

A *(very)* Rough Guide to

# UK Fighter & Bomber Colours

## September 1939 to the 1990s

*You all probably know all this already.....!*

### RAF fighters: UK & NW Europe

#### Sept 1939 to June 1940

*Dark Earth/Dark Green* disruptive camouflage was on the upper surfaces. Undersides were originally port-side **Black** and starboard-side **White**, divided along the centre-line of the fuselage - but on June 6, 1940 all fighter undersides were ordered to be painted in *Sky*. Little of this paint was immediately available to front-line squadrons, and thus aircraft undersurfaces appeared in a variety of locally mixed colours ranging from *Eau-de-nil* to *Duck Egg Blue*, but from early/mid-August 1940, the supply of *Sky* had much improved; by the end of September *most* fighters had *Sky* undersides. Squadron code letters were *Medium Sea Grey*; spinners were painted *Black*.

#### July 1940 to July 1941

*Dark Earth/Dark Green/Sky* camouflage continued in use. Between 27 November 1940 and 15 April 1941, Fighter Command's day-fighter aircraft had their *port* wings painted *Black* as an additional means of identification. Night-fighters were now being painted overall *Night* from mid-autumn in 1940, and from late 1940 *RDM2A Special Night* was applied. Day-fighter squadron code letters remained *Medium Sea Grey*, but night-fighter squadron codes were changed to *Dull Red*. Propeller spinners were painted *Black*; there were a few exceptions, e.g. No.66 Squadron's red spinners.

From late December 1940, an 18" wide *Sky* band was applied round the aft fuselages, just ahead of the tail-fin; this was an additional means of identification, and was retained beyond the end of the war. Spinners were now painted *Sky*. Some fighter aircraft acquired *Sky Blue* tail bands and spinners for a brief period, before being repainted in *Sky*.

#### July 1941 to 1947-50

From July 1941, the outer leading edges of the wings of day-fighters were painted with a 4" deep *Yellow* stripe that tapered towards the wing tip; this aided identification from ahead in order to avoid head-on attacks on friendly aircraft in

the confusion of aerial combat. (This yellow stripe was *not* carried on high-altitude day-fighters, night-fighters, or on **Mosquito** fighter-bombers.) After the cessation of hostilities in 1945, this leading-edge stripe *very* gradually disappeared from many (but not all) fighter airframes, though the **Sky** fuselage band remained.

Now that Fighter Command had gone over to the offensive in the early summer of 1941, “leaning” into France and the Low Countries, a new standard **Temperate Day-Fighter Scheme**, more suited to over-water operations, was introduced from dawn on 15 August, 1941, using **Ocean Grey/Dark Green/Medium Sea Grey**. The 18” **Sky** band, **Sky** spinners, and **Yellow** leading-edges, were retained. Day-fighter squadron code letters were changed to **Sky**, and spinners were also painted in this colour. National Markings were changed to the “C” types from mid-May 1942.

From September 1942, Night-fighter camouflage was changed from overall **Night** to an overall **Medium Sea Grey** finish with a **Dark Green** disruptive camouflage pattern on the upper surfaces; night-fighter codes remained **Dull Red**. (**Mosquito** intruders also had **Night** undersurfaces, with the night-fighter style camouflage on top). The thick, sooty black **RDM2A Special Night** finish was discontinued as it adversely affected aircraft performance and was difficult to maintain.

The **Dark Green/Medium Sea Grey** night-fighter camouflage lasted well after the war and was last used on **Gloster Meteor NF.11/12/13** night-fighters, finally changing with the introduction of the **Gloster/Armstrong Whitworth Meteor NF.14** in 1954 which carried the then standard fighter camouflage, though the earlier marks of **Meteor** night-fighters retained the original night-fighter camouflage.

From 3<sup>rd</sup> January 1945, all RAF fighters serving in Europe with 2<sup>nd</sup> TAF had their 18” **Sky** rear fuselage bands painted out, and spinners were repainted **Black**.

Some RAF **Mustang IVs** acquired a natural metal finish (as per the USAAF’s P-51B/C/D aircraft) during the last few months of hostilities; although they retained the **Yellow** leading-edge stripes, they lost the 18” **Sky** fuselage band.

## **RAF Fighters: Desert Air Force & Italy - 1941~1945**

At the start of the North African campaign against Italian forces in 1940, British aircraft were finished in the then current **Temperate Land Scheme** of **Dark Green/Dark Earth/Sky**. Soon, **Middle Stone** replaced **Dark Green**, and **Azure Blue** replaced **Sky** on undersurfaces. Fighters wearing the Desert Scheme did not have the 18” **Sky** band or the **Yellow** leading-edges. Spinners were **Dull Red**.

