

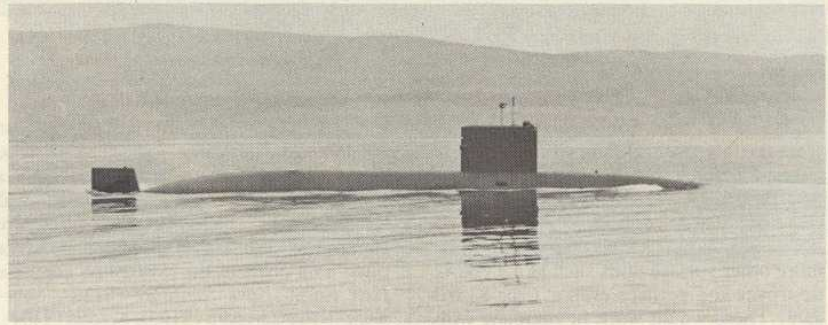
The fleet submarines of the Royal Navy, are nuclear powered but conventionally armed giants of the deep. They can disappear under the waves once out of the harbour, and re-appear in any corner of the world, without having had to surface. These vessels are truly worlds of their own. Free even from the air, due to electrolytic grills which are used to extract oxygen from the sea to keep the submarine's air conditioning plant functioning at all times, the nuclear reactor can give the vessels almost unlimited underwater endurance. This enables them to remain submerged for years, rather than hours, as was the case with the conventionally powered diesel/electric submarines. Fresh water is provided by means of a distilling plant, which purifies sea water making it quite drinkable.

Life beneath the waves is 'luxurious' when compared to the wartime submarines. Great attention is paid to the quality of the submariners' food; film shows are held in the evenings; pop music is relayed over the ships internal broadcast system; instructional classes are held along with indoor games and competitions. Even exercise machines are available, for those who want to keep their weight down. Model making is another popular pastime for the modern day submariner.

Each ship's company is made up of eleven officers and 88 ratings, each man



HMS Conqueror, one of the 'Valiant' class SSN's. The 'Valiant' class were the first nuclear powered submarines built of exclusive British design and construction, and had an impressive increase in capabilities over the earlier Anglo/American built Dreadnoughts (S101). Their speed was increased by about 5 knots, and their range was considerably more than the earlier boat (Photo: MoD Navy).

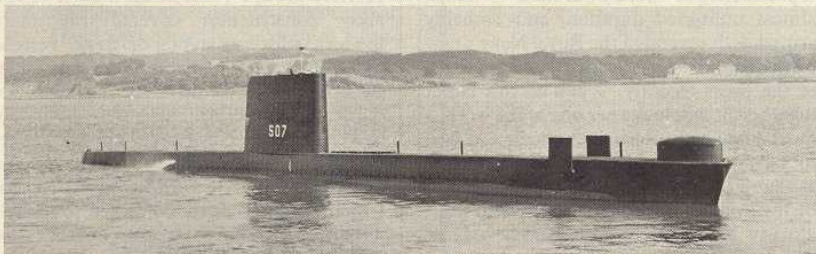


HMS Sovereign of the 'Swiftsure' class. The 'Swiftsure' boats are an improved design of the earlier 'Valiants,' but differ outwardly in some respects, and possess greater abilities as regards their speed, duration, and diving depth (Photo: MoD Navy).

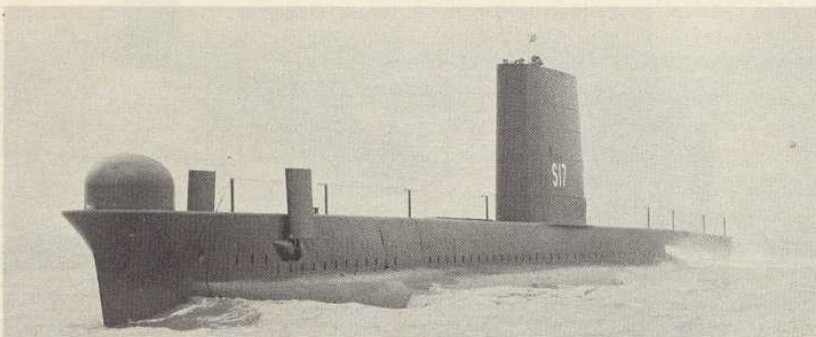
The Modern Submarine Service

by Andrew Ambrose

Part 2



Diesel Electric powered submarines, such as HMS Sealion (S07) still rank as important units in the modern navy. Although not as fast, with less duration and ability to dive as deep as the 'Nukes', they are smaller, and consequently can get in a lot more places than the bigger boats, and so are (or would be in times of hostility) much more useable for coastal clandestine operations (Photo: MOD Navy).

