MU-2 magazine

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what's inside:

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MU-2 magazine

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COVER PHOTO:

Michael Adams,
Owner/Operator

Photo by Jan Glenn during PROP photo shoot.

The Mitsubishi MU-2, one of Japan's most successful aircraft, is a high-wing, twin engine turboprop with a pressurized cabin. Work on the MU-2 began in 1956. Designed as a light twin turboprop transport suitable for a variety of civil and military roles, the MU-2 first flew on September 14, 1963. More than 700 MU-2 aircraft were built before the aircraft went out of production in 1986. Presently, nearly 300 MU-2 aircraft remain in operation with the majority of the fleet registered in the U.S.

Turbine Aircraft Services, Inc. (TAS) is under contract to Mitsubishi Heavy Industries America, Inc. (MHIA) to assist with the support of the MU-2. TAS distributes MHIA-issued publications and serves as liaison between MHIA and MHIA's contracted Service Centers, Vendors and Training Agencies.

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OOPS! :(

There are a couple of errors we need to address from the last issue (October, 2016).

At the bottom of Jim Lara's article, "Aviation Mastery or Minimum Standards: What's Your M.O.?", his company's name was misspelled. It should have been Gray Stone Advisors.

In Ralph Sorrells' "Sideslips" article, Michelle Kole's last name was misspelled.

So sorry, the Editor.

Editorial by Pat Cannon

This issue will be bittersweet for all of us at Turbine Aircraft Services. It will be the last MU-2 Magazine that will be created and published by TAS. After this issue, MHIA will assume full responsibility for the publication of the magazine in the future. I was reviewing past articles and their authors recently, and I am amazed at the variety and quality of the content provided by a wide range of very knowledgeable writers. After the demise of the AAOG magazine, published by Paul Neuda and which included an MU-2 section, it was felt that the MU-2 community needed a communication outlet. So thanks to Carol Cannon, this magazine was born. It is largely due to Carol's effort that this magazine has been financially viable and has continued to provide a wide variety of subjects. She was the driving and creative force that made the magazine a reality. We also must give major credit to the two publishers that have brought the actual magazine to life each quarter. Mike Taylor, who has an incredible writing talent, was responsible for a few years for organizing the articles and the ads into the magazine itself. He is an aviator and knows the business of flying. Thanks to Mike for his long service. More recently, Jason Butler, who owns a visual communications company here in Texas, took over the publishing and organization of the magazine. Both publishing companies have done a great job and hopefully MHIA will continue to use Jason in their efforts to make the magazine even better.

This month, please enjoy the O/O spotlight on John Richardson. He has had a long history with Mitsubishi going back to the early MAI days. Tom Hudak produced a great first hand article about checklists and why we use them. Rick Wheldon will talk more about CDFA approaches, which are a very new concept but are continuing to prove their worth to safety during non-precision approaches. Chris Turnbull has provided an article, the topic of which is "Flying to Cuba", a very timely topic. I have written a piece that brings together all of the questions I get on a regular basis from prospective buyers about which model to buy. Lastly, Carol will update you on MHIA's and TAS's activities at the 2016 NBAA Convention in Orlando.

As all of you know by now, TAS's product support contract will expire in March, 2017. TAS will no longer provide the product support activities and consulting to MHIA, and all responsibility for product support will be transferred on April 1, 2017 to MHIA. MHIA has committed long term support to the MU-2 community and is ramping up their activities for the next PROP to be held in 2018. MHIA will continue to use consulting services from several of us for a period of time as they get their feet on the ground and learn the customer support aspect of the business.

I want to thank each and every one of you for your long-standing loyalty. It has been a real pleasure working with all of you for the past 22 years through PROP and other activities. It has been one of the richest parts of my life in aviation, and I have grown immensely as a pilot and as a mentor by what each of you has brought to the table for me from which to learn. Every employee of TAS wishes for me to convey their heartfelt thanks for your friendship and support for so many years. Most will go on to new jobs, but they all want me to extend their well wishes to you and your families and to wish you "safe flying".

Pat Cannon is President of Turbine Aircraft Services.
He is an FAA Designated Pilot Examiner, former MU-2 Demo Pilot, and Safety Expert.

CHECKLIST. CHECKLIST. CHECKLIST!

by Thomas (Woody) Hudak

For anyone involved in any form of flying, from your first flight of fantasy, you're told to use a checklist. As a pilot or aircraft mechanic, it is consistently beat into you to always use a checklist. Procedures are put in place in order to promote safety.

Anytime there is major maintenance completed on a TPE 331 engine gearbox, and prior to return to service, an inflight engine shut down must be performed. So it happened that I, as a head engine technician, was tasked with training a new engine mechanic on the intricacies of completing an NTS in-flight shut down and air restart. For the sake of this story, we'll call the mechanic Jeff. I had just trained Jeff on completing a compressor seal change and was able to demonstrate to him how the negative torque sensor system operates on a TPE 331 engine. As the mechanics, we had completed our task at hand and performed all required ground operational checks of the engine and NTS system. As the senior technician, my job was to instruct

Tom Hudak graduated from Pittsburgh Institute of Aeronautics in 1978 and began his career with Pratt & Whitney, working final test and assembly on JT8D (737engines) and JT9D (747engines). Tom started working with Beckett Aviation in 1984, became lead technician, then moved into the authorized TPE-331 Major Service Center engine shop. Winner Aviation (formerly Beckett) is the oldest Honeywell TPE-331 Service Center. Tom is now the Engine Shop Supervisor and also the DOM of Winner's 135 operation. Tom has been based at the same FBO (KYNG) for over 30 years.

the pilots on the upcoming checks and to make sure they have reviewed the Pilot's Operating Handbook (POH) in case of any unexpected outcomes.

The next day we planned our NTS inflight shutdown. It was a sunny afternoon, and I was training Jeff and flying with the airplane owner, who I will call Pat. I had instructed Pat several times to review the POH for inflight air restart on the MU-2P model. All ground operational checks were satisfactory, so we took off smoothly and headed to our usual test area. Once at altitude and with clearance from center, we proceeded to shut the right engine down using the engine maintenance manual checklist. We feathered the propeller and the shutdown was uneventful. Jeff, the novice engine mechanic, stared in wonder at the stationary propeller. Pat and I discussed the airplane's characteristics with one engine shut down. Pleased by the outcome of the aircraft's performance, it was time to restart the engine. Questioningly, I asked Pat, "What's our next step?"

"Just push the unfeatherpump button and the engine will restart."

