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PART III

OPERATIONAL TRAINING

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PART III OPERATIONAL TRAINING

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CHAPTER 17BOMBER OPERATIONAL TRAINING

The need for 'operational' training had its roots in the reorganisation of flying training carried out in 1935 when the FTS course length was shortened to six months and squadrons were left the task of bringing pilots up to operational standard. This reliance on squadrons for making up the shortcomings of basic training was satisfactory in peace-time in so far that it kept them busily and profitably employed, but that was all that could be put on the credit side. From both the training and the operational point of view the procedure was most unsatisfactory. It impaired the immediate efficiency and readiness for war of the squadrons and it tended to obscure the precise amount of post FTS training necessary to bring pilots up to front-line standard.

These shortcomings grew as technical development progressed. Faster, larger and more complex aircraft increased the standard needed for operational efficiency, but it was impossible to raise this standard through the training schools, and a growing burden of additional instruction fell on the squadrons; a burden which was even further increased as the size of crews grew and the need for specialised crew training arose.

The need for this 'operational' training was greatest in bomber squadrons which had to give instruction in navigation, night and instrument flying and crew work. The problem in fighter and army co-operation squadrons was not so acute, while Coastal Command already had several specialist schools which met at least part of the needs. By the middle of 1938 it was recognised that an interim stage of training between basic schools and squadrons was essential, at least for bomber crews. At that time, however, few aircraft and instructors were available for such training and the best that could be done was to allot two Ansons (Oxfords although considered more suitable were not available) to each flight of the bomber squadrons for training purposes.

Advanced Flying Training Centres

In September 1938 another problem arose. The Munich Crisis had brought to light the fact that no provision had been made for any reserve of trained pilots and crews from which casualty replacements could be drawn in war.

The following month a combined solution to these two most pressing problems - the need for more training and the need for trained reserves - was devised. Advanced flying training centres were to be set up to deal in peace-time with the interim stage of training and with the advanced training of volunteer reservists, and in war-time to become pools for holding casualty replacements, (1) with facilities for keeping them in flying practice. Their precise functions were defined as:-

In War:-

- a. To provide each operational group with a reservoir or pool from which replacements could be drawn.
- b. To train the output of the FTSs up to an operational standard.

In Peace:-

- a. To provide intermediate training and practice to regular pilots after leaving FTSs and before joining operational units.
- b. To act as advanced training centres for volunteer reservists and thus fit them to take their place in operational units in the event of war.

In November it was decided to form one advanced flying training centre for each operational fighter and bomber group and one for Coastal Command, (2) making ten in all. Their size and establishment were calculated on the war requirement of holding casualty replacements for one week of sustained operations. The ten group pools (the name Advanced Flying Training Centre was soon dropped) were to hold 371 pilots or crews between them and were to be equipped with a total of 174 aircraft. They were to vary in size according to the needs of the group they backed, and were to feed 73 bomber, 36 fighter and 19 coastal squadrons.

Non-Mobilisable Squadrons for Training

Although the need for these pools were urgent - it was so recognised even in the autumn of 1938 - only one was started before the war, No. 11 Group Pool in Fighter Command. Shortage of aircraft, and, more particularly, experienced personnel, prevented the rapid formation of further pools before the war. Bomber Command, where the need was most urgent, had not the

(1) AM File S.46938

(2) EPM 158(38)

facilities to establish group pools, and in the spring of 1939 it was decided to fill the gap, as a temporary measure, by the use of some of the non-mobilisable bomber squadrons. Shortage of both first-line personnel and reserves had already sub-divided Bomber Command into those which were readily available for operations and those which were not - classed as mobilisable or non-mobilisable squadrons. No. 75 (Harrow) Squadron (it was re-equipped with Wellingtons in July) at Honington became the first group training squadron on 1 March 1939. Two more, Nos. 52 and 63, both at Upwood, using Battles were converted the following month and six more (Nos. 104 and 108 at Bassingbourn on Blenheims, Nos. 7 and 76 located at Finningley equipped with Hampdens, No. 97 (Whitley) Squadron at Leconfield (1) and No. 148 (Wellington) Squadron at Honington) started training on 1 June. These squadrons retained a nucleus of their more experienced personnel as instructors, the remainder being posted to mobilising units, and had half their operational types of aircraft replaced by Ansons. The Ansons in the mobilisable squadrons were withdrawn. No syllabus was laid down in the early stages, but in August 1939 the AOC-in-C Bomber Command suggested that the peace-time syllabus required to bring pilots up to operational standard was 62 hours for heavy bombers (Whitleys, Wellingtons and Hampdens) and 80 hours for medium bombers (Battles and Blenheims). The heavy bomber squadrons (with 24 aircraft) could train 22 pilots at a time on a 14 weeks course, and the medium bomber squadrons (with 36 aircraft) could train 27 pilots on a similar course. The training of other crew members was not specifically outlined, but it could be carried out in the time necessary to train pilots.

Reorganisation on Outbreak of War

Before these proposals could be further considered, war was declared, and arrangements had to be made to put the squadrons on a war-time footing. Four more non-mobilisable squadrons (Nos. 35, 166, 207 and 215) were converted to training squadrons and No. 90 Squadron was withdrawn from the operational strength of No. 2 Group to become a training squadron. These five squadrons together with the other 10 already employed on training were transferred from the various operational groups to No. 6 Group, which was now

(1) AM File S.46938

to deal exclusively with training. The training staff at these squadrons were screened from posting and squadrons themselves were given priority over operational units in the supply of aircraft. The course length was fixed at six weeks (temporarily extended to nine for the winter) and included 55 hours flying for heavy bomber pilots and 60 for medium bombers. The heavy bomber squadrons were to have 12 aircraft (to be increased to 16 as soon as possible) and were to train 11 crews at a time, while medium bomber squadrons with 16 aircraft (increasing to 24) were to train 15 crews at a time. The original intention to replace half the operational aircraft with Ansons proved impracticable except in the case of the Hampden squadrons and the others were established with 75 per cent operational types and 25 per cent Ansons.

Although administered by No. 6 Group the training squadrons were still affiliated to their original groups and supplied crews for squadrons in those groups. As a result, a clutch of squadrons working together on a common type of aircraft and supplying the needs of a particular group soon became known as the Group Pool. The position at the end of September, after several moves had taken place, was as follows:-

Squadron No.	Location	Group Pool No.	Training on - Aircraft
35) 207)	Cranfield))		
63) 52)	Benson))	1	Battle
104) 108) 90	Bicester)) Upwood)	2	Blenheim
75) 148) 215	Harwell)) Bassingbourn)	3	Wellington
97) 166)	Abingdon)	4	Whitley
7) 76) 185	Upper Heyford)) Cottesmore)	5	Hampden

These arrangements were made with training as the primary consideration, and were satisfactory so far as the giving of adequate instruction was concerned. The aircraft were fully equipped and a certain amount of bad weather and instrument flying could therefore be done. They could provide trained crews for operational squadrons at a rate of about 1,600 per year, but made no provision for any reservoirs to hold crews after they had been trained. This requirement still existed, however, and became inevitable at a time when practically no active operations were going on, and so five reserve squadrons were used to hold trained crews and keep them in practice. No. 98 Squadron at Hucknall, and later in France, held Battle crews; No. 101 at West Raynham, Blenheims; No. 214 at Methwold, Wellingtons; No. 78 at Linton-on-Ouse, Whitleys; and No. 106 at Finningley, Hampden crews.

The rate of flow through the training squadrons, or group pools as they were now called, was a serious problem. 1,600 pilots and crews per year was too small to match either the SFTS output for Bomber Command (planned as 3,196 per year) or the rate of wastage expected, and would therefore cause an inevitable accumulation of pilots and crews awaiting group pool training, as well as a probable shortage of casualty replacements when active operations began. It was this bottleneck in the flow of pilots to bomber squadrons that led to the lengthening of all basic training courses in December 1939. An investigation showed that to provide adequate group pool training (ie 55-60 hours flying per pilot) for either the whole flow from SFTSs or the planned rate of casualty replacement would need more aircraft in group pools than in all the first-line squadrons. The effect of reducing the flying hours at group pools to 30 was worked out, but the figures still remained formidable. (1) The group pools would still require nearly 500 aircraft.

On Bomber Command's estimate of 55-60 flying hours for adequate training the ratio of group pool to first-line aircraft would be 250 per cent for heavy bombers and 100 per cent for Battles and Blenheims. On a compromise between full training and economy of aircraft, by allowing 45 flying hours, the ratios became 200 per cent and 66 per cent respectively. The problem resolved itself into two main questions:-

(1) AM File S.46938

- a. Were group pools to produce fully-trained crews, leaving no working up to be done by the operational squadrons, or were they to be an 'interim stage' and merely assist squadrons?
- b. Were group pools to be given enough aircraft to provide a fixed number of flying hours per pilot, or were they to be given an agreed number of aircraft and left to make the most effective use of them?

Need for better Training

When these questions were considered at a conference on 4 December, the AOC-in-C Bomber Command outlined how the existing output from schools fell short of operational standard - pilots in particular were inexperienced in blind flying and wireless operators had little flying experience - and he made it clear that pre-squadron training up to that standard, either at schools or in group pools, was essential. As a result the need for training up to operational standard in group pools before crews went to the first line was agreed, and at the same time it was decided to rename group pools,
 (1)
 'operational training units'.

