ASIAN AIR ARMS Newsletter 30 January/February 2022



Serving Asian Air Arm Enthusiasts and Modellers in 60 countries

# A Boil<sup>\*</sup> of Hawks

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First and foremost, I would once again like to wish you and your families all a Happy New Year for 2022 with the sincere hope that we all have a better time than we have experienced over the last two years. The New Year of 2022 will herald some small changes for the Asian Air Arms SIG which I hope will add value to your membership of this particular group of like-minded individuals. The most significant of these changes has seen the recent addition of Iran to the list of countries that we focus on within the Special Interest Group, after a lengthy period of consultation and consideration with some of the membership. From a personal perspective, I am very pleased to add Iran to the Group since I lived in



Tabriz as a child for two years holding fond memories of the country and even travelled on IIAF aircraft!. Geographically Iran is described as being part of Western Asia (or Asia-Minor) and has borders with four other countries that are already a focus of our Special Interest Group. All of the Iranian Air Arms have operated a fascinating array of fixed and rotary-winged aircraft during their existence further enriched by extensive operational use during long years of crisis or conflict in the region. Furthermore, we have a number of acknowledged experts on the Iranian Air Arms within our membership and last but not least, the vast majority of aircraft types operated by the Iranian Air Arms are available in kit form and supported by an extensive array of aftermarket decal sheets; I am already aware that several members of the SIG are poised and ready to offer display models of IIAF/IRIAF subjects for the AAA SIG Stand at future events.

Turning to this particular edition of the AAA SIG Newsletter, I would like to echo the Editor's welcome to new contributors Hugh Thomson and Peter Sharpin for their respective articles on the MiG-19/Shenyang J-6 in Asian Air Arm Service and the Fairey Gannet AS.4 in Indonesian Navy Service. It is very gratifying to see the results of Steve's hard work in recruiting new contributors, which lends further depth and quality to the content of the newsletter, further backed up by the welcome return of James Robson and Meindert de Vreeze with some unusual and esoteric subjects.

In closing I would like to include a short notification regarding a proposed new Special Interest Group that may be of interest to some of our own membership. The founder is our very own Brian Griffin, former Asian Air Arms SIG Leader, who is now keen to establish an '*Airborne Police and Security Forces Special Interest Group*'. Brian intends to gain the approval of the International Plastic Modellers' Society to set up the SIG which will display at ScaleModelWorld 2022. A website is in the very early stages of development with the layout yet to be finalised, but there is a link at <u>https://brianmgriffin1.wixsite.com/</u> <u>airbornesupport</u>. Brian will, initially, be unable to cover US police but if anyone would like to cover this area, I'd be grateful. If this new SIG is of interest please get in touch with Brian via FB or at <u>brianmgriffin1@outlook.com</u>

Mark Attrill



A very happy and (hopefully) healthy New Year to all our readers!

In this, the 30th(!) edition of our newsletter, I'm very pleased to welcome two new contributors: Hugh Thomson, with the first of a very detailed and informative two-part article on the Shenyang J-6, and Peter Sharpin with a build of the Trumpeter Fairey Gannet in Indonesian Navy markings. James Robson is back with another of his highly-detailed and fascinating builds, this time a very complex kit-bash which uses parts from no fewer than four kits to produce two very different Asian Hawks.

Regular readers will notice that I have made some minor cosmetic changes to the layout of the Newsletter. The reasons for these small changes are two-fold; firstly, it makes the task of laying out each page slightly easier for me, and secondly, it maximises the space available on each page for content.

A good number of you have now responded to Mark's recent email appeal for feedback, and I'm really gratified to say that the response has been overwhelmingly positive, a sign that most of you feel that the newsletter is headed in the right direction. I know that 'no news is good news', but feedback, positive or negative (as long as it is **also** *constructive*), is always welcome.

In my digital 'library', I now have a complete collection of the excellent 'Small Air Forces Observer' newsletter, which began in January 1975 and continued until as recently as April 2018. I have begun trawling through each issue to extract articles relevant to our publication., which I am sure will be of some interest to many of our members. I plan to insert one or two of these extracts, which usually occupy only 1 or 2 pages, in future editions, and the first, on the Burmese Air Force (as was) is featured else where in this issue. Where necessary, I have replaced the hand-written text of the original with typed and formatted text to improve legibility.

#### Happy reading!

**P.S.** The most eagle-eyed among you may have noticed the extra roundel in the second row of insignia on the cover - that of Iran. See Mark's announcement above for more details.

\* 'Boil' (front cover) is one of the collective nouns used to denote two, or a small number, of hawks flying together.

## A handful of kit-bashed Hawks









This was a build that I completed in 2020 on the Airfix Tribute Forum website during the initial Covid lockdowns. However, I thought I would share it here, in a more readable format, as the two resulting models are relevant to the SIG.

The build started because I wanted a 1/72nd Hawk 200. The only mainstream kit produced so far was the one which Matchbox released in 1987 as the first prototype was flying. It suffered from deep panel lines, and some significant issues if you want a modern 200 series Hawk. To explore this, I started by building one. (I attempted some sanding on the nose to get a better shape, but otherwise it is out of the box.)



This allowed me to identify where the problems in the kit are. Seen from the side, you can see that the panel line for the radome is in the wrong place, and at the wrong angle. That's not too much of an issue, but the radome itself is the wrong shape, and the fuselage ahead of the windshield is angled too steeply. This actually results in the radome being ovoid rather than round.

So now I'd better explain why I bothered building this and why it is relevant here. At the time I built this, there were two options for building a 1/72 Hawk 200. Either get the Matchbox kit or use the Neomega Resin conversion kit. [IMPORTANT NOTE : Since then, Air Graphic Models have released 1/72 resin conversion sets to produce both the Hawk Mk.200 and the Hawk Mk.67 – I'll most likely try them next time I want to produce either!] Of the kits available at the time, the Matchbox kit was actually easier to find, as the problems with the kit mean that less people build it. (In my case I just filled the panel line in the radome on the one photographed above and left it at that). As I wanted something better than the Matchbox build, and nothing else was readily available, I decided that the best option was to attempt a major kit-bash, using 3 Hawk kits in total, PLUS a Sea Harrier 2 radome.

As you can see, what I decided upon was to use the Matchbox forward fuselage to convert an Airfix Hawk 100 series into a 200 series, and to use an Airfix T.1 rear with the Mk.100 Forward fuselage to produce a Mk.67.

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#### **Kit Selection**

So, a few notes on the Hawk 200 to start with. The first prototype (ZG200) was lost within 2 months, so there aren't that many photos of it. It was replaced by a second aircraft (ZH200). Both of these are unique, in that they are the only Hawks to have been fitted with internal cannon, and their radomes were a unique shape. Behind the cockpits, both aircraft were essentially similar to early Hawk 60 series or Hawk T.1A aircraft. ZH200 later received some upgrades such as a Radar Warning Receiver on the fin. All subsequent Hawk 200 series aircraft had a new radome, the new combat wing, fin mounted RWR,



and various other improvements, including the option of a refuelling probe. Most of these improvements were also added to Hawk 100 series aircraft. So the Matchbox kit is only really suitable for making the first two prototypes, but not great for a production example, while the Airfix Hawk 128D kit has the right features behind the cockpit to match a production Hawk 200. Note that anywhere I refer to the 128D, the current release Airfix 100 Series kit contains the same plastic.

Now for the Hawk 67. This is the only long nose variant of the Hawk that does not have all the upgrade features of the Hawk 100 series. It has a simple radome rather than the FLIR package of the 100 series. As such, it should be fairly easy to make from a standard Hawk kit, with the addition of a modified nose. However, this can be further simplified by careful selection of kits. Airfix have released a number of Hawk kits over the years, so I have simply gone through my stash and selected an example that uses the same parts as the Airfix Hawk 128D kit. That way, I know that key dimensions at similar points will be the same on both kits, and things should fit together more easily. The boxes for the three kits can be seen at the start of the article.

#### The Kit Parts

Starting with the fuselage sections first, all of which are destined for the saw.









These are the parts which are unique to the Hawk 128D kit.

And these parts are unique to the Hawk T.1A kit.





These parts are common to both kits. (Note that the photo of the clear parts also shows the Hawk 200 canopy).







