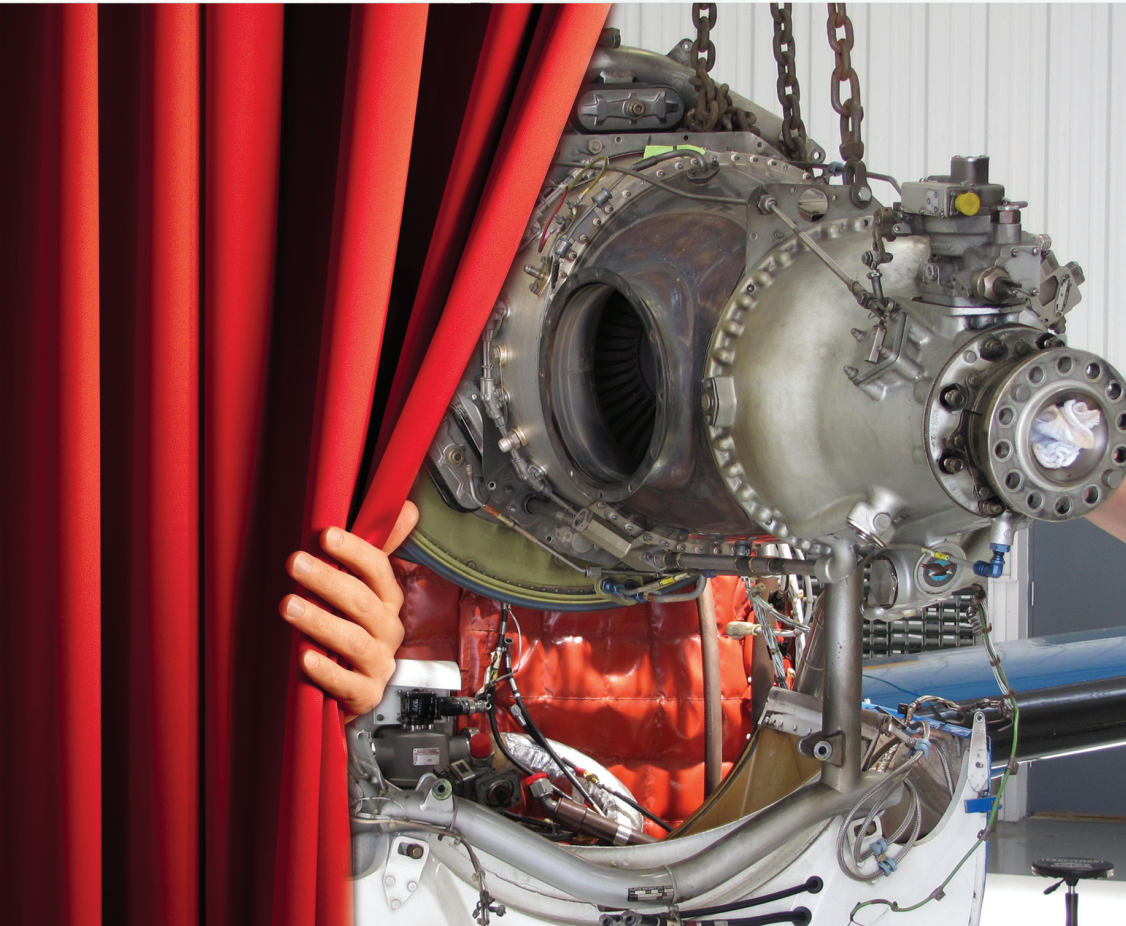


OWNER PILOT Advantage

A Magazine for Owner/Pilots from *Skytech, Inc.* Publications



PT6 ENGINE OVERHAUL: BEHIND THE CURTAIN

To the uninitiated, the turbine engine overhaul experience can seem like a daunting task. Even seasoned owner-operators take pause when faced with an impending overhaul. The myriad of tasks, choices and considerations can quickly overwhelm. What really happens at overhaul time - what are my resources - and how much will it cost are the major questions that arise. It helps to understand the overhaul process by breaking it into a sequence of major phases, establishing fantastic communication with knowledgeable resources and planning ahead for schedule and budget. If you plan ahead and ask the

right questions you can confidently navigate the overhaul process adhering to budget with the least amount of down-time.

What really happens at overhaul time?

The six weeks typical for most overhauls appears mysterious without a basic understanding of the process. They're just tearing it apart and putting it back together...right? Well, yes - but they are also inspecting each of its various components with non-destructive tests, hand inspections and precision instrument tolerances. There are hundreds

It's Overhaul Time.

Historically the world of turbine engines was left up to the professional flight departments with full time managers, directors of maintenance, and chief pilots. Now we fast forward to a time when highly reliable turbine engines are used on owner flown and entry level corporate aircraft. The proliferation of single engine turbines has brought terms like hot section, time life items, and turbine wheels to the forefront of owner pilots' minds. As more and more of these airplanes march toward overhaul, these owners also move towards uncharted territory.

In this issue we continue to help unravel the mystery of turbine aircraft ownership. As you will see, careful planning, good research and a helpful maintenance provider can be the keys to a successful experience. Start early, take your time, and ask lots of questions. If you have a trusted maintenance provider, they can be your best resource when it comes to making this expensive decision. Overhaul of a turbine engine is not the best time to be making new friends. As is the case for your flights, preflight planning is essential.

Skytech, Inc., publisher of this magazine is an aircraft sales and service company with FBOs in Westminster, MD (DMW), Rock Hill, SC (UZA - Charlotte Metro Area) and Administrative Headquarters in Baltimore, MD (MTN).

