

## Canadians in Coastal Command #2

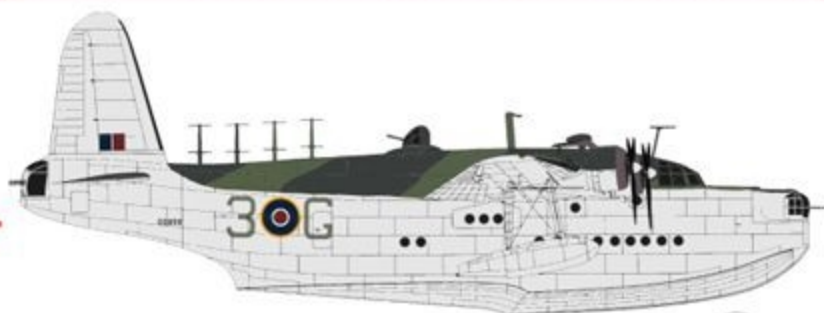
### Sunderland GR.III EK591

as aircraft 2 • U of  
422 Squadron RCAF,  
RAF Coastal Command,  
Castle Archdale, Ireland  
early-mid 1944

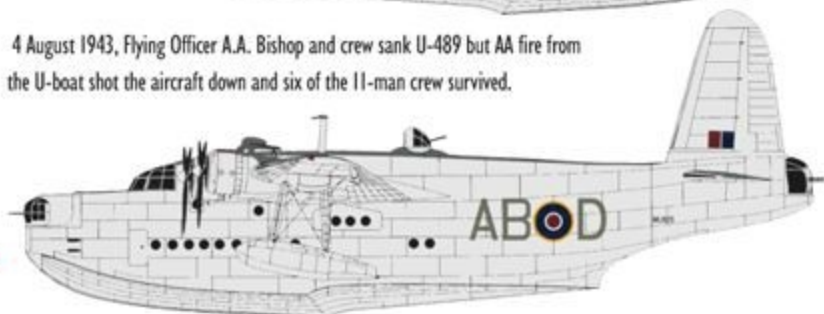


### Sunderland GR.III DD859

as aircraft 3 • G of  
423 Squadron RCAF,  
RAF Coastal Command,  
Castle Archdale, Ireland  
August 1943



4 August 1943, Flying Officer A.A. Bishop and crew sank U-489 but AA fire from the U-boat shot the aircraft down and six of the 11-man crew survived.



11 September 1944, Flying Officer J.N. Farren and crew joined *HMCS Dunver* and *HMCS Hespeler* in sinking U-484.



10 March 1944 (while based down the road from Castle Archdale at St. Angelo) Warrant Officer 2<sup>nd</sup> Class W.F. Morton and crew, sank U-625, while on W/O Morton's first operational mission as an aircraft commander.

### Sunderland GR.III ML825

as aircraft AB • D of  
423 Squadron RCAF,  
RAF Coastal Command,  
Castle Archdale, Ireland  
September 1944

**Updated  
& Expanded**

Documentation now includes a revised article on Sunderland ASW ordnance loads, completely illustrated with scale drawings.