The propeller came out of feather and the engine rotated up to 18% rpm - but failed to light off. I feathered the propeller, and the propeller again stopped its rotation. I looked at Pat, and he said with raised eyebrows, "That's interesting. Should we try it again?" We agreed to attempt another air restart.

I again pressed the unfeatherpump button, and just as before, the propeller came out of feather, the engine again failing to ignite. This time, however, I noticed we had no fuel flow or ignition. Turning around, Jeff's curious wide eyes had turned into the wide eyes of worry. I turned to Pat and asked if he had reviewed the checklist, to which he replied with a blank stare, "No. I thought all you had to do was press the unfeatherpump button." I asked Pat to hand me the POH. He responded, "It's back in the drawer under the rear seat." I turned to ask Jeff if he would retrieve the book; he now had a look of consternation on his face. Jeff quickly retrieved the POH and shoved it in between Pat and I. Pat looked at me and asked, "Do you want to read, or do you want to fly?" Jeff answered for me - "READ, WOODY, READ!"

I read the proper procedure from the checklist and the engine did indeed restart. The rest of the flight was uneventful with a faultless return to our home airport. Since I was not new to check flights and was confident in Pat's skills, the two of us were able to keep our heads - although Jeff was a little shaken by the experience. I reiterated to them both again when we landed: checklist, checklist, checklist; it is always necessary.

Continuous Descent Final Approaches

by Rick Wheldon

Beginning November 7, 2016, the training requirements of SFAR 108 were transferred into a new FAR, CFR 91 Subpart N, and the training curriculum and profiles previously included in SFAR 108 were incorporated into the new rule by reference to a new Advisory Circular 91-89. One of the significant changes to the profiles was the incorporation of Continuous Descent Final Approaches (CDFA) as an alternate option to straight in non-precision approaches. CDFA approaches are encouraged by the FAA, as opposed to the old "dive and drive" non-precision approaches, for a number of reasons, chief of which is that CDFA offers "increased safety by employing the concepts of stabilized approach criteria and procedure standardization." Also, it should be noted that European countries require the use of CDFA unless otherwise approved by EASA. Clearly, the safety benefits of CDFA are recognized worldwide.

What is CDFA? Advisory Circular 120-108 is our guideline, and defines CDFA as the "technique for flying the final approach segment of an NPA (non-precision approach) as a continuous descent. The approach is consistent with stabilized approach procedures and has no level off." In other words, it mimics a precision approach.

Last month, I completed my annual recurrent training and found CDFA approaches to be easy to fly and surprisingly accurate. In fact, on my first glideslope inoperative localizer approach, my simulator instructor noted that the vertical tracking, with me using descent rate only, was closely overlaying the actual glideslope. I broke out slightly above minimums in a perfect position to land, as if I had been on a real glideslope. This technique offers clear advantages for single engine non-precision approaches in the MU-2, primarily because it allows gear extension at (or near) the final approach fix, whereas the "dive and drive" profile requires that the gear remain up until sometime after the MDA level off when the pilot judges that a normal glide path to touchdown can be maintained.

AC 91-89, referenced in Subpart N, includes 2 profiles for CDFA – one for 2 engines and another for one engine. We'll look at both profiles, but let's start by looking at basic CDFA techniques.

First, you need to have access to the Rate of Descent Table from AC 120-108, part of what is depicted in Fig. 1. This table lists vertical path angles, corresponding descent gradients in feet per nautical mile, and descent rates for various groundspeeds. I have downloaded that table into the "Documents" section of ForeFlight on my iPad, and I would recommend that everyone have it available in your cockpit in some manner.

CLIMB/DESCENT TABLE 10042

INSTRUMENT TAKEOFF OR APPROACH PROCEDURE CHARTS
RATE OF CLIMB/DESCENT TABLE
(ft. per min.)

A rate of climb/descent table is provided for use in planning and executing climbs or descents under known or approximate ground speed conditions. It will be especially useful for approaches when the localizer only is used for course guidance. A best speed, power, altitude combination can be programmed which will result in a stable glide rate and altitude favorable for executing a landing if minimums exist upon breakout. Care should always be exercised so that minimum descent altitude and missed approach point are not exceeded.

CLIMB/ DESCENT ANGLE (degrees and tenths)	FT/NM	GROUND SPEED (knots)										
		60	90	120	150	180	210	240	270	300	330	360
2.0	210	210	320	425	530	635	743	850	955	1060	1165	1275
2.5	265	265	400	530	665	795	930	1060	1195	1352	1460	1590
VERTICAL PATH ANGLE 2.7	287	287	430	574	717	860	1003	1147	1290	1433	1576	1720
2.8	297	297	446	595	743	892	1041	1189	1338	1486	1635	1783
2.9	308	308	462	616	770	924	1078	1232	1386	1539	1693	1847
3.0	318	318	478	637	797	956	1115	1274	1433	1593	1752	1911
3.1	329	329	494	659	823	988	1152	1317	1481	1646	1810	1975
3.2	340	340	510	680	850	1020	1189	1359	1529	1699	1869	2039
3.3	350	350	526	701	876	1052	1227	1402	1577	1752	1927	2103
3.4	361	361	542	722	903	1083	1264	1444	1625	1805	1986	2166
3.5	370	370	555	745	930	1115	1300	1485	1670	1860	2045	2230

Figure 1

Rick Wheldon is Vice President of Turbine Aircraft Services.
He is an Aeronautical Engineer, a former U.S. Navy aviator, and MU-2 Demo Pilot.

Some preliminary planning will make the approach much easier and more precise. First, the CDFA procedure requires a published Vertical Descent Angle (VDA) on the approach chart. Without a published VDA, CDFA approaches are not allowed. VDA is available on both Jeppesen and government approach plates, but in slightly different formats. Jeppesen will typically place glide slope angle in the bottom left portion of the chart near the minimum requirements, such as in Fig.2.

