

## Q & A – February 2003

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*(From a Usenet discussion regarding the MAD-defeating effectiveness of the titanium hull in the Alfa, Papa, Sierra & Mike submarine classes)*

*-"Do you suppose the galley, bulkheads, seats, pipes, tubes and toilets were made of titanium, too?" - JCC*

*-"No, this is the Soviet Navy, not the US Air Force" -- Brad Meyer*

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### **OlegM:**

[...] I have always wondered what exactly Soviets hoped to achieve with late 70s rebuilding of their surface fleet, advocated by admirals like Gorshkov etc.?

I mean, when you are clearly inferior in surface naval forces - you build subs! That should be clear as morning sun. Why waste precious little resources you have in floating mammoths (by modern naval standards) like Kirovs, Slavass etc.?

Defense of the motherland? You can always defend with subs, land based airforce, or even static SSM sites along the shore. You don't need Kirovs or Sovremennys or Slavass to defend your coastline.

Break-in to Atlantic to raid convoys, Bismarck-style? Ridiculous, don't you think? In the age of satellites they'd be discovered in a matter of hours.

"Imperialist" blue water navy, to show off around the globe? AFAIK, they never used surface units in "imperialist" fashion, like, to form a squadron and base it in some friendly African or Asian base etc. There was some talk of Soviet naval Indian Ocean squadron, but I haven't been able to read much about it.

Way I see it, in case of conflict - Soviets would do EXACTLY as Germans did in WW2 - they would use their surface forces to support conquest of Norway. They'll most probably get Norway, or at least most of it, but losing half of their surface forces in the process, to NATO subs and aircraft, as did Germans.

From then on - it'll be just subs and land based long range bombers from Norway bases - which is exactly what Germans did in WW2.

On the other hand - some of their surface units surely are impressive platforms. So, in what fashion did they plan to use their surface fleet and how realistic their plans were?

### **Byron Audler:**

*Why waste precious little resources you have in floating mammoths (by modern naval standards) like Kirovs, Slavass etc.?*

Well, for starters, the Soviets have always invested a serious percentage of their naval budget, going all the way back to the end of WWII. Their first means of power projection at sea were the ballistic missile boats and the guided missile subs. The bad thing about those subs, though, is that you can't see them. Part of the usefulness of a Navy, is to have that large, grey, low lying silhouette, bristling with antennas and barrels, quietly sliding through the ocean, brimming with purpose and menace. Ask Perry....Ask Teddy Roosevelt. They knew the value of simply parading a huge warship around. It makes a statement all it's own about a nations intent. And the point isn't always to be made to future and possible enemies...it's also for the home folk, who have something tangible to see and hopefully appreciated the cost in treasure they represent.

*Break-in to Atlantic to raid convoys, Bismarck-style? Ridiculous, don't you think? In the age of satellites they'd be discovered in a matter of hours.*

As for this one, I suggest you ask some of the professionals about this. If you know the empheris of the satellite, then you can quite easily avoid them. As I understand it, the satellite does not really "see" the ship; so much as it "sees" the wake. I realize this does not hold true for RORSATs, but then again, there not so many of these aloft.

*On the other hand - some of their surface units surely are impressive platforms. So, in what fashion did they plan to use their surface fleet and how realistic their plans were?*

Just my guess, but I'd say you were near enough. A lot of the Sov warships toted whacking big, one shot, one kill cruise missiles, whose sole target were the NATO carriers, preferably the big ones, but an ASW CVH would do just as nicely. I suspect that their surface assets would do as you suggest, protect the Scandinavian flank, and their Pacific ports. They might in a pinch, sortie against a CVBG in a combined arms strike with aviation and sub assets pitching in. Don't forget this as well: it's easier to hunt subs in a group, and the better the group is at self-defense, the better it will stay alive long enough to kill subs....or enough of them.

## **Dimitris Dranidis:**

There are further points in favor of surface units in the Soviet Navy:

1) Even such a short amphib hop as from Murmansk to northern Norway is a major undertaking of Sea Control. To ensure that the HVAs (amphibs) will reach the destination in sufficient strength, you need to provide them protection from air and sub attacks. In theory, this can be provided by land bases, but the distances involved make this impractical real fast. The only practical solution is organic AAW and ASW capability, and if you don't have a CTOL carrier around, only surface ships (possibly with SSN/SSK support) can provide this.

The Soviet involvement in Third-World affairs in the 70s/80s, with the frequent expeditions of surface and amphib groups in various countries, only intensified this need.

2) The big capital ships (Moskva, Kiev, Kirov, Slava) were built primarily to support the SSBN bastions. The Kievs would coordinate the ASW groups, the Kirovs would lead the anti-surface forces. As the Sovs learned during Okean-70, coordinating from land centers all the assets that participate on bastion patrol duty is a major PITA: you have to transfer command & control (or some degree of it, anyway) to sea. Now, the platform that will act as one of the command nodes needs to have:

- ample displacement, volume and power available for the command systems (this problem was even more acute for the Soviets, due to their inferior state of electronics), as well as extra facilities for the command staff.
- excellent real-time communication with other air, sea and land units for effective control & coordination.
- ample ability to rapidly transfer command personnel to and from the platform, i.e. at least rudimentary helicopter facilities.

All these abilities are the province of surface vessels.

OTOH of course there is no denying the fact that the Soviet Navy always relied on submarines and long-range aircraft as its primary means of power projection and Sea-Denial operations.

## **Ragnar Emsoy:**

I can strongly recommend Milan Vego's book "Soviet Naval Tactics". The book costs a few \$\$\$, but it is a big \*MUST\* for all serious Harpoon players (and especially if you're a Cold-War nut and hard-core Harpoon 3 scenario designer, hehe). What I especially liked about this book is that it uses Soviet terms, not NATO terms, which gives a special 'feeling' too it. For example ASW is known as 'struggle against submarines', and the term 'struggle on sea (oceanic) communications' is what NATO knows as both anti-SLOC and pro-SLOC. And I think the book will explain all of your above questions in detail.

