

# THE AIRLINE GUIDE TO PMA



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# Welcome to the Profitable New World of PMA

Airlines by their very nature combine huge, perpetual fixed costs with fickle demand. This makes them extremely vulnerable to any kind of disturbance. The years have seen a multitude of economic downturns, wars, acts of terrorism, diseases, aircraft crashes, and strikes suddenly shrink demand for air travel. Meanwhile, the costs of jet fuel and aircraft maintenance go up, up, and up. Survival demands that cost control must be a major ongoing effort for every airline in good times as well as bad. Over half the global profit in 2015 is expected to be generated by airlines based in North America (\$15.7 billion). For North American airlines, the margin on earnings before interest and taxation (EBIT) is expected to exceed 12%, more than double that of the next best performing regions of Asia-Pacific and Europe.

Many airlines try to save money by short building engines. They remain legal and safe, but they do not build in longevity. I call this strategy, “saving oneself into bankruptcy”. Maintenance is an investment that returns flying hours. A significant portion of a shop visit cost is fixed and is not reduced by short building the engine. Thus, an engine that returns to the shop early has a very high maintenance cost per flying hour. Within the space of a very few years the airline that short builds its engines are churning shop visits, operations are adversely affected, and maintenance costs are out of control.

A far better way to control maintenance cost is to reduce the cost of maintenance materials. According to data from ICF International, one of the leading consulting organizations in the aerospace industry, airlines spent more than \$32 billion on OEM new parts in 2015. Savings on spare parts can definitely help an airline’s bottom line. Over the past several years a major, but under-utilized, tool has become increasingly accepted by maintenance organizations to help reduce these material costs – PMA parts. PMA parts are new parts, fully approved by the FAA. They are now available from PMA suppliers at savings ranging from 25% to 45% of what you are currently paying the aircraft or engine manufacturers (OEMs).

One leading PMA supplier estimates that they can save a customer up to \$130,000 on a single engine overhaul, and there are many PMA suppliers. A single airline in the US has documented \$40 million in material cost savings per year due to an aggressive PMA approval program that covers airframes, engines, and components.

The savings from PMA may go far beyond the PMA discount itself. Historically, the OEMs have held a strong monopoly on the sale of replacement parts. This has allowed them to push through spare part price increases on the order of 5% per year. According to industry analysts, competition from PMA has tended to moderate this rate of growth. PMA provides operators with a useful tool, along with surplus parts, extensive part repairs, and joint procurement to counter the OEM pricing power and reduce the rate of price escalation.

Lack of knowledge about PMA continues to be a major obstacle in the path to achieving PMA savings. Airline maintenance organizations must necessarily be conservative about what they install on their aircraft. If you can't be certain about the origin or quality of a material (i.e., you don't have enough information), you won't let it near your aircraft. My goal here is to improve the level of knowledge about PMA and to show that the certification process for these products is both real and robust.

All of the information about the process that governs the approval of PMA is currently available. It's just arranged in a tangle of regulations that is difficult to sort out and understand. I was once at a conference where a gentleman from an Asian carrier asked if somebody could please translate these regulations into Japanese. I thought, "Japanese is fine, but I wish somebody would translate them into English!" I'm going to do just that. I'll untangle this information and describe the process in an easy-to-understand summary. This summary is intended for an airline wanting to know more about PMA. It does not try to include all of the information that a PMA supplier would need to obtain approval for a part. If you work for an airline, you don't need all that legal detail. You just need to understand the PMA approval process well enough to have confidence that it is every bit as rigorous and thorough as the process that originally certified the aircraft.

I'm also going to address some of the major concerns about using PMA parts. I spent nearly three decades working in the maintenance arm of a major airline, so you can count on me to take an airline point of view on the issues.

I shall also share what I have learned about the industry best practices for making PMA a part of your overall supply chain strategy. Airlines are not keeping any secrets when it comes to PMA. Everyone I have contacted has been willing to share their experiences.

I'll list some useful resources that you can use to help you implement PMA parts, and I'll provide the links to the FAA regulations and some contacts to organizations that can help.

Finally, I'll provide a list of PMA suppliers that belong to the Modification and Replacement Parts Association (MARPA), the trade association that represents the PMA community.



# Is PMA Legal, Safe, and Reliable?

When I worked as an engineer in an airline maintenance organization, I clearly understood that one of the worst sins I could commit was to poison the fleet with bad material. This would be a career limiting mistake that could shut down a large part of the airline fleet while corrections were being made. The question at hand is, will installing PMA parts increase your risk of ending up with bad material in your fleet? The answer is a very strong **NO, it will not increase risk**, and when you look at the approval process required for PMA parts, I'm confident that you will agree. A close examination of the PMA approval process and the performance of PMA parts in service for more than 15 years will show that a PMA part has no more technical risk than the equivalent part provided by the original equipment manufacturer.

## Approved Replacement Parts

The PMA (Parts Manufacturer Approval) is a combined design and production approval by the FAA for replacement parts for type-certificated aircraft, engines, and propellers. In fact, the law states that all replacement and modification parts must either have a PMA or be approved via one of the following exceptions.

- A part produced under a “one-time only” supplemental type certificate or a field approval should not get a PMA. This part is produced to return only one aircraft to service. If you are going to make parts for more than one aircraft, you need a PMA.
- Existing Production Approval Holders (the OEMs) don't need a PMA. If a supplier to the approval holder wants to sell parts without direct ship authority from that approval holder, the supplier will need a PMA.
- Aircraft owners or operators may produce parts for installation on their own aircraft. They must be able to prove that these parts comply with existing airworthiness standards, and they can't sell the parts unless they get a PMA.
- Civil air transport air carriers may produce parts for installation on their own aircraft without a PMA. The carrier must have accepted instructions and procedures in their manual, and they must comply with the applicable regulations on maintenance. ***This is good way to reduce material costs if you have internal manufacturing capability. I know of at least three major airlines that have saved a great deal of money using this provision to produce simple parts such as bushings.*** If the carrier intends to sell the parts, however, they must obtain a PMA.
- FAA certificated repair stations may fabricate parts for installation on aircraft during course of repair. Landing gear repair stations commonly produce custom bushings for installation on the gear, and every aircraft heavy maintenance facility has a sheet metal shop and a machine shop to support the aircraft repair process. Again, however, if these parts are going to be sold rather than be installed during the course of repair, a PMA is required.
- Standard parts such as nuts and bolts that conform to established industry or U.S. standards do not require a PMA. ***This is another opportunity to save money. OEMs typically buy this hardware and apply huge mark-ups. If you are willing to invest in the research to find the standard equivalent to the OEM part number, the savings, which can be substantial, are yours.***
- Parts produced under an FAA technical standard order (TSO) also do not need a PMA. TSOs include such product families as airspeed instruments, automatic pilots, aircraft tires, aircraft fabric, APUs, and many others.

The combination of PMA and all of the exceptions to PMA listed above constitute the entire universe of “approved parts”. Any other replacement part is unapproved and cannot be legally installed on a type-certificated product.

Note that the standard legal requirement for replacement and modification parts is the PMA, and OEM-produced parts are actually just an exception to the PMA requirement. In the view of the FAA there is no drop off in status from the OEM part to the PMA part. Both have equal standing. In fact, you won't find the term "OEM" in any of the FAA regulations.

### WHAT IS AN OEM?

*The common understanding of an OEM (Original Equipment Manufacturer) in our industry is they are the corporations that sell the new aircraft or engine. In practice the OEMs have never manufactured every part of the product they sell. They have always relied on a combination of internal manufacturing and external suppliers to provide the best value proposition. Over the last two decades the OEMs have emphasized outsourcing to the extent that they have become systems integrators rather than manufacturers. In fact, many of today's PMA suppliers are, or were, the actual OEM for the parts that they supply. Thus, there is no legal standing for the concept of an OEM in the regulations. The corporation that proves the design and manufacturing quality systems is the Type Certificate and Production Certificate holder (TC/PC-holder). For my convenience and your ease of reading, I shall continue to refer to these corporations as the OEMs.*

### FAA Approval Offices

As I wrote earlier, the FAA must approve both the design and the manufacturing process for PMA parts. To do this they have two separate types of organizations, the Aircraft Certification Offices (ACOs) and the Manufacturing Inspection District Offices (MIDOs).

The ACOs are responsible for determining that a PMA applicant's part meets the airworthiness standards that apply to the type-certificated product (aircraft, engine, or propeller) on which the part is to be installed. ACOs come in a couple of different flavors. The routine, simple PMA applications are processed by the geographic ACOs. This is typically the closest office to the PMA applicant. If the PMA part is complex or potentially critical to airworthiness, the application must be coordinated by the local ACO with the Certification Management ACO (CMACO in government speak). This is the organization that managed the original certification process for the type-certificated product on which the PMA part will be installed. The CMACO has extensive airworthiness experience for the product and may establish special test requirements to ensure the PMA part meets airworthiness requirements. For example the New England CMACO with responsibility for engines required a PMA applicant to conduct costly whole engine endurance testing in order to receive approval for a turbine blade design.

In the near future, the FAA plans to delegate some of the design approval authority to non-FAA organizations for simple, non-critical parts. The FAA will manage and supervise the process similarly to their current Delegated Engineering Representative (DER) process for repairs. Delegated organizations will be approved based on their proven experience and integrity. Their performance will be continuously monitored, and the authority will be revoked if the organization does not act in accordance with FAA policy.

The MIDOs are the Manufacturing Inspection District Offices. It doesn't matter how good the design is if the part is not manufactured correctly. The MIDO closes this loop. It audits the manufacturing facility that will produce a PMA part to ensure that it has the production and quality systems necessary to reliably produce an aerospace quality part per the design. Only when both the design and production system are approved will the Parts Manufacturer Approval be issued by the FAA.

### The PMA Certification Process

The PMA process is the primary legal basis for approved replacement parts. Just how good is this approval process? If you look at the standards for approval, you will find them not only to be every bit as good as the standards for the original design of the aircraft, but that they are identical. Let's dig in and justify this claim.

At the very beginning of the PMA approval process the applicant must identify the applicable airworthiness standards to the FAA. It's important to note that the certification standards for the PMA part are exactly the same as for the original OEM part.

If you want to produce a PMA part for manned free balloons, for example, then you must meet all of the applicable requirements of 14 CFR, Part 31, AIRWORTHINESS STANDARDS: MANNED FREE BALLOONS, the standards for the original product certification.

Once the applicable airworthiness requirements are identified the applicant must identify the basis for design approval. The FAA has three standard paths that can be selected.

- [Identity with a license agreement](#) – Often an OEM will decide that a portion of their certificated product is not a core part of their business, and life would be simpler if they were no longer responsible for supplying it. This part or system may have always been provided by an external supplier, may be a low dollar value part, or it may be at the end of its product life cycle. The OEM can license another firm to produce the part and notify the FAA that they are doing so. Since the OEM is providing a design that has already been approved by the FAA to the PMA applicant, there is no need for the FAA to reinvent the wheel on design approval. These applications go straight to the appropriate MIDO for approval of the production and quality control processes.
- [Identity without license agreement](#) – A PMA applicant taking this path tells the FAA that he can prove that his PMA part is identical in all respects to the OEM part. If the applicant does not have OEM part drawings, Identity is very difficult to prove. If the applicant has OEM drawings and no license agreement, he can potentially expect a lawsuit from the OEM. Many suppliers have obtained part drawings from the Air Force using the Freedom of Information Act, but the Air Force program to buy designs from the OEMs ended years ago. Each year fewer and fewer parts are being substantiated using this method.
- [Test and Computation](#) – The applicant uses analyses and tests to prove the PMA part is equal to **or better** than the approved original part. Only minor changes or improvements from the original OEM part are allowed in a PMA design. (Significant changes require a Supplemental Type Certificate.) Most PMA parts and virtually all complex parts now use test and computation for design substantiation. This is also referred to as reverse engineering.

At this point in the process, we have a proposal for a PMA part, and the applicable airworthiness standards and basis for proving the part meets these standards have been determined; but the PMA applicant is just getting started.

The applicant now has to determine the criticality of the part. This is done by means of a failure modes and effects analysis for the part and for the next higher assembly as well. Every possible way the part could fail is examined and the consequences of the failure are assessed. Based on this analysis the part is classed as **critical** (possibly affecting airworthiness of the aircraft), **important** (possibly affecting the performance of the aircraft or engine), or **not critical or important** (all the rest). Most PMA parts are neither critical nor important.