I've already mentioned that some correction will be required to the radome of the Hawk 200. I used the radome of the Airfix 1/72 Sea Harrier FA.2 during the build. Removing it from the kit could mean throwing out a Harrier, but fortunately Pavla released a corrected nose for the FA.2, so that went back into the Harrier box instead.

On the subject of throwing things out, there are two completed kits at the end of this build. The remaining parts include an Airfix Hawk T.1 forward fuselage, and most of the rest of a Matchbox Hawk. You could possibly try and put them all back together to make another Hawk T.1, but you'd have to deal with filling and re-scribing a lot of panels to get something worthwhile, which seems a waste compared to a cheap 1/72 starter kit!.

As another alternative, if you don't wish to make a Hawk 200 series, but simply a Hawk 67, note that you will also have enough leftover parts to make a Hawk 63A, using the same information in this article.

And as the decals are needed early in the build, here they are:





asian air arms newsletter 3d





In this photo, you can see that only the Hawk 128D kit included instrument panel decals, which I used in the cockpit for the Hawk 67.



### The Build

To begin with, I cut up the fuselages, then joined the Hawk 100 fuselage to the T.1A. The cannon were removed from the Hawk 200 by sanding.

As you can see, I also cut the Sea Harrier's radome to shorten it. I cut the Hawk 200 radome off by making a vertical cut down from the top of the radome panel line/groove (note **vertical**...I didn't follow the oblique panel line, so most of the line is still on the fuselage, up to approx. 2mm from the front on the very underside). To shorten the SHAR FA2 nose, I made the cut on the forward side where the sprue gates meet the plastic of the radome, the gates giving me something to rest the saw against while I cut. In the next picture, the two resulting parts are resting on the sides which have been cut by the saw.



While the new Hawk 67 fuselage parts dried, I made a start on the cockpits. (I hadn't glued the Hawk 200 fuselage parts together here, as it was easier to get the 200 forward fuselage reshaped while it is still detached.) The Hawk 67 cockpit is a simple case of following the instructions, and sticking a 5g nose weight under the floor of the second seat. The Matchbox one is rather sparse though (dry fitted/taped on the left).



So, rather than doing that, I've prepared a new interior using the spare cockpit from the 2nd Airfix kit. I had no decals for this one, but did have some Eduard PE, so I used that. It might be a waste as I can't see much through the Matchbox Hawk 200 canopy though. For the cockpit plastic, I used the forward section of the dual cockpit, along with the corresponding instrument panel. I had to cut off the seat locating tabs and the instrument panel in the Matchbox parts to get everything to fit. I also added a 5g nose weight under the floor here too, taking advantage of the bulged avionics bay. Not perfect, but good enough based on the visibility.

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So, with the cockpits done, I closed up the fuselage parts, and stuck the radome into position. then I sanded the upper half of the Hawk 67, trying to achieve a perfect quarter sphere, in preparation for building it up the lower half of the radome with filler.

After that, I added filler under the Hawk 67 nose, and on the Hawk 200 covered the whole of the upper fuselage from the radome to the windscreen with filler. I let all of this dry overnight before a round of sanding and another layer of filler. My aim here was to have the Hawk 200 nose run in a straight line from the windscreen to the highest point on the radome. This means that its a couple of millimetres taller where the radome joins, and less sloped than the original Matchbox version.







Turning the Hawk 200 over, there was a bit of a gap on the underside. I fixed this with some filler, and attached the tailplanes while I waited for it to dry.



Also visible in the photo to the right is a small dark grey conduit added behind the wing of the Hawk 67 - I have no idea what this is, but it's visible on certain Hawk variants, so I scratch built it for the Mk.67 using some old sprue. The Mk.209 should have one too, but I added it later in the build.

After a bit of fiddling, I got the wings, intakes and Hawk 200 fuselage attached. This required total removal of the V shaped splitter plates on the Matchbox forward fuselage. Some light sanding of the outer intakes was required on both models to make them fit flush with the trunking.





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On the subject of the tails and rear fuselages, this shot shows



many of the major differences between the two Hawk variants. As you can see, the Hawk 209 has a fixed aerodynamic blade ahead of the tail planes, and a much busier fin.

Finally, while the filler was still drying on the underside of the Mk.209, I sanded the entire nose area and intakes using micromesh to remove any small blemishes and added the centre console to the Mk.67.



#### Technical Intermission – Hawk Wing Fences and Vortex Generators

These vary between Hawk variants, but essentially there are two types of wing fence - large and small. The current Airfix Starter kit includes the large ones conveniently moulded in position for a Hawk T.1/T.1A, which doesn't have small ones. On the kits I selected, the large fences are included as separate items, which is important as the wing fences wander around about depending on the variant.

Initially, the prototypes had no wing fences. However, this changed early on with the first prototype being the first Hawk to trial them, with the large fences mounted 25% of the way along the wing (i.e., near the intake). The optimum position was found to be at approx. 66%, and all Hawk T.1/T.1A/52 and 53, adopted this configuration, as well as the initial Mk.51s.



The next change was the addition of small wing fences. This started with three each side, inboard of the large ones. Though not

fitted on T.1s, they were fitted to many export Hawks, including the Mk.51A, later re-winged Mk.51s, and the entire 60 series with the exception of the 63A. The T-45 Goshawk has full length slats and no fences at all. Of course, the 60 series includes the Mk.67, so for that I have to scratch build the little fences.



The new generation Hawk 100 and 200 series, as well as the new combat wing, introduced further variations. Early versions have no large wing fence but have the 3 small wing fences accompanied by a single small fence at around the 75-80% position. This applies to the Mk.102/103/108/203/208. All later variants from the 109 and 209 onward, including the CT-155, replace the inner three small wing fences

with a large wing fence located at approx. the 50% position, just outboard of the inner wing pylon. Aircraft with the large wing fence in this position retain the new small wing fence at the 75-80% position. That includes the Mk.209 - in fact, the large wing fence is the reason I decided on the Mk.209 rather than the other variants of the Mk.200 series - it means less scratch building.

While looking at the wing fences, it's also worth adding some words about vortex generators. This is a fairly simple subject - pretty much every Hawk built has 8 on each wing, until the new combat wing was introduced with 14. The kits I'm using have 8 on each side - I'm not adding the extras on the Hawk 209 because they are so tiny that I can only detect them by feel most of the time!

#### **Back to the Build**

So, to recap, for the Hawk 67 we need the large wing fence at the 66% position and 3 small fences inboard. For the 209 we need the large fence at the 50% position with a single small fence outboard at approx. 75-80%. I stretched some square rod for this and bent it to follow the wing. At the same time, I also added the fairing behind the tail on the 209 (this is a kit part). While working on the fences, I had to turn the kits over, so I also added the flap actuator fairings on the underside, as well as the airbrakes and ventral strakes.

I was getting closer to having to identify aerials and avionic bumps. However, before doing that I thought I'd add the undercarriage so that they had something to sit on without risking any aerials getting knocked off.

The undercarriage was now firmly on, and the 5g weight was plenty to ensure the two kits sat right. With that done, I added the various antennae. Here's the full list of my additions:



 Exhaust hole either side of fuselage
Blade aerial (kit part)
Nav light blisters each side (209 only)
HUD (kit part)
Small triangular aerial
Pitot tube each side (209 only)
Long thin antenna
Funny conduit
Rectangular blister aerial (67 only)



With those added, I was approaching the painting stage. The 200 series may cause some decision problems, as there are plenty of choices. Note that Gary Madgwick has released some new ones under the Air Graphics UK brand at Scale Model World this year, so that may be the easiest decal set to acquire (see page ??). Alternatively, there is the decal sheet I used, or another for the Hawk 200 prototypes. The 67 is a simpler proposition, as they've essentially had only one scheme with some movement of the colour demarcations, and changes from hi- to low-vis markings. Lack of a low-viz set of decals restricted me to one scheme, but this is resolved by the new decal sheet which includes the low-viz markings, unless you prefer to print your own decals.







Based on what was available at the time of this build, and with the clear bits added, it was time to apply the first paint. Both aircraft will be in the South-East Asia scheme.