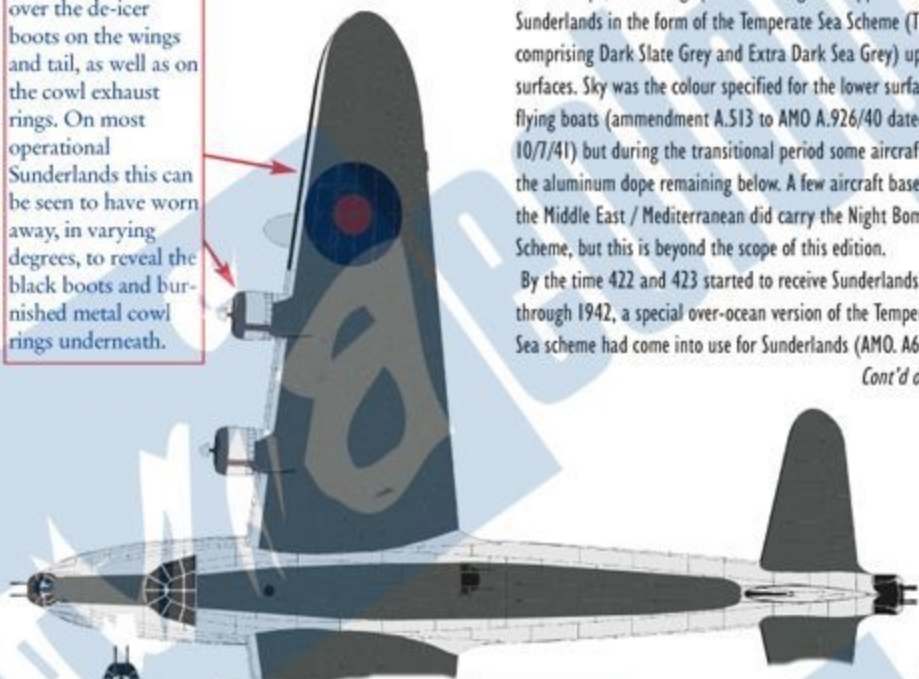
later aircraft will often feature a special white coating over the de-icer boots on the wings and tail, as well as on the cowl exhaust rings. On most operational Sunderlands this can be seen to have worn away, in varying degrees, to reveal the black boots and burnished metal cowl rings underneath.

## Wartime Sunderland Colours

After an initial period of entering service sporting overall aluminum dope, camouflage paint soon began to appear on Sunderlands in the form of the Temperate Sea Scheme (TSS, comprising Dark Slate Grey and Extra Dark Sea Grey) upper surfaces. Sky was the colour specified for the lower surfaces of flying boats (ammendment A.513 to AMO A.926/40 dated 10/7/41) but during the transitional period some aircraft had the aluminum dope remaining below. A few aircraft based in the Middle East / Mediterranean did carry the Night Bomber Scheme, but this is beyond the scope of this edition.

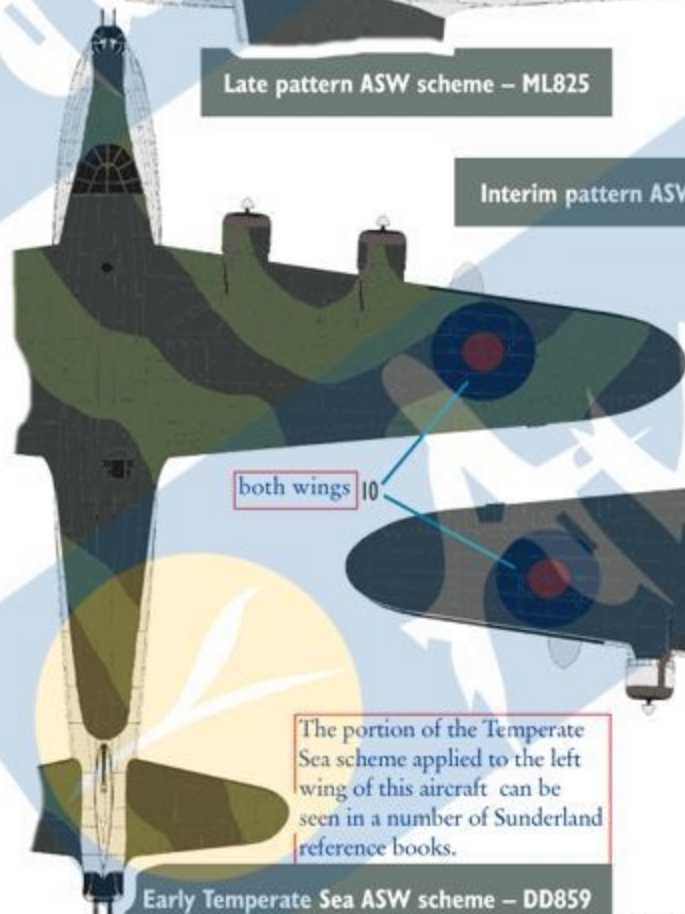
By the time 422 and 423 started to receive Sunderlands through 1942, a special over-ocean version of the Temperate Sea scheme had come into use for Sunderlands (AMO. A664,