The applicant must also identify all Airworthiness Directives and unresolved service difficulties pertaining to the original part from the type design. The FAA will not approve a PMA for a part with an existing AD. Also, service difficulties will cause them to delay processing the application until the problem in the original part is cleared. Remember, only minor changes from the original design are permitted on a PMA. The FAA does not want a PMA part that duplicates and perpetuates a known problem.

If the part is critical, important, or complicated, the FAA will want to see a Project Specific Certification Plan. This plan is a tool used by the applicant and the FAA to manage the testing process. It provides information on the testing procedures and performance measures along with milestones that must be met.

The applicant will generally work with the ACO to develop this plan before investing a great deal of time and money in the testing process. The FAA can modify the plan to require any additional testing that they consider necessary.

The test plan will identify:

- Test purpose
- Physical and functional description of the test article and setup
- Number of test units
- Unit identification
- Test conditions and duration
- Test success and failure criteria
- Test instrumentation and data collection
- Test safety control
- Control of test procedures

The applicant now must execute the plan and carry out the testing to ensure the part performs its intended function. Often an applicant will obtain a representative sample of OEM parts and analyze them to establish a benchmark that must be equaled or bettered by the PMA part. Careful dimensional analyses of the OEM part samples establish the part dimensions and tolerances for manufacturing.

Various chemical and metallurgical tests are conducted to establish the materials and processes used on the original part. Finally, physical testing is accomplished to determine OEM part's ultimate strength and response to the operating environment. The PMA part is then designed using the findings from the OEM part sample. Advances in materials, processes, and manufacturing since the original product certification combined with airline experience with OEM part durability may enable the PMA supplier to provide a design that is superior to the original part.

Another approach to Test & Computation is to study the higher-level certificated product and determine the physical requirements for a part to fulfill the function of the OEM part and satisfy the airworthiness standards. The PMA part is then designed to meet these requirements. Results of the tests are supplied to the FAA. This approach works well for plug-in units such as filters.

The applicant must also establish a fabrication inspection system that ensures that each completed part conforms to its design data and is safe for installation. The requirements are identical to the OEM manufacturing requirements:

- Materials must conform to part design specifications.
- Processes affecting the quality and safety of the finished product must be accomplished in accordance with acceptable specifications.
- Parts must be inspected for conformity with the design.
- Current design drawings must be available to manufacturing and inspection personnel.
- Major changes in the design must be controlled and approved.
- Rejected materials must be segregated to preclude their use in the finished part.
- Inspection records must be maintained and identified with the completed part, where practicable, for at least 2 years after the part has been completed.

After the PMA design is approved by the ACO, the MIDO will be dispatched to audit the PMA manufacturing facility to ensure that the applicant has an effective fabrication inspection system.

We're not done yet! The PMA applicant must also demonstrate that they have inspection and repair instructions for their part (Instructions for Continued Airworthiness). They can often simply state that the PMA part can be maintained according to the OEM maintenance manual, but if their part is different from the OEM, or if the OEM does not provide instructions (which is increasingly common and may be a violation of FAA regulations), the PMA supplier must provide current instructions to the airlines on how to inspect and repair their PMA parts.

The applicant must also develop a Continued Operational Safety (COS) plan for their parts that addresses problem prevention, part monitoring, and problem response. The COS program must include at least:

- Detailed records of all aspects of the manufacturing cycle
- A record keeping plan for the entire part life
  - Methods to isolate possible discrepant part population, continually monitor the service use of parts, and review design assumptions based on service experience
  - Means for identifying possible failure modes and effects that account for the part's operating environment and interfaces to the next higher assembly and product
  - Methods and resources used to identify causes of failures and to develop corrective actions and means to carry out these actions quickly based on assessment of associated risks

The Modification and Replacement Parts Association (MARPA), the non-profit trade association that represents the PMA community, worked closely with the FAA to develop the COS requirements for PMA.

### **The Real Test – PMA Performance in Airline Operations**

As you can see from all of the above, the certification process for PMA parts is every bit as rigorous as the process required for the OEMs. (I haven't even included all of the details found in the regulations.) How well does this certification process actually work? The proof is in the results. PMA parts approvals began to grow rapidly in 1992. To see how PMA stacks up against the OEM parts for safety, a few years ago I reviewed all of the Airworthiness Directives for transport aircraft engines from 1992 to the present.

I chose engines because they have the greatest percentage of critical and important parts of any of the certificated products.

I found 287 Airworthiness Directives for turbine engines generated during this period; 286 were generated by OEM problems. There were three ADs associated with PMA parts. Two of these PMAs were clones of OEM designs that exhibited the same design problem as the OEM and were included on the ADs issued for the OEM parts. Beyond the engine category, I also know of one other PMA part that was found to have been the cause of a fatality in a helicopter accident. This part also replicated a design problem from the original OEM part and was joined with the OEM part in the ensuing AD.

The numbers appear to be overwhelmingly in favor of PMA. Given that there is a far greater amount of OEM material than PMA material out there flying, it's fair to say that the failure rates are probably about comparable with the PMA parts performing somewhat better than the OEM parts. The bottom line is that you absolutely do not have to accept any reduction in safety margins in order to use PMA. The PMA track record to date is outstanding!

My own small investigation mirrors the results of a much larger FAA Repair, Alteration and Fabrication (RAF) Study completed in August 2008. This study was prompted by persistent lobbying from some OEMs who claimed that PMA represented a threat to aviation safety. The study team completed a thorough review of all existing regulations, policies, and practices governing the approval of replacement parts. They also reviewed the operational performance of PMA replacement parts to date. The FAA reported,

*"... the team did not find substantive evidence of failures or unsafe conditions arising from non-TC/PC holder (non-OEM) developed data. The general population of PMA parts and non-TC/PC holder repairs, alterations have increased substantively in past years particularly in the commercial aviation sector yet the occurrence of service difficulties and airworthiness directives on such parts for design or compliance shortfalls have not increased proportionally."*



# Some More PMA Challenges

The arrival of PMA parts in large numbers in competition with OEM replacement parts is a relatively new phenomenon in our industry. Although PMA was established by the FAA about 50 years ago to enable pilots to repair obsolete WWII military aircraft, it didn't take off commercially until the 1990's. PMA is a relatively new way of doing business. Instead of acting as a passive customer and accepting replacement parts as a fixed, and often increasing, cost of business, airlines can now proactively shop for the best value proposition.

Any new way of doing business tests the existing institutions that have been built around the status quo. Regulatory agencies must modify or strengthen rules, procedures and their own organizations; repair agencies must establish new supply chain management systems to cope with the new market; and leasing companies must address issues of transferability and asset valuation.

To existing replacement part suppliers (the OEMs) the emergence of capable and aggressive competitors in what had been a monopoly market was a shock. After all, spare part sales provide most of the profit on engine programs. Predictably the OEMs reacted aggressively to defend their revenue streams, and the ensuing war of words has created still more issues that must be resolved in the minds of potential PMA customers. (Note: I have studied a number of alternative product markets such as drugs, printer cartridges, auto parts, etc. in order to estimate the potential of the PMA market. I found that while our OEMs know how to play hardball, they are gentlemen compared to some other industries.)

I'll start with those issues created by a new way of doing business.

## Regulation

All replacement parts for transport aircraft must be produced under a regulatory framework, and the rapid growth of the PMA market tested that framework. As we have already seen, the FAA regulations and procedures have grown proactively to provide a robust regulatory structure for certification that can provide a high level of confidence in the safety of complex and important parts.

The FAA has also worked with airworthiness authorities around the world to forge Bilateral Aviation Safety Agreements (BASAs). The FAA recognized that the globalization of aircraft production was a fact and set out to leverage their efforts by building a global regulatory network that could ensure the airworthiness of parts originating in any nation that had a BASA with the US. In June of 2008 a BASA was signed with the EASA, the EU airworthiness authority.

The BASA with EASA provides seamless coverage of PMA between the US and the 31 nations covered by EASA. Prior to the EASA activation Finland, France, Germany, Italy Netherlands, Norway, Sweden, Switzerland, and the United Kingdom had signed BASAs with the US. BASAs also exist with several other nations as shown in the table below.

The FAA has committed to finalizing additional BASA agreements with other nations at a rate of 2 per year. Other more limited Bilateral Airworthiness Agreements (BAAs) exist with Argentina, China, Indonesia, and South Africa. The management of replacement parts with these nations with a BAA is a matter of individual negotiations leading to the bilateral agreements. What does this mean if you are a non-US carrier? If your country has a BASA with the US, then the FAA approval of PMA carries over to your country with the exception of critical parts. If your country has a BAA, or the PMA is a critical part, you should check with the airworthiness authority in your country to determine the regulations applicable to you before you take any action on purchasing the PMA.

### Nations Having BASA Agreements With the U.S.

Australia	France*	Liechtenstein*	Romania*
Austria*	Germany*	Lithuania*	Russia
Belgium*	Greece*	Luxembourg*	Singapore
Brazil	Hungary*	Malaysia	Slovak Republic*
Bulgaria*	Iceland*	Malta*	Slovenia*
Canada	Ireland*	Mexico	Spain*
Cyprus*	Israel	Netherlands*	Sweden*
Czech Republic*	Italy*	New Zealand	Switzerland*
Denmark*	Japan	Norway*	United Kingdom*
Estonia*	Korea	Poland*	
Finland*	Latvia*	Portugal*	

*\*Nations included in the BASA agreement with EASA*

In summary, there is a robust certification and approval process for PMA that has been developed in the US. This process is being spread around the world through Bilateral Aviation Safety Agreements between the US and other airworthiness authorities. Each year the presence of PMA in an aircraft or engine is becoming less and less of an issue when transferring an aircraft title between different regions of the world.

### Availability of PMA With Outsourced Maintenance

The trend among airlines is to consider maintenance to be a non-core activity and outsource it. Once maintenance is outsourced, an airline gives up the detailed management of such things as material procurement. This may or may not be a bad deal.

If your maintenance provider is the engine OEM, you can pretty well forget about PMA savings unless you are a very large customer, and they really need the business. The most effective tool that OEMs have to block the growth of PMA competition is their ownership or control of maintenance providers. If they control the store window, they also control the type of parts that are sold through that window. You may benefit by high level maintenance management skills with an OEM, but you will not receive PMA savings. You have to decide whether a maintenance contract with an OEM is still competitive without PMA.

If you have a per-hour maintenance contract with performance guarantees, then the material costs are transparent to you. You care about the high-level value proposition - your maintenance cost per flying hour or trip. If these costs are high relative to other airlines, you are not getting a good deal. Airlines that fly aircraft types that are operated in the US can relatively quickly determine whether their costs are competitive using data that US airlines submit to the Department of Transportation. In the short term, your ability to select material sources in a per-hour maintenance contract is limited by your existing contract. All is not lost. Negotiations for contract renewal provide the opportunity to force some savings. This is the time to set up a PMA program and motivate it by sharing some of the savings with your maintenance provider.

If you have a time and material contract with your maintenance provider, and your provider is not an OEM, you definitely want to get your nose into the material. PMA could save you more than \$100,000 in an engine shop visit. Your provider should already have a catalog of PMA that they use, and they should also have experience on how these items perform. Your provider can also provide guidance on how to change your manuals to authorize the use of the parts. In this case the normal material handling fee charged by a time and material supplier should cover their cost in procuring the PMA replacement parts for you. Third-party (non-OEM) maintenance providers offer an excellent opportunity to incorporate the cost-savings benefits of PMA into your maintenance contracts.

## Leasing

Leasing is currently a challenge for PMA. This is a classic example of how a new way of doing business can intrude on an existing business structure. Lessors have two major problems with PMA, but both of these problems are diminishing over time. Every lessor has a horror story about not being able to place an aircraft at the end of the lease. The lessor is stuck with the aircraft payments but has no supporting flow of revenue. The concern is that PMA can block an aircraft transfer because not all regulatory agencies and not all airlines will accept an aircraft with PMA replacement parts, particularly if the parts are complex or “important”. This problem is getting smaller every year. Because of the operating success of PMA, more and more airlines across the globe are taking advantage of the savings they provide.

The strong regulatory structure established by the FAA is also winning over other aviation authorities, and good progress is being made with the Bilateral Aviation Safety Agreements to enable seamless use of PMA throughout the world.

The other concern to lessors is asset valuation. Lessors are finance people who are concerned that if you change out high-priced OEM parts and install lower cost PMA parts, their aircraft will have lower residual value. I believe that this too will eventually become a non-issue. When you purchase an aircraft or an engine, you are buying a capability. The fact that a small portion of that aircraft or engine may have a different manufacturer’s name on it does not affect its capability. The purchase price for that capability will be set by the supply and demand conditions in the market at that time.

