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ASIAN AIR ARMS NEWSLETTER 23

October/November 2020

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Image by Shimizu Brothers

Inside this issue:

ROCAF's AIDC AT-3	1/48 Lockheed U-2 Review	Early French Aircraft—I MS.500 Criquet	"Against All Odds" Book Review	ICM's 1/48 Cessna O-2 Review	ROKAF in the Korean War—Video	1/48 PAF GD F-16 MLU Modelled by Arif Saeed
<u>3-5</u>	<u>6-7</u>	<u>8-9</u>	<u>10</u>	<u>11</u>	<u>12</u>	<u>13</u>
Douglas C47 in VNAF	Super Tucano joins Philippines A.F.	B-25s in RNEIAF Part 6	Extra Decals 1/48 Sabres & 1/72 C-130	Mil Mi-24/35 In Asia Part 3 East & South East Asia	JASDF Color Specification Chart Z8201E-2	Join IPMS You know you want to!
<u>14-17</u>	<u>18</u>	<u>19-20</u>	<u>21</u>	<u>22-25</u>	<u>26</u>	<u>27</u>



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MARK'S UPDATES AT ASIAN AIR ARMS RESEARCH GROUP/SIG



EXPECTATION MANAGEMENT

Welcome to this edition of the Asian Air Arms Newsletter, with me in the seat as your new Leader. First and foremost I hope that you and your families are fit and healthy as we pass through these difficult times with the ongoing COVID-19 pandemic. The title of this Newsletter, "Expectation Management" has been chosen since it has several connotations with regard to the immediate future of our SIG and I should like to share my thoughts with you.

Firstly, the realist in me suggests that any rapid return to the regular format of those Air Shows and Tours, major modelling events, or Trade Shows that we have previously enjoyed, is highly unlikely in the near future, and in normal circumstances, many of us would now be preparing for our annual "pilgrimage" to IPMS(UK) Scale Model World at Telford in England. This is the first time in the 50+ year history of IPMS(UK) that they have had to cancel such an event. I know that some other event organisers are already planning novel ways in which to host shows and I wholeheartedly applaud this but I am not confident that we will see a return to the scale of such events as the Royal International Air Tattoo, the IPMS Nationals in the USA or Scale Model World at Telford anytime soon, unless there is significant progress made in overcoming the global pandemic. I also fear that many of the smaller events will simply not happen due to the inevitable plethora of new Health and Safety regulations and guidelines that would make them barely viable. Indeed, I've already learned that several organisers have made the hard decision to cancel their 2021 events, particularly during the first half of the year. Perhaps I am being overly gloomy about the long term prognosis but the point I wish to make here is that, for us, the Newsletter and the website now take on even more importance. We really do owe Brian a huge vote of thanks for launching these two vehicles for the exchange and viewing of information, and keeping us in touch with each other. These tools will never replace the interaction and joy that comes from physically attending shows and events, but hopefully we shall soon return to a time when we can share our hobby in a more personal way—but in the meantime please enjoy and contribute to both the Newsletter and the website.

That leads me neatly to the immediate future of both the SIG Website and Newsletter. I'm delighted to report that our "operations team" has been enlarged by two enthusiastic volunteers. Greg Kittinger from the USA has kindly agreed to take over the management of our very comprehensive website. Greg has a sound background in website management, being heavily involved in running one for his own IPMS Chapter in Oklahoma. As you all know, and thanks to your generosity, we have already secured the funding of our website for the next 12 months, so we're in a good position to maintain the status quo, and look at making improvements to ensure it meets the demands of our changing world.

The other addition to our "operations team" is Steve Komor from the UK. Steve has very kindly agreed to assist in the preparation and production of the Newsletters—he and I shall split the task between us. There are some caveats to this for, as some of you already know, I'm about to undergo a significant change in employment in the New Year, as I complete a 40-year career in the military and take on a brand new role as a College lecturer, here in Estonia. As a consequence, and at least in the short term, I simply will not have the time to undertake all of the complex roles associated with compiling and publishing the Newsletter, whilst at the same time also making major contributions to the editorial content. Therefore, following discussions between Brian, Steve and myself, it has been agreed that I shall be responsible for gaining new articles and contributions from SIG members (YOU) and passing them on to Steve, who will then compile and publish our regular Newsletter. I shall initially retain editorial control although I do see a point in time when I may be able to delegate this responsibility in full to Steve - should he be agreeable. In the meantime, and as we move through this transitional period for a few months, I do envisage a potential reduction in the overall content of the Newsletters, although this could be mitigated if we receive more articles or contributions from members (YOU). I know it has been said before, and I appreciate that some of you may not be confident in your English language skills, but we are very happy to help you in creating an article featuring information from your home country. We really want to provide a Newsletter that is more representative of our global membership, so do not be shy – share your ideas for articles with us. Send me, Mark (tigerpress@aol.com) your ideas, photos or suggestions—we need your input! Without YOUR support we shall not be able to sustain the level of content that Brian and I have previously maintained. Remember that in these difficult times, the Newsletter will become an even more valuable tool for communication in our Research Group/SIG.

So, just to reiterate, the "operations team" now comprises: Mark Attrill (Estonia)—Leader; David Thomas (UK) —Deputy Leader; Greg Kittinger (USA) —Website Co-ordinator; and Steve Komor (UK) —Newsletter Co-ordinator, and through the wonders of the Internet this team is now spread over three countries!

I do hope you enjoy this latest edition of the newsletter which is Brian's penultimate contribution before he hands over the reins to Steve and myself. As always, please provide us with any feedback or advice for making it even better and in the meantime, please make sure you and your families Stay Safe !

Mark Attrill—Asian Air Arms Research Group and SIG Leader
tigerpress@aol.com

AIDC AT-3 *Tzu Chang* of the ROCAF

By Andy Binks



The project for what was to become Taiwan's first indigenous aircraft design, the AT-3 *Tzu Chang* advanced jet trainer, began in 1975. By 1978, the design had been given final approval and two prototypes were produced, with the first aircraft rolling out on 17 July 1980 and making its maiden flight two months later, on 16 September.

The result of this hard work by the manufacturer AIDC, with support from Northrop Corporation in the USA, was a contract for 60 AT-3As for the ROCAF.

Equipped with two Martin-Baker Mk-10LQ ejection seats, the rear of which is raised 30cm to allow for better rear-seat visibility, the aircraft has a tandem, dual-control cockpit and a simple, but robust low-wing layout, that is ideal for rigorous training purposes. Power comes from two Garrett TFE731-2-2L non-afterburning turbofan engines.

The first AT-3A operator within the ROCAF, was Flight Training Command at the ROCAF Academy, where in 1988, the Thunder Tiger aerobatic demonstration team also replaced its F-5E aircraft with AT-3s.



Photo courtesy www.egroups.com/group/AirRecognition



Following on from this initial success, a ground-attack variant was created by AIDC from existing airframes, to greater utilise the aircraft's seven weapon mounting points (one on the centreline, two under each wing and one on each wing tip for AAM missiles). The rarely used small bomb bay feature on the aircraft could also be made to carry a machine gun pack or auxiliary fuel tank.

Adopted into service, and painted in more suitable camouflage colours, the new design known as the AT-3B, operated for ten years from September 1989, with the 35th Combat Squadron (Night Attack). At the end of this period, the aircraft were withdrawn from

frontline service and transferred back to Flight Training Command.

All remaining AT-3s went through a mid-life update programme between 2001 and 2006, to extend their lives well into the 21st century and, based at Gangshan Air Force Base, the aircraft continue to give sterling service today, with daily mass launches in their stylish white, red and blue colour scheme.





AIDC AT-3 *Tzu Chang* of the ROCAF

By Andy Binks

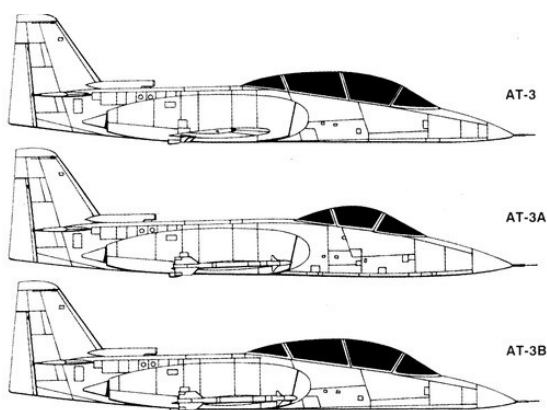


The only other development of the basic AT-3 concept was a single-seat ground attack aircraft named the XA-3 *Lui Meng*. This project began in 1981, after AIDC had received a contract from the ROCAF to modify the AT-3 for dedicated attack missions.

The new design included modern navigation and attack avionics, which together with changes to the forward fuselage structure, were successfully incorporated into the airframe. Many test flights were flown by the two prototypes to prove-out the AN/APG-66 radar and weapon delivery systems, but the initial order was cancelled in 1983.

However, AIDC continued to privately work on the aircraft, modernising them for an anti-ship role, but it was not to be, as design priorities within AIDC went to the F-CH-1 *Ching Kuo* fighter.

However, during the third Taiwan Straits crisis, the prototype XA-3's were temporarily made combat ready. Fortunately, their services were not required, and again they were put into storage, but not scrapped as an XA-3 can be seen today in the ROCAF museum at Gangshan Air Base.



For the modeller, these are heady times for such rare aircraft, as Freedom Model Kits have just released four 1/48 boxings of the AT-3/XA-3, (**Ed. It looks like 5!**) covering all three major variants and the prototype airframes. From internet photos, and knowing the quality of the company, the kits look to be very well detailed indeed. There are even after-market items available, in the form of resin seats from KASL Hobby, so why not give one a go? It will certainly make for an interesting topic of conversation at the first post-Covid model show, won't it?





AIDC AT-3 Tzu Chang of the ROCAF



SORRY - but just too delicious not to make a full-page spread of it!



PREVIEW – AFV Club 1:48 Scale Lockheed U-2C Dragon Lady By Mark Attrill



The Taiwanese kit manufacturer AFV Club are, by virtue of their name, best known for their range of excellent 1:35 scale Tanks and AFVs although they do occasionally venture into producing 1:48 scale aircraft kits of types operated by the Republic of China Air Force. Although some of these kits are re-boxed Academy offerings with new decals, the company has previously released their own products, including an extensive family of Northrop F-5 Tiger IIs and the indigenous F-Ching Kuo-1C/D fighter. In doing so, AFV Club applied the same standards that they applied to their AFV kits with both

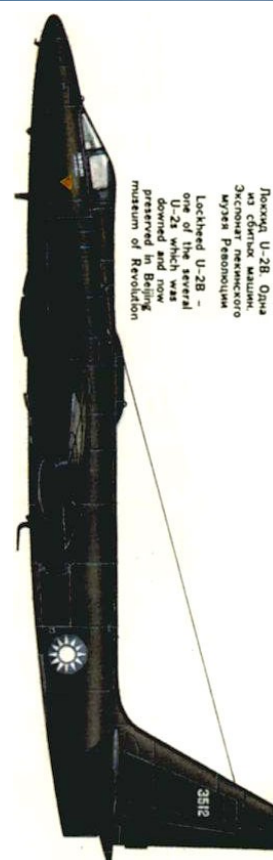
the F-5 Tiger and F-Ching Kuo widely acknowledged as the best kits of these types in 1:48 scale. AFV Club's 2018 announcement of a newly tooled, early-model Lockheed U-2 Dragon Lady was, therefore, greeted with considerable enthusiasm, since this was a kit that had been on the 'wanted list' of many aircraft modellers for decades; Hawk had produced the only other 1:48 scale kit of the early-model U-2C back in 1962 and although it was regularly re-released by Italeri/Testors and the new owners of the Hawk trademark as recently as 2016, the kit was typical of its era and showing its age. As further news of the forthcoming AFV Club emerged, so too did the disquiet among enthusiasts of this iconic high-altitude reconnaissance aircraft (aka spyplane !) as CAD images and photographs of the test shots appeared to show some inaccuracies particularly with the nose contours and canopy shape. These fears were realized when the U-2A variant was eventually released in 2019, together with the confirmation that from the leading edge of the wing forward, the nose contours, air intakes and canopy were not well rendered. It was a huge disappointment for many given the company's previous success with other aircraft kits. That said, and to their immense credit, AFV Club replicated Eduard and Great Wall Hobby's approach to correcting obvious errors (with the initial releases of their respective ME Bf-109G and F-15 Eagle kits) and by the time the subsequent U-2C variant was ready for release this year, the aforementioned shape issues had been largely addressed. I was particularly pleased to wait since I have always had a desire to model Gary Power's fateful aircraft and one of the more exotic ROCAF examples that conducted hazardous missions over the Peoples' Republic of China. To my delight the 'new' release previewed here offers three marking options including two ROCAF examples from different time periods, which allow me to preview the kit for this newsletter.

