

# HOW TO BUDGET FOR REPAIRS, UPGRADES & MORE...

**Budgeting for aircraft maintenance is a crucial consideration for aircraft owners and operators. For owners not enrolled with a maintenance program, what practices should they adhere to? Gerrard Cowan asks a panel of industry experts...**

**W**hile a growing proportion of aircraft owners today opt to join an hourly maintenance program that covers their engines, Auxiliary Power Units (APUs), and a range of other critical systems and components, there is still a significant proportion of those who choose to fund maintenance demands directly, according to Michael Parrish, President and CEO of Elliott Aviation.

This is particularly true for owners operating older aircraft or flying lower annual hours, he elaborates – the appeal being largely financial and strategic.

The perception such owners have is that “it allows them to avoid fixed monthly payments, maintain tighter control over cash flow, and retain flexibility in how and where they maintain the aircraft,” Parrish says.

“In some cases, owners are also comfortable taking on the variability because they believe their overall costs will be lower over the life of ownership.”

This can be a risky approach but is a chance that a certain profile of aircraft owner is prepared to take.

The particular financial demands involved clearly depend on the system in question. Engines are almost always the largest cost driver, Parrish notes. Major inspections, hot section events and full overhauls represent significant

capital outlays, and their timing plays a major role in total ownership costs.

Beyond the engines, key focus areas include landing gear overhauls, which are typically driven by calendar limits, “and can be expensive when they come due,” he says. APUs follow similar maintenance cycles, while avionics can be a major cost factor – particularly as systems age and upgrades are required for compliance or capability.

“In addition, time-limited components and certain structural inspections (especially on aging aircraft) can add meaningful complexity to the cost profile,” Parrish warns. The key point is that many of these expenses are not linear; they occur in larger, less frequent intervals, which makes planning essential.”

Therefore, estimating maintenance costs without a maintenance program requires a disciplined, data-driven approach, he says.

Elliott Aviation can work with owners to build a forward-looking maintenance forecast, based on the specific aircraft, its current condition, and its expected use. A review of maintenance records and logbooks is then aligned with OEM-recommended inspection intervals and component life limits.

“From there, we layer in our own fleet-level experience to model both scheduled and unscheduled

maintenance events,” Parrish explains. “The end result is a realistic projection of cost per flight hour and a multi-year outlook that allows owners to plan with a much higher degree of confidence.”

## **Not all Aircraft MRO Costs are Predictable**

Timothy Ferrell, Senior Vice President of Technical Services at JSSI, outlines some of the key cost drivers that owners and operators should be aware of if they decide to self-reserve.

“Operators who know a specific aircraft type deeply, who’ve built reliable cost models from their own operating history, and who have the financial tolerance to absorb unscheduled events sometimes choose to self-reserve, knowing they take on more risk,” he notes.

While aircraft engines represent the most significant expense, he highlights that the area can be surprisingly nuanced. Indeed, while hot sections and overhauls tend to dominate the conversation, it’s often Line Replaceable Units (LRUs) that catch operators off guard.

“Engine FADECs, fuel controls, and inlets – for instance – frequently carry six-digit price tags, and these replacements are typically unscheduled,” he warns. “On the airframe side, notable cost drivers include landing gear, brakes, thrust reverser buckets and actuators, primary flight displays, and satellite data units.” ➔

Needless to say that operators choosing to self-serve will need to ensure they include sufficient funds within that maintenance budget for unexpected costs.

### Failure to Anticipate 'Showstopper' Aircraft Inspection Findings

Substantial costs are inevitable when it comes to aircraft maintenance. Major airframe inspections can produce significant findings, warns Barry Lambert, Executive Vice President of Southern Sky Aviation and Co-Chair of NATA's Air Charter Committee. This could include corrosion or structural issues that were not visible before the inspection.

"Supply chain constraints can magnify these costs by turning what should be a routine part replacement into a lengthy and expensive event," he warns. An intermittent windshield heating issue may pass ground tests and continue operating for months, "but if replacement windshields are on back order, the aircraft can still face a long-term operational problem".

