

Published online: 10-1-2000

## Why Submariners Should Talk to Fighter Pilots

Benjamin S. Lambeth

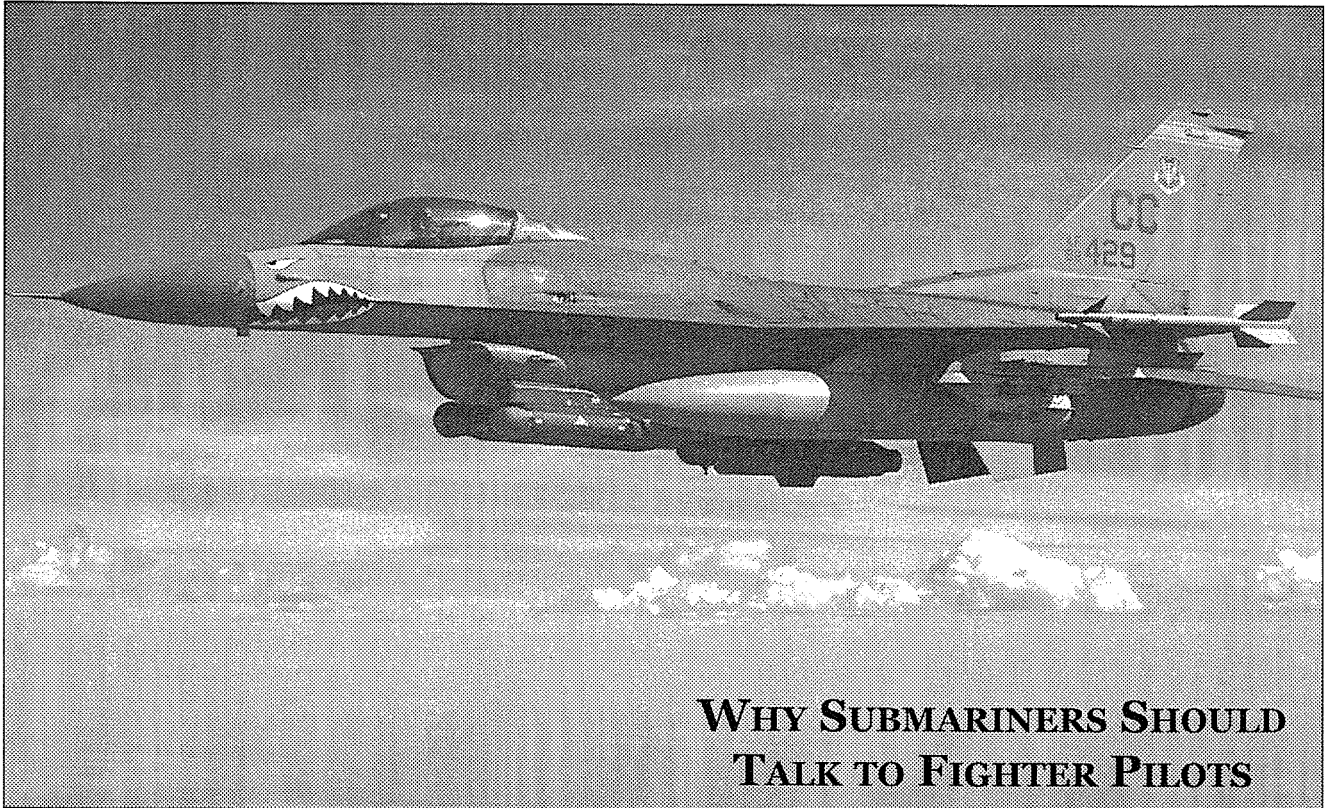
---

### Recommended Citation

Lambeth, Benjamin S. (2012) "Why Submariners Should Talk to Fighter Pilots," *Journal of Human Performance in Extreme Environments*: Vol. 5: Iss. 1, Article 12.