Your thoughts, suggestions, comments and criticism are important to us and we will always welcome reader feedback. Please respond to:
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Your opinions, suggestions, as well as ideas for new articles and content are important for continuing improvement and growth that will serve all our readers.

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Thank you!

The Pilot-In-Command is solely responsible for the safe and proper operation of his/her aircraft and it is the responsibility of the pilot-in-command to operate that aircraft in compliance with that aircraft's Pilot's Operating Handbook and other official manuals and directives.

Vref

SLOW, BUT SURE COMEBACK.

As we move into the Summer of 2010, there has never been a market so fractured, with so many ups and downs. Or, does it just seem that way after a dismal 2009, when everything raced toward the bottom – together? There are numerous influences, positive and negative, and each one is a worthy headline. Let's start with the most important.

Exports Revive GA. For years, we have thought pitiful airline service was one of the best drivers of general aviation. Though the airlines continue to send disgruntled customers our way, it is the robust export market that has helped breath life back into everything from Cessna 182s to Gulfstream 550s. As offshore economies recover and grow, the U.S. remains the best source for private aircraft.

Personal Wealth Staggering! It is true that the personal savings rate in the U.S., Japan and elsewhere is not what it should be. However, for a certain upper percentile life has never been better. Aircraft dealers estimate that nearly 90% of today's transactions are sans loan. This is just as true for \$500k Cirrus SR22 as it is for a \$50M Global Express. That Wealth headline at least partially offsets one of the big negatives in the current market, **Lending Standards Remain Tight.** Potential buyers, not in the upper percentile, continue to complain loudly about higher down payments and other restrictions which keep them out of the market.

Huge Underclass Confounds Market! The large number of repossessed airplanes continue to make the backend of the elephant seem pretty bad. Fortunately, today's buyer is not going in blind – in fact, most are more knowledgeable than ever. A professionally marketed, well-maintained airplane can easily be worth 20 to 30% more than a derelict, or one that is perceived as such. By the time a buyer makes an offer on a Cessna Cardinal RG or a Falcon 900, he or she has probably inspected a dozen of them, and flown four or five. Most of today's buyers can tell the difference between a good value and a cheap airplane with a cover-up paint job.

Piston Singles Advance! After a decade of falling prices, eager buyers have moved in and prices are moving up. The Vref Light Single Index jumped 4.4% in the recent quarter. Complex Sin-

gles gained 2.6%, up three quarters in a row. In any other economy, we'd call that a trend. However, there is no way to tell how future buyers will adjust to a market that has clearly moved off the bottom.

The rising tide did not float all boats. If an aircraft is too needy – poor paint, damage and ancient radios – it'd better be really cheap.

Turboprops Flat, but Active. Another way to put it is stability. After settling to an all time low, the Vref Turboprop Index has stayed there for one year. With steadily increasing activity, there is the expectation of higher prices. However, the horde of inventory must thin out before any real price increase is realized. King Air B200s, one of the industry benchmark turboprops, still has 12% of the fleet for sale. There has been little change in that percentage for several quarters.

Have we turned the corner? The general consensus is, we have. However, there are way too many airplanes for too few real buyers to sift through. Total inventory levels are only down about 2% from early last year. And, then there is still the lending issue. The perception on the street is that money remains tight. Finally, the issue that trumps all others – The Economy. When the Stock Market had its 1,000-point hiccup a few weeks ago, the aircraft resale market got acid reflux disease – thankfully just for a day. At this early stage of the recovery, consumer confidence is very easy to shake.

The Look Ahead: IF the U.S. recovery stays on track, and the European nations keep each other bailed out, and if banks loosen the purse strings just a little – ok, a lot – we are poised for a slow, but sure comeback. •

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FACTS

FOR OWNER/PILOTS

BONUS DEPRECIATION UPDATE.

On Monday June 21, 2010, Senate Finance Chairman Max Baucus (D-Mont.) and ranking member Chuck Grassley (R-Iowa) introduced a bi-partisan legislation that will extend 50% bonus depreciation for 2010.

Bonus Depreciation Extension to Create Jobs Act (S.3513) will allow qualified taxpayers to deduct 50% of the cost of a new business aircraft purchased in 2010. There is bi-partisan support of the bill in the Senate. The current language of the bill will extend bonus depreciation retroactive to January 1, 2010 and it is scheduled to expire on December 31, 2010.

There is no consensus as to whether this bill will be passed by both Houses of Congress and enacted into law, however, it may be wise to begin planning for the purchase of a new business aircraft if you can benefit from the generous bonus depreciation in 2010. With the tightening of credit and the reduced production by most manufacturers, you may begin the purchase process so that you are in position to complete the purchase before the end of the tax year if bonus depreciation returns.

FLORIDA SALES AND USE TAX UPDATE

Florida governor Charlie Crist signed a bill which will allow out-of-state non-Florida resident aircraft owners to visit Florida without fear of use tax being assessed.

Current Florida legislation states that an aircraft entering Florida within the first six months of purchase will be presumed to be purchased for use in Florida and may be subject to Florida use tax. This bill does not affect Florida residents and other individuals that have economic and business ties to the state of Florida.

This bill is a major victory for aircraft owners around the country because Florida is a popular destination both for personal and business use aircraft. Orlando and other cities in Florida are major tourist attractions and many pilots visit Florida annually for tradeshow like Sun N Fun in Lakeland in April, or Simcom for recurring training.

The new legislation goes into effect on July 1, 2010 and it will allow non-resident aircraft owners to visit Florida without the risk of incurring a Florida use tax assessment:

Within 6 months of purchasing an aircraft, out-of-state owners will be able to visit Florida with that aircraft for less than a total of 21 days for any purpose.

