

## GA-FDM Safety and Value White Paper

The GA-FDM team has developed a unique Flight Data Mentoring product that provides important new capabilities for all Cirrus aircraft. The GA-FDM system, with its embedded ETMS and FOQA capabilities offers critical Maintenance, Operational, Safety and Training features, coupled with added value for Cirrus and its customers, and is so affordable that the system pays for itself.

GA-FDM is also the cornerstone of a safety culture and an effective safety management system – pro-actively using today’s data to make tomorrow’s flights safer. This affordable, ground-breaking FOQA capability has never before been available in a GA aircraft, and is available today to owners of SR20 and SR22 aircraft, new and pre-owned.

It's been our experience that most pilots are constantly looking for ways to improve - to fly better, to fly safer, to learn, to become a better pilot.

That's what GA-FDM and Flight Data Mentoring is all about - helping pilots learn from situations, giving them timely feedback that helps with Continual Aviation Proficiency, showing them similar situations using de-identified data, and providing them with the expert advice and mentoring that helps them become a better pilot when the situation arises again.

### Safety and Value Details

- FAA-approved, patent-protected Engine Trend Monitoring program, for Single-Engine IFR operations under Section 135.419 (Approved Aircraft Inspection Program) and Section 135.421 (Additional Maintenance Program). In short, ETMS provides 'plug-and-play' ETM capability for CFR 135 operators.
  - To a fleet operator, having a pre-approved ETM program saves the substantial costs of developing, gaining approval, and manually operating their own program. Fleet customers benefit immediately.
  - Individuals benefit as well, through increased TBO. Plus, the system provides owner peace-of-mind – direct knowledge about how your engine is performing, with predictive condition-based maintenance warnings.
- The value proposition is compelling. Pilots flying with GA-FDM can expect to save \$1,450 per aircraft per year if flown 40 hours per month. ETMS provides superior engine awareness and subject to FAA approval will allow increased TBO intervals, leading to increased confidence in single powerplant operation and decreased maintenance costs. In this, ETMS equates to airline industry experience with ETOPS – better data and data scrutiny leading to condition-based maintenance and decreased maintenance and operating cost.
  - Table 1 presents the typical operating costs for an SR22 GTS. The original spreadsheet was prepared by Cirrus, and has been modified by GA-FDM to show the expected cost and benefits from applying GA-FDM Gold and Sprint Broadband services to the example aircraft. All GA-FDM costs are included.
  - The average TBO costs \$33,000 and is required every 2000 hours.

- Increasing TBO by 500 hours means 25% fewer overhauls. Instead of 5 overhauls in 10,000 hours, there would be 4. \$33,000 saved.
- The net result is over \$1,450 saved per aircraft per year if flown 40 hours a month (10 hrs per month per partner).
- Over the 5-year financing period, that's a net savings of over \$7,260. *Pilots flying with GA-FDM save money*, even after paying for the DFDS equipment and the monthly fees for FOQA Gold and Sprint broadband.
- ETMS adds confidence in single powerplant operation – an important value for all pilots who fly single-engine aircraft.
- Customers who fly with GA-FDM will incur less cost per month than customers operating without GA-FDM.
- Resale Value
  - At resale time, GA-FDM aircraft will command a higher resale price. GA-FDM provides a complete electronic history of the aircraft. Hard landings. Exceedances. Flap overspeeds. Spins. Trend warnings. Excessively steep banks. Excessive taxi speeds with attendant brake wear. Everything you'd want to know if you were thinking about buying a pre-owned aircraft.
  - Future customers will pay a premium for pre-owned aircraft carrying the full GA-FDM pedigree. How much is that worth? A conservative 5% premium on the average SR-22 GTS resale brings an additional \$15,500 to the seller.
- Safety Management Benefits
  - Those adhering to safety standards and pro-actively using GA-FDM will be rewarded with lower insurance rates.
  - Pilots will be better trained and perform in a more consistent manner.
  - Operational concerns will be identified and addressed.
  - GA will be safer, and aviation claims will go down.
- Av-mail™ and FD-mail™
  - Lots of aircraft make a statement... Cirrus with GA-FDM sends you email after every flight.
  - Emails summarize what you need to know, when you need to know it. Quicker diagnostics. Early trend identification. Fault-avoidance. Fault isolation. Lower maintenance costs. Operational exceedances and FOQA events.
  - "How'd you know your engine had a leaky valve seal?"
    - "My aircraft emailed me."
- Insurance companies recognize the value of GA-FDM
  - Utilizing GA-FDM and FOQA practices leads to better GA pilots and fewer accidents. That's not just conjecture... 30 years of airline FOQA operations have proven that FDM reduces accidents.
  - As accident rates are reduced, underwriters will provide lower rates. Owners of GA-FDM aircraft will directly benefit from these tangible, annual savings.