Available at: <http://docs.lib.purdue.edu/jhpee/vol5/iss1/12>

This document has been made available through Purdue e-Pubs, a service of the Purdue University Libraries. Please contact [epubs@purdue.edu](mailto:epubs@purdue.edu) for additional information.



## WHY SUBMARINERS SHOULD TALK TO FIGHTER PILOTS

BY BENJAMIN S. LAMBETH

The sky above and oceans below share a lot more in common than being blue. Despite sharp contrasts in character, they represent operating mediums for remarkably similar forms of high technology combat.

At first glance, few would even remotely consider the sub-on-sub and air-to-air arenas as having any significant unifying features. Among the many differences between the two, the most obvious is the vast dissimilarity in relative speed of operations. Fighter pilots routinely engage at closure rates of 1,000 kts or more. Commitment decisions and initial moves typically occur only minutes, sometimes even seconds, apart. In contrast, the commander and crew of a nuclear fast-attack submarine (SSN) operate at a far slower pace. For them, a speed of 30 kts or more is attained only when making noise is not an operational concern.

In yet another key difference, SSNs typically hunt and engage as singles, whereas the basic fighting unit in aerial combat is a two plane section of fighters. Four or more four plane divisions will often be committed in major offense sweeps, and fighting without the support of a wingman is uniformly shunned as an invitation to disaster.

There are also differences in the human demands that figure in the two contrasting arenas of combat. Although both entail high task loading, often to a point of mental and even physical saturation, fighter pilots work alone in the cockpit or, at most, with a single weapons officer in the back seat. For their part, SSN commanders take into combat a crew of up to ten officers and 100 or more enlisted men. That, in conjunction with the longer engagement times typically involved, makes for significant dissimilarities in task management, crew coordination, and needed stamina going into a fight.

By the same token, thanks to secure radio, fighter pilots can talk freely among themselves and share tactical information via data link, even in a heavy jamming environment. For them, communication is instantaneous and generally unobstructed. In contrast, submariners fight an unseen, unheard, and very private fight beneath the ocean's surface, in which contact with the outside world is out of the question.

Furthermore, there is a considerable difference in the relative comprehensiveness of the awareness picture enjoyed by the two combatants. Fighter pilots usually command a rich, if not definitive, visualization of what they are facing going into a fight. SSN commanders, on the other hand, while not totally blind by any means, tend at best to have a more ambiguous grasp of their tactical situation throughout most of an engagement.

Finally, there is an asymmetry in stakes between the sub-on-sub and air-to-air missions. A fighter pilot who absorbs a surface-to-air or air-to-air missile shot *may* be lucky enough to have the option of ejecting and saving his life. For the submariner, taking a lethal torpedo hit is generally a lose-all proposition. Neither individual typically broods about these possibilities. But an SSN commander knows at some level that he has more to lose going in a fight.

Yet with all due allowance for these and other differences, there are enough areas of comparability between the sub-on-sub and air-to-air mission arm to suggest that the two classes of high technology warriors share more of a kinship than either may be prepared to acknowledge. Without exhausting the many examples, they include:

**Operating in a three dimensional arena.** There is a big difference between maneuvering on a flat plane and in free space. Submariners and fighter pilots both face the complexities of a third dimension that do not routinely figure in the planning of those who fight in the surface warfare world. In each medium, it is difficult to

hide, given the capabilities of sensors on both sides. Fighters and SSNs can remain elusive up to a point, the former by terrain-masking and the latter by exploiting thermoclines and other ocean anomalies and generally operating a quiet and stealthy ship. But as a rule, unobstructed line of sight means detectability. The big difference between the two lies in detection range. An air intercept radar can acquire a fighter-sized target at a distance of 40 nautical miles or more in the forward sector. Modern attack submarines, by contrast, are now so quiet that in the most challenging cases, one must be in very close proximity to an enemy vessel before it can be detected by passive sonar.

