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JOINT



SERVICES

RECOGNITION

Journal



Vol. 23 FEBRUARY 1968 No. 2



Solution on the back cover



The *Joint Services Recognition Journal* is a monthly publication produced by the Directorate of Flying Training (R.A.F.), Ministry of Defence, and prepared in collaboration with the Admiralty Board, the Army Department and the Ministry of Technology. Applications for copies can only be accepted from the Services or other official bodies, and must be submitted through the normal official publications supply channels—not to the Editorial Office or direct to the Ministry of Defence.

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NO MORE RECOGNITION TRAINING!

NO MORE RECOGNITION TRAINING? Yes, that's what we said! And when the true and simple meaning of the word "recognition" is appreciated it will be realised that such a need never existed. What has been needed—and still is—is *identity* training.

This is not a quibble: nor a matter of terminological exactitude: it is a matter of bringing home to all concerned the true nature of the training needed to enable the non-expert spotter chaps—who incidentally, form the majority of the Services—to learn to identify aircraft, ships and vehicles to a good high standard, which they can well be trained to do if given the right methods.

Nature has endowed us all with the ability automatically to learn to recognise (it means knowing, when we see something, whether we have seen it before). On the other hand nature has not endowed us with the same degree of ability to *identify* those things we see again (i.e., the ability to be able to *say precisely what it is* we are seeing again).

If you think about it in those terms you will realise that you can recognise a great many more things than you can identify and it is in this faculty that we need specific training particularly where large groups of objects such as aircraft, ships and/or tanks have to be identified individually.

Look at the picture opposite. It shows two of the many hundreds of different aircraft types flying today. Did you identify them the instant you clapped eyes on them? If you did, good for you!—and goodbye! We're not concerned with you. Nothing personal, of course, but this is not a game for experts. On the other hand, if you were one of those who did not know them, or who knew you knew them but could

not name them—who *recognised* but did not *identify*—then we can help you.

If these were the only aircraft you needed to know you could easily memorise names and features, but they are amongst many you may have to identify in a flash. To try to memorise each as so many bits and pieces of information *and* the name of each asks too much of anybody. Identity training is not a matter of information and knowledge or of memorising in the ordinary sense: it is a matter of *experience*. You may feel the need for knowledge later, but a skill demands very little knowledge: it is a "doing" thing, like tennis or golf which we learn by playing tennis or golf. To learn to identify we start to identify.

Now here we have to be a bit careful because it may be thought that spotting tests provide training. Actually they don't; they only find out if you've been trained.

In principle identity training consists of a continuous process of systematically finding out the identity of an object with the aid of a known key, the process continuing until identifying is automatic and without the aid of the key.

Now a word for the experts. We have already said that this is not a game for you because you are already trained. But you are often expected to train others in your skill and you may find this rather hard going. But you must remember that your trainees may not be motivated by the same deep interest in the subject as you are—nor must you expect them to be. In time, a few may acquire such an interest but most of them will not and cannot therefore benefit from the kind of training which appeals to you personally. But they will absorb and enjoy and benefit from practical identifying work such as is provided by this *Journal*.

LESSON INSTRUCTIONS

Identity training is a matter of "doing", rather than of gathering information. Submit to the instructions given below in every lesson and the ability to identify will become automatic.

1. Read the text associated with the lesson.
2. Prepare a list of target numbers so as to be able to tackle the targets in any order.
3. Identify the target pictures by comparing them with the key views: start with the easy ones so as to gain experience: also use targets already identified to solve the more difficult ones.
4. When certain of the identity of a target write down its name *IMMEDIATELY* against the appropriate number on your list. **THIS IS IMPORTANT**
5. Lessons should not be hurried or given a time limit. So far as beginners are concerned, it is more important to identify accurately than quickly.
6. Do not attempt conscious memorising of details, shapes, or names. The procedure will take care of that. Do not attempt to do it without the key too soon, wait until it is self-evident.

Conduite des leçons

1. Lire le texte correspondant à la leçon.
2. Préparer une liste de numéros de cible, de façon à pouvoir prendre les cibles dans n'importe quel ordre.
3. Identifier les photos de la cible en les comparant avec les vues-clé: commencer par les plus faciles de manière à gagner de l'expérience: se servir aussi de cibles déjà identifiées pour trouver les plus difficiles.
4. Quand vous serez certain de l'identité d'une cible, notez son nom immédiatement en face du numéro correspondant sur votre liste. **CECI EST IMPORTANT.**
5. Les leçons ne devront pas être précipitées ou d'une durée limitée à l'avance. En ce qui concerne les débutants, il est plus important d'identifier avec précision que rapidement.
6. Ne pas s'efforcer d'apprendre par cœur les détails, les formes ou les noms.

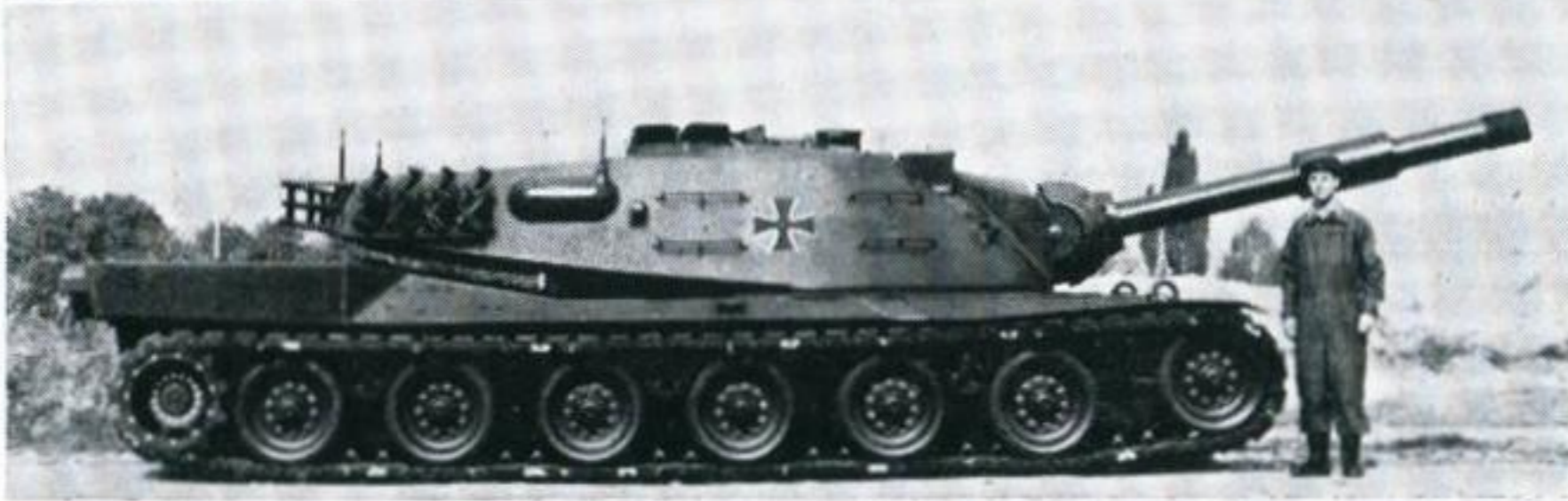
Gebrauchsanweisung für die Typenlehre

Um den größten Nutzen aus den Übungsbildern, die in diesem Heft veröffentlicht werden, zu ziehen, sollte wie folgt verfahren werden.

1. Den zur Lehre gehörigen Text lesen.
2. Eine numerierte Typenliste vorbereiten, in der angesprochene Typen in eine gewisse Ordnung gebracht werden können.
3. Typen ansprechen durch Vergleich mit den Hauptansichten (von oben, von unten, von vorne, von hinten und von der Seite). Anfangen mit den einfachen Bildern, um Erfahrung zu bekommen. Die angesprochenen Typen zur Ansprache der schwierigeren benutzen.
4. Wichtig: Sobald ein bestimmtes Flugzeugbild mit Sicherheit richtig angesprochen ist, sofort die Typenbezeichnung in die entsprechende Stelle der Liste eintragen.
5. Bei der Übung nicht beeilen oder eine zeitliche Begrenzung festlegen. Für Anfänger ist es wichtiger, richtig anzusprechen als schnell.
6. Nicht mit Einzelheiten, Umrissen, Namen aufhalten.

MBT-70

A United States-German Main Battle Tank for the 1970s



No tank has attracted as much attention recently as the MBT-70, the U.S.-German main battle tank for the seventies. The reasons are that it represents an important example of international cooperation and embodies several advanced features.

The development of the MBT-70 dates from August 1963, when the United States and Germany agreed to develop jointly a single battle tank for their armies. The basic design was approved by both countries in March 1965, and the first prototypes of the MBT-70, which are illustrated here, were completed in mid-1967.

At first sight the MBT-70 might appear very conventional. In fact its design represents a major departure from traditional practice in having the driver located in the turret. The location of the driver in the turret has reduced the height of the tank but it also posed the problem of keeping the driver facing forward no matter which way the turret is traversed. This has been solved by placing the driver in a "capsule" which rotates in the opposite direction to that of the turret.

The driver's counter-rotating capsule is on the left of the main armament. The right side of the turret is occupied by the other two members of the three-man crew: the gunner and, behind him, the commander. To enable the crew to remain "buttoned up" for long periods in contaminated areas their compartment is provided with air filters, an air conditioning unit and a heater.

The main armament of the MBT-70 consists of a 152-mm. gun/launcher capable of firing Shillelagh guided missiles as well as conventional projectiles. The 152-mm. gun/launcher is similar to that already used in the M551 Sheridan light tank and the M60A1E1 battle tank but it has a considerably longer barrel. In consequence it is capable not only of firing medium-velocity high explosive shells but also high-velocity armour-piercing projectiles.

Secondary armament consists of a coaxial 7.62-mm. machine gun and a 20-mm. automatic cannon mounted in a cupola behind the driver and remotely controlled by the commander or the gunner. The semicircular covers of the cupola can be raised to allow the 20-mm. gun to be elevated and fired by the commander against air targets.

Other features of the MBT-70 include combustible cartridge cases for its conventional rounds and an automatic loading mechanism, which has made it possible to dispense with the human loader and thereby reduce the crew to three men.

One of the most interesting features of the MBT-70 is its variable compression ratio air cooled V-12 diesel engine of 1,475 b.h.p. The engine is of United States manufacture but its ability to vary the compression ratio is based on pistons originally developed by the British Internal Combustion Engines Research Association. The engine gives the MBT-70 a remarkably high power-to-weight ratio of almost 30 b.h.p. per ton and enables it to exceed 40 m.p.h. on level road surfaces.

Yet another important feature of the MBT-70 is its adjustable hydro-pneumatic suspension. The suspension makes it possible for the MBT-70 to "duck" behind cover or, when raised, to increase the ground clearance when moving cross-country. The suspension also makes it possible to tilt the hull to increase the depression of the main armament, so that the MBT-70 can more readily take up firing position on reverse slopes when only the top of its turret needs to be exposed to enemy fire. When required the suspension can also be used to tilt the tank sideways.

All the refinements incorporated into the MBT-70 have, however, made it expensive to produce.

M 109

155 mm s.p. Howitzer



KEY

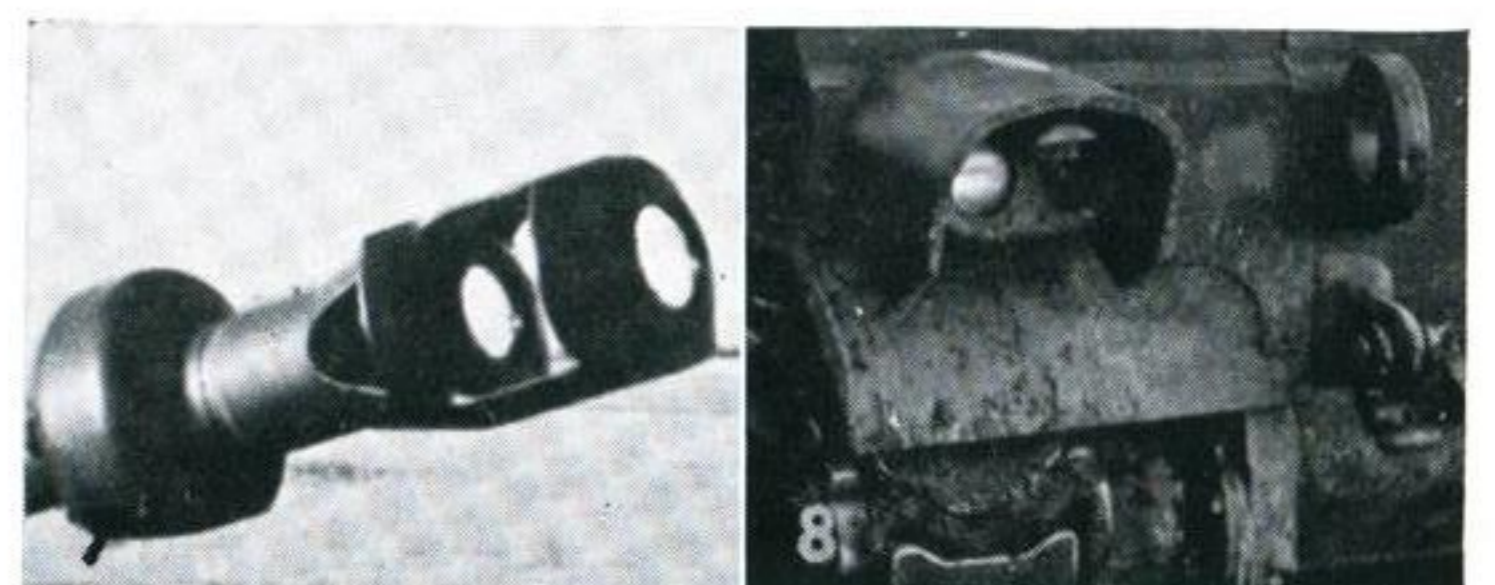
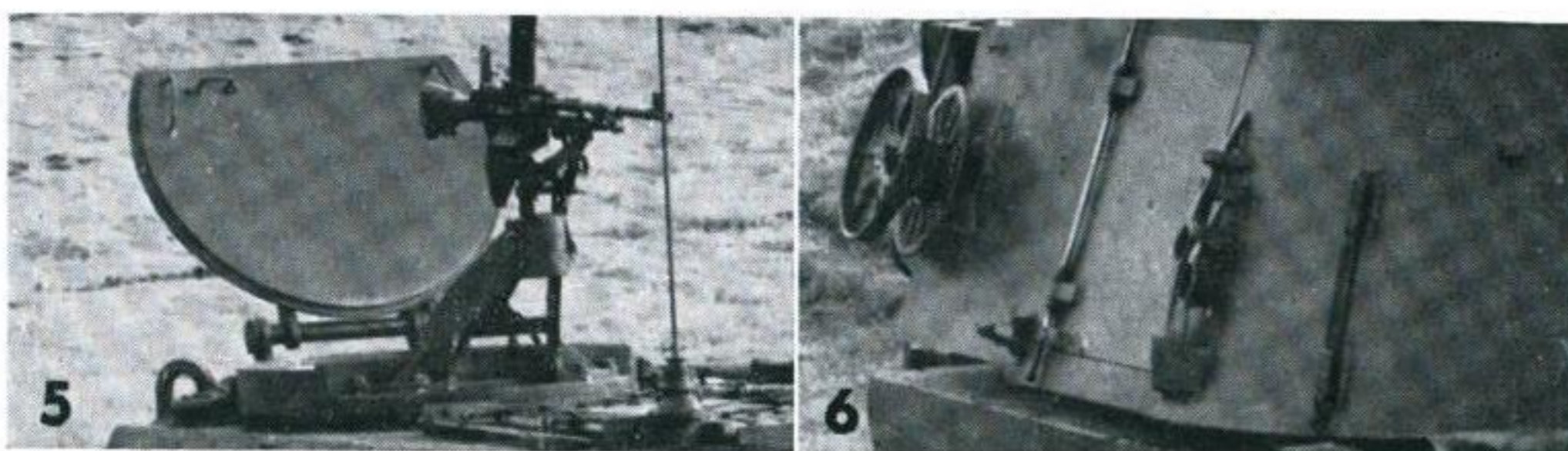
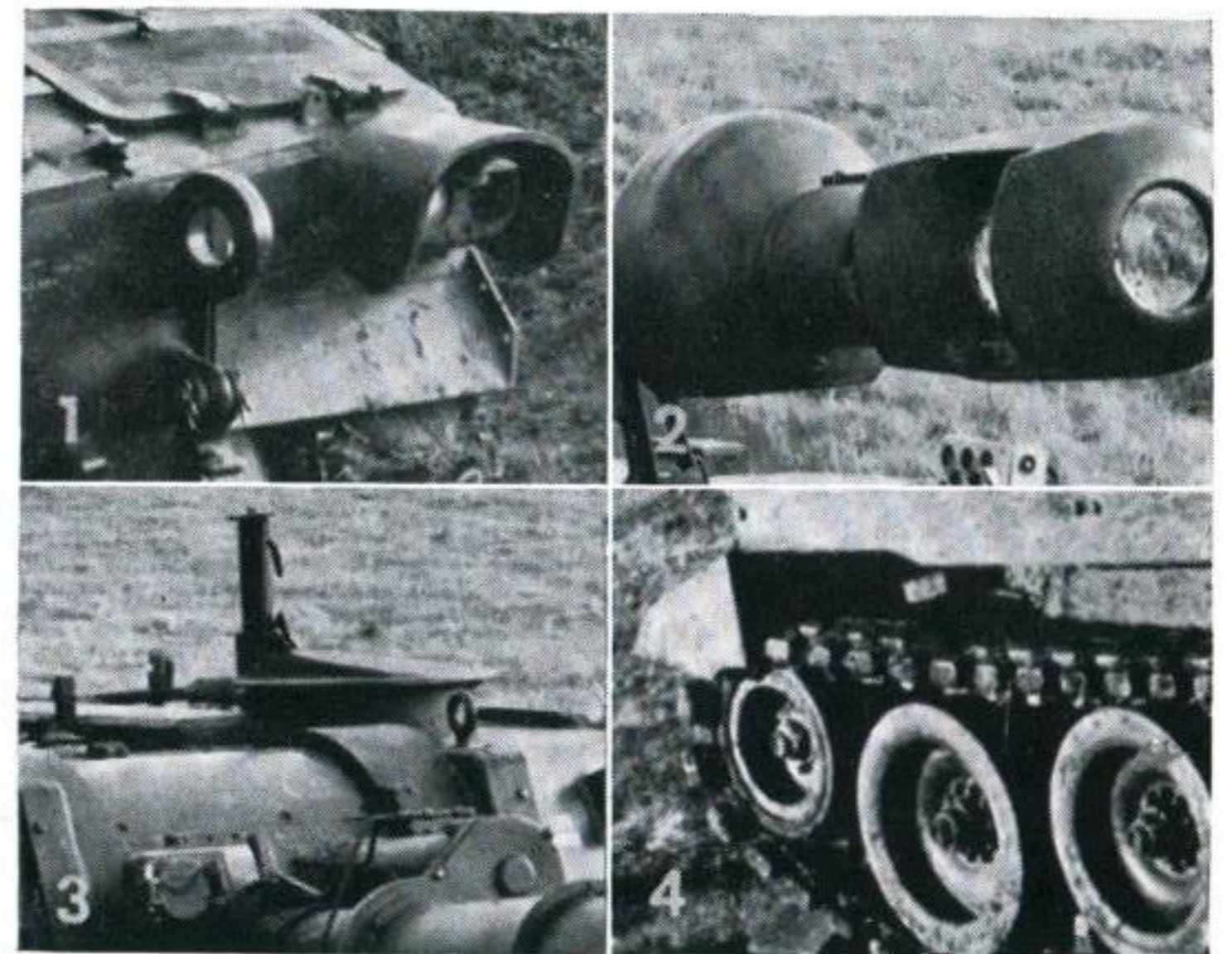
The M109 155-mm. self-propelled howitzer is an American built vehicle which is used not only by the United States but also by the British Army and others, including the German and Italian Armies. It replaces the earlier M44 155-mm. s.p. howitzer on which it is a very considerable improvement.

