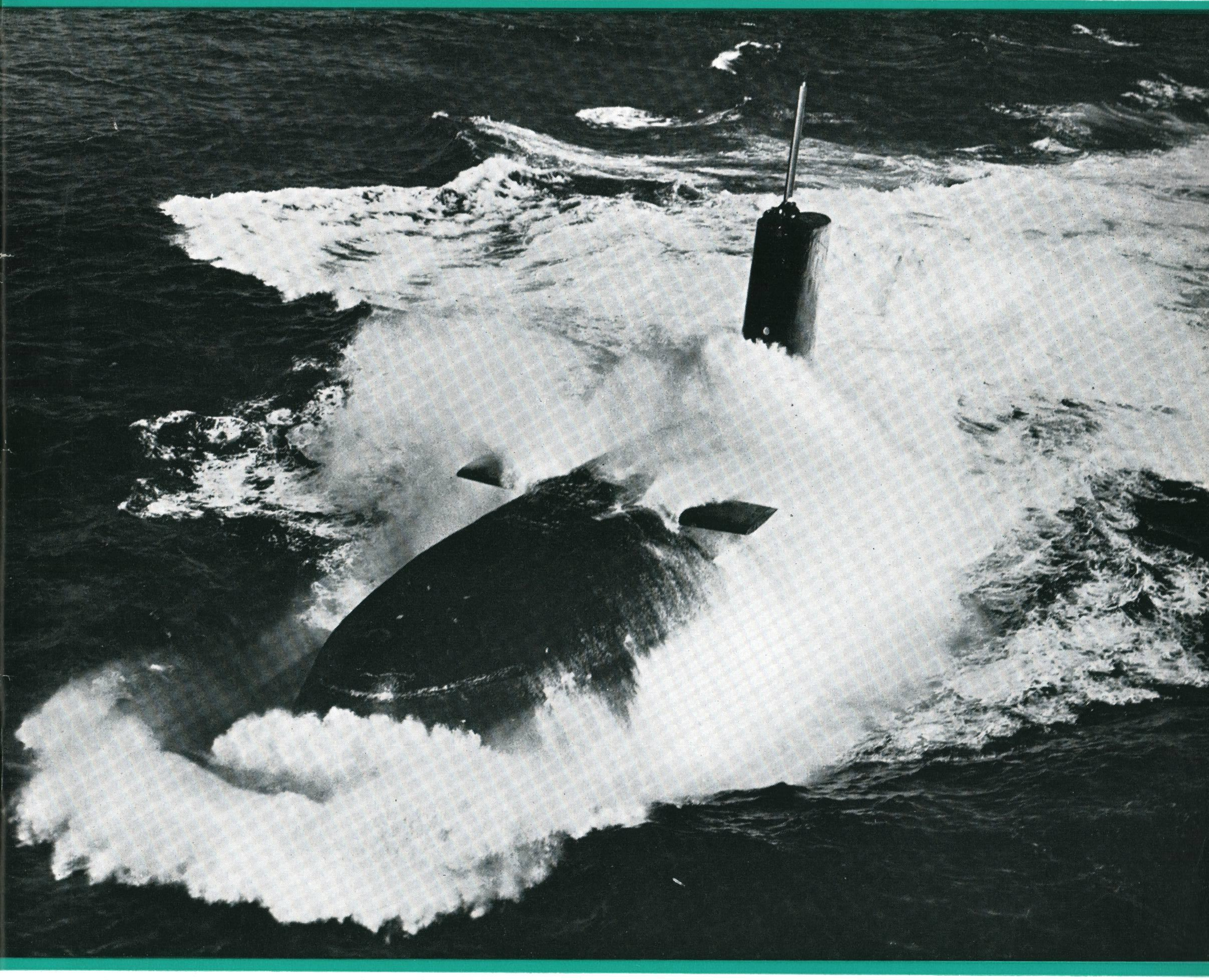
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JOINT SERVICES

# RECOGNITION *Journal*



Vol. 22 AUGUST 1967 No. 8

# H M S Valiant

The second of the Royal Navy's nuclear-powered fleet submarines (the first of all-British design) recently completed a submerged passage from Singapore to the United Kingdom.

The views on this page were taken of her as she surfaced and the small target views on the right-hand page may or may not be of HMS *Valiant*.

To most eyes "all submarines look alike". Part of our job is to show that they are not. It is a common belief too that HMS *Valiant* and HMS *Dreadnought* (the first nuclear-powered submarine) are identical in appearance. The silhouettes drawn below will show the differences.

To push this lesson home, all you have to do is to compare each target with the pictures and the silhouettes and decide whether you are looking at a *Valiant* or a *Dreadnought*.

*Valiant*



*Dreadnought*



AUGUST 1967 Vol. 22 No. 8

JOINT SERVICES

# RECOGNITION JOURNAL

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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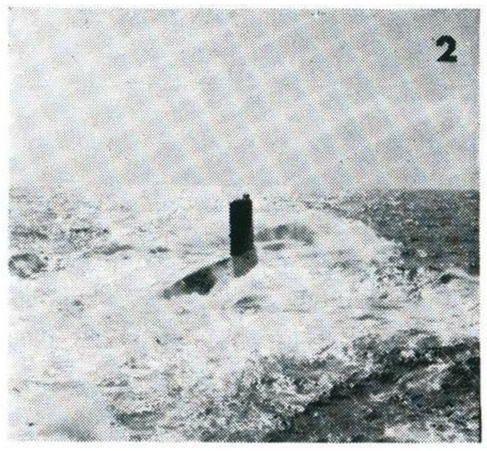
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* *Identification Lessons*

*N.B. No attempt has been made to show the "forest" of periscopes, snorts, radars, etc. which may or may not emerge from the fins of either of the ships. In any case, they can assume so many different arrangements that it would be impossible to cover them all. The lesson should therefore be done by, as far as possible, reference to the main structure shapes of each vessel only.*

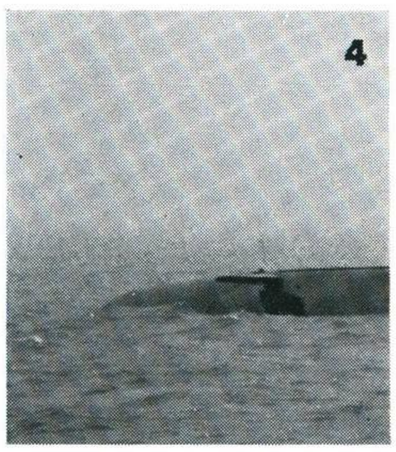
*solutions on cover*

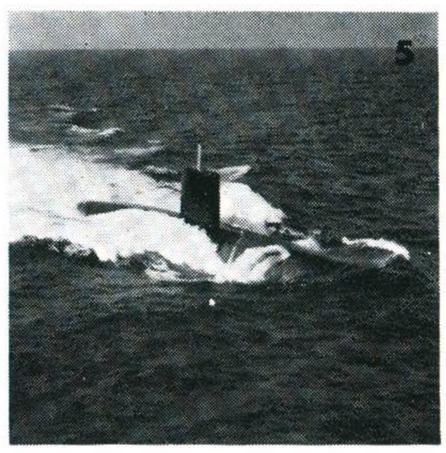


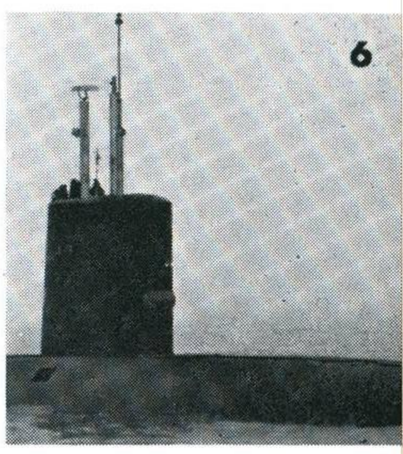









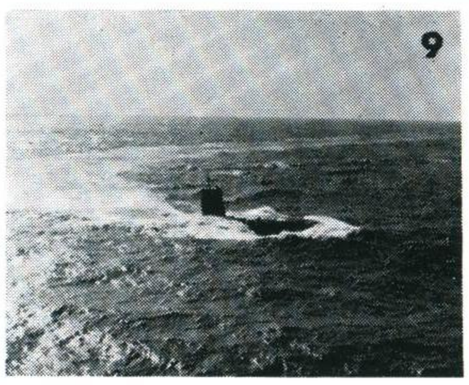



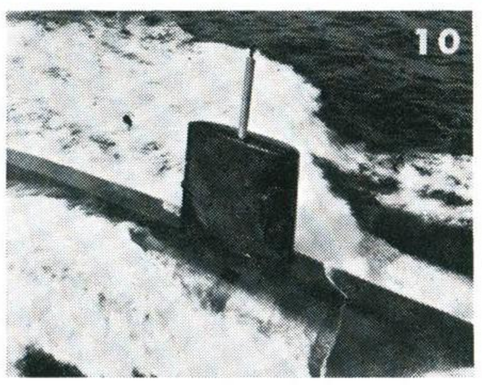



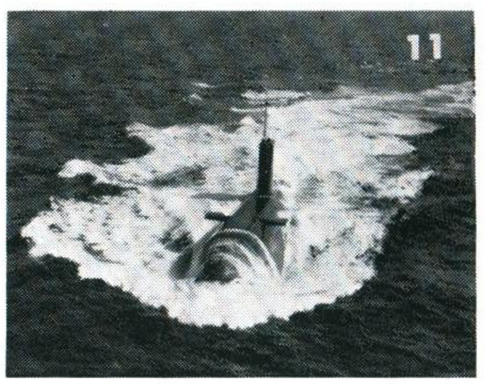






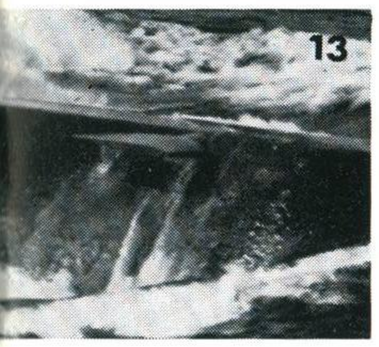



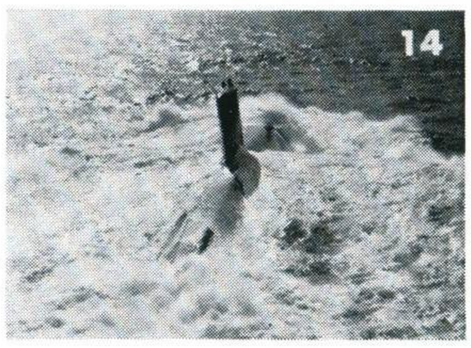



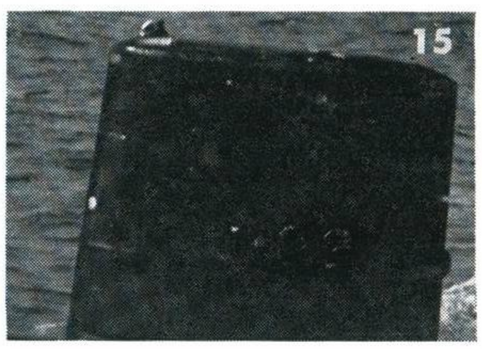



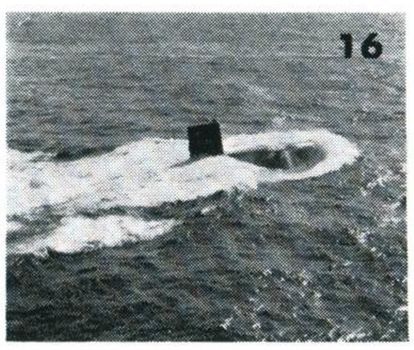


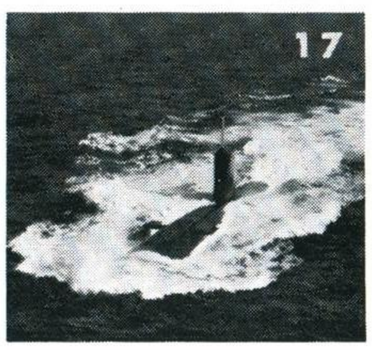


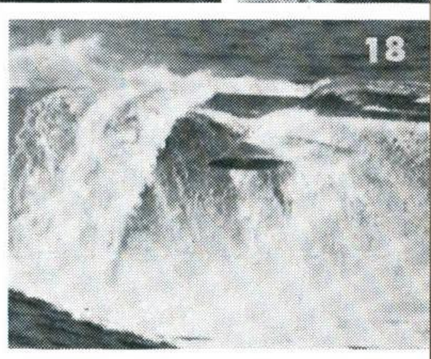


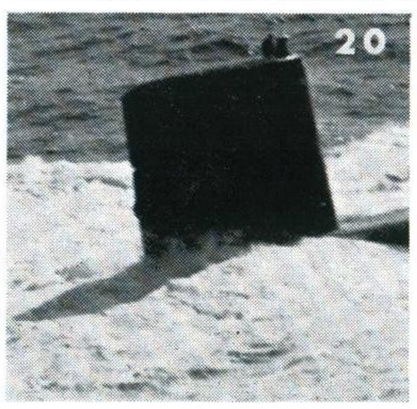



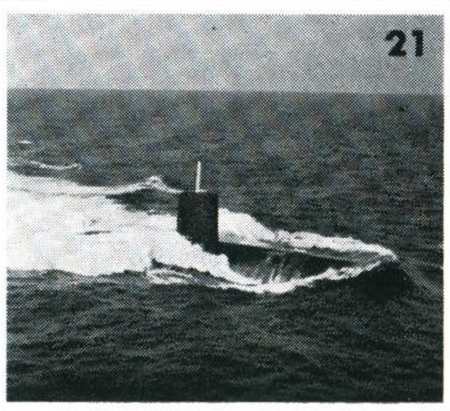



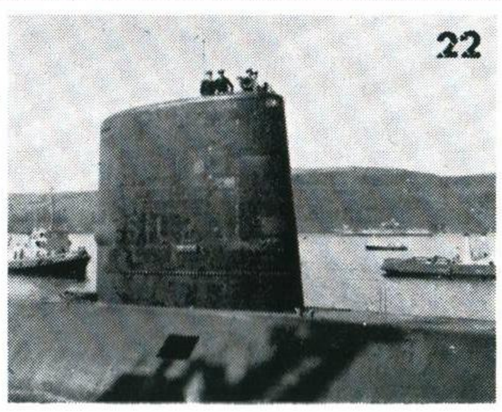



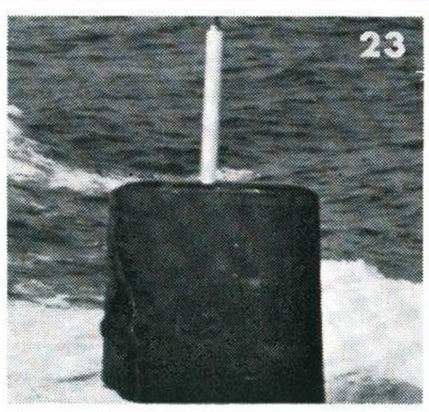


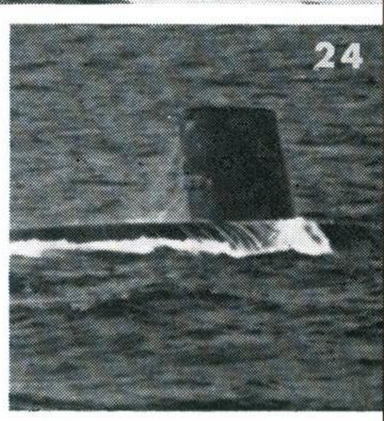




# Learning Perceptual Skills: The Sargeant System of Recognition Training

*By Dr. M. D. Allan*

*Dr. Allan, who held the rank of Senior Psychologist in the Department of the Scientific Advisor to the Air Ministry, reports here a study of a system of aircraft recognition training which leads to discussion of wider problems in the teaching of perceptual skills.*

## INTRODUCTION

The Sargeant system has been named after Charles Sargeant who, in his capacity as Editor of the *Joint Services Recognition Journal*, employed a special type of journalistic device for giving instruction in the recognition of aircraft, armoured vehicles and ships. At first sight it appeared to be nothing more than a "gimmick", an ingenious addition to current methods of instruction. On closer inspection, however, it was found to be fundamentally different in principle from orthodox methods of teaching recognition. It was the duty of the writer to assess the value of this principle from a psychological point of view and to put the system, so far as aircraft recognition was concerned, to the test of controlled experiment.

Apart from its usefulness from the military point of view, aircraft recognition training has psychological significance.

Psychological significance because, for the first time in history, "recognition" was treated as a subject of formal instruction, and literally millions of men were trained in it during the last war. Perceiving and recognising are closely related, and would appear to be different levels of the same psychological process. Recognising is an experience of "the same again" and is in fact a function of perception involving memory. Psychologists in recent years have been speculating about a learning factor in perception, and investigators in the field of industrial and operational research have been drawing attention to the perceptual element in learning operational skills. A study therefore of the efforts to give formal instruction in aircraft recognition is not without relevance to the wider problem of learning perceptual skills, and may even throw some light on the mental mechanisms involved in acquiring basic perceptions. In this paper an attempt will be made to show the unique character of the Sargeant system as an instructional method and to relate it to some of the current speculations about perception.

## HISTORICAL BACKGROUND OF AIRCRAFT RECOGNITION

The danger of invasion during the last war brought into prominence the need to be able to identify objects from a distance, and forced Service authorities to organise instruction in recognising and identifying different types of aircraft, ships, armoured vehicles, etc. Gibson (1948) says that "*as a subject of formal instruction* learning to identify objects of this sort was a complete novelty", and he points out that psychological theory at that time could provide no clear guide with regard to procedure. Consequently, although specialised training in recognition was provided on a large scale, the methods employed were fumbling, and based upon opinion rather than upon any psychological insight into the nature of recognition or of how to provide formal training in the skill.

