
Model		Gulfstream 650ER GVI	BBJ 737-700IGW	ACJ319 A319-133	BBJ MAX8 737-8	BBJ MAX9 737-9	
BCA Equipped Price		\$69,400,000	\$79,000,000	\$87,000,000	\$95,300,000	\$103,300,000	
Characteristics	Seating	4+16/19/19	4+19/55/149	4+19/19/156	4+19/71/189	4+19/75/220	
	Wing Loading/Power Loading	80.7/3.07	127.5/3.13	127.8/3.12	135.1/3.24	145.2/3.48	
	Noise (EPNdB): Lateral/Flyover/Approach	78.7/89.6/88.3	85.4/94.9/95.8	85.4/94.6/94.2	NA/NA/NA	NA/NA/NA	
External Dimensions (ft.)	Length	99.8	110.3	111.0	129.7	138.3	
	Height	25.7	41.2	38.6	40.3	40.3	
	Span	99.6	117.4	111.8	117.8	117.8	
Internal Dimensions (ft.)	Length: Main Seating/Net/Gross	32.7/46.8/53.6	72.7/79.2/—	78.0/78.0/—	91.9/98.5/98.5	100.6/107.2/107.2	
	Height/Dropped Aisle Depth	6.3/flat floor	79.3/flat floor	7.4/flat floor	7.1/flat floor	7.1/flat floor	
	Width: Max/Floor	8.2/6.7	11.6/10.7	12.2/11.6	11.6/10.7	11.6/10.7	
Baggage	Internal: Cu. ft./lb.	235/2,500	NA/NA	160/NA	NA/NA	NA/NA	
	External: Cu. ft./lb.	—/—	159/NA	NA/NA	713/NA	874/NA	
Power	Engines	2 RR BR700-725A1-12	2 CFMI CFM56-7B27E	2 CFMI CFM56-5B7/3*	2 CFMI LEAP-1B	2 CFMI LEAP-1B	
	Output (lb. each)/Flat Rating	16,900/ISA+15C	27,300/ISA+15C	27,000/ISA+29C	28,000/ISA+15C	28,000/ISA+15C	
	Inspection Interval/Manu. Service Plan Interval	10,000t/—	OC/—	OC/—	OC/—	OC/—	
Weights (lb.)	Max Ramp	104,000	171,500	169,530	181,700	195,200	
	Max Takeoff	103,600	171,000	168,650	181,200	194,700	
	Max Landing	83,500	134,000	137,790	152,800	163,900	
	Zero Fuel	60,500c	126,000c	128,970c	145,400c	156,500c	
	BOW	54,500	98,040	96,450**	110,000	118,080	
	Max Payload	6,000	27,960	32,520	35,400	38,420	
	Useful Load	49,500	73,460	73,080	71,700	77,120	
	Max Fuel	48,200	71,737	72,560	69,814	73,325	
	Available Payload w/Max Fuel	1,300	1,723	520	1,886	3,795	
	Available Fuel w/Max Payload	43,500	45,500	40,560	36,300	38,700	
Limits	MWO	0.925	0.820	0.820	0.820	0.820	
	Trans. Alt. FL/Wo	FL 290/340	FL 260/340	FL 250/350	FL 260/340	FL 260/340	
	PSI/Sea-Level Cabin	10.7/31,900	9.0/24,000	8.3/22,000	9.0/24,000	9.0/24,000	
Airport Performance	TOFL (SL elev./ISA temp.)	6,299	6,085	6,170	6,630	8,200	
	TOFL (5,000-ft. elev.@25C)	11,139	10,330	8,360	NA	NA	
	Mission Weight	103,600	171,000	168,650	NA	NA	
	NBAA IFR Range	7,437	6,297	6,000	NA	NA	
	V <sub>2</sub>	148	141	137	NA	NA	
	V <sub>REF</sub>	114	117	111	122	124	
	Landing Distance	2,680	2,360	2,220	2,440	2,570	
Climb	Time to Climb/Altitude	21/FL 370	25/FL 370	22/360	24/FL 350	26/FL 330	