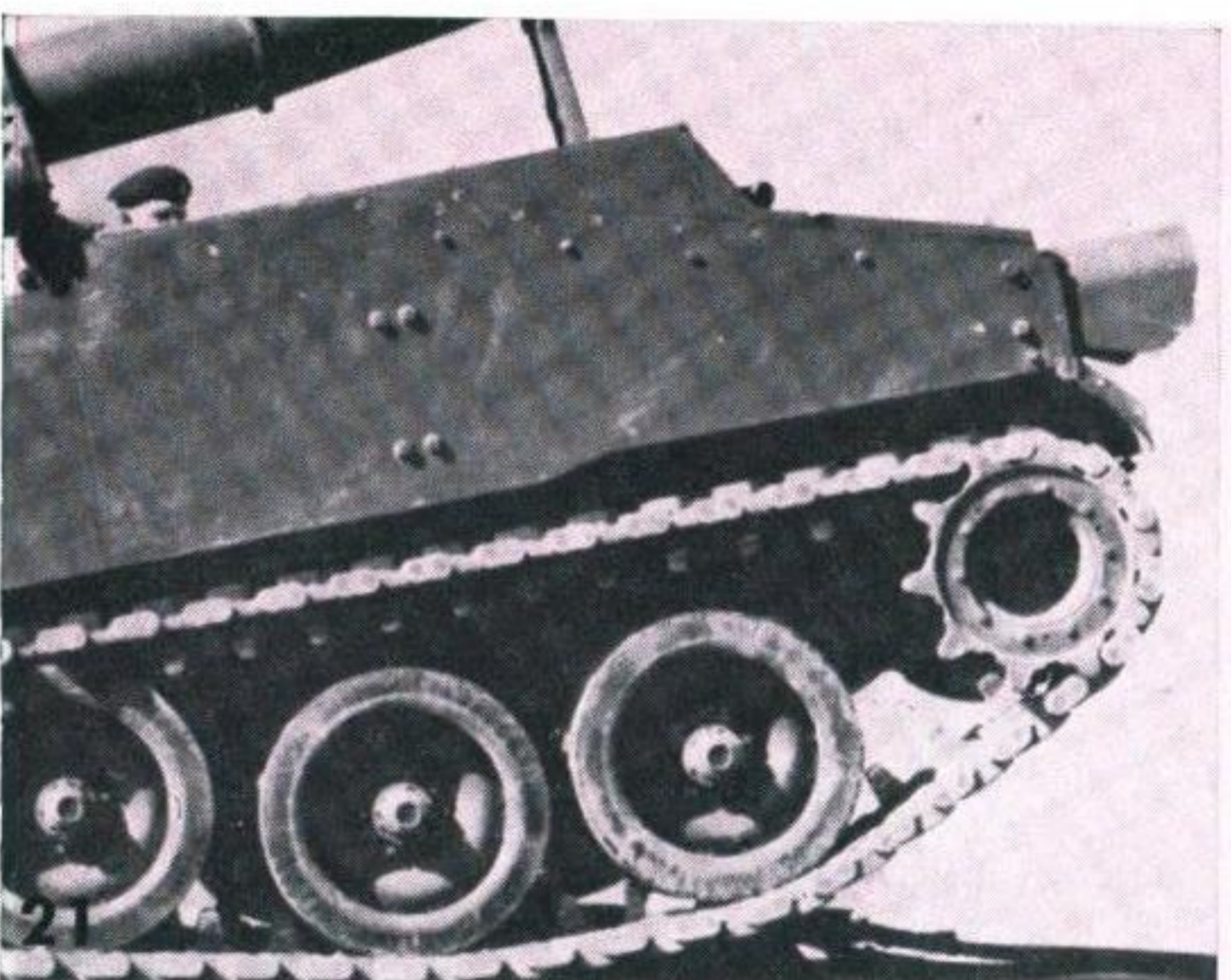
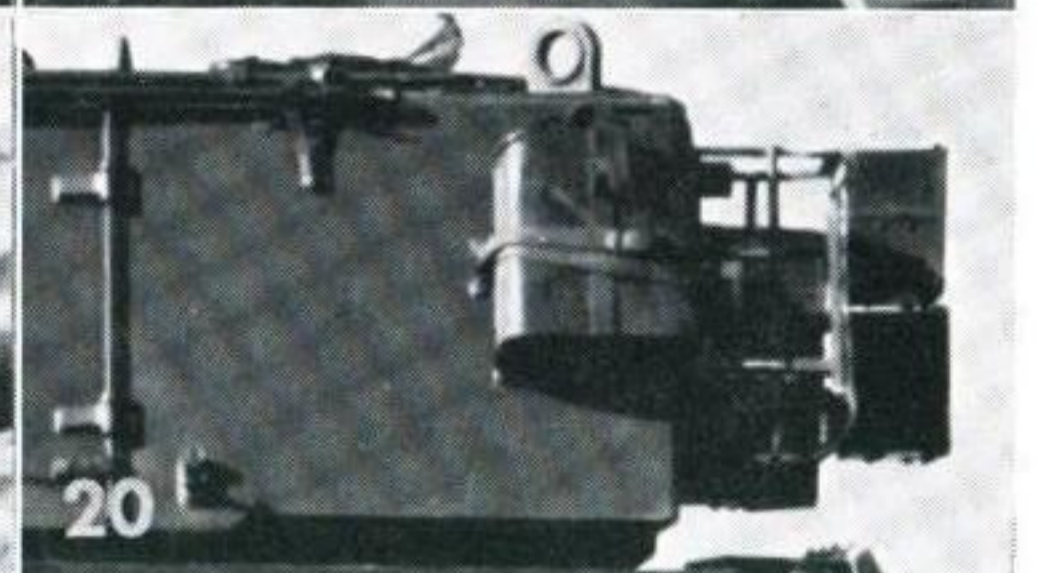
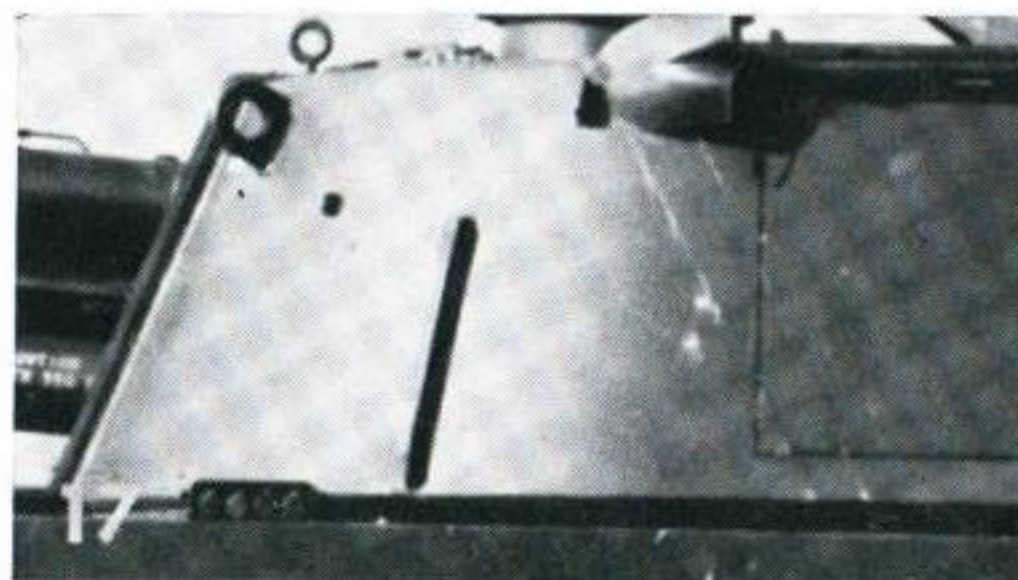
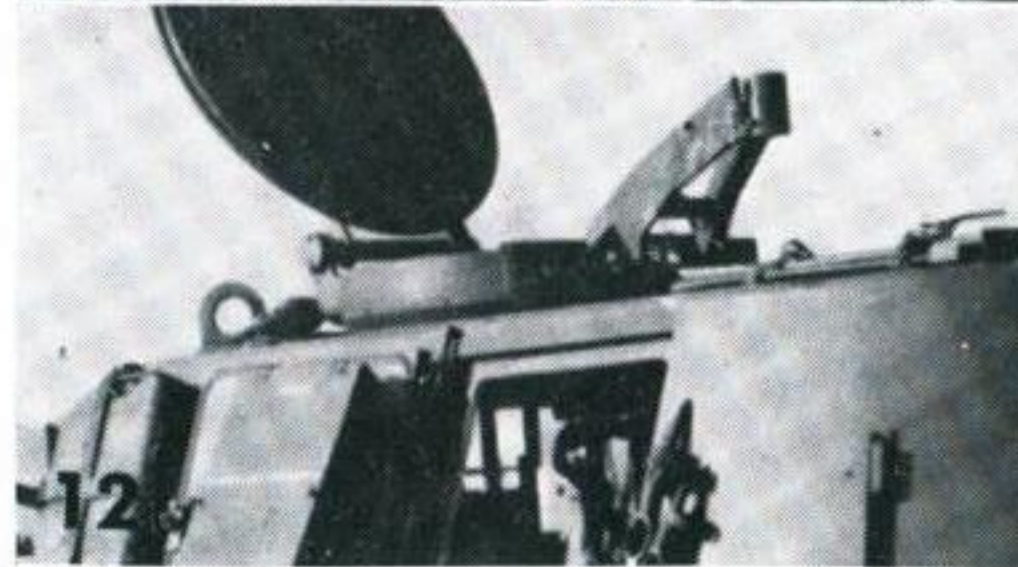
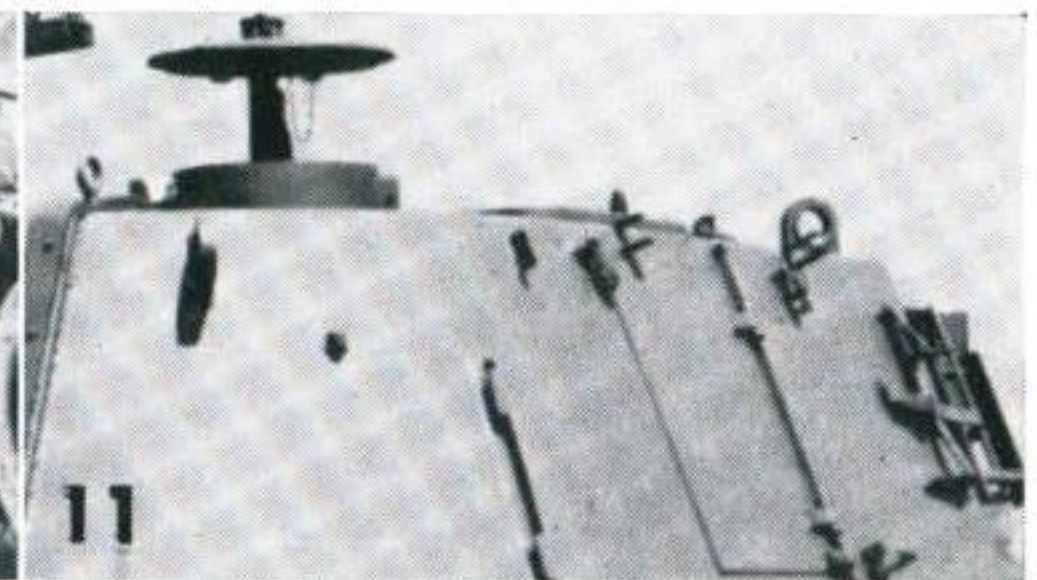
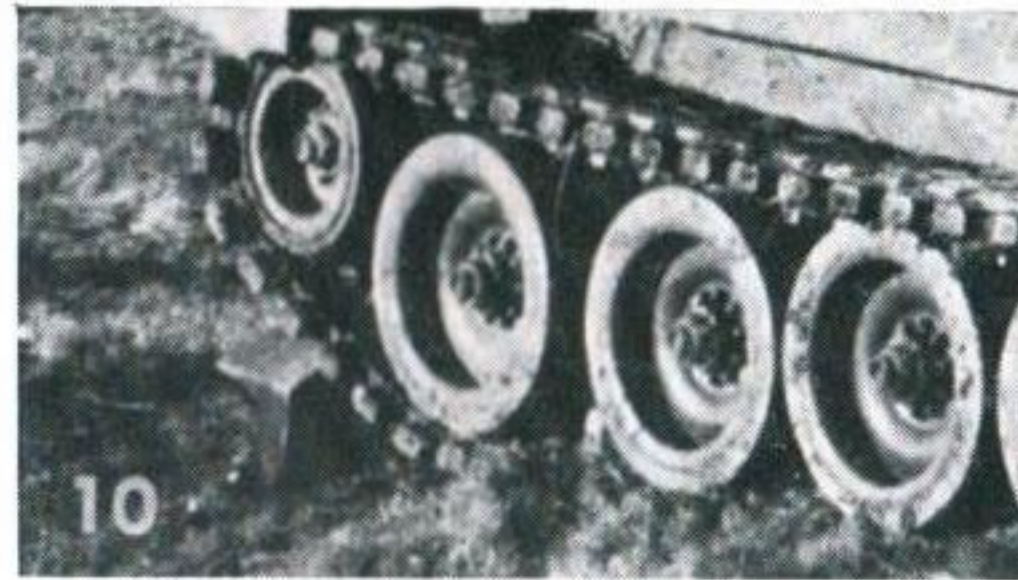
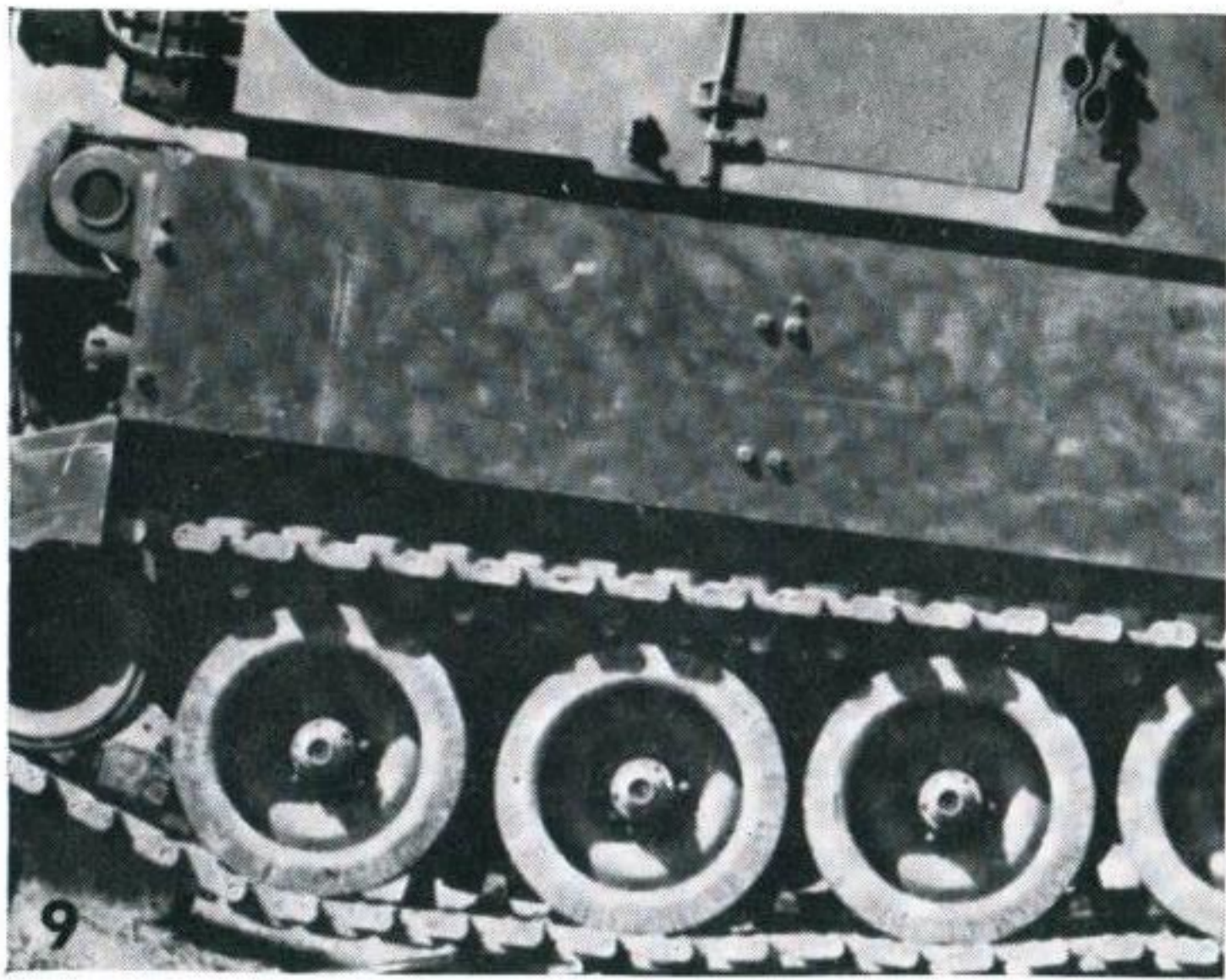
First, unlike the M44, it has its armament mounted in a fully enclosed, rotating turret. The turret is relatively large and is mounted at the rear of the vehicle. The left front part of the hull is occupied by a General Motors V-6 diesel engine and the left by the driver's compartment.

The turret and the hull are both welded from aluminium alloy armour, in contrast to the steel armour of the M44 and other self-propelled guns. The use of aluminium armour has helped to make the M109 sufficiently light in relation to its bulk to be amphibious. Thus, it can swim across inland water obstacles without the use of special flotation equipment.

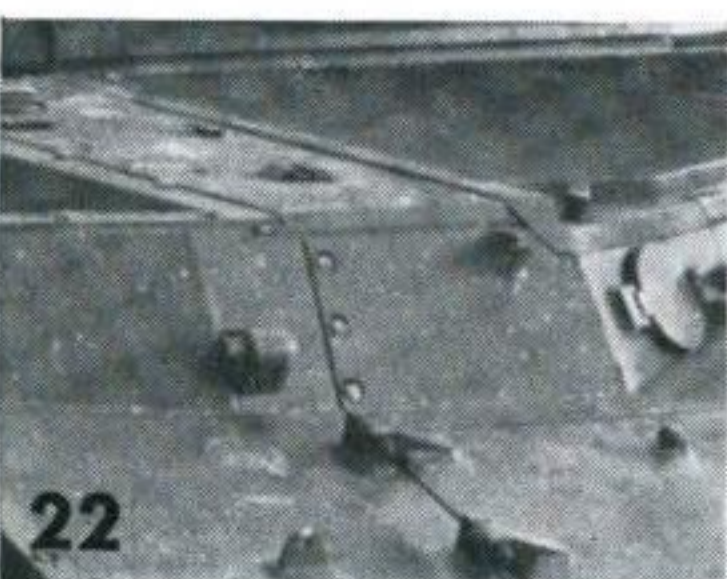
Lesson instructions are on page 32

Solutions on the cover



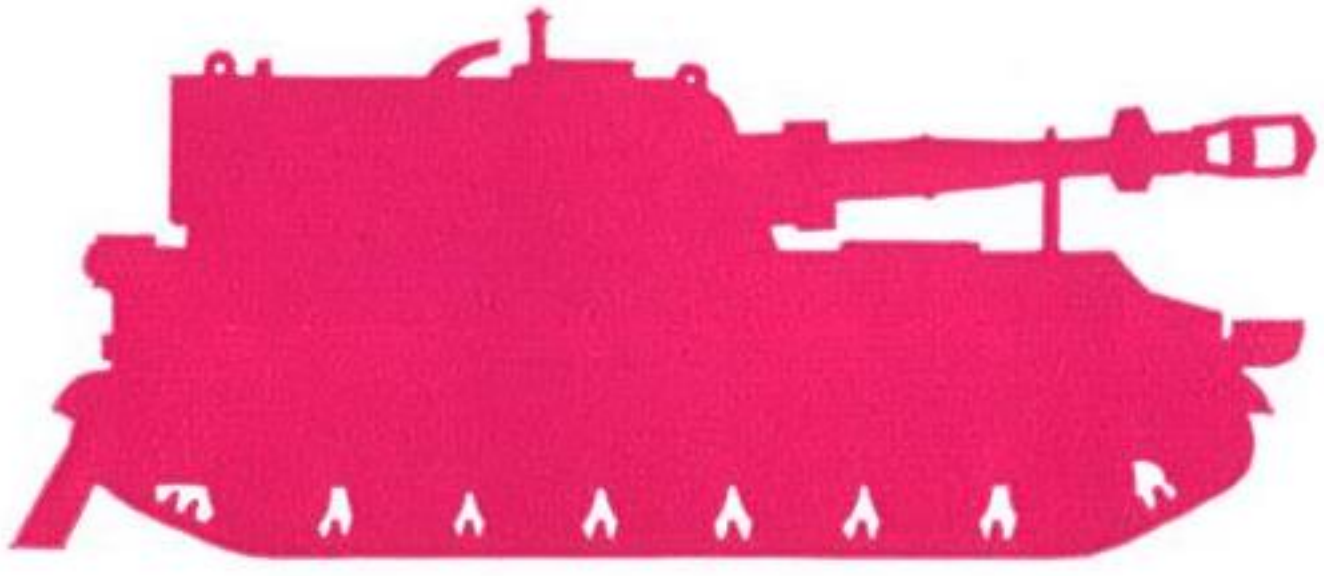


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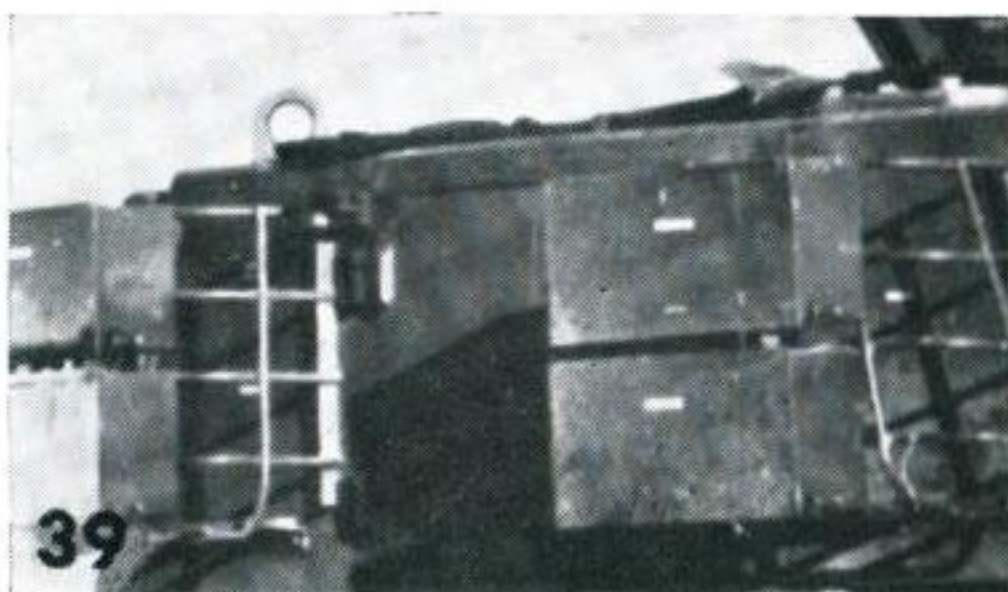
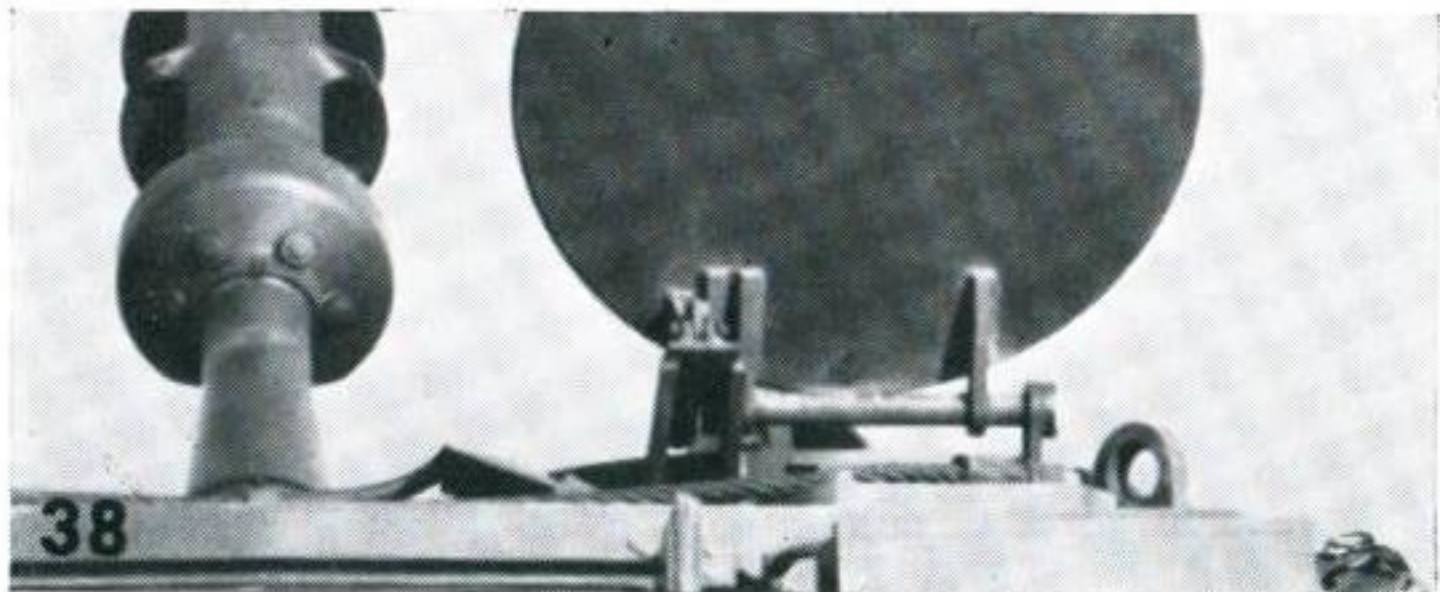
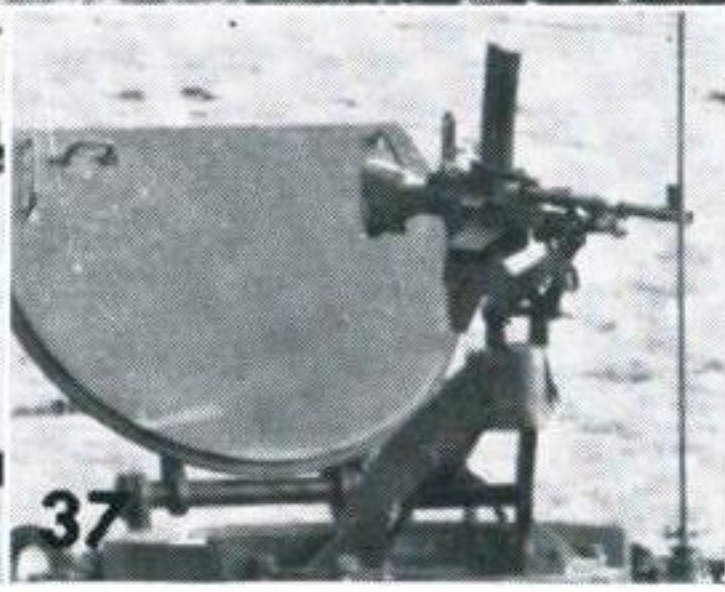
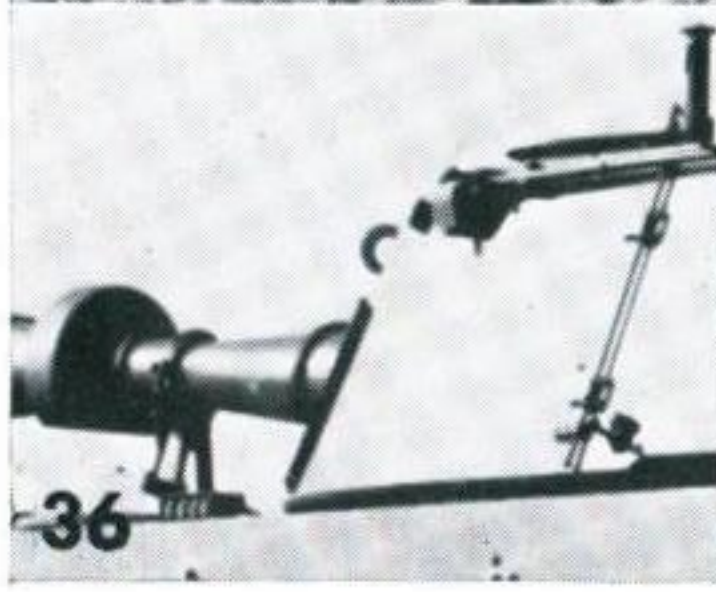
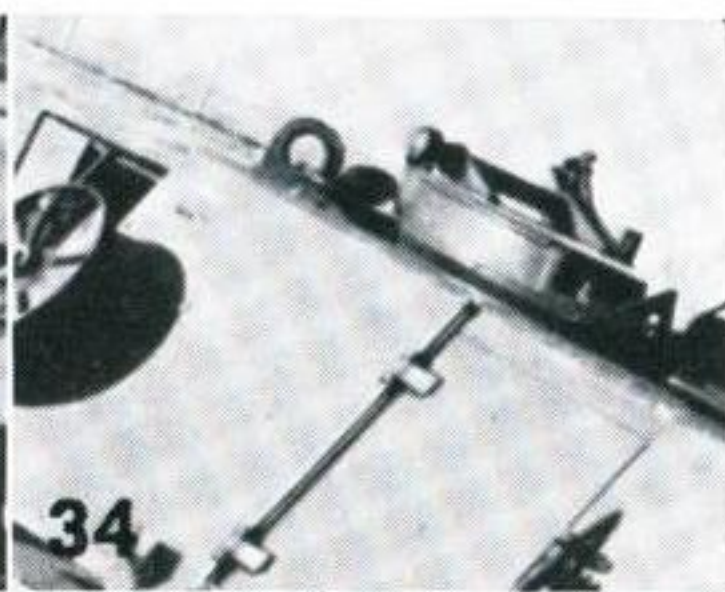
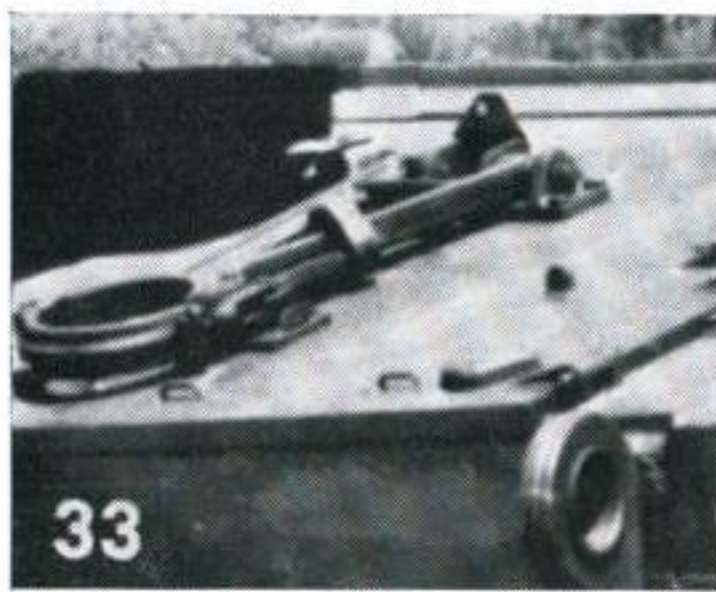
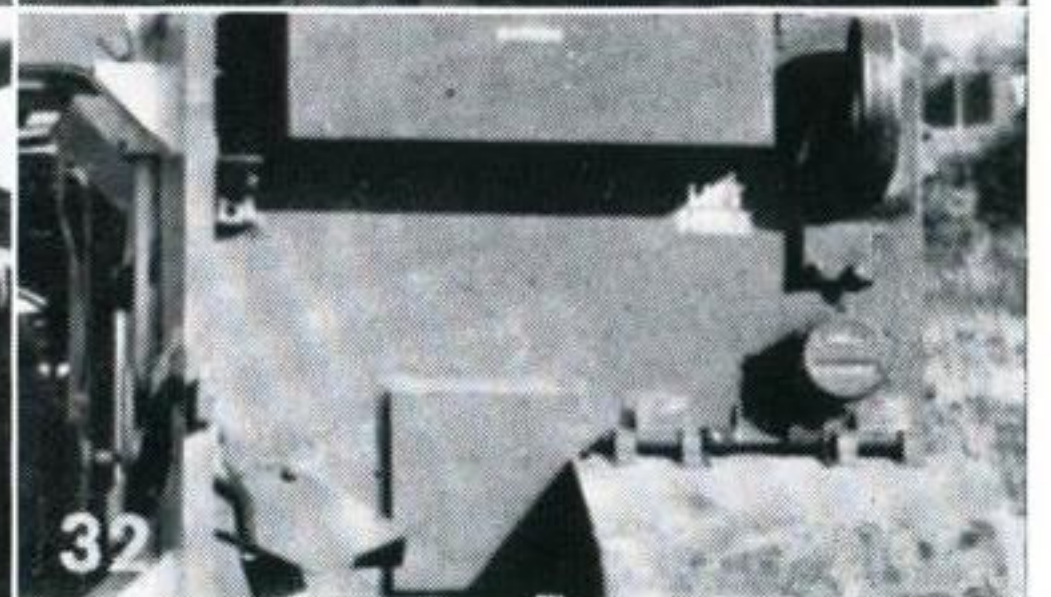
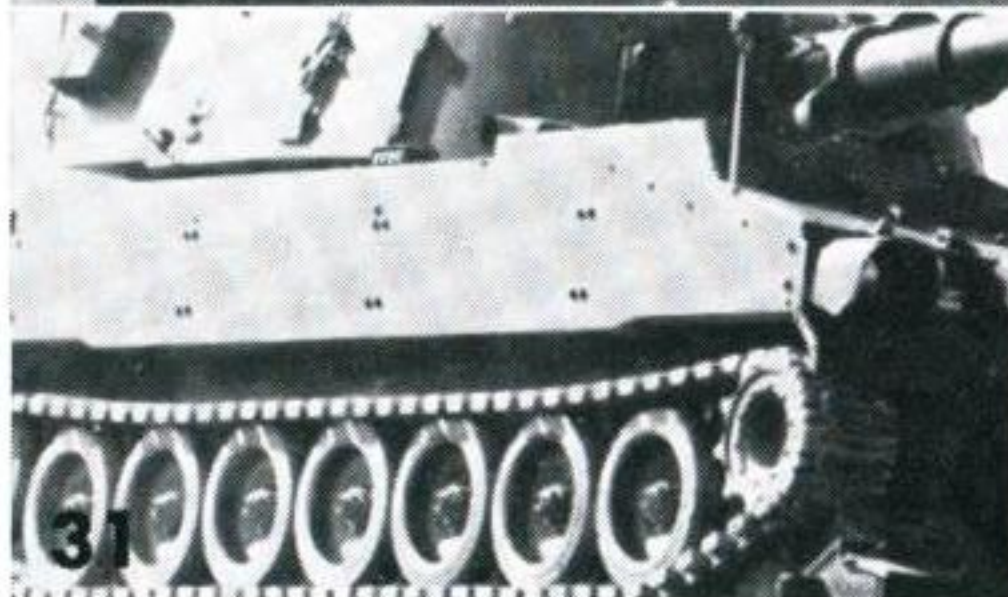
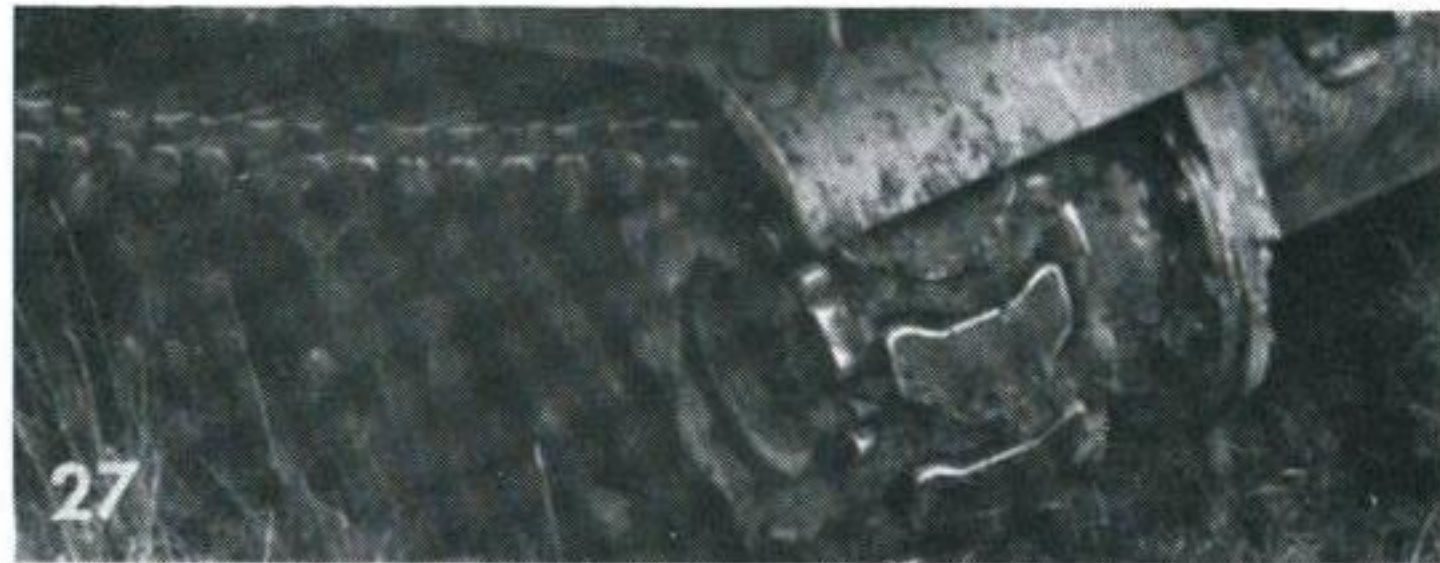
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M 109