*Cont'd on pg.2*



Late pattern ASW scheme – ML825

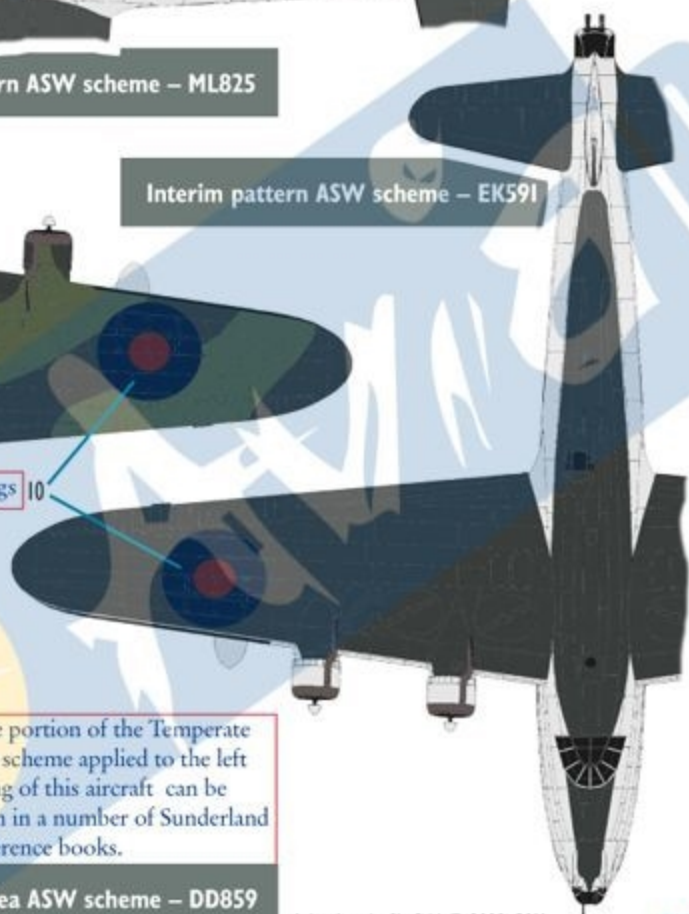
Interim pattern ASW scheme – EK591



both wings

The portion of the Temperate Sea scheme applied to the left wing of this aircraft can be seen in a number of Sunderland reference books.

Early Temperate Sea ASW scheme – DD859



Many thanks to Carl Vincent, Frank Cauley (EK591's Navigator, via Carl Vincent), and Jimmy Forrester\*, and Kim Elliott for their assistance and encouragement

*Cont'd from pg.1*

Appendix I, dated 2/7/42) comprising the same original TSS uppers with matte White under and side surfaces (see aircraft DD859). The goal was to reduce the aircraft's silhouette against the often cloud filled North Atlantic sky. This eventually developed into the ASW scheme with the white carried even further up the fuselage so as to nearly disappear when viewing the aircraft in profile on Sunderland. As with many other Coastal Command general reconnaissance aircraft, it wasn't long before the two-colour upper scheme was replaced by Extra Dark Sea Grey only. EK591 carries an example of this modified scheme.

This ASW scheme specification also called for the under surfaces of the wings and tail to be overcoated with a gloss transparent dope and, additionally for flying boats, an anti-fouling White (specification DTD4208) overcoating the standard White on the "underwater surfaces of the hull and wing-tip floats." Other special finish areas on these aircraft are covered in the illustrations. There is some ambiguity with regard to later wartime evolutions of this scheme. For example, some sources suggest that the upper EDSG was eventually replaced by Medium Sea Grey. While this has been determined to be the case for post-war aircraft, it may be that the EDSG appeared as MSG, having faded after some time in service on long-service Sunderlands (see aircraft ML825).

