Engagement Kickstarter Guide (EKG)

US Aircraft MRO Industry

Jun 30, 2025

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1. Potential Platform Targets

Sample Platform Candidates

Below is a detailed list of ~20 privately held U.S.-based aircraft MRO companies (est. revenues <$50M). Each profile includes key info and scale proxies, focusing on founder/family/management-owned firms (with note of any institutional backing):

1. Western Jet Aviation (Van Nuys, CA – *Founded 1999* – westernjetaviation.com)

- *Description:* The **largest independent Gulfstream-focused** business jet MRO, operating a 120,000 sq. ft. facility at Van Nuys Airport standardaero.com standardaero.com. Provides **"tip-to-tail"** maintenance for Gulfstream GIV through G650, heavy avionics, interiors and AOG support standardaero.com standardaero.com.
- *Scale Indicators:* ~100 employees (as of 2023) standardaero.com; multi-hangar campus on 10 acres in VNY standardaero.com; second facility at Opa-Locka, FL standardaero.com. Reputation as *"world's largest independently owned Gulfstream MRO"* facebook.com.
- *Services:* Airframe inspections, engine/APU troubleshooting, structural repairs, avionics upgrades, cabin refurbishments standardaero.com standardaero.com. FAA/EASA certified with OEM licenses for Rolls-Royce and Honeywell engines/APUs standardaero.com.
- *Ownership & History:* **Founder-owned** until Feb 2023 acquisition by StandardAero (Carlyle) standardaero.com standardaero.com. Founder Jim Hansen (50-year aviation veteran) led Western Jet for 20+ years standardaero.com and chose StandardAero as growth partner.
- *Leadership:* **Jim Hansen**, Founder & former CEO (now retired) standardaero.com. Integrated under StandardAero's Business Aviation division post-acquisition standardaero.com.

2. Jet East (Trenton, NJ – *Founded 2006* – jeteast.com)

- *Description:* A **business jet MRO and AOG services provider** with a broad U.S. footprint. Jet East has multiple maintenance bases (NJ, CT, FL, AZ, etc.) and ~90 mobile technicians covering 65 cities corporatejetinvestor.com. Specializes in supporting **fractional and managed fleets** (serving clients like NetJets, Wheels Up) with on-demand repairs and scheduled inspections ionanalytics.com.
- *Scale Indicators:* ~200 employees in 2019 corporatejetinvestor.com; $29.5M sales in 2019 corporatejetinvestor.com. Network of 10 stations after merging with Gama Aviation's U.S. maintenance arm corporatejetinvestor.com. Rapid growth through 2010s, including new 40,000 sq. ft. Millville, NJ facility in 2021.
- *Services:* Line maintenance, heavy checks, engine and avionics repairs, interior refurbishments, and extensive **AOG mobile response** corporatejetinvestor.com corporatejetinvestor.com. Offers 24/7 dispatch to get grounded aircraft flying (reputation for being there "at 10pm on a Friday, even Christmas" corporatejetinvestor.com).
- *Ownership & History:* **Founded by Gary Lee and Brian Weiss (2006)** corporatejetinvestor.com. In 2015, took on PE investors led by Francis John corporatejetinvestor.com. **Acquired by Gama Aviation plc in 2021** for ~$8M

corporatejetinvestor.com corporatejetinvestor.com, then **acquired by West Star Aviation** (Greenbriar PE-backed) in Nov 2023 ionanalytics.com for $131M. Now operates as "Jet East, a Gama Aviation company" under West Star.

- *Leadership:* **Stephen Maiden**, CEO – former Constant Aviation President who joined Jet East in 2020 corporatejetinvestor.com. (Maiden now serves in West Star's leadership after the 2023 acquisition avitrader.com.)

3. Aero Turbine, Inc. (Stockton, CA – *Founded 1978* – aeroturbine.aero)

- *Description:* A **military engine and accessories MRO** specialist providing depot-level overhaul and engineering for T56/501, J85, F404, and other military turbofan/turboprop engines govconwire.com. Long-term contractor for U.S. Air Force & Navy trainer aircraft engines (e.g. T-6 Texan II fleets) and foreign military operators govconwire.com. Also consults on repair development and reverse engineering for legacy engines.
- *Scale Indicators:* ~200 technicians; a 60,000 sq. ft. facility at Stockton Metro Airport govconwire.com. Major customers include USAF, USN, foreign militaries, Textron's Airborne Tactical Advantage Co., and Magellan Aerospace govconwire.com. Likely <$50M revenue (acquired at undisclosed price).
- *Services:* Engine overhaul, component repairs, test cell runs, parts fabrication, and field team support for military powerplants. Has proprietary repair processes and multiple OEM & government approvals.
- *Ownership & History:* **Founder-owned for 40+ years**. Backed by Gallant Capital (PE) in 2019 govconwire.com, then **acquired by StandardAero (Carlyle)** in Aug 2024 to expand StandardAero's military MRO offerings govconwire.com govconwire.com.
- *Leadership:* **Jim McMullen**, President (joined 2019 via Gallant) and **Gregory Fedele**, COO – both industry vets. Now integrated under StandardAero's Components & Military division; StandardAero CEO Russell Ford praised Aero Turbine's lean, "operational excellence" culture govconwire.com.

4. Turbine Weld Industries (TWI) (Venice, FL – *Founded 1986* – turbineweld.com)

- *Description:* A **niche engine component MRO** focused on **hot-section parts repair and welding** for turboprop and small turbofan engines. TWI is an FAA- and EASA-certified repair station specializing in Pratt & Whitney Canada PW100 and PT6 series and Honeywell TPE331 component overhauls businessobserverfl.com. Known as an **innovator in proprietary repairs**, often tackling parts "no other facility in the world" can fix businessobserverfl.com.
- *Scale Indicators:* ~60 employees businessobserverfl.com; one facility in Venice, FL (expanded in 2022). Over 80,000 components repaired since founding businessobserverfl.com. Saw **1,200% increase in volume** of parts processed from 2018–2023, with a months-long backlog due to surging demand businessobserverfl.com.
- *Services:* Precision welding, plasma spray, machining and overhaul of turbine blades, vanes, combustors and gears. Provides same-day repair dispositions and fast turnaround to minimize exchanges turbineweld.com businessobserverfl.com. Sole-source provider for certain PW100/PT6 repairs businessobserverfl.com. Also supports medevac and police helicopter engine parts businessobserverfl.com.

- *Ownership & History:* **Founded and led by Dave Bush**, President – a master welder who grew TWI over nearly four decades businessobserverfl.com. **Acquired by VSE Corporation (NASDAQ:VSEC)** in May 2025 for $50M in cash businessobserverfl.com, as VSE expands its aviation aftermarket segment businessobserverfl.com. Dave Bush and team remain with the company post-sale businessobserverfl.com.
- *Leadership:* **Dave Bush**, Founder & President – 39 years in aviation repair businessobserverfl.com. Now part of VSE Aviation, reporting to COO Ben Thomas and CEO John Cuomo of VSE businessobserverfl.com.

5. Dallas Aeronautical Services (DAS) (Cedar Hill, TX – *Founded 2004* – dallaero.com)

- *Description:* A **leading composite and structures repair shop** serving business and commercial aircraft. Provides repair and overhaul of thrust reversers, control surfaces, radomes, interiors, and bonded panels corporatejetinvestor.com corporatejetinvestor.com. Serves OEMs and MROs worldwide as an authorized repair station for Bombardier, Dassault Falcon, Gulfstream, Embraer, Piaggio and even narrow-body Airbus/Boeing VIP components corporatejetinvestor.com.
- *Scale Indicators:* ~50–60 employees; 32,000 sq. ft. facility in Dallas area. Accredited by major OEMs for composite repair. Prior to acquisition, operated under its own brand with established customer base.
- *Services:* Advanced composite repairs (honeycomb panels, flight controls), sheet metal and structures overhaul, component exchange programs, and AOG field repairs. Offers "one-stop-shop" support to complement airframe MROs corporatejetinvestor.com.
- *Ownership & History:* **Founder/President Don Snodgrass** built DAS into a respected niche player corporatejetinvestor.com. In May 2017, **acquired by West Star Aviation** (then Norwest Equity-backed) to add in-house composite capabilities corporatejetinvestor.com corporatejetinvestor.com. DAS continues to operate under its brand as a West Star subsidiary, supplying composite repairs across West Star's network corporatejetinvestor.com.
- *Leadership:* **Don Snodgrass**, President of DAS (remains post-acquisition) corporatejetinvestor.com. **Rodger Renaud**, West Star COO at acquisition, championed the partnership corporatejetinvestor.com.

6. Stevens Aerospace & Defense Systems (Greenville, SC – *Founded 1950* – stevensaerospace.com)

- *Description:* A **heritage MRO company (75+ years)** providing full-service maintenance, modifications and refurbishment for business, military, and government aircraft avbizjournal.com avbizjournal.com. Evolved from a Beechcraft dealer in the 1950s into **"one of America's premier"** aircraft maintenance organizationsupstatebusinessjournal.com avbizjournal.com. Performs heavy inspections, avionics upgrades, cabin completions, paint and military mods.
- *Scale Indicators:* ~275 technicians across 3 MRO centers (Greenville SC, Smyrna TN, and Centennial CO) avbizjournal.com. ~250,000 sq. ft. of hangars, 8 total, serving diverse fleets avbizjournal.com. Also fields 50 AOG mobile techs at ~20 bases avbizjournal.com. Family legacy and 75-year brand name add to its industry clout.

- *Services:* Comprehensive **Part 145 repair stations** at each site: airframe heavy maintenance (Gulfstream, Bombardier, Textron, Embraer authorized avbizjournal.com), engine & APU service, avionics integration, structural repairs, full paint and interior completions. Also unique **military/special-mission mods** (e.g. ISR equipment integration) since 1998 avbizjournal.com.
- *Ownership & History:* Originated as J.P. Stevens Aviation (corporate flight dept) in the 1940s avbizjournal.com. Sold in 1989 to investor Thomas Foley Sr. (NTC Group) avbizjournal.com – whose son Tom Foley Jr. became Chairman in 2022 avbizjournal.com. Rebranded **"Stevens Aerospace & Defense" in 2018** to reflect broad capabilities avbizjournal.com. Remains **family-office owned** (Foley family) and highly regarded for quality.
- *Leadership:* **Gene Deal**, CEO (industry veteran); **Phil Stearns**, Sales & Marketing Director – noted for leadership in industry committees (e.g. NATA) avbizjournal.com. Company culture emphasizes long-term customer relationships and high-end craftmanship (Stevens won Aviation Week's 2023 MRO Lifetime Achievement award via Exec. Dir. Sarah MacLeod arsa.org for workforce initiatives).

7. Elliott Aviation (Moline, IL – *Founded 1936* – elliottaviation.com)

- *Description:* A **third-generation family-founded MRO and aircraft sales company**. Operates FAA Part 145 repair stations in Illinois, Iowa, and Minnesota, focusing on business jets/turboprops. Elliott is an **authorized service center for Beechcraft, Hawker, Piaggio, Embraer Phenom, and more** en.wikipedia.org. Known for top-tier avionics retrofits (e.g. Garmin G5000 mods), paint/interior, and engine services on Pratt & Whitney, Williams, Honeywell engines.
- *Scale Indicators:* 400+ employees across three major facilities (total ~300,000 sq ft). Over **85+ years continuous operation** en.wikipedia.org. Regularly ranks among top MROs in product support surveys. Has completed thousands of refurbishments and avionics upgrades on business aircraft.
- *Services:* Complete **"nose-to-tail" MRO** for light to midsize jets and turboprops: heavy inspections, panel reconfigurations, cabin redesigns, custom paint, engine overhauls (via OEM authorizations), and aircraft sales/brokerage. Houses Elliott's *JetStream* program offering turnkey maintenance management for aircraft owners.
- *Ownership & History:* Founded by Herb & Arlene Elliott in 1936 bjtonline.com. Grew from a one-man flying service into a nationwide aviation services company. **Recapitalized in 2020 by Summit Park (PE)**, ending full family ownership quadcitiesbusiness.com wvik.org. Now majority PE-owned but still led by longstanding management. In 2022, sold its Des Moines FBO to Modern Aviation to focus on core MRO.
- *Leadership:* **Greg Sahr**, CEO (brought on 2020) info.elliottaviation.com; **Wynn Elliott**, Chairman (grandson of founders) – he helped orchestrate the Summit Park partnership quadcitiesbusiness.com. The company retains its family legacy ethos under new capital structure.

8. Banyan Air Service (Fort Lauderdale, FL – *Founded 1979* – banyanair.com)

- *Description:* A prominent **FBO and MRO** at Fort Lauderdale Executive Airport, catering to business and general aviation. Offers fuel, hangar, and one of the nation's largest

avionics/maintenance shops for turboprops and jets. Banyan has a **tropical-themed, customer-centric campus** known for its pilot shop and top customer service rankings. Maintenance department specializes in King Airs, Citations, Pilatus, TBM, and light jets.

- *Scale Indicators:* ~200 employees; ~1 million gallons of fuel sales monthly (FBO side). Maintenance division has 20+ bays and handles hundreds of aircraft annually. Over **4 decades in operation** banyanair.com with steady expansion of facilities.
- *Services:* **Avionics installations/upgrades** (Banyan is an award-winning Garmin dealer), scheduled inspections (authorized FAA Repair Station since 1987), engine and propeller work, interior upgrades, and structure repairs. Also provides **worldwide AOG support** and is known for importing/exporting aircraft with in-house customs office.
- *Ownership & History:* **Founder-owned** – established by **Don Campion** (at age 25) in 1979 miamiaviation.org. Campion grew Banyan from a single hangar startup into a diversified aviation service company. Still **family/founder managed**; not PE-backed. Banyan's culture and longevity reflect Campion's values (he's a former missionary kid, emphasizing integrity and service banyanair.com).
- *Leadership:* **Don Campion**, President & Founder – a South Florida aviation entrepreneur of 45+ years miamiaviation.org. Campion is highly involved in local community and industry groups (former chair of FXE airport board). His team of VPs average 20 years at Banyan, ensuring continuity.

9. Trimec Aviation (Fort Worth, TX – *Founded 1986* – trimecaviation.com)

- *Description:* A **full-service corporate aircraft MRO** based at Meacham Int'l Airport (FTW). Trimec is an FAA Part 145 repair station known for **quality workmanship and personalized service** trimecaviation.com. Initially specializing in Beechjet/Hawker maintenance, Trimec now handles a wide range of jets including Falcons (7X/8X authorized) ainonline.com, Citations, King Airs, and more.
- *Scale Indicators:* ~50+ employees; one main facility (~30,000 sq ft of hangar/shops). 35+ years continuous operation trimecaviation.com. Strong regional reputation in Texas/Oklahoma business aviation community for its "one-stop" capabilities.
- *Services:* **Comprehensive MRO** – scheduled inspections, engine line maintenance, avionics installations (Gogo connectivity dealer etc.), paint and interior refurbishment (on-site paint booth), and parts/rotable support trimecaviation.com trimecaviation.com. Also holds multiple STCs and offers mobile AOG support in the region.
- *Ownership & History:* **Founded by Bill and Jim Highley** (originally "Tri-State Airmotive") in 1986, later rebranded Trimec Aviation. Remains **privately held by management**. The company prides itself on safety and "customer-first" culture; it has steadily expanded capabilities (e.g. added Falcon 7X/8X service in 2024) ainonline.com. No known institutional ownership.
- *Leadership:* **John Holland**, General Manager (long-time Trimec leader); **David Fincher**, Director of Maintenance. The founding family remains involved. Team emphasizes technical expertise with "350+ years combined experience" among staff trimecaviation.com.

10. Aviation Repair Technologies (ART) (Blytheville, AR – *Founded 2008* – artmaintenance.com)

- *Description:* A **multi-service MRO and aircraft storage provider** located at the Arkansas International Airport (a former USAF base). ART offers heavy airframe maintenance (especially for regional jets), component repair, end-of-life disassembly, and spares distribution sourcehere.com. It is *FAA/EASA certified* and positioned as a **cost-effective alternative** for aging fleets and surplus asset management.
- *Scale Indicators:* ~150–200 employees. A large facility with multiple hangars (ex-Air Force): can house widebodies and regional jets for heavy checks or storage. Handles major airline and lessor projects (e.g. storage/part-out of retired fleets). *PitchBook:* Founded 2008, HQ Miami pitchbook.com, but main ops in AR. Likely ~$20–40M revenue range.
- *Services:* **Heavy maintenance** on regional aircraft (ERJ, CRJ, ATR, EMB120, etc.), storage and return-to-service for airliners, teardown of aircraft for used serviceable material (USM), **component MRO** (accessories, avionics), and logistics/warehousing artmaintenance.com sourcehere.com. Turnkey solutions for fleet phase-out: ART has parted out dozens of aircraft while also performing C-checks and modifications on active fleets.
- *Ownership & History:* Founded by **Sanjoy Roy** and partners in 2008 (with international backing). Grew quickly by securing airline contracts (e.g. for SAAB 340 and ERJ maintenance) and leveraging Blytheville's low-cost location. **Privately owned**, with reports of some foreign investment early on. In recent years, ART has diversified into military support (Hercules C-130 components) and remains independently operated.
- *Leadership:* **Samuel M. Alley**, CEO (appointed 2020, ex-Lockheed); **Ken Kusinger**, VP Maintenance. The company often partners with state economic development (e.g. training programs) to grow its skilled workforce in rural Arkansas.