Aircraft purchased within the previous 6 months will be able to visit Florida for an unlimited amount of time for the exclusive purpose of flight training, repairs, alterations, refitting, or modification purposes.

FLORIDA FLY-AWAY EXEMPTION

A word of caution in regard to taking delivery of an aircraft in Florida: this continues to be an area of concern for many aircraft owners. Florida does have a "fly-away" exemption which allows non-residents to purchase an aircraft in Florida without being subject to Florida sales tax – provided that some detailed documentation is submitted to the Florida Department of Revenue within the prescribed time frame to claim this exemption.

A little known fact about the fly-away exemption is that only aircraft purchased from a registered Florida aircraft dealer will qualify for the exemption. Therefore, if you purchase an aircraft from a Florida resident



and you take delivery of the aircraft in Florida, this transaction will be subject to Florida sales tax, regardless of how soon you remove the plane from Florida after closing.

Despite the enactment of the new Florida legislation exempting non-Florida residents from Florida sales and use tax, there are many scenarios where a lack of proper planning would result in a surprise tax bill from the State of Florida. •

*Daniel Cheung, CPA,
Member*

Aviation Tax Consultants (ATC) assists aircraft purchasers in acquiring aircraft in a tax efficient manner. Our services include the elimination or reduction of sales and use tax at the time of purchase, maximizing income tax savings, controlling the cost of personal use of the aircraft, avoiding passive activity loss rules and complying with Federal Aviation Regulations. Cooperation with client's current tax and legal advisors is welcome and encouraged.

of parts composed of a myriad of materials to review, repair and rebuild. The major phases include analysis of competing proposals, scheduling, engine removal, engine teardown, inspection and cost estimate review, reassembly, test and finally re-installation of the overhauled engine onto the airframe.

As with your aircraft itself, every engine is different. Factors for its successful overhaul include your specific serial number, campaign status, environment and hours/cycles. Any of these items can affect both budget and downtime. A little planning and a brief understanding of the process and timeline help to allay any concerns about what is happening with your engine.

WHAT ARE MY RESOURCES?

Said another way: How do I make sure that someone is looking out for me and my engine? Of course, you need to make

certain to understand the details of your contract in terms of prices, campaigns and replacement parts, but there are some knowledgeable resources who will be involved with you throughout the process that can help significantly.

Typically people rely on their regular maintenance provider to manage the overhaul process. The two people who will be most involved with your engine once it ships will be your service manager, or appointed expert at your maintenance facility, and the administrator at the overhaul facility.

Your primary point of contact will likely be the service manager at your repair facility. Where an individual owner typically will need to overhaul their engines once every 8 to ten years, the service manager at your local facility oversees many overhauls every year.

They can provide detailed information and history specific to your aircraft and engine to the overhaul facility, helping to take as much guess work out of the estimate as

possible. They will guide you through each phase of the overhaul, and be your advocate to help make decisions once your engine is on site with the overhauler. They can even travel with you, or on your behalf, to the overhaul site to see your engine while it is in process or review any scrap or components with you.

Most overhaul shops welcome customers for a factory tour and scrap review. There is no substitute for being able to see the physical characteristics of your engine components with the experts on site. It is also impressive to see the specific machinery, talents and test cells for the engines.

The primary point of contact at the overhaul facility is the administrator. Sometimes this person is called a product support representative or customer service manager. They are there to help guide your engine through the process at the facility and make certain they are keeping to the terms offered to you in its proposal.

see **PT6 Overhaul** on page 5

OVERHAUL TIMELINE

ONE – SIX WEEKS BEFORE	SCHEDULE WITH SHOP, REQUEST DETAILED QUOTES, PLAN FOR OTHER MAINTENANCE/DOWNTIME
ONE WEEK BEFORE	CONFIRM SCHEDULE, MAKE TRAVEL ARRANGEMENTS TO/FROM FACILITY
DAY OF ARRIVAL AT MAINTENANCE FACILITY	REMOVE ENGINE, SHIP TO OVERHAUL FACILITY
DAY OF ARRIVAL AT OVERHAUL FACILITY	UN-CRATE ENGINE, SEND TO PRE-INSPECTION COMMUNICATE, CHECK LOG BOOKS
FIRST WEEK OF OVERHAUL	COMPLETE TEAR DOWN, FINAL COST ESTIMATE, RECEIVE TEAR DOWN REPORT, SEND ACCESSORIES TO APPROPRIATE TESTS
SECOND WEEK OF OVERHAUL	PARTS TO DETAILED INSPECTION/NDT
THIRD / FOURTH WEEK OF OVERHAUL	PARTS BACK FROM REPAIR
FIFTH / SIXTH WEEK OF OVERHAUL	REASSEMBLY, TEST, SHIP TO MAINTENANCE SHOP FOR INSTALLATION

HOW MUCH WILL IT COST?

This answer depends on the particular variables of your engine. After you have provided your serial number, campaign status and basic maintenance information, a more detailed quote can be provided. Usually overhauls are quoted as “time and material” or “flat rate”, but all quotes will contain similar key elements.

Key price elements for any overhaul are as follows:

•**Labor:** This covers everything from taking it out of the crate all the way to final inspection. Usually quoted as a flat rate.

•**Parts:** these are the specific parts (new or used) to be replaced in your engine

•**Consumables:** fluids, small gaskets and other small parts required to reassemble your engine. Sometimes quoted as a flat rate.

•**Exchange parts:** parts that have long repair turn-around times and are replaced with like parts, but not the originals

•**Other items that may be included or should be considered:**

- Freight costs for getting the engine to/from the facility
- Travel cost for seeing the engine while in production

- Major campaigns that may be optional, but recommended

- Separate line item for testing

- Separate line item for accessories or outside vendors

- Rental Engines

•**Airframe related expenses:** These are usually billed through your regular maintenance provider, so you will need to make certain you have an understanding of any airframe related maintenance that is required at the time of the overhaul.

