DUNCAN AVIATION

Duncan Debrief

A PUBLICATION OF DUNCAN AVIATION • APRIL 1998

Duncan's specialized fuel tank team saves time on inspections

Duncan Aviation is emerging at the forefront of specialized services in the General Aviation industry. Duncan now employs a dedicated seven-person team of fuel system specialists. The team, which is led by Marvin Kadavy and includes Jeff Cadwallader, Matthew Arguin, Charles Green, John Barrineau, Jonathan Strunk and Ray McGinn, works exclusively on fuel system problems throughout the Duncan facility.

This approach benefits customers in a big way. With the specialized fuel tank team, the airframe team assigned to the aircraft is freed from repairing the fuel system. This reduces downtime for the customer as the airframe teams concentrate on other repairs.

Assistant Airframe Shop Manager John Biever explains, "By having our fuel team work exclusively on an aircraft's fuel system, the airframe team assigned to the aircraft is freed from that responsibility. Many service facilities don't see the value in having a dedicated team of specialists to perform this work; however, at Duncan, we believe that this level of commitment is important to the customer's peace-of-mind."

The team works on all facets of an aircraft's fuel system, including fasteners, panels, fuel cells and the removal and reinstallation of bladders. They are experienced on Falcon, Hawker, Learjet, Citation, Astra, Westwind and Gulfstream airframes.

Fuel System Team Leader Marvin Kadavy inspects wing skin fasteners for leaks.

"It is important to note," Team Leader Marvin Kadavy says, "that because of this specialized service, and the continuity we provide, customers can depend on the quality of fuel system maintenance they will receive at Duncan."

If you are interested in having your fuel system checked by the top professionals in the aviation business, please call **Tom Burt, Jeff Manion, Tim Klenke** or **Skip Laney** at **1.800.228.4277**.

Autopilot awareness

Larry Troyer

Autopilot/Flight Management Systems can be tricky to troubleshoot. Pinpointing problems is not for the inexperienced nor the faint-hearted. That's why it's nice to have Duncan's Avionics Technical Representatives available—especially Larry Troyer.

With seven years of hands-on experience in Autopilot/Flight Management Systems and eight years of technical assistance, Larry specializes in your toughest flight director system questions. He works to help pilots and maintenance personnel troubleshoot through problems that seem rare to them, but which are commonplace to Larry. Most of Larry's expertise was developed through actual shop experience, but a degree in applied sciences and electronics does come in handy.

Many new customers tell us that they become permanent customers after calling Larry or one of Duncan's other Avionics Technical Representatives for help. After listening to such a high level of technical experience, most want to send their units to Duncan. With a $7.5 million inventory of free loaners, free technical assistance from professionals like Larry and the service you'd expect from the #1 Avionics Shop in the world, isn't your choice clear?

For more information about your Autopilot/Flight Management System or other avionics systems, please call us at **1.800.LOANERS**

Duncan receives line service center authorization for TFE731-20/-40/-60 and CFE738 engines

Duncan's Engine Shop continues to expand its capabilities and Service Center authorizations. The most recent additions are Line Service Center Authorizations for AlliedSignal's second-generation TFE731 series engine and the CFE738 engine, which was developed jointly by AlliedSignal and General Electric.

The CFE738 powers the Falcon 2000 aircraft. The TFE731-20/-40/-60 powers the Falcon 900EX, the Falcon 50EX, the Astra SPX and the Learjet 45. The separate authorizations complement Duncan's existing Falcon, Learjet and Astra Service Center authorizations by adding enhanced coverage that previously excluded these engines.

"As a top corporate aircraft service provider, it is a natural progression for Duncan Aviation to stay up with the latest technology and product improvements," explains Skip Madsen, Vice President of Aircraft Maintenance and Customer Service. "This authorization not only provides for instant levels of support for routine maintenance, but a future of major repairs and a heightened level of technical support from our talented engine experts and technicians."