Anyway I'd like to add a few things to the previous posts:

According to Milan's book, the Soviet large SSM-armed surface ships were intended to be used against enemy (NATO) SSM-armed ships. According to Soviet thinking, surface ships using mainly passive sensors (!) were the most effective platforms for accomplishing this task. Secondary missions were in-theatre offensive actions against convoys, amphib groups, as well as destroying enemy installations and troop concentrations on an enemy-held coast. The large missile ships of the Soviet Navy included classes like Kildin/mod, Slava, Kirov and Kresta I.

It appears Sovremenny DDGs were not considered to be large SSM-armed surface ship. Nor were they placed in the same class as small missile ships (like Nanuchka and Tarantul). These DDGs would be used to destroy enemy warships and merchants, for scouting, patrolling, shore-bombardment, support of amphib landings, and to lay mines. The ships thus shared quite a few roles with the ASW DDs.

Now, please notice that none of the above missions included strikes against NATO carrier battle groups. This task would go to the AV-MF (naval aviation), long-range and short-range missile submarines, and nuclear attack submarines.

For an in-theatre anti-carrier strike, Tu-95s and other long-range radar platforms as well as reconnaissance Tu-22R Blinders would go looking for and try to identify the carrier (or other high-value units). Once found, submarines and aircraft would attack simultaneously or in succession, depending on the type of target/defenses and the assets at hand. The general rule was like this: One or two SSG/SSGNs (Charlie, Papa) with short-range missiles would attack first, attempting to sink screening AAW ships. 20-30 minutes later, four to six SSG/SSGNs (Echo II, Juliett, Oscar) would launch their long-range missiles. The next wave would follow after another 20-30 minutes and would consist of one to three regiments (18-20 aircraft each) of naval bombers (Backfire, Badger) approaching over a wide sector (180 degrees or more). If both Backfires and Badgers were to be used in the same raid, the high-end Backfires would attack first, followed by the older Badgers a little later, ca 20 minutes. Then, if ship-launched SSM were available (in most cases they would not), these would now be launched. And lastly, one or two attack submarines (Victor, Akula,

Sierra, Alfa, November) would be sent in 1/2 hour after the final missile had struck home to finish off damaged and surviving ships.

Now, Vego repeatedly questions the Soviet's ability to carry out such an attack 'by the book', mainly due to C3I but also doctrine and force-control-related difficulties. Also, only a few of the above assets would be in place at any given time. And a typical strike would be limited to, say, only two short-range and six and long-range missile submarines used together with two naval bomber regiments.

Prior to 1987/88 and the widespread introduction of the Su-27 Flanker, the naval bombers did not have fighter escorts. Achieving surprise and attacking over a broad sector (high dispersal) was therefore extremely important as the Backfires' only defensive measures was their high speed, on-board ECM systems and escorting Tu-16 Jammers. It was also hoped (or assumed) that the long-range submarine-launched SSMs fired 20-30 minutes before the bombers would launch their own weapons would soak up the defending F-14 fighters' Phoenix and Sparrow missiles. If not, some of the bombers would also launch their AS-4 Kitchen (Kh-22) missiles at 'less-than-effective' range. I think this means at ranges of 300nm or more. But normally Backfires and Badgers would launch their missiles at 170-200nm, using their on-board radar to acquire the targets.

So, where did the Soviet aircraft carriers planned for the early 1990s fit in all of this? Well, I think you can consider the Soviet carriers being an extension of the large missile ships. Main roles would be in-theatre offensive actions against enemy surface ships, convoys and amphibious groups, as well as support for amphibious operations. And unlike USN carriers, the Kuznetsov offer little if any (overland) power projection capabilities. The carrier would carry a rather limited number of Su-33s for use the air defense role, and the carrier battle group's main offensive weapon was anti-ship missiles on the carrier itself (12x SS-N-19 on the Kuznetsov) and on the escorts.

And so, with Soviet warships used mainly for the in-theater strike and escort role, only the submarines would be tasked with raiding the Atlantic sea-lanes. Which is exactly what the Germans did during WWII.

We have put all of these tactics in to good use in the scenarios we have made for Harpoon3, to give you the feeling of fighting the real 1980's Soviet Navy.

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### **Steve Mills:**

Can anyone update me regarding the latest on the Tornado F3? This is mentioned in the first Waypoint and suggests queries be e-mailed in. However the link appears to be broken.

In essence, the conclusion of the article is that the Tornado's engines are geared towards low-altitude performance and the speeds would be accordingly adjusted. Don't the interceptor versions have different engines to the attack versions?

### **John Cleary:**

Yes - the Tornado F.3 has a different version of the RB199 turbofan (Mk104 compared to Mk101), which has a longer afterburner section to give higher thrust. ISTR that the engine and associated sub-systems were optimized in light of the greater amount of time the F.3 would spend at high altitude (this was back in the days when RAF strike aircraft operated exclusively at low level).

It should also be noted that the F.3 has a slightly different airframe (only 80 percent common with ground-attack versions). The airframe is longer (extra fuel tank) and marginally more aerodynamic (more pointed radome, higher maximum wing sweep). According to the official stats, the F.3 is marginally faster at high altitude (Mach 2.27 compared to Mach 2.2 for the GR.1).

I don't know if the Tornado would be faster if it had engines that were designed for high altitude work from the start (like the EJ200 in the Eurofighter Typhoon), but the stats reported in the usual guides (Jane's etc.) already take any limitation in account.

### **Steve Mills:**

There is something clearly wrong with the changes proposed to the Tornado F3 database changes, or alternatively the original article is worded wrong. You state that the Tornado was never a dogfighter which is correct and I was aware of. However, you also state that the type was optimized as a high-speed interceptor. The proposals make it the slowest platform I can think of. The wording of the Waypoint article suggests lowering its top speed to 792 knots maximum. Most of the family will be at around 650 or 680 knots. The article also states that at higher levels its performance will be poorer or implies that. This doesn't make any real sense to me. At what level of altitude does a Tornado achieve Mach 2.27? If not, is every single article written about the Tornado incorrect? I appreciate you also have good authorities but it is hard to reconcile the two different speeds. I have also spoken to people who worked on the project who stated in respect of the Tornado (admittedly the IDS) that it was the fastest plane in the world at sea level. Basically my question is if the speeds at low level barely exceed mach one, and at altitude the type cannot exceed mach one (or barely as the article implies), why on earth do so many sources state Mach 2-ish as its speed?