Note: from around July 1943, from the invasion of Sicily onwards, many fighter airframes delivered to the Mediterranean Theatre were finished in the, by then,

standard **Temperate Day-Fighter Scheme**, and by 1945 most fighters in this theatre were finished thus, but **Medium Sea Grey** was very occasionally replaced with **Light Mediterranean Blue** as an underside colour (eg. No.43 Sqn Spitfire IXs) code letters in North Africa and Italy were (usually) **White**, though red or black, both sometimes outlined in white, were not unusual.

The 18" **Sky** rear fuselage bands were present during the Sicilian, Italian, Balkan, Corsican, and South of France campaigns on some airframes wearing the Temperate Day-Fighter Scheme, but was deleted on others - *photographic references are vital here*. Day-fighters' spinners continued to be painted **Dull Red** in the Mediterranean Theatre of Operations.

## **RAF Fighters: South East Asia December 1941~1945**

Fighter aircraft based in the Far East and India, before, and during the Japanese invasion of Malaya, carried the **Dark Green/Dark Earth/Sky** colours of contemporary home-based airframes.

New aircraft from the UK delivered to this theatre also wore **Dark Earth/Dark Green/Medium Sea Grey** camouflage. However, many of the early reinforcement Hurricanes sent to this theatre were in the **Desert Camouflage Scheme**, having come from stocks held by Maintenance Units in Egypt.

By early 1944, all fighter airframes were being delivered to South East Asia Command in the standard **Temperate Day-Fighter Scheme**, but the earlier **Dark Earth/Dark Green/Medium Sea Grey** scheme was still quite common up to, and for at least twelve months after, the Japanese surrender in August 1945.

Some aircraft, notably **Republic Thunderbolt Is and IIs**, were often in a natural metal finish, as well as in the earlier **Dark Earth/Dark Green/Medium Sea Grey** scheme.

After encountering very serious problems with the humidity and heat affecting the adhesives used in their construction, **Mosquito** airframes in South East Asia Command were painted with **Aluminium** dope.

Fighter aircraft in this theatre had **White** identification bands painted across their wings, tail-planes, and vertical tails; the bands on natural metal/aluminium painted airframes were painted in **Night**. (Note: *these identity bands did not cross ailerons, elevators or rudders*; they were only applied to fixed flying surfaces.)

## RAF Bomber Command: 1939~1945

Bombers were painted matt *Dark Earth/Dark Green/Night [Black]*; late in the war, *Glossy-Black (Night)* gradually came into use as a result of experiments conducted in the USA in connection with the planned B-29 raids on Japan.

At the start of hostilities, the undersides of many light and medium bombers were painted initially with *Sky Blue* (going through all the variations thereof) and eventually *Sky*, and later, *Night* undersides.

*Mosquito* bombers did not follow the established scheme - being delivered initially in *Dark Earth/Dark Green/Medium Sea Grey* camouflage, they soon adopted the standard Temperate Day Fighter scheme of *Dark Green/Ocean Grey* upper surfaces with *Medium Sea Grey* undersides, and even carried the 18" *Sky* band around the rear fuselage. Later, *Night* replaced *Medium Sea Grey*, and the *Sky* band was removed.

A new colour began replacing *Night* on bombers' undersurfaces, and was used overall on night-fighters (from November 1940), this being *RDM2A Special Night*. This was a very sooty, very coarsely pigmented, matt black finish which had no reflective qualities. It had, however, major drawbacks: the thick finish induced drag; tests showed that a *Mosquito* night-fighter painted in overall *RDM2A Special Night* was 26 mph slower than one finished in overall *Night*. The *RDM2A Special Night* could also be rubbed, brushed, and even scooped off the airframe by hand and therefore needed constant re-touching. A very serious problem with this finish emerged during the night-time bomber raids over Occupied Europe, as although this was an exceptionally matt finish, when an aircraft in *RDM2A Special Night* was caught in enemy searchlights, it showed up as a light grey, thus completely negating its intended purpose! *RDM2A Special Night* was replaced by *Night* on bomber airframes. Trials in the USA had shown that a glossy black underside did not show up nearly as clearly as a matt finish. As a result of these trials, *Gloss Night* was appearing on many Bomber Command airframes during the final year of the war.

## RAF Bombers: Post-1945

At the end of the war, *Avro Lancaster* airframes that had been earmarked for "Tiger Force" operations against mainland Japan were painted *White* with glossy *Night Black* undersurfaces, a scheme also worn by many of the new *Avro Lincolns*.