Owners often fail to budget well for what Lambert calls 'showstopper' events, by which he means a failure or inspection finding that grounds the aircraft.

"A generic contingency should be carried for these events, but some of them provide early indicators," he advises. "That is where communication between flight crews, maintenance providers, and management becomes important."

James Schnell is National Director of Owner Services at George J. Priester Aviation and a member of National Air Transportation Association's (NATA's) Air Charter Committee. He suggests that for near-term help, an MRO bidding process could help to establish realistic pricing, particularly for large inspections or known maintenance coming due.

MRO shops can be particularly helpful in quoting for defined maintenance events, he adds – but this should be supplemented with OEM fleet cost figures or third-party sources for broader planning assumptions.

"Management companies may provide similar figures but can often improve the estimate by using actual data from the aircraft tracking system (rather than relying solely on fleet projections)."

Lambert echoes this, noting that the



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broader budget picture demands coordination among maintenance, operations, accounting, and the owner or business manager. When these function as silos, information often does not fully flow between them, meaning a management company can be a useful addition.

"Maintenance may understand the inspection exposure, operations may understand how the aircraft is being flown, accounting may understand the spend pattern, and the owner may only see pieces of the picture," Lambert says.

### Factor in the Necessary Future-Proofing Costs

Some cost categories remain largely invisible until they occur, warns Robin Dunlop, Founder and Partner at ALTEA. These include long-lead-time parts, rotatable exchanges, composite repairs, environment control system components, and findings uncovered during major inspections.

"In ALTEA's experience, many maintenance events remain manageable when identified early but become considerably more expensive when issues emerge late in the process," he says.

The first step is to build a maintenance forecast based on factors such as the aircraft's approved maintenance schedule, engine/APU status, airworthiness directives, service bulletins and life-limited parts. Owners should determine the 12-, 24- and,

ideally, 60-month maintenance forecasts.

OEMs provide extensive guidance through their Instructions for Continued Airworthiness (ICAs), which detail how aircraft systems should be maintained throughout their operational life, he adds.

"Any forecast should include both calendar-driven and utilization-driven events, estimated labour inputs, expected material costs and reasonable assumptions around shop findings," says Dunlop.

"It should also distinguish between routine line maintenance, scheduled inspections, unscheduled events and major shop visits."

Future-proofing is vital, and owners should be particularly mindful of the risk of obsolescence in avionics, says James Carroll, who works in EMEA Aircraft Sales and Acquisitions at Duncan Aviation.

"It can quickly become very costly if you need to upgrade a whole avionics suite or full cabin system - some parts and systems are supported by manufacturers longer than others."

It is always wise to have someone on the team who knows the type being operated well, keeping things running smoothly and addressing issues before they become larger problems, he adds. "A part of this is actively looking at what tasks can be embodied or performed – and what upgrades can be made – while other work is already in progress.

"This can then ensure less downtime overall and future-proof the plane for ongoing operations and years." ➡

### Aircraft MRO Costs: From a Surprise to a Plan

The key is to turn maintenance “from a surprise into a plan,” says Gökçehan Dağ, Managing Partner – MENA Region at GJM Aviation Group. “You may not predict everything, but you can predict far more than [you may] realize.”

The reserve must be real money, he warns, not just an accounting line. “It should be separate from operating cash flow and available when needed.”

If outside a program, the owner will need a strong Director of Maintenance or a trusted aircraft advisor who knows the aircraft well, he adds. “Someone must challenge MRO quotes, track upcoming events, source parts intelligently and understand when factory-new parts are necessary and when approved alternatives may be acceptable.”

There can also be savings in the aftermarket, he adds, such as component exchanges, overhauled parts, etc. “But this must be done carefully. Saving money is useful. Compromising quality or documentation is not.”

Operating without a program enrolment requires strong discipline, proper records, realistic reserves, strong technical oversight and the honesty to accept that one major event can quickly change the economics.

“The owners who get into trouble are usually not the ones who choose to operate without a program – they are the ones who do it without a plan,” Dağ says.

### Aircraft MRO Budgeting With Clarity

A practical rule of thumb is to budget in the way a program would charge, but pay yourself instead, suggests Cristine Kirk, President and CEO of Malone AirCharter and NATA Board Chair.

