

# A.T.P. (Avidyne's Terrific Panel): Using Avidyne's R9 Flightdeck on an ATP Checkride



by Matthew McDaniel

**T**hirteen years ago, I earned my initial Airline Transport Pilot (ATP) certificate in a typical manner. Since only a commercial certificate with instrument and multi-engine rating (AMEL) is required to fly as co-pilot in most airline or charter operations, few would-be professional pilots bother to pursue an ATP before applying to their first airline or charter job. They know that when it's time to upgrade to captain, they will be trained for the new position, including an ATP certificate and a PIC type-rating in the appropriate aircraft.

Back then, my airline used simulators for training, but not for checkrides. With my written passed, I completed ground school and simulator training. Shortly thereafter, I saddled up to a Beech 1900 with a check-airman to my right and an FAA inspector looking over my shoulder, and I earned my ATP certificate in a triple checkride (captain, BE-1900 PIC type-rating and ATP certificate). But, the ATP privileges only applied to the specific type-rating and my AMEL rating, leaving my aircraft single engine land (ASEL) rating limited to commercial privileges only.

Fast forward three years – I'd moved up to flying DC-9s for a national airline, was in the hiring pool of two major airlines, and the future looked scripted; then 9/11 occurred. I was furloughed and went to work for Cirrus Aircraft (then called Cirrus Design). Little did I know at the time, I would soon start my own company and dive into areas centered on mostly-ASEL aircraft. While an ATP/ASEL

rating was not required for any of those activities, I always felt that someday I should add ASEL privileges to my ATP, if for no other reason than to challenge myself and to practice what I preach: "Never stop training and never stop learning." In August 2011, I finally got around to doing just that.

## Choosing the Aircraft and Avionics

Using a Cirrus SR22 was a no-brainer for me. I am familiar and comfortable with it on every level. The tougher choice was which avionics package to choose. I fly and teach every generation of Cirrus avionics from the earliest six-packs, to the newest Garmin Perspective, and the various aftermarket upgrades as well, but no ATP checkride is without challenge or stress, and I wanted to minimize both. I considered which platform offered me the lowest workload, most intuitive operations, and



One feature of R9 the author has grown to appreciate is the option of displaying engine data on the PFD. Above is his preferred display convention for takeoff and initial climb (especially when launching into low IMC).

simplest solutions for such things as charts, flight plan adjustments, and partial panel work. The answer became obvious soon after I began teaching the Avidyne R9 system. Lucky for me, my good friends and clients, Doug and Carrie Woods, own a beautiful SR22 G2 (N822TW) with R9 which they made available to me.

### Hurry Up and Wait

In late 2009, I did a few flights in an R9 Cirrus aircraft with at least some focus on practicing for the ATP practical exam. Then, in early 2010, I flew one of the first Cirrus aircraft upgraded with the Avidyne DFC-90 Autopilot (A/P) and I was floored by the intuitive nature, along with the smoothness and accuracy of this attitude-based digital A/P. I decided I would wait for the DFC-100 A/P to be certified before doing any final prep for the ASEL/ATP. (The DFC-100 is the version of the DFC-90 that is compatible with R9.) So, I waited. In the interim, I became increasingly comfortable with the nuances of R9 and even more convinced it was the platform of choice for my goal. Meanwhile, the DFC-100 was in certification purgatory and I waited some more ... good things come to those that wait.

Throughout the rest of 2010, I flew several R9 Cirrus aircraft and several other aircraft with the DFC-90 A/P. I often fly solo ferry flights and took those opportunities to hand-fly practice approaches in IMC whenever possible, and to really organize my cockpit flow patterns and

personal preferences using the Avidyne R9 suite. By spring of 2011, the DFC-100 was certified and being installed in R9-equipped Cirrus aircraft. I did a post-installation flight check on N822TW and decided the time had come to complete my ATP/ASEL.

