

Cats and Cathedrals

Most readers will doubtless be acquainted with the popular 'Leander' class frigates, of which there are 26 in the Royal Navy and a number in the fleets of other nations. The 'Leander' evolved from a group of three similar types which were produced in the 1950s to replace obsolete war-built escorts, being the first British warships to be designed after the war.

The three classes in question were the Type 12 'Whitby' class anti-submarine frigates whose design was repeated in the 'Rothesay' class and modified to become 'Leander'; Type 41, the 'Leopard' class anti-aircraft frigates; and Type 61, the aircraft direction frigates of the 'Salisbury' class. Most of these, except the 'Rothesay', are now gone, for scrap or to foreign navies. All of them can be modelled by conversion of the Airfix *Leander* kit; this article gives guidance on modelling the two latter classes, named respectively after big cats and cathedral cities.

Both types were ordered from 1951 onwards and came into service between 1957 and 1960. They used the same hull and machinery, but differed in armament and superstructure to suit their respective purposes. The hull, rather smaller than the contemporary 'Daring' class, was of light welded construction and largely prefabricated to facilitate rapid production of any further units that might be required. Power was supplied by four Admiralty Standard Range diesel engines on each of two shafts, and one of each type ('Jaguar' and 'Lincoln') was given controllable pitch propellers. The choice of diesel power—as opposed to steam in the 'Whitbys' and 'Leanders'—was guided by the need to fit a 14,000 BHP plant into a hull 30 feet shorter, with range being considered more important than speed. Compared with 'Whitby's' big raking funnel, the diesel types had smaller uptakes hidden inside the masts; this, with their longer raised superstructure, made them quite handsome and well-balanced in appearance.

Five 'Cats' were ordered, of which 'Panther' was transferred to India as 'Brahmaputra' before completion; a second 'Panther' was then ordered but eventually appeared as a 'Leander'. Being intended as anti-aircraft escorts, they were armed with two of the new twin 4.5 inch gun mountings and, originally, a STAAG twin 40 mm, with a triple-barrelled Squid mortar to give some anti-submarine capability. Unfortunately this outfit does brand them as a product of the fifties; in the next

decade they really became obsolete, for supersonic aircraft and long-range guided missiles call for a better defence than 4.5 in and 40 mm guns, and for some reason the proposed installation of Seacat launchers were never carried out. 'Puma' was deleted in 1976, 'Leopard' in 1978; 'Jaguar' took part in the 1976 'Cod War' with Iceland and was subsequently sold to Bangladesh as 'Ali Hyder'; 'Lynx' remains, albeit in reserve.

The Type 61 aircraft direction frigates originally numbered six, of which 'Gloucester' and 'Exeter' were cancelled in 1957. They carried one twin 4.5 in. gun forward and a STAAG mounting aft, plus a Squid, but their main 'armament' was radar of several types in order to give early warning of attackers and to direct friendly shore- or carrier-based aircraft. With a top speed of 24 knots they would effectively be limited to performing these functions for slow convoys; a number of the faster 'Battle' and 'Weapon' class destroyers were converted at the same time to do likewise for the Fleet. Radar technology advances rapidly, and so all ships of the 'Leopard' and 'Salisbury' classes were given extensive refits in the mid sixties with modern radar sets on new masts. However, as first the Light Fleet Carriers and then 'Victorious', 'Eagle', 'Ark Royal' and finally 'Bulwark' were withdrawn, the A/D ships became redundant. 'Llandaff' was sold to Bangladesh in 1976 as 'Oomar Farooq'; 'Chichester' with radar removed, served as guardship at Hong Kong from 1973-76, then went for scrap in 1978; 'Lincoln' joined 'Jaguar' in the 1976 'Cod War', and was sold abroad in 1978; 'Salisbury' has recently supplanted the war-built 'Ulster' in the role of training frigate.

Yet, although not the most famous or successful of post-war British warships, these two types are surely among the most handsome, and in either their original or their modernised configurations make very interesting and attractive subjects for modelling. In 1:600 scale our starting point is the Airfix *Leander* kit; in 1:500 scale there is a kit of a 'Whitby' class frigate formerly made by Frog which may now be available in the Novo range, although I have not been able to obtain it. In either case the kit hull is

used, with suitable surgery, and several other parts; superstructure and fittings are made from scratch using the methods described below.

Hull

As in so many conversions the first job is to reduce the hull, which in this case involves shortening the fo'c'sle as well as the overall length. Lay the starboard hull half on the drawing to see what is required.

With a knife and file, bring the main deck level forward to a point 29 mm from the extreme bow; file the top line of the fo'c'sle to the shallow curve drawn; then mark a point 23 mm from the bow and cut the sloping line from there to the 29 mm mark. Make these measurements precisely, to avoid any discrepancy between the two halves which would become apparent on fitting the deck.

