

Annual Product Support Survey

2005 RATINGS

Products are listed in the order of their 2005 overall averages.

| | AUTH SERVICE CENTER | FACTORY SERVICE CENTER | FAIRNESS OF PARTS POLICY | PARTS AVAILABILITY | COST OF PARTS | AOG RESPONSE | WARRANTY FULFILLMENT | TECH. MANUALS EASE OF USE | TECH. REP. RESPONSE | 2005 OVERALL AVERAGE | 2004 OVERALL AVERAGE | PERCENTAGE CHANGE |
|---|---------------------|------------------------|--------------------------|--------------------|---------------|--------------|----------------------|---------------------------|---------------------|----------------------|----------------------|-------------------|
| NEWER BUSINESS JETS * | | | | | | | | | | | | |
| GULFSTREAM (all models) | 7.13 | 7.07 | 6.65 | 7.42 | 5.57 | 7.67 | 7.18 | 6.94 | 7.93 | 7.06 | 7.54 | -6.35% |
| RAYTHEON (Beechjet, Premier I) | 7.35 | 7.18 | 7.00 | 7.11 | 5.06 | 7.42 | 7.94 | 6.59 | 7.67 | 7.06 | 6.57 | 7.41% |
| CESSNA (Citation) | 6.97 | 7.03 | 6.71 | 7.48 | 5.55 | 7.44 | 7.43 | 6.92 | 7.29 | 6.97 | 7.13 | -2.21% |
| DASSAULT (Falcon) | 7.27 | 6.05 | 6.24 | 7.04 | 4.98 | 7.51 | 7.52 | 6.67 | 7.32 | 6.75 | 6.80 | -0.77% |
| RAYTHEON (Hawker) | 7.17 | 6.27 | 6.28 | 5.90 | 5.31 | 6.77 | 7.64 | 6.15 | 6.97 | 6.50 | 6.44 | 0.87% |
| EMBRAER (Legacy) | 5.10 | 4.67 | 6.20 | 7.10 | 6.60 | 6.10 | 7.40 | 8.20 | 6.20 | 6.42 | 7.00 | -8.35% |
| BOMBARDIER (Challenger) | 6.84 | 6.42 | 6.07 | 5.65 | 4.93 | 5.97 | 7.12 | 6.79 | 7.77 | 6.38 | 6.09 | 4.76% |
| BOMBARDIER (Learjet) | 7.00 | 6.86 | 5.80 | 6.22 | 4.83 | 6.43 | 6.78 | 6.20 | 6.95 | 6.32 | 6.42 | -1.60% |
| BOMBARDIER (Global Express) | 6.93 | 6.24 | 6.31 | 4.65 | 5.19 | 5.53 | 7.12 | 6.56 | 7.94 | 6.27 | 5.60 | 11.88% |
| OLDER BUSINESS JETS ** | | | | | | | | | | | | |
| GULFSTREAM (all models except Westwind) | 7.44 | 6.95 | 6.64 | 7.64 | 5.37 | 8.09 | 7.35 | 7.59 | 8.09 | 7.23 | 6.65 | 8.72% |
| CESSNA (Citation) | 6.70 | 6.54 | 5.98 | 7.15 | 5.21 | 8.45 | 6.83 | 6.73 | 6.65 | 6.68 | 6.40 | 4.39% |
| RAYTHEON (Hawker) | 7.65 | 6.67 | 5.75 | 6.00 | 4.59 | 6.06 | 7.23 | 6.50 | 7.36 | 6.38 | 6.42 | -0.70% |
| DASSAULT (Falcon) | 6.56 | 5.50 | 5.54 | 6.37 | 4.44 | 6.67 | 6.17 | 6.46 | 6.74 | 6.06 | 6.21 | -2.43% |