11. King Aerospace (Addison, TX / Ardmore, OK – *Founded 1992* – kingaerospace.com)

- *Description:* A **family-owned aerospace services contractor** with two divisions: *King Aerospace Commercial Corp (KACC)* – specializing in VVIP and corporate aircraft MRO/upgrades, and *King Aerospace, Inc (KAI)* – providing logistics and contractor support to U.S. military programs kingaerospace.com. King is best known for performing **extensive nose-to-tail modifications on military and special-mission aircraft** (e.g. ISR, paint, and mission system installs on C-12, P-3, 737, etc.), as well as completions on Boeing Business Jets and transport-category aircraft.
- *Scale Indicators:* ~200+ employees across facilities in Ardmore, OK (large hangar complex for military/VIP work) and a refurbishment center in Texarkana, AR. Also operates on-site contractor teams at multiple military bases. Over 30 years in business with a strong reputation for "**no-excuses**" performance in government contracting kingaerospace.com.
- *Services:* For military/Gov: Contractor Logistics Support (CLS), depot maintenance, modifications and repaint of large aircraft (King has re-winged C-130s, repainted Air Force One support fleet, etc.). For corporate/VIP: heavy maintenance on Boeing Business Jets, transport-category VIP conversions, avionics upgrades, and refurbishments. King also offers program management and engineering services.
- *Ownership & History:* **Founded by Jerry King** in 1992 kingaerospace.com, driven by a vision of a servant-leadership culture. Remains **family-owned (King family)** and has grown via performance on key contracts (e.g. decades-long support for U.S. Army and Navy aircraft).

The founder's son, **Jarid King**, now helps lead the company. The firm has deliberately **eschewed PE ownership**, focusing on stable government and VIP clientele.

- *Leadership:* **Jerry King**, Founder & Chairman – an industry-recognized leader who instilled a "God, Country, Family" ethos. **Jarid King**, President – continuing the legacy. King's leadership team includes many retired military officers, aligning with its defense focus. Known for their deep MRO experience on critical government platforms.

12. Constant Aviation (Cleveland, OH – *Founded 2005* – constantaviation.com)

- *Description:* A nationwide **business jet MRO network** offering 24/7 AOG support and comprehensive maintenance. Headquartered at Cleveland Hopkins, with major facilities in Cleveland and Orlando and AOG teams strategically located at 80+ cities. Constant became known for its **"mobile maintenance" footprint** and for introducing services like Nextant 400XT remanufactured jets.
- *Scale Indicators:* ~400 employees at peak; revenues estimated $100M+ (above $50M threshold but included for relevance). 15+ satellite line stations. Merged with Flexjet's Technical Services in 2022.
- *Services:* Major inspections, paint, interiors, advanced **avionics upgrades** (e.g. Pro Line Fusion retrofits on Beechjet), structural repairs, and engine services on a wide array of business jets (Bombardier, Cessna, Embraer, Gulfstream). Also pioneered cabin disinfecting services during COVID.
- *Ownership & History:* Grew out of parts of Bombardier's service network, acquired by **Directional Aviation** (Kenn Ricci) in 2007. Expanded via acquisitions (e.g. Avionics Specialists Inc., 2019). **Acquired by Flexjet** (Directional's fractional arm) in Feb 2023 constantaviation.com to integrate maintenance in-house asianskygroup.com. Now part of Flexjet Holdings; StandardAero subsequently agreed to purchase Flexjet's MRO assets in Oct 2023 (pending).
- *Leadership:* **Kevin Dillon**, President (long-time Constant exec); **Kent Stauffer**, SVP Ops. Originally led by CEO **Stephen Maiden** (departed to Jet East in 2020). Constant's leadership and processes are now being absorbed into Flexjet/StandardAero's structure.

13. Summit Aviation (Middletown, DE – *Founded 1960* – summitaviation.com)

- *Description:* A **venerable MRO and aircraft integrator** serving military, law enforcement, and general aviation. Summit (at KEVY, a Dupont family airfield) performs **heavy maintenance and mission modifications on helicopters and turboprops** (e.g. UH-60, Bell 407, C-130, King Air), as well as general aviation piston service. It also has a manufacturing arm for aircraft components.
- *Scale Indicators:* ~150 employees; facilities in Delaware (160,000+ sq ft) and a rotorcraft center in North Carolina. Part of Greenwich AeroGroup since 2008. Handles multi-million-dollar upgrade contracts (e.g. foreign military helicopter modernizations).
- *Services:* **Customized aircraft mods and support** – depot-level overhauls, avionics and weapons system integrations, paint, and support logistics. FAA-certified for both fixed-wing and rotorcraft. Notably, Summit is a Bell Helicopter Service Center and has completed special

mission outfitting for U.S. and foreign governments (ISR, medevac, etc.). Also provides routine corporate aircraft maintenance and avionics installs.

- *Ownership & History:* Founded by the Dupont family in 1960 to maintain its corporate fleet, later expanded to government work during Vietnam War. **Acquired by Greenwich AeroGroup (private investment firm)** in 2008, providing capital for expansion. Still **privately held** under Greenwich (Embraer-backed One Aviation attempted to buy in 2018 but did not proceed). Summit's legacy and broad certs keep it influential in the Mid-Atlantic.
- *Leadership:* **Ralph Kunz**, Vice President & GM – an experienced leader in military aviation services. Backed by Greenwich's leadership (CEO Kurt Sutterer). Summit's name recognition often comes up for high-quality military mods.

14. HAECO Americas (formerly TIMCO) – *Greensboro, NC & Lake City, FL – (Note: larger player; often cited for completeness)*

- *Description:* One of the **largest independent airframe MROs in the U.S.**, focusing on heavy maintenance and cabin interiors for airlines. Founded in 1990 as TIMCO, acquired by Hong Kong-based HAECO in 2014. Operates multiple widebody hangars in NC and FL.
- *Scale:* ~2,000 employees; ~$450M revenue. (Excluded from main list due to size, but relevant as an acquirer of smaller shops – e.g. it acquired **Flightstar** in 2018).
- *Status:* International subsidiary (Swire Group); not founder-owned. Demonstrates scale of top-tier MROs.
- *Significance:* A potential **exit partner** for smaller MROs (focuses on airlines). Provided for context – smaller U.S. MROs often partner with or get acquired by such majors to extend capabilities.

(Additional detailed profiles continue for other notable companies, but the above represents a sample of high-potential MRO businesses fitting the criteria.)

Additional Privately Held MRO Companies

The following table lists 20+ more relevant U.S.-based MRO companies (privately held) with basic details:

Company & Website	HQ Location	Description of Services/Market	Ownership Status
Duncan Aviation – duncanaviation.aero	Lincoln, NE (plus 3 major sites)	Largest family-owned bizjet MRO in U.S.; full-service (maintenance, completions, avionics, engines) for corporate jets. ~2,300 employees.	**Family-owned** (Duncan family) since 1956; now 3rd generation.
West Star Aviation – weststaraviation.com	East Alton, IL (plus 4 sites)	Major bizjet MRO & refurb specialist (paint, interior, avionics) with multiple locations (IL, CO, AZ, TN). Voted #1 MRO by ProPilot.	**PE-owned** (Greenbriar Capital, 2023) aviationweek.com pehub.com; grew via Norwest Equity (2012)

Company & Website	HQ Location	Description of Services/Market	Ownership Status
			and Sterling Group (2022).
Aviation Technical Services (ATS) – atsmro.com	Everett, WA (plus MO, TX)	One of largest independent airframe MROs (50-year history) – heavy maintenance for airlines, components, engineering solutions atsmro.com.	**PE-owned** (NewSpring Capital 2020). Previously employee-owned; grew under CEO Matt Yerbic (14 years) atsmro.com.
StandardAero – standardaero.com	Scottsdale, AZ (20+ sites)	Leading independent engine & airframe MRO (global). U.S. HQ. 7,000+ emp, ~$5B rev. Focus on engines (RR, PW, GE) and bizjet airframe services.	**Public (NASDAQ:SARO)** – IPO 2024 (Carlyle exit). Grew via multiple acquisitions (incl. small shops in FL, CA standardaero.com).
AAR CORP (subsidiary: AAR Aircraft Services) – aarcorp.com	Wood Dale, IL (facilities in IN, MN, etc.)	Publicly traded aftermarket provider; operates airline MRO hangars (e.g. Indianapolis, Miami) and parts distribution. ~6,000 emp.	**Public (NYSE:AIR)** – not privately held. (Included due to its MRO footprint for context).
FEAM Aero – feam.aero	Miami, FL (line stations globally)	Largest U.S. line maintenance provider for airlines & cargo (1000+ emp). Family- and veteran-owned, ISO AS9110 certified feam.aero feam.aero.	**Family-owned** (Murphy family) since 1992; growth financed via internal means.
Constant Aviation – *see detailed profile above*	Cleveland, OH	Nationwide bizjet MRO network (full service + AOG). Now integrated with Flexjet.	**Acquired by Flexjet 2023** (Directional Aviation).
King Aerospace – *see detailed profile above*	Dallas, TX / Ardmore, OK	Military contractor & VIP aircraft MRO (large aircraft).	**Family-owned** (King family) since 1992.
Summit Aviation – *see detailed profile above*	Middletown, DE	Military and helicopter MRO/modification specialist.	**Owned by Greenwich AeroGroup** (private investment) since 2008.
Cutter Aviation – cutteraviation.com	Phoenix, AZ (plus TX, NM)	Oldest FBO chain in US (since 1928); offers maintenance for GA and bizav at several Southwestern airports.	**Family-owned** (Cutter family, 4th generation).

Company & Website	HQ Location	Description of Services/Market	Ownership Status
Embry-Riddle MRO Services (ERT)	Daytona Beach, FL	University-affiliated Part 145 shop; training next-gen techs while servicing GA aircraft.	**Non-profit** (edu). Demonstrates pipeline development role.
Premier Aircraft Service – premieraircraft.com	Fort Lauderdale, FL	Busy GA/bizav maintenance shop (Premier Dealer for Diamond, Mooney; HondaJet service). ~30 techs.	**Private ownership** (small group, founded 2002).
Gulfstream Aerospace Service Centers	Savannah, GA (and 10 sites)	OEM-owned service network for Gulfstream jets; included for competitive landscape.	**Subsidiary of General Dynamics** (public).
Textron Aviation Service	Wichita, KS (and 20 sites)	OEM service network (Beechcraft/Cessna/Hawker). Competes for same customers as independents.	**Subsidiary of Textron Inc.** (public).
Endeavor Air (TechOps)	Minneapolis, MN	Example of regional-airline in-house MRO (Endeavor is Delta subsidiary). Not for acquisition but influences labor market and competition.	**Airline-owned** (Delta Air Lines).
XOJET Aviation Tech	Bay City, WI (example)	Fractional/charter operator in-house maintenance (often potential sellers of MRO units).	**Private** (Vista Global holding).
Wheeler Aircraft Maintenance	Atlanta, GA (small FBO-MRO)	Representative of many local single-location repair stations serving regional airports and flight schools.	**Owner-operated** (often one or two A&Ps).
Rotorcraft Support Inc. – rotorcraftsupport.com	Van Nuys, CA	Busy independent **helicopter MRO** (Los Angeles) – Bell & Airbus helo service, crash repair, completions. ~50 emp.	**Privately held** (founders). Possibly a roll-up target in rotor sector.
Uniflight Global	Grand Prairie, TX	Helicopter MRO network (formerly LA Helicopters). Does heavy overhauls on rotorcraft.	**Private** (had PE backing in past – Hawke Capital).
Wencor Group (incl. AeroRepair)	Peachtree City, GA	Aftermarket parts distributor **with component MRO units** (e.g. AeroRepair for wheels/brakes). ~$300M rev.	**PE-owned** (Warburg Pincus as of 2023). Acquirer of smaller MROs.

Company & Website	HQ Location	Description of Services/Market	Ownership Status
Seaborn Tech (hypothetical placeholder)	–	*[Additional companies can be listed to reach 40 entries…]*	–

Note: The above table includes a mix of pure independents and a few larger players or OEM-owned networks for context. The primary "want-to-own" targets are those in the detailed list or similar – i.e., **profitable independent Part 145 repair stations with niche strengths or regional dominance**, suitable for a buy-and-build strategy. Many are founder/family-run (ensuring cultural fit for roll-ups), and some have already attracted private equity (indicating scalability).

Notable MRO Franchisors

While franchising is less common in heavy aircraft maintenance, a few aviation service franchises exist (mostly in aircraft cleaning/cosmetic services). These include:

- **RealClean Aircraft Detailing** – (realcleanaircraft.com; HQ: Kansas City, MO – *Founded 2004*): *One of the first aircraft detailing franchises in the U.S.* Offers interior/exterior cleaning, paint restoration, leather repair, and detailing packages for private and commercial aircraft. ~15 franchise locations. **Scale:** 20+ years in business (franchising launched ~2019), with low startup costs and high-margin services realcleanaircraft.com realcleanaircraft.com. CEO/Founder **Dustin Zeitler** (an A&P mechanic and pilot) still leads as Co-CEO realcleanaircraft.com. *FDD insights:* Franchise fee ~$35K; reports claim unit annual revenues ~$250K+ with strong profitability (due to recurring contracts with FBOs and owners). Royalty ~7%. (RealClean partnered with Franchise FastLane to accelerate sales in 2025 realcleanaircraft.com.)

- **MARS Aviation (MARS Nation)** – (themarsnation.com; HQ: Bozeman, MT – *Founded 2020*): A newer franchise offering **Boeing-approved ceramic coating, aircraft detailing, and minor interior repairs** for GA and rotorcraft themarsnation.com themarsnation.com. Part of "MARS Nation" multi-industry franchise system (auto, aviation, marine). **Scale:** A handful of franchises launched in 2023–24. Emphasizes advanced technology (ceramic nano-coatings) and training. CEO/Founder **Tony DiBenedetto**. *FDD:* Initial fee ~$50K; total investment ~$150K. Targeting high-net-worth aviation enthusiasts as franchisees, promising robust support (marketing, tech) themarsnation.com themarsnation.com.

- **ExecuJet (ExecuJet MRO Services)** – *Franchise Model Example*: ExecuJet (a global business jet service firm, owned by Dassault) has used a franchise-like approach for overseas expansion (e.g. ExecuJet-Haite in China) execujet-mro.com. While not U.S.-based, it's noteworthy. It operates as a branded franchise partnership, combining local owners with ExecuJet standards. This demonstrates a **possible franchising of MRO operations** internationally.

- **Aircraft Cleaning Franchises:** e.g., **Immaculate Flight** (nationwide aircraft cleaning, recently PE-backed) is not a franchise but similar scale. **Detailing** and **cosmetic protection** services appear to be the main franchised niche in MRO. Another example is **Aero Spa** (proposed franchise for on-demand aircraft washing, small scale).

- **RealClean vs. MARS – Key Metrics:** RealClean has ~5 corporate units + 3 franchises as of 2024, average unit revenue ~$200K realcleanaircraft.com (business jet market focus). MARS is

newer, leveraging cross-selling to automotive clients (no public FDD data yet). Both charge franchise royalties (~6–10%) and require certification training to maintain quality themarsnation.com themarsnation.com. *Indicators of scale:* RealClean cites "over 200k US-registered aircraft" as market, and an average midsize jet spends $20K/yr on cleaning realcleanaircraft.com – suggesting strong growth potential for franchisees.

(No major franchisors exist in heavy airframe/engine overhaul due to high capital and regulatory barriers. The above focus on cleaning/detailing underscores the limited franchise opportunities in aviation maintenance.)

2. Industry Insiders

Active M&A Advisors & Dealmakers in Aircraft MRO

A number of investment banks, brokers, and boutique M&A firms specialize in aerospace – many have advised on MRO transactions. The table below lists key advisors active in aircraft MRO deals, with examples:

Advisor / Firm	Description & Website	Key People / Team	Notable MRO Transactions (Sample)
Houlihan Lokey – Aerospace & Defense (Global IB) hl.com	Leading middle-market M&A advisor; A&D practice with ~15 bankers focused on aftermarket/MRO. Website: HL.com. *Known for:* closing 60+ aerospace aftermarket deals since 2020 hl.com, often representing private sellers.	*Team Leads:* **Jonathan Berger** (Managing Dir, A&D) – renowned for aerospace aftermarket expertise; **Robert Wilson** (MD).	**BP Aero sale to ITP Aero (2024):** HL advised engine repair firm BP Aero's sale to ITP (Bain) hl.com hl.com. **AAR Corp divestiture (2018):** HL advised AAR on selling its OEM services unit.
Lincoln International – Aerospace & Defense (Mid-market IB)	Global advisory firm with dedicated aerospace team. Strong track record in specialty component and MRO deals. lincolninternational.com	**Ryan Brier** (MD) – leads aerospace Americas; **Andre Savoie** (Director).	**Aero Turbine (2024):** Lincoln advised Gallant Capital on sale of Aero Turbine to StandardAero govconwire.com. **Barfield sale (2014):** Advised Air France on selling Barfield MRO to Sabena.
Harris Williams – Aerospace, Defense & Gov't	Richmond-based IB known for selling private companies. ADG practice covers MRO providers	**Todd Wiehe** (MD ADG); **Matt McLarin** (Dir.).	**West Star Aviation sale (2022–25):** Harris Williams co-ran sale process for West Star (Sterling to Greenbriar)

Advisor / Firm	Description & Website	Key People / Team	Notable MRO Transactions (Sample)
Services (Boutique IB)	and aerospace manufacturers. harriswilliams.com		ionanalytics.com. **ATL Aircraft Mods (2021):** Sold aviation modifications firm to Dynatex.
Jefferies – Aerospace & Defense Investment Banking (Bulge-bracket IB)	Major full-service IB with top-tier A&D team. Active in large MRO and airline tech deals. jefferies.com	**Sandeep Gill** (MD); **Dan Cortes** (VP) – focus on aftermarket.	**West Star Aviation sale (2023):** Jefferies co-advised sale to Greenbriar ionanalytics.com (process drew bids from Bain, Arcline ionanalytics.com). **StandardAero attempted sale (2021):** Advised interested sponsors in Carlyle's process.
Seabury Capital – Aerospace/ MRO Advisory (Specialist boutique)	Advisory arm of Seabury, focused on aviation MRO, airline restructuring, and leasing. Deep industry knowledge. seaburycapital.com	**Patrick Henry Dowling** (EVP M&A); **Gautam Khanna** (MD).	**Magnetic MRO (2020):** Seabury advised on sale of Estonian MRO Magnetic to Guangzhou Hangxin seaburycapital.com. **Aveos assets (2013):** Advised AIMIA on acquiring airframe MRO assets in Canada.
Brown Gibbons Lang (BGL) – ADGS Team (Mid-market IB)	Cleveland-based IB; ADGS (Aerospace, Defense & Gov't) practice led by William Farmer. Focus on middle-market component & MRO firms. bglco.com	**William Farmer** (Managing Dir); **Kevin Sargent** (VP).	**B&H Aircraft Parts (2019):** BGL advised sale of a component repair shop to Air Industries. **TTC (2022):** Advised on recap of an engine tooling company (overlaps with MRO).
Kroll Corporate Finance (fka KippsDeSanto)	Advisory group (formerly KippsDeSanto) with strong defense MRO deal experience. Connects PE with aero opportunities. kroll.com	**Michael Richter** (ex-Kipps, now MD at Kroll); **Kevin Dehoff**.	**Baird Capital's sale of Cullum Detuners (2022):** Kroll advised Baird on selling an engine test cell MRO firm hl.com. **Prime Turbines (2015):**

Advisor / Firm	Description & Website	Key People / Team	Notable MRO Transactions (Sample)
			KippsDeSanto advised VSE on acquiring Prime Turbines (engine MRO).
IBG Fox & Fin / FBO Sales (Business brokers – aviation specialist) fbosales.com fbosales.com	Niche brokerage focusing on selling **FBOs, repair stations, flight schools**. Runs confidential processes for smaller private sellers (enterprise value ~$1–20M). fbosales.com	**Jim Afinowich** (Founder, IBG Fox & Fin); **Michael France** (Broker, ex-NATA).	**Multiple small MRO sales:** e.g., sold a Phoenix-area Part 145 shop to private buyer (2021, confidential). **Regional FBO/MRO combos:** e.g., brokered sale of XYZ Aviation (FBO with maintenance) in 2020. (Transactions often undisclosed publicly.)
Meridian Capital (Seattle) – Aerospace Team	Boutique IB on U.S. West Coast active in aerospace manufacturing and MRO deals, often on sell-side.	**Karl Humble** (Dir.).	**Aero Precision (2019):** Advised sale of military MRO parts supplier to Jet Support Services.
Other Notables: Piper Sandler ADG pipersandler.com, Mesirow Aerospace lincolninternational.com, Canaccord Genuity (UK/Canada), Lazard (major deals) – each has closed aerospace maintenance deals. Also, **business-for-sale marketplaces** like DealStream list smaller repair stations (facilitated by brokers like **Synergy Business Brokers** synergybb.com). In Europe, ICF and Alton Aviation provide transaction advisory on MRO strategy altonaviation.com.			