Turning to the 'blunt end', the low quarterdeck (a characteristic of the pre-*Leander* frigates) requires more knife and file work. Cut 4 mm down from a point 12 mm from the stern, and meet this with a horizontal cut from the stern; this should come a little above the bottom of the stern cut-out, and it should be possible to preserve, in a thinned form, the moulded propeller-guards at the base of the first cut. Next, mark 19 mm from the stern, and carefully cut the shape of the angled side aft and downwards from there to the propeller-guards, including the change of angle part-way down. The thickness of its edge will show, so file it down from inside until the edge is fairly thin. Also with the file, chamfer inside the thick edges forward where the deck sills have been lost, to facilitate fitting of the deck in due course.

To reduce the overall length, cut through the hull half in two places, discard the middle piece, and mate the two ends. Do this as cleanly as possible to minimise the work of filling the joint. The cuts must come in places where the body sections are similar, which is not easy with this hull as there is virtually no parallel section; my cuts were a shade too far forward and resulted in a slight angle on the bilge keel, so I would recommend making these incisions about 95 mm from the bow and 78 mm from the stern, subject

I.M. Fleming models the Leander class frigates

to the overall length after cutting, trimming and joining being 172 mm or 6.8 in (In 1/500 scale, the overall length is 8.15 in.)

When cutting the various deck levels, take the opportunity to capture their sheer, for they are not horizontal. This is not so noticeable from the side as when looking *along* the hull, when the main deck should be seen to rise a little towards the ends. The fo'c'sle deck has quite a steep sheer; conversely, the low quarterdeck has less than the main deck above it. All top edges of the hull part except the quarterdeck should be rounded with the file, as shown by the photographs; and from 5 to 9 cm from the bow the sides are best cut down to the level of the moulded deck sill, in order to provide a firm seating for the superstructure sides.

Repeat all the above procedures with

At the transom, I found that the joint was poor; after rubbing it down I overlaid the whole transom with 20 thou card, giving a much better surface. If you do this, take its thickness into account when altering the length. The hull can now be tidied up and given a coat of light grey paint.

Most of the decks can be made from suitably cut portions of the kit deck. Cut across the fo'c'sle deck just abaft the capstans, trim around its fore end, bevel its edges from below, and cement it in position. The next area, from the break of the fo'c'sle to the superstructure, is cut from the kit part, incorporating the slope, the angle of which should be slightly increased. Use the gun position and the deck-edge bollards as your datum points; the breakwater, the lower of the two moulded, will then also come in the

Scuttles in the hull and superstructure sides should be drilled at this stage or marked on after painting, taking their positions—not quite the same port and starboard—from the drawing and photograph. The assembly so far is now ready to be tidied up and painted.

Superstructure and fittings

With a view to minimising blast damage from a nuclear explosion, *Leander* has few excrescences, everything vital being enclosed. Her precursors, however, were not so protected and their decks are cluttered with a multitude of small fittings. This, and their rather complex masts and radar aerials, means that there is a fair amount of detail work to be done. Every item is shown up by the colour contrast between its light grey and the green deck, and a glance at the aerial



Aerial view of *Lynx* as drawn and described in the text. Note arcs, probably red on yellow, painted on deck around guns and whip aerials; also oriental lamp emblem on main mast. These can be omitted, but the Squid should be included, to depict the same ship a couple of years earlier (C & S Taylor).

the port hull half; take it slowly and carefully, with constant reference to the half already finished, so as to produce an exact match.

One of the features of *Leander* not shared with the Type 41/61 hull is the long slender fore-body; by this stage it will be apparent just how narrow it is at main deck level. I felt it necessary to increase the hull width here, and so inserted strips of plastic card along the keel from behind the forefoot to near the midships joint before joining the hull halves. These spacers totalled 60 thou thickness, lessening at the ends, and were simply trimmed from below when the halves had been cemented around them; their effect on the sonar domes is not worth worrying about. The joint at the bow is not affected. Even with the keel spacers the forward gundeck looked too narrow, and so I also inserted a length of scrap plastic between the sides, set low enough to clear the underside of the deck, to force them apart. This gave a width of 14 mm across the bottom of the sloped part of the deck, which looks about right; at the top of the slope it is 15 mm on account of the flare.

correct position. As this section of the deck comes further forward than it would in *Leander*, it needs a good deal of careful trimming to fit snugly.

The longest part of the main deck can be cut in such a way that the bollards on it are placed as on the drawing, 36 mm from its after end; the unwanted well is then filled with plastic card and filler. Card is also used for the quarterdeck; and there may be enough of the kit deck remaining to form the raised superstructure deck, which should otherwise be made from thick plastic card.

Amidships, the superstructure sides are continuous with the hull form; I made these and the bulkheads at the ends of this structure from card assembled on the underside of its deck, with enough plastic packed inside the forward corners for the radius shown in the plan view to be filed into its thickness. When dry and firm this assembly is cemented on to the hull and its sides rubbed down so as to form a vertical extension of the hull sides, giving a slight 'knuckle' at the fore end of the joint where the hull is still flared and a flush surface for the rest of its length.