\* often referred to as such, but not an official name

From at least early 1944 onwards, any conspicuous features on the leading edges of anti-submarine tasked Coastal Command aircraft were "whited out" with special-purpose coatings developed for application to surfaces such as rubber de-icer boots and cowl-front exhaust collector rings. This is often seen in period photos with varying degrees of wear and tear evident.

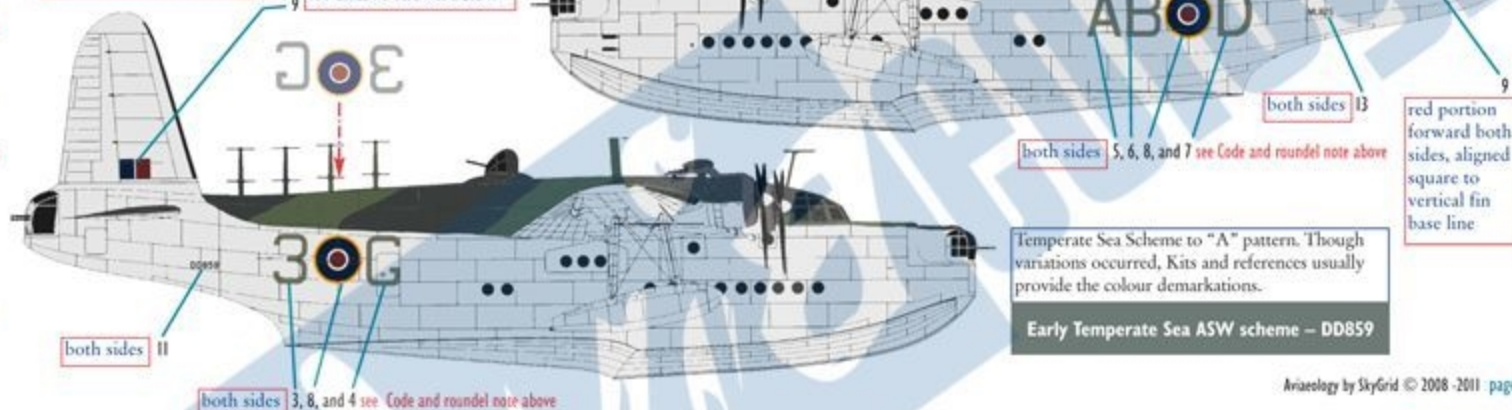
Officially Extra Dark Sea Grey, but appears much lighter on many late-war Sunderlands. Note the white wrapping above the leading edge of the wing quite a bit and continuing towards centre chord at the tip (compare ML825 and EK591 top views).

**Late pattern ASW scheme – ML825**

placement same as that for EK591 shown below

Code and roundel placement appears to have been "to spec" within 423 Squadron, with the character string right-reading left to right when facing either side of the aircraft.

Cockpit framing, pitot / radio mast and upper turret are White on Belfast-built Mk.IIIA aircraft



both sides 5, 6, 8, and 7 see Code and roundel note above

Temperate Sea Scheme to "A" pattern. Though variations occurred, Kits and references usually provide the colour demarcations.

**Early Temperate Sea ASW scheme – DD859**

red portion forward both sides, aligned square to vertical fin base line

Extra Dark Sea Grey pretty consistently usually with exhaust staining on the wing upper surfaces (common to all Sunderlands. Note the white wrapping above the leading edge of the wing only a little (compare ML825 and EK591 top views).

**Interim pattern ASW scheme – EK591**

Code and roundel placement appears to have been more haphazard and random within 422 Squadron, with the character string not necessarily right-reading squadron character(s), left, to aircraft letter, right, when facing either side of the aircraft.