Formal training was first given in England in 1940 stimulated by the imminence of invasion. Expert "spotters" existed—people who had been enthusiastic about aeroplanes from their earliest days, and who possessed a high level of skill in aircraft differentiation. But there were not nearly enough of them. It was absolutely necessary to train a large body of "spotters" both civilian and Service, so training centres were set up. Unfortunately the experts had no notion about how they had acquired their skill in the first place. It was something that had grown, apparently as a by-product,

**Aircraft recognition training in the Royal Air Force has undergone fundamental changes. The "informational" methods of World War II which involved trainees in considerable feats of consciously memorising information, gave way to an experience-giving technique which trains people to identify aircraft without involving them in so much work. The adoption of the technique has brought about considerable economies in the production of training material—much training can be done direct from the *Journal* alone; training efficiency has also been greatly improved. New training principles are involved which cut right across the traditional ones and lift recognition training to a new plane—so to speak. How the system works and details of the experiments which led to its adoption are explained in the following article by Dr. M. D. Allan, M.A., Ph.D. We are indebted to Professor Alec Rodger, the Editor of "Occupational Psychology" the official Journal of the National Institute of Industrial Psychology, for permission to reprint this article.**

from an early interest in aircraft; how to transmit that skill to others was something of a problem.

The method set up by the British in 1940, no doubt influenced by the enormous popular interest in aviation and aircraft development at that time, was something more comprehensive than visual training in shape recognition. The instructors often knew a great deal about design and development, and much of this information was passed on in the course of recognition instruction. Pupils were taught to identify aircraft by studying diagrammatic views known as "silhouettes" (plan view, head-on view, side view) and memorising the details. The eagerness with which pupils in 1940 were prepared to absorb semi-technical information about aeroplanes obscured the psychological weakness of the system as a means of teaching recognition. The recognition of familiar objects in everyday life does not involve the conscious memorising of individual features. Thus the methods employed avoided coming to terms with the perceptual factor involved, and drew instead upon the well tried intellectual and analytical methods employed in nearly all formal schooling. The result is that today, when invasion is no longer imminent, and aircraft development has lost much of its popular appeal, this method of instruction is unsatisfactory. Trainees find the subject difficult and dull unless they are already interested in aeroplanes and have acquired informally a fair degree of differential skill before instruction begins.

## AMERICAN BACKGROUND

In the United States, recognition training developed along similar lines. From 1940–1942 the official form of instruction was the WEFT system representing wings, engines, fuselage and tail. The method was an analytic technique systematised to assist the memorising process. Its great weakness was that it encouraged verbal memorisation and rote learning of visual features at the expense of what Gibson (1947) calls "acts of recognition".

In contrast to the WEFT system, Dr. Samuel Renshaw of Ohio State University introduced a system of training which emphasised "total form", and which depended on tachistoscopic exposures or flash presentation. This system, known as the "Renshaw system" or the "flash system", was adopted for a time by the U.S. Navy and Air Force. Gibson (1948) ascribes its success to "a systematic drill in the actual identifying of stimuli which looked like aeroplanes in the sky". Renshaw himself however, believed that tachistoscopic practice could improve visual perception generally, and he believed that transfer of training could take place from one type of material to another. Thus tachistoscopic training in the perception of digits and dot patterns formed an integral part of his aircraft recognition training.

Gibson (1947) criticises the Renshaw system on the grounds that there was no experimental evidence from Renshaw or from any other source to show that these basic assumptions were correct. Also, as time went on it became evident that flash recognition was not the main requirement in the operational field. Accuracy of recognition to maximum distance was more important. Eventually the American Navy and Air Force dropped the Renshaw system of teaching aircraft recognition, but the flash trainer itself was retained as a useful device for the speeding-up of the recognition of known shapes.

## THE SARGEANT SYSTEM

The Sargeant system regards the problem of aircraft recognition training as a problem in how to learn to recognise, differentiate and identify new shapes. In short it is basically a problem in perceptual learning. Obviously the human organism possesses a mental mechanism capable of carrying out perceptual organisation without the aid of lectures or formal instruction, otherwise there would be none of the spontaneous recognition skills of everyday life, such as the ability to recognise faces and objects. The problem is how to stimulate this perceptual organising capacity into action. Underlying Sargeant's technique is the device of providing one sort of perceptual material to unlock the identity of another. Pupils work out identities for themselves with the aid of key information.

## PLAN OF INVESTIGATION

There are many ways of implementing Sargeant's idea into an instructional technique, and he uses a variety of devices in his journalistic work. However, for the purposes of this investigation, it was decided to produce a full-scale training scheme for 20 aircraft, incorporating the principle in a form suitable for application in a classroom, and to apply the scheme in a live situation where the results could be compared with those of a matched sample trained by the conventional method which involved lectures and organised attention to detail.

### (1) *The Training Device*

Only photographic materials were used in what became known later as the Sargeant Recognition Trainer (Aircraft). The device in itself is quite simple, consisting of two books of photographs for each set of aircraft. There are never more than four different aircraft in a set, and they are grouped according to similarity of design. In the first book are named photographs of the four aircraft shown in different positions. The photographs are well printed on good paper. They are clear, arresting and unambiguous. With each type of aircraft there is inset a small three-view silhouette or plan drawing. This constitutes the key material with which pupils must puzzle out the identity of aircraft in the second book. This second book has 120–140 target views of these four aircraft arranged to give maximum observational experience of the aircraft in different positions and at different ranges.

The procedure is to invite pupils, without any formal instruction, to go ahead and identify the aircraft in the second book by cross reference to the key pictures and to write down the name each time they succeed in identifying one. Each pupil is allowed to work at his own speed and he is allowed to discuss difficult cases of identification with other pupils or with the instructor. The function of the instructor is not a teaching one. The pupils virtually teach themselves, but the instructor must be alert to the needs of individual pupils. He must supply them with training material as the need arises, supervise and correct their efforts, and be available to discuss difficult points and answer questions.

The subjects of the experiment were recruits undergoing Light Anti-Aircraft Basic Training at the end of 1955. Aircraft recognition was one of the subjects in their syllabus of training and after 18 training periods, each of 40 minutes' duration,

they were required to do a spotting test on 20 prescribed aircraft.

(ii) *Experimental Design*

The experiment was conducted within the framework of normal school routine, and the final testing was exactly in accordance with conventional procedure on the unit.

The experimental group consisted of four entries of recruits, totalling 62 men, who happened to come up for training at that time. In order to assess the value of the Sargeant Trainer, no other device was used throughout their training, and no lectures were given.

One of the difficulties of assessing the effectiveness of any method of teaching aircraft recognition is the fact that there are always some pupils with some knowledge of the subject before they come up for training. It is customary therefore to give a test to find out how much they know before the course begins. Table 1 below shows the distribution of marks on this initial test for the Experimental Group.

TABLE 1: EXPERIMENTAL GROUP, INITIAL TEST

| Initial Mark | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Number of Pupils | — | — | — | — | 1 | — | — | — | 1 | 2 | 2 | 1 | 2 | 6 | 5 | 3 | 6 | 3 | 6 | 13 | 11 | Total Pupils 62 |

A Control Group was selected from those trained by the conventional method, having exactly the same distribution of marks on the initial test. These two groups of 62 men, matched for initial knowledge, having the same instructor, but differing in the method by which they were trained, were given the official spotting test by an independent body after the same number of training hours.

(iii) *Results of Experiment*

The distribution of marks on the 20 item spotting test which takes place at the end of the training period is shown in Table 2.

TABLE 2: BOTH GROUPS, FINAL TEST

| Score .. .. | 20 | 19 | 18 | 17 | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Experimental Group N=62 | 23 | 5 | 5 | 6 | 7 | 2 | 5 | 2 | 2 | 3 | – | – | 1 | – | – | – | – | – | – | 1 | – |
| Control Group .. N=62 | 14 | 7 | 5 | 5 | 5 | 2 | 2 | 6 | 7 | 1 | 1 | 2 | – | 2 | 2 | – | 1 | – | – | – | – |

This distribution indicates superior performance by the experimental group, and Table 3 shows the difference to be significant at the 5 per cent level.

TABLE 3: COMPARISON BETWEEN EXPERIMENTAL AND CONTROL GROUP IN FINAL TEST

| | Mean | Variance | t | P |
|---|---|---|---|---|
| Experimental Group .. N=62 | 16·952 | 13·195 | 2·115 | <0·05 |
| Control Group .. .. | 15·435 | 18·293 | | |

At a later date it was thought that the difference between initial score and final score might be taken as a measure of the effectiveness of training. In Table 4 a comparison is made between the two groups in terms of this difference. Unfortunately, owing to an accident, the individual scores were available for only two of the experimental groups, thus reducing the size of the experimental sample to 31.

TABLE 4: COMPARISON BETWEEN EXPERIMENTAL AND CONTROL GROUPS FOR IMPROVEMENT AFTER TRAINING

| | N | Mean Improvement | Variance | Standardised Difference Z | P |
|---|---|---|---|---|---|
| Experimental Group | 31 | 15·000 | 10·581 | 4·40 | <·001 |
| Control Group .. | 62 | 11·565 | 16·686 | | |

Quite apart from the statistical significance of the training results, there was clear evidence that the technique itself catches and holds the attention of the pupils. Unfortunately this cannot be measured, but it was remarked upon by the Commanding Officer of the Unit who wrote in his report that trainees were exhibiting great interest and enthusiasm, and that there was "genuine reluctance to leave the class on completion of the training period".

## DISCUSSION

It was pointed out at the beginning of this paper that "Recognition", as a subject of formal instruction, received little guidance from psychological theory at the outbreak of the last war. That is because recognition is a perceptual skill, and the relation of learning to visual perception was, and still is, a matter of psychological controversy. Broadly speaking, at that time there were only two schools of thought from which to choose in setting-up a training procedure—one based on an atomistic view of perception, and the other on a psychology of perception emphasising the *gestalt* to total form. The classical theory of perception held by psychologists in the early part of this century was an atomistic one. According to this view a perception is a one plus one linkage of elements, and so a perception can be analysed without loss into elementary units. The WEFT system of recognition training mentioned earlier in this paper was a systematised training scheme founded on such a psychological belief.

Atomism is no longer in favour as a sound approach to perception, but its influence on training techniques is deeply entrenched. Where something to be learned is too complex to be taken in at once, the tendency is to carve it up, tackle the pieces separately, almost as independent units, then string them together. The obvious weakness of this approach to learning recognition is that it is in no way related to the way in which the recognition skills of everyday life are acquired. The stringing together of units is an addition process and we know that small children have acquired quite a high degree of skill in the recognition of familiar objects before they are able to grasp the most elementary idea of summation.

*Gestalttheorie* is responsible for the most important feature of the Renshaw system of aircraft recognition namely the

emphasis on "total form" without mention of features. Such a change of emphasis infused new life into the subject and was undoubtedly an important contribution at the time. However we do know that the Renshaw system suffered eclipse. This could be ascribed to the discovery that split second recognition was not a real operational requirement and also to some doubt regarding the validity of Renshaw's basic assumptions (Gibson, 1947, 1948). But perhaps the real reason was that the Renshaw system made no real contribution to the problem of how to teach recognition. It could train students in split second identification of flashing slides to a degree which was quite spectacular, but it has nothing to say about how to learn differential recognition except to insist on the "learning of total forms" and to discourage analysis of feature. Renshaw was entirely consistent with orthodox *Gestalttheorie* in insisting on total form without mention of feature, but a controlled experiment carried out in the United States at Santa Ana Army Air Base, and described by Gibson (1947) showed that "the method of instruction which emphasises the total form of airplanes without mention of feature is, if anything, slightly less efficient in training for aircraft recognition than a method which emphasises features".

In spite of these findings one cannot help feeling that the *Gestalt* emphasis should not be rejected out of hand, particularly if the only alternative is likely to be an analytical technique based on the old one plus one connection of parts. There is no denying the "whole" character of a perception, and the *Gestalt* insistence that the whole is something other than the sum of its parts is extremely important, but the fact is, *Gestalttheorie* can give no clear guidance on how to learn a perceptual skill because of its insistence that perceptions are not learned. This belief has been challenged in recent years (Hebb, 1949) and there is some evidence to support the view that perception is a function of experience; in short, that perceptions are learned. If that is so, then the learning is a spontaneous activity which starts very early in a child's life and develops through activity in getting to know his surroundings. In this connection Grey Walter (1953) puts forward the theory of a scanning mechanism in the brain. He describes it as a process of scanning, searching for a pattern which relaxes when a pattern is found. He suggests (1956) that a scanning of the world of experience for events which are significantly related is an aspect of learning, and "learning in this sense and pattern recognition are essentially the same process". The pupils who were taught aircraft recognition by the Sargeant system did pay attention to detail but always in relation to the whole. In other words they scanned their problem pictures for features which could be said to belong or not to belong to certain given shapes. With repetition the features which fit are reinforced, and appear to structure themselves spontaneously into a pattern which henceforth functions as a unit and has the immediate characteristic of a perception. In this way differential perception becomes possible and eventually automatic.

This is not orthodox *Gestalt* theory where perception of wholeness comes first, and may exist independently or even before perception of its parts. In recent years many psychologists have not been altogether happy about this basic assumption in *Gestalt* theory. Allport (1955) speculates what would have happened if *Gestalt* psychology, "instead of conceiving structure as the result of the organising activity of wholes, had thought of whole character as a by-product of structure". Structure in this sense becomes a verb and implies a need to seek for "laws of dynamic structuring in nature rather than for laws of dynamic wholes". This is a very exciting speculation and very pertinent to the problem of learning perceptual skills, for it suggests that the living organism may have an innate capacity for perceptual organisation which, given the right conditions, will function spontaneously (Allan, 1957). It would explain why pupils, trained in aircraft recognition by the Sargeant system, by repeatedly examining features in relation to the whole aeroplane were able to achieve differential recognition skill without consciously memorising parts. Furthermore, it is not out of step with some of the contributions made to psychology by Information Theory. By means of "recording", communication engineers are able to stretch the channel capacity of their machines. There is a limit to the number of items that can be processed at any one time, but the amount of information that can be handled can be increased by recording or organising the input information into units or "chunks" each containing as much information as possible. It has been suggested by Miller (1956), that the amount of data which the human mind can process at any one time is also strictly limited (the early experiments in span of apprehension would seem to confirm this). So efficiency demands that as much information as possible should be packed into the available span. Miller suggests that some sort of recoding takes place, and points out that the use of language is a form of verbal recoding which "is the very lifeblood of thought processes".

But language is a relatively sophisticated skill and one not shared by the lower animals. Might not the living organism be capable of a more primitive sort of recoding of experience in the percept? Such a speculation has more than academic interest because it makes recoding and learning the same thing and brings sensory perception, language and thought processes into the same family tree. It implies that living organisms are equipped with mechanisms for recoding sense impressions into percepts and the inference is that if this dynamic were clearly understood it would point the way to better techniques for teaching perceptual skills.

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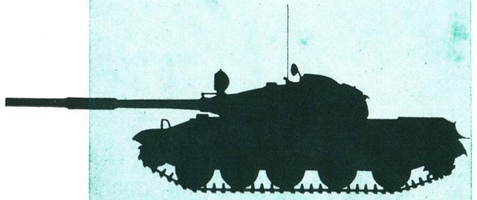
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## ARMOUR OF THE USSR

# T-62

## BATTLE TANK

*The T-62 is the latest Soviet tank but it began to come into service with Soviet armoured formations four years ago, gradually displacing the T-54, the most recent lesson on which appeared in the January 1967 issue of the* Journal. *Externally the T-62 bears a strong family resemblance to the T-54. The most noticeable differences are that the T-62 has a 115-mm. gun with a fume extractor near the middle of its long barrel and five unevenly spaced road wheels with a characteristic large gap between the last three; it also has a longer hull and a flatter turret.*