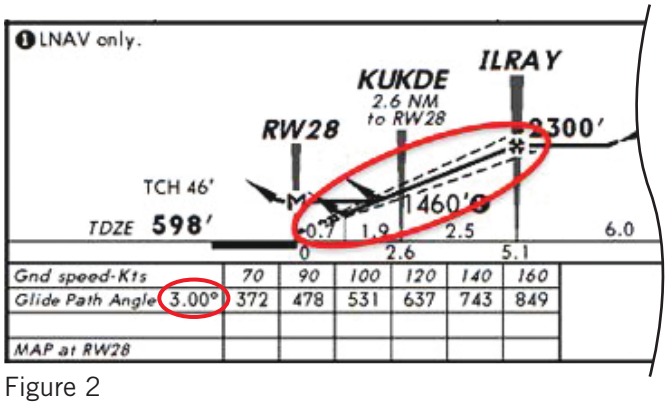

Figure 2

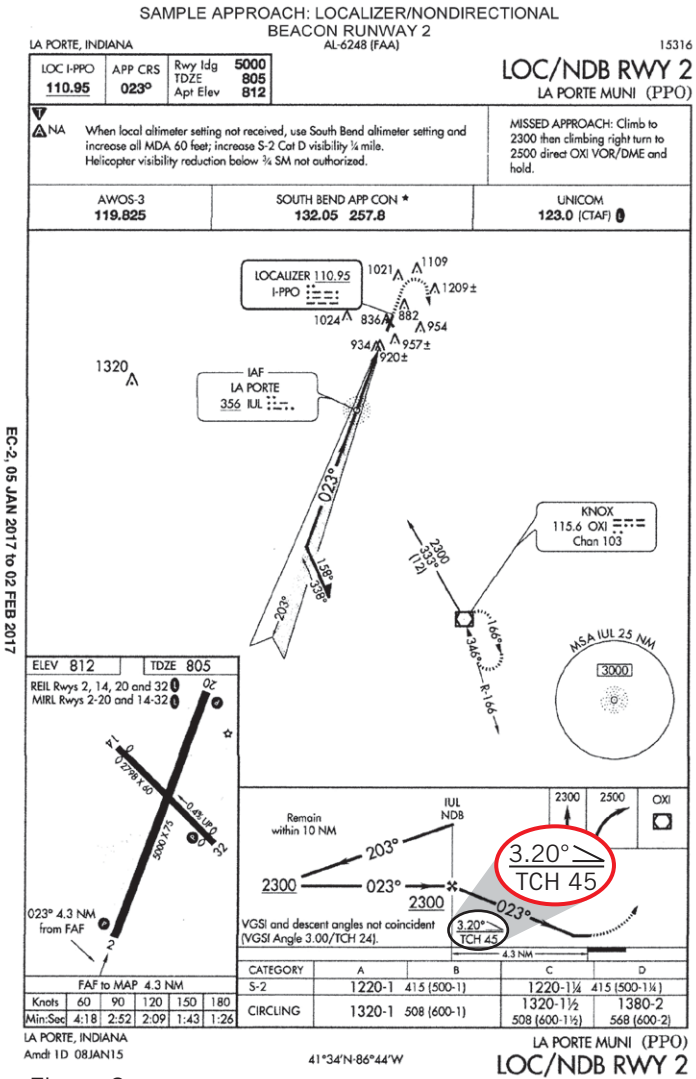

Figure 3

Government charts will show the descent angle somewhere on the profile view of the approach, as in Figures 3 and 4. Be familiar with the charts you're using. Also, be careful with VDA. Most likely, the VDA will be the angle from the final approach fix to the threshold crossing height, but sometimes, if VDA is charted inside a stepdown fix (as in Figure 4), it is the angle from the stepdown fix to the crossing height. If VDA is published inside a stepdown fix, the stepdown fix may be higher than a constant descent from the FAF to landing would require. In that case, you must either fly a lesser descent rate from the FAF to the stepdown fix, then increase your descent rate at the stepdown fix, or you can delay beginning your descent from the FAF altitude to a point where the published VDA will take you all the way to touchdown. I recommend the latter.

Once you've determined VDA, look at the corresponding gradient in feet per nautical mile. That should be your target gradient. Determine your expected groundspeed for the approach, and from that, find the target rate of descent. Now, grab a sheet of paper. Write down the touchdown zone elevation and add it to the Threshold Crossing Height. For each mile outbound, add the gradient in feet per NM all the way to the Final Approach Fix (or stepdown fix). You now have a set of checkpoints to cross check your descent rate. Checkpoints can be measured in miles to go, DME, or even time. If your GPS provides miles to touchdown, that is a simple way of monitoring your progress.

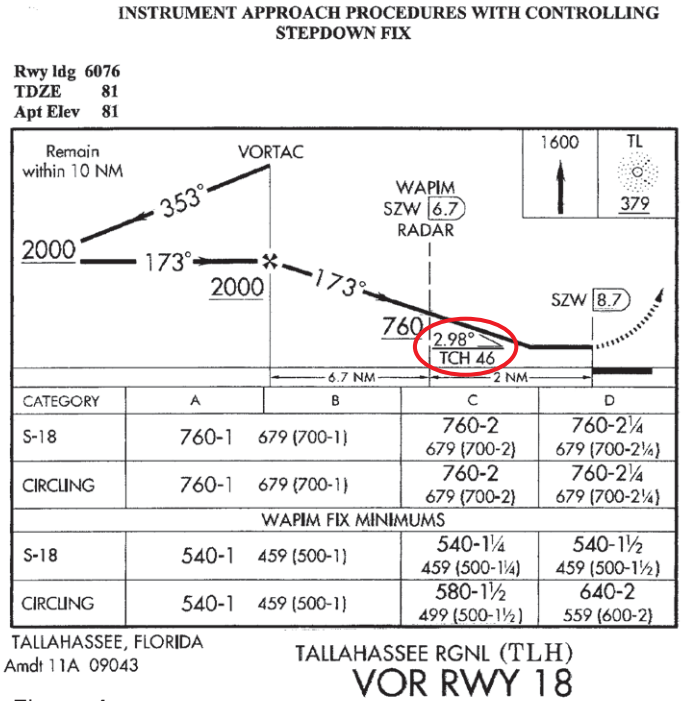

Figure 4

There is a "rule of thumb" that can be used for most CDFA approaches to determine target rate of descent. Assuming an approximate 3 degree glide path, you can read your groundspeed off of your GPS, divide it by 2, and multiply that result by 10 to get a desired sink rate. For example, at 120 knots, calculated target sink rate will be (120/2) x 10 = 600 fpm. From the chart, the target will actually be 637 fpm, so there is a slight difference, but it is close. Note, though, that if the proper descent angle varies much from 3 degrees, this "rule of thumb" will not work, and even with our example, on a 2 minute approach, you would be 80 feet above a perfect glide path when breaking out.

There is one other thing to accomplish before commencing the approach – determine your Derived Decision Altitude (DDA, Fig. 5).