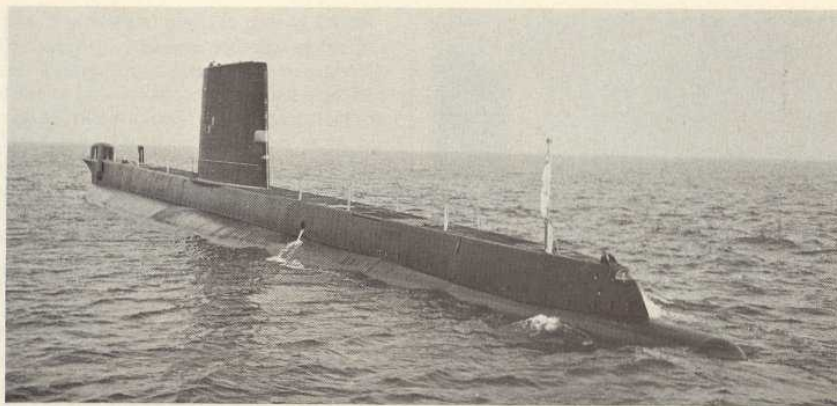


S17, HMS Ocelot. The 'Oberons' are virtually identical to the 'Porpoise' class subs, but were built later, allowing addition of one or two excellent refinements. They were built utilising the experience gained from both German and British Submarines of World War 2 and represent considerable advances over their predecessors (Photo: MOD Navy).

being a specialist at his chosen trade or profession. The standards of these submariners are exceptionally high, mere mortals being cast out very early in the submariner's highly technological training programme.

Discipline in the Submarine Service would appear to be unusual, to say the least, with the emphasis being on self-discipline and teamwork, each member of the submarine's crew being expected to do his job without having to be told or ordered about.

The main weapon of the fleet submarines, is the homing torpedo, several varieties of which are available, but all basically follow the same form. They are usually electrically driven in order to give them silent running, so that an enemy cannot detect their approach. They are primarily for anti-submarine work at various depths, but also have the capability for use against surface targets. The basic principle of operation, is for the torpedo to be fired from the tube, and follow a straight or pre-programmed path towards the last known or expected position of the target. On arrival in target area, the torpedo's active or passive sonar homing device is activated, and searches for the target. When this is located, the torpedo silently tracks and approaches the target, until the proximity or contact fuse is fired, so causing the destruction of the enemy submarine or surface ship.



HMS Onyx (S21), with a submerged speed of 17 knots, these vessels are not fast when compared to the 40+ knots of the latest SSNs but they make up for this in their stealth and quiet running operation, and of course their 8 x 21" Torpedo tubes. They have undoubtedly proved popular as they are presently in use with several of the Free World navies, and one or two of the not so free South American states too (Photo: MoD Navy).

The term 'fleet submarine' is derived from the fact that these boats often operate in conjunction with other units of the fleet. A typical deployment would for example show an 'Invincible' class carrier and its ASW Sea King helicopters, plus two or more other surface units such as a Type 42 destroyer and perhaps even a Type 22 frigate. These would work in company with one or more nuclear fleet submarines in a hunter killer role, searching an area such as the Faroes Gap, for hostile submarine/surface units. The fleet submarine would most likely work ahead of the main task force in constant radio communication with the carrier and its ASW helicopters. The Harriers from the carrier, and the destroyer's missile operators would then keep a watchful eye open for airborne intruders, and possibly even surface interlopers.

There are four classes of fleet submarine presently serving with the Royal Navy or under construction. The first of these was HMS *Dreadnought* (S101) which first saw service in 1963. She was built in the UK but fitted with a US nuclear reactor and propulsion equipment such as fitted in the USS *Skipjack*. She had the distinction of being the first British submarine to surface at the North Pole. *Dreadnought* is of 3,500 tons displacement (4,000 tons when submerged) and measures 265 ft overall with a 32 ft beam. She has six 21 inch torpedo tubes, all facing forward, and is capable of submerged speeds of up to 28 knots.