For more information about Duncan's engine services, contact **Jon Dodson** or **Cecil Sloan** in Duncan's Engine Service Marketing at **1.800.228.4277.**

Mark Earnest and Lance Boatwright of the Engine Shop discuss repair and inspection procedures. Duncan's Engine Shop can work on a variety of AlliedSignal, Pratt & Whitney and GE engines.

Duncan has extensive history with JT15Ds

Duncan Aviation has performed Hot Section Inspections, repairs and Service Bulletin work for Pratt & Whitney JT15D engines for more than 20 years. Yet, many of our customers don't think of us for their JT15D work. If you have an upcoming HSI, keep the following in mind.

- Duncan is an Authorized Pratt & Whitney Service Center for the JT15D
- Duncan is a Cessna Authorized Citation Service Station
- If your inspection coincides with other work, like airframe, paint, interior, system modification, etc., Duncan can perform everything here, decreasing your overall turntime and making tracking and invoicing easier to follow.
- Duncan has JT15D road crews and tooling available to perform in-the-field HSIs when needed.
- Duncan has in-house technical experts for the JT15D and the Citation 500 series who can answer your questions and help with troubleshooting via Duncan's toll-free, 24-hour support line.
- Duncan has an excellent reputation in the industry serving aircraft operators for more than 40 years.

To discuss Duncan's JT15D capabilities, contact **Cecil Sloan** or **Jon Dodson** in Duncan's Engine Service Marketing at **1.800.228.4277.**

Duncan helps Learjet cockpits warm up

Many Learjet 20/30 series operators have grown accustomed to cold feet. Duncan Aviation now has a way to help them warm up.

You see, the floorboards in the cockpit of a Learjet become "cold-soaked" during long cruises at altitude, making the cockpit floor uncomfortably cool for the pilots. Duncan has developed a floorboard warming system that provides a simple, reasonably priced way for Learjet operators to keep the chill from setting in.

"My feet used to freeze when I flew our Learjet, especially if my shoes had gotten damp on the ramp," says Larry Bartlett, Chief Pilot for Duncan Aviation. "Now that we installed the floorboard warmer, the cold doesn't penetrate the cockpit floorboards and my feet don't get uncomfortable. It's a subtle, but wonderful difference."

Duncan's electric heating system is easy to operate, provides individual controls for pilot and co-pilot floorboards and includes three different temperature settings. Operating on 28-volt DC, the system covers the pilot and co-pilot cockpit floor areas. In addition to installing the modification, Duncan has received PMA approval and will provide kits for operators who wish to install the system themselves.

For more information about the heating system or for pricing and availability information, contact **Skip Laney**, Duncan's Learjet Airframe Service Representative at **1.800.228.4277**.

Duncan Aviation partners with Kal-Aero

Michigan-based Kal-Aero becomes Duncan division

In February, Duncan Aviation acquired the business operations of Kal-Aero, Inc. Headquartered in Battle Creek, Mich., with a second site in Kalamazoo, Mich., Kal-Aero employs more than 350 people and provides many of the same aircraft support services as Duncan Aviation.

"We are very excited about the prospects this announcement holds for our customers and employees," states Duncan President Aaron Hilkemann. "Like Duncan Aviation, Kal-Aero is an organization with an excellent reputation in the industry. This reputation is directly attributable to the excellent leadership, expertise, craftsmanship and work ethic of Kal-Aero's employees. We are thrilled they are joining the Duncan team and plan to take advantage of the synergies of this affiliation and the individual strengths of each organization. The result will be consistent superior service and scheduling flexibility for all customers."

"We plan to take advantage of the synergies of this affiliation and the individual strengths of each organization. The result will be consistent superior service for all customers."
—Aaron Hilkemann

Kal-Aero Founder and President John Ellis agrees. "The merging of these two organizations that already lead the industry in customer satisfaction and leading-edge capabilities will set new standards in customer service," he says. "We are proud to be affiliated with Duncan Aviation, its people and its customers and we greatly look forward to working together."