Lessors also fear PMA replacement parts may affect residual value if an aircraft or engine is parted out. This usually occurs at retirement after the airlines have wrung all possible usefulness out of the aircraft. The question then becomes, “What is the value of a surplus, used aircraft part?” How much more value will a used OEM turbine blade have than a used PMA turbine blade? I predict that at aircraft retirement these parts will become commodities, and the difference in residual value will be negligible.

At this time, however, lessors can perceive financial risk with no compensating financial benefit to using PMA. At some point in the indefinite future, the lessors may find a competitive advantage in allowing PMA. The world’s largest lessor is an engine OEM that will not allow PMA. (However, at a recent trade show, even this lessor acknowledged that PMA is a reality of the industry and that they are aware that PMA parts are used on their aircraft.) Conceivably a smaller lessor could establish relationships with trusted maintenance providers that offer PMA and use this relationship to structure very competitive lease terms concerning maintenance reserves with prospective customers. We shall see.

Meanwhile, most lessors are not too concerned about small PMA items such as brackets and hardware, but you need to check your contract before you adopt any PMA on a leased aircraft or engine. Just as in outsourced maintenance, the time to bring up PMA is during contract negotiations with the lessor. It is therefore important that your maintenance, procurement, and legal teams (or other team negotiating the lease) are all on the same page with respect to PMA. Once restrictions are cast in stone, you have to live with them.

A good life cycle financial model of the cost of leasing with and without PMA can help you estimate what a leasing restriction will cost you, and you can use this estimate to press for favorable terms on the maintenance reserve. I have seen in recent years at least two major air carriers openly state that they refuse to sign any lease agreement unless it permits the use of PMA because PMA has become such an important part of their overall maintenance and financial strategy.

Now let’s look at the controversy created by the OEM opposition to PMA.

## OEMs claim that PMA parts are not as good as the original OEM parts

Years ago, there was an advertisement by an engine OEM showing a tired, second-rate Elvis impersonator along with the headline, "LET'S FACE IT, LOOKALIKES NEVER PERFORM QUITE LIKE THE ORIGINAL". As we have seen earlier, the substantiation requirements for PMA are the same as for the original equipment, and the approval process is quite rigorous. In fact, OEMs receive approval via a type certificate for the entire aircraft or engine and do not have to substantiate the design of every individual part the way that PMA part designers do. Typically, a new engine design matures five years or more **after** the engine enters service. The engine is considered technically mature when the number of new part failure modes finally decreases. If the OEM part designs were perfect, we wouldn't see so many service bulletins.

The Airworthiness Directive database maintained by the FAA and the recent FAA comprehensive study also show that PMA parts perform every bit as safely as those supplied by the OEMs. In fact, as we have seen, in two out of the three ADs for PMA engine parts, the problem was that the PMA did perform quite like the original.

This OEM campaign provoked a sharp response from the FAA in the form of a Special Airworthiness Information Bulletin. This bulletin made it clear that when the FAA approves a PMA part, they expect that

*"...the industry will treat that approval with the respect that a decision of the FAA deserves, and that furthermore, such parts are entitled to the full recognition of the FAA's approval, and it is not up to the engine manufacturer to say that installation of a PMA part is wrong or invalid."*

Ouch!

## OEMs claim that PMA designers don't understand system effects

This concern, raised by an engine OEM, is a subtle variation of the first issue. The logic used is that the OEM is the designer of the entire engine, and only they understand the relationships that exist between different parts of the product. Engines are sophisticated and complex. A small change anywhere can have dire consequences somewhere else on the engine. A PMA company that designs a single part has no concept of how they might be affecting the rest of the engine.

This sounds like a valid concern unless you understand how engines are really designed and manufactured. Today the OEMs often do not design the entire engine. If you own an IAE or CFM engine, different portions of the engine were designed and built by different companies on different continents. In spite of the potential communication difficulties, these are highly successful engines that perform very well. Secondly, any mass-produced item uses dimensionally controlled parts that are interchangeable. It is not uncommon to have an original engine part manufactured by more than one external supplier according to prints supplied by the OEM. PMA suppliers act in the same manner as any OEM supplier. Instead of receiving a print from the OEM, however, they develop their own print using samples of OEM parts and reverse engineering techniques. In many cases these reverse engineering techniques produce parts that have tighter tolerances than the OEM originals. Furthermore, my experience is that engines are not quite as mysterious and sensitive as the OEMs would have us believe.

A possible slight change introduced by a PMA design is certainly smaller than the changes that are routinely introduced by maintenance organizations during the repair of the original engine parts.

## OEMs threaten not to honor their warranty if PMA parts are used

Potential customers are frequently deterred from purchasing PMA parts because they fear that the OEM will no longer honor their warranty. This is in fact a non-issue for a couple of reasons. Firstly, the value of your warranty changes with the age of your engines. The most important warranty that you get from the OEM is the new product warranty. These typically provide replacement of all parts that fail during the term of the warranty.

Nobody is going to consider buying PMA instead of accepting free parts from the OEM. Conclusion: the most valuable warranty you have is never threatened because there is no motive to use PMA while the warranty is in effect. **(Caution: you need to prepare your cost accountants and senior management for the shocking increase in maintenance cost that will occur when these warranties run out!)**

The extended warranty following the new product warranty is defined by your contract with the OEM. Legally, a contract is a promise that is enforceable under law. This contract defines your rights and the OEM's obligations. The OEM cannot ignore your rights or change their obligations without a negotiation and a new (or amended) contract that is accepted by both parties. (This is another reason to make sure the team negotiating your contracts is on the same page as the rest of the organization with respect to PMA.) If you are concerned about the OEM not honoring the warranty, read it to determine if they can legally carry out the threat, and analyze your warranty to determine its actual value to your airline.

I recommend this approach if the OEM threatens not to honor their warranty:

- Thank them for bringing up the subject
- Tell them that the warranty has not been at the top of your priority list, but that they have aroused your interest, and you will now review it to make sure you are collecting everything to which you are entitled
- If the warranty is worth anything, establish and resource a system to ensure that you collect every dollar possible under the warranty (***This may actually pay off handsomely.*** I've extracted a few millions from OEM warranties during my airline career.)
- If the warranty is not worth a systematic effort to collect it, then why worry about it at all?

After this happens a few times, I bet that a letter appears from the front office telling local OEM representatives not to mention warranties anymore.

Finally, PMA parts have warranties too. Check out the part warranty offered by a PMA supplier and see how it compares to the OEM part warranty. You might be favorably impressed.

### **OEMs threaten not to support the engine if PMA parts are used**

The regulatory obligation of the OEM after the sale of the aircraft is the same as that of the PMA supplier:

- Report malfunctions, failures or defects in their products
- Distribute the initial Instructions for Continued Airworthiness for their products
- Make any required design changes to preclude unsafe conditions and correct non-compliances when the FAA finds that an unsafe condition exists or is likely to develop which requires an airworthiness directive to correct

There is no regulatory requirement for an OEM to provide support beyond these three items, and they could legally reduce support to this level. This could cause problems. Sometimes aircraft or engine problems are beyond the capability of an airline engineering staff to diagnose. OEMs have a wealth of engineering knowledge, and their support is a valuable tool in these instances. I have used it many times during my career. Refusal to support their products, however, is a sword that cuts two ways.

Any airline engineer responsible for maintenance understands how the loss of OEM technical support would hurt the airline, but what would the pullback of support cost the OEM? The OEM could lose the operational information that they need to ensure the airworthiness and competitiveness of their products. Severe airworthiness problems never appear out of thin air. There are always warning signs that develop ahead of time in field operations. That is why OEMs need to stay close to the fleets operated by their customers to find these problems early and to apply corrective actions.

Failures affecting airworthiness hurt the reputation of the OEM. The airlines are a small, interconnected, and unforgiving community. An OEM that hurts the airlines by failing to contain technical problems will have great difficulty selling its products in the future. Airlines should always remember that they are the customer!

Even if you don't use PMA, you will find that engine OEMs are already reducing their industry support to some extent. Their manuals, that are legally required to provide instructions for continued airworthiness, are increasingly populated with part repairs that state something along the lines of, "Send your part requiring repair to one of my business partners. By the way we are not responsible for anything that they do." This tactic provides revenue to the OEM, drives up maintenance costs, eliminates information that could be used to develop PMA, and forces PMA suppliers to dedicate resources to develop instructions for continued airworthiness.



## Starting a PMA Program

I remember a conversation that I had long ago with a sales representative from a PMA supplier. He said, "I have the easiest job in the world. All I have to do is convince airline employees to take on extra work and extra risk." We have thoroughly disposed of the extra risk part of that quote, but there is no doubt about PMA creating extra work. In order to reap the rewards of PMA, which can be substantial, an airline must do some extra work. In this section I'll talk about what you must do to operate a profitable PMA program. This "what to do" will be based on best practices that I have seen in the industry and a few best practices (recommendations) that I developed to maximize savings.

### Senior Management Involvement

Senior management must drive your PMA program if it is going to be successful. Without senior management involvement, you may dabble in PMA, but you'll never save millions of dollars. PMA incorporation requires resources from supply, engineering, purchasing and quality assurance.

As I mentioned above, it also requires legal to be aware that they should push for the right to use PMA in your leases and extended warranties. Management interest ensures that these resources are available to do the work required to operate the program. Management must also establish goals and measures for PMA implementation to drive the program and maximize the savings.

Senior management also protects the program against OEM pricing countermeasures. The OEMs often react to PMA with sudden and dramatic price reductions. Once the PMA has been forced out of the market, they are free to raise prices again. Senior management can take the strategic, long-term viewpoint to achieve some level of control over replacement part prices to moderate the growth of material costs in the future. Senior management involvement sends a clear message to the OEMs. "Your market share will shrink just as fast as your prices increase."

### Interdisciplinary Approach

No single existing organization in the airline is resourced to accomplish all the activities that must be carried out to operate a PMA program. The program will require the synchronized actions of supply, purchasing, engineering, and quality assurance. Supply needs to focus efforts on the applications with the greatest potential for savings and manage the PMA supply chain. Purchasing takes care of the business aspects and evaluates the financial viability of vendors. Engineering determines the acceptable criticality of applications and reviews and approves the quality of the PMA design. Quality Assurance audits and approves the quality system of the supplier.

The team established by senior management must provide dedicated resources from all of these organizations. If a prospective PMA must bounce from organization to organization, each stop becomes another long queue, and savings will accrue very slowly.

## Supply

“Show me the money!” is a classic movie line that should apply to your PMA program. Supply spends the money to obtain replacement parts for your aircraft. A simple analysis that ranks the amount spent on replacement parts from greatest to least will separate the significant few from the trivial many. In some cases it may be beneficial to group very similar parts into families to obtain a true picture of their financial impact. This analysis will focus the organization on the parts with the greatest potential for savings. Sorting by amount spent also provides an efficient approach for purchasing by developing a high impact shopping list to focus efforts on the greatest potential PMA savings.

Once the program is up and running, supply must manage the PMA supply chain and manage the stocking and distribution of the new PMA parts.

## Purchasing

Use the information from supply to set up your PMA attack plan. Provide some quick wins with easy applications to gain management confidence. Follow on with some big wins on high impact parts that combine high unit cost with high volume to keep their interest.

One of the best ways to leverage your resources for the PMA program is to evaluate and approve suppliers before you approve parts. Why use resources to approve part designs if you don't want to do business with the supplier?

Airlines fly their aircraft for many years. You want your supplier to be in business as long as you own your aircraft. The purchasing organization can screen potential vendors on such criteria as their financial resources, years in the business, track record, liability insurance, and part warranty.

It is easier to work with a relatively few suppliers with broad product offerings than a host of small suppliers. Once a prioritized list of parts is available from supply, find suppliers who can provide many of the products that you need. This reduces the overhead in vendor management and quality assurance. An exception to this rule would be a supplier that specializes in a high value replacement part not offered elsewhere.

Alliances with a broad-based supplier can be beneficial. Under these alliances the PMA supplier commits to developing the parts from your high priority list in return for a guarantee from you to purchase these parts from them for a specified period of time.

This type of agreement provides you with relatively rapid development of the parts you need and protects the PMA provider from being undercut by new competition or the OEM. As part of a development program, you may share some parts or information about your experience with the part performance with a PMA supplier, but you should never share OEM data or drawings.

Responsible airlines understand the need to protect the intellectual property rights of the OEMs. When I managed airline engineers, I made sure that they understood that it would cost them their jobs if they shared an OEM print with any outside organization.