AF-72115 AF-48115 sheet squadron supplied, MA-72115 47105L 00000 1 00:-600 603 603 605 605 600 LL-5304 04 Ô TT-5309 AU LL-5304 04 O TNI 000 ... TO DE 20 0 00 TNI AU U T NI AU TNIAU TT-IOI OI

tan, painting continued with the other major colours.

After the first coat of

As seen here, the Mk.67 is nearly ready for decals, while the Mk.209 still had some painting to be done.

For decals, I had aftermarket sheet AF-72115 from Airframe Decals that I used for both aircraft.

For the Mk.209, only the badges are but there are enough national markings for other variants to produce what I need. You are also expected to make up the serials by cutting up the decals from other schemes. This would require cutting the serials from the Saudi decals (yes, you guessed it ... the big hole in the middle of the sheet. Mick Burton kindly supplied me with serials from his own supplies to overcome the problem.)

The Mk.67 decals consist of 4 national markings and 2 tail codes. The national markings each consist of three decals, a larger one and then two very small red stripes to make up the bars.

I gave the Mk.67 a coat of Pledge Revive-It for a gloss finish before applying the fore decaling)



ALLIANCE DECALS

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Wingtip launch rails were added to the Mk.209 along with spare AIM-9P series Sidewinders



(from the Airfix F-5E probably), and all the major decals were added, before applying another coat of Pledge Revive-It to seal them in. This was to stop them moving while the small stencils were added to both aircraft. The final task was to add any underwing stores. For

the Mk.209 I decided to add just pylons and fuel tanks. The Mk.67 did not get these, as they usually appear to have been clean in ROKAF service (most photos showing armed 67's are more recent, after the aircraft were all acquired by Air USA).

Just before finishing with some photos of the finished models, here is a comparative shot between the original [Matchbox] Hawk 200 and the result of my kit-bashing. I think it was worth it!

Thank you all for reading this. *James* 



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## The MiG-19 and Shenyang J-6

#### The MiG-19 - Development

It may be said that the origins of the MiG-19 lie in a meeting between Soviet leader Joseph Stalin, Artyom Mikoyan (head of the aircraft design bureau known as OKB-155 or 'MiG'); and Aleksandr S. Yakovlev (head of OKB-115, that is 'Yak'). The purpose of this meeting was to discuss the development of a new twin engine jet fighter, to be produced in day fighter and all-weather interceptor versions, and the use of the new projected AM-5 axial flow turbojet<sup>ii</sup>.

As a result of this meeting MiG produced a new prototype, the I-340 or SM-1, which was, in effect, twin engine derivative of the MiG-17 using two side-by-side AM-5 engines. This was intended to have a greater range and speed than the original MiG-17. The results were sufficiently encouraging for MiG to pursue further development.

Lessons learned from the SM-1 and improvements to the AM-5 resulted in a new design, the SM-2, which first flew in May 1952. The SM-2 had greater sweepback



than the SM-1/MiG-17, slight anhedral, a shorter span with a single boundary fence, a 'T' tail (later replaced by a conventional tail unit), an air intake with a sharp splitter like the MiG-17 but a more streamlined cockpit. The aircraft attained a speed of Mach 1.045 at 32,000-36,000 feet and Mach 1.16 in a shallow dive. Stability and handling were satisfactory, though problematic at high speeds, while range was disappointing.

The SM-2 underwent significant testing through 1952 and 1953. Although the Soviet Air Force believed in the aircraft, these tests concluded that the SM-2's performance fell short of expectations with shortcomings including poor manoeuvrability, poor acceleration, insufficient G limits and insufficient service ceiling.



Nevertheless, the Soviet Air Force and government supported further work and this resulted in a new design, the SM-9. Externally, very similar to the SM-2, the main difference being the enlarged tail (which utilised a small fillet), a concave leading edge to the air intake splitter (later reconfigured to a straight leading edge to help avoid engine surge) and a wider and recontoured rear fuselage (to take the afterburners of the twin AM-5F engines – now known as the AM-9B and later redesignated as the RD-9B). The aircraft was equipped with three

23mm NR-23 cannon – one in each wing root and one low on the starboard side of the forward fuselage. Completed in late 1953, the SM-9 first flew in January 1954 with the aircraft soon reaching Mach 1.33 in level flight and Mach 1.44 in a shallow dive. The prototype was passed to the Soviet Air Forces Research Unit<sup>iii</sup> in August 1954 for assessment



The Research Unit report following trials stated that the aircraft 'considerably outperforms the MiG-17F tactical fighter, especially in vertical manoeuvrability and rate of climb....as well as in level flight...' and could be flown 'without difficulty by pilots having an experience with modern jet fighters' <sup>iv</sup>. Although the Soviet Air Force had several reservations and criticisms (in particular, manoeuvrability and control were a problem) the Soviet Government was sufficiently impressed to order the aircraft into production in early 1954 as

the MiG-19. This was notwithstanding that MiG trials were not complete, the concerns expressed by the Soviet Air Force had not been addressed and the aircraft had not yet been cleared for military service.

#### **Production**

The initial production version of the MiG-19 (i.e., the MiG-19 'sans suffix' – denoted by NATO as 'Farmer A') basically corresponded to the SM-9. But the new aircraft was not popular with pilots – issues with fuel tank insulation caused a number of aircraft to explode, deploying airbrakes resulted in severe turbulence, the landing approach speed was considered to be too high while aerodynamics resulted in a significant and unpredictable yaw at transonic speeds. That said, the MiG-19 was regarded as superior to its USAF opposite number, the F-100 Super Sabre. It had a better rate of climb, was faster and more manoeuvrable, and had a greater range<sup>V</sup>.

In 1956 production shifted to the MiG-19S (NATO designation 'Farmer C'). This differed principally from the MiG-19 in having an enlarged fin root fillet, a rudder cropped at the base, a higher set tail and stabilators replacing the conventional stabilisers. There were additional changes dealing with the rear fuselage contours, the armament (30mm NR30 in place of 23mm NR23 cannon), new avionics, powerplant controls, wheels, brake parachute and so on.



The combined effect of all these changes improved the aircraft's manoeuvrability and handling. Furthermore, the 'new' MiG-19S was regarded as more 'maintenance friendly' than the original MiG-19

('sans suffix'). Nevertheless, the accident rate remained high, the aircraft was plagued with ongoing technical and production issues and spinning characteristics were regarded as dangerous<sup>vi</sup>.

Two other sub types of the MiG-19 can be briefly mentioned. The MiG-19SV was a high-altitude interceptor, using a development of the RD-9B engine, intended to deal with an increasing number of Western reconnaissance aircraft overflying the USSR. Externally it appeared to be very similar to the MiG-19S save that the cooling air scoops on the rear fuselage were larger than on the MiG-19S. Only a small number were produced – perhaps thirty or so<sup>vii</sup>.

A photo reconnaissance version of the MiG-19S was also produced in small numbers. This was designated the MiG-19R with the fuselage cannon being replaced by vertical and oblique cameras. The number produced was again quite small.

By the late 1950s Soviet interest in the MiG-19 type began to wane. As if ongoing manufacturing and design difficulties were not enough, the Soviet authorities were aware that the MiG-19S had only a marginal speed advantage over British V bombers and American strategic bombers it was supposed to be able to intercept<sup>vill</sup>. However, international tension and delays with other new aircraft were such that the MiG-19 continued in production while further research and investigation began to address the various ongoing snags with the aircraft<sup>ix</sup>. As a result, by the late 1950s the MiG-19S had become the principal supersonic fighter of the Soviet Air Force and Air Defence Force.

#### **Day Fighter and All-Weather Fighter**

The MiG-19 and MiG-19S were fundamentally day fighter aircraft. In 1953 the Soviet government authorised development of an all-weather interceptor version of the MiG-19 day fighter. This resulted in a new prototype known as the SM-7 – that is a MiG-19 (sans suffix) with an RP-1 radar system incorporated into a lengthened nose (the search antenna was accommodated in an extended upper lip on the air intake, while the tracking antenna was incorporated into a bullet shaped centre body installed on the air intake splitter).



Some redesign of the forward fuselage was required, and the pilot's cockpit was widened with a new windshield. The aircraft's fuselage cannon was removed, leaving the two wing-based cannon as armament<sup>x</sup>.