The second question was answered by a decision that group pools (or OTUs) should have a fixed number of aircraft - or rather, a fixed ratio between the number of operational training aircraft and the number of first-line aircraft they were backing. The ratio decided on was tantamount to providing enough aircraft to give full training to the whole flow of pilots and crews if two favourable contingencies were taken into account:- the improvement in school training expected to follow the 25 per cent lengthening of courses and the possibility of reducing the flow through OTUs. by cutting down the scale of operational effort. The ratio varied according to the type of aircraft used at an OTU, and the following figures were agreed on 5 December:-

(1) AM File S.46938

Type of OTU	IE aircraft (operational & training types) Percentage of operational squadrons IE
Heavy Bomber	100%
Medium Bomber	60%
Fighter	20%
GR Landplane	20%
Army Co-op (Single Engine)	25%
Army Co-op (Twin Engine)	50%

This operational training to operational ratio for aircraft reflected the conflict between the claims of expansion and operational training. It was a compromise between economy in aircraft and the need for thorough training; it would permit satisfactory OTU training if the standard of basic training was considerably raised, and it would provide enough trained men to expand the first line if the wastage rate were kept down. In the case of heavy bombers, for instance, the one-to-one ratio that was agreed would give about 38 hours flying per pilot to the rate of flow required by current estimates of casualty replacement, whereas Bomber Command considered 55 hours the minimum for pilots of the existing SFTS output standard.

Although operational training was to be planned on the basis of the agreed aircraft ratios, it was not until April 1940 that these ratios were applied to the existing bomber group pools. In the meantime the pools continued to work on the original training squadron basis, with considerably fewer aircraft in the heavy bomber pools than the one-to-one ratio allowed. In some cases the two squadrons at a group pool station worked more or less independently, while others combined their resources. At Harwell, for instance, Nos. 75 and 148 Squadrons pooled their facilities and divided the work up between the four flights each of eight aircraft so that one (with Wellingtons) dealt with conversion to the operational type, one (with Wellingtons) with armament, one (with Ansons) with navigation and wireless training, and one (Wellingtons) with operational exercises. Ground training (1) was generally done on a station basis.

(1) AM File S.1925

The limited number of aircraft in the heavy bomber pools kept their output down to about 400 per year, although the actual wastage rate (including postings for courses, sickness and accidents as well as operational casualties in heavy bomber squadrons at the time was some 680 per year. The deficiency was made up later by converting Battle and Blenheim crews (of which the group pool output was larger than the wastage) to the heavier types. In spite of the low rate of flow through group pools, the expected accumulation of pilots between the SFTS and group pool stages did not become serious. The SFTS output was heavily reduced as a result of longer courses combined with exceptionally bad weather, and although a flying practice unit for pilots awaiting group pool training was opened at Meir in March 1940, it was called on to handle only about 100 pilots before it was disbanded in June.

Formation of OTUs

The bomber group pools were eventually changed into OTUs and their establishment raised to the one-to-one ratio on 8 April. (1) Seven of the group pool squadrons (Nos. 7, 75, 76, 97, 148, 197 and 215) were to become operational, and the remainder reduced to a 'number only' basis until they could be re-formed. In their place the following nine OTUs were formed:-

OTU No.	Location	Aircraft Establishment			
10	Abingdon	Whitley	54	Anson	18
11	Bassingbourn	Wellington	54	Anson	18
12*	Benson	Battle	72	Anson	18
13	Bicester	Blenheim	36	Anson	12
14	Cottesmore	Hampden	36	Anson	36
15	Harwell	Wellington	54	Anson	18
16	Upper Heyford	Hampden	36	Anson	36
17	Upwood	Blenheim	36	Anson	12
18+	Hucknall	Battle	16	-	-

* Training for the squadrons in France

+ Training Polish personnel

The one-to-one ratio was also applied to the long-term planning of heavy bomber OTUs to back the ultimate target force - resulting in a most formidable requirement of aircraft. The ultimate first line was to contain just over 2,000 heavy bombers, and a one-to-one OTU organisation matching this figure

called for 1,548 operational aircraft and 516 trainers to be used on operational training, with a further 516 and 172 respectively as initial reserve. The manpower needed by this heavy bomber OTU organisation would be some 2,000 officers and 30,000 airmen, while the requirement of stations with satellites would be at least 29. (1) Moreover, even this extremely large organisation would not provide the full 55 flying hours training which Bomber Command considered essential: it had the inevitable corollary of the one-to-one ratio of providing only about 38 hours flying for the anticipated rate of casualty replacement.

These estimates of the ultimate heavy bomber OTU requirement were made in January, but the formidable nature of the problem caused a decision to be deferred until April. In the meantime, the AOC-in-C Bomber Command made it quite clear that bomber OTUs had to undertake a great deal of training, and (2) that this training was indispensable. He went on:-

'The proper role of the Operational Training Unit is to convert otherwise fully trained pilots, air observers and air gunners to the type of aircraft in which they will be required to operate and to give them sufficient operational training to fit them to take their place in operational squadrons. At present, a considerable amount of elementary training for all members of the crew, which ought to have been done previously, has to be undertaken in the Operational Training Units

The necessity for carrying out this elementary training at OTUs means that Service aircraft, of which there is a great shortage, have to be employed on training which could be done better on elementary types, and also takes up time which ought to be given to operational training, but has, in fact, to be devoted to elementary flying and conversion courses.'

He also described what was involved in training new flying crews up to operational standard:-

'Obviously the first essential is to teach the new pilots how to fly a Service type by day and by night, which entails a considerable amount of local flying at the OTU. Once a pilot has mastered the new type he has to be trained in advanced instrument flying, and long distance flying by day and by night, but to enable him to do

(1) AM File S.46938

(2) AM File S.46938

this the remainder of the crew must have reached a satisfactory standard in wireless operating and navigation. During these flights the whole crew must be trained in regional control procedure and bad weather flying. Finally, the complete crew must be taught bombing and air firing.'

As a result of these representations, the whole problem of OTU organisation was considered at a CAS's conference on 19 April. ⁽¹⁾ The crux of the matter was the heavy bomber requirement: in comparison, other operational training demands were light. The total front-line force was planned at 4,000, half of which were heavy bombers. The supporting OTU organisation would require roughly 2,000 operational types, three quarters of which were heavy bombers. It was agreed that no reduction of the existing standard of first-line training could be accepted, and that further training was necessary between the SFTS and the squadrons. OTU requirements could therefore be lowered only by reducing the amount of training needed at the OTU stage - which meant raising the standard of output from the earlier stages of training.

Bomber Command were prepared to reduce the amount of heavy bomber OTU training to 30 hours for pilots already trained on twin-engined aircraft and to 35 for those trained on single-engined machines provided they had priority in the allotment of the best pupils from basic training and provided the standard of instrument flying at the SFTSs was considerably improved. They also insisted that every requirement for 'synthetic training' on the ground should be provided in order to save flying time. The fulfilment of these demands was unlikely for at least a year, and until they were met no reduction in the existing requirement of 55 hours flying per pilot at OTUs could be accepted.

For the immediate future, therefore, and until Bomber Command's provisos could be satisfied, it was agreed that nothing less than the 55 hours standard of OTU training would be satisfactory. The OTUs were to be brought up to their one-to-one establishment as soon as possible, which meant delaying first-line expansion in order to provide the aircraft. The operational

(1) AM File S.46938

effort would probably have to be reduced because the one-to-one ratio could not produce enough pilots trained to the 55 hours standard to meet the anticipated rate of wastage.

Shortage of aircraft prevented the immediate expansion of the OTUs and the position at the beginning of May 1940 was that of the seven units backing the operational squadrons of Bomber Command only three (Nos. 13, 15 and 17) had actually been brought up to full size, the others remaining at the 'Group Pool' strength of 32 aircraft each. Of the remaining two units, No. 12 OTU backing the Battle squadrons in France (which had been transferred from No. 1 Group Bomber Command to BAFF earlier in the year) had been brought up to full size, while No. 18 OTU was not yet supplying crews for Bomber Command and in consequence was not regarded as part of the bomber training organisation. Equipped with Battles and operating at roughly quarter size, it was busy converting and preparing Polish crews for service with the RAF. The first Polish manned squadron (No. 300) formed in Bomber Command in July 1940. Bomber Command's first line consisted of $2\frac{1}{2}$ squadrons, to which it was planned to add seven of the former group pool squadrons as soon as they had been re-formed into operational units.

Expansion in the Summer of 1940

The seven OTUs backing Bomber Command were turning out crews at the rate of some 930 per year compared with a conservatively estimated probable wastage (1) of 1,350 crews per year. If the need for relieving tired crews after about 100 hours operational flying was taken into account, the probable wastage rate rose to 2,300 crews per year (for 24 squadrons). Against this, the seven OTUs backing Bomber Command would, if brought up to full size, be capable of turning out 1,750 per year. It was decided in May 1940 to bring them up to full size immediately and to close the resultant gap by forming two additional OTUs. To provide the additional aircraft and instructors for this expansion, six of the seven group pool squadrons re-forming as operational units were rolled up (No. 75 Squadron, a New Zealand squadron, was reprieved because of its special character), but even so there was a lack of operational types which had to be made up by using Wellingtons, Whitleys,

(1) AM File S.1925

and Blenheims without full operational equipment and by employing the rather unreliable Hereford at Hampden OTUs. A serious deficiency of more than a hundred Ansons had to be accepted.