| BOMBARDIER (Challenger) | 6.40 | 5.44 | 5.65 | 5.90 | 4.30 | 5.74 | 6.26 | 6.73 | 7.07 | 5.93 | 5.53 | 7.26% |
| BOMBARDIER (Learjet) | 6.50 | 6.06 | 5.33 | 6.15 | 4.81 | 6.30 | 6.25 | 6.09 | 6.14 | 5.93 | 6.38 | -7.11% |
| GULFSTREAM (Westwind) | 7.10 | 4.71 | 5.82 | 6.27 | 5.13 | 6.08 | 4.50 | 5.69 | 5.91 | 5.81 | 5.93 | -2.06% |
| NEWER TURBOPROPS * | | | | | | | | | | | | |
| PILATUS (PC-12) | 8.50 | 8.70 | 7.57 | 8.17 | 6.48 | 8.43 | 8.50 | 8.22 | 8.48 | 8.11 | 7.22 | 12.34% |
| RAYTHEON (King Air) | 7.04 | 6.86 | 6.04 | 6.62 | 5.00 | 6.63 | 7.00 | 6.23 | 7.00 | 6.48 | 6.24 | 3.84% |
| OLDER TURBOPROPS ** | | | | | | | | | | | | |
| #1 MITSUBISHI (MU-2) → | 8.73 | 9.00 | 8.73 | 8.64 | 8.55 | 8.73 | 9.00 | 8.75 | 9.00 | 8.76 | 6.75 | 29.72% |
| RAYTHEON (King Air) | 6.86 | 6.74 | 5.88 | 6.85 | 4.98 | 6.56 | 6.18 | 6.92 | 6.98 | 6.42 | 6.22 | 3.25% |
| CESSNA (Conquest) | 7.40 | 3.00 | 4.75 | 5.60 | 5.36 | 5.43 | 6.00 | 5.86 | 4.60 | 5.56 | 5.22 | 6.60% |
| PIPER (Cheyenne) | 4.22 | 2.71 | 4.78 | 4.38 | 4.31 | 4.45 | 5.25 | 4.60 | 3.22 | 4.21 | 4.55 | -7.43% |
| TURBOFAN ENGINES | | | | | | | | | | | | |
| ROLLS-ROYCE (Spey) | 7.53 | 7.50 | 6.69 | 7.35 | 5.61 | 8.20 | 7.75 | 7.64 | 8.32 | 7.37 | 7.00 | 5.27% |
| ROLLS-ROYCE (Tay) | 7.05 | 7.19 | 6.60 | 7.27 | 5.64 | 7.26 | 7.08 | 6.05 | 7.50 | 7.25 | 7.00 | 3.54% |
| WILLIAMS (FJ44) | 6.86 | 7.17 | 7.00 | 7.37 | 6.44 | 7.24 | 7.50 | 7.56 | 7.42 | 7.18 | 6.96 | 3.27% |
| BOLLS-ROYCE (AE3007) | 7.76 | 7.80 | 6.50 | 6.90 | 5.33 | 8.18 | 7.60 | 6.37 | 7.29 | 7.03 | 7.18 | -2.07% |
| P&WC (PW Series) | 7.00 | 7.26 | 6.84 | 7.15 | 5.47 | 7.23 | 7.35 | 7.03 | 7.55 | 6.98 | 6.88 | 1.47% |
| RR-DEUTSCHLAND (BR710) | 7.16 | 7.23 | 6.72 | 6.89 | 5.85 | 7.03 | 7.16 | 6.41 | 7.39 | 6.87 | 6.84 | 0.55% |
| CFE (CFE738) | 7.50 | 7.57 | 6.75 | 6.29 | 4.13 | 7.00 | 7.67 | 7.00 | 7.50 | 6.83 | 7.13 | -4.25% |
| HONEYWELL (TFE731) | 7.27 | 7.08 | 6.64 | 6.90 | 5.67 | 6.99 | 7.20 | 6.53 | 6.95 | 6.80 | 6.87 | -1.04% |
| GE (CF34) | 7.03 | 6.87 | 6.60 | 6.71 | 5.67 | 7.18 | 7.12 | 6.45 | 7.12 | 6.75 | 6.66 | 1.37% |
| P&WC (JT15D) | 7.04 | 7.00 | 6.00 | 7.00 | 5.00 | 6.00 | 7.00 | 6.00 | 7.00 | 6.00 | 6.00 | 0.00% |

