TWIN & TURBINE®

FOR THE PILOTS OF OWNER-FLOWN, CABIN-CLASS AIRCRAFT

FEBRUARY 2015 $3.95 US

VOLUME 19 NUMBER 2

How To Gain With Your Plane

NASCAR Great Enhances His Conquest II Panel

Flying and Servicing The MU-2

Cold Weather Operating Tips

Is The Vmc Demo A Circus Trick?

The Worldwide General Aviation & Business Aviation Markets

owner/operators and chief pilots of these aircraft *ALL RECEIVE* Twin &Turbine every month

100% TOTAL MARKET COVERAGE

Do you want your marketing message to reach these key decision makers?

It will when you advertise in Twin & Turbine

JETS

CHIEF PILOTS & OWNERS

Aircraft Count

- 4 AIRBUS ACJ319
- 32 ASTRA 1125
- 31 ASTRA 1125SP
- 63 ASTRA 1125SPX
- 51 BEECHJET 400
- 275 BEECHJET 400A
- 58 BOEING BBJ
- 391 CHALLENGER 300
- 65 CHALLENGER 600
- 58 CHALLENGER 601-1A
- 133 CHALLENGER 601-3A
- 56 CHALLENGER 601-3R
- 279 CHALLENGER 604
- 5 CHALLENGER 800
- 169 CITATION 500
- 319 CITATION 525
- 284 CITATION BRAVO
- 151 CITATION CJ1
- 69 CITATION CJ1+
- 202 CITATION CJ2
- 160 CITATION CJ2+
- 390 CITATION CJ3
- 180 CITATION ENCORE
- 306 CITATION EXCEL
- 5 CITATION I
- 288 CITATION I/SP
- 478 CITATION II
- 50 CITATION II/SP
- 173 CITATION III
- 329 CITATION MUSTANG
- 138 CITATION S/II
- 257 CITATION SOVEREIGN
- 284 CITATION ULTRA
- 287 CITATION V
- 20 CITATION VI
- 104 CITATION VII
- 257 CITATION X
- 199 CITATION XLS
- 1 DIAMOND I
- 53 DIAMOND IA
- 3 DORNIER ENVOY 3
- 282 ECLIPSE EA500
- 47 EMBRAER LEGACY 600
- 8 EMBRAER LEGACY 650
- 158 EMBRAER PHENOM 100
- 82 EMBRAER PHENOM 300
- 123 FALCON 10
- 28 FALCON 100
- 25 FALCON 200
- 176 FALCON 2000
- 21 FALCON 2000EX
- 81 FALCON 20C
- 17 FALCON 20C-5
- 26 FALCON 20D
- 3 FALCON 20D-5
- 7 FALCON 20E
- 8 FALCON 20E-5
- 59 FALCON 20F
- 82 FALCON 20F-5
- 229 FALCON 50
- 8 FALCON 50-40
- 113 FALCON 50EX
- 135 FALCON 900
- 21 FALCON 900C
- 116 FALCON 900EX
- 98 GLOBAL 5000
- 112 GLOBAL EXPRESS
- 25 GULFSTREAM G-100
- 161 GULFSTREAM G-200
- 8 GULFSTREAM G-300
- 27 GULFSTREAM G-400
- 222 GULFSTREAM G-450
- 7 GULFSTREAM G-500
- 330 GULFSTREAM G-550
- 42 GULFSTREAM G-I
- 110 GULFSTREAM G-II
- 31 GULFSTREAM G-IIB
- 186 GULFSTREAM G-III
- 188 GULFSTREAM G-IV
- 317 GULFSTREAM G-IVSP
- 182 GULFSTREAM G-V
- 40 HAWKER 1000A
- 9 HAWKER 125-1A
- 2 HAWKER 125-1AS
- 1 HAWKER 125-3A/RA
- 2 HAWKER 125-400A
- 29 HAWKER 125-400AS
- 1 HAWKER 125-400B
- 4 HAWKER 125-600A
- 11 HAWKER 125-600AS
- 113 HAWKER 125-700A
- 50 HAWKER 4000
- 187 HAWKER 400XP
- 21 HAWKER 750
- 223 HAWKER 800A
- 2 HAWKER 800B
- 335 HAWKER 800XP
- 14 HAWKER 800XPI
- 67 HAWKER 850XP
- 131 HAWKER 900XP
- 4 JET COMMANDER 1121
- 6 JET COMMANDER 1121B
- 12 JETSTAR 731
- 11 JETSTAR II
- 51 JETSTREAM 31
- 40 JETSTREAM 32
- 15 JETSTREAM 41
- 15 LEARJET 23
- 26 LEARJET 24
- 5 LEARJET 24A
- 19 LEARJET 24B
- 53 LEARJET 24D
- 14 LEARJET 24E
- 9 LEARJET 24F
- 33 LEARJET 25
- 57 LEARJET 25B
- 7 LEARJET 25C
- 94 LEARJET 25D
- 6 LEARJET 28
- 28 LEARJET 31
- 172 LEARJET 31A
- 43 LEARJET 35
- 426 LEARJET 35A
- 21 LEARJET 36
- 34 LEARJET 36A
- 24 LEARJET 40
- 219 LEARJET 45
- 193 LEARJET 45XR
- 115 LEARJET 55
- 5 LEARJET 55B
- 12 LEARJET 55C
- 293 LEARJET 60
- 130 PREMIER I
- 16 SABRELINER 40
- 13 SABRELINER 40A
- 7 SABRELINER 40EL
- 3 SABRELINER 40R
- 24 SABRELINER 60
- 1 SABRELINER 60A
- 2 SABRELINER 60AELXM
- 12 SABRELINER 60ELXM
- 3 SABRELINER 60EX
- 1 SABRELINER 60SCEX
- 85 SABRELINER 65
- 1 SABRELINER 75
- 17 SABRELINER 80
- 3 SABRELINER 80SC
- 101 WESTWIND 1
- 4 WESTWIND 1123
- 45 WESTWIND 1124
- 76 WESTWIND 2

TURBO PROPS

CHIEF PILOTS & OWNERS

Aircraft Count

- 275 CARAVAN 208
- 1087 CARAVAN 208B
- 3 CARAVAN II
- 34 CHEYENNE 400
- 221 CHEYENNE I
- 14 CHEYENNE IA
- 303 CHEYENNE II
- 59 CHEYENNE III
- 21 CHEYENNE IIIA
- 59 CHEYENNE IIXL
- 22 CHEYENNE IV
- 303 CONQUEST I
- 354 CONQUEST II
- 49 KING AIR 100
- 502 KING AIR 200
- 12 KING AIR 200C
- 12 KING AIR 200T
- 203 KING AIR 300
- 3 KING AIR 300LW
- 588 KING AIR 350
- 34 KING AIR 350C
- 17 KING AIR 90
- 7 KING AIR A/B90
- 120 KING AIR A100
- 203 KING AIR A200
- 58 KING AIR A90
- 221 KING AIR A90-1
- 135 KING AIR B100
- 902 KING AIR B200
- 78 KING AIR B200C
- 63 KING AIR B200GT
- 2 KING AIR B200SE
- 3 KING AIR B200T
- 66 KING AIR B90
- 295 KING AIR C90
- 32 KING AIR C90-1
- 160 KING AIR C90A
- 316 KING AIR C90B
- 7 KING AIR C90SE
- 278 KING AIR E90
- 160 KING AIR F90
- 17 KING AIR F90-1
- 1 MERLIN 300
- 1 MERLIN IIA
- 29 MERLIN IIB
- 12 MERLIN III
- 20 MERLIN IIIA
- 49 MERLIN IIIB
- 14 MERLIN IIIC
- 5 MERLIN IV
- 13 MERLIN IV-A
- 13 MERLIN IV-C
- 105 MITSUBISHI MARQUISE
- 1 MITSUBISHI MU-2D
- 29 MITSUBISHI MU-2F
- 1 MITSUBISHI MU-2G
- 22 MITSUBISHI MU-2J
- 32 MITSUBISHI MU-2K
- 15 MITSUBISHI MU-2L
- 23 MITSUBISHI MU-2M
- 30 MITSUBISHI MU-2N
- 38 MITSUBISHI MU-2P
- 55 MITSUBISHI SOLITAIRE
- 673 PILATUS P-12
- 341 PILATUS PC-12 NG
- 549 PILATUS PC-12/45
- 154 PILATUS PC-12/47
- 18 PIPER 700P AEROSTAR
- 492 PIPER MERIDIAN
- 10 ROCKWELL 680T TURBO
- 6 ROCKWELL 680V TURBO II
- 7 ROCKWELL 680W TURBO II
- 9 ROCKWELL 681 HAWK
- 89 SOCATA TBM-700A
- 91 SOCATA TBM-700B
- 4 SOCATA TBM-700C1
- 115 SOCATA TBM-700C2
- 318 SOCATA TBM-850
- 22 SOCATA TBM-900
- 6 STARSHIP 2000A
- 51 TURBO COMMANDER 1000
- 27 TURBO COMMANDER 690
- 129 TURBO COMMANDER 690A
- 113 TURBO COMMANDER 690B
- 58 TURBO COMMANDER 840
- 16 TURBO COMMANDER 900
- 23 TURBO COMMANDER 980

