RAF TRANSPORT COMMAND REVIEW

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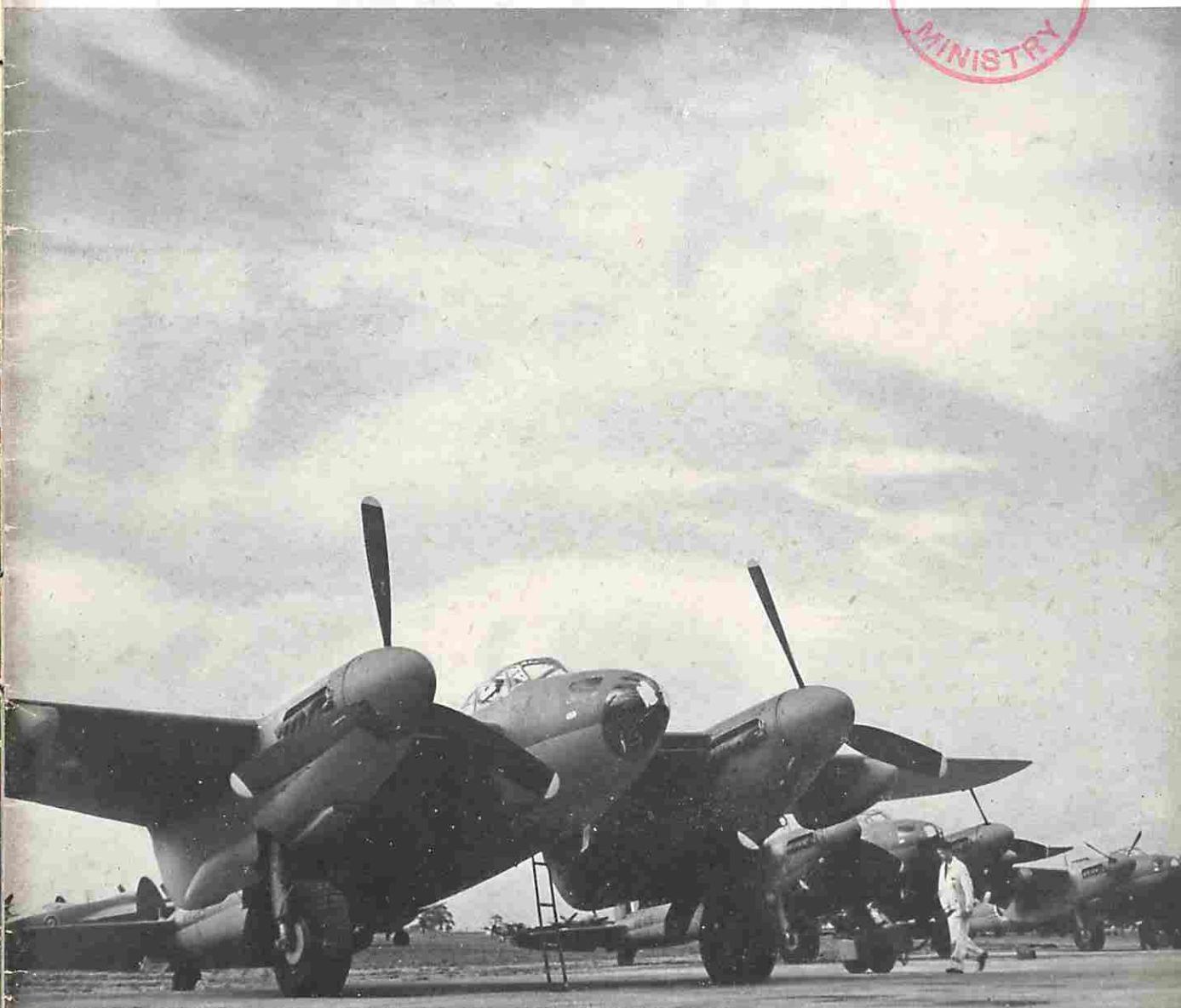


MOSQUITOES MK. XXV OF No. 162 SQUADRON

AIR TROOPING FROM THE WEST.
Indian troops from Europe arriving at MAURIPUR.
A Stirling freighter, previously used for trooping, in the background.

TRANSPORT COMMAND REVIEW

ISSUED BY H Q TRANSPORT COMMAND
ROYAL AIR FORCE

No. 8 APRIL 1946

CONTENTS

POINTS FOR CAPTAINS

The introduction of the Air Quartermaster into some Squadrons of Transport Command was described in the previous number of the REVIEW. *It will be some time before all passenger carrying captains can expect the assistance of Air Quartermasters, and these notes are intended to remind captains of the responsibilities that fall to them outside their flying duties.*

IN the course of training, transport captains receive intensive instruction in the perfection of their flying skill and technical knowledge. In the course of their subsequent operations, the exercise of these qualities can never for a moment be relaxed; the perpetual and over-riding consideration for the safety of the aircraft clearly permits no neglect.

But the less tangible qualifications required of a captain can easily be forgotten when the Transport Conversion Course is over, and during his flying duties there is no one to remind him of them and no special circumstances to force them into the realms of necessity.

By less tangible qualifications we mean his manner —and his manners—off the flight deck; his consideration for passengers, his ability to deal with them correctly and pleasantly, his appearance, bearing and discipline.

It is true that the initial categorisation and regrading of flying personnel will automatically bring these points to the captain's attention every six months, but during the intervening months of flying they can be easily forgotten again. On page 21 of this issue of the REVIEW there is an article on Categorisation and it is emphasised there that the final grading of a pilot is assessed from the *lowest* marks obtained throughout the test. A pilot who hopes to qualify for passenger carrying duties must obtain a minimum of 80 per cent in *all* ground subjects. If his flying and technical skill are above average he will still need all the marks he can collect on his own personality for "appearance, bearing and discipline."

The importance attached to these qualities in Transport Command cannot be over-emphasised. To experienced captains operating the trunk routes, these remarks will seem obvious, but there are many fine pilots new to the Command to whom the idea is strange and even unwelcome, for some tend to resent the imposition of duties over and above the standards of flying skill in which they have already proved themselves

competent. These remarks are intended for the pilots who think their duties begin and end with flying, the pilots who have difficulty in remembering that there are now others to be thought of, beside their crew.

There are several reasons WHY the captain should take trouble to ensure the comfort of his passengers. First, undoubtedly, the simple code of good manners and consideration for others. Second, the passengers are not joy-riding, but travelling on Service or Government business—and quite possibly would have preferred to go by surface transport; probably some will not have flown before, and to be ignored from take-off to touch-down is the very worst and most anxious-making introduction to air transport. Following from this is the fact that on arrival the passenger will be expected to start his work, and he may want to work *en route*, so everything should be done to make his journey comfortable, pleasant and free from worry. Thirdly, it is from the way they are treated by Transport Command aircrew that passengers of all three Services, the civilians and foreigners, will form their judgment of the Command and the RAF. And finally, though it should not affect our treatment of Service passengers, we also carry some fare-paying passengers.

Naturally, Transport Command cannot offer all the comforts of a civil airline, but it can, and must, provide an equal standard of civility and service. As we pointed out in last month's REVIEW it is not always realised by passengers that our aircraft were primarily required for military transport and must operate within the limitations of Service requirements.

These facts, however, only underline the responsibility of every transport captain to treat his passengers with special courtesy and consideration, to be correct in his relations with his crew, and to be scrupulous in his appearance and general behaviour.

The captain's introduction to his passengers is normally at the briefing. Even if he is not present, he is responsible for satisfying himself that this has been done properly. But if he does the briefing himself, he should do it authoritatively but humanly, and leave no doubt in anyone's mind that he *is* the captain. Safety precautions should be explained as comparable with boat drill on a liner. This subject can be dealt with early, and it need not be lengthy to be adequate; the passengers will not then set out in a state of morbid anxiety. Explain the layout of the aircraft interior, the seat adjustment, and, of course, the use of safety belts and oxygen apparatus.

Once the flight has started, and as soon as the aircraft can be handed over to the co-pilot, the captain should go aft and talk informally with any of the passengers irrespective of rank—in fact, the humblest may well merit special attention.

Throughout the flight, the captain should from time to time, renew his contact with his passengers, either in person, or through one of his crew. It is not enough to restrict these contacts to the necessities of refreshment serving. There are numerous opportunities. An occasional inquiry about the cabin temperature will be appreciated. Progress reports on the journey, places of interest, a reference to altitude—these need not be disposed of merely by the "every-hour-on-the-hour" slips. Remember that altitude, and changes of altitude, may affect some passengers more than others, and it is of the first importance that all passengers should be advised before appreciable changes in altitude are made.

If bad weather is met, make your visit cheerfully and confidently, and even though you are English, don't grumble about the weather. If some feel sick, *don't* let them feel silly as well (one of your crew might shortly let you down and seize a bag, too). There is nothing undignified about these attentions; there is nothing ruder or in worse form than to show off your operational experience by ignoring your passengers' reactions. And the effect on passengers of quite ordinary acts of courtesy can be magical.

At the Staging Posts, the captain and crew can still be very helpful to passengers. One of the crew should go into the cabin before the final descent and make sure that everyone has his safety belt fastened. There will be many questions to answer and quite a lot of things to remind the passengers about. Time spent in this way will make reception by the Traffic staff much easier.

So much for crew-and-passenger relations. Now a word about captain-and-crew relations.

The transport captain *must* be the leader of the crew. The slap-happy Tom, Dick and Harry arrangement born of combat operations has no place in the services that Transport Command has to provide for its passengers. The captain should command and exercise authority. He cannot expect much regard from his passengers if his crew treat him as an overgrown schoolboy. Admittedly, it would be difficult, if not impossible, for some captains to superimpose this code of behaviour on to an integrated team which has already got into easier ways, but crews will be changing increasingly, and it is for the captain to set the correct standards from the start.