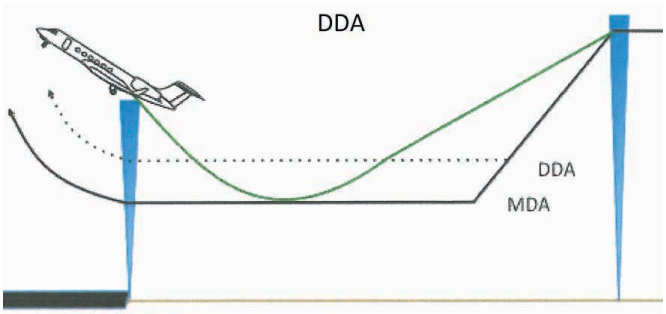

Figure 5

DDA is an altitude above MDA where you will make a decision to continue or to go-around. Since this is a non-precision approach, you are not allowed to descend below published MDA in your transition to the go-around, as would be allowed in a precision approach. In your descent, you need to decide prior to MDA to go missed so that you will not descend below MDA. Although there is no prescribed altitude loss for the transition in our MU-2 profiles, I will assume that the DDA will be 75 feet above the MDA.

Let's look at the LOC/NDB RWY 2 sample approach into PPH airport from AC 120-108 (Fig. 3). The published VDA for this approach is 3.2 degrees, which, from the table equates to 340 ft./nm. The threshold crossing height is 45 feet, and, since the touchdown zone elevation is 805 feet, the threshold crossing altitude is 850 feet. The missed approach point is based on timing, assuming that you are doing this without GPS distance readout. If your groundspeed is 120 knots (no wind, 120 knots approach speed), each mile will take 30 seconds, and your target sink rate is 680 fpm. The approach will take 2 minutes and 9 seconds. Therefore, you can write down the following checkpoints, preferably on your approach plate, determining altitudes by just adding 340 ft. increments for each mile to the threshold crossing altitude on the bottom line:

NM from IUL NDB	Seconds on Approach	Target Altitude	
0	0	2300'	
0.3	9 (0:09)	2210'	
1.3	39 (0:39)	1870'	
2.3	69 (1:09)	1530'	
3.3	99 (1:39)	1190'	←DDA (1295')
4.3	129 (2:09)	850' (805'+45')	

Figure 6

As explained above, I will use DDA of 1295 ft., which is 75 feet above published MDA.

Approaching the FAF (NDB), lower your gear, drop your flaps to 20, slow and stabilize at 120 knots, and check your groundspeed at about 120. Passing the FAF, start the clock, power back and begin descent at 680 fpm. 39 seconds into the approach, you should be passing 1870 feet. Make small adjustments to your sink rate if you are above or below this target. Similarly, other checkpoints can be compared with the predicted values and appropriate adjustments made to the sink rate. You will reach your DDA just prior to 90 seconds into the approach. Upon reaching DDA, if you see the runway, continue and land. Without the runway in sight, immediately execute a missed approach. It's that easy – just like an ILS!

Now let's look at the single engine CDFA for the MU-2, and we'll add a stepdown approach to the planning. We'll use the TLH VOR RWY 18 example from AC 120-108 (Fig 4.) and assume that we have DME operating. The published VDA is 2.98 degrees, which in this case is shown past the stepdown fix, so it is the angle from the stepdown fix to the threshold crossing altitude. From the plate, the touchdown zone elevation is 81 feet with a threshold crossing height of 46 ft., so the threshold crossing altitude is 127 ft. at 8.7 DME. Interpolating from the Rate of Descent Table, the descent gradient is 316 ft./NM. Let's make a list of our checkpoints. Start by filling in the threshold crossing

altitude and missed approach point at the bottom, then determine altitudes at each 1 mile interval from the runway by adding the gradient per mile from the previous checkpoint below it.

DME past SZW	Target Altitude	
0.7	2000'	
1.7	2000'	
2.7	2023' (2000')	
3.7	1707'	← Begin descent
4.7	1391'	
5.7	1075'	
6.7	759'	← DDA (615')
7.7	443'	
8.7 (MAP)	127' (81'+46')	

Figure 7

As you can see from the numbers above, we'll have to delay beginning our descent past the FAF. We will begin just beyond 2.7 DME past the SZW VOR, where the target altitude for the descent passes the published FAF altitude. A precise interpolation will reveal that the descent should begin at 2.8 DME past the VOR.

Now, since we will be using the WAPIM fix on a CDFA approach, we can descend to the lower MDAs listed. Per the standard single engine CDFA profile, the approach speed will be 140 (130 minimum) configured with gear down and flaps 5. I typically aim for 135 KIAS for this segment. Above 120 KIAS, we will be Category C, and the MDA is 540 ft. Add 75 ft. to MDA to get a DDA of 615 ft.

As we reach 615 feet MSL, if the field is in sight, we can continue to land. If we reach 615 feet, and the field is not in sight, we will initiate a go-around, by adding power to 100% on the operating engine, raising the nose slowly, raising the gear, and maintaining Vx until clear of obstacles, then Vy airspeed for the go around, as appropriate.

Let's talk about the transition to single engine landing. If we see the field at 615 feet, just at minimums, we are nearly 500 feet above the ground. This leaves plenty of time to ascertain that the landing is assured, so that flaps can be selected to 20, the single engine landing checklist completed, and the aircraft slowly decelerated to cross the threshold at 110 (long) or 105 (short).

Some have argued that a flaps 5 landing is preferred, because there is no flap reconfiguration required after breaking out. I have found that the transition to flaps 20 can easily be accomplished from as low as 200 feet, so my preference would be to make the transition to flaps 20 on a CDFA approach. However, if you elect to land flaps 5 under the pilot's emergency authority, then remember to increase your threshold airspeed to a minimum of 115 in accordance with the No Flap or Flaps 5 landing profile. You are in effect combining the flaps 5 profile with the single engine profile if you do this.

CDFA approaches can be a great tool in your tool bag. If you have not tried them, give it a shot during your next recurrent. There is a bit of planning required beforehand, but if you understand the concepts, the numbers can be quickly determined with the descent table and a pencil and paper, and you will be surprised how accurately you can fly a constant descent profile. I was!

Flying to Cuba in 2017

by Christopher Turnbull

I'm amazed by the number of calls I've received recently from clients asking if they can fly their airplane to Cuba now. This is obviously the result of the U.S. and Cuban government's agreement to open embassies in each other's capitals. Additionally, they agreed to reestablish diplomatic relations for the first time in more than 50 years.