As development of the MiG-19 day fighter and MiG-19 interceptor proceeded alongside each other many of the developments of the former were incorporated into the latter. The new interceptor entered production in 1955 receiving the designation MiG-19P. As with the MiG-19S, however, the Soviet military began to lose interest in the MiG-19P. Although the all-weather version offered Soviet Air Defence a huge increase in capability, the performance of the new interceptor was inferior to the MiG-19S, and the 'P' suffered from various defects over and above those experienced by the 'S' <sup>xi</sup>.

At this point Nikita Khrushchev's passion for missile systems intervened to breathe new life into the MiG-19P. In 1954 the Soviet Government ordered the testing and development of air-to-air missiles. This resulted in Soviet 'fighter' design OKBs being required to adapt existing or projected interceptors for the carriage of these new weapons and to present them for evaluation<sup>xii</sup>.

MiG accordingly modified a MiG-19P to carry four K-5 AAMs on four horizontal underwing pylons fitted inboard of the main undercarriage. The RP-1 radar was also changed to a new RP-5 system. The aircraft went through a long program of testing and modification (including the adoption of the improved K-5M missile) before entering production as the MiG-19PM in 1957. However, the performance and reliability of the MiG-19PM was disappointing (in some respects worse than the MiG-19P)<sup>xiii</sup>.



#### End of production

Although the MiG-19 type offered Soviet Air Forces a significant improvement in capability the Soviet Government fell out of love with the aircraft quite soon. The Soviet Union's 1956-60 economic development plan did not envisage any significant increase in MiG-19 production. Indeed, it was planned that production would cease, and the MiG-19 (in general) would be withdrawn from service by 1962. The focus was on new types. Even as early as 1956 Soviet Air Force documentation suggests that the MiG-19 was only regarded as interim type to help pilots master supersonic flight prior to the introduction of new aircraft by Sukhoi, MiG or Yak offering even greater improvements in performance<sup>xiv</sup>.

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It seems that production of the MiG-19 in general ended by about 1960. The exact number of aircraft constructed in the USSR is the subject of some disagreement but a total of approximately 2,000 seems likely. One breakdown<sup>xv</sup> includes:



MiG-19/MiG-19S <sup>xvi</sup>	- 1083
MiG-19P	- 433
MiG-19PM	- 369

Another 104 MiG-19S were constructed in Czechoslovakia by Aero under licence, where the aircraft was, for a short time, known as the Aero S-105 before reverting to the Soviet designation.

The MiG-19 type would, however, remain in service for some time following the end of production. The aircraft would continue to be used by air defence and tactical aviation units in the Soviet Union and Eastern Europe across the 1960s (until as late as the early 1970s) with the type being replaced by various new aircraft\_depending on the applicable role. The type was certainly deployed by Soviet Air Forces in the 1968 invasion of Czechoslovakia.

Exactly when the aircraft finally disappeared from the Soviet inventory is unclear – probably by about 1971 or 1972<sup>xvii</sup>. Service with the East European Air Forces did not last much longer<sup>xviii</sup>.

#### The Chinese MiG-19 - Shenyang J-6

#### **Development**

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In the early post war years, the newly established Communist State of China and the Soviet Union enjoyed good relations. As the Soviet Union entered the supersonic era with the MiG-19, China thought it would follow suit and in 1957 the two parties signed a licence agreement that would permit Chinese construction of the 'all-weather' MiG-19P. This was followed by a subsequent agreement to permit construction of the MiG-19PM and then a 1959 agreement to build the MiG -19S<sup>xix</sup>.



Chinese construction of a licence-built version of the MiG-19 would fall within the period of 'the Great Leap Forward', a Communist policy which sought to convert China from an agrarian based economy into a commune based industrial society. The policy as applied sought rapid modernisation of Chinese industry and infrastructure. However, the 'Great Leap Forward' proved to be a grotesque failure – it led to widespread famine (resulting in millions of deaths) and a chaotic industry where quantity was more important than quality. Licence production of the MiG-19 suffered in consequence and the 'Cultural Revolution' in the later 1960s did not help.

Originally, licence production of the MiG-19P was to be undertaken at a factory in Shenyang (formerly Mukden), Liaoning Province<sup>xx</sup> (now known as the Shenyang Aircraft Corporation). This aircraft was to be known as the DongFeng ('East Wind') 102. A few aircraft were produced using Soviet kits with full scale local production only beginning in 1959. The political pressure to produce as many aircraft as possible and the poor-quality Chinese tooling used resulted in most aircraft built in the 1959-60 period being rejected by the Peoples' Liberation Army Air Force (PLAAF)<sup>xxi</sup>.

Shenyang resumed production in 1960 using Soviet supplied jigs, but continued to struggle. Production was then shifted to another factory in Nanching, Jianxi Province<sup>xxII</sup>. However, Nanching also found the aircraft difficult to build and by the early 1960s the entire project was put on hold. In 1964, China changed the designation system used for aircraft, such that the DongFeng 102 became the J-6 Jia or J-6A (the 'J' standing for 'Jianjiji' or 'Fighter')<sup>xxIII</sup>.

As far as the author can ascertain the J-6A was externally identical to the MiG-19P. The total number produced is not known with any certainty nor is the extent of its service with the PLAAF. However, in 1974 the J-6A underwent some modification by the addition of two pylon mounted launch rails (inboard of the main undercarriage) to utilise the PL-2 AAM (the PL-2 being a licencebuilt version of the Soviet K-13A missile) and the deletion of the two wing mounted cannon<sup>xxiv</sup>. This would suggest some longevity in service and production numbers which were more than nominal.



The factory in Nanching was also engaged to build the 'all weather' MiG-19PM – this was known originally as the DongFeng 105, but its designation was changed to the Jianjiji-6Yi (or J-6B) in 1964. However, once again, Nanching found this aircraft beyond its abilities and after only 19 J-6B were completed the project was mothballed. The project was restarted in 1974 (possibly using some Soviet built MiG-19PM aircraft acquired from Albania as a pattern) and production resumed in 1977 but again the numbers completed are believed to be quite small<sup>xxv</sup>.

Interestingly, the external appearance of the J-6B differed from the MiG-19PM in that the parachute brake was moved from its ventral position underneath the tail to a cigar shaped housing at the base of the fin (the inboard and outboard missile rails were also of unequal size).

The radarless equivalent of the MiG-19S, initially known as the DongFeng 103, later the J-6 (with no suffix), seems to have appeared later than the J-6A. Production was also originally located in the Shenyang factory and the first DongFeng 103 took to the air in 1959. But, as with the J-6A, quality control difficulties brought production to a halt in 1960 and large numbers of aircraft were in no condition to be delivered to the PLAAF. Production only resumed in 1963<sup>xxvi</sup>.



The external appearance of the J-6 differed from the MiG-19S in a number of respects<sup>xxvii</sup>.

- The pylons for the unguided rockets were mounted on the wing leading edge rather than the L shaped pylons aft of the main wheel wells used by Soviet aircraft;
- The emergency pitot head was located on the port side of the aircraft rather than the starboard side; and
- There were two cooling scoops on the rear of the fuselage instead of four.

The J-6 later underwent some local improvement, and this resulted in the J-6C. The J-6C (like the J-6B) moved the parachute brake from a housing below the tail to a new position in a cigar shaped cylinder at the base of the rudder – this change meant that when the brake was deployed after landing the nose pitched up, increasing drag, and reducing the length of the landing run. This is in contrast to the parachute brake housed in the ventral position such that the deployment of the parachute drew the nose down, cleaning up the aircraft, reducing drag and increasing the landing run. Other changes were also made to flaps and airbrakes to improve efficiency while new hydraulic systems and control surface actuators were also installed<sup>xxviii</sup>.

The J-6A, J-6B and J-6 were all twin-engine aircraft using a licence-built version of the Soviet RD-9B engine (in effect a development of the original AM-5). However, the J-6C used a local development of the Soviet RD-9BF engine known as the WP-6A.

The cannon armament of the J-6A, J-6B, J-6 and J-6C broadly followed the location of their MiG-19 equivalent (though whether the J-6B had a cannon armament is not clear)<sup>xxix</sup>. However, there seems to be some difference in the calibre of the weapon deployed within each variant. Some aircraft used a Chinese-built 30mm equivalent to the original Soviet weapon whereas others used a Chinese 23mm type.

