

## The 2-32, Vietnam – and Me

By Stan Hall

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Of the two things I can think of that are more exciting than flying a sailplane, one is getting shot at.

At a time in life when most men are content to relax in the comfort of their homes and well-ordered life styles I was 10,000 miles from both, looking into the wrong end of a Russian AK-47 rifle.

I was placed in this ridiculous situation by a couple of sailplanes. Or to be more accurate, a couple of powered sailplanes. Or to be even more accurate, a couple of powered sailplanes so quiet that at cruising throttle they couldn't be heard above 800 feet from the ground in the dead of night.

Let me tell you about these machines and how together we "celebrated" the 1968 Tet Offensive in South Vietnam.

In 1966 a couple of friends of mine in the Research and Development Directorate at Lockheed, Jack Baumann and Don Galbraith, conceived an airborne observation platform so quiet that it could spot enemy ground troops without detection, from low altitude, operating at night.

This vehicle was a Schweizer 1-26, powered by a VW engine. The Army saw merit in the idea but turned thumbs down on the single-seat feature of the 1-26, and the 55 horsepower VW engine. They wanted two seats and a certified aircraft engine.

Lockheed subsequently proposed a Schweizer 2-32, powered by a 100 horsepower Continental aircraft engine.

The proposal was accepted and I was reassigned from my job as a manager in the Lockheed Agena satellite program to head up the quiet airplane program.

We were to design, build and test two aircraft, the purpose being to test the feasibility of developing a really quiet airborne platform. There was no thought of actually placing these two experimental aircraft in combat. They were to be test beds, only. If they were successful in test, so the doctrine went, the Army would then consider asking us to design a more advanced vehicle for combat duty.

The idea was not so popular in the Pentagon that the money flowed with abandon. On the contrary. The program was so rigorously funded and so tightly scheduled that it was necessary to

essentially bypass the complicated and expensive internal Lockheed "system."

We organized a kind of "skunk works" operation, consisting of a half-dozen or so senior technical types, about 10 first class experimental mechanics, a secretary and a few "expeditors." For working space we fenced off one end of Lockheed's executive aircraft hangar at San Jose airport.

As an operating entity we were almost completely severed from our parent company. In fact, practically none of our leaders at the home plant knew what we were doing, or if they knew, were at all interested. This made the project an airplane nut's paradise. Talk about kids turned loose in a candy store.

What manufacturing we couldn't handle efficiently ourselves we farmed out to little shops scattered around town. We couldn't afford to deal with Lockheed's R and D shops. They were too expensive, too slow and didn't always measure up in terms of workmanship.

Budget and time constraints required that we do as little as necessary to the 2-32's to make quiet airplanes of them. I'll be showing some slides later but all we did was install an engine on top the fuselage, right behind the rear cockpit, essentially on the aircraft's center of gravity. The propeller was located at the nose of the aircraft and was driven by a long tubular drive shaft which extended forward over the heads of the flight crew. We also enlarged the vertical tail to account for the destabilizing effect of adding the propeller.

We had very little go on in the way of quiet airplane technology because there wasn't much of it around. We had to proceed mainly on the basis of simple judgment—which didn't always pan out the first time.

Since most of the noise an airplane makes comes from the propeller, we started there. Now, a conventional, 100 horsepower airplane turns a two bladed propeller of about six feet diameter at around 2100 - 2300 rpm at cruise. Our propeller had four blades (at one time or another we tried two, three and even six blades eight feet in diameter, turning, through a system of V-belts, at a lazy 800 rpm. And it was quiet to the point of being spooky.

Next we installed a muffler on the engine exhaust, which called for the use of a muffler off a 1958 Buick.

The combination of large, slow-turning, multi-bladed propeller and engine muffler had a dramatic effect on lowering the overall noise level. It was so dramatic, in fact, that the internal clanking, rattling and banging of the engine itself now predominated.

On a conventional propeller-driven airplane you don't hear all these noises because the propeller and engine exhaust cover them. But take away the propeller and exhaust noise and even the smoothest of engines sounds like a concrete mixer.

To combat this we covered the inside of the engine cowling, which was of fiberglass, with thick fiberglass mats, and this helped considerably, although much of the high frequency rattling and clanking still came through.

Although it is probably obvious, the reason we used a sailplane as our test bed instead of an airplane is because of the low power required to keep a sailplane in flight. And what makes noise is the generation and use of power. Less power, less noise.