The standard Bomber Command scheme eventually comprised *Black* undersides with *Medium Sea Grey* upper surfaces; this scheme being carried over on to the early *Canberra* deliveries (e.g. No.101 Sqn). *Canberra* bombers were also painted in a "high altitude" *Medium Sea Grey/Light Slate Grey* upper surface

camouflage, with *PRU Blue* undersurfaces. Canberra bombers were finally painted *High Speed Silver*. Bomber Command's Boeing Washingtons (B-29s) were left in *Natural Metal*. The first Vickers Valiant bombers to enter service were painted *High Speed Silver*, as were the initial Avro Vulcan B.1 deliveries, but this scheme was fairly soon replaced by high gloss *Anti-flash White*: Handley Page Victors B.1 and B.2 airframes and Avro Vulcan B.2s were delivered in this scheme from the start.

In the mid-1960s, the V-Bombers' upper surfaces were camouflaged in *Dark Green/Medium Sea Grey* to reflect their change of tactics to low level (under the radar) operations. In the 1970s the white undersides were painted *Light Aircraft Grey*. When a wrap-round scheme was introduced for the Vulcans, *Medium Sea Grey/Dark Green* was adopted, though some Vulcans were later finished in a *Dark Sea Grey/Dark Green* wrap-round camouflage.

## RAF Fighter Command & RAF Germany: 1945-54

Day fighters: overall *High Speed Silver*. Note that the wartime Temperate Day-Fighter Scheme lasted for *long* after 1945, owing to the costs involved in repainting: the UK was almost bankrupt! Night-fighters remained *Sea Grey Medium/Dark Green*. From 1954/55, Day Fighter and Night/All-weather Fighter schemes were changed to a common camouflage scheme of *Dark Sea Grey/Dark Green* with *High Speed Silver* undersides.

## To Strike Command (1968), and beyond

Airframes were painted *Dark Sea Grey/Dark Green/High Speed Silver* (the latter colour being replaced by *Light Aircraft Grey* from the mid-1960s). The RAF's Canadair Sabres based in RAF Germany had *PRU Blue* under-surfaces, but the Sabres based in the UK (i.e., the Linton-on-Ouse Wing of Nos.19 and 92 Sqns) had *High Speed Silver* undersurfaces. Aircraft finishes were usually high gloss until the mid-1970s when new-formula matt paints were introduced. Ground attack/strike aircraft eventually received a *Dark Sea Grey/Dark Green* wrap-round camouflage, e.g. Hawker Siddeley Harrier, SEPECAT Jaguar, and Hawker-Siddeley Buccaneer.

English Electric Lightnings were overall *natural metal*, though the Lightning F.2a aircraft stationed in RAF Germany (Nos. 19 and 92 Squadrons) were repainted *Dark Green* with *natural metal* undersides, a scheme unique to these two squadrons).

Back In the UK, **English Electric Lightnings** were later camouflaged in **Dark Sea Grey/Dark Green** with *natural metal* undersides.

From the mid-1970s, air defence camouflage employed **Medium Sea Grey/Barley Grey** (now known as **Camouflage Grey**)/**Light Aircraft Grey**, in various combinations and proportions: these colours were employed on **Lightnings**, **Phantoms**, **Hawks**, and **Tornado F.3s**, and even on some **Jet Provosts**, and now on the **Eurofighter Typhoons**. A new colour- **Dark Camouflage Grey** was introduced as the darker component of the grey schemes later used on the upper surfaces of **Buccaneers**, **Harriers**, **Jaguars**, and **Tornado** strike aircraft.

Many **Vulcans** involved with the “Black Buck” operations in the South Atlantic in May 1982 acquired **Dark Sea Grey** undersides, if they had the **Medium Sea Grey/Dark Green** upper surface scheme.

A new colour, **Hemp**, was introduced to camouflage the upper surfaces of **Canberra PR.9** airframes which were painted **Light Aircraft Grey** underneath; this scheme was also later introduced on **Victor** tankers, **Nimrod** maritime reconnaissance aircraft, and on **VC-10** and **Lockheed TriStar** tankers. **Hemp** was intended to camouflage the aircraft, while parked on concrete hardstandings, from Soviet spy satellites.

## The Royal Navy (Fleet Air Arm)

### 1939 to 1947

**Extra Dark Sea Grey/Dark Slate Grey/Sky Grey** was the standard Fleet Air Arm camouflage until (after mid/late-1940 **Sky** began to replace the **Sky Grey** component. Many **Swordfish** and **Avenger** aircraft on anti-submarine duties, notably those operating in the North Atlantic from escort carriers and MAC ships, had **White** lower surfaces *and* sides; this finish was also applied to **Sea Hurricane** fighters operating from these ships.

In the East Indies Fleet and the Pacific Fleet, during 1944-45, many (but not all) American-built aircraft (**Corsairs**, **Avengers**, **Hellcats**, and **Wildcats**) retained the standard US Navy **Sea Blue Gloss** factory finish in which they were delivered to the Royal Navy.