Kal-Aero, now a division of Duncan Aviation, is keeping its name and its management staff. An Affiliation Team has been comprised of representatives from both organizations and is hard at work developing an affiliation process.

Duncan Aviation is based at a four-hangar, five building site in Lincoln, Nebraska.

Kal-Aero, based in Battle Creek, Mich., with a second site in Kalamazoo, Mich., spans more than four acres under one roof.

"While this announcement provides many future opportunities and benefits for us as well as our customers, we are not letting the acquisition process distract us from the customer focus we are known for at both Duncan Aviation and Kal-Aero," Aaron says. "Our first priority is giving customers at all of Duncan's locations the best customer service and the highest quality work."

"The merging of these two organizations that already lead the industry in customer satisfaction and leading-edge capabilities will set new standards in customer service."
—John Ellis

KAL-AERO

Bulk Rate
U.S. Postage
PAID
Permit No. 730
Lincoln, NE

DUNCAN AVIATION

Lincoln Airport
P.O. Box 81887
Lincoln, Nebraska 68501
Telephone: 402.475.2611
Fax: 402.475.2541
CRS#: JOVR194F
http://www.duncanav.com
http://www.avpac.com

Return Service Requested

Don't forget to join us at the following trade shows:

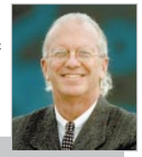
PAMA/NATA , Super Show, April 1-3, Kansas City, MO Booth #715/717

AEA, April 8-10, Orlando, FL Booth #800/802

A message from the Chief Pilot

1998 is shaping up to be a big year already for Duncan Aviation.

Obviously, the big news is our recent acquisition of Kal-Aero. Kal-Aero is an excellent organization that is known for first-class customer service and high-quality workmanship. Kal-Aero Founder and President John Ellis has built a superior team that will complement the extensive talent and expertise that we have in Duncan Aviation. I am thrilled to welcome Kal-Aero employees, families and customers to Duncan Aviation and I look forward to the unique opportunities this new partnership will provide for general and business aviation. I would also like to thank long-time acquaintance Pete Parish and aviation enthusiast Sue Parish, former co-owners of Kal-Aero, for their cooperation and vision. I welcome Pete to the Duncan Aviation Board of Advisors as Vice Chairman and I look forward to working with him on a continuing basis.



Kal-Aero President John Ellis has built a superior team that will complement the extensive talent and expertise that we have in Duncan Aviation.

Duncan has 16 corporate aircraft service locations.

Making the affiliation process smooth and transparent for customers of Kal-Aero and Duncan Aviation is very important to us. However, we will not lose sight of our customer focus and our desire to increase our capabilities and services in all areas. This will be apparent as you read the rest of our *Duncan Debrief* newsletter.

Avionics system capabilities and requirements for international aircraft operation are rapidly changing. We have taken a page out of this *Debrief* to outline some of the new rules and certifications required for international operations. This is just part of our effort to help operators prepare their aircraft for service into the 21st century and beyond.

Our Engine Shop recently received Line Service Authorization for the TFE731-20/-40/-60 and the CFE738 engines. Our Accessory Shop adds new capabilities every week and is preparing to move into a newly expanded shop. The FAA grants us new Supplementary Type Certificates every few weeks. We recently received PMA approval for a Learjet cockpit floorboard warmer kit. We have developed four standard entertainment system packages with Audio International to make custom entertainment systems more affordable and faster to install. And we continue to train our technicians in special interest areas like aircraft fuel systems.

With another busy year for Duncan Aviation and the corporate aviation industry on the horizon, you'll want to talk to the Duncan experts available at the NATA/PAMA Super Show in Kansas City and the Aircraft Electronics Association convention in Orlando this April. We hope to see you there.

J. Robert Duncan

Duncan News At-A-Glance

In 1997, the FAA granted Duncan Aviation 20 Supplemental Type Certificates (STCs) on various projects and various aircraft, including installation of TCAS, GPWS and FMS systems.