The gross weight of the 2-32 sailplane is about 1340 pounds. In making the 2-32 into an airplane we added another 600 pounds—and the only thing we strengthened on the basic 2-32 was the landing wheel support structure. We installed a larger wheel and tire.

Although the program was unclassified (mainly because there wasn't enough money in the budget to seal off the operation from prying eyes or to hire guards) we were asked to keep things, including the airplanes, as "quiet" as possible.

This gave us a few problems: how in that era could we fly out of San Jose Municipal Airport in an obviously experimental aircraft which had "U.S. Army" splashed all over its sides without drawing a lot of attention. With its overhead propeller drive shaft the aircraft was already so weird-looking it would undoubtedly draw hordes of interested spectators—and reporters.

So, we got the aircraft licensed by the FAA in the Experimental Category and painted the things the most innocuous color we could find—an anemic, sandy kind of cream-yellow.

And we trucked them out to Tracy airport for the flight testing. The only person around Tracy who really knew who we were was the airport manager—and he kept our secret.

The main reason we went to Tracy, though, was that the thrust of our test program was to measure how much noise the vehicles made. And Tracy airport was sufficiently isolated to be fairly quiet. We wanted to hear the airplane, not trucks and trains and barking dogs.

Since the operational concept laid on us by the Army called for flying in Vietnam at night, our acoustic tests at Tracy had to be carried out between midnight and an hour or so before dawn, the quietest time of the night.

We would fly at 250 feet altitude, back and forth over a rank of microphones arranged along the flight path.

Since we realized that the paved runways would cause the sounds of the airplane to be reflected and thus give false readings at the microphones, we set the mikes up out in the dirt, on piles of sawdust, away from the runways and buildings.

So that the pilot would know where to fly we marked out the course with kerosene flare pots, the kind you occasionally see around highway construction projects.

We placed a small light in the belly of the aircraft so that we could, through an optical device, track the vehicle so that later on we might determine its exact height over the microphones.

The only real problem we had with the airplane was in cooling the engine. The engine was a long distance aft of the propeller, which turned too slowly to deliver a concentrated blast of cooling air to the engine. Besides that, the air wouldn't flow straight aft to the engine, but would swerve off to the right, missing the left hand engine inlet entirely. By the way, this swerving-off is characteristic of all propellers. Anyway, the engine operated at or near redline temperature all the time, and there was nothing we could do about it, try as we did.

It took us a long time to get all the acoustic data we needed because, we could only fly on dead-calm, moonless or nearly-moonless nights. A full moon represented complete disaster because every dog, cat and jackass in the county could be expected to be in full voice.

And even on moonless nights we frequently had to ask the aircraft to hold off the range until an errant truck or train passed out of earshot. It is amazing how far you can hear such a vehicle in the dead of night—even from miles away. We learned to communicate in whispers.

I recall my boss's boss coming out one night to see what we were up to. He was a good sort, although very professorial, precise and proper in manner—and somewhat out of place in the dust, dirt and general confusion of the test site. But he wanted to help.

Mostly to keep him out from under foot I handed him a clipboard and assigned him the "job" of taking test data. I cautioned him to take particular note of any extraneous sounds he might hear in the environment.

What I saw the next day in my office was his data: a neatly executed series of numbers set against the time at which the aircraft passed over the microphones.

The last entry read, "Time 04:30. Testing called on account of intermittent roosters." Like I said, precise.

Toward the end of the flight test program we started getting more visitors, people whose faces I didn't recognize, people addressed by their escort (my boss) as "General," "Colonel," "Admiral," etc. None wore uniforms, and I guessed correctly that we were drawing increased attention in the Pentagon.

Our visitors were stunned by the unusually low noise level of the aircraft. One of the demonstrations we delighted in putting on was to ask the pilot to turn his lights off and approach the field from some random direction at about 800 feet up. I would then ask our visitors to listen very carefully and sing out when they could first hear the vehicle, and point out from what direction it was approaching.

None ever heard it. I would turn our ground-based receiver, which had a speaker, up to full volume. Just as the pilot got directly overhead he would flip on his lights and boom into his microphone, "Gotcha." Although the faces of the visiting dignitaries were invisible in the dark one could hear them gasp as if someone had just stuck a pistol in their ears. Then they would begin chuckling and giggling like children with a new toy. We had a winner, for sure.

It was interesting, though, that the members of our test team could hear the airplane sometimes from a distance of up to a mile—whereas no one else could. It had a kind of acoustic "signature" which, after listening to it night after night, we became accustomed to listening for. It had the gentle, rushing sound of the ocean surf and we had inadvertently become trained in perceiving it at considerable distances. After listening to the vehicle throughout the night, even our visitors found their perceptions sharpened.

