

## 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 more than 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, designed to adhere to AC120-92, 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 save on operating costs, 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, patented 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 right from day one.
  - 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.
  - And, it helps you reduce operating costs.
- The value proposition is compelling. **Pilots flying with GA-FDM can expect to save, on average, over \$7,000 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 2,000 hours.
- Increasing TBO by a conservative 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 \$7,000 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 \$35,000. **Pilots flying with GA-FDM save money**, even after paying for the 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.
- 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 are identified and addressed. Trackfiles can be viewed using GoogleEarth, and every flight can be played back using X-plane.
  - GA will be safer, and aviation claims will go down.
- Av-mail™ and FD-mail™, right to your iPhone or PDA
  - 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 and isolation. Lower maintenance costs. Operational exceedances and FOQA events.
  - “How’d you know your engine had a bad 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**.
- 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.
  - As accident rates are reduced, underwriters will provide lower rates. Owners of GA-FDM aircraft will directly benefit from these tangible, annual savings.

# Adding GA-FDM Can Provide Lower Cost per Flight Hour for Cirrus Owners

for more information:  
www.ga-fdm.com

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Total Cost of Ownership Calculator			Cirrus SR-22, with GA-FDM (Leased Eqpt)		
<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	Original Cirrus Model		Cirrus with GA-FDM	
# of partners	4	\$ 448,685		\$ 448,685	No Added Cost for GA-FDM (see 'leased' line)
<b>Hourly Operating Costs</b>					
		Hours		Hours	
fuel (\$/gal)	\$ 5.99			\$ 98.14	estimate (SR22 = 19.1 GPH; SR20 = 12 GPH cruise flight, FDM est'd 14% avg savings)
oil (\$/quart)	\$ 5.00			\$ 0.50	estimate (1 quart per 10 flight hours @ \$5/quart)
maintenance (\$/shop hour)	\$ 75.00	10	12	\$ 6.25	estimate (1 hour Mx per 12 flight hours, improved by GA-FDM)
engine & prop reserves	\$ 33,000	2,000	2,500	\$ 13.20	estimate (SR22 = \$33,000; SR20 = \$28,000 overhaul)
<b>Total Hourly Operating Cost</b>		<b>\$ 139.09</b>		<b>\$ 118.09</b>	@ 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	estimate (\$50/month)
database subscriptions	\$ 1,550	\$ 1,550	\$ 1,518	\$ 3,068	estimate for GPS, MFD and Cmax databases & XM WX, plus GA-FDM Gold AND Sprint
GA-FDM equipment lease			quote	\$ 2,727	lease cost for GA-FDM eqpt, 36 months (includes Broadband and install labor)
annual inspection	\$ 2,000	20	16	\$ 1,700	estimate (16 hours @ \$75/hr + \$500 incidental - maint data saves est'd 4 hrs diagnostics)
insurance	\$ 6,100	100%	85%	\$ 5,185	estimate (SR22 @ 500+ hour IFR = \$6,100; SR20 @ 100 hour PPL = \$3500)
<b>Total Annual Fixed Costs</b>		<b>\$ 10,250</b>		<b>\$ 13,280</b>	(estimated 15% 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>\$ 3,176</b>	
<b>Total Cost of Ownership</b>					
	<b>Total</b>	<b>Per Partner</b>		<b>Per Partner</b>	
upfront investment	\$ 89,737	\$ 22,434		\$ 22,434	
monthly fixed expenses	\$ 4,031	\$ 1,008		\$ 1,071	
hourly operating cost	\$ 139	\$ 139		\$ 118	
<b>Resale Value</b>					
Estimated Re-Sale Value at 1,000 hours		(estimated without GA-FDM)	Basis	(estimated with GA-FDM)	
		\$ 310,000	5%	\$ 325,500	
<b>Net Cost (Or Savings) of GA-FDM Per Partner</b>					
				\$ -	Upfront investment - No Change
				\$ 63.13	Fixed monthly costs increase by small amount
				-\$21.00	Results in Lower Operating Cost (per Hour)
				-\$147	Net Lower Monthly Cost, 10 hrs/month/pilot
				-\$1,763	Net Lower Annual Cost, 10 hrs/month/pilot
<b>Net Cost (Or Savings) of GA-FDM Per Aircraft</b>					
				-\$588	Net Monthly Cost per Aircraft (40 hrs/month)
				-\$7,051	Net Annual Cost, operating 40 hrs/month
				-\$35,253	Net Five-year Cost, operating 40 hrs/month
				\$15,500	Increased Resale Value, from GA-FDM pedigree
GA-FDM provides complete reports of aircraft usage, exceedances, and other factors to provide Buyer with knowledge on prior use and wear					
Net Result: With ALL of the GA-FDM costs and subscriptions included, including Sprint Broadband, a group of 4 pilots operating a shared SR22-GTS with GA-FDM Gold could expect to save \$147 per month per pilot from the benefits achieved through using GA-FDM (10 hrs each or 40 hrs airframe). That's \$1763 per pilot per year savings. \$7,051 per aircraft per year. \$35,253 saved during the 5-year ownership period. Plus added savings from maintenance, operations, safety and training (MOST) benefits.					
This worksheet was originally prepared 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.					