There are things that you do want to share with PMA suppliers. A significant annoyance expressed by airlines is that the PMA part documents do not show the complete effectivity for the part so the airline is unable to fully deploy the PMA. Let the suppliers know the aircraft and engine types and subtypes that you operate so they can provide complete information.

In addition, when you have landed a supplier, keep them informed on the volume of purchases that you will make in the future. This helps them to manage their production efficiently and minimizes the possibility of shortages.

In some instances, you may find it beneficial to form alliances with other airline maintenance organizations to build up the demand for a specific PMA part. Accurate insight into a high level of unfilled demand can spur a PMA supplier to move quickly.

A few airlines have provided engine test time for PMA development in return for substantial compensation. This is not a common practice. In general airlines expect the PMA suppliers to come to them with complete designs.

A good way to waste program resources is to compete several PMA providers against each other. The significant savings you need to achieve is found in the difference in price between the OEM and PMA. The difference in cost between PMA providers is small in comparison to this.

It is better to use your resources to move on to the next part approval where you can save dollars rather than to try to save pennies on an existing PMA application. Once the magnitude of program savings has achieved its goal, you can always return and fine tune the program.

Purchasing will play a key role in the PMA program if maintenance is outsourced. In this case purchasing must ensure that favorable PMA provisions are included in the maintenance contract. These provisions should be structured to drive the program to the level of savings desired by the airline. Sharing savings with the maintenance provider should be considered to provide motivation to the provider in a by-the-hour contract. In a time and materials contract you should be able to select the PMA items that you want from the provider's inventory, and you should be able to specify new types of PMA parts that will benefit your own operations. The provider should be willing to work with your engineering department to develop a list of approved PMA for your operations. The bottom line is that you need to understand the financial potential of PMA savings and make them a part of the financial analysis when selecting a maintenance provider.

## Engineering/Technical Services

The FAA approves PMA, and no further technical approval by an airline is legally required. The only FAA requirement regarding replacement part installation is that the airline must ensure that it installs only FAA approved parts. All PMA parts are, by definition, FAA approved parts. Remember, these PMA parts have already gone through the same certification as the original product from the OEM.

Currently, airline internal approvals of PMA applications cover the entire range from simply ensuring that the part is FAA approved to a full recertification of the PMA product design. You are responsible for maintaining the airworthiness of your aircraft. Your engineering organization must do some soul searching concerning how you want to approach the PMA process before you review your first part or receive your first PMA salesman.

If you decide that you must have a technical review of PMA before you approve it for your airline, an approach that maximizes scarce engineering resources is basing the intensity of review on the criticality of the PMA application and your experience with the PMA supplier. Applications with higher levels of criticality merit more review than simple parts that are neither "important" nor "critical". New suppliers to your airline also merit more review than suppliers that have demonstrated their competence and integrity to you.

What level of criticality are you capable of evaluating for a PMA application? What level of criticality do you want to accept in a PMA part? You can build a simple hierarchy from easiest to most difficult such as:

1. Simple external hardware (Nuts, bolts, brackets, shims, hoses, etc.)
2. Simple internal hardware (Nuts, bolts, bushings, etc.)
3. Simple parts
4. Complex parts or assemblies
5. Important parts (Can affect the performance of an aircraft or engine)
6. Critical parts (Can affect the airworthiness of an aircraft)

Several airlines are flying important parts such as brakes, blades, and combustors. There are several life-limited critical parts now in test, but nobody is flying them yet.

Another technique to leverage engineering resources is to group parts into part families. A part family is simply a group of parts with similar characteristics and operating environment. Examples would be all compressor blades or all low-pressure turbine blades. Think through the important characteristics related to safety and reliability associated with the family. These are the characteristics you will want to verify in the PMA design. Once you have done this analysis for one part in a family, the same pattern can be repetitively applied to all of the rest of the parts in the family using a family-oriented checklist. This can get even easier. Once you know that a certain PMA supplier is fully competent in designing and manufacturing one part in a family, you need to spend very little time reviewing other similar parts from that supplier. This is similar to the risk-based approach that the FAA takes.

If you lack the technical expertise to directly review the certification basis and supporting data, or if you do not have the engineering resources to commit to a technical review, you can exploit the prior experience of other airlines to determine how a part will behave in service. Ask the PMA supplier for the operating history of the part, and also ask for airline references. Every airline that I have talked to is willing to freely share their technical experience with PMA. Actual operating experience is a better test than any external review, and there is no reason for every airline to accomplish the same design review over and over again. Don't forget that there is no legal requirement to duplicate the FAA approval process on PMA parts, and the performance of PMA to date has been outstanding.

Technical approval of a PMA part is just the beginning. Engineering still has some work to do. The airline is legally responsible for keeping maintenance records, and the engineering organization is responsible for defining the content of the aircraft. Every part on the aircraft must be shown as approved for installation in an engineering document, and every part that is to be repaired must be approved for that repair.

- Typically, the Illustrated Parts Catalog must be revised to show the PMA parts approved for the aircraft, and interchangeability with OEM part numbers must be documented
- The stores catalog must be revised to show that the PMA parts are approved for purchase.
- Installation documents such as job cards and on logs must be revised to specify the use of the PMA part
- Repair documents for the part such as inspection criteria, repair instructions, and shop routers must be revised to show them to be applicable to the PMA part
- If the PMA repair is different than the OEM part repair, new repair documents specific to the PMA part must be issued. These must be blended with existing OEM documents so that both types of parts can continue to be repaired

In other words, if use of a part has to be documented for an OEM part, it also has to be documented for a PMA part.

## Quality Assurance

Airlines are no strangers to quality assurance. Airlines continuously send inspectors to audit the quality systems of maintenance suppliers. In this respect PMA suppliers are no different than any other maintenance supplier. No special training of your quality assurance organization is required to verify the quality systems of a PMA supplier.

Like everyone else in maintenance, your quality assurance organization is already very busy. This is one good reason to work with a few very good suppliers with a broad range of products. One audit can cover the audit requirements for many products, and fewer quality assurance resources will be required to support the program.



# Meet the Authors

## David Doll

Mr. Doll is a 40-year veteran in the field of maintenance design and operations management. He has held key technical manager positions at United Airlines, including process engineering, fleet technical services, manufacturing engineering and component re-manufacturing. He currently provides consulting services in operations analyses, process re-engineering and market evaluation.

Mr. Doll has extensive experience in strategic planning, process improvement and project management. He pioneered the concept of high velocity production systems in repair environments and has helped numerous repair facilities improve maintenance programs and repair operations.

Mr. Doll holds a B.S. degree in mechanical engineering from Trinity College and an M.S. degree in mechanical engineering from the University of Santa Clara.



## Ryan Aggergaard

Ryan Aggergaard is an attorney based in Washington, DC. He is an honors graduate of the George Washington University Law School and was a member of The George Washington Law Review.

Mr. Aggergaard represents numerous clients in the aviation industry, including manufacturers, distributors, and repair stations, as well as trade associations such as the Modification and Replacement Parts Association and the Aviation Suppliers Association.

Mr. Aggergaard has assisted clients in various matters before the FAA, as well as export compliance matters before the State Department and the Department of Commerce. He is also an expert in Export regulations and the emerging field of Unmanned Aircraft Systems (UAS or “drone”) law.



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Website: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

### Representative Information

Name: \_\_\_\_\_ Title: \_\_\_\_\_

E-Mail: \_\_\_\_\_

### Please check appropriate box and fill in answer:

**We produce PMA parts (Regular Member)**  
Date your first PMA was issued: \_\_\_\_\_  
Number of employees: \_\_\_\_\_  
Number of production locations: \_\_\_\_\_  
If a Corporate Membership, name company affiliates: \_\_\_\_\_

**We do not produce PMA parts (Supporting Associate, DER, Government, Cooperating Trade Association, or Airline)**  
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### Mission Statement

MARPA is the non-profit association of aviation industry modification and replacement PMA parts manufacturers, and other individuals and entities associated with that industry. The Association promotes its members' business efforts by promoting uniform standards of excellence in the members' efforts to secure FAA design and production approvals for parts while representing the industry on regulatory issues. MARPA speaks with a single, powerful voice to the entire worldwide aviation community thereby elevating the acceptance and prestige of each of its members.

MARPA Dues Table	
1-50 employees in one company	\$1,500
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Please contact MARPA with any questions.

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As of October 31, 2023

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*ametekmro.com/services/pma*

ATA Codes: 26 35

Founded in 1988, AMETEK AMERON has pioneered numerous advances in aerospace fire suppression systems & is a leader in fire extinguishers, oxygen crew masks, oxygen bottles & other high pressure cylinders. Ameron Global Product Support has more than 650 FAA PMA parts & components for aircraft fire extinguishing, crew oxygen & EPAS systems. These parts & components are designed & manufactured as a high quality solution for operators & MROs & are available for quick delivery via a global distribution network.

## **Aruba Airlines**

*arubaairlines.com*

Aruba Airlines is the flag carrier & the sole airline of Aruba. The airline, founded in 2006, provides scheduled & charter air transport for passengers to 13 destinations.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Approved Air Parts

Steve Grieme  
President  
steve.grieme@airgroupamerica.com  
+1.724.779.9500

[airgroupamerica.com/aapco.asp](http://airgroupamerica.com/aapco.asp)

ATA Codes: 21 22 24 25 27 28 29 30 32 33 36 38 49  
54 61 63 71 72 73 75 76 78 79 80

Approved Air Parts, LLC. (AAPCO) was founded in 1994 as a FAA-PMA development company, focused on offering customers deeply discounted, top quality alternatives to O.E.M. products. The FAA-PMA parts we produce meet or exceed the quality & performance of the respective OEM products they replace. Over the years we have earned a great reputation for producing a product line of exceptional quality at very competitive prices. We specialize in high precision, specialty bearings, carbon parts, & machined parts.

## Atco/LanAir

Mike Demers  
President  
mdemers@atcosales.com  
603.433.0081

[www.lanairinc.com](http://www.lanairinc.com)

ATCO, Inc. is an established direct-sales distributor in the commercial aviation spares aftermarket and FAA Part 145 Repair Station. LanAir, Inc. is the research & development arm of ATCO, responsible for engineering, manufacturing, and quality controlling all of the goods sold through ATCO.

## Asiana Airlines, Inc.

Jasmine Lee  
Purchasing Contract Manager  
gyoony@flyasiana.com  
+82.1588.8000

[us.flyasiana.com](http://us.flyasiana.com)

Established in 1988 with the management ideology, 'maximum safety & customer satisfaction through service', Asiana Airlines had developed into a truly global airline.

## Austrian Airlines AG

Mario Perovic  
Component Engineer  
mario.perovic@austrian.com  
+43.676.854.63095

[austrian.com](http://austrian.com) or [austriantechnik.at](http://austriantechnik.at)

ATA Codes: 21 22 23 24 25 26 27 31 32 33 34 35 38  
44 46 50 51 54

Austrian Airlines (AUA), is part of the Lufthansa Group operating from its hub in Vienna. It is Austria's biggest airline with over 60 years of aviation experience.

Austrian Technik-

Our mission is to provide operational aircraft.

We maintain aircraft & components & solve problems quickly & in a customer-oriented manner to support Austrian Airlines' operations.

We are your partner of choice for all maintenance services & continuously improve our services. Our services have a direct impact on the passenger experience & satisfaction – so we keep moving.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **AV8 PMA, LLC**

Michael Morton  
Project Manager  
mikem@av8pma.com  
713.589.2668

*av8grp.com*

ATA Code: 32

AV8 PMA uses the latest technology, combined with more than 20 years of engineering experience to aid in the reverse engineering of aircraft parts. The team at AV8 PMA has the experience & resources to successfully navigate the certification process all the way through to manufacturing. The result is high-quality, certified replacement parts at a very competitive price. We have experience with a variety of parts & assemblies including Sheet metal parts, machined parts, rubber seals & O-rings, Teflon parts, electrical & hydraulic components, specialized hardware & much more.

## **Aviation Component Solutions**

Rick Ray  
Sales Director  
ray@acs-parts.com  
801.673.3220

*acs-parts.com*

Aviation Component Solutions is a principal in the OEM alternate product industry. A world-class PMA company. ACS designs, certifies & manufactures PMA parts for every major MRO & airline worldwide. Our forte includes: HMU/FMU Fuel, Vacuum Generator, Hydraulic Pumps/Actuation, Pneumatic Valves & Air Conditioning components.