Duncan Aviation was the first non-factory facility in the United States to install a Collins Six-Channel Satellite Communications System on a Falcon 2000. Besides installing the complex worldwide communications system, Duncan technicians also removed two existing Flight Management Systems and installed a pair of new Honeywell NZ-2000s with GPS approach capability so the customer could have fleet compatibility with their Falcon 900. A custom-designed Securaplane 500 Security System was also installed.

Duncan Aviation's Accessory Shop was recently named an Authorized Service Center for Weldon Pump, an aircraft pump manufacturer based in Ohio.

Duncan's Calibrations Lab, which performs calibrations and repairs on a variety of electronic and mechanical equipment, has moved to a newly renovated area nearly four times its original size. The new lab provides the eight calibration technicians with nearly 2,600 feet of work space and a better testing environment that provides control of the room's temperature, humidity and airborne particles. These controls let Duncan perform calibration and repairs as specified by original equipment manufacturers.

By hiring more technicians and adding more evening and weekend shifts, Duncan Aviation has improved its already aggressive turntimes. Additional weekend crews in Paint, Interior, Cabinet, Installations, Engine and Airframe have helped to increase flexibility with customer deliveries and unexpected "drop-ins" in addition to holding down overtime charges. In fact, the additional weekend shifts have worked so well that we are considering other creative ways to increase the size of our evening shift or possibly add a third "night" shift in 1998.

Duncan's Accessory Components Services is growing by leaps and bounds and continues to expand its capabilities even as construction for a new shop is underway. Some of the most exciting repair and overhaul capability additions follow: Hawker butterfly refrigeration valve 123188-1; several other Hawker butterfly valves; Hawker landing gear; Hawker mix valve 3213788-1-1; Hawker fan and venturi assembly 132322-3-1; and King Air engine-driven fuel pumps and landing gear actuators.

The Avionics & Instruments Components Services area has settled in to its new, 50%-larger location at Duncan West, 3410 W. Mathis St., Lincoln, NE 68524. Don't forget to use this address when shipping your avionics/instrument units.

Duncan's Components Services Guide, which lists more than 13,000 avionics, instruments, accessory and propeller part numbers that Duncan works on, is now available. To request a copy, please call **Rick Whitesell** or **Chris Gress** at **800.228.4277**.

Duncan Aviation's Components Services can save you money on freight to Duncan Aviation through Federal Express. Call our avionics tech reps at **800.LOANERS** for details.

Duncan's Avionics & Instruments Shop provides more than 750 loaner units to customers each month. Duncan has more than 2,100 units in our loaner pool and provides them free for customers while their unit is being repaired or overhauled at Duncan.

Clearing confusion about operating aircraft internationally

Over the last few years, the international operations requirements of aircraft have become more confusing.

That's why several avionics system experts at Duncan Aviation have put together the following informational list outlining recent and upcoming international requirements. Although this list was accurate as of January 1998, there may be recent changes not included here. So if you are unsure whether your aircraft meets international operations requirements, please call **Dave Pleskac, Ron Hall, Gary Harpster** or **Steve Elofson** in Duncan's Systems Installations Group at **1.800.228.4277**. They'll be happy to answer your questions and help you clear your head.

Duncan Aviation recently installed Collins' ProLine 4 retrofit package in this Falcon 50 aircraft to help ready it for service in the 21st Century. This package includes a fully digital autopilot with RVSM-compatible Air Data Computers, an updated instrument panel with large 7 1/4-inch EFIS displays, state-of-the-art Navigational and Communication Transceivers with compact Radio Tuning Units that yield high reliability and reduced weight, the Collins Doppler Radar and the capability to meet present and future FANS and MNPS requirements.

Duncan Aviation received FAA approval to install dual Collins RTU-4200 Remote Radio Tuning Units in this Falcon 50. By removing the old Proline I equipment and mechanical control heads and installing the new Proline radios and RTUs, this operator now is able to transverse European airspace under the new regulations and experience much greater reliability and dispatchability. The RTUs reduce cockpit clutter by replacing up to 12 individual controllers and feature a compact design. The increased versatility of these RTUs includes 20 preselect frequencies for each radio and cross-side tuning so the co-pilot can tune the pilot's radios without reaching across the instrument panel or pedestal. Each RTU also has built-in diagnostics that monitor and record the status of all radios and data bus, which make troubleshooting much more efficient and effective.

