

**SPEND YOUR SUBMARINE CAREER IN THE A-GANG?
WELL, NOW YOU'RE THE SKIPPER!**

YES, RADIO-CONTROLLED MODEL SUBMARINES ARE A THING

by Jeff Porteous



688i class



Gato class



Ohio class SSGN



USS Thresher
(SSN-593)

Many—even career bubbleheads—are surprised to learn that r/c model submarining has actually been a viable, fulfilling hobby for decades. Basically born of the '70s as primitive wooden hulls, bulky electronics and spotty waterproofing, the hobby matured in the '80s and '90s with the advent of sturdy fiberglass hulls, dedicated submersible technology, growing popularity among devoted enthusiasts, plus demonstrably better performance and reliability. With today's advanced and miniaturized electronics, widely sold plastic submarine kits (ripe for conversion to practical r/c hulls), and internet-fed dispersal of technical information, kits, parts and passion, r/c submarining—if you can overlook its inherent priciness—has become more routinely available to interested hobbyists around the world.

As you might imagine, a radio-controlled model submarine is essentially a reduced duplication of the very same mechanical principles and engineering employed by the 1:1 boats you used to ride around in. Making use of the same transmitter, receiver and servo technology successfully pioneered by the r/c model airplane industry long ago, the typical model submarine simply places all these same workings into some sort of waterproofed box or tube within the model's hull. Though specific methods are as varied as the modelers who make them, in some fashion (through variable pumps, expanding/shrinking bladders, compressed gas, precision pistons, etc.), ballast water is let into or expelled from onboard tanks to control the diving and rising action—exactly as with their big sisters. (Less sophisticated positively buoyant “dynamic diving” model subs also exist which can submerge temporarily through the brute force of thrust alone.) Dive planes and rudders control the direction of movement through water, and various throttled propellers, Kort nozzles or pump jets provide propulsion. Standard hobby radio technology—getting more computer-advanced and wildly multi-functional all the time—controls these models via your own hands from quite a distance. The latest high-tech hobby radios featuring 2.4-GHz operation are the most versatile and feature-

packed of these workhorses. But as all former radiomen certainly know, such high frequency transmissions cannot readily pass through water to permit submerged operation, so recent models thus equipped are limited to running only at periscope depth with an antenna exposed above the surface. As such, some model submariners still prefer the older hobby radio technology of 75-MHz or lower, the transmissions from which can penetrate freshwater to significant depths for truly scale below-the-surface maneuvering.

What about subject matter for these functioning, practical models? Pretty much if you can imagine it, someone established in the hobby has built one and runs it. Of course, detailed scale recreations of submarines from all the world's navies—and of all eras—have always been popular. Examples from the current crop of boats the U.S. puts to sea include reasonably to highly accurate hull kits available of *Ohio*-, *L.A.*-, *Seawolf*-, and *Virginia*-class submarines. But history is important too: *Lafayettes*, *Permits*, *Skipjacks*, *Barbells*, the *Nautilus*, and others from recent collective sub memory abound (one *you* were aboard, perhaps?), and of course many buildups of WWII's heroic fleetboat classes are also currently prowling local lakes and ponds. If you want to go further back, this author has witnessed functional representations of the original USS *Holland*, the Civil War *Hunley*, even the game-changing “first submarine” of the Revolutionary War—the one-man *Turtle*—all getting wet and taking names. Among foreign navies, the Scandinavian boats (*Walrus* and *Sjoormen* classes, for example) and WWII-era and current German U-boats remain perennially popular. The Russian subs—recent examples, and also from Cold War history—have likewise been recreated in small scale and are seen regularly plying the waves where submarine modelers gather. NATO-designated Alfas and Akulas are particularly prevalent, but there are also Oscars, Foxtrots, Typhoons and others cloak-and-daggering out there, giving our boys someone to play tag with. Some r/c sub modelers, however, prefer to abandon reality completely and embrace fantasy instead. Accurate operating recreations of fantastical boats like the *Nautilus* from Disney's *20,000 Leagues Under the Sea*, the *Seaview* and *Flying Sub* from *Voyage to the Bottom of the Sea*, the *Proteus* from *Fantastic Voyage*, and even the *Sir Frankie Crisp* Moebius-inspired sub from *Heavy Metal* magazine have been the result. Still others prefer to create one-off submarine designs completely of their own invention.

Having read this far, you may already be wondering about



Large *Gato* boat launches a “Mark 14.”

submarine weapons. Yes, some boats have been built to launch scale operating torpedoes—powered by compressed gas or tiny electric motors. (For safety and legality's sake, of course, no live warheads

are carried!) And the large missile boats have also been known to put solid-fuel scale-size missiles into the sky.