It is not only during the flying hours that the captain must watch these points. On trunk route operations a captain is on duty from the time he takes off to the time he returns to base. It requires firmness and tact to maintain this relationship, but that it can be done successfully is shown by the behaviour of the best crews that operate our trunk route services. And the results in all-round efficiency speak for themselves.

We must say more about appearance, though. For some reason, gallantry in the RAF is thought to confer superiority to normal conventions in dress. Not so in the Navy; not so in the Army. The captain of a ship always appears before his passengers in "band-box" smartness, and the best regiments of the Army are invariably the smartest, on duty and off duty. Service and civilian passengers are not at all impressed with the sort of careless appearance that some RAF crews adopt; it looks to them like a deliberate insolence. And in Transport Command, the battered hat and the rumpled, tatty uniform go with—Category "E."

The All-Weather Air Service

Every morning at 1000 *hours a Transport Command Dakota leaves Prestwick for Blackbushe, and every afternoon at* 1400 *hours it takes off on the return trip—an All-Weather Service that has not missed a day's flying since it started in September,* 1945. *In this article* WING COMMANDER J. H. G. MCARTHUR, D.F.C., *explains the purposes of the service and discusses some of its experiences with radio and radar aids*

At the present time much thought is being given to the question of providing radio and radar aids to the navigation, approach control and landing of aircraft in bad weather. There are many types and applications of radio and radar systems available or under development, each having its own particular advantages and limitations.

As there are now enough proven aids available to operate aircraft independently of practically all weather conditions, Transport Command inaugurated its All-Weather Air Service with two main objects in view: to operate a busy and important air service on a 100 per cent efficiency basis, and, by using all the available systems and combinations of systems under actual bad weather conditions, to attempt to decide upon the most suitable aircraft equipment and ground installations for standardisation throughout the Command, and possibly throughout the RAF.

The service is operated daily by a detachment of No. 24 Squadron, in 46 Group, and flies between Prestwick and Blackbushe return. It has flown every day since its inception in September last year. From the experiences and reports already available, it is now possible to make some observations on bad weather flying which will be of assistance in the final achievement of operating air services with safety, regardless of weather conditions. For instance, it will no doubt surprise many to learn that the crews who have operated the service this winter are unanimous that, if they had a choice of landing in conditions of 40 yards visibility or with a 40 m.p.h. cross-wind, they would infinitely prefer to approach and land in the conditions of 40 yards visibility. In passing, it should be noted that the need for a much more accurate system of measurement of horizontal, and, if possible oblique visibilities has been apparent; below 100 yards visibility the estimates given by Met. Sections and Flying Control do not always coincide.

Until the present time a considerable gulf has existed between the operational and scientific aspects of the various aids to bad weather flying. The All-Weather Flight is attempting to bridge this gap between theory and practice. Normally, transport pilots are enthusiastic over any new aid which they consider will assist them to live longer, but on this service they are encouraged to use in good weather and bad, all the available systems, and so should eventually arrive at unbiased opinions on the merits and demerits of any particular radar or radio aid used. Reports and figures are co-ordinated and analysed by the Operational Research Section of Transport Command.

Apart from the vital necessity that Transport Command aircraft should be able to fly anywhere and find the same system and procedure in use, the following points must be considered in attempting to standardise on equipments:

Reliability.
Ease and suitability for universal use.
Weight and size.
Ease of maintenance.
Cost and possibilities of production.

The whole problem of standardisation which, up to the present, has had to be shelved for interim measures and short term policies, is now becoming urgent.

Radio and radar techniques have advanced and become so involved during the past few years that it has become very difficult for the average experienced pilot to understand and appreciate fully *all* the potentialities of *all* the various radar and radio aids available, and it is therefore not surprising that many decisions are still unmade. Amongst the most important are:

(i) GCA (radar talk down system) *v.* Pilot-operated systems for approach and landing.
(ii) Aural indications *v.* Visual indications.
(iii) Loran *v.* Sonne (Consol) for long-distance navigation.
(iv) Gee *v.* Radio track guides and marker beacons for short and medium distance navigation and position keeping.
(v) Micro wave *v.* VHF for glide paths and localisers.
(vi) Cathode ray tube *v.* Meter presentation to pilot.

In addition to the above, the new Decca Navigator has been undergoing trials in the short and medium distance navigational aid fields and full reports should be available shortly.

Although it is still a little early to have reached any major decisions on the suitability or potentialities of all the equipments now being used on the All-Weather Air Service, the following figures recorded between December 10, 1945 and February 2, 1946, will be of interest.

Total number of radar-radio assisted approaches made during above period = 71.

Comprising: 24 on GCA.
25 on SCS 51.
22 on Babs Mk. II.

Total number of faults, failures or unserviceability during period:

GCA: 7 times.
SCS 51: 3 times.
Babs Mk. II: 7 times.

The above figures should not be read to indicate any real superiority of any one particular aid because, on some of the occasions the equipment was being adjusted or serviced and the need for its use had not been anticipated. But it must be emphasised that a very high standard of maintenance is necessary, so that eventually the pilot will come to rely on his approach aids with complete confidence.

Impressions gained from the pilots using the above three types of approach aids, both on the special air service and in their daily approach practices, is that all three systems are sufficiently accurate to keep the aircraft lined up with the runway during the approach. But for an approach and landing in thick fog, the necessity for a straight line glide path cannot be denied. This feature of the SCS 51 type of equipment, together with the fact that the indication to the pilot is direct by meter presentation on the instrument panel, would appear to be its chief advantage. An aircraft of the Dakota type will not bounce when flown into the ground at the correct airspeed down a glide path at an angle of 2½ degrees, which has been found the most suitable for this equipment.

The accurate continuous reading of distance, which is the chief charm of the Babs Mk. II equipment, has to be improvised when using SCS 51 equipment from a knowledge of height and glide path angle, as shown in the following table. It has been found that with constant practice, the mental calculation of distance becomes automatic, thus obviating the necessity for marker beacons. The need for a reliable radio altimeter is very obvious.

ALTITUDE DATA

ALTITUDE *v.* DISTANCE FROM POINT OF CONTACT

DISTANCE OUT MILES	ALTITUDE IN FEET FOR THE FOLLOWING BEAM ELEVATION					
	1.5°	2°	2.5°	3°	3.5°	4°
1	140	185	230	275	325	370
2	275	370	460	555	645	740
3	415	555	695	830	970	1,110
4	555	740	925	1,110	1,290	1,480
5	690	920	1,150	1,380	1,620	1,850
6	830	1,110	1,380	1,660	1,940	2,220
7	970	1,290	1,620	1,940	2,260	2,580
8	1,110	1,470	1,850	2,220	2,600	2,960
9	1,240	1,660	2,080	2,490	2,910	3,320
10	1,380	1,840	2,310	2,770	3,230	3,690
15	2,080	2,760	3,460	4,150	4,850	5,540
20	2,760	3,680	4,610	5,530	6,460	7,380

A similar mental calculation is necessary in the case of approaching by means of Babs Mk. II, where the glide path can only be derived from an accurate knowledge of range and height. Recordings of errors in the barometric altimeter readings immediately after landing show that about 200 feet must be regarded as the vertical safety limit of this glide path. Again, the need for a reliable radio altimeter is very evident.

Using an airfield perfectly clear of obstructions, the following are estimates of the weather limits which it is felt can be safely worked to:*

SCS 51	Ceiling	30 ft.	Visibility .. 30 yds.
GCA	„	50 „	„ .. .. 50 „
Babs Mk. II ..	„	200 „	„ .. ..500 „
Gee Let Down	„	200 „	„ .. 1,500 „

In conjunction with some of these instrument approaches, FIDO has been used, but from what evidence there is, this appears to be something of a mixed blessing.

Flying personnel who have had experience of cumulo nimbus cloud formations in Burma will not be surprised to learn that this great hazard to flying is viewed with much greater concern than either thick fog landings or icing conditions. Flying at night, or in certain cloud layer conditions, it has been found difficult, if not impossible, to avoid flying into these dangerous cloud formations with consequent great stresses and strains on the aircraft and crew. Recording accelerometers have now been fitted to the aircraft and special inspections are carried out when an airframe has been subjected to any undue stresses. The appearance of radar storm warning devices is eagerly anticipated.

The All-Weather Air Service has been unusually lucky this winter as regards the intensity and number of occasions on which icing conditions have been encountered. Moderate icing has been experienced over lengthy periods, severe icing for shorter periods. The normal airframe and airscrew de-icing equipments have proved fairly satisfactory, but there can be no doubt that the final answer is still to be found. On one occasion the indicated airspeed fell from 150–125 m.p.h. in a very short time, owing to accumulations of clear ice on the nose, aerials and other unprotected parts of the aircraft. The ultimate solution may well be by means of a combination of thermal and mechanical methods. The crews have received lectures from Headquarters Transport Command technical experts on the prompt diagnosis and clearance of carburettor icing, which have proved most helpful.

(*Concluded on page 8*)

**The Rebecca/Babs Training Flight at RAF Station, Melbourne, has been operating since October 15, 1945. Throughout this period, there have been only three occasions on which flying had to be cancelled: once due to severe icing conditions, and twice on account of strong gales. Training flights have been carried out in all visibilities—on one occasion when visibility was eighty yards in fog, with no ceiling.*—EDITOR.