**Table 1 – Projected Total Cost of Cirrus Ownership including GA-FDM**

<b>Total Cost of Ownership Calculator</b>																									
<b>Cirrus Shared Ownership</b>		This chart has been modified from the original Cirrus Design document, to explore relative costs and benefits from GA-FDM. Acquisition and Operating cost estimates were provided by Cirrus at the time of release, and may not be the most current.																							
<b>Partnership Info</b>																									
airplane type & configuration	SR22-GTS	<b>Original Cirrus Model</b>	<b>Cirrus with GA-FDM</b>																						
# of partners	4	\$ 448,685	\$ 452,185																						
Added Delta Cost of \$3500 for GA-FDM over the existing ADL (includes Broadband and crashresistant USB enclosure)																									
<b>Hourly Operating Costs</b>																									
		Hours	Hours																						
fuel (\$/gal)	\$ 3.75	\$ 67.50	\$ 67.50																						
oil (\$/quart)	\$ 5.00	\$ 0.50	\$ 0.50																						
maintenance (\$/shop hour)	\$ 75.00	10 \$ 7.50	12 \$ 6.25																						
engine & prop reserves	\$ 33,000	2,000 \$ 16.50	2,500 \$ 13.20																						
<b>Total Hourly Operating Cost</b>		<b>\$ 92.00</b>	<b>\$ 87.45</b>																						
estimate (SR22 = 18 GPH; SR20 = 11 GPH cruise flight) estimate (1 quart per 10 flight hours @ \$5/quart) estimate (1 hour Mx per 12 flight hours, improved by GA-FDM) estimate (SR22 = \$33,000; SR20 = \$28,000 overhaul @ 2,500 hour TBO - low ROM TBO improvement due to GA-FDM; actual improvement may be higher, subject to FAA approval (ref: R. Wilkinson, formerly TCM) )																									
<b>Annual Fixed Costs</b>																									
		Basis	Basis																						
tiedown	\$ 600	\$ 600	\$ 600																						
database subscriptions	\$ 1,550	\$ 1,550	\$ 2,894																						
annual inspection	\$ 2,000	20 \$ 2,000	16 \$ 1,700																						
insurance	\$ 6,100	100% \$ 6,100	90% \$ 5,490																						
<b>Total Annual Fixed Costs</b>		<b>\$ 10,250</b>	<b>\$ 10,684</b>																						
estimate (\$50/month) estimate for GPS, MFD and Cmax databases & XM WX, plus GA-FDM Gold AND Sprint estimate (16 hours @ \$75/hr + \$500 incidental - data saves est'd 4 hrs diag/labor) estimate (SR22 @ 500+ hour IFR = \$6,100; SR20 @ 100 hour PPL = \$3500) (conservative 10% savings from GA-FDM)																									
<b>Financing</b>																									
down payment	20%																								
interest rate	6.75%																								
term (years)	15																								
<b>Monthly Payment</b>		<b>\$ 3,176</b>	<b>\$ 3,201</b>																						
<b>Total Cost of Ownership</b>																									
	<b>Total</b>	<b>Per Partner</b>	<b>Per Partner</b>																						
upfront investment	\$ 89,737	\$ 22,434	\$ 22,609																						
monthly fixed expenses	\$ 4,031	\$ 1,008	\$ 1,023																						
hourly operating cost	\$ 92	\$ 92	\$ 87																						
<b>Resale Value</b>																									
Estimated Re-Sale Value at 1,000 hours		(estimated without GA-FDM) Basis \$ 310,000	(estimated with GA-FDM) 5% \$ 325,500																						
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<p>This worksheet is provided to you as a service by your Cirrus Regional Team. Assumption fields are highlighted in yellow, and we strongly recommend you adapt the assumptions to your particular circumstances, as costs can vary significantly (e.g., different insurance rates depending on location and pilot qualifications; different fuel prices, maintenance labor rates, tie-down or hangaring costs) and as you are the sole judge of your tax situation. Consult with your accountant on how an aircraft purchase will impact your personal financial situation. Cirrus Design and GA-FDM cannot accept any responsibility for the accuracy of these materials, including, but not limited to, the formulas contained herein and any and all of the assumptions made.</p> <p>Net Result: With ALL of the GA-FDM costs and subscriptions included, a group of 4 pilots operating a shared SR22-GTS with GA-FDM Gold could expect to save \$30 per month per pilot from the benefits achieved through using GA-FDM (10 hrs each or 40 hrs airframe). That's \$360 per year per pilot savings. \$1,450 per aircraft per year. \$7,260 saved during the 5-year ownership period.</p>																									