The other thing that bothers me slightly (and it's hardly a true test I'll admit) is that the F3 puts on a decent display at airshows. It's no dogfighter that's clear, but it's also clearly not a slow aircraft either. I'd be interested to hear what is now thought to be the top speed of the F3 and at what altitude it achieves this?

## **Steve Holland:**

I used to be in the RAF on a Phantom FGR2 squadron, at the time that the Tornado F3 was about to come into service.

What I can tell you is that nothing was faster than the Tornado at low-level with the exception of the F-111. The Tornado F3 was designed as an Interceptor, not a dogfighter as mentioned in other posts, which could loiter for some hours two hundred miles from the coast without AAR.

To achieve this, some design changes were made to basic IDS model (GR1). These included more powerful engines to aid acceleration, lengthening the fuselage to allow more fuel to be carried internally but also to increase the fineness ratio to allow a greater top speed, this also aided it to get through the mach 0.95-1.05 region quicker. Also semi-automatic wing-sweep was added.

The article in Waypoint #1 that kicked all this off stated that the Tornado routinely refuel using afterburners, that I can't comment directly as I don't know whether we are talking about the GR1/4's or the F3's or what AAR platform is being used. Why are these important? Two reasons: Firstly the GR's are not as aerodynamically efficient and normally carry the added drag of attack stores. Secondly, what I can tell you is that the Phantom FGR2's used to have to have burner in to refuel - from the Hercules C1(K) aircraft in the Falklands as the Hercules was at full throttle, at refuelling height, was only just above the stalling speed of the FGR2 so the burner was needed to keep the FGR2 flying at that AOA and height.

The reality is that the RAF got a weapon system that had longer range, a higher top speed, a greater intercept capability and a better dogfighting capability than the FGR2 that it replaced. Could it out-accelerate the FGR2? That I can't answer.

Finally, if we were going to try and apply real-world operating criteria to one aircraft platform, you would have to apply it to all. For example, we all know that the Foxbat can do Mach3+ and that the F-15 can do M2.5, however neither come close when loaded with full fuel, missiles and drop tanks.

May I suggest that we check whether the speeds that are quoted are IAS, as at 40000ft 480kts IAS equals 854kts GS, approx, which is M1.5, approx.

The Harpoon Classic/97/2002 system does not take into account the drag and load factors in aircraft performance, nor does it increase the performance of aircraft that have just delivered ordinance and are making their getaway. The system is a compromise, accepting at face value the air platforms' published maximums. You can't change one without changing all, that would be wrong. Maybe that level of reality should be left to Harpoon 4.1/5.0 when it can be applied across the board.

After all, is any really saying that a Tu-22 has a pull away speed of 280kts at 12000 metres (Tu-22 published top speed of 802kts)!

The bottom line is that until the game system and all the platforms are amended in the same way then the aircraft should remain the same.

## **Craig Paffhausen:**

The Tornado family, as the article states, has engines (the RB.199) that are optimized to give greatest fuel economy at very low altitudes. At about 8000 meters as stated in the article the engines performance begins a rapid drop off to subsonic speeds in the IDS family at about ~9000 meters. The engines do not deliver enough thrust to accelerate the Tornado to a speed much above Mach 1 at any altitude. YES, the Tornado CAN break Mach 2...but only after a very, VERY long run in full afterburner. In game terms, that means these planes are strictly a Mach 1.0 plane at most altitudes.

My sources for this information are several issues of World Air Power Journal, several interviews with USAF Pilots and Several interviews with RAF pilots of the Tornado. It takes the F-15 about 1 minute to go from subsonic to Mach 2.5 Fully loaded. It takes a CLEAN Tornado several times that.

## **Steve Mills:**

The more I think about it, the less happy I am with the proposed changes to the database RE: the F3 Tornado. If the plane can break Mach 2, then it should do so in game. In my view its as simple as that, sorry. The acceleration up to Mach 2 is not modelled in the game at all. The game assumes that a speed setting selected results in an immediate increase. Unless this is changed, I see no real reason to penalise the Tornado. I have to say, I also have some doubts

that we are comparing like with like as well. I have seen a number of reports (oddly enough, on the II-2 forum) that suggest that an F-15 cannot keep up with a tanker in a climb once refuelling is completed. I hasten to add, I suspect this is another case where we are not getting the full story. If the F3 is to be changed to represent the fact it cannot reach Mach 2.2 in an instant, can the CVNs I am trying to torpedo please be changed so they cannot turn on a pixel at 30 plus knots please!

**Steve Mills:**

While I don't want to harp on about a subject, the issue regarding the Tornado F3 seems very clear indeed to me.

In reality the F3 can make Mach 2.2.

In reality the F-15 can make Mach 2.5

Both currently can make this speed in game by selecting flank speed. It happens instantly and might not be altogether realistic but produces reasonable representations of air combat.

The Tornado is (I understand) going to be downgraded, and not by just a little bit either.

I agree most combats in "reality" would take place at or below Mach 1. I agree it actually would take a plane some time to reach Mach 2.

However, we will have the situation where the F3 will be one of the slowest platforms in game. It will be downgraded for reasons that all combat aircraft suffer from, and all other combat aircraft in game will remain where they stand currently. How on earth can this stance be defended ?

**Craig Paffhausen:**

The reduced speed is completely in line with H4 Mini rules. Larry Bond has designed Airspeed acceleration into the rules by limiting the top speed of aircraft depending on how fast they accelerate, how they maneuver at speed etc. IF you look in any H4 annex, you will find the maximum flank speed of an aircraft does not approach anywhere near the plane's real-world maximum speed.

Here are some examples:

From Command at Sea (same basic rules just set in WWII):

F4U-1D Corsair. Flank speed 359 KTS Real speed 404Kts

P-51D Mustang Flank Speed 435 KTS Real speed 440kts

And now from H4.1 Mini rules:

F-4E Phantom II Flank Speed 1244 kts Real speed 1450kts

F-15C Eagle Flank speed 1358 kts Real Speed 1680kts

I have used planes of the United States as they are the ones with the most accurate performance data available. Sources DO vary, so the F-15 and F-4's speed can vary by as much as 10%.