As the J-6 type began to be extensively used by the PLAAF, a need arose for a lead-in conversion trainer i.e., a two seat J-6. The PLAAF was using two seat derivatives of the MiG-15UTI, the JJ-2, and a locally designed two seat version of the MiG-17, the JJ-5, for lead-in training on other Chinese jet fighters, namely the J-2 (Soviet supplied MiG-15) and J-5 (licencebuilt MiG-17). However, the JJ-2 and JJ-5 were not considered appropriate for the more demanding J-6. This resulted in a



Chinese designed and built two seat version of the J-6' known as the JJ-6<sup>xxx</sup>. This was not a Chinese copy of a Soviet aircraft as no two seat MiG-19 was ever constructed.

The JJ-6 was really a J-6 with a 0.84m 'plug' inserted into the fuselage ahead of the wings, the instructor and student sitting in tandem ahead of the front spar. The aircraft was unarmed, which allowed additional fuel to be carried. Two large outward canted trapezoidal fins were installed under the aft fuselage (in addition to existing ventral fin) to counter the increase in fuselage length and maintain directional stability. The prototype flew in 1970 and production commenced in 1973. A total of 634 JJ-6 aircraft had been completed by the time production ceased in 1986<sup>xxxi</sup>.

The only other sub type that should be mentioned is the low altitude tactical reconnaissance JZ-6 (the 'JZ' standing for 'Jianjiji Zhenchaji' or 'fighter reconnaissance'). The JZ-6 was basically the J-6 equivalent of the MiG-19R. Four cameras (three oblique and one vertical) were installed in the nose, replacing the single nose cannon, the armament being confined to two remaining 23mm cannon. Production began in 1967, some aircraft however were externally like the J-6, with the parachute



brake in a ventral position, others similar to the J-6C, with the parachute brake in a cylindrical housing at the base of the rudder.

Some JZ-6 aircraft were modified for a more high-altitude role with a long ventral fairing running from the rear of the nose wheel undercarriage bay tapering toward and stopping short of the ventral fin. This fairing contained various camera ports<sup>xxxii</sup>.

There were a number of other variants of the J-6 produced though these all seem to be in relatively small numbers and not worth mentioning here. Production of the J-6, and all sub types, appears to have ended in or about the mid-1980s<sup>xxxiii</sup>. The total number

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built is uncertain though estimates vary from 3,000 to 4,000<sup>xxxiv</sup>. Given China's chaotic state for much of the 1960s it is doubtful whether we shall ever get a more specific number.



Of course, the J-6 later became the basis for the Chinese designed and built Nanchang Q-5 (known as the A-5 in its



export form). Although the Q-5 has a completely different nose to the J-6 (and a bifurcated intake system) the resemblance to the J-6 aft of the cockpit is unmistakeable<sup>xxxv</sup>.

## **Operational - China**<sup>xxxvi</sup>

The PLAAF operated the J-6 type generally in large numbers from the 1960s through to the early 2000s with the various sub types serving in the fighter, ground attack, reconnaissance, and training roles across all of China's five military districts. Broadly, each Military District at that time appears to have had at least one Air Division using the type<sup>xxxvii</sup>.

In principle an Air Division could include two or three Regiments with each Regiment consisting of three squadrons of about nine to twelve aircraft divided into three flights. That could give you an Air Division with, potentially, over 100 J-6 aircraft, however strength varied, and an Air Division may have operated more than one type, so it is difficult to offer any certainty over unit organisation and actual numbers of J-6 with any Air Division at any time.

The Chinese People's Liberation Army Naval Air Force (PLANAF) also operated the type though in much smaller numbers. PLANAF organisation appears to have been the same as the PLAAF with Divisions attached to the North Sea Fleet (operating in and about the Yellow Sea) and East Sea Fleet (operating in the East China Sea). Of course, these were all land-based units (following Soviet/Russian practice of a 'Naval' Air Force assuming responsibility for coastal air defence).

In general, photographs suggest that most Chinese J-6 aircraft were operated in an overall natural metal finish. In the 1980s some aircraft began to appear painted white while there are a very few photos of J-6 finished in camouflage.

The first PLAAF J-6 action was probably against Taiwanese aircraft – it is said that the first victory by a J-6 was in November 1956 when they shot down a Taiwanese C-46 undertaking intelligence operations over China<sup>xxxviii</sup>. Thereafter there were repeated and ongoing clashes between PLAAF J-6 and Republic of China (Taiwan) (RoC) Air Force and USAF aircraft in and about Taiwan and over mainland China.

Reported J-6 interceptions involved:

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- 1956 a USAF C-130 (probably gathering electronic intelligence) over the East China Sea<sup>xxxix</sup>;
- 1964 the shoot down of a RoC RF-101C in 1964;
- 1965 the shoot down of another RF-101C and RoC F-104A;
- 1967 an engagement between twelve J-6 and four RoC F-104G aircraft with the RoC pilots claiming two J-6 for one F-104G lost.

There are reports that four RoC U-2 aircraft (probably operated by the CIA in RoC markings) were shot down in the early 1960s. Although not credited to the J-6, this aircraft is believed to be the only type then in operation to have the performance to engage the U-2 (though some believe one or more of the U-2 aircraft may have been forced down).

Two USN A-6 Intruders which accidentally entered Chinese airspace in 1967 were destroyed by the J-6. According to Chinese data, a total of 21 RoC and US aircraft were shot down between 1964 and 1971, of which fifteen 'kills' were scored by the J-6. It is believed that PLAAF J-6 aircraft also participated in Chinese operations in northern Vietnam and Kampuchea, with at least one J-6 being lost to ground fire.

In another perspective on J-6 operations, some ten J-6 aircraft were flown by Chinese pilots defecting (with varying success) to Taiwan, South Korea, and the Soviet Union (though, unfortunately, this pilot was returned to the Chinese). Although little is known of North Korean use of the J-6, at least four Korean Peoples' Army Air Force aircraft were flown by defectors to South Korea<sup>xI</sup>.

The PLAAF continued to use the J-6 and its various related sub types in large numbers until at least the mid-1990s, with the type beginning to disappear in the years that followed<sup>xli</sup>. There are references to the J-6 remaining in use in small numbers, particularly the JJ-6, and there are also stories suggesting that the PLAAF may be converting retired J-6 aircraft into drones, not as unmanned targets but for operation in a combat role<sup>xlii</sup>.

Given the extremely limited material on PLAAF operations generally, it is difficult (if not impossible) to make any statement or remarks on the day-to-day experience of Chinese aircrew with the J-6. That said, whatever may have been the Soviet experience of the MiG-19, and whatever may have been the opinion of Chinese aircrew and ground crew of the J-6 (which we may never learn), Chinese use of the J-6 is notable for its extraordinary longevity. For an aircraft to have remained in service for around 40 years there must have been something to like.

Hugh Thomson, November 2021

- i., Much of this article is derived from, and reflects the works of, Yefim Gordon and Dimitri Komissarov – specifically 'Mikoyan MiG-19', 'Soviet Air Defence Aviation' and 'Soviet and Russian Military Aircraft in Asia' and I must acknowledge that I have extensively drawn from these works. This article would not have been possible otherwise.
- See 'Mikoyan MiG-19' by Yefim Gordon and Dimitri Komissarov, Hikoki Publications 2017 pp 8 and ii. 9