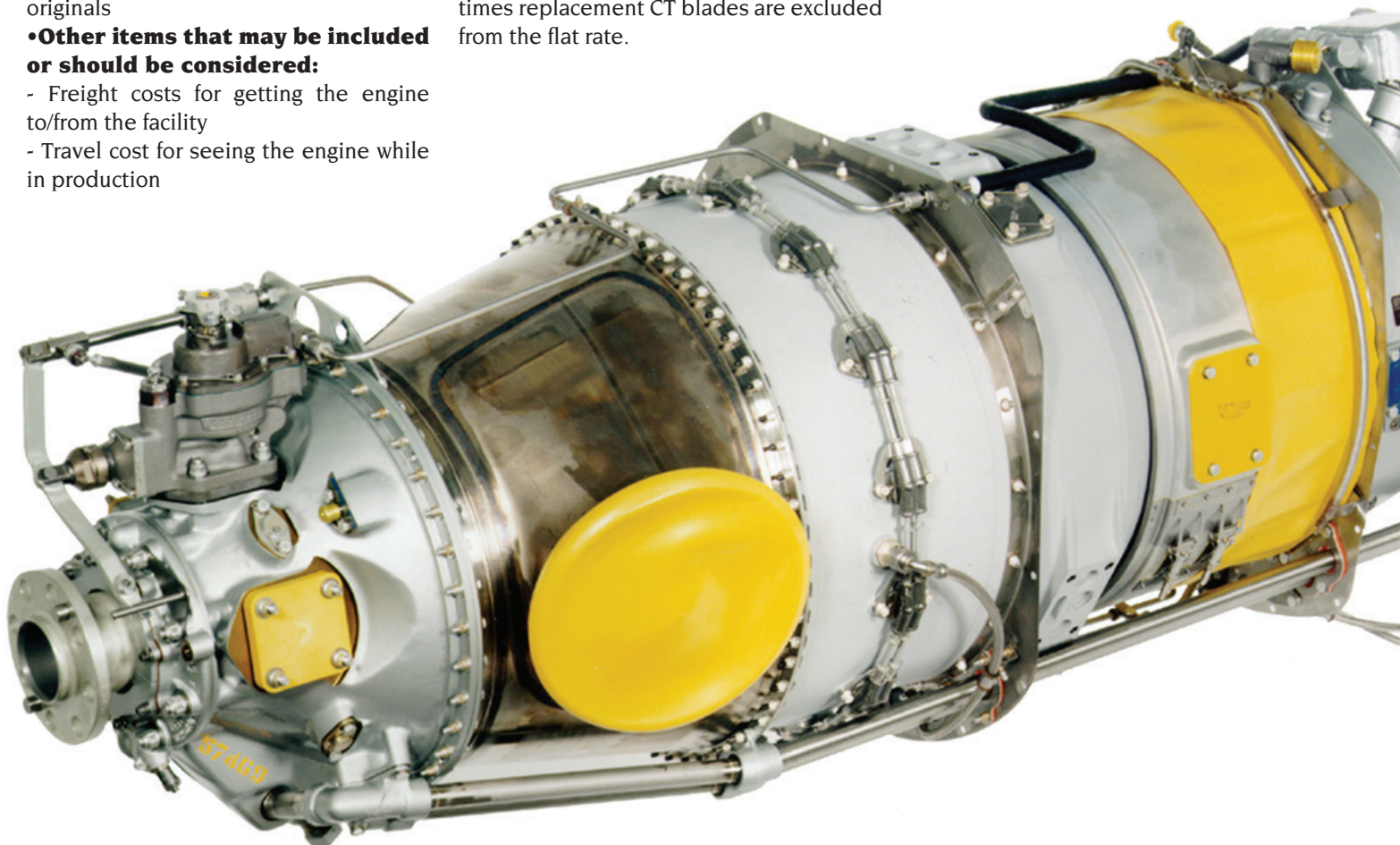
You will find that quotes from different vendors can appear vastly different, but frequently say the same thing. It is important to consider all the factors when reviewing your quote – an upfront quote that doesn't include a critical (but not legally required) campaign may appear less expensive than a more inclusive quote. So – read the fine print.

So what is a flat rate anyway? Some overhaulers will offer a flat rate, usually at a premium, for taking on some of the risk for scrapped parts. They typically include all of the labor, consumables and known parts for your particular dash model and serial number range. Even though flat-rated, most exclude major components, so again - read the fine print. For example, often-times replacement CT blades are excluded from the flat rate.

Do I have any choices here? Yes – it is your engine. You will have choices to make regarding new or used parts, exchange parts or optional service bulletins. Working closely with your trusted service manager to ensure the proper choices are made can have a profound effect on the final cost and effectiveness of your project. Important points to consider when making budget choices are, warranty, performance, compatibility and the next hot section inspection.

SUCCESSFUL OVERHAUL

When the six weeks are up, you will have a safe, well-performing up-to-date engine; adding value and life to your aircraft. Take time to read the details, know the shop and full advantages of all the resources that are available to you and you will have a smooth experience with your PT6 overhaul. •



TURBINES, TORQUE AND TEMPERATURE.

One of the most appealing aspects of stepping up to turbine powered aircraft from pistons is the simplicity of operation they afford. In a lot of ways flying a turbine is as easy as lighting the engine, pushing the power lever forward to go fast and pulling back to slow down. Although that isn't too far from reality, as with all airplanes there are certain parameters and limits that a turbine pilot needs to adhere to for safe, reliable and cost effective operation.