The kit arrived neatly packaged in a robust box with a very attractive rendition of a ROCAF Lockheed U-2C, overflying territory against a rising (or setting?) sun. Interestingly I have seen more than one version of the box art which suggests that AFV Club had to wrestle with the specific equipment fit for this particular airframe since one image shows the aircraft with one of the many variations of avionics humps that appeared on the various sub-variants over time. Inside the box are eight individually-wrapped light grey sprues and two in clear plastic together with comprehensive assembly instructions and a decal sheet offering three marking options including the aforementioned ROCAF examples. It is immediately apparent from the breakdown of the parts that there are several options available in the kit for both late and early model U-2C sub variants, with options for the subtle differences in the shape of the air intakes, the dorsal avionics 'canoe' fairing and the 'sugar scoop' exhaust fairing to reduce the Infra-Red signature, which all appear on two of the aircraft. In addition, the kit includes an excellent 16-part Type B camera array which can be fitted to the aircraft or posed separately on a specialised transit trolley, and the distinctive sun shade that was often used to protect the cockpit and sensitive camera bays from the weather, all of which could be utilized to produce a nice diorama setting for the completed model. The distinctive 'pogo' wheels for the outer wings, which drop off after take-off are also included, together with the 'A' frames used to keep the aircraft upright when parked.



[Click image for video of ROCAF U-2](#)

Continued overleaf



Boxing U-2B, Olin
to the Republic of China
Academy manufacturer
Myers Personnel
Lockheed U-2B -
of several
downed and now
preserved in Beijing
museum of Revolution



Guideline Publications



PREVIEW – AFV Club 1:48 Scale Lockheed U-2C Dragon Lady

By Mark Attrill

As one would expect from an AFV Club kit the parts are, with one exception, crisply moulded with excellent detail and no signs of flash. The kit features a very nicely detailed cockpit, including a 12-part ejection seat, and clear-part instrument panel. The wheel wells and main undercarriage are also nicely rendered and the kit features well moulded intake tunnels, detailed engine front and exhaust pipe. As previously noted, the highly detailed Type B camera can also be fitted in the prominent camera bay located immediately behind the cockpit. The wings have separate flying control surfaces and options to fit the late-model ECM fairings and 'slipper' tanks that were often carried for long-range missions. The distinctive periscope fitted to the U-2 and the camera bay fairing has also been helpfully moulded in clear plastic to aid with masking and finishing. The kit also features separate air brakes, which can be posed open. The one area where the mould maker has slipped up is with the main undercarriage doors, all four of which have very prominent ejector stubs on the *outer* surfaces of the doors, which will be tricky to eradicate although I have no doubt some enterprising aftermarket company will provide resin replacements in due course. As you may have now ascertained, there are quite a few options included in this kit and probably more than the three marking options accommodate, so extra care should be taken when planning your build. As a final note on the kit parts, a quick comparison between this U-2C kit and the earlier U-2A release (AR48113) does reveal that considerable work has been done to correct the nose and canopy profile in particular. I will admit that I am no expert on the Lockheed U-2 and I suspect there are still issues as far as the purists may be concerned but from my perspective, the kit does now look very good and I look forward to making a start on it.

As previously noted, the decal sheet offers three different marking options. The first covers an overall Black U-2C operated by 35 'Black Cat' Squadron of the ROCAF and reportedly flown by Captain Huang Jungpei in September 1967. This particular airframe has the enlarged 'Coke Bottle' air intakes, dorsal avionics canoe, 'sugar scoop' and wing mounted ECM fairings and small national insignia. The second ROCAF U-2C is undated but since it features an overall Midnight Blue (FS35042) colour scheme (reminiscent of early CIA aircraft); straight air intakes; none of the 'lumps and bumps' associated with the first option; and large national insignia it should be assumed that it is from an earlier time period. The third option is for a late-model USAF 100th Strategic Reconnaissance Wing example which was also fitted with the long-range slipper tanks. This particular aircraft features a two-tone grey scheme which was applied in an attempt to divert attention away from the aircraft's primary mission and placate political sensitivities in some of the foreign countries from where the aircraft frequently operated their long-range reconnaissance flights.

In summary, an excellent, if somewhat pricey, kit of a long neglected subject – and not just in 1:48 scale. AFV Club are to be commended for their timely response to the accuracy issues associated with the original kit and for providing us with another Asian Air Arms subject.

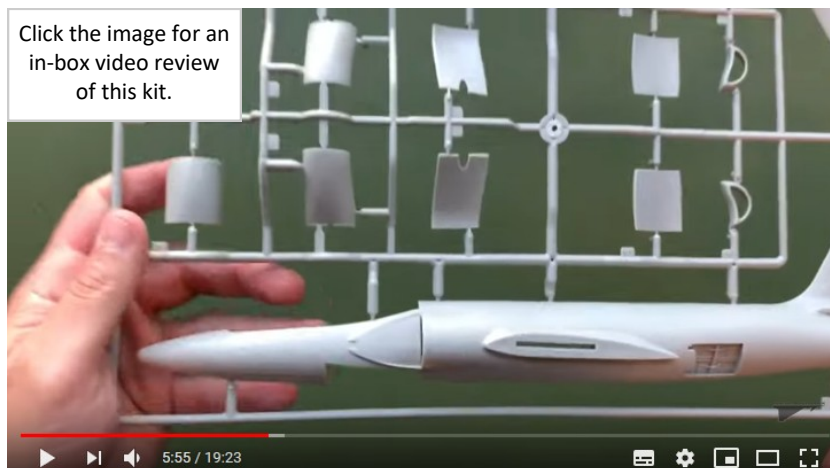
Highly recommended – Preview sample courtesy of my wallet !

Mark ATTRILL

July 2020

SPECIAL OFFER TO MEMBERS OF ASIANAIR ARMS RESEARCH GROUP!

The AFV Club Lockheed U-2C comes in at a whopping £74.99 (UK RRP) but I can supply the kit for only £59.99 including UK shipping on a first come, first served basis. E-mail me at: tigerpress@aol.com.





Early French Aircraft in the service of Asian Air Arms Part 1—Morane Saulnier MS.500 Criquet Series

Morane Saulnier MS 500, South Vietnamese Air Force, Nha Trang, ca. 1956



8.4.2006 MF www.wings.de.ms

The Morane Saulnier M.S. 500 Criquet was the name given to examples of the Fieseler Fi. 156 Storch built at Puteaux in France after the end of the Second World War. The Criquet was built at Puteaux from 1942, and by the end of the war French production represented the main source of new aircraft. After the war Morane Saulnier continued to produce the standard Fi 156C, using the same Argus As 10 engine, with the designation M.S. 500. The aircraft was also produced with other engines as the M.S. 501 and M.S. 502. The use of the aircraft by the Armée de l'Air in Indochina highlighted the weakness of the wood in the construction of the airframe; it was then decided to build the wings in metal. Among the modifications, the defensive weapon aiming through the back window was dropped, although some aircraft were modified in the field to take a machine gun MAC 34T, firing through one of the side windows. 141 aircraft were built before the end of World War II and a total of 925 aircraft were built before the end of the production of all type of *Criquet* by Morane-Saulnier in 1965.

As well as serving with the Armée de l'Air (AdIA) in Indo-China, they were also used by the following Asian air arms:

Vietnam—In March 1952, a training school was set up at Nha Trang, and the following year, two army co-operation squadrons (1st & 2nd Observation and Combat Support Squadrons) began missions flying the Criquets. They were mainly used for artillery spotting and visual reconnaissance, however enthusiastic aircrew did, on occasions, hurl mortar rounds onto enemy positions!

Cambodia—Although the first tentative steps to form a Cambodian air arm had been taken in 1952, it wasn't until April 1954, that the Aviation Royale Khmère, or AVRK, was created by Royal decree. Its commander was Colonel Ngo Hou. Originally, it was envisaged that the AVRK would consist of 2000 men and 80 aircraft. Seven of these French built observation aircraft were delivered (ex-AdIA), four in 1954 and three in 1955. By October 1954, French instructors had initiated the first flight training courses. At this time the AVRK had a total of eight aircraft on strength: four MS 500s, two Cessna 180s, one Cessna 170 and one VIP DC-3. They were replaced by eight Cessna L-19As delivered in 1958.

Laos—Ten Criquets were delivered from Armée de l'Air stocks in 1955 and were used as primary trainers. They were withdrawn from use in 1958, being replaced by Cessna L-19s. All remaining M.S.500s were returned to the AdIA. (Interestingly, one MS 500 in Lao markings was spotted at La Ferte Alais airfield, Ile-de-France in 1969, it was probably their resident Fi.156, re-painted.)