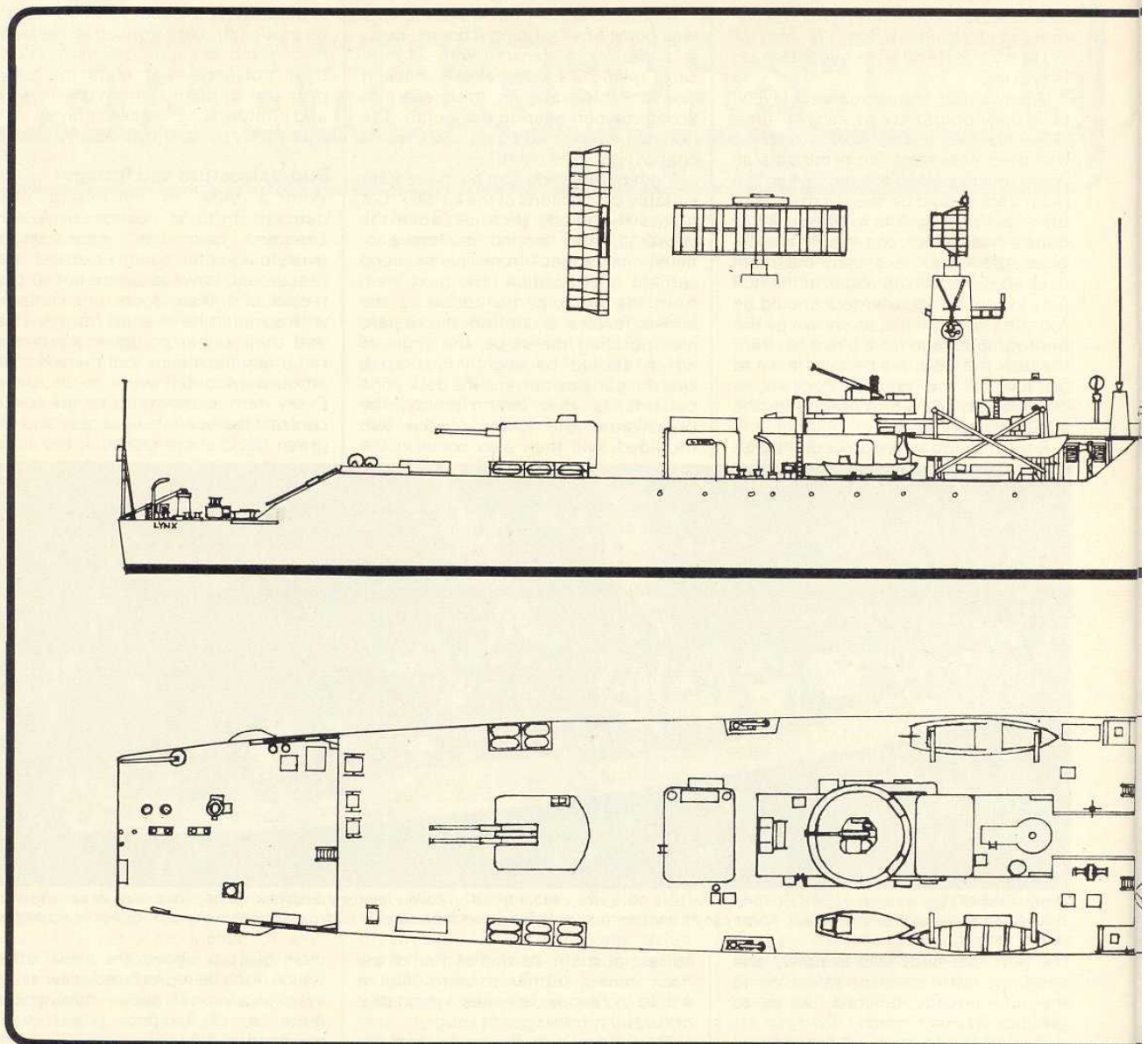
view of *Lynx* shows the visual effect which must be reproduced as far as our small scale will allow—making this quite a challenging project, and correspondingly rewarding.

In view of the amount of detail shown by the drawings and photographs, which should be used to interpret each other, a stem-to-stern commentary is given here, starting with the plan of *Lynx* (F27).

Airfix have already provided the necessary items on the fo'c'sle, with bollards, capstans, anchor tackle and hawse holes; the deck-edge bollards should be sliced off and repositioned further forward.

On the sloping section, the breakwater can be improved by adding fillets as drawn on its inner faces. The fittings within its angle approximate to those on the kit. At the deck edge are large bits, which can be made from plastic card along with the plates on which they are mounted.

On the forward gundeck are three winches, quite simply made with rod drums and thin card end pieces. Flanking the gunhouse are additional breakwaters—card again—followed by



the moulded bollards. Aft of the gun is a hatchway and a slim ventilator cowl.

