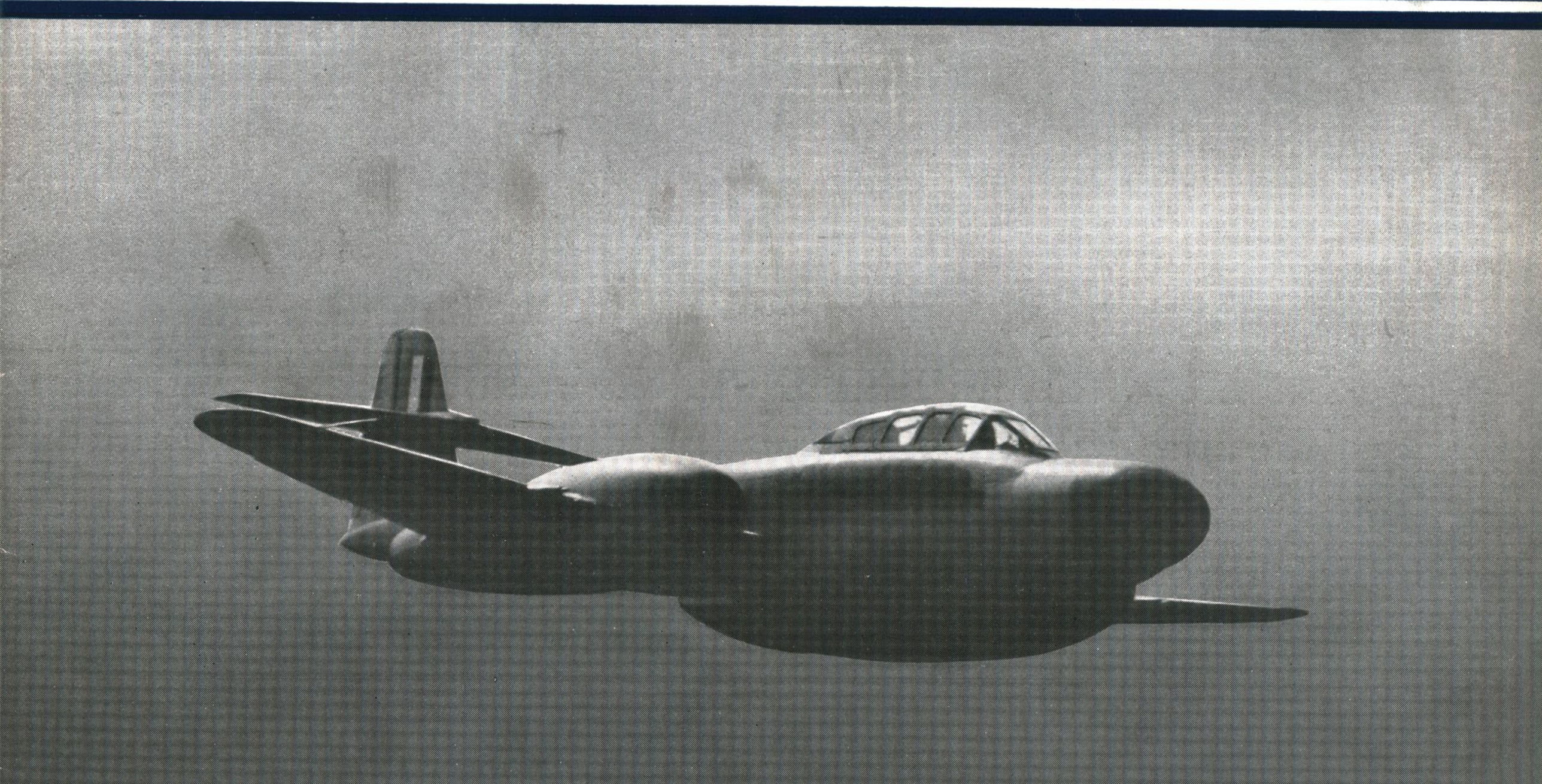
THE INTER SERVICES

AIRCRAFT RECOGNITION

Journal



Vol. 5 SEPTEMBER/OCTOBER 1950 No. 1

Five-Fives of Fifty Four—Vampires F Mk.5 of No. 54 Squadron photographed in formation near the top of a loop. This is a grandstand view (which no spectator could get) of one of the items of their display of formation aerobatics at the Royal Air Force Display at Farnborough in July. (*Photo by courtesy of Picture Post Library.*)

SEPTEMBER/OCTOBER 1950 Vol. 5. No. 1

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Per Ardua . . .

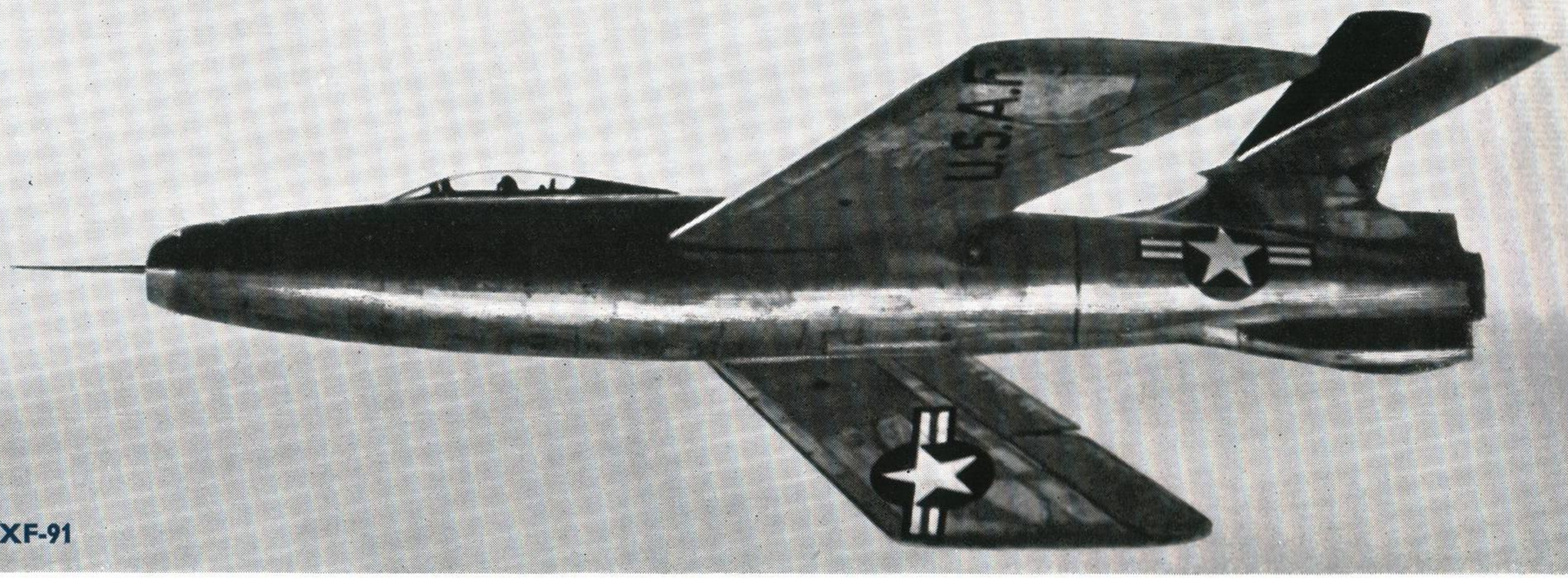
THERE is no such thing as easy recognition training, and, excluding the exceptionally brilliant student, training is more than a matter of glancing at a few pictures and of listening to a lecture. Proficiency in recognition comes only from the joint effort of instructor and students, although the best instructor can do no more than inspire his students to work. He cannot, as one's wife puts a batch of cakes into the oven, put a batch of aeroplanes into the minds of his students ; they must learn them for themselves. This month we have assumed the rôle of instructor and present the Journal in a practical form, providing some basic training for the inexperienced recognition student as well as a good searching test for anyone who considers himself already expert.

The entire edition is devoted to jet-fighters. In the centre spread we illustrate some of the most promising prototypes, which, incidentally, have all flown, and many of which can reasonably be expected to come into service in the course of time. Most space has, however, been given to the recognition (in every sense of the word) of jet-fighters in regular service, and any student who cares to take the trouble to work his way carefully through each sillograph and photograph of the " regular " jet-fighters (according to the instructions) will acquire a good degree of familiarity with those aircraft. Moreover, his familiarity will be soundly based upon a three-view silhouette foundation which is so essential to safe recognition. Those readers who have advanced beyond the basic stage can use the illustrations as straight recognition tests, completing a list of answers and comparing them with the results which are given on the rear cover.

The " translation " method of familiarization should help to solve some local basic training problems. Instructors will be able to complete their own sets of illustrations with appropriate silhouette indices to suit their requirements, and by careful selection of illustrations, direct attention to difficult recognition angles of individual aircraft and make great play upon the essential differences between similar types.

Completion of such exercises does not, of course, make the expert spotter, but, over a period of time, with plenty of flash-training and practical spotting a safe standard of recognition will be attained.

Hawker P.1081



XF-91

SWEPT-WING JET-FIGHTERS

by Observer ROY McLEAVY

(Royal Observer Corps)

SPEED AND RATE OF CLIMB are two vital factors determining the efficiency of present-day fighters. Regardless of firepower and range, the fighter without a generous supply of these combat qualities stands little or no chance of successfully intercepting modern high-altitude heavy bombers.

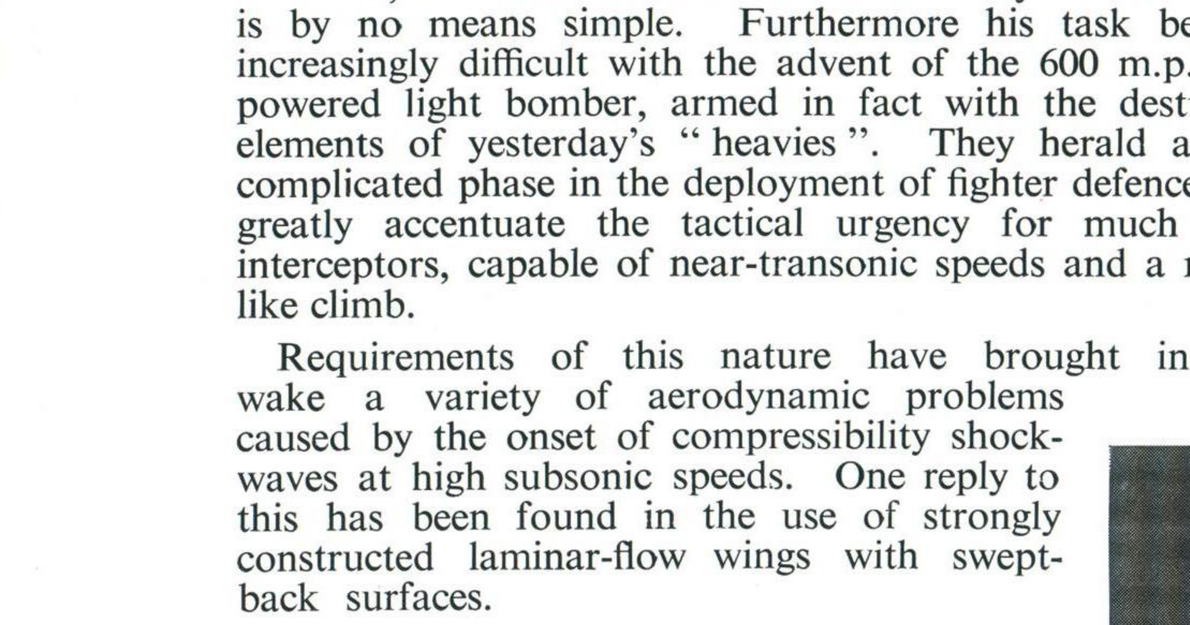
Operating at their most favourable heights, typical " heavies "—like the Boeing B-50 series, the Convair B-36 and the Tupolev TU-4—can fly quite comfortably at speeds around 300 m.p.h. It is evident therefore that the mission of a fighter pilot, who has to take-off and climb to a height six or seven miles above the earth, be vectored to his target area, seek-out and chase his quarry : engage it within his radius of action, then return to his base in a relatively short duration, is by no means simple. Furthermore his task becomes increasingly difficult with the advent of the 600 m.p.h. jet-powered light bomber, armed in fact with the destructive elements of yesterday's " heavies ". They herald a more complicated phase in the deployment of fighter defences, and greatly accentuate the tactical urgency for much faster interceptors, capable of near-transonic speeds and a rocket-like climb.

Requirements of this nature have brought in their wake a variety of aerodynamic problems caused by the onset of compressibility shock-waves at high subsonic speeds. One reply to this has been found in the use of strongly constructed laminar-flow wings with swept-back surfaces.

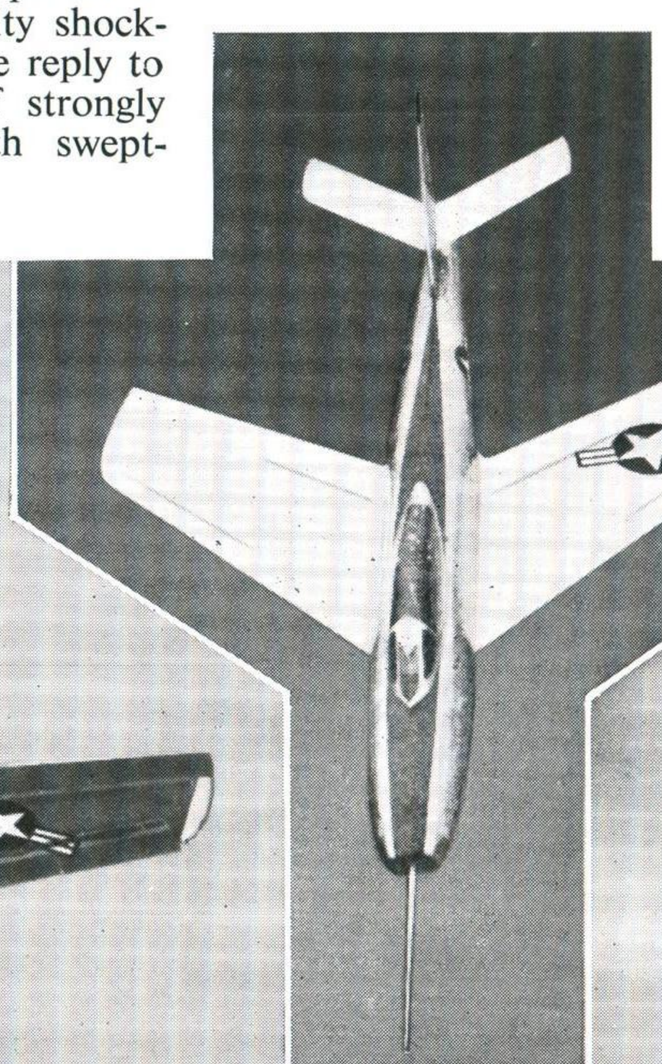
In practice these more or less fit into the initial pattern formed by the shock-waves and generally delay their dangerous effects. Although the solution may prove a temporary one, conceivably giving way to Delta configurations or, even a reversion to straight-winged fighters that can be " pushed " through the transonic region by rockets, it governs the shape of present fighter design.

The swept-wing theory is by no means new. It was advocated in 1935, but this was some time before sufficiently powerful engines were available to produce aircraft speeds warranting research in this direction, so the idea was shelved. Eventually, the Germans, who for many years had devoted immense resources to the development of gas turbines and bi-fuel rocket units to power high-speed military aircraft, found themselves confronted with the (then alarming) phenomenon of shock waves, and fully realized the limitations of their existing air-frames. They learnt that the adoption of swept surfaces and thinner aerofoil sections would greatly assist in overcoming their difficulties.

By the end of the war extensive progress had been made in the design of fighters with moderately swept-back surfaces for the Luftwaffe, and two such aircraft (the tailless Me 163B rocket-powered target-defence fighter and the twin-jet Me 262) had attained a limited operational status. Additionally, several swept-wing prototypes had either been built or were in course of construction, and the design of many others had reached quite advanced stages.



F-86 Sabre



F-84F

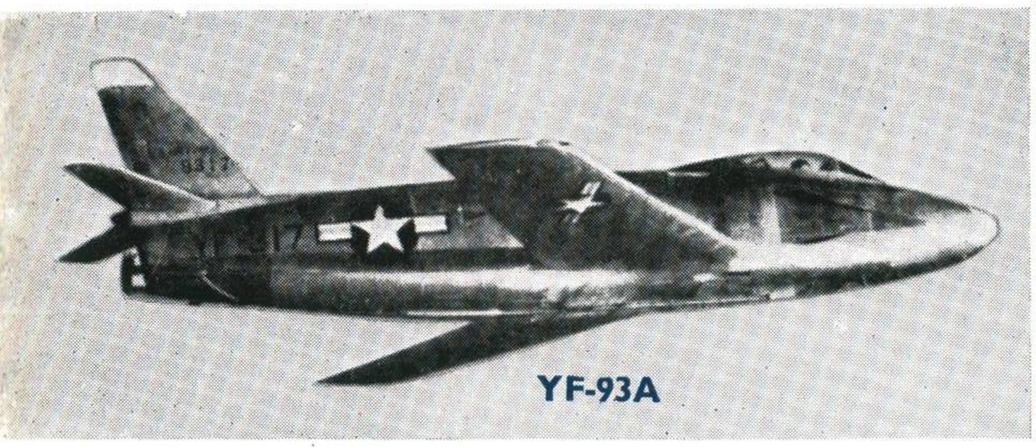
J.29

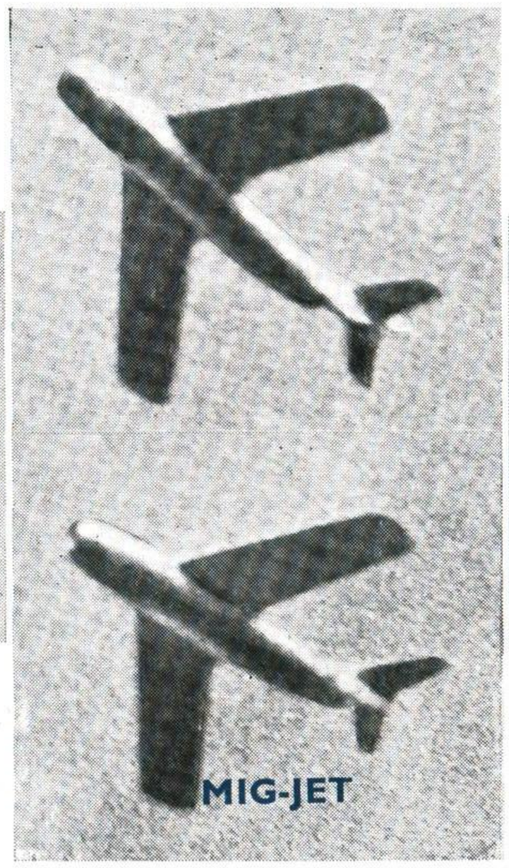
Much of Germany's research data on this line of approach became available to the United States, France and ourselves in 1945 as the spoils of war. Inevitably, the material, supplemented by German aerodynamicists, has also been used by the Soviet Union. From reports filtering through the heavy guard of East European security, this seems to have been put to good effect.