- iii. More specifically the GK NII VVS – State Red Banner Air Forces Research Unit
- iv. See 'Mikoyan MiG-19' pp48-51
- See 'Mikoyan MiG-19' pages 72 and 78 ٧.
- Spinning and spin recovery methods were the subject of considerable testing see 'Mikoyan MiG-19' pp81-84. Given the vi. MiG-19's apparently questionable handling record its curious that the aircraft was used by the Soviet Air Forces display team - see this old Soviet video on Youtube 'MiG 19 pilotazh Tushino' https://www.youtube.com/watch? v=fc9BGi4F0kE&list=PLZcgrYRnsQb9bgF6BvXijYTsEo0IGdC57&index=12 - the Kovozávody Prostějov 1/72 kit of the MiG-19 (No. KPM0159) included markings for Soviet, East German and Czech display teams using the MiG-19. In 'Arab Migs' Volume Two by Tom Cooper and David Nicolle 'Harpia Publishing 2011 page 81, an Egyptian Air Force (EAF) pilot is quoted as saying that the EAF rejected use of the MiG-19S as an aerobatic display aircraft as its controls were not sufficiently sensitive (due to a 'compensation' system).
- vii. See 'Mikoyan MiG-19' pp 87-92.
- Page 88 of 'Mikoyan MiG-19' gives a maximum true air speed for the MiG-19S of 714mph at 32,810 feet in afterburner mode and drop tanks or 901 mph in clean configuration. With drop tanks and afterburner, the MiG-19 margin of speed viii. over a Vulcan travelling at Mach 0.95 is marginal - without drop tanks it is much more comfortable but the aircraft's range in that case (869 miles at 546mph, 45,930 feet) is such that the remaining time in the air is very limited. Given the vast expanse of the Soviet Union to cover, fuel consumption and range for a Soviet Air Defence MiG-19 would be critical.
- See 'Soviet Air Defence Aviation' by Yefim Gordon and Dimitri Komissarov, Hikoki Publications 2012 pp242 and 243 ix.
- In the mid-1960s some MiG-19P aircraft were upgraded to carry two K13/R-3s missiles from pylons protruding from the х. wing leading edge outboard of the existing hardpoints. These were designated MiG-19PT.
- See 'Mikoyan MiG-19' pp48-51 xi.
- 'Mikoyan MiG-19' pages 112 and 113. xii.
- xiii. 'Mikoyan MiG-19' page 114.

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- See 'Mikoyan MiG-19' page 85. xiv.
- XV. See 'Mikoyan MiG-19' page 176
- This includes the MiG-19SV a high altitude derivation of the MiG-19S. xvi.
- xvii. In the writers experience Soviet aircraft always end up remaining in service far longer than anyone anticipates.
- In general, East European Air Force experience with the type was not encouraging. Maintenance was challenging, there xviii. were complaints about the quality of Soviet workmanship in the aircraft and attrition rates were high (e. 48% in the Bulgarian Air Force, 21% in the Czech Air Force and 50% in the East German Air Force). Interestingly, both the Polish and Rumanian Air Forces only operated the 'all weather' MiG-19P and MiG-19PM types i.e. they did not acquire the MiG-19S. See 'Mikoyan MiG-19' Chapter eight.
- xix. 'Mikoyan MiG-19' pages 177 and 178.
- XX. Liaoning Province broadly sits on the Northwest border of North Korea and abuts the Yellow Sea.
- xxi. 'Mikoyan MiG-19' pages 177 and 178.
- Jiangxi Province is in Southern China, north of Hong Kong and southwest of Shanghai. xxii.
- xxiii. 'Mikoyan MiG-19' page 180
- xxiv. 'Mikoyan MiG-19' page 182. Note that the MiG-19P was similarly modified to produce the MiG-19PT.
- XXV. 'Mikoyan MiG-19' pp179-181.
- 'Mikoyan MiG-19' page 181. xxvi.
- xxvii. 'Mikoyan MiG-19' page 181.
- xxviii. 'Mikoyan MiG-19' page 184-185.
- xxix. There is a photo of a J-6B on page 184 of 'Mikoyan MiG-19' which seems to show a cannon armament.
- XXX. JJ stands for Jianjiji Jiaolianji – Fighter Trainer.
- 'Mikoyan MiG-19' pp 193-195. 'Mikoyan MiG-19' page 187. xxxi.
- xxxii.
- xxxiii. 1986 according to 'Soviet and Russian Aircraft in Asia' page 80.
- xxxiv. 'Mikoyan MiG-19' page 178.
- xxxv. I have relied extensively on Chapter 4 of the book 'Mikoyan MiG-19' by Yefim Gordon and Dimitri Komissarov, Hikoki Publications 2017. This Chapter deals with Chinese production of the MiG-19 and its derivatives.
- xxxvi. 'Mikoyan MiG-19' pp 331 to 345.
- xxxvii. PLAAF organisation has undergone some changes of late so these remarks should be seen as applicable only to the period in which the J-6 remained in PLAAF service.
- xxxviii. This is cited in Chapter 7 of 'Mikoyan MiG-19' by Gordon and Komissarov though the author finds the date difficult to reconcile with other sources which indicate that the J-6 did not enter production in China until the 1960s. Was this aircraft a J-6 or was it a Soviet supplied MiG-19 or is there another explanation?
- xxxix. Same comment on this interception as in the previous endnote. The date is difficult to reconcile with other sources which indicate that the J-6 did not enter production in China until the 1960s
- Material regarding PLAAF operational use of the J-6 is drawn from 'Mikoyan MiG-19' pp297-299. xl.
- There is (as at 18 Nov 21) a Youtube film of PLAAF J-6 and JJ-6 allegedly operating in the mid-1990s see https:// xli. www.youtube.com/watch?v=2u8UtT-BSnE
- xlii. See: https://www.popularmechanics.com/military/aviation/a38028066/china-turning-old-fighter-jets-into-drones/

Nepalese 'Chetak' by Meindert de Vreeze



The land locked country of Nepal lies in the Himalayas. It is a sort of buffer state between India in the south and China in the north. In the past there were close relations with British India, with perhaps the best-known manifestation of these relations being the famous Gurkha soldiers. From 1951 a democratic political system was introduced in the "Sanghīya Loktāntrik Ganatantra Nepāl".

In the 1960s, with British and American aid, a Royal Flight was established with 2 Scottish Aviation Twin Pioneers and an Ilyushin Il-14. Soon, a pair of Short Skyvans followed along with Twin Otters. In the mid 1970s, 2 HS.748 transports were acquired along with a pair of Puma helicopters. In the 1980s, 8 HAL Chetaks (licence-built Alouette III (SA.319)) and 7 HAL Cheetah (Alouette II SA.315B Lamas) were acquired for high altitude operations, along with the armed version called HAL "Lancer", supported by Brazilian Helibras.

In recent years HAL Druv helicopters have been purchased, together with several Mil helicopters like the Mi-17 and 2 PZL-Mielec M28 Skytrucks. The VIP flight has an AW.139 and Bell 206. Most aircraft have civil registrations, and all fly with the Army Air Wing with the main base at Kathmandu-Tribhuvan with dozens of smaller air strips in the mountains.

This Heller 1/72 model was built as a HAL Chetak in the markings of the Nepalese Army. The Chetak is an Alouette licensemanufactured by Hindustan Aeronautics in India (HAL), and is externally very similar to the French helicopter.

The kit has only a few parts. Aligning the forward lower floor to the mid fuselage is crucial, otherwise you get gaps between the bulbous windows and the airframe. The lower areas may need some filler/ putty.



If things go wrong later, white glue can be used to close any gaps. The large bulbous cabin windows need some care. It is better to glue these very carefully before continuing the model. I added a piece of card inside for a stronger joint. Also on the inside, some detail was suggested where some circuit breakers and headphone instalments are seen in the real Alouette III. Sometimes the fairing on top of the roof is not present so remove this if not needed (study photos of your desired helicopter model).



You may decide you want to open up one of the forward doors or larger aft sliding doors. In that case, use a fine razor saw but be careful not to break the glass panels! The left slide door was cut open and set to the rear.



Cabin configuration varies, sometimes with different benches and the left seat turned towards the rear. The pilot sits in the right seat. The collective and pitch controls are nicely represented in the kit.



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There is a choice of 2 engines in the kit, the Artouste with parts #36+37 or the Astazou with main parts #38+39. Study photos which engine is appropriate for your desired model. Each engine can be improved



by adding extra details like pipes, hydraulics and fuel lines, and this is definitely recommended and worthwhile. Antennae and some smaller fairings may vary. In many cases only the basic antennas are seen, but sometimes there



are more, as in this illustration. Antennas and fairings below the cockpit and on the tail boom are also common. There is sometimes a longer tail protection bar in front of the tail part #34. Also, on the wind screen a wiper was added from thin black stretched sprue. This wiper is located either left or right on the central screen so it is essential to study photos.

Alouettes and Chetaks are seen with many different steps and frames on the outside. I replaced these with thinner ones from rod and stretched sprue using the kit parts as a pattern. It is a lot of work but worthwhile on such a small model.