### The Checkride

In late August, I met with my designated pilot examiner (DPE). After discussing the weather, we began the oral exam. I'd laid out all the aircraft's logs, manuals, and certificates for inspection. Satisfied with the aircraft's legality, we launched right into a discussion on performance. I used an iPad<sup>®</sup> equipped with apps for weight and balance, performance, and flight planning. Some discussion followed about various performance-related topics, legalities, and techniques. From there, I conducted an in-depth pre-flight inspection while the DPE used my progress to trigger a barrage of questions about the aircraft's systems, limitations, and features. An hour-plus after the pre-flight had begun, we were finally ready to climb aboard.

I ran all my electronic checklists on the PFD (Integrated Flight Display 1, or IFD1, in R9-speak). After acquiring ATIS, the DPE gave me a long clearance, including Victor Airways. Quick work was made of this in the FMS, thanks to R9's geo-fill feature and airway database. Once airborne, the DPE took the controls at 100 feet AGL, and I put on my Foggles. I took over again, hand flying to

altitude, while following the assigned heading to intercept the airway. Upon reaching the practice area, we did some clearing turns and initiated a series of maneuvers.

## Maneuvers

Steep turns were my “warm-up” maneuver. While certainly not the best of my career, they were within the required standards. Slow flight led right into a series of three stalls (in takeoff, landing and banking configurations), all held to the full aerodynamic stall. With these, I managed to get a “nice job” out of the otherwise almost-silent DPE.

The first unusual attitude recovery was routine. On the second, when I looked up, the PFD was black (dimmed by the DPE while I was head-down). I dropped my gaze to the standby instruments and initiated recovery from the nose-low, airspeed-increasing attitude. I then quickly reached up and punched the PFD button on the MFD (IFD2), giving me a copy of the PFD information that the “failure” of IFD1 had denied me. I believe this caught the DPE a little off guard. Partial panel with the R9 flight deck is a bit like full panel in many lesser systems! After getting us back into stable flight and on course to the first destination, IFD1 was “repaired” and I was given a clearance for the first approach.

## Approach Procedures

The assignment was a full procedure GPS approach, to be hand-flown to minimums using only raw data (i.e., no flight director allowed). This WAAS-enabled approach offered a for-reference-only glidepath (LNAV+V), which I utilized in my descent to MDA. I was then allowed to look up and land. At flare altitude, I was told to go around and go back under the hood.

Next was an autopilot-coupled VOR-only approach. The combination of R9 and DFC-100 takes the stress out of such an “old school” approach. I elected to fly the approach as a GPS-overlay, while simultaneously monitoring the actual VOR radial via a bearing pointer on the HIS, and a textual depiction of the actual radial was displayed in an adjacent data field. The advantage to this method being a more stable navigation signal and, thus, flight path, while still meeting the letter of the law by ensuring my position in relationship to the designated VOR course radial at all times. The DPE was pleased with this methodology and its intuitive presentation within R9. Normally, R9 automatically loads and identifies the appropriate approach frequency, requiring the pilot to simply ensure both were done correctly. In this case, the textual ID for the VOR was incorrect. I’ve seen this



A favorite R9 feature for the author is the split-screen MFD. This is one such option, seeing the traditional moving map and the geo-referenced approach chart simultaneously. Similarly, you could elect to have the flight plan displayed on the right half of the screen. He often uses both options during various phases of instrument approaches.

sort of anomaly occasionally in every FMS I've ever used with such capabilities (including turbine equipment), so, I quickly confirmed the VOR frequency via its audible Morse-code identification. This was a great example of potential automation complacency. The DPE said candidates using such automated systems often don't monitor it closely enough and/or correct errors via manual means. This has been my experience while TAA instructing, as well. Automation is wonderful and I'm a big fan of integrated systems such as R9, but, the PIC must never relinquish their responsibilities to "the magic."