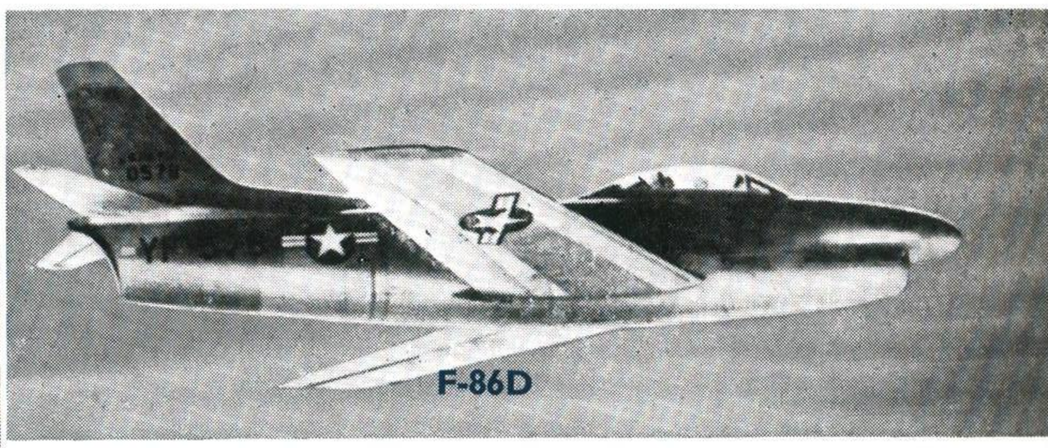
For the past five years the basic German theories have been improved and translated into substantial winged facts, and now well over a dozen types of fighters employing aviation's " new look " are being developed or produced for the Air Forces of the United States, Sweden, France, Great Britain and Russia.

As a result, the spotting community at large will soon be assailed by a new and rapidly breeding generation of fighters, that combine higher speeds with finer salient features : two points clearly underlining the vital necessity for skilful recognition and close study of outline.

This summary deals briefly with a fairly representative collection of the newcomers and stays within the confines of the more conventional types, *i.e.*, those with a recognizable tail unit. Basic structural differences of the breed are few, being mainly limited to wing positioning and modes of jet respiration. In addition, although many are now at the cross-roads of " specialization," much elasticity in duties at present makes analysis by function difficult. For convenience they are classified here by nationality.


YF-93A


MIG-JET


F-86D

Great Britain

So far as is known no order has been placed for swept-wing aircraft by the R.A.F., but the existence of the Hawker P.1052 and Vickers-Supermarine 535 reveals that British progress in this direction is by no means dormant. Relatively few details of the performance of either have been released, but both have been demonstrated at speeds in excess of 650 m.p.h. The Hawker P.1052 established the present London-Paris record of 618.27 m.p.h., all the more remarkable for having been set up in very unfavourable weather.

Both are powered by a Nene turbojet and have been derived from straight-wing designs—the Seahawk and the Attacker.

Their principal structural differences lie in the wing positions, the jet lay-out and tail surfaces. The P.1052 has a mid-wing and preserves its elegant lines by " inhaling " through small wing-root nostrils and " exhaling " through divided trailing edge exhausts. In contrast the 535 is a low-wing design with fuselage intakes and a tail orifice.

Hawker's attractive newcomer—the P.1081—retains the nose, centre fuselage and mainplane of the P.1052 : in fact the structure of the first P.1081 prototype has largely been based on components of the second P.1052. However, to allow the provision of an afterburner, the novel bifurcated jet outlets have been dispensed with and instead, the rear fuselage has a swollen girth to house a straight-through exhaust. A Nene 4 is fitted.

Unlike its forebear, which was produced in a hurry, primarily to test the behaviour of swept wings at the lower end of the speed scale, the P.1081 has completely donned the " transonic look " for both the fin and tailplane are now swept back. Unfortunately, the everlasting battle for speed has finally led to the sacrifice of the traditional " Hawker " fin and rudder.

P.1081s are to be produced in Australia and they will probably be assembled side-by-side with the Commonwealth's twin-jet " penetration " fighter, said to resemble the XF-90. Construction of both of these new RAAF fighters will be undertaken by the Commonwealth Aircraft Corporation.

United States

Representative of her vast aircraft industry, about 50 per cent of the prospective entrants to this new field have been produced in America. The pace was set in 1947 by the North American F-86 Sabre, the first fighter of its kind produced outside Germany.

The F-86A is fundamentally an all-purpose day fighter-cum tactical-support aircraft, but its immediate successor, the F-95A (now re-designated F-86D) is a " specialist " modification ; its combat duty of seeking out hostile machines in any weather is characterized by a radome nose extension.

A new arrival to the Sabre family is the YF-93A, a fatter and much heavier Tay-powered variant, intended for long-range escort duties, and differing from its two stablemates by the adoption of flush intakes on either side of the cockpit. The " solid " nose can house far more equipment than was possible in the " upper lip " of the F-86A or the distinctive " shark-nose " of the F-86D. The addition of an afterburner to its J-48 turbojet provides a rapid rate of climb ; the level speed reaches well into the lower transonic region. Output of the J-48 with the reheat system turned on is about 8,000 lb. s.t.

Precise performance details of the F-86A are still lacking, but it will be recollected that the Sabre holds the world's official air speed record of 670.981 m.p.h., achieved while carrying a normal military load. 710 m.p.h. has been attained in level flight and dives have reached 800 m.p.h.

Some measure of the success of the F-86A and F-86D can be assessed from the combined U.S.A.F. and R.C.A.F. production figures which nearly reach the 800 mark.

" Heavyweight " contributions have come from Lockheeds —the XF-90, and McDonnell—the XF-88, two twin jet designs intended for long-range escort and ground-attack duties. At the outset these were described as " penetration " fighters, a term that roughly covered the same mode of operation as our war-time " intruder ".

A family similarity to the Shooting Star has been inherited by the XF-90, but apart from being a far larger machine with swept flying surfaces, the fuselage has a wide horizontal cross-section to house the two 3,600 lb. s.t. Westinghouse J-34 turbines mounted side-by-side. Jet intakes on both sides

Hawker P.1052

Vickers 510

of the cockpit accentuate the long, needle-like nose extending well ahead of the wing and the thick, untapered rear fuselage. Although credited with light handling qualities and excellent manœuvrability, the XF-90 is no fairy—it weighs nearly 28,000 lb., the same as a fully-laden Dakota. One of the more unorthodox points is the provision of duplicated controls to increase its " staying " powers if damage is sustained during long-range missions.

An elegant approach to the original " penetration " calling is to be found in the slim, tapered lines of the McDonnell XF-88, unofficially dubbed " Voodoo ". Here, two J-34 turbojets complete with specially shortened afterburners, are housed side-by-side in the lower front portion of the fuselage and use is made of wing-root entries. The rear fuselage has a slight upward sweep to clear the jet efflux.

The basic armament of both aircraft, given as four 20 mm. cannon for the XF-90 and six 20 mm. cannon for the XF-88, is supplemented by the usual facilities for the under-wing stowage of bombs and rocket projectiles. Long-range drop-tanks may be carried at the wing tips.

Reports indicate that these machines are normally capable of speeds well in excess of 650 m.p.h. and the XF-90 is reputed to have exceeded Mach 1.

An ambitious attempt to solve the problem of " getting up there " quickly and at the same time maintain a high degree of controllability through a wide speed range is apparent in the Republic XF-91. Variable incidence wings with inverse taper, i.e. wide chord tips and narrow roots, are fitted. By altering the wing incidence, a high angle of attack is permitted for take-offs and landings and a lower angle for high-speed flight. Also the increased taper combined with leading edge slots, reduces the wing tip stall normally experienced with this type of aircraft, and allows flight at a lower speed than is possible with any other jet-fighter. The General Electric J-47 will be augmented by four small solid-fuel rockets mounted in the dorsal and ventral tail fairings to accelerate climb.

Thinner wings naturally present greater stowage difficulties and one means of overcoming this is demonstrated in the XF-91 by the use of thin wheels of small diameter mounted in tandem and retracting outwards to the wing tips.

Less bizarre is the new F-84F, powered by an Allison J-35-25 delivering 5,200 lb. s.t. The F-84F employs the same fuselage as the earlier straight-wing Thunderjet. The familiar nose entry has been retained despite Republic's earlier experiments with flush side-intakes on a modified F-84.

Sweden

The SAAB J-29 is a promising Scandinavian addition to the breed and a healthy sign of Anglo-Swedish enterprise. So far only three experimental prototypes of this angular, robust, Ghost-powered fighter have been built. Aircraft of this type will eventually supplement Vampire 50s and J-21Rs of the Royal Swedish Air Force. The Ghost is mounted pod-fashion below the mid-wing, with the tail components carried above and slightly beyond the orifice by a stub boom extension. An unusual detail feature is presented by the single piece elevator, extending across behind the rudder. Reports credit the SAAB-29 with a maximum speed of slightly over 650 m.p.h. and an armament of four 20 mm. cannon.

U.S.S.R.

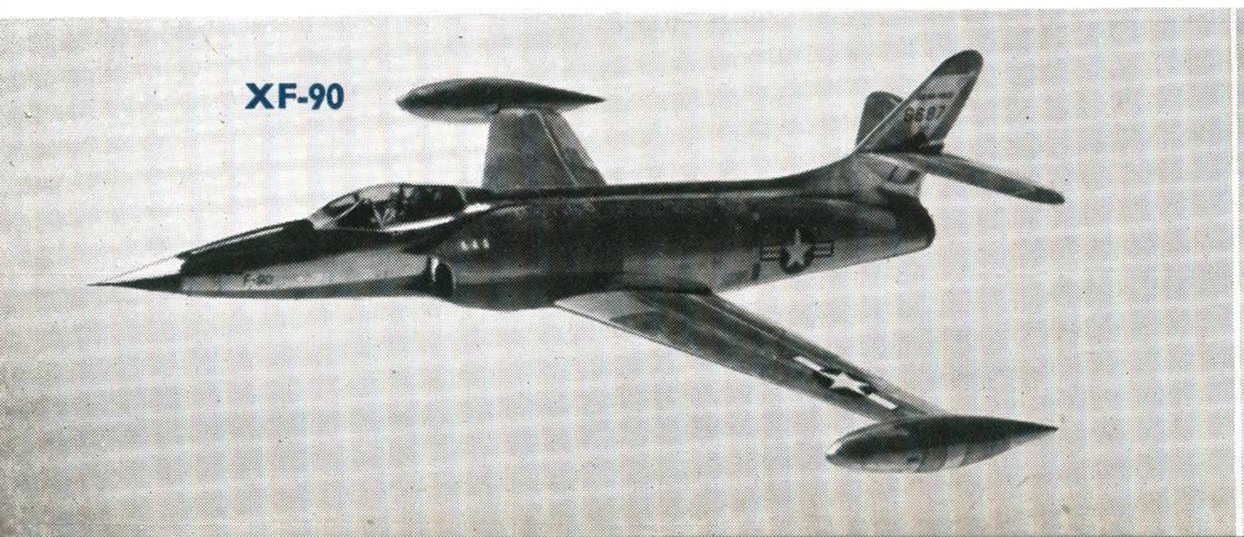
For many years Russia has relied on foreign countries to pave the way of progress while her own resources have lamely followed after.

Promising seeds of knowledge sown by one or two far-sighted designers before the first World War were quickly choked by the Red Revolution, a catastrophe which, nevertheless, gave America Igor Sikorsky and Alexander Kartveli two of the world's most brilliant designers.

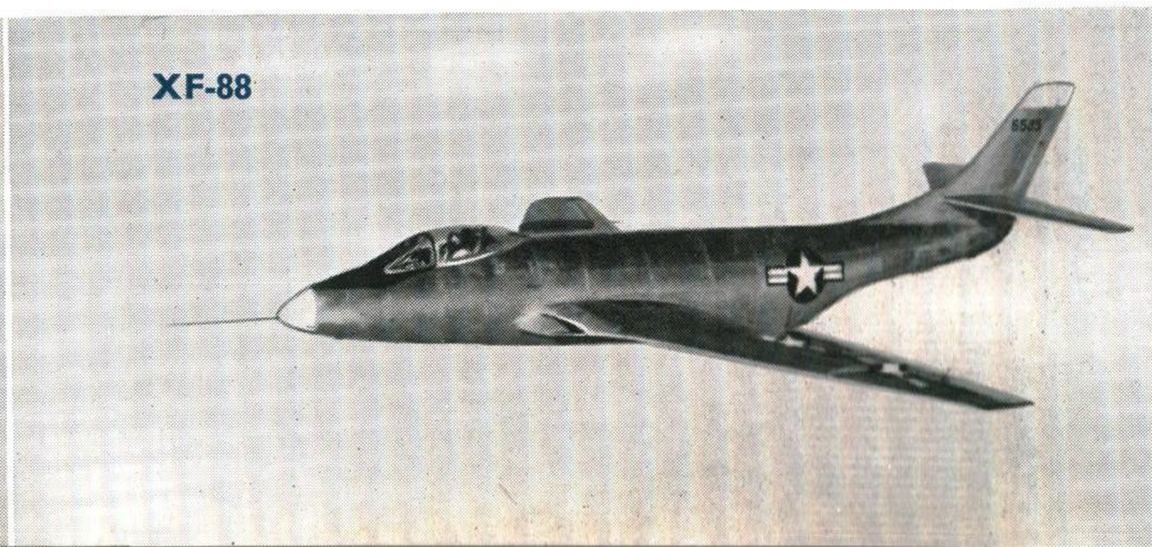
Now, with the " assistance " of German technicians, Russia at last shows signs of catching up. The new MIG swept-wing fighter—apparently joining P.V.O. squadrons as the standard short-range interceptor—appears to be an original and completely sound design. The novel tail layout may well be intended to dampen or eliminate the " snaking " movement experienced in many jets at high altitudes.

Prominent features are the severely swept-back, wide-chord mid-wings ; stubby, circular-sectioned fuselage with a full-vision canopy well to the fore, and the exaggerated backward lean of the tapered fin and rudder. " Semi-detached " summarizes the somewhat insignificant tailplane, which looks rather like an afterthought : its leading edge comes roughly into line with the tail orifice.

In passing, tribute must be paid to Mikoyan and Gurevich for their originality. According to Russian reports the Tupolev " Superfortress " is a great aeroplane—who knows, we might have been confronted by an MIG " Sabre."



XF-90



XF-88

SILLOGRAPHS

by C. H. GIBBS-SMITH

THE SILHOUETTE-PHOTOGRAPH, to give the cumbersome origin of the name, is of course simply a blacked-in photograph. But in this simple process of reducing a full range of tones and chiaroscuro, to one overall tone—preferably black or dark grey—lies a most valuable training or testing aid.

To appreciate why the sillograph is so effective one must go back to the basic principles of the whole business of recognition. Let us start with two of the best known classes of object in our environment—people and words. We have only to catch the most fleeting glance of a friend, even at long distance or in bad light, to know unerringly who it is. It is the same with words. No matter how fast the word AEROPLANE is flashed on a screen, provided one is looking at the exact spot on which it appears, the word will register on the mind. But try and recognize a man you have just seen carry out a snatch and grab raid, among a police identification parade, and see the difference. It is one of the truisms of criminal investigation that even the fairly observant person is lamentably unreliable when trying to remember, or identify, what is unfamiliar. Or flash the word ENALPOREA on the screen and see how many people will remember it right off ; and (also of interest) how long it will take them to realize it is AEROPLANE spelt backwards.

Now the speed at which we recognize familiar objects depends not on identifying one's friend because he has a large nose or a toothbrush moustache or whatever—many people have these features—but because his whole appearance, his *configuration**, is familiar. By constant, but unconscious, viewing of him his configuration has become familiar and one's eye takes him in at a single sweep or glance, or " blick " to use an expressive German word. The same is true of the word AEROPLANE. We don't have to spell out the letters and our eyes do not even travel over them as such. The total word has a particular overall configuration of its own which the eye and the mind instantly recognize.

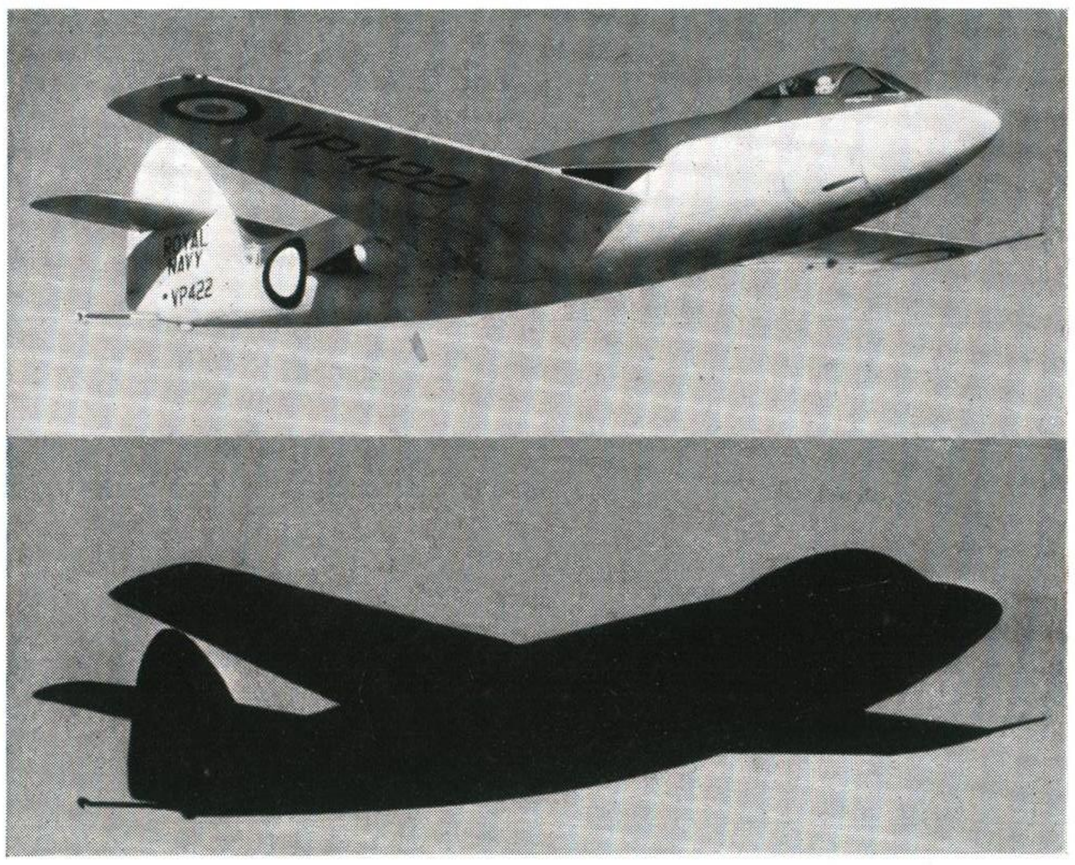
This instantaneous recognition comes through constant contact and practice and a smooth unconscious mechanism is built up in our heads. The results would be just as good in aircraft recognition if any of us had the time and the practice, which of course is impossible. The standing recognition problem is then to achieve as nearly as possible the same results, only with a fractional amount of time spent in training.