Ladders lead to the upper deck, and look more effective if provided with handrails as in the photographs. Between the ladders are two square-section ventilators with cubic tops, and between these a rectangular locker.

On the crowded upper deck the principal structure is of course the bridge, and as this is much larger than *Leander's* it must be made up from plastic card. Except for the wings, all surfaces here are flat, but care is needed to arrange the various angles correctly and symmetrically, including the shallow slope of the outboard sections of the bridge roof. A pair of horns (the noisy kind) appear on the flat central panel—there being, naturally, no steam whistle on a diesel ship. The raised platform and screens aft of them, and the sighting and naviga-

tional instruments in the open after end of the bridge, are best described by the appropriate photograph.

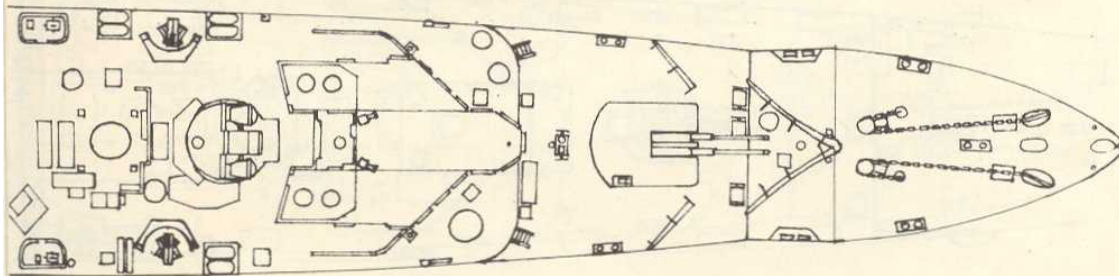
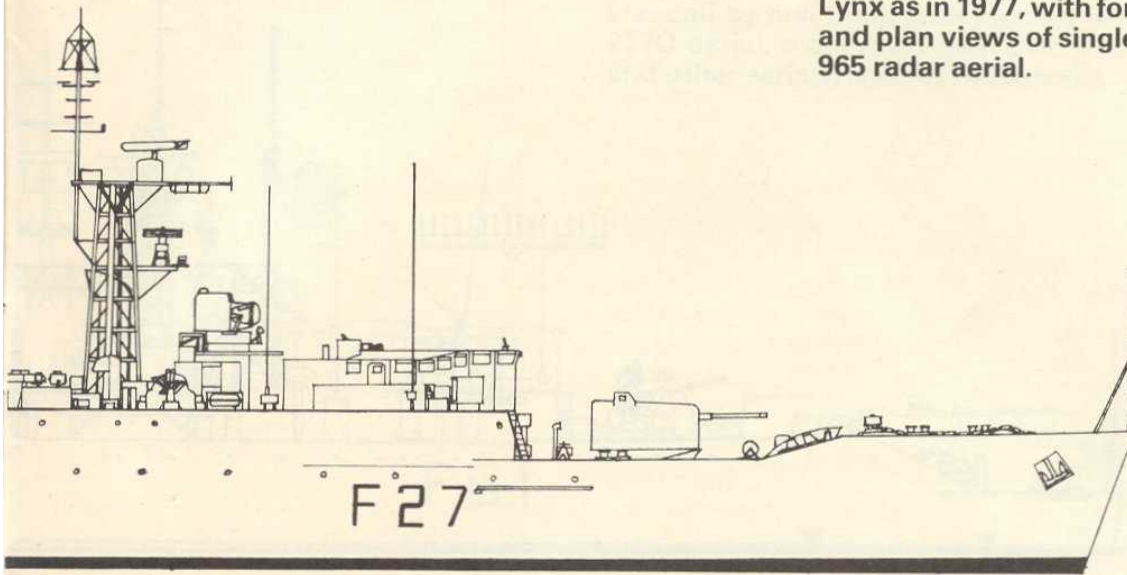
Between the bridge and foremast is the large Mk 6M fire control director with Type 275 radar in twin 'headlamp' nacelles. It is supported on a cylindrical trunk, surrounded by a platform below the director itself; the platform on the after side is one level higher, and those skilled with fine stretched sprue may care to attempt its prominent guard-rail. The coffin-like structure to starboard of the director trunk is presumably the associated office.

Against the fore side of the mast is a small stage containing the flag locker, while other lockers and ventilators add to the clutter in this area. The ventilators are of the round, or in some cases square, 'mushroom' style in various sizes; one to starboard of the mast is upright with hooded top.

Making these multifarious small fittings is quite simple, using the availability and the properties of the large amount of spare plastic in the kit box, the sprue, and some unused parts unlikely to be required elsewhere. A ventilator (for example) can easily be filed to shape on the end of a length of sprue which meanwhile acts as its handle, then painted, detached and installed. The tools required are tweezers, a flat file, and a *sharp* knife—blades are cheap, and it is probably time you had a new one! The knife is also used to scrape the paint from the deck where the part will go, and the joint should be made with *liquid* polystyrene cement on a brush; in these two basic rules lies the secret of a firm join without mess.