155 mm s.p. Howitzer

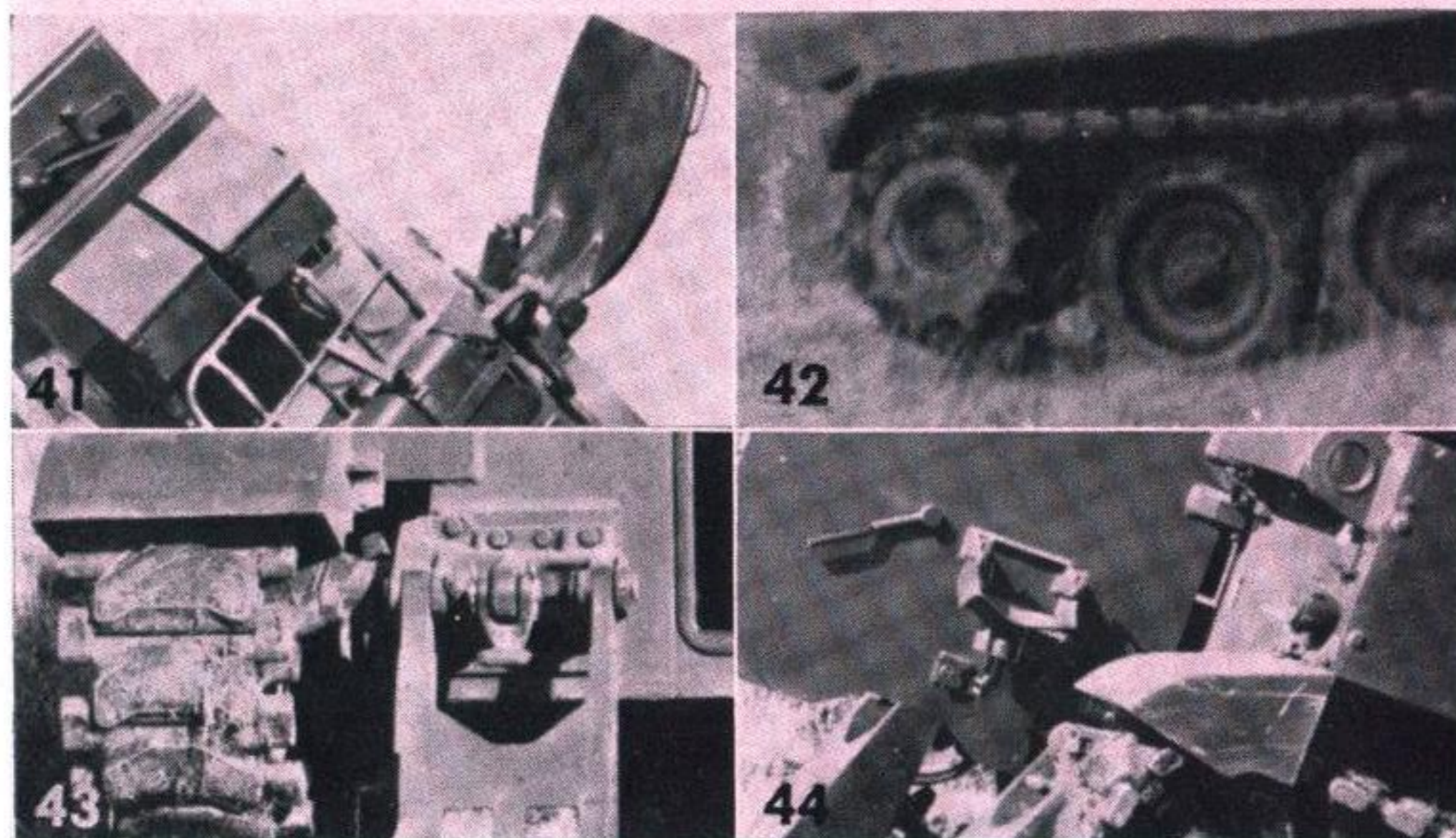




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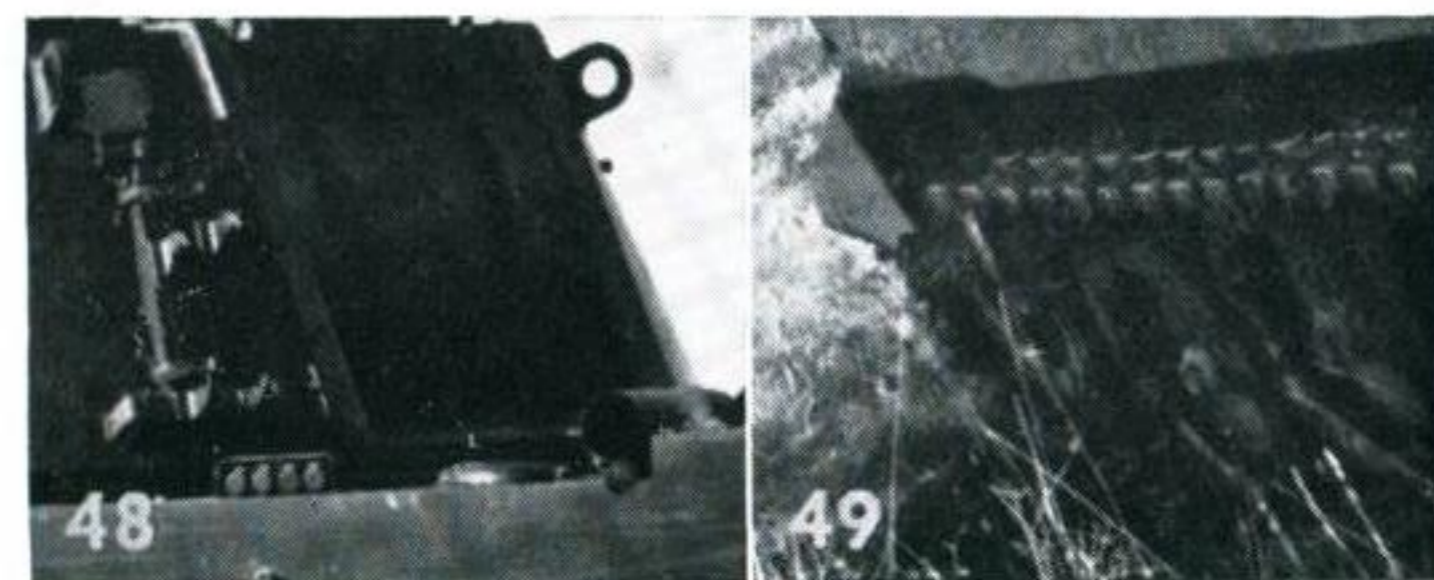
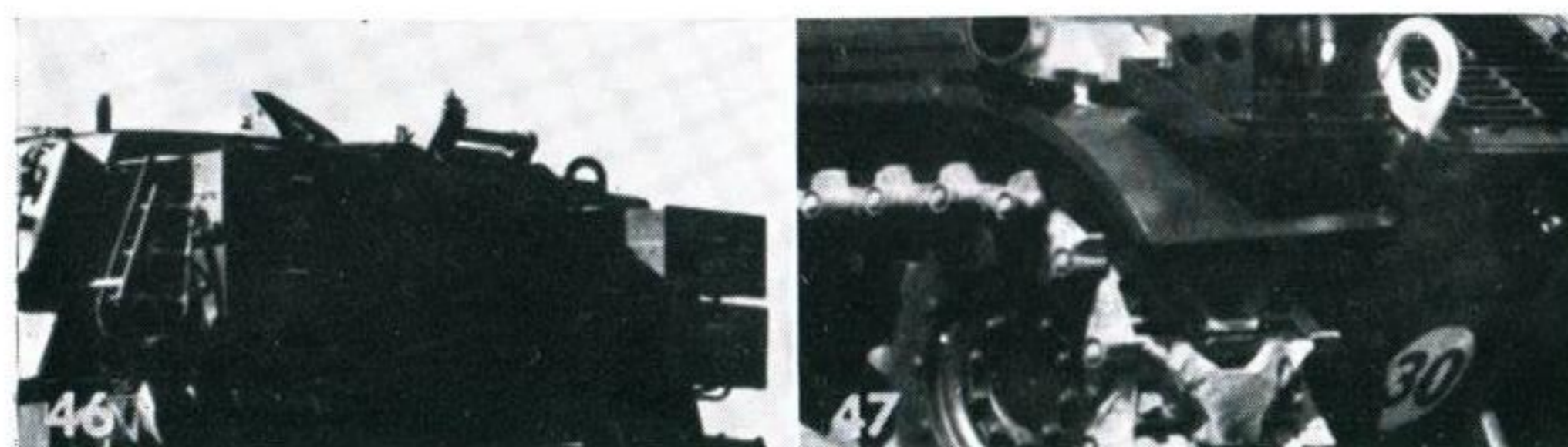
The 155-mm. howitzer of the M109 has a relatively short barrel which tapers appreciably towards the muzzle. Even more characteristic is its short but large diameter fume extractor, or "bore evacuator" in U.S. Army parlance, and the large double-baffle muzzle brake.

The running gear of the M109 is also characteristic as its track assembly includes seven relatively small road wheels per side and no return rollers.



Lesson instructions are on page 32

Solutions on the cover



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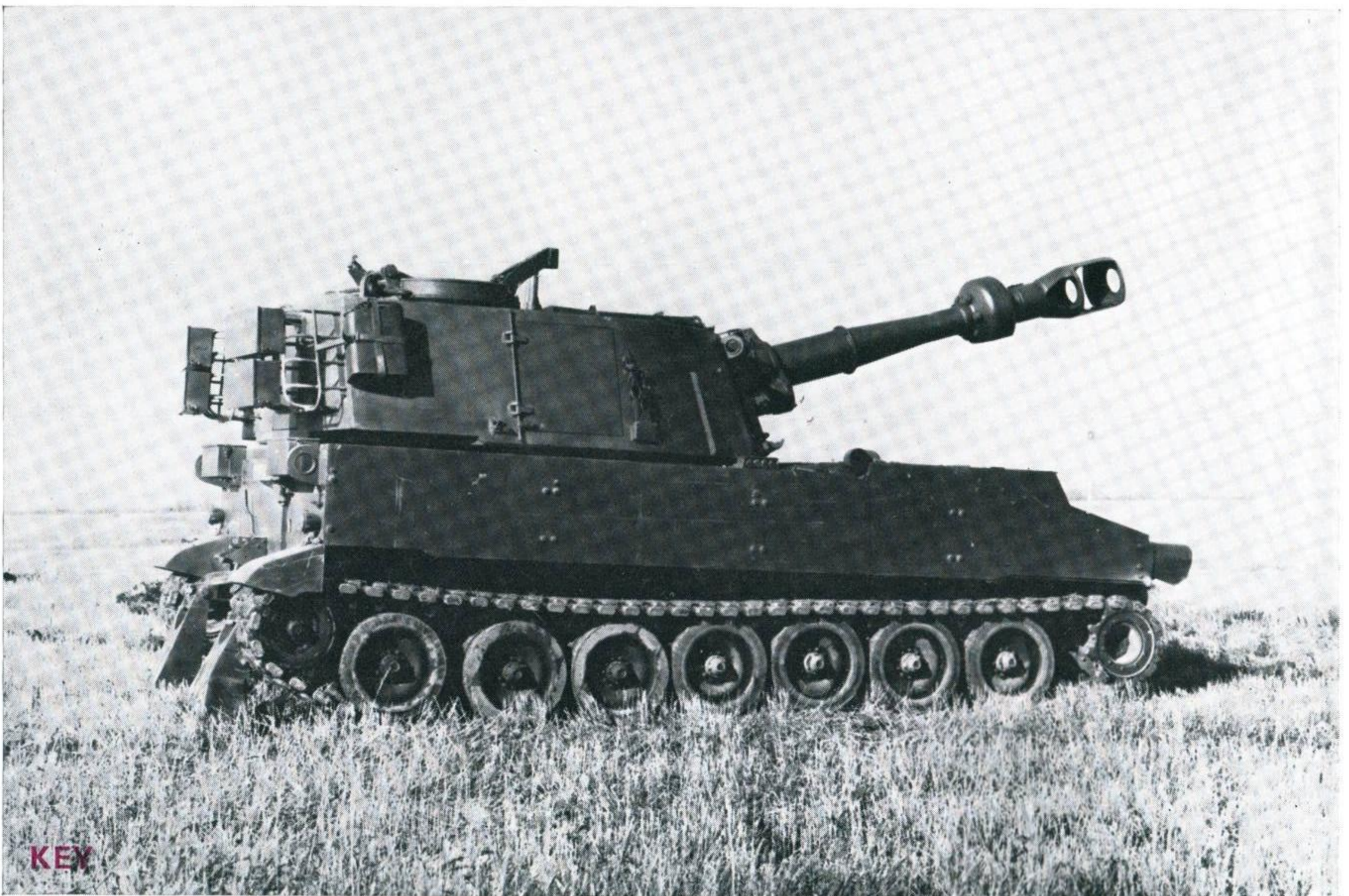
M 109 155 mm s.p. Howitzer

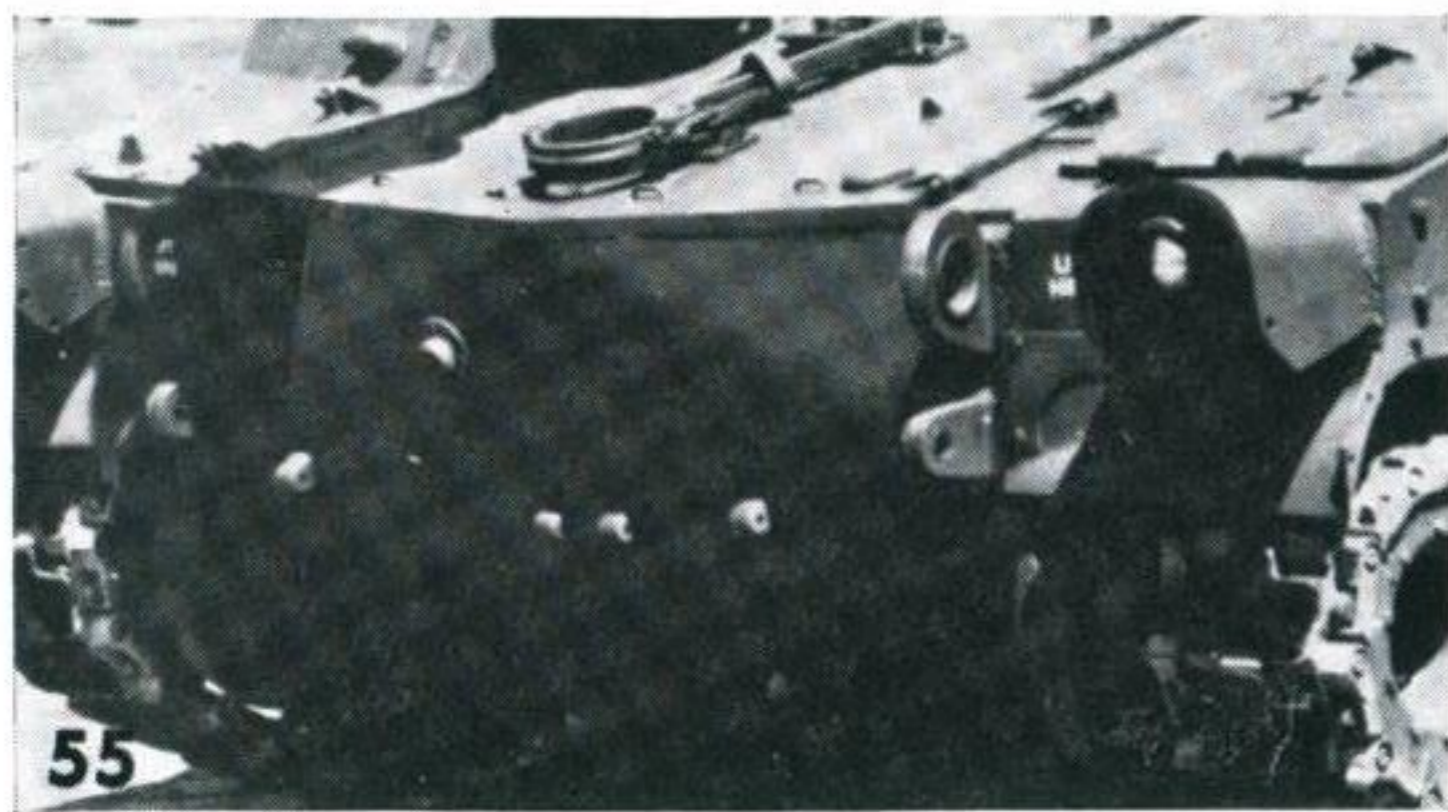
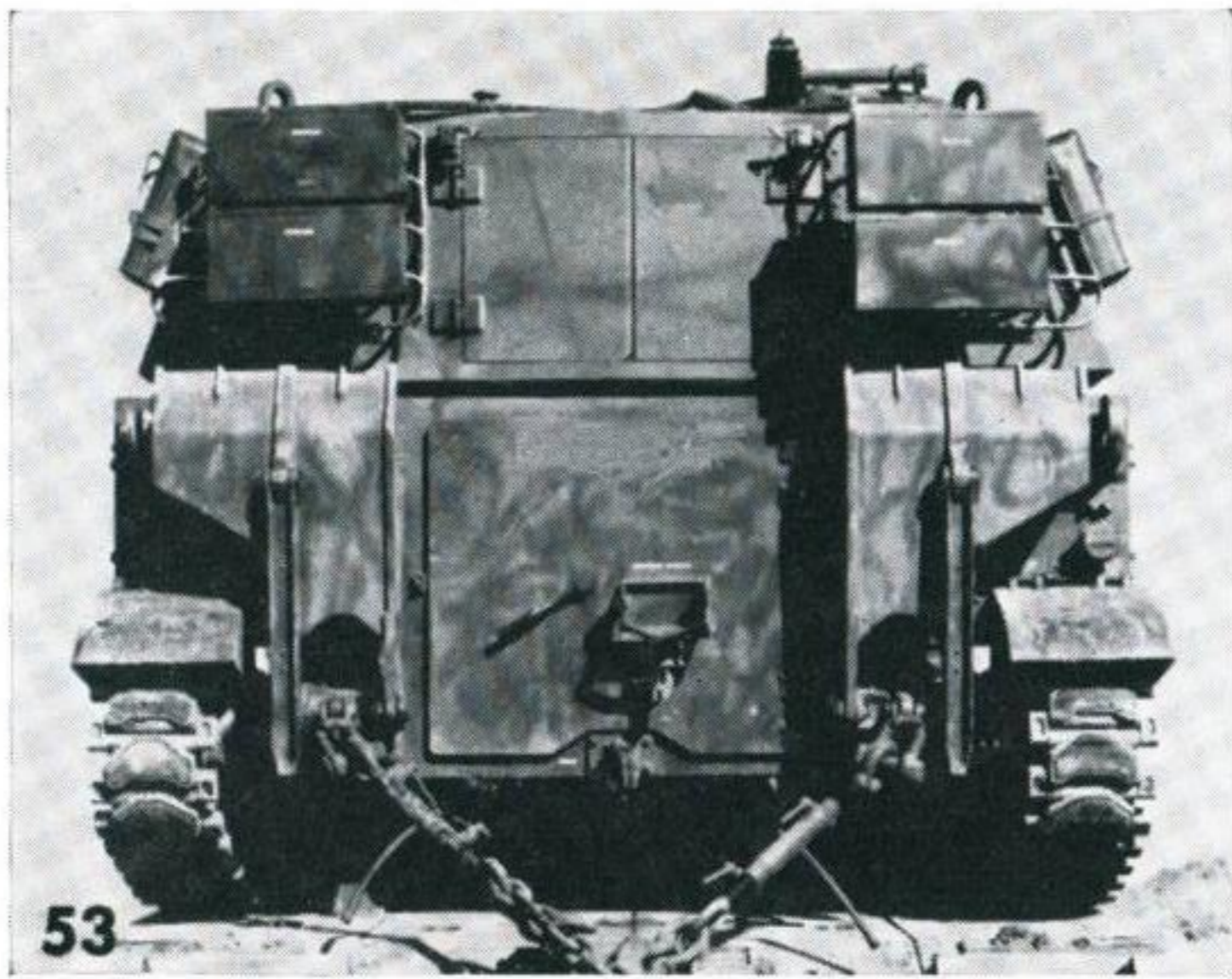
As with other vehicles with the engine at the front, the driving sprockets are at the front also and the track links have replaceable rubber pads.