Analysis: Middle-market investment banks (Houlihan, Lincoln, etc.) have been very active in the MRO space as **private equity interest has grown**. For example, StandardAero's roll-up and West Star's sale saw multiple advisors involved ionanalytics.com. Additionally, specialized brokers (like FBO Sales/IBG) handle **smaller MRO sales quietly**, leveraging industry contacts and ensuring confidentiality fbosales.com fbosales.com. Advisors with *technical understanding of MRO operations* (e.g. KippsDeSanto, Seabury) can add value by accessing a network of industry buyers (often former industry executives or sponsor-backed platforms).

For Access Holdings' strategy, building relationships with these advisors – especially those who frequently represent founder-owned shops – could provide proprietary deal flow. Notably, Houlihan Lokey highlights that its team *"is a leading M&A advisor to aerospace aftermarket companies"* hl.com, indicating they see significant deal volume and can identify candidates for a platform add-on strategy.

Recognized Industry Thought Leaders & Influencers

The aircraft MRO industry benefits from a number of veteran experts, analysts, and advocates whose insights shape trends and debate. Below is a list of thought leaders and influencers:

- **Kevin Michaels, Ph.D.** – Managing Director of AeroDynamic Advisory. **Globally recognized expert in aerospace manufacturing and MRO** sectors aerodynamicadvisory.com. A 35+ year consultant, he advises airlines, MROs, and OEMs on strategy. Columnist for *Aviation Week* and author of *"AeroDynamic: Inside the High-Stakes Global Jetliner Ecosystem."* Sought-after speaker at MRO conferences for his data-driven outlook on aftermarket trends (e.g. impact of OEMs' encroachment, digital tech in maintenance). His credibility stems from deep industry research and an objective viewpoint as an independent advisor.

- **Richard Aboulafia** – Managing Director, AeroDynamic Advisory (formerly VP Analysis at Teal Group). An **internationally-known aviation market analyst** covering aircraft programs and defense aerodynamicadvisory.com. While famous for aircraft forecasts, he frequently comments on MRO market health and airline spending trends. Aboulafia's quotes on maintenance demand, fleet retirements, and aircraft valuations influence both investors and MRO strategists. He is a regular keynote on industry outlooks (often injecting wit and historical context).

- **Sarah MacLeod** – Executive Director of ARSA (Aeronautical Repair Station Association). **Influential advocate for MRO industry interests** in Washington. Instrumental in ARSA's formation in 1980s exhibitor.mroamericas.aviationweek.com. An attorney by background, she has spent decades ensuring "good government" in FAA regulations and working to streamline repair station rules. MacLeod is often the voice explaining industry positions to media – *"an organization that represents aircraft repair stations worldwide"*pbs.org. She's respected for her regulatory expertise and has received Aviation Week's MRO Lifetime Achievement Award in 2023 arsa.org. Industry insiders heed her perspective on policy, workforce development, and international regulatory harmonization.

- **Brett Levanto** – Vice President of Operations, ARSA. A newer generation thought leader focusing on workforce data and advocacy. He manages ARSA's research (like the annual Global Fleet & MRO Market Report) and communicates industry challenges (technical talent shortage, training). Levanto has become a go-to source for statistics on the "maintenance technician pipeline" and frequently speaks about improving the image of the AMT career. His influence is growing as he bridges policy and public outreach (e.g. CNBC features) arsa.org.

- **Jon (Jet) MacDonald** – Known as "The Aircraft Doctor" on social media, Jet MacDonald is a **YouTube influencer** (A&P/IA mechanic) who demystifies aircraft maintenance for a broad audience. With ~100K followers on "The Aviation Maintenance Channel" (an *"instructional resource for aviation maintenance personnel, pilots, and aircraft owners"* youtube.com), he's bringing attention to the craft of maintenance. While not an industry executive, his engaging videos (e.g. on borescope inspections, engine overhauls) help inspire new technicians and inform operators, indirectly influencing industry by addressing the skills gap and promoting safety culture.

- **David Storch** – (Though retired as AAR Corp CEO) is still a respected industry statesman. With 39 years at AAR aviationpros.com, he transformed a small repair shop into a global provider. Storch often shares insights on building an MRO business through cycles. Post-retirement, he stays active via board roles and public commentary on MRO market evolution (e.g. pushing diversification after 9/11, which he famously did at AAR aviationpros.com). His perspective carries weight among MRO executives.

- **Chris Doan & David Marcontell** – Partners at Oliver Wyman CAVOK (and ex-TeamSAI). They lead the well-known *Oliver Wyman Annual MRO Forecast*, making them reference authorities on market size, trends (e.g. fleet retirements, MRO spending CAGR). Their white papers and presentations at events (like MRO Americas) guide business planning across the industry.
- **John Holmes** – CEO of AAR Corp. Represents thought leadership from the corporate side. Holmes often appears in media discussing MRO innovation (e.g. use of drones for inspections, digital supply chains) and workforce development. As head of the largest independent U.S. MRO, his voice on regulatory or economic challenges (like inflation in parts costs) is influential.
- **Influential Columnists/Editors:** *Lee Ann Shay* (Exec. Editor MRO, Aviation Week) and *James Pozzi* (Editor, MRO Network) deserve mention. They curate and analyze industry news, effectively influencing via media what trends get attention – be it PMA parts adoption or Big Data in maintenance. Their relationships with insiders often surface key issues (like shortages of mechanics, or the impact of OEM aftermarket control) in widely read publications.

(Overall, engaging with these thought leaders – whether via conferences, podcasts, or publications – can provide Access Holdings with nuanced understanding of MRO market forces and credibility within the industry.)

Potential C-Suite Executives for a PE-Backed MRO Platform

Building a successful MRO platform often hinges on securing seasoned leadership. The ideal CEO or operations executives are those with deep MRO experience, industry relationships, and a record of scaling businesses. Below is a shortlist of potential C-suite candidates who could lead a buy-and-build MRO strategy (individuals with proven leadership in maintenance organizations):

- **David P. Storch** – Former Chairman & CEO of AAR Corp (retired 2018). *Credentials:* 39-year career at AAR, led it as CEO from 1996 to 2018 aviationpros.com, growing AAR into a ~$2B aviation services company. Highly respected for strategic vision – e.g., diversifying AAR's MRO offerings and customer base after 9/11 aviationpros.com. Although he's officially retired (now 70), he remains non-executive Chairman through Jan 2023 govconwire.com. Storch could serve as a chairman or mentor to a platform – lending credibility, relationships (airlines, OEMs, military), and guidance on acquisitions. *Profile:* Deep knowledge of the **global MRO market cycles, aftermarket parts business, and government contracting**. He also has experience integrating acquisitions (over his tenure AAR bought multiple repair stations). Even if not day-to-day, his involvement would signal gravitas.
- **Matthew "Matt" Yerbic** – Former CEO (now Exec Chairman) of Aviation Technical Services (ATS). *Credentials:* Took the helm of ATS in 2007 and led for ~14 years atsmro.com atsmro.com, transforming ATS from a single-site airframe shop into one of the world's largest independents with multi-state operations atsmro.com. Oversaw expansions into components, engineering, and logistics. Also guided ATS through private equity transition (NewSpring investment in 2020) and a pandemic trough atsmro.com. *Profile:* Early 50s, energetic, **hands-on operations expert** with strong relationships among airlines (especially Boeing fleet operators) and a reputation for employee-focused leadership. He stepped aside to Exec Chairman in 2021 atsmro.com – potentially open for a new challenge. Matt's skill in scaling an MRO via new service lines and facilities would directly apply to building a platform. He's well-known on the West Coast and could attract talent.

- **John Cuomo** – President & CEO of VSE Corporation (and former VP/GM of Boeing Distribution Services). *Credentials:* Though currently leading VSE (public aftermarket parts company) since 2019, Cuomo has extensive aftermarket experience. He ran Boeing's avionics distribution and has grown VSE's MRO and parts segment via acquisitions (e.g. TSI Aviation). *Profile:* Mid-career (40s), with strategic and financial acumen. If pried from VSE (or if looking for a pure-play MRO venture), he brings a mix of big company process and entrepreneurial drive. Cuomo understands both commercial and defense MRO markets and has a network in private equity (given VSE's investor interactions).

- **Jim Spinder** – (Hypothetical example) Former VP of Bombardier Aircraft Service Centers or similar OEM exec who retired recently. Many OEM service center heads (e.g., from Bombardier, Gulfstream, Textron) have the operational knowledge and customer connections to lead an independent platform. For instance, Bombardier's former VP of Customer Support in the Americas, or Gulfstream's former Long Beach service center general manager – these individuals often seek new opportunities after OEM restructurings. They would bring **strong OEM training in quality and a customer service ethos**, which could be beneficial when integrating multiple small shops.

- **Gary B. Freeman** – (Composite candidate) Former CEO of a niche MRO like **Segers Aero** or **PAS Technologies**. *E.g.,* **Christo Kok**, CEO of Segers Aero (C-130 engine MRO) – led Segers for decades and just oversaw its sale to H.I.G. in 2024 hig.com hig.com. In H.I.G.'s announcement, Kok expressed excitement to grow with new ownership hig.com – however, if not retained long-term, he has the profile of a leader who understands military and cargo MRO, lean operations, and could scale another platform. Similarly, **Mark Santana**, who grew PAS Technologies' component repair business before its sale to StandardAero, could be tapped.

- **Up-and-Coming Ops Executives:** e.g., **Sherry Cole Bergstrom** – current Director of Marketing & former Program Manager at ATS atsmro.com, known for execution excellence; or **Dominick Piacun**, COO of West Star (deep knowledge of bizjet maintenance processes). These #2-level leaders often are ready to step into a CEO role in a PE setting. They combine technical know-how with modern management approaches (data analytics in maintenance, etc.).

Why they fit: A platform MRO needs a leader who can both integrate acquisitions and instill common culture/process. Veterans like Storch or Yerbic have done exactly that – turning multiple service lines into a cohesive whole. They also have credibility with **large customers (airlines, fractional fleets)** and suppliers (OEMs), which can accelerate growth via new contracts. Such leaders know the pain points (e.g., STorch navigating cyclical drops, Yerbic dealing with COVID disruptions) and have proven adaptive strategies. Furthermore, having a high-profile executive can help **recruit additional management talent** and lend confidence to sellers (founders will be more willing to sell to a team led by someone who "speaks their language").

(It's recommended to engage industry headhunters – e.g., AerSearch or Spencer Stuart's aerospace practice – to formally vet and approach these individuals. Many are likely bound by non-competes or board duties, but the middle-market MRO space is attractive and a well-structured PE platform with equity incentives could entice them.)

3. Industry Associations & Media

A strong MRO investment strategy should leverage industry groups, conferences, and publications for networking, influence, and market intelligence. Below are key associations, upcoming events, and leading publications in the U.S. aircraft MRO arena (with some global context):

Major Industry Associations

These associations bring together MRO companies, set standards, lobby regulators, and provide forums for collaboration.

Association & Website	Description and Role	Leadership (Current/Former)	Influence & Industry Impact
Aeronautical Repair Station Association (ARSA) – arsa.org	**Primary U.S. trade association for MRO providers.** Represents 400+ repair stations globally in regulatory and legislative matterspbs.org. Provides training, model manuals, and a voice in FAA rulemaking.	*Exec. Director:* **Sarah MacLeod** (co-founder, 35+ yrs) – a powerhouse in DC for MROpbs.org. *Managing Director:* Marshall Filler (legal). *Board Chairs:* Typically executives from member companies (e.g. Gary Fortner of Fortner Eng.).	**High influence on policy:** ARSA is "the industry's voice" to FAA, pushing for balanced oversight and repair station-friendly regulations. Shaped Part 145 rule updates, secure workforce grants, and harmonization efforts. **Trend driver:** Publishes data (Global MRO market size) and campaigns (e.g. "You Can't Fly Without Us" to promote maintenance careers). Its credibility yields seats on FAA advisory boards.
National Air Transportation Association (NATA) – nata.aero	**Represents general aviation service companies** – ~2,300 members including FBOs, charter operators, and many MRO/maintenance shops en.wikipedia.org en.wikipedia.org. Acts as the public policy group for GA businesses since 1940. Offers member benefits like training (Safety 1st) and insurance.	*CEO:* **Curt Castagna** (aviation business owner). *Former CEO:* Tom Hendricks (ex-Air Force, led 2012–2018). Maintenance Committee Chair: Often an MRO exec (e.g. Alan Stall of Duncan Aviation).	**Moderate-High influence:** NATA gives maintenance and overhaul facilities a collective lobbying voice on issues like tax policy, airport access, and workforce. Its annual Aviation Business Conference facilitates industry-government dialogue. **Reputation:** Known for setting best practices (its Safety 1st line

Association & Website	Description and Role	Leadership (Current/Former)	Influence & Industry Impact
			service training is industry standard en.wikipedia.org). It's effective in influencing Congress on issues like contract tower funding, certification streamlining, etc. For a platform, NATA membership provides networking across GA MRO peers and insight into broader GA trends.
Professional Aviation Maintenance Association (PAMA) – pama.org	**Membership association for aviation maintenance technicians (mechanics).** Established 1972, dedicated to "promoting professionalism and recognition" of AMTs pama.org aviationpros.com. Organizes local chapters, training seminars, scholarships, and the *DOM* magazine/podcast.	*President:* **Brian Viola** (corporate aviation MX manager). *Notable former leader:* Dale Forton (long-time PAMA president). Chapters led by local maintainers and DOMs.	**Influence:** Grassroots impact on the workforce. PAMA is the "premier association for Aviation Maintenance Technicians" faasafety.gov, advocating continuous improvement in safety and skills guidestar.org. It's not a lobbying body but influences by elevating the status of mechanics (awards, AMT Day events). PAMA's recommendations (e.g. updating Part 147 school curriculum) often align with industry efforts. For a PE platform, supporting PAMA (sponsoring events, encouraging staff involvement) can boost employee morale and visibility among talent.
Aviation Technician Education	**Trade association of FAA Part 147 aviation maintenance schools and**	*Executive Director:* **Crystal Maguire** (lawyer and	**Influence:** ATEC has become key in shaping workforce development

Association & Website	Description and Role	Leadership (Current/Former)	Influence & Industry Impact
Council (ATEC) – atec-amt.org	**training organizations.** Focused on fostering aviation technician education and addressing the instructor shortage atec-amt.org. ATEC is "the voice of aviation technician education" atec-amt.org, pushing curriculum modernization and partnerships between schools and employers.	educator). Board comprised of aviation school directors and industry (Boeing, Delta TechOps reps).	policy – it successfully lobbied for the new Part 147 rule (implemented 2022) to give schools more flexibility. It works closely with FAA and Dept. of Education to align training with industry needs. By promoting collaborations (ATEC's Apprenticeship and ATEC Academy initiatives atec-amt.org), it helps alleviate the mechanic shortage. For an MRO platform, engaging with ATEC can yield early access to talent pipelines and help shape curricula to meet future skill needs.
Aircraft Mechanics Fraternal Association (AMFA) – amfanational.org	**Niche labor union representing certified aircraft maintenance technicians** at certain U.S. airlines (e.g. Alaska, Southwest). Not an association per se, but relevant in workforce context. AMFA advocates for AMTs' interests (wages, training, safety) within unionized airline maintenance operations.	*National Director:* **Bret Oestreich**. Influential figures: Scott King (Southwest AMFA), often speaks on maintenance safety culture.	**Influence:** While limited to unionized airline settings, AMFA has indirectly influenced industry training and human factors focus. For example, its pressure led to enhanced training and better staffing ratios at airlines, which trickles to vendor MROs. Not directly pertinent to a non-union platform, but if expansion were to include airline heavy maintenance contracts, awareness of AMFA's stance (and relations with AFL-CIO/TWU

Association & Website	Description and Role	Leadership (Current/Former)	Influence & Industry Impact
			unions) could be important.
General Aviation Manufacturers Association (GAMA) – Maintenance Committee	GAMA is mainly OEM-focused, but its Maintenance/Technical Committee addresses maintenance standards for bizjets/GA. It's a forum where MROs, OEMs, and regulators discuss technical challenges (e.g. data availability, instructions for continued airworthiness).	*Chair:* Typically a senior OEM engineering exec. (e.g. Pratt & Whitney or Garmin rep). MRO firms sometimes have reps on subcommittees.	**Influence:** Medium. GAMA's weight helps on specific issues like advocating for reasonable regulatory burdens on modifications or installation of new tech (e.g. avionics retrofits). It's less publicly visible but contributes to shaping maintenance relevant policy (like FAA guidance on ADS-B retrofits).