### 1947 to 1958

**Extra Dark Sea Grey/Sky** was adopted as the standard Fleet Air Arm scheme after the war. **Dark Slate Grey** often remained as a component of the upper surface camouflage (along with the wartime National Markings) until repainting was due and the application of the new post-war roundels and elimination of the fin-flashes. Note that the proportions of each colour changed during the late 1940s,

from the greater part of the airframe being **EDSG** with **Sky** undersides, to extending the **Sky** to cover most of the fuselage except for the upper fuselage, and the upper wings and tail-plane. The finish was very glossy.

## 1958 to 1982

Glossy **Extra Dark Sea Grey** remained in use, but now **White** replaced **Sky** as the underside colour and the **EDSG** resumed its earlier position as the dominant colour. **Buccaneers** were at first **Extra Dark Sea Grey/White** - then overall gloss anti-flash **White** with toned-down (*pink/white /pale blue*) roundels - and finally overall **EDSG**. **Sea Harriers** were introduced in glossy **EDSG** with gloss **White** undersides, remaining thus until the Falklands War, when those sent to the South Atlantic in HMS 'Invincible' were re-painted, while en route, in overall **EDSG**, their roundels being modified (with black paint) to eliminate the white component (Argentine pilots nicknamed them "the Black Death"). The **Sea Harriers** that were later sent to the Falklands in HMS *Illustrious* were finished in semi-matt **Medium Sea Grey**, with the undersides of wings and tail-planes in **Camouflage Grey BS4800 18.B.21**- originally known as **Barley Grey**.

The **Sea Harrier FA.2** wore an overall **Medium Sea Grey** scheme, until its final withdrawal from service.

## RAF & RN: Roundels and Fin Flashes

The following apply in *very general* terms...

National Markings vary in diameter (roundels) and height (fin flashes) according to the aircraft types to which they are applied.

There are strict rules pertaining to which part of the airframe on which they are painted: **upper-wing roundels** are positioned at a point 2/3 of the distance measured from the aircraft's centre line to the wing-tip; **under-wing roundels** are positioned in the same way (though there are very many variations to this rule, often to accommodate the under-wing serial numbers); **fuselage roundels** are positioned by measuring the chord of the mainplane at its root- this measurement is then divided by 5 - the result is then used to give the distance from the wing trailing-edge to the *forward* edge of the roundel.

**Fin-flashes** are in three standard heights (*usually!*): 18, 24, and 36 inches according to the size of the fin. Occasionally some are raked back as, for example, on some **Lightnings**, **Hunters**, **Jaguars**, **Phantoms**, and **Harriers**. The enormous fin-flashes applied to the **Gloster Javelin** were *very definitely* an exception!

## Type “A” & “A1” markings

These were the pre-War markings in use on September 3<sup>rd</sup> 1939, on non-camouflaged aircraft and on overseas based aircraft. Under wing roundels were plain **Bright Red / White / Bright Blue**, now *unofficially* known as Type “A”, the fuselage roundels had a yellow outer ring, to improve their visibility against the Dark Green / Dark Earth camouflage, these are now known as Type “A1” roundels - again an unofficial designation.

Fin-flashes were not introduced until May 1<sup>st</sup> 1940.

## Type “B” markings

These were principally used as upper wing roundels and as such were the largest roundels on the airframe. They were **Dull Blue** and **Dull Red**. Photo-reconnaissance aircraft and high altitude fighters (and some early night-fighters) used Type “B” roundels (as we now, *unofficially*, call them) in all positions on the airframe, they also had **Red / Blue** fin-flashes, though these were not applied to the night-fighters. (At the outbreak of hostilities, Type “B” roundels were being used as fuselage roundels on camouflaged airframes, but they were changed to Type “A” after a number of “friendly fire” incidents.)

## Type “C” & “C1” markings

These replaced the type “A” and “A1” markings) from July 1<sup>st</sup> 1942. The Type “A1” roundel was replaced by the “C1” roundel. In the “C” roundels the **Dull Red and Dull Blue** portions were increased in size and the **White** rings were narrowed; “C1” roundels also had a narrow **Yellow** ring added to the outside. Type “B” roundels continued to be used above wings until January 3<sup>rd</sup> 1945 when Type “C” roundels were ordered to be applied- in many cases Type “C1” roundels were erroneously applied above the wings instead of Type “C” roundels. “C” style fin-flashes had enlarged **Dull Red** and **Dull Blue** sections separated by a thin **White** stripe. The unofficial designations of Types “C” and “C1” markings were applied in retrospect.