The second of the UK's SSNs to appear, was *Valiant* (S102), commissioned in July 1966, and was later followed by another four vessels of the same class. Slightly larger than *Dreadnought* at 4,500 tons submerged, is the 'Valiant' class which carries five extra crew members, and are fractionally faster than *Dreadnought*. *Valiant*, was the first British submarine to travel the 12,000 mile journey from Singapore to the UK completely submerged in only 28 days. Other vessels of the class are *Warspite* (S103), *Churchill* (S46), *Conqueror* (S48) and *Courageous* (S50).

The latest SSN to see service in the Royal Navy, is the 'Swiftsure' class. Similar to the 'Valiant' class, but slightly shorter, it has the pressure casing retaining its shape further forward, consequently necessitating the further forward position of the

foreplanes. Complement is the same as *Dreadnought*, but one less torpedo tube exists. The 'Swiftsure' class also have a speed advantage over the 'Valiant' and 'Dreadnought' boats, in that they are capable of submerged speeds of 30 knots plus. The boats of the 'Swiftsure' class are HM Submarines *Swiftsure* (S126), *Sovereign* (S108), *Superb* (S109), *Sceptre* (S104), *Spartan* (S111), and *Severn* (S112).

The fourth class of SSN for the Royal Navy, have not yet entered service. The first vessel of the class, *Trafalgar* (S113) is presently under construction, and as yet no definite date has been set for it to enter service. Her abilities at present, still appear to be something of a mystery, and no figures have yet been released as regards her speed and armament. It is believed however that she will closely follow the latest USN 'Los Angeles' class of Fleet Submarines, with a top submerged speed of around 45 knots, almost unlimited duration, and probably armed with several of the Royal Navy's new torpedoes, details of which have appeared in the press recently. When all this is put together, it will make her one of the world's most advanced submarines afloat, and well in advance of anything the Soviets have available. It is expected that *Trafalgar* will be the first of a class of about ten, with work already having started, it is believed, on

both the second and third vessels of this class.

Constructing the models

Whilst essentially, the rules for modern submarine warfare to be given in the third of this series, pertain to a wargame involving 1:600 scale models, there is no reason whatever, to prevent the game being enacted using models of an alternative scale. Probably the most widely available 'alternative' scale is 1:1200, as there are many of these models available from the makers of white metal castings. In addition, there are several companies whom, at one stage or another, have manufactured ships to this scale, and have since ceased production. Some of these can be found, by searching the out-of-the-way model shops for old stock, and from classified advertisements in *Airfix Magazine*, and certain of the other publications in this field.

An example of such a company were the fine models to 1:1200 scale manufactured by Eaglewall who unfortunately ceased production in the late 1960s, but one regularly still comes across their models here and there. The range manufactured by Eaglewall, was indeed vast, and the plastic construction kit models covered nearly all the more important World War 2 vessels, and many others besides, including nearly all the various types of German 'Unterzee' boats and British submarines, as well as such items as submarine depot ships, etc. It was a sad day for the modeller when the firm ceased production, but keep your eyes open for these kits, as they are worthwhile acquisitions.

Another company which has now ceased production of 1:1200 scale ships, is the Hornby group. Their Minic models of cast alloy construction covered the more modern post-war types of naval vessels, including vessels from the 'Ton' class minesweeper of the RN up to the massive USN battleship *Missouri*. There were definitely two submarines available in this range, being the 1945 vintage 'A' class, and the later, post-war reconstructed 'A' class, which bore a great resemblance to today's 'Oberon' and 'Porpoise' class boats. These



HMS Revenge. These Polaris missile subs, whilst meant to be quietly gliding along in the deep, securing the safety of the Western World, also seem to get themselves a lot of publicity without really wanting to, such as the recent fuss about the replenishment of Revenge's sister ship HMS Resolution, when her replenishment was held up by a strike of civil servants in April of this year (Photo: MoD Navy).