The dirt and grime weathering illustrated below, especially along the waterline, was typical of operational Sunderlands during WWII

red portion forward both sides, aligned square to rudder hinge line

see EK591 specific Modelling Notes section for details

Upper part of cockpit framing, pitot / radio mast and upper turret are local camouflage colour on Dumbarton-built Mk.IIIA aircraft. Note single pitot head

External post sight present on all fixed forward firing gun equipped Sunderlands

Beaching gear typically aluminum lacquer with red visibility markings



1, 8, and 2 both sides see Code and roundel note above and cover illustration for opposite side placement

### The Sunderland Mk.III / Mk.IIIA

- With the exception of the obvious differences between the early radar antenna arrays of the initial Mk.III and the later underwing radomes of the Mk.IIIA, both basic subtypes of this main wartime production variant of the Sunderland were essentially the same. This is especially true when viewed from a distance. Closer inspection, often useful for accurate modelling, reveals that there were detail differences and similarities within subtypes as well, ranging from turret installations to bomb doors and factory interpretation (apparently) of the ever evolving paint scheme.

### Sunderland Mk.III DD859

- Since an exhaustive search failed to turn up even a single photo of the ill-fated DD859, the configuration, camouflage and markings presented herein were collated based on careful study of other early Mk.III's of the Dumbarton-built DD828-DD867 serial range, and of other early 423 Squadron aircraft. Even without such hard data with which to reconstruct the paint and markings scheme with 100% certainty, F/O Bishop's aircraft is historically significant enough to warrant inclusion in this set, herein is our best-guess rendering of the aircraft's salient features.
- By August of '43, most early Sunderlands on the squadron featured the ASV.III radar installation, so it seems very probable that DD859 had the installation at the time of her loss. Antenna arrays along the top and sides of the rear fuselage plus smaller units fitted to struts above the cockpit and under each wing make up the external components of the ASV.III set.
- Also, surprisingly, some aircraft within this serial range feature the later twin Browning M2 .303 calibre equipped nose turret. It is not known if this was the result of a retrofit program, or an early factory provision. The receiving MUs (Maintenance Units) fitted armaments consistent with the factory provisions.
- Not so surprisingly, DD859 did not have the fixed, pilot-fired four-gun flak suppression armament in the nose. This was a later service modification.
- Bomb doors on all aircraft in this serial range were "three holers."

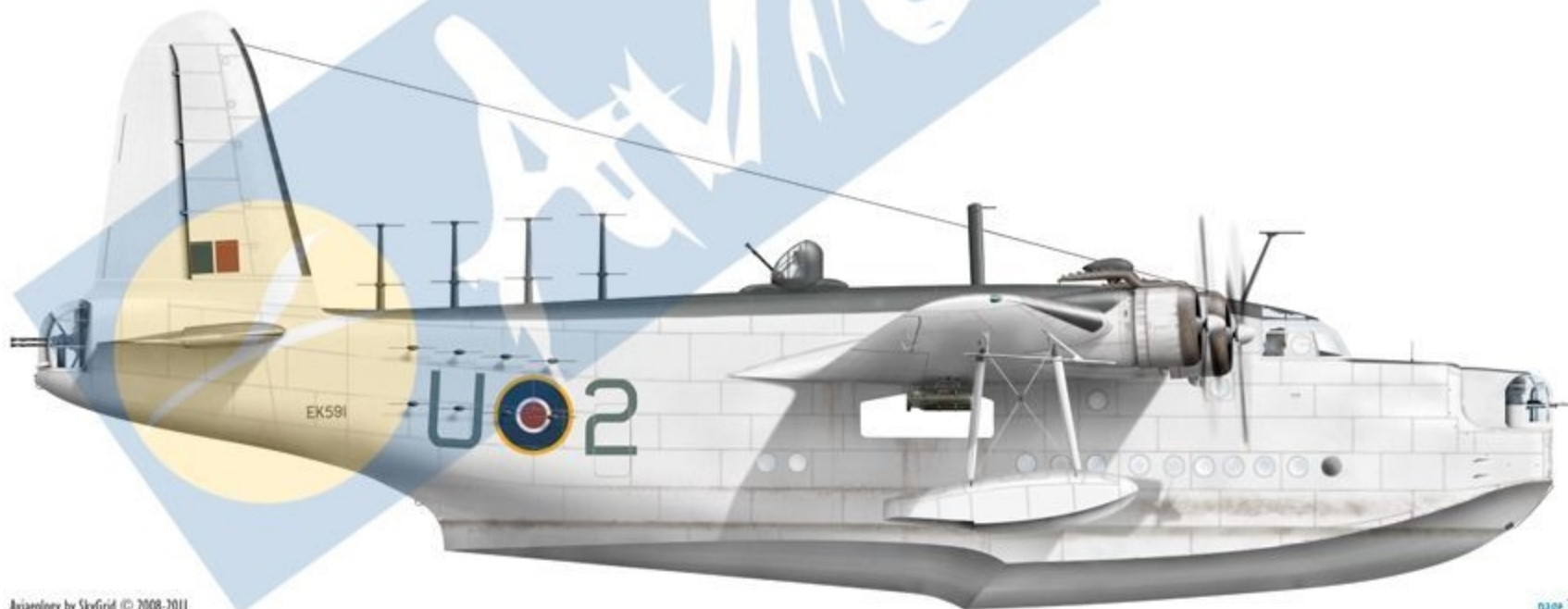
*follow this link (if viewing this as a PDF on your computer) or type "Sunderland RAF Museum image" into your web browser search field to view reference images of a restored Sunderland GR.5 (generally similar to the Mk.III). The restoration features nicely exhibited D/Cs as well. See page 4 for additional details on the D/C arrangement.*