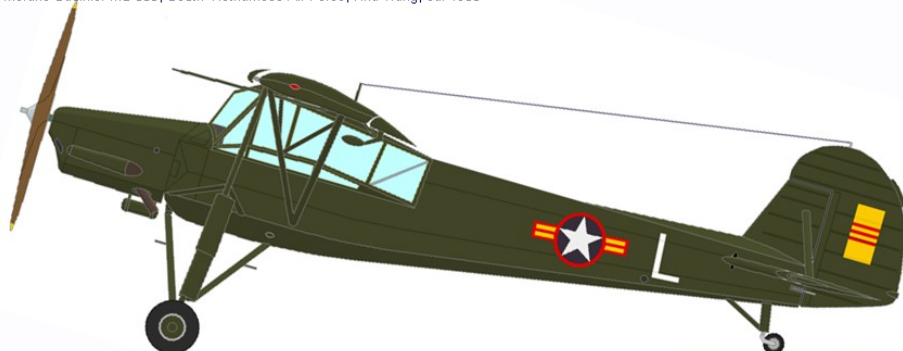
All photos below are of Vietnamese aircraft





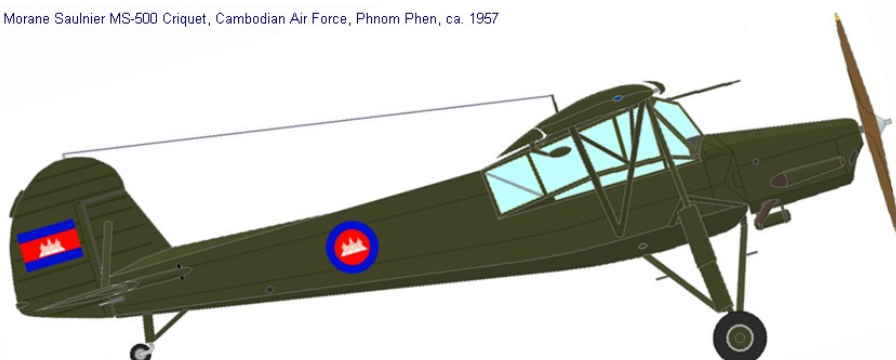
Early French Aircraft in the service of Asian Air Arms Part 1—Morane Saulnier MS.500 Criquet Series

Morane Saulnier MS 500, South Vietnamese Air Force, Nha Trang, ca. 1956



8.4.2006 MF www.wings.de.ms

Morane Saulnier MS-500 Criquet, Cambodian Air Force, Phnom Penh, ca. 1957



www.wings.de.ms 6.4.2006 MF

Morane Saulnier MS 500 Criquets, Royal Lao Air Force, Wattay Air Base, ca. 1955



8.4.2006 MF www.wings.de.ms



MS-501, Laotańska Armia Narodowa, Vientiane, styczeń 1955 roku. MS-501 of Laoan National Army, Vientiane, January 1955.

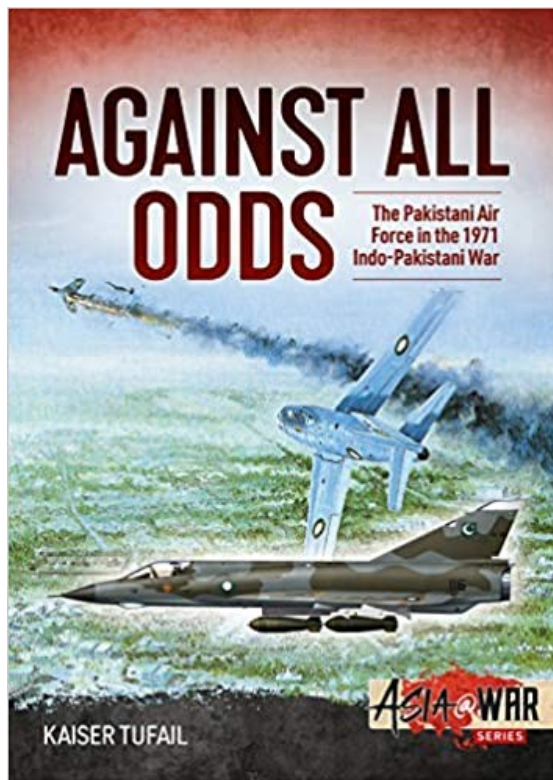




AGAINST ALL ODDS

Pakistan Air Force in the 1971 Indian-Pakistan War

Reviewed by David Thomas



I have been a fan of Helion's "@War" series of monographs for some time, ever since I discovered they contained several pages of aircraft profiles which stimulated my modelling appetite. However, this volume as well as the obligatory profiles, has the added benefit by being written by a former officer in the Pakistan AF, who had experience of flying a number of fighter aircraft, following his commissioning into the service in 1975. He flew Chinese J-7s, French Mirages and American F16s. In addition he commanded a squadron, a wing, and an air base as well as experiencing a number of staff appointments. Following his retirement from the air force in 2005 he has written extensively on current aviation topics. Accordingly he brings a wealth of experience and knowledge to this book.

The book itself, a slim 88 pages, contains eight chapters which break down in to four sections; Backdrop, Operations, Review, followed by a series of appendices, designed to aid further study. As you might expect the Backdrop explains the situation, both political and military before the outbreak of the hostilities which culminated in the separation of West and East Pakistan into the two independent nations of Pakistan and Bangladesh. The author examines the military plans and preparations as well as considering the human and political issues. A.C. Tufail considers the role of the anti-West Pakistan insurgency in the East and the subsequent invasion by the Indian army to support that movement. Plans and preparations by both the Army and the Air Force are explained.

The second section, Operations, focuses on the higher command's attempts to achieve a balance in both offensive and defensive actions while at the same time being aware of the need to husband irreplaceable human and material resources. The author discusses at length the tactical use of the air force, covering the various sectors where combat occurred.

It is worth noting at this point that he is quite scathing about the neglect of maritime air power in the years prior to the war and the resulting inability of the air force to support and protect naval activity in the northern Indian Ocean.

The assessment of the several weeks of bitter fighting in various locations along the borders between the two countries is reviewed in the third section of the book and covered in Chapter 8. It is here that the author makes his most telling contribution to our overall understanding of the nature and events of this conflict. In particular he is at pains to give credit where it is due but does not shy away from the fact that mistakes were made and there were lessons to be learned and improvements made.

It's important to note that this is not a "from the cockpit" book and although he clearly values and appreciates the sacrifices made by many young men on both sides he is dealing with the conflict from a more elevated view, examining the organisation of the war and the decisions that were made at higher levels in the Pakistan military.

In his final section A.C. Tufail provides the reader with a number of appendices consisting of tables and charts. Importantly, he disputes the widely published details of aircraft losses on both sides and his access to previously classified material helps to clarify this matter. He points out that he doesn't think that the final reckoning has been achieved yet but that with the increasing volume of information of material available to the internet on both sides of the border his contribution is a significant step forward towards a final record being achieved.

Clearly his position as a senior officer in the service has given him access to previously unavailable material which he claims was vetted by the authorities prior to publication and no issues were identified or changes requested. It is this access which provides the backdrop to the general feeling of authority created by the book.

From a modelling point of view it's easy to appreciate the usefulness of the profiles of the major aircraft used by both sides during the conflict. Incidentally these are the work of fellow Asian Air Arms member Tom Cooper. In particular I was most intrigued by the profiles of the Pakistani Mirages and Sabres, and the Indian Hunters and Canberras. I can see several of them being used as the inspiration for a model or two from me in the future. Additionally the book contains a large number of black and white images of the aircraft and these add immensely to the enjoyment of the book.

All things considered I found this publication to be an easy book to read and enjoy. The author writes with authority and knowledge in a manner which makes what could be a dry assessment of the conflict, an interesting and informative read. I have no hesitation in recommending this book to you all.

David Thomas





In-Box Review—ICM 1:48 Scale Cessna O-2A Skymaster



In the mid-1960s, and mainly as a result of combat experience in Vietnam, the United States Air Force commissioned Cessna to build a military variant of their highly successful Model 337 Skymaster, a distinctive twin-engine light aircraft of unconventional design with a 'push-pull' engine configuration with one engine placed traditionally in the nose of the aircraft and a second mounted in the rear fuselage, in-between a twin boom tail arrangement. The aircraft was designed to replace the ubiquitous Cessna O-1 Bird Dog, primarily in the highly risky Forward Air Controller (FAC) role in the jungles and mountainous areas of Indo-China where the slightly more robust aircraft design combined with twin-engine safety would increase survivability rates among the pilots.

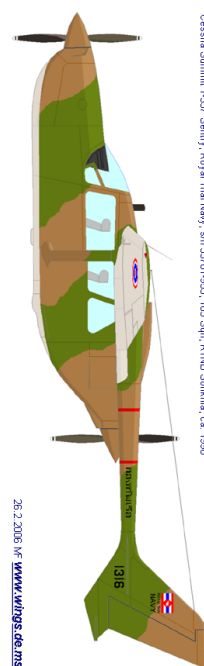
The USAF took delivery of its first O-2A in early 1967 and by 1970, over 500 examples had been delivered with many of these operating in the FAC role. The Cessna O-2A was operated not only by the USAF over Vietnam but over 30 examples were also provided to the South Vietnamese VNAF and at least four other Asian Air Arms have operated the type, or its sub-variants, over the years.

The ICM announcement of this 1/48 release was somewhat of a surprise to the modelling world. Many had assumed that Roden would downscale their recent 1:32 release of the Cessna O-2 in much the same way as they had done with their excellent Cessna O-1 Bird Dog, producing a high quality kit from the original large scale version. The ICM kit comes in one of their typically robust boxes, which is actually twice as deep as it needs to be. Fortunately the kit parts are neatly packaged in plastic bags and consist of two medium grey runners containing approximately 180 parts with a third sprue holding 15 crystal clear parts for the windscreen, cabin windows and navigation lights. This first boxing of the Cessna O-2A also includes nice decal markings for four USAF FAC examples with three in the familiar Light Grey/White colour scheme with the fourth presented in an overall black scheme optimized for night operations. The nicely printed instruction sheet includes a very useful paint chart with recommendations for Revell or Tamiya shades, together with full colour four-view profiles for the four marking schemes including very clear decal placement instructions which are especially useful for the extensive number of stencil and maintenance markings that adorn the Light Grey/White machines in particular.

The parts are crisply moulded with well-defined detail and fine engraved panel lines; the main characteristics of the fuselage, mainplane and flying surfaces are well captured. The aircraft cabin is bound to be a focal point of this model, given the number of windows and doors through which to view it. ICM have done an excellent job in portraying the relatively simple layout of the original. The main instrument panel and controls are made up from nicely detailed plastic parts, utilizing decals for the main instruments. A comprehensive radio rack dominates the rear of the cabin which comes complete with a pair of separately-moulded M-16 carbines, which would have been used by the crew should they come down over enemy territory. The forward mounted engine and nose undercarriage are also very nicely rendered, considering that not much can be seen once the fuselage has been put together. ICM have avoided the temptation to provide separate engine access panels or cabin doors, although this reviewer would have personally liked to have the option to pose one of the doors open, to lend interest to a diorama setting. Care will need to be taken to ensure enough ballast is packed into the nose to prevent a tail sitter'. Some of the flying control surfaces, notably the ailerons and twin rudders are, however, provided as separate items and can be posed in different positions to lend interest. The assembly of twin-boom aircraft kits can often be fraught with difficulty but ICM seem to have come up with a neat solution to aid the assembly and alignment of these items with a somewhat unorthodox but effective sequence of assembly, which should present few problems. The kit is also supplied with a representative load of appropriate wing-mounted stores including 2 x SUU-11B/A Gun Pods and 4 x LAU-68 rocket launchers, all of which are nicely detailed. Modellers should also note that some of the parts included in this kit are not used for this particular variant, most notably the streamlined propeller spinners. The original Cessna and licence-built Cessna-Reims 337 Super Skymaster spawned a considerable number of variations between aircraft, in terms of cabin window arrangement, wing tips, aerial fits etc. As was noted with the larger scale Roden kits, a common set of sprues could not replicate the latter variant without considerable modification and given that some of the Asian Air Arms, including Bangladesh and Sri Lanka, reportedly operated licence-built variants of the Cessna O-2, modellers will have to check their references carefully before embarking on a particular project. That said, and taking into account the provision of additional parts, I have every confidence that ICM will release other boxings in the near future.

All in all, this is a very nice kit of a long neglected subject – the old Heller (actually 1:50 scale) and the Italeri/Testors kits were products of their times so this aircraft is long overdue for re-tooling. ICM have continued to build on their growing reputation for producing superb 1:48 kits of some quite esoteric subjects and this is yet another example of the genre.