TWIN PISTON

OWNERS

Aircraft Count

- 9 ADAM A500
- 1550 BARON 58
- 479 BARON 58P
- 137 BARON 58TC
- 5 BARON A56TC
- 142 BARON G58
- 43 BEECH BARON 56 TC
- 2 BEECH BARON 58 PA
- 217 BEECH DUKE B60
- 193 CESSNA 340
- 556 CESSNA 340A
- 120 CESSNA 402B BUSINESS LINER
- 64 CESSNA 402C
- 38 CESSNA 404 TITAN
- 288 CESSNA 414
- 374 CESSNA 414A CHANCELLOR
- 72 CESSNA 421
- 61 CESSNA 421A
- 454 CESSNA 421B
- 757 CESSNA 421C
- 66 CESSNA T303
- 124 PIPER 601P AEROSTAR
- 29 PIPER 602P AEROSTAR
- 465 PIPER CHIEFTAIN
- 28 PIPER MOJAVE
- 870 PIPER NAVAJO
- 24 ROCKWELL 500 SHRIKE
- 33 ROCKWELL 500A SHRIKE
- 69 ROCKWELL 500B SHRIKE
- 46 ROCKWELL 500S SHRIKE
- 8 ROCKWELL 500U SHRIKE
- 28 ROCKWELL 520 COMMANDER
- 15 ROCKWELL 560 COMMANDER
- 21 ROCKWELL 560A COMMANDER
- 17 ROCKWELL 560E COMMANDER
- 11 ROCKWELL 560F COMMANDER
- 36 ROCKWELL 680 SUPER
- 17 ROCKWELL 680E
- 19 ROCKWELL 680F COMMANDER
- 22 ROCKWELL 680FL GRAND COMMANDER
- 14 ROCKWELL 680FLP GRAND LINER

HIGH PERFORMANCE MOVE-UP SINGLES

OWNERS

Aircraft Count

- 250 BEECH BONANZA
- 493 CESSNA 182
- 71 CESSNA 206
- 448 CESSNA P210N
- 26 CESSNA P210R
- 58 CESSNA T182
- 1 CESSNA T206
- 2714 CIRRUS SR22
- 240 PIPER MALIBU
- 387 PIPER MALIBU MIRAGE

37,744 TOTAL AIRCRAFT

TWIN & TURBINE

John Shoemaker, Advertising Director
2779 Aero Park Drive • P.O. Box 968 • Traverse City, MI 49685-0968
(800) 773-7798 • (231) 946-3712 • Fax: (231) 946-9588
E-mail: john.shoemaker@VPDemandCreation.com • www.twinandturbine.com

TWIN & TURBINE

EDITOR
LeRoy Cook

EDITORIAL OFFICE
2779 Aero Park Drive
Traverse City, MI 49686
Phone: (660) 679-5650
E-mail: cookleroy@juno.com

PUBLISHERS
J. Scott Lizenby
Dave Moore

PRESIDENT
Dave Moore

CFO
J. Scott Lizenby

PRODUCTION MANAGER
Mike Revard

PUBLICATIONS DIRECTOR
Steve Smith

GRAPHIC DESIGN
Michael McCatty

ADVERTISING DIRECTOR
John Shoemaker
Twin & Turbine
2779 Aero Park Drive
Traverse City, MI 49686
Phone: 1-800-773-7798
Fax: (231) 946-9588
johns@villagepress.com

REPRINT SALES DIRECTOR
MEDIA COORDINATOR
ADVERTISING ADMINISTRATIVE ASSISTANT
Betsy Beaudoin
Phone: 1-800-773-7798
betsybeaudoin@villagepress.com

SUBSCRIBER SERVICES
Deb Neuman
Kathy Erlewein
Maria Mellberg
San Juana Fisher
P.O. Box 968
Traverse City, MI 49685
1-800-447-7367

COVER PHOTO
Paul Bowen Photography

TWIN & TURBINE WEBSITE
www.twinandturbine.com

Search for the MediaWire app on your iPad. Issues of Twin & Turbine are available for free www.twinandturbine.com

Contents

FEBRUARY 2015 • VOL. 19, NO. 2

FEATURES

4 **Editorial**
Authority

6 **Where Are You Going To Take Your MU?**
Bringing An MU-2 Home For Service

14 **No Plane, No Gain**
How To Make It Work For Your Company
– *John Loughmiller*

18 **A NASCAR Legend Turbocharges His Panel**
Bill Elliott Upgrades His Nav System
– *Kevin Knight*

From The Flight Deck

22 **Baby, It's Cold Outside**
– *Kevin Dingman*

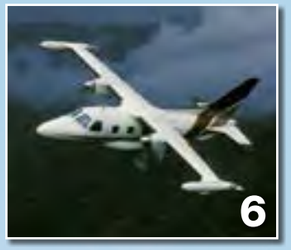
Twin Proficiency

24 **Checkride Circus Tricks**
– *Thomas Turner*

28 **En Route:**
NetJets Adds 10 Signature Series Phenom 300s to Embraer Order
January Error Correction: Missing Text For "From The Flight Deck" column
BPPP Initial and Recurrent online classes now FREE to American Bonanza Society members.

31 **Advertisers Index**

32 **On Final**
Better Weather
– *David Miller*



Twin & Turbine (ISSN 1945-6514), USPS 24432 is published monthly by Village Press, Inc. with advertising offices located at 2779 Aero Park Drive, Traverse City, Michigan 49686. Telephone (231) 946-3712. Printed in the United States of America. Periodical Postage Paid at Traverse City, MI.

SUBSCRIPTIONS: *Twin & Turbine* is distributed at no charge to all registered owners of cabin-class aircraft. The mailing list is updated monthly. All others may subscribe by writing to: *Twin & Turbine,* P.O. Box 968, Traverse City, MI 49685, or by calling 1-800-447-7367. Rates for the United States and its possessions follow: one year $29.95; two years $52.50. Canadian subscriptions are $15 per year additional, including GST tax. Overseas subscriptions are $30 per year additional, U.S. funds. Single copies $3.95.

ADVERTISING: Advertising in *Twin & Turbine* does not necessarily imply endorsement. Queries, questions, and requests for media kits should be directed to the Advertising Director, *Twin & Turbine,* P.O. Box 968, Traverse City, Michigan 49685. Telephone 1-800-773-7798. Website: *www.twinandturbine.com*.

MANUSCRIPTS: *Twin & Turbine* assumes no responsibility for unsolicited manuscripts, photographs, or art work. While unsolicited submissions are welcome, it is best to query first and ask for our Writer's Guidelines. All unassigned submissions must be accompanied by return postage. Address queries and requests for Writer's Guidelines to the editor.

POSTMASTER: Send address changes and inquiries to Twin & Turbine, Village Press, Inc., P.O. Box 968, Traverse City, MI 49685.

Authority

Years ago, I was reminded by my superior management "You can delegate your authority, but you can never delegate the responsibility." That admonition applies to aviation, with great precision. In the final analysis, quoting FAR 91.3(a), "The pilot in command of an aircraft is directly responsible for, and is the final authority as to, the operation of that aircraft." It has to be that way, because no one else is in a position to observe what's taking place and there's certainly no way to board the aircraft in flight to lend a hand.

Whenever I read about an incomprehensible accident, I have to temper my rush to judgment with the knowledge that I wasn't sitting there in the weather or in the out-of-control airplane. I might have reacted similarly, although we all like to think we'd have pulled the fat out of the fire before it was burned up. Regardless, the responsibility is in the command seat, and not always is the PIC up to the challenge.

Of late, we've seen a rash of single-pilot twins involved in fatal crashes after takeoff; Chicago, Wichita, Denver. In each case, only the deceased pilot was aboard, so we don't have a lot of information to go on. It would seem that continued flight should have been possible if an engine was lost, but somehow the pilots couldn't keep their brief flight from coming to a bad end. In training exercises, we know an engine cut is coming; we're loaded, cocked and ready to spring into action with a rudder-mashing foot and a feathering drill. But, would we be up to the challenge if we lost one unexpectedly…in the dark…in the weather?

Sharing authority is normal in aviation, even when flying single-pilot. When we click on the autopilot, we're abdicating some of our authority, unless we stay plugged in and monitoring the automation. When we program the FMS to guide us through the flight plan, we're letting it have some authority, but we're still responsible for watching the aircraft's progress. And air traffic controllers have authority over the airspace we're going to use; we have to share authority with ATC, despite our responsibility as PIC.