Nos. 19 (Whitley) and 20 (Wellington) OTUs were opened at Kinloss and Lossiemouth respectively on 27 May 1940 and began training in June. No. 20 was opened originally as a half-size unit but was expanded to full size eight months later. A third unit, No. 21 OTU, on Blenheims had been planned to form at Wyton but did not materialise owing to a reduction in the number of medium bomber squadrons after the fall of France. The output from OTUs backing Bomber Command then went up to some 2,180 per year and was planned to reach nearly 3,000 a year when all nine OTUs were in full operation on six week courses. About 1,000 of these were from the two Blenheim OTUs; the output from the seven heavy bomber (Wellington, Whitley and Hampden) OTUs was at the planned rate of 1,200 crews per year, rising to just over 1,900. This output was, more or less, enough to meet the estimated wastage for 24 first-line squadrons, but it needed more than double the 1,900 pilots per year then being turned out by SFTSs for Bomber Command. Working OTUs at their full size made it necessary for each to have a satellite, and OTU satellites were given priority in construction.

The five reserve squadrons were gradually converted into operational squadrons and it was ruled that in future any OTUs needed to back new first-line squadrons should be formed six weeks (ie the length of the OTU course) in advance of the new squadrons.

This expansion of bomber OTUs naturally caused demands for more observers and air gunners and steps were taken to increase the output of the bombing and gunnery schools by relinquishing armament training facilities for the OTUs at the bombing and gunnery schools, and dispensing with target towers (which had just been established at the OTUs so that more pupils might be trained. A suggestion that air gunners should be trained ab initio at OTUs was strongly resisted by Bomber Command and was therefore dropped.

(1) AM File S.60810

(2) AM File S.4928

(3) AM Files S.1925 and SD155/741/40

In June it was decided that six of the eight Battle squadrons which had come back from the French campaign should remain Battle squadrons, and (with two Polish Battle squadrons due to form) reconstitute No. 1 Group in Bomber Command which would be backed by No. 12 OTU at Benson and No. 18 (Polish) OTU at Hucknall. The remaining two squadrons from France were converted to Blenheims and added to No. 2 Group. Bomber Command's first-line strength then became 34 squadrons, rising to 37 in August when three of the reserve squadrons became operational. To provide the trained crews for this first-line there were eleven OTUs, one of which was half size (No. 20) and one, a quarter size (No. 18), capable of producing trained crews at the rate of approximately 3,000 per year (1,200 heavy bomber crews, 1,000 Blenheim crews and 800 Battle crews) and requiring an intake of about 4,300 pilots per year. In July 1940 No. 7 Group was formed to take part of the heavy load being carried by No. 6 Group. The Blenheim and Hampden OTUs (Nos. 13, 14, 16 and 17) were taken over by the new Group, leaving No. 6 Group in control of the Wellington, Whitley and Battle OTUs. The new Group, which opened at Huntingdon, moved to Brampton the following month.

Shortage of Pupils

Throughout the summer of 1940, however, the bomber OTUs had to work far below their planned figures. The output of pilots from SFTSs was not enough to meet all demands, and as the claims of Fighter and Coastal Commands ranked over those of Bomber Command, pupils could not be found to fill the bomber OTUs. A further difficulty was that the bomber OTUs were short of their full establishment of instructors, the deficiency being over 200 pilots out of an establishment of some 600 (with corresponding shortages of other aircrew instructors), and more instructors could be found - directly or indirectly - only if a full flow of pupils was passing through the OTUs. One result of this light loading of the bomber OTU organisation was that there were enough facilities to spare to try the 'X' course experiment at No. 10 OTU Abingdon and No. 13 OTU Bicester, but the small flow of pupils and consequent shortage of suitable men (the whole of the EFTS output being required for SFTSs) helped to bring the experiment to an end.

(1) AM File S.60810

(2) AM File S.4928

Effects of the Second and Third Revise

When the 'Second Revise' was introduced the bomber OTU course was lengthened from six to eight weeks, the flying time being increased from 60 to 75 hours for Battles and Blenheims, and from 55 to 70 for Wellingtons, Whitleys and Hampdens. The change affected OTU courses starting after the end of September 1940, and reduced the theoretical rate of output (the actual output was at the time governed by the scarcity of pilots for intake as pupils) from 3,000 a year to 2,700.

The 'Third Revise' proposed to lengthen the bomber OTU course by another two weeks, to ten in all, and to put up the flying hours to 90 for Battles and Blenheims and to 85 for Wellingtons, Whitleys and Hampdens. The output from the existing OTUs would then go down to 2,250 a year, but it was intended to open more OTUs to compensate for this. How many more OTUs was not clear; the possibility of working OTU aircraft more intensively, and so getting more flying hours from the existing units, was not promising but Bomber Command were strongly of the opinion that it would be unnecessary to make the course longer than eight weeks and 70-75 hours, even though 'Third Revise' pupils would have only 120 hours pre-OTU flying experience. In spite of Bomber Command's protests, it was decided to introduce the ten-week OTU course in November when the first 'Third Revise' pilots came forward. This was really in the nature of an experiment and the possibility of returning to the eight weeks course was borne in mind. In fact a good deal of the later planning was done on the assumption that the eight weeks course would be adopted.

After these course extensions the bomber OTU organisation remained largely unchanged during the winter of 1940-41, and was theoretically capable of producing Wellington, Whitley and Hampden crews at the rate of about 1,500 a year, and Blenheim crews at about 750 a year on ten weeks courses. The pilot intake needed to produce this output was some 4,300 per year, and this matched the allocation of pilots from SFTSs between November 1940 and April 1941. The training of Battle crews had ceased in the autumn of 1940 and No. 12 OTU was converted into a half sized Wellington OTU in December. The Polish OTU which moved from Hucknall to Bramcote in November was also converted into a half-sized Wellington unit.

(1) AC 6(41)

(2) AM File S.69865

(3) AM File S.4928

(4) SD155/1124 and 1125/40

The actual training capacity of the OTUs was considerably lower than the planned figures and, when the adequacy of the OTU output for expanding the bomber first line was examined, the outlook was depressing. Operational wastage of the existing first line was estimated at 2,650 pilots a year, the withdrawal of experienced pilots for instruction duties at 540 a year, and Middle East reinforcement at some 600 a year. The surplus of pilots available for expansion would be less than 500 per year and, when Bomber Command's existing pilot deficiency (some 320 on 1 November 1940) and the need for forming new OTUs in advance of the squadrons they were to back (OTU development might absorb pilots at the rate of 600-700 a year for instructor duties) were taken into account, expansion seemed impossible. Fortunately the true position was not quite as black as had been painted, and the theory that Bomber Command would be unable to make any appreciable first-line expansion before the summer of 1941 at the earliest was partially based on false evidence, since casualty rates were not as heavy as had been feared, and were being revised as the basis for future planning. Even so, no planned allowance was made for war-weariness and consequently an uncertain additional wastage factor existed until the 'operational tour' of 200 hours was introduced in March 1941.

The chief problem in expanding the bomber first line was that of providing trained crews for new squadrons due to form when the increased production of aircraft expected later in the year materialised. Training the crews in OTUs would absorb large numbers of experienced men and occupy aerodromes, at the expense of the first line. The alternative was to make the new squadrons 'work up' by training their new crews themselves. It was not a good alternative. Besides being uneconomical, liable to increase training accidents, and almost certain to lower the ground training standard of crews, it involved the wide dispersal of key instructors. Consequently it was not used except for the first Manchester, Halifax and Stirling squadrons, and in these cases they were not new squadrons with inexperienced crews, but veteran squadrons specially selected for re-equipping with new types. The question of re-equipping OTUs with Halifaxes and Stirlings to provide backing for the four-engined types in operational use had first been

raised in October 1940, but Bomber Command were opposed to this and preferred to select crews with operational experience on old types for the new aircraft
 (1)
 and convert them on the squadrons.

Ratio of Operational Training to Operational Effort

The expansion problem thus resolved itself into that of getting a larger output of trained crews from OTUs without neutralising that larger output by the number of instructors required. Lack of pilot output from SFTSs was no longer the difficulty: in fact, after June 1941 when schools overseas were due to turn out trained men in larger numbers, so many pilots would be coming forward to Bomber Command that the equivalent of $11\frac{1}{2}$ more OTUs (making 20 in all) would have to be opened in the first six months of the year if they were
 (2)
 all to be trained, and this was assuming an eight weeks OTU course. If the 10 weeks courses were continued the requirement would be proportionately greater. These additional OTUs would need over 600 pilots as instructors, all of whom could only come from the first line, and there were no more than
 (3)
 1,120 pilots in the first line. There were other difficulties too; aerodromes could not be provided for all these extra OTUs; and the forming of so many new OTUs would cause excessive dilution of the first line, too high a proportion of inexperienced crews, therefore a probable increase in
 (4)
 the accident rate, and so a further demand for more OTU output.