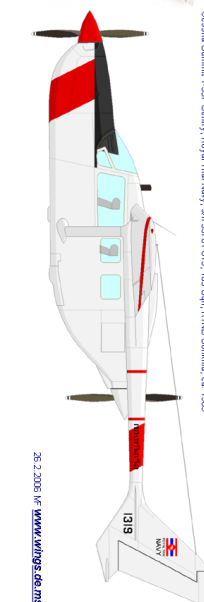
Very highly recommended – preview sample courtesy of my wallet !



Cessna Summit 1337 Safety, Royal Thai Navy, s/n 33701-953, 103 Sqn, RTNAB Samkhla, ca. 1980



Cessna Summit 1337 Safety, Royal Thai Navy, s/n 33701-813, 103 Sqn, RTNAB Samkhla, ca. 1980



Cessna Summit 1337 Safety, Royal Thai Navy, s/n 33701-813, 103 Sqn, RTNAB Samkhla, ca. 1980



"ROKAF in the Korean Air War" Video directed by our ROKAF Specialist Gary Markham



Hi Brian, I'm forwarding you our unique video documentary of the ROKAF (Republic of Korea Air Force) and the role it played in the Korean war, alongside the US Air Force, the RAAF and the SAAF. It has just been completed, and received its first public showing on KBS (Korean Broadcasting Service) TV, just a few weeks ago.

A personal work of two and a half years in the making with a small but equally able team of work colleagues and friends, we've finally pulled it all together. It's amazing what we found in the war memorial vaults, the archives of various TV networks files etc. Interviews with surviving veterans was heart wrenching at times, but, was moving by their compassion, something we seemed to be lacking today.

The aircraft films (ground and aerial) are something else, pretty sure you wouldn't have seen most of what we found—very interesting stuff to watch. It starts with the end of the European and Japanese wars, then leads into the Korean conflict. There are some English parts included (American veteran pilots) and bits of views with American museum aircraft, but the rest is Korean all through - sadly without English sub-titles! A part I've included was that on the Reverend Dean Hess (the subject of the autobiography *Battle Hymn*, published in 1956, which later served the basis for the 1957 film of the same name, where he was played by Rock Hudson) and his aircraft. A hotly debated subject being which was his P-51, as there are four in similar markings—fortunately I was proved correct (serial numbers don't lie!) Talking with his family and friends is also included.

I hope this is of interest to you and the members of AAA Research Group—you can of course watch this via KBS Doculife on YouTube if you prefer.

Gary Markham garymarkham@yahoo.com



And by way of
complete contrast,
watch
"MiG-29 in
Korean People's Army
Air and Anti-Air Force"
One of the most
bizarre videos
you'll ever see!





1/48 PAF F-16MLU—Modelled by member Arif Saeed



Kit Manufacture: Hasegawa 09332 **Scale:** 1/48 **Type:** F-16A MLU

Extras used: Aries resin MLU cockpit, PW engine nozzle, AIM-120C (kinetic), vinyl strengthening plates.

Paints and colours used: Gunze/Tamiya Lacquer paints

Weathering: Flory black wash and Abteillung oils.

Decals: Caracal models CD48054

Pakistan Air Force: No.11 Squadron block 15 85728.

Around 2009 Pakistan began the Mid Life Upgrade (MLU) program for their F-16A/B, which included structural reinforcement, upgraded radar, new cockpit, joint helmet mount curing system (JHMCS) and new electronic warfare/countermeasure suite which allowed them a BVR capability.

This particular aircraft has the tail code 85728 of No 11 squadron and is based at Shahbaz AB. It has the nose art "TOP GUN", this being a title given to the winning inter-squadron gunnery/armament competitions of the PAF, which it won several times and again as recently as 2019.

The kit generally went together quite well, better than the later Kinetic offerings but lacks detail, which is why aftermarket resin was used for the cockpit and exhaust nozzles. The cockpit resin took some effort to make it fit and was not a drop-in fit. The exhaust PW F100 from Aires was a very nice fit. The age of the kit was also apparent with regards to armament and only early AIM-9 sidewinders were included. As this was going to be an MLU upgraded F-16, I borrowed a couple of AMRAAM AIM-120C from a Kinetic kit I have in my stash and used these for wing mounted missiles.

All in all, an enjoyable build and I'm very pleased with the results.

Arif Saeed

We'd like to give a big welcome to 10 new members

Welcome to: Mike Grant from **Canada**; Wee Lee Chan and Osprey Ong from **Singapore**; Chetan Garalapur from **India**; Leonard Prakasam from **USA**; Alex Vagl from **Germany**; Arif Saeed, Gary Marshall, Simon McKinlay and James Robson from **UK**.

We now have 474 members from the following 55 countries!

Abu Dhabi, Algeria, Argentina, Australia, Austria, Bangladesh, Belgium, Bermuda, Canada, Chile, China, Croatia, Denmark, Finland, France, Germany, Greece, Guatemala, Honduras, Hong Kong, India, Indonesia, Ireland, Israel, Italy, Japan, Laos, Latvia, Malaysia, Malta, Myanmar, Namibia, The Netherlands, New Zealand, Norway, Pakistan, The Philippines, Portugal, Poland, Qatar, Singapore, Slovenia, South Korea, Switzerland, Taiwan, Thailand, Ukraine, UK, USA and Venezuela—Phew!



The Douglas C-47 Skytrain and Sub-Variants in Service with the South Vietnamese Air Force (VNAF) 1955-75

By Mark Attrill—Part 1



The all-time classic Douglas C-47 Skytrain or 'Gooney Bird' as it was affectionately known in South East Asia had the distinction of being one of only two aircraft types⁽¹⁾ to serve with the South Vietnamese Air Force from its formation on 1 July 1955 until its final demise in April 1975, when several aircraft safely made their way to U Tapao Air Base in Thailand after the mass exodus from South Vietnam.

The C-47 Skytrain was, of course, no stranger in the skies over Indo-China having served the Allies in the region with distinction during and immediately after the Second World War. In the 1950s, the French Armée de l'Air were the grateful recipients of the relatively modern C-47, under the US sponsored Military Aid Programme (MAP), to replace the Amiot AAC.1 Toucan, a licence-built version of the Junkers Ju.52, then supporting French Ground Forces engaged in a bitter struggle against the Viet Minh. As it became clear that France, burdened by the aftermath of the Second World War and a desire to reduce its overseas colonial commitments, was seeking an exit strategy from Indo-China so it came to pass that some form of Vietnamese Self Defence Force would need to be created and equipped. As the French sought to provide assistance for the creation of an embryonic Vietnamese air arm, the United States, keen to halt the spread of communism in South East Asia, formed a Military Assistance Advisory Group (MAAG) and over time engineered the transfer of US MAP equipment to the fledgling South Vietnamese Air Force (VNAF).

The first recorded 'transfer' of a C-47 to the then French-controlled Vietnamese Air Wing was as early as 1951 when one example appears to have been operated by the Liaison Flight, as it was known, with more transfers taking place over 1954-55. By the time the VNAF was officially created on 1 July 1955, sixteen ex-Armée de l'Air Douglas C-47D Skytrains had been ultimately transferred to the VNAF to form the 1st Transport Squadron at Tan Son Nhut Air Base (also known as Saigon Airport). At the same time the co-located 312th Special Mission Squadron also received several VIP-configured C-47s for use by senior Vietnamese Government and Military representatives.



Early VNAF C-47 with propaganda slogans painted on fuselage and wings (circa 1954)

The first Commander of the 1st Transport Squadron was Major Nguyen Cao Ky, who would later become the charismatic Commander-in-chief of the VNAF and then go on to be Prime Minister, and ultimately Vice-President of the Republic of Vietnam. As the Vietnamese Armed Forces developed and grew in size, so did the demands on transport assets to facilitate deployment across a large area of responsibility and within a year the US Government supplied a further sixteen aircraft to the VNAF through their military aid programme: these formed the 2nd Transport Squadron in June 1956 and led to the creation of the 1st Air Transport Group, also at Tan Son Nhut.

The 1st Air Transport Group spent the next few years developing an effective network of air transport routes to support an increasing number of deployed Army of the Republic of Vietnam (ARVN) Establishments and Units throughout the length and breadth of South Vietnam. As the conflict between North and South intensified in the early 1960s, some of the C-47s and crews of the 1st Air Transport Group were employed in less traditional activities.

(1) The other was the Cessna L-19 (O-1) Bird Dog Light Observation Aircraft



The Douglas C-47 Skytrain and Sub-Variants in Service with the South Vietnamese Air Force (VNAF) 1955-75

As early as April 1961, several C-47s drawn from the two VNAF transport squadrons became involved in covert operations over North Vietnam, flying low-level missions at night, to drop saboteurs tasked with destroying roads, bridges and power plants in the area surrounding the capital, Hanoi. As these clandestine operations continued and became ever more complex, it was natural for the small group of VNAF volunteers engaged in these dangerous missions to want to develop an identity of their own. It is understood that sometime in 1962, the Special Operations unit was informally established to operate a variety of aircraft types including a small number of C-47s. By early 1964, and following a *coup d'état* in November 1963, Lieutenant Colonel Nguyen Cao Ky had risen to the rank of Colonel and become the Commander of the VNAF after active involvement in some of the covert missions undertaken by the C-47s. Ky's increased influence allowed him to bestow official unit status on the clandestine organisation, which became known as the 'Biet Doan 83' or 83rd Special Operations Squadron, being subsequently elevated to Group status as the 83rd SOG. By mid 1963 VNAF C-47s were also involved in joint air operations with USAF Fairchild C-123 Provider aircraft, conducting flare illumination missions in support of air interdiction missions against lines of communication.

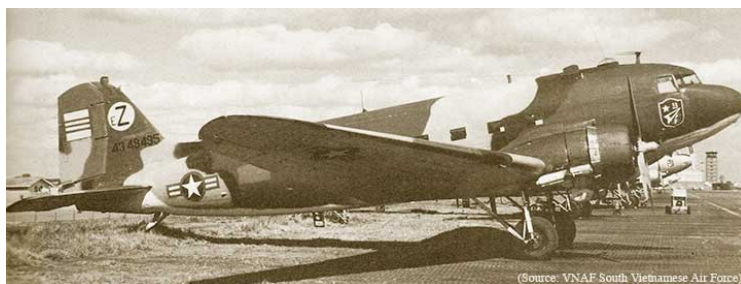
The mid-1960s was an extremely turbulent time in the history of South Vietnam with another attempted coup d'état in September 1964, and the VNAF C-47s played a decisive role during the internal struggles that month, transporting large numbers of troops to quell the rebels and bring order from the chaos. At the same time, the US Government were increasing the delivery of new aircraft to the VNAF and this included a further batch of C-47s which may have included several specialised mission aircraft, with which to partially equip the 314th Special Missions Squadron (2).

The US Government delivered or transferred additional C-47s to the VNAF between 1965-67 and some of these were almost certainly more specialised versions of the standard 'Gooney Bird' as the United States sought to expand Vietnamese capabilities. For example, up to 1968 the USAF was providing air base protection by employing orbiting AC-47D 'Spooky' gun ships to drop flares and engage infiltrators. In July 1969, five AC-47Ds were transferred to the VNAF and by late August the newly established 817th 'Fire Dragons' Attack Squadron had received its full complement of sixteen aircraft before declaring full operational capability on 31 August 1969.