Other fittings on this deck are: three pairs of inflatable life-rafts; a signal lamp and searchlight each side, with

Lynx as in 1977, with forward and plan views of single type 965 radar aerial.



surrounding screens; the curved screens of the Corvus rocket launchers, around which is a three-sided stage; and a large square fitting which is probably a ventilator on a pedestal by the starboard searchlight.

Corvus is a fairly recent standard fitting in frigates and destroyers, being an eight-barrelled close-range anti-missile missile launcher. Its lowest three barrels are set about 40° to the left, the three above them 40° to the right, and top two barrels and the sight straight ahead, when looking outboard. The mounting is quite easy to make from rod, and the photograph should make its configuration clear.

On the long main deck the principal structure is a simple rectangular deckhouse, flanked by lockers and ventilators. Connecting it with the bridge deck is a broad catwalk, abaft which is the secondary conning position, reached

by a ladder on its starboard side. Above the deckhouse is a 'bandstand', with a single 40 mm Bofors gun which can be made from scratch or modified from kit part 27—it does need improving!

Next comes a small, squarish house with rounded corners, on which at some time a second gunnery director was sited. The second twin 4.5 in. gun can be made, or there may be one in your spares box—perhaps left over from an Ikara or Exocet 'Leander' conversion. (The latter was described in the April 1980 issue of *Airfix Magazine*, and both were detailed by Peter Hodges in *Warship 7*, July 1978). Both twin 4.5s can be improved, by filing the web between the guns to a curve, and adding the lookout position on the right top of the gunhouse.

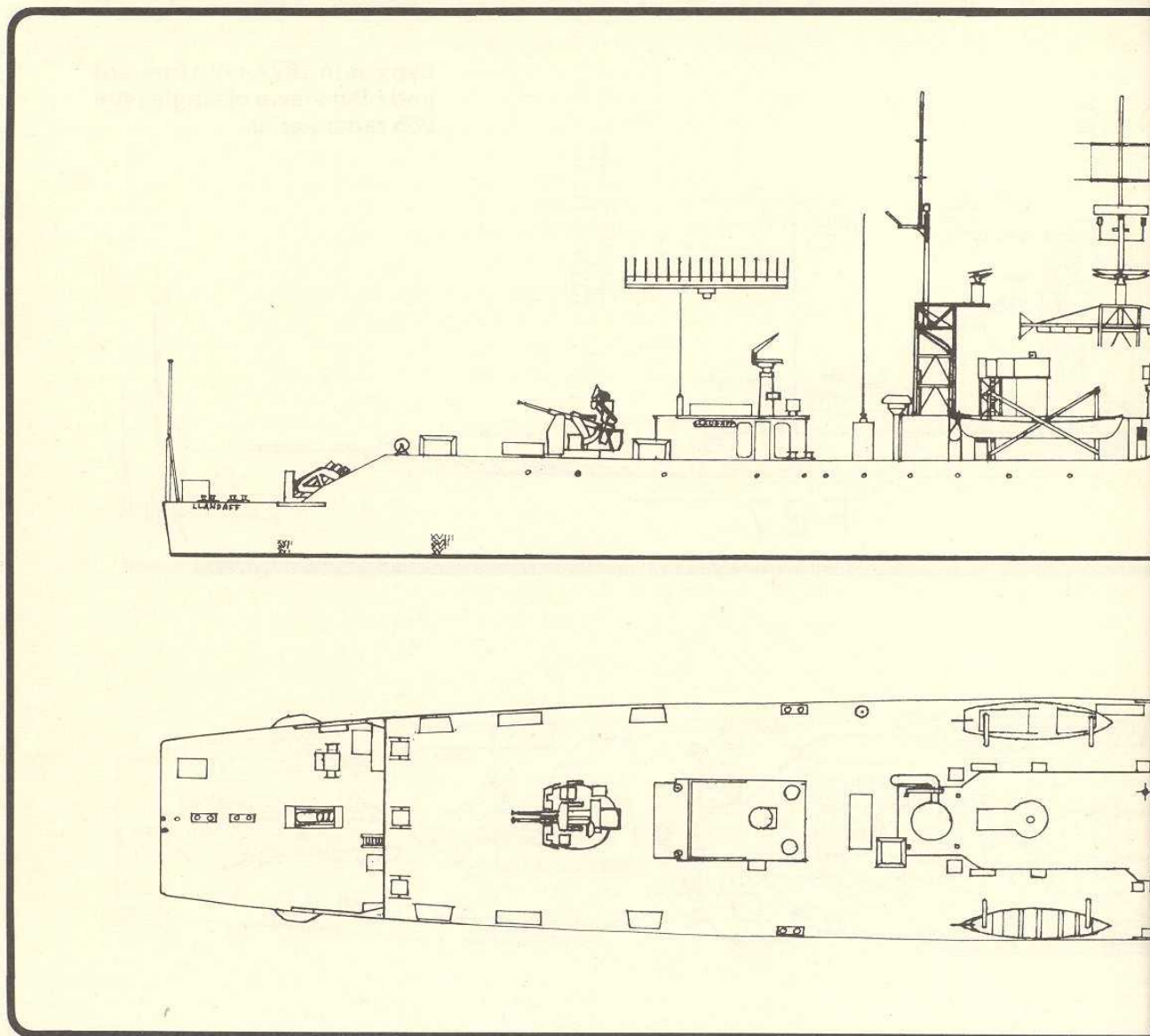
Along the edge of this deck are the boats (motor boat to port, whaler and dinghy to starboard), a davit and