AIRCRAFT INSPECTION ON TRUNK ROUTE SERVICES

WING COMMANDER N. G. N. DAVIS
Engineering Plans, Headquarters, Transport Command

THE operation of home-based aircraft on long distance scheduled services showed the unsuitability of the Major/Minor system of inspection for that task. Under this system an aircraft has to adhere to a fairly rigid basis of inspections according to its flying hours, *e.g.* after 50 hours' flying a minor inspection is due and after 400 hours a major inspection must be carried out. This 50-hour period may be anticipated by carrying out the minor inspection at say 45 hours, or exceeded by doing the minor inspection at, say, 55 hours.

Despite this latitude, however, the next minor inspection becomes due at 100 flying hours. The results of this system are that minor inspections fall due at staging posts along the route and not necessarily on the same staging post on each successive journey. Further disadvantages are the long delays caused by carrying out minor inspections *en route*, and the loss of aircraft for long periods on major inspections.

Both effects clearly prevent the efficient and economical use of aircraft on scheduled services.

To overcome these disadvantages, and at the same time to maintain a servicing system which would ensure the safety of the aircraft together with their maximum economical use, Progressive Servicing was introduced into Transport Command. Three main points had to be considered:

(*a*) The minimum of servicing, compatible with safety *en route*.

(*b*) The maximum of servicing, in the minimum time, at Base.

(*c*) The maximum flexibility in the system to enable the inspection scheme to fit any service.

The first Progressive Servicing scheme was introduced in March, 1944, under which groups of items of the minor inspection were detailed to be carried out at different staging posts along the route to be flown. The disadvantages experienced were lack of continuity in the inspection, differing standards of workmanship and lack of flexibility, in that the minor inspection had to be split up in accordance with the route flown.

The second scheme, introduced in July, 1944, broke away from the standard inspection schedule, and detailed inspections were graded as I, II and III. The Grade I inspection was made at all stopping places and a standard time of two hours was required by servicing personnel. The Grade II and III inspections were to be made after a given number of flying hours. From a study of the York operating schedules it was found that the flying time between suitable staging posts was in the region of 15 hours. Hence the interval between inspections was laid down at 15 hours, with a plus allowance of 5 hours. A standard time of 6 hours was required for the Grade II inspection and 12 hours for the Grade III. On return to Base, aircraft received a Base Inspection, taking approximately 6 days. Under this scheme standard inspections had been achieved, with the larger ones being done at the better-equipped staging posts, standard servicing times could be laid down, equipment provisioning was made easier and a more flexible system of inspection attained.

But it was still considered that improvement could be made. Far greater flying intensities were being called for, necessitating much less time being spent on the ground for servicing purposes. So, in the current scheme, based on twelve months' experience of the grade inspection procedure, inspections are reduced to the minimum on the route, and minimum and maximum inspections are made on alternate returns to base.

The Progressive Servicing scheme now in operation calls for:

(*a*) Route Inspection at all stopping places *en route*. Time required, 2 hours, including re-fuelling.

(*b*) A Terminal Inspection up to 50 hours' flying. The term "up to" is used advisedly, since it permits the inspection to be made earlier, if more economical use of the aircraft results. The time required is 12 hours on overseas stations and 1 working day in the UK.

(*c*) An Inter-Base Inspection. This is carried out at base up to 100 hours' flying, but if this period is exceeded while the aircraft is on service, the inter-base inspection can be made at any well-equipped overseas station.

(*d*) Finally, the maximum inspection is made at base at 200 flying hours. This is known as Base Inspection.

Thus, the scheme provides maximum flexibility in its adaptation to any service on any route, the minimum of inspection while *en route* and the maximum amount of inspection at base.

It was to be expected that the introduction of route and terminal inspections would reduce the time an aircraft spent on the ground while *en route* overseas. But the problem of reducing servicing time at base remained. Clearly, the Base Inspections could not be reduced in quantity, since it was policy to carry out the maximum amount of work there. So both Inter-base and Base Inspections were in themselves planned.

The objects aimed at were to employ the maximum number of personnel on any one aircraft without any one of them interfering in the work of his neighbour, to ensure that the workmanship was of the highest quality, and to complete the inspection in the shortest possible time. The inspections were first pruned of all unnecessary work and then the task of each tradesman was carefully studied by Air Ministry Manpower Research Units.

The outcome of these studies were Inspection Cards, on which were shown, in their correct sequence, the inspections to be made by each tradesman and the time allowed for the inspection of each item. Each card was checked against the others to ensure that no tradesman had been positioned, or was working, to the detriment of others.

So that each tradesman should be "in step" with his particular job, a Progress Chart was introduced. This chart in effect consolidates the inspection cards, and the progress of each tradesman is indicated by moving flags throughout the total period of the complete inspection. The chart is made up at hourly intervals, thereby providing an easily seen picture of the progress of the work.

Complementary to this chart is the Disposition Chart. This indicates by a clear colour scheme where each tradesman should be at given times. It also shows when various parts of the aircraft are not being inspected, and so indicates where and when extra personnel can be fed in, without interrupting the sequence of the inspection proper.

This method of carrying out an inspection calls for a high degree of organisation, not only of each inspection team but also of those specialist bays in which component parts of the airframe, engines, electrical services, instruments, signals equipment and safety equipment are serviced. The whole organisation of the Servicing Wing itself must be adapted to meet this intensified servicing. The basis of the organisation is the "Inspection Gang or Team"—the latter term is preferred. Sufficient of these teams are organised to meet the planned number of inspections arising daily.

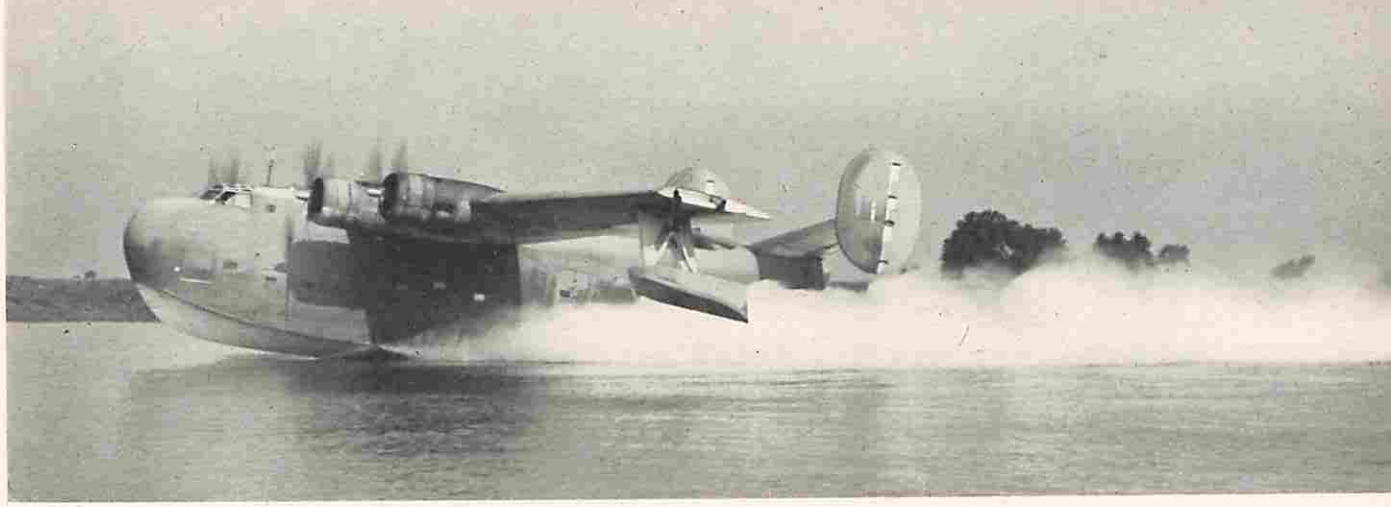
A "Repair and Rectification Team" is formed which is used to carry out major repairs or rectifications; if these were done by the Inspection Team, the timed inspection sequence would be dislocated. The Repair and Rectification Team also provides a pool of tradesmen from which to boost any trade which may be behind schedule. Both Inspection and Repair Teams are backed by the centralised specialist bays. The work of the Inspection Team must be carefully progressed to ensure all tradesmen being "in step." This is done by the "Progress Control"—the department which maintains each progress chart and feeds in extra personnel, if required, to maintain parallel working. All technical records, Log Books, Forms 700, Modification State of Aircraft and other statistical records, are centralised and maintained under the supervision of Progress Control.

The Progressive Servicing scheme and the planned organisation of each inspection as outlined in this article has been in full operation in one squadron for the past six months. During this period the Base Inspection time has been reduced from six to three days, and from statistics available over the four months ending December, 1945, an average flying intensity of 150 hours per month per aircraft has been achieved, 23,700,000 passenger miles have been flown without casualty and 14,800,560 ton freight miles flown without serious accident. This achievement is its own advertisement.

THE ALL-WEATHER AIR SERVICE

(*Concluded from page 6*)

At the start of this unique service in September, 1945, the loads carried were not abnormal. But very soon it began to get known that a certain aircraft would very definitely be leaving Airport A every day, wet or fine, at a certain fixed time and proceed to Airport B in a certain stipulated length of time (this being the elapsed time for the journey, plus a few minutes extra for a practice let-down on arrival), the aircraft would then definitely spend ninety minutes on the ground for unloading, re-fuelling, etc., and return in a similar manner to Airport A. As this became known, so the loads of passengers and freight increased, and to date, the record shows that on passenger traffic alone this single aircraft service handles an average of approximately 150 passengers weekly.



Reminiscences of
A Coronado Captain

FLIGHT LIEUTENANT ANDREW FAIRTLOUGH

ALTHOUGH originally quite a large order for Coronados had been placed by Air Ministry, eventually only ten were delivered. The boats were intended for service in Coastal Command, but it proved impractical to maintain in the UK such a small number of complex aircraft on operational service.