Thus Aircraft ARE properly modeled in both Computer Harpoon games. Ships and their ability to turn on one pixel or less, and perfect acceleration are still bugs in BOTH the computer Harpoon games. Or should I say "Features?"

**Steve Mills:**

Bah - the penny finally dropped...

Pretty much most aircraft under the DB2000 now max out at 800 knots, so the Tornado proposals would not be unbalanced. That'll teach me for always playing on the Russian side.....

Apologies - I though we still had the situation where F-15s hit 800kts on military thrust alone.

**Dimitris Dranidis:**

This is one of those "paper vs. reality vs. simulation" issues. Yes, the Tornado F3 can do Mach 2. But under what circumstances? At the stratosphere, after near-emptying its fuel tanks on afterburner and without any weapons whatsoever? And for how long can it sustain it after reaching it? How practical is that value for the environment that the Harpoon series simulates? (Actual combat with weapons load, various altitudes etc.)

Lets' get back to the CV example: Maximum speed ~30-31kts. How often does it reach that speed in actual use? Very often, both when transiting and when turning against the wind to launch heavily loaded aircraft, and can easily attain it under any other circumstance (including very heavy sea state). How long can it sustain it? Quite long for CVs,

practically indefinitely for CVNs (the nukes also have their hull-lines optimised for high speeds, in contrast to most warships). So it makes perfect sense that it gets the full 30kts treatment in the DB2K.

Another example: MiG-25 vs SR-71. Both can do Mach 3.2 on paper, and both have demonstrated it in actual flight. However, the Blackbird regularly clocks this speed and can sustain it for a significant portion of its flight. The Foxbat almost never goes above M 2.8-3, as the engines are going to be wrecked, and its endurance at this speed is relatively small, because of its limited fuel tankage and high fuel consumption. So it makes sense that the DB2K stats give the Blackbird a definite speed advantage.

Same with anti-air missiles and their extremely optimistic brochure figures. Same with radars. Same with passive sonar sets. The list goes on and on.

Entering values for near damn everything in the DB2K is never as simple as grabbing a bunch of figures from this book or the other and dumping them into the data tables. Each and every piece of information goes through a filter of careful critical analysis: How "true" is that data? Who is the source? Cross-references? Does it "jive" with other previously established information? Does it make sense? Is it a "paper" ability (e.g. MiG-25 at M3.2) or is it being used regularly? Does it "fit in" with the other components of an integrated weapons system? (e.g. if for a 100km SARH missile you have an illuminator that reaches out only to 50km, it means your missile is hampered to less-than-paper parameters). Rag and the rest of us take quite a bit of time to update our data, and there is good reason for it: this whole filtering process is time-consuming, but we deem it worthwhile.

### **Art Chausmer:**

I think it is important to remember that there are different airspeeds and that one must note the difference. Much of the posting about the Tornado makes note of the IAS of 800 kts at altitude. Indicated airspeed (IAS) is NOT the same as true airspeed since air density decreases with altitude and IAS measures the effect of "impact" air on the static system. The true air speed corrects for altitude and temperature. In most airplanes, at least the ones I fly, there is a correcting ring on the air-speed indicator to give you TAS for a given IAS, temp and altitude.

Finally, there is calibrated air speed which, as you might imply, corrects for each individual instrument. Ground-speed (GS) of course is affected by winds and represents a track across the ground and has little to do with IAS or TAS.

Mach-meters compute the speed of sound for a specific altitude and temperature and give, essentially, a true air speed with reference to the speed of sound under specific conditions, not related to things like MPH or KPH airspeed.

Hence, to have an indicated air speed (IAS) of 800kts at altitude is very fast indeed, much greater than 800kts TAS and certainly supersonic by a lot.

### **Ragnar Emsoy:**

Acceleration and turn rates are planned for aircraft in Harpoon 3. Both will be based on the H4 rules, using the ATA values to determine performance. Is that cool or what? ☺

### **Craig Paffhausen:**

As stated previously, the Tornado has a severe performance penalty at high altitudes. It has become apparent to me that people are now assuming that the DB2K staff are blanket-adjusting the speeds of all aircraft downward. In truth, only the Tornado family is affected by this.

In the clearest way possible I want to lay to rest this discussion.

1) The Tornado F.3 CAN fly at Mach 2.2 at about 6000 meters altitude. This is a lot lower than most aircraft can fly that speed at. That is because the engines were designed to give Mach 1.1+ performance at sea level. However, in designing the engines to give Mach 1.1+ performance at sea level, the high-altitude performance was sacrificed. To put it bluntly, the Tornado engine test-bed for the EJ.200 program literally flew rings around the stock Tornado F.3.

2) The commonly held figures for the Tornado are NOT ACCURATE! The Tornado can NOT even refuel from a tanker without using its afterburner! Yes, the RAF's motley collection of VC.10s, L1011s and other converted airliners CAN outrun a non-afterburning Tornado!

3) The fact that as a platform gets older more accurate information becomes available has been lost on many of the community. Most of the information I gathered for this article comes from two World Air Power Journal issues as well as interviews with prominent RAF test pilots of high regard and caliber arranged through an equally prestigious but privately-held (at their request) source.

This all being said, I have found out that the calculator I used to calculate True Air Speed from a Mach number was not properly factoring in air pressure. Nor did I at the time factor in weapon loads. The numbers that were in the

Waypoint article are about 10-15% lower than they should be. No, the Tornado IS NOT capable of doing Mach 2.2 routinely. I will be including an updated table in Waypoint #3 to correct this. I have one new source that I am waiting to pan out before I call these numbers hard (if it pans out completely, I will have confirmed from three un-related sources the vastly overblown performance data on the Tornado F.3). Here are some good numbers that I can throw out now, to give you an idea of how poor the RB.199 engine really is for the F.3.

One bit of data that I have a relatively hard lock on is the max speed of the Tornado Test bed vs. a standard Tornado F.3. The EJ.200 Tornado sustained a Mach 2.0 speed with a peak of Mach 2.23 at 11000 meters. The best I have found thus far (again waiting on one new source) for the F.3 clean with RB.199s is sustained Mach 1.72 @ 7300 meters. This is in a CLEAN condition!