## **Avianca Group**

*avianca.com*

Avianca S.A. is a Colombian airline. It has been the flag carrier of Colombia since December 5, 1919, when it was initially registered under the name SCADTA. It is headquartered in Colombia, with its registered office in Barranquilla & its global headquarters in Bogotá & main hub at El Dorado International Airport. Avianca is the largest airline in Colombia & second largest in Latin America. Avianca & its subsidiaries have the most extensive network of destinations in Latin America.

## **Aviation Technical Services (ATS)**

Travis Day  
Manager, Product Support  
travis.day@ATSmro.com  
+1 972.245.6699

*ATSmro.com*

ATA Codes: 20 21 25 27 28 29 30 32 33 36 38 51 52  
53 54 57 71 75 78

ATS specializes in making the MRO process better through reducing span times, increasing mechanic efficiency, improving airline operational performance, & lowering overall costs through repair prevention strategies including targeted delivery of PMA parts & STC offerings.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Aviatron, Inc.**

Alex Troche  
Mechanical Engineer  
802.865.9318

*aviatron.com*

Aviatron is an FAA certified & EASA approved repair station providing component overhaul & repair services for a wide range of turbine powered aircraft.

## **British Airways**

Gerald Ojo  
Technical Engineer  
gerald.ojo@ba.com  
+44.0.778.961.3324

*britishairways.com/travel/home/public/en\_us/*

British Airways is a global airline, bringing people, places & diverse cultures closer together for more than 100 years. Serving our community & planet is at the heart of everything we do, & we look forward to sharing our exciting sustainability initiatives with you.

## **Brackett Aero Filters**

Scott Brackett  
President  
baf@citlink.net  
928.757.4009

*brackettaerofilters.com*

Bracket Aero Filters, formerly AC, have been in service on aircraft & helicopters since 1968. At present, Brackett Foam Filters are installed as factory original equipment on 16 current production aircraft & four helicopters.

## **Bel-Air Manufacturing**

Ali Ossaily  
President  
ali@belairmachine.com  
714.801.2222

*belairmfg.com*

Since 1956, we have developed into a global supplier of precision metal formed components. "ISO 9001:2015" certified by DQS Inc, we dedicate ourselves to acting as a division of every company we do business with. We provide engineering services, high volume tooling, metal products & assemblies. We take pride in our emphasis on early customer involvement which allows us to assist in the early stages of design & engineering. Ultimately, we are able to provide the resources & expertise to exceed our customers' expectations & supply them the finest metal stampings, components, wire forms & assemblies. Our ability to supply Stampings, Four-Slide formed components, Wire-forms & Assemblies allows our customers to reduce their vendor base by two or even three companies when bringing Bel-Air Manufacturing on board to meet all their metal forming needs!

## **Chromalloy**

John Riggs  
Director of Airworthiness  
jriggs@chromalloy.com  
561.935.3571

*chromalloy.com*

Chromalloy's LifeX® solutions safely & reliably extend the life of aircraft engines. Our innovative LifeX repairs & solutions increase the yield of critical engine parts, meaning fewer parts to replace & savings on each shop visit. If a replacement is required, our FAA-certified & industry-proven LifeX parts, provide further value.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Civil Aviation Authority of New Zealand

[aviation.govt.nz](http://aviation.govt.nz)

We work to make sure everyone involved in New Zealand aviation meets the legal standards set by the Minister of Transport.

There are two parts to our organization: the agency overseeing aviation safety & security, & the rules underpinning it the Aviation Security Service, known as AvSec. You'll see most of AvSec's staff working at airports – they're the ones screening passengers & their luggage.

## Copa Airlines

Erick Yep

PMA Development & Contract Parts

[eyep@copaair.com](mailto:eyep@copaair.com)

[copaair.com](http://copaair.com)

Copa Airlines was founded in 1947 as the national airline of Panama. It is now a leading Latin American provider of passenger & cargo service.

## DAC Engineered Products, LLC

Erik Hatch

President

[info@dac-industries.com](mailto:info@dac-industries.com)

651.748.1750

[dac-industries.com](http://dac-industries.com)

For over 35 years, DAC Industries has developed & manufactured a line of spray products tailored for injection molding operation & maintenance. DAC Industries serves the Plastic Injection Molding, Die Casting & Textile Industries, as well as related manufacturing.

DAC Industries is recognized for high performance products & impeccable technical support. Our purpose is to advance changes that benefit our customers by producing consistent, quality products today, & developing innovative solutions to serve the needs of tomorrow.

## Civil Aviation Safety Authority Australia

Larry Russell

Manufacturing Inspector

[larry.russell@casa.gov.au](mailto:larry.russell@casa.gov.au)

+61.7.3144.7338

[casa.gov.au](http://casa.gov.au)

The Civil Aviation Safety Authority (CASA) is a government body that regulates aviation safety in Australia.

## Core Parts LLC

Chris Hinkle

Engineering Manager

[chinkle@coreparts.com](mailto:chinkle@coreparts.com)

480.292.9380

[coreparts.com](http://coreparts.com)

ATA Code: 70

Core Parts LLC is a PMA parts provider for both turbofan & turboprop engine components, specializing in PT6 & JT15D. Our proven high-quality products span from complex components to 100% replacement parts. One of our core strengths is our attention to the customer's needs & we work diligently to create the right solutions for them. We understand our customers have choices with PMA suppliers so we focus our attention on part quality, customer service, product availability, & pricing.

## DCMA - Commercial Item Group

Jacob Marble

Commercial Price/Cost Analyst

[jacob.d.marble.civ@mail.mil](mailto:jacob.d.marble.civ@mail.mil)

727.365.5340

[dcma.mil/Commercial-Item-Group](http://dcma.mil/Commercial-Item-Group)

Commercial Item Group Mission - Modernize commercial acquisition practices supporting affordability & readiness for the Warfighter.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Delta Air Lines

David Linebaugh  
Manager, PMA Approval Team  
david.linebaugh@delta.com  
404.714.0294

*delta.com*

Delta Airlines is a worldwide airline, serving more than 160 million customers each year, offering service to 350+ destinations in 70 countries on 6 continents.

## Donaldson Company, Inc.

Scott Petersen  
Territory Manager  
Scott.Petersen@donaldson.com  
+1 952.887.3726

*donaldson.com*

ATA Codes: 21 23 24 25 27 28 29 30 32 34 36 38 47  
49 63 66 69 70 73 75 78 79 80

Filtration solutions

## Egypt Air

*egyptair.com*

EGYPTAIR is the world-renowned national airline of Egypt, based in the cosmopolitan city of Cairo. It started operations May 7th 1932 as the first airline in the Middle East & Africa & the seventh airline in the world to join IATA & become a treasured brand. Throughout its 88 years of service, Egypt Air has experienced significant growth.

## DHL Air Limited

André Fabricius  
Director Quality Management & Compliance Monitoring  
Andre.fabricius@dhl.com  
+49.341.4499.1211

*dhl.com*

DHL offers integrated services & tailored, customer-focused solutions for managing & transporting letters, goods & information. We're the global leader in air freight, carrying 12% of the total worldwide market.

## EDC

Brad Renter  
Business Development  
brad@edcpma.com  
206.600.1931

*edcpma.com*

ATA Codes: 21 25 27 29 30 32 33 38 52 69

EDC is committed to providing OEM alternative solutions for our airline & MRO customers. Our experience spans over 30 years within the FAA PMA Industry, reducing part costs & improving part availability. EDC capabilities include machined alloys, glass lenses, wiring harnesses, lighting of all types, seals & molded plastics.

## El Al Engineering

Kobi Golan  
AVP Global Operations  
kobig@elal.co.il  
+972.3.971.6945

*elal.com*

El Al Israel Airlines Ltd. is the flag carrier of Israel. Since its inaugural flight in September 1948, the airline has grown to serve over 50 destinations, operating scheduled domestic & international services & cargo flights within Israel & to Europe, Middle East, Americas, Africa & the Far East.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Emirates

+971.4.218.1474

[emirates.com](http://emirates.com)

Emirates is the largest airline in the Middle East, operating over 3,600 flights per week from its hub at Dubai International Airport, to more than 140 cities in 81 countries across six continents. Cargo activities are undertaken by Emirates SkyCargo.

## Envoy Air Inc.

Melisa Price

Commodity Manager

[melisa.price@aa.com](mailto:melisa.price@aa.com)

972.374.9432

[envoyair.com](http://envoyair.com)

Envoy Air Inc. is a wholly owned subsidiary of American Airlines Group operating over 150 aircraft on nearly 900 daily flights over than 150 destinations. The company's over 14,000 employees provide regional flight service to American Airlines under the American Eagle brand & livery & ground handling services for many American flights.

## EthosEnergy Accessories & Components, LLC

Nelson Rouette

Vice President

[nelson.rouette@ethosenergy.com](mailto:nelson.rouette@ethosenergy.com)

713.812.2300

[ethosenergy.com/sectors/aerospace](http://ethosenergy.com/sectors/aerospace)

EthosEnergy has over 40 years' industry experience providing quality certified & OEM-approved MRO solutions. With repair, overhaul, & testing services for aero-derivative fuel nozzles, turbines, & other critical aerospace components, we have the expertise you need to maximize your airtime.

## Endeavor Air

Ethan Strauss

Purchasing Agent

[ethan.strauss@endeavorair.com](mailto:ethan.strauss@endeavorair.com)

+1.612.266.1367

[endeavorair.com](http://endeavorair.com)

Endeavor Air, a wholly-owned subsidiary of Delta Air Lines, is the world's largest operator of CRJ-900 aircraft. Flying as Delta Connection, Endeavor operates 124 regional jets on 700 daily flights to over 100 cities in the United States & across North America.

Headquartered in Minneapolis, Minn., Endeavor has hub operations in Atlanta, Cincinnati, Detroit, Minneapolis, & New York City.

## Ethiopian Airlines

[ethiopianairlines.com](http://ethiopianairlines.com)

Ethiopian Airlines is Ethiopia's flag carrier & is owned by the Ethiopian government. Its hub & headquarters are at Bole International Airport in Addis Ababa, from where it serves a network of 113 passenger destinations & 35 freighter destinations. Ethiopian flies to more destinations in Africa than any other carrier.

## EXTEX Engineered Products

Eric Kessler

Sales & Business Development

[eric.kessler@kaman.com](mailto:eric.kessler@kaman.com)

480.632.1039

[extensexengineered.com/](http://extensexengineered.com/)

EXTEX Engineered Products designs & supplies high-precision, aftermarket aerospace replacement parts for helicopters & fixed-wing aircraft. Our proven innovations & consistently high-quality aircraft parts have kept us at the forefront of our industry. Backed by our heritage of aerospace innovation, EXTEX Engineered Products conform to the original form, fit & function, with robust designs that, in some cases, have been adopted by the OEM.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **EVCO, LLC**

Ed Vido  
President  
evido@evco-llc.com  
714.305.1964

*evco-llc.com*

ATA Codes: 27 28 29 30 32 35 36 38 48 52 53 54 56  
61 71 72 72T

A solutions-based company that works closely with airlines & partner companies to provide superior replacement products. We strive to make our PMA parts superior to OEM parts. EVCO utilizes partner companies who have experience with a target component. Most often, the partner company has produced a similar part for an OEM. EVCO looks to replicate successes like the Cobham/Eaton ASM with other PMA products. With our partner companies, we provide a wide range of components/parts & capabilities such as ASMs, fluid & pneumatic valves, oxygen sensors, assemblies, actuation, gears, motors, composites, landing gear, etc...

## **Finnair**

Petriina Lustig  
Purchasing Manager  
petriina.lustig@finnair.com

*finnair.com/us-en*

We are a network airline specialized in connecting Europe, North America & Asia via our Helsinki hub.

Founded in 1923, we are one of the oldest continuously operating airlines in the world. We are part of the oneworld alliance.

Sustainability is at the core of our strategy. Our long-term target is carbon neutrality: we want to maintain the social & economic benefits enabled by air connections, while dramatically reducing the carbon footprint of air travel.

## **FedEx Express**

Michael Wilson  
Manager, Supplier Relations & Performance  
Management  
mjwilson@fedex.com  
901.224.3436

*fedex.com*

FedEx Express covers every U.S. street address & services more than 220 countries & territories. Our global network provides time sensitive, air-ground express service through 375 airports worldwide.