That was at the beginning of 1944, and at that time No. 45 Group, Transport Command, was anxious to obtain more passenger-carrying aircraft for the return of Ferry crews from the UK and Africa. So the remaining five Coronados were handed over to them for transport service.

Until the appearance of the Mars flying boat, the Coronado was the largest aircraft to take part in Allied operations. Empty weight was around 41,600 lb. and the operating maximum, 68,000 lb., though this was on several occasions pushed up to 71,000 lb. Even so, a take-off at 80–85 knots, fully loaded, could be made in a 60-second run.

Designed for long-range patrol and bombing, the Coronado was fitted with four Pratt and Whitney R-1830 model 88 engines, with 2-speed, 2-stage supercharging for high altitude flying. This proved to be a peculiarly unsuitable type of an otherwise very sound engine, and subsequently the Coronados were refitted with the model 92 engine, so successful in the Catalina.

Airscrews were 3-bladed on the outboard engines, and 4-bladed on the inboards, but of lesser diameter, to provide greater water clearance on take-off. A most excellent feature was that the inboard propellers were reversible, so that it was possible to remain stationary, go forwards or sideways or backwards from awkwardly placed buoys. Cruising speed was about 130 knots with an average fuel consumption of 200 US gallons per hour.

Obviously, a good deal of conversion was required to make these aircraft suitable for passenger and freight carrying, even under war service conditions. A special maintenance organisation had to be built up, and, of course, crews had to be found or trained.

The Coronado Flight was formed as part of the 45 Group Communications Squadron—later No. 231 Squadron—but the crews had to be picked from the most experienced flying boat delivery crews; half were civilian, half were Service men.

The first transport flights of the Coronado were made in June, 1944, from Boucherville (Montreal's marine base on the St. Lawrence), to Reykjavik, via Gander Lake. They carried freight to Iceland and returned with the Ferry crews who were assisting with the delivery of Catalinas by the North Atlantic route to Russia. When this commitment finished, a trans-Atlantic schedule was flown every third day, 12 hours direct flight from Gander to Largs, near Prestwick, returning by Iceland and Goose. These trips were very popular with passengers, who, in spite of numbering up to 25, had ample space, comfort, and excellent cooking facilities. As many as 38 passengers were often carried in and out of Reykjavik.

Winter operations were confined to flights from Bermuda to Lagos, via Trinidad, Belem, Natal, and Freetown, and returning via Nassau.

By the spring of 1945 four of the Coronados had been refitted with the model 92 engines, paint was stripped from the polished aluminium, and the Flight returned to its North Atlantic route, operating twice weekly with 100 per cent regularity up to September, 1945.

But the Coronados' time was up. The boats were returned to the US authorities at the end of Lend-Lease.

Those of us in 45 Group who first delivered, and then flew, the Coronados (the only flying boat service in the Command) remember some of our happiest flying in the boats that float idly at Bermuda, unwanted but not forgotten.

World's Fastest Air Mail Service

TOMMY TUCKER had to sing for his supper. Members of No. 162 Squadron, after rising at 0200 hours daily for a take-off at 0430 hours, have to fly 1,400 nautical miles for their breakfasts. This they do to fulfil the Air Delivery Letter Service schedules, supplying a fast air delivery of mail and newspapers to the capitals of Central and Northern Europe. It is believed that this Mosquito squadron—the only one of its kind in Transport Command—operates the fastest regular air-mail services in the world.

Originally part of the Fast Night Striking Force of the PFF Group, 162 Squadron was transferred from Bomber Command into 46 Group for this work in June, 1945. All its crews are highly experienced in the Pathfinder Force, having completed a minimum of one and a half Bomber tours; in addition, no less than 29 of the pilots are qualified flying instructors.

It was decided that, as speed was essential, it would be best to drop containers rather than load and unload packages. The Squadron's B. Mk. XXV Canadian built Mosquitoes have never been officially modified and most of the teething troubles were over methods of stowage. A special rack for carrying eight metal containers was installed by the Squadron armourers. Two faults showed up. On opening the bomb doors, the racks became warped through aerodynamic stresses and permitted the canisters to drop in places not intended by the pilot; and the containers, when dropped, were found to skip big distances and would sometimes split, scattering their contents. In fact, after dropping at Fornebu in a northerly gale, one pilot reported flying QBI down the fjord in a storm of newspapers. The eventual solution was to stow the newspapers and mail in an airman's kit-bag, to which a wooden slat containing a bomb-lug is attached. Eight of these bags can be stowed athwart-ships in the bomb bay and are dropped from 200 feet at 200 knots without suffering damage. Each bag can contain 800 newspapers.

The Squadron has been engaged on a variety of routes. During last summer, daily schedules were in operation as far afield as Cairo, via Malta, with a flying time of 8 hours for the single journey, and to Rome, flying time 3 hours 20 minutes, Naples 3 hours 50 minutes, and Athens 5¼ hours. These runs have been temporarily discontinued because of shortage of aircraft.

Two European schedules are at present operated: UK—Wunstorf, near Hanover—Oslo—Copenhagen—UK, and UK—Prague—Vienna—UK. The former is primarily a newspaper run, the latter a mail delivery. Take-off for both routes is at 0430 hours and Copenhagen is reached in 5 hours flying, after covering 1,400 miles. On the other route, a landing is made at Prague after 2 hours 20 minutes flying, and a further 40 minutes flying brings the aircraft to Austria. Both aircraft are brought back to base by slip crews before lunch.

The bomber Mosquito is, of course, a high altitude aircraft, and on long trips the pilots normally fly above 20,000 feet to achieve high efficiency. A great advantage derived from the use of this type of aircraft is that by climbing to 27–28,000 feet the crews can get over much of the dirty weather *en route* and often utilize high, favourable winds. Ground speeds of 400 mph are frequently obtained. On the Copenhagen route, however, one frontal system commonly covers all delivery points and this necessitates descent through the weather. The only approach aid available to the Mosquitoes for the drop at Wunstorf is GCA, and in blind approach conditions (the squadron flies in all weathers) the controller at Wunstorf brings the aircraft over the airfield and gives the order over VHF for the actual moment of drop. This method of dropping is almost as accurate as visual dropping. Approach to Fornebu (Oslo) must be contact, and by Command order a minimum cloud base of 600 feet is essential.

A special Met. telephonic service has been developed

to improve the forecasting for the dropping zones on this route. One and a half hours before take-off, Met. at Blackbushe contact BAFO Met. and obtain actuals for the dropping zones. As the aircraft takes off, the Operations Officer contacts Wunstorf and gives the ETA of the aircraft. As the pilot drops his load he can obtain a further series of actuals for points on the route.

The Squadron can of course fly in conditions which would preclude passenger flights. Because of this, and because of the few aids available to crews—VHF and Gee only—a high standard of both piloting and navigation is essential. Shortage of aircraft has meant that the high standard is maintained primarily through continuous and intensive ground training.

What is there to show for the Squadron's efforts? No great total in weight of freight delivered, for bulk considerations limit the maximum weight to approximately 400 lb. per trip; no great total of accident free passenger miles; but a great speeding up of Diplomatic mail between the Embassies; a speeding up of the troops' mail; a delivery of London morning papers in Europe before most London booksellers are open. That cheers the troops overseas.

The Squadron shows the flag in Europe, and on no occasion to better effect than when vaccine was urgently required in Warsaw to combat a threatened epidemic. With the barest of information and nothing in the nature of a diplomatic pass, two aircraft of the Squadron, bulging with vaccine, set course for Warsaw. The first was forced to land in Poland *en route* and the crew were detained by the Russians for three days before being allowed to proceed. But when the silver Mosquitoes skimmed across the city of Warsaw (they were the first British aircraft seen there) and landed to deliver their loads, there was great enthusiasm.

ABOVE : *Loading the Mosquito with kit-bags full of mail and newspapers. Normally, this is done shortly after midnight, for 0430 hours take-off.*

BELOW : *Cold take-off at Kastrup (Copenhagen).*

SPORT
IN TRANSPORT COMMAND

SQUADRON LEADER J. S. LANCASTER
Command Physical Fitness Officer

ON Thursday, 7th March, 1946, the Command Individual Boxing Championships were held at RAF Station, Ringway. Over forty entries had been received, and after many interesting and sporting contests the following came through as winners:

Flyweight: LAC Sims, Crosby-on-Eden.
Bantamweight: LAC Raisin, Tempsford.
Featherweight: LAC Bayley, Netheravon.
Lightweight: Sgt. Kent, Ringway.
Welterweight: Cpl. Smith, Ringway.
Middleweight: Sgt. Mason, Broadwell.
Light Heavyweight: F/Lt. Watson, Ringway.
Heavyweight: W/O Roy, Ringway.

These winners, together with winners from other Commands, compete in the RAF Individual Championships at Halton on 11th and 12th April.

RUGBY

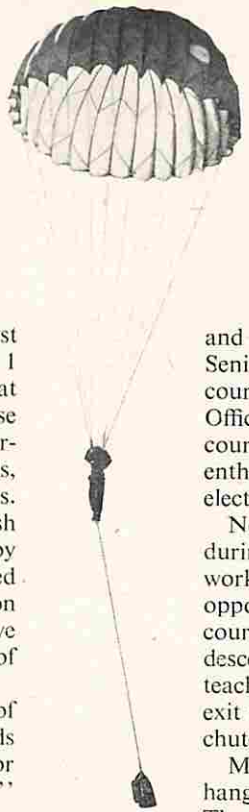
On Wednesday, 6th March, No. 38 Group met No. 43 Group at Ringway in the semi-final of the Inter-Group Rugby Competition, and after a hard struggle came through as winners by 9 points to 6. The final between Nos. 38 and 24 Groups was played on the Richmond Rugby Ground on Wednesday, 27th March, 24 Group winning, 16-6.