All its characteristic features make the M109 relatively easy to recognise but the U.S. Army also has the M108 105-mm. s.p. howitzer which is very similar to it. In fact, the M108 has basically the same turret and hull as the M109 but the barrel of its 105-mm. howitzer is considerably smaller.

Lesson instructions are on page 32

Solutions on the cover



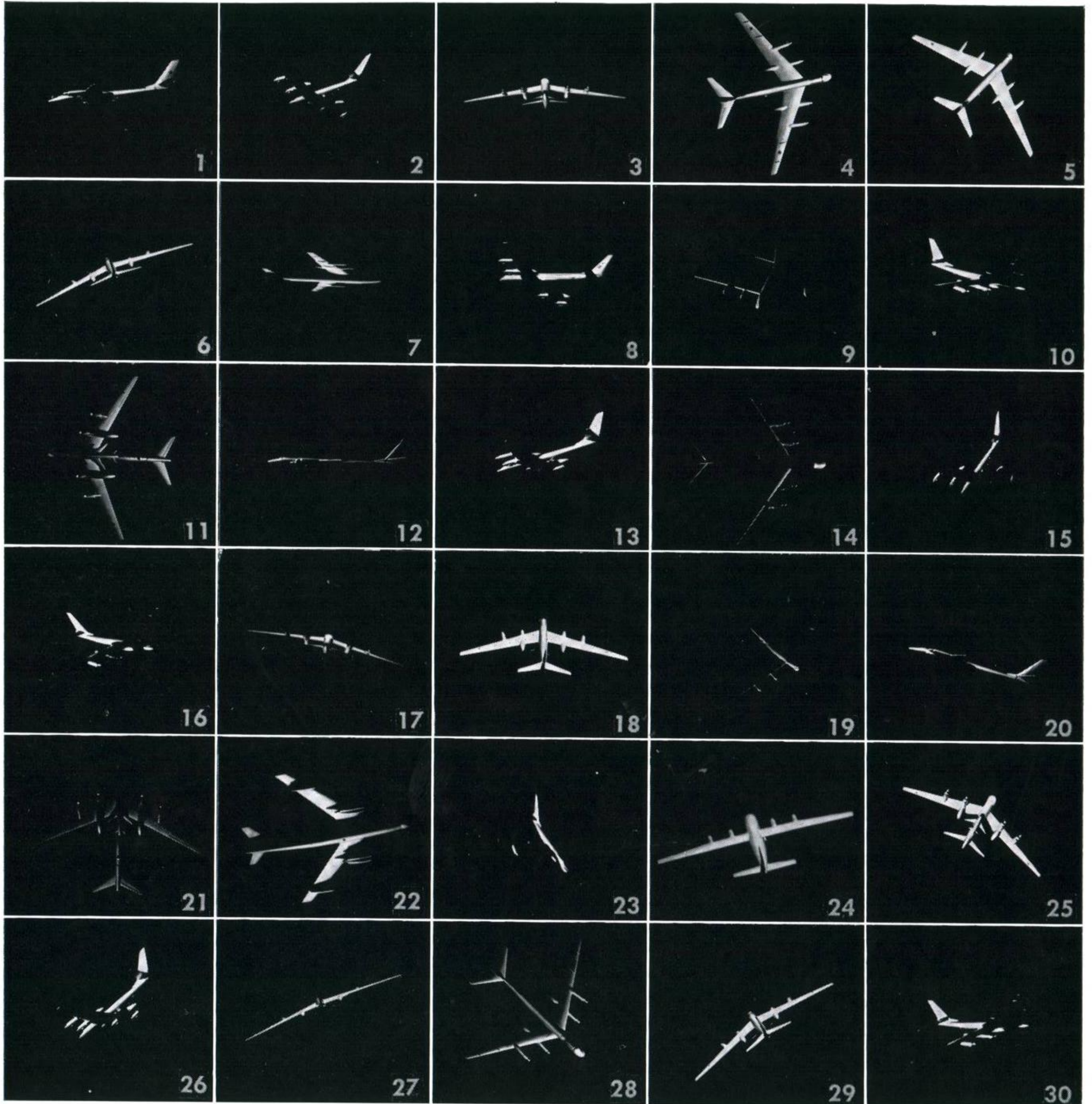


BEAR

Comparable in size with the B-52, this Russian long-range turboprop-engined bomber exists in several versions, which include a missile carrier and an electronic and photographic reconnaissance aircraft. The missile carrying model features a redesigned nose with large duck-billed radome (see silhouette). Read the instructions on page 32 and report as Bear, or otherwise if jokers.

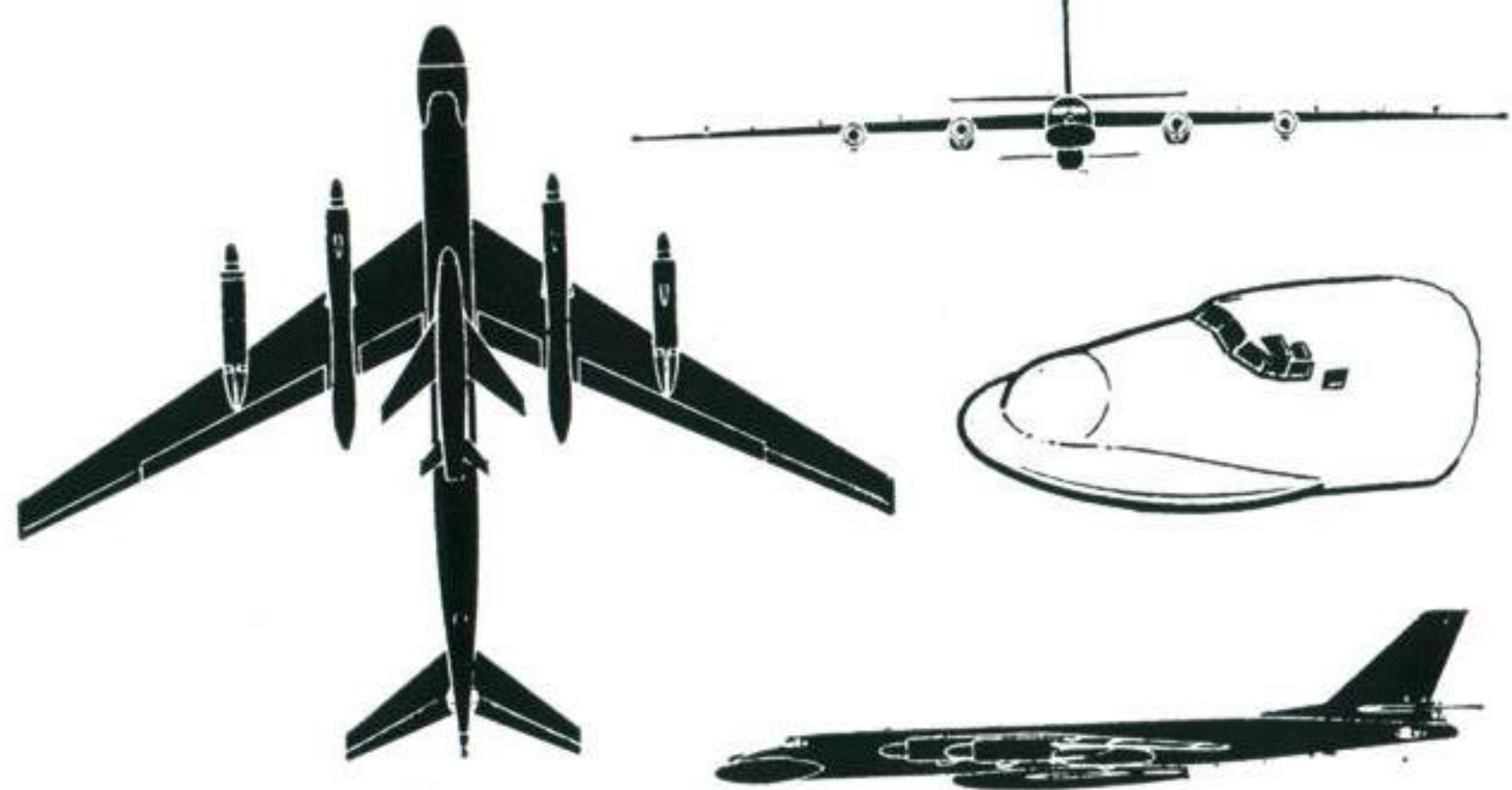


Solutions on the cover

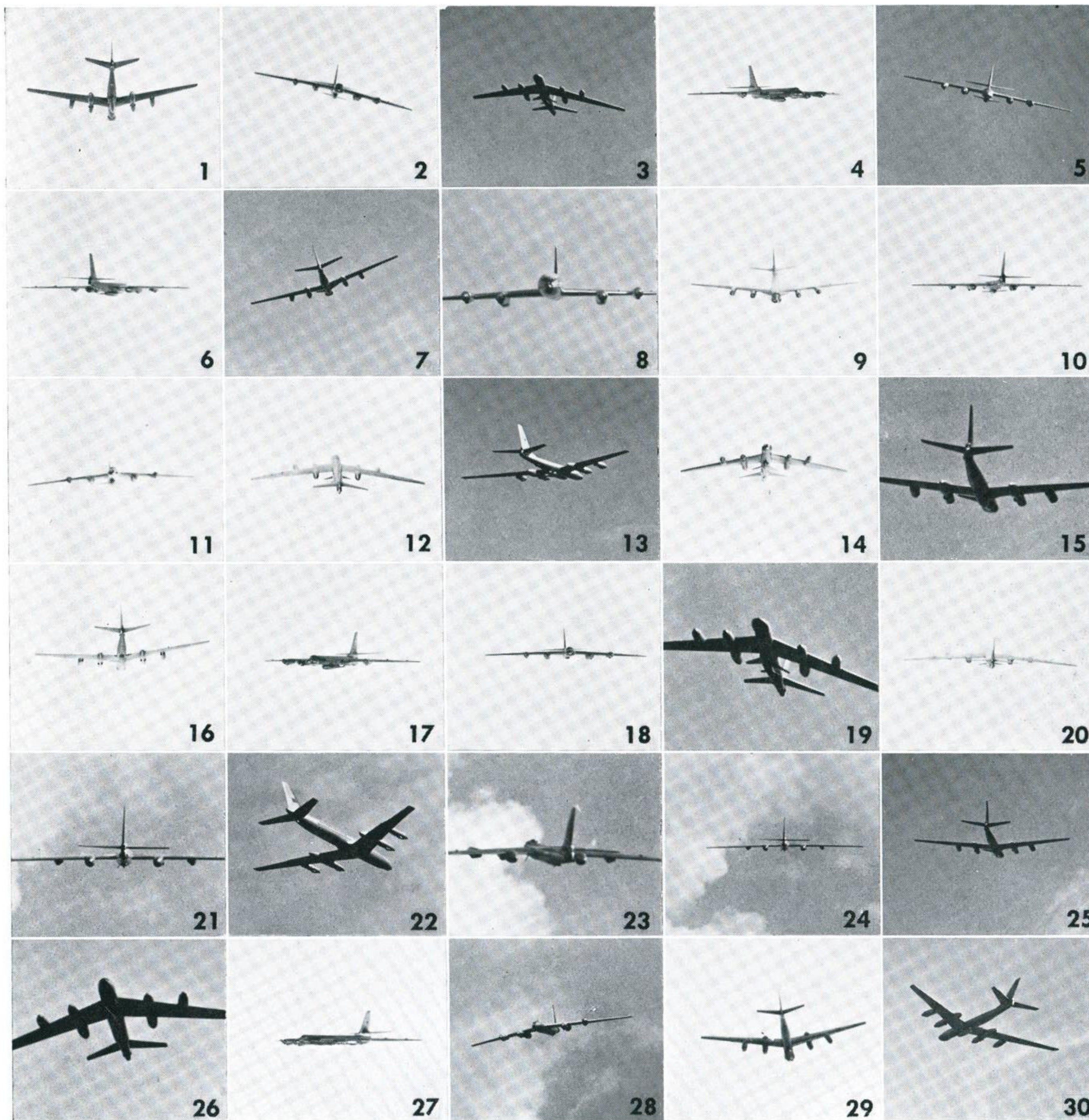


BEAR B (Duckbill)

Span 168 feet



End-on identification needs special training. Here is an exercise on that aspect of the Bear.



KC-135



BOEING C-135

This military adaptation of the Boeing 707 airliner is used by the U.S.A.F. in a wide variety of roles, the main version being the KC-135A Stratotanker which is capable of refuelling aircraft by its "butterfly boom" beneath the rear fuselage and also by drogues streamed from beneath the wings.

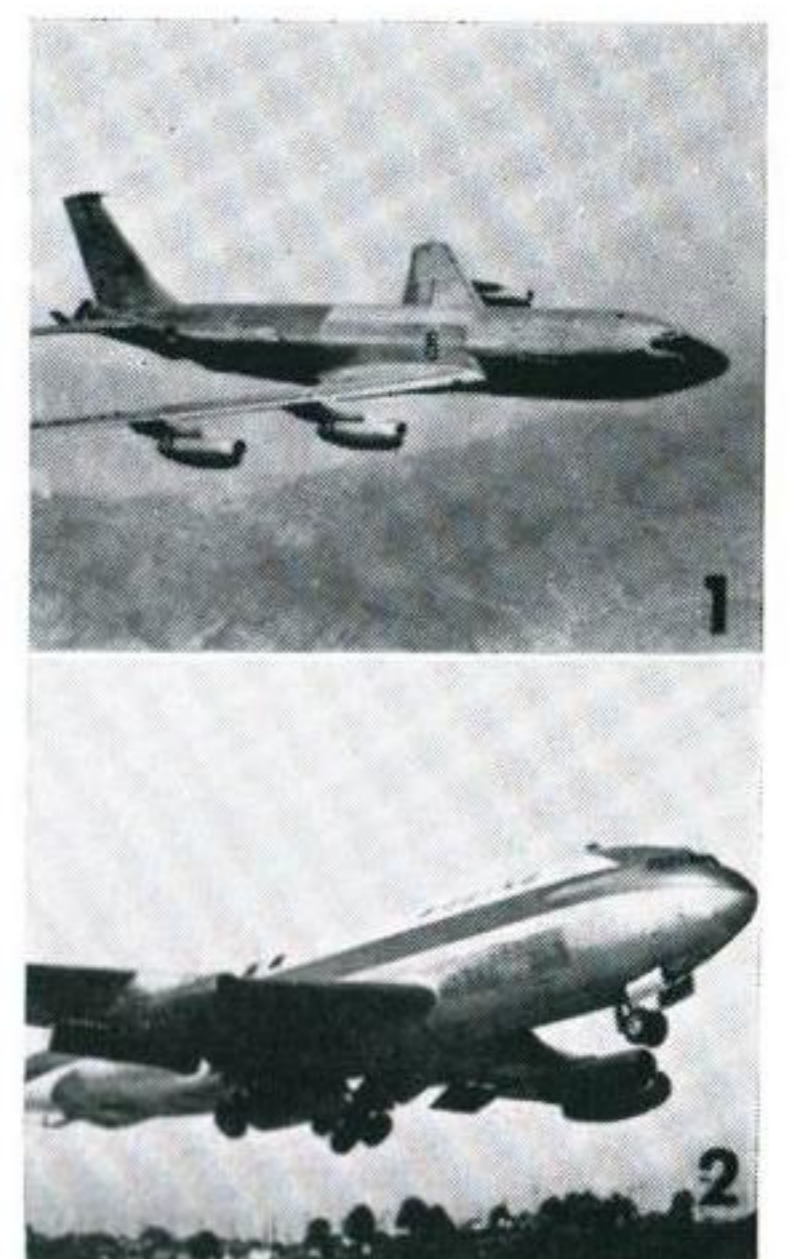
The KC-135A first flew in August 1956 and in the period up to 1965, 820 C-135 Series aircraft were built for the U.S.A.F. Among the specialised transport versions are the C-135A (15 built) and the C-135B (30 built) both of which retained the rear fuselage configuration of the tanker but with the actual "butterfly boom" deleted. The B model features the enlarged vertical tail surfaces of the civil 707 as do such other variants as the EC-135C

aerial command post and the RC-135B radar reconnaissance aircraft.

Twelve KC-135F tanker/transports, generally similar to the A model, have been supplied to the *Armée de l'Air* for logistics support and to act as tankers for the Mirage IVA bomber force.

A particularly noteworthy variant of the C-135 from the recognition viewpoint is the JC-135A which serves with the U.S.A.F. Systems Command, this machine having a large bulged fairing with an observation position above the fuselage.

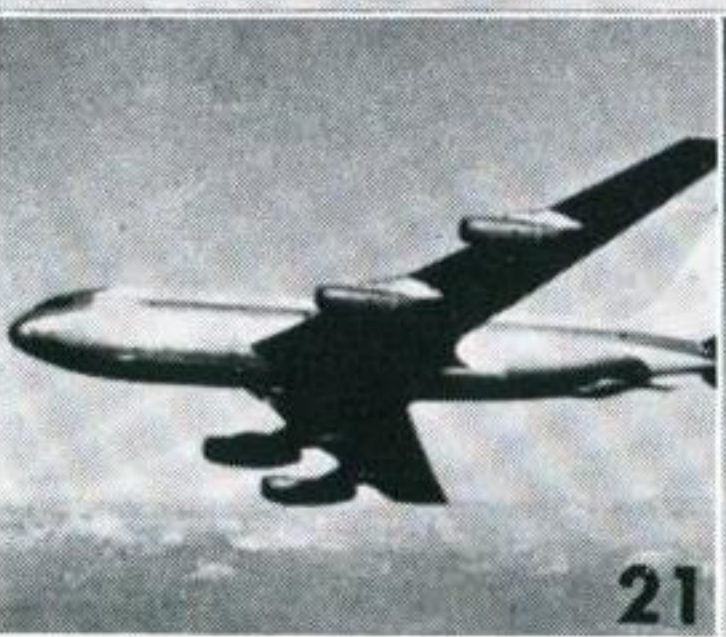
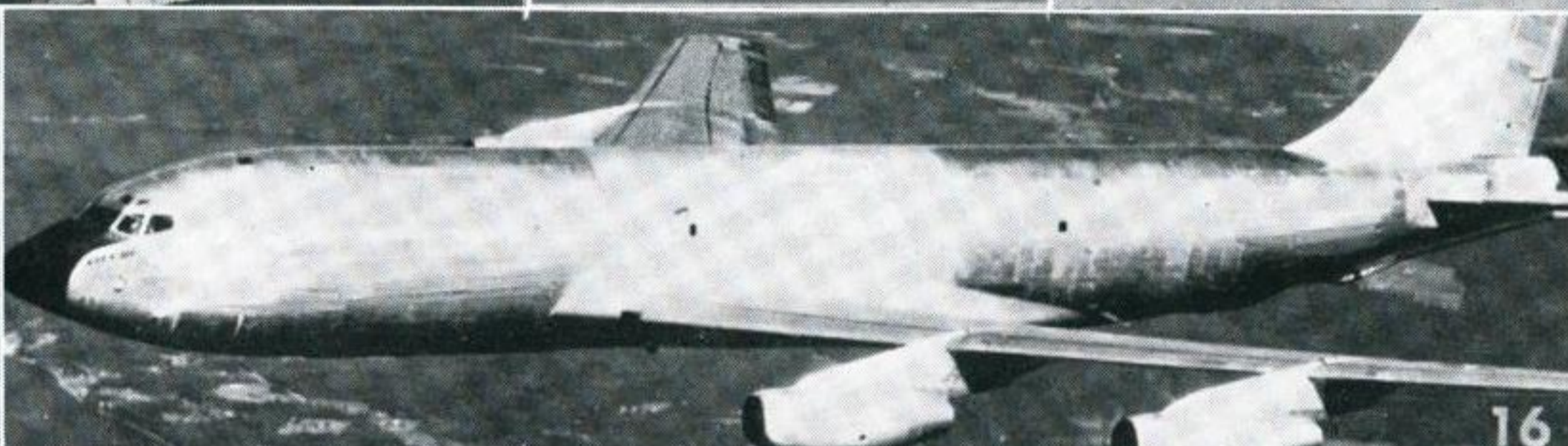
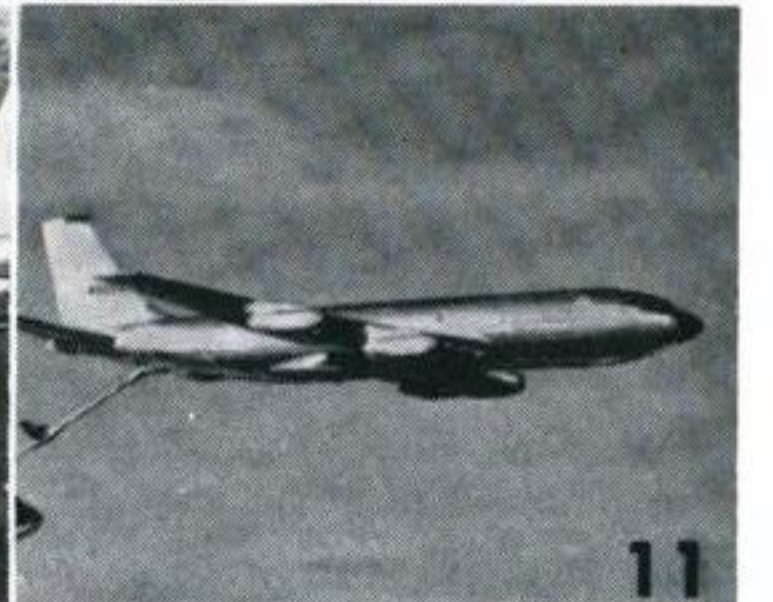
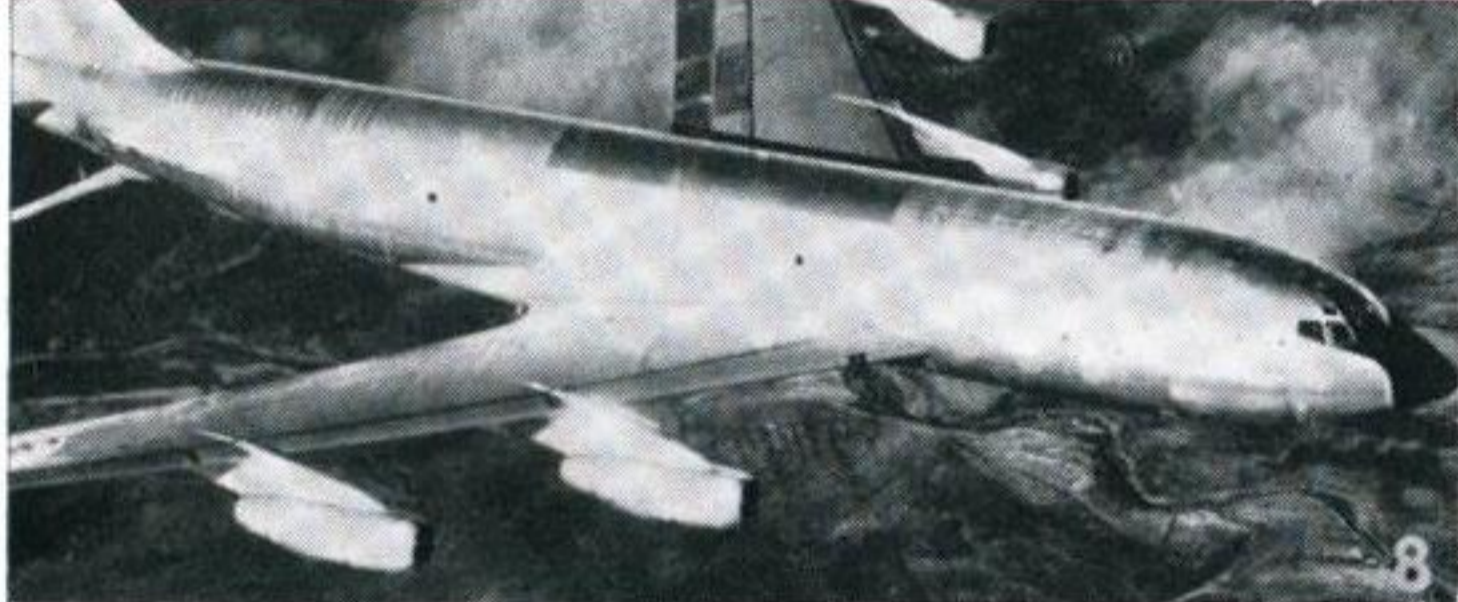
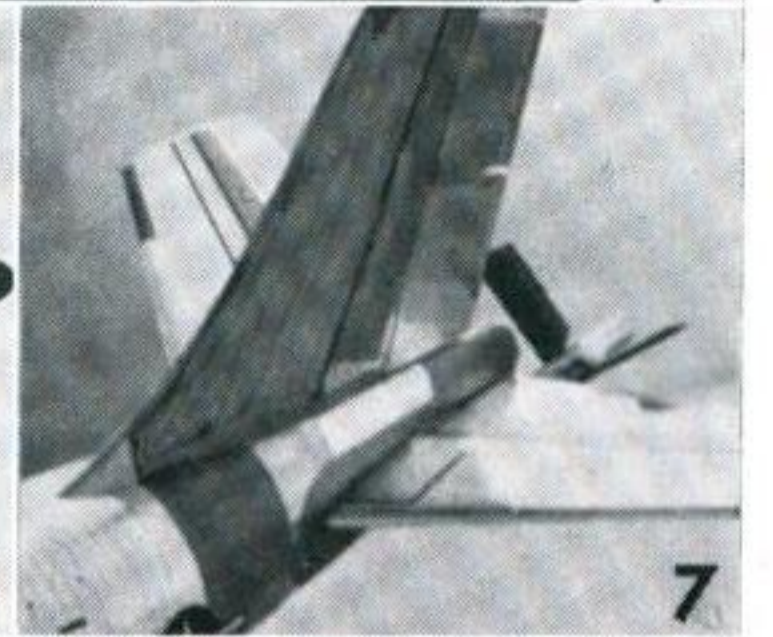
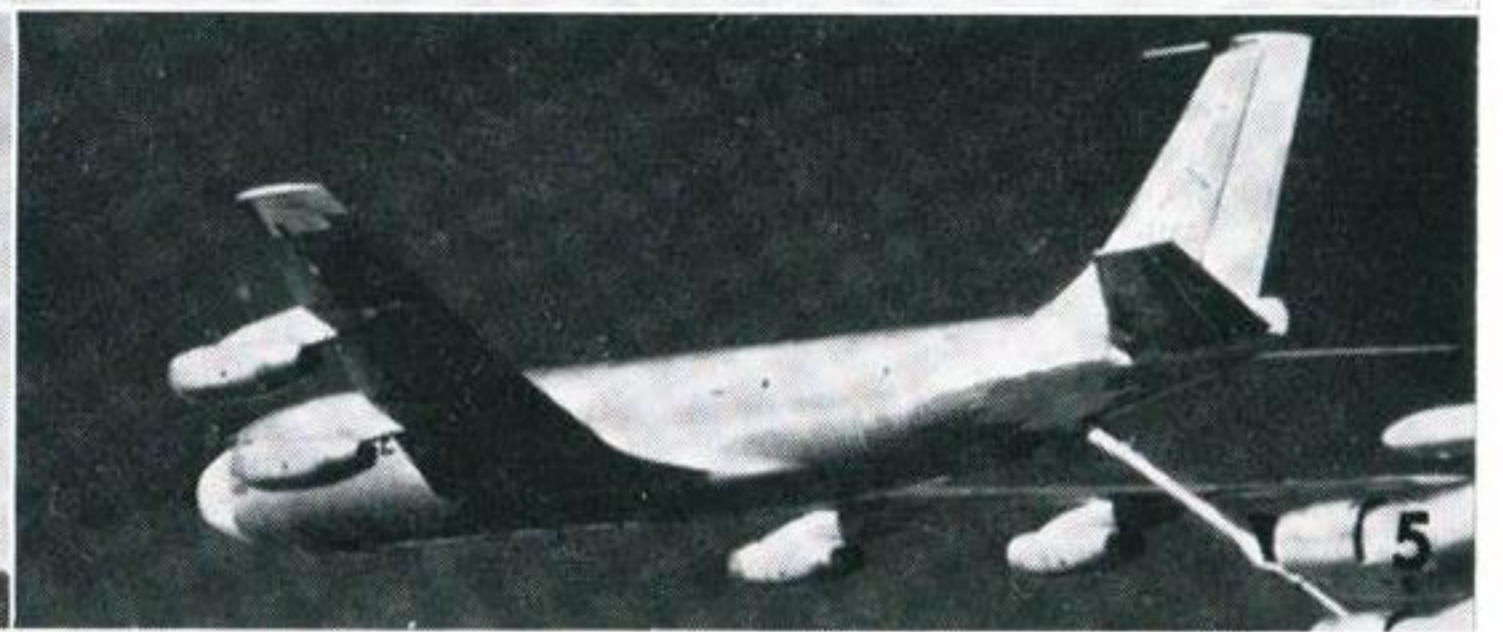
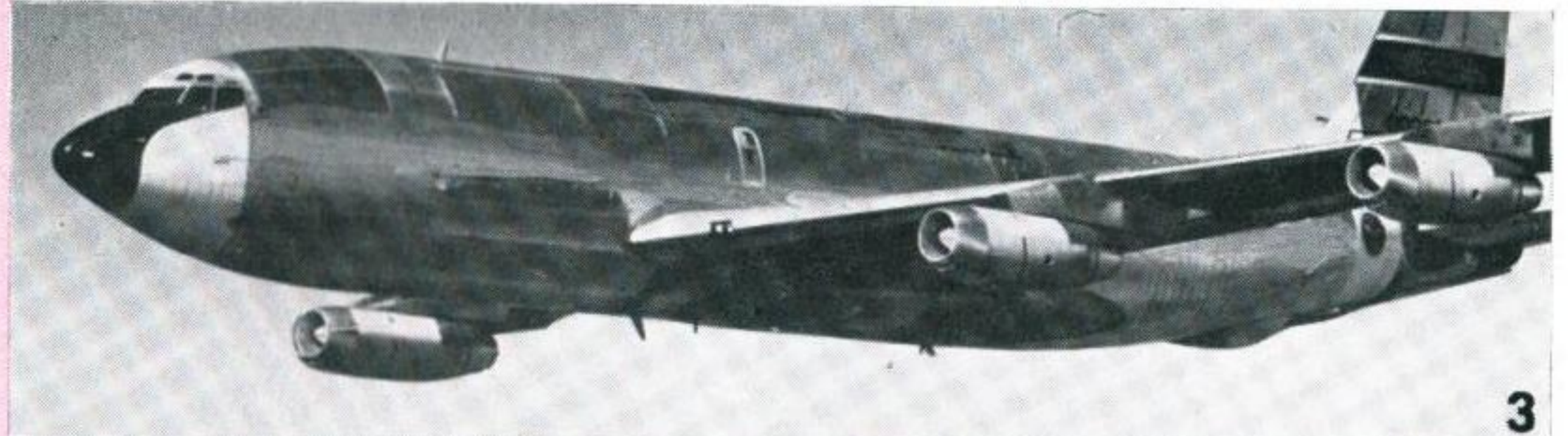
The general layout of the C-135 (and its civil counterpart) is very similar to such other machines as the DC-8, and Convair 880/990, so to be certain of it work to the instructions on page 32. Solutions on the cover.