These various factors were peculiarly intractable and irreconcilable, but the fact remained that unless a very marked increase could be made in OTU output without undue expense in aircraft, aerodromes and instructors, Bomber Command's first-line expansion would be negligible. A suggestion that OTUs should be established in Canada was not followed up because it could not solve the immediate difficulties. One factor in the problem changed slightly. Bomber Command reported at the end of January that 'Third Revise' pilots were found to be of much the same standard as their predecessors who had received longer SFTS training, and that they needed only an eight weeks
 (5)
 OTU course with 55-60 hours flying. In March it was agreed that all

(1) AM File S.1925/II

(2) AM File S.60810

(3) AM File S.1925

(4) AM File S.60810

(5) AM File S.69865

bomber OTU courses should be of eight weeks duration, thus raising the annual output to 2,700 crews; the amount of flying would be the same as the original six weeks course, an extra two weeks ground instruction being added.

This theoretical shortening of the course, however, was no practical help in solving the problem of expansion: all the planning and discussion had already been done on the basis of an eight week course. All the while the call for heavier bombing of Germany was urgent and insistent, especially when it was apparent that aircraft were available and pilots were passing through the SFTSs in ever increasing numbers.

These problems were hammered out in the first three months of 1941. At the end of March the Air Member for Training proposed that OTU output should be increased without a correspondingly heavy dilution of the first line by using experienced men for instructing only where it was absolutely necessary and by training a proportion of the OTU output to less than 'captain' or 'first pilot' standard. Investigation showed that the existing OTU establishment of 72 pilot instructors could be cut down to 55, and that only 35 of these need have operational experience: the other twenty were wanted either for conversion instruction to the operational type or for staff pilot work in Ansons, and could if necessary be drawn (with suitable training) direct from the SFTS output. It was a waste of training effort to bring all pilots turned out by OTUs up to 'captain' standard when half of them would of necessity be employed in the first line as second pilots: half the OTU output, the AMT suggested, could go forward as second pilot standard.

An investigation into the disposal of the OTU output and its effect on expansion showed the remarkable way in which OTU output disappeared without leaving any surplus available for expansion (in spite of the fact that the planned wastage rates were now lower).⁽²⁾ It was clear that immediate bomber expansion would be negligible unless unorthodox methods at the OTU stage were used to stimulate the flow of pilots to the first line. The output of pilots from SFTSs would very soon be ample for expansion, but the OTU requirements for turning them into operationally-fit men for the first line were enormous

(1) This meant that pilots would go forward to first-line bomber squadrons after only 177 hours flying (50 hours at EFTS, 72 at SFTS and 55 at OTU). The total duration of EFTS, SFTS and OTU training would be 24 weeks.

(2) AM File S.69865

and were the limiting factor. It was also observed that the German policy of one-pilot crews for bombers gave a great advantage by reducing the resources devoted to training, although this remedy was not seriously considered at that time.

Measures to achieve larger Output by Shorter Courses

The only apparently satisfactory answer to the obstinate riddle was that OTUs should turn pilots out at a lower standard and, although Bomber Command expressed some misgivings, it was agreed on 12 April that the Wellington and Whitley OTU course should be reduced from eight weeks to six and should no longer aim to teach pupils to become captains. (1) The output of crews from these OTUs was to be doubled, their OTU aircraft establishment remained unchanged, but their establishment of pilot instructors was reduced from 72 to 64. Trainees were to go to squadrons and serve for a short period as second pilots before graduating to captains. Short conversion courses to train second pilots to become captains would be given on the squadrons. Bomber Command emphasised that this revised Wellington and Whitley OTU course, which aimed at giving pilots 30 hours (at least nine of them by night) at the controls and a further 20 hours as second pilot, should be regarded as experimental and dependent for its success on a number of provisions:-

- a. An all round improvement in the pre-OTU training of pilots, observers and W Ops/AG.
- b. The provision of sodium synthetic night training equipment, because of the difficulty of giving enough night flying practice.
- c. Dual control in operational Wellingtons, so that training might continue in squadrons.
- d. Full serviceability at OTUs by the use of the latest marks of aircraft.
- e. Improvement of OTU aerodromes.
- f. A speeding up in the supply of synthetic trainers.

While these discussions were going on the bomber OTU organisation was in process of expanding. The number and type of OTUs required to provide for and maintain target force 'A' (75 heavy and 20 medium bomber squadrons by December 1941) had been worked out in February. Four more Wellington OTUs were to be formed and the half-sized units at Benson and Bramcote were to be

(1) AM File S.69865

brought up to full strength. One extra Hampden (this was actually to be 50 per cent Manchesters) and one more Blenheim OTU were also proposed, all to be in operation by the beginning of June. The reduction in the number of Blenheim squadrons modified this plan and one of the existing Blenheim OTUs was to be converted to Wellingtons, and the extra Blenheim unit (No. 26, planned to open at Cranfield) was replaced by an additional Wellington OTU (No. 27 at Lichfield).

By June the Polish OTU at Bramcote had been expanded to three-quarter size and five of the six new units had been opened: Nos. 21, 22, 23 and 27 were equipped with Wellingtons (the latter a three-quarter sized unit equipped with 40 aircraft instead of 54) and No. 25 with Hampdens and Manchesters. The expansion of Benson OTU was delayed until it could be moved to a more suitable aerodrome, and the formation of No. 24 OTU (proposed to be at Chipping Warden) was postponed until early 1942 when it opened at (1) Honeybourne. By mid-1941, therefore, the bomber training organisation comprised 16 OTUs, one of which was half size and one three-quarter size. (2) Fourteen of them were equipped with medium bombers (nine Wellingtons, two Whitleys, two Hampdens and one Hampden/Manchester) while the remaining two operated with Blenheims. Two Wellington squadrons had been despatched overseas, however, and in May No. 15 OTU at Harwell stopped training for Bomber Command and began to produce reinforcements for the Middle East, working on the old eight weeks courses. The theoretical output of these 16 units, after allowing for a wastage rate of 10 per cent, was some 5,200 crews per year for Bomber Command and 180 per year for the Middle East, requiring an intake of about 13,200 pilots a year from the SFTSs. This output was, however, dependent on the success of the six weeks Wellington and Whitley courses and of the more intensive working which they meant, while the six weeks courses in turn depended on a number of somewhat wishful provisos about basic training and the supply of equipment.

(1) AM File S.1925/II

(2) In May 1941 the first Halifaxes and Stirlings came into service. After that time the four-engined types were known as heavy bombers, whilst the former heavy bombers became medium bombers and the former 'mediums' became 'light'.

OTU requirements had been further revised in May 1941 on account of the introduction of American types of bombers and a new target force (target force 'E') drawn up. To support a front line force of 4,000 bombers (250 squadrons of 16 IE each - this was subsequently revised to 174 squadrons at 24 IE and 20 at 16 IE) a total of 25 OTUs, some equipped with American types, would eventually be required. This was a long term forecast, however, and target force 'E' was not due for completion until April 1943.

Failure of Shorter Courses

By the beginning of August it was evident that the six weeks courses were not working out according to plan. The OTUs had, in general, received the proper intakes from SFTSs, but they had not turned out a corresponding number of trained crews, and as a result they were becoming crowded with partly-trained men. An analysis indicated that, instead of the theoretical six, they were in fact taking anything between seven and twelve weeks to train their pupils. Surprisingly enough lack of flying time - in spite of the fact that practically all the OTUs were markedly short of aircraft, particularly Ansons - was not the explanation; they were achieving their target of flying hours.

There were several reasons for this failure: OTUs had to give more training than was bargained for when the six weeks course was introduced; the standard of pilots from SFTSs was low; squadrons had no dual control Wellingtons and so could not accept men at 'second pilot' standard. There had been delay over satellites and synthetic night flying equipment. Pilots with operational experience were not necessarily good instructors, and there was a shortage of CFS-trained men. Nevertheless, Bomber Command insisted that there was no need to lengthen the course above a basic six weeks, with winter variations to eight and ten, and held that the output from OTUs would soon reach the planned figures.

In the event, however, output continued to be well behind the programme. Congestion increased, intakes from SFTSs could not be accepted, and the whole planned flow through the training organisation was being dislocated. In

(1) AM File S.1925/II

(2) AM File S.69865

October the winter length of the course had to be extended by another two weeks (ie to 12 weeks as a maximum) as a margin of safety, principally because of the difficulty of doing enough night flying.

Effect of Shorter Courses on Front Line Wastage

Another factor was now appearing. The output of trained crews, though falling behind what had been wanted for first-line expansion, was in excess of the expansion that could be achieved (due mainly to a setback in the production of operational aircraft) and squadrons became over-full of crews fresh from the OTUs. Unusually bad weather during the autumn hampered operations and made it difficult for squadrons to keep all their crews in practice. By November it was impossible for squadrons to accept any more crews and there was an almost complete block in the flow of bomber crews through the training organisation. Bomber Command then extended the OTU course to 45 hours at the controls in order to slow up the flow. In theory this change involved no lengthening of the current (winter) course duration, (although it implied a basic (summer) duration of eight weeks) and was made without reference to the Air Ministry. In practice, however, courses were extended up to as much as 17 weeks, due to Bomber Command's attempts to improve the standard of training of the pupils.