*NB. It took until 1950-52 for the change to the new “D” markings to be completed.*

## Type “D” markings

On April 16<sup>th</sup> 1946 new aircraft colours were promulgated for many types of aircraft- a **High Speed Silver** painted (*not* natural metal) finish. On May 16<sup>th</sup> 1947, an Order was given to revert to a variant of the pre-War “A” markings, using the pre-war bright shades of the **Roundel Red** and **Roundel Blue**. These new roundels were of a different proportion to the pre-War versions, having the **Red** centre the same diameter as the widths of the **Blue** and **White** rings. The fin-flash stripes were of equal widths. Post-war, for a while, on Royal Navy airframes, until

the general introduction of the “D” roundels, the Admiralty ordered the painting of roundels with same proportions as those of the 1930s, with the small red centre.

Again, the term Type “D” is unofficial.

A variant of the “D” markings, using very *Pale Red* and *Pale Blue*, was introduced as part of the anti-flash finish (*White*) on the nuclear armed V-Force (Valiant, Vulcan, and Victor)- as well as on the Buccaneer S.1s and early production S.2s of the Fleet Air Arm).

**Note: The terms “A”, “A1”, “B”, “C”, “C1”, and “D” were coined during the late 1950’s by the late Bruce Robertson to more clearly define the different styles of National Marking - originally for the benefit of modellers!**

### “Tactical” Markings

The type “D” markings have remained in use to date on uncamouflaged airframes and on the current all-black training finish it is outlined with a thin white ring.

In the early 1970s “Tactical” *Red/Blue* markings were introduced on camouflaged airframes; these retained the bright colours of the “D” markings and the roundels are, at first glance, similar in appearance to the wartime “B” markings, but the colour proportions are quite different.

The Tactical markings also gave rise to the *Pale Red/Pale Blue* markings that were introduced at the same time as the all-grey camouflage on air-defence aircraft; the Tornado GR.4 and GR.4a aircraft retained small versions of the Tactical markings.

### Roundel & fin flash colours

They’re red, white, and blue - simple...! No... *Not quite!*

Pre-1939, the introduction of aircraft camouflage was first mooted in a Royal Aircraft Establishment Report, commissioned by the Air Ministry in 1933; this drew on much of the experimental work on camouflage that had been done at Orfordness, on the Suffolk coast, during the First World War. As a result various experiments and practical tests were carried out at Farnborough.

In 1936, an Air Ministry committee was established, which was chaired by Air Marshal Sir Hugh Dowding, and recommended that only home-based aircraft (initially, only bomber and fighter types) need to be camouflaged, and all overseas-based aircraft were to be left in silver dope.

However, before September 1939, it had become clear the National Markings were compromising the beneficial effects of camouflaging bombers and fighters - to put it simply, the colours were too bright, particularly the White rings of the roundels.

So, the **Bright Red** and **Bright Blue** were replaced with **Dull Red** and **Dull Blue** shades, and **White** was either eliminated, or reduced in area by reducing the sizes of the markings; so the RAF and Fleet Air Arm entered the war with the roundels thus treated. *The fin-flash was not yet in existence!*

At the outbreak of war, the RAF sent an Air Component to accompany the BEF to France, to serve alongside the French Air Force. This force was mainly comprised of types such as **Hawker Hurricane** fighters, **Fairey Battle** light bombers, and **Westland Lysander** army co-operation and reconnaissance aircraft. The French used their blue/white/red roundels as national identification plus another very useful means of identity- a blue/white/red-striped rudder; soon the **Hurricanes** of Nos.1 and 73 Squadrons belonging to the Advanced Air Striking Force of the Air Component, based in Northern France, were wearing rudder stripes too, though with the colours in reverse order to those of the French.

On May 1<sup>st</sup> 1940, shortly before the Germans launched their devastating *blitzkrieg* on May 10<sup>th</sup> 1940, the Air Ministry, recognising the usefulness of the French-style rudder stripes as used by Nos.1 and 73 Squadrons, sent Signal X.485 to all Commands (at home *and* overseas), instructing that vertical stripes of **Red/White/Blue**, in equal widths, be applied to aircraft fins - *not on rudders*, with **Red** leading on both sides. It was considered that, in view of the experience gained in France, it would be better to apply the stripes to the fixed vertical fins, rather than risk unbalancing the moveable rudder surfaces. (It may be noted that there are many recorded instances of the fin stripes being applied in the wrong order!) The Admiralty also adopted the fin-flash at the same time for all Fleet Air Arm aircraft. Outer **Yellow** rings were also added to the "A" Type fuselage roundels to aid identification at longer distances.