There is a BIG difference between Peak speed and Sustained speed. The only modern combat plane that could sustain it's peek speed that I am aware of is the B-70 Valkyrie whose CRUISE speed was Mach 3.02 at just below 80,000 feet. That was due to a very interesting design concept called Compression lift.

I hope the above helps to clear the issue at hand up. The DB2K staff is NOT artificially limiting any platform(s) to make things "fair", or the game "more playable" etc. We ARE adjusting as new information becomes available and when we can we use SUSTAINED Max speed for our calculations.

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### **Ragnar Emsoy:**

Does anyone know if more than one command-guided AS-7 and AGM-12 missile can be fired (i.e. guided) simultaneously? Now that weapons in H3 are also limited by the available datalink channels [from DB2000 v6.3 onwards], I'd be very interested in getting this number right.

And what about Walleye, Hobos and GBU-15? How many weapons can be kept in the air at once? And AS-13/18?

If I have 6x A-7Es each armed with 2x Walleye bombs, how many weapons can be fired at once? I have one source that says the pod could operate on two channels, so that two aircraft could each fire one bomb. The six A-7Es would then have to attack in succession, with only two bombs in the air at any time. If this is the case, the Walleye is almost useless as an anti-ship weapon and can not be used as the Ultimate ship-killing weapon as it is today.

### **Craig Paffhausen:**

In a nutshell, you can have one bomb in the air per pod. The ERDL pod of the Walleye is 2 channels: 1 from the missile and 1 to the missile.

### **Ragnar Emsoy:**

I found this on the web: <http://www.ordnance.org/walleye.htm>

*"Tactically, the two-aircraft operation dominates because of the limited number of available pods. For example, a one-pod configured aircraft monitors the weapon control functions for several individual weapon launchings during one mission (not simultaneously).*

*The three frequency channels (A, C, and E) are used to control the individual weapons launchings. The three channels prevent the control section of the weapon from responding to override (steering) commands from a pod that is not set to that weapon's specific frequency channel. Therefore, more than one weapon/pod operation can be conducted in the same area."*

Does this mean up to three bombs can be guided at once, one each from three different aircraft?

### **Peter Grining:**

Sounds like 3. Also note the AWW-9/13 weight is given as 270 kg, this corrects the current Annex G2 'Walleye II ERDL Data Link', which currently has a an estimated weight of 100 kg.

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### **TheRivash:**

I heard F-14 are going to be phased out of US navy, as a result of their aging status. I was just wondering if that means the demise of a superb Air Intercept Platform, it being the only fighter to be able to launch the Phoenix. Does this have to do with the new strategic situation, assuming that there is no longer a need of a long-range interceptor in the Navy? Or is it going to be substituted by a newer incarnation? Are there any other fighters capable of using the Phoenix? It struck as strange that these planes are being taken away, i had always thought of them, and my Harpoon experience had told me, that along with an AWACS, these things were a mainstay for my fleet...

### **Dimitris Dranidis:**

The F-14 was designed for a very specific mission profile: engaging large numbers of AV-MF bombers at long range, plus any ASHMs that these bombers may launch before being shot down. Today this threat has diminished, both politically and physically.

The modern threat profile is a hypothetical swarming attack by multiple low-RCS short/medium range AShMs (or alternatively scores of tactical aircraft), possibly coming from multiple directions so as to overwhelm the CVBG's defences. Against such a threat you want as many fighters in the air as possible, armed with lots of reliable and relatively inexpensive missiles. They don't necessarily need to be very long-ranged, as the potential threats do not possess the formidable stand-off armament of the AV-MF, and instead they have to approach the CVBG fairly close before using their weapons.

Against such a threat profile, the F-18/AIM-120 pair is more effective than the F-14/AIM-54 combo. Here's why:

- More available firepower in the air: The F-14 is maintenance-intensive and thus has a lower sortie rate than the more modern F-18. What this means is that you're likely to have more F-18s in the air than F-14s, and numbers count when you have to deal with a mass attack. Also the practical Phoenix load of the F-14 is 4 missiles (you can load it with 6, but then if the enemy doesn't show up, it has to jettison two of them in order to land - not good!), whereas the F-18 can carry up to 10 (6 is IIRC the normal load). So overall you have more fighters and more missiles in the air at once. Additionally, each carrier can carry only about 120 Phoenix missiles (the thing is HUGE!), instead you can stuff it with much more AMRAAMs.
- The AMRAAM is more effective against the modern threat than the Phoenix. The latter was designed to engage the large AV-MF bombers plus the occasional Soviet-style (=large!) cruise missile. It has much reduced capability against Harpoon-class weapons and tactical aircraft. The AIM-120 was designed from the outset to engage such targets. Also AFAIK the AIM-120 can be ripple-fired in a more rapid succession than the Phoenix, which is again important when you have a bazillion small anti-ship missiles incoming.
- Soviet naval bombers had no fighter escort until the late-80s. The current threat may easily include fighters, as CVBG operations move closer to the coasts. The F-14, after expending its Phoenix missiles is virtually naked against modern fighters. Sure it has the gas to run home, but that's about it. The F-18, after shooting its AMRAAMs, is still a very dangerous dogfighter and can hold its own as long as the other guy hasn't held back any BVR bullets.

The F-14 does hold the range & endurance advantage, but these are more useful for strike operations rather than CVBG defence, and are largely offset by the presence of AAR assets. Plus, the USN is increasing its reliance on cruise missiles for deep strike, so the Tomcat's longer reach is becoming less relevant even for offensive operations.

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## **Franck:**

I find it very hard to figure out what Strike ammo works best for each type of facility. Also in the recent scenarios, towards the end of the strike, some facilities remain on the map and no weapon will attack them... Also with the AGM 65 Maverick, it seems they sometimes get launched directly at take off of the plane (Hornet) seem to fall on the target almost instantly and provoke no damage... Does anybody know why? Or what am I doing wrong?

## **Ragnar Emsoy:**

Bunkers have armor. Lots of armor. And your AGM-65F Mavericks won't kick it.

Harpoon 3 operates with several different levels of armor, and which weapons are capable against which types of armor. Like, for instance, 12.7mm MGs will do no damage whatsoever against protected areas a battleship, etc. Even mounts and sensors can be protected/armored.