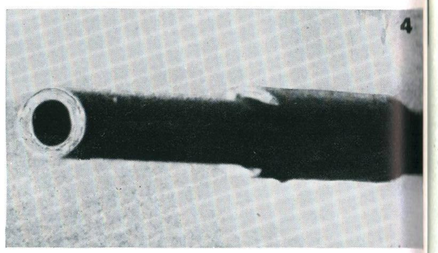
*continued* ▶





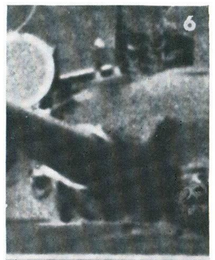


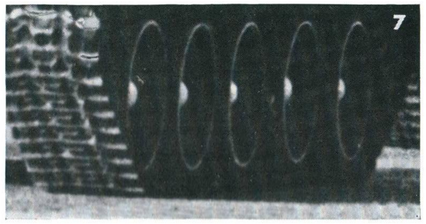


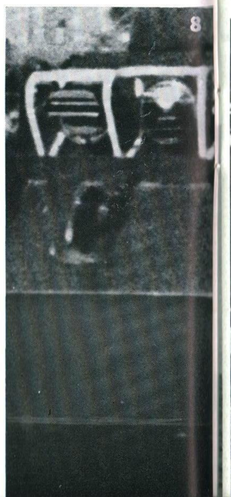



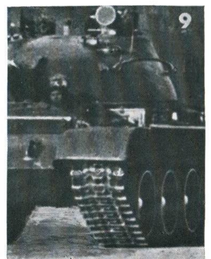






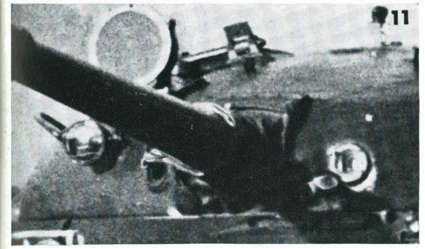



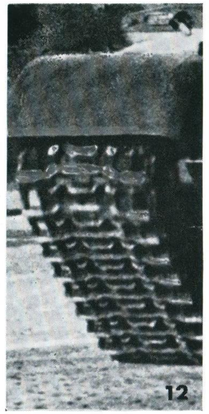



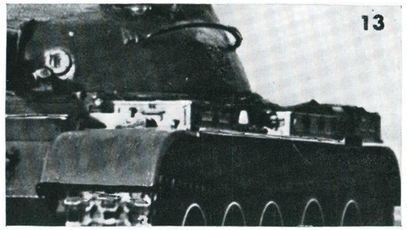









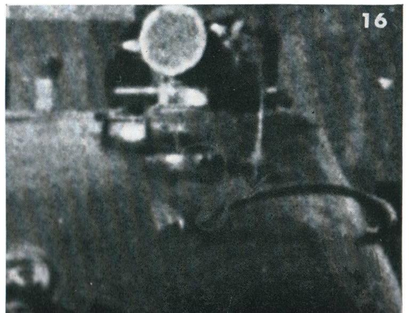



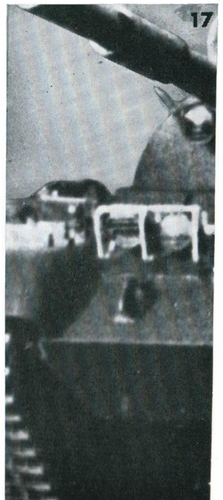


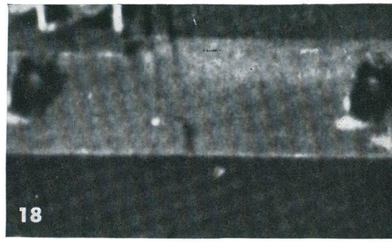


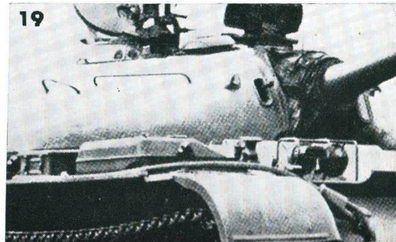


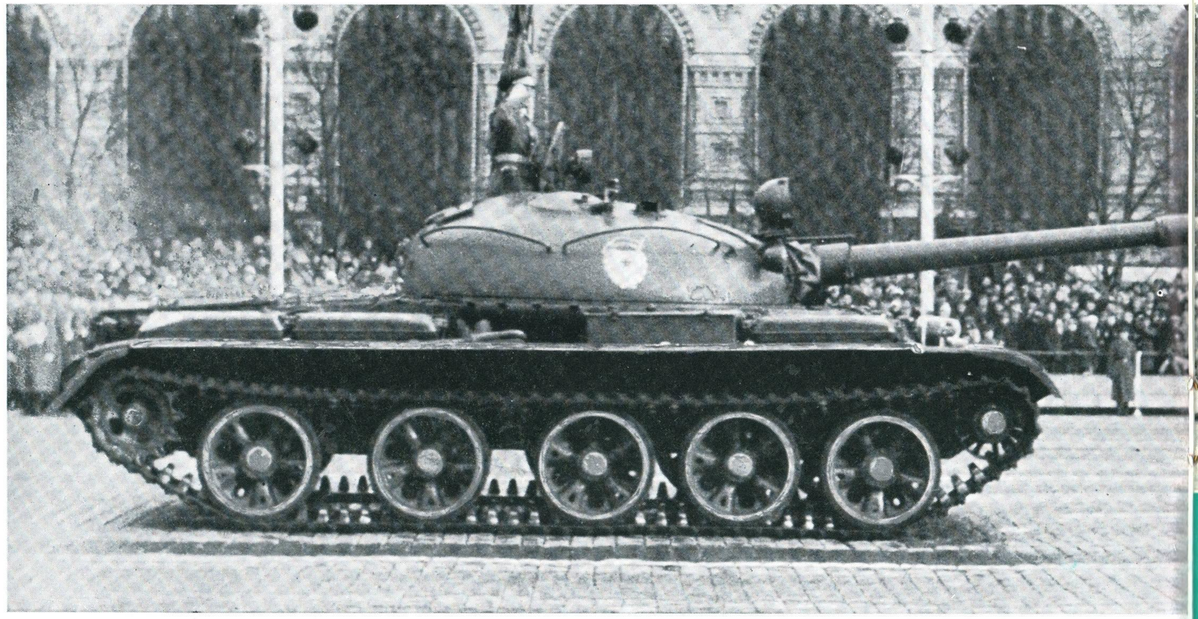

*solutions are on the cover*



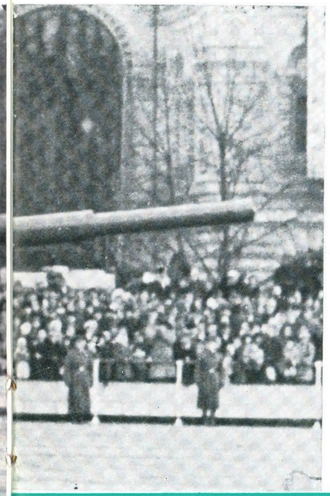





*SOVIET T-62 BATTLE TANK*



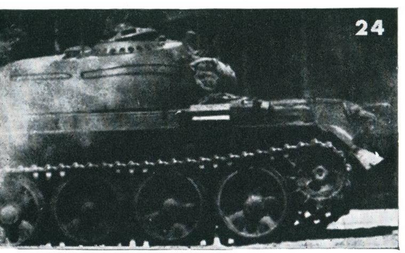
# T-62





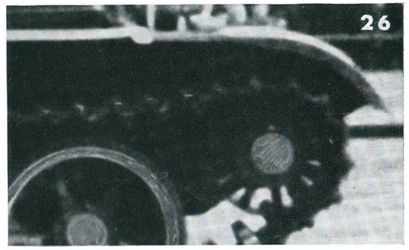




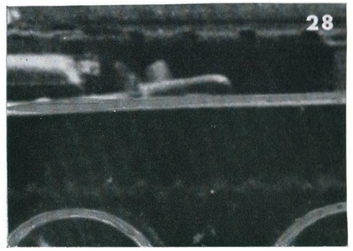


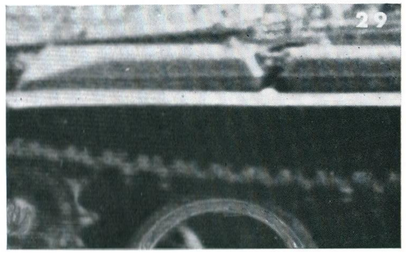








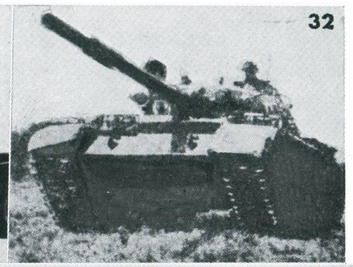










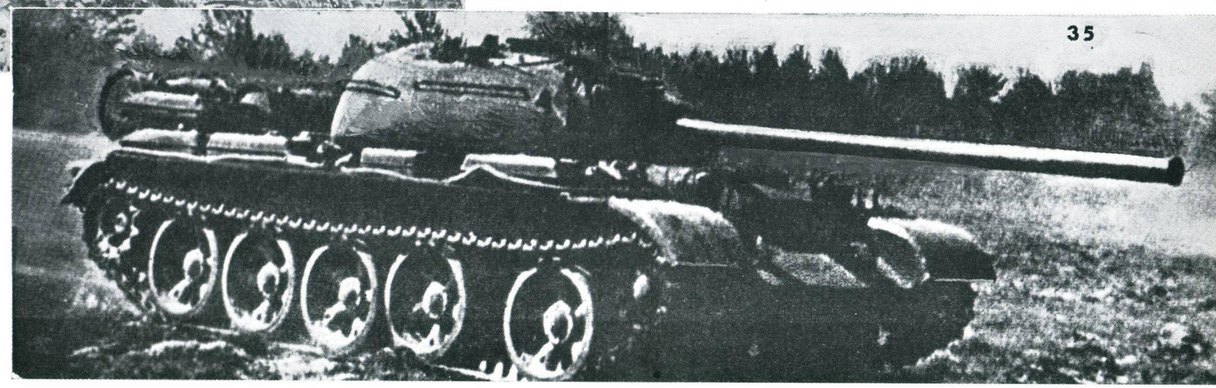








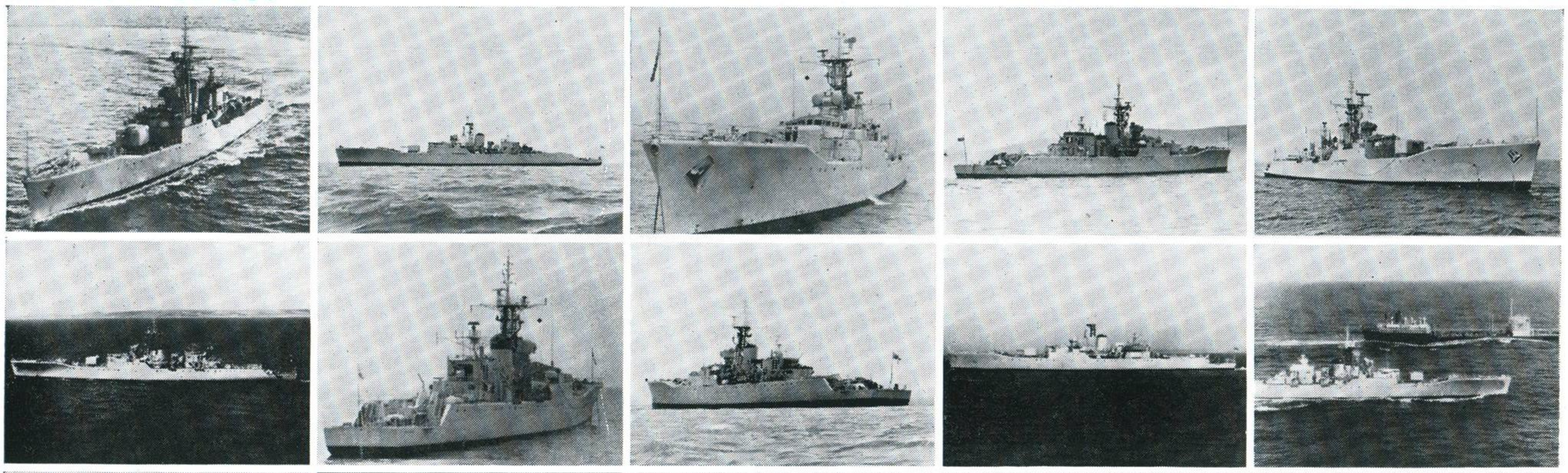




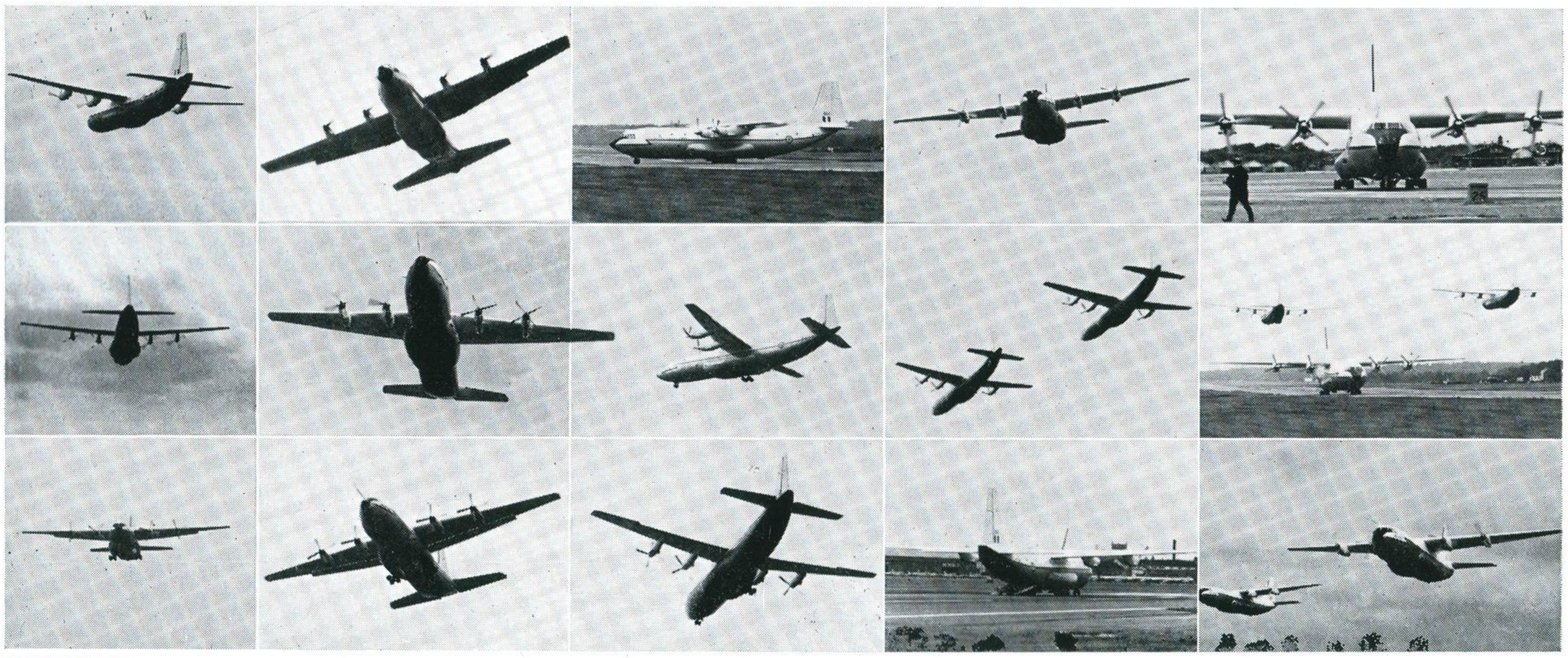
# TEST PAPERS

## ROTHESAY CLASS?

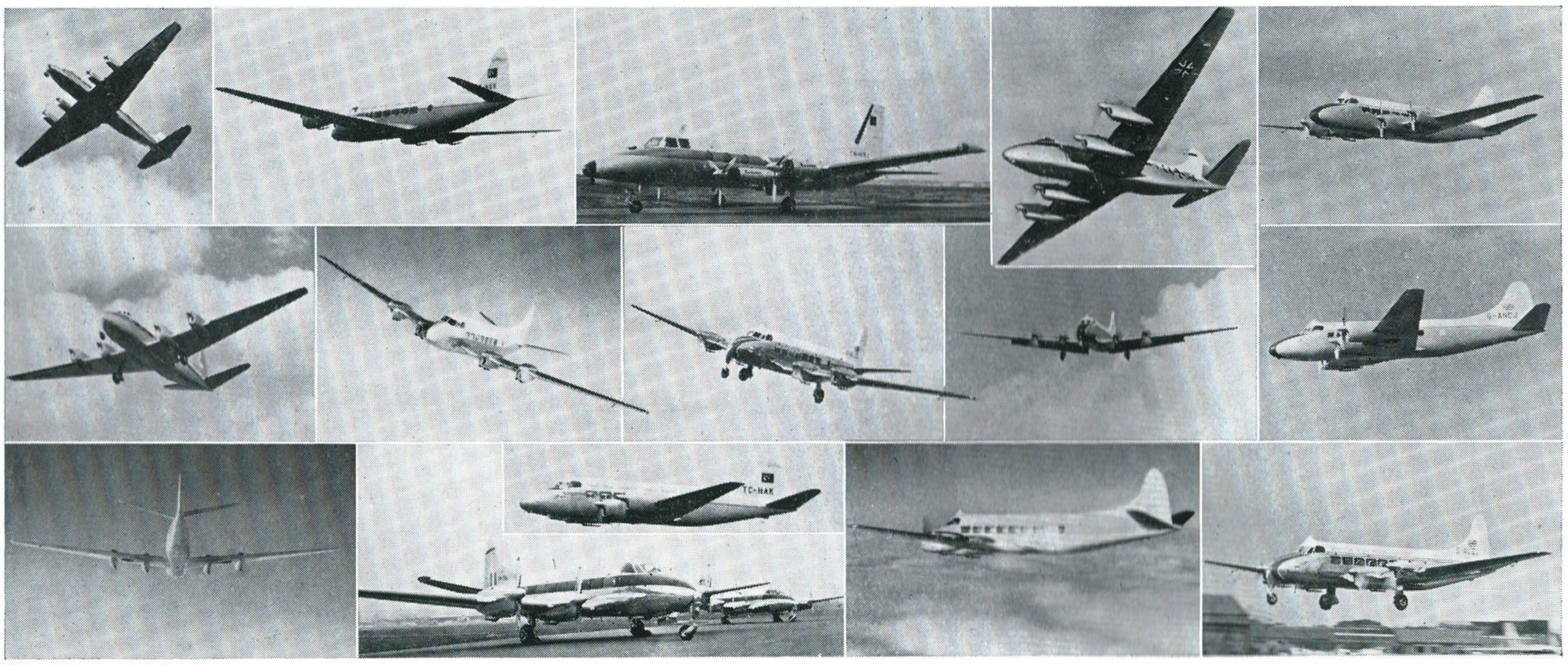
Solutions on cover



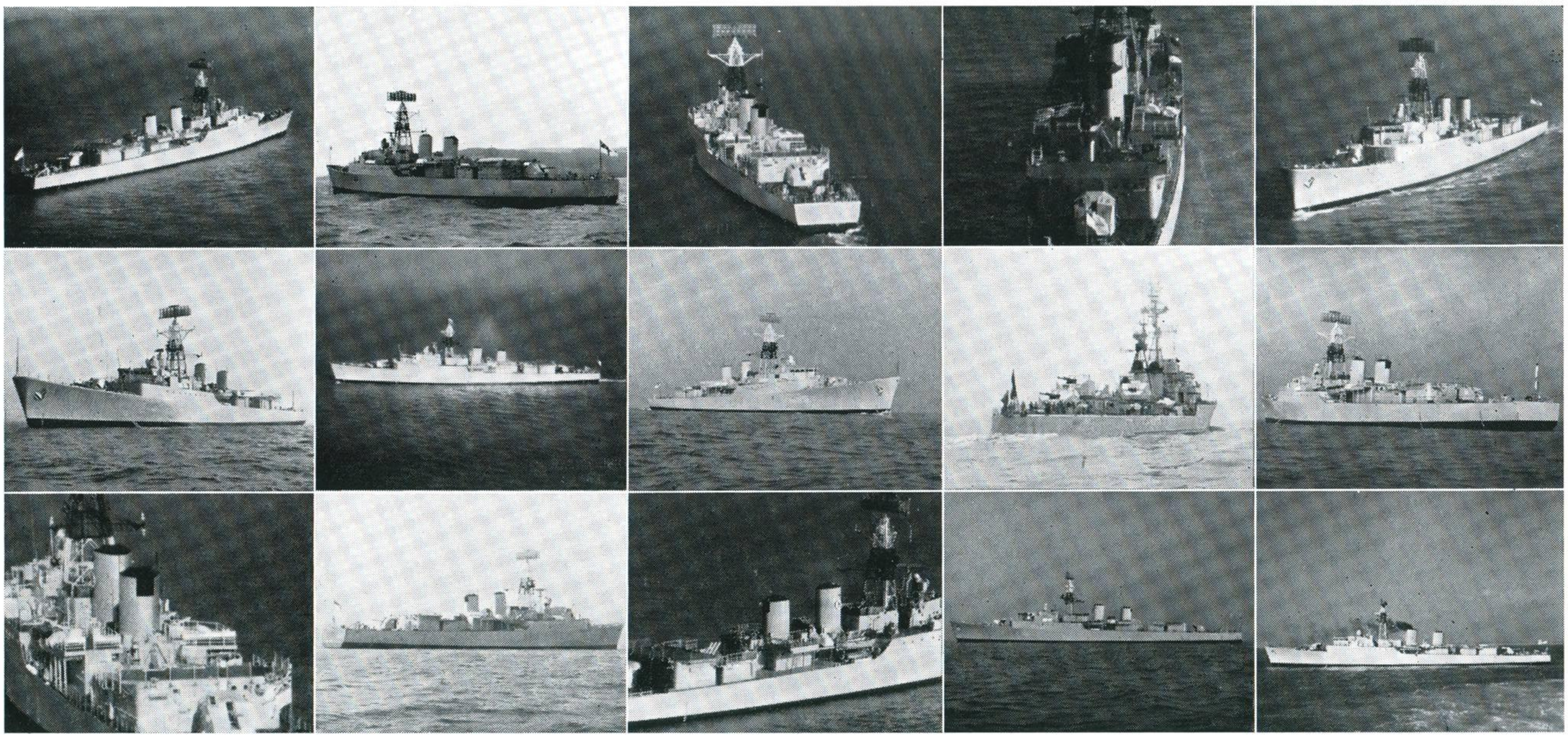
## BELFAST?