Chris Turnball came to Chappell, Smith & Assoc. Insurance from the airline industry where he served as VP of Operations, Director of Safety, Airline Captain, Air Safety Chairman, and a trained airline accident investigator. He is a licensed Airline Transport Pilot and a former Flight Instructor. He earned his Bachelor's Degree at the University of Washington and served as a paratrooper in the U.S. Army. Chris has over 30 years of leadership experience, business planning, financial analysis, operations management, safety analysis, and public relations.

Going back in history: On October 19, 1960 the U.S. placed an embargo on exports to Cuba, excluding medicine and some foods. By February 7th of 1962, President John F. Kennedy expanded the embargo to include imports from Cuba to the U.S. As a result of the embargo, American businesses cannot conduct business with Cuban interests. Upon review, the regulations do not technically limit travel by U.S. citizens to Cuba. However, it does make it illegal for them to spend money (or receive gifts) in Cuba.

The regulations required U.S. citizens to be "licensed" in order to engage in any travel-related transactions associated with travel to Cuba. However, financial transactions related solely to tourist travel to Cuba cannot be licensed.

Over the years, some U.S. citizens have risked prosecution and significant fines by sidestepping the regulations by traveling to Cuba from different countries like Mexico and Costa Rica. They learned that Cuban immigration authorities do not routinely stamp passports. Instead, the immigration authorities provide the traveler with a separate, stamped visa page. They do not permanently affix the visa page to the person's passport.

Regardless of your political view on the topic, things are changing. Although restrictions between the U.S. and Cuba are beginning to ease, U.S. citizens are still technically prohibited by law from traveling to Cuba for tourism purposes. However, they are not required to have a license from the U.S. Government anymore. Instead, the trip must fall within 12 approved categories:

- Family visits
- Official business of the U.S. government
- Journalistic activity
- Professional research and professional meetings
- Education and people-to-people activities
- Religious activities
- Public performances, clinics, workshops, athletic and other competitions, and exhibits
- Support for the Cuban people
- Humanitarian projects
- Activities of private foundations or research or educational institutes
- Exportation, importation or transmission of informational materials
- Certain authorized export transactions

Does this mean you can fly your airplane to Cuba for one of these approved categories? Yes, as long as you meet all of the government's requirements, including those imposed by the FAA and the Department of Homeland Security (DHS).

What about your aircraft insurance?

Once government clearance is received, many of the insurance carriers will approve travel to Cuba on a trip-by-trip basis. The carrier will need a signed copy of the Cuba Compliance Certification from each passenger. Additionally, they will want to know the purpose of the trip, the dates of travel, the length and route of the trip, information about the handling and security of your airplane while there, as well as the number and relationship of the passengers traveling with you. One carrier indicated it will also need a copy of your itinerary while in Cuba. Regulations also require any U.S. operator authorized to travel to Cuba to maintain certain documentation for a minimum of five (5) years.

Once the carrier has this information, it will add Cuba to your Approved Territory in your policy. NOTE: some carriers may charge a fee for this approval and/or will increase your deductible while traveling to, from or within Cuba.

With the recent death of Fidel Castro and election of Donald Trump as President of the United States, relations between the U.S. and Cuba will continue to change going forward. As a result, we recommend you work closely with companies that have experience with regulatory and operational details associated with travel to/from Cuba. Working with your underwriter and your aviation insurance specialist is also a critical step in the process.

THE MU-2 BOOTH AT NBAA 2016

by Carol Cannon

The 2016 NBAA Convention was held in Orlando, FL at the Orange County Convention Center on Nov. 1, 2, and 3. At this point in the history of the NBAA Convention, the only two convention centers that are large enough to handle this convention are in Orlando and Las Vegas. NBAA's Business Aviation Convention & Exhibition is the country's sixth-largest trade show and is the largest in the world focused on business aviation. The MU-2 booth was staffed by personnel from Mitsubishi Heavy Industries America, Turbine Aircraft Services, and the five domestic Authorized Mitsubishi MU-2 Service Centers (Carolina Turbine Services, Intercontinental Jet Service Corp., Jet Air Group, Professional Aircraft Maintenance, and Winner Aviation).

This year's convention was again a great success. There were over 27,000 people in attendance, 1,100 plus exhibitors, 114 aircraft at the Static Display at Executive Airport (sold out), and 9 fixed wing and 6 rotorcraft aircraft at the static display in the convention hall (the largest ever in the convention hall). The MU-2 booth had 20 Owners and Operators stop by, and they all received a garment bag with the MU-2 aircraft embroidered on it and a short or long body medallion/coaster/paperweight. Quite a few vendors also visited the MU-2 booth, along with many former MU-2 owners and operators, some of them from the 70s and 80s. They just can't stay away.

The show opened on Tuesday, Nov. 1, and there was a steady stream of people through the MU-2 booth. The show continued on Wednesday and Thursday, and the personnel in the MU-2 Booth were excited to see so many old and new faces of Owner/Operators and Vendors. MHIA, Aircraft Product Support Division had a large contingent of personnel on site in the booth. General Manager Kensuke Takeuchi, Deputy General Manager Ralph Sorrells, Yoshiaki Asako, Kenichiro Tsujita, Manabu Okano, Jenna Herzog, Joe Megna, Sophia Thach, Ikumi Okano and Joel Howells represented MHIA.

On Monday, Oct. 31, the day before the start of the convention, Turbine Aircraft Services' Pat Cannon

participated in a panel with the NBAA Single Pilot Safety Committee, of which he is a member. The 2016 Single Pilot Safety Standdown showcased the most effective safety strategies for single-pilot operators. This event included informational sessions designed to enhance operators' knowledge and provide them with tools and training methods. Panel discussions on topics such as best practices and areas of concern offered attendees a variety of perspectives on today's most pressing safety issues.

All Owner/Operators who visited the MU-2 Booth were entered into a Door Prize drawing for Owner/Operators only. The prize was a laser-engraved crystal on a lighted base with the double MU-2s engraved in it. The winner was Mr. Emil Wirth, Jr., SN 400, of Laceyville, PA. Congratulations, Emil!

By 4:00 Thursday afternoon, the convention attendees had all departed for points across the country and the lights were brought down on another year at the MU-2 booth. Mitsubishi Heavy Industries America will be on site next year at the 70th NBAA Convention in Las Vegas, NV on Oct. 10, 11, and 12. Hope to see you there.

Carol Cannon has worked on Turbine Aircraft Services' projects for over 20 years. She manages the PROP series of seminars, the MU-2 Booth at the NBAA Convention, MHIA's Barrington Irving "Dream and Soar" events, other MHIA/TAS trade shows and appearances, and the MU-2 Magazine.