A misnomer sometimes heard amongst turbine pilots is that any power setting is safe as long as you don't exceed Inter-Turbine-Temperature (ITT) limits. This belief is wrong and can lead to costly repairs or worse. Whether the confusion stems from a deficiency in training or a simple misunderstanding, there are several resources available to educate and deter operators from knowingly crossing the power setting boundaries set forth in their airplane's POH.

A recently released Pratt & Whitney Service Information Letter (S.I.L. NO. GEN PT6A-028) addresses this subject in detail.

"In conjunction with the Aircraft Manufacturer (OEM), a mission profile is established for every PT6A engine application. This mission is used to analyze and establish engine component lives and durability factors such as Low Cycle Fatigue (LCF), Creep, Oxidation and Vibration. Using this data and taking into consideration airframe influences such as bleed extraction, accessory loading and inlet efficiency, the power setting information is established and then published in the POH and Airframe Manual (AFM).

P&WC's power rating philosophy is to ensure the maximum likelihood that your PT6A engine will deliver the power specified in the POH / AFM throughout its overhaul life. To achieve this, all PT6A engine installations use torque as the primary

power setting parameter. All other engine parameters are only monitored to verify they are within acceptable limits. The POH / AFM contains power setting information which must be used to determine the torque setting for all ratings which vary according to altitude, ambient temperature and aircraft weight. This is important because the P&WC rating philosophy is based on the engine being operated per the POH / AFM and maintained in accordance with the Engine Maintenance Manual and Aircraft Maintenance Manual (EMM / AMM) including all applicable periodic inspection recommendations by P&WC.

before-overhaul. Operating your engine per the power settings set forth in the POH is the manufacturer's way of ensuring no undue harm is inflicted on engine components, thus limiting the chances of making the book power throughout the engine's life. Even though exceeding torque limits for brief periods of time may seem harmless when I.T.T limits are adhered to, the cumulative effect of heat will catch up. It is for this same reason that many corporate operators choose to start their engines while connected to a Ground Power Unit (GPU). The added power boost of the GPU allows the engine to spool faster, resulting in cooler starts through a minimum amount of heat exposure.

Furthermore, even though a certain "dash-number" PT6 may be used on several different aircraft models, that doesn't mean that it can be operated the same across the board. Variations in the cooling architecture, amount or type of engine driven accessories and many other aspects are airplane specific. Only that particular airplane's power setting chart accounts for installation variables.

Turbine aircraft are extremely reliable when operated properly. Not adhering to manufacturers' recommendations is asking for a handful of problems. Proper torque settings are essential in limiting the engine components' exposure

to destructive temperatures and stress. Conditions such as blade creep, fatigue, vibration and other issues can make for costly (and sometimes pre-mature) maintenance events. In some extreme cases, the effect of operating an engine outside of acceptable parameters is much more sudden; leaving the pilot to explore a new realm of flight in a surprisingly engine-less airplane. Clearly the best procedure is to follow your POH, adhere to the indicated torque settings and enjoy all the benefits your turbine engine provides. •

SECTION 5 PERFORMANCE						
ISA + 10 (°C)						
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)	
0	28	25	983	360	186	
5000	19	15	1048	330	201	
10000	9	-5	1127	305	217	
15000	0	-15	1224	295	235	
20000	-9	-25	1200	282	254	
25000	-18	-34	997	260	259	
30000	-29			214	254	
ISA + 20 (°C)						
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)	
0	38	35	996	363	189	
5000	29	15	1064	334	204	
10000	20	5	1148	310	221	
15000	10	-5	1248	299	240	
20000	1	-15	1310	292	257	
25000	-9	-24	1147	250	258	
30000	-19		955	207	253	
ISA + 35 (°C)						
Altitude (FT)	IOAT (°C)	OAT (°C)	Torque (FT-LB)	Fuel Flow (PPH)*	TAS (KT)	
0	54	50	1017	368	194	
5000	44	40	1088	339	209	
10000	35	30	1177	317	227	
15000	26	20	1285	307	246	
20000	16	10	1201	274	253	
25000	7	0	1071	237	255	
30000	-3	-9	890	195	250	

*E: Shaded areas are beyond aircraft OAT limit
See paragraph 2.28
S: NORMAL
Maximum Speed Cruise

Operating the engine beyond the recommended power settings in the POH / AFM for a prolonged period will result in accelerated margin deterioration due to hot section component distress and will affect engine reliability and durability. This effect is cumulative and will lead to the engine prematurely reaching an operating limit (usually ITT) before the recommended power is produced."

In short, engines are designed from the factory to produce a certain amount of power throughout their specified life-

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BORN TO FLY: BOB DUPREY OBTAINED HIS GOAL WITH HARD WORK AND DETAILED PLANNING.

From early on Bob Duprey knew where he wanted to be. At 7 years of age, Bob's Uncle introduced him to a world that never left his mind. In one day Bob received his first airplane ride in his Uncle's V-tail Bonanza and then embarked on what many would consider a ride-of-a lifetime in his Uncle's P-51 Mustang! How is that for an introduction to flying!

The thought of obtaining a pilot's license was omnipresent, but like so many others can attest to, finding the time was a different story. On July 2nd of 2004 Bob's calendar opened up through retirement of his at times 80+ hour a week career. Eight days later on July 10th Bob started flight training. 27 Days later Bob Duprey was a Private Pilot! That should only come as a shock to those who don't know Bob. When he sets his mind to accomplish a task, a plan is created and executed through to completion. In this case the plan called for flight training 2 times a day, 6 days a week with 2 hours of ground each day. Immediately after

receiving his license Bob went to work on his IFR rating.