bollards, three pairs of life-rafts, a locker, and at the after end four winches.

A ladder leads down to the quarter-deck. Until about 1978 *Lynx* carried a Squid (available from the *Daring* it) here, as on the drawing of *Llandaff*, and this may be included optionally. The sundry other small fittings (of which the electric crane is kit part 68) are well shown by the photograph.

This leaves us with the masts and assorted aerials to be made and installed; they are described later.

The other ship drawn is the Type 61 *Llandaff* (F61), and to provide a contrast with the drawing of *Lynx* she is shown as completed, about 1958. Editions of *Jane's Fighting Ships* in the period 1957-66 contain very useful photographs of both these classes before modernisation, and it is interesting to compare *Lynx* as described above



with the close-up view of her in the 1958/59 and the aerial view of her sister *Leopard* in the 1960/61 editions. For an early Type 61, I recommend using this drawing of *Llandaff* in conjunction with the photographs of her in the 1960/61 and (on page 61) in the 1958/59 *Jane's*, or of *Salisbury* in 1961/62.

A number of major differences from *Lynx* stand out, notably in the after superstructure and in the gun and radar fitment. The after end of the bridge, the heights and positions of the masts and funnels, life-rafts of an earlier type (as in the kit), and the absence of *Corvus* and the dinghy, are further points to note; and the various deck fittings differ in detail, not only between the two classes, but among sisters within the same classes, so that it is always advisable to use a photograph of the ship chosen for modelling if one can be found.

Llandaff has no second twin 4.5 in;

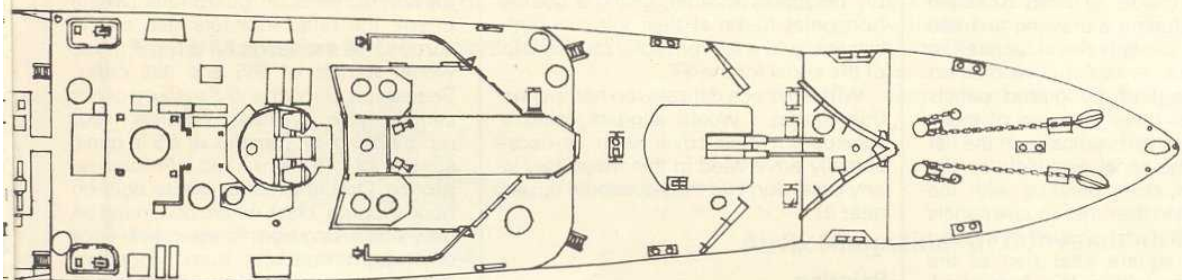
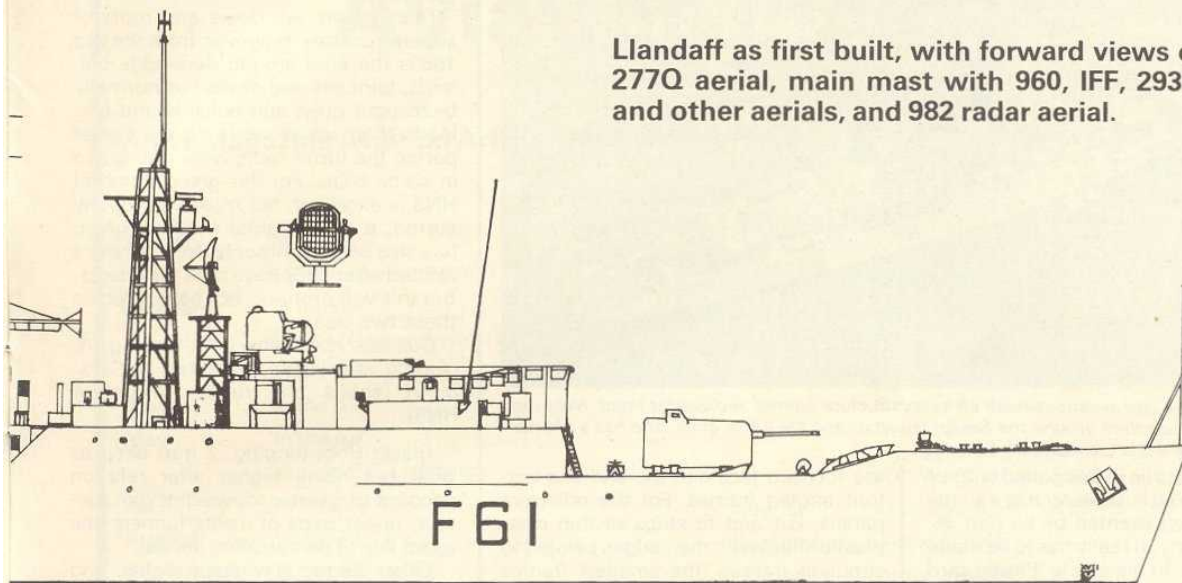
its place is occupied by a twin 40 mm STAAG mounting. This was a highly complex anti-aircraft weapon designed to track a target with its own integral radar (type 262), and was widely fitted in British warships of the 1950s. The 'Leopard' class originally carried a STAAG on the bandstand, replaced on refit by a single Bofors; *Lincoln* began with a single Bofors, but later exchanged it for Seacat. The Seacat system as fitted in *Lincoln* and *Salisbury* comprised a quadruple missile launcher—kit part 48, with its corners filed away to produce a smaller square base with the missiles in the corners—and, on the high aft deckhouse, the simple GWS 20 director, which was optically aimed: these are visible in the photograph of *Salisbury*. In *Llandaff* the STAAG was replaced with the less complex Mk 5 twin Bofors, controlled by a type 262 radar mounted separately, on the deckhouse immediately before