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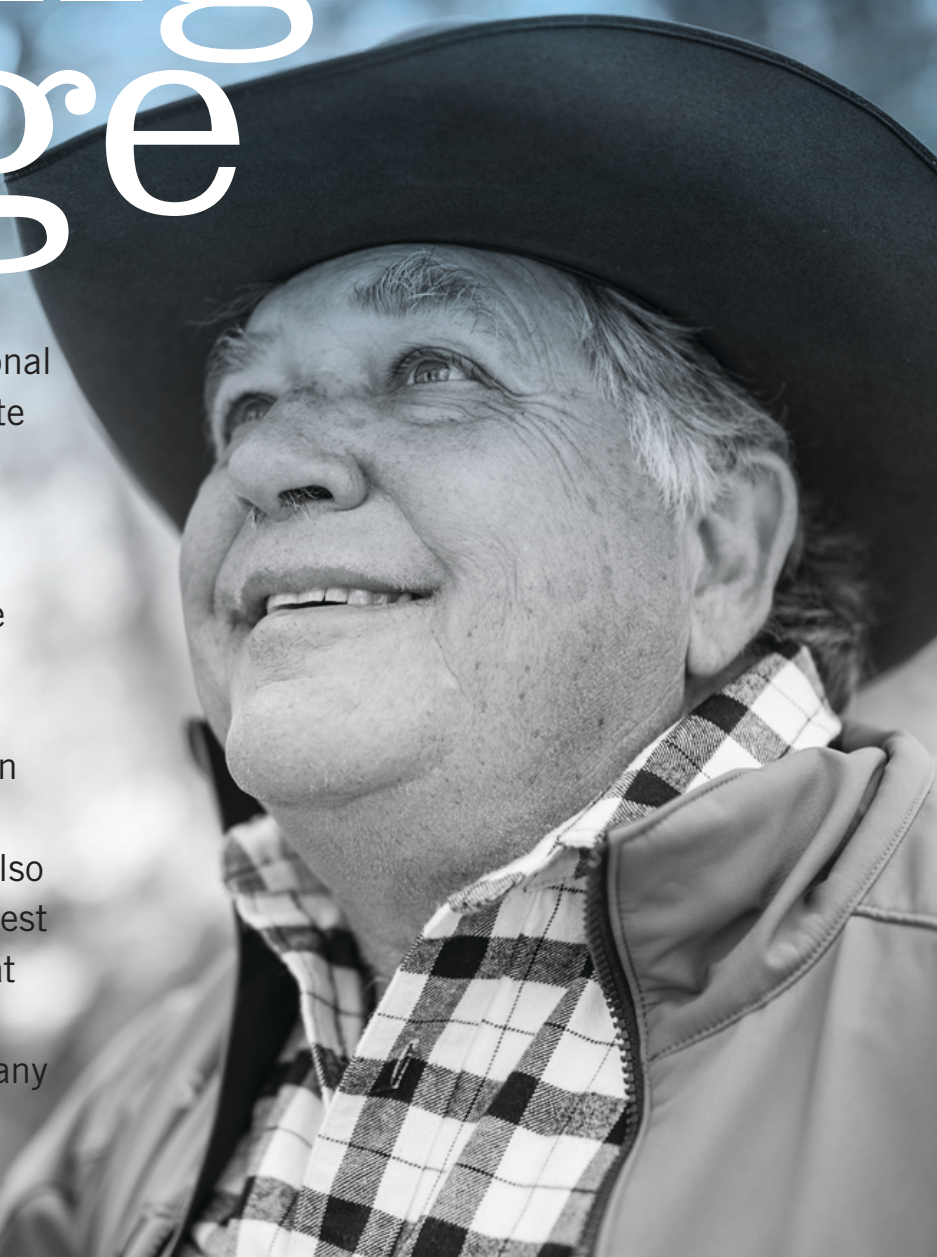
John Richardson: Living Large

by Kimberly Fish

John Richardson had an unconventional upbringing, and he loved every minute of it. Raised in a military family, he spent formative years roaming the halls of Balboa High School, a Department of Defense school on the western coast of Panama, fishing off the Pacific coast, and learning to fly airplanes. While immersing himself in the Panamanian culture, he and his dad, a Special Forces Army officer, also learned the formula for making the best of the opportunities one is dealt. That joy of living still underscores John's conversations, and it translates into any language.



With a heaping of Army grit, John enrolled in Texas A&M's ROTC program in the early 60s and signed on for an aerospace engineering degree. Already a qualified flight instructor and more familiar than most regarding the military supply planes outfitting the Aggie hangar, John flourished in a program that had been infused with NASA-caliber training labs and prototypes. As an upper-classman he operated as a flight instructor helping other military pilots find new footing in the US Air Command Services, all the while applying to serve during the last seasons of Vietnam. Though he was far more experienced than others, the US Army shuffled him away from planes and helicopters; into a transportation division where John learned the finer points of engineering as it applied to all means of moving from point A to point B. Big rigs weren't exactly what he had in mind, but it was important work for a war winding down, and he was willing to do what was needed.

After John's military service, he returned to College Station and entered graduate school. With a Texas bride by his side, Susie and John decided the MBA was the tool he needed to roll his varied life experiences into a successful career.

It was while working through case studies with one of his favorite professors, Herb Thompson, that a late night call from Carl Mudd, CFO of Mitsubishi Aircraft International, started him on a new trajectory. Mudd had received John's resume from a mutual friend and saw a skill set that was needed at Mitsubishi. John, ever hungry to learn more about airplanes, took the role with the understanding that MAI would teach him to fly the MU-2. Twenty-four-years old and the ink barely dry on his MBA, he and another rookie, Tom Bersheidt, set about sorting out Mitsubishi's product support needs and warranty claims in a back room in San Angelo. Learning as they went, John connected with the best mechanics and FBOs in the nation. Through solving those warranty issues, he made friendships with the staff at Mitsubishi, a group that soon became like family, and relationships with the service centers across the US; folks who have become lifelong friends.

It was just a few short years into his tenure with MAI that his finesse with the Spanish language helped him enter a new dimension for success. Pilots in Latin America were discovering the unique qualities of the Mitsubishi turbo prop, and they wanted someone who would bring them the airplane. John, with his language skills and flight history, transitioned from product support to sales. With this new business card, John had the liberty of flying across the States and Latin America, showcasing the airplane that had won fans for its speed, power and reliability.