Minic ship models also included various merchant ships of the day, and numerous accessories such as docks, harbours and tugs, etc. The models were basically good, but always became a lot more impressive if treated to a coat of paint, and a little extra detail here and there.

Of the models still in production and generally available today, both Fleetline and Navwar offer various ranges of good 1:1200 scale subjects, and finally, there are also the Airfix 1:1200 scale waterline series kits which will make up into good standard models, and all help to give the modeller quite a large range to choose from if he is prepared to look around a bit.

As regards larger scales, there are models available from Revell, of various World War 2 submarines, and of course, their absolute masterpiece, the 'Lafayette' class SSBN *Andrew Jackson*, is another story in its own right! When this supposedly secret model first appeared on the shelves of various model shops, a certain Congressman asked Congress if the 'Lafayette' class was still regarded as Top Secret. The USN replied that of course it was, whereupon the Congressman then asked why it was that his son had a perfect model of one, showing full internal detail, sitting on his bedroom bookshelf. The US Navy was rather embarrassed by this, and there was some talk of Revell having the model hastily withdrawn from sale, but by then, the damage (if any) had already been done and consequently the model is still available on sale in your local model shop today!

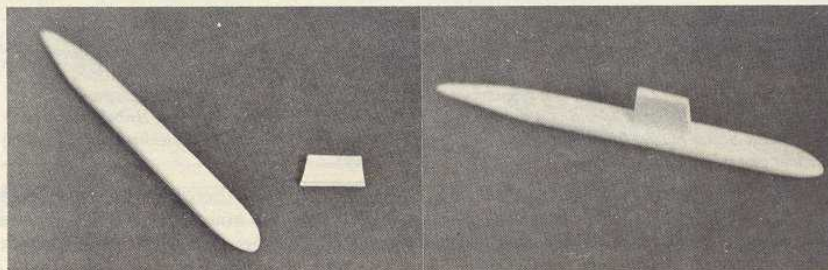
The reason that 1:600 scale is now more commonly used in modern naval wargaming, than the 1:1200 scale normally used to portray earlier conflicts, is two-fold. First, in modern wargaming, there is a tendency for considerably more use of smaller units at sea. There are no massive battleships nowadays, and the overall inclination in modern warfare, is towards computerisation of command and systems, this making weapon platforms as small and effective as possible. Therefore, the models used for a modern action tend to be considerably smaller than their earlier counterparts, and hence, so much more difficult to reproduce in miniature with any degree of authenticity. As a result, everything has moved up the scale ladder, from 1:1200 to 1:600 scale, in order that the vessels and their respective equipment and aircraft, can be more easily depicted. The second reason is purely cosmetic. For in addition to being useful wargames models, they also make very nice shelf display pieces too as much more detail, can now be included, even by the less skilled modeller.



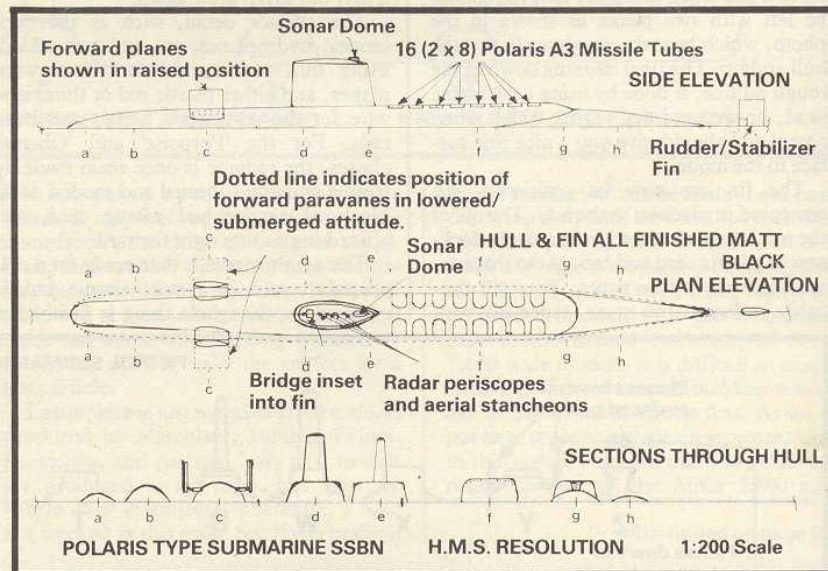
A Nuclear powered but conventionally armed Fleet Submarine HMS Churchill, speeds homeward after a four month underwater patrol (Photo: MOD Navy).