Of course, the SSN commander also has the option of using active sonar. However, like initiating a radar search in air-to-air combat, that has the effect of pinpointing the illuminator's location and marking him as hostile. It is the equivalent of someone turning on a beacon in a darkened room full of armed opponents. For that reason, it is advisable only when a firing solution and disengagement option are at hand.

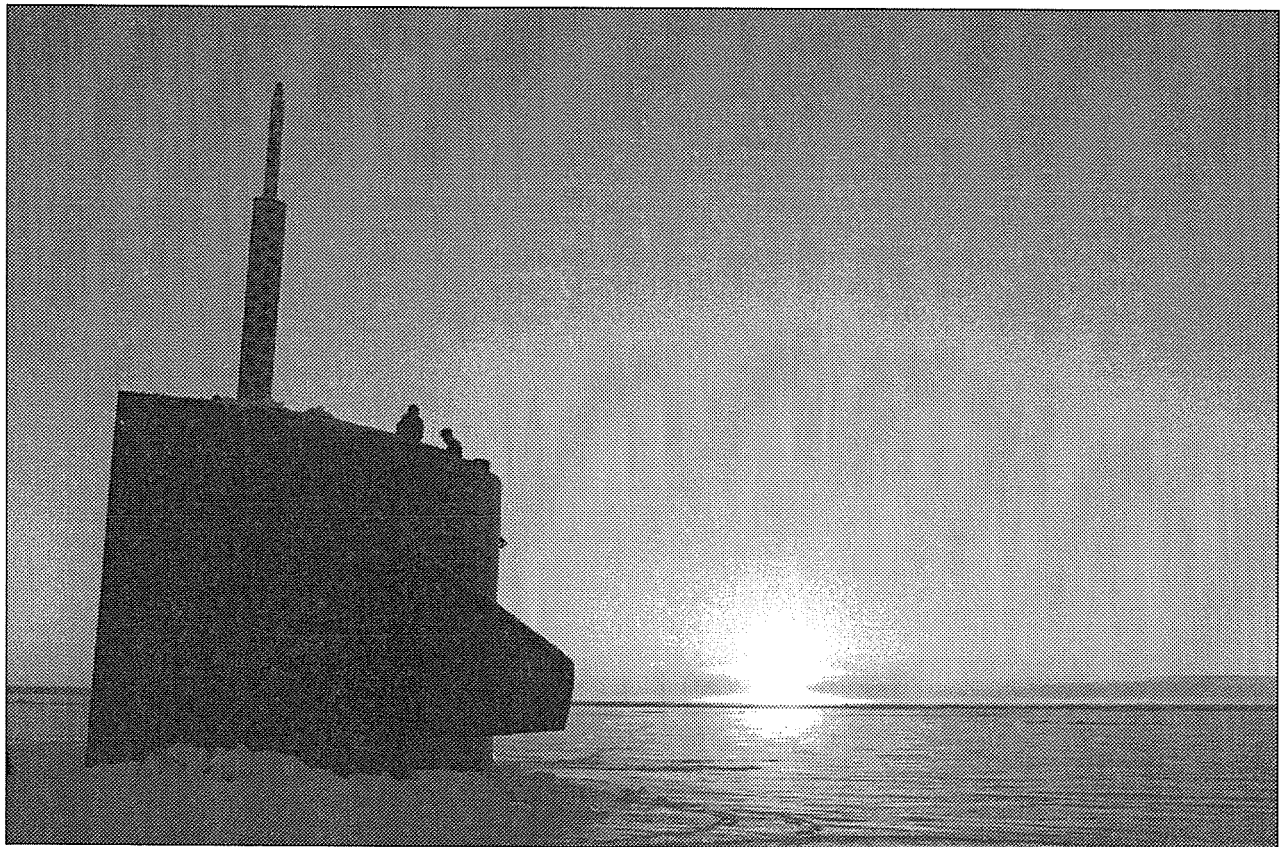
**A high premium on initiative and stealth.** In both undersea and air-to-air combat, the winner will be the one who can enter the fight unobserved, take the first shot with impunity, and disengage at will. Since the SSN, in a manner of speaking, was the original *stealth fighter*, submariners have known this for years. Only with the advent of low observable technology and extended range missile capability has it emerged as the dominant tactical advantage in aerial combat.