The overall colour was Revell Aqua 65 olive green, applied with an airbrush.. On the nose, extra antennas were made from thin rod. Below the tail a wire antenna was made with fishing line

attached with superglue. The rotor blades were painted olive green on top and the lower blade surfaces are black with red tips

The Nepalese markings were designed at home with a photo editor and home-printed. When no suitable decals can be found, the missing markings can be home made....Various air force roundels can easily be found on the internet, downloaded and scaled to 1/72 scale in any photo editing program, set at 600 DPI resolution. With a ruler, check the required size on the actual model, then **double check**! Re-size in the editing program as required. When done, it is advisable to print some test prints on plain paper. I used my EPSON XP-530 high resolution inkjet printer at 600 DPI resolution, on 'inkjet paper'. If you have a laser printer, then you should use the special decal paper which is readily available for laser printers.











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## Extracts from Small Air Forces Observer



Indonesian Angkatan Laut Gannet AS.4

Having the Trumpeter I/72 kit and aftermarket parts required to make a Fairey Gannet with folded wings, I began looking for a scheme to finish it in. While searching through Gannet references, I came across a picture of an Indonesian aircraft. Until that point, I was unaware that Indonesia had used the Gannet and it seemed a very appropriate scheme considering my interest in SE Asian colours.

The model was built to represent an AS.4 as used by the Angkatan Laut (Indonesian Navy), and included the excellent FAA resin bomb bay, Eduard colour cockpit detail set, and the CMR resin wing fold set. The decals were home produced using Viseo and Crafty Decal Paper.

The following photos of Angkatan Laut aircraft were kindly supplied by Mr.Mike Black, whose Father worked for Fairey after leaving the Fleet Air Arm, and took these photographs whilst working in Indonesia.



The following photos show a layout of all the parts used during construction. Because the wording on Indonesian aircraft changed between black and pale grey/sky throughout their service career, I printed both colours with a view to deciding which scheme I would do later.



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The first stage was to clean up the resin bomb bay and then assemble the fuselage incorporating the cockpit detail set. This involved cutting away the forward undercarriage.bay rear bulkhead, bomb bay doors and centre section of the wing spar. Then the bomb bay was slotted into the void and with a bit more scraping it fitted well. The resulting gap at each end was faired in with





#### a little filler.

Then it was onto the wings and tailplane. Before fitting the resin inner wings I removed about a millimetre of plastic from the lower part of the exhaust fairings to make the wings fit in the right place. This resulted in a large gap between the wing and fuselage which required filling. Also, because of this surgery, the kit exhaust pipes had to be cut down in length as they impinged





on the trailing edge of the resin wing inside the exhaust fairing. The tailplane was fitted as per the kit instructions.







When fitting the u/c, I used the discarded plastic wing to determine the correct fitting depth for the u/c legs on the replacement resin wings and glued them in place. The legs had to be cut down in length slightly to keep the right sit of the aircraft. The nose leg and strut were glued in place without issue.



The canopies had mould lines along the top of each part which had to be removed with fine micromesh and plastic polish. They were also quite thick. Unfortunately, this distorted the view of the cockpit interior, which prevented much of the detail set from being seen after the canopies were fitted.

The resin wing parts were fitted together using U shaped pieces of brass rod painted black to represent cable conduits. These replaced the resin items supplied in the wing fold conversion kit to introduce rigidity to the structure and allow me to test fit everything before committing to super glue. Once this was done the disassembled wing parts and fuselage were painted using Xtracolor enamels and the home-made decals were applied. The pale grey ANGK LAUT wording did not show up very well on the dark sea grey, so I chose to use the black lettering. When making homemade decals, colour density can be a problem depending on the type of printer used.

Panel lines were accentuated with a Flory wash, then the whole airframe was given a matt varnish coating. When dry, the rest of the smaller resin wing fold parts were added to the middle and outer wing sections. At the same time the remaining U/C parts were fitted along with the large resin bomb bay doors.







The final stage was to fit the middle and outer wing sections on their brass mounts and when properly aligned they were super glued in place. The small aerials and probes were then

probes were then attached along with the aerial wire, and the navigation lights were painted on. The very last thing was to add the wing braces, which were made from brass rod and the attachment bracket from the original resin part, which was discarded as it was too warped to use.









An interesting project which produced a nice little replica of an Indonesian aircraft with folded wings. It was only later that I discovered that the wing-fold mechanism might have been removed from the aircraft prior to delivery! Ah well!

## Air Graphic Models – On Target Decals 1:72 Scale -



## BAe Hawk in Worldwide Service – Part 1



One of Air Graphics Models' latest decal sheet releases serves up a real treat for fans of the British Aerospace (BAe) Hawk with no less than 10 of the 17 options that are provided catering for Asian Air Arm subjects, including some very nice special markings and/or colour schemes. Taking the Asian subjects in alphabetical order, decals are provided for a distinctive red & white Indian Air Force Hawk Mk.132 operated by the Suryakiran Formation Aerobatic Team in what can only be described as one of the most attractive colour schemes to ever grace the BAe Hawk.

Next up are three examples from the Indonesian Air Force (TNI AU). Since the TNI AU operate both the single-seat Mk.209 and two-seat Mk.109 decals are provided for both variants, which include two options for the Hawk Mk.209 operated by 12 Squadron. One is featured in the

now standard two-tone grey colour scheme with low visibility national markings while the send option features an aircraft in a





very attractive three-tone blue/grey colour scheme with high visibility national and unit markings. The third TNI AU option, for a Hawk Mk.109 operated by 1 Squadron, is again featured in the two-tone low visibility camouflage scheme.

The Royal Malaysian Air Force (TUDM) also operates two variants of the Hawk and these are both catered for with no less than five options provided on the decal sheet covering the three Units that have operated the BAe Hawk during its extensive service with the TUDM. Both the single-seat Mk.208 and two-seat Mk.108 are currently operated by No.6 and No.15 Squadron with decal options available for all types including two Mk.208s in the original overall medium grey low visibility colour scheme and a third, belonging to No.6 Squadron that sported a special 25<sup>th</sup> Anniversary of Hawk operations colour scheme with a black fuselage spine and tail with Red/Gold trim and appropriate titles. The first of the two-seat Mk.109 options is another special, operated by No.15 Squadron and, again, sporting a special colour scheme and markings associated with the 25<sup>th</sup> Anniversary commemoration. The fifth, and final, TUDM option on this decal release is for another Mk.109, presented in the original low-visibility grey scheme and featuring the Unit markings of the now disbanded No.9 Squadron that undertook conversion training during the early years of TUDM Hawk operations. The tenth, and final, Asian Air Arms option on this release is for the rather unusual two-seat Hawk Mk.67 variant operated by the Republic of Korea Air Force (ROKAF). This particular variant has

distinctive nose features and sports a three-tone tactical camouflage scheme over two-tone grey undersurfaces and high-visibility fluorescent orange wing and fin panels, underlining its role as a tactical training aircraft.

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As I have mentioned in previous reviews, Air Graphics have built up a very good reputation for the accuracy and standard of their decal sheets which are the result of a long partnership with Cartograf of Italy, so their quality is assured. The decals are presented on three A5 sized sheets with two small



correction sheets, such is Air Graphics' attention to accuracy and detail. The decal placement instructions are some of the best in the marketplace with, in most cases, comprehensive colour references including FS numbers and specific paint references for at least six of the most popular brands. As an added bonus, this particular decal issue also includes a separate and very useful Paint Colour & Conversion chart for no less than seven of the most popular model paint ranges including Humbrol, Xtracolor, Gunze Sangyo and Tamiya. Modellers should also note that some of the schemes on offer, including the Asian Air Arm options, rely on the use of some stenciling from the donor kit. The DPIs also include a nice selection of photographic references for each type for further inspiration.