Left—KC135 refuelling B-52

KC-135

Span 130' 10".



KEY



HARRIER

When it enters R.A.F. squadron service next year, the Hawker Siddeley Harrier will be the first VTOL combat aircraft in regular service with any air force in the world. Developed from the experimental P.1127 Kestrel, it will replace the veteran Hunter in the ground attack role and in such operations it will work in conjunction with Phantoms, which have the necessary performance to provide top cover.

Six pre-production Harriers were built and the first of the initial R.A.F. production batch (reportedly compris-

ing 60 GR.1s plus a number—believed to be 10—T.2s) flew on December 28th, 1967. The T.2 will be a two-seater but will have the same operational capability as the GR.1.

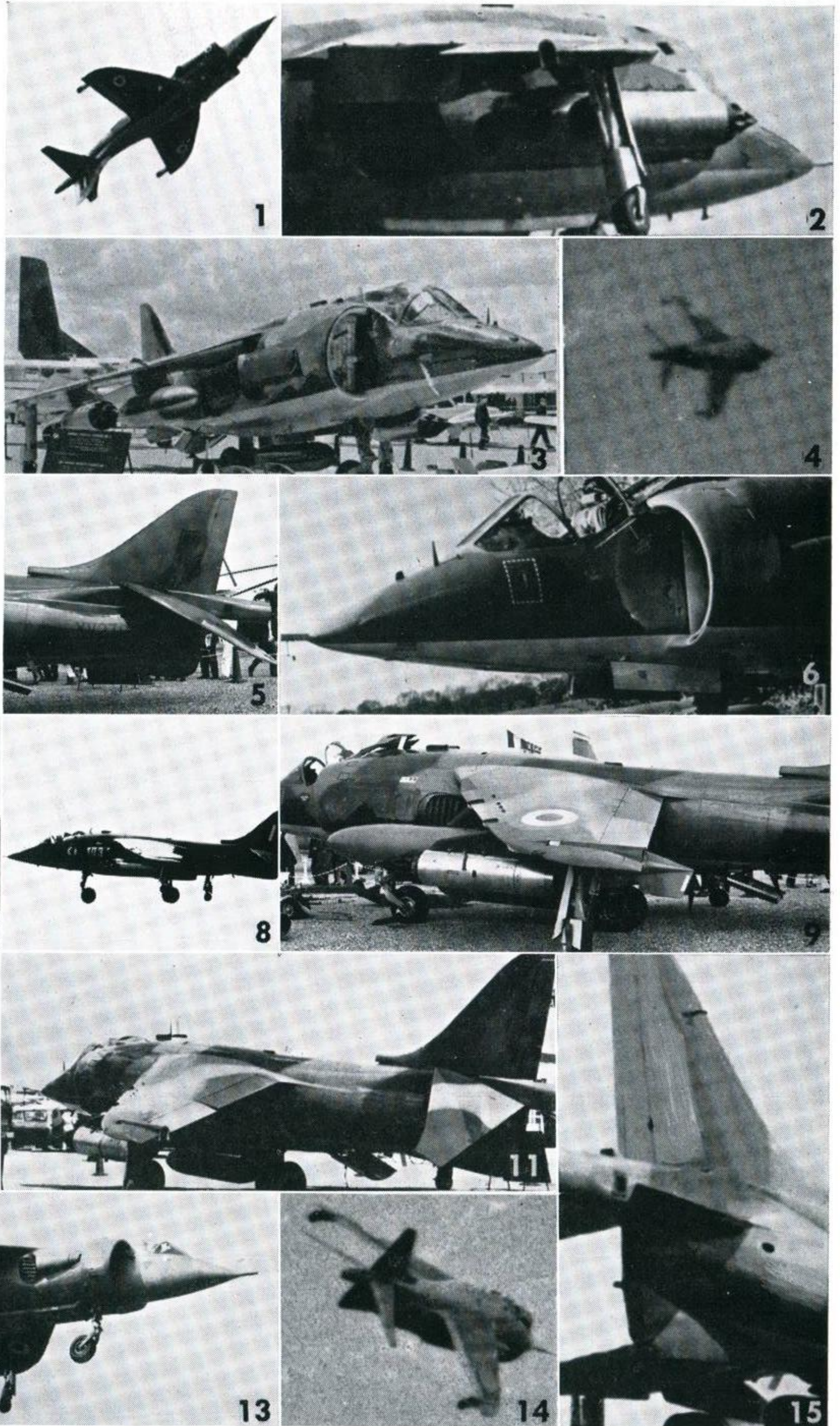
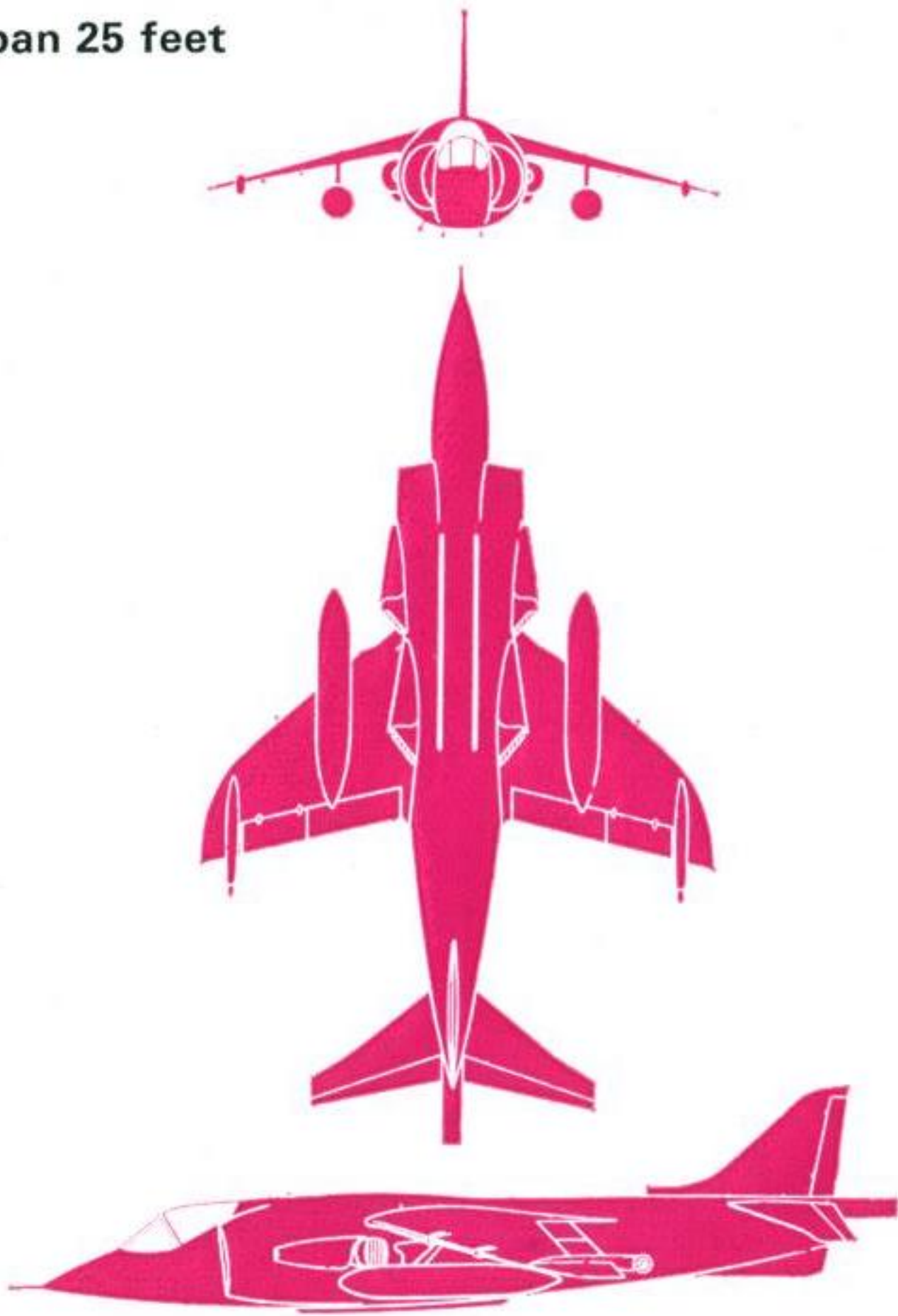
Powered by a Bristol Siddeley Pegasus vectored thrust engine, the Harrier can take off vertically from clearings near the forward edge of the battle area within seconds. Taking off from a short, unprepared strip, it can carry a 5,000 lb. external load with a radius of action comparable with conventional aircraft operating from

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KEY



Span 25 feet



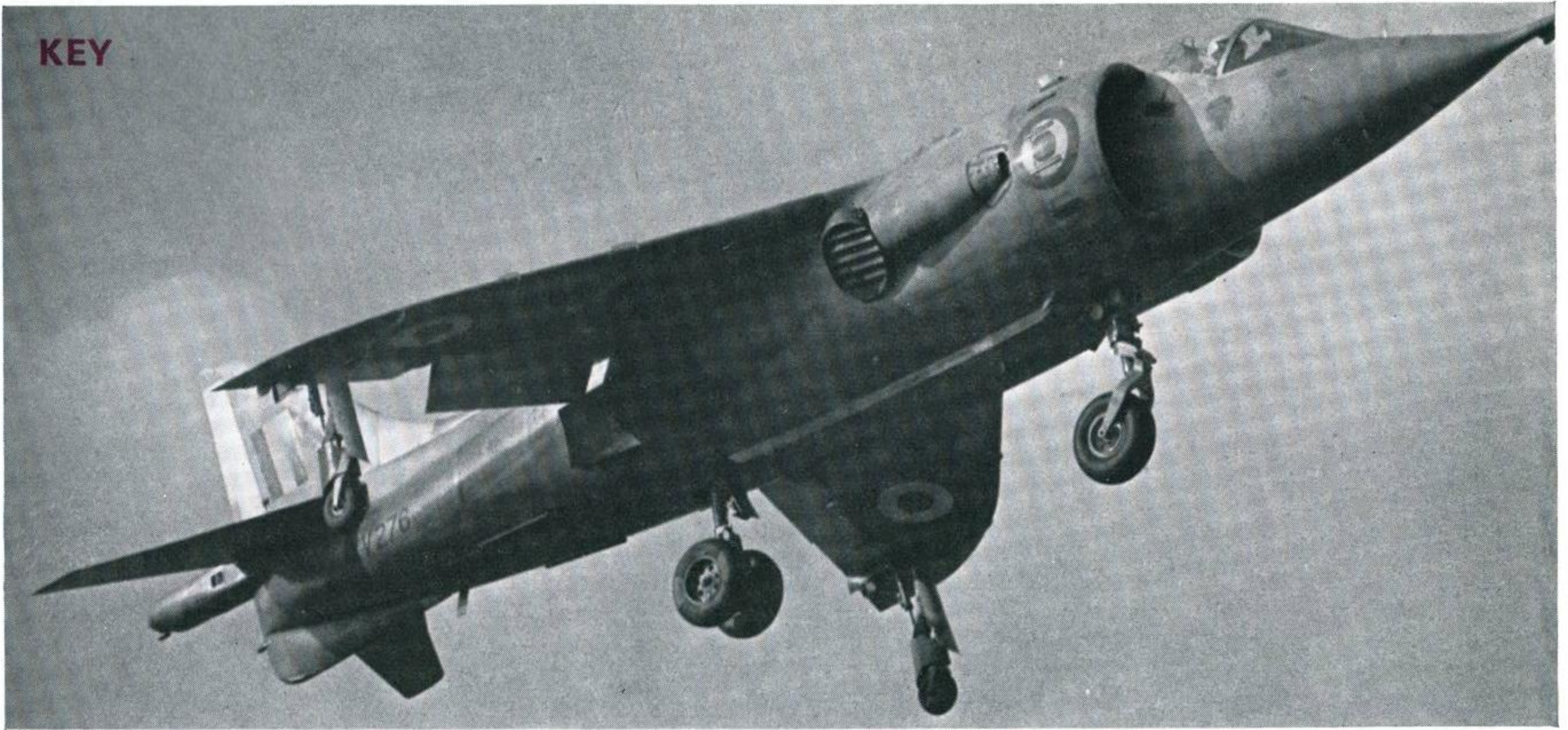
Lesson instructions are on page 32

Solutions on the cover

KEY



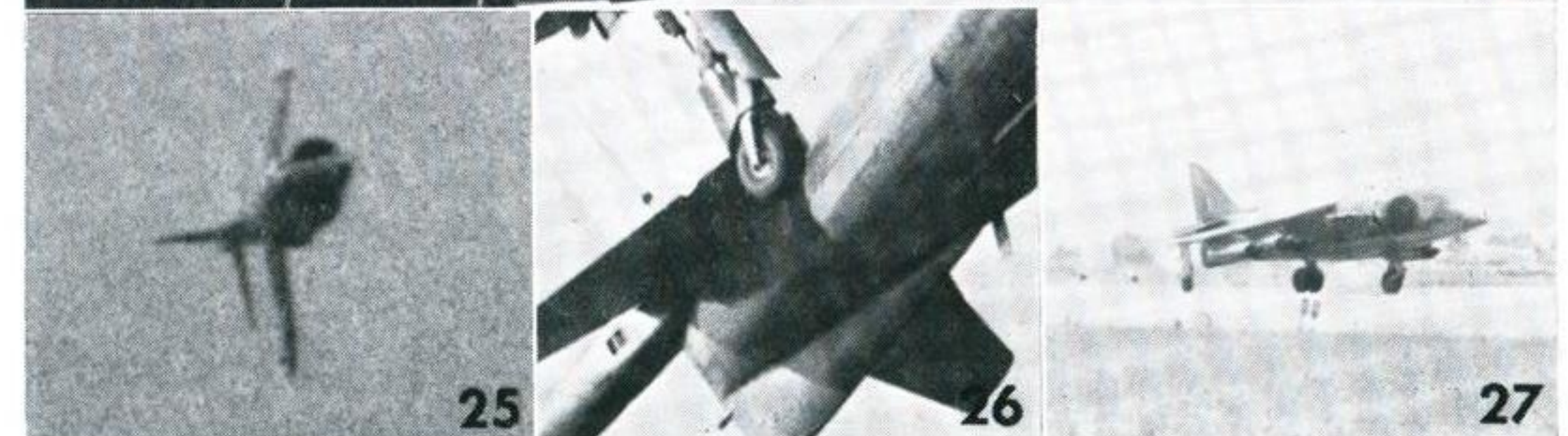
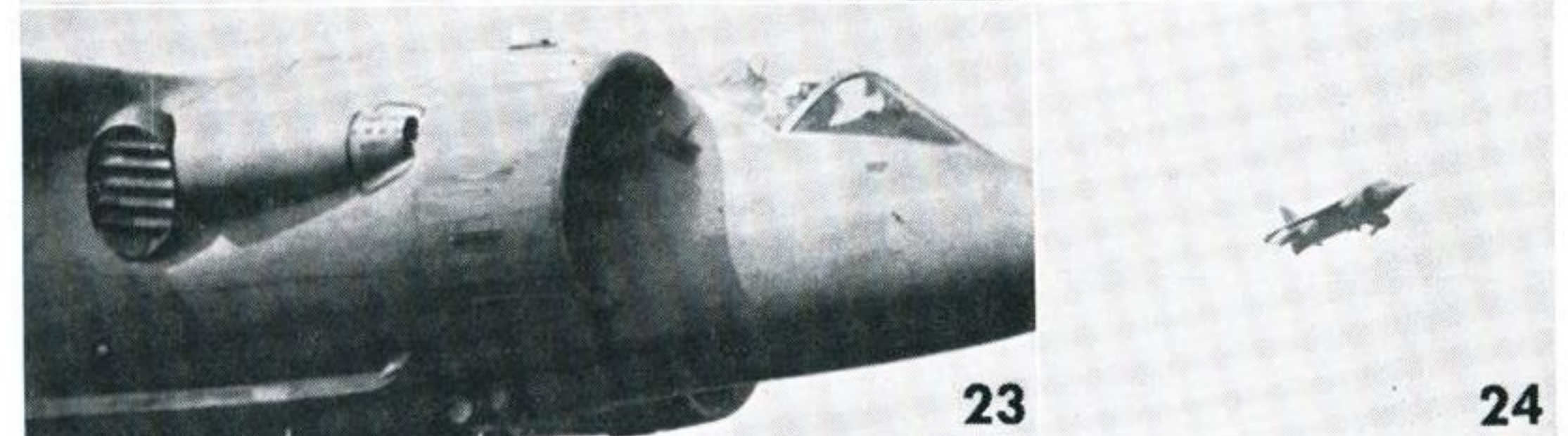
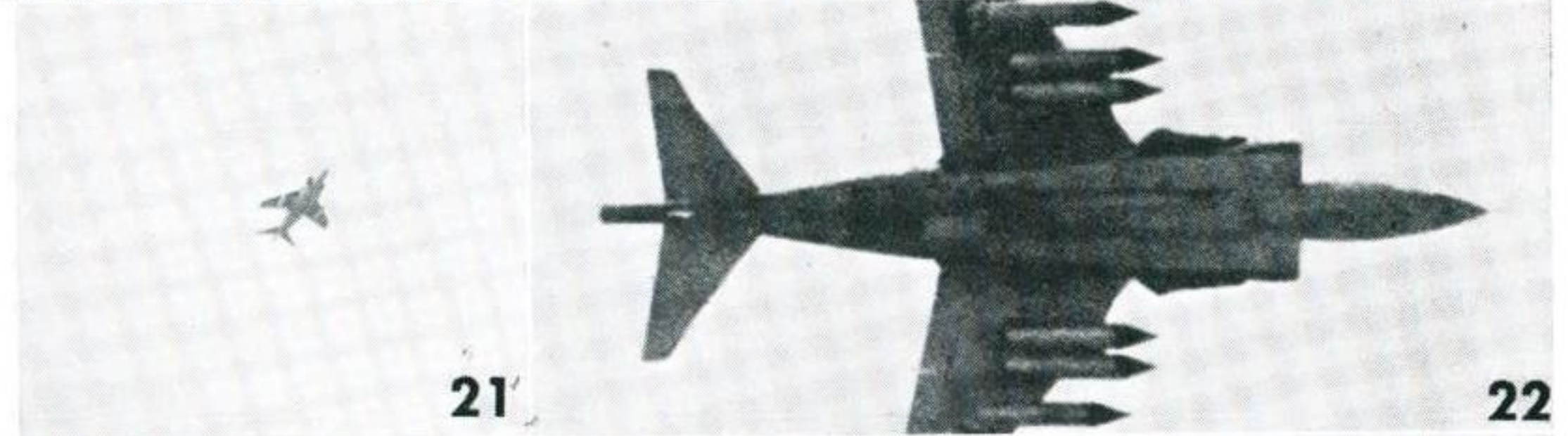
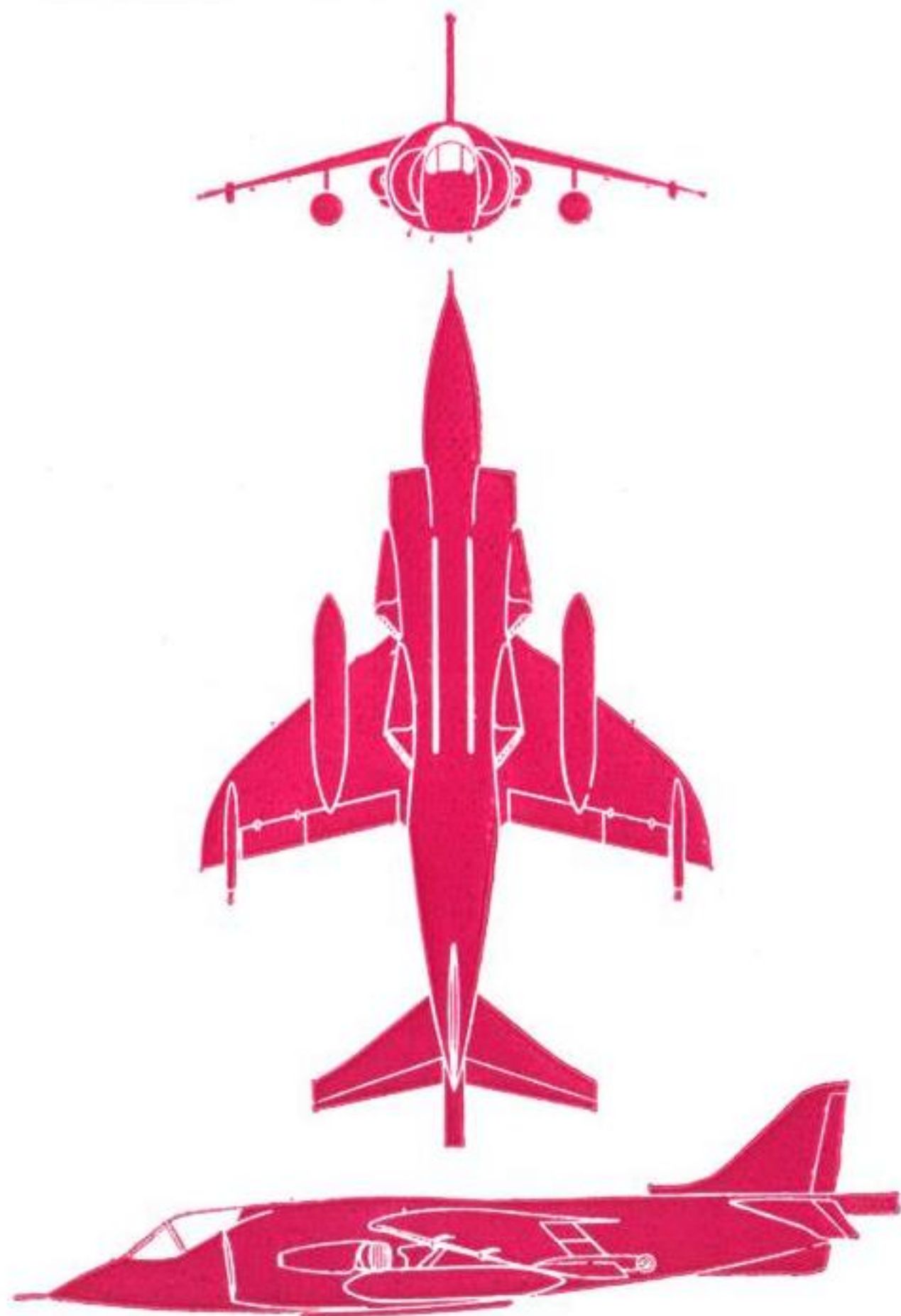
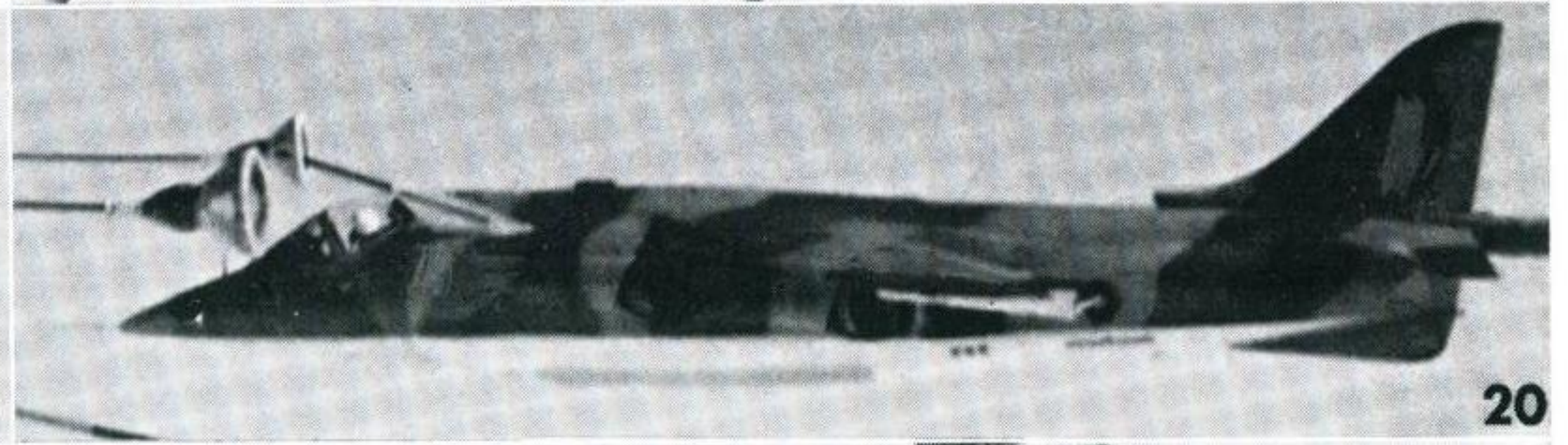
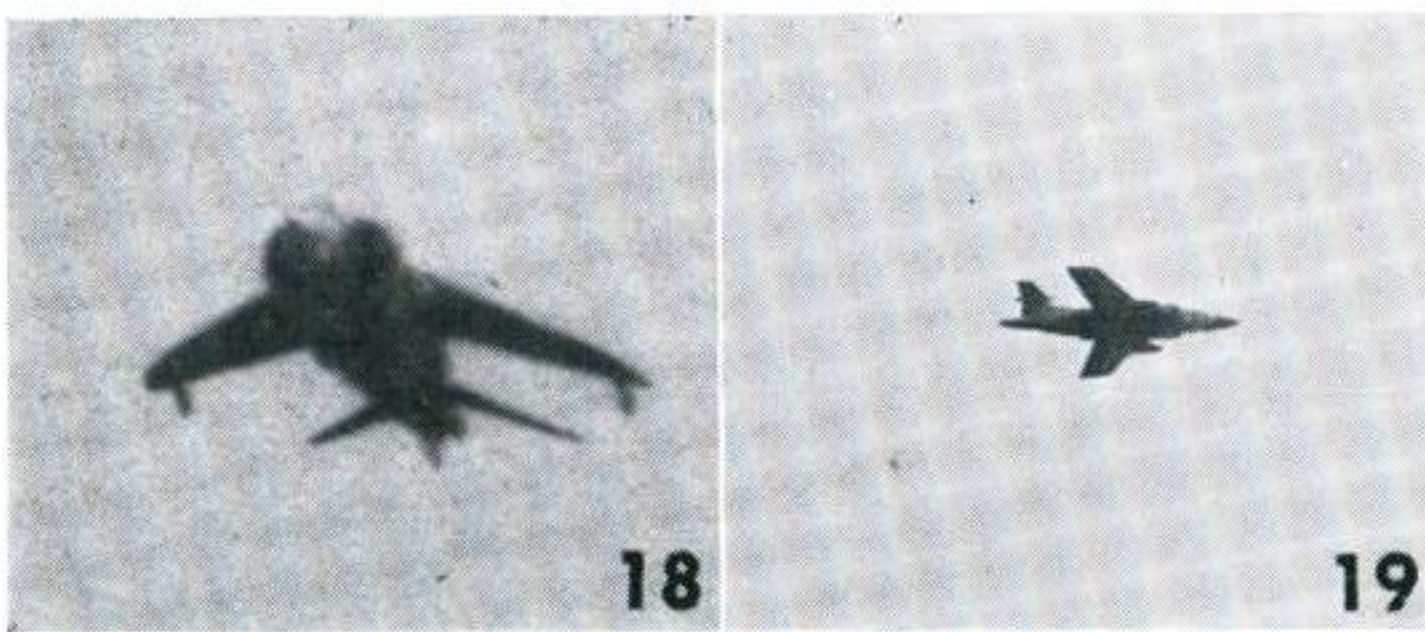
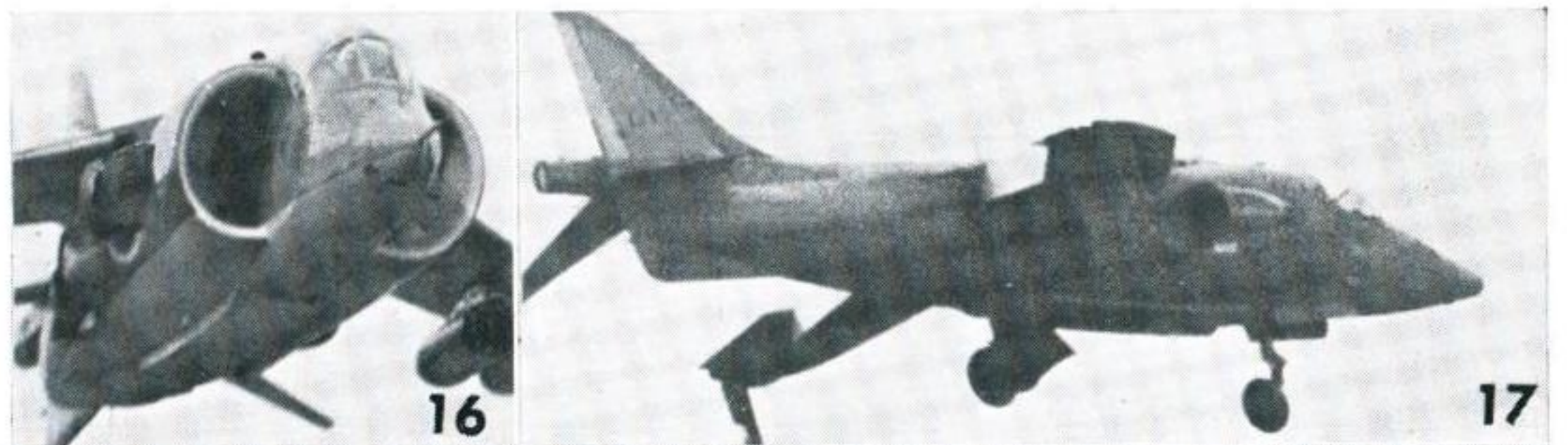
KEY