“While unexpected events will always occur, major expenses like hot sections and overhauls are largely predictable. Owners who self-fund those costs by setting aside reserves at an hourly rate similar to a maintenance program are often better prepared when the bill arrives,” she explains.

However, owners should take particular care with basing their budgeting on cost-per-hour assumptions. Lambert notes that inspections can also be calendar-driven,

as well as utilization-driven, coming due regardless of flight hours.

That means low utilization does not necessarily equate to a low maintenance cost. Aircraft that fly less will still require calendar inspections, repairs, preservation, troubleshooting and corrective work.

“For example, if a calendar inspection costs \$25,000 and the aircraft flies only one hour, that inspection effectively costs \$25,000 per flight hour. If the aircraft flies 300 hours, the same inspection works out to approximately \$83 per hour. The maintenance obligation exists either way.”

Meanwhile, Dunlop says the most practical approach is to budget in layers:

- First, establish an annual baseline for predictable scheduled maintenance.
- Second, create separate reserves for engines, APU, landing gear and other major lifecycle events.
- Third, maintain a contingency provision for unscheduled findings and operational disruptions.

Owners should also divide maintenance into three categories, he says: known recurring events; long-cycle future liabilities; and unplanned findings.

“For many owners, the mistake is underestimating the third category. Even a well-maintained aircraft can generate unexpected costs when inspections reveal wear, corrosion, time-expired components, or non-compliant legacy modifications.”

Owners should also understand the operational context, he adds. “Aircraft used for charter, short sectors, harsh environments, frequent APU use, or extended idle periods often experience very different maintenance patterns. Budget assumptions should reflect how the aircraft is actually operated – not how the manual assumes it may be operated.”

Technical governance is a crucial consideration, too. It is still sensible to work with trusted technical advisors – such as an MRO, CAMO, aircraft manager, independent consultant or experienced operator – even when an owner wishes to maintain flexibility and avoid program enrolment.

“Good maintenance budgeting is not simply an accounting exercise; it is a technical and commercial planning exercise tied directly to safety, aircraft availability, operational reliability and long-term asset value,” Dunlop highlights. “At ALTEA we believe that the more structured the approach, the fewer surprises owners are likely to encounter.”

Ferrell says a wide range of key variables make any broad number unreliable for a maintenance budget or reserve, including aircraft type, age, utilization and operating environment. “That’s why the most reliable starting point isn’t an industry average – it’s a cost model built around your specific aircraft, your operation, and your maintenance history.

“Whatever figure you arrive at, build in at least a 20-30% buffer for unscheduled and AOG events,” he



Courtesy of Duncan Aviation

advises. Overall, the goal should be to "expect the best, but plan for the worst".

Sometimes, Ferrell says, everything goes wrong at once. "A major engine repair, a landing gear overhaul, and an avionics failure landing in the same budget cycle can be financially devastating. Without adequate reserves, you may find yourself forced to sell the aircraft."

If a management company is involved, the owner should consult that company first before budgeting for maintenance demands, Schnell adds, because it may have access to the aircraft's tracking data, operating history, budget history and upcoming maintenance schedule.

Where no management company is involved, "the owner can request quotes through an MRO bidding process for near-term maintenance and ask for average discrepancy budgets associated with comparable inspections," he adds. "The OEM can also be consulted, though that process may be tedious or costly."