A new goal and associated plan was put in motion about this time – Bob wanted to own and fly a Pilatus PC12. Knowing you can't jump from a fresh private pilot rating to the left seat of a PC12, Bob mapped out a path with the insight of various industry professionals to help him achieve his goal in the most time and cost effective manner possible. Airplanes are vital aspects of Bob and his wife Margaret's active schedule which includes a second career running a successful farm for show and race horses as well as raising Black Angus cattle to sell genetics to other breeders throughout the country. The ability to visit multiple cities in a day and quickly change direction are imperative to Bob and his wife in support of this endeavor and Bob knew the PC12 would offer the rare combination of range, speed and payload that they desired.

STEP 1: OBTAIN PRESSURIZATION AND FLIGHT LEVEL EXPERIENCE – PIPER MIRAGE

After owning a 1981 fixed-gear Saratoga for the purpose of obtaining his instrument rating, Bob set his sights on gaining the experience needed to move up the aviation ladder. First stop was a new 2005 Piper Mirage to gain high-altitude, weather and pressurization experience. At 350 hours total time, this required flying with an instructor for a pre-determined period to get the necessary insurance blessing. One week and 56 hours later he was ready to go. In two years of owning the Mirage Bob made many trips from his East Coast base of Chester County, Pennsylvania including West Texas, San Diego, Denver, Florida and a weekend New Mexico hunting excursion where Bob, an avid hunter, discovered that two Antelope cleaned and dressed in a cooler can fit in the Mirage's nose baggage just fine.

see *Born to Fly* on page 9

STEP 2: GAIN TURBINE EXPERIENCE – PIPER MERIDIAN

Bob purchased a 2007 Piper Meridian as a logical step to gain the necessary turbine experience needed to get him one step closer to his goal. The Meridian represented a perfect first-time turbine opportunity and was an easy transition coming from the Mirage. The airplane was very reliable and offered great performance, but Bob's missions needed more size and range than the Meridian could offer.

THE GOAL IS REALIZED

In the fall of 2008, with all the insurance requirements met, Bob became the owner of a well maintained and equipped 2001 Pilatus PC-12/45. It was the right airplane and made possible non-stop flights to destinations with

passenger loads that weren't possible before. This airplane was put to the test as Bob racked up 600 hours in 18 months of ownership. Just recently, Bob took delivery of a brand new 2010 Pilatus PC12/47E NG. The smile on his face (coupled with the around 30 hours in two weeks since delivery) tell you everything you need to know about whether he likes the airplane. The transition from the /45 to the new NG was a smooth one for Bob, because like all other facets in his life he went into the process prepared. Among other obvious differences (including the advanced Honeywell avionics package), Bob points to improved low speed take-off and landing handling characteristics, increased payload and power as noticeable improvements over his previous Pilatus. The PC12's abilities have created opportunities in other areas that Bob has taken on with the same dedication that every other aspect of his life commands.

VETERANS AIRLIFT COMMAND

One day while standing in line at an airline security screening checkpoint, Bob witnessed a Military Veteran undergoing a demeaning search of his prosthetic limbs courtesy of the TSA and knew he had to do something to help these returning Heroes travel in the dignity they deserve. The Veterans Airlift Command was exactly the avenue he was looking for. Founded by Walt Fricke, a Vietnam Veteran whose helicopter was shot down and spent six months in a hospital far away from home recovering, the Airlift Command strives to transport Veterans to their families, treatment centers or any other location that can help with the healing process. Bob speaks very highly of this organization and the effectiveness of their missions through multiple personal experiences; saying it is "one of those things you can do with an airplane that can really make a difference". For more information on how to join the growing number of volunteer pilots visit www.veteransairlift.org. In addition to the Veteran's Airlift Command, Bob participated, like many PC12 owners, in the relief efforts after the devastating earthquake in Haiti.

FULL CIRCLE

Now with almost 3000 hours, Bob is Single and Multi-Engine Commercial, Instrument and Single-Engine Sea rated (oh yeah – he added the seaplane rating for a BFR one year to spice things up). He set a plan to achieve owning and flying a Pilatus PC12 and uses the airplane's versatility to promote his multiple business, personal and volunteer endeavors. When asked for what advice he would give to someone that is starting out who aspires to climb the aviation ladder, Bob offered this: "Set a goal, create a plan, rely on trusted professionals to get you where you want to go efficiently, be flexible if the plan isn't working, but stick to the plan." We at Skytech know that Bob has a choice of where to purchase and service his airplanes and are thrilled to call him a loyal customer. The 7 year old boy who discovered flight one day with his Uncle is living the dream –and yes the Uncle has received a ride on Bob's PC12! •



RADAR IMAGES: THE DEVIL IS IN THE DETAILS.

Whether planning or conducting a flight, knowing the capabilities and limitations of all essential information you are viewing is paramount in ensuring a safe outcome. The old saying of “the devil is in the details” is very accurate in aviation context. Radar images, both those used on the ground for pre-flight planning and in-cockpit fed, are not all created equal and knowing the variety you are viewing can make all the difference when the storms start building.

There is no question that viewing NEXRAD radar maps to get an overview of the weather affecting your intended route is a major benefit for pilots. Radar images are generated thanks to a nationwide network of individual WSR-88D NEXRAD Doppler weather radars with overlapping coverage. In simple terms, these sites shoot a very narrow beam to scan their surrounding area and wait for returns from the surrounding area and wait for returns to paint their picture. These returns of transmitted power to the radar receiver are called “Reflectivity” and are measured in dBZ. Two types of Reflectivity are provided and knowing which one you are viewing is very important.