## **First Aviation Services, Inc.**

Paul Bolton  
Chief Operating Officer  
pbolton@firstaviation.com  
+1.336.970.5921

*firstaviation.com*

ATA Codes: 24 26 27 29 32 33 35 39 51 52 53 54 55  
60 61 62 63 64 65 67

Leading provider of aircraft parts manufacturing, component repair & overhaul, & rotables management to the aviation industry. First Aviation's principal operating subsidiaries are: Aerospace Turbine Rotables, Inc., Associated Aircraft Manufacturing & Sales, Inc., Aviation Blade Services, Inc., Evolution Aerospace, Inc., Master Support, Inc., Heliblade International, LLC, & Piedmont Propulsion Systems, LLC. Together, the companies repair & overhaul aircraft landing gear systems, helicopter rotor blades, actuation systems, structures, IFF systems, lighting, power supplies, oxygen & fire suppression systems, hydrostatic testing, crew masks, & all Dowty, Hamilton, Hartzell & McCauley propellers.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Flaps Aviation PVT LTD

sales@flapsaviation.in

+91 9999741207

*flapsaviation.com*

Our company's backbone is its dedicated team that brings to the table a collective expertise & experience that makes us a formidable ally in the Indian aviation sector.

We are determined to provide state-of-the-art, easily accessible & affordable spare-parts, maintenance services, management services & stellar turnkey & aircraft management services to our customers.

We were also the first Indian service provider to offer online booking for air ambulances & look forward to introducing emergency air-evacuations at par with those present in USA & Europe.

## Garuda Indonesia

Lutfie Salman Al Farisy

Senior Manager Aircraft Engineering

lutfie.sa@garuda-indonesia.com

+62.897.965.4634

*garuda-indonesia.com/sg/en/index*

Presenting a new level of service excellence in air travel, Garuda Indonesia, the national flag carrier of Indonesia, seamlessly connects more than 90 destinations worldwide to not only one of the largest economies in Southeast Asia, but also an array of exotic destinations in the beautiful archipelago of Indonesia all at once. With more than 600 daily flights, Garuda Indonesia proudly serves its passengers with the award-winning "Garuda Indonesia Experience" service, which highlights the warm Indonesian Hospitality & rich diverse culture. Garuda Indonesia group currently operates 202 aircraft with an average age less than five years. This amount is accommodated by Garuda Indonesia as a main brand with a total of 144 aircraft, & Citilink as a Low Cost Carrier Airline which operates 58 fleet aircraft.

## Garrett Engineering Consulting LLC

Steven Garrett

Consultant DER

Steven.Garrett@GarrettEngineering-LLC.com

480.776.9907

*GarrettEngineering-LLC.com*

ATA Codes: 20 21 22 23 24 25 26 27 28 29 30 31 32  
33 34 35 36 37 38 39 40 41 42 44 45 46 47 48 49 50 51  
52 53 54 55 56 57 60 61 62 63 64 65 66 67 70 71 72  
72T 72R 73 74 75 76 77 78 79 80 81 82 83 84 85

As a Consultant DER, I work with my clients by offering reverse engineering services, DER approvals & PMAs.

## Global Filtration, Inc.

Rick Caouette

President

rick@globalfiltration.com

+713.856.9800

*globalfiltration.com*

ATA Codes: 21 28 29 47 79

Global Filtration manufactures Air, Oil, Fuel, Hydraulic, & NGS filters for multiple platforms. We make custom kitting products that include all hardware & filters for regular maintenance for the airlines. We also do contract manufacturing for Distributors & companies seeking to get PMA on a product.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Growth Industries Enterprises, Inc.**

Heather Reasoner  
Sales Manager  
HREASONER@GROWTHIND.COM  
816.763.7676

*growthind.com*

ATA Codes: 21 22 23 24 25 32 33 35 38 46 50 51

Growth Industries is a leader in the manufacture of FAA-PMA parts. The company was founded in Grandview, Missouri in 1968 with the goal to provide our customers the highest quality parts, delivered when needed, at the lowest possible price. With a vision for the future Growth Industries obtained its first PMA (Parts Manufacturer Approval) approval in 1975. Now a full service supplier, dedicated exclusively to commercial aviation with a state-of-the-art manufacturing facility. We stock over 3,000 items approved by the FAA, including high-usage components from nose to tail, our customers include most major airlines & maintenance facilities around the world. Growth Industries is internationally recognized for its quality products & customer service.

## **Hemico, Inc.**

Kevin Eitapence  
Program Manager  
keitapence@hemicoinc.com  
603.836.3096

*hemicoinc.com*

Hemico, Inc. is a Parts Manufacture Approval (PMA) holder focused on the Regional Aircraft market supporting wheel, brake, landing gear, & actuator components.

## **Hawaiian Airlines**

Michelle Nguyen  
Technical Sourcing Manager  
michelle.nguyen@hawaiianair.com  
808.835.3185

*hawaiianairlines.com*

Hawaiian Airlines, the largest airline in Hawaii, has been serving travelers since its establishment in 1929. The airline provides exclusive non-stop services to Hawaii from various destinations in North America, Asia, & the South Pacific. Additionally, it offers convenient inter-island flights within the Hawaiian Islands & plays a pivotal role in facilitating the arrival of visitors to Hawaii with non-stop connections from points in the Continental US & the South Pacific.

## **HEICO**

John Hunter  
Executive Vice President / COO  
jhunter@heico.com  
954.744.7770

*heico.com*

ATA Codes: 20 21 22 23 24 25 26 27 28 29 30 31 32  
33 34 35 36 37 38 39 40 41 42 44 45 46 47 48 49 50 51  
52 53 54 55 56 57 60 61 62 63 64 65 66 67 70 71 72  
72T 72R 73 74 75 76 77 78 79 80 81 82 83 84 85

HEICO Corporation is a successful & rapidly growing technology-driven aerospace, industrial, defense & electronics company with facilities around the world that have been providing customers with innovative cost-saving solutions for 64 years. HEICO Parts Group (HPG) is the world's largest independent supplier of FAA-PMA approved engine & component parts for virtually every engine platform & ATA chapter, holding over 11,000 FAA approvals, & producing more than 500 new, highly engineered parts each year. HPG's success has resulted from our ability to deliver the highest quality parts at the lowest possible costs, creating true leverage for our loyal customers.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Iberia Airlines

Maruja Correa Morales  
Technical Department  
mcorrea@iberia.es  
+34.91.587.4971

*iberia.com*

Iberia Lineas Aereas de Espana S.A. provides international & domestic passenger & cargo airlines services. The Company offers aircraft maintenance, airport handling, information technology, telecommunications systems, support services for passengers, & aircrafts. Iberia Lineas Aereas operates internationally.

## Jazz Air LP

*flyjazz.ca*

Jazz Air operates more flights & flies to more Canadian destinations than any other carrier.

## Jet Parts Engineering

John Benschmidt  
dent  
jbenschmidt@jetpartsengineering.com  
+1 206.2810963

*jetpartsengineering.com*

ATA Codes: 21 22 23 24 25 26 27 28 29 30 32 33 34  
35 36 38 49 52 53 54 55 57 71 72 73 74 75 76 78 79 80

Jet Parts Engineering is devoted to providing spare part solutions to our global network of airline & MRO partners. We help our customers battle their increasing costs of component, airframe, & engine maintenance with our competitive pricing, reduced lead times, & major/minor repairs. We specialize in over 30 ATA chapters across most aircraft systems with capabilities to develop a wide range of part-types including machined & cast alloys, molded plastics & rubbers, glass & acrylic lenses, electromechanical assemblies, & many others. Our ecommerce portal gives immediate access to pricing, availability, technical information, & the ease of order placement & tracking. Jet Parts Engineering's staff is comprised of some of the best & brightest in the industry - our people are the best part.

## Japan Airlines

Emi Akatsu  
Component Service Engineer  
akatsu.9hqk@jal.com  
+81.70.4242.7870

*jal.co.jp*

Japan Airlines Co., Ltd., also known as JAL is an international airline & Japan's flag carrier & one of the largest airlines, headquartered in Shinagawa, Tokyo. Its main hubs are Tokyo International Airport (Haneda) & Narita International Airport.

## Jet Blue Airways Corp.

Francisco Flores  
Technical Purchasing Supervisor  
Francisco.Flores@jetblue.com

*jetblue.com*

JetBlue Airways exists to provide superior service in every aspect of our customer's air travel experience.

## Jet2.com

Keith Woof  
Purchasing Manager  
keith.woof@jet2.com  
+44 (0) 203.059.8336

*Jet2.com*

From our Friendly low fares & great flight times to our famously welcoming service, we go the extra mile to make your experience a fantastic one and with daily flights departing year-round from our 11 UK airports, plus more than 65 destinations across Europe to choose from, you're spoilt for choice when it comes to flying with us. Whether it's a winter break in Krakow or a sizzling summer getaway to Spain you're after, we've got you covered. On top of taking you to all the most popular beach destinations, we also offer ski & city flights too, meaning you can choose the break to suit you. So whether you're planning to top up your tan, hit the slopes or unlock the secrets of a new city, explore our fantastic selection of cheap flights.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **KADEX Aero Supply**

Diandre Ryce  
Marketing coordinator  
diandre@kadexaero.com  
705.742.9725 x 119 or  
705.868.5587

*kadexaero.com*

KADEX Aero Supply is a leading aircraft parts supplier & offers a wide range of overhaul/ repair services from 3 locations across Canada (Peterborough, ON – Winnipeg, MB – Calgary, AB). Trusted by maintenance organizations & operators for over 29 years KADEX has everything you need to maintain your aircraft including de-ice boots engine oil, batteries, tires, igniters, filters, exterior & interior lighting, sealants, windshields, instruments, & much more! KADEX specializes in FAA PMA parts & we help maintainers & operators reduce maintenance costs significantly with using products from companies like Ice Shield De-Ice Boots, Whelen Aerospace Technologies, Champion Aerospace, Concorde Battery, Barry Engine Mounts, PPG, Donaldson Filters & many more.

## **KLM (Royal Dutch Airlines)**

Frank Laurensen  
Master engineer Repair Lab  
Frank.Laurensen@KLM.com  
+31.6.2487.8939

*klm.com*

KLM is an European airline with his home base in Amsterdam (Netherlands) & is part of the Air France / KLM group.

## **Kellstrom Aerospace**

Mike Rezman  
Managing Director Distribution Growth Strategy  
Michael.Rezman@kellstromaerospace.com  
+1 954.538.6568

*kellstromaerospace.com*

Kellstrom Aerospace is uniquely capable of supporting aircraft owners, operators, & MROs with cost saving solutions or value added services at each phase of the aircraft's life cycle. Kellstrom Aerospace provides innovative, service-led inventory supply chain programs to global commercial airlines. We work closely with our clients to ensure that as your aircraft parts needs change, we have the service solution ready to be tailored to your needs.

## **Korean Air**

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+82.02.2656.6541

*koreanair.com*

Korean Air is the largest airline & flag carrier of South Korea based on fleet size, international destinations & international flights. Korean Air's international passenger division & related subsidiary cargo division together serve 127 cities in 44 countries, while its domestic division serves 12 destinations. It is among the top 20 airlines in the world in terms of passengers carried & is also the top-ranked international cargo airline.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## LATAM

Tiago Vieira Da Silva  
PMA Approvals  
tiagov.silva@latam.com  
+55.114.517.2486

*latamairlinesgroup.net*

LATAM Airlines Group is Latin America's leading airline group with one of the largest route networks in the world, offering air services to around 140 destinations in 25 countries, & is present in six domestic markets in Latin America, in addition to its international operations worldwide.

## Lufthansa Group

Nils Wittmaack  
Manager Corporate Procurement  
nils.wittmaack@lht.dlh.de  
+49.40.5070.60137

*lufthansagroup.com/*

Airline group consisting of Lufthansa, Swiss, Austrian Airlines, Brussels Airlines, Eurowings, Discover Airlines, Edelweiss Air & Lufthansa Cargo. We connect the world with our fleet of 710 active aircraft as well as 174 aircraft on order & 58 additional options.

## Measure Tech Inc.

Todd Haroutunian  
Operations Manager  
Todd@Measure-tech.com  
818.734.9075 x21

*Measure-Tech.com*

ATA Codes: 21 23 27 28 29 30 32 36 38 49 54 73 74  
77 78 79 80

Measure Tech Inc specializes in electronic/electrical PMA parts & DER Repairs. Utilizing in house design, manufacturing & distribution, we provide solutions for a variety of areas on the aircraft. Some DER repairs are for parts that have never been repaired in the past. Our product offerings include sensors & switches used to monitor: temperature or pressure, level sensors, thermocouples, position sensors, wiring harnesses & electro-mechanical switches.