Having introduced the **Dull Red** and **Dull Blue** colours in 1936 for camouflaged aircraft, it is a little surprising to note that, as late as September 1940, **Hawker Hurricanes** being built by Gloster Aircraft Ltd had their roundels and fin-flashes painted in the pre-war **Bright Red** and **Bright Blue** - one can only assume that Glosters were using up their pre-war stocks of these paints. Other airframes also had the old bright colours applied; examples of Bolton Paul **Defiants** were occasionally seen with bright fin-flashes, particularly when finished as day-fighters in the Temperate Land Scheme.

**Dull Red** and **Dull Blue** continued in use throughout the war and beyond...

### [Indian Ocean, South East Asia, & Pacific theatres](#)

In the Pacific, the Americans had discovered that the red centres of their cocardes were being mistaken for Japanese "meatballs" in the heat of combat, and damage and losses from "friendly fire" were reaching unacceptable levels - so both the US Navy and the US Army Air Force eliminated the Insignia Red centre from their national markings as of 15<sup>th</sup> May 1942; this change was applied on a world-wide basis - including within the USA itself.

The RAF and Commonwealth air forces retained the **Dull Red** centre to their roundels. (The South African Air Force did *not* use **Red** in its National Markings - throughout the war, and beyond, they used **Orange** instead. The SAAF also retained army ranks for its personnel.)

*NB.* All British Empire aircraft serving east of Aden had the red component of their National Markings removed as of June 24<sup>th</sup>, 1943.

The Australians adopted a **Dull Blue/White** roundel and fin-flash from the summer of 1942. However, the RAF deemed that merely eliminating the **Dull Red** centres would compromise camouflage by imposing a large, empty white disc on the camouflage finish (it could also serve as an aiming point...), therefore it was decided that the **White** would be mixed with **Dull Blue** (in the ratio of 7 parts **White** to 1 part **Dull Blue**) to reduce its brightness and reflectivity; furthermore the National Markings of *all* RAF and Royal Naval aircraft in India and Burma, and the Far East, were to be very much reduced in size. **White** (as well as **Dull Red**) was also eliminated from the fin flash and replaced by this new pale blue, which had now acquired the official name of **India White** - the new markings were generally known as SEAC (South East Asia Command) markings.

When the British Pacific Fleet joined the US Navy operating against Japan as Task Force 37, in April/May 1945, fin flashes were (generally) painted out and the **Dull Blue** roundels were given **White** centres and **White** outlines, with **White** flanking bars, all outlined in **Dull Blue**, to achieve a degree of commonality of identity markings with US aircraft.

## Post-War National Markings

After the end of the war, the UK was very nearly bankrupt, and a return to either pre-war markings or the adoption of a new version would cost money. So, for much of the late 1940s, British aircraft could be seen wearing the wartime National Markings with the **Dull Red** and **Dull Blue**, and only gradually did the new post-war National Markings appear, in the restored pre-war **Roundel Red** and **Roundel Blue** colours. Sometimes, these new bright Type "D" markings were applied on the wartime camouflage colours.

When Royal Naval aircraft shed their wartime colours and wartime National Markings and adopted the new proportioned roundels, the Admiralty decided that their aircraft would discard the fin flash that they had been obliged to adopt in May 1940. For a time many Royal Navy airframes carried the pre-war "A" type roundels, until the "D" type roundels were adopted.

The next major change in the colours of British National Markings came not long after the V-Bomber force was set up. Initially, the first two V-Bombers to enter service with RAF Bomber Command, the **Vickers Valiant** and the **Avro Vulcan**, were in **High Speed Silver**, with the standard colours for the National Markings, but soon they were repainted in what became known as **Anti-Flash White** - a very glossy finish. This paint was simply to reflect the intense (hot) flash of a nuclear detonation: immediately after take-off, the cockpits of V-bombers were blacked

out to prevent serious eye-damage to the crew; navigation to and from their intended targets was entirely on instruments and radar. It was later further considered that the standard colours of the National Markings might also attract that intense heat and endanger the integrity of the airframe, so the Red and Blue components of the National Markings were painted in a very *Pale Blue* and *Pale Red (pink)* to avoid any such problems; the **Handley Page Victor** entered squadron service in this scheme. The Royal Navy's carrier-borne **Blackburn Buccaneers** were at one time similarly painted because of their primary nuclear-strike role.

From the early 1970s, the RAF's tactical strike aircraft and fighters had new National Markings applied, using only **Roundel Red** and **Roundel Blue** for roundels and fin-flashes. *These new tactical roundels were differently proportioned to the old "B" type roundels of World War Two.* These tactical markings were eventually applied to **all** camouflaged aircraft, including camouflaged trainers such as the **Jet Provost** and the **Hawk**.