And it was this phenomenon that led the Army to direct us to do some daytime testing over a group of soldiers at Fort Hunter-Leggett in central California. Here, some 50 or so soldiers were seated in an open field, with blindfolds over their eyes and a pickle switch connected to a master recorder in their hands.

We were flying in a sort of "competition" with an Army Cessna 0-1 "Bird Dog" which was quieted through the use of a small, six bladed direct-drive propeller and exhaust muffler.

Our job was, along with the 0-1, to fly over the assembled soldiers from prearranged, but

unannounced directions, order and time intervals. The soldiers were to press their switches upon hearing anything strange. We beat the Cessna hands-down.

Before we could finish our celebrating we received an astonishing order from the Army: "Paint those aircraft black—and send them to Vietnam".

Although ours was an Army program we were assigned a gung-ho Navy Lt. Commander with pilot experience in Vietnam to oversee the installation of about 500 additional pounds of communications and other equipment. We ended up with a gross weight of 2450 pounds—which is about 1100 pounds, or 56 percent over the certificated gross weight of the 2-32. And no structural beef-ups to help. Talk about your long takeoff runs—and bending wings!

In cruising flight the upper wing skins buckled from root to tip. A wooden two-by-four would make a better airfoil! And you should have seen the wing bend with the spoilers open! We had to limit the maximum load factor to around 2.5.

There simply was insufficient time in which to redesign the structure to handle all that excess weight: the Army wanted those birds in Vietnam.

Before disassembling the aircraft and packing them off to Vietnam we trained 10 military pilots to fly them. We sent them out to Sky Sailing for indoctrination in the basic 2-32 and thence to Moffett Field and Crows Landing for nighttime workouts in the operational aircraft.

The Pentagon wanted the crews to evaluate the aircraft and their suitability to various branches of the military and so pilots were chosen from the Army, Navy and Air Force.

In the middle of January 1968, we loaded the aircraft, on their modified 2-32 trailers, aboard a couple of C-130s.

The Lockheed contingent comprised myself and a sort of administrative type engineer plus two mechanics: one for the aircraft and the other for the communications equipment. (DALE STITH & BRVILLE CURTIS)

The mechanics rode one of the C-130s while we "executive" types left a few days earlier aboard Pan Am with, believe it or not, soaring pilot Don Fisher at the controls. Don and I "discovered" one another as we disembarked at Guam to take on fuel.

I should point out at this juncture that none of us Lockheed types had to go to Vietnam with the aircraft. But the Army really needed us because we alone were familiar in detail with the aircraft and their systems. And, we had lived with the project since its inception. We wanted to see it all the way through if we could. Besides, we were told we would be going to a place in South Vietnam called Soc

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Trang, a helicopter base about 80 miles south of Saigon, near where the Mekong river flows into the South China Sea. Soc Trang hadn't seen any enemy action at all in 6 months. My tour was scheduled to last only two weeks—long enough to assemble the aircraft, oversee check out of their systems and a little flight testing. My companion's tour was scheduled to last 4 weeks—long enough to gather operational information suitable for a report to the Company. The mechanics were scheduled to stay 8 weeks, enough time to train a cadre of military mechanics in the care and maintenance of the vehicles. These relatively short tours, coupled with information regarding the absence of enemy action at Soc Trang caused us no concern of our personal safety, so we all volunteered to go.

We arrived in Saigon aboard Pan Am and were ushered through customs where we traded our American money for Vietnamese currency and U.S. military script. We were then hustled off to Army headquarters where we were outfitted in GI fatigues and boots so that we might give and receive briefings without attracting too much attention. It was a little unsettling, though, when they also issued us steel helmets and flak jackets, "Hey, you guys told us there wasn't any war around here."

After a few days in Saigon we were flown down to Soc Trang. The airfield at Soc Trang was simply an airstrip out in the rice fields, heavily fenced-in, with hangars, barracks and miscellaneous outbuildings along one side. They had a control tower on the field, manned, believe it or not, by the FAA.

The airstrip could handle the helicopters and the Cessna 0-1 Bird Dogs but was too short for our underpowered motorgliders. So, a few weeks before our arrival they lengthened the runway.

The primary mission of Soc Trang was to transport ground troops to and from the combat zones and to treat the wounded in a little field hospital they had there. And there were many heavily armed, so called helicopter "gun-ships" stationed at the field. Whenever the 0-1 Bird Dogs spotted a target they would call in the gun-ships, which would proceed to "hose down" the target area. The gun-ships were fearful weapons.