## LOT Polish Airlines

*lot.com*

Tradition, quality, competence – for more than 90 years, we have been making global aviation history, offering comfortable & safe travel to the farthest corners of the world. We always put the passenger first, providing a service of the highest standard. We're professionals who boldly pursue the goal of providing specialized products tailored to each customer.

## Magee Plastics Company

Angèl Roy  
Account Executive  
aroy@mageeplastics.com  
+1.724.776.2220

*mageeplastics.com*

ATA Code: 25

Magee Plastics Company is a PMA manufacturer & AS9100 accredited company that produces interior products for OEM, airlines, & MRO markets worldwide. The company has been in business for over 50 years as a highly regarded manufacturer & repair station with renown customer service & quality parts.

## Mingo Aerospace LLC

Benjamin Nguyen  
Engineering Manager  
bnguyen@mingoaero.com  
918.308.4690

*mingoaero.com*

ATA Codes: 25 50

Mingo Aerospace specializes in narrow & wide body aircraft cargo loading system repair, landing gear, & avionics instruments, overhaul, & sales, HVOF thermal spray repairs, & air chiller & refrigeration repairs.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Miraj Corporation**

David Piper  
General Manager  
dpiper@mirajcorp.com  
201.288.8877

*mirajcorp.com*

Industry leading electromechanical replacement parts & components for the global aviation market.

## **New Horizons Aircraft Ignition Parts**

Christine Johnson  
Sales/Production Manager  
newhorizonsair@gmail.com  
310.525.0910

*newhorizonsaircraftignition.com*

ATA Code: 74

New Horizons is a manufacturing & distribution company that specializes in PMA ignition lead repair parts & kits for the following engines: CFM56, V2500, CF6-80, CF34, GE90, PW4000, JT8 & GENx. New Horizons also manufactures & distributes PMA / USA Patented general aviation ignition harnesses for the Lycoming, Franklin & Continental engines. Please visit our websites for additional information.

## **Pacific Sky Supply, Inc.**

Emilio Perez  
President  
emilio@pacsky.com  
818.768.3700

*pacsky.com*

Pacific Sky Supply stocks more than 40,000 part numbers. Since our inventory is regularly replenished & maintained, you're free from maintaining one of your own.

## **Mitchell PMA, LLC**

Greg Kucera  
General Manager  
gregk@mitchellair.com  
847.462.6215

*mitchellair.com/pma*

ATA Codes: 21 25 27 29 30 32 36 38 52 55 57 73 80

Mitchell Aircraft is a global aviation material supply solutions provider. Its innovative customer centric culture has been providing expendable & rotatable supply solutions for over 34 years through its worldwide distribution & brokering networks. We also offer FAA-PMA approved airframe & accessory replacement parts to our global network of aviation maintenance providers.

## **NSL Aerospace**

sales@nslaerospace.com  
+1.800.527.0011

*nslaerospace.com*

Over 31 years of experience in custom packaging & distribution of aerospace sealants & adhesives for the commercial, corporate, & military sectors. We serve MRO, airlines, OEM, & chemical management & are AS 9100D & ISO 9001:2015 certified & Nadcap accredited.

## **Pegasus Airlines**

333.300.3555

*flypgs.com*

Pegasus Airlines is a Turkish low-cost airline headquartered in the Kurtköy area of Pendik, Istanbul with bases at several Turkish airports.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **PMA Sales, LLC.**

Michael Escudero  
Operations Manager  
michaeescudero@aeropneumatic.com  
480.730.9707

*pma-sales.com*

ATA Codes: 21 27 29 30 33 36 38 47 49 54 75 78 80

PMA Sales is a design, engineering & assembly company serving MRO's, Airlines & Military customers. PMA Sales specializes in electro-mechanical & pneumatics at the component & assembly level. Making You Competitive... An Intelligent Choice with our approach to Price, Quality, Reliability, Flexibility, & Availability.

## **Prime Propulsion**

James Brooks  
Engine & Powerplant DER  
Jbrooks@primepropulsion.com  
+1.404.919.1584

*primepropulsion.com/*

ATA Codes: 28 31 71 72 72T 73 74 75 77 79

Prime Propulsion, LLC provides comprehensive certification services to companies seeking PMA utilizing our in-house DER. We pride ourselves on building strong client relationships & tailoring our services to meet customers' specific needs.

## **Precision FliteParts Inc.**

Zach Orcutt  
Program Manager  
zorcutt@southwestturbine.com  
602.415.9438

*southwestturbine.com*

Precision FliteParts is a provider of PMA parts for APU, turboshaft, & turboprop engines. We are as dedicated today to providing the highest quality products as when we made our first parts in 1998 & will work hard to build upon our reputation as a leader in gas turbine engine parts manufacture.

## **Proponent Technical Services**

Frank Beyersbergen  
Vice President Technical Services  
fbeyersbergen@proponent.com  
404.512.0720  
Albert Cepeda  
Engineering Manager  
acepeda@proponent.com  
954.247.2853

*proponent.com*

ATA Codes: 21 22 23 24 25 27 28 29 30 31 32 33 34  
36 38 52 56 57 72 73 75 78

Proponent Technical Services is a Proponent Inc strategic business unit & is the Production Approval Holder of FAA-PMA. Our team specializes in the design, development, certification & support of PMA & STC products for Proponent. Our PMA expertise has evolved over the years based on the needs of our OEM partners & industry customer. As a result, we have extensive experience with interior & exterior lighting, IFE equipment, LCD's, seat components, cabin & cockpit components, elastomer & metallic seals, cargo roller system components & non-critical engine parts.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Qantas Airways**

+1 800.227.4500

[qantas.com.au](http://qantas.com.au)

Qantas Airways is the national airline of Australia. Utilizing a large fleet of narrow & wide-body Airbus & Boeing aircraft, Qantas operates an extensive domestic & international network. Qantas is a founding member of the oneworld alliance.

## **R&D Dynamics, Inc.**

Alex Garrett

VP Aftermarket Sales

[Alexg@rddynamics.com](mailto:Alexg@rddynamics.com)

+1 678.358.6758

[rddynamics.com](http://rddynamics.com)

ATA Code: 21

R&D Dynamics specializes in PMA parts for ATA Chapter 21 Air Cycle Machines (ACM). For the last 30 years, we have provided low risk solutions to ACM replacement part needs. We are approved at the world's leading airlines. Our parts are designed & manufactured in our state of the art 83,000 square foot manufacturing & engineering facility. Our world-renowned Air Cycle Machine engineers develop all PMA parts needed for successful repair & overhaul, saving time & money, while maintaining high component reliability. We can also provide overhaul & repair in our FAA Part 145/EASA certified repair facility, Hartford Aero Maintenance.

## **PSA Airlines**

800.235.0986

[psairlines.com](http://psairlines.com)

PSA Airlines operates an all-jet fleet consisting of exclusively Bombardier regional jet aircraft. We have an incredible team of more than 5,000 employees who do a tremendous job of operating more than 600 daily flights to nearly 100 destinations on behalf of American Airlines. Headquartered in Dayton, Ohio, PSA also has flight crew bases located in Dayton, Ohio, Washington, D.C., Charlotte, North Carolina, Dallas, Texas & Philadelphia, Pennsylvania. We have made significant investments in our team & organization that have greatly enhanced our long-term sustainability. These investments will continue with the establishment of a new crew base in DFW, set to open in the first quarter of 2023. PSA has maintenance facilities in Akron-Canton Airport (CAK), Charlotte-Douglas International Airport (CLT) Cincinnati/Northern Kentucky International Airport (CVG), Greenville-Spartanburg (GSP), Norfolk International Airport (ORF), Savannah/Hilton Head International Airport (SAV), Pensacola, Florida (PNS) & Dayton International Airport (DAY). PSA operates Bombardier CRJ700 & CRJ900 aircraft.

## **Republic Airways**

[CorpComm@rjet.com](mailto:CorpComm@rjet.com)

317.484.6000

[rjet.com](http://rjet.com)

Republic Airways Holdings, based in Indianapolis, Indiana, is an airline holding company that owns Chautauqua Airlines, Frontier Airlines, Republic Airlines & Shuttle America.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Ryanair Ltd**

Éimear Costigan  
Warranty Manager, Engineering  
costigane@ryanair.com  
+353.87.694.0480

*ryanair.com*

Ryanair operates more than 1,400 flights per day from 44 bases & 1100+ low fare routes across 27 countries, connecting 160 destinations.

## **Scandinavian Airlines System**

Susanne Karlsson  
Vendor Manager, Technical Operations - Supply Chain Management  
susanne-karlsson@sas.se  
+46.70.9975381

*flysas.com/en*

Based in Stockholm, Scandinavian Airline System (SAS) is the national airline of three Scandinavian States; Denmark, Norway & Sweden, operating three primary hubs at Copenhagen-Kastrup Airport, Stockholm-Arlanda Airport & Oslo Gardermoen Airport. SAS' network consists of extensive regional services within Europe & internationally. SAS is member of the Star Alliance.

## **Saudia Technic**

Ahmed S Aseeri  
General Inquiries  
aseerias@saudia.com  
+96.650.808.5500

*saudiatechnic.com*

Proud to be partnered with the national airline of Saudi Arabia, Saudia Technic (formerly SAEI) serves our regional & global clients from a network of more than 50 locations around the globe. Saudia Technic provides end-to-end aircraft maintenance, repair & overhaul solutions.

## **Sheffield Aerospace LLC**

Teddy Gil  
Chief Administrative Officer  
Teddy.gil@sheffieldaerospace.com  
404.797.8789

*sheffieldaerospace.com*

ATA Codes: 20 21 22 23 24 25 26 27 28 29 30 31 32  
33 34 35 36 37 38 39 40 41 42 44 45 46 47 48 49 50 51  
52 53 54 55 56 57 60 61 62 63 64 65 66 67 70 71 72  
72T 72R 73 74 75 76 77 78 79 80 81 82 83 84 85

Sheffield Aerospace is a specialized, professional engineering, supply chain, procurement, & quality/compliance service provider. We specialize in establishing, administering, managing, & reporting on an airlines alternate material solutions (PMA program) utilizing our proprietary holistic Alternate Materials Solution Program AMSP(TM) approach. With our exclusive & vast partner supplier base we are able to reverse engineer/develop aerospace parts specifically for our customers at a considerable cost savings from typical sourcing channels. With our proprietary database we are able to quickly identify part solutions that saves our clients time & money.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Silver Airways**

+1 801.401.9100

*silverairways.com*

Silver Airways is a regional airline headquartered in Fort Lauderdale-Hollywood Airport with a maintenance facility based at Gainesville Regional Airport. The airline operates scheduled & charter services to 30 destinations. Silver Airways operates with a fleet of Saab 340B aircraft, & it is privately owned by Versa Capital Management.

## **Soundair Aviation Services**

Andrea Ferrenberg

VP Repair Engineering

Andreaferrenberg@soundair.com

360.453.2300

*soundair.com*

ATA Codes: 25 33 35 38 56

145 Repairs & PMA development to support. Galley Equipment, Waste & Water, Oxygen Masks, Cockpit windows

## **Spirit Airlines**

Brian Rogers

Director, Material Management

brian.rogers@spirit.com

803.422.9206

*spirit.com*

Spirit Airlines empowers customers to save money on air travel by offering ultra low base fares with a range of optional services for a fee, allowing customers the freedom to choose only the extras they value.

## **SkyWest Airlines**

Joe Sigg

VP of Maintenance

jsigg@skywest.com

435.634.3000

*skywest.com*

SkyWest operates over 1,700 flights per day for United Express, Delta Air Lines operated by SkyWest, & proudly flies the EMB 120, the Bombardier CRJ200, CRJ700, & the CRJ900.