At the very end of the 1970s, the RAF joined the growing international trend to camouflage interceptor aircraft in various shades of grey, and with these new colour schemes on the **Lightnings** and **Phantoms**, small *Blue/Pink* roundels and fin-flashes appeared, as in the anti-flash markings adopted by the V-Force prior to their adopting camouflage for their later low-level nuclear attack role. This is now the standard National Marking style adopted for the RAF's **Eurofighter Typhoons**, whereas, in spite of being in a grey finish, **Tornado GR.4s** retained the **Bright Red/Bright Blue** tactical roundels and fin-flashes, albeit in a small size as on air-defence aircraft, until they were retired from service in 2019.

## What was "Type-S" paint?

A major innovation in paint technology began in early 1940, after a team from the Royal Aircraft Establishment at Farnborough had developed paint with much finer ground pigments than hitherto. There had been, since the introduction of matt camouflage paint finishes, some concern about the aerodynamic qualities of matt paints, and the possibility of their contributing a measure of drag to combat aircraft, particularly fighters; matt paints being, by their very nature, far less smooth than their gloss equivalents.

However, under operational conditions a matt finish would be preferable to a shiny one, as there is much less "glint" off an aircraft's surfaces that would betray its position - but a shiny surface would give a few miles per hour extra speed which might make the difference between life and death. Royal Aircraft Establishment had conducted tests which revealed that if the thickness of the pigment in the camouflage paint did not exceed 0.0005 inch, then that vital bit of extra performance may be obtained through the use of this very smooth paint.

Aircraft manufacturers could obtain the desired result by using new paint materials that would be easy to apply and not dry with the roughness common to the existing matt paint. Otherwise, the existing paint finishes could be rubbed down using wet “wet and dry” paper, but this would be a very time consuming process. A third idea was to keep to the existing paint materials, but use a different means of applying it by exercising precise temperature and humidity controls, and meticulously prepare the airframes for the paint with abrasives before spraying, and not storing the paint for any long periods to avoid pigments settling and so risk the resultant stirring before use as being less than perfect; again, this would be time-consuming, greatly extending aircraft production times.

A team from the RAE had visited Boulton Paul, makers of the **Defiant**, at Wolverhampton, and discussed the possibility of a better (smoother) paint finish on the new **Defiant**; and the above methods of overcoming the roughness of their finish was discussed. It was decided that the problem lay not with the method of applying the paint, but with the paint itself.

In mid-March 1940, the problem with matt paint was raised as a matter of urgency, and it was decided that the solution lay in the much finer grinding of the paint pigments by the paint manufacturers- this would give a far more aerodynamically smooth surface than the existing paint without resorting to an undesirable gloss finish. Furthermore, the introduction of the new smooth paints would have little effect on aircraft production. It was calculated that the use of the new paint would add an extra 2 mph to the top speed of a Bristol Blenheim bomber. The new paint was certainly not glossy, but it would be stretching a point to call its finish “satin” - it was simply a *very smooth finish* possessing a very slight, though distinct, sheen.

Thus, it was decided that the new Type-S (“S for Smooth”) paint was to be introduced. However, the existing stock of matt paint had to be used up first: it might be possible to gradually introduce the Type-S paint in May/June/July 1940. Incidentally, at about this time, the mandatory requirement for a soft demarcation (*¾ of an inch, I believe...*) between the camouflage colours was abandoned; it was up to each aircraft factory to decide on the timing of this change. In fact, it appears that Armstrong Whitworth was the first to use a hard-edge finish in April 1940, using the original standard matt paint.

By the end of 1940, with the exception of the new, and *very sooty*, matt RDM2 Special Night finish, all camouflage paint was manufactured to the Type-S specification.

So, why do we call Sky, “Sky *Type-S*”, if most paint was now Type-S?

From 6 June 1940, the Air Ministry issued Signal X.915 to Fighter Command, the Black/White undersides of fighter airframes were to be repainted a new colour: a

pale bluish-greenish shade - this was Sky Type-S. This very new colour had been secretly evolved at the Photographic Development Unit for use on photo-reconnaissance aircraft over the previous eighteen months and was initially called "Camotint". It was also to be applied to the undersides of both light and medium bombers, army co-operation aircraft such as the **Westland Lysander**, to Royal Navy aircraft, and to Coastal Command's maritime reconnaissance aircraft. As this particular colour was the first Type-S paint to come into use, and, because it was both a new colour and new paint type to Fighter Command's squadrons and Maintenance Units, the "**Sky Type-S**" appellation has stuck.

There was a problem however, in that being a new colour, those who had to repaint aircraft in accordance with Signal X.915 had no real idea what the colour looked like. Consequently, until supplies became easily available in August/September 1940, the undersides of many of Fighter Command's combat aircraft were painted in a variety of locally mixed colours ranging from pale blue to a rich, almost green, eau-de-nil. To further confuse matters, the colour was very frequently described in official Air Ministry documents as "*duck-egg blue*" or "*duck-egg green*". Because of the initial poor supply situation, some squadrons retained the **Black/White** underside finish well into July 1940, and some Spitfires were even noted as having "silver" (natural metal?) undersides for a short time, presumably while awaiting the application of the new colour.