In a two-crew cockpit, somebody's got to be the Captain. I may let the other fellow make the takeoff or landing, but I know I have to guard my set of controls and back up his configuration changes, particularly when we're close to the ground. No matter how experienced he or she might be, I had best check the frequencies and crossing altitudes being input. Responsibility doesn't transfer with the controls.

In the case of AirAsia's A320 that took 162 people to the bottom of the Java Sea, there was a denial of a request to deviate because of weather. One can speculate that the pilots acquiesced to ATC's refusal out of respect for the traffic situation and the controller's authority. But the controller is never responsible for the operation of an aircraft in flight. If the situation demands immediate action to avoid loss of the airplane, the PIC should act under FAR 91.3(b), with or without ATC clearance. We'll clean up the mess and talk about it later.

Whether it's automation, ATC or supervisory oversight, you must stay in command. Never forget who's responsible up there.

LeRoy Cook.
Editor

Where Are You Going To Take Your MU?

Intercontinental Jet Services Provides Factory Support For The MU-2

By **LeRoy Cook**

By any reasonable prediction, one would expect that the Mitsubishi MU-2 twin turboprop, introduced in the late 1960s and out of production since 1983, would be an "orphan airplane", with factory parts and support no longer available. As it turns out, that's the farthest thing from the truth. Not only is the MU-2 fleet alive and well, it still enjoys support from its manufacturer, Mitsubishi Heavy Industries, and 12 authorized Service Centers.

Among the dozen Centers worldwide, only one is owned by MHI itself: Intercontinental Jet Service located in Tulsa, Oklahoma. ICJS also hosts the MU-2's global parts supply warehouse and can offer just about every possible service option for the venerable MU-2. Only full painting and zero-time overhauls for the Honeywell TPE-331 powerplants are farmed out; everything else, from propeller overhauls to avionics updates, can be done at the Tulsa facility.

The MU-2, of course, has had a long and storied history, not the least of which are tales of "killer airplane" and uninsurability. As the only twin turboprop in its class that was designed from the very beginning to be a turboprop (all of its competitors were developed from piston-engine predecessors), it was extremely advanced for its time. The MU-2 introduced features like spoiler roll-axis control so it could be given full-span flaps, a high wing loading for both speed and a solid ride through turbulence, and over-built military-style construction with no life limit on the airframe. Mitsubishi Heavy Industries had considerable experience with building aircraft under license from U.S. firms, hence the MU-2 drew heavily on its in-house expertise.

It was the first true over-300-mph small business airplane, outpacing competitors and attracting buyers seeking the highest-performing aircraft they could afford. But, because it required somewhat different operational techniques, some of the new owners got behind the MU-2 and its accident toll became inflated by armchair experts. MHI rose to the occasion and 20 years ago it developed a PROP (Pilots Review of Proficiency) biennial pilot-proficiency training course.

Thanks to that and other initiatives, the MU-2 has now earned the honor of having the lowest accident rate in its category over the last half-dozen years. It just took some respect for the aircraft and proper training in how to avoid carrying bad habits into its operation.

Yes, there is a 2006 Special Federal Air Regulation 108 for the MU-2, requiring specific initial and recurrent training to fly the airplane, but it's mostly common sense requirements, such as a functioning autopilot for single-pilot IFR, and PIC standards that would be required by insurance companies in any event. An FAA review of the aircraft's ability to meet its Part 23 certification standards had turned up no issues. Thus, the agency imposed stiffer pilot training, and that has apparently worked.

A Place To Go

Recently, we stopped at the Intercontinental Jet Service Corporation complex on the northwest side of Tulsa International Airport, where the normal contingent of MU-2s was on the ramp. More importantly, a half-dozen were in the shops, getting upgrades and phase service. ICJS president Dennis Braner and Director of Operations Mark James gave me the tour of the sprawling facility, established in 1987. Although the company does work on other airplanes, like the Piaggio Avanti we saw in the hangar and a Beech Starship that was coming in during the next week, it is noted for being the go-to place for MU-2 service.

According to Mark James, about 270 MU-2s are currently in the fleet, about evenly split between the short-body and long-body models. The longer MU-2G, with two extra seats, maingear pods and aft-fuselage strakes, first appeared in 1970 and was subsequently identified with J, L & N letters before winding up as the Marquise in 1979. The original short-body airplanes, with a sleeker fuselage that folds the maingear behind the cabin, are suffixed by B, D, F, K, M and P, finishing as the Solitaire. But, officially, these are all MU-2B airplanes, with dash-numbers to show various iterations.

The Honeywell TPE-331 engines on the MU-2 are most commonly –5 or –6 versions, with equivalent shaft horsepower ratings from 724 to 776; tailpipe thrust adds extra push. TBO is a lengthy 5,400 hours, with hot sections scheduled at 1,800-hour intervals. However, it makes sense to convert to the –10 engine at overhaul time, gaining vastly improved efficiency at altitude. The single-shaft AirResearch/Garrett/Honeywell turboprop is noted for its ease of operation and good fuel specifics, with very quick response to throttle changes.

The Ultimate MU-2

James showed us the Limited Edition MU-2 developed by ICJS, which incorporates a total makeover from the bare airframe up. Everything gets looked at and refurbished, with a new interior and paint, but the showpiece is the SAFRAN-Sagem flight deck, using digital displays of primary flight, navigation and engine instrumentation. Given the low acquisition price of older MU-2s, a fine Limited Edition upgrade can result in a like-new performer, with the latest bells and whistles, for less than any equivalent airplane. As an example, ICJS found a long-body Marquise with less than 2,000 hours total time that it is currently going through; it'll be a prime candidate for the Limited Edition mods.

He also showed us the method of compliance for MHI's frame-inspection service bulletin, a check

for fuselage frame cracking that is to be performed every 2,400 hours, usually in conjunction with a phase inspection. Since some of the airframes have accumulated 20,000 hours in service, continuing airworthiness concerns led MHI to issue the bulletin, which may or may not become an AD. In truth, very little cracking has been found, and nearly all was on long-body models, James said. The MU-2 is a very over-built airplane. A test-article fuselage in the shop had been used for pressurization cycle testing, again showing no damage after an extended time-in-service regimen.

Mark James' advice for prospective MU-2 buyers is to get their aircraft into an approved service center, where the aircraft is well understood, have it given a good prepurchase check, and have the pilot attend the PROP training, along with sending a mechanic to the SimCom service training course. The aircraft is a good buy, but it needs proper care and operation. ICJS sees very little corrosion, even from coastal locations, James says.

Originally, the MU-2 was test flown with Turbomeca Astazou turboprops, changed to Garrett TPE-331-25AA engines of 605 eshp for production. It was upgraded to the 705-eshp TPE-331-1-151A after two years. The aircraft was originally marketed by Mooney Aircraft in the U.S.A., but the arrangement was abandoned in 1970. The MU-2 was actually built and certified in the U.S., at a San Angelo, Texas plant, from MHI-supplied subassemblies. There, the 60-percent American components were added to the airplane, which received an airworthiness certificate from the FAA instead of the JCAB.

Understanding The Difference

The MU-2's unusual appearance was cutting edge in 1967; fuel was carried in large tip tanks, requiring simultaneous or staged refueling to avoid tipping imbalance. Pronounced wing droop can be seen with full tanks, although the underslung tip tanks make the droop appear greater than it actually is. The double-slotted full-span flaps needed to enhance takeoff and landing performance required spoilers to be used for roll control; roll trim is provided by adjustable tabs on the flap trailing edges. James pointed out that the MU-2 is an all-electric airplane; only the brake system uses hydraulics, everything else is actuated electrically.

The fully-enclosed main landing gear stows in the lower fuselage, in large fairings on the long-body models, or behind the baggage compartment in short-body versions; large 8.50 x 10 tires are fitted. If the gear looks like it came off a Lockheed F-104 fighter, it's probably because MHI license-built Starfighters for the Japan Self Defense Force. The 5.00 x 5 dual-wheel nosegear swings aft for retraction; after parking, it is disconnected from the steering links for towing.

The empennage is conventional, but the horizontal stabilizer has noticeable undercamber as part of its airfoil design. Dual trim tabs are provided for symmetry. The powerful rudder is adequate for handling single-engine flight, but the Honeywell engine incorporates negative torque sensing that drives the propellers toward feather automatically if power is lost. Transitioning pilots are cautioned not to crank in "aileron" with the control wheel in such a case; that would add drag by activating the spoiler. Instead, the roll trim surface is toggled while holding rudder against the dead engine.

Performancewise, the MU-2 is a rocket. The short-body airplanes can top out above 300 knots, initially climbing at nearly 3,000 fpm. Best altitudes are 20,000 to 28,000 feet, where the parsimonious TPE-331's will use 65 to 80 gph total. Although the later-model airplanes

are certificated to fly as high as 31,000 feet, RVSM certification is normally not pursued for the limited benefit it provides.