John's enviable people skills, his easy manner, and professional handling of the MU-2 escalated him to routinely being named Mitsubishi's top-producing salesman. But that success and the hours logged in the air were taking its toll at home.

With one son and a second child on the way, John's heart was tugging him deeper towards the family ranch in Bellville, Texas. As all the turns in John's life have proven, it was through friendly connections that he heard of an opportunity to buy a small water well business in Bellville. John is not shy about admitting that as an avowed pilot he had zero knowledge of the water well business, but that didn't stop him from giving 110% to learning a new business model. And it was through another friendly lead that John decided to do the outrageous thing of bidding on providing water wells for Exxon rig sites. Sure that he'd overstepped, a Latin American executive who appreciated John's language skills assured him that the deal was good. With corporate doors opening, and a few other drilling opportunities in hand, John set about cultivating new relationships in the oil business and within a short amount of time grew a prosperous business. In one year, he was running 5 rigs and had multiple employees from 5 to 50. Since those heady days in the 1980s, he has diversified the company into ranching, real estate, marine operations, oil and gas investments, and the use of renewable resources for pumping and treating water. The company has given to charitable causes providing clean drinking water to developing countries and work on projects from windmills to large turbine pumps.

The company flight profile is as diverse as their holdings. With a main base in Brenham, Texas and another base in Hamilton, Montana, the company flies as far south as Panama and as far north as remote Canadian locations. Operating from the high mountains of western Montana to the rainy jungles of southern Panama can pose a challenge for any aircraft; the MU-2 handles the challenges easily.

MU-2s have long been a part of John's family. His three sons have grown up with an MU-2 in the hangar. Close friends from the early Mitsubishi days, Bob Kidd and John Fields have traveled the world in John's MU-2 with fishing adventures in Venezuela, Panama, Mexico and the islands of the Caribbean. John's pilot group is low key, but professional. Jack Chapman, a retired Southwest

Airlines captain, and John have been flying MU-2s since their days together at Mitsubishi – forty years ago. Bryan Gold and Monte Richardson have been flying MU-2s for four years. John also operates a helicopter. All the pilots are seaplane rated and backcountry qualified in tail wheel aircraft. They have fun flying, and they especially love flying the MU-2. Because of the extensive travel necessary for checking rigs, water projects, and marine operations in Panama, John has purchased 4 MU-2s over the years, and still maintains a Solitaire (S/N 399) and an MU-2P (S/N 375) in his fleet. Both aircraft are equipped with Garmin GTN 700 series navigation, Garmin GWX 70 weather radar, TCAS, Iridium Satphone, engine pre-heaters, and LED landing/tip lights. The MU-2P has been upgraded with dash 10 engines and a Garmin G600. Both aircraft utilize the Bendix M4D autopilot. Because John and his pilots fly in Latin America and Canada, the aircraft still have ADFs, RMIs, and DME. Intercontinental Jet, Tulsa, Oklahoma, maintains both aircraft and has completed all the upgrades. Matching paint and interiors were done by Ranger Aviation in San Angelo, Texas. Each aircraft logs between 250-300 hours a year. John has maintained an incredible flight record; only scrubbing one MU-2 flight in 17 years for a mechanical issue. This reliability is at the heart of why the MU-2 is still his airplane of choice.

John applauds the upgrades that have offered him safety and ease of operation. The FAA's mandatory training requirement has been a boon to pilots. Not only because everyone is a better pilot for the safety training, but all the upgrades make the MU-2 a better performing airplane. And through all these years, and the market shift to jets, Mitsubishi is one of the only manufacturers that stands by their owner/operators. The availability of MU-2 parts and well-trained technicians in the service centers is a fact he touts.

John's life has grown even more large these days now that his son, Monte, has taken over as president of J&S Well Water Drilling. His son, Wade, manages the marine operations in Panama and ranching operations in Montana. And his third son, Justin, a drilling supervisor for a major oil company, oversees ranching operations in Texas. John now has more time to indulge his love of ranching and sport fishing but has never forgotten his roots. He is devoted to wildlife habitat conservation, water conservation, and veterans. One of the most compelling reasons he still flies his Solitaire is to volunteer with the Veteran's Airlift Command, a compassionate flight program airlifting wounded soldiers around the country.

With ranching endeavors in Montana and Texas, sport fishing in Panama, and volunteer work that keeps him closely connected to the military, John is living a dream he didn't know he had when he pursued that aerospace degree at Texas A&M. And he wouldn't change a single minute of it.

Which MU-2 is Best for You?

by Pat Cannon

One of the most commonly asked questions I hear from prospective MU-2 owners is "What are the real differences that I should pay attention to when I make my decision on which MU-2 model to purchase?". This question always results in questions back from me, such as range or lift requirements. Why? Because out of the 13 original models of the aircraft, only 9 remain, but there are several different engine dash numbers involved and the progressive upgrades between models can, in many cases, be confusing.

Let's start with the basics. Out of the original 13 models, some of the early models have no aircraft remaining in service. As an example, the first MU-2B models were all short bodies, two of which had the 65 gallon tip tanks. All gone. The B, D, and DP models have all disappeared from service. Many of those older aircraft had the 25AA engines, which can be difficult to support today, so most of these old aircraft have been either scrapped or are in maintenance training schools all over the country. Turbine Aircraft Marketing recently donated one of the last B models to a high school in Ft. Worth, Texas.

That brings us to the earliest models still in operation, the F and G models. The last G, or -30 model, flying is in New Zealand and has been upgraded in engine, avionics and cabin amenities. All others are gone. Its sister model, the F, or -20 is also in limited supply with less than 15 of these light, efficient aircraft still in service. The F is a great aircraft, in production from 1970 to 1972, with an efficient -1 engine and aircraft light empty weight combination that gives it a 250 true airspeed at FL250 on a miserly 55 gallons or so an hour. The -1 engine is not being supported well by Honeywell, but parts and service are still available through the service center network or other Honeywell parts suppliers. The F is only certified to FL250, so those few that had the super 1 conversion were still stuck at FL250, but could muster a little extra speed at that altitude. Both of these models have the M4C autopilot and a few even had flight directors. Single buss electrical systems kept things simple but would not support more than a single, pilot's heated windshield because of amperage draw.