The only downside, at present, is the dearth of good quality 1:72 scale kits of the single and two-seat BAe Hawk variants required to accompany this decal release, with the possible exception of the Airfix BAe Hawk 100, which is recommended by Air Graphics in the DPIs. Matchbox have previously produced a very basic kit of the single-seat BAe Hawk 200 and Italeri had a two -seat Hawk Mk.100 in their catalogue for many years but I believe both these kits are hard to source and cannot really be recommended. On a more positive note, the proprietor of Air Graphics is a huge fan of the BAe Hawk and, as a result, has released a number of resin conversion sets or kits to convert the baseline Airfix 1:72 BAe Hawk 100/127 kit into the relevant variant portrayed on the decal sheet. Some of the resin sets are already available with more set to be released in 2022. Check out the Air Graphics advertisement elsewhere in this newsletter.

With the release of this latest Air Graphics decal sheet, the company have demonstrated their commitment towards including more Asian Air Arms subjects in this series in the future and, I understand, several of our members provided reference material during the research into this particular decal release. I would, therefore, encourage you to continue to support this enterprise since, in recognition of the support Air Graphics received from the Asian Air Arms SIG, they are now kindly offering an exclusive discount on their products ordered through the website. Again, check out the advertisement.

Highly recommended to 1:72 modellers of the BAe Hawk and Asian Air Arms

Thanks to Air Graphics Decals for the review sample

Mark ATTRILL – January 2022



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NEWSLETTER

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## ICM – 1:48 Scale North-American Rockwell OV-10A Bronco

One of my abiding memories from the early 1970s is of my late father's enthusiasm for completing a model of the then newlyreleased Airfix 1:72 scale North-American Rockwell OV-10A Bronco. For some reason, which I never really fathomed, he had a particular fondness for twin-boomed aircraft, such as the P-38 Lightning and de Havilland's Vampire, Venom and Sea Vixen and this, combined with seeing images of the OV-10 Bronco in Vietnam on news bulletins in Singapore, fuelled his desire to add an example of this rather esoteric aircraft to our growing collection of ceiling mounted air assets!. I will readily admit that my fascination for the Bronco did not always match his, but having observed several European-based USAF examples at UK Airshows in the 1980s, as well as serving on an operational tour of duty with a USAF pilot who had flown the type in Vietnam and often regaled me with his tales, I have waited patiently for a good kit to emerge in the larger 1:48 scale, since the only 'show in town' for several decades has been the ancient and largely inaccurate kit from Hawk that has surfaced in several guises since, including re-releases from



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Italeri and Testors. Rather like the Kinetic FMA IA-58 Pucara that I recently reviewed, my interest in any new kit of the Bronco was piqued by the fact that Indonesia, the Philippines and Thailand have all operated this distinctive design, with its twin-boomed airframe construction, large panoramic cockpit and stalky undercarriage, all designed to facilitate its primary function as a Forward Air Control/Counter Insurgency (COIN) aircraft designed to operate from rudimentary airfields or landing strips. Thus, the announcement by ICM in early 2021 that they would release a 1:48 scale kit was met with renewed enthusiasm since I had previously obtained several of their kits and had been impressed with the overall accuracy, level of detail and quality of parts.



The ICM Rockwell OV-10A Bronco is presented in one of ICM's trademark sturdy boxes featuring a Vietnam-era United States Marine Corps example, in Dark Green and Light Grey camouflage, flying low across hostile terrain in South-East Asia and delivering ordnance in dramatic style over a target. Inside the rather full box, the modeller will find no less than eight medium grey sprues containing 258 parts and a clear sprue with 9 parts for the OV-10A with an additional two sprues of 47 parts each for generic US military ordnance from a previously released weapons set, most of which are applicable to the OV-10A Bronco. The surface detail on the main airframe parts is a mixture of fine recessed panel lines and rivets together with raised rivet detail where appropriate and in line with the original aircraft. The plastic parts may exhibit a mildly grainy texture that requires a gentle rubdown with a very fine sanding pad although this may be an isolated case on the review kit. ICM includes two decal sheets providing for four Vietnam-era OV-10As including two USMC examples in the Dark Green and

Light Grey camouflage scheme and one each from the USAF and US Navy that sported an overall Light Grey colour scheme. Last, but not least, is the comprehensive instruction booklet, which is nicely presented with a very useful parts map, very clear assembly instructions and some nice colour profiles outlining the four schemes and decal options included in the kit, and complete with detailed decal placement instructions. Other highlights include a very useful cross-reference table for ICM, Revell and Tamiya paints, an external stores/ordnance configuration diagram and templates to help the modeller produce their own masks for the cockpit canopy.

As with the vast majority of modern aircraft kits, assembly is rather conventional and starts with the nicely detailed cockpit tub, the major element of the fuselage nacelle design of the Bronco, that sits underneath the huge 'glasshouse' cockpit canopy that is wider than the fuselage. Over fifty parts provide for two highly detailed ejection seats and the cockpit coaming, instrument panels and consoles, which together with the forward undercarriage bay, are neatly sandwiched together between the three-part main fuselage nacelle. Assembly of the distinctive fuselage mounted weapons stub wings or 'sponsons', which house 4 x 7.62mm machine guns and provide 4 x stores pylons, is then followed by the mainplane, which includes separate flying control surfaces. Modellers should not that the latter will need to be adjusted if the modeler wishes to display them in a deployed position. The next stages of construction focus on the nicely detailed main undercarriage bays that are housed in the twin booms and the engine nacelles Once again the main flying control surfaces; the twin rudders and taileron are





moulded separately but will need adjusting if they are to be portrayed off-centre. Previous kits of twin-boom subjects have often proved difficult to assemble, due to the complex nature of the original design, but ICM appears to have designed the kit parts to fit together neatly with a logical break point between the



mainplane and the twin boom assemblies which should aid considerably with the final alignment of the latter and the horizontal tail surfaces. Final airframe assembly is concentrated on the twin turboprop propellers, air brakes, airframe and undercarriage details. Final assembly then focuses on the various ordnance options that are provided, which includes a centerline mounted 150-gallon drop tank, LAU-10A, -33, -68, -69A rocket pods, and Mk 81 or 82 low-drag or snakeye bombs with or without elongated 'daisy cutter' fuses, so there are plenty of ordnance configurations to choose from.

As previously mentioned the kit provides decal markings for four different Vietnam-era US aircraft;

Option	Type/Unit	Notes
1	OV-10A 155471, Light Attack Squadron 4 (VAL-4) 'Black Ponies', US Navy	Overall Light Grey Scheme
2	OV-10A 155456, Marine Observation Squadron 6 (VMO-6), USMC	Dark Green/Light Grey Scheme
3	OV-10A, 67-14649, 20 <sup>th</sup> Tactical Air Support Squadron, USAF	Overall Light Grey Scheme
4	OV-10A 155416, Marine Observation Squadron 2 (VMO-2), USMC	Dark Green/Light Grey Scheme





This new ICM kit builds on the Ukrainian company's sound reputation for producing high quality kits of both mainstream and slightly esoteric subjects and the North-American Rockwell OV-10A sits firmly in the latter category with its almost unique design features and limited use when compared with other US combat aircraft designs. The overall appearance of the kit parts, with finely recessed panel lines and excellent detail, should confer the modeller with a pleasant build experience although I imagine that care will still need to be taken with some of the assembly, most notably the joining of the fuselage with the mainplane and twin booms, although some early test-fitting suggests that this will not be too onerous. The nicely-detailed cockpit will, I am sure, satisfy the needs of the majority of modellers although I have little doubt some aftermarket companies will wish to capitalise on providing additional super-detailing for this rather prominent feature of the original design, and the model may also benefit from white metal or turned brass undercarriage components in due course. The selection of stores provided is excellent and very much in line with the variety of ordnance carried by US OV-10As during the long Vietnam War, and the modeller will have plenty left over for other projects, given ICM's generous provision. From an Asian Air Arm perspective, the only disappointment is the current lack of any decal options for Asian subjects. That said, I feel sure that Kits World will re-release their previous 1:32 scale OV-10 Bronco sheet, which included examples from Indonesia and Thailand, in 1:48 or Caracal may produce a new sheet to complement their existing US focused OV-10 decal sheet.



In closing, I should also like to compliment ICM for their pricing policy which has resulted in the provision of a comprehensive, nicely detailed kit, complete with a very generous provision of ordnance which results in a sizeable model, at a very reasonable cost to the buyer.

Review sample courtesy of my wallet and Hannants of Lowestoft

Very Highly Recommended

Mark Attrill, January 2022

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## Asian Users of the OV-10A Bronco











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