Inflight workload is light; there are no boost pumps, cowl flaps or tank switching to be handled. Fuel is fed from a center tank, refilled from the bleed-air pressurized tip tanks and outboard wing tanks, which are auto-fed on some models. Fuel capacity began as 280 usable gallons, increasing to 366 gallons in later airplanes, and to 403 gallons in the last models, which had wet wing tanks. The job of the MU-2 is to carry 1,000 pounds of payload with full fuel at 300 to 350 mph; accordingly, its handling is transport-like, not aerobatic. Trimmed up, it stays where it's put and rides through bumps like a steamroller with its 65-lb/sq.ft wing loading. With the spoiler system, there is no adverse yaw.

As with all high-performance airplanes, the MU-2 must be

flown by the numbers, in proper configuration for the phase of flight. Flap extension lowers stall speed by as much as 25 knots; a 20-degree takeoff setting is normally used. The 40-degree flap setting is reserved for maximum-performance short-field landings. The nosegear comes down as soon as the maingear touches at 85 knots or so; the MU-2 is immediately done flying.

Normal takeoff procedure is to rotate to about 7.5 degrees nose-up at 99-103 knots, looking for a single-engine climb speed of 125 knots, with 20-degrees flaps. Gear-up requires about a 15-second cycle; flaps come up above 140 knots and a typical cruise climb is at 180 knots. Descent management is easy, thanks to the drag provided by the big three-blade props turning at 2,000 rpm (1,591 with four blades). Setting up for an approach works well at about 175 knots, the retractable landing lights speed limit, with gear extension permitted below 160 or 170 knots, depending on the model. With 20-degree flaps deployed, an ILS can be flown at 120 knots.

With the proper training, the MU-2's can safely deliver more bang for the buck than just about any other aircraft between big piston twins and light jets. And with factory support from service centers like Intercontinental Jet Service Corporation, there are no surprises in its well-known maintenance. The ICJS Limited Edition upgrade will keep it competitive for many years to come. T&T

NO PLANE NO GAIN

By **John Loughmiller**

Turning The Slogan Into Reality

For many years, the National Business Aviation Association (NBAA) and General Aviation Manufacturers Association (GAMA) trade groups have been telling the business world that General Aviation is a viable business tool, using the slogan "No Plane, No Gain". The message is often considered to be aimed at larger companies, but its logic applies to all companies, regardless of size. It's a catchy slogan, but what are some real-world ways to turn your airplane into a cash flow-producing tool, instead of a deduction that makes your accountant cringe every tax filing?

Consider this: You have a client that needs a product your company sells and after-sales support is extremely important to her. Including your company, she has three firms from which to choose. One is a multi-million dollar conglomerate with a worldwide footprint. The second is a very small operation with a product line that pretty much matches yours, but it can sell at a lower price because it has less overhead than your company. And then there's your sole-proprietorship company: 25 employees, a brilliant but small engineering team, and two sales people including you. Oh, one more thing; you own a cabin-class airplane.

What's your strategy to land the order?

How about you button-hole an engineer with good people skills and encourage him to take an airplane ride. You call up the client and ask if she can meet you at a restaurant which happens to be near a General Aviation airport and her company's office. Over lunch, you introduce the engineer and casually remark that if she has any after-sales support issues that require onsite support, he can be at her location within a few hours via your company airplane. Later, during a quick look at the airplane, the engineer makes an off-hand remark that he's going to install a firmware upgrade on another client's machine on the way home. Without belaboring the point, you've just proven the superior after-sale support claim you made at lunch.

How does the competition match that level of support? First of all, the large company won't match it. Its legal staff has long since banned employee-flown airplanes due to perceived liability issues. The low-overhead company isn't going to ruin its meager profit margin by allowing anyone on the staff to submit an expense report with a rental aircraft on the sheet, and the head honcho has zero interest in buying a company airplane for the same reason: a misread of the impact on SG&A costs (Sales – General and Administrative).

Result? You get the order.

Another example:

Your company has introduced a new widget to the marketplace. Unfortunately, you know from past experience that a press release and a few phone calls aren't going to result in a quick sale because customers want to see the product actually work. You need to prove the widget really is better than anything on the market, but your customer base is scattered out in cities large and small, within a circle roughly defined by a 500-mile radius from your office. You could drive to some and fly commercially to others, but doing so would mean three weeks on the road. You can't use the airlines exclusively because they only serve 50% of your market. What to do?

You start with a press release heralding the imminent availability of the new widget and within the press release you mention you'll be utilizing a company aircraft to demonstrate the product to your customers. You send emails with the press release attached to all your current customers as well as some of those 'tough to crack' potential customers that you've tried to reach in the past.

You follow up the email with personal-invitation phone calls and set up your schedule. You have pictures taken of you and some staff members in front of your airplane and, after the Dog and Pony show is over, you do a follow-up press release praising the immediate acceptance of the product and mentioning the ability of your company to "react instantly" and "turn on a dime" since you can be onsite within hours at any customer's location, because you have a dedicated company aircraft. You casually mention that no competitor has made a similar commitment to customer support.

Along these same lines, you write an article for a trade publication explaining what makes your company exceptional. Once again, you can pitch how your customer support cannot be equaled - both before and after the sale - because your company is different; it has an airplane and uses it to benefit the customer.

In "churn and burn" sales, you can often make money by having the lowest price and selling without regard to after-market support. Many online web-based companies use this very approach and when you're dealing with commodity products and serving the consumer directly, you'll be hard pressed to overcome the reality of "Give me the lowest price and I'll give you the order."

When selling capital goods and targeted services, though, sales are made based on friendship, fair pricing and after-sale support. Use of an airplane can put you in a position to develop friendships AND provide superior support after the sale.

The Wow Factor

In spite of what the mass-market print and broadcast media reporters think, non-pilots are still fascinated with people that fly. When you make an appointment and then climb into a private airplane to appear at the customer's location two hours later, you're viewed as different. And because the general public believes even an elderly Cessna 150 costs more than their house, you are also thought to be successful; how else could you afford an airplane? People naturally gravitate to those they perceive as successful; it's a trait you can use to separate yourself from the others trying to get the same order.

Given the opportunity, you can mention that you have 6,000 airports to choose from, versus the airlines' total of slightly more than 600. You can tell customers you know everyone on board your airplane and none of them are terrorists – which always brings a smile. And you can gleefully point out that airport delays are not something you're familiar with.

All of this plays into your customer's frame of reference: "Did you see the story about the passengers that were stuck for 4 hours on a fully-loaded Regional Jet last week, due to airport delays?" They will ask a question like that as soon as the subject of air travel comes up. They will recall rude airline employees, uncouth passengers, knees-tucked-under-their-chin legroom and too-small seats. That's the average person's frame of reference when you mention the utility of air travel.

Since 90% of your customer base doesn't realize how much a vendor with an airplane can improve their operation, you should help them understand. Tell them your firm is not just another company trying to book an order. Yours is a company that considers the customer to be a partner. To support that concept, you have an airplane available to make sure they receive frequent consultations and fast, reliable, on-site expertise if there are ever problems. Your company is mission-oriented, which is why it uses a private airplane to maximize the customer's success and reduce the number and magnitude of problems. And isn't that what everyone wants; someone to help them succeed while making their problems go away? T&T

John Loughmiller is a freelance writer, commercial pilot and CFIIMEI-A. He retired from the business world a few years back and is now living the dream as a contract pilot flying various piston and turboprop twins.

RAISBECK'S MONEY-SAVING COMBOS ARE HERE IN 2015

SWEPT BLADE PROPELLERS PLUS...

Combinations	Combo Price	Customer Savings
RAM AIR RECOVERY SYSTEM (B200GT/B200/200)	$ 126,132	$ 15,000
DUAL AFT BODY STRAKES (ALL)	$ 107,609	$ 10,000
CROWN WING LOCKERS (ALL)	$ 137,372	$ 20,000

CROWN WING LOCKERS PLUS...

Combinations	Combo Price	Customer Savings
RAM AIR RECOVERY SYSTEM (B200GT/B200/200)	$ 99,751	$ 9,000
ENHANCED PERFORMANCE LEADING EDGES (B200GT/B200/200)	$ 86,513	$ 8,000
DUAL AFT BODY STRAKES (ALL)	$ 78,408	$ 7,000
HIGH FLOTATION GEAR DOORS (ALL)	$ 102,428	$ 10,000

DUAL AFT BODY STRAKES

CROWN WING LOCKERS

Simply more of what you bought your King Air for!

info@raisbeck.com
(206) 723-2000
(800) 537-7277
www.raisbeck.com

RAISBECK ENGINEERING

A NASCAR Legend
Turbocharges His Panel

By **Kevin Knight**

NASCAR champ and Conquest II pilot Bill Elliott seems like a character from The Andy Griffith Show who would have been nicknamed "Rocket." He lives at the base of the Blue Ridge mountains in Dawsonville, Georgia, an hour north of Atlanta. He speaks with a pleasant drawl and has countless stories, from working at his father's building supply store as a 10 year old, to building car motors in his back yard, to wondering if he'd survive an F-16 crash. (More about that later.)