BRNAV
(Effective Date: April 23, 1998)
Basic RNAV (BRNAV) requirements will apply to all US-registered civil aircraft operating in European airspace above 9,500 ft. An aircraft may be eligible for BRNAV approval if it is equipped with one or more RNAV systems, which were installed in accordance with FAA Advisory Circulars 90-45A, 20-130A, 20-138 or 25-15. Capable BRNAV sensors include VOR/DME, DME/DME, INS or IRS, Loran C and GPS. Part 91 operators need no special authorization. Part 135 operators must add BRNAV to their ops specifications. (Ref: AC 90-BRNAV, **http://www.nbaa.org**)

RNP
Required Navigation Performance (RNP) is an ICAO effort to improve Air Traffic Management (ATM) and Future Air Navigation System (FANS) services. Similar to the Minimum Navigation Performance Specification (MNPS) existing for North Atlantic operations, RNP is designed to benefit operators with optimum routings, reduced delays, reduced operation costs and increased safety. RNP ratings are assigned to designate the maximum lateral or longitudinal error an aircraft is allowed throughout 95% of the total route of flight; i.e., RNP-5 designates +/-5nm maximum crosstrack error.

RNP-10
(Implementation: April 23, 1998)
A reduction of the current 100nm lateral spacing to 50nm is planned for the Northern Pacific (NOPAC) and Central East Pacific (CEPAC) routes. Aircraft utilizing those routes will require RNP-10 certification designating +/- 10nm maximum cross track error. As with BRNAV, most systems currently utilized will qualify for approval. One exception is INS systems that are not capable of enroute up-dates. This may limit the use of INS to five (5) hours from initialization. (Ref: FAA Order 8400.12, **http://www.nbaa.org**)

8.33KHZ CHANNEL SPACING FOR VHF COM RADIOS
(Effective Date: January 1, 1999)
Certain European states will require radios operated between 118-136.975Mhz to be capable of channeling frequencies with 8.33Khz spacing rather than the existing 25Mhz spacing. This is being done to ease the current overlapping of Com frequencies in certain congested areas. Austria, Belgium, Germany, Luxembourg, Switzerland and the UK will require this capability on two Com radios on all flights above FL245. Additionally, operations in France above FL195 will need the close channeling. Most new radios sold after January 1, 1998, will have this feature incorporated. Modifications of current production radios will be available soon. (Ref: **http://www.iata.org**)

FM IMMUNITY FOR VHF RADIOS
(Effective Date: January 1, 1998)
All VHF Com and Nav radios operated in European airspace will be required to provide radio frequency (RF) immunity to outside interference. Modifications involve the addition of filters in each transceiver by way of a manufacturer's Service Bulletin. FM Interference modifications for VHF Communication radios can be postponed until 8.33Khz compliant equipment is installed. (Ref: ICAO Annex10, Vol 1 Radio Navigation Aids, **http//www.nbaa.org**)

VLF/OMEGA SHUTDOWN
(Effective: September 30, 1997)
As predicted in the 1994 Radionavigation Plan, the United States has ceased its support and funding for the Omega Radio navigation system and has decertified it as a source of navigation. The Global Positioning System (GPS) has been declared as a replacement capable of providing primary means trans-oceanic navigation. (Ref: 1996 Radio navigation Plan)

RVSM
(Implementation Date: Ongoing)
All aircraft operated in the North Atlantic (NAT) Minimum Navigation Performance Specification (MNPS) airspace at FL330 to 370 are required to have Reduced Vertical Spacing Minimum (RVSM) approval. (This will soon be expanded to FL310 to 390.) RVSM requirements are the result of the reduction in vertical spacing of aircraft from 2,000ft to 1,000ft. All operations at these altitudes must be RVSM certified. The Special, Northern or Blue Spruce routes are included in this requirement. Operational trials for European RVSM operation will be initiated in November 2000.