### Sunderland Mk.III EK591

- Quite the opposite to DD859 above, EK591, as 422 Squadron's 2•U, is very nicely covered by a series of photos taken in the summer of 1944.
- ASV.III radar definitely installed, featuring antenna arrays as described above.
- Had the earlier single Vickers .303 equipped nose turret according to the combat report for the mission on which U-625 was sunk. Though interestingly, when the photo series mentioned above was snapped, this turret appears to have been replaced by a simple opaque fairing similar to that seen on some BOAC and post-war transport-tasked Sunderlands. This fairing appears to have had the same simple domed outline as the early turret. The reason behind its appearance on EK591 in July of 1944 is unknown. One possibility is that the aircraft was undergoing some sort of service test or retrofit.
- Fixed, pilot-fired four-gun armament installed in the nose. When compared to later aircraft, the troughs appear to have slightly different shape. It is not known if these were installed at the Service reception MU immediately ex-factory, or as a retrofit while on Squadron service.
- The same combat report mentioned above also reveals that this aircraft was one of those carrying Browning .50cal M2s to be deployed on simple pintle mounts in the galley hatches (just "downstairs" from the cockpit just above the step in the hull). From a model builder's point of view this detail may be considered as merely academic given that the guns were usually stowed, to be mounted in the opened hatch only when engaging the enemy. Whether 2•U carried one or two of these galley guns is open to debate.
- Bomb doors on all aircraft in this serial range were "three holers."

### Sunderland Mk.IIIA ML825

- The research and reconstruction method note referred to in the DD859 entry above applies here as well. However, we feel this one is somewhat more accurate since there were more photos of aircraft from this particular Belfast-built serial range (ML807-ML831) available for scrutiny at research time.
- ASV.IVc radar installed, the external evidence of which are the radomes; one under each wing.
- The photographic record shows the first dozen or so aircraft (up to ML819 for sure) of this batch with the single Vickers .303 equipped nose turret, while ML824, ML827 and ML828 show the later twin Browning installation. Though it is unclear if this was an ex-factory MU or operational squadron effected change, modelling ML825 with the later turret while in her late squadron markings, as here, seems reasonable.
- Both earlier "three holer" and later "two holer" bomb doors can be seen on photos of various Sunderlands in this serial range. It is difficult to determine if either was factory standard or service retrofit. From a modelling perspective, speculation can be avoided by having the bomb doors "rolled down" out of the way, perhaps even with weapons carriages "rolled out" under the wings.