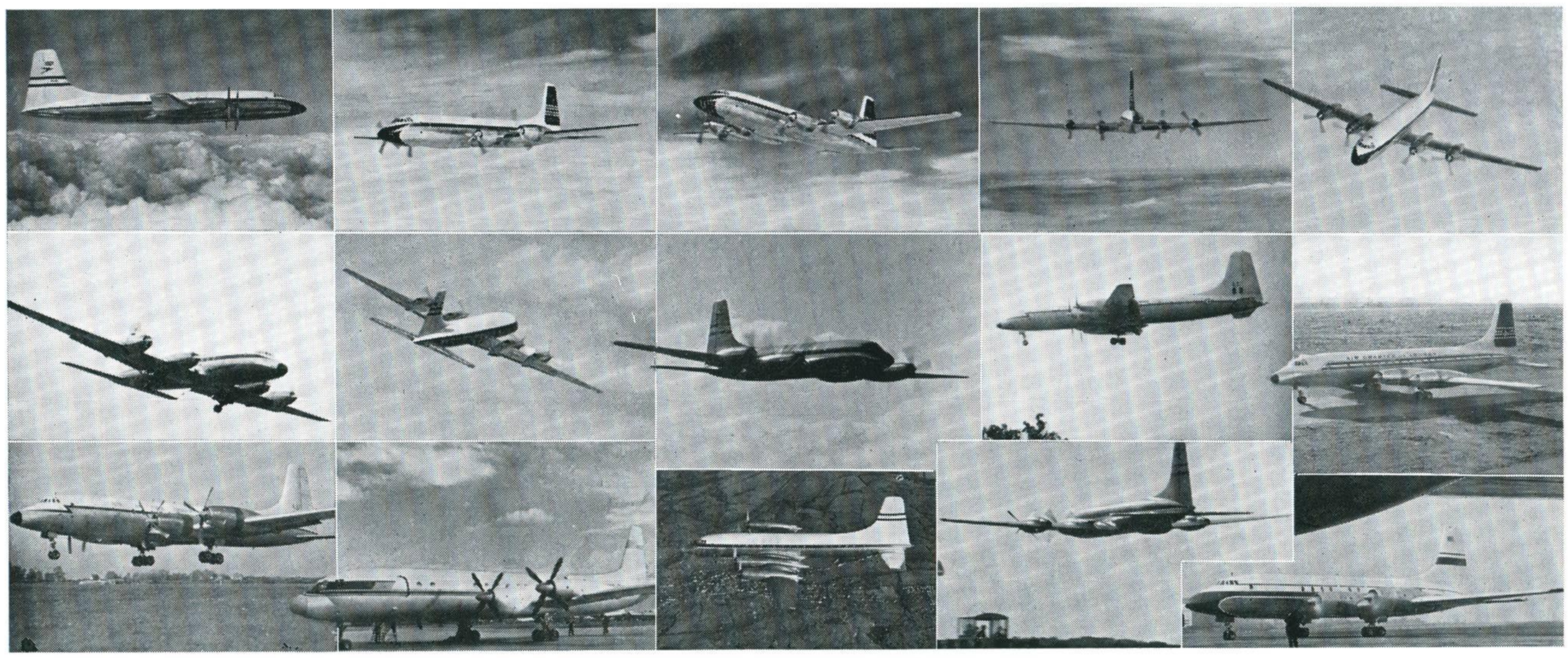
## HERON?



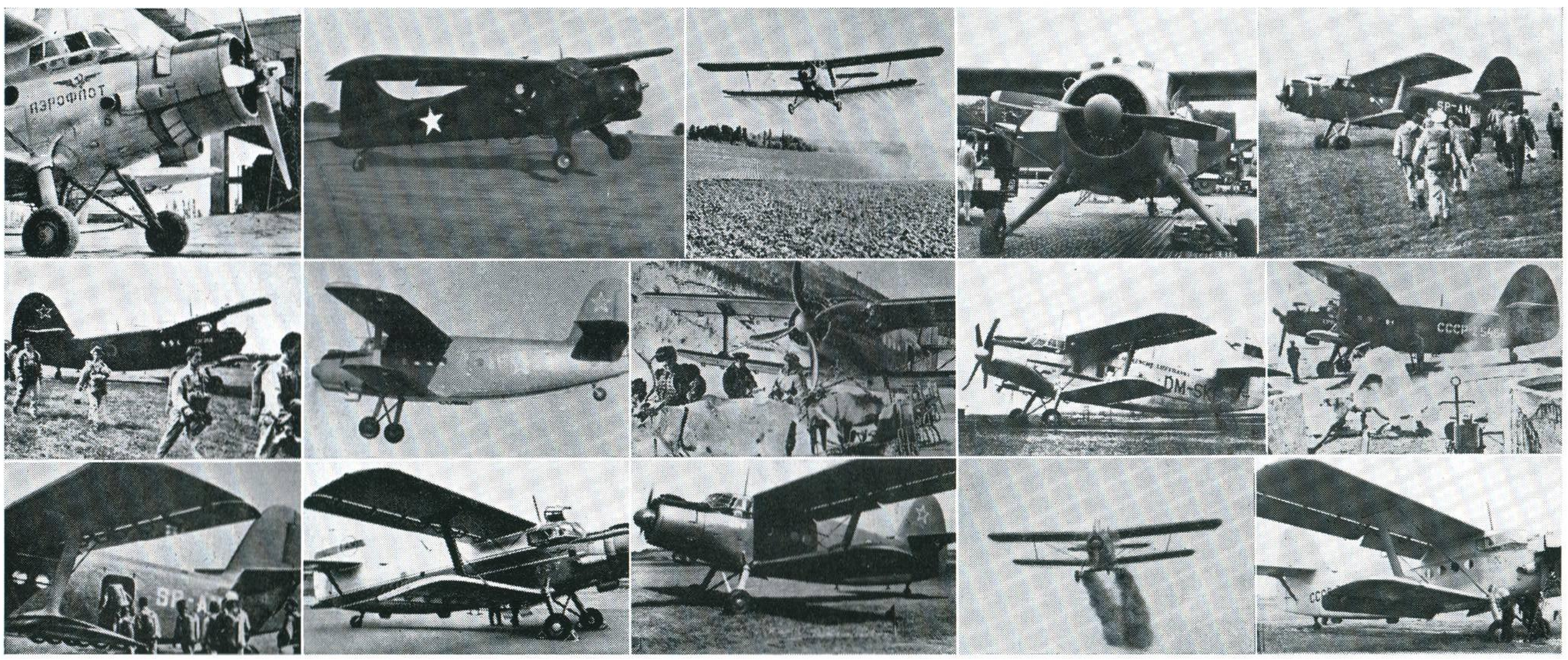
## TRIBAL CLASS?



## BRITANNIA?



## COLT?

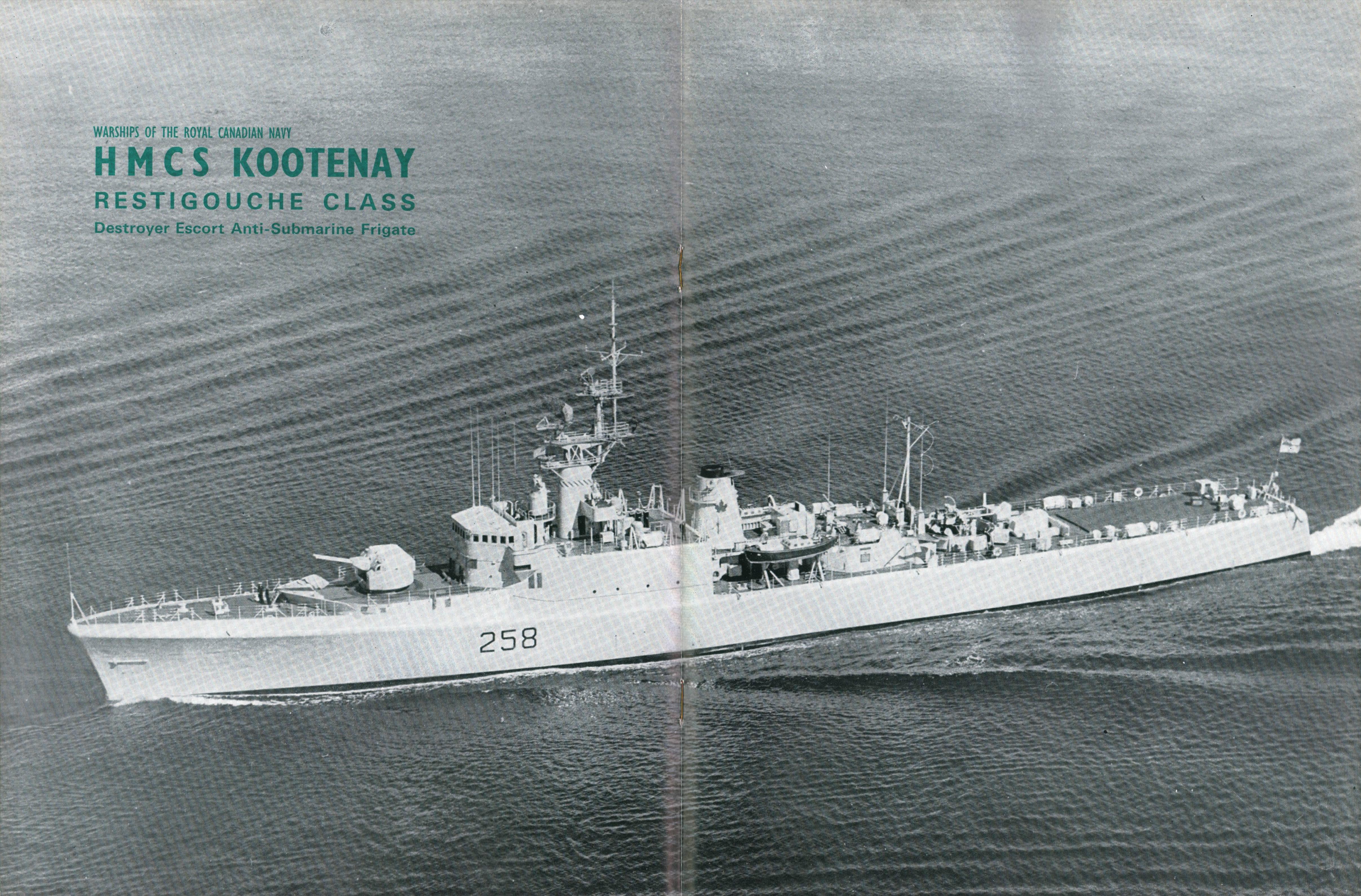


WARSHIPS OF THE ROYAL CANADIAN NAVY

# HMCS KOOTENAY

## RESTIGOUCHE CLASS

**Destroyer Escort Anti-Submarine Frigate**





# RESTIGOUCHE Class ROYAL CANADIAN NAVY DESTROYER ESCORTS

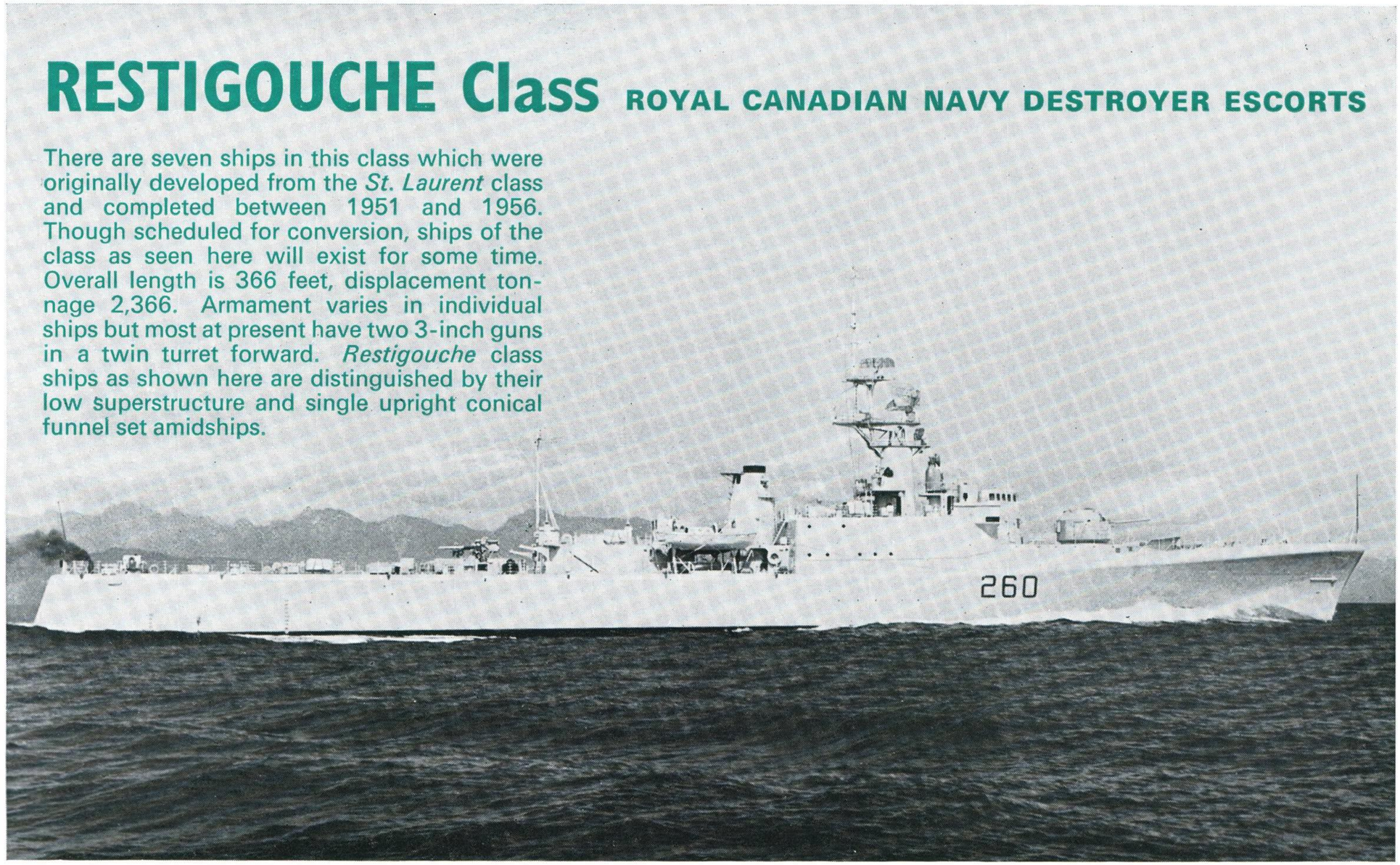
There are seven ships in this class which were originally developed from the *St. Laurent* class and completed between 1951 and 1956. Though scheduled for conversion, ships of the class as seen here will exist for some time. Overall length is 366 feet, displacement tonnage 2,366. Armament varies in individual ships but most at present have two 3-inch guns in a twin turret forward. *Restigouche* class ships as shown here are distinguished by their low superstructure and single upright conical funnel set amidships.