The military population of Soc Trang consisted of both South Vietnamese and American soldiers, although the two were kept apart. In fact, the Vietnamese soldiers lived at one end of the base, with their families, and the wives of the Vietnamese officers worked for the Americans as domestics.

Although in a literal sense there was no "war" at Soc Trang something strongly suggestive of war began every night, promptly at 8 o'clock.

The Vietnamese at the far end of the base would fire their artillery in what was known as "H and I" (for Harassment and Interdiction) fire.

They would lob a couple dozen rounds in random fashion to scare off any Viet Cong who might be lurking out there in the night. Sometimes the artillery shells whistled right over our heads. After a minute or so one could hear the distant "clump" of their impact and explosion.

After the artillery barrage the 0-1 Bird Dogs would all take off and scatter, looking for anything suspicious.

We would go out on the balcony of our two-story barracks and watch the flares being dropped by the 0-1's. If more than two or three were dropped in one place we could be sure that a gun-ship would soon take off and strafe the area. We could see their tracers in the distance. All most fascinating to watch.

As for our quiet aircraft, they worked to perfection. Each aircraft was flown 10 hours per night, in two 5-hour shifts. Those little 100 horsepower sewing machine motors, running right up against their temperature redlines all the time, never missed a beat.

Although the aircraft discovered many targets, assisted by a night-vision device operated by the crew member in the rear seat, the most memorable one was discovered near the end of my official tenure there. One of our vehicles spotted a Chinese submarine offloading its cargo into large sampans. Our crews circled that submarine at an altitude of 1000 feet for two hours—and were never discovered! They left the area when their fuel started getting low—and called in the gun-ships on the way back to the base.

One trouble with the gun-ships, and all helicopters for that matter was, the enemy could hear them coming from miles away. They were notoriously noisy. All the enemy had to do when they heard them coming was to douse their campfires and wait for the helicopters to go away. The gun-ships were, of course, helpless in such situations.

But our little power-gliders helped put a stop to that. Our flight crews would find the campfires and lights and pinpoint their location accurately on a map. They would then radio the exact coordinates back to the base and the gun-ships attacked the point or points thus designated—in the dark. Apparently, the effect on the Viet Cong was stunning. Thanks to our quiet airplanes they could no longer find protection in the darkness.

Although on the basis of previous experience no one expected we would get shelled for several months, yet we were briefed on what to do in

the unlikely event the Viet Cong decided to engage in a little H and I fire themselves.

The VC's standard procedure was to lob in two or three mortar shells, wait for a minute, then lob in a couple more. If this were to happen, we were instructed to hit the deck and keep our heads down for at least two minutes—because the base had lost some personnel in the past who got up too soon and were hit by a second volley of mortar shells.

On the eve of Tet, which is a Vietnamese holiday, at about 3 o'clock in the morning, all hell broke loose. Mortars!

I was sound asleep at the time. At the first explosion, which I swear was right under my bunk, I grabbed my helmet and rolled off the bed onto the floor. The mortars kept coming.

Eventually, they stopped and I muttered to my companion who was stretched out beside his own bunk, "Well, that's nine rounds. Maybe we won't get any more." He rolled his saucer-sized eyes toward me and with an incredulous look on his face, said, "You mean you're counting the god damn things?!"

After we got our blood pressures back under control we crawled back into our respective sacks and dozed off, thankful that we wouldn't hear from the Viet Cong again during our stay. A half hour later the VC hit us again! This time the shelling didn't stop—for four days. This was the beginning of the infamous Tet offensive.

We worried not only of our own safety but for the safety of the crews in our defenseless little power-gliders flying around out there, somewhere in the night. We were immensely relieved when they showed up over the field just at dawn. One pilot, realizing the base was under attack, managed to stay clear of the field until a break in the action came. In the process he managed to get 6 hours of flying out of 5 hours of fuel. He came in absolutely dry!

After several hours of cowering in a bunker of sandbags we civilians were told by the base C.O. that an Air Force C-130 was on its way to evacuate us. The base was surrounded by Viet Cong and was running out of fuel and ammunition (a thought we found less than comforting). The reason the Air Force was coming instead of the Army was because the strip hadn't yet been surveyed for Army C-130's and the Army didn't think it could get in. The Air Force apparently didn't care about surveys; they came in anyway.