HM Submarine Repulse, fourth of the 'Resolution' class SSBNs carry the present Polaris deterrent. These vessels have now become technically, almost obsolete if you believe everything you hear about the Russians, but their future is certainly assured for the next few years at least, until they are replaced by the new Trident Missile submarines, now under development for the Royal Navy. The Trident class will dwarf the physical size of these boats 3,500 tons displacement, by weighing in at about 18,000 tons when completed. This is bigger than almost all Surface warships about today, excluding Aircraft Carriers (Photo: MoD Navy).



Left: A 'Resolution' class SSBN model under construction. The hull has been trimmed off with a knife, and sanding down to its final shape has commenced. The layered plasticard of the fin can be seen, after trimming but before sanding. Right: The 'Resolution' class hull with fin attached, but not yet sanded. Note that the end of the missile storage section of the boat, doubles back on itself, and calls for rather careful sanding if the right curvature is to be achieved.



The construction of a fleet of 1:600 scale model submarines, is in itself relatively simple, there being very little surface detail to reproduce, as the casing of the modern submarine is relatively uncluttered. There are of course, several ways of building up a fleet, my modelling group uses two basic

methods. First of these is plastic card construction, which is by far the simplest method if only a few models are required.

The first step is to obtain several sheets of a reasonable thickness (say 30 thou), and, allowing for a bit of leeway, cut out a number of oblong sections, of a length just slightly greater than the vessel's extreme beam at the waterline. Measure the maximum height of the subject's hull from waterline to highest point, excluding the fin, and then stick the oblong strips together, one on top of another, until the hull height is built up. This section should be put aside and allowed to dry thoroughly before further work is carried out on it.

The next step is to follow exactly the same process for the fin or conning tower, only working vertically this time, instead of horizontally as with the hull.



One of the later class of Nuclear Fleet submarines, HMS Sovereign, follows her tug/pilot into port. From the background view, it would appear that she is entering Holy Loch on the Clyde, which is the British base used by the United States Navy, from which the USN operate some of their Polaris and Poseidon missile carrying nuclear giants, such as the 'Lafayette' class (Photo: MoD Navy).

When the hull has dried, using a sharp knife, carefully trim away the outline shape of the hull, working initially from the plan view, and when completed, following the side elevation and the various cutaway section drawings. Then trim the excess away until the rough lines of the hull begin to take place. Follow the same process for the fin section and when this is dry too, you should be left with two pieces as shown in the photo, which bear the rough outline of the hull and fin. The final cleaning down of the rough outline, is done by using a fairly fine sand, or wet and dry paper, which when completed should give you a nice fine surface to the model.

The fin can now be positioned and cemented in place on to the hull. The tail of the sub is manufactured from a single thickness of plastic card and brought to shape by sanding with a fine paper. You will probably realise at this stage, especially with

the SSBNs, that there is nothing to stick the tail fin to! So now, get a section of clear plastiglaze sheet, and cut out an oblong, to the 'overall' length of the model. This is then stuck to the underside of the hull, and forms a base plate to which the tail fin is affixed in the correct position. The residue of clear sheet is then removed with the trusty old sharp knife again.

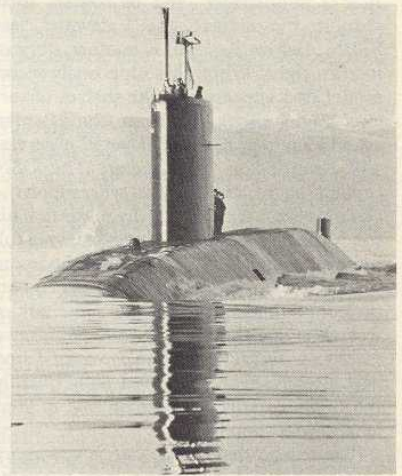
The surface detail, such as the periscopes, hydroplanes, etc, are now added, using thin plastic card for the forward planes, and either plastic rod or thin piano wire for the periscopes, aerials and hand rails. For the 'Porpoise' and 'Oberon' classes, the radome is once again made up from a suitably trimmed and sanded down block of sandwiched plastic card, and affixed in position right forward.