BASE REFLECTIVITY

Each radar site is capable of varying the tilt angle of their scan to capture returns at various levels in the atmosphere. The returns from the lowest NEXRAD antenna tilt angle (0.5 degrees above the horizon)

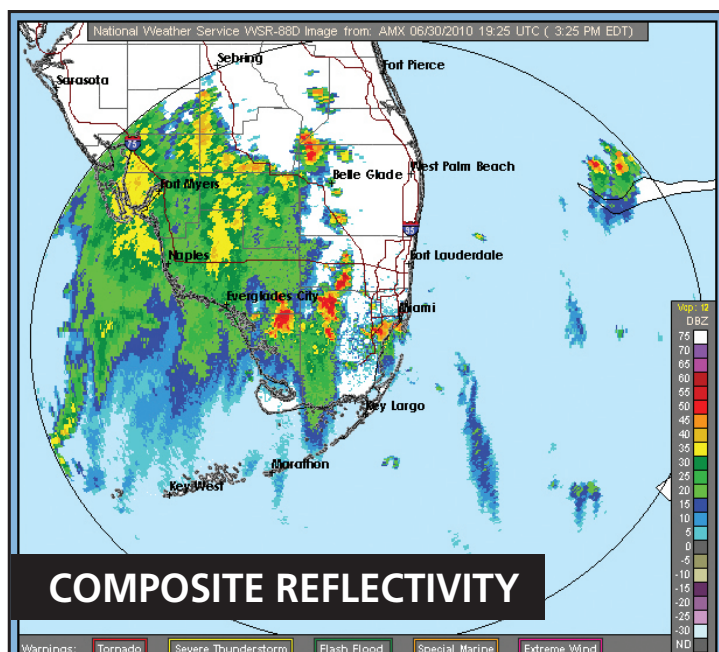
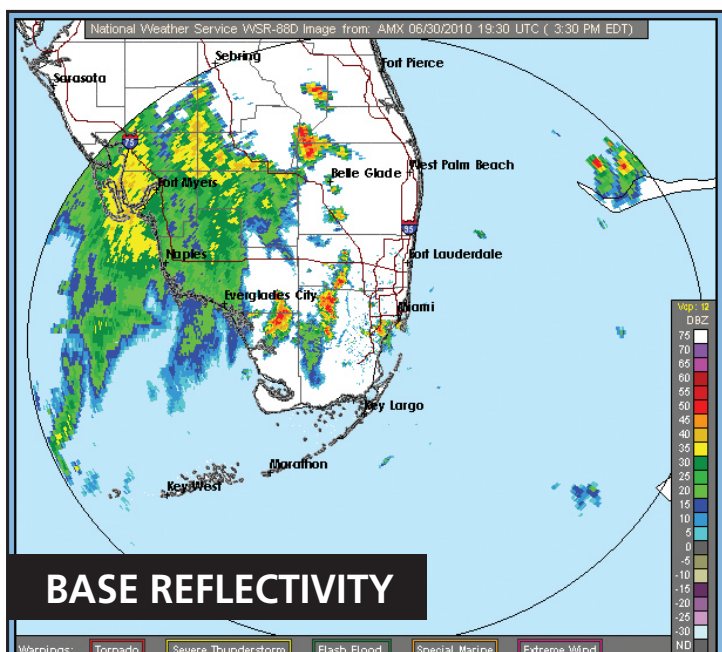
form the Base Reflectivity radar image. This lower level sweep typically gives you a good picture of what is happening on the ground with regards to precipitation. Its scan can detect precipitation as low as a couple hundred feet when measured close to the station. This low level focus makes Base Reflectivity scans the favorite for ground based activity subjects. Golfing, boating and cookouts all would be keenly interested in this type of scan. For that reason, many popular weather venues depict Base Reflectivity scans as their standard radar. The Weather Channel, Intellicast, and surprisingly WSI (both the ground weather station and in-flight variety) all fall into this category. For pilots, viewing this information is only half the picture as we are flying at altitudes placing us significantly higher than the intended returns of the Base Reflectivity scans.

COMPOSITE REFLECTIVITY

Each radar site in the nationwide network completes scans of various tilt angles to take a broader picture of the atmosphere and capture returns of the corresponding intensity. The strongest returned energy for each elevation angle in a volume scan is compiled into one image called Composite Reflectivity. The Composite Reflectivity image needs information from all the tilt angles to determine the maximum return. This takes a little more time than a Base

Reflectivity scan, but for pilots provides very critical information of precipitation and storm development. This upper-atmosphere depiction is extremely important as during the development of strong to severe thunderstorms areas of light to no precipitation at lower levels can be indicative of strong updrafts. Essentially, the Composite image is a “worst case” scenario and gives pilots the information to avoid such areas of intense weather. If one were to only check the Base Reflectivity images these areas could be missed leading to penetration of intense weather. A comparison of both Base and Composite images can be found on the Aviation Digital Data Service ADDS website (<http://adds.aviationweather.noaa.gov>). For in-flight storm information, XM provides Composite images that highlight the information pilots would be interested in for most situations. Caution should always be taken to consider the age of the data to ensure accuracy.

It is clear that determining which type of radar depiction you are viewing is critical to knowing the effect weather will have on your flight. Base Reflectivity may be useful for low level information, but Composite Reflectivity is a much more detailed view of the higher flight levels that we traverse. As with all information, the details are extremely important and the decisions made with the information can make or break a flight. •



VISIT SKYTECH'S NEW WEBSITE.

Skytech's website recently underwent a complete overhaul and is now fully operational. Some of the highlights of the new site include:

- A "Site Search" bar to make finding specific information easier than ever
- Current inventory listings complete with photo galleries and downloadable specification sheets
- Translation features enabling English to Spanish, Portuguese, German and French with one click
- Past Advantage Magazine downloads complete with issue highlights
- A look at Skytech's dynamic history
- Linked access to Skytech's Facebook page
- And much, much more!