its guns. (From about 1966/74 *Puma* and *Lynx* had 262 radar in a Close-Range Blind Fire Director, drum-shaped with pram-style hood, on their square aft deckhouse, to control the after 4.5 in guns.) Both the STAAG and the Mk 5 twin 40 mm mountings are available in the *Daring* kit, or can be made; the latter is quite straightforward, but with the STAAG it is a matter of simulating as much detail as your skill permits. A good reference photograph of a STAAG model appears on page 84 of *Scale Model Warships* (Conway, 1978).

Masts and radar

Whichever version is chosen, it is not possible to avoid a certain amount of lattice work. A post-refit Type 61 only requires the short pylon for its 2770 radar, for both masts are plated; on the Type 41 only the main mast was plated on refit, leaving the fore as a lattice; the

Llandaff as first built, with forward views of 277Q aerial, main mast with 960, IFF, 293Q and other aerials, and 982 radar aerial.



early Type 61, as drawn for *Llandaff*, has all three structures of open girder construction.

For the upright and horizontal members, use Microstrip rather than rod or stretched sprue, as a square section is required. Make up the two sides of each mast over a traced pattern, using liquid cement, a sharp knife, and patience; be prepared to scrap your first attempt, as this sort of work improves with practice. Put in the members of the forward and after faces last; then dry-fit, trim and install the assembly. The funnel inside each mast should be made—filed to shape from sprue—and installed on deck first, and if the funnel is correctly aligned, so will the mast be.

Quite apart from radar aerials as such, the masts bristle with assorted tentacles—one cannot really call them yards—bearing tiny aerials which presumably relate to various electronic devices: that on *Llandaff's* fore topmast

invites comparison with a cake-stand. These items vary with period, and from ship to ship; the aerial views of *Lynx* and *Salisbury* show them particularly well. It is best to measure and construct each arm with its aerials and struts and then install it as a complete unit to avoid repeated pressure on vulnerable lattice masts; with plated masts this precaution is less necessary.

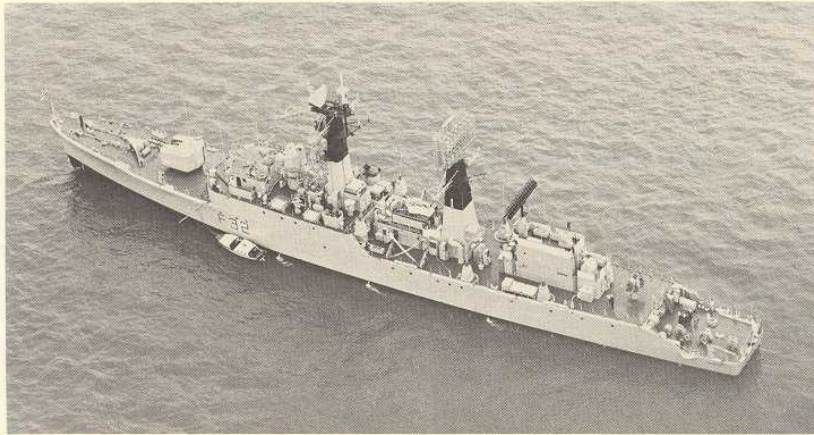
As first built, the 'Leopard' class were equipped with the following radar types: 262, part of the STAAG mounting; 275, in the 'headlamps' on the director, to control the 4.5 in guns; 960, with a frame on the main topmast, for long-range air warning; 974, with a very small 'cheese' aerial on a platform projecting from the fore mast, for navigation; and on the fore mast top, the wider 'cheese' of the 293Q target-indicating set (kit part 33 will do, reversed). In addition an IFF aerial (a simple strip in form) appeared below the 960 radar,

and an HF/DF on the fore topmast.