The whole model is then ready for a coat of paint, and is a very simple artistic exercise, as the whole thing is finished in

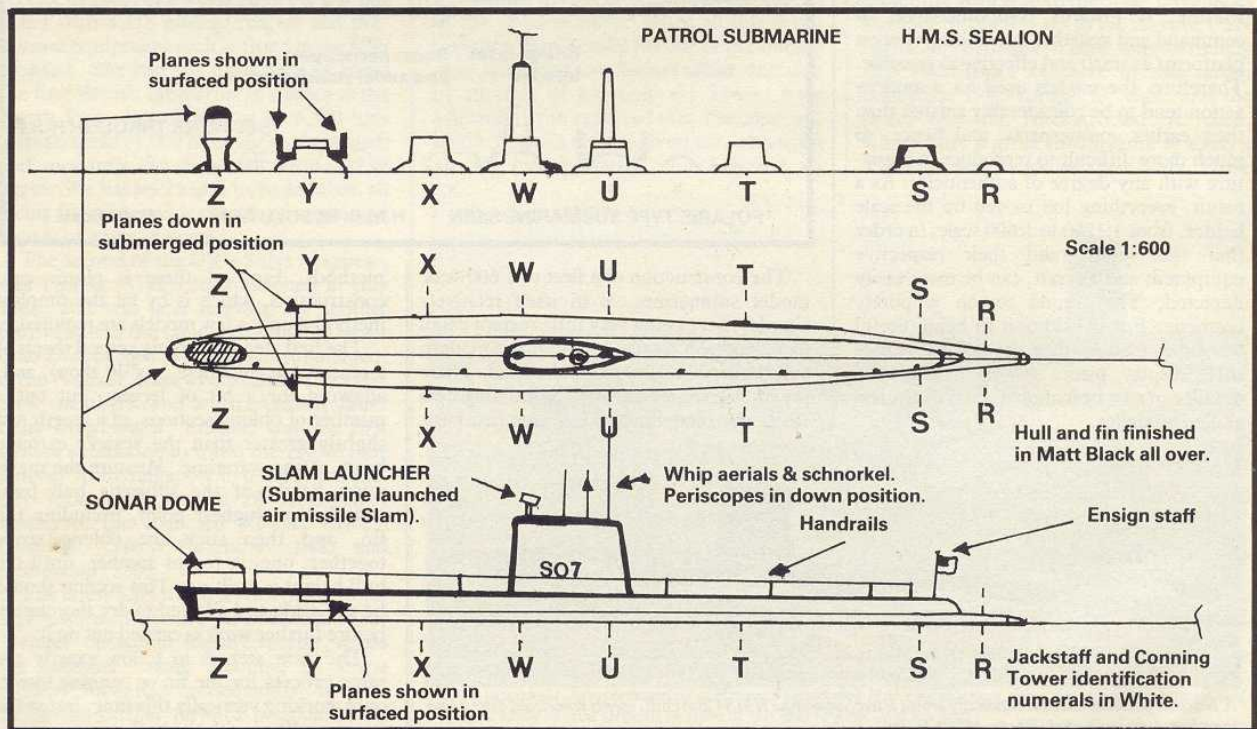
matt black, with the singular exception of the clear plastic section which holds the fin on. This is left clear in order to be as invisible as possible.