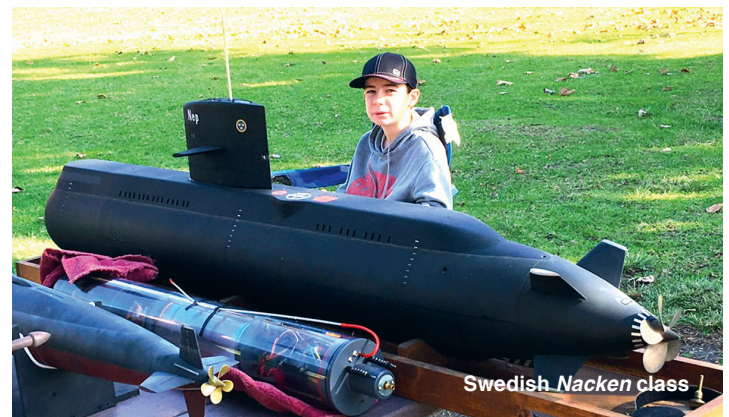
Probably more common however, especially with today's



USS *Scamp* (SSN-588)



SSRN *Seaview*



Swedish *Nacken* class

video-mad hobbyists, is camera technology. Sometimes strapped to the back of any model sub headed out to sea, but equally found mounted behind the clear domes and viewports of scale research subs or even homemade ROVs, video cameras have become *de rigueur* among r/c submariners marrying their love of photography with the love of their boats. GoPro and similar cameras record all the doings on patrol, sometimes bringing the action back on removable data cards, other times actually transmitting ship-to-shore in real time to their skippers' waiting hand-held video monitors—these days often being their smartphones, of course. This sort of onboard photography represents a particularly recent and techie bent of the r/c sub hobby in general. Other added-on fun can include LED lighting systems for night running (or just looking cool up on the shelf); sound systems to mimic engine noise, dive klaxons, torpedo launches, the skipper calling for a dive...or any other noisy possibilities; or mechanized systems to raise and lower 'scopes or hatches, rotate radar antennae, etc. The possibilities are endless, limited only by your imagination, skills and budget.

So what's it take to become a model submariner? A lot of what it takes to be a real one, it turns out: a certain pride and fearlessness (ignoring the fools who tell you it's safer to sail skimmers instead,

for one thing); expert training (taking advice from others already more established in the hobby); basic engineering skills in place or picked up along the way (zero problem for a bubblehead like you); plus the certain knowledge that should your boat's submergences not equal her surfacings, you'll likely be going swimming.

And cash of course. Lots of cash. Kits, hobby radios, internal mechanisms and subsystems, plus the various tools and supplies required to orchestrate it all don't come cheap. Just the cost of a hefty plastic model kit (for conversion) will start at around \$100 for openers—with the more robust fiberglass and resin hull kits designed and created specifically for this hobby costing hundreds more. Add to that the price of a ready-made dive system containing the propulsion motor(s) and complex ballasting device essential to making your model submarine act like a real one—or all the parts needed to construct one of your own design—and you're into additional hundreds. Now add a transmitter/receiver system with the servos to control your beloved new boat: prices vary widely based on the level of technology and functionality, but you're approaching \$200 for a pretty basic setup and easily slinking higher for anything offering more splash.

The good news is that one transmitter can indeed run many subs, should you be hoping to start a whole fleet. And a single dive system can also be transferred among different submarine hulls of similar sizes—if they're all built to permit easy switchouts—adding further practicality. Still, just to get started with everything needed to make and run your first humble r/c submersible, you're probably looking at around \$1,000—and it goes up fast from there for a higher fun quotient. Again, not for the feint of hobby heart. In fact, if you frequently have to ask the price, this hobby probably isn't for you. But hey, you didn't really want that fancy motorcycle or new jet ski, did you?

So now you have beginner's questions, right? Well, here are a few answers...

Who builds and runs r/c subs? Well, hobbyists of all stripes, actually. Some have already conquered the world of r/c aircraft and want to try something fresh and exciting. (R/C submarines are undeniably sexy!) Others have been running model surface ships or sailboats for years and want to try their hand at watercraft which actually operate in three dimensions instead of just two. Still others have simply always held a deep affection for submarines in general. Not surprisingly, significant numbers of new enthusiasts entering the hobby are former (even current!) 1:1 scale



Seawolf class



Emergency deep!
USS Blueback
(SS-581)

submariners themselves, hence the impetus for this article in this particular publication.