**Overlaps in tactics and tactical repertoires.** Likewise in both undersea and air-to-air combat, employment concepts begin with getting the most out of one's platform and systems against enemy

equipment of comparable capability. From that, they progress to dynamic one-on-one maneuvering as the foundation for more complex scenarios. In both undersea and air-to-air combat, the tactics package proceeds from one-on-one to one-on-one-or-more (or one-versus-unknown). Where the point of comparison breaks down is that fighter engagements will usually be many-versus-many - an unlikely scenario in SSN combat.

More to the point, the winning edge in both cases involves an amalgam of good situation awareness going into a fight, plus the ability to analyze and sort quickly, make crisp commitment decisions inside the enemy's information processing loop, get off a valid shot, and then reengage from a position of strength or exit the fight to safety. The big difference lies in the way in which the time factor plays in the two cases. In aerial combat, elapsed time from initial vector to weapon impact and disengagement will be minutes at most. In the SSN world, things generally proceed more slowly at first, with the premium going to perseverance and steel nerves. But in both cases, events begin unfolding quickly as the endgame approaches. Also in both cases, the side with the better situation awareness will invariably command the tactical advantage.

**Overlap in mission character.** There is at least an indirect resemblance between the offensive sweep missions in the air-to-air and undersea warfare worlds. In both cases, the classic injunction *lose sight, lose fight* applies, although in air-to-air, *sight* may include a radar paint, and in undersea warfare it obviously refers to sensor contact. Likewise in both cases, there is a premium on making the most of guile and deception. There are points of comparison as well in the use of passive defenses, such as decoys, chaff and flares, and other countermeasures. With respect to cueing, there are



analogs in the uses of offboard support by radar surveillance platforms like the E-2 in the case of the fighter pilot and the combination of the P-3, S-3, and ASW destroyer for the submariner.

**A clean fight.** In theory at least, fighter pilots die alone, while submarine commanders go with a lot of company. But in both cases, moves and countermoves are distant, impersonal, and anti-septic. And in both cases, the tactical problem is generally couched in terms of the attacker against the opponent's *platform*, with the priorities typically being to survive first and then win.

**Maximum weapons range is a pivotal consideration.** Likewise in both cases, if the attacker's reach is greater than the defender's, the attacker can control the fight from initial moves to resolution and disengagement. Contrariwise, fighter pilots and SSN commanders can both use angles and speed to negate or defeat an opponent's shot - if they have the requisite performance margin in their own platform.

**Smart last-ditch maneuvers can be a lifesaver when energy and ideas have been exhausted.** By throttling back and releasing flares, fighter pilots can defeat all but the most sophisticated infrared missiles. Similarly, SSN commanders can employ countermeasures or go to all stop to reduce noise and negate an enemy's targeting solution. That said, a world class guns defense in close air combat, or a *Red October* last chance break turn during the crucial endgame of an SSN engagement (the movie depiction of the latter no doubt a considerable exaggeration of real world SSN maneuvering), depends critically on good situation awareness and timing. Anyone attempting such a tactic had best have a viable disengagement option. Otherwise, he may simply be helping to solve his attacker's problem.

**Fair fights are a losing proposition.** Both submariners and their air-to-air compatriots will seek to avoid, at all reasonable cost, the sort of close-in engagements that fighter pilots have aptly characterized as "knife fights in a phone booth". In each case, in the terminal phase in which the opponents are eyeball-to-eyeball (figuratively speaking, in the submariner's case) and committed to the fight, it is often very difficult for either side to disengage cleanly. That means a high probability of a kill by the luckier or more aggressive and tactically astute combatant. Accordingly, the preferred game plan in both mediums is to conduct standoff combat, in which stealth and surprise are the pivotal factors. Ideally, the first indication that a fight is on should be a fire light in the enemy's cockpit - or the sound of an incoming torpedo in the enemy sonarman's headset.