These were also fitted in the 'Salisbury' class, but with the 293Q sited on the short main mast, and VHF/DF in place of HF/DF. For aircraft direction, types 277Q height-finding and 982 target-indicating aerials were fitted, respectively on a lattice tower abaft the director and on the after superstructure.

In the course of modernisation in 1963/67 the type 974 was replaced by 975 or 978, with a larger 'cheese'; 293Q by 993 (kit part 34), sited on the fore mast in both classes, for combined air and surface warning; and 960 by the formidable—for the modeller—type 965 long-range air warning radar, with a single aerial on the 'Leopard' class and double on the 'Salisbury', surmounted by the IFF aerial.

The 'mattress' aerial of type 965 has been fitted on nearly every frigate, destroyer and aircraft carrier built or modernised since 1960, so that those



Salisbury in the late seventies, with aft superstructure altered and Seacat fitted. Note red circles painted on deck around the Seacat launcher and the 4.5 in guns. She has a shorter bridge than her sister Llandaff (C & S Taylor).

whose interests lie in this period will not be able to avoid it. *Leander* has a single 965 aerial, represented by kit part 45, but very poorly; it really has to be made from scratch. In his article 'Plastic card for miniature models' in *Model Shipwright* 22 December 1977, page 40-50, J.L. Geary described his method of tackling the double version of this aerial—and for anyone seeking a more ambitious project that article, on a scratch-built model of HMS *Sheffield* (Type 42) including a drawing at 1:600 scale, can be strongly recommended: it is still in print. An alternative method takes advantage of the 'glazed' panels on the aerial: there are nine of these reflective strips laid vertically on the flat fore face of the aerial, and eight on the top and back corresponding with the spaces between the nine; square panels of the same material, shaped as the end view of the square after part of the aerial, appear within the framework such that their top and aft edges butt against the starboard edges of these eight strips. Thus, only the outline frame needs to be made up from stretched sprue, plus the middle horizontal bar on

the forward face and the end and bottom angled frames. For the reflective panels, cut and fit strips of thin clear plastic sheet with their edges painted to simulate frames (the smallest frames are not worth attempting in our scale). This sounds complicated, but is a far simpler and more effective method than trying to build up the whole array with plastic rod. On the 'Salisbury' class, the double aerial is simply one such assembly on top of another, giving a double horizontal frame at their joint; in both classes, add a 4.5 mm solid strip on top of the aerial for the IFF.

With so much delicate top hamper on this model, I would suggest using a transparent dust cover such as occasionally advertised in this magazine. In any case, don't let the household duster near it!

Painting

Light grey: Ship's side, including rounded top edges; all fittings (including anchors) except as provided for below; lower parts of masts/funnels. Humbrol HN1 is *not* suitable for post-

war light grey; their Matt 64 is a better match.

Deck green: All decks and roofs of superstructures. However, from the late 1960s the area around deck-edge bollards, fairleads and davits has normally been light grey, and bollards and fairleads themselves white. In the earlier period the turret roofs were also green in some ships. For this green Humbrol HN3 is excellent, but *must* be properly stirred; a rather lighter shade of green has also been commonly used. All ships refitted after 1977 have dark grey decks, but this will probably not have affected these two classes.

Dull red: Hull below boot-topping, including stabilisers (not fitted in *Salisbury*), shafts and rudder. (Humbrol HN5).

Black: Boot-topping, 2 mm deep as built but rising higher after refit on account of greater topweight; gun barrels; upper parts of masts/funnels (the exact line of demarcation varies).

Other items: Navigation lights, and hoops on dan buoys (the poles stowed on edge of angled plating aft); red (port) or green (starboard). Boats; white below waterline, blue above, with wood decks; white canopies on motor boat; white gripes; dinghy can be any colour. Canvas screens on guard-rails (where fitted), life rafts, fore topmast, and in some ships the aerials on the fore mast; white. Aerials of 965 and 982 radar; Seacat (on *Lincoln* and *Salisbury* only); centre boss, yellow; missiles, red; remainder grey. Muzzles of 4.5 in guns, silver; of 40 mm, red. Propellers; bronze. Draught marks; white dots on boot-topping, black where continued on grey side, rising from fore and after ends of straight keel and from propellers. Pendant numbers; black, of style and size drawn on sides, smaller on stern; their white outline is not visible from any distance and is not worth attempting. With these, your labour is complete.

Llandaff in 1976, contrasting with the drawing. In her modernised state, the masts and most radar and other aerials have been replaced, 982 raised, secondary conning position moved forward, and STAAG replaced by Mk 5 mounting (C & S Taylor).