All this time operational loss rates were increasing and, although the extremely bad weather was thought to be the chief cause, it was felt that the employment of a high proportion of inexperienced crews resulting from the shortened OTU courses might be a contributory factor. It was for this reason that, in December 1941, the Chief of Air Staff wrote to the AOC-in-C, Bomber Command:-

'I am under the impression that when it was decided to reduce the OTU course it was agreed by all concerned that the reduced course would be adequate to produce the necessary training. I understand that the course is to be lengthened once more and I fully support this, but there arises out of these ideas a point upon which we must insist most firmly. It is the responsibility of the Bomber Command, its Group and Station Commanders to ensure that no crew is normally sent on an operation if they are considered to be insufficiently trained. We in the Air Ministry have no means of knowing immediately whether the training periods we prescribe are adequate. We can do no more than lay down what we think necessary. The Command, on the other hand, receive immediate evidence in the shape of OTU output indicating whether

(1) AM File S.69865

we have in fact cut things down too much. It is vitally important that the Command should not relax the standard required for operations simply because the Air Ministry have cut down the training courses.'

It was not only at the OTU stage where training was thought to be inadequate. The low standard of pre-OTU training had also been causing a great deal of concern. The whole problem of bomber training, in fact, had reached a point at which the balance between OTU and pre-OTU training, and the adequacy of the whole training sequence for Bomber Command's requirements, had to be reconsidered.

While the problems of policy had been moving towards this point, the bomber OTU organisation expanded slightly. The one-time Battle OTU at Benson (No. 12) moved to Chipping Warden in September and became a full-size Wellington OTU, and No. 25 OTU at Finningley became a completely Manchester OTU in November. The number of Blenheim squadrons in the Command continued to be reduced and, after October, part of the output of No. 13 OTU was sent to the Middle East.

The 'New Deal' Reorganisation

For just over a year, from May 1940 to the summer of 1941, all training was dominated by the urgent need for producing the maximum number of pilots in the shortest possible time. This urgent need came when there was a serious shortage of advanced trainer aircraft and, to a lesser degree, of instructors. As much training as possible was therefore shifted to operational types, and advanced trainers used only where they were indispensable. The whole organisation was worked intensively, and courses were reduced to the minimum in both duration and flying time for the sake of output. In particular, instruction was transferred from the SFTSs to the OTUs until a pilot's pre-OTU flying training lasted only 16 weeks and consisted of about 122 hours' flying. This called for a large OTU organisation and in consequence the heavy bomber OTUs (ie Wellington, Whitley and Hampden OTUs) where night flying presented a particular problem, absorbed so high a proportion of the available resources that first-line heavy bomber expansion became almost impossible.

The standard of proficiency produced by the training sequence in the summer of 1941, in spite of the speeding up and altered distribution of training between stages, was not materially different from that produced before pilot training was revised in 1940. There had been no major change in what was taught, and against the handicaps of newly-opened schools and inexperienced instructors could be offset improved methods, greater emphasis on night flying, instrument flying and navigation, and greater use of synthetic trainers. In fact, it was sometimes put forward that the overall training process of the 'Third Revise' produced a standard higher, if anything, than that of 1940.

Comparison with the standard of 1940, however, was not enough. There was a progressively-mounting accident rate, the incidence increasing sharply as pilots went on to more complex types - a fact which suggested that, although they were being taught to handle the aircraft, they were given too little background of general flying experience.

By the summer of 1941 it was clear that the proficiency required for operational fitness - and in particular the requirements of heavy bomber operations at night - called for a considerably higher standard of training. In September, the United Kingdom SFTS course was increased to 12 weeks (85 hours flying) and further extensions were to be made during the winter months. There were, however, a number of other factors besides the need for better training to consider: firstly, graduates from overseas schools needed some form of acclimatisation and refresher training when they arrived in the United Kingdom; secondly, there was now a surplus of trained pilots - due partly to the lower casualty rate than had been expected (because operations were restricted) and partly because first-line expansion was much less than had been anticipated; thirdly, Bomber Command was losing aircraft - largely from accidents - faster than they could be built and repaired; lastly the first-line squadrons were to a considerable extent occupied with training and roughly 40 per cent of their flying time was for instructional purposes in the autumn of 1941. Both the accidents and the preoccupation of squadrons with instructional work were due to too low a standard in the training sequence.

(1) AM File S.58474

Bomber Command's Criticism of Basic Training

On 2 December the AOC-in-C Bomber Command stated his difficulties in a letter to the Air Ministry. (1) The low standard of airmanship and navigation (which meant that a large proportion of bombers did not reach the target area), the need to devote a great deal of squadrons' time to training, and the high wastage rate (which made it practically impossible to expand the first-line) was a vicious circle. Valuable aircraft were lost owing to the incapacity of crews and the shortage of aircraft brought about by that wastage limited the training which could be given both at the OTUs and at the Service squadrons. He put the responsibility for this state of affairs on inadequate basic training, which produced too low a standard of proficiency to allow OTUs to carry out their proper function of operational training to produce crews ready for operations when they joined their squadrons.

The inadequacy of basic training, he maintained, was due partly to too short a period of instruction (the RAF's 6-7 months and 177 hours flying compared unfavourably with the German Air Force pilot's $17\frac{1}{2}$ -23 months and 220-270 hours), and partly to the selection of indifferent raw material as pupils. One of the advantages of a policy of using comparatively few large bombers should be economy in the number of crews needed, and hence the opportunity of training those crews to a very high standard. Inadequate training would undermine morale, and signs of it could already be seen.

Bomber Command made a number of proposals for putting training on a more satisfactory basis. More training, particularly night flying experience, should be given to all crew members; pilots should receive more instrument flying, observers more navigation training and air gunners more gunnery experience; schools should work to a standard rather than a syllabus, rejecting those failing to reach the standard; crews should be fully trained and ready for operation when they joined their squadrons.

AMT's Proposals: Longer Basic Training

The need for more thorough training had for some time been considered by the Air Member of Training who, also at the beginning of December, produced plans for a higher standard of basic training, for the more economical use of

(1) AM File S.77400

(1) operational aircraft, and for increased effectiveness of operational effort.

He advocated a minimum of 300 hours flying before pilots reached the first (2)
line and proposed a number of improvements in the basic training organisation.

All SFTS training should be transferred overseas; a system of grading should be introduced to weed out unsuitable candidates before they commenced flying training; advanced flying units to give overseas trained pupils a refresher and acclimatisation course on their return to the United Kingdom should be established.

With the provisional approval of these proposals by the Air Council on 9 December a very much longer period of training than ever before was agreed to be necessary. Before the war bomber pilots had reached squadrons after 150 hours flying (and squadrons had then given a good deal of instruction); in 1939 and 1940 their pre-first-line flying had been 205 hours (150 pre-OTU and 55 OTU); through 1940 and 1941 it had sunk to 164 (122 pre-OTU, 42 OTU). The 'New Deal' now aimed at 290 hours pre-OTU training for bomber pilots, plus 40-80 at the OTU (according to the type of aircraft). The pre-OTU improvements were effected immediately, but the extension of the OTU syllabus was dependent largely on a new crewing policy, and at the end of the year the flying hours were still theoretically 30 per pilot, although in practice Bomber Command was aiming at forty-five.

Though the 'New Deal' was practicable so far as pre-OTU training was concerned, some awkward bomber OTU problems remained. (3) Bomber Command's first line was clogged up with inexperienced, partly-trained, crews, and could neither operate nor train efficiently. The increase of the OTU syllabus to 45 hours in the autumn of 1941, and the frequent unofficial lengthening of courses by Bomber Command, had reduced the flow into squadrons and produced better trained men, but it had also dislocated the flow of men from SFTSs and created a surplus of over 1,000 pilots who should have been in OTUs but for whom the OTUs had no room.

(1) See AP 3233 Flying Training, Volume I, Chapter 10 for a full description of the 'New Deal' proposals

(2) AC 70(41)

(3) AM File S.77400

Two main questions still had to be solved. The first was how to train the over-diluted bomber first line, restore its operational efficiency, and make expansion possible. The second was how to provide sufficient OTU capacity; there were not enough OTUs to give each pilot more than 30 hours training, and 30 hours would not be enough to keep the first line efficient. The first-line problem had been made more manageable by stopping the flow from Bomber Command's squadrons to the Middle East in November 1941 (thereafter all Middle East crews were drawn from OTUs) and so reducing the dilution due to this cause, and the inexperienced crews were brought up to standard by means of training schemes devised by the bomber groups. OTU capacity set the familiar riddle of what proportion of the first-line aircraft and resources should be devoted to operational training and what to operational effort.