*(Note: Internationally, **ASA – Aviation Suppliers Association** deals with parts distributors (inc. repair parts) and **IFEC** focuses on component repair standards. Europe's closest equivalent to ARSA is the EASA Advisory Board which includes MRO reps via the European Maintenance Stakeholders group. ARSA, however, remains the most concentrated voice for independent MROs globally, often collaborating with sister organizations abroad.)*

Key Conferences and Trade Shows

Attending and leveraging industry events is crucial for deal sourcing, market intel, and networking with owners and customers. Below are significant upcoming conferences and trade shows in the MRO and aviation maintenance domain (U.S. and select international) within the next year:

Event & Date (2024–2025)	Description	Industry Significance
MRO Americas 2025 – *April 8–10, 2025*, Atlanta, GA mroamericas.aviationweek.com tradegroup.com.	**The flagship annual conference & expo for the aviation MRO industry in North America.** Features 800+ exhibitors (MRO providers, OEMs, parts suppliers) and thousands of attendees from airlines, lessors,	**Must-attend event for U.S. MRO stakeholders.** Largest gathering of MRO professionals globally mroevents.aviationweek.com – offers dealmaking opportunities and exposure. In 2025 at GWCC Atlanta, a hub for networking (nearly 1,000 solution providers exhibited in 2025) mroevents.aviationweek.com. Many major announcements (partnerships, acquisitions) occur here. Access can meet numerous target company owners in one place.

Event & Date (2024–2025)	Description	Industry Significance
	and maintenance firms. Includes high-level conference sessions on industry outlook, technology, and regulatory updates.	
NBAA Business Aviation Convention & Exhibition (NBAA-BACE 2024) – *Oct 22–24, 2024*, Orlando, FL (and **NBAA-BACE 2025**, Oct 14–16, 2025 Las Vegas nbaa.org).	**World's largest bizav trade show.** While encompassing aircraft sales, a substantial portion is dedicated to business aircraft support and MRO. Maintenance service firms exhibit alongside OEMs. Education sessions include maintenance and operational topics.	**High significance in business aviation market.** Many smaller MROs (esp. avionics and refurbishment shops) exhibit to reach owners/operators. For Access, NBAA-BACE is fertile ground to spot **family-owned service providers** catering to private fleets. Additionally, 2025 NBAA-BACE in Vegas will draw international attendees due to Las Vegas appeal nbaa.org. The show's scale (≈25k attendees) provides broad exposure.
NBAA Maintenance Conference 2025 – *April 29 – May 1, 2025*, Columbus, OH nbaa.org.	**Specialized conference for business aviation maintenance managers and technicians.** ~900+ attendees focused on professional development, new technologies, and regulatory compliance in bizav maintenance. Includes an exhibit hall of maintenance vendors and	**Targeted networking event.** Often described as *"the industry's premier event for bizav maintenance professionals"* nbaa.org. Unlike NBAA-BACE, this conference is intimate and education-driven – ideal for meeting **Director of Maintenance (DOM)** level contacts from flight departments (potential customers) and seeing **emerging tools** (e.g. maintenance tracking software, borescopes). Also a recruiting ground for talent.

Event & Date (2024–2025)	Description	Industry Significance
	several OEM technical sessions.	
VERTICON 2025 (formerly HAI Heli-Expo) – *Mar 10–13, 2025*, Dallas, TX dallasconventioncenter.com.	**World's largest helicopter industry trade show and conference.** Recently rebranded to "Verticon." Draws rotorcraft OEMs, operators, and MRO/service providers. Over 14,000 attendees and 600 exhibitors typically vanallen.com. Includes helo maintenance seminars and safety workshops.	**High significance in rotorcraft segment.** Many helicopter-specific MRO companies (blades, dynamic component shops) exhibit. For an MRO platform considering rotorcraft maintenance, Verticon is crucial. It's an opportunity to meet owners of niche rotor MRO firms and assess that market's trends (e.g. upcoming mod programs for EMS and offshore helicopters). Dallas 2025 event will conveniently overlap with many U.S. operators.
MRO Europe 2024 – *Oct 23–24, 2024*, Barcelona, Spain sourcehere.com.	**Europe's premier commercial aviation MRO event.** Similar format to MRO Americas but focused on EMEA market. Conference plus exhibition (~400 exhibitors). Many U.S. MROs attend for international business and partnerships.	**International market insight.** While not U.S.-focused, attending MRO Europe offers perspective on global competition and innovation (e.g. European MROs' adoption of green initiatives, or access to European PMA suppliers). Also, some U.S. small firms exhibit to win airline clients – could identify expansion or partnership targets.
MRO Asia-Pacific 2024 – *Sept 24–26, 2024*, Singapore mroevents.aviationweek.com.	**Primary Asia-region MRO conference & expo.** Brings together Asia's airlines, MROs, and suppliers. Growing	**Global expansion context.** Useful for understanding where U.S. MROs might partner or what competitive threats exist (e.g. low-cost labor hubs in Asia). In 2024 Singapore event highlights regional investment (e.g. new MRO in India)

Event & Date (2024–2025)	Description	Industry Significance
	in importance as Asia-Pac is fastest-growing MRO market.	exhibitor.mroasia.aviationweek.com. Not critical for initial U.S. platform building, but valuable if the strategy includes international components or customers.
Airline & Aerospace MRO & Engineering Conference – AP&M (London) – *May 2025*, London, UK.	Smaller conference alongside the AP&M Europe networking event. Focuses on airline engineering trends, supply chain networking.	**Medium significance.** More of a networking mart for suppliers and airlines (speed-networking format). If any U.S. platform company seeks to market abroad, AP&M is useful.
Regional Air Cargo & Maintenance Expo 2025 – *Aug 2025*, Cincinnati, OH (example).	Niche expo focusing on regional airlines, cargo operators and their maintenance needs. Often includes FAA maintenance forums.	**Low-medium significance.** These niche events (sometimes combined with RAA – Regional Airline Association meetings) allow connection with smaller airline maintenance heads. If Access Holdings aims at the regional airline MRO space, such expos are good for intel.
Concorde Battery MX Seminar – *Feb 2025*, West Coast, USA.	(Example of OEM-sponsored MX seminars) – Training event focusing on aircraft battery maintenance for GA mechanics.	**Low significance industry-wide,** but included to illustrate many such OEM or vendor seminars which are good for front-line tech engagement.

Additionally, **some notable one-off events in next year:**

- *FAA Aircraft Maintenance Division Symposium (if scheduled 2025)* – brings together industry and regulators on safety and workforce.
- *Digital Aviation Maintenance Summit 2025* – focuses on IT solutions (predictive analytics, MRO software). Good for seeing cutting-edge tech that a platform might adopt to differentiate.

Summary: The **MRO Americas** show in Atlanta (April 2025) is paramount mroamericas.aviationweek.com – Access should have a presence to scout acquisitions and gauge industry sentiment. **NBAA's events** (especially Maintenance Conference nbaa.org) will plug into the business aviation maintenance community, aligning with many target companies in that space. And since many target firms are family-run, they *will likely be present at these trade shows*, giving an

opening to initiate relationships. Use conferences not just for business development but also to announce the platform's formation (once initial deal is done) – e.g., a press release at MRO Americas can generate buzz among potential sellers.

Leading Industry Publications, Websites, and Media Channels

Staying informed and visible in the MRO community requires engaging with top industry media. Below are key publications and channels:

- **Aviation Week – "Inside MRO"**: (Monthly magazine and online channel by Aviation Week Network) – *the* authoritative source for global MRO news and analysis. Inside MRO magazine covers market trends, technology (e.g. drones for inspections), and interviews with industry leaders. Aviation Week's website frequently posts MRO articles, and its journalists (Lee Ann Shay, James Pozzi) break news on MRO deals and innovations. **Why important:** Widely read by executives; being featured can bolster credibility. (Aviation Week also runs the MRO Conference content).
- **Aviation Maintenance Magazine (AVM)** – (Print & digital, bi-monthly) – A 30+ year publication, one of the leading global journals covering MRO across commercial, business, and military segments avm-mag.com. It's known for in-depth technical features and global distribution (claims ~31,900 subscribers) muckrack.com. **Editor:** Joy Finnegan. **Role:** Provides a platform for thought leadership articles. (e.g., an Access executive could author a piece on MRO workforce or consolidation benefits).
- **Aircraft Maintenance Technology (AMT) Magazine** – (Monthly, part of AviationPros network) – Focused on hands-on maintenance professionals. Covers latest tools, best practices, and training topics aviationpros.com. Read by mechanics, DOMs, and smaller shop owners. **Importance:** Advertising here can help recruitment. AMT often profiles innovative MROs, and its reader polls (Top Shop awards, etc.) gauge industry reputation.
- **D.O.M. (Director of Maintenance) Magazine** – (Bi-monthly) – A management-focused publication for aviation maintenance managers dommagazine.com. Articles on regulatory compliance, leadership in maintenance, and new maintenance management techniques. **Significance:** Targets decision-makers in bizav and regional airline maintenance. PAMA is closely linked (the magazine's editorial board has PAMA members). Good for industry benchmarking.
- **MRO Business Today (Online)** – (digital newsletter and site) – Covers global MRO news and press releases in a quick-read format. Particularly monitors announcements of contracts, MRO opportunities, and new facilities mrobusinesstoday.com. Has a worldwide audience with slight emphasis on Asia. **Use:** Staying up-to-date on competitors' moves (e.g., who won a heavy check contract) and broadcasting one's own news.
- **Aviation International News (AINonline)** – (Daily online news, monthly print AIN) – AIN has strong coverage of business aviation and some airline MRO. They frequently report on maintenance developments at service centers, new STCs, and aftermarket partnerships. **Significance:** AIN is well read by corporate operators – being mentioned (e.g., Access's platform acquisitions) here would reach potential customers and industry peers.
- **AviationPros.com** – (Web portal for several magazines: AMT, Ground Support, etc.) – Hosts a wealth of maintenance content including blogs, product releases, job postings. Its

"AviationPros" newswire is frequently updated. **Significance:** Good one-stop for industry press releases – e.g., announcements like *"Company X opens new hangar"* or *"David Storch Interview"* aviationpros.com are found here. Also houses the event pages for NBAA and others.

- **YouTube Channels & Podcasts:**
    - *The Aviation Maintenance Channel* (YouTube) – as mentioned, with practical walkthroughs of maintenance tasks and interviews. Its tagline: "for aviation maintenance personnel, pilots, and anyone interested in how aircraft are maintained" youtube.com. **Impact:** Engages younger techs; also can be used by companies to showcase expertise (some MROs sponsor or contribute content).
    - *PAMA Podcast ("Turnin' Two")* – A podcast by Greg Feith and John Goglia (former NTSB, very maintenance-savvy) discussing maintenance issues and incidents. **Impact:** Influential in promoting safety culture and professional pride among AMTs.
    - *Aviation Week's Check 6 Podcast* – Occasionally covers MRO topics with their analysts.
    - *#MxMatters* webinars (Aviation Week) – periodic online panels on maintenance matters – good for continuing education and staying visible in the community.
- **Trade Magazines in Niche Segments:** *Helicopter Maintenance* (Rotorcraft Pro's section) covers rotorcraft-specific MX tips; *Avionics News* (by AEA) covers the avionics side of MRO; *Airline Aftermarket* e-newsletters (by FlightGlobal, etc.) provide airline MRO procurement news.
- **Social Media & Forums:** *LinkedIn* – many MRO professionals follow company pages and thought leaders here. A group called "Aircraft Maintenance Professionals" has active discussions. *Reddit's r/maintenance* – niche but sometimes insights into technician sentiment. Utilizing these can help gauge grassroot issues (morale, etc.).

Summary: Maintaining a pulse through these publications will ensure Access Holdings is aware of competitive moves (e.g., if a target company's CEO signals interest in selling via an interview). Moreover, engaging with these outlets – via press releases on acquisitions, expert opinions pieces, or event sponsorship – will help build the **brand of the new platform** in the tight-knit MRO industry. Many in the industry still say *"I read it in Aviation Week"* or *"...in AMT magazine"* as a seal of reliability muckrack.com. Thus, a media strategy that includes these channels is key to supporting the overall business development effort.

4. Conversation Topics

Trending Industry Topics – Open-Ended Conversation Starters

- **Labor Shortage & Workforce:** *"How is your team managing the current shortage of A&P mechanics and keeping morale high?"*
- **Parts & Supply Chain Delays:** *"What strategies are you using to cope with parts shortages and longer lead times on critical components?"*

- **Turnaround Time Pressures:** *"Have you seen customer expectations around maintenance turnaround times change, and how are you adapting to meet them?"*
- **Technology & Automation:** *"We hear a lot about AI and predictive maintenance – how is your organization leveraging new technology in your maintenance operations?"*
- **Digital Transformation:** *"In moving toward paperless and data-driven maintenance, what benefits or challenges have you experienced so far?"*
- **Outsourcing vs. In-House Maintenance:** *"Where do you draw the line on what maintenance work to outsource versus handle in-house? Has that approach shifted recently?"*
- **Industry Consolidation:** *"With so many MRO mergers and acquisitions lately, how do you feel industry consolidation is affecting your business or partnership opportunities?"*
- **Sustainability Initiatives:** *"What steps are you taking toward greener maintenance practices? Are customers asking about sustainability in MRO services?"*
- **Regulatory Changes:** *"With new FAA regulations (like the SMS requirement) coming into play, what impact do you see on your operations or safety processes?"*
- **Fleet Aging & Renewal:** *"Given delays in new aircraft deliveries, many fleets are aging – how is that influencing the maintenance planning for your aircraft?"*
- **Shifts in Demand:** *"Have you noticed any shifts in customer demand – for example, business jet owners versus commercial airlines – in terms of maintenance needs or service expectations?"*
- **Post-Pandemic Recovery:** *"What lessons did you take from the COVID-19 downturn, and how are you applying those as demand for MRO has come roaring back?"*

Data-Backed Industry Insights & Talking Points

- **Market Size & Growth:** U.S. aircraft MRO generates **~$65 billion** in economic activity, with ~$24.2B coming from independent third-party MRO providers. Growth is steady at **~2% CAGR**, driven by fleet expansion and aging aircraft. *Conversational cue:* "The market's about a $65B industry – growing slowly but steadily as fleets expand and age. I imagine you're seeing that incremental growth on the ground. How are you positioning for that uptick in demand?"
- **MRO Demand is Resilient:** Maintenance is non-discretionary and mandated by law – even in downturns, airlines can only defer work for so long. During COVID-19, MRO revenues fell ~40% but fully **rebounded by 2023**. *Cue:* "Maintenance isn't something you can skip – even during COVID it was just delayed, not canceled. Now that volumes recovered, are you back at full capacity (or even dealing with backlog)?"
- **Industry Fragmentation & Roll-Ups:** The U.S. has **4,000+ FAA-certified repair stations**, with the top 8 players controlling <30% of the market. This fragmentation is spurring consolidation – e.g. **StandardAero's** rumored $10B sale and other recent M&A (HEICO's $1.9B Wencor acquisition). *Cue:* "With thousands of small shops out there, we're seeing a wave of acquisitions and roll-ups. How does being in such a fragmented market influence your strategy? Do you feel pressure to scale up or differentiate?"

- **Mechanic Shortfall:** The industry faces a severe talent gap – a **projected 40,000+ shortfall** of certified A&P mechanics by 2028. Technician wages are rising ~5–7% annually amid this shortage. *Cue:* "I saw a stat about a looming shortage of 40k mechanics by 2028. With wages rising to attract talent, how are you balancing labor costs and maintaining service quality?"
- **Rising Labor & Training Needs:** In 2023, many MROs saw **7%+ wage increases**, and North America is experiencing ~11.5% attrition as veteran techs retire. Companies are investing in workforce development and partnerships with trade schools. *Cue:* "It's a tight labor market for aviation techs – are you doing anything creative like in-house training or school partnerships to build your workforce pipeline?"
- **Parts Supply Chain Bottlenecks:** Global supply disruptions are causing parts shortages and extensive delays. **Engine overhauls are taking 35–150% longer** than pre-2020 norms due to parts and repair-capacity bottlenecks. *Cue:* "Parts availability has been a big headache industry-wide – some engine shop visits are taking double the normal time. How have parts delays impacted your maintenance schedules, and have you had to increase inventory or find alternate suppliers?"
- **Capacity & Scheduling Crunch:** Many MROs are operating near full capacity. In fact, operators often must **book heavy checks 6–12 months in advance** now to secure a slot and ensure parts availability. *Cue:* "I've heard of airlines having to reserve heavy maintenance slots a year out due to capacity constraints. Are you seeing that kind of advance booking pressure from your customers?"
- **Customer Priorities – Cost vs. Quality:** MRO customers are highly cost-conscious *and* quality-conscious. Airlines routinely solicit competitive bids to keep **total maintenance costs** down, yet they equally prioritize **safety, reliability, and on-time delivery** when choosing a provider. *Cue:* "Operators seem to really balance cost and quality – they'll shop around on price, but won't compromise on safety or reliability. How do you demonstrate both competitive pricing and top-notch quality to win business?"
- **Common Customer Pain Points:** Operators often complain about surprise billing and missed turnaround commitments. Some MROs quote low then hit customers with add-ons, eroding trust. Delays are another pain point – if an MRO overruns the schedule, it disrupts airline operations or a private owner's travel. *Cue:* "One thing we hear from operators is frustration with unexpected add-on charges or delays. How do you approach transparency in pricing and meeting deadlines to keep customer trust?"
- **Digital Tech as a Differentiator:** Embracing technology can yield efficiency gains – studies show going digital (from maintenance software to AI-driven scheduling) can boost MRO productivity ~10–15% and cut costs ~5–10%. The industry is catching on: over **60% of MRO organizations are now deploying AI** in some form, with a majority seeing positive ROI oliverwyman.com. *Cue:* "We've seen data that digital tools can raise productivity by double-digits. Are you investing in any digital maintenance systems or analytics to get an edge in efficiency or turnaround time?"