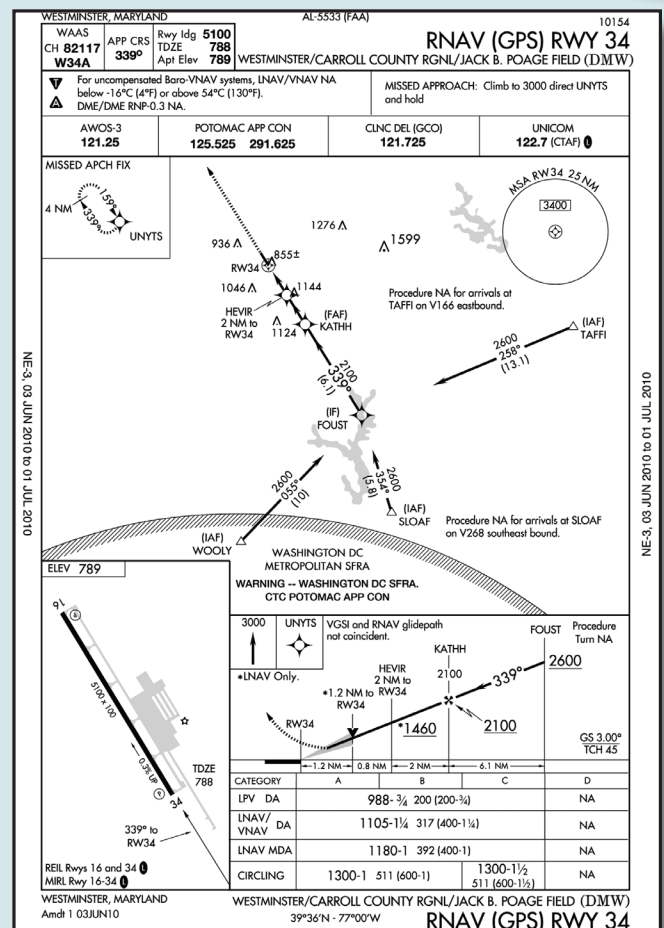
Visit www.skytechinc.com to see for yourself!

NEW WAAS APPROACH AT SKYTECH'S DMW LOCATION LOWERS MINIMUMS TO 200-3/4

Pilot's flying into Skytech's Carroll County Regional Airport FBO, Service Center and Sales Facility now have the benefit of lower minimums when using the RNAV (GPS) RWY 34 WAAS approach. The LPV DA for this approach is 200-3/4, which is a marked improvement from the previous LNAV MDA of 400-1. This precision approach requires WAAS certified equipment and offers a 3 degrees glideslope with a straight final approach course. Both runways at DMW are now served by WAAS precision approaches.

Located just north of Baltimore outside of the Washington ADIZ, Carroll County is ideally positioned to serve the Baltimore – Washington Metro Area.

As always, consult proper navigation aids prior to flight for complete information. The information provided here is for reference purposes only – not for actual navigation.





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A WORD To The WISE

by Dave Conover



INSIGHT ON THE RECENT 121.5 ELT ANNOUNCEMENT.

While the initial words might have been scribed on the wall in 1992 when Technical Standard Order, TSO-C126 governing ELT's was adopted; the entire GA community was caught offguard by the FCC's announcement in June announcing a prohibition of 121.5 MHz ELT use. Fortunately, it appears that the logistical log jam that would have resulted from an estimated 220,000+ aircraft utilizing 121.5 has been halted. At this time, it looks like the FCC rule, at least in its current form, will not proceed down the path to the Federal Register. However, what is not clear is that despite opposition from virtually all the major aviation organizations, whether or not the FCC and FAA will actually coordinate efforts to formulate a united plan.

Regardless of whether there is ultimately some sort of ELT upgrade requirement imposed on us or not, it has certainly sparked a renewed interest by owners to review the benefits of the 406MHz transmitters. When considering a possible upgrade there are several factors to take

into account. First of all, when was your existing ELT manufactured? ELT's have consistently improved since they were initially mandated in 1973. The initial ELT activation rates after a crash were below 25% and 97% of the activations were false alarms! With the newer units manufactured after 1985, the activation rate improved to just over 73% and false alarms were reduced. With the latest version ELT's manufactured after 1992, the activation rates increased to 83% and continue to improve. Secondly, where does my signal go? Satellite monitoring of the 121.5 MHz signal ceased in February 2009. The COPAS-SARSAT satellite system is in its 28th year and has recorded over 28,000 rescues (Sea, Aviation and Terrestrial) worldwide since implementation. In addition to a burst of data every 50 seconds or so on 406 MHz, many 406 MHz transmitters also transmit a continuous 121.5 signal to provide additional directional finding capability as well as options to interface with GPS, to send out lat/long position reports.

Currently the Civil Air Patrol and US Coast Guard use 121.5 DF equipment for rescue missions. Additionally, there is an FDC notam requesting that all aircraft (if able) monitor 121.5 to provide another layer of detection. Lastly, review your overall flight operation and perform a risk assessment. Basically, the likelihood and timing of your ELT signal being detected can be correlated to where you are flying.

While the FAA and the FCC try and coordinate their efforts – AOPA, AEA and EAA (among others) are all watching for any developments and will alert their memberships of any news. However, with what appears to be a bit of breathing room – it is probably safe to assume there is at least a possibility that we will see some type of new requirement pertaining to ELT's at some point. With this in mind, it may be prudent to review your existing ELT requirements and obtain a quote from your service center for possible upgrade options. •