As this article is primarily concerned with the Sillograph, we must take it for granted that any particular aircraft has already been adequately " learnt " through silhouettes, photographs or direct observation. Now the problem for the learner is to dislodge his attention from details or individual shapes, and to persuade his eye-brain mechanism to take in *overall* shape and character ; to persuade attention away from the inside towards the periphery.

Look first at the illustration of the Seahawk and see how naturally one looks at details of jet pipe, intake, etc., brought out clearly by high lights, tones and shadows. It is as if the aircraft was set on a pin like a butterfly and we were looking at it close up, piece by piece.—An admirable exercise, but necessarily to be superseded.

**Configuration :* " Relative disposition of parts ; figure ; contour."

Now look at the sillograph of this photograph nearby. What happens ? No detail is properly visible as a separate shape ; there is no light and shade to reveal form



and substance ; there is no sign of the jet pipe or the intake. The result is that the " eye-mind " is forced to regard the overall shape, the outline and the main masses created by the complex shapes merging in perspective, and modified by overlapping.

If the aircraft has been well learnt, this sillograph effect will not confuse us after a short amount of practice, as it will be seen that the black outline-mass still reveals the essential basic character of the aircraft. What is more, the appreciation of character is not impaired by the eye darting to pick up details which are often irrelevant and which distract from the speedy assessment of the total shape.

Before noting the extension of the uses of sillographs, it is only right to look at the limitations. These limitations will mostly follow and echo the " visual shortcomings " of the aeroplanes themselves. Some aircraft do not have a very distinctive character, or some will have close family resemblances to others. And, of course, there is the standing difficulty of giving a quick diagnosis to almost any (especially small) aircraft from dead ahead or astern. These are the inevitable occupational hazards of the recognition job ; they have nothing to do with the sillograph as such.

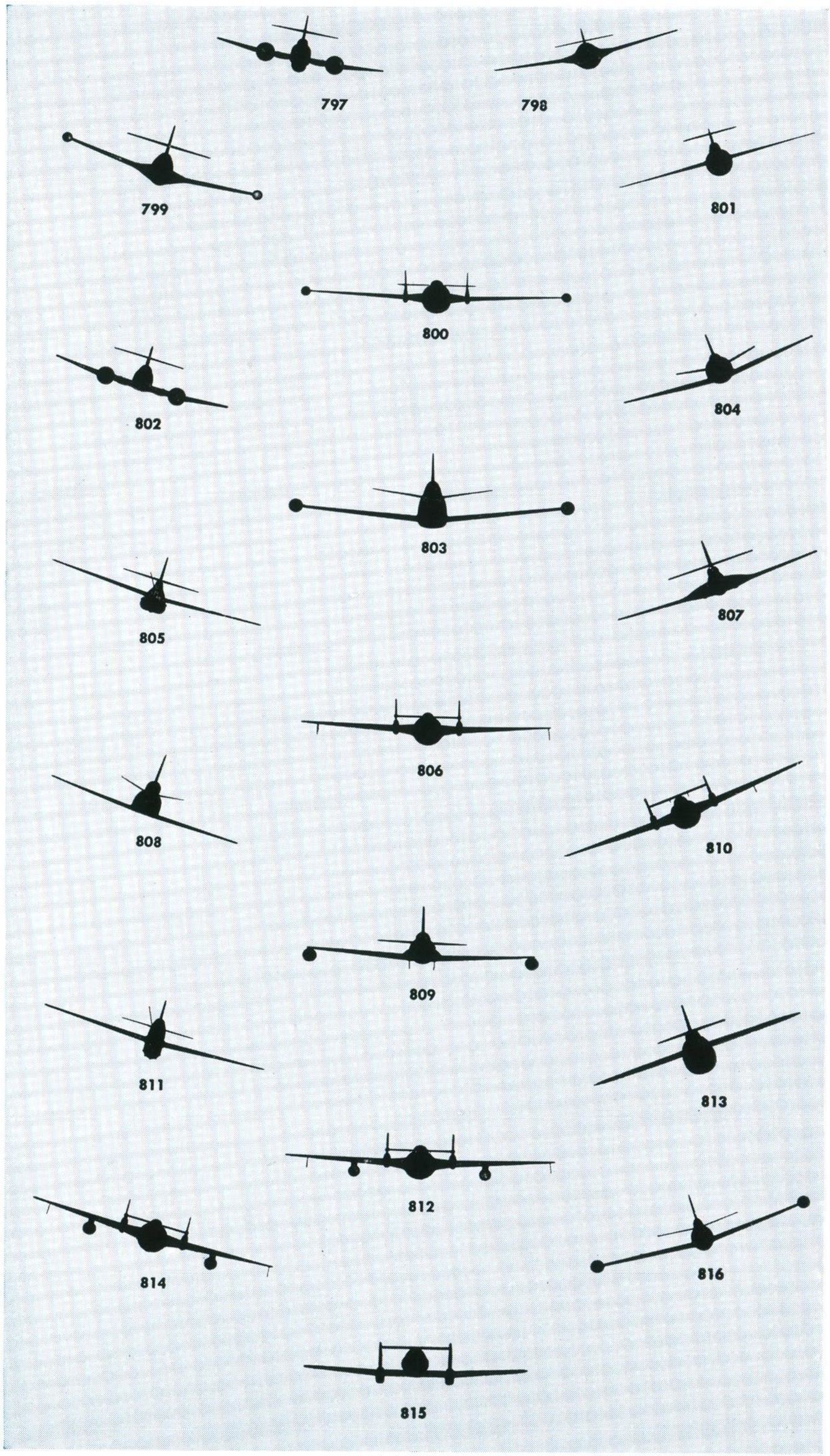
It follows that the sensitive well-trained viewer will be able to lessen the effects of these hazards, just as a detective specially trained in face-memory will be able to remember and recognize, as different, two faces that most of us could scarcely tell apart.

So the sillograph is one of the most valuable of all recognition aids both in training and testing. It forces attention away from details to overall outline and configuration ; it reveals aircraft-character in a flash ; and it has a most beneficial effect on the whole optical-psychological mechanism which is involved in the job of recognition, at the same time suppressing irrelevances and bringing out essentials.

An ideal extension of the sillograph method would be the sillograph film, where one could watch the character of the aircraft in all its subtle and changing forms. That is why the single-coloured models used cleverly against a light background, with no light in front, are an excellent substitute, provided the models are suspended, not held, by the form-destroying hand.

JET-FIGHTER FORM

An instructive method of familiarizing yourself with the twenty most important of the World's jet-fighters is to "translate " these sillograph views (and those on the following pages) with the aid of the three-view silhouettes on pages 17, 18 and 19. As you examine and recognize each view prepare a list. Those with which you are familiar will, of course, take less time than the "doubtfuls" you have to cross-check with the three view drawings. There is no point in guessing ; aim at obtaining a one hundred per cent correct result before checking your list with the solution on the rear cover.



Turn to page 10 . . .

BOOK REVIEWS

by JOHN W. R. TAYLOR

Observers' Tale should be of outstanding interest to many readers of this Journal, for, although it is the story of just one Group of the Royal Observer Corps, it is at the same time very largely the history of the Corps as a whole.

The first section of the book deals with the history of No. 17 Group, centred at Watford, including a chapter describing a wartime visit by Their Majesties the King and Queen and Princess Elizabeth to Post 17/E.4, situated on the Brunswick Tower of Windsor Castle.

This is followed by more general descriptions of the work of the Corps, from basic plotting and reporting to its special local alert system, which did so much to maintain production, and the achievements of the Seaborne volunteers with the D-Day invasion fleet. Scores of excellent photographs illustrate every aspect of this work, and there is a selection of cartoons by Sessions, who needs no introduction to members of the R.O.C. Finally, there are 50 pages of Post Stories, covering every Post in the Group, and accompanied by illustrations of each. In all, a fine tribute to a fine service.

Equally outstanding is **Keep the Memory Green—The Story of Dunkirk,** written by two Army officers who took part in the Battle of France and the evacuation of June, 1940. It is a great book because it recaptures perfectly the spirit of those grim days, losing nothing of the comradeship, the valour or the occasional humour, yet making it quite clear that, however glorious the achievement, Dunkirk was still an evacuation and that " wars are not won by evacuations."

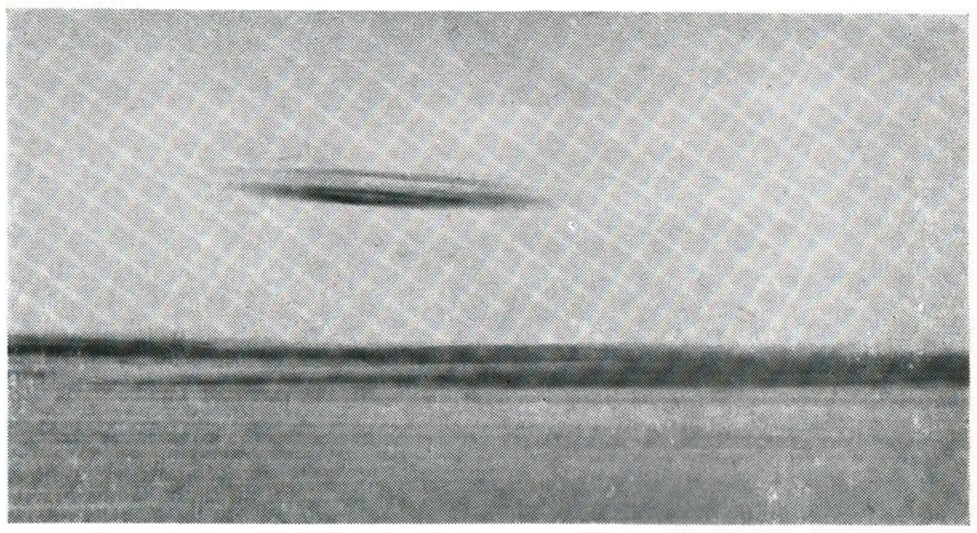
It is great, too, because there is no element of inter-Service ill-feeling, so prevalent at the time. On the contrary, the authors believe that the Royal Air Force was perhaps bravest of all the Expeditionary Force. They explain the Army's 1940 views on the R.A.F., but they do not excuse them.

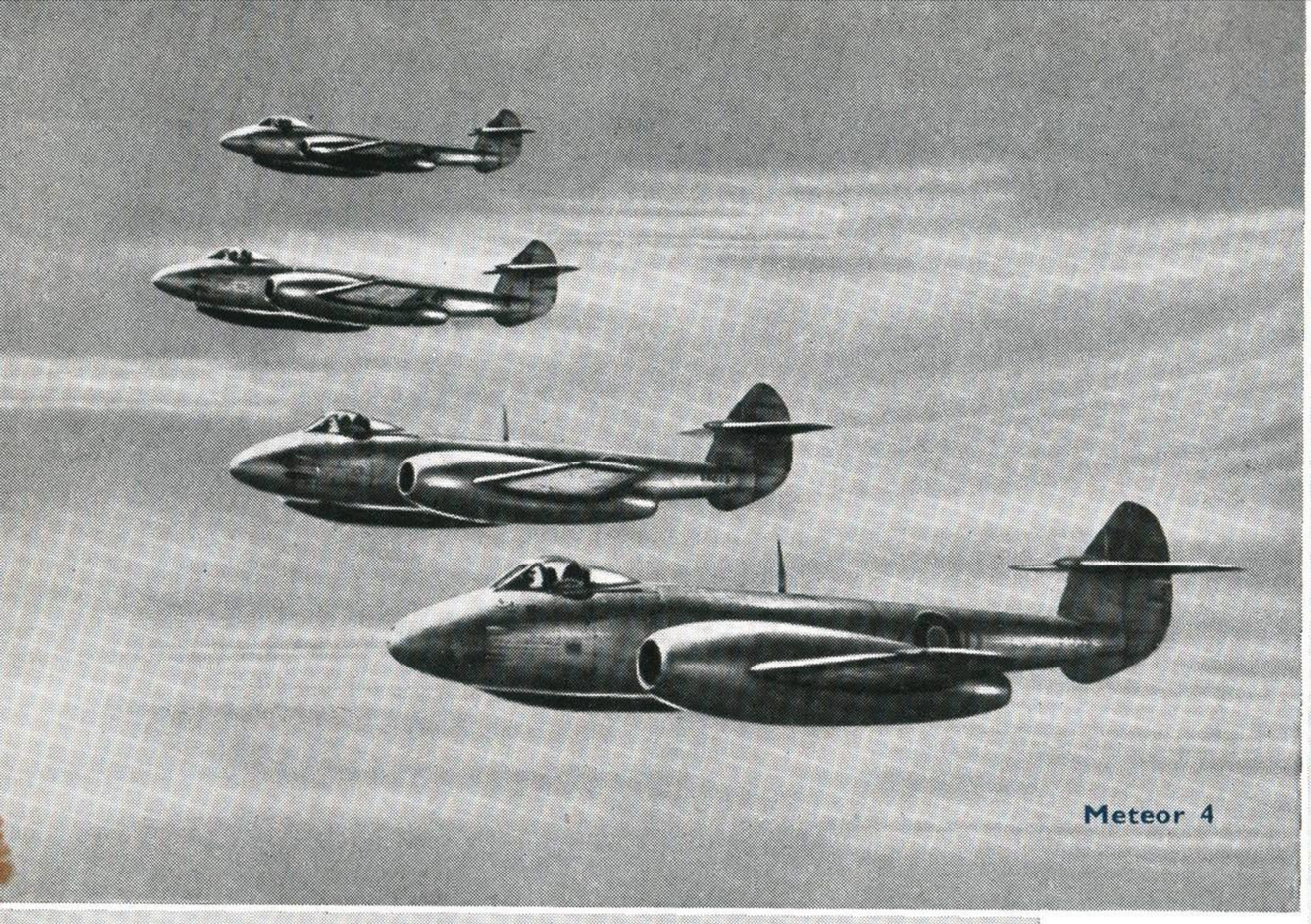
Above all, this is a tribute to the men who made up the gallant little force which took the first shock of Hitler's *blitzkrieg* in the West. But there are lessons to be learned from it too, for " by the end of October, 1939, Advanced Air Striking Force had lost eight aircraft by enemy action and nine, regrettably, by the good shooting of French anti-aircraft artillery and French fighters." Keep the memory green !

" OBSERVERS' TALE "—The Story of Group 17 of the R.O.C. Obtainable from H. R. Whitty, White Walls, Carbone Hill, Cuffley, Herts. 120 large pages. 21s., plus 1s. postage.

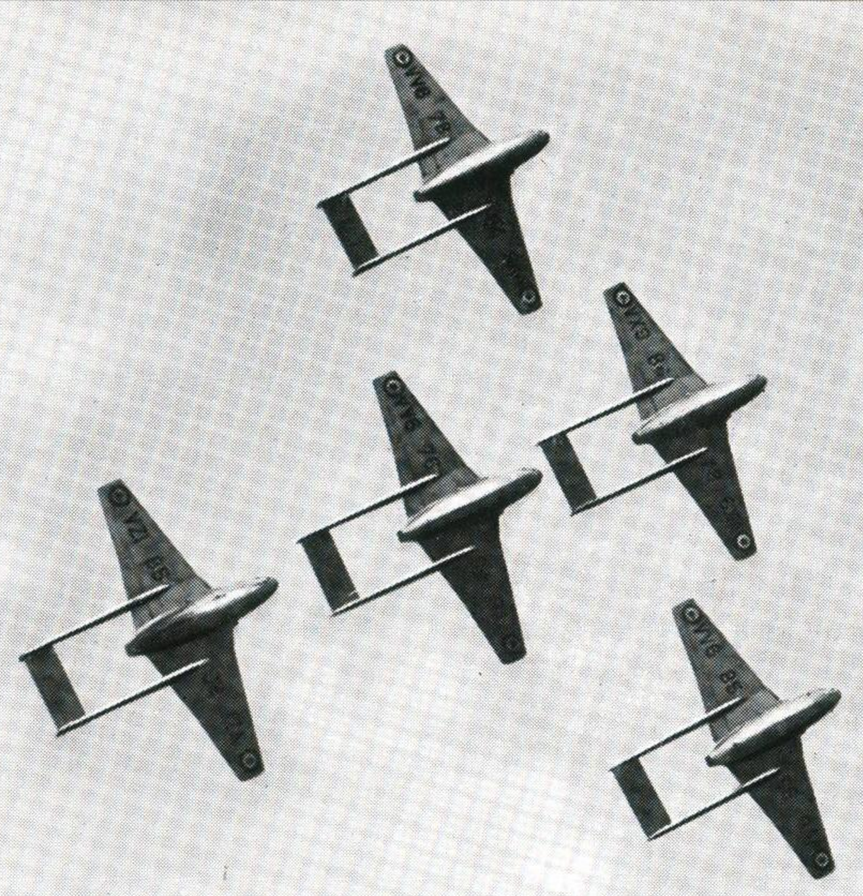
" KEEP THE MEMORY GREEN "—The Story of Dunkirk, by Lieut.-Colonel Ewan Butler and Major J. Selby Bradford. Hutchinson & Co. Ltd. 180 pp. Illustrated. 12s. 6d. net.