In January 1942 Bomber Command's revised basis of 45 hours flying per pilot on a 12 weeks (winter) course at OTUs was officially approved. These figures were for Wellingtons and Whitleys which carried two pilots, an observer and two wireless operators/air gunner. Hampdens were now one pilot aircraft, and Hampden pilots were to have 72 hours training; Blenheim pilots (1) were to have 60 hours, both types of OTU working on eight week courses. This was considered to meet the need for quality of output, and the flow through OTUs was brought under stricter control to avoid future disturbance of the planned phasing of training. On 21 January Bomber Command were reproved for altering the length of the OTU course and upsetting the planned training flow, without prior approval.

Training for the Four-Engined Heavy Bombers

This was by no means the end of the problem. Provision of sufficient OTU capacity to meet the demand of the front line had still to be made, and the training of crews for the new types of bomber had to be considered. It was typical of the vicissitudes of the operational training position that while the 'New Deal' proposal was under discussion the re-equipment of Bomber Command with four-engined bombers was introducing an added complication. It was originally intended to meet crew requirements for heavy bomber squadrons

(1) AM File S.77400

in two phases. While the ratio of heavy to medium bomber squadrons was less than one to two, operationally experienced crews were to be selected from the medium squadrons and passed to the heavy squadrons where they would convert to their new type of aircraft. When the ratio rose to one heavy squadron to two medium, OTUs would be equipped with heavy bombers to feed the heavy squadrons.

Bomber Command soon found that the conversion of medium crews to heavy bombers was proving a strain on the operational squadrons and on 29 August 1941 an experimental flight of eight Halifaxes was established at Linton-on-Ouse under No. 4 Group to carry out this conversion. (1) The principle of having specially established conversion flights within the operational groups was accepted as a temporary expedient by the Air Ministry in October at a time when all available OTU resources were needed for light and medium bomber training. Accordingly two conversion flights, one for Halifaxes already formed in No. 4 Group and a new one for Stirlings (at Waterbeach under No. 3 Group) were authorised and numbered respectively as Nos. 28 and 26 Conversion Flights. In December these two flights were joined by three more - No. 106 (Stirlings) at Waterbeach, No. 107 (Halifaxes) Leconfield and No. 108 (Liberators) at Polebrook - and a few days later the two Stirling flights (Nos. 26 and 106) were combined to form No. 1651 Conversion Unit at Waterbeach to serve No. 3 Group, and the two Halifax units (No. 28 and 107) combined to form No. 1652 Conversion Unit at Leconfield (later moving to Marston Moor) for No. 4 Group. Simultaneously, No. 108 Flight in No. 1 Group was expanded to 16 Liberators and renamed No. 1653 CU and was intended to convert crews for new Liberator squadrons to be formed and despatched to the Middle East. At the same time it was agreed to form small flights of four aircraft each at stations where heavy bomber squadrons were located and affiliate them to the particular squadrons re-equipping with four-engined types, to assist with the conversion of crews to the new types of aircraft. It was to avoid confusion between the flights working with the groups (which had 16 aircraft each and were intended to supply crews for new squadrons) and those working with existing squadrons (which had four aircraft each) that the

(1) AM File S 36609/48/I

former, the larger formations, were numbered as heavy conversion units. Flights affiliated to squadrons took the number of the squadron they served. Ten such flights were formed on 2 January 1942: Nos. 10 Leeming, 35 Linton-on-Ouse, 76 Middleton St. George and 102 Topcliffe, all equipped with Halifaxes; Nos. 7 Oakington, 15 Wyton, 149 Mildenhall and 218 Marsham, all with Stirlings, and Nos. 44 Waddington and 97 Coningsbury with Lancasters and Manchesters. (Owing to the shortage of Lancasters, these two units were originally equipped with four Manchesters each, but a few weeks later they were re-equipped with 50 per cent Lancasters, and it was intended that Manchesters should be replaced entirely when more four-engined aircraft became available). It was also agreed that new flights would be formed as more squadrons were re-equipped with four-engined types. Two more flights, No. 78 (Halifax) Flight at Croft and No. 216 (Lancaster/Machester) Flight at Bottesford were formed later in the month, and three more - No. 61 (Lancaster/Manchester) at Woolfox Lodge (subsequently moving to Syerston), No. 83 (Lancaster/Manchester) Scampton and No. 214 (Stirling) Waterbeach (subsequently moving to Stradishall) - three months later.

So much for heavy bomber training. Although in theory it was still intended, at some later date, to form OTUs with the heavy bomber aircraft now in the conversion units and flights, it had been recognised that such a step was impossible at that time. It was virtually an accepted fact that conversion flights and units would stay.

Introduction of the One-Pilot Policy

The problem of how to provide adequate training capacity without retarding front line expansion still had to be solved. Since May 1941, the OTU target had been for 25 OTUs by 1943, 16 of which had been formed by December 1941. With the expansion plan visualised in January 1942, however, some 20 bomber OTUs were required at once, while 30 more would be needed when expansion was complete in 1944. By 1944 the OTUs would have absorbed 1,300 more aircraft than had been allowed for them, and there would have to be a reduction of some 50-60 bomber squadrons in the planned first line.

The repercussion of adequate OTU training on the first-line was immediate as well as long-term. 45 hours flying at OTUs meant that 25 per cent fewer squadrons could be formed in 1942 than had been estimated on the previous 30-hour basis. Agreement to the longer course could therefore only be provisional, since the CAS was in the United States and the matter could not be settled until he returned. The old, original, impasse still existed: the number of pilots who had to pass through the OTUs if the first line was to be adequately backed and the 45 hours flying that each required if the backing was to be well-trained and competent called for more aircraft and facilities than could be spared if the first line was also to expand. There were clearly only two possible solutions - either to cut down the training or reduce the number of pilots passing through the OTUs. Failure to find a solution would mean abandoning all hope of expanding the bomber force. Cutting down training had been tried, and had produced the alarming result of a part-trained, inefficient, ineffective first-line. The only solution was to reduce the number of pilots needed for the first-line.

This meant changing from two-pilot to one-pilot crews. It was unwelcome and was regarded with grave distrust, but the inevitability of one-pilot crewing if any solution was to be found soon became obvious, and at the beginning of February Bomber Command were considering one-pilot crews in Halifaxes, Whitleys and Wellingtons, and two-pilot crews (with only one of the pilots fully trained) for Stirlings, Lancasters, Manchesters and Liberators.

By the time the CAS came back from America the possibility of one-pilot crewing had virtually broken the back of the bomber OTU problem. A conference was held on 12 February - it was in fact two conferences, the first of which, concerning pre-OTU training, ratified AMT's 'New Deal' proposals. Minimum standards for basic flying training in the future were laid down, standards which would enable OTUs to concern themselves solely with operational crew training. These standards ranged from 210 to 290 hours pre-OTU flying, dependent on the operational employment for which a pilot was destined, and would, it was hoped, with the OTU courses planned, produce well-trained pilots fit to take part in operations immediately on joining their squadrons. The minimum standard of pre-OTU training was markedly higher than that to which

the training organisation had previously been working. Pilot training was doubled in its total length, more than doubled in its flying hours, and increased sixfold in night flying. Observer training was increased by more than 50 per cent in both total duration and flying time. Wireless operator training was increased slightly, and 'straight' air gunner training greatly increased.

The second-half of the conference dealt with two aspects of prime importance in OTU planning: the standard at which pilots should be turned out (1) by OTU, and the conversion of second pilots into captains. So far as one-pilot crewing was concerned, fatigue had been shown not to be a great factor, so that the fatigue argument for two pilots could be disregarded; casualties to first pilots and the need for a second pilot to take over had proved rare, and could be many times offset by the accidents which occurred while second pilots were being trained. Captaincy and the need for someone to relieve the first pilot while he acted as captain were the main factors, but the 'captain's relief' need not be a highly trained pilot. As regards second-pilot conversion, it had been found that it was impossible for squadrons to spare the time to provide training in captaincy.

As a result, the conference recommended that second pilots should be abolished and on 27 February the last step in settling these 'New Deal' plans was taken when Bomber Command accepted one-pilot crewing. They did so with some reluctance, however, and made it clear that they would have preferred two-pilot crewing. They accepted one-pilot crews only because of the logistic relation between adequate training, numbers which could be trained, and the possibility of expansion. They stipulated that aircraft should have automatic pilots, that flight engineers should be carried in Stirlings, Liberators, Halifaxes and Lancasters, that one member of the crew should be capable of bringing the aircraft back in an emergency and that provision should be made (by establishing 26 pilots per squadron of 20 aircraft) for pilots to get operational experience before they took charge of aircraft on missions. They also proposed other changes in crewing. The development of

(1) AM File S.77400

radar meant that the observer could not deal with both navigation and bomb aiming, and so a separate bomb aimer who could also act as front gunner was needed; there was no need for two wireless operators because in practice only one was used on wireless work, the other could be replaced by a straight air gunner. They emphasised that the whole plan depended on adequate training, and urged even higher standards than the 'New Deal' contemplated.

Reorganisation of OTU Training

The acceptance of this policy meant that the incompatibility of OTUs and front-line expansion was at last coming to an end. Higher standards of pre-OTU training meant that the operational training stage would no longer have to deal with the miscellaneous assortment of basic instruction. Reduced flow, through one-pilot crewing meant that fewer aircraft and instructors would be required, thus freeing more for front-line expansion. The OTU maintenance organisation was overhauled and various belated improvements put in hand.