So instead of Mavericks, I suggest using GBU-10/24 bombs with BLU-109 penetrator warheads, or the GBU-24B/D with BLU-116 advanced penetrator warheads. There are also versions of the JDAM with BLU-109 warhead.

The reason why you suddenly cannot attack a target that has been bombed repeatedly is that the unit may have been destroyed, but none of your units witnessed its destruction. If you drop the contact ('3'-key on the numeric keypad) and it doesn't re-appear, it has probably been destroyed.

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## **Ragnar Emsoy:**

I'm very curious about the APR-3 and APSET-95 torpedoes, which are said to have entered Russian Navy service after 1991. Did they actually enter service, or are these claims just a bluff to help sell these torps abroad (as apparently is the case for the UGST)?

Also, have these weapons actually been exported? Tnx.

## **Chris Carlson:**

Both of these weapons did enter into Soviet/Russian service, and probably India as well as that country operates Russian IL-38 MAY and Tu-142 BEAR-F MPA. Now, the name "APSET-95" is a bit of hype as this torpedo is the UMGT-1 or E40-79, which has been around for quite awhile.

The UGST on the other hand, apparently has not entered into service with the Russian Navy. The last Military Parade article I have says that it could enter in 2000-2001, but there has been nothing from the manufacturer announcing any

sales. An improved version, the UGST-M, is said to be in development and should be ready by 2004-05. Now, if you have a modification this close after the initial weapon becomes available, this tells me that maybe the first one isn't what the Russian Navy wants. I believe they will eventually go the monopropellant, thermal torpedo route as it is cheaper than silver-zinc batteries.

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## **Steven Lohr:**

I have some photos that might be useful for some of the ships that don't have them in the Database. Let me know if you are interested, and I'll send them to you. Also, if you have a list of ships that don't have write-ups or photos, I'll gradually try to work my way through the list and get them for you.

## **Ragnar Emsoy:**

Thanks for your offer, but there are several good reasons why there are no new photos in the database:

- The original photos are copyright protected and we'd have to sign papers to be allowed to edit them. Bummer. And all rights would still belong to AGSI.
- The files grow extremely large. I 'pirate-edited' one of the resource files in my early Pooning days, and the file size soon made it impossible to distribute it over the internet.
- The simulator (especially Harpoon II) does not handle bad resource links well, and crashes if it does not have the very latest version of the file.

So, Pooners will have to access other sources to look at their platforms. We are currently working on a very large web-based encyclopedia and this will be available soon, in the meantime Jane's and various web resources will have to do ☺

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## **Philip Sanderson:**

I have a suggestion to make.

Have you ever thought of releasing the changes to the [DB2000] database not as often as you do? Say do a release every quarter, I think the work you've done on the database is great but I get a little downhearted when I've downloaded all the scenarios and see a couple of weeks later another version of the database has been released with the scenarios updated (or is it me I've waited too long to download them). Which means I'll have to download them again.

This in turn will mean you've more time to develop the great scenarios you do and other scenario designers will be able to do the same. Instead of you having to re-build the scenarios as you presently do????

## **Ragnar Emsoy:**

The database is being continuously updated to reflect player requests (and we have tons of those!), newly discovered data, and the real-world situation in general. The DB is in fact updated several times a week, but in most cases these changes does not affect the scenarios in any way and are not announced. We also carry out quite a few unannounced scenario fixes and improvements: Last week we re-visited the Islands and Scud scenarios, this week the first Falklands scenario, etc.

So instead of downloading all the scenarios every time, we only recommend you to download the scens you intend to play during the next couple of weeks. And when you're done, come back and download the latest database and another small set of scenarios. Doing things this way will save you a lot of work and at the same time ensure you always have the latest and hottest scens and database ☺

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## **Steve Mills:**

I could do with a second opinion on something I have had happen in that "Polaris Hunters" scenario and only this scenario.

I tested it out again just, not sure what's going on or what it means, if anything.

Basically, if playing the Red side you run out of missiles pretty quick so its time to send in the subs.

I have run this scenario a number of times and each time get the same thing. If you attack the Italian group with subs, all seems to be pretty normal. You usually get some decent torpedo shots in and get found sooner or later depending how noisy your sub is.

However, on several encounters I have tried attacking the other group mostly of Elli class Greek ships (I think they are Greek anyway). I normally "cheat" for this and have a Helix up as spotter just so I can be sure what happens. As I close with an Elli, nothing much happens until I open fire. AT that point (and usually without fail) the Vittorio Veneto or Garibaldi launches some 9 or so helicopters which head in line for my sub. When I say in line, they literally form up and head on the exact bearing to intercept.

When I was testing out the miss/hit percentage just for the missiles I tried it again and watched what happened. At 9 NM away from an Elli and with no other contacts about, I fired a torp from a Victor III. Again 8 helicopters took off,

formed a pretty line and came towards the Victor III. They dropped one torpedo which headed straight in, no deviation whatsoever and sank me.

This was a pretty long-range attack, so I would have expected the Elli to only get a fairly weak contact if that. Is it possible for a torpedo launch to give such an accurate fix? Similar attacks against, say, a Spruance don't seem to cause such a problem.

I'm going to do a bit more testing on it, see if I can work out what's up. However wouldn't mind you playing that one from the red side and seeing if you get the same thing?

**Ragnar Emsoy:**

Hi Steve, what happened was that the enemy detected the torpedo launch. There are a number of helos attached to sub-strike missions, and once a sub is detected, they will take off and try to sink it.

Torpedoes and torpedo firings are extremely noisy and can be picked up by most sonar systems at pretty long ranges. The fact that the helos managed to sink you with the first torp was probably pure luck, normally they need some time to pinpoint your location.

So, what you need to do is get closer to the enemy ships (3-5nm) and launch your torps. Since the range is shorter, you'll be able to kill the surface ships and escape quicker.

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**Phil:**

I ordered a copy of the game through e-sellerate, filled out my lok file and e-mailed it to the correct place. I then went to the website and tried to download the latest version of the game. I then unzipped it and I got an error.

First, the harpoon3\_358.exe file size is only 2.33 megs? I think I'm missing something else but I can't find out what.

The error I get is: *"The dynamic link library alleg40.dll could not be found in the specified path"*. Then it gives a path which is really long.