Flying Saucer ? Readers who were at Farnborough this year will have little difficulty in recognizing this aeroplane. We have printed its name on the rear cover. (*Photograph by A. N. Hossbach.*)

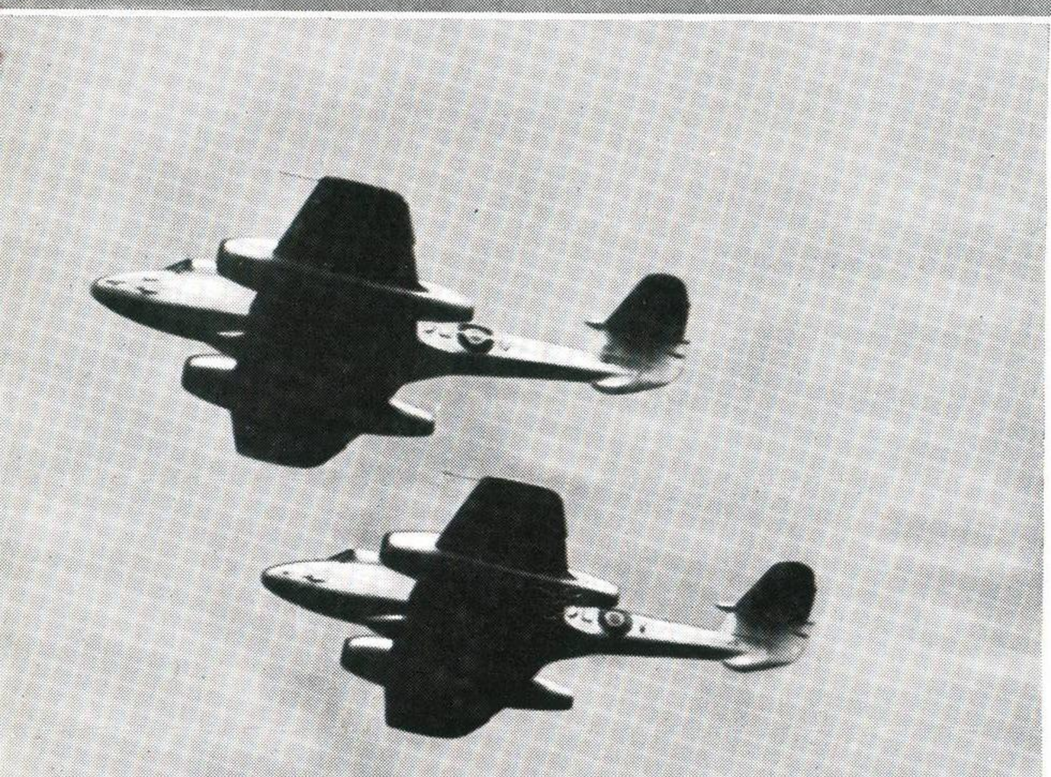




Meteor 4



Vampire 3



Meteor 4

JET-FIGHTER FORMATIONS

(Round the Clock from 1 o'clock)

Clipped and Clipping. Another view of 54 Squadron's Vampire aerobatic team at the R.A.F. Display, Farnborough, 1950. They are Vampires F Mk.5.

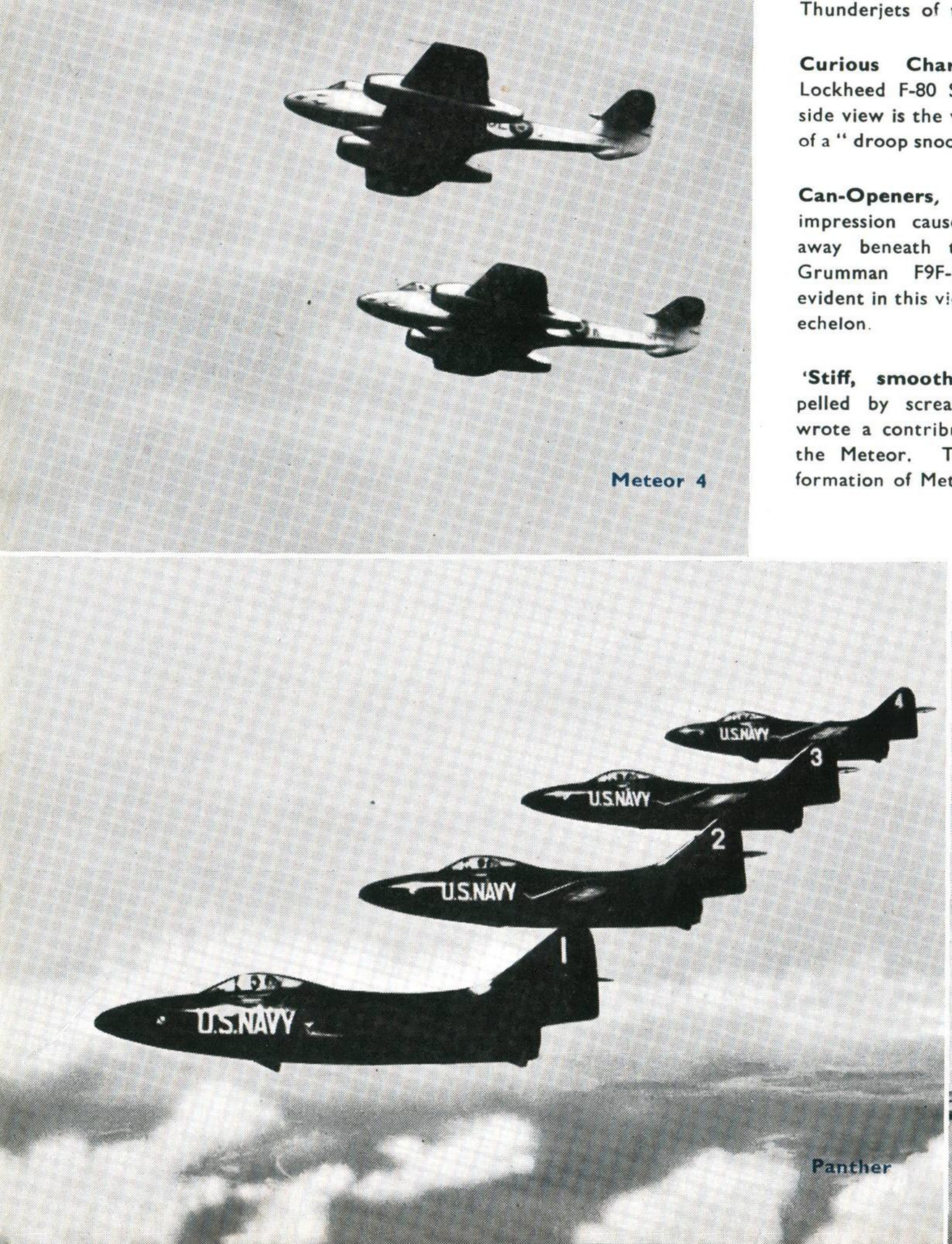
Now frequently seen over Great Britain, Republic F-84E Thunderjets of the U.S.A.F.

Curious Characteristics of Lockheed F-80 Shooting Star in side view is the visual impression of a " droop snoot."

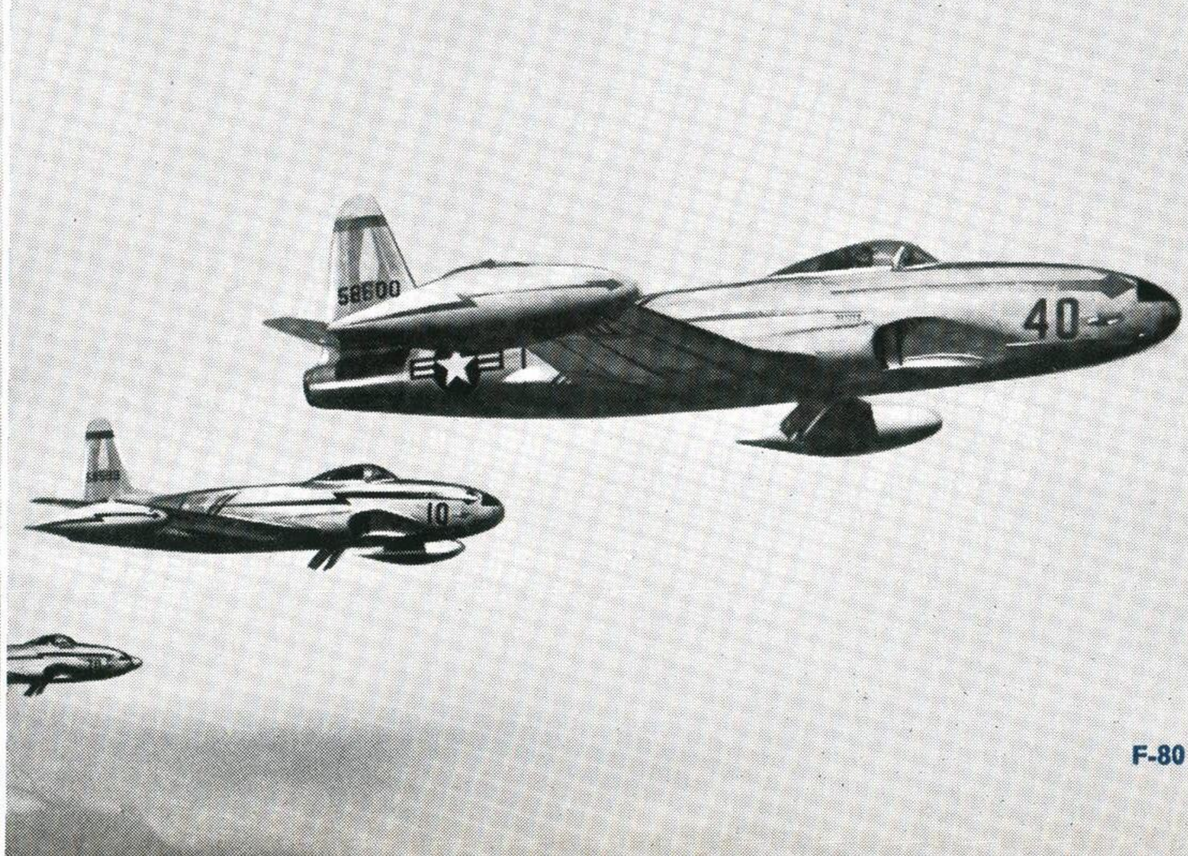
Can-Openers, or the curious impression caused by the cut-away beneath the tail of the Grumman F9F-3 Panthers is evident in this view of their neat echelon.

'Stiff, smooth snakes propelled by screaming spindles," wrote a contributor recently of the Meteor. Two views of a formation of Meteors F Mk. 4.

F-84

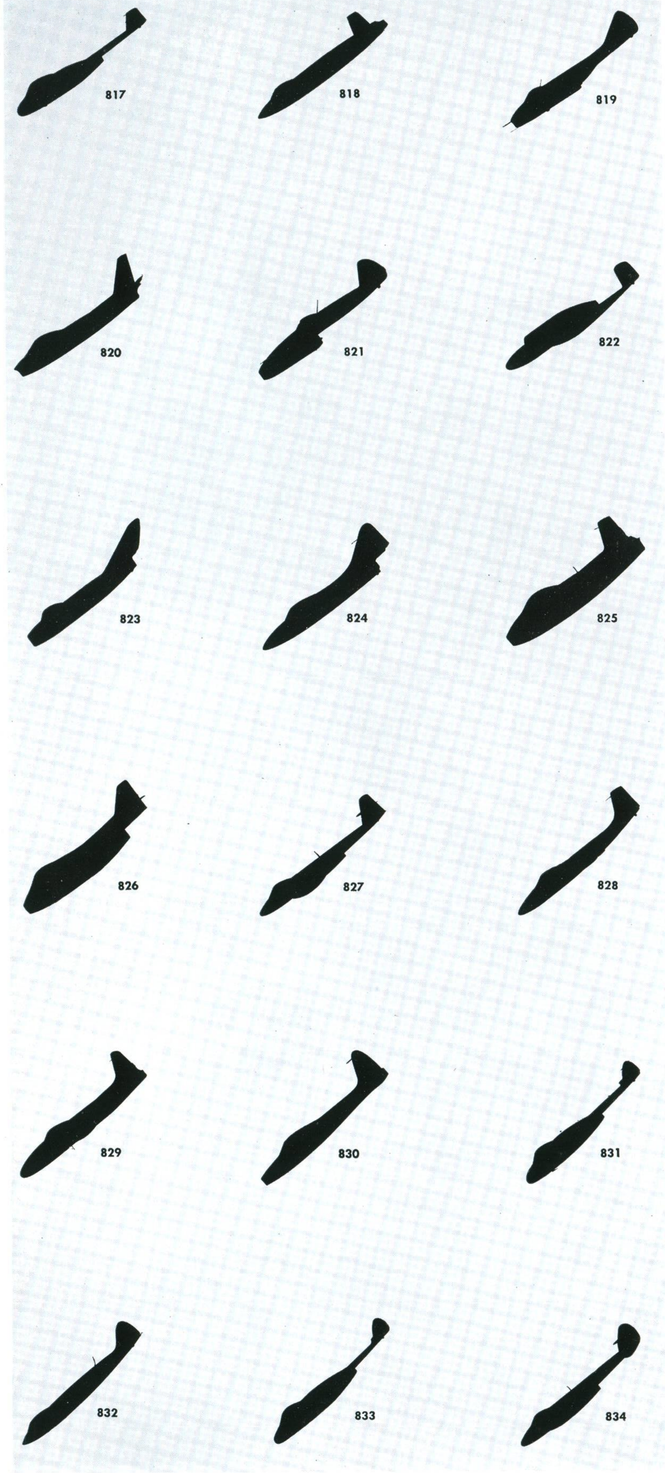


Panther



F-80

Jet Fighter Form . . .



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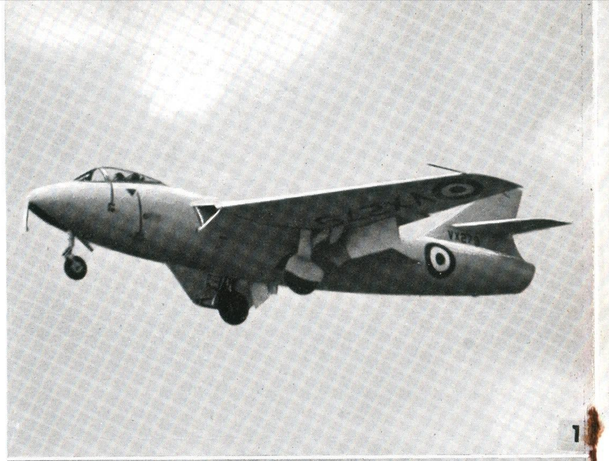
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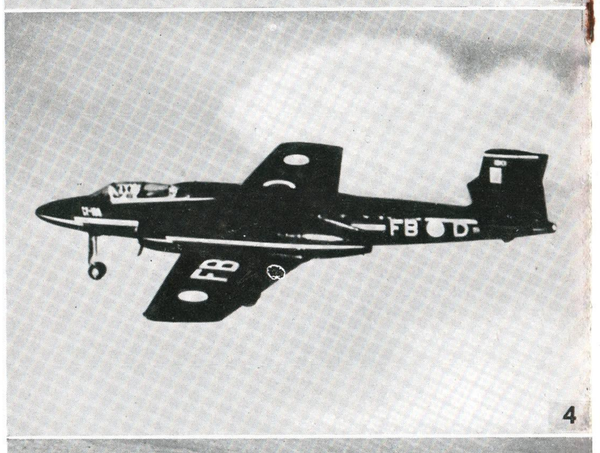
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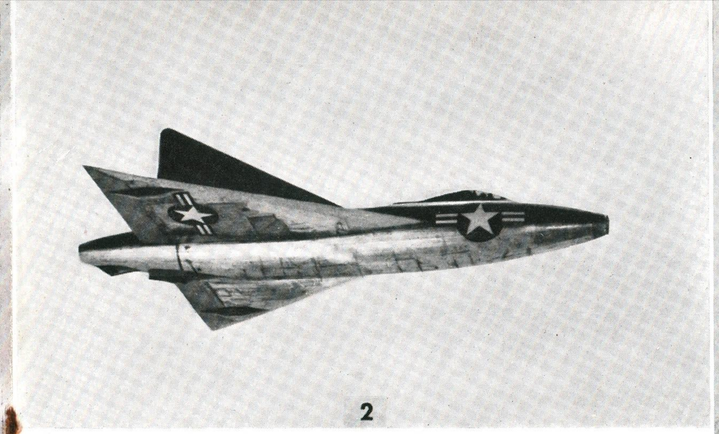
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Promising Prototypes

This collection of British, Canadian and American jet fighter prototypes illustrates a variety of methods of tailoring a turbojet into an airframe as well as an interesting variety of airframe shapes.

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1 **The Hawker P.1081,** a single-seat, single-turbojet swept-wing fighter. Its wing span is 37 ft. 2 ins.

2 **The Convair XF-92A,** a delta-wing interceptor with a 60° sweep-back in leading edge. It is a single-seater and has a single turbojet in the fuselage.

3 **The Chance Vought XF7U-1 Cutlass,** twin-turbojet, swept-wing, tailless, monoplane fighter under development for U.S. Navy.

4 **Avro C.F.100 Canuck twin-jet** (high-mounted—close to fuselage) two seat (tandem) all-weather fighter built by Avro (Canada). Wing span 52 ft. 0 ins.

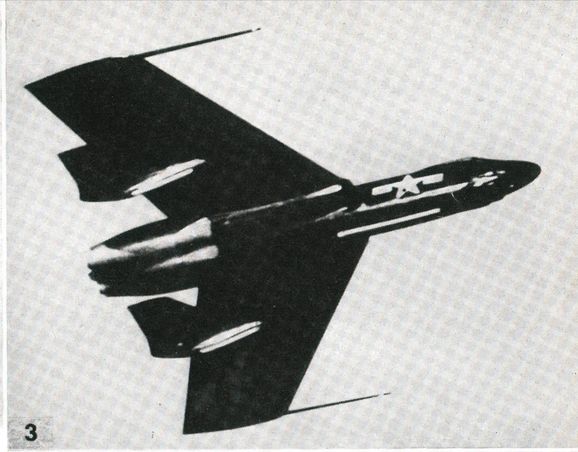
5 **De Havilland DH 113** design based upon the well-tried Vampire formula is a two-seat (side-by-side) night-fighter, has a single turbojet in the fuselage.