Following Bomber Command's acceptance of the new policy, detailed plans were worked out. Their provisos regarding the number of pilots per squadron and the new aircrew categories were accepted, and new basic training courses were introduced for navigators, air bombers, wireless operators/air gunner, air gunners and flight engineers. Their demand for an even higher standard of OTU training, however, could not be met. In place of giving two pilots 45 hours each, they proposed that one pilot should be given 90. This of course would not effect the desired saving of OTU capacity, and in March 1942 it was agreed that the new medium bomber OTU course should include 80 hours flying. Those pilots destined for heavy bombers would be given a further 30 hours at a conversion unit or flight.

The new courses began in April 1942. The medium bomber (Whitley and Wellington) OTUs continued to operate with 54 medium bombers (the two Whitley OTUs - Nos. 10 and 19 - were increased from 48 to 54 aircraft in January) and with 18 Ansons, (although a few months later the Anson establishment was reduced to 10), and two Lysanders and one Defiant were added to each OTU, the former for use as target towers and the latter as attack aircraft for gunnery practice. The target tower establishment was raised to give by the end of the year, by which time the Anson, Lysander and Defiant establishment was

common to both medium and light bomber OTUs. Intakes were altered to 14 crews per fortnight (a few weeks later they were increased to 16 a fortnight) and the course length standardised at eight weeks, plus two extra weeks for ground preparation prior to the commencement of flying training. This was the basic (summer) course. The winter course was 12 weeks. Crews comprised one pilot, two observers (replaced as soon as the new crew categories were trained by one navigator and one air bomber), one wireless operator/air gunner and one air gunner. Those crews destined for heavy bombers were joined by a flight engineer and an extra air gunner at the conversion unit. The Hampden and Blenheim OTUs remained unchanged by this reorganisation. The former, equipped with 49 Hampdens and 13 Ansons and training 60 crews at a time (comprising one pilot, one navigator, one wireless operator/air gunner and one AG), provided 72 flying hours for the pilot on an eight weeks (summer) course. The two light bomber OTUs (Nos. 13 and 17), equipped with 48 Blenheims and 16 Ansons, trained 80 crews (comprising one pilot, one navigator and one wireless operator/air gunner) at a time on an eight weeks (summer) course which provided 80 hours flying. At both the Hampden and (1) Blenheim units winter courses were extended to 12 weeks.

The Blenheim OTUs, in addition to providing crews for No. 2 Group, continued to meet overseas light bomber crew requirements, and from time to time they were assisted by No. 42 OTU, a bomber reconnaissance OTU working under Army Co-operation Command, which was also equipped with Blenheims and worked closely to the light bomber OTU syllabus, and was producing more crews (2) than could be absorbed in army co-operation squadrons.

Revised OTU Requirements

Theoretically the elimination of the second pilot from bomber crews halved the pilot training requirements, but this saving was almost entirely taken up by the increasing of the syllabus hours from 45 to 80 per pilot. It was now estimated that 25 OTUs - each with one satellite - would be needed to back the front-line. This coincidentally, was the number estimated in

(1) AM File S.77400/I

(2) AM File S.99536/I

May 1941 when the syllabus included 30 hours for two pilots and was exactly half the number estimated in January 1942 when the syllabus was increased to 45 hours per two pilots. To provide for unforeseen expansion and possible under-production at the OTUs (through aircraft shortages, aerodrome unserviceability, etc), it was proposed to provide ultimately a total of 27 OTUs organised into three groups of nine each. The two existing Groups, Nos. 6 and 7 (renumbered as Nos. 91 and 92 Groups in May 1942) were supplemented by the formation of a third, No. 93, at Burton-on-Trent in June.

The chief difficulty over the formation of new OTUs was the lack of suitable airfields. This had always been a problem in Bomber Command and in the early days of the war it was the policy that training units in the Command should use the rearward aerodromes. These were considered too remote for operational use and had the advantage of being more secure from enemy attack. After America entered the war, however, a large number of US bomber forces were sent to the United Kingdom and the aerodrome shortage became acute. Over 100 airfields were needed for the US forces alone, and it was clear that some of the OTUs would have to be moved so that their airfields could be used for operational purposes. In spite of these difficulties a number of new units were formed in the first nine months of 1942. The OTU strength, which stood at 16 at the beginning of the year, rose to 18 by April (with the formation of Nos. 24 and 26 OTUs at Honeybourne and Wing), to 20 by June (with the formation of Nos. 29 and 30 at North Luffenham and Hixon) and to 22 by September when Nos. 28 (at Wymeswold) and 81 (at Ashburn) had been formed. All of the new units were equipped with medium bombers; Nos 24 and 81 with Whitleys and the remainder with Wellingtons. The Hampden/Manchester OTU (No. 25) was re-equipped as a full sized Wellington OTU in May. Not all of these 22 units were full sized OTUs: of the 18 Whitley and Wellington units, Nos. 12, 18, 23, 27 and 29 were established at three-quarter strength, having 40 medium bombers and 8 Ansons as against the normal 54 and 10 respectively; two more (Nos. 24 and 26) had only 36 medium bombers and 7 Ansons; and a further three (Nos. 28, 30 and 81) were at half strength with 27 medium bombers and 5 Ansons. One of the full size units, No. 22, at Wellesbourne Mountford had, as an experiment, been established

with 66 Wellingtons instead of 54 in June 1942 and was training 18 crews a fortnight instead of 16. If the experiment proved successful the other (1) units would be expanded accordingly. This was in response to the recommendations made by Air Commodore Cuckney (who, on behalf of AMSO, had carried out an investigation into the aircraft establishment of medium bomber OTUs) that each OTU should have 78 aircraft and should be expanded to train larger intakes. This figure was considered unduly pessimistic and a compromise establishment of 66 aircraft was tried.

The other four units, two with Blenheims (Nos. 13 and 17) and two with Hampdens (Nos. 14 and 16) had not yet been changed, but it was intended that all four should be re-equipped in the near future since their types of aircraft were no longer in operational use. It was planned to re-equip the Hampden units with Wellingtons, but the future of the light bomber units was uncertain as replacements for the Blenheims were in short supply. Mosquitos, Bostons, Mitchells and Venturas were all in use in the front line but none was available for training. In addition to these 22 OTUs, a small operational training flight (No. 1429 Flight) equipped with 10 Wellingtons and 3 Oxfords had been operating at Woolfox Lodge since December 1941, training crews for No. 311 (Czech) Squadron in Bomber Command.

It was not anticipated that the remaining five projected units would be formed before mid-1943. It was necessary to move some of the existing units to new airfields to release those they occupied for operational use and these units had to be given priority over new OTUs. No. 81 OTU moved to Whitchurch Heath on 1 September, and No. 11 OTU to Westcott four weeks later. It was hoped that aerodromes for three more units would be available the following year (it will be remembered that the remaining two were merely an insurance against under-production and were not a basic necessity) and until that time some of the existing units would have to be increased in size to make up the deficiency.

Bomber OTUs Overseas

So much for the position in the United Kingdom. With the prospect of large deliveries of American bombers for the RAF, plans were made, in the early summer of 1942, to establish a number of medium and heavy bomber OTUs

(1) AM File S.77400/I

in North America. Five heavy (Nos. 110, 114, 116, 118 and 119) and five medium (Nos. 112, 113, 115, 117 and 120) bomber OTUs were projected in the United States and one heavy (No. 35) and two medium (Nos. 34 and 38) bomber units in Canada, and arrangements for their formation were in an advanced stage by June 1942. With the signing of the Arnold/Towers/Portal agreement on the 5th of that month, however, the supply of American aircraft to the RAF was drastically curtailed and these plans collapsed. The idea of forming OTUs in America was abandoned, and only one medium bomber OTU was formed in Canada (No. 34 OTU equipped with Venturas and Mitchells) which trained crews for No. 2 Group, Bomber Command.

The only other overseas OTUs training bomber crews were Nos. 70 and 71 OTUs in the Middle East, and No. 152 OTU which was about to form in India. These three units were all equipped with light bombers and there was no provision for the operational training of medium and heavy bomber crews in these areas. Consequently, crews for heavy and medium squadrons in India and the Middle East had to be trained at the bomber OTUs in the United Kingdom - a procedure which was deeply resented by Bomber Command since it meant that a great deal of their training effort was spent on training crews who never reached their front-line squadrons. Not only did it involve the use of Bomber Command's OTUs for training personnel required for overseas, it meant that special ferry training flights, absorbing more aircraft and instructors, had to be formed to prepare the crews to ferry their own aircraft overseas. The work of these flights, however, originally formed at Nos. 13 and 15 OTUs, training on Blenheims and Wellingtons respectively, was eventually made the responsibility of Transport Command. By mid-1942 over 2,000 bomber OTU trained personnel had been sent to the Middle East and this drain on their resources was in danger of becoming a restricting factor on the expansion of Bomber Command. Had it not been for the short falls in aircraft production, which slowed down front-line expansion in the early part of the year, there would have been an acute shortage of crews in Bomber Command by mid 1942; as it happened, however, the shortage of crews was not the limiting factor.