The unit, the first VNAF squadron to be formed to perform these specialist duties, was initially located at Nha Trang AB before relocating to Tan Son Nhut and was, ultimately, the only squadron to operate the AC-47D, since the newer and more capable AC-119G and AC-119Ks would eventually undertake the role with other VNAF Attack Squadrons. The *Fire Dragons* initially deployed a six aircraft detachment to Binh Thuy for operations in the Mekong Delta and quickly established a reputation as a highly effective unit, thanks mainly to the crews' prior knowledge of the C-47 through their service with the 1st Air Transport Group and local familiarity with the terrain. By 1971, the 817th AS had established detachments at Da Nang, Pleiku and Binh Thuy, providing VNAF gunship support for all ARVN military regions. The 716th Reconnaissance Squadron received three specialised RC-47D aircraft with infrared photo systems that could locate enemy locations and movements through heat source imagery and were regularly used for photographic reconnaissance on behalf of ARVN Corps Headquarters.

At the same time, the 413th Transport Squadron, which had operated the C-47 since the creation of the VNAF, gave up its aircraft (some of

which had originally been received from the Armée de l'Air) to be re-equipped with the C-119G Flying Boxcar. The best of the 413th Squadron C-47 fleet were subsequently transferred to the 415th Transport Squadron. In keeping with most other VNAF air assets, the C-47s participated in supporting the ARVN during the Tet Offensive in late January/early February 1968. The 33rd Transport Wing in particular were heavily tasked with flare illumination missions, dropping three times the monthly average during the first two weeks of February. During these operations at least one VNAF C-47 was lost to ground fire.



(Source: VNAF South Vietnamese Air Force)

(2). The status of the 312th Special Missions Squadron, originally established with French assistance during the formation of the VNAF, was obscure by the mid-1960s and it is assumed that it was re-numbered as the 314th SMS since the new unit fulfilled several missions and operated a number of different types including the VC-47D used for the transportation of high ranking Government and Military officials, which had previously been the mission of the 312th SMS.





The Douglas C-47 Skytrain and Sub-Variants in Service with the South Vietnamese Air Force (VNAF) 1955-75



By 1970, the VNAF transport fleet had been increased to five squadrons, as USAF units leaving the country transferred their aircraft and support equipment to the VNAF. Throughout all of this expansion, which involved the acceptance of C-7A Caribous and C-123 Providers, the 415th Transport Squadron continued to operate their dependable C-47Ds from Tan Son Nhut until circa 1973. In spite of the reduction in numbers of the C-47D transport aircraft during the early 1970s, the type was still prevalent in the VNAF ORBAT with the more specialised sub-variants equipping or partially equipping three other Squadrons within the 33rd Tactical Wing at Tan Son Nhut.

By now the EC-47D Electronic Intelligence (ELINT) variant had been supplied in limited numbers, augmenting the RC-47Ds operated by the 716th Reconnaissance Squadron and all co-located with the 314th SMS and 817th AS operating the VC-47D and AC-47D respectively. By 1972, the 716th RS operated five RC-47Ds, two EC-47Ds and C-47Ds together with several other aircraft types engaged in reconnaissance missions. Additional RC-47Ds were also modified in January of the same year to carry Palletised Airborne Relay (PAR) sets but the programme was abandoned by the end of the year due to a lack of key analytical and exploitation equipment and the aircraft were returned to standard photographic reconnaissance work.

As the USA continued to draw down their military presence in South Vietnam, improving VNAF Electronic Warfare capability became a priority, so the USAF handed over more advanced versions such as the EC-47Q/P equipped with AN/ALR-34 equipment and even a limited jamming capability.

As a result by April 1973, the VNAF were able to establish a second E/R-47D equipped unit, the 718th Reconnaissance Squadron which was the largest operational unit in the VNAF with 36 E/RC-47Ds on strength. The 718th operated not only from Tan Son Nhut but also under the 41st Tactical Wing from Da Nang AB. Both the 716th and 718th RS worked directly for ARVN Intelligence Agencies under extreme secrecy.

The demise of the C-47D transport variant in the VNAF occurred in 1973, shortly after the VNAF accepted its first Lockheed C-130 Hercules for the newly formed 435th and 437th Transport Squadrons at Tan Son Nhut. In order to facilitate training and conversion on the new type and to reduce the drain on resources and the number of transport aircraft at the base, the VNAF disbanded the three co-located C-123 Provider equipped Transport Squadrons and sought to draw down the number of C-47Ds held on the strength of the 415th Transport Squadron, although it is likely that some of the C-47Ds were transferred to supplement the hard-pressed VC-47Ds of the 314th SMS. Increased requirements for field and HQ Commanders to have immediate transportation on the hand had resulted in the 314th SMS deploying VC-47D assets to multiple locations throughout South Vietnam during the challenging period between 1973-74.

At the same time the 817th Attack Squadron had also relocated its AC-47D Gunships back to Nha Trang to serve under the 62nd Tactical Wing at Nha Trang.

It was, however, clear by 1974 that the VNAF was struggling with both the influx of massive numbers of aircraft into their inventory and the effective employment of the more specialised C-47D variants. As a result, in June 1974 the VNAF took the decision to place over 200 'surplus' aircraft into storage including over thirty C-47s, which included the majority of the AC-47D Gunships, which had proved to be vulnerable to the more advanced types of Viet Cong Anti-Aircraft systems although some were disarmed and returned to cargo configuration.

Airborne reconnaissance was now a particular challenge for the VNAF, with two aircraft types operating at either end of the spectrum and an ever changing security landscape evolving, as the North Vietnamese began shaping and probing action across Vietnam. The fast moving RF-5A Freedom Fighter had difficulty collecting the necessary high-resolution imagery from the battlefield and processing it in a timely fashion. In contrast the slow, lumbering RC-47Ds could deliver high quality photographs from the battlefield but was extremely vulnerable to the more sophisticated forms of Anti-Aircraft weaponry being employed by the NVA.



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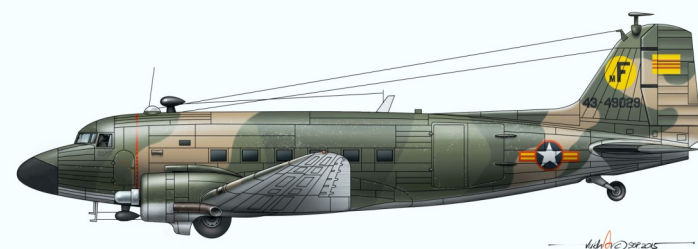


The Douglas C-47 Skytrain and Sub-Variants in Service with the South Vietnamese Air Force (VNAF) 1955-75

In spite of this, the VNAF still enjoyed some success, including a particularly effective operation in December 1974 that involved both RC-47D and EC-47D assets and the aircraft continued to operate, albeit limited to those areas considered to be within a permissive environment, throughout early 1975. Near the end however, the R/EC-47s of the 716/718th RS inadvertently contributed to the success of the North Vietnamese radio deception campaign in the Central Highlands by monitoring messages and providing misleading intelligence to the II Corps Commander that allowed the enemy to launch their attack from elsewhere in the region and

execute a decisive blow against the ARVN in early March 1975.

As the NVA swept through the central part of Vietnam, VNAF C-47s were hastily used in their original transport role to supplement the C-119s and C-130s and move equipment and personnel between military bases including Phu Cat and Phan Rang. As the rout continued, these transport tasks multiplied and



included civilian evacuation flights: in one case a C-47D carried 80 refugees instead of the usual 30 from Pleiku AB to further south. VNAF E/RC-47Ds, reinforced by examples operated by Air Vietnam and Air America (the US CIA's Airline) continued to facilitate the movement of demolition teams during the fall of Hue and Da Nang AB before retreating back to Saigon, Bien Hoa and Tan Son Nhut AB. Some of the E/RC-47D/Ps continued to operate in both their primary and new secondary roles throughout the first weeks of April as the ARVN and VNAF, but by the end of the month it was clear that the war was lost.

Following a major air attack on Tan Son Nhut on 28 April, two of the home-based VNAF E/R-47s defected, one being flown to Thailand, with the second arriving at Clark AB in the Philippines and within a few days another eighteen examples fled to various locations in Thailand, including U Tapao AB where the majority of ex-VNAF aircraft were finally consolidated. It is reported that some 38 serviceable examples of E/RC-47s were abandoned to the North Vietnamese, mainly at Tan Son Nhut⁽³⁾, Nha Trang and Binh Thuy. The US government subsequently turned over a total of sixteen R/C-47D and three EC-47P/Q aircraft to the Royal Thai Air Force although it is unclear whether all of these were ex-VNAF aircraft, since US supplied aircraft had also arrived in Thailand from Cambodia during the same period. With the fall of Saigon in April 1975, the North Vietnamese acquired a huge amount of military resources and equipment including the damaged transport aircraft repair facility at Tan Son Nhut, which was quickly repaired to receive an influx of aircraft. By the end of the year, the VPAF had accounted for the capture of over 900 ex-VNAF aircraft, although only circa 220 examples were declared operational. It has been reported that this number included some twenty C-47 airframes and, given the relative simplicity and utility of the Gooney Bird, it can be assumed that at least some of these aircraft were pressed into service by the 919th Air Transport Corps which had been established to restore and operate a range of transport and utility types to supplement their Russian and Chinese sourced aircraft, although no photographic evidence to support this claim has been made available.

Clearly it was not an illustrious end to the long service that the Douglas C-47 'family' had enjoyed with the VNAF but the longevity of its presence in the skies over Vietnam, where it demonstrated extreme utility in a wide variety of roles, was never in question. Its lineage from the mid 1930s, honed in all theatres of operation during the Second World War, had resulted in an aircraft that was rugged and easy to maintain and operate which were all key to its continued success in VNAF hands. Even with the advent of more advanced transport types, such as the C-119 Flying Boxcar and Lockheed C-130 Hercules, the trusty C-47 was still needed, to operate into those rudimentary air fields and landing sites throughout South Vietnam that were deemed unsuitable for the operation of the more complex aircraft types. VNAF use of the C-47 in the more specialised roles produced mixed results. There is little doubt that the AC-47D equipped *Fire Dragons* of the 817th Attack Squadron acquitted themselves very well during their five years of intensive operations. The VNAF Electronic Warfare/Intelligence and Reconnaissance community did not fare so well, although the operation of the more complex E/RC-47 variants was mainly hampered by the lack of suitable resources, including appropriate exploitation equipment, procedures and training. That said, the ease with which the E/RC-47 aircraft could be re-configured, combined with the VNAF crews' familiarity with the terrain and environment, did permit the force to achieve one or two notable operational successes during the type's long service in these specialised roles.

⁽³⁾ The North Vietnamese reportedly captured twenty-one E/RC-47s at Tan Son Nhut alone.

LOOK OUT FOR PART 2 IN NEXT ISSUE

Mark Attrill

shesto



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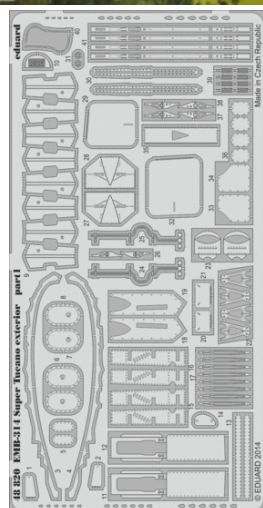
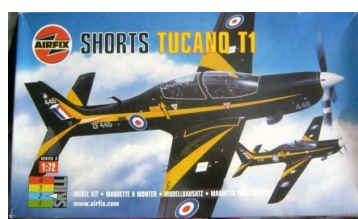
Philippine Air Force formally inducts A-29B Super Tucano




The first four of the recently commissioned A-29Bs arrived at Clark Air Base in Angeles City, Pampanga Province on 19 September, and the remaining two arrived on 2 October.