**Ragnar Emsoy:**

The OpenPlay and other DLL files are available for download on the Harpoon3 site:

<http://www.harpoon3.com/harpoon3.html>

Scroll down until you get to the "Latest Version" section and download the OpenPlay Libraries (the link is in quite small letters and perhaps not too easy to spot outright).

Put the TCPIP.dll file in the following directory on your computer: "\\Harpoon3\OpenPlay Modules". Is it working better now?

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**Antonio:**

I don't know if it's just me, but I'm very confused with so many flavours of Harpoon. I have Harpoon 2 and Harpoon'97. Harpoon 2 was upgraded to Harpoon 3. Harpoon'97 is being upgraded to Harpoon'2002. Harpoon 4 is coming. I don't have money to buy them

all ☹.

Where can I find a good comparison between Harpoon 3, Harpoon 2002 and Harpoon 4? About graphics I have no [interest]. I'm more interested on realism comparison: platform modelling, sonar, AI, map, database extension (e.g. Portugal is modelled in H'97/02, but not in H3 and H4), etc.

**Ragnar Emsoy:**

The complete Portuguese OoB is of course included in the DB2K database for Harpoon3:

<http://www.harpoonhq.com/db2000.html>

The main feature of this Harpoon 3 database is that it does not only include the 'basic' version of all military units since 1980, but also all sub-versions and upgrades. For example, the Ticonderoga-class Aegis cruiser has no less than 69 database entries covering all blocks, mods and main weapon configurations from 1983 to 2009. The F-16 has even more entries, 117 in all if one also counts in the 2001 and 2003 versions of the Japanese F-2 fighter.

The DB2K covers the complete OoB of more than 60 countries, and should contain most all of the platforms you'll need for your scenarios. And if something is not there already, it can be added as long as we have good info on it.

Sonar has by far the most complex sensor model in H3, and is a 1:1 implementation of the real world. For example, detection range for passive hull-mounted sonar depends not only on sonar sensitivity. The other main contributors are self-noise, self-speed, sea state, background noise, layer, cavitation, plus the speed and noise level of the enemy submarine or ship. The detection ranges for passive towed array, VDS, sonobuoys and dipping sonar are all

calculated differently from hull-mounted sonar, as the above factors influence them in different ways. Lastly, there is active sonar, which is an entirely different matter indeed ☺

And as a last small note on sonar. H2/3 was designed primarily with the big slugfests between the 80's Soviet Navy and the US Navy in mind, and it was assumed that nuclear-powered submarines would be used almost exclusively in these scenarios. Since SSNs have to constantly keep their reactor cooling pumps running, the developers decided to have a constant noise level below 5kt. So it doesn't matter if you do 0kt, 2kt or 5kt. It's all treated the same. Cavitation is also added for both submarines and ships doing full and flank speed, which may easily result in counter-detection two, three and even four convergence zones away.

More details on the db can be found here:

<http://www.harpoonhq.com/harpoon2/db2000/features.html>

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### **Steve:**

*I seem to have run into some problems on trying to write a scenario for H3 and would appreciate help and or therapy! Is there a work round for the restriction on date change at all? IE say you have a date set to 2006, you can change the date to 2000 and save it, but woe betide you if instead you try for 1999.....*

*I have pretty much tried every combination I can think of and no luck.*

### **Ragnar Emsoy:**

Okay, there is a 'year 2k bug' in H3 ScenEdit ☺. So you cannot change century after you have created the scenario. There are two ways to overcome this problem: 1) make a new map and enter the correct date, 2) use the Harpoon II Admiral's Edition ScenEdit. I have H2 installed as well, so if you send the scen to me I'll fix it for you, no problem.

*The other is an odd one, and I can't for the life of me think where I went wrong. I have two sides so far. They are set to be hostile to each other. I have saved the scenario several times as I went through and like good opponents they still hated each other.*

This is an easy one; Since Harpoon3 allows you to create as many sides as you could possibly want, it requires you to set the side postures outright when you create new sides. After that, the postures are "locked down" and cannot be modified. But I guess that's what you get with a sim offering this level of depth and realism, huh? ☺

But there are ways to come around this one:

1. Add a facility on each side, start the sim and let it run for 5 seconds. Then select the enemy side's facility in the map and press 'H' (hostile). Switch side, highlight the enemy facility and press 'H' again.
2. Make a strike mission targeting an enemy facility.

*Now, all of a sudden they decided they'd be neutral. I can go back into the postures screen as often as I want and reset it to hostile, but it simply defaults back to neutral each and every time without fail. So, did I miss any clues ?*

*P.S remind me never ever to do this again, and a very big thank you to all those who have designed scenarios before, I honestly never realised how painful it could be.*

Ah, these two issues were minor indeed, and very easy to fix. I don't think you should give up on scenario editing just because of it. I bet that once you've added all the units and are starting to get things up and running, you will find it quite rewarding ☺

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### **Frans Koenz:**

Is it possible to move ground units in a future [version]?

### **Ragnar Emsoy:**

It is not currently possible to move ground units, but this is a planned feature in future versions of Harpoon 3. This feature will be especially useful to simulate mobile SAM sites.

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*(from a discussion on cluster-warhead weapons to simulate kamikaze units such as terrorist suicide boats)*

### **Dale Hillier:**

*However, I have discovered another problem. The warhead I am using was developed from the old DB2K nukes, from before the release of H3. They are based on "stages", where each weapon releases more warheads. A single "stage" weapon would release 8 warheads that would convert to missiles with sensors along a specific arc to cover the major compass points. A second "stage" would release another 8 warheads per compass point. And so on and*

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so fourth. A single stage weapon would have 8 warheads while a second stage weapon would have 72 warheads (one warhead for each cardinal and half-cardinal point plus another 8 warheads for each point... $8 \times 9$  is 72).

Finally, a third stage warhead could have as many as 576 warheads ( $72 \times 8 = 576$ ). Or something like that...

## **Ragnar Emsoy:**

According to the tests we made, the sub-warheads acquire targets randomly, and a large number is needed to make 100% certain that all targets are destroyed (for nuclear weapons). Since the 'suicide boat' will only have to attack two targets, destroying one and damaging the other, many fewer missiles will be needed. If you have three layers of 1, 4 and 4 missiles, chances are good you'll achieve what you want.