Strip away the "aw, shucks" exterior, however, and it's clear that "Awesome Bill from Dawsonville" is detail oriented, focused on success, and embraces technology that won't let him down when push comes to shove. That's what made it possible for this fit and funny 59-year old to win the Daytona 500 twice, capture the 1988 NASCAR Winston Cup Series championship, and set speed records at Talladega and Daytona. Elliott recently entered NASCAR's Hall of Fame, just as his 19-year old son Chase is now shifting the gears, becoming the first rookie to win a NASCAR national series championship when he took the 2014 NASCAR Nationwide Series.

"I got started flying in '76 when I was 21, but before that I had never been in a small plane," he said, speaking from his building complex full of race cars and parts. "I went to the local airport, met an instructor, flew around the pattern once and thought, 'Yep, I'd like to do this.' I didn't realize you could fly in the pattern and have time to talk on the radio."

He laughed about his solo flight, since there's little he doesn't know about engines. "We were doing touch-and-goes when my instructor got out and said, 'It's time for you to solo.' I took off with the carb heat on and the engine sputtering. I was thinking, 'Oh, Lord!'"

Within 50 hours he had his license and joined a flying club. He'd rent a 172 for $15 an hour to pick up parts in Charlotte or Asheville. "I'd go to 12,000 feet 'cause I thought that's what it took with the mountains around here. Looking back, you thought you knew everything but you knew absolutely nothing.

"One time my brother and I went up on one of those terrible, hazy summer days. I raced at Bristol Speedway in Tennessee that weekend, then took off on Sunday and got into the clouds. I wasn't IFR rated but had the good sense to turn around, land, rent a car and drive home. I decided I'd better get my instrument rating."

Fast forward ten years. After logging nearly 2,000 flight hours, owning several single engine planes, and earning lots of victory laps, Elliott bought a Piper Cheyenne II in 1986, then a Cessna Conquest II in 1992, since he was flying 150 to 200 hours annually for his racing team.

"At FlightSafety you learn how much stuff can tear up on these planes. They fail this, they fail that in the sim. At the end of that school I couldn't remember my own name. It was a lot of learning in a little time. "

In January 2008, he bought his current Conquest II in Ohio, after owning several Cessna jets. "I asked myself, 'Why did I ever leave this thing?' I can't recall many trips where I've had to stop for gas. And the Conquest can go into any short field. It's a great plane with all the benefits of my Cessna jets but none of the problems."

In May 2008, West Star gutted the plane and put three Avidyne Entegra screens in the panel. A Garmin 540 and 430 provided the GPS. However, Elliott is always looking for better technology that's easier to use. When Avidyne introduced a distinctive, yet familiar, new system last July, he made a move up.

The ID540 is a plug-and-play replacement for Garmin's GNS 530. (The IFD440 upgrade for Garmin's GNS 430 should have FAA clearance this spring.) Avidyne's goal was to produce a modern GPS/NAV/COM that can be installed in a Garmin 530 or 430 tray in less than a minute. It does everything the old Garmins do – and lots more – thanks to Avidyne's powerful Flight Management System, built-in WAAS, terrain awareness, WiFi and Bluetooth integration, and aural warnings. It has a full-featured touch screen that can be zoomed in and out, plus a compliment of buttons for easy use in turbulence.

Elliot compared the IFD540 with Garmin's GTN650 and GTN750 units, which would have required costly new installations, assuming they could even fit in his center console. He also didn't like that the interface on those units is nearly 100-percent touch screen. That's a nightmare in turbulence, said Elliot.

"I wanted more than a Direct To button. Garmin makes good boxes but they really don't have flight management systems, or Victor airways. Inputting every intersection in a 530 or 430 takes lots of time since you're scrolling to each one. If the airway's straight, it's easiest to string VORs together. But you've got to really pay attention and pray you don't have a dogleg with an intersection.

"I fly a lot up and down the East Coast, and it's work putting in all your intersections. It seems you get rerouted four or five times every flight. I've loaded many flight plans into my box, blasted off and then gotten a new flight plan issued before my gear is barely up. You need to make changes quickly easily and accurately, especially single-pilot IFR. The 540 has made my flying a lot more relaxed and safer."

Although Elliott could have sold his Garmin 530 to offset a lot of the IFD540's cost, he kept it for a homebuilt sitting in the corner of his large hanger. When the IFD440 is available this spring, he'll pop out the Conquest's 430 and find another use for that older GPS.

After 50 hours with the new system, he's shared some feedback with Avidyne's Steve

Jacobson, principal designer of the IFD540/440 systems and a decorated A-10 "Warthog" fighter jock who flew sorties in Iraq and Bosnia. His team is continually upgrading the software at no extra cost to pilots.

"It's an easy box to learn, and the FMS system is terrific. I've had experience with other FMS's and it's very sophisticated. I go to a lot of different places and routes so it's really opened up what I do trip to trip. You can even practice in your living room by downloading an app on your iPad or computer."

He then shifted the discussion to a memorable F-16 flight in autumn 1987. Elliott had been going toe to toe with racing legend Dale Earnhardt all season when the folks at Dobbins Air Force base asked if he'd like to fly in an F-16 after winning the Atlanta Journal 500 race on Sunday, November 22.

"I thought, 'Man, that would be great.' I tire tested on Monday, then went to Dobbins on Tuesday.

The base commander said it would be neat if they could do some combat maneuvers. What did I know? We took off and went afterburners straight to 10,000 feet. It was unbelievable. I'd done some aerobatics but never experienced g-loads like that.

"We were at 2,500 feet and did a couple of engagements chasing each other around. Then we went to 14,000 feet. An F-15 was crossing at 2 o'clock on the heads-up display. It was so close I couldn't focus on it. We turned left and he turned left when our right wing went through his plane's belly. He punched out while his plane went down.

"We immediately went wings level and I lost communication when our intercom went out. I thought we were going to eject. This was right after the movie Top Gun and I figured I was Goose. You know, the guy who punches out, smacks his head on the canopy and dies.

"The pilot had some control over the airplane and handed me a note. It said 'I'm going to try and land but if we lose control we'll have to eject.' He had underlined 'eject' about three times.

"We got down low and that thing has two big fuel tanks under the wings. The one on the left came off and the one on the right was so badly damaged it came off. We slowed down, dropped the gear and I saw three green. He eased down to about 180 knots and the plane started shuddering and breaking towards the bad wing. The aileron was stuck straight up and fuel was pouring out of the wing. I thought, 'We aren't going to make it,' but he put that thing on the runway at 200 knots.

"The funny thing is, I was at Daytona in 2007 or 2008 and met a guy who knew the F-16 pilot I flew with.

He told me our crash was the number-one film in the training class!"

Elliott laughs at his good fortune before jumping into a fire-engine-red Dodge Viper and driving a quick half-mile back to his office. An hour later, he's programming the IFD540 and heading to North Carolina with his son, who recently soloed. The young racer, who's already learned from his Dad that great equipment and training are critical to success, could hardly have a better teacher. T&T

Author Kevin Knight is a 1,000-hour instrument-rated pilot who owns a Mooney in Dallas, Texas. He regrets his father doesn't own a Conquest II, or several buildings filled with race cars.

by **Kevin R. Dingman**

Baby, It's Cold Outside!

It's winter in this hemisphere, which means it's colder – colder than when it's not winter. And although winter is a fine time to add a nip of something to your cocoa and wrap yourself in an afghan near a crackling fireplace, it's not such a fine time for your airplane out on the ramp.

This article is about the issues our flying machines face during winter ground operations. It's about being nice to your battery (ies), motor(s), furnishings and equipment when it's cold outside by using the proper gasses, liquids, pre-heating, and warm-up techniques. In other words: how to convince your airplane to go flying when it doesn't want to go.

And before you turbine-powered pilots peel off to peep at Dave's article on the posterior page of this publication, postulating that the preponderance of pearls in this pilot's column are probably pointed at piston-powerplant-powered-planes, pa-fa and au contraire, mon capitaine. There will be plenty of potentially pertinent pearls presented to you as well, so please be polite and persevere.

Half-Naked

We all become acclimated to the temperature of our environment, and therefore have different perceptions of what temperature feels cold. The Mayo Clinic in RST is a common destination for Wings of Mercy trips, and at my Part-121 job we fly to MSP quite often. The hardy souls in these two locales strip-down if the Hg climbs to 30, and are in shorts by 40 degrees. Bless their half-naked, thick-skinned hearts. In some parts of the country, 50 degrees Fahrenheit is cold.

If it's 50 in February where I live, we don short sleeve shirts, cartwheel out to the deck and fire up the Weber. The only way to know the temperatures at which our aerospace vehicles feel the cold is to follow the manufacturer's recommendations, learn from our experiences and listen to the tales of old-timers. Here, in the warm surrounds of your home, office, FBO or cockpit, we will explore a splattering of each.