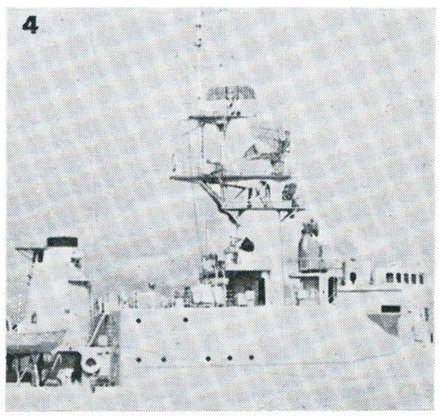


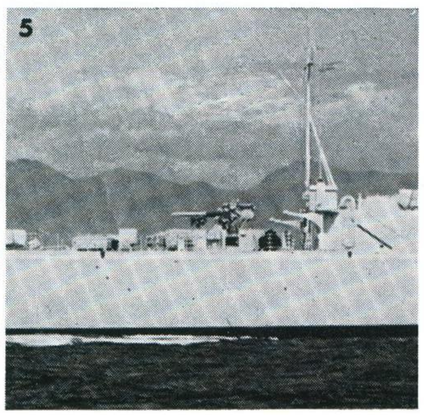


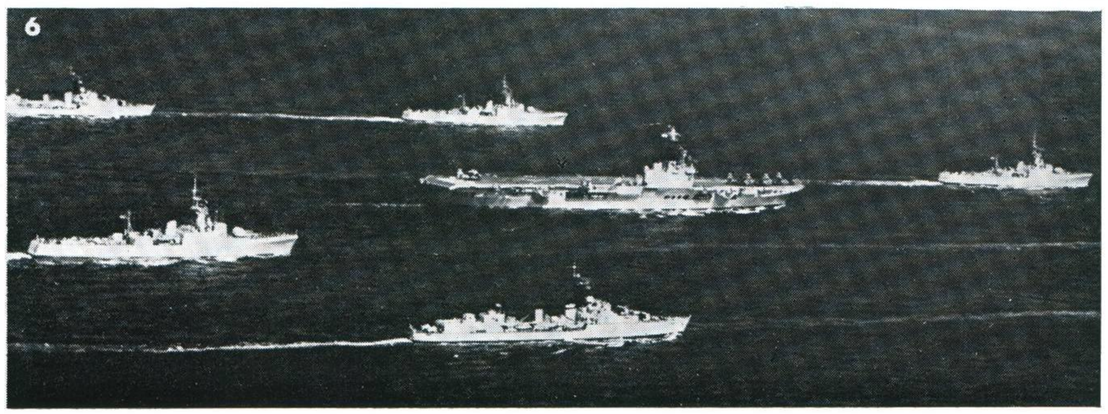


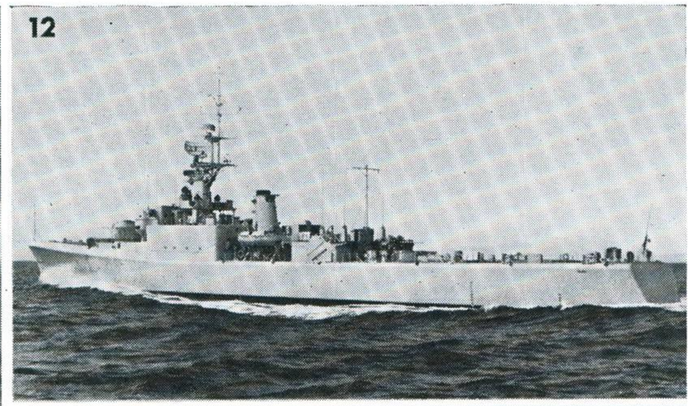

Solutions on the cover



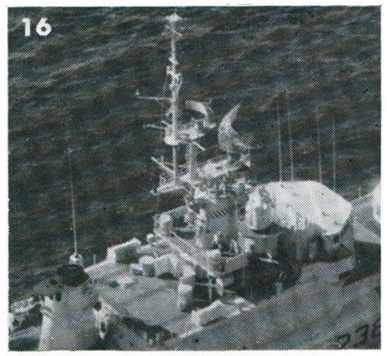



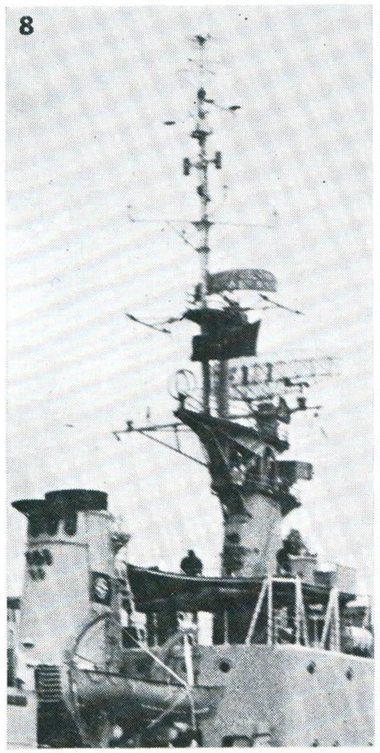

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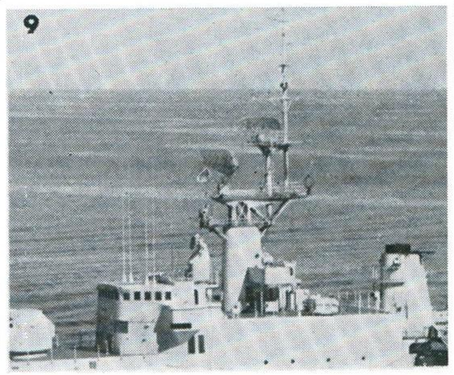

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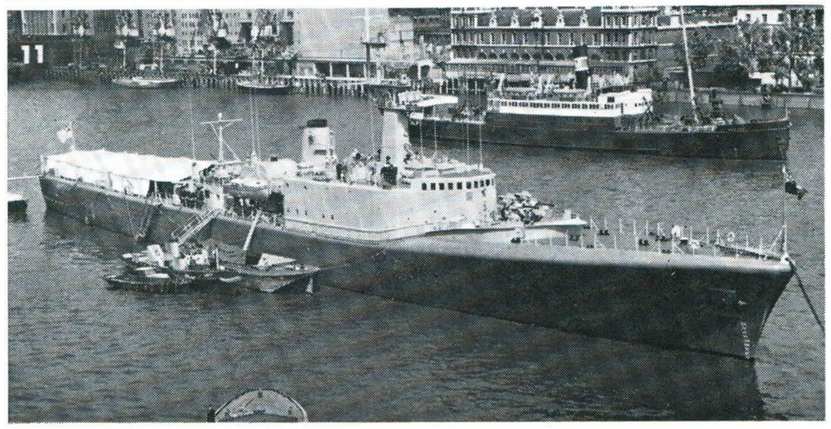

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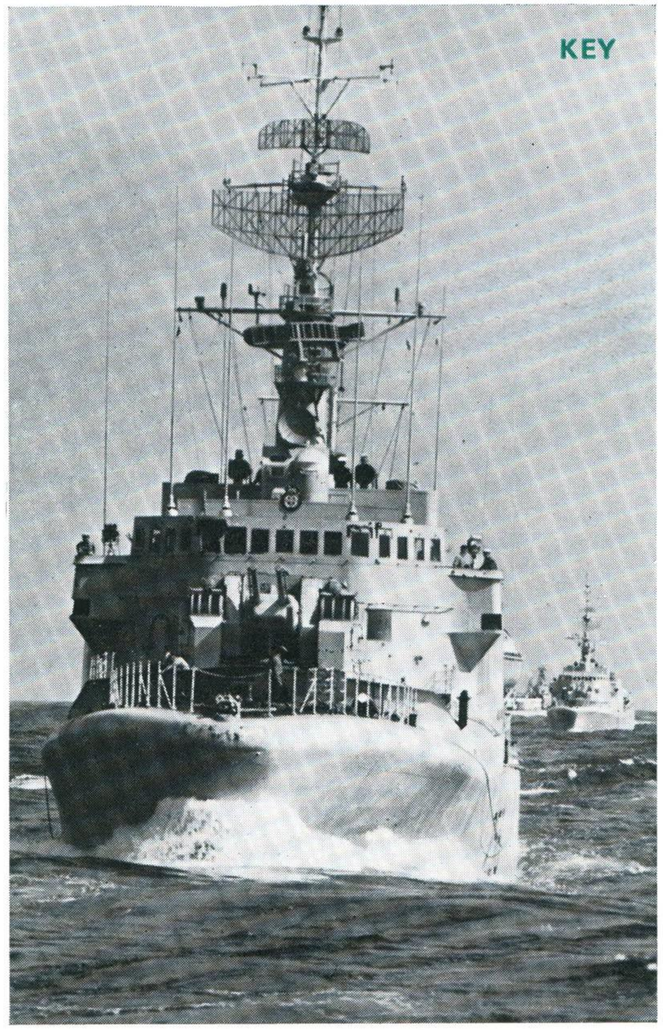

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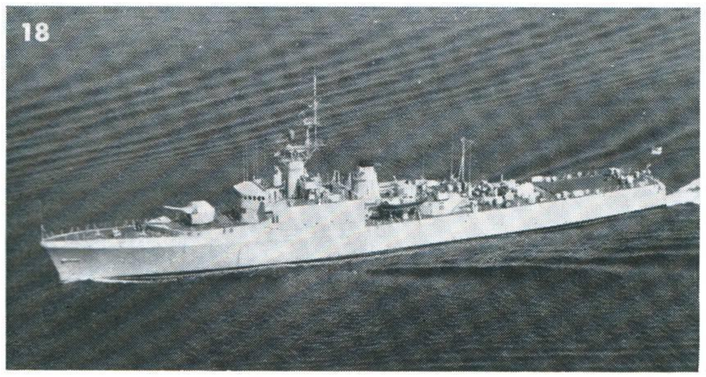

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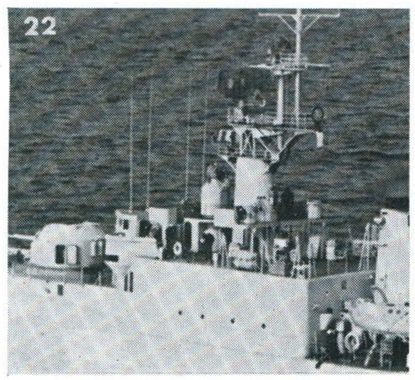
## Restigouche Class continued

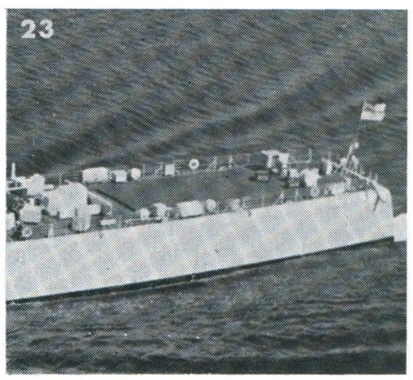






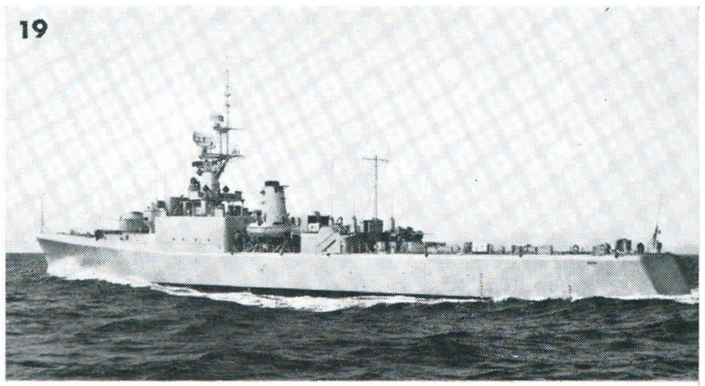



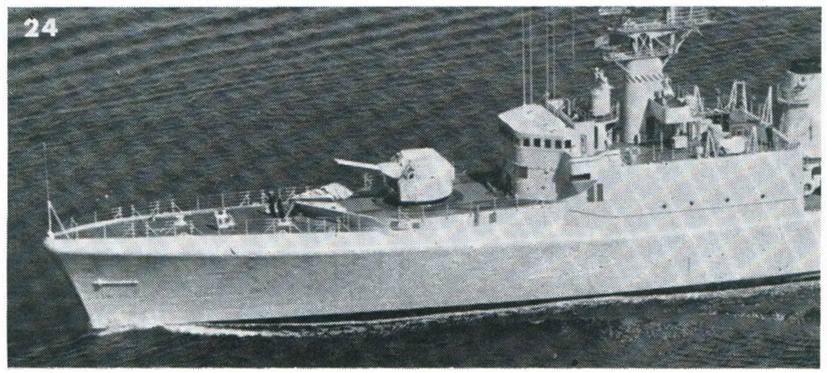



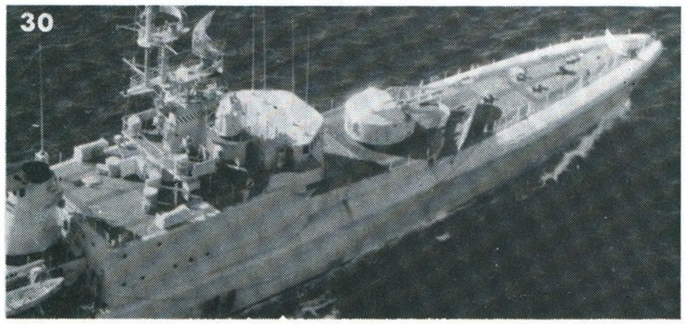







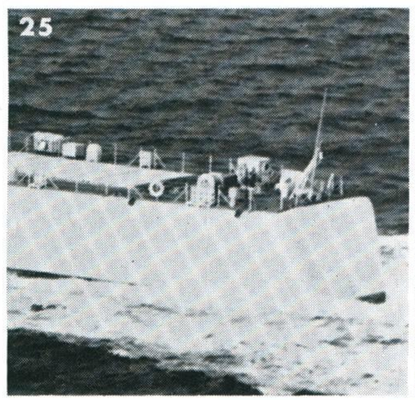


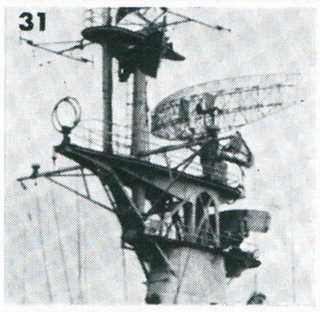


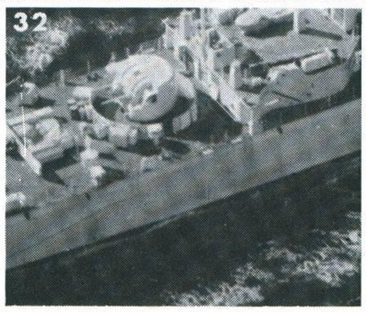






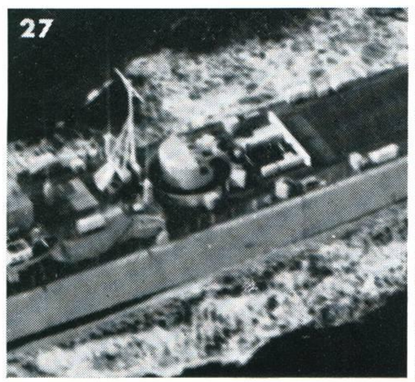


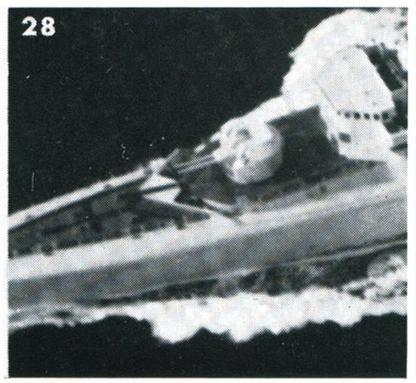




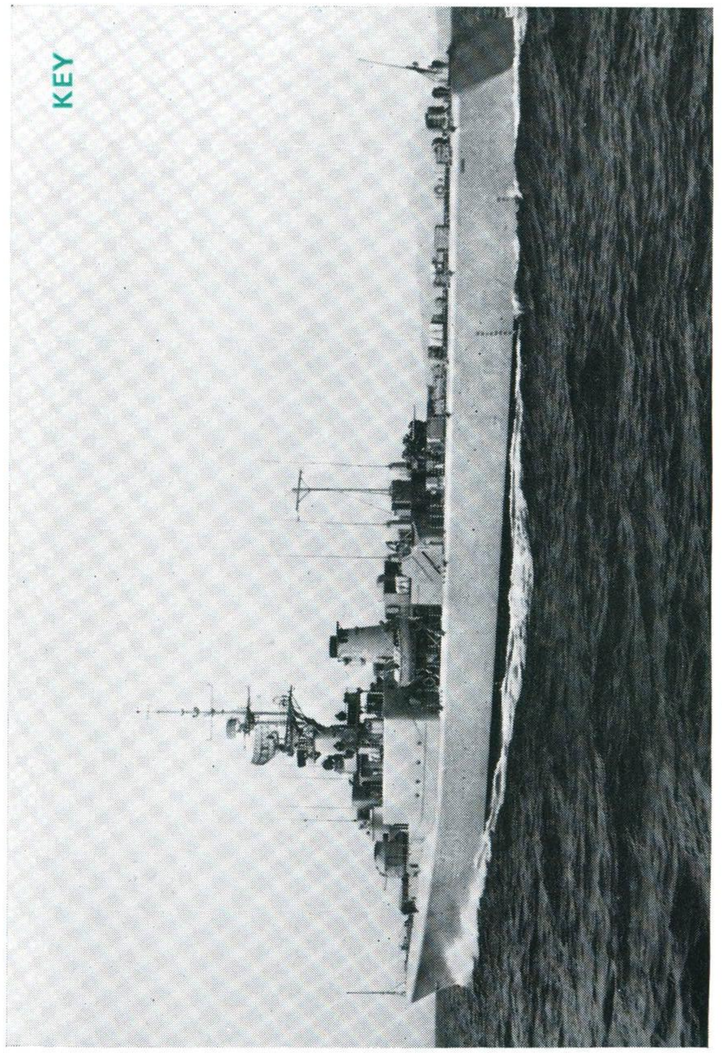


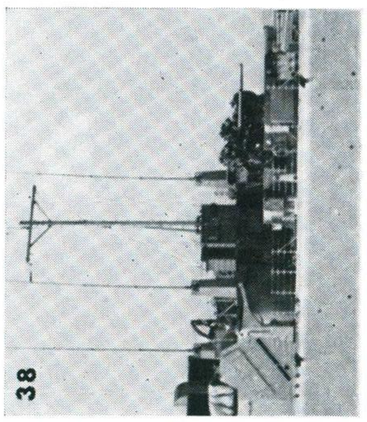


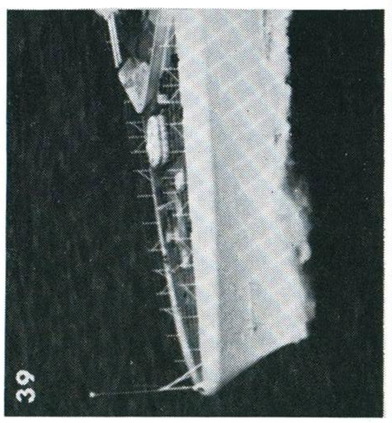



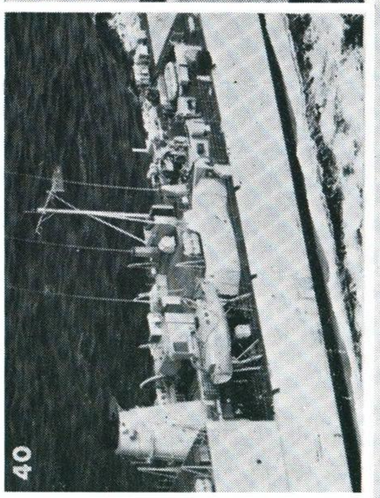


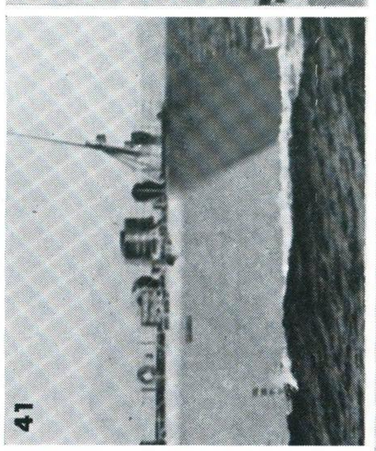

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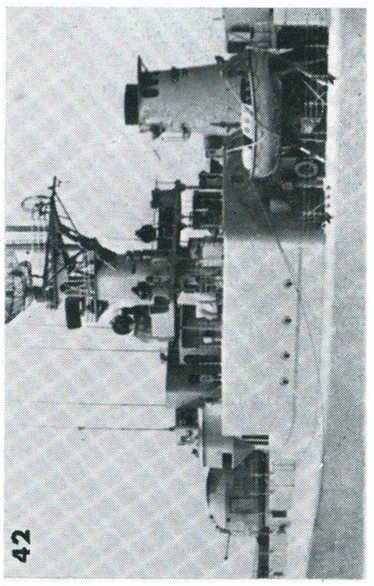