6 **Douglas F3D-1 Skyknight,** a two-seater (side-by-side) all-weather carrier-based fighter for U.S. Navy, of mid-wing monoplane design. It has twin-turbojets mounted semi-externally on lower fuselage.

7 **Northrop XF-89 Scorpion,** twin-jet two-seat (tandem) all-weather fighter. Turbojets are mounted on lower fuselage.

8 **Gloster Meteor NF Mk.11,** twin-jet two-seat (tandem) night-fighter developed from well-tried Meteor design. Greatly lengthened nose and extended, rounded wing-tips aid recognition.

9 **Lockheed F-94,** twin-jet two-seat (tandem) all-weather fighter. Radar gear lengthens the nose, and an after-burner, the rear fuselage, otherwise family characteristics are of F-80.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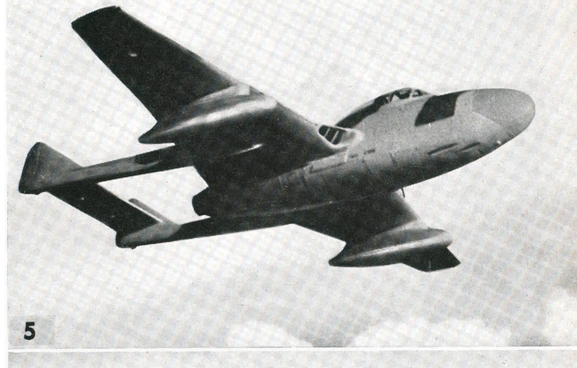
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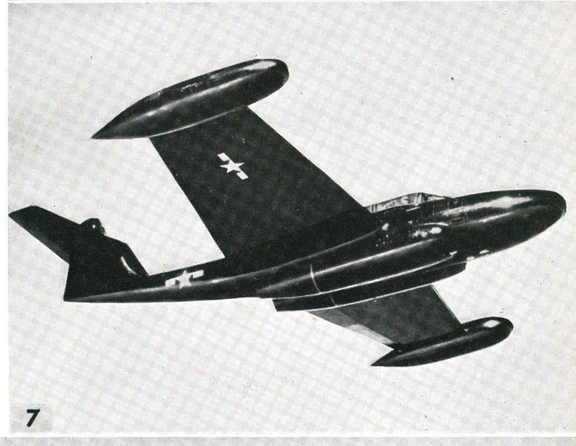
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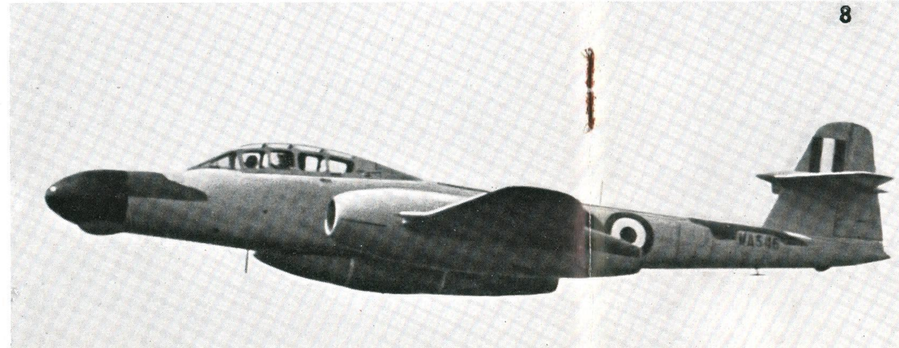
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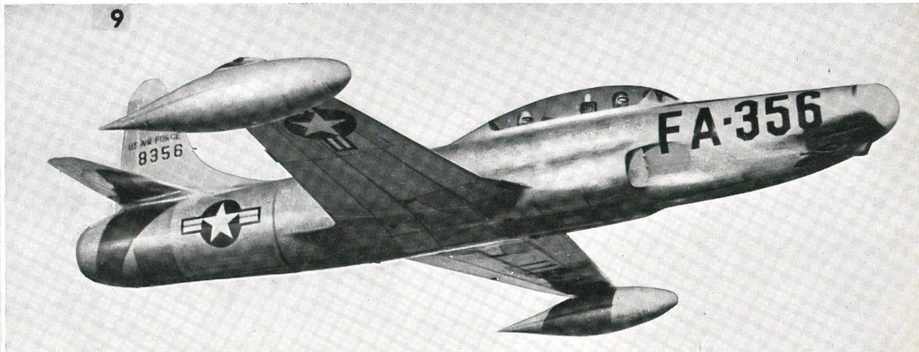

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Jet Fighter Form . . .

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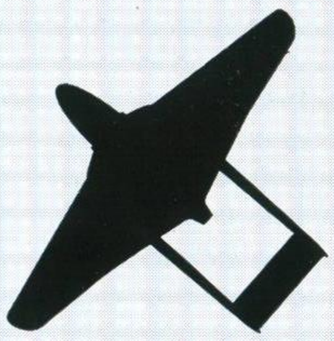

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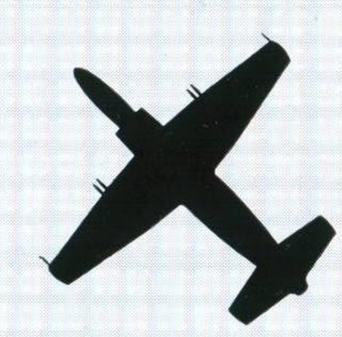

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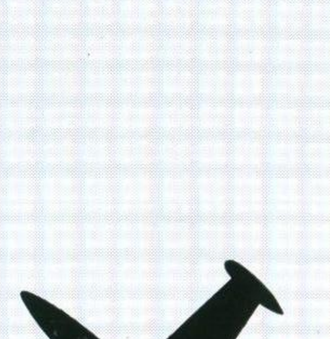

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Turn to page 14 . . .

American Aircraft Designations

The list of designations published in the July *Journal* is superseded by the following :—

AD-1	Skyraider
AF-1	Guardian
AM-1	Mauler
B-17	Fortress
B-25	Mitchell
B-26	Invader (Ex-A-26)
B-29	Superfortress
B-45	Tornado
B-47	Stratojet
B-50	Superfortress
C-45	Expediter
C-46	Commando
C-47	Skytrain (DC-3 Dakota)
C-54	Skymaster (DC-4)
C-74	Globemaster
C-82	Packet
C-97	Stratofreighter
C-118	DC-6
C-119	Packet
C-121	Constellation
C-124	Globemaster 2
C-125	Raider
F-47	Thunderbolt
F-51	Mustang
F-80	Shooting Star
F-82	Twin Mustang
F-84	Thunderjet
F-86	Sabre
F-89	Scorpion
F3D-	Skyknight
F6F-	Hellcat
F7F-	Tigercat
F8F-	Bearcat
F9F-	Panther
FH-	Phantom
F2H-	Banshee
FJ-	Fury
F4U-	Corsair
F6U-	Pirate
F7U-	Cutlass
HRP-	Rescuer
HUP-	Retriever
JRM-	Mars
PBM-	Mariner
P4M-	Mercator
P2V-	Neptune
PBY-	Catalina
PB4Y-	Privateer
RB-26	Invader
RB-29	Superfortress
RB-50	Superfortress
RF-51	Mustang
RF-61	Reporter
RF-80	Shooting Star
R60-	Constitution
T-6	Texan (Harvard 2)
T-7	Navigator
T-11	Kansas
T-13A	Valiant
T-13B	Kaydet
T-17	Kaydet
T-29	Convair Liner
T-33	Shooting Star
TBM	Avenger

CHARACTER STUDY No. 8

The Swept-Wing Mig-Jet

HERE is a winged stove-pipe which has caught up a baby boomerang on its huge tail and carries it indifferently along. Never was there an aircraft so tail-conscious, and it is one of the few aeroplanes aflight which can legitimately be taught by a feature and not by overall pattern.

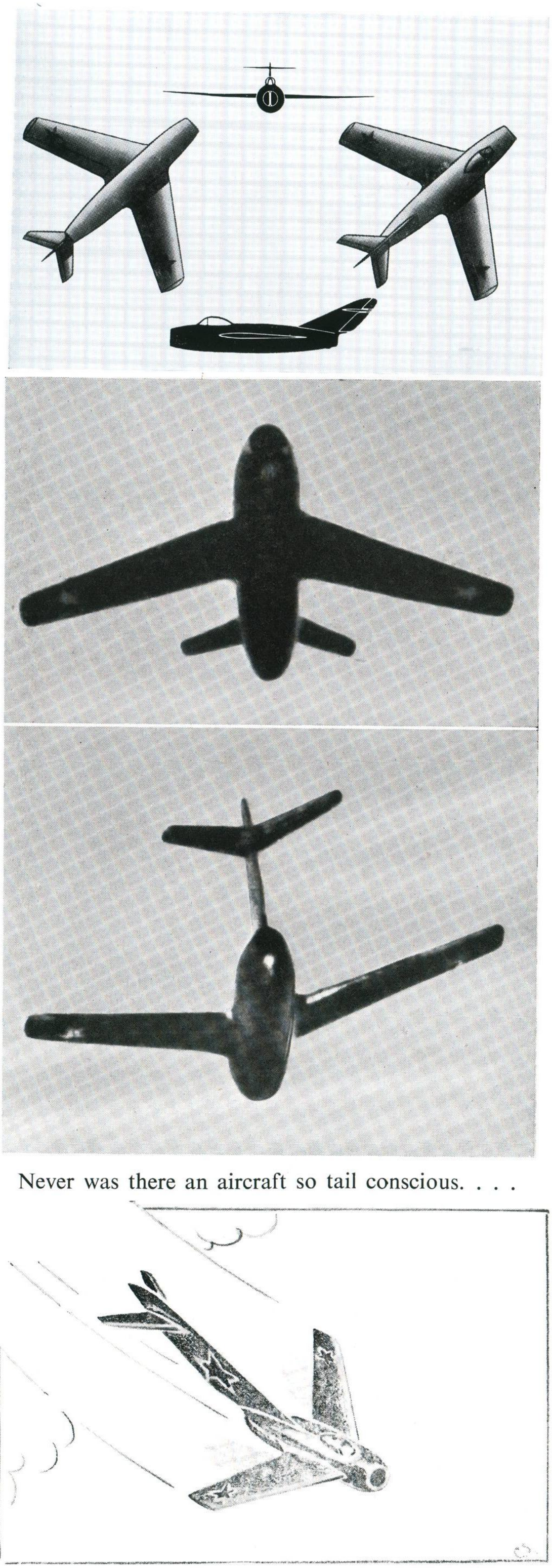
The wings of this Kremliner are familiar swept-back affairs, tapering in themselves, and with blunt almost straight-cut tips. There is no dihedral and nothing particularly noteworthy about them (although from some views the sweep-back gives them a dihedral effect and in other views, anhedral effect). They are placed in a high mid-wing position on the fuselage, and right in the middle of a fore and aft line.

The fuselage is a nondescript fat pipe, slightly tapered at both ends, with the pilot sitting well up under his canopy just abreast of the wings' leading edge. It makes a very heavy and blocky aerial shape from any angle and, in perspective, the tapering is accentuated to give it an almost bullet-rounded nose and stern. But from no position does it look nose-conscious.

Now for the tail unit. To start with, the MIG-Jet has proportionately the largest fin and rudder of anything flying today, and it is almost half as long as the fuselage from leading-edge root to trailing tip. It leans back at a rakish angle and there, high up towards the top, is stuck the diminutive swept-back boomerang tailplane, looking as if it never had anything to do with the machine at all. This fin-rudder-tailplane combine has an extraordinary visual effect from almost every angle. At times the tailplane even looks detached, or as if it is being towed along behind, but always it is there (with the great fin and rudder) dominating the whole machine and stamping a striking character into the mind of the viewer.

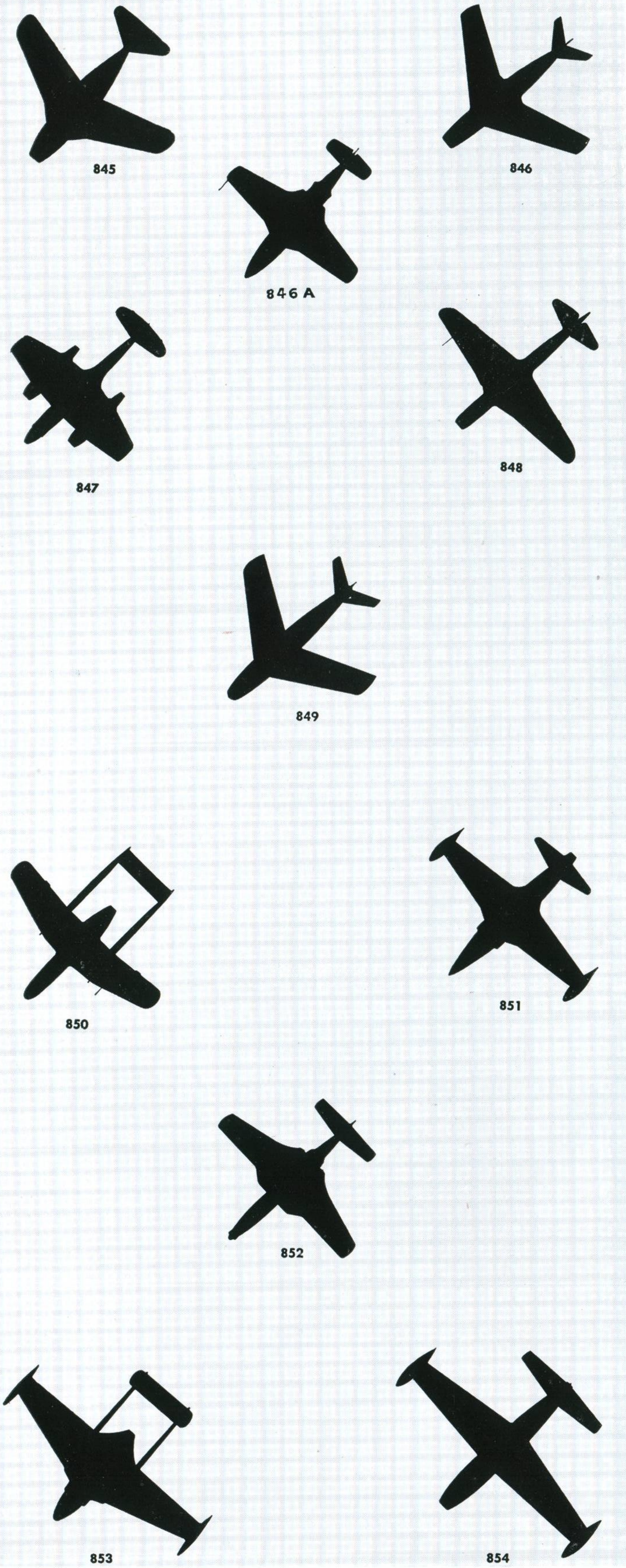
Basic Figures for this Miggerjet are as follows :—
Span : 34 ft. approx. Length : 32 ft. approx.

C. H. GIBBS-SMITH



Never was there an aircraft so tail conscious. . . .

Jet Fighter Form . . .



Turn to page 16 . . .

A.B.C. of Civil Aircraft Markings

Observers and spotters are called upon to recognize and report aeroplanes, and all training must aim at speeding that function. For most however, the mainspring of their aircraft recognition prowess comes from a deeper interest in one or other of the technical and operational aspects of aeronautics. We know of many readers who will be interested to hear that Mr. John W. R. Taylor (who is himself a Leading Observer) has produced a new book, and one which they will be keen to acquire. " The A.B.C. of Civil Aircraft Markings " contains, apart from full particulars of markings of all civil aircraft likely to be seen in British skies, many excellent illustrations. Amongst them are many of the seemingly endless number of different types of light aeroplanes with which every observer (R.O.C.) has cause to recognize and report—and which do indeed add interest, and spotting and plotting practice to air exercises. A useful feature of the tables of markings is that they are arranged alphabetically, so that the embryo spotter, if he can read the marking, will not only find out something of the " who and why " of the aeroplane but also its identity. Incidentally, any experienced spotter who finds himself of necessity using this facility, will, we hope, blush with shame. Your visits to the local airport will have added attraction if you take a copy of " The A.B.C. of Civil Aircraft Markings " with you.

" The A.B.C. of Civil Aircraft Markings " by John W. R. Taylor Published by Ian Allen Ltd., 282, Vauxhall Bridge Road, London, S.W.1. 72 pp. Illustrated. 2s. 0d. net.

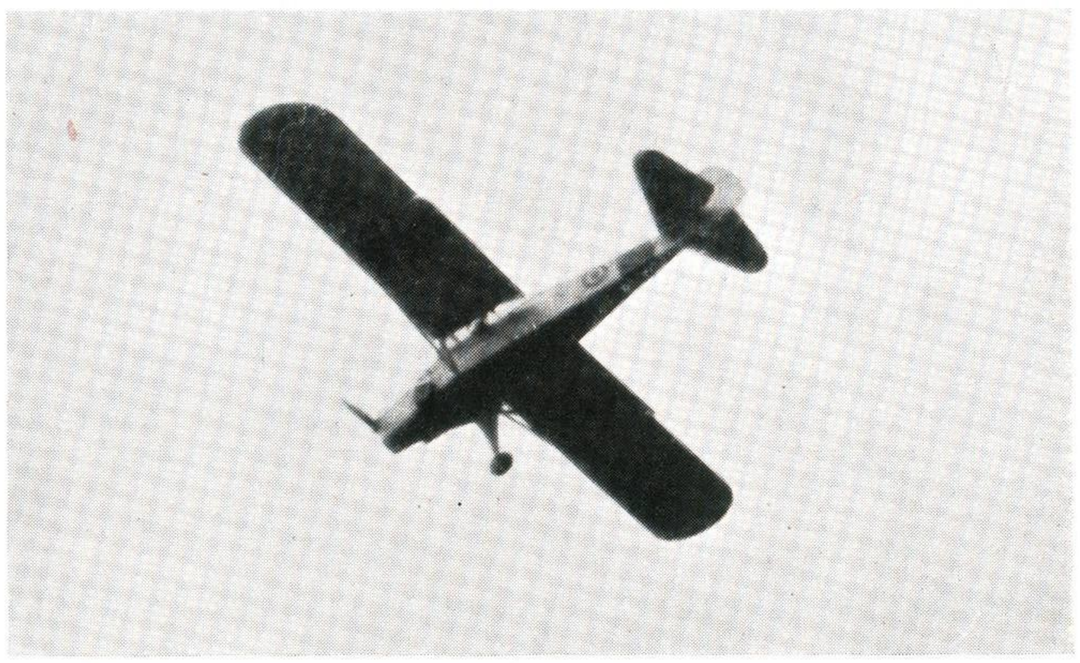
New Aircraft Recognition Material

NIGHT SILHOUETTE
A.D. 4942 AD-1 Skyraider

1/72 SCALE MODEL
Stores Ref. 52/905 AM-1 Mauler

If no local arrangements are already in force, applications for supplies should be through the usual official channels quoting reference numbers as above.