HARRIER *continued*

vulnerable concrete runways. Its ferry range is about 2,000 nautical miles and it has been flown at speeds in excess of Mach 1.0.

The normal lesson instructions as given on page 32 apply. The solutions are given on the cover.







The Hansa executive "twin" and light transport is the first original product of the resurrected Blohm und Voss concern in Hamburg and the first series production aeroplane to be developed by any manufacturer in West Germany since World War 2. Development began in 1961, the two prototypes flew during 1964 and the first production aircraft flew in February 1966. A C. of A. was obtained in February of last year and a small number have already been ordered by the *Luftwaffe* for communications duties.

Like many other business twin-jets the Hansa features rear-mounted engines and a T-tail, but it is unique in

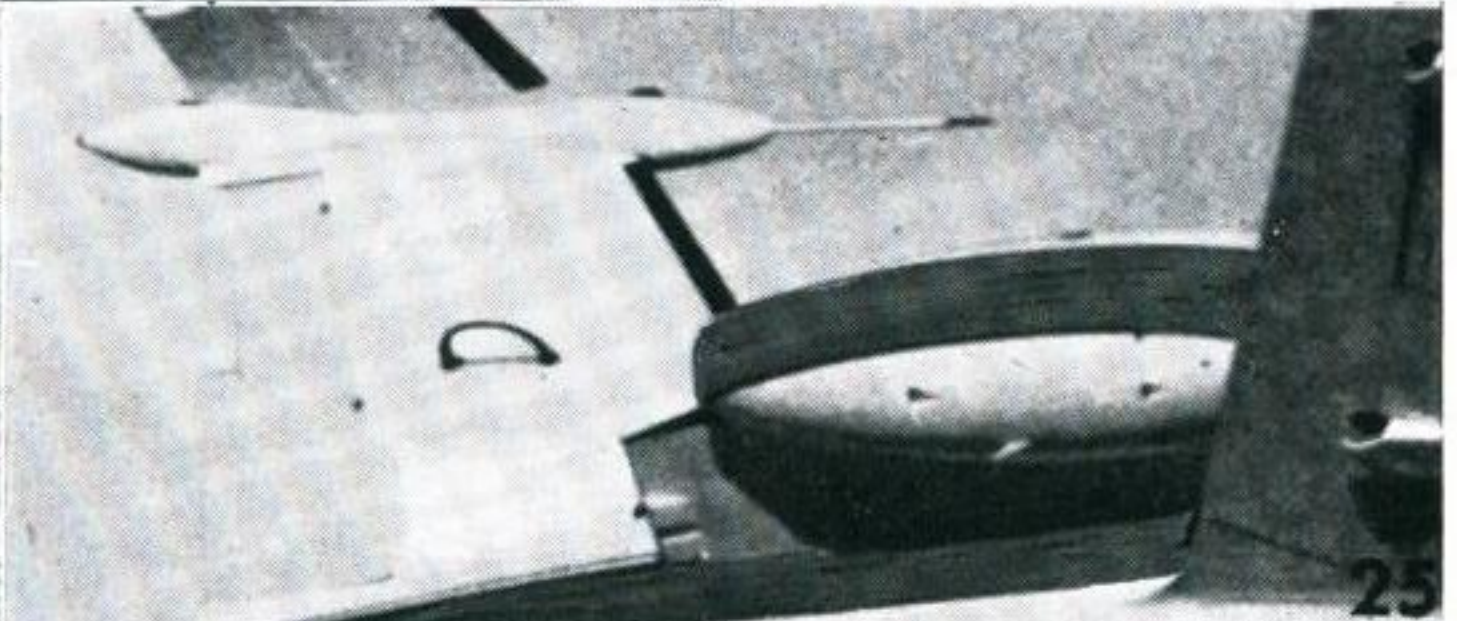
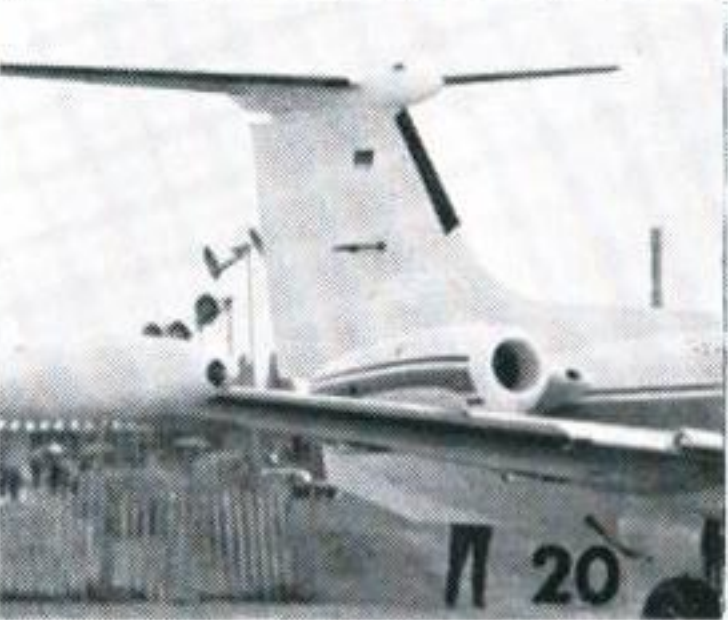
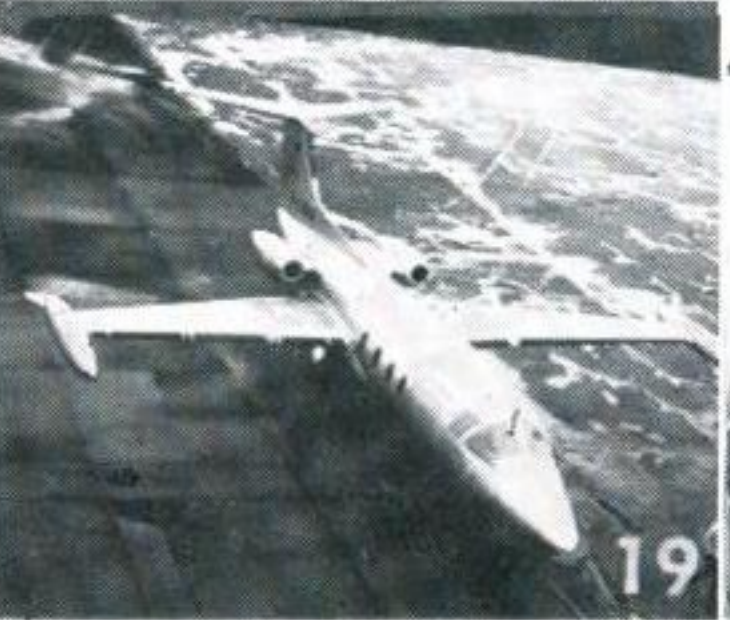
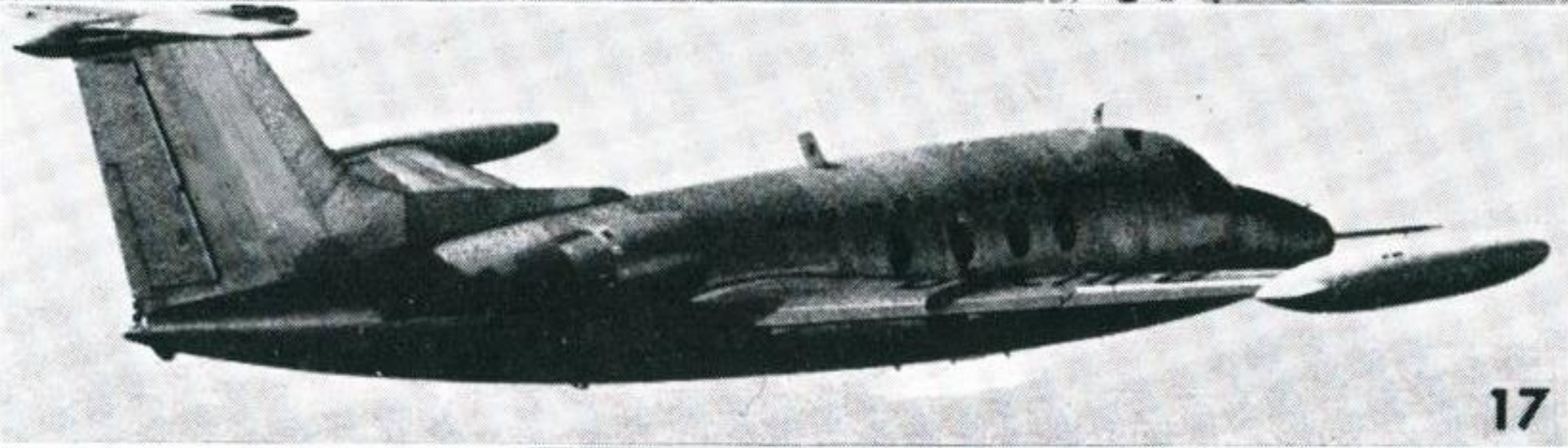
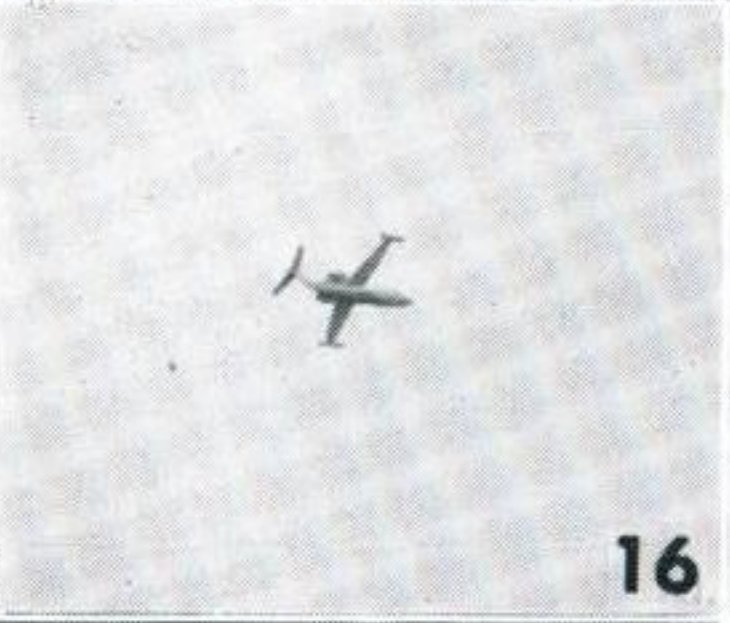
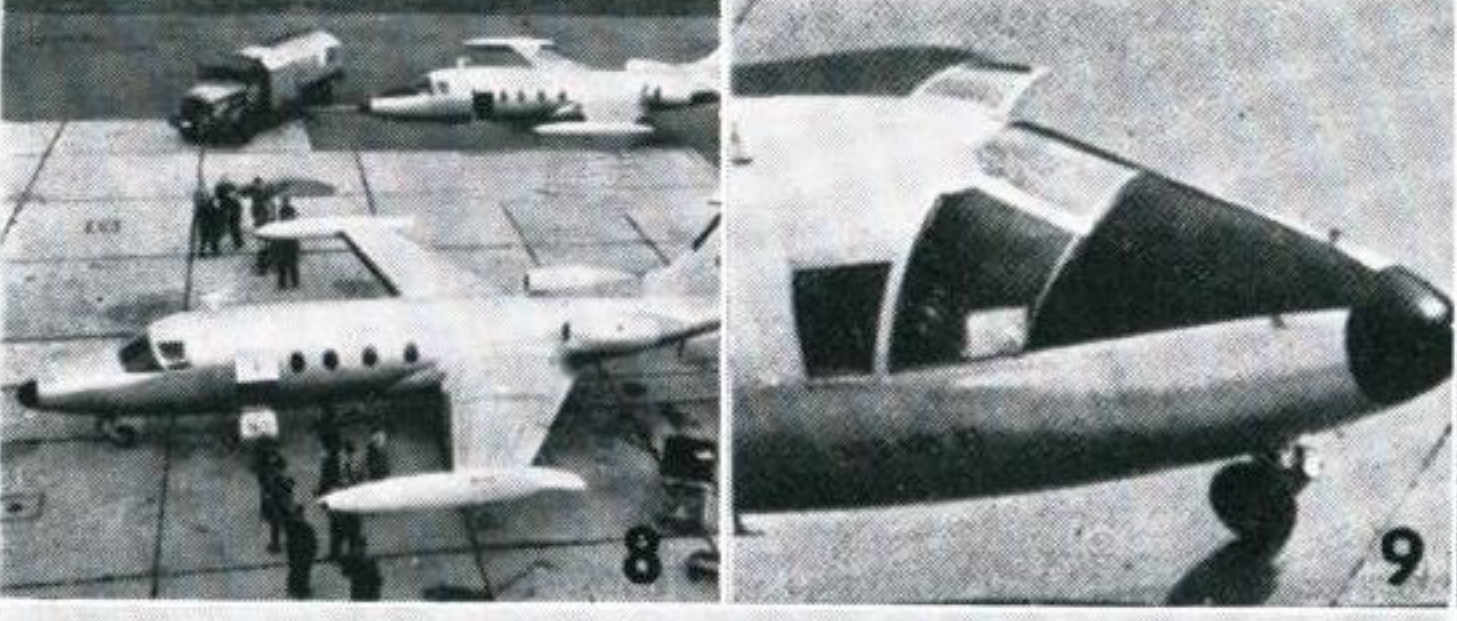
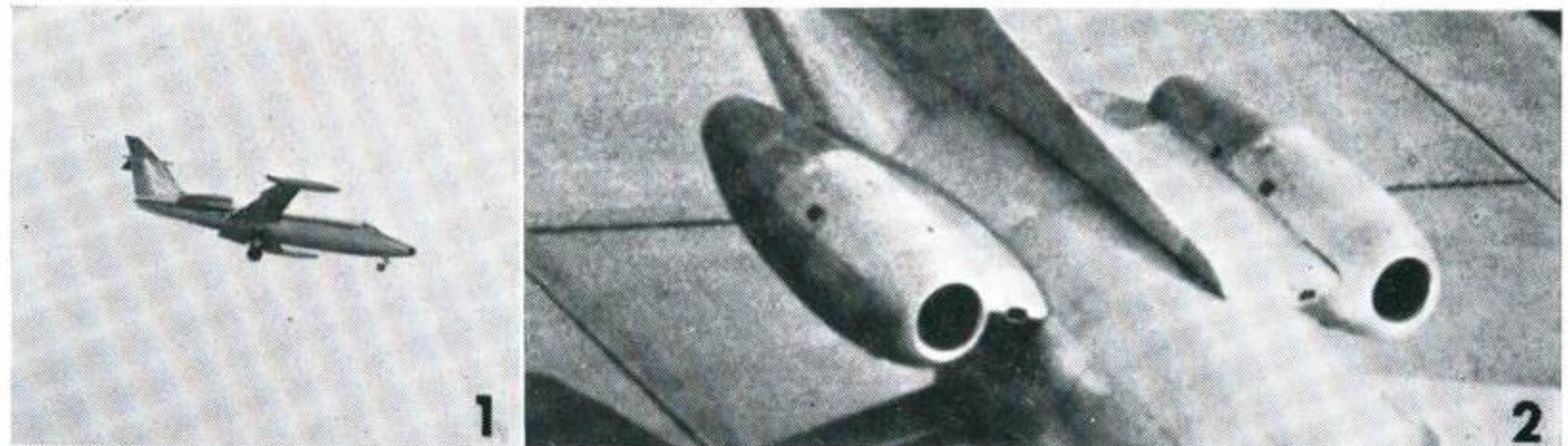
having forward-swept wings, a design innovation previously tested on the experimental wartime Junkers Ju287 bomber. The advantages gained from this wing are, firstly, improved controllability and handling at low speeds; and, secondly, increased headroom in the passenger compartment because the wing centre section is sited aft of it.

The Hansa carries a crew of two and four to nine passengers, and its performance is near-STOL with the ability to land and take-off from grass strips.

The normal lesson instructions as given on page 32 apply. The solutions are given on the cover.



Span 47½ feet



WHAT SHIP IS THAT?

PACKETS

The object of this exercise is to familiarise you with the outstanding characteristics of three important types of merchant ships.

The Key Views will give you some idea of the basic outlines of the types concerned although there are considerable variations of each in the silhouettes themselves.

By comparing the key views closely with the examples, you should have no difficulty in providing the correct answers. Write down the headings Packet, Freighter and Tanker. Carefully referring to the keys, check the targets and as you decide what a target is, place its number under the appropriate heading. Do not attempt to go through consecutively the first time.

You may already know more about these ships than is indicated, recognising Number 1 as a standard "Liberty" freighter or Number 74 as a "Baltic" type, but that is not the point of this test.



These have all the characteristics of passenger liners reduced to their own scale; boats and other features look considerably larger. They present a "bunched up" appearance.