**Knowledge warfare is the name of the game.** This applies especially if there are major asymmetries in the opposed weapons at play. An example in air-to-air combat would be a situation in which one side had launch-and-leave radar missiles and the other did not. Knowing one's own and the enemy's platform and weapons performance parameters and limitations, plus the tactics and operational proclivities of the other side, is crucial to success in both mediums.

**The human factor will usually be the swing variable.** The Israeli Air Force's chief of training opined some years ago that "the three most important ingredients in air-to-air combat are aggressiveness, aggressiveness, and aggressiveness". He meant disciplined aggressiveness, to be sure, not the headstrong combativeness of a bull in the ring. But aerial and undersea warfare are closely akin in not being forgiving places for the indecisive. Baron von Richtofen in World War I well described an irreducible trait of the winning air warrior as "the spirit of attack born in a brave heart".

This has commonly been taken for granted in the case of the fighter pilot. It has not, however, been a part of the stereotypical image of the submariner. Yet Norman Friedman has offered a useful corrective in the latter regard: "When we went to nuclear subs, Admiral Rickover, who ran the program, was an engineer, not really a combat type. To this end, every officer commanding a nuclear ship is a nuclear engineer. But what you really want in a submarine commander is a pirate."

Just as basic flying ability is an insufficient precondition for the successful fighter pilot, so is nuclear engineering training for the SSN commander. Flying skills are but a means of putting fire and steel on target. Likewise for the SSN commander, the submarine is but an instrument for getting a job done. When all the polite language is pared away, the winning fighter pilot and the winning SSN commander are, at bottom, winning personality types. The airplane and submarine are only extensions of their competitive instinct and prowess.

To take the point of comparison further, the accomplished nuclear engineer is not, by the qualification alone, automatically suited to the tactically demanding hunter-killer mission in undersea warfare. There remains a core element of initiative and unwavering commitment to prevailing in combat that is key to success in that mission, without which any SSN commander will suffer an inherent liability going into harm's way.

For the same reason, in an ideal selection approach, fighter pilots are screened first for personality traits deemed essential for success in air warfare, including emotional maturity, calmness under pressure, the ability to absorb information quickly, controlled self-confidence, adaptability under stress, and a deeply rooted will to win. Then, and only then, does it become important to determine whether candidates also have the aptitude to fly an airplane. The latter is important but secondary to mission performance. Almost anyone with basic intelligence and good motor skills can be taught to fly a fighter. A different ingredient comes into play when it comes to wielding it effectively as a weapons platform. It is that added factor derivative of attitude and will which largely accounts for the difference between mediocrity and mastery. Likewise in undersea warfare, tactical cunning and boldness in execution will frequently be the deciding factors in determining an engagement's outcome.

If these points have any validity in principle, what do they mean for the submarine community in practice? In years past, submariners and fighter pilots remained seemingly light years apart professionally because they lived and operated in arenas with no functional overlap whatever. Yet with the Cold War now over, the classic high end challenges for each community have largely gone away. For fighter pilots, these were topped by massed offensive sweeps into enemy airspace, initiated by head-on missile shots from beyond visual range and devolving into swirling dogfights against the enemy's superior numbers. For fast attack submariners, they were headed by the epic hunter-killer campaign against Soviet SSNs and SSBNs, from the open ocean to the Barents Sea and other Soviet sub bastions.