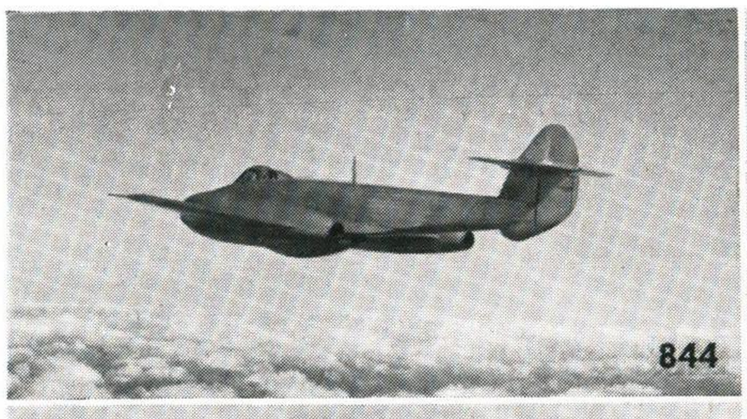
Aerogram



A suit saver (answer on rear cover).

(*continued on page* 16)

ELEMENTARY SPOTTING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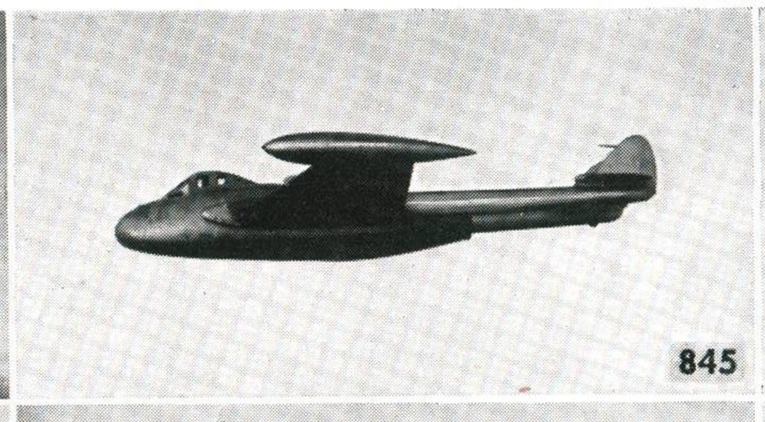
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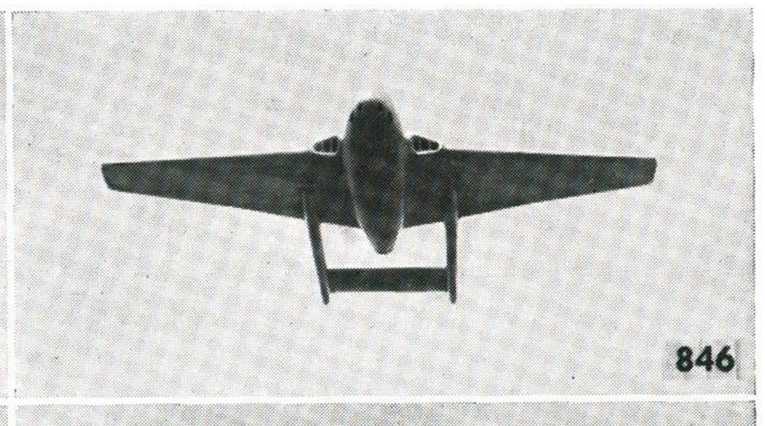
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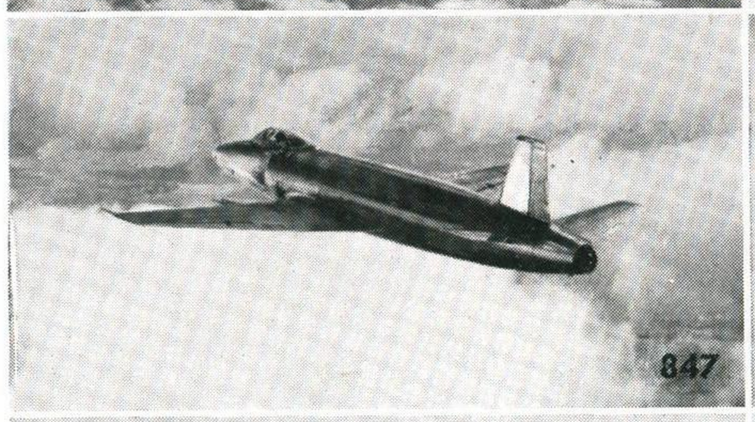
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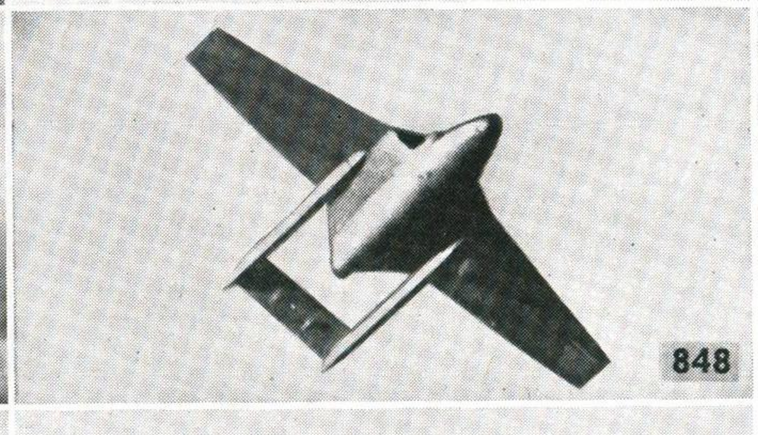
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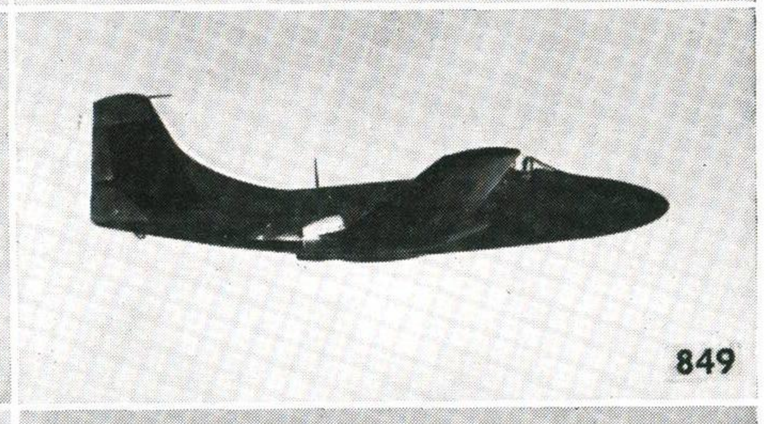
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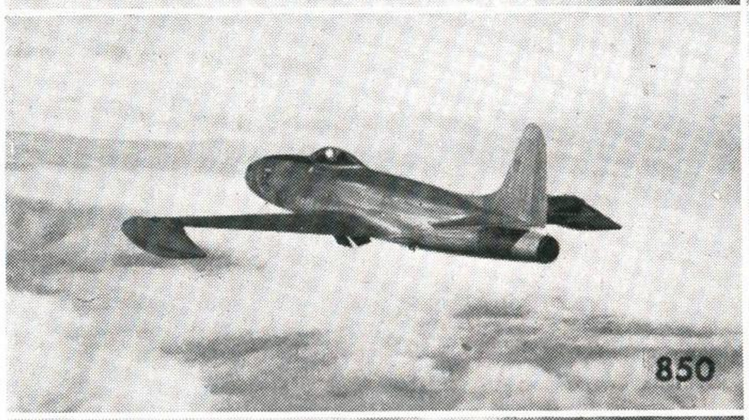
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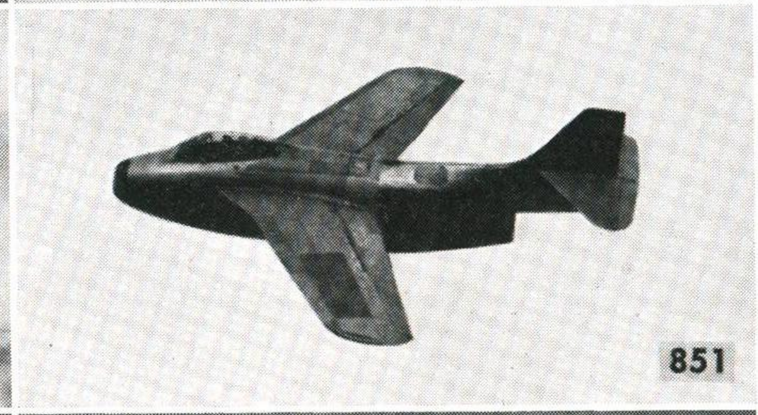
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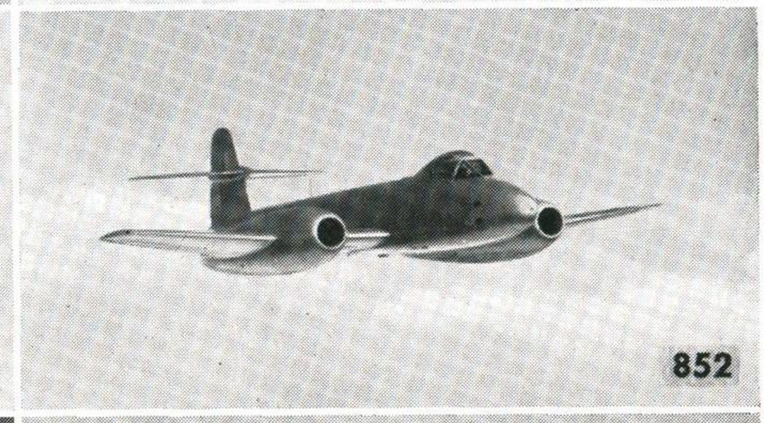
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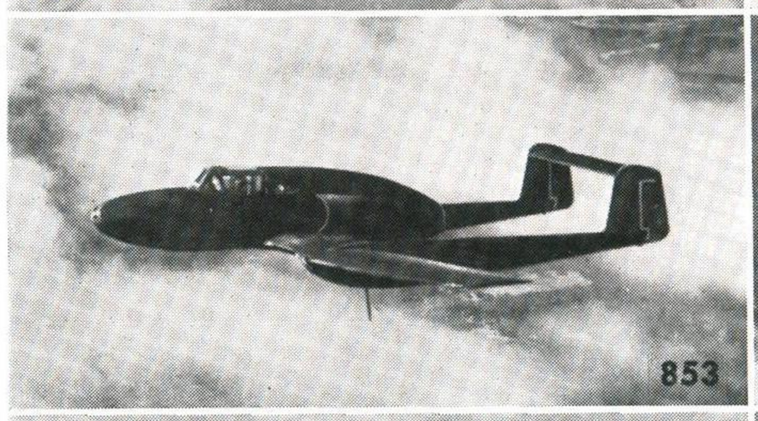
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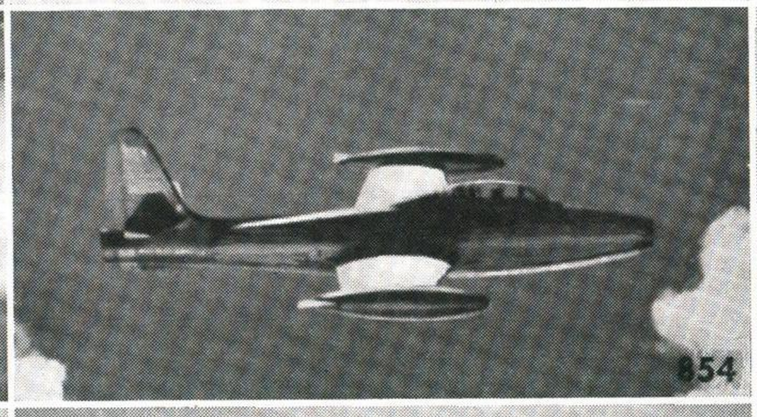
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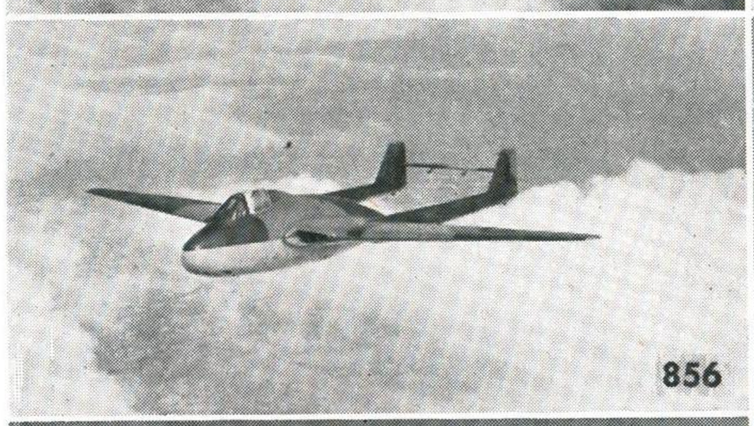
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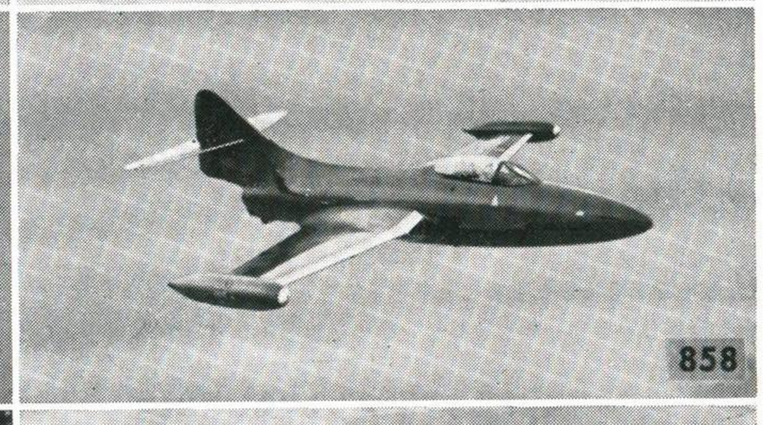
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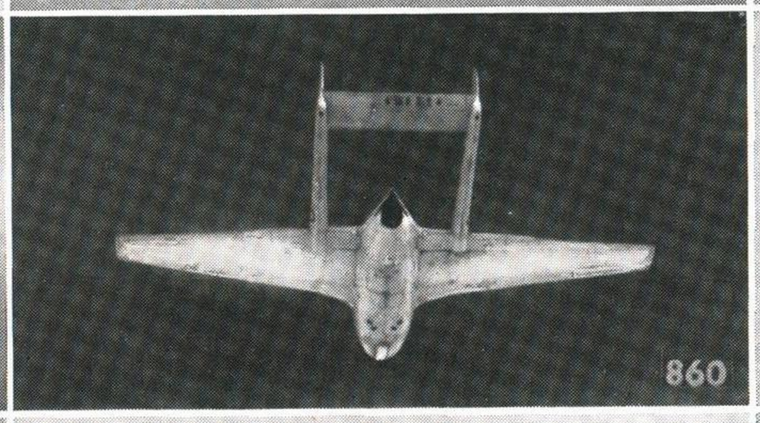
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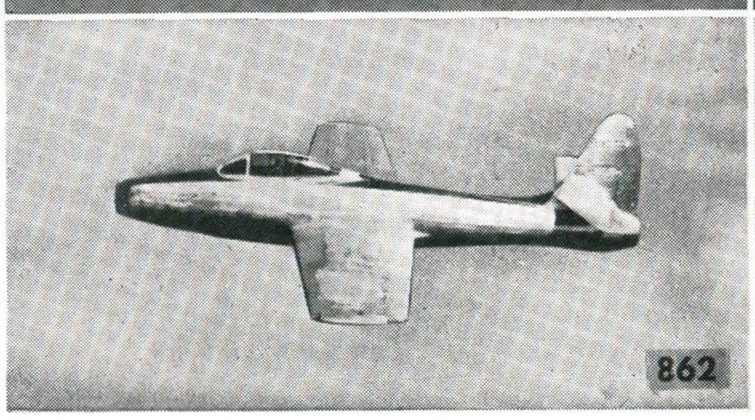
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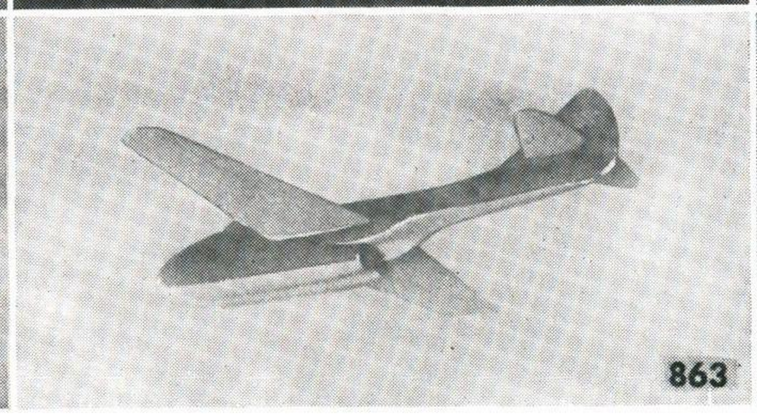
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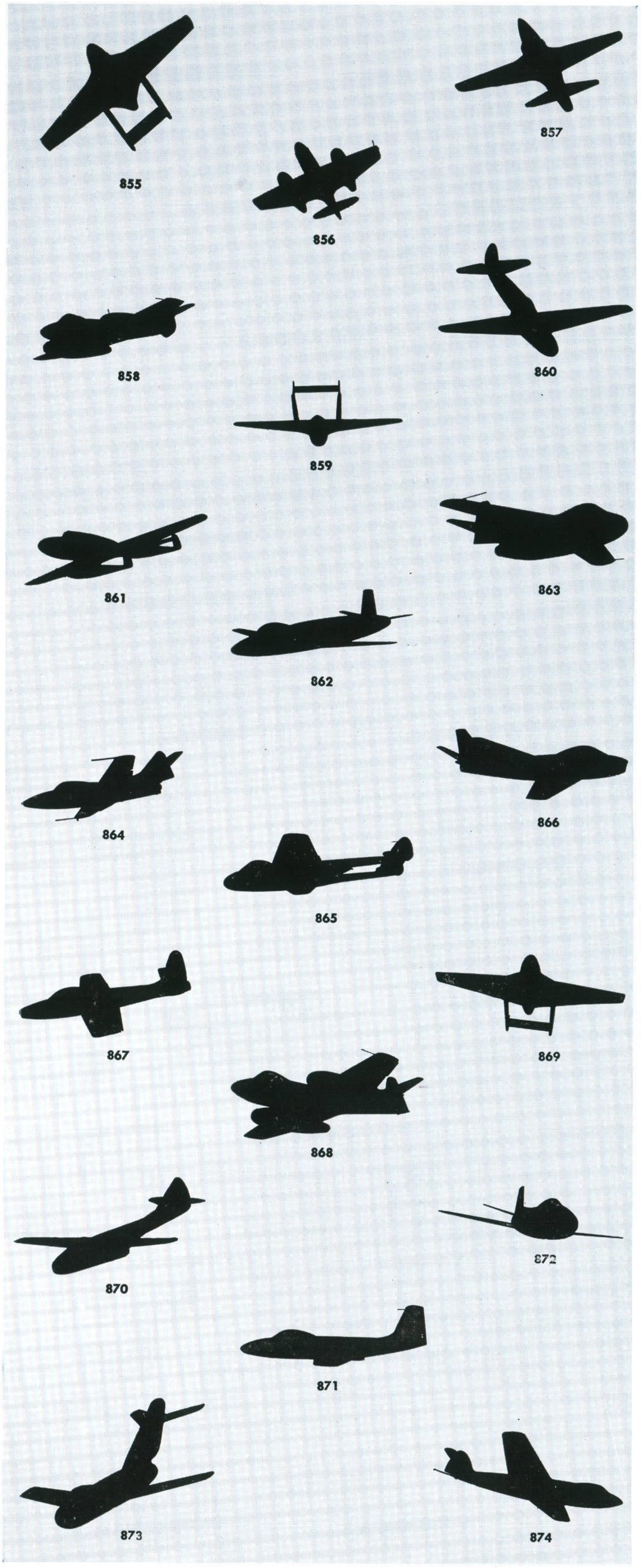
Jet Fighter Form . . .