The next models produced are the K and J models (the -25 and -35) produced between 1972 and 1974. Originally produced with the -6 engines, these models are all still restricted to FL250, even though some have been upgraded to the -10 engines. These engines, however, increased the performance of these models, mostly because they are lighter than their later cousins. In any case, the straight -6 aircraft that remain are efficient, but the long body version will realistically only make about 260 knots and will max out in the low 20s on altitude. The straight K will make FL250, but will only make about 280 knots. During this production run, the M4D autopilot and some flight directors were introduced into the fleet. Early flight directors were a combination of Collins and Bendix systems, with the later models settling on flight director mode selectors that were integrated into the autopilot mode selectors. In this and earlier versions, you may still find the engine run by a Bendix fuel control unit, and it was during these production years that the engine manufacturer began offering the Woodward fuel control as an upgrade. These fuel control units were more reliable. Currently the Bendix FC is still serviceable and does a very good job if maintained properly. They are also not subject to the recent costly fuel pump spline AD. The Ks and Js are dwindling in number as most of the long body versions were used by the Federal Reserve to fly paper checks, and when the Fed went paperless, that program ended leaving most of these aircraft in a condition that was not economically feasible to put back into service. The K was always known as the corporate car of the industry and is a good reliable airframe. Many of these aircraft have been upgraded to the -10 engine and the short bodies are making in excess of 300 knots. This series of models still had the single buss electrical system and smaller generators, restricting them to a single glass heated windshield as an anti-icing option.

As Mitsubishi continued to look into the future of the airframe, and with an eye set on a U.S. type certificate, the transition models of the M and L models or -26 and -36, were next and were produced in 1975 and 76. These models of the MU-2 were short production runs and were the last of the A2PC or JCAB-certified aircraft. The M was upgraded in both maximum takeoff weight, to 10470 lbs and pressurization of 6.1 psi, allowing it to carry more to a higher altitude. This improved the efficiency of the -6 engines and provided a longer range for those flights where more seats were needed. There were still limitations on the electrical system, so full glass, heated front windows could still not be used, but by now the Collins FD112-C and V along with the Sperry Stars flight directors were on board almost every aircraft, still coupled to the Bendix M4D autopilot. The Collins is my personal favorite between the two. With the higher altitude certification and higher pressurization differential, better fuel efficiency is experienced and a bit better speed on the M was the result. The companion model, the L long body was primarily used, once again, as a freighter and with its improved takeoff weight was popular in the Federal Reserve program. Passenger Ls are few and far between with only a handful still flying. The L remained certified to only FL250 and because of its weight to power ratio, would not operate with much more speed at that altitude than its earlier J model cousin. The M is one of the most popular today and they are sought after when they become available. Many have been converted to -10s and are proverbial hot rods with

speeds at the higher certification altitude of FL280, in excess of 300 kts. All models discussed so far are known as the A2PC or JCAB certified aircraft. There were, however, one each of the K, J, M and L models that were also certified under a U.S. type certificate. A couple of these aircraft are no longer flying.

In 1977, the transition was made to the A10SW, or U.S. Certified models. These P and N, or -26A and -36A models, came factory equipped with the -5 engine. They were advertised as the "Quiet" versions because they sported the 4 bladed Hartzell propeller which, through the gearbox, slowed propeller RPM from 2000 to 1591 RPM, thereby reducing cabin noise. The -5 engine has the same horsepower as the -6, but slowing the prop through a reduction gear resulted in the prop turning counter clockwise. These heavier props cause the aircraft to gain a little weight and the four bladed props are not quite as efficient as the three bladed props, thus performance on these two models was not quite as good as their predecessors. These models also used the same autopilot and flight directors as the L and M versions. Also like earlier models, they had the 15 gallon outer tanks with a total fuel capacity of 366 gallons. Some differences, though, were the upgraded electrical system and generators, which allowed the use of two glass heated windshields for ice and bird strike protection, both with high heat capability. These replaced the earlier glycol deice systems. Weight was also added to this model by adding heavier soundproofing and this added to the slower speeds of about 280 knots for the P and 270 knots for the N. While not spectacular performers, these are popular models to convert to -10 power, giving them about the same performance as the next models, the Solitaire and Marquise.

The last two models produced were the Solitaire and Marquise, respectively the -40 and -60 models. Many changes took place during this production. First and foremost was the addition of factory installed -10 engine power. These engines also came from the factory with the single red line or SRL computers on each engine that gave the pilot one maximum EGT to fly with. On the whole, EGT is also somewhat more reliable than ITT as the ITT harness is subjected to higher temperatures where it is mounted within the hot section of the engine. The SRLs also added some additional features during start, by metering fuel at around 700 degrees C to provide maximum acceleration during the start. You rarely need to use the fuel enrich or SPR button with SRL equipped aircraft. These models also sport the greatest takeoff weights and maximum pressurization. Most Solitaire and Marquise models were produced with what was called Lead Vinyl soundproofing. This heavier option, plus new cabinetry for the galley increased the empty weight of these aircraft. Many have now had that original soundproofing removed in favor of newer, lighter weight soundproofing kits. These models are by far the most popular with speeds approaching 300 knots for the Solitaire and upwards of 290 knots for the Marquise. One of the biggest changes in these models was the addition of the SPZ-500 Autopilot Flight Control System. This autopilot added the features of altitude preselect, vertical speed hold and indicated airspeed hold through the addition of an integrated air data computer. This autopilot change came in about 1980, well into the production run of these models, so not all Solitaire or Marquise aircraft have this newer system.

A few interesting facts about equipment: air cycle machines were installed as normal equipment but varied during the production run. Earlier models had the Airesearch model which prevailed through the earlier models and were replaced by the Hamilton Standard air cycle machine sometime around 1973. Both are supported through overhaul of the component.

RVSM has never been obtained for the MU-2, thus restricting flight to FL280. In reality two of the three autopilot models, the M4D and SPZ-500, have obtained RVSM certification in other aircraft having the capability or requirement to fly above FL290. Even if certification had been obtained for RVSM, the only model that might regularly fly in RVSM airspace is the Solitaire or perhaps a -10 P. With a fairly small fleet of these models the expense to certify to RVSM standards might be cost prohibitive unless most of those models participated. Similar aircraft, after RVSM certification was obtained paid between $85,000 and $175,000 for the kits, per aircraft. A large price to pay for the ability to go 3000 feet higher.

I have tried to hit only the highlights of the different models. There are many subtle changes that took place during the developmental years for this innovative airplane. Many service recommendations, such as the addition of 5 flaps and the flap extension pulse system in 1974, were great additions to the operational flexibility of the MU-2. These fine aircraft continue to be popular move-up aircraft for pilots looking for a roomy, fast, pressurized aircraft for their family or business.

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