## Racks and Carriers

- The Sunderland's main armament of Antisubmarine (A/S) Bombs and, later, Depth Charges (D/Cs) were carried suspended on standard Universal Bomb Carriers (UBCs), which were, in turn, suspended beneath the aircraft's ordnance carriages. Essentially sturdy mechanical racks on rails, this arrangement was a uniquely Sunderland feature designed to both allow reloads while airborne and to enhance loiter and / range performance (less drag with the droppable load stowed). The rails, one set per side, extended from the fuselage ceiling structure adjacent to the wing root on each side to underneath the wings. The moveable carriages tracked along these rails from their stowed position fully within the fuselage to a deployed position when rolled out and locked under the wings. The massive bomb doors that formed the fuselage sides under the wing roots had to be retracted downwards prior to deploying the ordnance load. Depending on mission endurance requirements etc, up to one complete ordnance load could be carried within the aircraft's huge hold immediately below the carriage's stowed position. In theory at least, when the deployed load was spent, the carriages were retracted, reloaded, and ready for another engagement with the enemy. In at least one documented case, the system was used to transfer D/Cs from malfunctioning UBCs (Universal Bomb Carriers) on one wing to those recently emptied (in a U-boat attack) on the opposite wing while the aircraft circled the target out of AA range, thereby enabling a second attack to be delivered.

On early Sunderland versions the systems for moving both the carriages and the bomb doors were manpower-driven mechanisms. By the time the Mk.III was in widespread production, both had become electro-mechanical push-button systems. Externally both were identical in appearance.

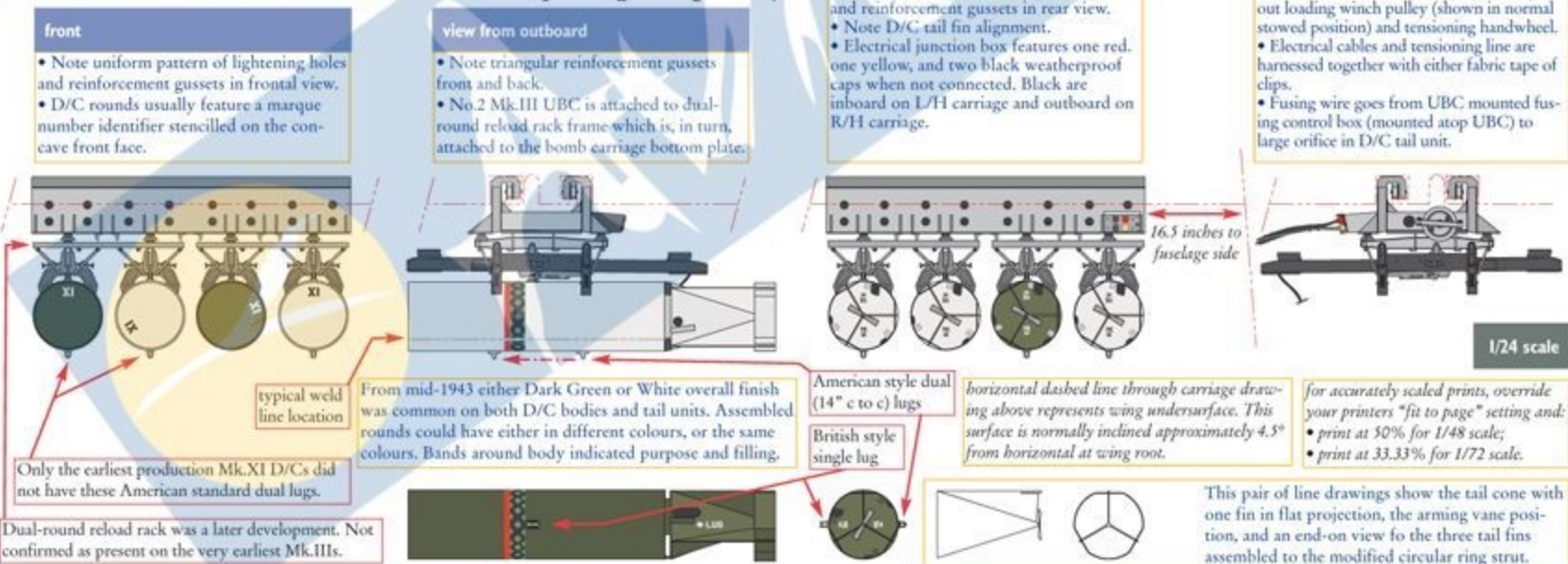
- From the earliest Sunderland Mk.I's through to the first few production blocks of the Mk.III the UBC No.1 Mk.I and its look-alike derivative Mk.II (modified in detail only from a modeller's perspective), were standard equipment for carrying Anti-submarine Bombs and Depth Charges. The photographic record shows that the Mk.II remained in service well into the late war period as well. Photos of aircraft contemporary to our subject Sunderlands show the more robust and compact UBC No.2 Mk.III on board. The RAF Museum's Sunderland GR.5 features similar UBC Mk.III's.