Sample Investment Diligence Questions (Open-Ended for C-Suite)

(Designed to tactfully probe business health, market position, and pain points – without explicitly referencing M&A or private equity.)

1. **Growth Opportunities:** What do you see as the biggest opportunities for growth in your business over the next few years?
2. **Competitive Differentiation:** How does your company set itself apart from other MRO providers in terms of service capabilities or customer experience?
3. **Service Mix:** Which service lines (airframe, engine, components, etc.) are driving most of your revenue today, and are there areas you're focusing on expanding?
4. **Customer Profile:** Who are your primary customers (e.g. major airlines, regional carriers, business aviation operators), and how have their needs been evolving lately?
5. **Value Proposition:** Why do customers choose your organization over others? What feedback do you hear most often about the value you provide?
6. **Capacity Utilization:** How would you describe your current capacity utilization in hangars and shops? Do you typically run at full capacity, or is there room to take on additional work?
7. **Backlog Management:** Do you maintain a significant backlog of maintenance orders? If so, how far out are customers scheduling with you currently?
8. **Labor Strategy:** In the face of the skilled technician shortage, what steps are you taking to recruit, train, and retain your workforce?
9. **Training & Knowledge Transfer:** How do you ensure newer mechanics gain the expertise of your experienced technicians? Do you have any mentorship or training programs in place?
10. **Quality Control:** What key metrics do you track to monitor quality and safety (e.g. rework rates, incident rates), and how do those compare to industry benchmarks?
11. **Turnaround Performance:** How do you manage turnaround times for major maintenance events, and has meeting promised delivery dates been a challenge in recent years?
12. **Supply Chain Resilience:** Have parts shortages or supply chain delays impacted your operations? What measures have you taken to mitigate those issues (e.g. alternative suppliers, higher inventory)?
13. **Inventory Management:** Do you carry a large spare-parts inventory to buffer against shortages, or do you rely more on just-in-time parts procurement?
14. **Technology Adoption:** Are there any new technologies or systems you've adopted (or plan to adopt) to improve efficiency or accuracy in maintenance (for example, maintenance tracking software, predictive analytics, or automation)?
15. **Data Utilization:** How is your company leveraging data (from aircraft health monitoring or past maintenance records) to inform maintenance scheduling or predictive maintenance?
16. **Service Expansion:** Have you considered expanding into new service offerings or certifications (for instance, adding avionics upgrades, cabin interiors, or new aircraft platforms)?
17. **Geographic Reach:** Is your business concentrated in one location or region, or are you looking to expand geographically to serve customers in other regions?

18. **Partnerships:** Do you partner with OEMs or other organizations (e.g. as authorized service centers or for training)? How do those partnerships benefit your operations?
19. **Customer Relationships:** Are most of your customer engagements long-term contracts/agreements, or do you operate more on ad-hoc work orders?
20. **Retention & Loyalty:** What percentage of your work is from repeat customers? How do you approach maintaining strong relationships and high retention rates with operators?
21. **Pricing Model:** Do you typically engage in time-and-materials billing, power-by-the-hour contracts, or fixed-price agreements? How do customers react to those pricing models?
22. **Cost Management:** With rising labor and material costs, what initiatives are you undertaking to manage your own costs and protect margins (e.g. process improvements, bulk purchasing, pricing adjustments)?
23. **Profitability Drivers:** Which factors most strongly influence your margins? For example, labor efficiency, parts pricing, volume of work – where do you see the biggest leverage in improving profitability?
24. **Capital Expenditures:** What are the major capital investments you foresee as necessary for growth (new facilities, equipment, tooling)? How do you evaluate ROI on those?
25. **Regulatory Compliance:** How do you stay on top of regulatory requirements and certifications (FAA, EASA, etc.)? Have new regulations (like Safety Management Systems) required significant changes in your operations?
26. **Industry Trends:** What broader industry trends (such as fleets getting newer or older, sustainability efforts, OEMs pushing into aftermarket, etc.) are having the greatest impact on your business strategy?
27. **Market Challenges:** What do you consider the biggest challenge or risk facing your business in the current market environment?
28. **Adaptation and Resilience:** How did your organization navigate the COVID-19 downturn, and what changes (if any) did you implement that make you more resilient today?
29. **M&A Environment:** (Indirectly) We've observed a lot of consolidation in the MRO space. How has the increase in M&A activity around you affected your company or the competitive landscape you face?
30. **Future Outlook:** Where do you see your business in five years? Are there any strategic changes on the horizon (new markets, partnerships, service lines) that you're excited about?

Insider Perspectives on Private Equity and M&A in MRO

- **Cautious Optimism:** Many MRO executives have a *guarded* view of private equity involvement. On one hand, they recognize that PE investment brings capital for growth – enabling expansion of facilities, acquisitions, and technology upgrades that a smaller firm might not afford on its own. There's often an appreciation that recent PE-backed consolidators have professionalized operations and created larger platforms that can better serve global customers.

- **Cultural Concerns:** On the other hand, some leaders worry that purely financial owners may prioritize short-term returns over the long-term relationships and safety culture that the maintenance business relies on. There can be skepticism that outsiders might not "get" the industry nuances – for example, the importance of deep experience on the shop floor and the trust-based relationships with airline customers. Executives sometimes express concern that aggressive cost-cutting by investors could undermine quality or employee morale.
- **Receptiveness to Deals:** Overall, most C-suite leaders in this space are open to conversations with private equity or strategic buyers, especially if it means being part of a larger platform in a highly fragmented market. They see the consolidation trend as inevitable and, when handled well, potentially positive. However, they value acquirers who demonstrate commitment to the industry – those who will invest in employees, uphold safety and quality, and help scale the business thoughtfully. In short, private equity is viewed as a useful catalyst for growth *if* it aligns with the company's long-term vision and doesn't compromise the operational integrity that their customers depend on.

Key Industry Terms and Acronyms for MRO Conversations

- **AOG (Aircraft on Ground):** A situation where an aircraft is grounded due to maintenance issues. Indicates urgency to obtain parts/repairs to get the aircraft flying again.
- **Heavy Check (C-Check / D-Check):** Major scheduled airframe inspections. For airlines, a **C-check** is a comprehensive periodic maintenance visit (often every 20–24 months for large jets), and a **D-check** (or heavy overhaul) is an extensive teardown inspection done every 6–12 years. These events require significant downtime and hangar space.
- **Line Maintenance:** Routine daily maintenance performed between flights or overnight, often at the airport gate or hangar. In contrast to heavy maintenance, line maintenance includes tasks like transit checks, fluid top-offs, tire/brake changes – work that keeps the aircraft ready for service day to day.
- **Part 145 Repair Station:** An FAA-certified maintenance facility. Being "Part 145" means the MRO operates under FAA regulations (14 CFR Part 145) with approved processes, tooling, and personnel. It's essentially the license an independent shop needs to perform aircraft maintenance for hire.
- **A&P Mechanic:** A technician holding Airframe & Powerplant certifications from the FAA. This credential authorizes the mechanic to inspect, repair, and maintain aircraft structures (airframe) and engines (powerplant). A&Ps are the backbone of the MRO workforce.
- **Turnaround Time (TAT):** The elapsed time to complete a maintenance task or check, from induction of the aircraft/component to return-to-service. Shorter TAT is crucial for customers, since an aircraft earns no revenue while in maintenance. MROs often pride themselves on fast TAT for competitive advantage.
- **First-Time Yield:** A quality metric indicating the percentage of maintenance tasks completed without rework or errors. A **95% first-time yield** means 95% of jobs required no follow-up fix. High first-time yield (approaching 99%) is a sign of strong workmanship and quality control.
- **Rotable Parts:** Parts that can be reconditioned or overhauled and reused multiple times (e.g. landing gear, avionics modules). MROs and operators manage rotable pools – when a part is

removed, it's sent for overhaul and often swapped with an already overhauled unit to minimize downtime.

- **PMA Parts:** Parts Manufacturer Approval – these are FAA-approved aftermarket parts made by third parties, not the original OEM. They are usually cheaper alternatives to OEM-produced spares. Some airlines and MROs use PMA parts to save cost, especially for older aircraft out of warranty.
- **USM (Used Serviceable Material):** Pre-owned aircraft parts harvested from retired or parted-out aircraft, inspected and certified for reuse. USM can dramatically lower cost and alleviate supply shortages, and is commonly used in engine overhauls and older aircraft maintenance.
- **Power-by-the-Hour (PBH):** A maintenance pricing model where the customer pays a fixed rate per flight hour or per month for maintenance coverage. It provides cost predictability for operators. Many business jet owners and some airlines use PBH agreements for engines or full-aircraft maintenance programs.
- **OEM Service Bulletin (SB):** A recommendation issued by an aircraft or engine manufacturer detailing modifications, inspections, or part replacements to improve safety or reliability. While not always mandatory, Service Bulletins are often incorporated during maintenance visits (and some may later be mandated as Airworthiness Directives).
- **SMS (Safety Management System):** A formal, organization-wide approach to managing safety risk. In 2022–2023, regulators began requiring SMS adoption by maintenance organizations. An SMS includes processes for hazard reporting, risk analysis, and continuous safety improvement – it's becoming a standard part of running an MRO business.
- **One-Stop-Shop:** In MRO context, a provider that offers a broad range of services in-house (airframe, engine, components, interior, paint, etc.). Operators often value "nose-to-tail" capability so they don't have to send different parts of the aircraft to different specialists, which simplifies logistics and potentially shortens downtime.
- **MTBF / MTBUR:** Mean Time Between Failures / Between Unscheduled Removals – reliability metrics for components or engines. A higher MTBF means the part reliably operates longer between failures. MROs track these to gauge performance of repairs or modifications (for example, after overhaul, how long does an engine run before an unscheduled removal?).

5. Draft Whitepapers

Article 1: Future-Proofing Aircraft MRO – Key Business Trends Shaping the Industry's Next Decade

Introduction: The aircraft maintenance, repair, and overhaul (MRO) sector has emerged from the pandemic downturn into a new landscape defined by both opportunity and challenge. In the United States alone, third-party MRO activity now exceeds **$24 billion annually**, buoyed by a full recovery in flight operations and an aging fleet that needs increasing care. Yet, the business of keeping aircraft airworthy is growing only modestly (~2–3% per year) and remains a game of efficiency, scale, and adaptability. As we look to the future of MRO, several key business trends are coming into sharp focus – trends that will shape which providers thrive and which get left behind.

1. Consolidation and Scale: Maintenance provision in the U.S. has historically been highly fragmented – over **4,000 FAA-certified repair stations** exist, with even the top players each holding only single-digit market share. This fragmentation is rapidly changing. In recent years, private equity and strategic buyers have been actively **consolidating MRO businesses**, pursuing scale advantages and broader service portfolios. High-profile deals like StandardAero's rumored **$10 billion** sale by Carlyle, HEICO's **$1.9B acquisition of Wencor** (a components specialist), and the merger of several business jet service companies are redefining the competitive map. Larger MRO platforms can spread overhead across multiple sites, invest in specialized capabilities, and negotiate volume discounts on parts – all crucial in a low-margin industry. For smaller independents, this wave of M&A presents both an existential threat and an opportunity: join forces to gain scale, or carve out a defensible niche. We can expect the MRO landscape in 5–10 years to feature fewer, larger players offering one-stop-shop solutions across geographies – alongside a tier of niche experts. For business leaders, staying attuned to consolidation trends is critical, as the partner, competitor, and acquisition universe is in flux.

2. Workforce Challenges and Labor Costs: Perhaps the most pressing day-to-day concern for MRO executives is the **shortage of skilled mechanics**. The industry's talent pipeline is not keeping pace with retirements and growth. By some estimates, the U.S. faces a shortfall of **40,000+ A&P mechanics by 2028**, which is roughly 19% of required capacity oliverwyman.com. This scarcity has turned experienced technicians into hot commodities: MROs report raising wages on the order of **5–7% annually** to attract and retain talent, far above historic norms. Indeed, a recent survey found North American MROs experienced ~11.5% workforce attrition in a single year as older mechanics retired or were lured away by other industries. The labor crunch not only inflates costs, squeezing already thin margins, but also can cap a company's growth – you simply *cannot* take on more heavy checks if you don't have crews to staff them. In response, forward-looking MROs are investing in labor force development: partnering with aviation tech schools, creating in-house apprenticeship programs, and even offering hiring bonuses or tuition reimbursement to draw newcomers. Others are implementing new efficiency measures (lean workflows, better tooling and IT systems) to get more productivity out of the techs they do have. Over the next decade, the MROs that succeed will likely be those that find innovative ways to win the talent war – turning their workforce into a competitive advantage. Conversely, those that cannot hire or automate fast enough may be forced to turn work away, hampering their reputation and financial performance.

3. Supply Chain Constraints and Parts Shortages: An aircraft is a complex assembly of thousands of parts – and an MRO's business is only as healthy as its parts supply chain. In the wake of COVID-19 disruptions, **global supply chain bottlenecks** have become a chronic challenge. MROs large and small have grappled with long lead times for critical components, from engine parts to avionics. The result has been a spike in maintenance downtime: for example, engine overhaul turnaround times have stretched **35% longer for mature engines, and a staggering 150% longer for some new-generation engines** compared to pre-2020 norms. This is due to a mix of factors – OEM production backlogs for spares, shortages of raw materials like alloys and semiconductors, and a lack of surplus part availability as airlines keep older jets flying longer. The **backlog of new aircraft orders** (over 17,000 jets on order globally) is at an all-time high, which means airlines are holding onto airframes for more years and putting additional cycles on them satair.com. All of this drives *higher demand for replacement parts* while straining the supply of those parts – a perfect storm. In response, MROs are adopting strategies that will define supply chain management going forward: increasing inventory buffers (though carrying more stock ties up capital), qualifying alternative suppliers and **PMA parts** to diversify supply, and even turning to used serviceable material harvested from retired aircraft to fill gaps. Some larger players are forging deeper partnerships with OEMs to get priority allocation of

scarce parts, or even bringing certain component repairs in-house to reduce dependence on third parties. The supply chain crunch is expected to persist into the mid-2020s – more than half of industry respondents don't foresee normalization until at least 18–24 months out oliverwyman.com. As such, the ability to creatively navigate parts shortages is now a key differentiator among MROs. Those who can keep customer aircraft moving despite global logistics woes will earn considerable loyalty (and market share) in the years ahead.

4. Evolving Maintenance Demand & Fleet Trends: The nature of maintenance demand itself is in flux, driven by changes in the aviation industry's fleet and utilization patterns. On one hand, airlines are taking delivery of new aircraft with longer maintenance intervals and more self-monitoring capabilities, which in the long run could *reduce* certain MRO workloads. On the other hand, delivery delays at Boeing and Airbus have forced operators to **extend the life of older aircraft**, leading to more heavy checks and modifications on aging jets. Many airlines that planned to retire older models in favor of new, fuel-efficient planes have had to postpone those retirements, directly boosting MRO demand for overhauls, corrosion repair, cabin refurbishments, and other age-driven work. Additionally, as travel demand returned post-pandemic, airlines have been pushing aircraft utilization to high levels – some talk of an MRO "super cycle" where a combination of high usage and older fleets is driving a surge in maintenance needs oliverwyman.com. Even newer aircraft aren't immune: early service experience has revealed **unforeseen reliability issues in some next-gen engines and systems**, prompting additional fixes and redesigns handled through MRO channels oliverwyman.com. For example, durability problems in certain turbofan engines have led to a wave of premature shop visits. From a business perspective, MRO providers must be agile in adjusting to these patterns. Those positioned to service legacy fleets (e.g. B737 Classics, older A320s, or out-of-production regional jets) may see strong demand for the coming years. Conversely, providers heavily focused on brand-new aircraft may find initial workloads lower than expected *until* those fleets mature. Many MROs are broadening their scope – for instance, adding capabilities to handle new composites or avionics on modern jets, while still maintaining expertise in "classic" aircraft that will be the workhorses for the foreseeable future. The bottom line: understanding the composition and health of the operating fleet is essential. The MRO industry of the next decade will be shaped in part by how quickly manufacturers resolve production backlogs and how the mix of in-service aircraft evolves (narrow-body vs. wide-body, new tech vs. old). Business leaders should keep one eye on Boeing/Airbus delivery trends and another on the secondary market for older aircraft, as both will feed into the MRO workload pipeline.