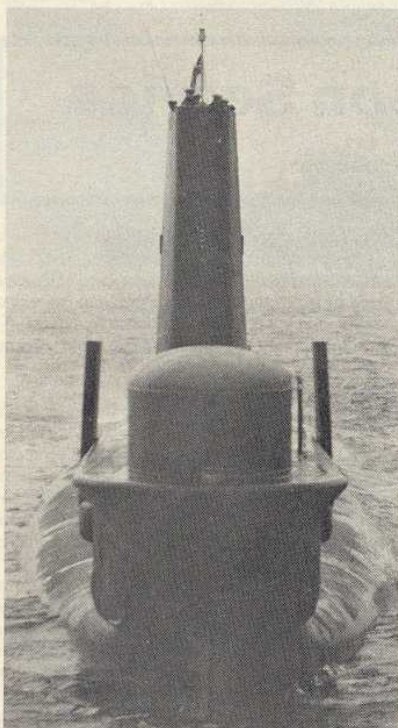
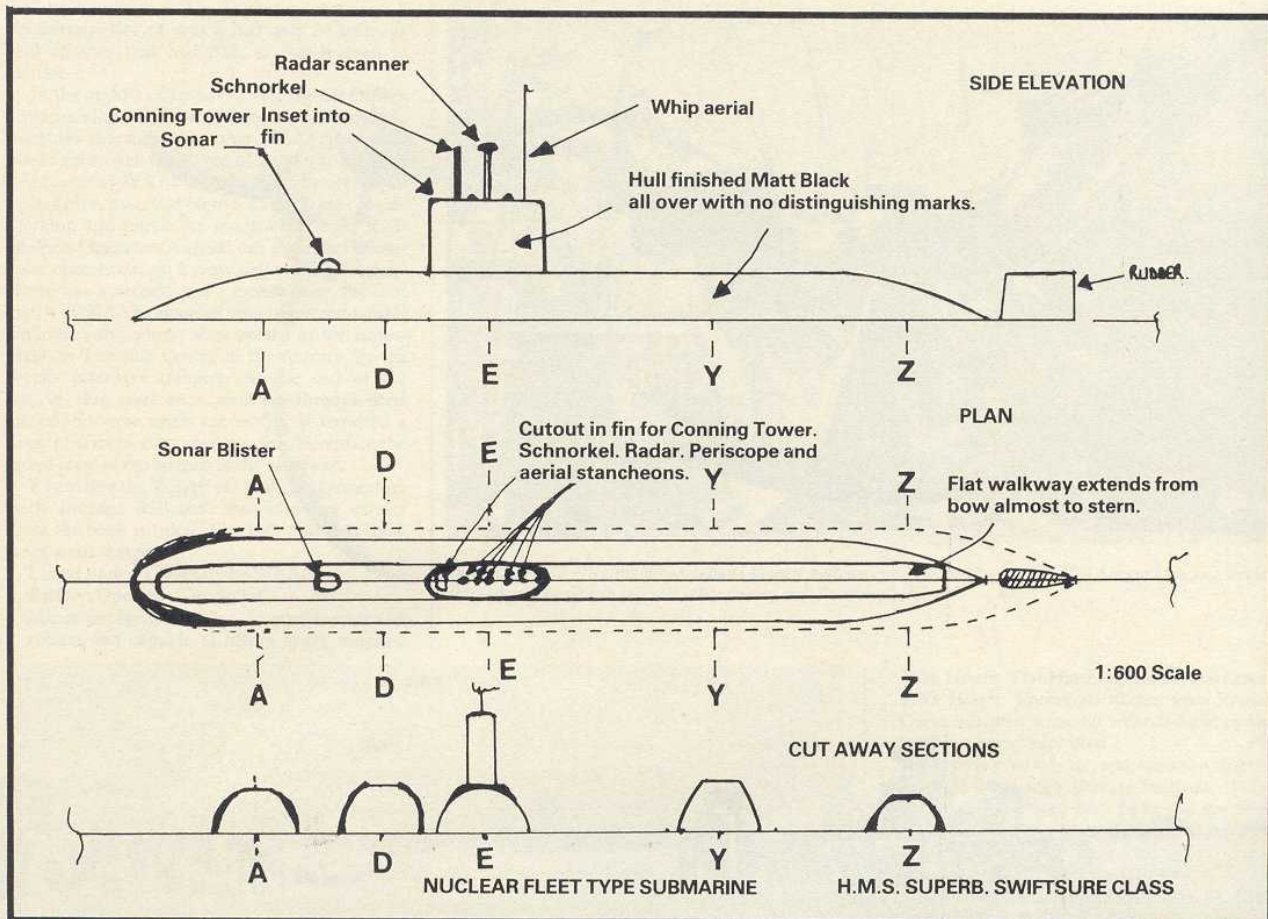
The 'Porpoise' and 'Oberon' classes can then have their pennant numbers painted on the side of the conning tower as shown in the drawings and photography, and the models are then complete. Note that it is practice nowadays, not to paint the pennant numbers on the nuclear powered submarines. For wargame purposes, the submarines should be marked underneath with their full name and pennant number, preferably painted, this being required in order to identify individual units during the course of a wargame action.