By the end of the war, the paint finish on many fighter airframes had become distinctly shinier: this was mainly owing to the widespread (albeit very unofficial) practice of polishing airframes to exact the maximum possible speed from them, particularly during the V-1 crisis of mid-1944. However, the paint itself was still being manufactured to the Type-S specification.

# ROYAL AIR FORCE & ROYAL NAVY

## Airframe Colours

**NOTE:** In the current British Standards colour chart, *ROUNDEL RED* is now called *CHERRY RED (BS 381C 538)*: (it was originally *Post Office Red*). This red is **NOT** the same as “Red Arrows Red”, which is actually *SIGNAL RED (BS 381C 537)*. There is no FS 595 match to Roundel Red, the nearest US equivalent being FS11140.

*ROUNDEL BLUE* is still called *ROUNDEL BLUE (BS 381C 110)* in the British Standards chart; the nearest US FS 595 match is FS 15056.

[NB: the US colours “Insignia Red” and “Insignia Blue” are markedly darker than Roundel Red and Roundel Blue.]

In the chart below I have chosen just three of the most common colour ranges... there are very many others! It seems that the Xtracolor range of enamel paints, by Hannants of Lowestoft, is the only range that has *nearly all* of the British colours, listed under their correct (official) names.

COLOUR	XTRACOLOR ref. no.	XTRACRYLIX ref. no.	HUMBROL ref. no.
Aircraft Grey-Green - for WW2 era cockpit interiors	X010	XA1010	HU078
Azure Blue	X026	XA1026	HU157
Barley Grey / Camouflage Grey	X017	XA1017	HU167
Dark Camouflage Grey	X036	XA1036	HU156
Dark Earth	X002	XA1002	HU029
Dark Green	X001	XA1001	HU163
Dark Mediterranean Blue	X048	n/a	HU046
Light Mediterranean Blue	n/a	n/a	n/a
Dark Sea Grey	X004	XA1004	HU164
Dark Slate Grey	X025	XA1025	HU224
Dull Roundel Blue	X045	n/a	n/a
Dull Roundel Red	X044	n/a	n/a
Extra Dark Sea Grey	X005	XA1005	HU123
FAA Sky Grey	X042	n/a	n/a
Gulf War Desert Pink	X032	XA1032	n/a
High Speed Silver	X038	n/a	HU011
Light Aircraft Grey	X015	XA1015	HU166
Light Slate Grey	X037	XA1037	n/a
Medium Sea Grey	X003	XA1003	HU165
Middle Stone	X009	XA1009	HU125

Night Black	X012	XA1012	n/a
Ocean Grey	X006	XA1006	HU106
PRU Blue	X008	XA1008	HU230
RAF Hemp	X016	XA1016	HU168
RAF Rescue Yellow	X019	XA1019	n/a
Red Arrows Red /Signal Red	X014	XA1014	HU174
Roundel Blue	X030	n/a	n/a
Roundel Red /Post Office Red / Cherry Red	X031	n/a	n/a
Sea Blue Gloss (USN)	X121	XA1121	HU015
Sky	X007	XA1007	HU090
Trainer Yellow	X011	XA1011	HU024

Note: Almost all of the above-mentioned Xtracolor and Xtracrylix paints are glossy, therefore “decal ready”, removing the need to apply a preparatory coat of gloss varnish), except for Aircraft Grey-Green (X010 and XA1010) which is matt, being an interior colour.

In many cases, for some unknown reason, Humbrol does not give the “official” names (as shown in the left-hand column, above) to many of its colours- for example Humbrol calls Sky “beige-green”. Hannant’s Xtracolor and Xtracrylix ranges use the correct colour names, which is why I have listed them above. Revell has its own paint range, but in its kit instructions modellers are told to mix many colours in precise proportions (“A% of colour X + B% of colour Y”)- a highly unsatisfactory solution; the correct names are not even given for the final colours! Tamiya’s paints are generally given the correct official names for the most common UK colours.

Humbrol does *not* make Night Black- this colour is in fact black to which a very small amount of ultramarine blue has been added, the minerals in this pigment hardens the mix, making it more durable; for all intents (and modelling) purposes, it is black. (For a finish in RDM2A Special Night, use Humbrol No.33, or, use gloss black, apply decals, and afterwards apply matt varnish.)

*Be wary of using preserved airframes for reference. Some preserved airframes are not always 100% accurate in their finish. Many preserved “warbirds” are in untypical high gloss finishes for durability and for anti-corrosion protection.*