5. Competitive Dynamics – OEM Aftermarket Push and Global Players: Competition in the MRO arena is intensifying from multiple angles. One major trend is the aggressive expansion of **OEMs (original equipment manufacturers)** into aftermarket services. Engine makers like GE, Rolls-Royce, and Pratt & Whitney, as well as airframe OEMs like Boeing and Airbus, have been capturing a larger share of maintenance via long-term service programs and "power-by-the-hour" agreements tied to new sales. These OEM aftermarket packages often lock in airlines to use the manufacturer's maintenance network (or approved partners), siphoning work away from independent MROs. In a recent industry outlook, 78% of airline executives expected OEMs to become the most dominant players in MRO within a few years oliverwyman.com. This poses a strategic challenge: independents must either specialize in areas OEMs don't cover well (older equipment, faster turnaround, superior customer service), or in some cases collaborate with OEMs as subcontractors. At the same time, **global competition** is increasing. Lower-cost MRO hubs in Asia and Latin America are vying for work, especially heavy airframe overhauls and engine repairs, where labor cost differences are significant. Countries like **Mexico, China, and El Salvador** have attracted U.S. airline maintenance jobs due to labor rates that can be half those in the U.S.. In one example, Delta Air Lines famously

sent some wide-body maintenance to Mexico; other airlines routinely shop globally for the best deal on heavy checks. This globalization means U.S. MROs must stay cost-competitive and efficient, or risk losing business to offshore providers. Many are investing in process improvements and specialized expertise (e.g. certifications for new aircraft types or cabin mods) to compete on value, not just price. On a positive note, not all work can easily go abroad – quick-turn jobs and maintenance that requires real-time interaction stay local – and some operators prefer domestic shops for quality or political reasons. Still, the trend is clear: the future MRO landscape will feature intense competition between OEM-backed service networks, large independent consolidators, and international providers. For an MRO business leader, this underscores the importance of clarity in your competitive strategy. Are you going to align with an OEM, double down on cost efficiency, or differentiate on niche capabilities? Those decisions will determine your slice of the global maintenance pie.

6. Embracing Technology and Digital Transformation: While a dedicated article in this report covers technology in depth, it must be said that one of the most game-changing trends for MRO businesses is the **adoption of digital tools, automation, and AI**. Historically, aircraft maintenance has been a very manual, paper-driven domain – think of technicians with clipboards and binders of maintenance manuals. That is rapidly changing. The best MROs today are leveraging technology to enhance productivity and reduce errors: for instance, using tablet-based electronic work cards instead of paper (eliminating guesswork from illegible handwriting and easing record-keeping), or equipping technicians with smart borescopes and sensors that feed data into analytics software. Predictive maintenance algorithms are helping optimize maintenance intervals, which may reduce some MRO revenue in the short term (fewer unnecessary checks) but ultimately increase airline willingness to entrust work to tech-savvy providers. Internal operations are also improving – modern maintenance management software can auto-schedule tasks, assign staff based on skill and availability, and flag parts requirements in advance. Studies indicate that **digital transformation could boost MRO productivity by ~10–15% and cut costs by 5–10%**, a significant gain in an industry where EBITDA margins are often in the low teens. Larger firms are forming dedicated innovation teams and even running trials with technologies like augmented reality for remote inspections and robotics for routine tasks. The pandemic served as a bit of a catalyst here – with travel down, some MROs had a window to implement new systems and catch up on tech. As a result, by 2025 a majority of MRO organizations worldwide report implementing some form of AI or advanced analytics in their operations, and notably **58% say the benefits have met or exceeded expectations** oliverwyman.com. This is a dramatic shift from just a couple years ago. The takeaway for business leaders is that technology adoption is no longer optional; it's a key pillar of competitiveness. MROs that under-invest in tech risk falling behind on turnaround times, cost, and even the ability to interface with customers (who increasingly expect digital status updates and transparency). Conversely, those that smartly integrate new tools will be better positioned to handle the industry's labor and cost pressures. The future of MRO will still rely on skilled humans turning wrenches – but those humans will be empowered by data and technology in ways that elevate the entire operation.

7. Sustainability and Regulatory Pressure: Lastly, a trend that will shape MRO business decisions in the coming decade is the growing emphasis on **sustainable aviation and regulatory compliance**. Environmental regulations are tightening in aviation, and maintenance is coming into focus – from the handling of hazardous materials and waste to the fuel efficiency of aircraft coming out of overhaul. The European Union, for example, has initiatives that will influence MRO (such as requirements for recycling parts and using a percentage of sustainable aviation fuels in test runs). **By 2025, FAA and EASA regulations are also requiring repair stations to implement formal**

Safety Management Systems (SMS), which, while focused on safety, impose new process and training requirements that every MRO must abide by. In addition, larger airline clients are now beginning to include sustainability metrics in their supplier evaluations. We're hearing of airlines asking MROs about things like solvent recycling programs, energy use in facilities, or whether they use chrome-free paints and other environmentally friendly practices. Forward-leaning MROs see an opportunity here: by adopting greener processes (for instance, using aqueous cleaning systems instead of chemical solvents, or investing in more energy-efficient hangar infrastructure), they not only stay ahead of regulations but can actually market these efforts to customers. Some maintenance providers are pursuing certifications for environmental management (ISO 14001) and touting their compliance as part of RFP bids. While the MRO industry's direct environmental footprint is smaller than that of airlines, it is part of the aviation ecosystem's push toward sustainability. Importantly, there is also an internal efficiency benefit – many eco-friendly practices, such as better waste handling or improved supply chain logistics (reducing expedites), dovetail with cost savings and process improvement. Executives will need to keep an eye on both *hard* regulations (like mandated SMS or disposal rules) and *soft* pressures (customer preference for sustainable partners). Those who integrate a culture of compliance and environmental stewardship will mitigate risk and potentially win business from environmentally conscious customers. In short, doing the right thing may increasingly become a competitive requirement.

Conclusion: The aircraft MRO business is at an inflection point. It has proven its resilience – bouncing back strongly from the worst aviation crisis in history – and now stands to benefit from steady long-term demand. But "business as usual" is giving way to a new normal characterized by larger players, a dire need for skilled labor, creative supply chain maneuvers, heightened competition, and the transformative impact of technology. MRO leaders must navigate consolidation and decide where they fit. They must invest in people and efficiency to stay profitable in the face of cost pressures. They need to remain flexible as the mix of aircraft and customer expectations evolve. And they cannot ignore the digital and sustainability trends that are redefining best-in-class service. The coming decade will reward those MRO organizations that are **proactive** – the ones anticipating these shifts and positioning accordingly. Whether you're running a regional repair station or a nationwide maintenance network, understanding these macro trends is the first step in "future-proofing" your business. The companies that do will not only survive in the next chapter of aviation maintenance, but thrive as indispensable partners in the air transport value chain.

Article 2: Customer at the Center – How Airlines and Operators are Shaping MRO Demand and Service Trends

Introduction: The relationship between aircraft operators (the airlines, cargo carriers, business jet owners, and others who *consume* maintenance services) and their MRO providers is dynamic. In today's market, as flying activity surges back to pre-pandemic highs, customers are both driving and responding to new trends in maintenance. The power balance has subtly shifted – with high demand and constrained supply (of both labor and slots), operators must plan further ahead and collaborate more closely with MROs. At the same time, they are raising expectations: pushing for better value, more transparency, and solutions tailored to their operational needs. This article explores the key trends in customer behavior and demand patterns that are impacting the MRO industry, across both commercial and business aviation segments. Understanding these customer-centric trends is crucial for MRO business leaders looking to win and retain clients in a competitive environment.

1. Cost Consciousness Meets Post-Pandemic Pressures: Airlines and corporate flight departments emerged from the pandemic in varying financial states, but nearly all share a heightened focus on cost control. Maintenance, which can be 10–15% of an airline's operating cost, is under the microscope. Customers are intensely **price-sensitive**, often soliciting multiple bids for major checks to ensure they get a competitive rate. In practice, this means MROs frequently find themselves in pricing shootouts, especially for commoditized services like airframe overhauls. At the same time, however, operators will not sacrifice quality or safety for price – they seek the **best overall value**. A low bid that comes with doubts about reliability isn't truly appealing. In fact, airlines have been burned by some providers who entice with an unrealistically cheap quote and then pile on extra charges mid-project. Such experiences make customers increasingly wary; they now emphasize **transparent pricing** and will often accept a higher quote if it's detailed and credible over a suspiciously low one. The pain of surprise invoices is a common gripe: "hidden" costs erode trust fast. As a result, we see customers driving a trend toward **PBH (power-by-the-hour)** or fixed-cost maintenance programs to gain cost predictability. This is especially true in business aviation, where fractional ownership programs and corporate flight departments like to budget maintenance in advance. In summary, today's operators want maintenance solutions that are cost-effective *and* predictable. MROs that can articulate savings (through efficiency or used parts, for example) while guaranteeing no financial surprises will earn business. The post-COVID era has amplified this need – many airlines are still rebuilding balance sheets and every dollar counts. Maintenance providers who help customers "do more with less" are highly valued.

2. Planning Ahead and Securing Slots: An interesting shift in customer behavior is how far in advance operators are planning their maintenance visits. Due to the capacity and supply chain issues discussed earlier, it's no longer feasible for an airline to call up in spring and schedule a heavy check for summer – the slots might be long gone. We are hearing that **major overhauls now must be booked 6–12 months (or more) in advance** in many cases. Airlines are effectively **locking in maintenance slots** as part of their fleet planning calendar well over a year ahead. This is a significant change; historically, with ample MRO providers and maybe some slack in capacity, lead times were shorter. Now, the onus is on the customer to anticipate needs early. This trend is partly driven by parts procurement timing as well – if an airline knows an engine overhaul is due next winter, they might engage an MRO now to ensure parts with long lead times (like life-limited turbine components) are ordered. Similarly, business jet operators, especially large fleet operators and fractional providers, are pre-scheduling their periodic inspections well in advance to reserve time at their preferred service centers. For the MRO industry, this customer behavior has pluses and minuses. The positive is better visibility: long-term scheduling can produce a nice backlog, smoothing out the workflow and revenue projections. The downside is that it reduces flexibility – last-minute maintenance demands (like an unexpected repair or an aircraft coming out of storage needing refurbishment) are harder to accommodate, which can frustrate customers if they *do* find themselves in a pinch. Indeed, a **common pain point** now is when an operator has an Aircraft on Ground (AOG) situation but every shop is jam-packed and can't slot them in quickly. To mitigate this, some larger airline customers are even signing agreements with multiple MROs or retaining some internal capacity as a buffer. In response, MRO providers are trying creative solutions – such as dedicated AOG quick-reaction teams, or "swing capacity" that can float to urgent jobs. Nonetheless, the trend is clear: customers are much more proactive and strategic about maintenance scheduling. An MRO that can offer guaranteed slot availability (perhaps through multi-year contracts or reserved capacity) will find receptive ears among operators. Conversely, providers who fail to communicate their booking lead times risk alienating customers who get caught off guard by a long wait.

3. Emphasis on Turnaround Time and Reliability: For airline and business aviation executives alike, **downtime is the enemy**. Every day an aircraft is out of service for maintenance is lost revenue – whether it's a Boeing 737 that isn't flying passengers or a Gulfstream that a CEO can't use for a trip. Therefore, one of the top demands on the customer side is that maintenance be completed *on schedule* (or ahead of schedule). Operators increasingly scrutinize an MRO's historical performance on turnaround time (TAT) and on-time delivery. Some aviation departments track the percentage of maintenance events delivered late, and this factors into their choice of provider. As mentioned, the current environment has made this challenging – parts delays and staffing issues mean even reputable shops sometimes run late. Still, from the customer's perspective, **"promised date" is almost as sacred as "promised price."** If an MRO slips by a few days, it can cascade: airlines have to cancel flights or reassign aircraft, business jet owners miss important trips or have to charter replacements (a costly inconvenience). Anecdotally, private owners especially have little tolerance – if their jet's annual inspection runs over and they miss a planned vacation, that MRO may lose their business next cycle. This is why **turnaround performance has become a key competitive metric**. Customers talk to each other; an airline MRO manager will know which vendors have a reputation for punctuality. MROs that consistently hit their delivery dates (or minimize delays) **earn strong loyalty**. From the customer side, many now build in contractual penalties or incentives around TAT. For instance, a heavy maintenance contract might include bonuses for early delivery or penalties for each day of overrun – aligning the MRO's incentives with the operator's schedule needs. Another aspect related to reliability is **first-time fix** rate. If an aircraft leaves the shop and then has to come back for rework on the same issue, that's a nightmare for an operator. Such incidents undermine confidence. Therefore, customers favor MROs with robust quality control who *"do it right the first time."* All of this boils down to a simple demand pattern: customers are gravitating to providers that help minimize downtime and uncertainty. In practical terms, this might mean an airline will pay slightly more for an MRO that has a track record of fast, reliable turnarounds because it saves them money in avoided disruptions. Business jet operators, too, may choose the service center known for turning a jet around in 2 weeks over a cheaper one that often ends up taking 4 weeks. The **value of time** is paramount in customer decision-making now.

4. Desire for Communication and Transparency: In the digital age, and especially following some negative experiences, customers want to be kept *in the loop* on their maintenance events like never before. One trend is a push for **real-time communication** and project visibility. Commercial airlines often have technical representatives liaising with the MRO on-site or via daily reports. Business jet owners or management companies expect frequent status updates – many MROs now provide customer portals or at least regular emails with progress, photos of findings, etc. This level of transparency is becoming a standard expectation, not a luxury. The reason is straightforward: surprises are what customers hate most. When an MRO discovers additional work (non-routine findings) or faces a parts delay, customers want to know immediately, not at the last minute. Historically, a common pain point was lack of communication – e.g. an operator calls on the day of expected delivery only to learn a delayed part means the aircraft won't be ready for another week. Such scenarios are being remedied by better comms practices. Many contracts now stipulate that the MRO must notify the customer within 24 hours of any critical path issue or added scope. On the flip side, customers are willing to be reasonable if kept informed; airlines understand maintenance can uncover the unexpected, and business jet owners will accept a delay if they see the MRO is transparent and doing everything possible. The trend is toward a more *collaborative* relationship during maintenance events. Some airlines speak of their preferred MROs as extensions of their team – sharing data back and forth, jointly problem-solving when an issue arises. Another aspect of transparency is **billing clarity**: customers want detailed breakdowns of labor, parts, and any variance

from the estimate. This goes back to trust – clear communication during the project and on the final invoice builds trust, whereas silence and then a big surprise cost at the end destroys it. In response, leading MROs are investing in customer service training for project managers and adopting IT systems that make it easy to share status updates. A number of providers highlight their communication practices as a selling point (e.g. "you'll get a progress report every day at 4pm with action items"). Given how often poor communication was cited as a top customer frustration in the past, the industry is noticeably shifting to a customer-centric communication model. For MRO businesses, this is a reminder that *soft skills* and transparency can be as important to customer satisfaction as technical skills. In an era where everyone is accustomed to tracking deliveries or ride-shares in real time, tracking the progress of a complex maintenance visit is something clients increasingly expect.

5. Operators Leveraging Outsourcing – and Insourcing – Strategically: There's a dual trend among airline customers when it comes to maintenance scope: some are outsourcing more than ever, while others have pulled certain tasks back in-house, depending on their strategic priorities. On the whole, **outsourcing has grown**, especially in North America – many carriers that traditionally performed heavy maintenance internally have over the last decade opted to contract that work out to third-party MRO specialists. The reasons include labor cost flexibility, avoidance of capital investment in facilities, and the ability to tap external expertise. This has expanded the addressable market for independent MROs significantly. For example, Delta Air Lines is one of the few U.S. majors that still does most airframe maintenance in-house; others like American and United primarily use external vendors for heavy checks. This outsourcing trend means airlines are behaving more like true *customers* – they issue RFPs, expect competitive bids, and will switch providers if expectations aren't met. It's no coincidence that consolidation among MRO vendors has accelerated; they're responding to the larger scale of contracts on offer. However, the pendulum can swing. If an airline is unhappy with vendor performance or sees a strategic need, it may insource certain functions. We've seen some airlines bring components or line maintenance back in-house for greater control over dispatch reliability. In business aviation, many corporate flight departments historically outsourced nearly everything (given they might only have a few planes), but larger fleet operators like fractional jet companies (NetJets, Flexjet etc.) have actually built internal maintenance capabilities for routine work to ensure quick turnaround, while still outsourcing heavy overhauls. The key point is operators are continuously evaluating the optimal mix. This affects demand patterns: an independent MRO might suddenly see a drop in work from a big airline customer if that airline opens its own facility or signs an exclusive deal elsewhere. Conversely, a strategic decision by an airline to shut a maintenance base can release a flood of work to the third-party market. The **perception of private equity** and consolidation also factors in here – some airlines worry about over-reliance on too few vendors and may keep some work in-house as a hedge. For MRO providers, staying close to the customer's strategy is important. If your airline customer's C-suite is thinking about building a new hangar for insourcing, that's critical intelligence. On the flip side, if they're looking to outsource more (for instance, a low-cost carrier deciding to outsource all engine overhauls), being positioned to capture that is a huge opportunity. Ultimately, operators are seeking the most efficient and reliable way to get maintenance done, whether inside or outside. Their behaviors will continue to shift with economic conditions: in a boom, outsourcing can make expansion easier; in a recession, some might insource to keep staff utilized. MRO businesses must remain agile and diversify their customer base to mitigate the swings in any single customer's outsource/insource decisions.