In the Duke community, 50 degrees and lower is when we pre-heat our 380-hp Lycomings. I've often received raised eyebrows or a shaking head when another pilot sees the torpedo heaters blowing up through the cowl flaps into the motors when the temperature drops below 50. A waste of time, they say – it's unnecessary. Those MSP folks would think it's toasty at 50 and pilots from TPA would say it's chilly. We need to select a temperature to pre-heat motors, interiors and avionics. Fifty degrees seems reasonable.

I Don't Think So

A few years ago I tried to get away with ignoring the recommendations from Lycoming and the Duke Flyers Association regarding cold weather starting procedures. The Duke had been parked outside at the DEN Centennial airport overnight where the OAT had been around 20 degrees Fahrenheit; granted, this is a smidgeon below 50. When the left starter was engaged (the engine closest to the battery), it responded with an undeniable "I don't think so". While the Duke enjoyed two hours in a heated hanger, the PIC enjoyed some light reading in the POH about GPU-assisted starting procedures. The engines started just fine after that, but this trip convinced me to pick a number well above freezing to begin preheat procedures. This was also the trip in which I had a very memorable GA experience.

We all know that "to con" or "conning", means to make contrails; non-pilots call them vapor trails. Contrails can be produced during high humidity if an airplane is in a configuration/attitude of high AOA, such as during landing. More often, we associate contrails with an aircraft at altitude. The white trails are generated by the moisture/temperature reaction of engine exhaust to the cold air. On the flight home from DEN that chilly morning, the OAT at FL 220 was minus 60 Centigrade. The Lycomings in the Duke were making contrails – cons from piston engines! It was reminiscent of WWII bombers and was an inspiring sight; after the two seconds it took to realize that they were not on fire, that is.

In order to convince our airplanes to go flying when it's cold on the ground, there are things to do before the weather turns cold, and after we arrive at a cold hangar, and both during and after the starting sequence. Installing oil cooler baffles, filling tires and struts with nitrogen, use of multi-grade or low-viscosity lubricants, setting the hangar temperature and removing water from the airframe: all of these fall under the before-it-gets-cold tasks. Use of pre-oilers, pre-heating the engines, and warming the cargo, cabin and avionics fall into the at-the-hangar section. And, finally, monitoring CHT's, oil pressures, temperatures and delta-P indications, and exercising hydraulic components and propellers, would be in the starting and after-start procedures.

Your Jet

For the turbine folks that have politely persevered to this point: paraffin, Prist, anti-ice fluids and fuel heaters are cold weather topics associated with your jet. Frozen water in jet fuel can and does clog fuel lines and filters (i.e. British Air flight 38). Like adding a nip of something to your cocoa, Prist, or any FSII (Fuel System Ice Inhibitor) is added to jet fuel in order to achieve an effect. In jet fuel, the desired effect is to prevent water in the fuel from freezing. For convenience and safety, most jet fuel is pre-mixed with an FSII before it's pumped from the truck; manually adding the proper ratio is not normally required.

Delta-P (ΔP) is a term that means "different, or difference in pressure" and is normally associated with the pressure measured at the input vs output side of a filter. This can be an oil, air or fuel filter. A caution or warning system alerts us if the delta-p reaches a preset value indicative of a clogged, or clogging, filter. Alternate-air is used to solve an induction-air delta-p, an oil filter bypass valve is for an oil filter ΔP, and a fuel/air heat exchanger is used to manage fuel-filter restrictions associated with ice in jet fuel. The heat exchanger uses warm air on a timer to heat fuel before it passes through the filters. The relatively-warm fuel will then melt ice and any congealed paraffin in the filters (Kerosene is derived from Greek: keros, meaning wax – a component of jet fuel).

It's recommended that oil coolers be warmed before engine start to

prevent extreme oil pressures due to congealed oil in the cooler. Oil cooler baffles are typically metal plates installed to block a portion of the airflow through engine oil coolers. Some manufacturers and mechanics recommend them below a certain temperature in order to increase oil temperatures. The baffles assist in achieving normal oil temperatures, which are necessary to both decrease oil viscosity and to boil off water deposited in the oil during combustion. After flying or an engine run, I remove the oil dipsticks to allow some of the remaining moisture to escape as steam.

Superior Piloting Abilities

We might think that a heated hangar would solve cold weather problems, and that's mostly true – but we're back to the "perception of cold" question. How warm do you need to keep the hangar, and for how long before a flight? And a problem actually created by a heated hangar is that snow will melt as it lands on the warm aircraft skin during taxi, and then re-freeze before or during takeoff. Light, dry snow that may have otherwise blown off will "adhere" to the surfaces, just as it does on warm engine cowlings during a quick turn. And that adhere word is one we are not allowed by the FAA. According to the AOPA Air Safety Institute, during the last 10 years there have been at least 25 accidents on takeoff as a result of wing contamination by snow. More importantly than the regs however, is that a contaminated airframe may cause us to need some of our superior piloting abilities – maybe all of them, and we don't want that.

Often, the best option is to heat a hangar to about 50 degrees for several hours, followed by the application of an anti-ice fluid if required. Polypropylene antifreeze is pink in color and can be found at RV or automotive stores. A two or three-gallon plastic garden sprayer from the home improvement store works well as an applicator. About four gallons covers the Duke. If away from your home supply of deicer, you may have to purchase aviation Type I, II or IV. Once deiced and anti-iced, if you decide to take off during a snow shower, don't forget to recalculate accelerate/stop distances using the contaminated runway numbers.

Frightful

There are challenges, tradeoffs and costs associated with cold weather ground operations. Once you've establish a routine to prepare the airplane, then preheating, applying fluids and referencing an extra performance chart or two simply adds a bit of time and effort to the launch schedule – it is time well spent. Your alternative is to stay home in front of that crackling fireplace with your enhanced cocoa. And when the weather outside is frightful, sometimes that option is indeed delightful. T&T

Kevin Dingman has been flying for 40 years. He's an ATP typed in the B737 and DC9 with 20,000 hours. A retired Air Force Major, he flew the F-16 then performed as a USAF Civil Air Patrol Liaison Officer. He flies volunteer missions for the Christian organization Wings of Mercy, is employed by a major airline, and owns and operates a Beechcraft Duke. Contact Kevin at Dinger10d@gmail.com.

Twin Proficiency:

by **Thomas P. Turner**

Checkride Circus Tricks

A King Air B200 impacted the Flight Safety International building after departure from Wichita, Kansas. The pilot, the sole aircraft occupant, was fatally injured and the airplane was destroyed. Three building occupants were fatally injured, two occupants sustained serious injuries, and four occupants sustained minor injuries. Visual conditions prevailed.

The airplane departed Runway 1R and was instructed to fly runway heading. One minute later the pilot declared an emergency and stated that he "lost the left engine." According to witnesses, after the airplane departed runway 1R, a left turn was initiated and the airplane's altitude was estimated less than 150 feet above the ground. One witness observed the airplane shortly after it became airborne and heard a reduction in power on one engine before it entered the left turn. Another witness saw the airplane from about 20 yards away. He said the airplane was in a left turn and approached the hangars east of FSI, then the wings were level as it flew west toward FSI. The airplane's landing gear [was] down, the flaps were extended, the rudder was neutral, and the right engine was at full power.

In the final seconds before impacting the building the airplane was on a heading of 240° in a gradual, descending left turn. Both propellers were rotating. The nose of the airplane struck the roof of the building before a large explosion and post-impact fire.

Common comments I've heard include "this isn't supposed to happen in a turboprop," and "a King Air should have no trouble climbing out on one engine, especially with only one person on board." The NTSB preliminary report, unusually detailed for a "prelim," describes a 90° or greater heading change immediately after the engine failure, followed by a gradual turn in a shallow descent until impacting the building…not the classic loss of control scenario, but more as if the pilot experienced an initial loss of control but then regained at least some control over heading and bank before riding the airplane into the building. The landing gear remained down, flaps were extended and the propeller was apparently not feathered. Read the NTSB's preliminary report and make your own (preliminary) judgment about this departure from the standard Engine Failure During Takeoff procedure.

Not only did the pilot perish, but persons on the ground doing the right thing – training, and providing quality flight training, including Russian language translation duties, – died or were hurt in the crash as well. The student in the simulator had traveled halfway around the world, in part (no doubt) because simulator training is so much safer than instruction in an actual aircraft.

Given what we know, and the apparent deviation from the engine failure procedures we all practice, I struggled to find a good lesson as a result. Only after much time thinking about this crash, an answer came.

There are a number of skills and maneuvers evaluated on Practical Tests ("checkrides") that, for many pilots, seem to have no direct application to flying after the pilot certificate or rating is earned. Some of the evaluated Tasks we might call "circus tricks," skills seemingly learned for the sole purpose of successfully passing the checkride. Flight at Minimum Controllable Airspeed ("Slow Flight"), S-Turns Across a Road, Lazy 8s, and Turns on Pylons are among those evaluated Tasks that might appear to be checkride circus tricks. Certainly they don't have as obvious an application as crosswind takeoffs and landings, stall recognition and recovery, and engine failure procedures.