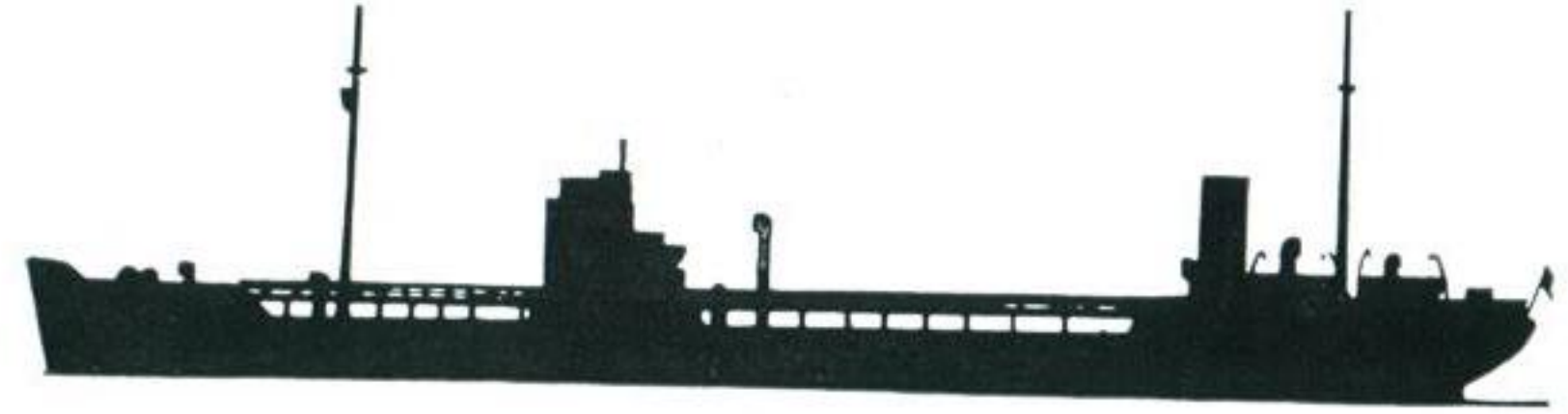
FREIGHTERS



Number 1 is of the "Composite superstructure" type with funnel and bridge structure together but number and position of masts and kingposts varies greatly.

Number 2 is of the older "Split superstructure" type with a space between bridge and funnel.

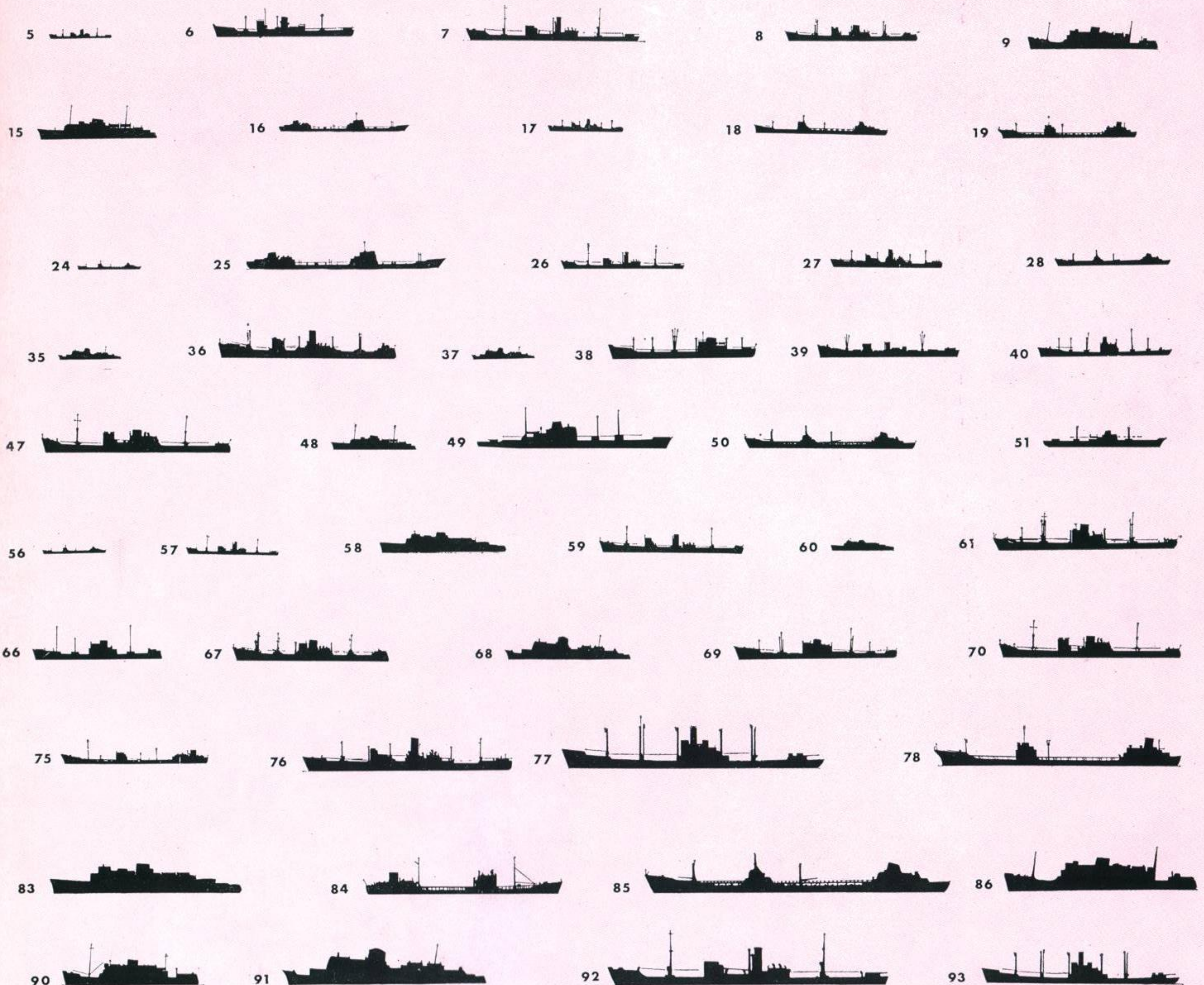
TANKERS



The outstanding characteristic of the tanker is the "cat walk" or flying bridge joining the "islands" and the funnel right aft although this latter feature is now increasingly common to many types of freighter.

Number 1 is an old type ship with tall funnel, tall bridge and cut-away stern.

Number 2 is of a more modern type of the medium size.



H M S RESOLUTION

The first of Britain's Polaris submarines joined the Fleet in October 1967.

The fourteenth ship to bear the name, she was launched at Vickers-Armstrongs yard at Barrow-in-Furness, by the Queen Mother.

Her displacement tonnage is officially given as being over 7,600 tons. Her length is 425 feet overall and she is nuclear powered to give a speed of 20 knots on the surface and 25 knots submerged.

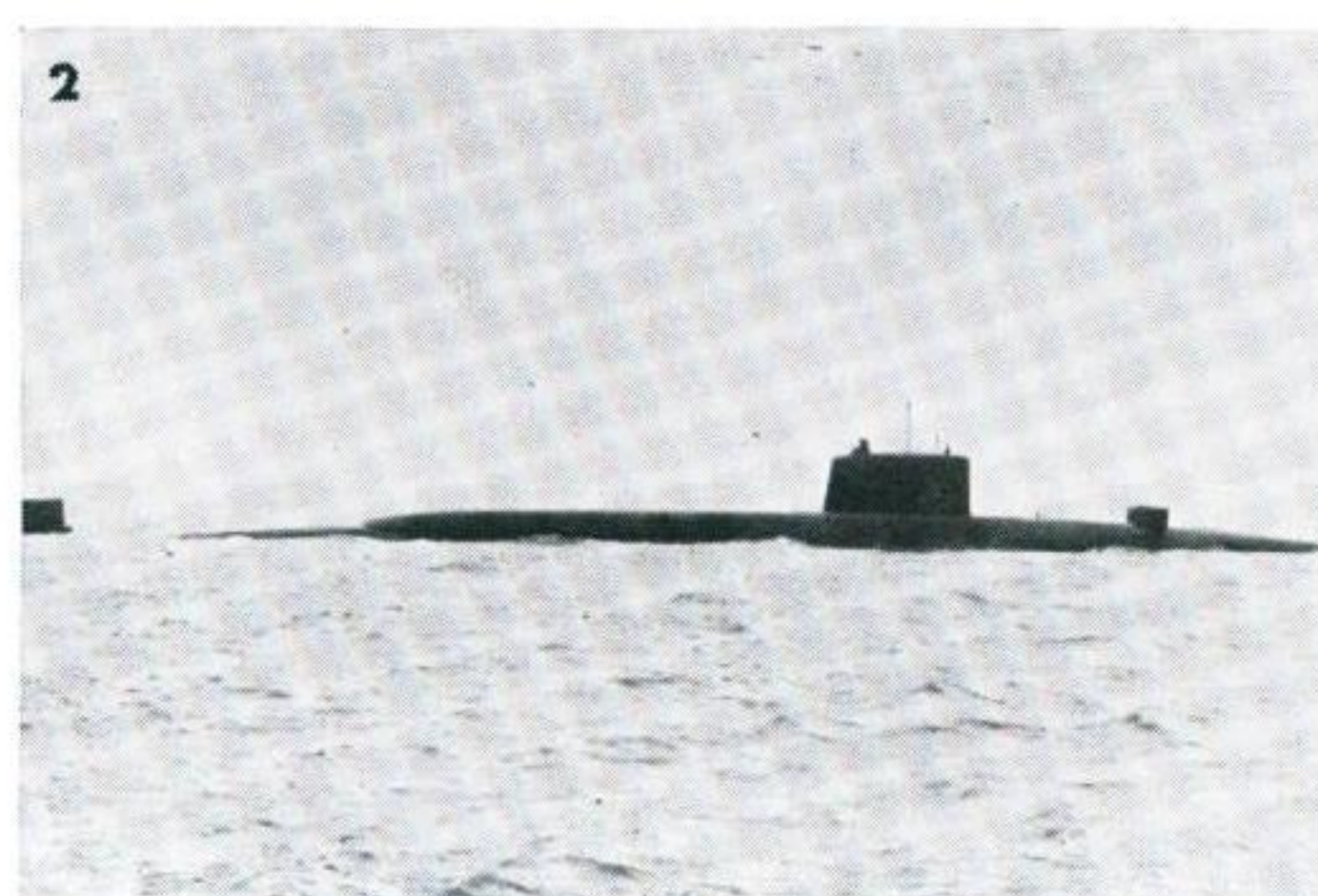
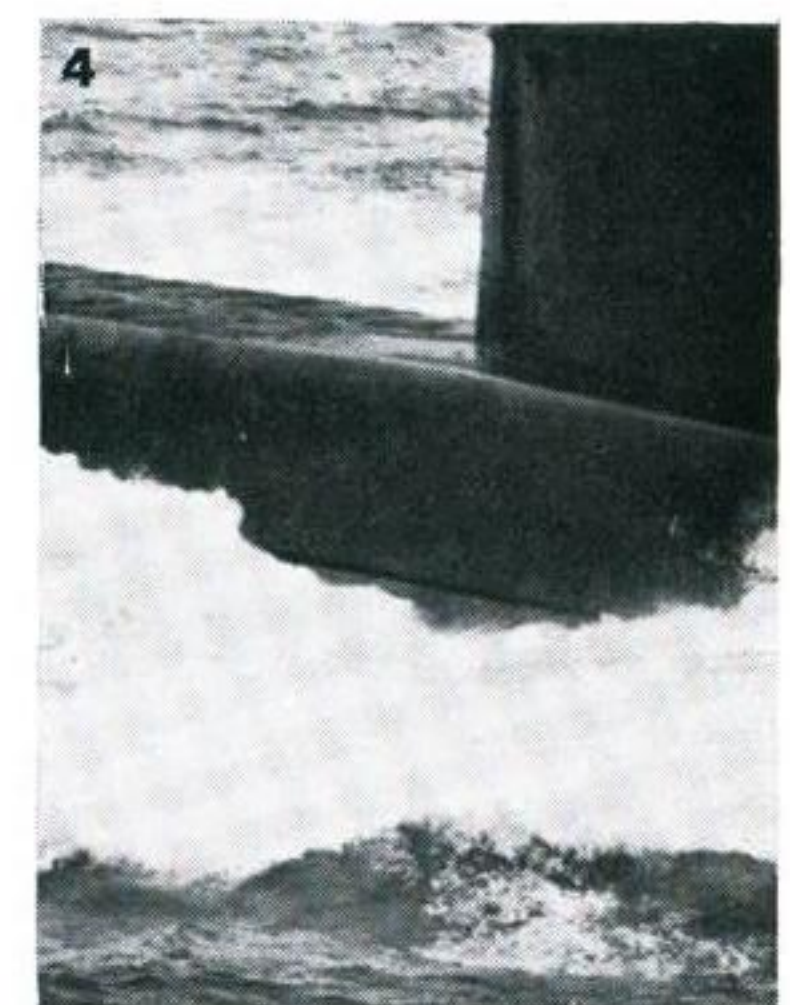
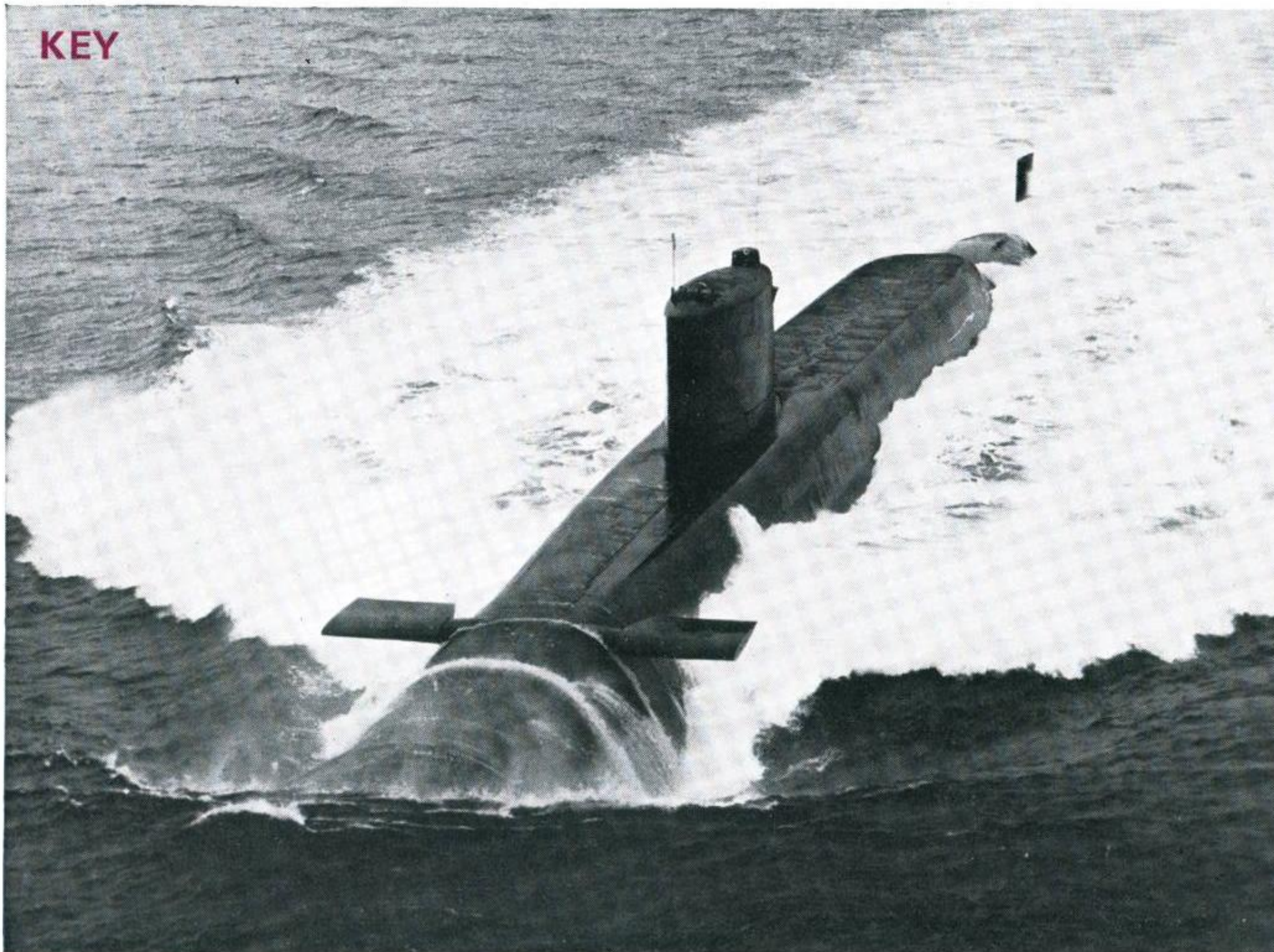
She carries 141 officers and ratings and is manned on a two-crew basis.

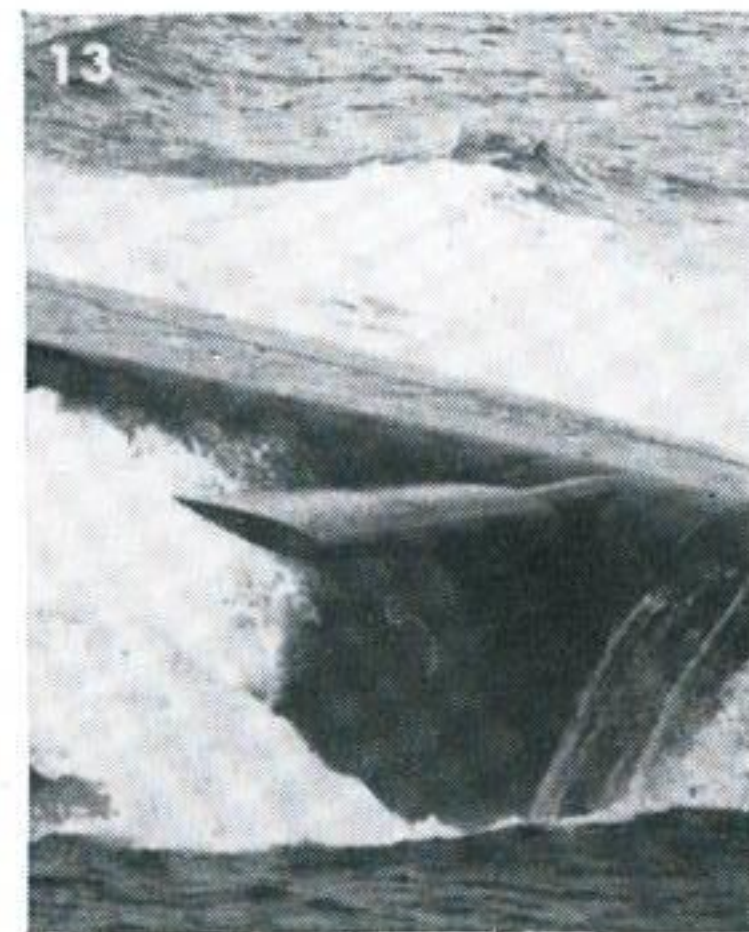
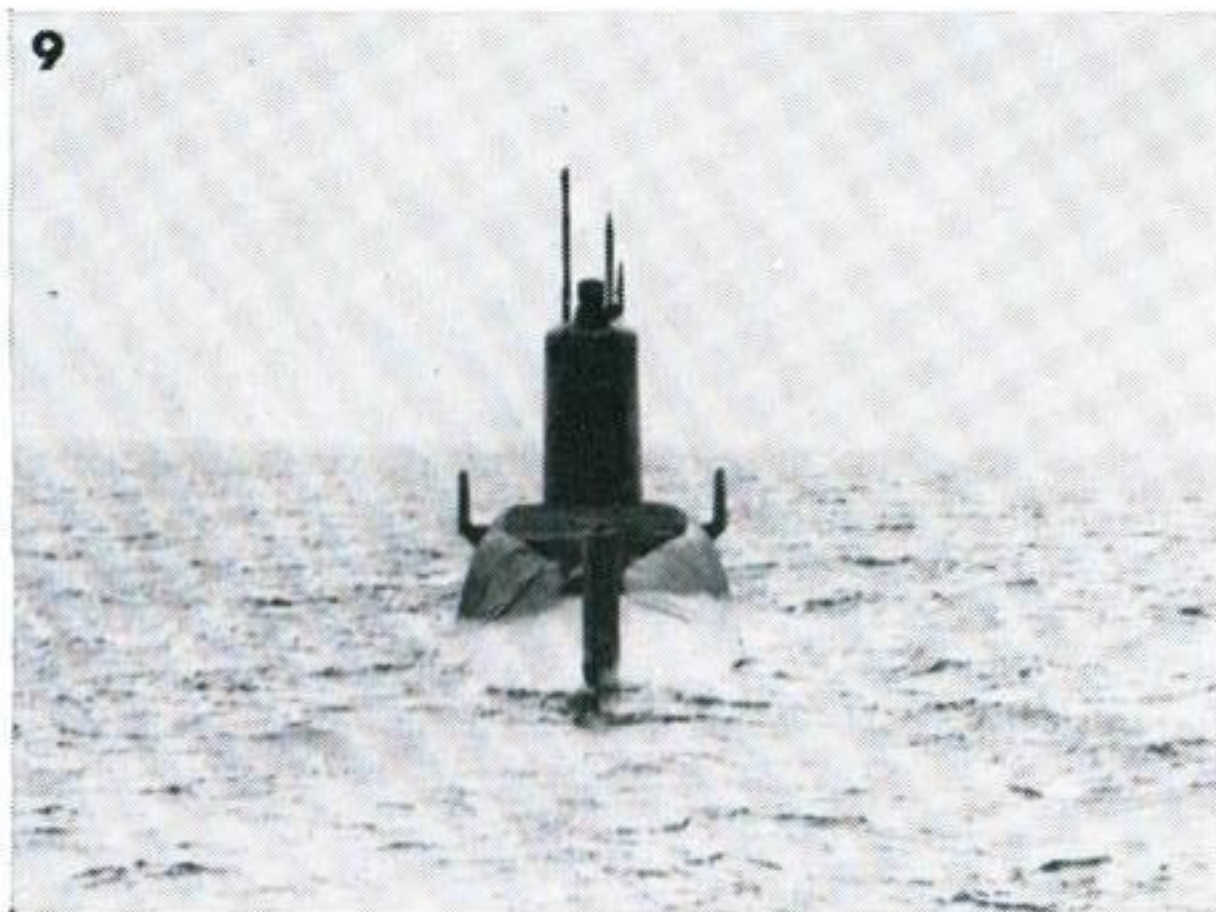
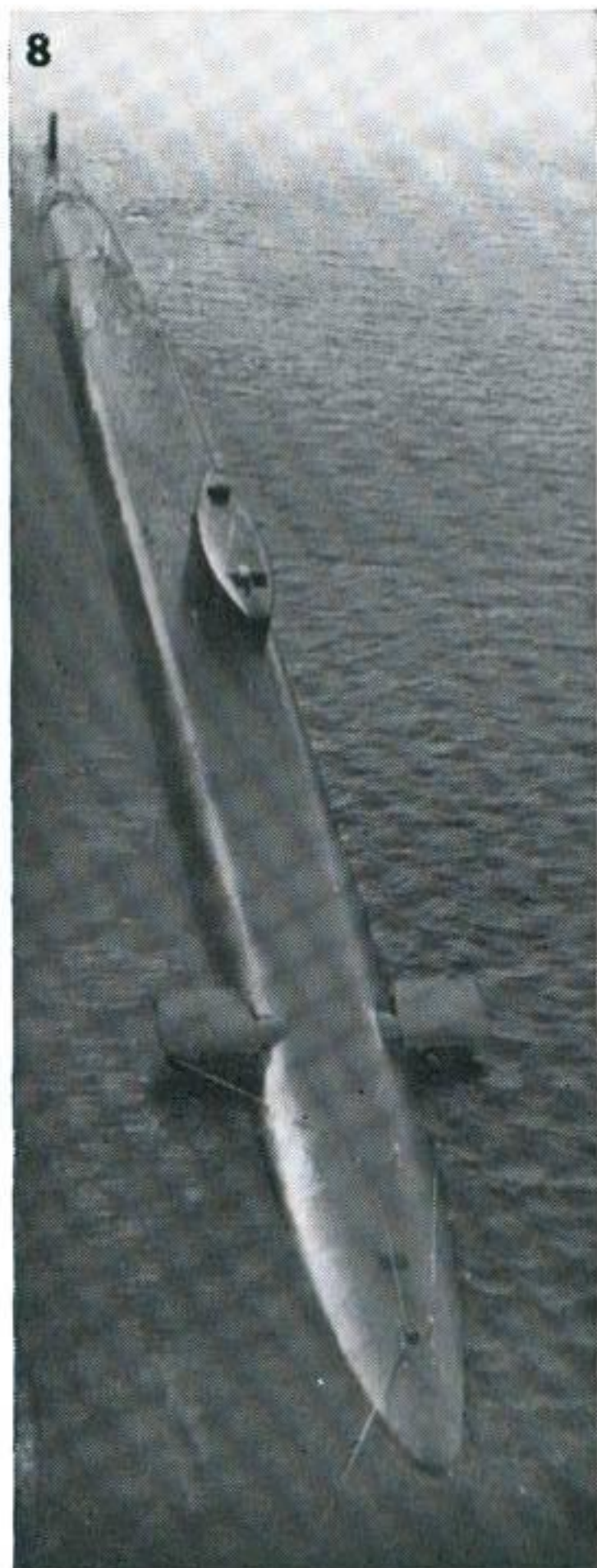
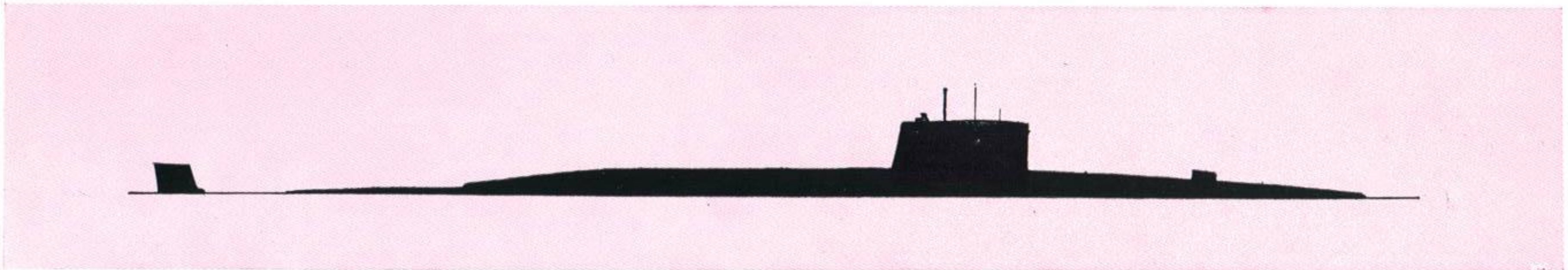
In addition to 16 tubes for "Polaris" ballistic missiles, she has six conventional torpedo tubes forward.

In appearance she is more like a conventional submarine than "Dreadnought" and ships of the "Valiant" Class. Her low fin is set well forward on the hull which has a distinctive "step down" aft.