6. Elevated Expectations in Business Aviation: While commercial airlines drive the bulk of MRO volume, the **business and private aviation segment** has its own distinctive customer trends that

are increasingly important. The pandemic introduced many new flyers to private air travel, resulting in record usage of business jets and a surge of **first-time aircraft owners** in 2020–2022. These new entrants – high-net-worth individuals or companies that bought jets due to health/security concerns – often rely heavily on MRO providers for turnkey maintenance support (since they lack in-house expertise). They also tend to be very demanding customers, expecting white-glove service. As a result, business jet MROs report that customers now expect faster turnaround on unscheduled fixes and more **personalized service**. For instance, if a private Gulfstream has an issue, the owner expects someone to be on it *immediately* – even if it means sending a technician to a remote airport at 2am. This has led to MROs enhancing their AOG response teams and mobile repair units. Another trend is **modernization and upgrades**: business jet owners are keen on cabin refurbishments, connectivity upgrades (like installing new Wi-Fi systems), and avionics modernization (such as ADS-B or NextGen compliance updates). This drives demand for MRO capabilities beyond just maintenance – more interior shops and avionics expertise are needed. Furthermore, because each private aircraft can be somewhat customized, owners expect flexibility and creativity from their MRO – one owner might want a custom cabin layout change during a heavy check, for example. Business aviation customers also place a premium on discretion and trust; many will stick loyally to an MRO that knows their aircraft's history and their personal preferences. Thus, while airlines might treat MRO services as a more transactional, cost-driven purchase, private jet operators treat it as a *relationship*. The trend here is that business aviation MRO providers are evolving into full-service partners: handling maintenance, managing records, advising on upgrades, and scheduling around the owner's usage needs. They often coordinate directly with flight department personnel or even personal assistants to minimize disruption to the owner's travel plans. Another noteworthy development is the influence of **OEM-owned service centers** in business aviation. Companies like Bombardier, Gulfstream, and Dassault have expanded their factory service center networks, and many owners default to the OEM for maintenance – especially while the aircraft is under warranty. Independent MROs in this space have to differentiate on either convenience (locations where OEM centers are sparse), customer service, or specializing in certain models where they've built a reputation. We see a bit of a split in customer behavior: some owners are *"OEM loyal"* for service, while others, especially once the jet is older, shop the independent market for better prices or quicker slots. In any case, the expectations in bizav are high. The MROs catering to this segment are adopting more of a hospitality mindset (e.g. VIP lounges, concierge services while the plane is in maintenance, detailed handover ceremonies after work). Business aviation customers are also increasingly asking about **resale value** impacts – they want maintenance done by reputable shops because it shows up in logbooks and affects the jet's residual value. This is another reason many stick with OEM or well-known service names. For MROs, being aware of this customer calculus is key: your reputation in the logbook can either increase or decrease an aircraft's appeal to buyers, and savvy owners know it. Thus, the trend is a flight to quality and name recognition in bizav maintenance. Up-and-coming independent shops can break in by offering boutique, high-touch experiences and perhaps slightly lower cost, but they must quickly build a name to truly compete for the long run.

7. Toward Partnership Models and Integrated Solutions: Across both airline and business aviation segments, there is a gradual shift from a transactional mindset ("fix this aircraft now") to more of a **partnership approach** between operators and MROs. Airlines, for example, are increasingly interested in *integrated maintenance solutions*. Rather than contracting dozens of individual tasks to different vendors, some seek a primary partner who can manage a large chunk of their maintenance program. This could take the form of comprehensive fleet maintenance agreements where an MRO (or a consortium) handles everything from heavy checks to component support for a fixed rate. The appeal to the customer is simplified management and risk-sharing. We see this in the

rise of PBH programs where airlines pay per flight hour and the MRO (or OEM/MRO combo) takes on the responsibility of ensuring availability of spares and doing repairs as needed. Another manifestation is airlines including MRO providers in their fleet planning and reliability programs. For instance, some carriers invite key MRO partners to participate in reliability meetings or provide input on modifications that could reduce maintenance downtime. This level of collaboration was not common a decade ago. In business aviation, management companies that handle aircraft for owners often develop very close relationships with certain MROs – almost like an extension of their own team – to the point where they plan maintenance events together long-term, align on budgeting, etc. The trend toward partnership is driven by the complexity of modern aircraft and the aforementioned need for predictability. If an operator can trust an MRO partner to *always be there* with the right support, that has huge value. On the MRO side, partnership arrangements often mean guaranteed volume and longer contracts, which they like. However, it requires a shift in mindset: success is not just measured by how much work was billed, but by mutual performance metrics like dispatch reliability of the customer's fleet. This trend is likely to continue: we might see more airlines sign multi-year exclusive maintenance deals, or even take minority stakes in MRO companies to secure their services. Lessors (aircraft leasing companies), another category of customer, are also becoming more active – some are partnering with MROs to manage maintenance for airlines that lease planes, ensuring the assets are properly maintained. All told, the traditional arms-length vendor relationship is evolving into a closer alliance in many cases. MROs that embrace this – by being flexible, investing in customer-specific solutions, and sharing data – will stand out to customers looking for a strategic ally and not just a repair shop.

8. Data-Driven Decisions and Self-Service Expectations: A subtler but growing trend in customer behavior is the use of data and digital tools on the customer's side to manage maintenance. Large airlines have developed sophisticated technical operations dashboards; they monitor metrics like component reliability, shop turnaround times, and even supplier scorecards. This means airlines come to the table armed with data – they might tell an MRO, "According to our records, your average TAT on our landing gear overhauls last year was 5 days longer than promised," and use that in negotiations or performance reviews. Customers are holding MROs accountable in a more quantitative way. In response, some MROs provide customers with direct data feeds or system access so the customer can see work-in-progress statuses. In the business jet world, owners and operators are starting to expect a more modern user experience when dealing with maintenance. For example, some ask, "Is there an app or online tracker where I can see the status of my aircraft's inspection?" It's not universally available yet, but a few forward-leaning MROs have introduced customer portals that show work progress, upcoming maintenance due items, etc. Essentially, as consumers, people are used to on-demand information – and that mentality is creeping into B2B expectations. An executive who can check on their personal package delivery on a smartphone naturally wonders why they can't also check on their jet's maintenance status. The industry is responding gradually: the partnership between customers and MROs is extending into the digital realm, with more shared data and transparency (as discussed earlier). For customers, having data is empowering them to make better decisions – such as deciding whether to overhaul or replace a component based on cost history and reliability data, or identifying which MRO vendor performs best for a certain task. In time, we might see operators use AI themselves to optimize maintenance planning, which could alter demand patterns (smoother scheduling, avoiding peaks and valleys). From the demand perspective, one could envision maintenance events being planned not just on fixed intervals but dynamically scheduled at optimal times. When customers start doing that, they will favor MRO partners who can accommodate such flexibility. While this is still emerging, the seeds

are there: more data-driven maintenance management on the customer side will influence how and when they seek MRO services.

Conclusion: The voice of the customer in the MRO industry is getting louder and more influential. Whether it's a global airline or a single-aircraft owner, operators are pushing for maintenance solutions that align with their core needs: cost efficiency, minimal downtime, and trust. We see this in their behaviors – meticulous cost comparisons, locking in slots far ahead, demanding quicker turnarounds, expecting real-time updates, and forging closer partnerships with those they trust. The balance of power can shift with market conditions (today's high demand environment gives top MROs the luxury of selectivity, whereas in a downturn customers will have the upper hand in pricing). But regardless of the cycle, an MRO's long-term success will always hinge on customer satisfaction. As the trends above indicate, customers are asking more of their maintenance providers than ever before. Those MROs that listen and adapt – by improving transparency, reliability, and overall value – will not only meet these rising expectations but set themselves apart in a crowded market. In an industry built on safety and relationships, keeping the customer's needs at the center is the surest way for MRO businesses to thrive amid changing skies.

Article 3: From Wrenches to Algorithms – How Technology and AI Are Fueling a New Era of Efficiency in Aircraft MRO

Introduction: For decades, aircraft maintenance has conjured images of skilled technicians with grease on their hands, working diligently in hangars to inspect and fix airplanes. That hands-on craft remains at the heart of MRO, but the industry is now entering a period of profound technological transformation. Facing pressures of labor shortages, cost constraints, and ever-more complex aircraft systems, MRO providers are increasingly turning to **digital tools, automation, and artificial intelligence (AI)** to augment human capabilities. In the same way that advanced avionics have enhanced how pilots fly, advanced maintenance tech is enhancing how technicians and engineers maintain. This article explores the practical use cases of AI and technology adoption in MRO – not as futuristic buzzwords, but as real solutions being deployed today to drive growth and efficiency. From predictive analytics that prevent failures to robots that streamline inspections, we'll look at how the toolbox of the MRO business is expanding far beyond the traditional wrench.

1. Predictive Maintenance – Anticipating Problems Before They Occur: One of the most impactful applications of technology in MRO is the rise of **predictive maintenance**. Modern aircraft and engines are equipped with hundreds of sensors that monitor performance parameters in real time. These data – encompassing temperatures, pressures, vibration levels, etc. – can be transmitted and analyzed to detect subtle signs of wear or impending failure. AI-driven algorithms are now combing through this trove of operational data to flag issues *before* they manifest as malfunctions. For example, slight increases in vibration on an engine's #2 bearing might not trigger a manual alert, but machine learning models trained on historical failure data can recognize this pattern as a precursor to a bearing wear problem and recommend an early intervention. Airlines have been early adopters of such technology (often through OEM-provided programs like Boeing's AnalytX or Airbus's Skywise platform), and they feed the insights to their MRO providers or in-house maintenance teams. The result is maintenance events becoming more **condition-based** rather than strictly interval-based, which prevents costly AOGs (Aircraft on Ground incidents) and optimizes use of components. An Oliver Wyman survey noted that operators are using AI for maintenance program planning and reliability analysis, and a majority of respondents felt that **AI initiatives were meeting or exceeding value expectations** in maintenance oliverwyman.com. For MRO companies, this predictive approach is a game-changer: instead of reacting to broken parts, they can schedule repairs at convenient times, bundle tasks together, and ensure parts and technicians are ready

ahead of need. It fundamentally improves efficiency and customer satisfaction – the aircraft experiences less unplanned downtime and the MRO can plan work more smoothly. A practical example comes from a case study where an MRO implemented AI-based predictive analytics on components and achieved a **20% reduction in inventory-related costs** by only stocking parts that data indicated would be needed stsaviationgroup.com. They weren't over-ordering spares "just in case," because the AI predictions honed what "just in case" actually required. In the future, predictive maintenance could evolve into **prescriptive maintenance**, where the systems not only predict *what* will fail and *when*, but also recommend *how* to fix it or mitigate it (for instance, suggesting adjusting an operating parameter to extend a component's life until next planned downtime). We're already seeing the beginnings of that, as AI systems cross-reference maintenance manuals and past fixes to propose solutions.

2. Maintenance Planning and Scheduling Optimization: The day-to-day scheduling of maintenance tasks – assigning the right people, tools, and parts to the right job at the right time – is a complex puzzle that technology is helping to solve. Traditionally, maintenance planning (especially for heavy checks) has been a laborious process done on whiteboards or spreadsheets, relying on the experience of planning teams. Now, specialized **maintenance management software (MMS)** augmented with AI is streamlining this. These systems can automatically generate work plans, optimize the sequence of tasks, and even adjust in real time if something changes (e.g. a part delivery is late or an extra defect is found). AI-based scheduling can crunch millions of permutations faster than any human, finding an optimal assignment of technicians to tasks that, say, minimizes waiting time or balances workloads. According to industry analysis, such digital tools can raise labor utilization significantly – one study cited potential **labor productivity gains of 10–15%** from optimized scheduling and workflow management. For an MRO, that directly translates to either more output with the same staff or the same output with fewer overtime hours – both beneficial to the bottom line. We see real-world use of this in large MRO shops where each shift gets a digitally generated work order list on tablets, rather than a supervisor manually handing out tasks. The system might, for instance, group tasks that can be done in parallel by different teams, or re-route a technician to another job if their current one is awaiting parts. Some AI tools even learn from past maintenance projects – for example, recognizing that a "12-year heavy check" on a certain aircraft type usually takes 5% longer in the structures phase than initially planned, and so it automatically adjusts future schedules to allocate extra time there. This learning aspect means the more the system is used, the smarter and more accurate it gets. Another efficiency booster is **digital workflow**: by eliminating paper, technicians can log their work instantly, quality inspectors can sign off electronically, and planners have visibility on task completion status in real time. This reduces delays waiting for paperwork or hunting down colleagues for updates. Big players in the MRO IT space (like TRAX, Rusada, or IBM Maximo) have all integrated AI and optimization features into their platforms, and many MROs are in the process of upgrading to these intelligent systems. For MRO managers, the benefit is not just internal efficiency – it's also a selling point to customers. They can confidently commit to shorter turnaround times because their planning is far more precise and adaptive than before. And if a customer asks for a progress update, the manager can check the system and respond instantly with accurate information on what's done and what's remaining.

3. Robotics and Automation in Inspection & Repair: While much of aircraft maintenance is intricate and not easily automated, there are specific areas where **robotics** and automated systems are making headway. One prominent example is aircraft **inspection**. Traditional visual inspection of an airframe (for cracks, dents, paint issues) is time-consuming – inspectors might spend hours on lifts closely examining an aircraft's skin. Today, several companies and airlines are using **autonomous drones** or crawling robots equipped with high-resolution cameras to perform visual

inspections of airframes. These drones can scan the surface of an airliner in a fraction of the time, capturing images that are then analyzed (often with the help of AI-based image recognition) to identify potential defects. Airbus, for instance, has demonstrated a drone-based inspection system for parked aircraft that reduces inspection time from 2 hours to 15 minutes. Another area is **non-destructive testing (NDT)**. Tasks like ultrasound or eddy current testing of structures can be done by robotic arms or portable automated scanners that move in precise patterns – improving consistency of coverage and freeing technicians from repetitive motion. In the engine maintenance world, robotic systems are being used for **engine borescope inspections**. Instead of a human manipulating the borescope joystick and eyeballing the interior of an engine, an AI-driven system can guide the borescope, systematically capture images of turbine blades, and even assess blade condition via algorithms. Aviation Week recently noted that AI "digital assistants" have been employed to help technicians diagnose borescope findings more accurately aviationweek.com. Beyond inspection, we're seeing early steps in **automated repairs**. For example, automated optical drilling machines are used in some airframe heavy maintenance to precisely drill out rivets or fasteners, a job that used to require a steady human hand to avoid elongating holes. Robotic paint removal and repainting systems are also in testing – painting a plane is a very labor- and time-intensive process, and a robot can potentially do it faster and with less waste (important for both cost and environmental reasons, given the chemicals involved). Some MROs have adopted conveyor-based automation in their component shops – e.g., an automated system that moves engine turbine blades through a series of repair steps (cleaning, coating removal, inspection) before a human does the final blending repair. The key point is, **automation is tackling the low-hanging fruit** of maintenance: repetitive, time-consuming tasks that don't require complex decision-making. This not only speeds up those tasks but also frees human technicians to focus on the skilled troubleshooting and complex repairs that truly require their expertise. It's a force multiplier in the face of labor shortages. For instance, if one robot can do the work of two people on certain inspections, those two people can be reassigned to other critical tasks that were understaffed. Over the next decade, we can expect more creative uses of robotics: perhaps small "crawler" bots that go inside wings or fuel tanks to check for corrosion (saving someone from the unpleasant job of squeezing in there), or robotic systems to assist in lifting and maneuvering large components precisely into place during reassembly. Each of these innovations chips away at the time and labor effort required for maintenance.

4. AI for Decision Support and Diagnostics: Not every use of AI in MRO is about big data or automation; sometimes it's about assisting humans in making the *right call*. Consider the wealth of technical documentation – maintenance manuals, service bulletins, Airworthiness Directives – that technicians and engineers must navigate. AI, especially **natural language processing (NLP)** and modern generative AI (like advanced chatbots), can help parse these documents and provide quick answers. We are on the cusp of seeing maintenance personnel equipped with something like a "maintenance assistant" AI: a technician could speak or type a query (e.g. "torque value for 737 NG flap track bolt?") and the AI system, having ingested all relevant manuals, instantly provides the correct figure and reference. This reduces time spent flipping through manuals or PDFs. Boeing and Microsoft have been working on such proof-of-concepts where technicians use HoloLens AR headsets and can query an AI which overlays the answer in their field of view. Furthermore, AI can assist in **troubleshooting**. Modern aircraft have complex fault codes, and while there are troubleshooting trees in manuals, AI can learn from past maintenance records which fixes resolved certain issues most often. A McKinsey analysis pointed out that generative AI tools could help maintenance staff sift through logbook write-ups and recommend likely corrective actions, speeding up return-to-service for tricky problems mckinsey.com. For instance, an AI might know

that when fault code X appears on an Airbus A350, 70% of the time replacing a particular electronic board fixes it – so it suggests checking that first, even if the manual lists five possible causes. This kind of decision support can significantly shorten diagnostic time, which is often a big part of maintenance – figuring out what's wrong can sometimes take longer than the fix itself. Another decision domain is **supply chain and logistics**: AI tools are helping materials managers decide when to order parts, which alternate parts to use, or how to route repairs. By analyzing supplier reliability and transit times, AI can suggest the optimal source for a part to ensure it arrives by the time it's needed stsaviationgroup.com stsaviationgroup.com. It can also predict if a part might stock out soon due to industry-wide trends (for example, knowing that a certain part's manufacturer is backlogged, it might advise to purchase it early or in bulk). The overarching theme is that AI is becoming like a knowledgeable colleague in the maintenance environment – one who never sleeps, has read every manual cover to cover, remembers every precedent, and can instantly crunch probabilities. Importantly, these systems don't replace human judgement but enhance it. The best outcome is when an experienced engineer collaborates with AI suggestions to make a call; the AI might surface an insight the human hadn't considered, and the human provides context and final determination. Early adoption of these AI-driven support tools has yielded promising results, with some MROs reporting faster troubleshooting and fewer instances of "no fault found" component removals (because the AI helped pinpoint issues more accurately). As comfort with AI grows, we can expect it to be a routine part of the maintenance process, much like autopilot is to flying – not flying the plane alone, but assisting the pilot.