	FAR 25 Engine-Out Rate (fpm)	NA	NA	NA	NA	NA	
	FAR 25 Engine-Out Gradient (ft./nm)	NA	NA	NA	NA	NA	
Ceiling (ft.)	Certificated	51,000	41,000	41,000	41,000	41,000	
	All-Engine Service	41,000	NA	36,000	NA	NA	
	Engine-Out Service	25,000	NA	18,000	NA	NA	
Cruise	Long Range	TAS	488	452	447	455	457
		Fuel Flow	2,883	4,679	4,695	NA	NA
		Altitude	FL 450	FL 390	FL 370	FL 380	FL 360
	High Speed	Specific Range	0.169	0.097	0.095	NA	NA
		TAS	516	470	470	471	471
		Fuel Flow	3,136	5,550	5,830	NA	NA
NBAA IFR Ranges (200-nm alternate)	Max Payload (with available fuel)	Altitude	FL 450	FL 370	FL 370	FL 360	FL 360
		Specific Range	0.165	0.085	0.081	NA	NA
		Nautical Miles	6,459	3,306	2,679	2,692	2,628
	Max Fuel (with available payload)	Average Speed	481	437	434	NA	NA
		Trip Fuel	40,285	39,508	33,677	NA	NA
		Specific Range/Altitude	0.160/FL 490	0.084/FL 390	0.080/FL 370	NA/FL 370	NA/FL 350
	Eight Passengers (with available fuel)	Nautical Miles	7,507	6,285	6,134	6,521	6,300
		Average Speed	482	443	442	NA	NA
		Trip Fuel	45,129	66,854	66,673	NA	NA
	Ferry	Specific Range/Altitude	0.166/FL 510	0.094/FL 410	0.092/FL 410	NA/FL 390	NA/FL 390
Nautical Miles		7,437	6,270	6,002	6,555	6,376	
Average Speed		482	443	442	NA	NA	
Missions (8 passengers)	1,000 nm	Trip Fuel	44,820	66,723	65,558	NA	NA
		Specific Range/Altitude	0.166/FL 510	0.094/FL 410	0.092/FL 410	NA/FL 390	NA/FL 410
		Nautical Miles	7,636	6,348	6,200	6,619	6,441
		Average Speed	482	442	442	NA	NA
	3,000 nm	Trip Fuel	45,168	66,886	67,207	NA	NA
		Specific Range/Altitude	0.169/FL 510	0.095/FL 410	0.092/FL 410	NA/FL 390	NA/FL 410
		Runway	3,241	3,485	4,075	NA	NA
		Flight Time	2+10	2+27	2+26	NA	NA
	6,000 nm	Fuel Used	5,942	10,478	10,370	NA	NA
		Specific Range/Altitude	0.168/FL 510	0.095/FL 410	0.096/FL 410	NA/NA	NA/NA
Runway		3,591	4,290	4,280	NA	NA	
Flight Time		6+17	6+54	6+54	NA	NA	
Remarks	Certification Basis	Fuel Used	16,280	29,534	30,070	NA	NA
		Specific Range/Altitude	0.184/FL 510	0.102/FL 410	0.100/FL 410	NA/NA	NA/NA
		Runway	5,241	5,855	6,160	NA	NA
		Flight Time	12+28	13+34	13+35	NA	NA
Fuel Used	34,622	63,311	65,528	NA	NA		
Specific Range/Altitude	0.173/FL 510	0.095/FL 410	0.092/FL 410	NA/NA	NA/NA		
		FAR 25, 2014	FAR 25 A 77, 1967/98 Split scimitar winglets. 2016 data.	FAR 25, 1999 *Also available with 26,500-lbf IAEV2527M-A5 engines; includes 6 additional center tanks plus VIP cabin. **Spec weight. BCA estimated data.	FAR 25 A TBD All data preliminary. 2016 data.	FAR 25 A TBD All data preliminary. 2016 data.	