The A-29s, which are now part of the PAF's 15th Strike Wing, will supplement the service's Boeing (Rockwell) OV-10 Bronco ground-attack aircraft.

The aircraft are expected to be employed in several roles, including close air support, light attack, surveillance and reconnaissance, air-to-air interception, and counter-insurgency. (Extract courtesy of Janes.com)



 <h1>AFTERMARKET PRODUCT REVIEW</h1>	
Manufacturer	CMK
Product	CMK resin detail sets for the 1:72 scale Airfix Short Tucano T1
Product Number	#7356 - Control Surfaces #7357 - Engine Set #7358 - Cockpit Set #7359 - Exterior Set
Scale	1:72
Parts Breakdown	Around 10-12 resin parts per set
Highlights	One of the four sets this review will take a nice degree of detail extra options to your Airfix Short Tucano T1, all four together stand to enhance the kit in some very impressive ways.
Drawbacks	Tiny casting defect in the engine set cockpit tub is not a "drop in" part and some thinning of kit sidewalls is necessary
Price	#7356 - Control Surfaces: \$13.00 #7357 - Engine Set: \$11.50 #7358 - Cockpit Set: \$13.00 #7359 - Exterior Set: \$0.00
Verdict	Highly recommended!



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North American B-25s in the Netherlands East Indies AF—Part 6

By Max Schep

Image 1

Line up at Tjililitan of 3 as Photo B-25's which were designated as PB-25's by ML-KNIL. N5-172, a B-25D has the early squadron marking of the Photo Verkenning Afdeling (PVA) painted at the nose of the aircraft. The N5-148 a B-25C is still without it. The Nationality markings are still the red white and blue flags introduced in February 1942. The propellers are bare metal with red tips. Photo Artz



Image 2

The start off every mission to get all the Fairchild photo equipment aboard the aircraft. They used a set of cameras' for overboard pictures and for mapping. After ww2 there was introduced an allied project to complete the mapping of the white parts of the map off Asia. The stairs to the entrance of the aircraft suggest the interior was painted interior green. Photo Boshoff

Image 3

N5.209, a B-25D was the highest registration used by the PVA. In total 10 B-25's was used by the PVA. The aircraft were B-25C N5-148, -149 and -151. B-25D N5-154, -164, -165, -166, -172, -173, -178, -208 and -209. The last crashed 14 May 1949 near Kroya and was the only aircraft not transferred to AURI in 1950. The base for the squadron marking is already visible on the aircraft. The propellers are black with yellow tips. The Nationality markings are still the red white and blue flags Photo Corsmit

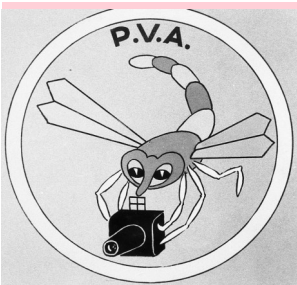


Image 3b

The first squadron marking was designed by mr. Romkes. It was a dragonfly with a camera on a blue shield with a gold yellow edge. The wings of the dragonfly were gold yellow and the tail segments were light green and gold yellow just as the legs and the eyes. The pupil of the eyes and the camera were black. The marking was painted on both sides of the aircraft. Collection Ward

Image 4a,b en c

There were different aerial camera's in the K- and F-series delivered by Fairchild Camera and Instrument Corporation USA.

- In the belly of the PB-25's just behind the Bombay a modification was made for making vertical photographs. The camera itself was placed in a gyroscopic construction to keep the camera in the correct position during mapping operations.
- The other cameras were used for other operations in which overboard photographs were made such as a camera for air to air.
- For detail photographs of objects on the ground a long lens camera was used. Photos Gerlach





North American B-25s in the Netherlands East Indies AF—Part 6

By Max Schep

Image 5

The registration system of ML-KNIL changed in the second half of 1947 as seen here at the B-25C N5-151 which became M-351. This was done by adding 200 to the original registration number and the exchange of "N5" to "M". The aircraft is still with the red white and blue flags which were deleted in 1948. The ML-KNIL changed them to the pre-war red white and blue disc with the small orange disc in the middle.

Collection Geldhof



Image 6

The intermediate placing of the new registration is seen here at N5-172 (see photo 1) with his new the new M-372 on the tail section and nose number. The aircraft was photographed at the airfield Sentain in former Dutch New Guinea.

Photo Kwee



Image 7a en b

In the middle of 1948, a competition started to choose a new squadron marking to replace the dragonfly. A lot of designs were presented. The selection was finalised on 27 October by the choice of design 12. The designer was probably mr. Baars. It consisted of a blue shield with a yellow and red outer edge. A yellow box shapes camera with yellow wings on a whit cloud was finalised with "PVA" in red. The marking replaced the marking on the PB-25's still in use. Look at the antennas of the aircraft.

Collection Casius

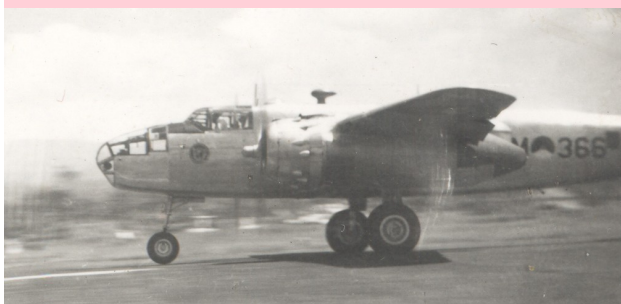


Image 8

The M-366 with the final placed registration and re-introduced pre-war nationality marking. The early squadron marking is replaced by the yellow-boxed camera one on the nose.

Photo Determeier

Image 9

This photograph of a line-up of B-25's probably in the beginning of 1950 at Andir before the last checks by the technical department making them ready for handover to the Indonesian air force. The old gun positions seen at PB-25 M-373 ex N5-173 were ideal for use for overboard photographs.

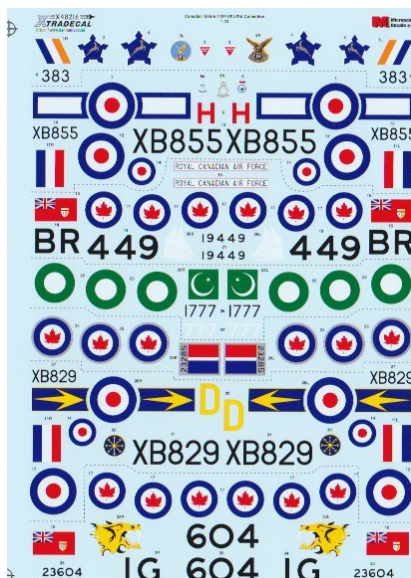
Photo Bouman



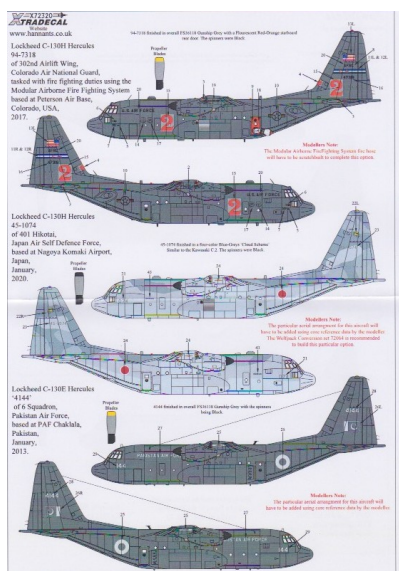
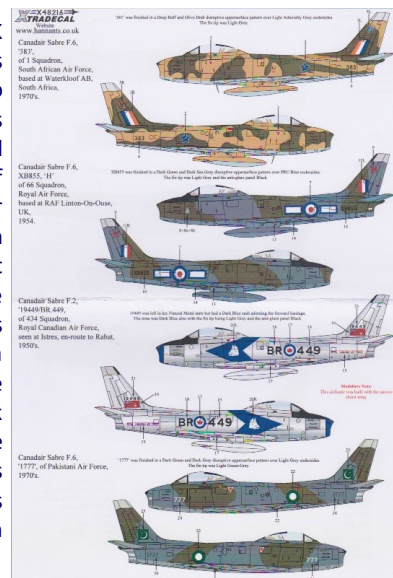
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Xtradecal Decals 1:48 Scale Canadair CL-13 Sabres (Product No. X48-216) and 1:72 Lockheed C-130E/H Hercules (Product No. X72-320)



Two of the most recent releases from Hannants, the UK Mail Order specialist that also manufactures decals under their Xtradecal trade name, will be of interest to Asian Air Arms fans. The first sheet in 1:48 scale covers the license-built Canadair version of the F-86 Sabre and is clearly timed to coincide with the imminent release of the eagerly awaited brand new Airfix kit of the Canadair Sabre F.Mk.4 variant. The vast majority of options on this sheet, understandably, cover RAF and RCAF aircraft given the significance of this type's Service with those Air Arms in the 1950s although several other countries operated the Canadair version type in later years. As a result the Xtradecal sheet includes a Pakistan Air Force example of the Sabre F.6 (Serial No.1777) in the Dark Green/Dark Grey over Light Aircraft Grey camouflage scheme applied to these aircraft in the 1970s. This is most welcome since the majority of previous aftermarket decal releases have covered PAF aircraft in the overall natural metal colour scheme.



The second decal sheet from Xtradecal also appears to be timed to coincide with a new kit release since it is some time since we have seen a new 1:72 aftermarket decal sheet dedicated to the earlier C-130E/H Hercules variants. The relatively recent announcement by Russian kit manufacturer, Zvezda of a brand-new 1:72 scale Lockheed C-130E/H Hercules, the release of which is imminent, has been met with considerable enthusiasm within the modelling community. It is over 35 years since Italeri released their kit and it, along with all of the previous iterations of the C-130, are a product of their time with raised panel lines and some serious inaccuracies. Early online images of test shots would suggest that Zvezda have addressed many of the previous issues and will have a winner on their hands so the Xtradecal release will, I suspect, be the first of many such products. The Xtradecal philosophy is to, where possible, keep their decal releases down to the provision of one A5 sized decal sheet in each release in order to keep the unit price to the consumer down to an



absolute minimum. As a result, and given the size of the subject, this first sheet is limited to five

options, all of which are relatively simple in terms of the type and number of markings applied to each. That said, two of the aircraft featured are operated by Asian Air Arms. This first is a rather plain looking Pakistan Air Force C-130E (Serial No.4144), operated by No. 6 Squadron and sporting the latest overall Gunship Grey (FS36118) colour scheme with low visibility National Markings and titles. I dare say the imaginative application of some effective weathering could live up to the finished model. The second subject is a C-130H (Serial No. 45-1074) of 401 Hikotai, Japanese Air Self Defence Force, based at Nagoya Komaki Airport in 2020. Although the National and Unit decal markings are also somewhat simple they are applied onto a four-colour Blue-Grey 'Cloud camouflage Scheme' which has to be one of the most attractive colour schemes applied to contemporary C-130 Hercules.