In the quarter finals of the Inter-Station Competition, RAF Ringway beat RAF Bishop's Court (Northern Ireland) by 6 points to 3.

WAAF SPORT

In the semi-finals of the Inter-Station WAAF Hockey Competition, Welford beat Blakehill Farm 5—2 and HQ (Unit) Transport Command beat Bassingbourn 2—0. The final between Welford and HQ (Unit) TC was played at the Lensbury Sports Ground on Tuesday, 19th March. At full time the score was 3—3, and after ten minutes extra time 4—4. In a further ten-minute period Welford scored three times. All seven goals were scored by the Welford centre-forward.

TEACHING THEM HOW TO JUMP



THE February gales were blowing their hardest when I walked into the Mess of No. 1 Parachute Training School (38 Group) at Ringway,* near Manchester. It is one of those mixed Messes with a numerous Army membership—in fact, the Army, who are the pupils, outnumber the RAF, who are the instructors. (In passing, how many realise that all British Army parchutists in this country are trained by the RAF at this School?) It is from such mixed communities that Army-RAF co-operation grows up naturally and becomes the positive force that had such great effect in the field of airborne operations.

But to-day there was an unmistakable air of vexed frustration. For three weeks the winds had howled across the flat countryside; for three weeks there had been no "jumping." Ground training and infantry exercises are no hardship to troops in the condition of these men (and they had had three weeks toughening before coming to Ringway), but they are a poor substitute for the man who has set his heart on parachuting.

The talk was nearly all "shop." Would there be any jumping to-morrow? What did the Met. man say? There was the same keenness about this crowd that used to run through the EFTS Messes in the early days of the war.

During that first evening in the Mess, they told me there were only three things to teach about parachuting —exits, control, and landings. One of the Army officers snorted impatiently: "We've been learning exits, controls and landings for three weeks—but we still aren't parachutists!"

A newspaper blew shivering across the floor as a door opened and banged with sudden violence. It was the Met. man—and he was actually grinning. "You might jump to-morrow," he said.

He was right. The next morning the wind had dropped to 12 m.p.h. It was still on the strong side, but the gustiness had gone out of it and the Chief Instructor gave the word for jumping.

After breakfast, while the Dakotas were warming up, the Training Wing Adjutant showed me the synthetic training apparatus and told me how the syllabus worked.

In this country all parachute training for the Army is carried out at Ringway. On assembling at the School, the troops, posted from the Airborne Division, are formed into syndicates of about sixty officers and men, and each group of ten is then under a RAF Senior NCO for instruction. In charge of each course, and supervising the training, are RAF Officer Instructors. Since everyone on the course, pupils and instructors, are volunteers, enthusiasm runs through the place like an electric current.

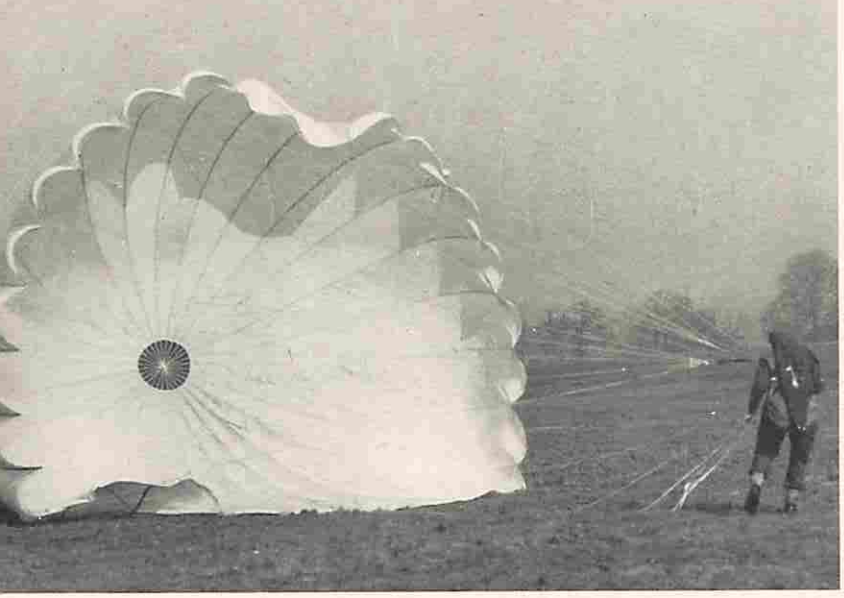
Normally, the ground training is completed during the first week of the course. Physical work is accompanied by lectures, films, and opportunities of watching a more advanced course carrying out their first parachute descents. The aim of the ground training is to teach the three essentials—correct method of exit from the aircraft, how to control the parachute during a descent, and how to land safely.

Most of this training is carried out in a hangar, equipped as a gigantic gymnasium. There are mock fuselages for the practice of exits from the different types of aircraft in use. At present these are confined to the side exit of a Dakota, and the floor exit of a Halifax, but each calls for a different technique of exit, and a different drill in the aircraft. The basic rules of landing are taught by jumping from progressively increasing heights, by swinging to the ground on ropes and in harness, and the pupil begins to learn at the same time how to manipulate the lift-webs so as to control his drift for a real descent.

Jumping through holes, if continued too long, will eventually bore and fatigue the keenest of spirits, and boredom is the worst thing in training for an exciting event. So the changes are rung frequently through these periods of ground training. Bruises, sprains, fractures are other dangers which the instructor has constantly to guard against, for if they were too frequent or too severe, the initial eagerness of the pupil might be so shaken that he would decide against persevering with the course, and nobody can make a parachutist out of an unwilling soldier.

But such mishaps as do occur are usually slight and rarely affect the morale of the men, unless it is to make them tougher. One of the reasons this vigorous training can be carried through with so few injuries is that all the RAF Instructors are volunteers from Physical Fitness officers and NCO PT instructors. Wrestling, unarmed combat and periods of physical training, with special exercises to strengthen ankles and legs, are important parts of the course and they all help to fit the parachutist for the first hard contact with the ground, as well as keeping him fighting fit.

*No. 1 Parachute Training School is shortly moving to Upper Heyford and will then be nearer to the Army Airborne Division's own training centres.



Running to windward of the parachute to collapse the canopy.

Going up. Those who wait below and those going up both think they would rather change places.

The packing room at Ringway. Nearly 50,000 parachutes were packed here in the three months before D-Day. In addition to the parachutes required for the Army training (over 400,000 to date), about 500 a month are used for experimental or demonstration purposes.

A daily muster parade at the Parachute Training School

So far, the pupil has not experienced any great heights, and the first test of his confidence at height is made when he is told to jump in harness from a mock exit 30 feet up in the girders. The harness is attached by a cable to a drum and, as the man jumps, the cable unwinds from the drum, rotating a fan which acts as an airbrake just before he reaches the ground. One of the instructors, who has jumped many hundreds of times from aircraft said: "If I look down while climbing up the ladder, I'm done." And it is at this point that a few refusals are first met. In spite of seeing their fellows safely landed in this apparatus, some find themselves quite unable to perform the first necessity of paratroopers—to launch themselves into space with confidence. The number of these refusals is very small and once this stage in the training is passed refusals rarely occur, even when the first real parachute descent is ordered.

The final lessons of the ground training are concerned with the fitting, releasing and care in handling the parachute. With a fair ground wind, and some old parachutes, the troops are exercised in the various methods of release from the harness, and given experience of how to handle the parachute and their other equipment quickly.

If all goes well, parachuting begins from a balloon on the sixth day of training. After watching a demonstration jump by the instructor, the men are taken up five at a time to a height of 700 feet. Naturally, every man is keyed up to a high pitch of nervous tension and the slow ascent can be a very trying time. The troops jump one at a time on the orders of the despatcher, and as each man descends, he can hear a running commentary of corrections and instructions from amplifiers on the ground. Quite understandably, he is frequently too preoccupied to benefit from these instructions, so a second balloon descent is made. On this occasion he is expected to put into practice the principles he has learned about exits, control, and landing.

And the next step is straight out of an aircraft. Anyone who found the balloon descents rather breath-taking is encouraged when it is explained that from the balloon he fell about 150 feet before the 'chute opened, whereas from the aircraft the slipstream will cause the 'chute to open after a drop of only 80 feet—or in two to three seconds time.

The Dakotas take off from the airfield and head for a dropping zone in a private park. It is a large stretch of turf ringed by trees. The troops have seen it from the ground; now they see it from the air, 700 or 800 feet up. It looks alarmingly small.

But the instructor is using all his wits to encourage the men and dismiss their doubts. Again, the instructor makes the first jump. As he goes out of the door it seems impossible to the soldiers that he can ever reach the DZ from this angle, but they know that the pilot, like the rest of the RAF staff at this School, has done this sort of flying a hundred times before. Anyway, it is their turn now, and they have to go.

They jump in pairs. As they float down, instructions are given from the ground over the amplifiers but, just as from the balloon, few of those making their first descent from an aircraft pay heed to instructions. This is their finest moment and they hear nothing but the joy of their achievement singing in their ears.

Suddenly the ground is coming up at them. Only thirty-five seconds in the air. No time to think. Can they remember the drill? Some don't, and they take the knocks. As soon as they are on the ground there is a tendency to sit there and think how grand it was. The amplifiers remind them sharply to get moving. The drill from now on is all at the double.

After this first descent from an aircraft, the troops make four more descents, developing "stick-jumping," practising exits, control and landings, making a night jump from the balloon, and finally jumping from an aircraft with full equipment and a 50 lb. kitbag. The kitbag is held to the leg for the exit and is then released on a 20-foot rope as the paratrooper descends. The

kitbag itself may swing fairly violently, but it has the effect of damping down any oscillation the parachutist might have developed, and tends to give light landings.