5. Digital Records, Blockchain, and Paperless Workflows: Aircraft maintenance is heavily regulated, which historically means *paperwork*. Every task must be signed off and every component tracked from birth to death. Technology is radically improving how records are kept and verified. Many MROs and airlines have moved to **electronic task cards** and signatures, using tablets or laptops. This eliminates the notorious stacks of paper and reduces errors (no illegible handwriting, no lost pages). It also speeds up the auditing and certificate process – regulators can be given access to digital logs showing all required steps were taken, and customers receiving an aircraft post-maintenance often appreciate a nicely organized digital package of all the work done. One emerging technology to further enhance record integrity is **blockchain**. Blockchain provides a tamper-evident, secure way to record transactions – in this context, maintenance actions or part life-cycle events. For example, when an engine part is overhauled, a blockchain entry can be created that all stakeholders (airline, MRO, lessor, regulator) can trust as an accurate log that can't be falsified. This could be very powerful in the used parts market, where verifying the provenance and service history of a part is critical. A few pilot programs are underway, supported by companies like IBM and some airlines, to put aircraft part histories on blockchain. If widely adopted, an operator could seamlessly verify that a used component they're about to install has all the right certifications and past maintenance entries, without the current hassle of chasing paperwork across multiple previous owners. Additionally, **RFID tagging** of parts combined with digital records allows automated tracking – when a part is removed or installed, an RFID scan can update the system instantly. The efficiency gained from digital records isn't just internal; it's a selling point to customers (less downtime waiting for logbooks to be compiled) and to lessors (who often require detailed records at lease return – doing that digitally can prevent heavy end-of-lease penalties due to missing documents). We're also seeing national aviation authorities start to accept and even encourage electronic records, especially after COVID made remote audits necessary. All of this indicates that the days of giant paper logbooks are numbered. In their place will be secure, searchable, and easily shareable digital records. MRO IT systems, as mentioned, integrate this with the workflow so that compliance checks are built in – you can't finish a work step without signing it off properly in the

system, ensuring nothing is skipped. For an industry where "if it isn't documented, it didn't happen," this digital approach ensures everything *is* documented and nothing falls through the cracks. It also opens the door to advanced analytics: with all records digitized, an MRO or airline can analyze trends in their maintenance data (for example, which tasks often get delayed, which parts fail most frequently after X hours, etc.) and use that insight to continuously improve operations.

6. Training, Knowledge Retention, and AR Support: A crucial aspect of MRO is transferring knowledge to the new generation of technicians – and here, technology plays a supportive role too. **Virtual Reality (VR) and Augmented Reality (AR)** are being used to enhance training programs. VR simulators can let trainees practice maintenance tasks in a 3D virtual environment before they ever touch a real aircraft. For instance, a trainee could virtually disassemble a landing gear or open an engine cowling, learning the sequence and technique, which builds familiarity and confidence that translates to the real world. This is especially helpful for rare or complex procedures that one might not get to practice often on actual equipment. AR, on the other hand, is finding its way onto the hangar floor. Wearing AR glasses, a technician can see overlay information on the real equipment – like a heads-up display of which bolts to remove next or the inside of a panel with wiring routes, without having to flip through a manual. It can also be used for remote expert guidance: imagine a junior mechanic is in the field trying to fix an avionics issue; through AR glasses, a senior expert back at headquarters can see what the mechanic sees and draw markers in their view or pull up schematics for them. This "see-what-I-see" technology proved its worth during the pandemic when travel was restricted – experts couldn't always fly in, so AR collaboration tools helped local teams get guidance to solve problems. Moving forward, this could be standard practice to efficiently leverage expertise across multiple sites. Another benefit of these technologies is retaining the knowledge of retiring veterans. By capturing their troubleshooting steps in an AI system or their demonstration of a repair on video/AR, you create a library of tribal knowledge that new employees can tap into long after the veterans have retired. For example, a seasoned mechanic might have a clever trick for installing a tricky component – if that is recorded via an AR instructional and tagged in a knowledge base, the next generation can learn it without having to reinvent the wheel (or worse, make mistakes learning it the hard way). In terms of efficiency, better-trained technicians mean fewer errors and faster work. AR-assisted maintenance has shown reductions in error rates in some trials, as the chance of missing a step or mis-identifying a component is minimized by guided visuals. And in a time when talent is scarce, these tools can help **up-skill new hires faster**. MROs are recognizing that tech in training isn't just a cool gadget but a strategic investment to address the workforce gap.

7. The Industry Impact – A Transformation Underway: All these technological advancements – predictive analytics, AI scheduling, robotics, digital records, AR training – might sound independent, but together they amount to a transformative wave. The MRO industry is often described as traditional or even conservative, due to its heavy regulatory burden (understandably, safety comes first). But a noteworthy data point is that **64% of MRO executives in a recent survey said their organizations have implemented some form of AI**, up from 58% the year before oliverwyman.com. Even more telling, **two-thirds anticipate widespread AI adoption in MRO within five years** oliverwyman.com. This indicates we're beyond the pilot stage – we are in the early majority phase of tech adoption. The COVID-19 crisis arguably accelerated this, as companies had to find ways to do more with less and work remotely. Looking at efficiency outcomes, those who have embraced technology are seeing significant benefits: for instance, STS Aviation Group (an independent MRO) reported that by using AI for inventory and supplier management, they improved parts availability and cut stock costs by that 20% mentioned earlier, and shortened lead times for critical parts stsaviationgroup.com stsaviationgroup.com. Another example: a European MRO found that using drones for visual inspections shaved a day off heavy check cycle time – a day per aircraft is a massive

gain when multiplied over dozens of checks a year. These improvements directly affect profitability in an industry where margins can be tight. They also enhance customer satisfaction; an airline doesn't care *how* you improve TAT, just that you do. If technology helps deliver their aircraft back sooner and with fewer recurring issues, they're happy. We're also seeing **dedicated innovation teams** at large MROs (Lufthansa Technik, for example, has a whole arm called "Digital Fleet Solutions"). Startups are also entering the fray, bringing fresh ideas like AI-driven defect recognition or marketplace platforms for MRO services. The ecosystem is vibrant, with a mix of big OEM tech (like GE's digital twins for engines) and nimble startup solutions. As these technologies mature, costs will come down and even smaller MRO shops will adopt off-the-shelf tech solutions. The likely scenario is that mundane tasks will become highly automated or assisted, and human technicians will focus on the high-skill, high-value parts of maintenance – complex repairs, creative problem solving, and assurance of safety. The role of an aircraft mechanic might evolve to be a more tech-savvy "systems manager" who knows how to work alongside AI and robots. This could also help attract younger talent into the field: portraying aviation maintenance as a high-tech career could expand the pool of applicants who might otherwise go into software or electronics fields.

Conclusion: The infusion of technology and AI into aircraft MRO is not a far-off future – it's happening right now, in hangars and repair shops around the world. We see practical outcomes: fewer delays, lower costs, and smarter decisions. An MRO facility today might have technicians inspecting an aircraft with the help of a drone, consulting an AI-powered knowledge base for a tricky fault, ordering a part via an automated system that predicts exactly when it's needed, and logging everything on a tablet that instantly updates the customer. That would have sounded like science fiction not long ago, but it's increasingly routine. Of course, the industry will continue to face challenges in tech adoption, from upfront investment costs to the need for regulatory acceptance of new methods. But the direction is set – the benefits are too significant to ignore. For business leaders in MRO, embracing these tools is key to staying competitive. Those who adopt useful technology early can offer faster turnaround, better reliability, and more attractive prices, quickly becoming preferred providers. Those who lag may find themselves unable to meet the market's evolving expectations. Ultimately, technology in MRO isn't about replacing the human touch; it's about amplifying it. It allows the collective knowledge and efficiency of an organization to grow beyond the sum of its individual mechanics' efforts. As the saying goes, "work smarter, not harder" – the MRO companies of the future will certainly still work hard, but thanks to AI and advanced tech, they'll be working *much* smarter. The winners in this new era will be the ones who skillfully blend the art of maintenance with the science of data and automation, delivering superior service in an industry where safety and uptime are paramount. The tools are ready – it's now up to the industry to wield them effectively.

6. Draft Customer Survey

Purpose: This 35-question survey is designed for aircraft operators (airlines, corporate flight departments, charter/fractional operators, etc.) to help identify high-priority customer segments, understand valued service attributes, and reveal how customers select and retain MRO (Maintenance, Repair & Overhaul) providers. The survey uses multiple-choice and Likert-scale questions to gather quantitative insights. Please answer from your organization's perspective. (All responses will be kept confidential and used in aggregate.)

Instructions: For each question, select the option(s) that best represent your view. Some questions allow multiple selections (indicated where applicable). Most are single-answer multiple choice or a rating scale.

1. **Which of the following best describes your organization?**
    - Major passenger airline
    - Regional/passenger charter airline
    - Air cargo or freight carrier
    - Business aviation operator (corporate flight department or private/fractional jet operator)
    - Other aviation operator (government, military, helicopter, etc.)
2. **How many aircraft are in your fleet (approximately)?**
    - 1
    - 2–5
    - 6–20
    - 21–50
    - More than 50
3. **When choosing an MRO provider, which factor is your top priority?** *(Select one)*
    - Price/cost of services
    - Fast turnaround time
    - Quality of workmanship and safety record
    - Range of services/capabilities (one-stop-shop)
    - Customer service and communication
    - Proximity/convenience of location
4. **How important is price/cost in your decision to select an MRO provider?**
    - Not at all important
    - Slightly important
    - Moderately important
    - Very important
    - Extremely important
5. **How important is turnaround time (speed of service) in selecting an MRO provider?**
    - Not at all important

- Slightly important
- Moderately important
- Very important
- Extremely important

6. **How important is the provider's quality and safety reputation in your selection process?**
   - Not at all important
   - Slightly important
   - Moderately important
   - Very important
   - Extremely important
7. **How important is the level of customer service/communication from an MRO provider?**
   - Not at all important
   - Slightly important
   - Moderately important
   - Very important
   - Extremely important
8. **How important is the breadth of services (e.g. airframe, engine, avionics in one place) offered by the MRO?**
   - Not at all important
   - Slightly important
   - Moderately important
   - Very important
   - Extremely important
9. **How important is the MRO's geographic location/proximity to your operations?**
   - Not at all important
   - Slightly important
   - Moderately important
   - Very important
   - Extremely important
10. **What is the primary way you identify or learn about potential MRO providers for your aircraft?**

- Word-of-mouth referrals or recommendations
- OEM or manufacturer recommendations/authorized networks
- Internet search, trade publications, or online directories
- Industry events, conferences, or trade shows
- Existing relationship (we typically use the same provider network)

11. **How often does your organization re-evaluate or consider switching MRO providers?**
    - Rarely – we have long-term relationships and only change if a major issue occurs
    - Every few years – we periodically review options but don't change often
    - Frequently – we shop around for almost every major maintenance event
    - N/A – we perform most maintenance in-house (minimal use of third-party MROs)
12. **If you were to consider switching to a new MRO provider, what would be the most likely reason?**
    - Lower costs or better pricing from another provider
    - Faster turnaround or capacity availability elsewhere
    - Dissatisfaction with quality or a safety/quality incident
    - Need for services/capabilities current provider doesn't have
    - Poor communication/customer service from current provider
    - We are unlikely to switch providers unless absolutely necessary
13. **Which statement best reflects your preference regarding maintenance providers?**
    - "We prefer a one-stop-shop" – a single MRO that can handle virtually all our maintenance needs
    - "We use specialists" – different providers for different needs (airframe vs. engine, etc.)
    - "No strong preference" – we choose case-by-case based on who is best for each job
14. **When planning a major maintenance event (e.g. heavy check or overhaul), how many providers do you typically consider or request quotes from?**
    - 1 (we go with our preferred provider without extensive bidding)
    - 2–3 providers
    - 4–5 providers
    - More than 5 providers
15. **Which additional services or support from an MRO provider would you find most valuable?** *(Select all that apply)*
    - Mobile repair teams / on-site AOG support anywhere I need

- Parts inventory management or pooling to ensure spare parts availability
- Engineering services for modifications/upgrades (STCs, avionics, cabin refurbishment)
- Fleet technical management (the MRO helps track and plan our maintenance schedule)
- Pickup/delivery logistics (ferrying aircraft to the MRO, etc.)
- Other value-added services (training, consulting, etc.)

16. **Do you prefer maintenance work be done by an OEM-affiliated service center or are you comfortable with independent MROs?**
    - Only use OEM-authorized service centers whenever possible
    - Prefer OEM service centers for critical work, but will use independents for less critical tasks
    - No strong preference – we evaluate both OEM and independent providers equally
    - Prefer independent MROs for the flexibility/cost advantage, as long as they have good credentials
    - Not sure / no opinion
17. **What is the typical length of the relationships or contracts you have with your primary MRO provider?**
    - We operate on one-off work orders (no long-term contract)
    - 1 year at a time
    - 2–3 year agreements
    - 4–5 year agreements
    - Over 5 years or open-ended long-term partnership
18. **Which area do you feel MRO providers most need to improve to better serve your needs?**
    - Pricing transparency and avoiding unexpected costs
    - Reducing turnaround times and meeting schedules
    - Communication and status updates during projects
    - Parts availability and supply chain management
    - Consistent quality of work (no rework, right-first-time)
    - Other (please specify)
19. **Overall, how satisfied are you with the performance of your current primary MRO provider(s)?**
    - Very dissatisfied

- Somewhat dissatisfied
- Neutral (neither satisfied nor dissatisfied)
- Somewhat satisfied
- Very satisfied

20. **How likely are you to recommend your main MRO provider to a peer (another operator)?**
    - Very unlikely
    - Unlikely
    - Neutral / Not sure
    - Likely
    - Very likely
21. **Which maintenance pricing model do you prefer for major maintenance services?**
    - Time-and-materials (pay for actual labor hours and parts used)
    - Fixed price contract for the defined scope of work
    - Power-by-the-hour or annual fixed-rate programs (flat rate covering maintenance per flight hour or per year)
    - A mix, depending on the situation (e.g. PBH for engines, time-and-materials for other work)
    - No preference / not sure
22. **Over the past year, how have your aircraft maintenance costs changed (per aircraft or per flight hour)?**
    - Increased significantly
    - Increased somewhat
    - Stayed about the same
    - Decreased
    - Not sure / not applicable
23. **How many different third-party MRO providers does your organization typically use in a given year?**
    - 1 (we stick to one provider for nearly all work)
    - 2–3
    - 4–5
    - More than 5

24. **If you use multiple MRO providers, what is the primary reason for not using a single provider for everything?**
    - Different providers have specialized expertise (airframe vs. engines, etc.)
    - To get competitive pricing / avoid dependence on one supplier
    - Geographic convenience – we use providers in various locations as needed
    - Capacity – no single provider can handle all our volume or timing requirements
    - Not applicable – we generally use one provider
25. **How important is it that an MRO provider has sustainability or "green" maintenance practices (e.g. proper waste disposal, using environmentally friendly materials, energy-efficient facilities)?**
    - Not at all important
    - Slightly important
    - Moderately important
    - Very important
    - Extremely important
26. **In the past 12 months, have maintenance-related delays or parts shortages significantly impacted your operations?**
    - Yes – frequently (many events where maintenance delays affected flights/availability)
    - Yes – occasionally (a few notable instances)
    - No – not significantly (no major delays beyond normal expectations)
    - Not sure / not applicable
27. **Which performance metric do you consider most important when evaluating an MRO provider's success on your projects?**
    - On-time delivery rate (percentage of projects completed on or before the promised date)
    - Cost adherence (final cost vs. quoted cost, avoiding overages)
    - Quality outcomes (e.g. no repeat discrepancies, low defect/rework rate post-maintenance)
    - Safety/compliance record (no incidents, proper certs, etc.)
    - Communication responsiveness (how well they kept you informed)
28. **In the next 1–2 years, do you expect your need for third-party MRO services to change?**
    - Increase significantly (we'll be outsourcing much more maintenance)
    - Increase somewhat

- Remain about the same
- Decrease somewhat
- Decrease significantly (planning to bring more in-house or reduce flying)

29. **Over the next two years, how do you anticipate your maintenance budget (per aircraft) will change?**
    - Increase significantly
    - Increase somewhat
    - Stay about the same
    - Decrease somewhat
    - Decrease significantly
30. **Are you open to using FAA-approved alternative parts (PMA parts or used serviceable material) in your maintenance to reduce costs?**
    - Yes – we frequently use PMA/used parts whenever feasible
    - Yes – in some cases (for non-critical applications or older aircraft)
    - Only if absolutely necessary (prefer OEM parts but will consider if no choice)
    - No – we insist on new OEM parts for all replacements
    - Not sure / need more information
31. **Are any of your aircraft covered under hourly maintenance programs or OEM maintenance service plans (e.g. engine power-by-the-hour, manufacturer service contracts)?**
    - Yes – engine programs only
    - Yes – airframe or comprehensive nose-to-tail programs
    - Yes – both engine and airframe programs
    - No – none of our aircraft are on such programs
    - Not sure
32. **How satisfied are you with the communication and transparency provided by your MRO provider during maintenance events?**
    - Very dissatisfied (communication is poor/lacking)
    - Somewhat dissatisfied
    - Neutral
    - Somewhat satisfied
    - Very satisfied (they are proactive and clear in all updates)

33. **Would you consider sending your aircraft to an MRO provider outside the United States if it offered significant cost or schedule advantages?**
    - Yes, definitely would consider international MRO options
    - Possibly – for a large cost/time advantage I would, otherwise prefer domestic
    - Only as a last resort – we strongly prefer domestic maintenance
    - No, we would not send our aircraft abroad for maintenance
    - Not sure / depends on circumstances
34. **How many times have you changed your primary MRO provider in the last 5 years?**
    - 0 (have used the same provider for 5+ years)
    - 1 time
    - 2 times
    - 3 or more times
    - Not applicable (e.g., new operator or do in-house maintenance)
35. **Please share any additional comments or suggestions regarding how MRO providers could better serve your maintenance needs:**
    (Open-ended — feel free to provide any other feedback about your expectations, pain points, or ideas for improvement in aircraft MRO services.)

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    URL: https://www.faa.gov/about/initiatives/sms

25. **ARSA Workforce Legislative Support**
    URL: https://arsa.org/workforce/

26. **BLS – Aircraft Mechanic Salary and Job Outlook**
    URL: https://www.bls.gov/ooh/installation-maintenance-and-repair/aircraft-and-avionics-mechanics-and-technicians.htm

27. **CNBC – Aircraft Mechanic Shortage Coverage**
    Example: https://www.cnbc.com/2023/06/15/us-airlines-struggle-to-fill-aircraft-mechanic-jobs.html

28. **PAMA – Professional Aviation Maintenance Association**
    URL: https://www.pama.org

29. **ATEC – Aviation Technician Education Council**
    URL: https://www.atec-amt.org

30. **NATA – National Air Transportation Association**
    URL: https://www.nata.aero