Xtradecal have built up a very good reputation for the accuracy and quality of their decal sheets which are the result of a long partnership with Microscale of the United States. My one reservation is with the rather sparse decal placement instruction sheet, which on previous examples, have also carried some inaccuracies although I cannot confirm if this is the case with these two more recent issues. The colour side profiles are nicely rendered and provide sufficient detail to enable the modeler to correctly place the decals although space limitations preclude the inclusion of useful plan views. Of course, the dedicated modeler will always conduct further research and I suspect that Xtradecal work on this basis and could legitimately argue their overall philosophy for keeping unit production costs down to a minimum.

I have little doubt that these will not be the only decal sheets from Xtradecal on these two subjects. The company are one of the most proactive and prolific aftermarket decal manufacturers around and I look forward to seeing more Asian Air Arms subjects appearing on future releases in due course (anyone else for ROKAF, Malaysian, Singaporean and South Vietnamese C-130s ?!) Highly recommended – Review samples courtesy of my wallet !

Mark Attrill October 2020



MIL MI-24 HIND AND SUB-VARIANTS IN ASIA

Part 3— East and South East Asia

By Mark Attrill

The **Mongolian People's Army Air Force** procurement of the Mil Mi-24V *Hind E* has been the source of much speculation. It had originally been believed that the Mongolian Ministry of Defence had taken an unusual route in procuring the aircraft directly from a Soviet Army Aviation Unit rather than the manufacturer, since the tail rotor warning stencils appeared in Russian. The six-digit construction numbers attributed to these aircraft indicate that the helicopters were built for export at Plant No.168 in Rostov-on-Don (now known as the Rostvertol Plant) in 1986, although the original consignee was believed to be a South American country. The aircraft were delivered in the standard desert colour scheme of Pale Khaki/Sand upper surfaces with Light Blue undersurfaces. The distinctive Mongolian Zoyombo insignia was initially superimposed over a Red Star, lending further credence to the belief that these were ex-Soviet machines. Over time, an individual Zoyombo insignia, in Yellow, was applied to the fuselage sides together with a Yellow 3-digit Bort number applied to the tailboom. The short-lived Mongolian helicopter unit, home-based at Nalaih, was reportedly disbanded by 1993 although other reports indicate that two additional aircraft were acquired in the 1990s with the unit maintaining sporadic operations until around 2001, by which time virtually all of the aircraft were inoperable. Protracted negotiations with the Konotop Helicopter Repair facility in Ukraine eventually led to the overhaul of some aircraft, which resulted in the return of a few airframes to Mongolian service with the remainder reportedly purchased by the Ukrainian company by 2015.



As with everything else related to the secretive **People's Democratic Republic of Korea (North Korea)**, information on the delivery and operation of Mil Mi-24 *Hinds* by the Korean People's Army Air Force (KPAAF) is sketchy. It is understood that 47 aircraft, mainly Mi-24D *Hind-Ds* but also including a small number of Mi-24DU trainers were delivered in 1985-86 although only around 20 were still reported to be still in service by late 2000. The North Korean Mi-24 *Hinds* were originally co-located with Mil Mi-8 *Hips* at the now defunct Mirim Air Base. The aircraft are, reportedly now on the strength of the 63rd Air Regiment of the 3rd Air Combat Division and based at Ayang-Ni in the DMZ Area although their operational status is not known.

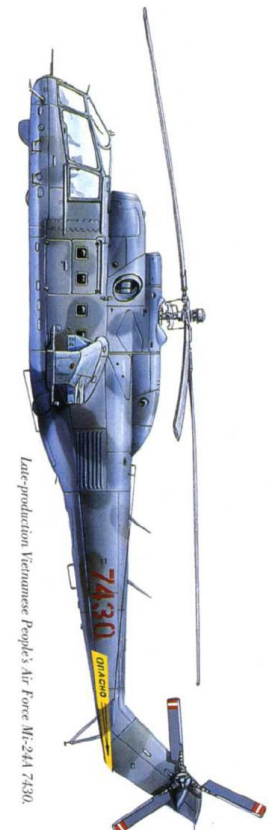
The **Myanmar Air Force** ordered an unspecified number of Mil Mi-35P *Hind-F* gunships in 2009, which were built by Rostvertol in Rostov-on-Don and delivered in late 2010. The allocation of serial numbers would suggest that at least twelve aircraft were delivered but this has not been verified.



The Mi-35Ps are operated alongside the Mi-17 *Hips* by Number 47 Helicopter Squadron at Taungoo Air Base and were reportedly used in the Kachin conflict of 2012-13 against the Kachin Independence Army. The aircraft were delivered in a distinctive Dark and Medium Green camouflage scheme with a 'Azure Blue' shade applied to the undersurfaces including those of the winglets. The triangular shaped Orange/White/Blue national insignia was applied to the fuselage sides and undersides together with a four-digit individual aircraft code. One aircraft has been observed with crests applied to both the fin surfaces and upper engine access doors but it is unclear if this was associated with a one-off application for a public air show.

It is understood that several ex-Vietnamese Mil Mi-24 attack helicopters were transferred to the **National Khmer Aviation (NKA)**, ⁽¹⁾ as the contemporary Royal Cambodian Air Force was previously known, in the mid-1980s. The specific type was unknown but was almost certainly either a Mi-24A *Hind-A* or Mi-24U *Hind-C*, the unarmed trainer variant, since these were the only types known to be on the strength of the VPAAF. Very little is known about the Mi-24s in service in Kampuchea although it is reported that only three remained airworthy by 1995 and that these were still on the strength of the Royal Cambodian Air Force in late 2000 but were retired from service shortly afterwards.

⁽¹⁾ After the restoration of the monarchy and the adoption of a new constitution in 1993, the Kampuchean Air Arm was renamed the Royal Cambodian Air Force.





MIL MI-24 HIND AND SUB-VARIANTS IN ASIA

Part 3— East and South East Asia

By Mark Attrill

The **Vietnamese Peoples' Air Force (VPAF)** received a total of fourteen ex-Soviet Army Aviation Mil Mi-24A/U *Hind-A/Cs* in 1984 and these were augmented with a subsequent delivery of Mil Mi-24D *Hind Ds* although some aircraft were reportedly transferred to the Cambodian Air Force, as outlined above. The helicopters were operated by the 916th Helicopter Regiment at Hao Lac Air Base and the Vietnamese Mi-24As were the last of the kind in service anywhere in the world. Details of the operational use of the VPAF Mi-24s remain sketchy although it is understood that these aircraft were used in support of the Vietnamese Army during search and destroy missions against the Khmer Rouge on the Cambodian /Vietnamese border during the late 1980s. The Mi-24s remained in service until circa 2014 when it was understood that the VPAF would begin to receive the later Mi-35M version of the *Hind* with advanced avionics and weapons, more powerful engines, and a fixed landing gear. The early aircraft appear to have worn a variety of different colour schemes during their Service with the VPAAF. The Mi-24As were initially delivered in what appeared to be a two-tone Medium Green and Sand camouflage scheme with very Light Grey lower surfaces although this scheme was prone to fading in the harsh climatic conditions experienced in the region. Since then, at least two different colour schemes have appeared on the *Hind-As*, presumably applied after an overhaul, including one which combines a three-tone Grey Black/Medium Green/Tan upper surface camouflage scheme with 'scalloped' light blue under surfaces. The second scheme is a four-tone wraparound version with Dark and Medium Green, Chocolate Brown and Sand Yellow. The more modern Mi-35Ms also sport what appears to be a three-tone wrap-around scheme in three closely matched Green/Grey-Green shades although only one aircraft has been observed in this scheme with VPAF markings. All of the VPAF applied colour schemes include large renditions of the national insignia and a White four-digit aircraft code, similar to those that have been observed on VPAF/VPAAF aircraft for some time.



The **Indonesian** government signed a large-scale contract with Russian in 2003, which included an initial order for two Mil Mi-35P *Hind-F* assault helicopters built by the Rostvertol plant in Rostov-on-Don. The *Tentera Nasional Indonesia – Angkatan Darat* (TNI-AD - Indonesian Army Aviation) opted for the standard *Hind-F* with the original retractable undercarriage, full-span winglets and fixed GSh-2-30 cannon rather than the later Mi-35M variant with fixed undercarriage, clipped wings and newer weapons. The first two *Hinds* were delivered to 1 Skudron at Ahmad Yani Air Base in September 2003. In 2006, the unit was redesignated as 31 Skudron and at least six more Mi-35Ps were added to the inventory in 2010. The aircraft were initially operated in an overall Dark Green colour scheme with low visibility national insignia on the fuselage sides and undersurfaces with a Red/White fin flash together with TNI-AD titles in black and special-to-type warning

insignia. In more recent times the Indonesian *Hinds* have appeared in a new two-tone camouflage scheme of Black Green and Dark Green, again with subdued national insignia.

In early 1997 the Government of **Papua New Guinea** managed to acquire several Mil Mi-24P *Hind-F* attack helicopters purchased from Belarus via a UK-based defence consultancy company. The aircraft were part of a consignment of weapons procured to suppress a secessionist revolt in Bougainville and were to be operated by South African mercenaries. A follow-on order, which would have included additional Mi-24Ps together with two Mil Mi-8 *Hip* utility helicopters and a consignment of air-launched weaponry for the *Hinds*, which was due to be delivered by cargo aircraft in March 1997, was intercepted by the RAAF, forced to land at RAAF Tindal in the Northern Territories and subsequently impounded by the Australian authorities. (Ed. In 2016 they were at Darwin's Shoal Bay Waste Management Facility, buried under hazardous waste!) The original Mi-24P *Hind-Fs* were only used briefly and their fate is unknown. There do not appear to be any details regarding the colour scheme or any markings applied to these aircraft during their brief service and it can only be assumed that they probably sported the standard Soviet colour scheme for the *Hind-F* and were almost certainly devoid of any markings, given their clandestine service. (Ed. See photo above.)





MIL MI-24 HIND AND SUB-VARIANTS IN ASIA

Part 3— East and South East Asia

By Mark Attrill

Asian Air Arm Operators – Table of Mi-24/35 Variants and Deliveries

Author's Caveat: The early Mil Mi-24/35 family of Attack/Assault Helicopters were developed, manufactured and delivered to many customers during a period of considerable change, both in the geopolitical domain and in the prosecution of several regional conflicts and/or civil wars in Asia. The sudden dissolution of the Soviet Union resulted in several newly independent countries inheriting considerable quantities of military equipment, little of which was actively accounted for at the time. Several others, most notably Belarus and Ukraine, held significant quantities of surplus Mi-24s and also possessed the industrial base with which to maintain, refurbish and ultimately pass on aircraft to new operators in order to boost their own economies. Allied to this, the ebb and flow during protracted conflict, particularly in Afghanistan and Sri Lanka have made it very difficult to keep track of aircraft deliveries, transfers, losses and modifications. In spite of extensive cross-checking, the attached table is not guaranteed to be 100% accurate given the difficulty in verifying every source of information. It has been provided to give a broad indication of what Mil Mi-24/35 variants may have been delivered and operated by each of the Asian Air Arms since 1979. Rostvertol, Konotop and other manufacturers still market variants of the Mil Mi-24/35 and deliveries of new-build Mi-35 Hind-F and refurbished Mi-24G Super Hinds to some of the Asian Arms continues to this day.