One such checkride "circus trick" applicable to multiengine aircraft is the V_{MC} Demonstration. V_{MC} is the airspeed, determined during certification of a multiengine aircraft, below which directional control is not possible with one engine inoperative and the other engine operating at full power. Flight controls become less effective as airflow decreases. Consequently, as speed decreases the pilot must deflect the controls progressively further to compensate for asymmetric thrust. Loss of directional control occurs at the point when the pilot reaches full control deflection and the airplane decelerates further.

The "V_{MC} Demo" consists of climbing to a safe altitude and clearing the area, then establishing the demonstration configuration (flaps, power, gear and trim) with the critical engine (if one engine is identified as critical by the manufacturer) at idle power and the other engine at takeoff power, with both propellers at takeoff RPM. While maintaining heading in a climb at approximately 10 knots above V_{SSE} (minimum safe single engine speed as defined in the Pilot's Operating Handbook), slow the airplane approximately one knot per second (a very gradual deceleration). Add rudder and aileron input as needed. Recover at the first sign of inability to maintain heading *or* the first indication of a wing stall, whichever occurs first. (see "V_{MC} vs. V_S" in the July 2014 *Twin and Turbine*).

Recover by reducing power on the "operating" engine sufficiently to stop the heading change (generally to idle power, to quickly eliminate the asymmetry that causes the V_{MC} effect), while simultaneously lowering the nose to increase airspeed and therefore airflow, making the controls more effective. Do so properly and

Inoperative engine
Pitch held excessively high
Airspeed decreases: Controls become less effective
Increasingly greater control deflection required to maintain directional control

Speed approaches VMCA
Controls reach maximum deflection
Airspeed continues to decrease: Full control deflection inadequate to maintain control

Recovery:
Reduce both throttles to idle: removes asymmetric thrust
Lower angle of attack: airspeed increases; controls become more effective

within 20° of the entry heading, accelerating to V_{XSE} or V_{YSE} (as designated by the pilot examiner) +10/-5 knots, and you've passed this task on the Multiengine Rating Practical Test at the Private Pilot level.

Why do twin-engine pilots learn to fly the V_{MC} Demonstration? Most say: "In order to pass the checkride." The FAA's *Airplane Flying Handbook* doesn't emphatically state the purpose of this demonstration, but does say that:

A thorough knowledge of the factors that affect VMC, as well as its definition, is essential for multiengine pilots, and as such an essential part of that required task….

Seemingly, the V_{MC} Demonstration is the ultimate "circus trick" maneuver, one taught for the sole purpose of giving pilots something on which to be evaluated. After all, you have to be at or below V_{MC} (red radial) speed in order to perform this maneuver. Takeoff in most

multiengine airplanes is recommended at V_{MC} + 5 knots, and final approach speed is usually 15-20% above V_{MC}. You'll never be *near* "red radial" speed in flight, right?

The King Air crash is a perfect illustration of the reason pilots learn to perform the V_{MC} Demonstration. What's missing in the way most of us were taught (and teach) the V_{MC} Demo is to put the maneuver into context. **The purpose of the V_{MC} Demonstration is to give the pilot an engine failure survival tool if he/she thinks he/she has done everything right and the airplane *still* begins to depart from controlled flight.** The V_{MC} Demonstration is a checkride circus trick no more!

Consider other checkride maneuvers that are often presented as if they are solely for the purpose of passing a checkride. Really think, and you'll find a potential life-saving (or at least damage-preventing) reason for every one.

The highest level of learning is called *correlation*: the ability to relate what you have learned under one set of circumstances with the need for action under a different set of circumstances. The FAA's *Aviation Instructor's Handbook* defines correlation as "associating what has been learned, understood and applied with previous or subsequent learning." Most flight instruction, however, is oriented toward teaching and demonstrating *application*. The "license to learn" we receive with a new, temporary pilot certificate or rating is the challenge to develop the experience, and learn from the experiences of others, to rise to the level of correlation.

The positive lesson from the King Air crash at Wichita is a reminder that all checkride maneuvers can be correlated to real, life-saving situations. We learn what we are required to learn for a reason. No matter what else he had done, if the pilot of the King Air had noted an inability to hold heading, he probably could have chopped both power levers, lowered the nose and landed more or less straight ahead – correlating the V_{MC} Demonstration to an actual Engine Failure During Takeoff.

Your challenge is to retain at least the level of proficiency you once demonstrated to earn your pilot certificates and ratings, and to correlate those skills with others. Tempered with judgment, this gives you a much better chance of being ready if you think you've done everything right, but things are still going seriously wrong. T&T

Thomas P. Turner is an ATP CFII/MEI, holds a Masters Degree in Aviation Safety, and was the 2010 National FAA Safety Team Representative of the Year. Subscribe to Tom's free FLYING LESSONS Weekly e-newsletter at www.mastery-flight-training.com.

NetJets Adds 10 Signature Series Phenom 300s to Embraer Order

Embraer Executive Jets and NetJets® Inc., a Berkshire Hathaway company and the worldwide leader in private aviation, have signed an agreement to convert 10 Signature Series Phenom 300 purchase options into firm orders. At current list prices, this addition to the contract is worth US$ 89.55 million. In October 2010, a purchase agreement was signed for 50 firm and 75 options. The total value of the deal may exceed US$ 1 billion, if all options are exercised.

"NetJets' addition of 10 aircraft to their order reaffirms the success of the Signature Series Phenom 300 and of our relationship," said Marco Túlio Pellegrini, President & CEO, Embraer Executive Jets. "The Phenom 300's market acceptance continues to grow in the fractional and corporate markets, having recently become the most delivered business aircraft."

Embraer has now delivered 36 Signature Series Phenom 300s to NetJets. These aircraft operate in the NetJets fleet, with fractional owners in the U.S. and Europe. Deliveries of the 10 additional aircraft will begin as of January 2016.

"The Signature Series Phenom 300 is an outstanding light jet and the fastest selling aircraft ever in NetJets fleet," said NetJets Senior Vice President of Global Asset Management Chuck Suma. "The Signature Series Phenom 300s are customized by adding special features, including advanced in-flight entertainment, a custom cabin design including specially selected fabrics and materials, enhanced seating, broad spectrum lighting and spacious storage features, as well as the most advanced avionics and technological features to ensure maximum safety, reliability and operating efficiency."

For further information, visit *www.embraerexecutivejets.com* or *www.netjets.com* T&T

January Error Correction: Missing Text For "From The Flight Deck" column

Somehow, someway, editorial gremlins got into Captain Kevin Dingman's January Twin & Turbine column, originally titled "The Window." The first three paragraphs of the story disappeared somewhere between his computer and our printing press, to our great chagrin because the final portion of the January column didn't make sense. We can only offer our abject apologies to author and readership alike, and we are printing the missing text below, so you can finally get the full message Kevin was trying to convey.

The Editor

The Window
by Kevin R. Dingman

Traditionally, the first of a new year is when we take a deep breath, make a resolution to finally do something about something and lean into the headwind of life. Our aviator- way is to analyze the situation, evaluate options and take the appropriate action with confidence and conviction.

In the process of analyzing New Year's resolutions, however, we may find ourselves day-dreaming about the reason we need to make a resolution in the first place. After all, just because we think we heard a bump in the night doesn't mean that there really was a bump in the night. The proper first step is to see if there is something that needs to be fixed at all. Is there really a problem? We need an instrument cross check.

Chief Ten Bears had it right (Dances With Wolves): in the grand scheme of things, pondering over a good fire may be the best thing in life. It was his way of enjoying the day and thinking before acting. Just as the Sioux learned of the looming approach of countless western settlers, so too do our challenges often rival the number of stars in the sky. As entrepreneurs and pilots, we aggressively confront a challenge and don't disparage or ignore the events in our GA village: instrument approaches, systems failures, check rides, flight physicals and the political paradigm of NextGen. These challenges coexist with a robust passion for the joy of flight and an enduring hope for the future of GA. So, we need to decide – or do we really need to decide at all – if should we continue to fly airplanes.

Clouds in My Coffee… T&T

BPPP Initial and Recurrent online classes now FREE to American Bonanza Society members.

The American Bonanza Society (*www.bonanza.org*) and its ABS Air Safety Foundation announce that the industry-leading Beechcraft Pilot Proficiency Program (BPPP) online pilot training programs are now available FREE to ABS members. The innovative "How to Teach Beech" ABS Flight Instructor Academy is also free to all members of ABS.