As a result of the increasingly important



HMS Superb, SSN with the bonny hills of Scotland in the background, also, a 'Leander' class ASW Frigate is visible just to starboard. Note the radar scanner showing atop the fin (Photo: MoD Navy).





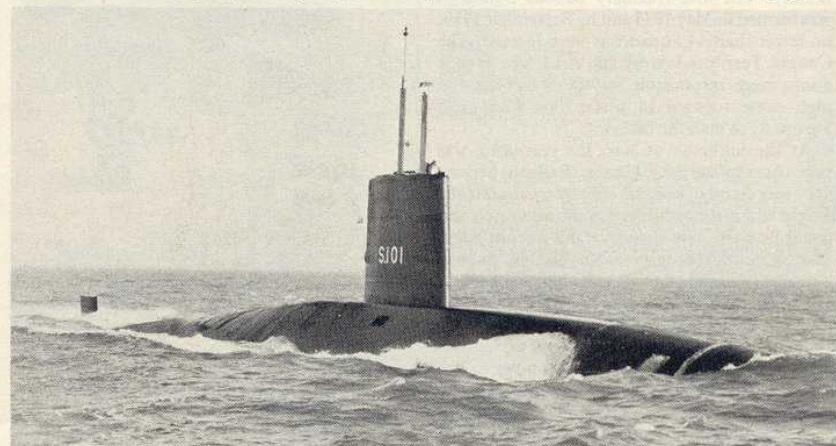
Patrol Submarine HMS Opportune, just about to ram the photographer. This shot gives modellers a good idea of the curvature and shapes of the hull etc. When building the models it is useful to have plenty of photography to hand, in order to get the shapely beasts depicted correctly as models (Photo: MoD Navy).

role now played by the modern submarine vessel, it may well be that one requires to manufacture the entire class of each vessel. If so, then another process of manufacture may be used, namely, moulding. It is not as difficult a process as it sounds, and is in fact quite easy to use when making submarines. However, we will leave the subject for a later article.

Lastly, let me just mention 1:700 scale, as produced by Matchbox, Tamiya, Fujimi, Hasegawa, and Aoshima. Very neat models are produced in kit form, but most are World War 2 subjects. Therefore, I have not worked in this scale, but if you prefer it

model submarines can be made just as easily following the plastic card method described. Obviously, if you wish to enact a realistic ASW action in a wargame (or even just in a sea diorama) one or two surface vessels will be needed in addition to the submarines. Due to the limited availability of Soviet 1:600 scale models, it is difficult to enact a situation without scratch-building a number of Soviet naval vessels first. As we do not have space to include these constructions in this series, I suggest that you get on and make up two of the Airfix 1:600 scale

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First of the Royal Navy's Nuclear powered Submarines, HMS Dreadnought, which first put to sea in April 1963. She is part American and part British in construction, and is approx. 15' shorter than her later contemporaries of the 'Valiant' class, and her submerged speed is only about 25 knots (Photo: MoD Navy).

Moskva Soviet ASW carriers, to play the parts of *Moskva* herself, and *Leningrad* her sister ship, as these two models are required in order to play the game. 1:700 scale models of *Kiev* and her sister ship are due to be produced this year, by the way, in the Japanese Aoshima 'Waterline' series.

Lacking Soviet ships, you could simulate a NATO exercise, in which case, one or two of the Airfix 'Leander' class frigates will suffice, plus a converted ASW cruiser such as the Airfix *Tiger* or *Blake*. However, for those eager to support the *Moskva* and *Leningrad* with a couple of Soviet destroyers, how about a conversion to the 'Leningrad' or 'Gorki' class destroyers of the Soviet Navy, from the Airfix 1:600 'Narvik' class destroyer. These are very similar, due to the fact that both were developed from the World War 2 'Narvik' design after the Russians had captured some German destroyers at the end of the war. See various issues of *Jane's Fighting Ships* for pictures and details of these classes.

Another bows-on view, this time of Fleet Nuclear Submarine HMS Valiant, showing an array of scanners aerials, and a Schnorkel atop the fin (Photo: MOD Navy).