The vessels making up this class are "Renown", due for completion this year, "Revenge" due in 1969, and the class ship.

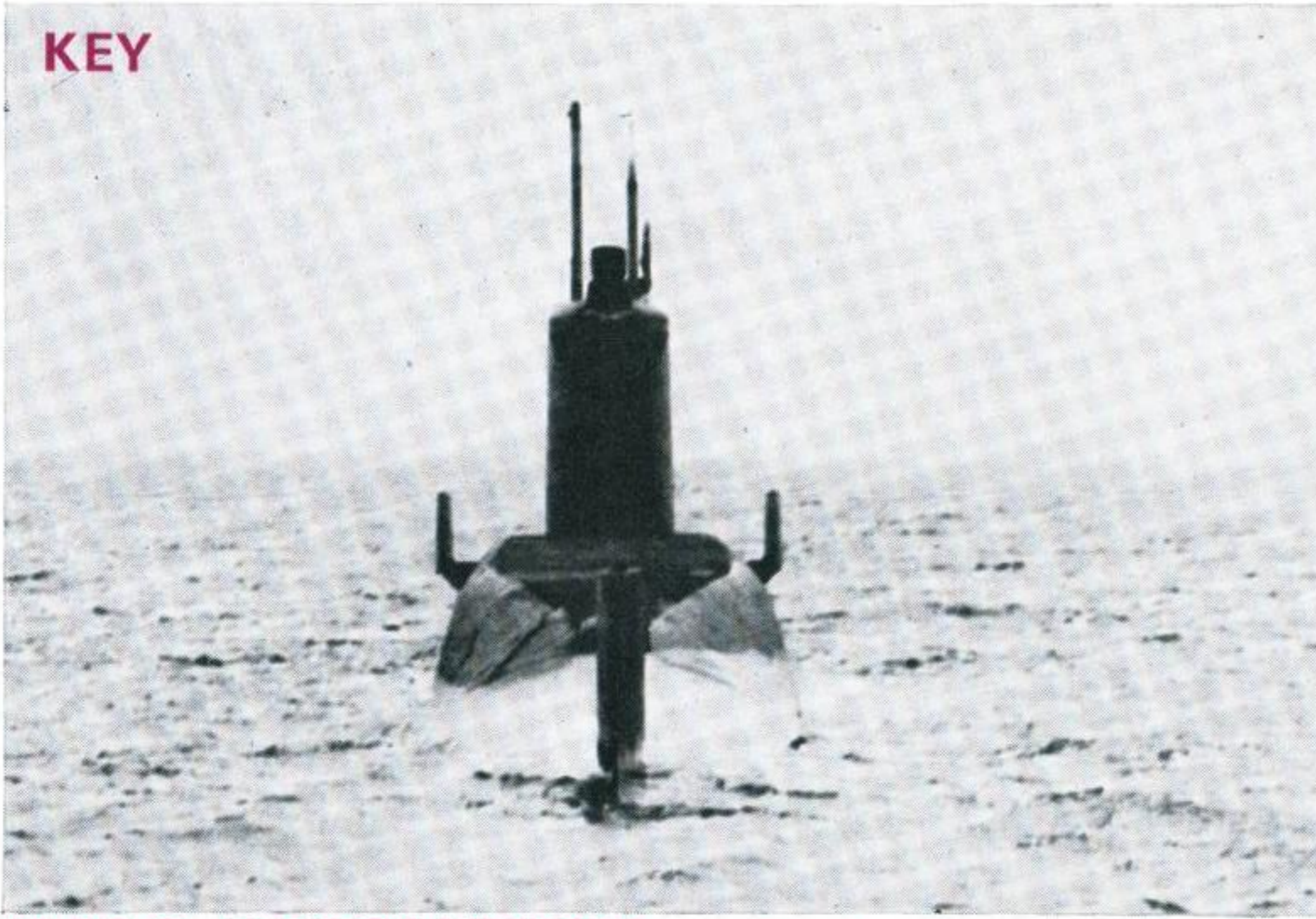
Adhere to the Lesson Instructions which are on page 32. Check your results with the solutions.



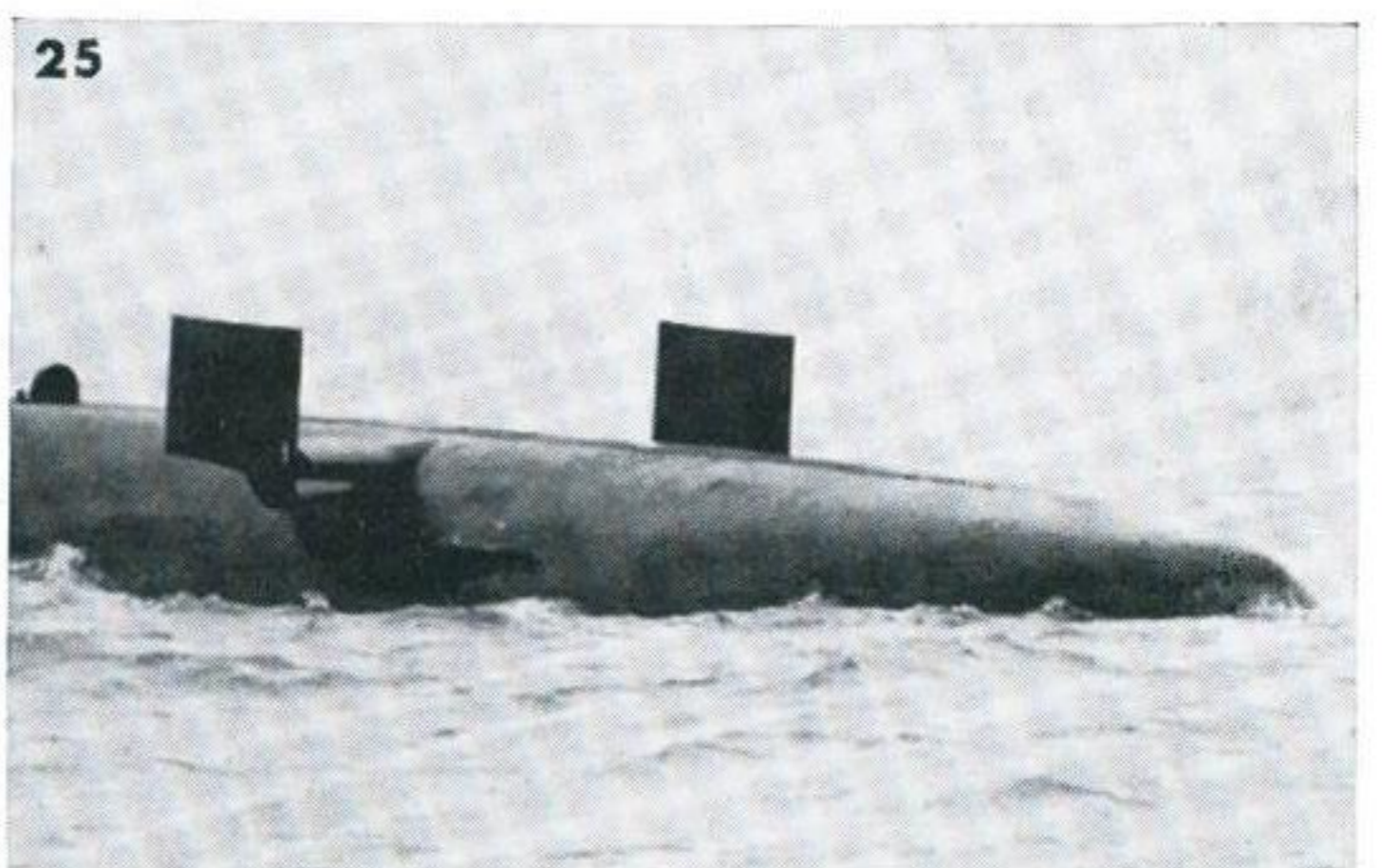
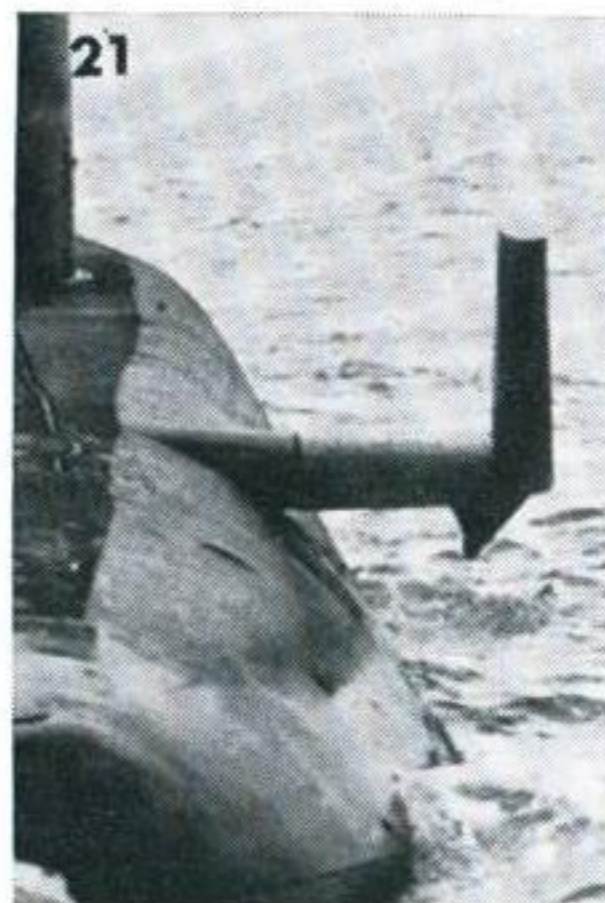
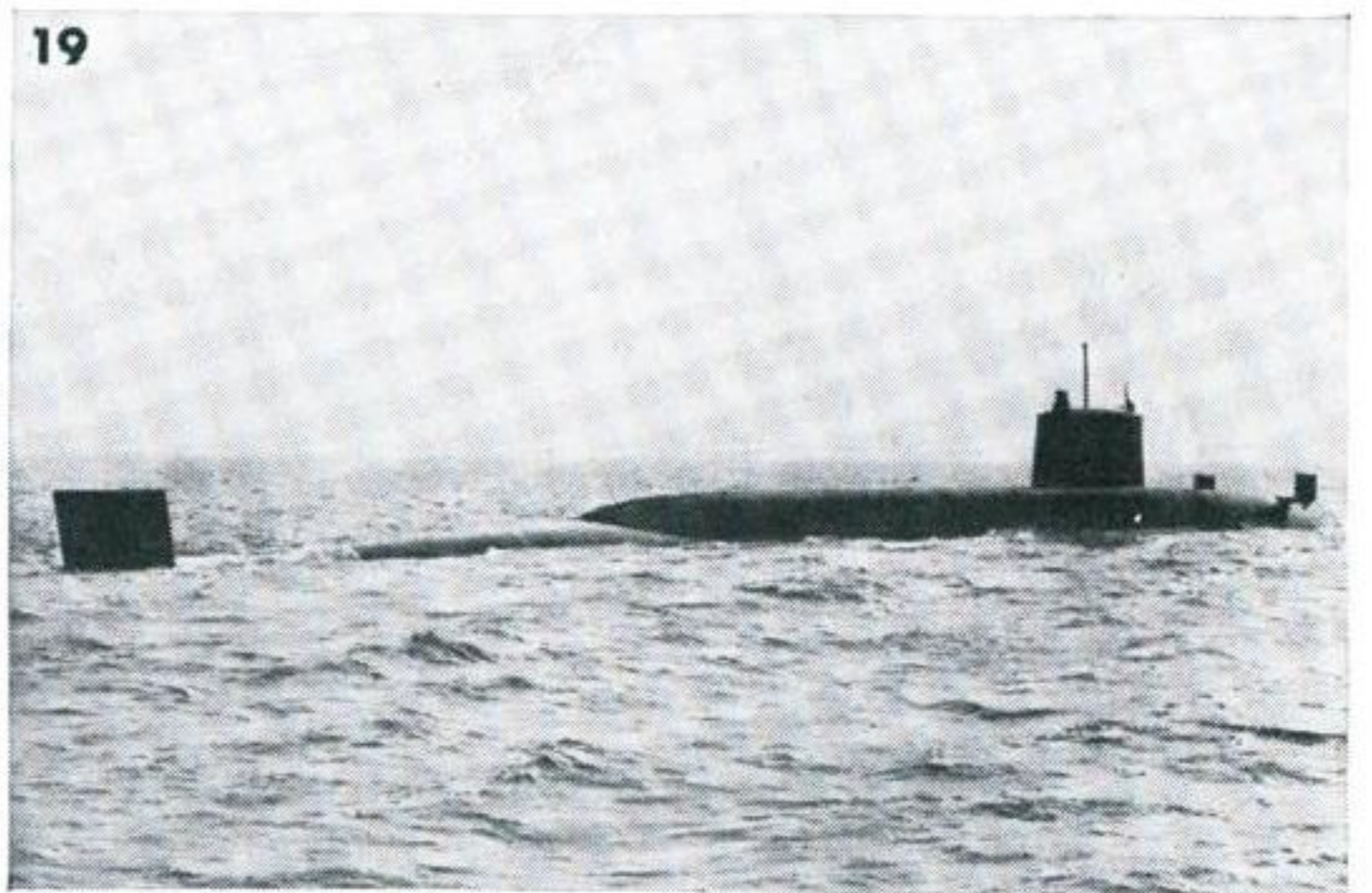
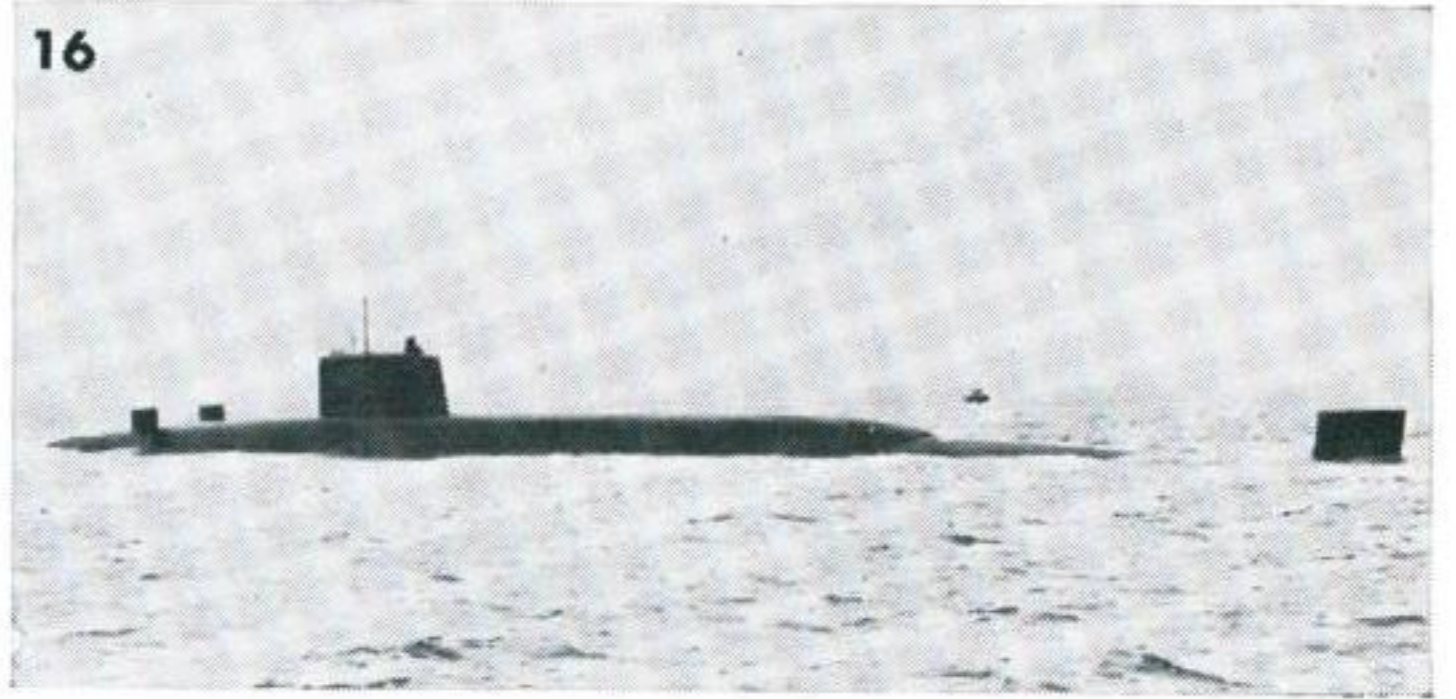


continued overleaf

KEY



H M S RESOLUTION *continued*



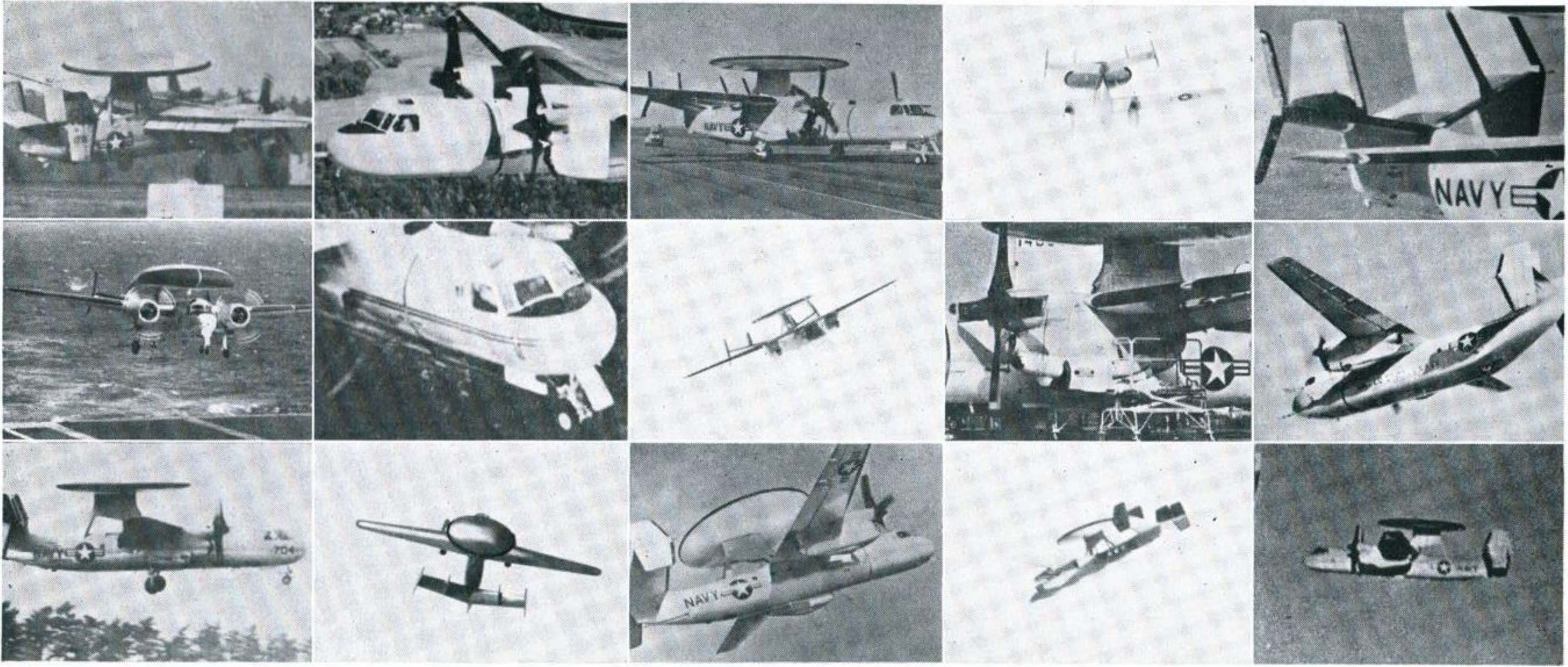
Lesson instructions are on page 32

Solutions on the cover

TEST PAPERS

HAWKEYE?

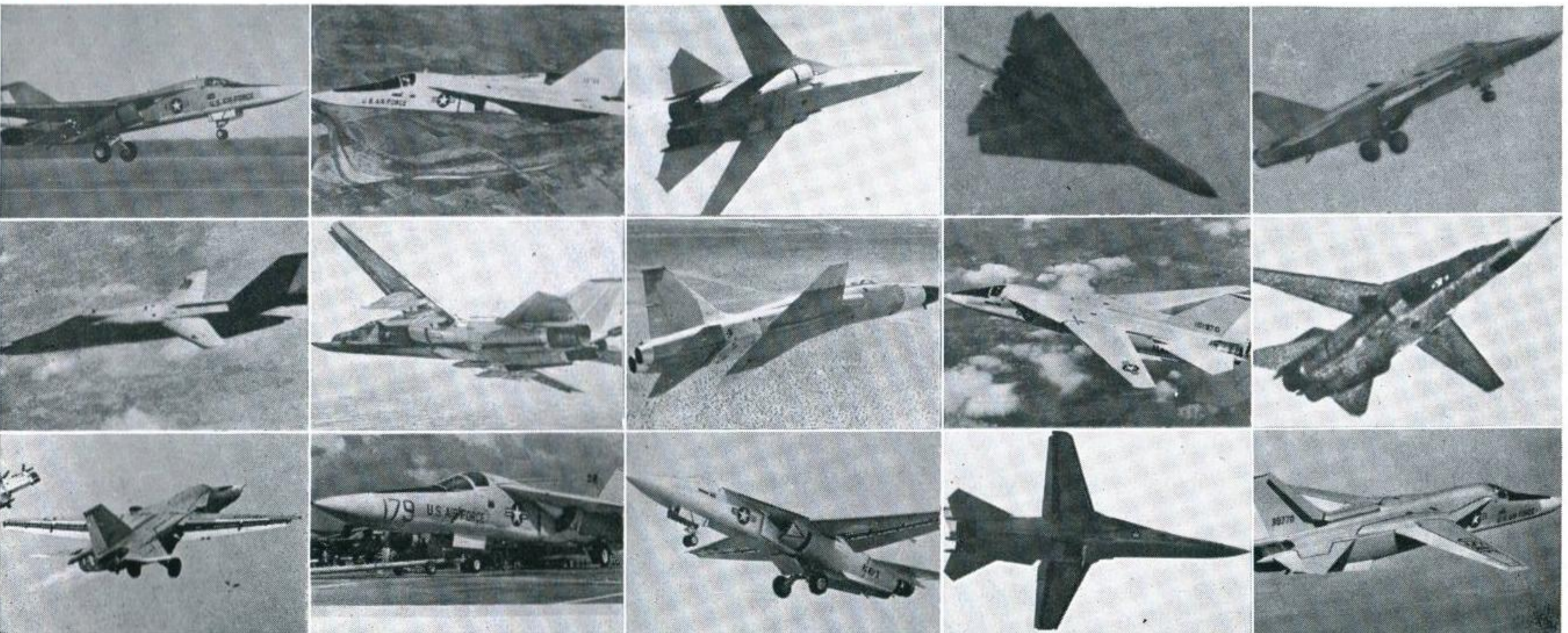
Solutions on the cover



WESSEX?



F-111?



SOLUTIONS TO TESTS AND EXERCISES



Cover Photo: Hawker Siddeley Buccaneer Mk. 2 carrying Martel air-to-ground missiles. The Defence Estimates in February 1967 announced that **Buccaneers** were being adapted to carry these new stand-off missiles.

CORRECTIONS

Joint Services Recognition Journal September 1967

Page 230: Delete **Super VC-10** from the silhouette and substitute **VC-10**.

Page 231: Delete **VC-10** from the silhouette and substitute **Super VC-10**.

Page 240: Amend the caption **Lightnings F.3s** on the photograph to read **Lightning F.6**.

Page 240: Amend **T.1** and **T.3** in the text to read **F.1** and **F.3** respectively.

Page 30

Bear with Frescoes

Page 34

MI09

All targets are of **MI09** except Nos. 15, 47 and 57.

Page 40

BEAR

All targets are of **Bear** except as follows:

Highlights: No. 8 **Cleat**, No. 22 **Boeing B-47**, No. 24 **Cat**

End-on: Nos. 8 and 22 **Cleat**

Page 42

BOEING C-135

All targets are of **Boeing C-135** except No. 10 **B-52** and No. 19 **DC-8**. No. 9 shows also **B-52**.

Page 44

HARRIER

All targets are of **Harrier** except No. 12 **Mirage F** and No. 19 **Buccaneer**.

Page 47

TESTING TIME

1 Starfighter	11 Hercules	21 Buccaneer
2 Sea Vixen	12 Friendship	22 Electra
3 Wasp	13 Hunter	23 Trident
4 Dove (Riley)	14 Sioux	24 VC10
5 Britannia	15 Badger	25 Andover
6 Basset	16 Whirlwind	26 Vanguard
7 Fiddler	17 Argosy	27 Vanguard
8 Buccaneer	18 Cleat	28 Shackleton
9 Boeing 707	19 Beverley	29 Caravelle
10 BAC 111	20 Viscount	30 Boeing 727

Page 48

HANSA

All targets are of **Hansa** except No. 11 which is a **Lear Jet**.

Page 50

WHAT SHIP IS THAT?

Freighters	1, 2, 5, 6, 7, 8, 11, 12, 13, 17, 21, 22, 26, 27, 29, 30, 32, 36, 39, 40, 41, 42, 47, 49, 51, 52, 55, 57, 59, 61, 62, 63, 64, 66, 67, 69, 70, 74, 76, 77, 80, 89, 92, 93.
Packets	4, 9, 14, 15, 20, 31, 33, 34, 35, 37, 48, 53, 54, 58, 60, 68, 72, 81, 82, 83, 86, 87, 88, 90, 91.
Tankers	3, 10, 16, 18, 19, 23, 24, 25, 28, 38, 43, 44, 45, 46, 50, 56, 65, 71, 73, 75, 78, 79, 84, 85.

Page 52

HMS RESOLUTION

All targets are of the **Resolution** except Nos. 14 and 22 which are of the **Valiant**.

Page 55

TEST PAPERS

Hawkeye: Jokers are second line 1st and 5th pictures.

Wessex: Jokers are second line 3rd picture and third line 2nd picture.

F-III: Joker is second line 3rd picture.

Page 56

HERCULES

Joker is second line 1st picture.

HERCULES?

TEST PAPER

Solutions above