ABS members can add on approximately four hours of flight training with a Beech-expert BPPP instructor near their home for only $395. Of this, $375 goes directly to pay the highly qualified instructor. Pilots of Beechcraft Bonanza, Baron, Debonair and Travel Air aircraft who complete BPPP online and flight training may receive up to10% off the cost of their aircraft insurance policy – ask your agent or broker. BPPP may now be the first major type-specific initial and recurrent flight training with a discount that actually covers the entire cost of training – making pilots safer and more capable at little to no cost at all.

ABS Board President Bob Goff says: "Why did ABS' Board make this decision? Because we're serious about the ABS Air Safety Foundation's mission: To protect lives and preserve the Beechcraft fleet. The best way to achieve these goals is to ensure that all ABS members receive regular, expert flight instruction. The best way to do that is to make BPPP training as convenient as possible to members, at the lowest possible cost. As a not-for-profit aviation safety charitable organization, it's ABS Air Safety Foundation's responsibility to do this."

ABS Air Safety Foundation Executive Director Thomas P. Turner adds: "Until about three years ago, our BPPP training program cost about $1,500 for a two-day weekend, plus travel and hotel/meal expenses for three to four days. Many of our members said that this was just too expensive and the time commitment was just too much, and enrollments in our weekend programs were falling. We weren't achieving our mission, and something needed to be done. This led to online delivery of the course material and the option of expert, type-specific flight instruction with a BPPP-accredited flight instructor near the pilot's home. This move away from pilot and instructor training as a profit center, and focusing on vital safety instruction as a value-added member service, means far more pilots and instructors will learn the ABS safety message. By now offering online pilot and flight instructor training free to our members, and flight instruction near the pilot's home at the lowest possible cost, we've removed the obstacles of price and scheduling that may have prevented many Beechcraft pilots from participating in life-saving type-specific training."

Bob Goff continues: "We want pilots to fly with one of our expert BPPP instructors. But even if they only take some of the free BPPP online courses, they'll learn more about their Beechcraft and be a safer pilot as a result. It's truly a win-win for Beechcraft pilots."

Here are the options: The Beechcraft Systems, Procedures and Techniques Course ("BPPP Initial")

If this is your first BPPP experience, or you want to refresh and expand your knowledge of your airplane's systems and how you use them in normal, abnormal and emergency situations, then this is the course for you. You'll go through your airplane system-by-system, learning techniques and tricks for getting the most out of your Beechcraft as well as operating it in a manner that promotes airframe and engine longevity. The Beechcraft Systems, Procedures and Techniques Course consists of 13 modules you may take at your own pace, even stopping and returning in mid-module. A short quiz at the end of each module highlights the most important points of the program, and is correctable to 100%.

The Beechcraft Pilot Skills Enhancement Course ("BPPP Recurrent")

Expand on what you've learned in BPPP with the Beechcraft Skills Enhancement Course. In five online courses you'll learn advanced techniques for Beechcraft emergency procedures, take a completely fresh look at stalls and angle of attack, review Special Use Airspace, learn tips for using Electronic Flight Bags, and (optional but recommended for Baron and Travel Air pilots) cover critical decision-making for engine failures after you've feathered the propeller. Again, a short quiz at the end of each module highlights the most important points of the program, and is correctable to 100%.

Add Flight Instruction

Add approximately four hours of Beech-expert flight instruction near your home, on your schedule. You'll be a safer and more accomplished Beechcraft pilot, and may earn a substantial discount on your aircraft insurance premium (ask your insurance agent or broker). If you qualify, you'll earn a Flight Review and/or an Instrument Proficiency Check (IPC) endorsement.

ABS Flight Instructor Academy: "How to Teach Beech"

The ABS Flight Instructor Academy teaches certificated flight instructors the techniques and procedures developed by ABS' contracted instructors in over three decades of teaching in Beech aircraft. ABS' goal with the ABS Flight Instructor Academy is to ensure that Beech pilots everywhere have convenient access to safe, informed and effective type-specific training, in or out of the BPPP system. This is a major effort in support of the mission of the ABS Air Safety Foundation, "to protect lives and preserve the Beechcraft fleet."

Pilots and flight instructors wishing to learn more about flying and teaching in Beechcraft Bonanzas, Debonairs, Barons and Travel Airs may join the 9,000 members of ABS at *www.bonanza.org* or by calling 316-945-1700. T&T

Ad Index

Aircraft Performance Modifications	27	RC Avionics	28
Aviation Technology Inc.	29	Rockwell Collins	2
Avidyne Corporation	Back Cover	Rocky Mountain Propellers	9
B/E Aerospace, Inc.	12	Scope Aircraft Finance	20
Covington Aircraft Engines	26	Select Airparts	30
Falcon Insurance Agency Inc	Inside Back Cover	Shoreline Aviation Insurance	9
Hillaero Modification Center	31	SmarTug	25
Microaerodynamics Inc.	28	Turbines Inc.	10
Nashua Flight Simulator	31	VAC-Veterans Airlift Command	13
Northeast Air Inc.	10	Winner Aviation	21
Paul Bowen	21	Woodland Aviation	5
Pilots N Paws	15	Yingling Aviation	29
Preferred Airparts LLC.	27		
Raisbeck	16, 17		

ADVERTISING DIRECTOR JOHN SHOEMAKER
2779 Aero Park Drive, Traverse City, MI 49686 • Phone: 1-800-773-7798 • Fax: (231) 946-9588 • E-mail: *johns@villagepress.*

ON FINAL

by **David Miller**

Better Weather

With 5,000-plus hours in his logbook, David Miller has been flying for business and pleasure for more than 40 years. Having owned and flown a variety of aircraft types, from turboprops to midsize jets, Miller, along with his wife Patty, now own and fly a Citation CJ1+. You can contact David at davidmiller1@sbcglobal.net.

How do you handle unforecast adverse departure weather? Do you fret? Cuss? Kick the dog?

I pace.

Two recent trips tell the story. A November-morning departure from KGUC (Gunnison, CO) to KADS (Addison, TX) found weather below Gunnison's landing minimums as we arrived at the FBO. Light snow to boot. Although Gunnison does not have a terminal forecast, the nearest larger airport, KMTJ (Montrose), had better than 5,000 and 5 with a good outlook. KTEX (Telluride) featured visibilities less than a mile, 300 overcast in snow. Some nice folks in the waiting area were trying to get there in a Cessna 340.

Although we Part 91 folks can legally depart in just about any weather, I have always found that rule suspect. And, whereas a large metropolitan area will have lots of departure alternates, mountainous airports like KGUC don't offer that option. As I paced, I envisioned an engine failure right after V1 and a single-engine climb in icing conditions for an ILS to runway 6. Or a sixty-mile trip to Montrose with smoke in the cockpit.

Then, Telluride issued a NOTAM advising that their only runway was closed due to snow. The nice folks in the 340 called off their trip. I paced a little more. Patty and I boarded the 4X4 and headed back up the mountain for lunch. I asked the guys in the FBO to call me if the weather came up to 5,000 and 5. A nice comfortable number for me in the mountains.

Three hours later, in sunshine, we were off to Dallas.

Two weeks later, a greater challenge. The departure weather from KOGD (Ogden, UT) called for ceilings of 3,000 feet, visibilities of greater than 6 miles in light rain with a temperature of 5 degrees C. As we drove from Park City to the airport in heavy snow, I wanted to pace. Instead, I squirmed in my seat.

The ATIS said, "Due to rapidly changing conditions, contact ground control for the latest weather."

Arriving at the airport, we found visibilities of 1 1/4 with light rain and snow mix, temps of +1 C and 800 feet broken, 2,000 overcast. At least I had the forethought to put the CJ1+ in the hanger. I paced the ramp and found nothing frozen. Light to moderate icing was reported by several aircraft on the climb out of Salt Lake City. I preflighted, picked up my clearance via a handheld, and boarded the passengers, all in the dry hanger. I coordinated with the tug driver so as to have minimal ramp time in the adverse weather, all of which was liquid.

"November 1865 Charlie, will you be ready at the end of 03?" queried the tower. "I will need a few moments to heat up the wings," came my reply. No more time for pacing or squirming. "Six-Five Charlie, after departure, turn left to a heading of 240 and do not exceed 180 knots until the turn. We would appreciate a base report."

Power up. Pitot, wing, windshield, engine, and tail deice on. Off we go. Solid IMC all the way to the tops at FL310.

I never did have time to call back with the base report. I was pacing too much.

Fly safe.

BUILT FOR SPEED.

"Going fast is my business. That's why I chose Avidyne's IFD540 for my GPS/NAV/COM upgrade. The direct replacement of my old 530 took no time at all, and entering flightplans is fast and easy."

Bill Elliott IFD540 Customer
NASCAR® Legend

IFD540 FMS/GPS/NAV/COM

- *Plug & Play for Fastest Installation*
- *Hybrid Touch for Fastest Performance*
- *GeoFill™ and QWERTY keyboard for Fastest flight planning*

www.IFD540.com

Call Brian for more info
781-402-7520

AVIDYNE
Flying Made Simple™