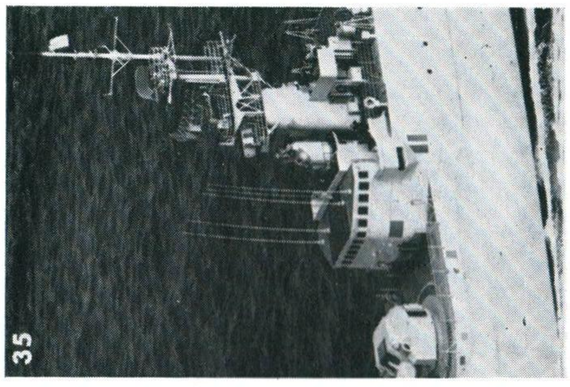

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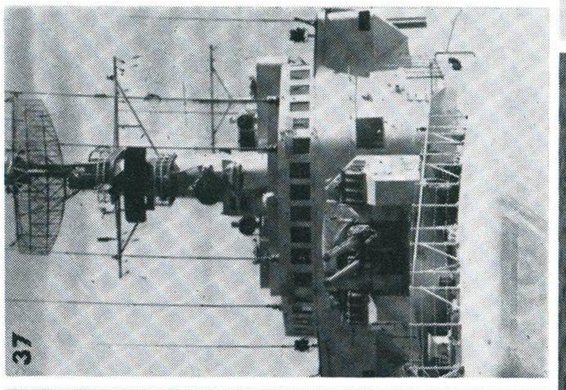

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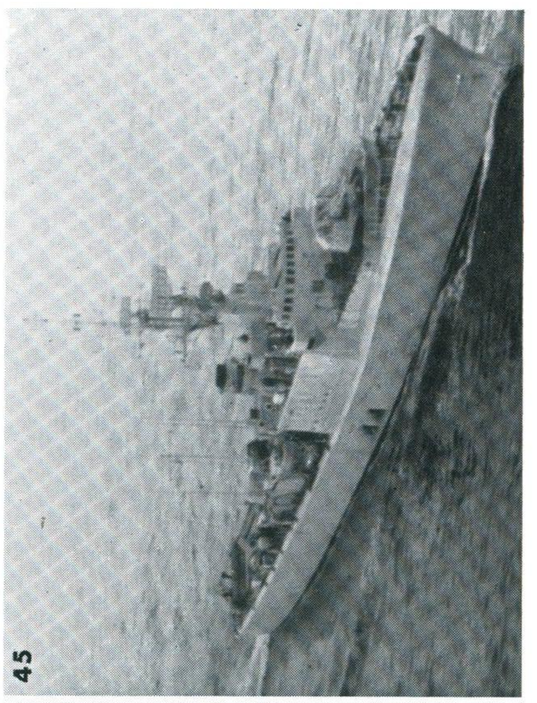

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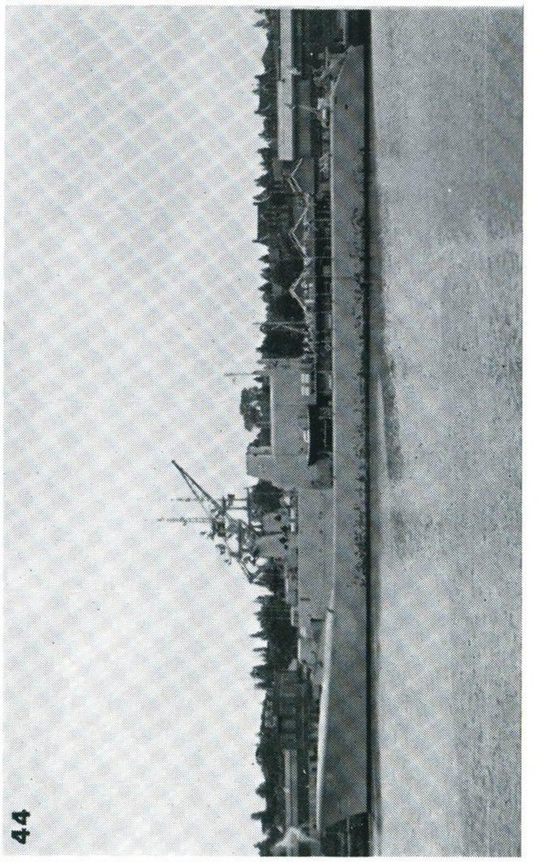

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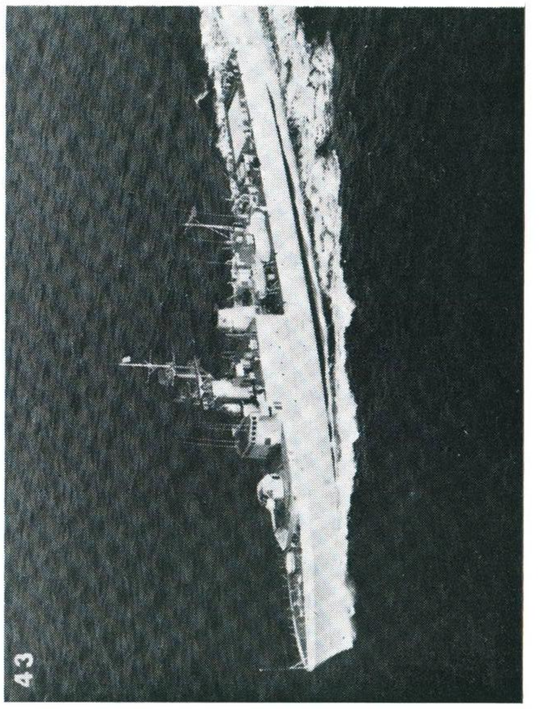

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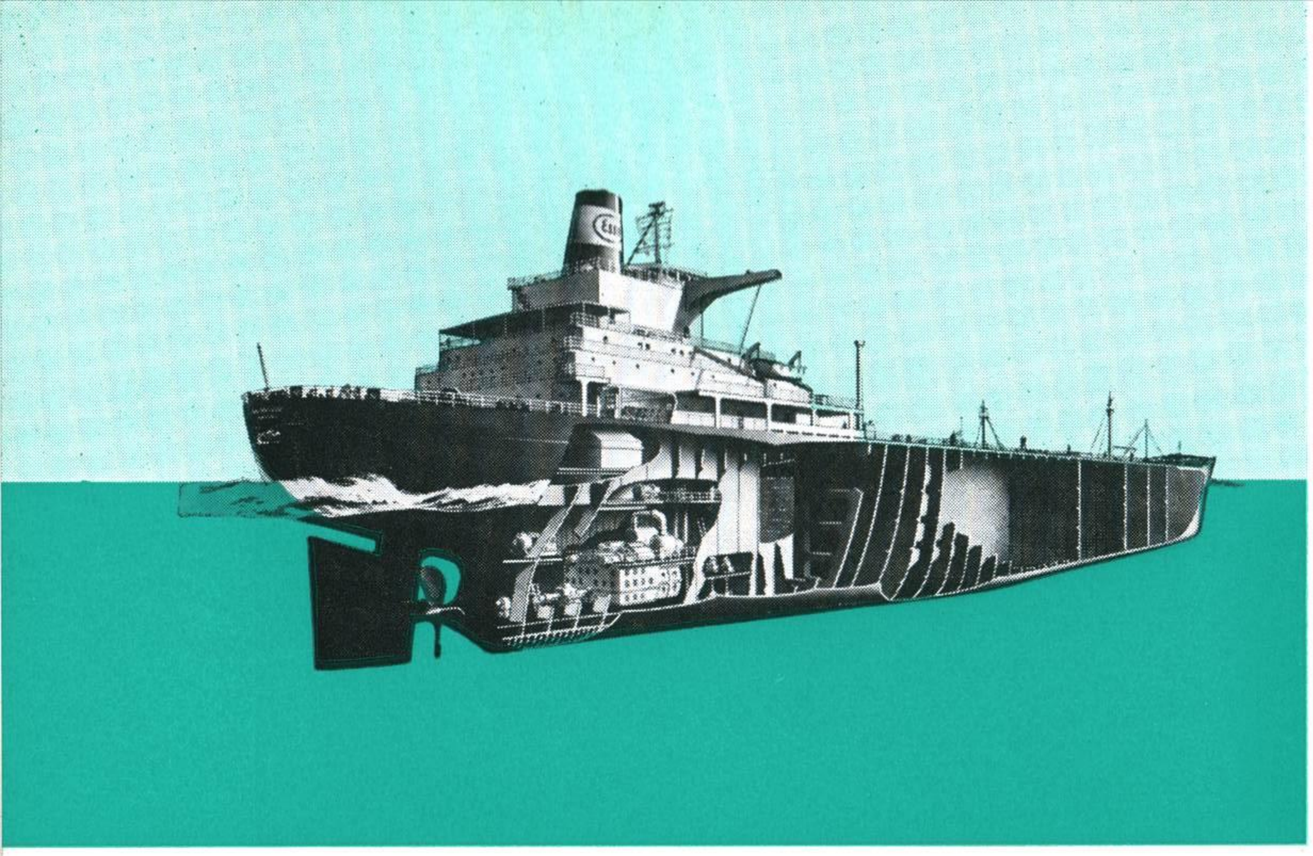

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# TAKING THOUGHT FOR TANKERS

The first cargo of oil which came to the Thames arrived in a sailing vessel 110 feet long, the *Elizabeth Watts*. She brought 901 barrels of rock oil to the order of G. Crawshaw and Co., and 328 barrels of coal oil consigned to Coates and Co. She sailed from Philadelphia on November 19th, 1861, and arrived, according to Customs' records, in the Victoria Dock on January 9, 1862.

The first vessel designed and built in Great Britain for bulk oil carrying was the sailing ship *Atlantic* built on the Tyne in 1863, so the virtues of bulk carriage of oil were appreciated very early. By 1902 big four-masted barques were being built for the trade, notable among these being the *Brilliant*, 3,700 tons, and the *Daylight*, built by Messrs. Lithgow Ltd. of Port Glasgow. Their names hint at the then important trade in lamp oil.

One hundred years after the *Elizabeth Watts* arrived, the total foreign imports of oil of the Port of London were 12·4 million tons and in the same year, 1962, the biggest tanker load to arrive was 55,000 tons of heavy fuel oil in the *W. Alton Jones*, 69,950 d.w.t. and 824 feet long. She arrived drawing 37 feet 6 inches.

In the ten years between 1950 and 1960, Europe's daily consumption of oil rose from about 15¾ million imperial gallons to about 55¼ million imperial gallons. By 1970 it is estimated that the figure will be around 123½ million.

The *Elizabeth Watts* certainly started something!

The biggest single shipment of oil so far handled by Thameside refineries was 88,386 tons brought by the tanker *Seven Skies* of 93,250 d.w. in July 1966. Her draught on arrival was 43 feet 6 inches. The maximum draught handled so far is that of the *World Friendship* which arrived in March 1967, drawing 46 feet 6 inches. Between 1964 and 1967 the draught at which tankers were thought safe to bring into the Thames has gone up from the 1964 record of 42 feet 8 inches to 46 feet. At present the P.L.A. provide a channel which gives a depth of 48 feet on all high tides—51 feet on spring tides. Thereafter, should such a channel prove capable of satisfactory maintenance, a 54-foot-deep channel may be considered.

It is as well here to dispel the present current notion that 200,000 d.w. tankers will soon be coming to the Port of London fully laden. Mobil intends to berth partly laden 200,000-ton tankers at Coryton, part of the cargo having previously been discharged at Continental terminals blessed with deeper water than the relatively shallow drowned estuary of the Thames can provide without extensive dredging.

One might mention, too, that the Thames has been visited by a tanker, the *Manhattan*, of 108,590 d.w., but she was only partly laden with a cargo of 33,500 tons of oil and drawing 29 feet only. Fully laden, her draught is 50 feet, which could be accommodated by the 54-foot channel contemplated.

The basic economics of transporting bulk oil are relatively simple. A 25 per cent increase in the dimensions of a tanker produces something like a 95 per cent increase in capacity so the weight of steel carried per ton of cargo is much less. In terms of propulsion, a 100,000 tonner requires engine power of about 21,000 h.p. for a service speed of 16 knots. To achieve the same speed a tanker of only 37,000 tons requires 14,000 h.p. The same kind of benefits are therefore reaped by the bigger tankers in the matter of fuel consumption: and with the advent of automation, a 100,000 tonner does not require a crew equal to twice the crew of a 50,000 tonner. But there are other more complex factors to consider.

Obviously it would be uneconomic to dredge, say, a 60-foot channel to allow an occasional visit by a fully laden 200,000-ton tanker. Equally it would be foolish to fail to provide a little more depth for tankers if there was considerable demand for this extra depth. Much depends on what trends in tanker designs are likely. Let us assume a hypothetical trend for the sake of illustration.

Suppose the highly improbable fact that all Thames-side oil companies will in future bring all their crude oil in 200,000-ton tankers on a two-port discharge policy and that in all cases such tankers would always discharge part of their cargo at another terminal in this country or on the Continent where nature provides deeper water, and then comes to the Thames with the remainder and drawing only about 40 feet. It would be foolish to go to the expense of dredging a 60-foot channel.

Naturally, matters are far more complex than this. Mobil does plan to operate such a policy with 200,000-ton tankers





and has announced the fact. The P.L.A. have made a considerable research study of the likely requirements of tanker trading to the Thames, aided by consultants and all others concerned. So far, because the business and commercial interests of the companies involved in the oil trade are involved, the detailed findings of much of this research are naturally confidential.

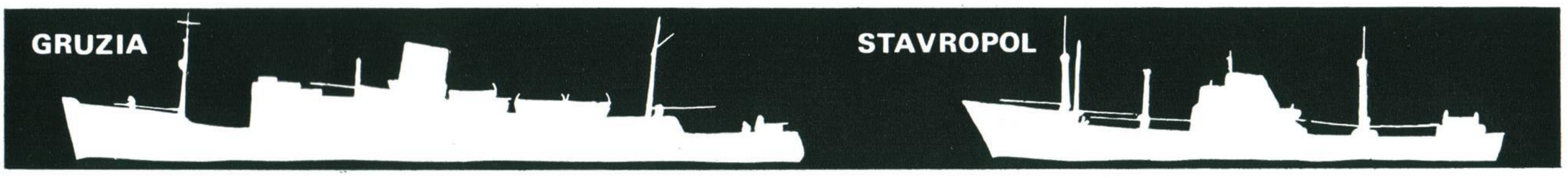
But general trends in tanker design, learned from a study of tankers delivered or on order, are open to anyone to discover for himself. In general tankers in the 80,000 to 100,000 d.w. class have draughts of 45 feet upwards. The average draught of a representative group of existing tankers in the 80,000 to 90,000 d.w. range is about 47 feet. For a typical 90,000 to 100,000 d.w. group, the figure is 48 feet plus.

There are upwards of 30 vessels of 150,000 to 200,000 d.w. on order. One trend revealed by the research referred to was illustrated by the finding that of tankers on order, about half require depths of over 45 feet. Of the tankers existing and on order which draw more than 45 feet over half are in the 90,000 to 110,000 d.w. range with draughts from 47 feet to 51 feet. Over a third of the "over 45 feet" group are in the 150,000 to 210,000 d.w. range requiring draughts from about 54 feet to 63 feet.