How deep do they go? Well, the standard answer is: "All the way to the bottom if you're not careful..."—and then there's that need to put on your swim trunks again. Actually, most model submariners are content to run their boats at or barely below periscope depth most of the time, just to keep careful track of them, with occasional forays into deeper depths of a few or several feet when looking to dial up the excitement. Ruggedly built boats with exceptional waterproofing have been known to head down ten or even twenty

feet or more; sometimes this is when their skippers are in the water with them sporting diving gear and a waterproofed transmitter. (Very clear water is



always required for safe submerged operations.)

How fast do they go? Most actually move along at a normal walking pace, with some of the smaller modern shapes getting close to ten miles per hour. Model submariners are generally interested only in achieving speeds which look "scale" for the size of their boats, rather than rocketing around like porpoising dolphins.

Are they hard to build, and how long does it take? Like any other hobby involving skill and detailed construction, these considerations depend entirely on you. Subs are not necessarily difficult to build, but *are* time consuming. If you have patience and a willingness to learn, you'll be fine—especially given your pre-existing submarine background and understanding. Building your first will take days, weeks or months, depending on the size and detail of the boat in question and whether or not you're building every element yourself. Simply buying a ready-made dive module rather than creating your own system will save you countless hours. (The device is often called a WTC or "watertight cylinder," by the way—where the electronics and rechargeable battery-powered motor are kept safe from that nasty aquatic element.) For some, however, designing and engineering operational onboard systems is almost the whole point of the hobby; the actual running of the boats then becomes something of an afterthought. Regardless, the total time taken is proportional to what you want your boat to do; or rather, what you want it to be. Many in the hobby say a sub is never actually complet-

ed; there's always room for some modification or improvement over the course of its many years of operational life. Remember, this is a hobby—building and running these models is what you do instead of watching TV or mowing the lawn—so long as you don't miss those USSVI base meetings, of course!

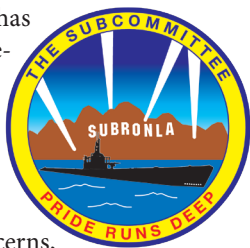
What about casualties? Well, that's one of the neatest things about an r/c sub: unless simply dropped, it's pretty hard to wreck one—not like crashing an r/c plane or helicopter. But if something goes seriously wrong “at sea,” you can certainly lose one. And when you do—*because you will*—well, have those swim trunks dried out yet? If your boat should happen to be lost while running in a very deep venue, you may even want to hire a diver...unless your Navy experience rates you for this task yourself. (That boat was expensive, remember? You'll want it back.) Happily, electronic failsafe systems do keep these sorts of tragedies pretty much to a rarity.

How do you get started in this amazing world of miniature submersibles? That's probably the most common question. A good place to begin is by joining The SubCommittee (www.subcommittee.com). Though other popular submarine modeling groups have



sprung up in recent years thanks to the internet, and all have their benefits and devoted followers, the SubCommittee, with its storied history, remains the oldest and perhaps best known nonprofit model submarine support group. Established around 1990, the SC was once the only place to go for details and tips on

building and running r/c subs—not to mention general information on all kinds of submarine history, culture and minutia. Over the years, through their website, online discussion forums and regularly published magazine, *The SubCommittee Report* (once printed and mailed, now e-published), the SC has successfully welcomed many first-time bubble-heads into the r/c hobby. In addition to providing how-to information, the group also supports “SubRon” squadrons of local members around the country (just like USSVI bases), where fellow enthusiasts meet to share information, help one another with build concerns, and of course, run their boats together in ponds, lakes and pools.



There's a decent chance an SC SubRon—or at least other interested members—already exist within a reasonable patrol distance from you... or, of course, you could always form your own chapter. The organization also shares information on vendors offering the exact specialty kits and supplies needed for this unusual hobby. Remember, like you and your real-life submarine service, this is an elite and niche group: some parts and supplies may be available through r/c aircraft sellers or general hobby shops, but many hull kits and items unique to model subs exist only via a cottage industry of garage builders and entrepreneurs who are themselves participants in the hobby. In other words, you usually can't just go on Amazon for that whatnot you need; but the SubCommittee and its members can probably help you locate whatever it is you're looking for. One well-known current vendor, for instance, is Nautilus Drydocks (nautilusdrydocks.com)—popular not only because they carry a wide variety of kits, parts, supplies and radio gear, but because they sometimes also offer complete build-up services if you'd rather order your boat ready made. (Experienced builders in the hobby can sometimes be hired for this as well.)

So take another look at the photos accompanying this article. Sweet, aren't they? Now you know you don't have to lose your submarine street cred just because you've mustered out of the Navy. In fact, join up with fellow r/c model submariners and *you* can be the skipper. Resolve today to stay tight with The Few, The Proud, The Submerged—only in a more manageable size!