### Strong Coordination is Required for MRO Budgeting

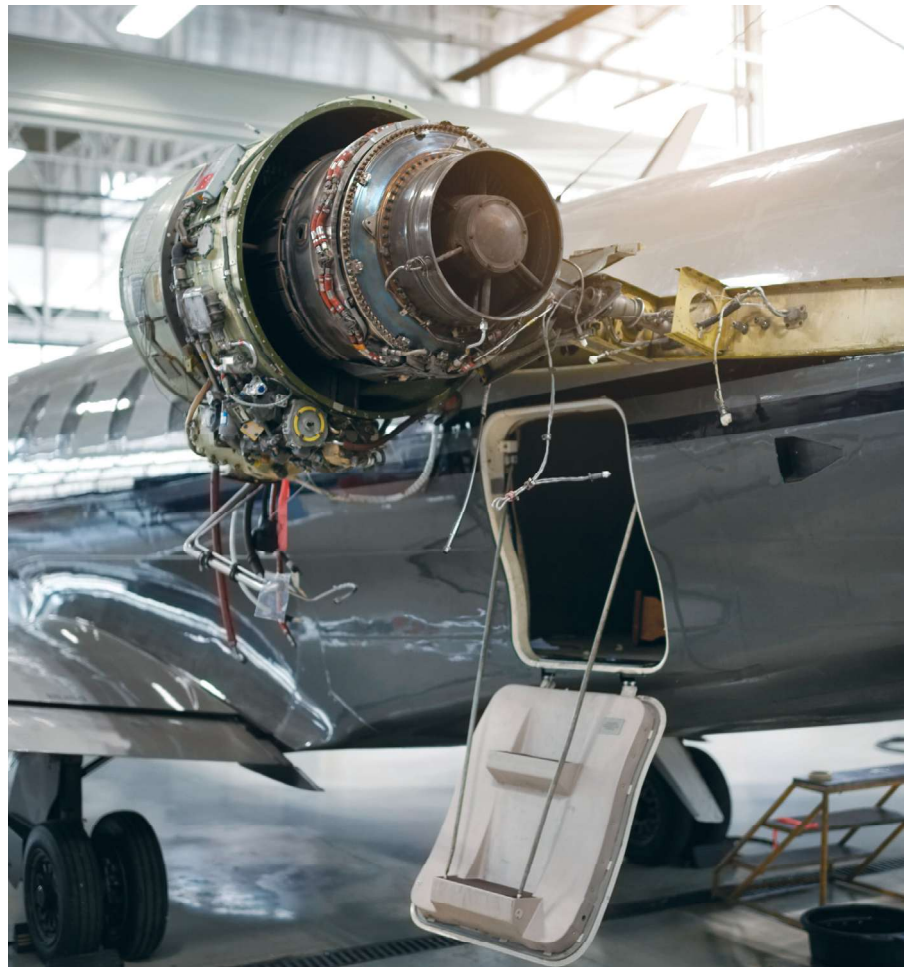
Regardless of whether the aircraft is enrolled on a maintenance program or not, the owner should keep it on a maintenance tracking platform, Lambert asserts. "Self-funding without reliable tracking creates guesswork."

"Tracking helps identify scheduled events, component timing, calendar items, and future exposure."

Moreover, he stresses the importance of protecting and organizing records, because they directly support residual value. "For a no-program aircraft, records become even more important because they help demonstrate maintenance status, care and 'saleability'."

Indeed, he says owners should think about the eventual sale of the aircraft before the purchase is made, and the impact that maintenance could have on this.

While he argues "self-funding is not inherently riskier than being on a program, unmanaged self-funding is the risk. It requires discipline, tracking, reserves, contingency planning, and clear communication among everyone responsible for the aircraft."



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Shannon Chambers, Senior Vice President of Communications at NATA, underlines the complexity of aircraft maintenance planning. Overall, she summarizes, it comes down to matching budgeting strategies to each aircraft's ownership profile, utilization, and operational needs.

"Whether costs are managed through a program or funded directly, disciplined planning, accurate records, clear visibility into upcoming events, and strong coordination among maintenance, operations, accounting, and management partners are essential," she concludes. ■

### More information from:

**ALTEA:** <https://altea-aero.com>

**Duncan Aviation:**  
[www.duncanaviation.aero](http://www.duncanaviation.aero)

**Elliott Aviation:** [www.elliottaviation.com](http://www.elliottaviation.com)

**George J. Priester Aviation:**

<https://gjpaviation.com>

**GJM Aviation Group:** <https://gjm.aero>

**JSSI:** <https://jetsupport.com>

**Malone AirCharter:**

<https://maloneaircharter.com>

**National Air Transportation Association:**

<https://nata.aero>

**Southern Sky Aviation:**

<https://southernskyaviation.com>



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