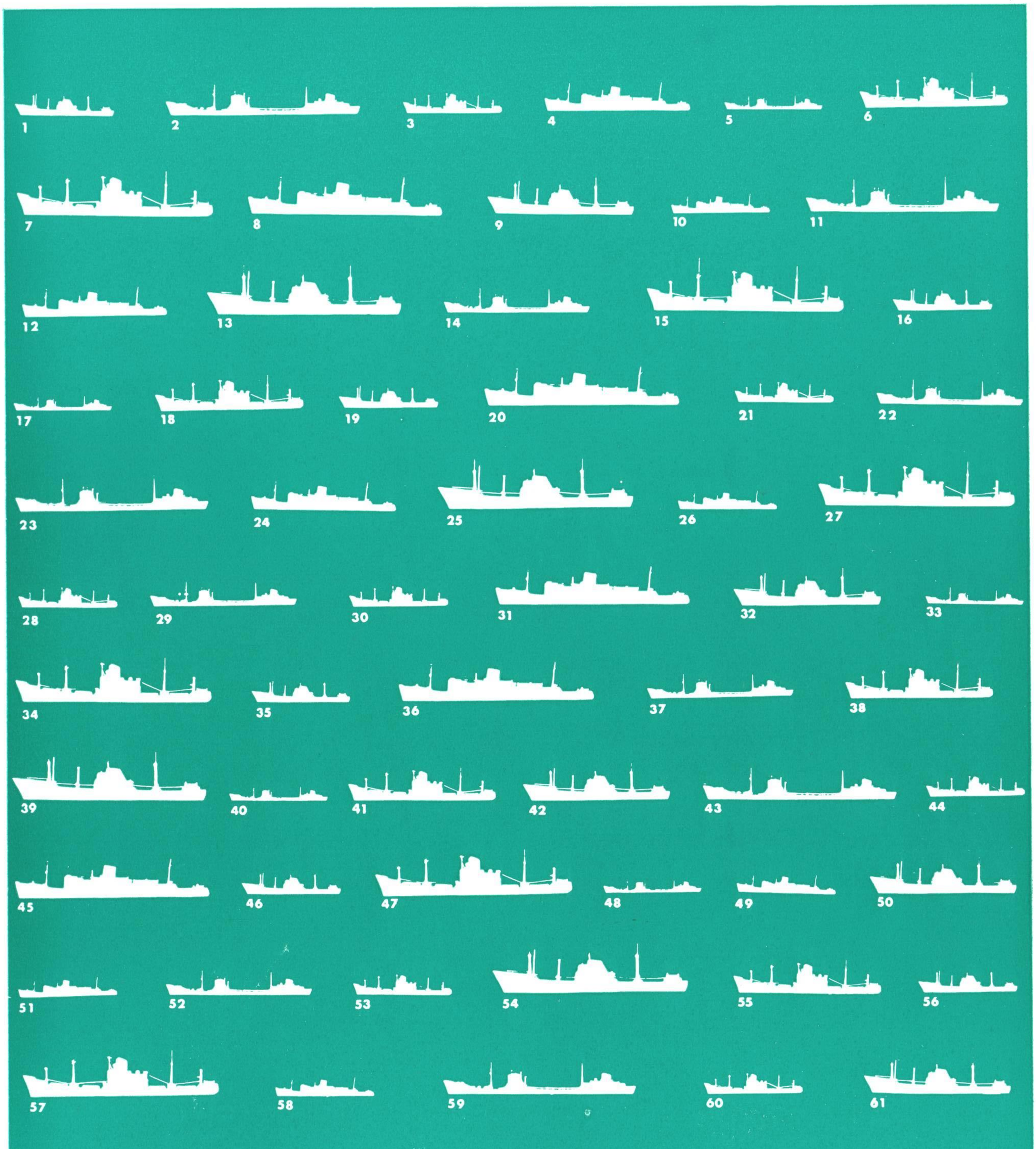
Though a very important factor, draught is not the only consideration which determines what kind of tankers will operate to which oil terminals, so it must not be assumed that the figures quoted above are the only data which determine P.L.A. policy in relation to provision for tankers. The object here is simply to illustrate some of the problems of a little appreciated aspect of the administration of the Port of London. As indicated, this aspect is the subject of continual and detailed study so that the Port's customers—the oil trade in this case—are served as efficiently and economically as possible.

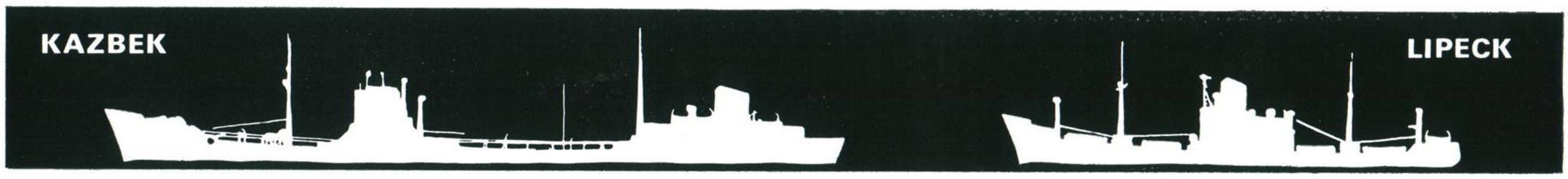
Before leaving this brief study of tankers and their size, however, it is interesting to take a closer look at a supertanker. The world's largest ship is a tanker, the *Idemitsu Maru*, launched at Tokyo on September 5th, 1966. She is 1,112 feet long, just under three times the length of an Association Football pitch. She has a deadweight tonnage of 209,000 and a crew of 32. Gulf Oil plans to have even bigger vessels—300,000 tonners—in service by 1970, to take crude oil to a new terminal at Bantry Bay in Ireland. Presumably these would have draughts of about 60 feet. Plans for a 500,000 d.w. tanker are taking shape in Japan. An expert has said that tankers of twice this size are technically possible! There was that story once, about the mountain coming to Mahomet . . .

Photographs by A. Cameron. Reprinted by permission from *P.L.A. Monthly*, journal of the Port of London Authority.




# MERCHANTMEN of the USSR






Except for *Gruzia* all these ships are class ships, that is to say there are many of them in service and although there may be slight variations between individual ships their main characteristics will be the same and the ships will be identifiable as of a particular class. Using the Key information above identify all the numbered target views below in accordance with the instructions on Page 224. A list of solutions appears on the cover.

































# ROTHESAY CLASS ANTI-SUBMARINE FRIGATES

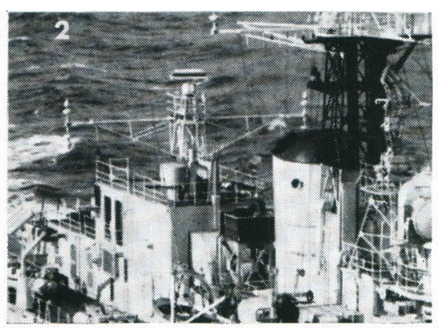


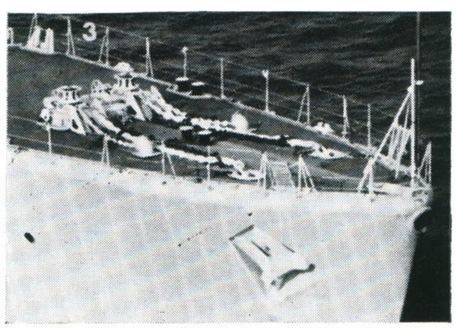

The nine ships of this modified Type 12 Frigate are of the same general design as the earlier six ships of the *Whitby* class. When completed they were regarded as being the most satisfactory class so far produced. They are fine sea boats and were designed with the primary object of anti-submarine service.

Of about 2,500 tons displacement, measuring 370 feet in length overall, powered by turbines giving a service speed of 30 knots. Armament consists of twin 5 inch turret foreward—at present H.M.S. *Rothesay* which is undertaking a long refit, will emerge with a flight deck and hangar aft for an anti-submarine helicopter—all of the class will be equipped with *Seacat* surface-to-air missiles.

In appearance both classes of ships are very similar but individual ships have variations. They all now have a small raking funnel on a square base, set slightly abaft midships, with a dome top. All have the "waisted" forecastle and the short drop-down aft. The *Rothesays* are more "built-up" abaft the funnel than the *Whitbys*.



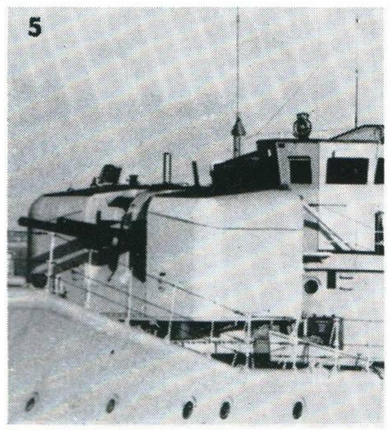



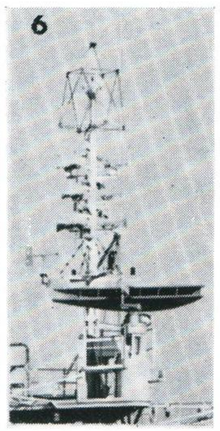



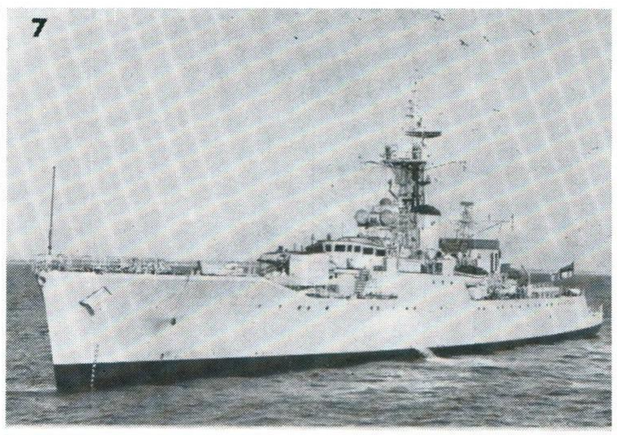


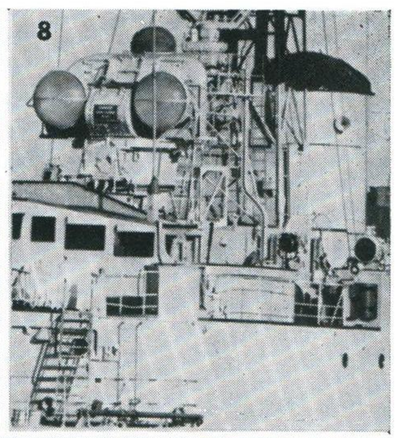


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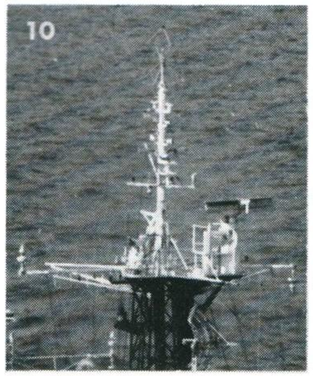

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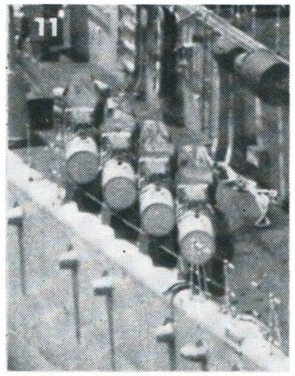

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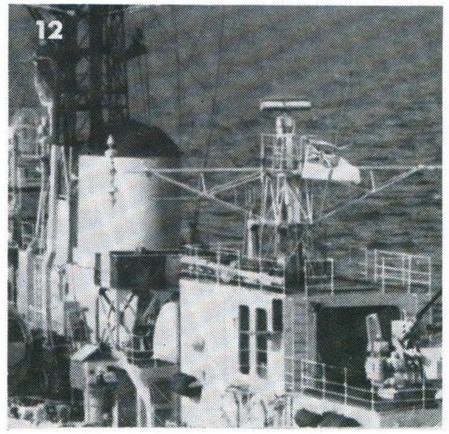

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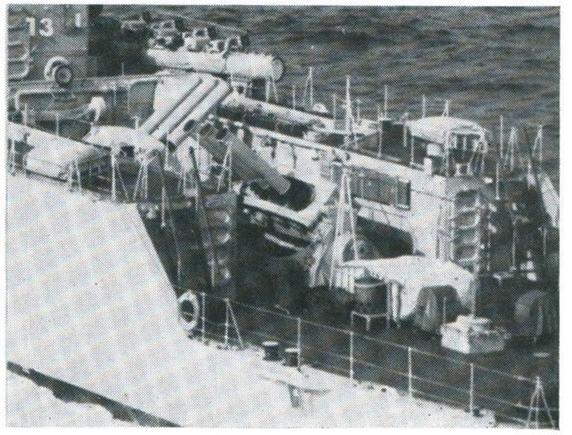

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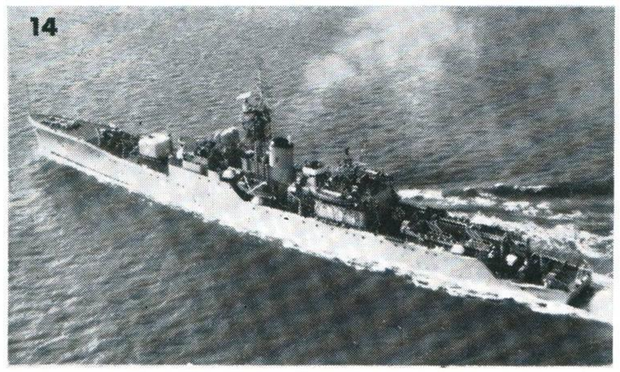

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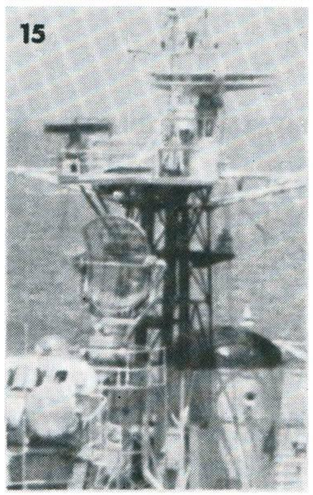

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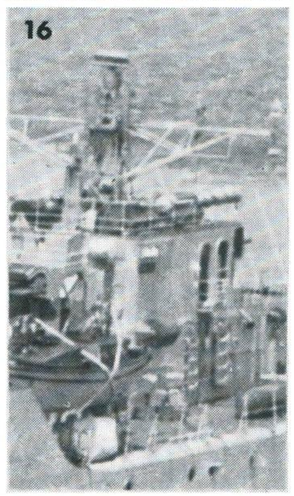

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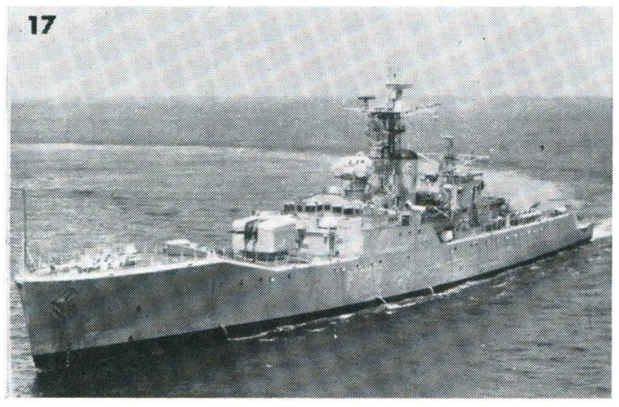

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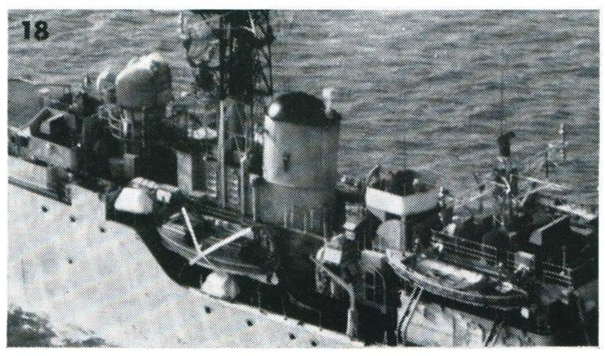

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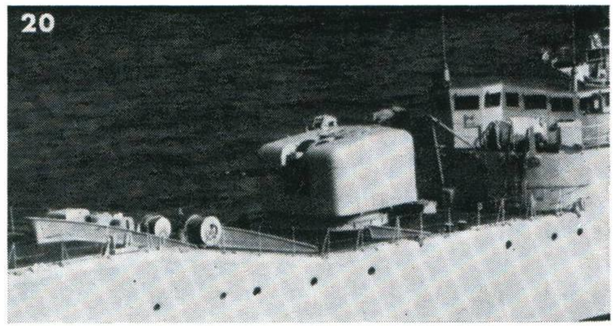
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## Rothesay Class continued

19

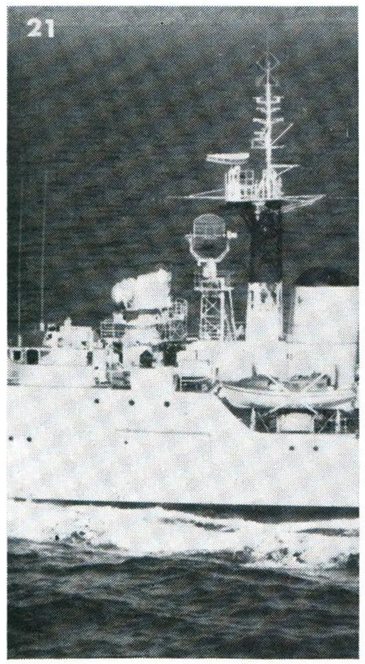


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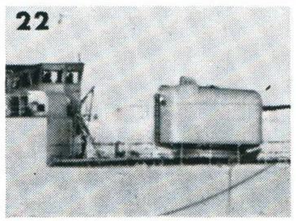