Product Support

TURBOPROP ENGINES

| | | | | | | | | | | | | |
|-------------------|------|------|------|------|------|------|------|------|------|------|------|--------|
| HONEYWELL TPE331 | 7.67 | 6.43 | 7.26 | 6.95 | 5.68 | 6.63 | 7.86 | 7.86 | 7.25 | 7.00 | 6.47 | 8.24% |
| ROLLS-ROYCE (250) | 7.33 | 7.00 | 6.91 | 6.71 | 5.17 | 6.52 | 7.36 | 7.33 | 7.27 | 6.83 | 6.50 | 5.14% |
| P&WC PT6 | 7.19 | 7.10 | 6.25 | 7.16 | 5.52 | 6.88 | 6.97 | 6.75 | 7.18 | 6.75 | 6.85 | -1.49% |

AVIONICS

| | FAIRNESS OF PARTS POLICY | PARTS AVAILABILITY | COST OF PARTS | AOG RESPONSE | WARRANTY FULFILLMENT | TECH. MANUALS EASE OF USE | TECH. REP. RESPONSE | 2005 OVERALL AVERAGE | 2004 OVERALL AVERAGE | PERCENTAGE CHANGE |
|---|--------------------------------|-----------------------|---------------------|-----------------|-------------------------|---------------------------------|---------------------------|----------------------------|----------------------------|----------------------|
| GARMIN | 7.53 | 7.52 | 7.02 | 7.49 | 7.84 | 7.24 | 7.38 | 7.43 | 7.46 | -0.39% |
| SAFE FLIGHT | 7.42 | 7.25 | 7.08 | 7.58 | 7.33 | 7.50 | 7.27 | 7.35 | 6.38 | 15.22% |
| UNIVERSAL AVIONICS | 7.00 | 7.22 | 6.28 | 7.23 | 7.40 | 7.05 | 7.27 | 7.06 | 7.04 | 0.26% |
| AVIDYNE | 6.73 | 7.13 | 6.47 | 7.12 | 7.29 | 7.00 | 6.86 | 6.95 | 6.98 | -0.47% |
| ROCKWELL COLLINS | 6.60 | 6.87 | 5.60 | 7.08 | 7.69 | 6.49 | 6.95 | 6.76 | 6.92 | -2.42% |
| HONEYWELL | 6.61 | 6.82 | 5.64 | 7.06 | 7.26 | 6.62 | 6.98 | 6.71 | 6.80 | -1.26% |
| AIRCELL | 6.62 | 6.75 | 6.38 | 6.55 | 6.85 | 6.83 | 6.93 | 6.70 | 7.00 | -4.33% |
| L-3 AVIONICS SYSTEMS/GOODRICH (TCAS I, Skywatch, Stormscope) | 6.52 | 6.78 | 6.35 | 6.70 | 6.77 | 6.73 | 6.79 | 6.66 | 6.86 | -2.89% |
| B&D INSTRUMENTS | 6.80 | 6.60 | 6.00 | 6.44 | 6.50 | 6.25 | 6.56 | 6.45 | 5.97 | 8.09% |
| HONEYWELL (Bendix/King, Flitefone Radiotel) | 6.41 | 6.46 | 5.75 | 6.48 | 6.92 | 6.47 | 6.71 | 6.44 | 6.62 | -2.64% |
| HONEYWELL (Global Wulfberg) | 6.47 | 6.37 | 5.80 | 6.35 | 6.85 | 6.79 | 6.54 | 6.44 | 6.78 | -5.03% |
| TRIMBLE | 6.27 | 6.08 | 5.83 | 6.22 | 6.56 | 6.11 | 6.50 | 6.22 | 6.71 | -7.39% |
| MEGGITT/S-TEC | 6.50 | 5.92 | 5.55 | 5.88 | 6.26 | 6.59 | 6.14 | 6.09 | 5.50 | 10.73% |
| LITTON | 5.64 | 5.00 | 6.09 | 6.22 | 7.50 | 6.38 | 5.88 | 6.03 | 6.16 | -2.15% |
| AIRSHOW (Rockwell Collins) | 5.94 | 5.92 | 5.30 | 6.03 | 6.54 | 5.94 | 6.13 | 5.97 | 6.19 | -3.64% |
| MAGNASTAR (Supported by Teledyne Controls) | 5.74 | 5.96 | 5.04 | 5.85 | 6.07 | 6.20 | 5.89 | 5.80 | 5.98 | -2.96% |

To measure their level of satisfaction with after-sale support, AIN solicited evaluations from more than 16,000 AIN subscriber flight department managers, chief pilots, line captains, first officers, maintenance chiefs and mechanics through a questionnaire listing more than 30 major manufacturers of turbine business aircraft, engines and avionics. This year we reformatted the questionnaire so it would provide more detail and insight into how respondents rate the support they receive.