Country	Variant	Delivered	Quantity	Notes
Afghanistan	Mi-24A	1979	1	Ex-Soviet Air Force
	Mi-24U	1979	1	Ex-Soviet Air Force
	Mi-25	1979	7	Factory Delivered
	Mi-35	1986	63	Factory Delivered
	Mi-24D	2002	5	Delivered from Russia
	Mi-24V	2005	3	Delivered from Ukraine
	Mi-24P	2005	2	Delivered from Russia
	Mi-24V	2005	1	Delivered from Russia
	Mi-24V	2007	1	Delivered from Ukraine
	Mi-24V	2008	3	Ex-Czech Air Force
	Mi-24V	2009	3	Ex-Czech Air Force
	Mi-24V	2009	1	Delivered from UAE – Origin Unknown
	Mi-35	2015	3	Ex-Indian Air Force
	Mi-35	2016	1	Ex-Indian Air Force
	Mi-24V	2019	2	Ex-Indian Air Force – To replace Mi-25s
Armenia (2)	Mi-24D/V	1991	15	Ex-Soviet Air Force (3)
	Mi-24V	1992	2	Captured from Russian Air Force
Azerbaijan	Mi-24D/V	1991	18	Ex-Soviet Air Force (3)
	Mi-24P (4)	2010	12	Delivered from Ukraine
	Mi-35M	2011	24	Factory Delivered
Georgia	Mi-24D/V	1991	9	Ex-Soviet Air Force (3) - Withdrawn from Use
India	Mi-25	1983	7	Factory Delivered
	Mi-25U	1989	4	Factory Delivered
	Mi-35	1989	20	Factory Delivered
	Mi-24V	1995	15	Delivered from Kyrgyzstan
Indonesia	Mi-35P	2003	2	Factory Delivered
	Mi-35P	2010	6	Factory Delivered
Kampuchea	Mi-24 (5)	1979	4	Donated by Vietnam – Withdrawn from Use

(2) Armenia inherited several variants including Mi-24D/V Attack helicopters together with the specialist Mi-24R and Mi-24K for reconnaissance and artillery spotting respectively.

(3) These aircraft were gifted to the respective Air Force/Air Arm of the former Soviet States following the collapse of the Soviet Union in 1991.

(4) Azerbaijan currently operate 7-8 Mi-24G Super Hinds which may have been upgraded from the original Mi-24P batch delivered in 2010.

(5) May have been either Mi-24A Hind-A or Mi-24D Hind-D. Former variant most likely.





MIL MI-24 HIND AND SUB-VARIANTS IN ASIA

Part 3— East and South East Asia

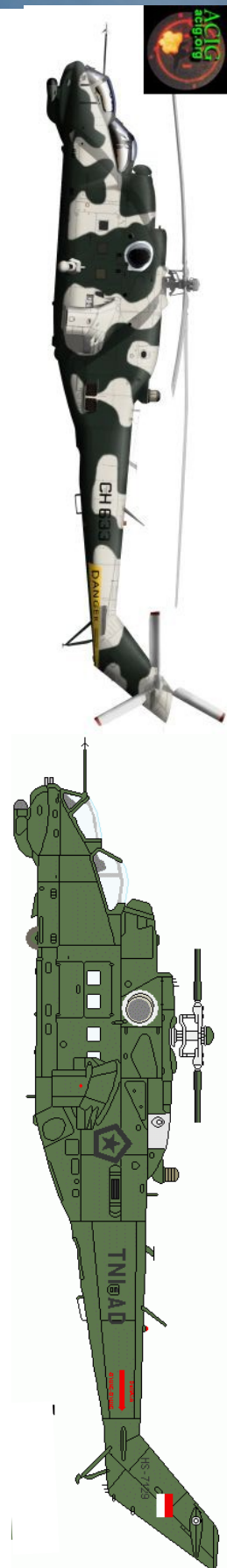
By Mark Attrill

Country	Variant	Delivered	Quantity	Notes
Kazakhstan	Mi-24D/V	1991	36	Ex-Soviet Air Force(3)
	Mi-35M	2016	8	Factory Delivered
Korea, Peoples' Republic	Mi-25	1979	24	Not Confirmed
Kyrgyzstan	Mi-24D/V	1991	28	Ex-Soviet Air Force(3)
Mongolia	Mi-24V	1986	12	Factory Delivered – Withdrawn from use
Myanmar	Mi-35P	2010	12	Factory Delivered
Pakistan	Mi-25	1985	3	Defections from Afghani Air Force (6)
	Mi-25	1989	2	Defections from Afghani Air Force
	Mi-35M	2018	4	Factory Delivered
	Mi-35M	2020 ?	5	Factory Delivered – Ordered November 2018
Papua New Guinea	Mi-24P	1997	2	Delivered from Belarus – Withdrawn from use
Sri Lanka	Mi-24R/V (7)	1995	6	Delivered from Ukraine
	Mi-35P	1995	6	Factory Delivered
	Mi-24P	1996	1	Delivered from Ukraine
	Mi-24V	1996	2	Delivered from Ukraine
	Mi-24V	2000	4	Delivered from Ukraine
	Mi-24P	2001	7	Delivered from Ukraine
Tajikistan	Mi-24D/V	1991	12	Ex-Soviet Air Force (3) (Number not confirmed)
	Mi-24D/V	2006	6	Delivered from Russia
Turkmenistan	Mi-24D/V	1991	16	Ex-Soviet Air Force (3) (10 operational)
Uzbekistan	Mi-24D/V	1991	40	Ex-Soviet Air Force (3)
	Mi-35M	2018	12	Delivered from Russia
Vietnam	Mi-24A	1984	12	Ex-Soviet Air Force – Withdrawn from use
	Mi-24U	1984	2	Ex-Soviet Air Force – Withdrawn from use
	Mi-24D	1986	6	

(3) These aircraft were gifted to the respective Air Force/Air Arm of the former Soviet States following the collapse of the Soviet Union in 1991 .

(6) At least two aircraft were acquired by US authorities for evaluation during the 1980s.

(7) The initial Ukrainian delivery included two Mi-24V Hind-E and one of the very specialized Mi-24RKhR (Hind-G1) variants, originally optimized for NBC reconnaissance although almost certainly employed in a standard attack helicopter role by Sri Lankan forces.



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JASDF Color Specification Chart Z8201E-2

Samurai Phantoms

The Mitsubishi Phantom F-4 Phantom II in Japanese service

October 1945



In collaboration with Dr. Rian de Bont (JASDF) Q&A

Hi Brian,

Some members have asked me about JASDF Color Specifications Char referred to in my book—*"Samurai Phantoms"*. So here's a copy of the Japanese colour specification Z8201E-2 which might be useful to all modellers of the JASDF.

Andy Binks

緑色(迷彩用) Munsell 7.5GY 3/1 HSV 86/9/23	7.4ボリ色(1) Munsell 10YR 9/1 HSV 87/9/4	うす緑(1) Munsell 10GY 8/1.5 HSV 112/23/80	スカイグレイ Munsell 5B 7/2 HSV 213/17/76	濃茶色 Munsell 5YR 4/4 HSV 25/52/50	黒(1) Munsell N 2
OD色 Munsell 7.5Y 3/1 HSV 46/16/30	7.4ボリ色(2) Munsell 5Y 9/1 HSV 18/6/93	うす緑(2) Munsell 7.5GY 7.5/2 HSV 86/7/75	ダルクグレイ Munsell 2.5PB 7/2 HSV 22/6/15/77	茶色 Munsell 10R 3.5/3 HSV 14/39/44	黒(2) Munsell N 1.5
茶色(迷彩用) Munsell 2.5Y 3.5/1.5 HSV 35/25/37	7.4ボリ色 Munsell 2.5Y 9/3 HSV 35/21/98	灰青緑 Munsell 7.5BG 7/1.5 HSV 206/12/73	あさぎ Munsell 5B 6/8 HSV 199/72/80	えび茶 Munsell 7.5R 3/6 HSV 10/63/46	銀色 Munsell N 6.5 (銀色)
スカークレット Munsell 7.5R 5/13 HSV 7/75/85	7.4ボリ色 Munsell 7.5Y 8.5/13 HSV 51/100/99	灰緑 Munsell 2.5G 7/1.5 HSV 150/5/69	サックスブルー Munsell 2.5PB 5.5/4.5 HSV 217/34/63	チヨコレート色 Munsell 7.5R 2/4 HSV 10/61/31	
ローマター Munsell 2.5R 4/5/10.5 HSV 346/61/73	ローマター Munsell 10YR 8/2 HSV 27/16/85	薄黄緑 Munsell 5GY 7/4 HSV 76/23/70	灰青紫 Munsell 5PB 5/1 HSV 240/10/53	明るい灰色(1) Munsell N 7.5	
赤(2) Munsell 5R 4/12 HSV 356/73/71	ローマター Munsell 10YR 8/4 HSV 32/31/90	青磁色 Munsell 2.5G 6/1.5 HSV 140/6/59	灰青 Munsell 7.5B 5/2 HSV 215/22/56	明るい灰色(2) Munsell N 7	
赤(1) Munsell 5R 4/13 HSV 354/78/73	山吹色(2) Munsell 2.5Y 8/12 HSV 45/100/100	暗い灰青緑 Munsell 5BG 5.5/1 HSV 206/10/56	明るい青 Munsell 2.5PB 5/8.5 HSV 213/60/74	灰色(1) Munsell N 6	
赤(3) Munsell 5R 3.5/10 HSV 356/69/61	山吹色(1) Munsell 2.5Y 8/12 HSV 40/100/100	にぶ緑 Munsell 5G 5.5/6 HSV 151/43/58	にぶ青 Munsell 7.5B 4/4 HSV 208/47/51	灰色(3) Munsell N 6 (GY)	
ベールベール(1) Munsell 7.5YR 9/2 HSV 18/14/98	山吹色(3) Munsell 10YR 7.5/14 HSV 38/100/100	黄みの緑(1) Munsell 7.5GY 4.5/10 HSV 85/100/49	青 Munsell 2.5PB 3.5/7 HSV 213/66/55	灰色(2) Munsell N 5	
ベールベール(2) Munsell 7.5YR 9/2.5 HSV 24/18/99	黄茶 Munsell 10YR 6/3 HSV 31/30/60	緑(1) Munsell 2.5G 4.5/5 HSV 133/36/47	あい色 Munsell 5B 2.5/2 HSV 205/40/30	暗い灰色(1) Munsell N 4	
サーモンピンク Munsell 2.5YR 7/6 HSV 21/44/89	黄土色 Munsell 2.5Y 5.5/4 HSV 38/43/62	黄みの緑(2) Munsell 10GY 4/8 HSV 112/66/44	青紫 Munsell 10P 2/6 HSV 244/52/36	暗い灰色(2) Munsell N 3	
明るい黄赤 Munsell 10R 6/12 HSV 17/74/94	オリーブグリー Munsell 10Y 4.5/3.5 HSV 56/37/45	緑(2) Munsell 2.5G 4/6 HSV 134/51/43	灰紫 Munsell 2.5P 5/4 HSV 257/25/61	暗い灰色(3) Munsell N 3 (YR)	
黄赤 Munsell 2.5YR 6/13 HSV 24/93/95	オリーブ色 Munsell 2.5Y 4/2 HSV 38/28/43	ベールスカイ Munsell 5BG 8.5/2 HSV 200/13/89	赤紫 Munsell 2.5RP 4.5/12 HSV 308/56/67	白(1) Munsell N 9.5	
朱色 Munsell 10R 5/14.5 HSV 18/100/88	白(2) Munsell 5GY 9/1 HSV 37/2/91	スカイブルー Munsell 5B 8/3 HSV 208/22/90	こはく色 Munsell 7.5YR 5/6 HSV 31/64/64	白(2) Munsell N 9	

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