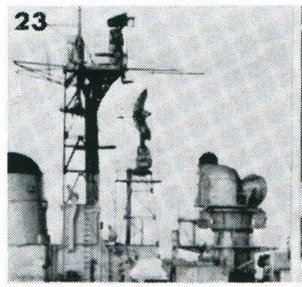

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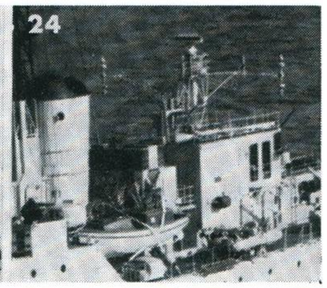
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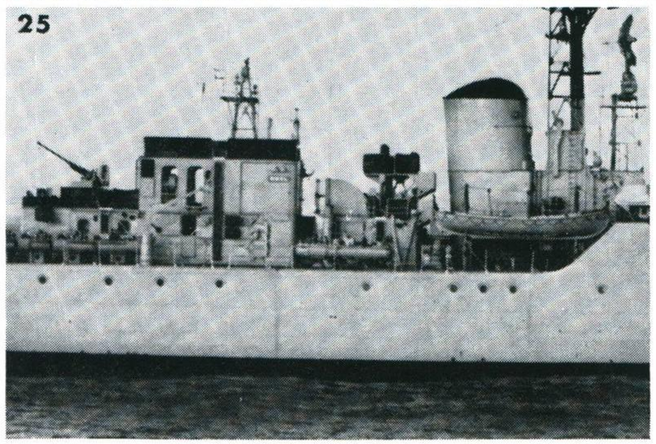
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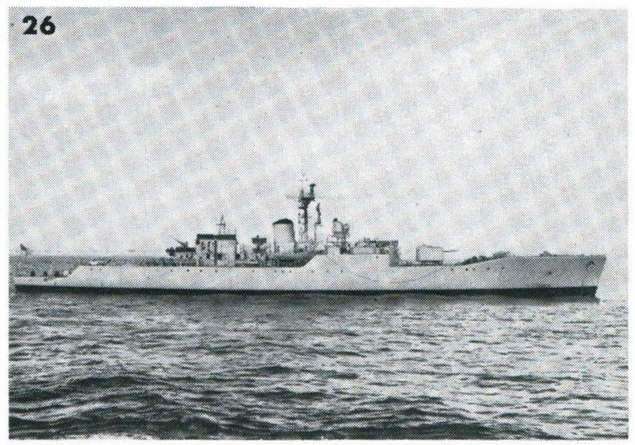
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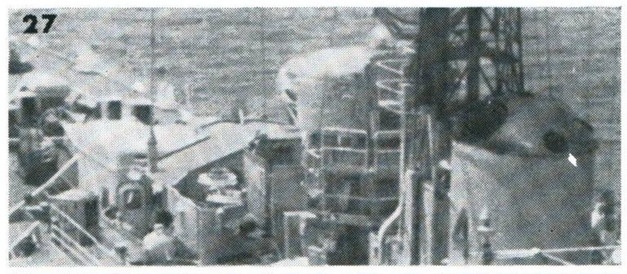
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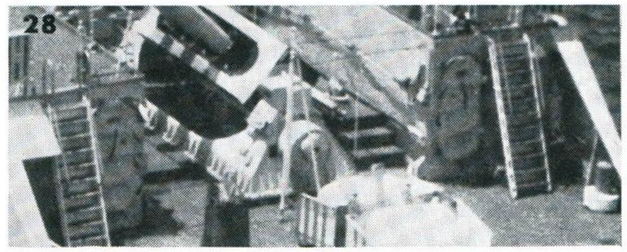
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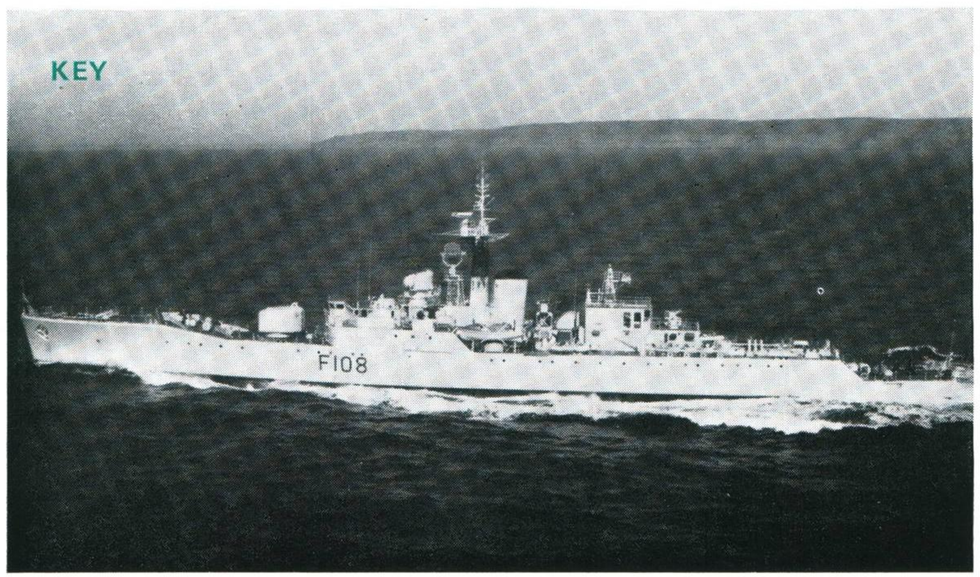


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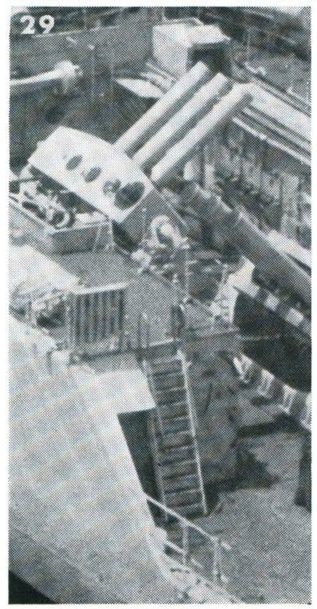


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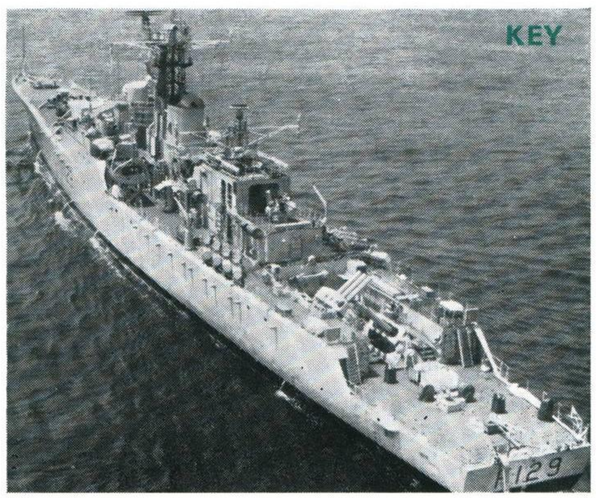



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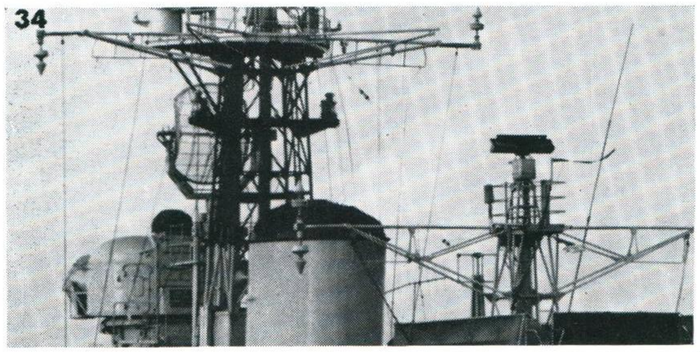


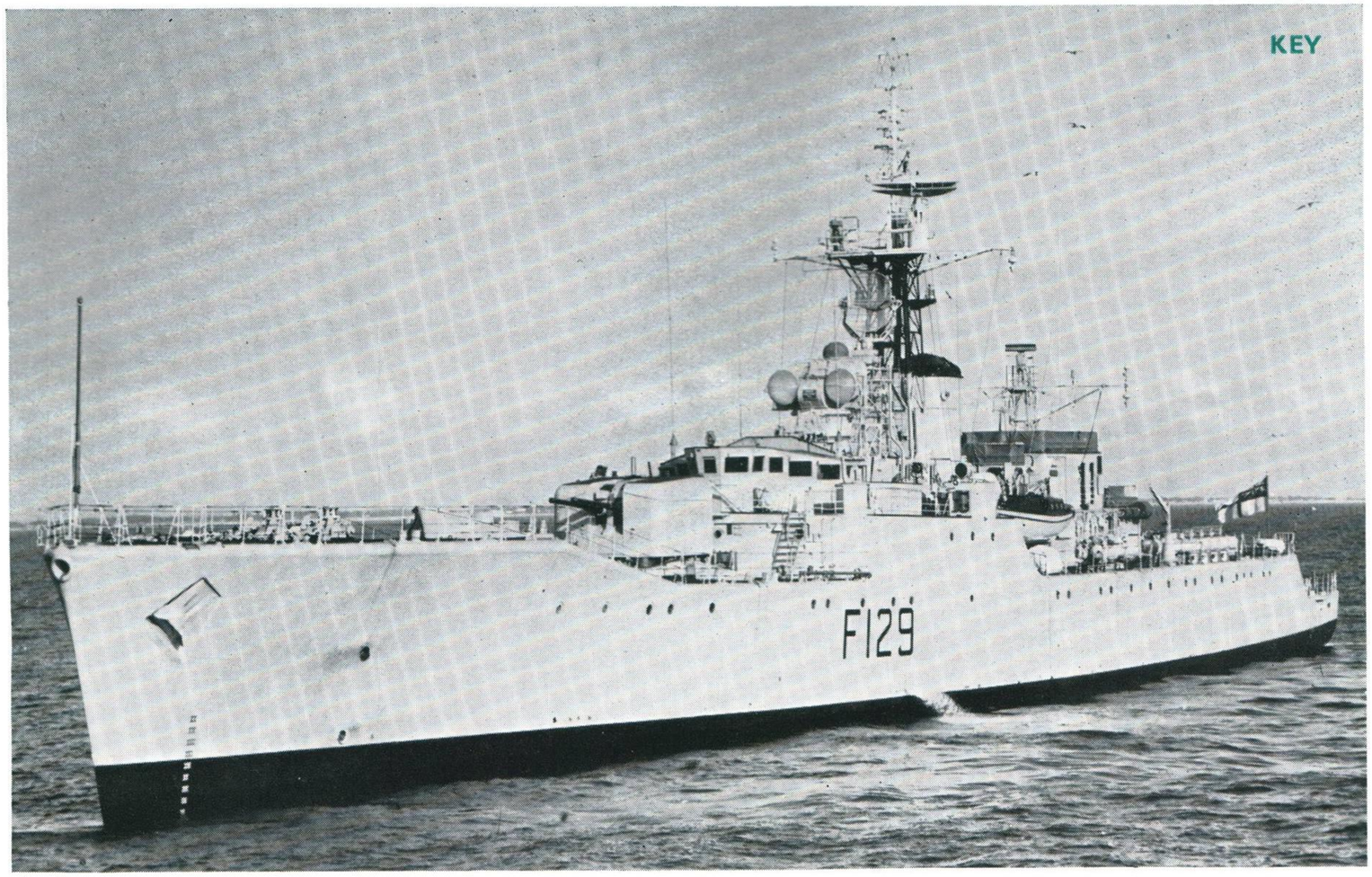


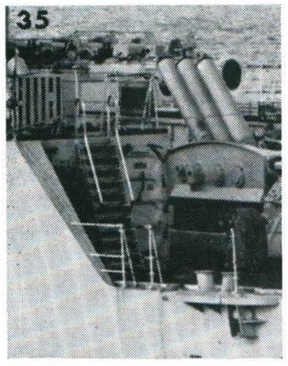






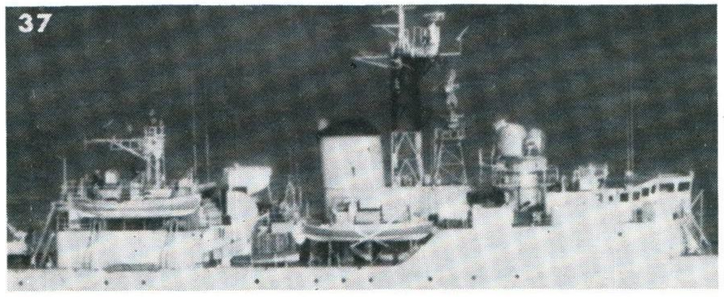















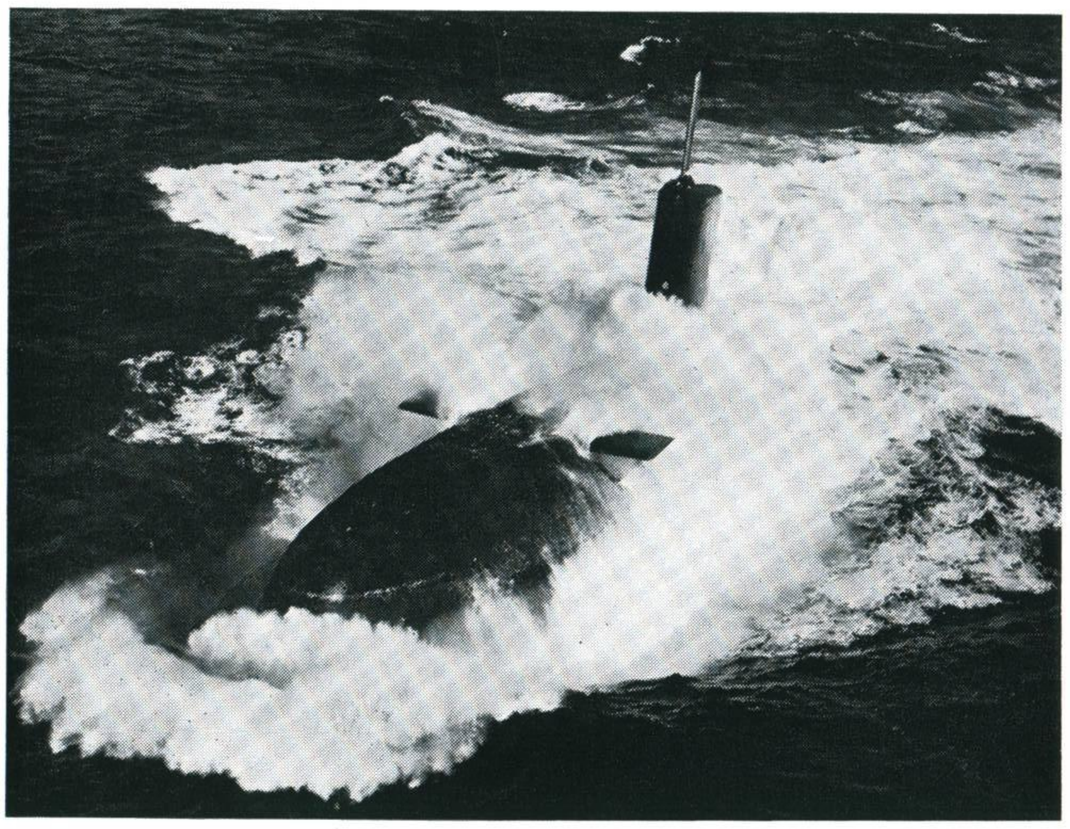







Solutions on the cover





**Cover Photo:** The British nuclear submarine ***Valiant*** which cruised (submerged for most of the distance) to Singapore has now completed the 12,000 miles homeward journey non-stop, the longest underwater voyage yet by a British submarine. She is seen surfacing in the north-west approaches.

# SOLUTIONS TO TESTS AND EXERCISES

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## VALIANT

All targets are **Valiant** except No. 8 which is **Dreadnought.**

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## T.62

All targets are of **T.62** except Nos. 19, 24, 27, 30, 34, and 35 which are jokers.

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## TEST PAPERS

**ROTHESAY:** Joker is second line 4th picture.
**BELFAST:** Joker is first line 2nd picture.
**HERON:** Joker is first line 3rd picture.
**TRIBAL:** Joker is second line 4th picture.
**BRITANNIA:** Joker is third line 2nd picture.
**COLT:** Jokers are first line 2nd and 4th pictures.

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## RESTIGOUCHE CLASS

All targets are **Restigouche Class** except Nos. 11 and 44, which are jokers.

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## MERCHANTMEN OF THE U.S.S.R.

**Gruzia** Nos. 4, 8, 10, 12, 20, 24, 26, 31, 36, 45, 49, 51, 58, 65, 69, 74, 76, 78, 92, 96, 98, 100, 106, 110, 114, 120.

**Stavropol** Nos. 1, 9, 13, 16, 19, 25, 32, 35, 39, 42, 46, 50, 54, 56, 61, 64, 72, 75, 79, 82, 83, 86, 93, 97, 103, 105, 107, 111, 113, 117.

**Kazbek** Nos. 2, 5, 11, 14, 17, 22, 23, 29, 33, 37, 40, 43, 48, 52, 59, 62, 67, 70, 73, 80, 84, 87, 90, 94, 99, 101, 109, 115, 118, 121.

**Lipeck** Nos. 3, 6, 7, 15, 18, 21, 27, 28, 30, 34, 38, 41, 44, 47, 53, 55, 57, 60, 63, 66, 68, 71, 77, 81, 85, 88, 89, 91, 95, 102, 104, 108, 112, 116, 119, 122.

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## ROTHESAY

All targets are **Rothesay Class** except Nos. 14, 18, 37, and 41, which are jokers.

## AERO COMMANDERS, GRAND COMMANDERS AND TURBO COMMANDERS

Our lesson in the *Journal* dated August 1966 referred to the Commander series of aircraft and in it we misquoted the solution to No. 30 target picture as a Grand Commander. It was, of course, a Turbo Commander, as a close look by anyone who knows his Commanders can easily ascertain for himself.

## JOURNALS

Readers are reminded that no copies of the *Joint Services Recognition Journal*, nor copies of its predecessor *The Inter-Services Aircraft Recognition Journal*, should be disposed of through any source which might involve the risk of their getting into unauthorised possession.

There are official channels for the disposal of unwanted *Journal* copies and there is also a great demand for them in various official establishments. In point of fact many *Journals* of considerable age still contain valuable training material.

The Editorial Office has a record of official requests for such copies and the list is gradually lengthening. It is realised that there are, in various unit libraries and reading rooms, etc., a considerable number that are no longer of any service to the unit possessing them. Any unit who has such copies for disposal should send them to: The Editor, Joint Services Recognition Journal, Old War Office Building, London, S.W.1 where they will be disposed of through official channels.

## Lesson Instructions

**The ability to identify is a skill and therefore a matter of "doing", not of gathering information. Submit to the instructions given below in every lesson and the ability 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.**

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.**

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