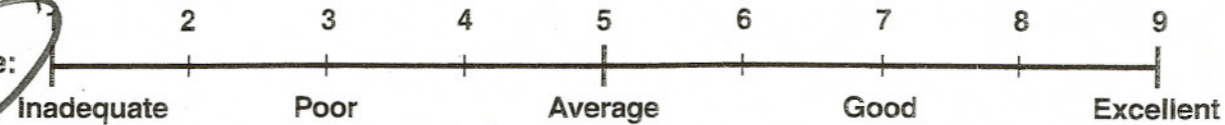
Respondents were asked to apply values from 1 to 9, with less than 2.5 defined as "inadequate" performance, 5.0 representing "average," and 8.5 to 9 designated "excellent." To ensure statistical validity, each product in a questionnaire section was required to garner at least 10 responses to qualify for inclusion in the survey results. The returns were processed by Eggers Consulting of Warrenton, Va.

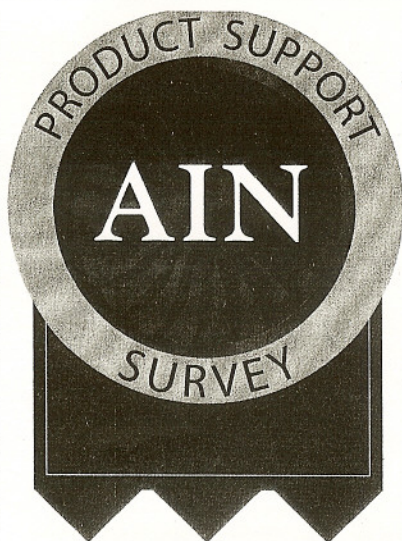
★ Less than 10 years old

★★ More than 10 years old

Bold Type indicates highest rating in each category.

Rating Scale:





2005 AIN Product Support Report

Among business jets, Cessna, Gulfstream and Raytheon share the top spots, while Mitsubishi shines brightest in the eyes of turboprop operators.

Buying an airplane is one thing; living with one is quite another.

Over the past several years, owners and manufacturers have begun to recognize aircraft product support as an increasingly vital function. Original equipment manufacturers with good service reputations work hard (and invest heavily) to defend their turf, while those who have made missteps are, in many cases, making significant investments of time, personnel, energy and money to "get it right."

For a number of years AIN took periodic snapshots of the market to gauge aircraft owners' and operators' opinions about support. Beginning in 2003, we decided to make our product support survey an annual feature because of the growing importance of the support function—to both operators and OEMs—and the difficulty in determining objective, unbiased and current opinions regarding the various OEMs' efforts.

The survey report that follows offers an incredibly detailed—and highly objective—look at the state of product support in 2005. For this year's survey, we went back to the drawing board with our questionnaire. We were particularly discriminating in verifying the type and age of aircraft ranked, as well as the current experience and qualifications of readers taking the time to respond.

Support in and of itself is a multifaceted subject, which is why we asked readers to evaluate the OEMs on nine different functions for each airplane, engine type or avionics unit: authorized service centers, factory service centers, fairness of parts policy, parts availability, cost of parts, AOG response, warranty fulfillment, technical manuals and tech rep response. Respondents rated each category on a scale of 1 to 9, with 1 being "inadequate" and 9 being "excellent."

We mailed paper survey questionnaires to several thousand current, qualified AIN readers in late April. Response closed with some 592 completed questionnaires received through mid-June. A total of 884 aircraft were rated, but to ensure statistical validity, only aircraft, engines or avionics rated by at least 10 respondents are included in the ensuing report. Data were tabulated by Eggers Consulting of Warrenton, Va.

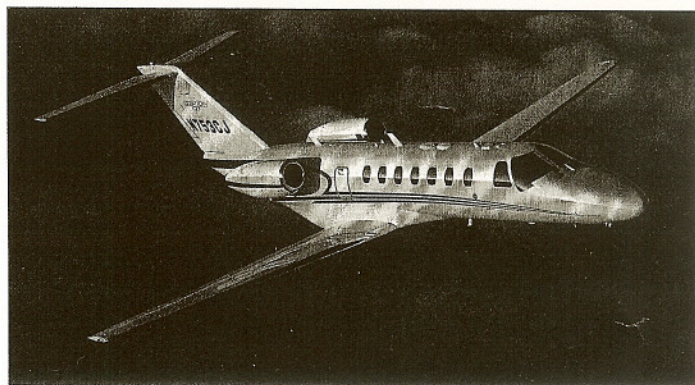
In previous years, we depicted the tabulated survey responses with colored dots, each representing one point on the rating

scale. (Green, for instance, was used to depict all averages from 6.5 points to 7.499 points.) This year, however, we are presenting raw numerical scores, in part so that OEMs can more precisely understand their performance. Furthermore, the raw scores better show the relative position of products being rated, a key change since models are often separated by only a tenth of a point or less.