see page 3 for website links containing images of Sunderlands in general and the D/C installation in particular

## ASW ordnance on mid / late Second World War Sunderlands

### Sunderland Mk.III through V bomb carriage details

R/H installation shown – L/H is similar



## Antisubmarine Weapons

- Initially the Sunderland's main offensive armament load comprised of Anti-submarine (A/S) Bombs and, later, Depth Charges (D/Cs). A newer 600lb A/S bomb was also a possible late-war option.
- Early aircraft could deploy either 4x 250lb, 2x 500lb A/S bombs, or 2x 450lb D/Cs per wing. Later aircraft used the 250lb D/C, 4 per wing, almost exclusively. This was the load-out option used by each of the RCAF aircraft featured in this set during their respective significant actions.
- The 250lb D/C was available in two similar, but distinctly different versions... the earlier Mk.VIII and the later evolution, the Mk.XI. Although similar looking at a distance, these were completely different weapons with no interchangeable parts. The Mk.XI was much more lethal to U-boats, filled with a more potent explosive triggered by a fuze and pistol system that behaved better at more shallow depths. Water entry characteristics were also improved upon by relocating the slightly convex nose of the Mk.VIII with a concave "spooler" nose.
- One potential area of confusion in modelling these RAF/FAA 250lb D/Cs (besides the nose shape that is) is the air tail fitted. Those on early Mk.VIII D/Cs featured a simple hollow cylinder of the same 11 inch diameter as the body of the weapon itself. The simple sheet-metal structure was stiffened with an internal spiral of thick spring-metal wire. Three equally spaced oblong holes around the forward end of the tail allowed armourers to attach the fuze-setting (depth control) link when loading the round on the UBC. The later Mk.XI D/C was initially equipped with a similar hollow cylinder tail. This, the "Tail Assembly Mk.III" was strengthened by six more or less equally spaced circumferential corrugations. Instead of three equally sized holes, the forward part of this tail featured one big hole for the control link, and two smaller ones to give access to the pistol and hydrostatic valve settings when loading. The different sized holes also had the benefit of imparting asymmetrical force on water entry, thus skidding the round sideways and slowing it down before it broke away. Later again, as the new air-arming Mk.XIX and XX Pistols and hydrostatic Mk.XIV and XVI Pistols came into use, the "Tail Assembly Mk.IV" was designed to better accommodate their fitment on the back end of 250lb D/Cs. Similar to the tails on RAF bombs of the war years, the fins on the conical tail were ring-strutted. But the similarity stopped there; there were only three fins (not four like most bombs) and the ring strut was not fully round, but flattened to end up perpendicular to the fins they were attached to. This last design feature is thought to have been for positive tail separation on water entry. The timelines offer a slim chance that 3\*G may have carried a load of cylindrically tailed Mk.XI's while the later two aircraft were most probably armed with the conical-tailed Mk.XI. The latter are illustrated here.
- Please note that more research is required before the upper and lower plan views of the overall bomb carriage arrangement can be rendered with reasonable accuracy. Hopefully what is offered here is enough to get you started.