(*continued from page 14*)

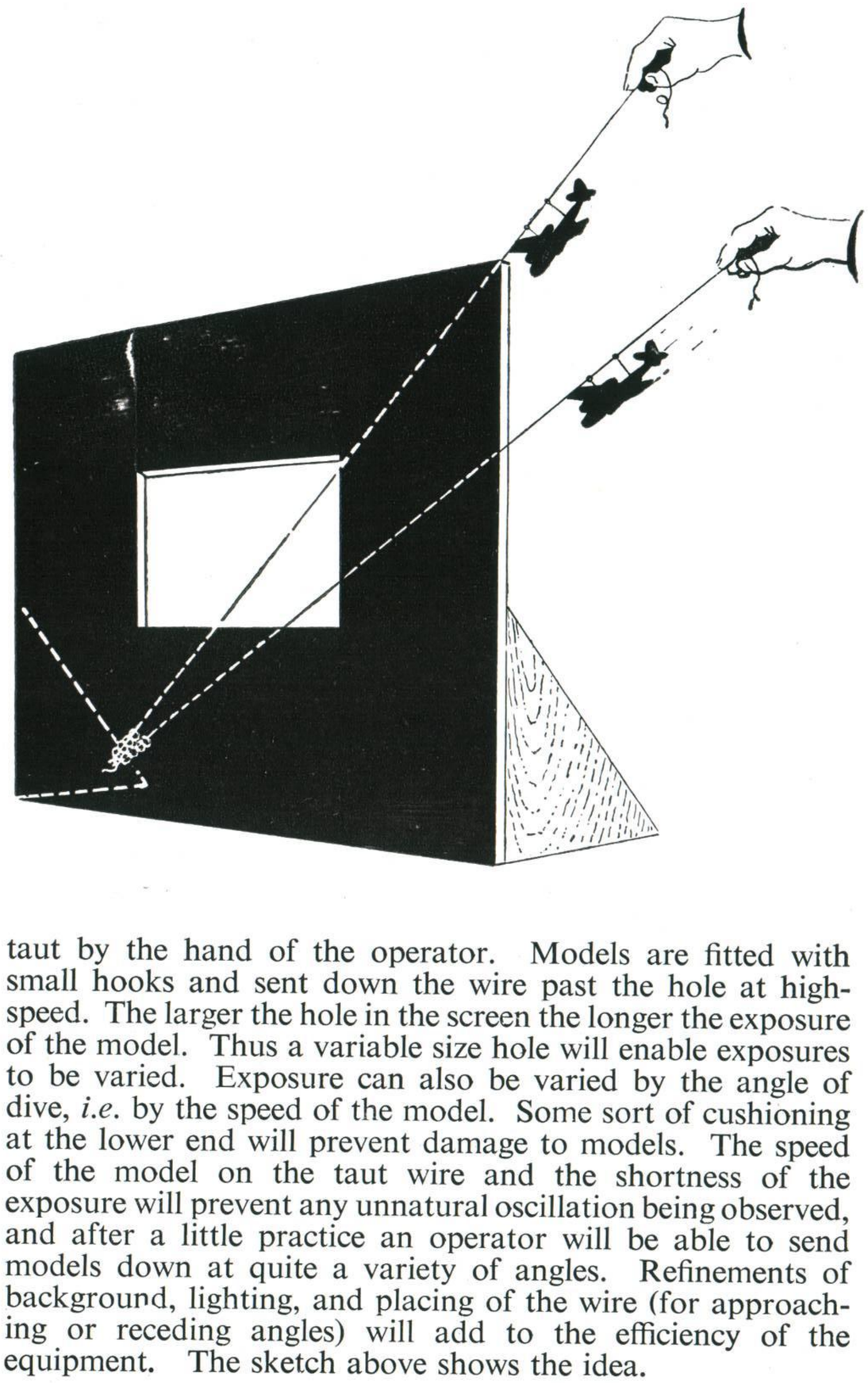
Cover Photo of August *Journal*

We have received many comments about the photo of the Canberra B Mk. 1 which appeared on the cover of the August *Journal*. To all who may still be doubtful we can assure them that it is a genuine untouched photograph of a genuine Canberra B Mk. 1 The picture was taken by Mr. F. Sabey of the Ministry of Supply whilst the Canberra was being photographed for recognition purposes. For those interested in photography, the camera was the R.A.F. F-24 type, the exposure 1/250th at f.8, the film Kodak Super-XX. A pale yellow filter was used. The Canberra was "sliding" beneath the Lancaster in a slight bank to port. The inky background is provided by the Irish Sea.

"Synthetic" Synthetic Trainer

The following idea for a practical and inexpensive flash-trainer has been sent to us by Mr. C. H. Gibbs-Smith :—

A practical make-shift flash trainer—giving split second exposures of moving models—can be built by the following simple means. All that is needed is a screen (of wood, card, blanket or curtain) with a large hole cut in it (more elaborate designs can have a hole adjustable for size), a length of wire or cord, and a number of aircraft models. The screen is erected facing the class, so that all can see into the hole. The cord or wire is fastened to the floor at one end (behind the screen) and passes at a steep angle behind, and about one foot from the hole in the screen, the upper end being held



taut by the hand of the operator. Models are fitted with small hooks and sent down the wire past the hole at high-speed. The larger the hole in the screen the longer the exposure of the model. Thus a variable size hole will enable exposures to be varied. Exposure can also be varied by the angle of dive, *i.e.* by the speed of the model. Some sort of cushioning at the lower end will prevent damage to models. The speed of the model on the taut wire and the shortness of the exposure will prevent any unnatural oscillation being observed, and after a little practice an operator will be able to send models down at quite a variety of angles. Refinements of background, lighting, and placing of the wire (for approaching or receding angles) will add to the efficiency of the equipment. The sketch above shows the idea.

JET-FIGHTER TYPES

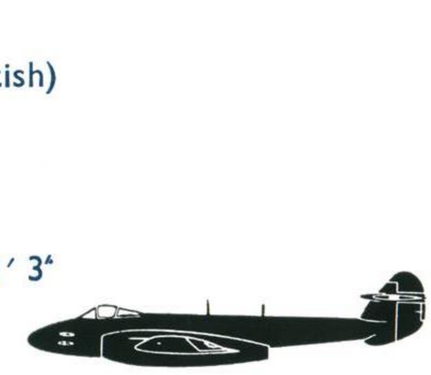
All aircraft recognition training must begin with the three-view silhouette. In this form we illustrate twenty " regular " jet-fighters. By using these diagrams to identify the aircraft illustrated in " Fighter Form " (sillographs) and " Elementary Spotting," a degree of familiarization with these aircraft is automatic. Further, their third-dimensional forms are associated closely with their respective three-view foundations. When you can claim absolute familiarity with these twenty, you will have gone far towards breaking the back of your jet-fighter recognition problem. Intensive flash-training will do the rest.

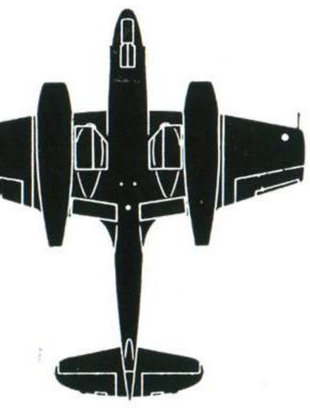
Gloster (British)

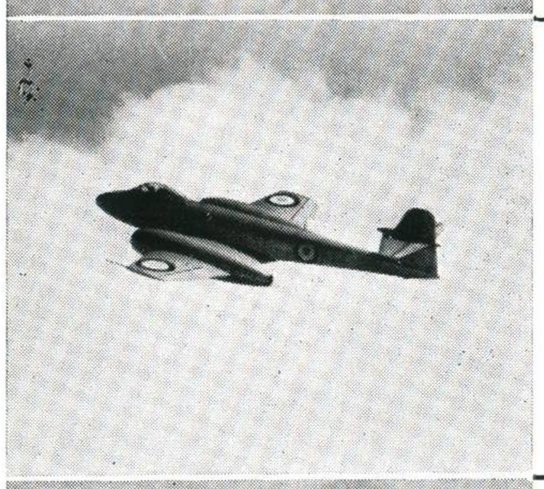
METEOR F Mk.4

(2 R.R. Derwent 5)

Span 37′ 2″ Length 41′ 3″







Gloster (British)

METEOR F Mk.8

(2 R.R. Derwent 5)

Span 37′ 2″ Length 44′ 7″

Lockheed (U.S.)

F-80 SHOOTING STAR

(1 General Electric J.33)

Span 40′ 6″ Length 36′ 0″

Vickers (British)

ATTACKER F Mk.1

(1 R.R. Nene)

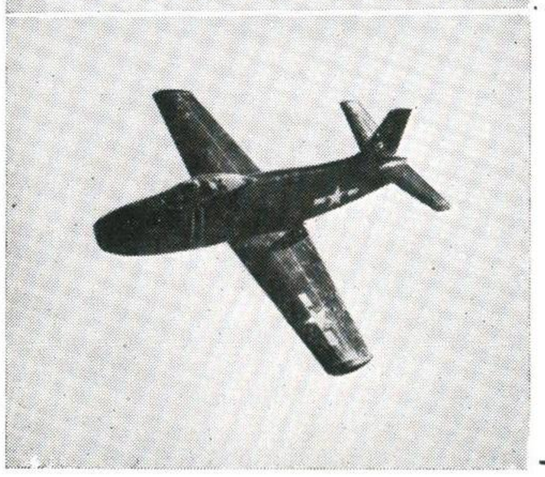
Span 36′ 11″ Length 37′ 6″

Republic (U.S.)

F-84 THUNDERJET

(1 Allison J.35)

Span 37′ 6″ Length 36′ 6″

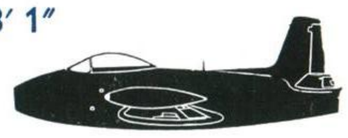


North American (U.S.)

FJ-1 FURY

(1 Allison J.35)

Span 33′ 8″ Length 38′ 1″

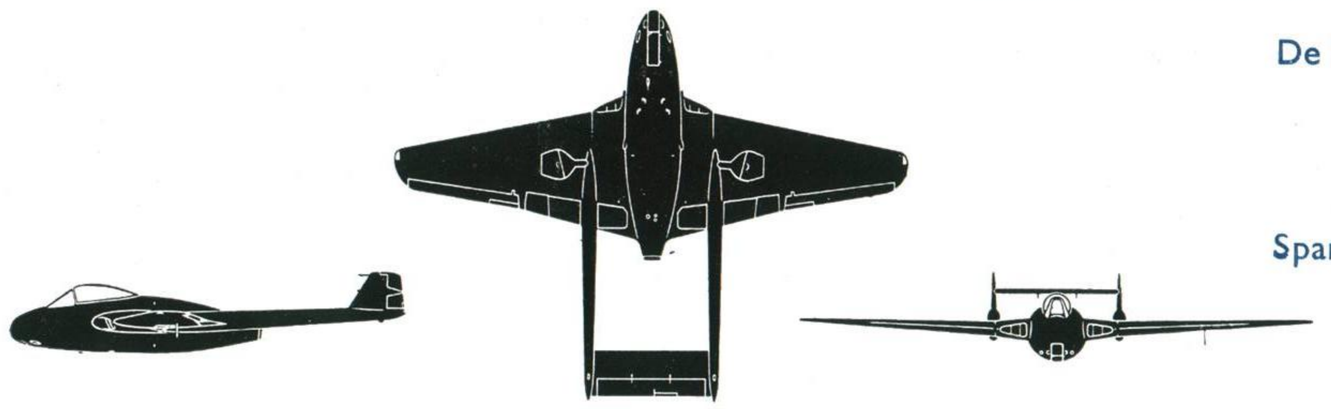


Hawker (British)

SEAHAWK F Mk.1

(1 R.R. Nene)

Span 36′ 6″ Length 38′ 4″

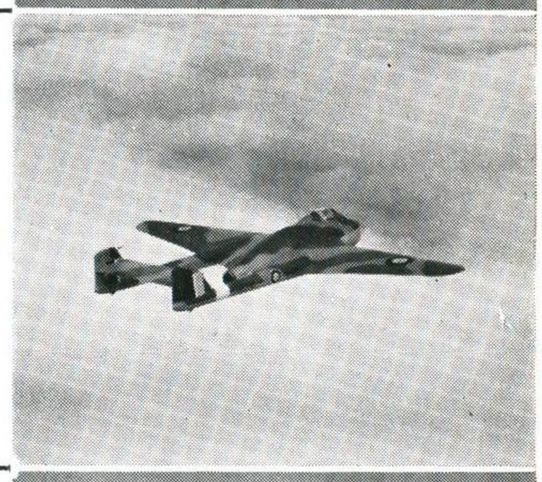


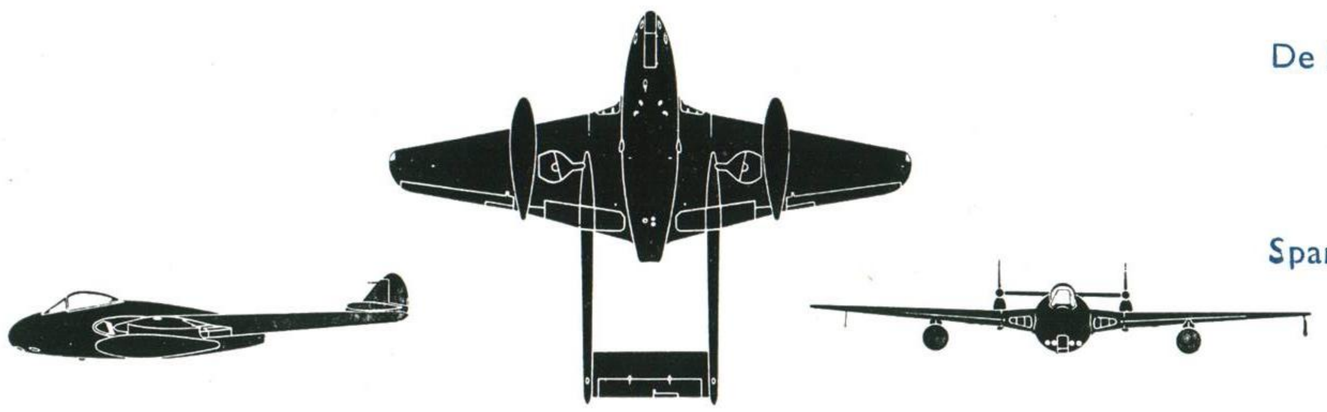
De Havilland (British)

VAMPIRE F Mk.3

(1 D.H. Goblin)

Span 40′ 0″ Length 30′ 9″



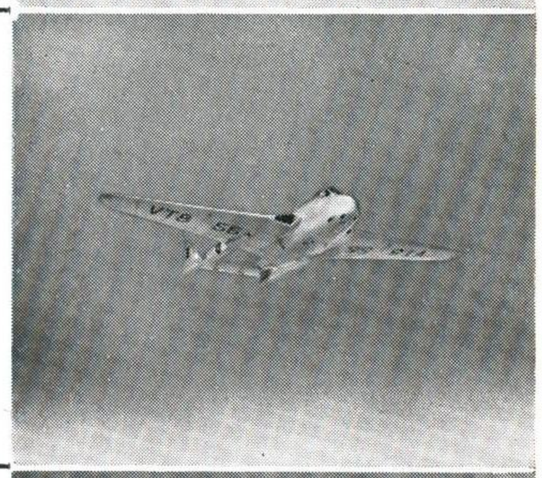


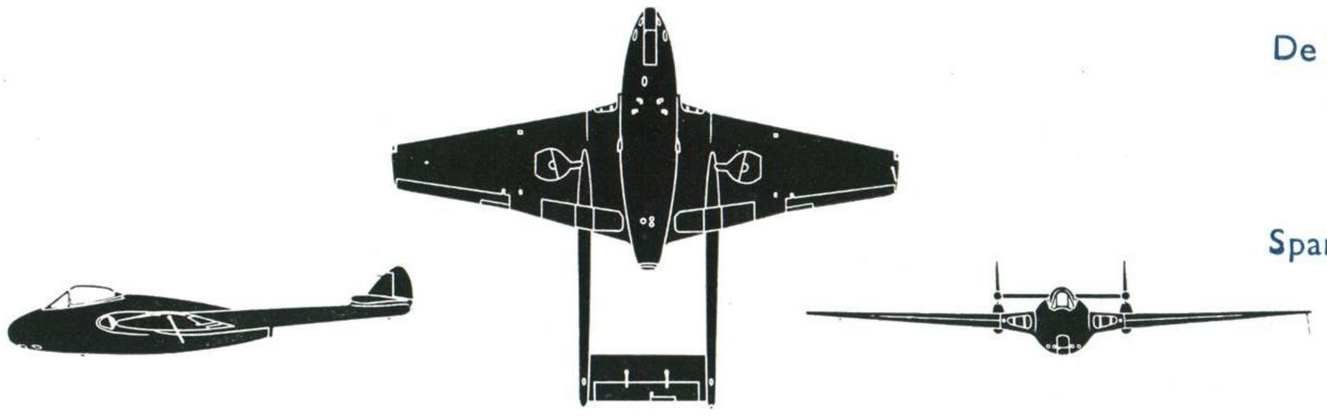
De Havilland (British)