*I may be a bit off with the Math (too damn lazy) but you can understand my problem is two-fold. First, there are too many warheads and second, the processing time could be a little too high. In the case of a second-stage weapon where each warhead is equivalent to 600 lbs of C4 (55 DP or so) that relates to a total DP of 3960. This will wipe out most platforms in the DB. A little impractical for a bomb that's just supposed to damage a ship. Not create a hole in the water ☺*

Dale, if you use 1x4x4, a total of 21 weapons are generated. Assuming that all of them carry warheads and 1/2 of them hit the target ship, giving each of the weapons a 5dp-warhead should produce the desired result.

*I tried reducing the number of warheads by creating a single-stage weapon only. However, I discovered that most of the warheads still home-in on the target ship and only one hit is required. More than one would be unrealistic. Moreover, I also discovered that lowering the number of weapons also decreases the chances of the suicide boat from being destroyed as well. This is a must, so I jacked-up the PK% to it's highest allowable in the editor 255%.*

*However, with most of the warheads are still hitting the target I may have to reduce the total DP of the weapon to be based on the number warheads and not the explosive composition. In other words, instead of having 8 warheads each with 55 DP, I may have 8 warheads worth a total of 55 DP. This would mean reducing the DP of each warhead to 7 each. That way, most of the explosive power of the warhead is expended on the ship, the Zodiac is destroyed and the target is damaged but not sunk.*

No weapon in Harpoon3 will have a PoK higher than 95%. So there is always a 5% chance that the terrorist bomb will not go off.

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## **Steve Mills:**

*OK, I almost have the workings of a scenario and I think I'll probably do more work on it before e mailing it over to change the date if that's ok. There are quite a few bits that don't seem to be quite right though.....*

*Basically, I have two convoys heading in to around the English channel. One bound for Rotterdam, one Liverpool. Each has around 8 varied NATO escorts and around ten merchants.*

## **Ragnar Emsoy:**

8 escorts for 10 merchants? Sounds like an overkill ☺. It should perhaps be 2-4 escorts for 10 merchants, 10-12 escorts for 30-50 merchants.

*I can't for the life of me work out whether that's balanced or not.*

Balance... what is balance?☺

A scenario should reflect real life, ditto for the victory conditions. So, both the battle and the minimum victory conditions should be set to they produce the outcome they would in reality.

*At present, each ship is pretty good, they all have accurate names as far as I can tell, the merchants look to be properly named also. However, the names for the convoys are an uninspiring "convoy north" and "convoy south", any better suggestions?*

For convoy scens I think you can use 'CN #', like 'CN1'. Or "TG ##.#", like TG 12.2.

*OPFOR are a few AGIs, some PCMs all of which are largely to be sunk. They don't offer much other than something for NATO to keep busy with. The main threat is some diesel subs. these are all Russian, I am going to have to think of why they are at war in 1993 ☺*

PCMs in the English Channel?

The subs are gonna eat the merchants for lunch. Losses will probably approach 30-50% if the sub threat is high.

*I was going to have an Echo, but can't seem to get it to surface to fire? Regardless, I need to drop the Russkie subs so that'll go I think as the convoys just got pulverized on the first playtest run.*

Echo subs are usually no good for this kind of attack, the missile's minimum range is too short. Ditto for Juliett. Charlie subs are the best missile strikers in a scen without OTH targeting.

*The biggest problem I have though, is that for no apparent reason the subs seem to surface now and then.*

Uhm yeah I've seen this too... In most cases the water is too shallow.

*I checked their patrol zones and all are at a decent depth. All subs are set to zones with "patrol anti-surface" as it stands. Any clues why they surface in deepish water?*

The water has to be -50m or deeper to prevent them from surfacing. In the English Channel you'll be lucky to find water this deep.

*And is there any way to make them open fire with torps at closer range? The AI usually goes for a max range shot.*

The AI will shoot when he gets a good firing solution ☺. Merchants are extremely noisy and thus the AI will be able to fire at longer ranges. Shallow water helps, ditto for using older subs (Tango instead of Kilo, etc).

*Forgot the other one..... is there a way to get the merchants into nice lines or formations ? The escorts are fine but the merchants I can't get into a realistic convoy as it stands.*

Yes: when you group a bunch of ships, their ASW patrol zone will be headed straight north. Do not plot any courses or assign them to a mission at this time, just enter the formation editor. Then set up the ships. See my "Atlantic Ocean" part 1 and part 2 scenarios for details☺

*Well, we now have some whales and fishing vessels etc., however false contacts rather bizarrely surface. Wonder whether its related to the same problem as the subs?*

All submarines without any orders will surface. When you add the False Contacts, they will be unassigned and thus surface.

The easiest way to overcome this problem is to plot them a course. The false contacts cannot move, and will never reach the end of the path. And thus stay "Plotted" for the duration of the scenario.

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## **Denny Taphorn:**

Just finished re-reading "Red Storm Rising" and dusted off my HC97 CD, re-installed and updated to HC2002. I started with the original Harpoon, was disappointed with glitchy Harpoon 2 and enjoyed HC97 for some time. Can anyone recommend the HC2002 scenarios that would come closest to re-creating the battles of "Red Storm Rising" (for me, the best of Clancy's works).

## **Daniel Hayes:**

Apparently Mr Clancy is a bit touchy about people "stealing" his ideas. However if you like the work of Larry Bond (the creator of Harpoon), then Mike Mykytyn has built some scenarios based on his book Cauldron. "Fight or Flight" is available at the HarpoonHQ (<http://www.harpoonhq.com/db2000.html>) and deals with a US or Russia force attempting to break out of the Kattegat. Of course if you want to write some RSR scens feel free, just don't mention RSR in the scen I guess ☺.

## **Byron Audler:**

What might you be looking for in the Harpoon2002 database? And as far as Clancy goes, I wouldn't worry too much about him. If you look at the original battlesets of Harpoon Classics, you'll note the fairly parallel those of Red Storm Rising. If you really want to reenact a part of a Clancy book, simply include in the description of the scenario, an acknowledgement of the author and the book which you took the idea from. After all, he'd look pretty damn foolish trying to sue Joe Six Pack over a game scenario that doesn't make anyone a dime.

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