It's worth noting that our readers are a critical bunch. In most cases, top-ranked firms in individual categories received average scores of around 7, "good" on our scale of 1 to 9. And for the most part, service and support seems to be fairly acceptable overall—rarely did average ratings dip below 5, or "average" on the scale. It's also worth noting that in several cases the "best" and "worst" performers in a group or category were very close in raw terms. For instance, the gap between the top and bottom on warranty fulfillment of new airplanes is just a little more than a point; in almost all instances, the gap is no more than two points.

With some aircraft models dating back 30 years or more, aircraft age can be a significant factor in overall ratings. This year, as in the past, we've separated aircraft into two categories: "newer" (less than 10 years old) and "older" (10 or more years old). Furthermore, in some instances, a particular manufacturer's offerings might be separated into multiple groups, generally to reflect acquisitions and mergers over the years. For example, Beechjets and Hawkers, now both Raytheon Aircraft products, are in separate categories, as are Bombardier Globals, Challengers and Learjets.

Finally, our hats are off to the AIN readers who took time and effort to fill out our (admittedly) detailed survey form. We know you are poked and prodded for opinions with increasing frequency, and we realize we asked a lot of you with our new format. Please believe us when we say it was well worth your effort. At the end of the day, this exercise isn't about winners and losers; it's about helping all operators get the quality support they need to complete their missions successfully. OEMs do tell us they take your opinions seriously, to the benefit of all operators. Thank you. —R.R.P.



by Gordon Gilbert

For the third consecutive year in AIN's Product Support Survey, readers gave Gulfstream top marks for both its newer business jets (less than 10 years old) and older business jets (10 years or older), when ratings for the Westwind series are excluded. When these models—which were built by Israel Aircraft Industries but for which Gulfstream now provides service and support—are included in Gulfstream's combined average, Cessna Aircraft moves into the top spot for new and old business jets combined (see table on page 26).

Raytheon Aircraft holds third place when ratings for its wide fleet of newer and older jets are combined into one overall rating. But interesting things happen when you parse the ratings by aircraft models and age. The company's newer Beechjets and Premier Is actually tied Gulfstream's new jets for first place in this category with an overall average of 7.06. (Cessna's new jet overall average is 6.97, putting it third.)

New Hawkers had a rating of 6.5 (fourth place), while older Hawkers received a slightly lower rating of 6.38, but this was high enough to put the model in third place overall for older jets. But when the ratings for older Beechjets (which just missed the minimum number of required responses to make the chart) are blended with the newer Beechjets, they bring the combined average for old and new Beechjets to 6.61. (The Boeing Business Jet and Airbus ACJ also did not receive the requisite number of responses to be included on the survey chart.)

Except for the Westwinds, which were the lowest rated older jets, Bombardier aircraft received the lowest ratings for both older and newer jets. The Canadian OEM's new Challengers garnered the highest ratings



Jet operators rated Cessna best in class for support of both newer and older Citation fleets combined.

(6.38) within the company's product line, just a tad above the ratings for newer Learjets (6.32) and the Global Express (6.27).

Despite being the lowest-rated new jet model, the Global Express showed the greatest improvement over last year in terms of percent change (11.88) of all jets, which certainly seems to be a positive sign for Global owners. The Challengers' ratings also improved, 4.76 percent for the newer ones and 7.26 percent for the older ones. Conversely, the overall ratings for both newer and older Learjets fell, 1.6 percent and 7.11 percent, respectively.

Unusual Aspects

The overall average for older Gulfstreams (Westwinds excluded) is one of the survey's unusual results, because at 7.23 it's higher than the overall rating for Gulfstream's new jets (7.06). It's also the highest overall jet rating, for both newer and older models. Furthermore, for every other aircraft model group with ratings for both newer and older aircraft, the overall averages for the older aircraft are lower.

In previous AIN product support surveys that requested ratings for newer and older aircraft, respondents have consistently judged the service and support they receive for their older aircraft lower than the service and support they receive for their newer aircraft. OEMs give two reasons for this. First, newer aircraft are usually still

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