Most of the aircraft original equipment manufacturers (OEMs) have or are in the process of developing certification paths via Service Bulletins or Supplemental Type Certificates (STCs). (Ref: **http://www.ARINC.com**)

Contact Duncan for a list of equipment required for and suggested steps to obtain RVSM certification.

GLOBAL POSITIONING SYSTEM (GPS)
TSO C129 is the new standard for standalone GPS replacing the blended sensor TSO 115 which used GPS to update the VLF/Omega signal. This

(Continued on next page)

Clearing confusion... (Continued)

standard will provide capability for GPS enroute, terminal and nonprecision approach navigation. GPS Receivers meeting this standard must have Receiver Autonomous Integrity Monitoring (RAIM) software to compare all received satellites for accuracy and validity. This software will direct the receiver to ignore signals from defective satellites ensuring that the four satellite minimum is met. If the receiver is provided with an altitude input, that signal will replace one of the required satellites.

Fault Detection and Exclusion (FDE) software ensures adequate GPS coverage for an entire flight profile. Aircraft which are meeting the dual Long Range Nav (LRN) requirement for NMPS operations with dual GPS systems must utilize FDE before each flight to ensure adequate GPS coverage. Currently, FDE PC-compatible software for most systems is available via a modem. However, in certain receivers, FDE queries can be conducted through the receiver itself.

TCAS
Airborne Collision Avoidance System 2 (ACAS 2 — the international title for the US-designated TCAS II system) will be implemented in European airspace according to the following schedule:

January 1, 2000. All turbine-powered aircraft over a maximum take-off weight of 15,000Kg and/or 30 or more passengers.

January 1, 2005. All turbine-powered aircraft over a maximum take-off weight of 5,700Kg and/or 19 or more passengers.

The present US-TCAS I requirement for 121/135 operations with 10 or more passengers will not be recognized and those systems will have to be upgraded or replaced.

TCAS Change 7.0 software will be released soon addressing issues of phantom and ambiguous RAs and reducing system sensitivity to allow for RVSM operations.

Duncan continues to "Perfect The Craft"

With more than 1,200 employees perfecting their respective "crafts," from airframe maintenance to satellite avionics service to interior finishes, Duncan Aviation is continuously improving and striving to "perfect the craft" of aviation as well as perfect each customer's aircraft before it leaves a Duncan site. In honor of these missions, we have developed this logo to recognize the efforts and accomplishments of those in the corporate aviation industry who are dedicating themselves to safety, continual improvement and high-quality craftsmanship in all areas.

Duncan's cabinet craftsmen and design team create galleys and custom cabinets for stylish storage and display

Designing new storage cabinets and galleys is often a challenge for aircraft owners and operators. A limited amount of space is expected to hold everything from china, stemware, silverware and food to entertainment components and office equipment. In addition, the appearance of the cabinets makes a major impact on the overall attractiveness of the interior; the cabinetry should be considered a work of art.

That's where Duncan Aviation's talented team of designers and a dedicated Cabinet and Finish Shop come in to play. They ensure that aircraft completed at Duncan fly off with beautiful cabinetry that is thoughtfully and stylishly designed to maximize every square inch.

In addition to aesthetically complementing an aircraft's interior, the cabinets we create are custom-built for an exact fit with the headliner, sidewalls and panels. Accessibility and ease of removal for maintenance are also design considerations.

For more information about Duncan's cabinet and completions capabilities, call **Jeannine Falter** or **Tracey Boesch** in Completions Marketing at **1.800.228.4277.**

This Challenger 601 was completed with unique curve-style custom galley cabinets that help to maximize storage with style.

This Falcon 50 galley features a pull-out monitor that can be viewed while stowed or pulled out. Duncan has already designed and installed cabinets with pull-out monitors for three aircraft, including the Astra SPX.

800.228.4277
800.228.4277