## **Southwest Airlines Co.**

John Darnold

Technical Project Manager

John.darnold@wnco.com

214.904.7324

*southwest.com*

Southwest Airlines Co. operates one of the world's most admired & awarded airlines, offering its one-of-a-kind value & Hospitality at 121 airports across 11 countries. Southwest took flight in 1971 to democratize the sky through friendly, reliable, & low-cost air travel & now carries more air travelers flying nonstop within the United States than any other airline. Based in Dallas & famous for an Employee-first corporate Culture,

Southwest maintains an unprecedented record of no involuntary furloughs or layoffs in its history. By empowering its more than 71,000 People to deliver unparalleled Hospitality, the maverick airline cherishes a passionate loyalty among more than 126 million Customers carried in 2022. Southwest has set a goal to work toward achieving net zero carbon emissions by 2050. Southwest has also set near-term targets & a four-pillar strategy to achieve its environmental goals.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Star Alliance Services GmbH

Anna Hennig  
Human Resources Manager  
anna.hennig@staralliance.com  
+49.6996.375.142

[staralliance.com](http://staralliance.com)

The Star Alliance network was established in 1997 as the first truly global airline alliance to offer worldwide reach, recognition & seamless service to the international traveler. Its acceptance by the market has been recognized by numerous awards, including the Air Transport World Market Leadership Award & Best Airline Alliance by both Business Traveler Magazine & Skytrax

## Sun Country Airlines

Ron Eaton  
Sr. Director Technical Operations Engineering  
ronald.eaton@suncountry.com  
317.531.1241

[suncountry.com](http://suncountry.com)

Sun Country Airlines is an American ultra-low-cost passenger & cargo airline, & the eleventh largest in the US by passengers carried. Based at Minneapolis–Saint Paul International Airport with headquarters on airport property. As of April 2023, the Sun Country Airlines fleet consists entirely of Boeing 737 Next Generation aircraft.

## SunExpress Airlines

Ergün Erkuş  
Technical Procurement Team Leader  
ergun.erkus@sunexpress.com  
+90 554 231 06 17  
Ezgi Gökay  
Technical Procurement Senior Specialist  
Ezgi.Gokay@sunexpress.com  
+90 537 775 16 08  
Ibrahim Ekal Evren  
Maintenance Planning Engineering Team Leader  
efkal.evren@sunexpress.com  
+90 530 915 80 39  
Mert Can Dağistan  
Technical Operations Engineer  
mert.dagistan@sunexpress.com  
+90 546 242 48 77

[sunexpress.com/tr/](http://sunexpress.com/tr/)

Founded in 1989 as a joint venture between Lufthansa & Turkish Airlines, based in Antalya, Turkey. SunExpress operates scheduled flights from popular Turkish holiday destinations- mainly Europe.

## TAP Air Portugal

1 800.903.7914

[flytap.com](http://flytap.com)

TAP Air Portugal is the state-owned flag carrier airline of Portugal, headquartered at Lisbon Airport which also serves as its hub. TAP – Transportes Aéreos Portugueses – has been a member of the Star Alliance since 2005 & operates on average 2,500 flights a week to 90 destinations in 34 countries worldwide. The company has a fleet of 100 airplanes, all of which manufactured by Airbus with the exception of 22 made by Embraer & ATR, operating on behalf of the regional airline TAP Express.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Team JAS, Inc

Ryan Rillstone  
Director, Engineering  
rillstone@teamjas.com  
Russ Carlson  
SVP, Business Development  
rcarlson@teamjas.com  
Jonathon Sanders  
VP, Operations  
jsanders@teamjas.com  
904.292.2328

*teamjas.com*

ATA Codes: 21 22 24 25 26 27 28 29 30 32 33 35 52  
53 54 55 56 57 59 71 73 76 77 79

Team JAS is an aviation company located in Jacksonville, Florida, that provides total aircraft support. Our 33,000-square-foot facility houses our inventory, Shipping & Receiving Department, our 145-Component Repair Station, & our PMA/ Engineering Department. Team JAS has provided quality aircraft support for over 36 years, & we are proud to be the solutions company for OEM aircraft parts, MRO repairs, & PMA part alternatives to Aircraft owner/operators worldwide.

## Thai Airways

contact @thaiairways.com  
+66.2.3561111

*thaiairways.com*

Thai Airways International Public Co.,Ltd is a national enterprise subordinated to the Ministry of Transport. It is a public company registered in The Securities Exchange of Thailand since 1991 with the Ministry of Finance as a dominance shareholder at more than 50%. We operate the airlines business that transport passengers, goods, parcels & postal through air transportation via Thai major cities to the primary cities around the world. From schedule flights to charter flights & through our alliances with Suvarnabhumi Airport as the main hub for all flight routes.

## Technetics Group Chicago, LLC

Rob Stuebing  
VP / General Manager  
rob.stuebing@technetics.com  
708.887.6338

*Technetics.com*

ATA Codes: 28 29 73 80 83

Technetics Group Chicago is a global leader in the design & manufacturing of custom engineered Qualiseal branded mechanical seals for the aerospace industry.

We work with original equipment manufacturers to develop sealing solutions for rotating shafts in most all accessory applications such as gearbox, starter, fuel pumps, APU's, generators & hydraulic pumps found throughout the aircraft. The Qualiseal product mix includes Contacting & Non-contacting Carbon Face Seal & Circumferential Seals, as well as all associated Seal Runners & Mating Rings. How can Technetics Groups Chicago help you find reliable, cost-effective solutions for your sealing needs?

## Triumph Accessory Services

Bill Ramsey  
Director of Engineering  
wrramsey@triumphgroup.com  
316.200.8780

*triumphgroup.com*

ATA Codes: 36 38 44 49 50 52 53 54 55 57 71 72 72T  
74 78 79 80

Components for Air Turbine Starters, Air Cycle Machines, Heat Transfer Products, Thermal Anti-Ice Valves, Cooling Turbines, Pneumatic Valves & Regulators, Hydraulics, Integrated Drive Generators & CSD's, AC/DC Generators (Air & Oil Cooled), Blue Water Products, APU-Electric Starters, Electric Fans, Air Turbine Drives & Pneumatic Drive Units

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## Triumph Airborne Structures

Jimmy Albert  
Senior Specialist, Field Sales  
jialbert@triumphgroup.com  
501.547.7999  
Bill White  
Manager of Engineering  
bwhite@triumphgroup.com  
501.767.7195  
*triumphgroup.com*

ATA Codes: 23 25 27 28 29 32 33 36 38 44 49 52 53  
54 55 56 57

Light Lenses, Inner Panes, Window Shades, Lav Pans,  
Vacuum/Thermoformed Plastic, Assembly, CNC  
Routing, CNC Machining, Sewing, UV Bonding, CNC  
Metal Fabrication Including Punching & Forming,  
Painting, Strip Forming & Vacuum/Thermoforming  
Tooling,

## Turkish Airlines Technic, Inc.

Burak Ferah  
Outsource Repair Engineer  
bferah@thy.com  
+90.506.795.6191  
*turkishairlines.com*

Based at Istanbul's Ataturk International Airport, Turkish Airlines (THY) is the national airline of Turkey & the country's largest carrier. Turkish Airlines operates a network of domestic & regional services throughout Turkey & the Middle East & international services worldwide. Turkish Airlines is also a member of the Star Alliance.

## TUI Airways

Laura Grosvenor  
Purchasing & Contracts Manager at TUI  
laura.grosvenor@thomson.co.uk  
+4420 38 303 111  
*thomson.co.uk*

Thomson Airways Ltd. owns & operates an airline in the United Kingdom. ... The company was founded in 1962 & is based in Crawley, United Kingdom. Thomson Airways Ltd. operates as a subsidiary of Thomson Travel Group (Holdings) Limited.

## Unipak Aviation, LLC

Kevin Pruett  
General Manager  
kevin.pruett@unipakaviation.net  
941.210.4332  
*unipakaviation.net*

ATA Codes: 21 24 25 27 28 29 30 32 33 36 38 49 52  
54 75 80 83

Unipak Aviation is a Part 145 FAA/EASA repair station for Class 1 & 2 accessories. The company is also an AS9100-certified build-to-print manufacturer of aerospace & defense parts & components for the DOD & for PMA customers.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## United Airlines

PMA/OOPP Request  
PMA-Request@united.com  
*united.com*

Connecting people. Uniting the world. Every day, we help unite the world by connecting people to the moments that matter most. This shared purpose drives us to be the best airline for our employees, customers & everyone we serve. As we explore alternate & modification parts for our aircraft, our focus is finding solutions that not only uphold the safety of our fleet but also enhance its value, streamline turnaround times, & deliver peak performance.

## US Air Force

Shauna Price  
405.734.3630  
*airforce.com*

Today's modern US Air Force delivers global reach, global power & global engagement to defend & protect American citizens & allies anywhere, at any time.

## Virgin Australia Airlines Pty Ltd

+61.7.3295.3000  
*virginaustralia.com*

Virgin Australia is one of Australia's largest airlines, & is the largest airline by fleet size to use the Virgin brand. The airline directly serves 41 destinations in Australia from hubs in Brisbane, Melbourne, & Sydney, as well as 15 international destinations.

## UPS

Mariel Prince,  
Components Aircraft Engineer  
marielprince@ups.com

Joe Wright,  
Component Engineering & Reliability Manager  
josephwright@ups.com  
502.329.6041  
*ups.com*

UPS is the world's largest package delivery company & a leading global provider of specialized transportation & logistics services.

## Virgin Atlantic Airways

+44.0.1293.444609  
*virginatlantic.com*

Virgin Atlantic Airways Limited is a British airline with its head office in Crawley, England. Virgin Atlantic uses a mixed fleet of Airbus & Boeing wide-body aircraft & operates to destinations in North America, the Caribbean, Africa, the Middle East & Asia from its main base at Heathrow, & its secondary base at Manchester. The airline also operates seasonal flights from Belfast, Edinburgh, & Glasgow.

## VRG Linhas Aereas S/A

+55 11 5504-4410  
*voegol.com.br*

114 aircraft among Boeing 737-700 & Boeing 737-800 are responsible for serving all of the company's routes in Brazil, South America, & the Caribbean.

# MARPA MEMBER DIRECTORY 2023-2024

As of October 31, 2023

## **Vogt Aero, LLC**

Joanne Vogt  
President  
joanne.vogt@vogtaero.com  
480.497.3959

*vogtaero.com*

Vogt Aero is a customer-centric solutions company. We are focused on understanding customer needs & developing the safe, reliable, cost-efficient solutions through our parts & services. Working closely with our customers eliminates lead time concerns & ensures we are developing parts that have increased maintainability. An FAA Production Approval Holder (PAH) with in-house DER support, Vogt Aero specializes in development & manufacturing of PMA replacements, STC modifications, & owner/operator produced parts. Vogt Aero specializes in customer solutions for most aircraft types & fleets covering a variety of ATA Chapters. We are proficient in: 11, 24, 25, 26, 33, 38, & 39. We also work in 23, 30, 31, 52, & 56. Our capabilities are always expanding to meet the needs of our customers.

## **Wencor Group**

Chase Harris  
VP of PMA & DER  
chase.harris@wencor.com  
678.490.0160

*wencor.com*

ATA Codes: 21 23 24 25 26 27 28 29 30 32 33 34 35  
36 37 38 49 52 53 54 55 56 57 71 72 72T 73 74 75 76  
77 78 79 80 83

Wencor Group provides PMA replacement components for every ATA chapter & focuses on new PMA development. Our FAA-approved PMA components offer cost savings & address limitations of OEM products

## **Vueling Airlines**

+34.676.154.768

*vueling.com*

Vueling Airlines, S.A. is a Spanish low-cost airline based at El Prat de Llobregat in Greater Barcelona with hubs at Barcelona–El Prat Airport & Leonardo da Vinci–Fiumicino Airport in Rome, Italy. It is the largest airline in Spain, measured by fleet size & number of destinations. Vueling serves over 100 destinations in Africa, Asia, Europe & the Middle East.

## **Westjet**

1 888.937.8538

*westjet.com*

WestJet Airlines Ltd. is a Canadian low-cost carrier that provides scheduled & charter air service to 87 destinations in Canada, the United States, Mexico, Central America & the Caribbean.

## **Wiggins Airways**

603.629.9191

*wiggins-air.com*

Wiggins Airways has been in the aviation industry for nearly 100 years & is now an all-cargo airline with operations throughout 12 states in the Northeastern & Southeastern United States. We are located in bases as far north as Presque Isle, Maine & as far west as Pittsburgh, Pennsylvania. Our team provides time critical feeder services for major express carriers, namely FedEx & UPS. Our business is to Keep Life Moving. With Ameriflight, we're the largest Part 135 Cargo airline in the nation. In the hands of our accomplished pilots & mechanics, cargo arrives on schedule in perfect condition. Wiggins has a 24/7/365 aircraft maintenance operation that provides service to our fleet & performs maintenance services as needed for aircraft based at MHT. We also have a fully staffed & equipped flight following operation to support our flight crew. We are proud of our long history in aviation & our dedicated employees.





**Modification And Replacement Parts Association  
2233 Wisconsin Ave, NW Suite 503  
Washington, DC 20007  
202.628.6777**

***[www.pmaparts.org](http://www.pmaparts.org)***