And so the soldier has become a parachutist—or paratrooper. A total of eight jumps is found sufficient to give the men all the confidence and proficiency necessary, but practice must be maintained. Advanced training is continued when the troops return to the Airborne Division, and RAF Instructors from the Parachute School are attached to the Division for this purpose.

No. 1 RAF Parachute Training School owes its origin to an order from Mr. Churchill, after the German airborne descent on Rotterdam, in 1940. He then ordered that a force of 5,000 paratroops should be trained. In 1941, the RAF was made responsible for the initial training of all parachute troops.

At the end of February, 1946, the School had logged 427,527 jumps, of which the Instructors themselves had made over 34,000; one Instructor has made 1,600 jumps, almost all have over 100 jumps to their credit.

Although recruited from PT Staff, the Parachute School Instructors have flown as despatchers on all the big airborne operations, and on most of the Special Air Service operations of 38 Group. Many of them wear the Croix de Guerre, awarded for services in support of the Maquis, some have the AFC. In July, 1945, Air Ministry authorised the issue of the parachute brevet to qualified instructors. (Redundant aircrew and aircrew cadets can now volunteer for training as instructors—AMO A/1101/1945.)

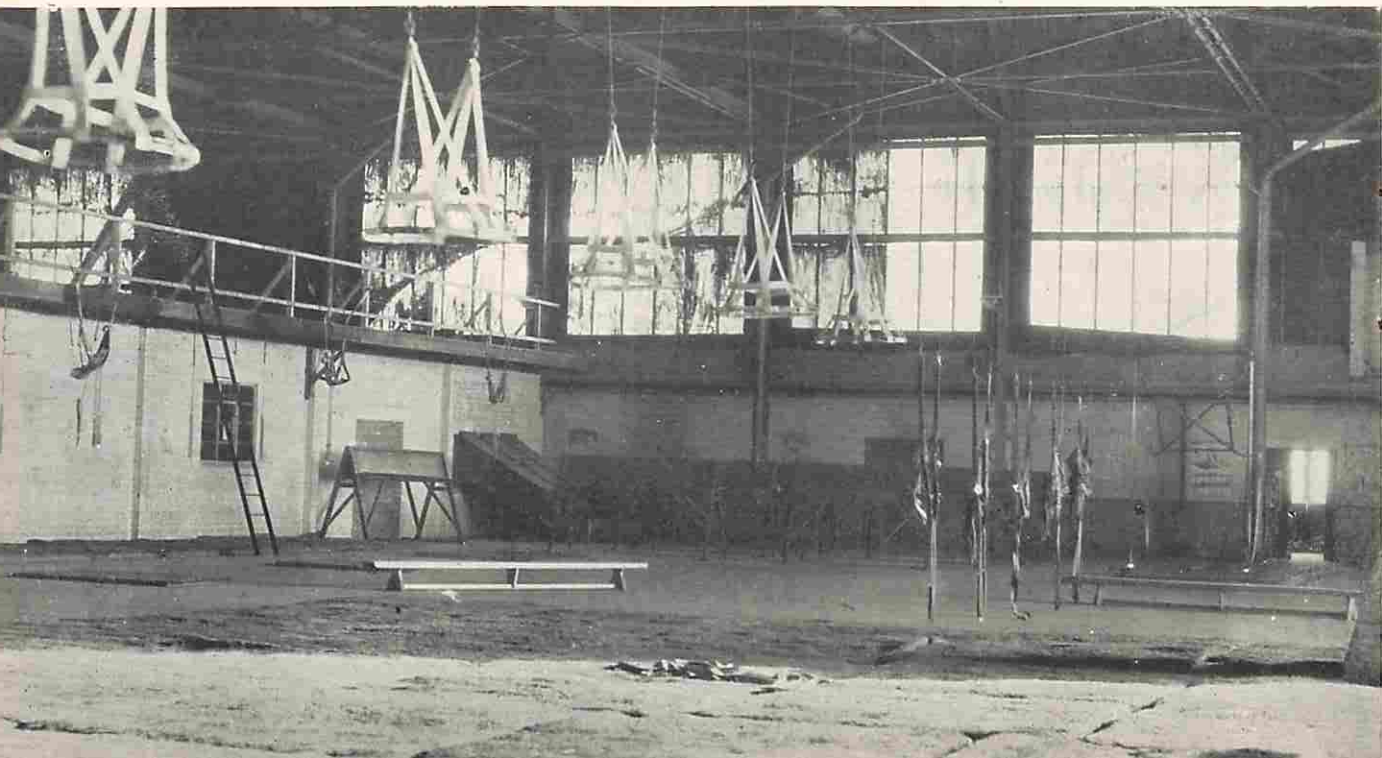
Approximately 60,000 parachutists (including, of course, Czechs, Poles, Dutch, French, Yugoslavs, Chinese and others, as well as British) have been trained by the School, and in addition 500 instructors have been trained, some to work with the Army, some to go to RAF Parachute Training Schools overseas.

It might be thought that the crews who fly these training flights would find their work boring. But it is not so. They are tremendously keen and they have a fine record to guard—they have had no flying accident in the history of the School.

The parachute packing section at Ringway is—quite unintentionally—one of the show-places of the RAF. Because of the care and efficiency with which every detail of the parachute's life is watched, checked and recorded, the daily routine in this section cannot fail to be impressive. It is part of the paratrooper's course to visit the packing section and see for himself the care taken over this all-important part of his equipment. He sees that every parachute that comes into the section is given a log card on which its whole history is recorded. After twenty descents, and subsequently after every five descents, every canopy is tested for porosity; after thirty-five descents the canopy is no longer used for "live" descents, however good it may seem. Much of the packing is now done by redundant aircrew. But there are, or were, over a dozen WAAF parachute packers at this School who could each claim to have packed between 10,000 and 12,000 'chutes. That still leaves a lot to be packed for the 427,527 jumps.

When the paratrooper leaves the Parachute School, he goes with a feeling of complete confidence in what the RAF can do for him on operations. That confidence is a vital part of his successful training, and the success of his training has been demonstrated on the battlefields of Europe.

Synthetic training apparatus in the gymnasium-hangar



(S)TALKING YOU DOWN

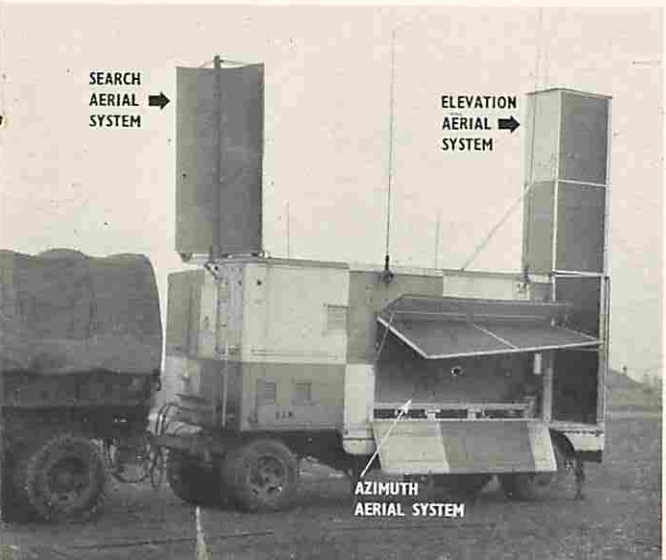
A DESCRIPTION OF THE GCA LANDING AID

From the pilot's point of view GCA (Ground Controlled Approach) is the simplest of all devices to assist landing under conditions of low cloud and restricted visibility. No additional instruments are required in the aircraft and no special skill or training is required of the pilot.

All the equipment is on the ground, in a truck and trailer just off the runway. The truck merely carries the generating plant and acts as a workshop for maintenance. In the trailer is a self-contained aircraft control unit, with R/T communication, radar sets and, of course, the operators of this equipment. By radar, the GCA unit can trace the approach and descent of an aircraft; by direct communication over the R/T, the pilot can be directed and guided right down the glide path on to the runway. He is literally talked down all the way. Confident landings can be made with a cloud base of 150 feet and visibility of 600 yards. In fact, at Lyneham a Mosquito was brought in through a cloud base of 50 feet, and a York has been landed in a fog with visibility down to 200 yards. And, of course, it works at night just as well as by day.

There is nothing unusual about the R/T equipment, but a wide range of frequencies is available—three HF transmitters and receivers, each with ten channels, and three VHF sets, each with four channels—so almost any aircraft can be contacted. By reason, also, of these numerous channels, whilst one aircraft is being landed others can be "held," that is, instructed to maintain given courses and altitude until they can be accepted into the circuit.

FIG. 1. *The GCA trailer on the airfield*



The radar equipment consists of two quite separate systems—separate in operation and separate in apparatus. Both are duplicated to provide dual control, and to provide against breakdown.

First, there is the Search System, which reveals the position of any aircraft within a radius of 20–25 miles, and up to an altitude of 3,000 feet. Signals, transmitted from the search set, and reflected back by the presence of aircraft in the vicinity, are received on a vertical scanner, rotating through 360 degrees (Fig. 1), and displayed on two parallel plan position indicators (PPI); thus the movements of two aircraft can be traced simultaneously. The operators of the PPI are RAF or WAAF senior NCOs, known as Traffic and Feed Directors, and their work is supervised by an officer usually of the Nav/Rad (GD) Branch.

As soon as the blip shows up on the PPI, it must be identified with the aircraft to be landed, to prevent any possibility of confusion with other aircraft in the vicinity. This can be done simply by taking DF bearings on the pilot's speech transmissions, or (if he is using Gee) by instructing him to report at a predetermined spot to which the search aerial will be directed.