VAMPIRE F Mk.1

1 D.H. Goblin)

Span 40′ 0″ Length 30′ 6″



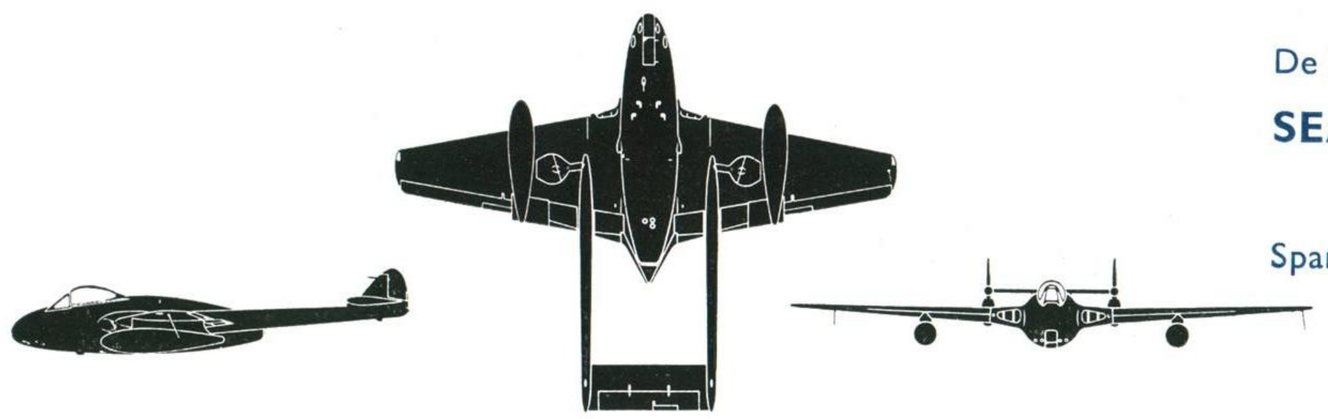


De Havilland (British)

VAMPIRE FB Mk.5

(1 D.H. Goblin 2)

Span 38′ 0″ Length 30′ 9″

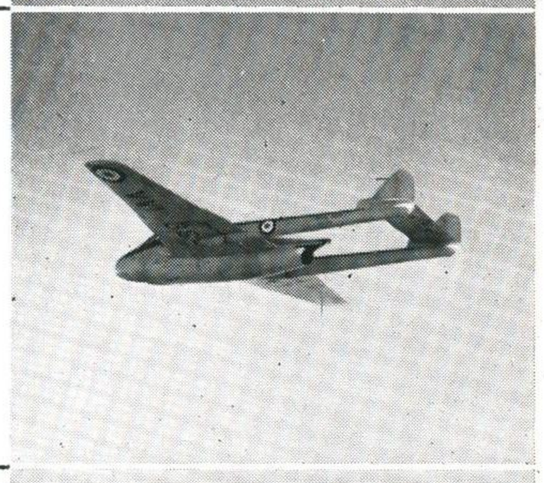


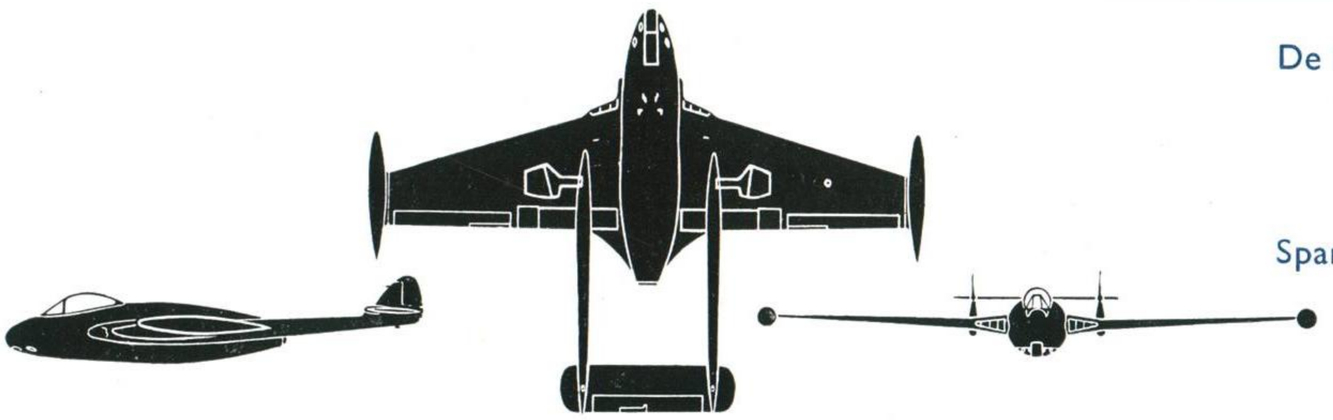
De Havilland (British)

SEA VAMPIRE F Mk.20

(1 D.H. Goblin 2)

Span 38′ 4″ Length 30′ 9″



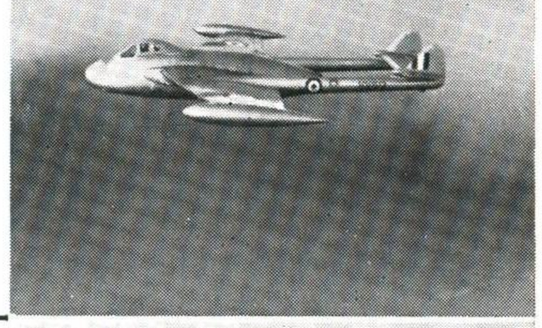


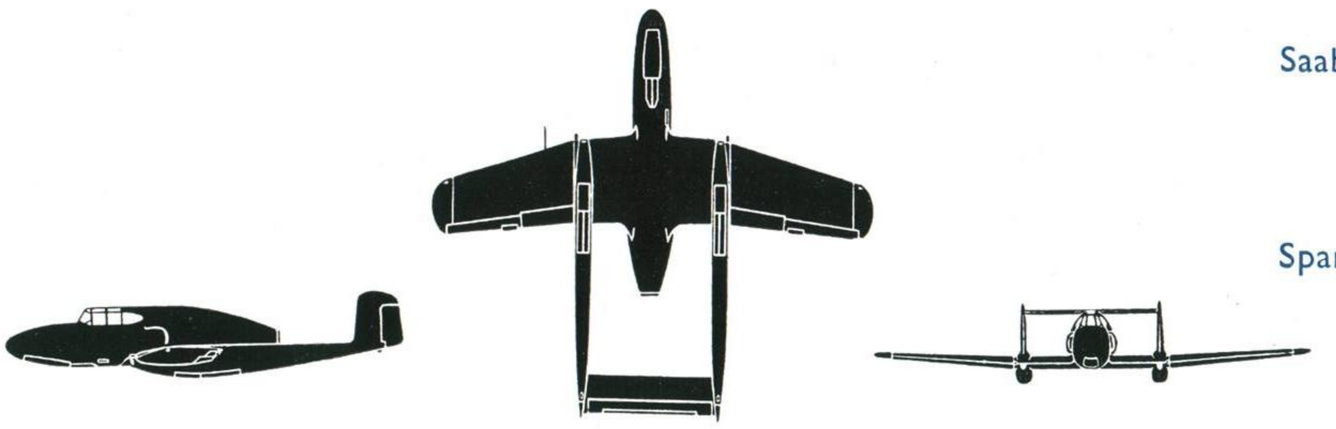
De Havilland (British)

VENOM FB Mk.1

(1 D.H. Ghost 2)

Span 41′ 9″ Length 31′ 3″





Saab (Swedish)

J.21R

(1 D.H. Goblin 2)

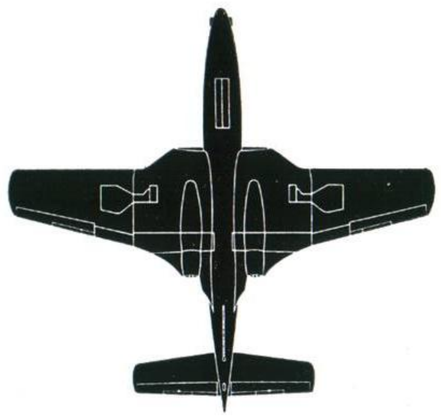
Span 38′ 1″ Length 34′ 3″

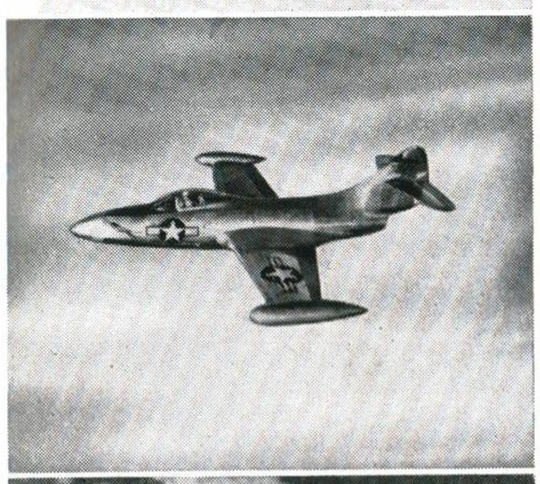
McDonnell (U.S.)

F2H-1 BANSHEE

(2 Westinghouse J.34)

Span 41′ 7″ Length 40′ 1″



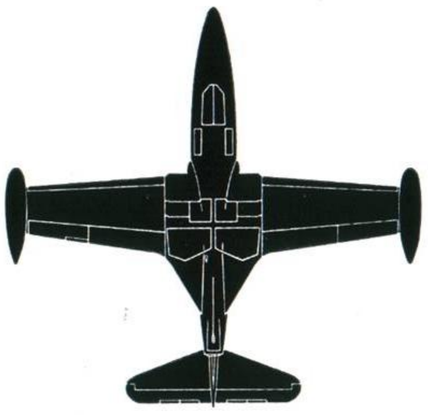


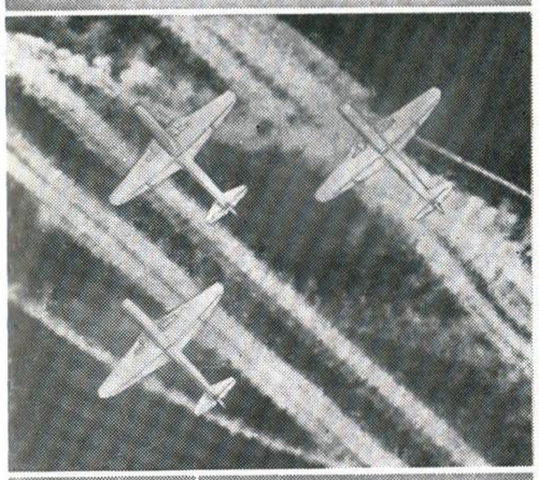
Grumman (U.S.)

F9F-3 PANTHER

(1 P. & W. Turbowasp (Nene))

Span 35′ 9″ Length 38′ 6″



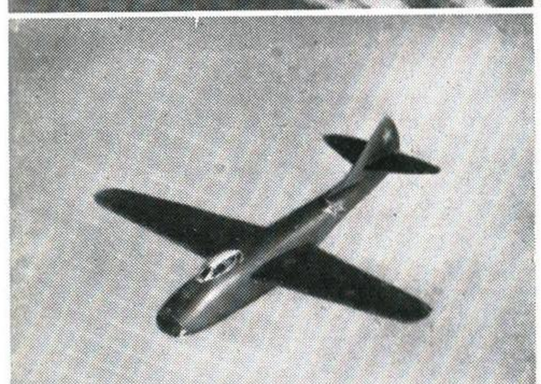


Yakovlev (Russian)

YAK-15

(1 BMW 003)

Span 32′ 10″ Length 29′ 0″

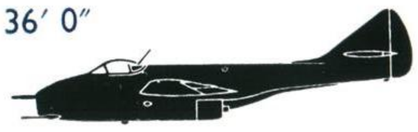


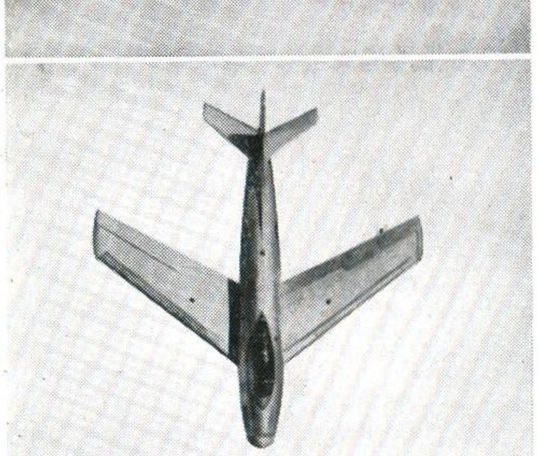
Mikoyan-Gurevich (Russian)

MIG-9

(1 BMW 003)

Span 40′ 6″ Length 36′ 0″





North American (U.S.)

F-86 SABRE

(1 General Electric J.47)

Span 37′ 1″ Length 37′ 6″

Mikoyan-Gurevich (Russian)

MIG-JET (Swept-wing)

(Provisional silhouette)

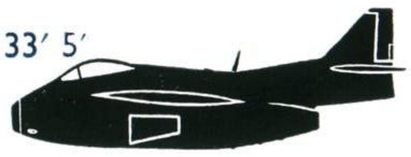
Span 34′ approx. Length 32′ approx.

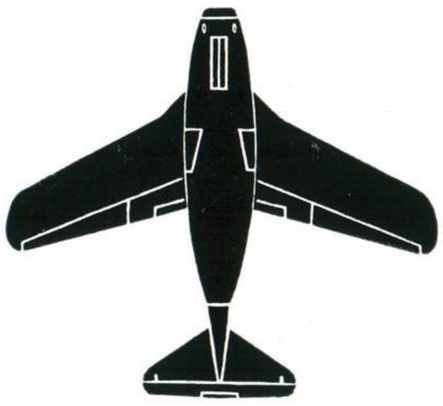
Saab (Swedish)

J.29

(1 D.H. Ghost)

Span 36′ 0″ Length 33′ 5′





Cover : Meteor NF Mk.11 Night Fighter as a sombre sinister shadow in the twilight. True form is revealed in the daylight views below.

SOLUTIONS TO RECOGNITION TESTS IN THIS EDITION :

SILLOGRAPHS

797 Meteor F Mk.8
798 Seahawk F Mk.1
799 F9F Panther
800 Venom FB Mk.1
801 MIG-JET
802 Meteor F Mk.4
803 FJ-1 Fury
804 Attacker
805 MIG-9
806 Vampire FB Mk.5
807 F2H Banshee
808 F-86 Sabre
809 F-80 Shooting Star
810 Vampire F Mk.1
811 YAK-15
812 Sea Vampire B Mk.20
813 Saab J.29
814 Vampire F Mk.3
815 Saab J.21R
816 F-84 Thunderjet
817 Vampire F Mk.1
818 Attacker
819 MIG-9
820 F-86 Sabre
821 YAK-15
822 Saab J.21R
823 MIG-JET
824 F9F Panther
825 FJ-1 Fury
826 Saab J.29
827 Meteor F. Mk 8
828 F2F Banshee
829 F-80 Shooting Star
830 F-84 Thunderjet
831 Vampire FB Mk.5
832 Seahawk F Mk.1
833 Venom FB Mk.1
834 Meteor F Mk.4
835 Meteor F Mk.8
836 Vampire FB Mk.5
837 Seahawk F Mk.1
838 Vampire F Mk.1
839 Sea Vampire F Mk.20
840 Attacker
841 Vampire F Mk.3
841A F-80 Shooting Star
842 F9F Panther
843 F-84 Thunderjet
844 MIG-9
845 Saab J.29
846 MIG-JET
846A Seahawk F Mk.1
847 Meteor F Mk.4
848 YAK-15
849 F-86 Sabre
850 Saab J.29
851 F-80 Shooting Star
852 F2H Banshee
853 Venom FB Mk.1
854 FJ-1 Fury
855 Venom FB Mk.1
856 Meteor F Mk.4
857 F-80 Shooting Star
858 Meteor F Mk.4
859 Vampire F Mk.1
860 YAK-15
861 Saab J.21R
862 Attacker
863 Saab J.29
864 F9F Panther
865 Sea Vampire F Mk.20
866 F-86 Sabre
867 F-84 Thunderjet
868 Meteor F Mk.8
869 Vampire FB Mk.5
870 MIG-9
871 F2H Banshee
872 FJ-1 Fury
873 MIG-JET
874 Seahawk F Mk.1

ELEMENTARY

844 Meteor F Mk.4
845 Venom FB Mk.1
846 Vampire FB Mk. 5
847 Attacker
848 Venom FB Mk.1
849 F2H Banshee
850 F-80 Shooting Star
851 Saab J.29
852 Meteor F Mk.8
853 Saab J.21R
854 F-84 Thunderjet
855 F2H Banshee
856 Vampire F Mk.1
857 YAK-15
858 F9F Panther
859 Seahawk F Mk.1
860 Sea Vampire FB Mk.20
861 FJ-1 Fury
862 F-84 Thunderjet
863 MIG-9
864 F-86 Sabre

AEROGRAM
A Suit Saver = Auster Avis

FLYING SAUCER?
A photograph of the Vickers Supermarine 535

TRICKY TRIO
Left to right : F9F Panther ; F2H Banshee ; Seahawk F Mk.1.

TAIL-PIECE

Remark overheard on tarmac at Royal Naval Air Station as an Anson flew over : "Good Lord ! I never knew the Swordfish had two engines."

TRICKY TRIO

52M 11/50 38-241-0

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