The aircraft landed, spun around smartly on the apron and opened its cavernous rear door. Out tumbled several large, rubber-like cylinders of soline and in tumbled four scared, rubber-like civilians, plus a visiting Army colonel headquartered in Saigon.

The C-130, now essentially empty, took off at an astonishing angle, making several climbing 360's within the confines of the field to escape ground fire.

We were headed back toward Saigon where we hoped to find safety. We thought that the attack on Soc Trang was strictly a local affair. Little did we realize that every base in South Vietnam was under attack.

Halfway to Saigon the C-130 turned around and headed back toward the coast; the airport at Saigon had been closed due to enemy action.

After milling around for awhile we finally landed at Vung Tau, a military R and R (for Rest and Recreation) area. Since there were no accommodations for anybody at the Vung Tau airbase we were jeeped into the town of Vung Tau itself, to a hotel converted to a Bachelor Officers Quarters. It was here that I experienced the most frightening few hours of my life.

While we were being escorted to our rooms by our Army colonel, he cautioned us to be alert to a couple of favorite Viet Cong "tricks." One, he said, was that they would charge up the stairs with guns firing and throw hand grenades into the rooms as they went. They also liked to stand outside the hotel and lob grenades through the windows. With that, he strode off to his own room, M-16 rifle at the ready - with a not-quite-enthusiastic "good night."

That night I lay on my bed, fully clothed and with helmet and flak vest in place, afraid to make a single move or sound. Vung Tau is about the size of Hollister here in California. Imagine a city of the size of Hollister without a light showing anywhere, and without a sound of any kind. The populace was absolutely terrified.

Somewhere around 3 in the morning I heard footsteps in the gravel beneath my second story window. I steeled myself for the grenade I knew was coming. Suddenly a shot rang out, and the whole hotel came alive with shouts.

A voice boomed out from someplace outside the building. It said, "Relax, guys, I got him." What I heard was exactly what I thought I heard: a Viet Cong soldier had slipped into the fenced-off perimeter of the hotel. He was a walking bomb—until he was caught by an alert guard.

For the next two days we sat under an open-shed roof at Vung Tau Air Base, trying to hitch a ride to Thailand. The activity, confusion and frustration were unbelievable. Nobody, but nobody knew what was going on. A staff sergeant who seemed to be in charge of getting people on airplanes said there was no room for civilians because the aircraft were carrying only gasoline, ammunition and soldiers. We

finally won him over and we got a lift to Cam Ranh Bay Air Base located near the bottom of the country.

In all our traipsing around Vietnam, trying to find a way out of the country, there was no way by which we could contact our Company in California and tell them of our plight or where we were—or to find out what they wanted us to do. The military communications channels were already overburdened with military business. No room for civilians. But we finally made contact from Cam Ranh Bay and were instructed to go back to Saigon. Apparently the war was slowing down there and we could get in.

Getting to Saigon was easier this time, but the war wasn't "slowing down" at all. In fact, the based closed again as we were on final. We looked out the windows of our C-130 to see a gun-ship flying off each wing, escorting us in. As we disembarked the plane we observed two F-100s flying a racetrack pattern off to one side of the main runways, pumping rockets into, were told, a horde of Viet Cong bent on overrunning the base.

At a hurried meeting in the Commanding General's office it was decided that my engineer companion and I would return home the next day—because my tour had been completed a week before and my companion's was due to be completed in another week. The two mechanics were prevailed upon to stay out the remainder of their tours. The

quiet airplanes were back, intact at Soc Trang and the Army wanted desperately to keep them airborne. Our electronic technician, who was an ex-marine and carried an M-16 with him wherever he went, had no qualms at all about staying. He almost seemed to be enjoying the war. Our airplane mechanic also decided to stay. I'm not sure what his problem was.

Since a strict curfew had been imposed on travel between Tansonghut Airfield, Saigon's airport, and Saigon itself, we had to spend the night at the base, stretched out on the floor of the General's office. I slept, as best I could, right up against one wall, behind the General's big leather sofa—fully clothed and with helmet and flak jacket in full operational placement.

The next day, after hours of haggling with, it seems, every minor Vietnamese official and G.I. pencil-pusher in Vietnam we finally boarded a Continental Airlines 727 complete with, believe it or not, soft music and the cutest little stewardess you'd ever want to lay eyes on. America, here we come!

It was simply astonishing; the only thing that separated the ugliness of war from the beauty of our homeland was a thin sheet of aluminum alloy: the door on that 727. When we walked through it we walked into another world. And when it closed behind us, well, we didn't look back.