Next came two ILS approaches. The first was radar-vector and I never "broke out." At decision height (DH), I initiated an autopilot-flown published missed approach. This is another thing of beauty when using R9/DFC-100. The R9 FMS is "altitude aware" and will not initiate the first turn, per the published procedure, until the minimum published altitude is reached and/or the aircraft is 400 feet above airport elevation. This is a huge safety feature and wonderful situation awareness tool. With a few simple inputs to the autopilot, we were soon entering the published missed approach hold. Holds in R9-equipped aircraft are given their own "waypoint" block within the flight plan, almost eliminating often-asked questions of FMS users: "What's it doing now?" Additionally, when ATC reports are required, all the necessary information is consolidated and easy to locate.

After becoming established in the hold, the DPE asked what I would do if ATC asked me to change the holding radial. I demonstrated how easy this was with R9, by highlighting the holding course, selecting the new course, and viewing the new hold in the FMS preview window (allowing input errors to be identified before they are executed).

Finally, I was assigned a second ILS to the same runway. Since I had just completed the same approach, I utilized one of my favorite features of R9, lovingly referred to as the "butler button." The butler button is a line-select key on the PFD that tries to anticipate the pilot's next need, request, or move. In this case, since I'd just flown an ILS, gone missed, and was established in the published hold, the butler thought maybe I would like to try the same approach again. Thus, the option presented was "Retry Approach?" By pressing this button, R9 reloaded the same approach in the same scenario (radar vectors) that I'd just flown. Presto! I was essentially ready for the next approach with a single button push. The DPE said, "Okay, that was way too easy!" Grinning, I flew on.

### Abnormalities and Emergencies

During vectors, I was told the flaps had "failed" and that this would be a no-flap, full-stop, circling approach. I adjusted my speeds accordingly and hand-flew the ILS (utilizing the DFC-100's highly accurate digital flight

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director) to circling minimums. Due to the flap situation, I'd chosen to circle to the longest runway available, accepting a direct crosswind, rather than circling to a shorter runway, directly into the wind, preferring long pavement over minimal crosswind. I think the DPE appreciated this judgment call and thus, forgave the few extra knots I carried across the threshold.

Twice during the checkride, I experienced an "engine failure." The first was immediately after going missed from the GPS approach. Back under the hood, the engine quit at 900 feet AGL. I immediately pitched for best-glide ( $V_{bg}$ ) and at 700 feet AGL announced that I was going to deploy CAPS. Simulation over! Later, during the first hold, the engine quit again. That time, I turned towards the nearest airport, while maintaining altitude and decelerating to  $V_{bg}$ ; I completed the memory items and then brought up the electronic checklists, choosing to do so directly below the flight instruments. The DPE was convinced that I would make the airport with a little tailwind help.

Departing the maneuvering area, a "cabin fire" broke out. I again turned to the nearest airport while initiating an emergency descent and talking through memory items. Available altitude limited this simulation, but the point was made.

### In Retrospect

Looking back, my performance was certainly not perfect. As with nearly every flight, I learned a few things

along the way. Chief among them was reinforcing my belief that all pilots should challenge themselves with newer/greater learning and performance goals. For anything worth doing, is worth doing well. Kudos to my DPE who helped to lower my stress by saying, "I stress the word 'practical' in Practical Test Standards and I only need to see you perform to standards, use good judgment, problem solving, corrective action, and calm control. I don't expect perfection." Thanks to Cirrus for creating a great and versatile aircraft. Finally, special thanks to Avidyne for an avionics platform that makes those in most modern airliners look positively antiquated. 

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**About the Author:** Matthew McDaniel is a Master and Gold Seal CFII, ATP, MEI, AGI, & IGI and Platinum CSIP. In 21 years of flying, he has logged over 12,000 hours total, over 4,500 hours of instruction-given and over 3,500 hours in various models of Cirrus Aircraft. As owner of Progressive Aviation Services, LLC ([www.progaviation.com](http://www.progaviation.com)), he has specialized in Technically Advanced Aircraft and Glass Cockpit instruction since 2001. Currently, Matthew flies the Airbus A319 and A320 for an international airline and holds six turbine aircraft type ratings. Matt is one of only 26 instructors in the world to have earned the Master CFI designation five consecutive times. He can be reached at [matt@progaviation.com](mailto:matt@progaviation.com) or (414) 339-4990.