Then the aircraft is directed round the circuit (and its movements are followed on the PPI) until it is flying the QDM (*i.e.* towards the airfield in the direction of the runway) and about seven miles from the runway.

At this point the Directors and the Search System cease to follow the aircraft, and the second of the radar units comes into operation, the Precision System, operated by a team of three, the Approach Controller (a GD officer) and two RAF or WAAF senior NCO Trackers.

The Precision System has two directional aerials, adjusted very precisely to the bearing of the runway in use, and searching in azimuth and elevation respectively. Signals, indicating the path of the approaching aircraft, are presented on independent screens to the two Trackers. Vertical or horizontal deviations from the ideal track or glide angle are measured independently on each of the screens by a hand-operated wheel controlling a tracking cursor. These measured deviations are translated and electronically transferred on to two meters in front of the Approach Controller (Fig. 2). An extremely accurate picture is thus presented of the progress of the aircraft in relation to the path it should take for making an ideal approach and landing. The Controller is able to assess the corrections required in course and height and pass these to the pilot by R/T in the form of a running commentary.

FIG. 2. *The Controller Unit*

As the NCO 'trackers' track the path of the aircraft in azimuth and elevation, the results are shown up on the two dials of the Controller's Unit. Thus the Controller is able to keep the pilot continuously informed of his exact position—high or low, left or right—in relation to the ideal line of approach.

So much for the equipment on the ground. Now let us see it at work from the pilot's end.

As he approaches the airfield, the pilot realises that weather conditions are so poor as to rule out any question of landing without aids, so he calls up Flying Control and asks for GCA assistance. Flying Control gives him his QFE setting (*i.e.* the barometric setting which will cause his altimeter to read zero on landing), tells him to fly a certain course and altitude and to switch over to one of the GCA frequencies.

While the GCA unit is locating the aircraft, the pilot will be asked the type of aircraft he is flying, so that the flying instructions passed to him will be appropriate to the type.

As soon as the aircraft is identified in the circuit (Point X, Fig. 3), the pilot will hear the Traffic Director say: "*You are in sight,*" followed by course instructions something like this: "*Turn right, steer* 150 *degrees. Fly at* 1,500 *feet. . . . You are on the down-wind leg, reduce to circuit speed. . . . You will shortly be turned cross-wind. What is your altitude?*" This last is a check for the pilot. All he need do is to obey the instructions (acknowledging them in the usual manner) and constantly watch his course and altitude.

The aircraft is directed to a point about twelve miles from the runway on the down-wind leg (Point A, Fig. 3), turned on to the cross-wind leg, and handed over to the Feed Director. (The Traffic Director is thus freed to accept another aircraft.) The Feed Director confirms the aircraft's position and course: "*You are now cross-wind, eleven miles from base. Lower landing gear and partial flap.*" The pilot acknowledges this, giving his indicated air speed.

When the pilot has flown about three miles cross-wind, the Feed Director turns him towards the runway (Point B, Fig. 3). "*Turn left, steer* 050 *degrees,*" and later, "*Steer* 360 *degrees. You are now eight miles from base. What is your altitude?*"

When the aircraft is seven miles from the runway the pilot will hear: "*Change to channel x and stand by to acknowledge. Over.*" He is now being tracked by the two Trackers and the Approach Controller on the Precision System.

Then he hears: "*Hello 'A' this is Approach Controller. Fly at* 1,000 *feet. Steer* 360 *degrees. How do you hear?*" When satisfactory contact is made the pilot is told not to answer any further instructions, and he is free to concentrate on the final approach and touch down, "*You are five miles from runway. Lose height at* 500 *feet per minute. . . . Check undercarriage down. Check flaps. Your present heading is good.*" If the pilot is seen to be deviating from the glide path, he will be told: "*You are (forty) feet below glide path, adjust your rate of descent. . . . (Twenty) feet below. On the glide path.*"

And finally: "*Look ahead for the runway.*"

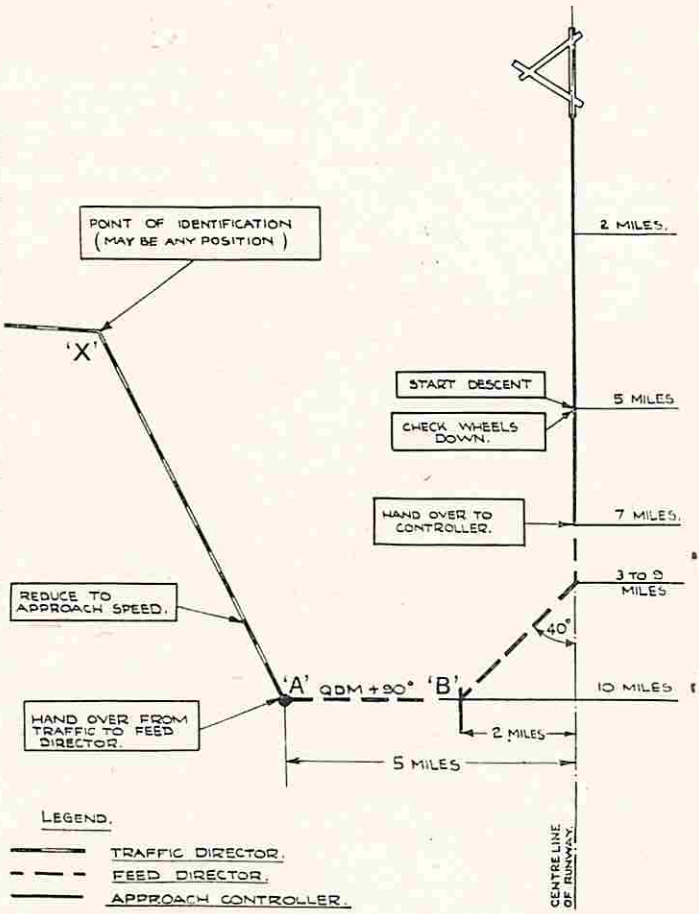


FIG. 3

Even if everything is going to plan, the GCA Controller talks to the pilot at frequent intervals, telling him his position, checking his altitude, his speed, his cockpit drill, so that the pilot is constantly assured that the GCA Unit has him still in sight and that his descent is safe. It sounds simple and it is simple. But, obviously, a pilot gains great confidence with practice, and it is a very good thing for him to go and watch the Unit at work. Everything, of course, depends on the accuracy of the GCA operators, the speed and the precision with which they work. They have never yet failed a pilot, and one need give no higher praise.

At present there are GCA Units in this country at Prestwick, Lyneham, Manston, St. Eval, Carnaby, Bassingbourn and Tibbenham, and on the Continent at Melsbroek, Wunstorf, Fuhlsbuttel and Gatow. In the period from September to February inclusive, the GCA Unit at Lyneham had assisted 553 practice landings in good weather and 278 landings in bad weather.

Expel the Propeller

SPEAKING to the Royal Aeronautical Society in London, Dr. S. G. Hooker, assistant chief engineer of the Rolls-Royce jet division, said that all would like to see the propeller die an honourable death.

"If we really must crawl about the skies at 200 mph," he continued, "then I see no hope for displacing the propeller, and as a punishment we shall have to put up with the propeller noise and vibration. If, on the other hand, we regard a journey by air as a boring thing to be got over as soon as possible, and are prepared to consider transport aircraft with cruising speeds greater than 400 mph, as we ought to be now—and will be soon—then we can begin to think of the jet propulsion unit with the advantage of its reduced noise and vibration for the passengers. Speed is always expensive in fuel, no matter how it is obtained, so that in our high-speed jet-propelled machine, we must be prepared to revise our ideas on fuel consumed.

"On the other hand, I suggest that the comfort and smoothness of this form of travel will be unsurpassed on land, sea or air."

The improvement in range of a jet-propelled machine at altitude was not so much due to the engine, he said, but, in the main, due to the aircraft, and all objections to jet propulsion could be overcome by flying high and fast. It should be clearly understood that jet propulsion was efficient at any altitude, provided the speed was greater than 500 mph. It should also be remembered that the higher the altitude, the more efficient the aeroplane.

Other advantages, he pointed out, in the gas turbine were:

It is a power plant incomparably lighter than the conventional reciprocating engine.

The mechanics of the engine allow operation for cruising conditions at a much higher proportion of its maximum power than is possible with the piston engine.

Jet propulsion units gave far less noise and vibration to the aircraft structure, and this contributed towards the comfort of passenger travel.

Installation of a jet engine was very much simpler than that of a piston engine, and because of the simplicity of the jet unit its liability to mechanical or functional failure must and will be reduced.

Maintenance required by jet units was very much less than that of conventional engines.

Reduction in maintenance and high cruising speeds will be reflected in the serviceability and the flying hours of the aircraft, materially lowering the cost of maintaining an air service.

Safer and cheaper fuels can be used with gas turbine engines, and the danger of an uncontrollable fire is appreciably diminished.

Engines can be grouped closely together and installed close to the fuselage of the machine, thus diminishing the risks at take-off, if one engine should cut.