Today, with the SSN community's once dominant focus on blue water sub-on-sub warfare now displaced by more littoral concerns, the combat aircraft analog for submariners has become more the Joint Strike Fighter than the F-14. That said, the rich experience of the SSN community at planning and training for sub-on-sub warfare has made for a corporate memory of great relevance to the emerging world of air combat. Low observability to enemy sensors

will be the dominant design feature of the next generation of fighters. In light of that, it seems more and more that submariners and fighter pilots have much in common to talk about. As the seams between force elements in all services continue to give way to the need for more rational force integration and joint employment, there are manifold reasons for combatants of all types to get to know one another's mission responsibilities better. Toward that end, submariners and fighter pilots would appear almost perfectly positioned to set the example.

Of course, some might object that this is an artificial matchup in the end, since much the same could be said for officers in *any* combat arm, whether undersea warfare, fighter aviation, or, for that matter, infantry, artillery, armor, surface naval warfare, or special operations. Up to a point, there is merit to such a view. The warrior ethic is generic and should inhere indivisibly in *all* military professionals, regardless of their mission tasking.

Yet to insist on such a leveling rule to a fault would be to ignore a special tie between submariners and fighter pilots that sets them apart from most, if not all, of their fellow combatants from other walks of service life. Both are literally at the sharp end of the lance when it comes to contact with the enemy. Both have full control over their tactics execution. In each case, their platforms and weapons are direct extensions of themselves. And their personalities and situation assessments figure centrally in the course and outcome of the fights they win or lose. In light of that, a gathering of attack submariners and fighter pilots aimed at exchanging operational insights on points of force employment where the two communities have features in common might make for an eye opening professional experiment for all concerned. It is a fair bet that the overlapping practices that would be unveiled through such an exchange would be as revealing as they were surprising to most participants on both sides.

To be sure, it would be a stretch in the extreme to suggest that just because of the surface similarities between the two modes of warfare, attack submariners and fighter pilots would stand to learn much of *direct* applicability to their respective missions by talking to one another. Short of that, however, the two communities could profit greatly by paying closer attention to how each goes about such common *processes* as prospective commanding officer screening, mission planning tactics development and validation, coordinated operations among diverse force components, and integrating technology, tactics, and training. The SSN and air-to-air communities should also have pertinent experiences to share with respect to technology application, most notably in the areas of information assimilation and display, combat data prioritization, and task management under stress.



Perhaps the most accessible bridge linking the two communities might be their vernacular associated with the dynamics of combat engagements. Fighter pilots use terms like high-low split, single-side offset, resolution cell, and so that relate to team tactics. Similar terms of art in the SSN world would no doubt resonate familiarly among fighter pilots. And for sure, any fighter pilot who had a chance to observe a sub-on-sub training engagement at first hand from the attack center and to monitor the debrief afterwards in the wardroom would feel almost instantly at home, since he would have seen it all before when it came to fundamentals. That was certainly my dominant impression gained from watching four days of sub-on-sub operations as an invited guest during a PCO training deployment in USS ATLANTA (SSN 712) in 1996. Might the same be said of a submariner after a day spent flying as an observer with a fleet fighter squadron? Whatever the answer, a trial operator-to-operator dialogue between interested representatives from the attack submarine and fighter communities would not only break new ground among naval warriors; it could also yield a learning outcome of untold professional value to both.

*The author is a senior staff member at the RAND Corporation. A civil-rated pilot and longtime specialist in air power, he has flown in more than 35 different fighter, attack, and jet trainer aircraft types worldwide. He also has attended portions of Navy Fighter Weapons School (TOPGUN) and has trapped twice in USS KITTY HAWK (CV 63) in an F-14 with VF-1. While preparing this article, he spent four days in USS ATLANTA (SSN 712) observing prospective commanding officer training in sub-on-sub operations.*

*Author's Note: For their helpful comments on an earlier draft of this article, I would like to thank RADM (Ret.) Frank Lacroix, CAPT Jay Donnelly, CAPT Bill Ostendorff, CDR Kevin Peppe, and CDR Chris Ratliff.*