

# Recollections of Vietnam

## Engine Starting Lessons



Somewhere part way through my tour at Cam Ranh, the 483<sup>rd</sup> Composite Wing was blessed with the arrival of a new DCO. This officer and gentleman was a very young full bird Colonel. We had a term for such officers, who made all their promotions at the minimum intervals, which was a "fast burner". Since names are unnecessary here, let's just call him Colonel FB. Colonel FB was a picture of military perfection. He was young, fit, always in an impeccably perfect uniform, and was determined that the operational units under his command were to going to be molded in his image. His directives started immediately and he enforced them with the true zeal befitting his stature as a "fast burner". The working day of a Caribou crew member started well before sunrise, because we were always scheduled for engine start at the precise moment of the astronomical sunrise. Before proceeding to our assigned aircraft each morning, we had to stop by the equipment shack to check out our side arms, ammunition, and survival vests. Colonel FB decided that this was the perfect opportunity to check that his directives were being followed to the letter. He would stand by the door of the equipment shack on many mornings with a flashlight to check that everyone had shaved to his satisfaction and that boots were polished and uniforms properly pressed. One would have thought that we were assembling for a parade, not a day playing in the Vietnamese mud! Needless to say, Colonel FB was not one of the more popular senior officers. That establishes the background.

Now it is befitting that the DCO occupy a nice air-conditioned office adjacent to and overlooking the flight line and, in fact, that is exactly where the good Colonel had his office. It seems, though, that one of Colonel FB's particular pet peeves was the sound of a Pratt&Whitney R2000 engine backfiring (actually, I believe the correct technical description is an "afterfire", because the relevant detonations generally occurred in the exhaust manifold pipes and augmentor tubes). Every morning one or more hapless 'Bou pilots would get an afterfire during the first start of the morning. The sound was quite impressive, and although relatively harmless to both aircraft and personnel, it infuriated our new DCO.

Let me describe the procedure for starting one of these marvels of mechanical engineering. Low down on the bottom left of the aircraft commander's instrument panel was a vertical column of three toggle switches which were spring loaded to the center, but could be moved to the left for the number 1 engine and to the right for the number 2 engine. The top one actually engaged the starter motor and cranked the engine. The center one controlled the high energy ignition, and the bottom one controlled the primer pump. The procedure was quite simple in description and a little more difficult in practice. The mixture controls to the carburetors were firmly placed in "Cutoff", assuring no fuel would be admitted via the normal route into the carburetor venturi. Then, on a cold start, the engine had to be pulled through 15 "blades" (five full revolutions of the three-bladed prop) in order to distribute some lubricating oil to the vital internal components. During the pre-oiling revolutions, the primer switch was blipped on and off to get some fuel into the intake manifolds and cylinders. A ground crewman would monitor the engine from the outside, while simultaneously standing by with a large fire extinguisher. He would hold his arm up with his thumb up as long as no raw fuel was being discharged from the supercharger case drain and would signal thumbs down when fuel started to come out. This cue was used by the pilot to judge how much fuel to inject with the primer pump. At the end of the fifteen blade cycle, the pilot would call for the copilot to turn on the magneto switch for the engine and would simultaneously engage the high energy ignition. Now the real art came into play. As the engine started to fire, the cranking switch had to be released, while maintaining the high energy ignition and the continued blipping of the primer pump to supply just enough fuel to maintain an idle condition. Once the idle was established, the pilot called for the mixture control to be advanced to full rich, while coordinating the reduction of fuel introduced by the primer pump. Any slight miscalculation during the initial priming or during the transition from primer to carb could result in an excess of fuel in the exhaust manifolds, which, of course, would burn rapidly enough to produce a spectacular bang. The procedure was repeated for the two engines. When starting the number 1 (left) engine, the pilot's hand was placed palm out with his third finger on the cranking switch, ring finger on the ignition switch, and index finger on the primer switch. When starting the number 2 (right) engine, the position of the hand was reversed to palm in with the index finger on the cranking switch, the ring finger on the ignition switch, and the third finger on the primer switch. It was nothing a concert pianist couldn't master in a few weeks. Now we add another variable; the climate. Vietnam was very humid and during the relatively cooler hours of the overnight period, moisture would condense on everything, including the internal electrical

components of the magnetos. It was standard procedure before the first start of the day to blow out the magnetos with high pressure dry nitrogen in an attempt to disperse the condensation to insure a reliable spark at the plugs in the cylinder heads. Sometimes this strategy worked and sometimes it did not. In short, it took many months of practice before one developed the necessary dexterity and experience to reliably start the engines perfectly. Many of our pilots were fresh out of UPT and were used to the fully automated starting systems of a modern jet engine - just punch one button and monitor the automated sequence, which rarely failed.

None of these observations or facts seemed to be of concern to Colonel FB. After listening to the morning explosions from the flight line for a few weeks, he decreed that all the Caribou pilots would be required to take a remedial engine starting course to be conducted by the maintenance squadron. What he didn't realize was that the maintenance people used an entirely different starting procedure. They simply pulled the engine through 15 blades, turned on the magnetos, and pushed the mixture lever up, letting the carburetor do its natural thing. The engines responded well to this technique and invariably light off without a whimper. The pilots were bound by the procedure contained in Air Force Technical Order 1C-7A-1 from which we were not allowed to deviate, while the maintenance people were bound by another procedural manual (or perhaps just good common sense).

While everyone was in a proper dither trying to decide just how the maintenance troops were going to teach the pilots how to start the engines with a technique with which they weren't familiar and never used, it came time for the good Colonel to go out and fly around for long enough to earn his flight pay for the month. Whenever a senior officer goes out to fly, he is placed in command of the aircraft on the flight orders, but generally has an experienced Instructor Pilot, fully qualified as an aircraft commander as a copilot. By this time, anyone who had anything to do with the Caribous at Cam Ranh was fully fed up with Colonel FB and a plan was forming. This plan might be termed the "underground military justice system", in which officers and enlisted alike conspire to see true justice done. The IP chosen to accompany the Colonel on this fateful day was one of those wonderful "good ole Southern boys" with a serious sense of humor and the will to carry out the plan. He carefully briefed the ground crew before the Colonel arrived and they readily agreed to cooperate. The Colonel strode out to the aircraft in his impeccable uniform, climbed into the left seat, dutifully stuck his head out the window and yelled "CLEAR". He then proceeded to crank number one through 15 blades holding the primer switch full on

during the whole time. It seems the ground crew was indicating thumbs up even though fuel was flowing from the supercharger case drain in a torrent. Just for good measure, the good ole boy in the right seat also pushed the mixture lever to Full Rich. When Colonel FB called for the magneto switch to be turned on, the IP pulled back the mixture lever so as not to be caught in his perfidy, cringed, and switched on the the magneto. The resulting explosion was so loud it actually echoed off the mountains on the mainland! It is a wonder to me to this day that the entire exhaust system wasn't blown off the aircraft. Needless to say, there was no more talk of "engine starting school" and Colonel FB quieted down quite a bit. It probably took less than 10 minutes for every member of every squadron in the air or on the ground to hear of the incident. With laughed about it for weeks and the good ole boy who pulled it off was definitely the hero of the hour.



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