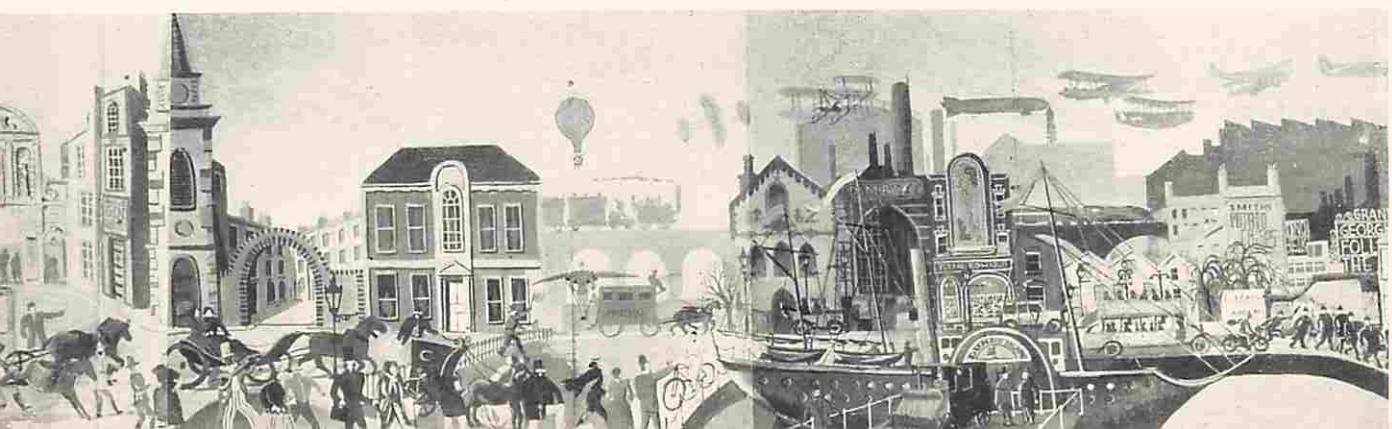
Avro Tudor II prototype on test flight. Britain's largest land plane yet built

A Painter passed this way

THE Waiting Room in the Passenger and Freight Section at Hendon was a pretty bleak place when the Passenger Services Section at Headquarters, Transport Command, went in with ideas. Bright paint and some excellent murals have changed the scene considerably.

The photograph on the left shows the room as it was, and above is a similar view after it was decorated. The mural to the right of the doorway depicts "English Weather," or some of the more familiar aspects of it. On another wall is a mural, 16 ft. long, which presents the evolution of transport through British history. (*See pictures below.*) Both of these murals were painted by an ex-glider pilot, Flight Lieutenant Stringer. The artist used poster colours and painted the one on plaster board, covered with a piece of wallpaper, the other on ordinary cardboard.

The furnishing of the room is completed with ash-trays, vases, lamps and book-ends manufactured out of scrap and salvaged materials in the Passenger Services workshops.



Categorisation of Flying Personnel

An explanation of the scheme for assessing aircrew qualities, as laid down in Air Staff Instruction, Vol. IX, No. 4

FLIGHT LIEUTENANT A. A. BETTS, A.F.C., *Training Branch, Headquarters, Transport Command*

THE Categorisation of Flying Personnel scheme is now in full operation in the Command.

Briefly, the object of the scheme is to ensure that all crew members are only employed within the limits of their ability, experience and knowledge.

Under the categorisation scheme, each individual member of a crew is to be given a category on the results of intensive and searching tests, both practical and theoretical.

There are five categories, A, B, C, D and E, dependent on the marks obtained over the whole test. They are divided up as follows:

Cat.	*% of Marks*	*Approx. Form 414 assessment equivalent*	*Qualification*
A	90% and over	Exceptional	Passenger qualified and fit for consideration for V.I.P. duties.
B	75%—89%	Above average	Passenger qualified.
C	65%—74%	Average	Passenger qualified (restricted).
D	50%—64%	Inexperienced	Freight only.
E	Below 50%	Fail	Unsuitable or requires further training.

The scheme has already achieved one of its objects —that is, to raise materially the general standard of knowledge and flying amongst flying personnel, and in the process the sheep are separated from the goats. In several cases, crews who were in the past considered knowledgeable, have, on completing their categorisation tests, been found wanting in some aspects of their duties.

Let us take a look at these tests, starting with pilot categorisation.

This is split up into flying and ground subjects. The flying tests are in turn divided into three parts—general flying, instrument flying and night flying.

In the general flying tests, marks are awarded for the checks the pilot makes before and after entering the aircraft, starting, warming up, testing the engines, taxying, take off, climb, and so on.

Once in the air, the pilot is tested on his manipulation of the various ancillary controls, such as the hydraulic system, automatic pilot, de-icing and heating controls. The pilot's actual flying comes under the closest scrutiny. He is made to carry out asymmetric flying (*i.e.* flying with one or more propellers feathered), asymmetric landings and overshoots.

The instrument flying tests not only incorporate the tests for the Air Ministry green and white rating cards, but go considerably further. Emphasis is placed on instrument flying accuracy, and on "let down" procedures. The pilot is tested in Q.G.H. "let down" procedure, and two other procedures from those available, one of these three being carried out under asymmetric power.

The night flying covers much the same ground as the general day flying tests. Variations are made in airfield lighting and aids to ascertain how a pilot will behave under abnormal conditions, including, again, asymmetric power flying.

The ground examinations for pilots' categorisation are as comprehensive as the flying tests. There are eight subjects: aircraft technical, meteorology, weight and balance, air sea rescue, air traffic, radio aids, passenger handling and briefing, aircraft papers. The lowest pass mark on the ground subjects is 80 per cent in *each* subject.

And, finally, in addition to the air and ground tests, a pilot is also assessed on captaincy, appearance, bearing and discipline.*

On the completion of all these tests, the pilot assumes the category of the *lowest mark obtained throughout.*

Suppose, for example, a pilot passes through the flying tests and ground examinations with over 90 per cent. So far, he is exceptional, and well on the way for an "A" category. But if for any reason his squadron commander should only assess him as 80 per cent in captaincy or appearance, bearing and discipline, then his total percentage will be reduced to 80, and he can only be granted a "B" category.

At first sight this may appear to be rather harsh, but the strength of a chain is its weakest link, and pilots who qualify for the highest grades will have heavy responsibilities. That is why the standards are exacting.

Categorisation tests for navigators, wireless operators and flight engineers, are equally searching, consisting of practical tests, and oral examinations on methods, equipment and airline procedure.

Each member of every crew in Transport Command now carries a categorisation booklet in which are recorded his special qualifications, courses attended (with results), and his category.

The higher pilots' categories A, B, and C, that is, those qualifying the bearer to carry passengers, are not easy to come by, for in addition to the tests to be

* *An article on the implications of captaincy, appearance, bearing and discipline appears on page 3 in this issue.*

passed, certain minimum flying qualifications are necessary as follows:

For Four-Engined Aircraft:

1,000 hours as pilot.
200 hours as four-engined captain.
50 hours as four-engined captain at night.
100 hours captaincy on the particular type.
20 hours captaincy on the type at night.

For Twin-Engined Aircraft:

850 hours as pilot.
200 hours as captain of a twin- or four-engined aircraft.
50 hours as captain of a twin- or four-engined aircraft at night.
100 hours captaincy on the particular type.
20 hours captaincy on the particular type at night.

In reckoning total hours as pilot every hour over 100 hours as captain on four-engined aircraft will count double, and half the time spent as second pilot in a Transport Command route squadron (up to a maximum of 400 hours) will count as pilot time.

Categorisation is carried out in the squadron and within the squadron's training organisation. The Squadron Commander is responsible for the categorisation of his crews. Normally this is carried out by his Training Officer and Flight Commanders in the case of pilots, and by Navigation, Signals and Flight Engineer Leaders in the case of the other crew members. But the categories awarded are valid for six months only, so aircrew must be regraded at least twice each year.

To ensure a uniform standard of categorisation throughout the Command, a unit has been formed called the Transport Command Aircrew Examining Unit. This unit has begun by categorising squadron and flight commanders in Transport Command so as to give them first-hand experience of the scheme and the standards required.

Later, when the scheme is more fully established, this unit will visit squadrons to carry out percentage checks on various crew members.

The Aircrew Examining Unit will also be responsible for testing flying personnel holding an "A" category who are considered suitable to carry V.I.Ps.

Flying personnel in the Command will realise that by attaining high grades in their categorisation, they will not only promote the efficiency and safety of R.A.F. air transport operations, but will be consolidating their position for future employment in Service and Civil flying.

ALMAZA

ALMAZA, *now the great airport for Cairo, is one of the main air terminals on the trunk routes between Europe and the East, and to South Africa. It was first opened in* 1930 *by the Egyptian State Airways and Misr Airlines were the first operators to use* ALMAZA *as a base, running services to Cyprus, the Sudan, Libya, and Palestine. The Royal Egyptian Air Force was also using the airfield as a base.*

During the war considerable improvements were made to the airfield by the construction of new and longer runways and the erection of a fine terminal building. But for strategic reasons it was preferred to conduct RAF operations from Cairo West, further from the city of Cairo. In 1945 *the reasons for this choice no longer existed and Transport Command decided to move its Terminal Staging Post to* ALMAZA, 8 *miles from the city. A camp was built to accommodate two Transport Command Squadrons and a Staging Post. In July, No.* 133 *Staging Post and No.* 216 *Squadron (for* 25 *years resident in Egypt) moved in. The Staging Post was to deal with the trunk route services, the Squadron was to provide internal air services.*

The peak air traffic through ALMAZA *was reached in November,* 1945, *when Flying Control handled* 7,888 *aircraft and the airfield Buffet served over* 25,000 *meals; total weight handled by the Traffic Section was* 2,723,438 *lb. When the airport is busy, so is the Heliopolis Palace Hotel, the Transit Mess for aircrews and passengers* en route, *and one of the most comfortable stops on the trunk routes. The Hotel accommodates* 500 *persons, but as is inevitable in airline operations the traffic is never steady for long and rush periods occur from time to time to tax the resources of the staff.*

ALMAZA *remains an Egyptian airfield and the RAF Units there are lodgers. Close liaison and co-operation between RAF and the many other national interests on the airfield ensures smooth and efficient working.*

Heliopolis Palace Hotel

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DAKOTAS OF No. 267 SQUADRON OVER THE BALKANS