(1) AM File S.78773

(2) The history of this ferry training is discussed in Chapter 20

Formation of Gunnery Training Flights

In fact, after the introduction of the 'New Deal' and the one-pilot policy, there was never a serious shortage of crews in Bomber Command, and it was at last possible to direct a few aircraft and instructional personnel to other forms of training in order to raise the efficiency of the Command. The first step in this direction came in January 1942 when it was decided to establish in each of the five operational groups a gunnery training flight for the purpose of maintaining the standard of air gunnery in bomber squadrons. Two such flights had been started in Nos. 106 and 214 Squadrons in 1940, but it was found that operational commitments precluded much practice flying and in January 1941 these two flights had to be reconstituted as separate units under the groups concerned. No. 3 Group flight had eight Wellingtons and No. 5 eight Hampdens. These two flights, together with three new ones, all known as Target Towing and Gunnery (TT & G) Flights, were re-established in January 1942 and numbered as follows, Whitleys replacing the Wellingtons and Hampdens in the old flights:-

Group No.	TT & G Flight No.	Location	Aircraft Establishment
1	1481	Lindholme	8 Whitleys 12 Lysanders
2	1482	West Raynham	4 Blenheims 8 Lysanders
3	1483	Stradishall	8 Whitleys 12 Lysanders
4	1484	Driffield	8 Whitleys 12 Lysanders
5	1485	Scampton	8 Whitleys 12 Lysanders

These five flights gave refresher courses, lasting approximately 6 days, to (1)
24 air gunners at a time, drawn from the operational squadrons.

Six months later, an air bomber training flight, equipped with eight Oxfords, was temporarily attached to each of these flights, except No. 1482 Flight in No. 2 (Light Bomber) Group which did not require air bombers, with

(1) ERP 159

the object of training wireless operators/air gunner rendered surplus by the introduction of the new crew composition, in the duties of the air bomber. These four flights were disbanded in March 1943 after their task had been accomplished and the flow of specially trained air bombers commenced.

Formation of Heavy Conversion Units

The conversion training organisation continued to expand rapidly during the summer of 1942. Ten more flights (Nos. 9, 49, 50, 101, 103, 106, 158, 405, 408 and 460) and two more conversion units (Nos. 1654 and 1656 both equipped with Lancasters and Manchesters) had been formed by September 1942, and arrangements had been made in August to double the aircraft strength of all the flights, bringing them up to eight aircraft per flight. Squadrons were re-equipping so fast that it was necessary to reconsider the policy of providing new conversion flights for every heavy bomber squadron. The system that had developed - that of having conversion flights to convert crews for existing medium bomber squadrons re-equipping with heavy types, and conversion units to supply crews for new heavy bomber squadrons - was unsatisfactory in a number of ways. The affiliation of conversion flights to particular squadrons meant that the resources of aircraft, instructors and training equipment was uneconomically dispersed in a large number of 'penny packets'; squadron wastage was not a constant factor and it was therefore necessary to direct the output of particular conversion flights to other squadrons; there was a tendency for the requirements of flights and units to overlap. To overcome these difficulties it was decided, in September 1942, to carry out the conversion of all medium bomber crews to heavy bombers in heavy conversion units. The existing conversion flights and units were combined to form HCUs of 32 aircraft each, capable of training 32 crews every four weeks in the summer, and 22 every four weeks in the winter, on a four weeks course. It was the ultimate intention to centralise all conversion facilities in each group at a clutch of three aerodromes, but until suitable aerodromes were available they were widely dispersed and had to operate independently. Three of the four existing conversion units were expanded by absorbing eight of the conversion flights and the remaining seventeen flights were amalgamated to form five new HCUs. The Liberator conversion unit (No. 1653) which had been formed to train crews for No. 1 Group, was surplus

to Bomber Command's requirements after the Liberator had been rejected as a heavy bomber and, after training a number of crews for India, it was to be transferred to Coastal Command. When the time came for its transfer, however, Coastal Command had made other arrangements for the training of Liberator GR crews, and No. 1653 HCU was disbanded on 31 October 1942. As a result of these changes the conversion training organisation on 31 October was as follows:-

HCU No.	Location	Aircraft Establishment	Remarks
1651	Waterbeach	32 Stirlings	absorbed Nos. 15 and 214 Flights
1652	Marston Moor	32 Halifaxes	absorbed Nos. 35 and 158 Flights
1654	Wigsley	(16 Lancasters (16 Manchesters	absorbed Nos. 50 and 83 Flights
1656	Breighton	(16 Lancasters (16 Manchesters	absorbed Nos. 460 and 103 Flights
1657	Stradishall	32 Stirlings	formed by combining Nos. 7, 101, 149 and 218 Flights
1658	Riccall	32 Halifaxes	formed by combining Nos. 10, 76, 78 and 102 Flights
1659	Leeming	32 Halifaxes	formed by combining Nos. 405 and 408 Flights
1660	Swinderby	(16 Lancasters (16 Manchesters	formed by combining Nos. 61, 97, 106 and 207 Flights
1661	Skellingthorpe	(16 Lancasters (16 Manchesters	formed by combining Nos. 9, 44 and 49 Flights

These HCUs continued to be affiliated to particular groups. No. 1 Group was served by No. 1656 HCU, No. 3 by Nos. 1651 and 1657 HCUs, No. 4 by Nos. 1652 and 1658 and No. 5 Group was served by Nos. 1654, 1660 and 1661 HCUs. No. 2 Group, the light bomber group, did not require heavy conversion units.

Only two of the HCUs (Nos. 1654 and 1660) were expanded to full size immediately; of the others, four (Nos. 1651, 1652, 1658 and 1661) were initially established at three-quarter size with 24 aircraft, and the

(1) AM File S.82429/I

remainder at half size with 16 aircraft. By the end of the year, however, all except one, No. 1659, had been expanded to full size. The establishment of the Lancaster/Manchester units was slightly changed to 12 Lancasters plus 20 Halifaxes or Manchesters. It had originally been the intention to re-equip them with 100 per cent Lancasters as soon as possible, but it was now decided to save as many Lancasters as possible for the front line. ⁽¹⁾

Revised Light Bomber Requirements

The future of the light bomber OTUs continued to be uncertain throughout 1942 - indeed the exact composition of the light bomber force, upon which the shape of the OTUs ultimately depended, was not finally settled until the summer of the following year when No. 2 Group was transferred to the newly constituted Tactical Air Force. By the autumn of 1942 however, a number of squadrons had been re-equipped, some with American types and others with Mosquitos. It was hoped to provide crews for the Ventura, Mitchell and Boston squadrons from No. 34 (light bomber) OTU in Canada, but crews for the Mosquito squadrons had to be trained in the United Kingdom. There were insufficient Mosquitos available to re-equip an OTU so in September 1942 a special conversion unit (No. 1655 CU) equipped with nine Mosquitos and six Blenheims was established at Marham to provide short conversion courses for Blenheim trained crews from Nos. 13 and 17 OTUs. Courses lasted six weeks and twenty crews were trained at a time. Before the formation of this unit Mosquito crews had to be converted by the squadrons themselves, and Nos. 105, 109 and 139 Squadrons had all been running makeshift courses since 1941. It was the aircraft and instructors from Nos. 105 and 139 Squadrons that helped to form the new unit. It will later be seen that No. 109 Squadron, on the other hand, continued to operate a small training flight of three Mosquitos and three Oxfords training crews for Pathfinder duties, until July 1943 when ⁽²⁾ No. 1655 CU was reorganised to train PFF crews. In March 1943 the course length of No. 1655 CU was extended to eight weeks without reducing the capacity and three more Mosquitos were added to provide the extra training involved. At the same time the Blenheims were replaced by Oxfords which were better for training purposes.

(1) OP2 Folder 3253

(2) AM File C.36574/48/I

Meanwhile, during the early part of 1942, practically the whole output of the two Blenheim OTUs (54 a month in winter and 80 a month in summer) was being taken to reinforce light bomber squadrons in the Middle East. Until that drain was stopped it was impossible to maintain existing squadrons let alone form new ones, and by the middle of 1942 the light bomber force in the United Kingdom had dropped to five squadrons.⁽¹⁾ The situation began to improve after June when the OTUs in the Middle East began training, and No. 2 Group was soon relieved of its overseas commitments. New squadrons were formed to replace those sent overseas and the OTUs soon began to show a surplus.

By September it was possible to take advantage of the surplus by reducing intakes and using the spare training capacity to improve the standard of training. Intakes at No. 13 OTU were reduced from 20 to 16 per fortnight (in the summer) and the syllabus hours were increased from 60 to 72 per pilot on an 8 weeks course, the additional 12 hours being devoted almost entirely to night flying. No. 17 OTU, which had formerly been a full-sized OTU, had its intake reduced from 20 to 8 per fortnight and followed the same syllabus as No. 13. No. 13 OTU was re-established with 48 Blenheims and No. 17 with half that number. The syllabus at the Canadian light bomber OTU was increased from 60 hours to 80 since crews were to be used to ferry aircraft across the Atlantic on completion of their training.⁽²⁾ The other Blenheim bomber OTU in the United Kingdom (No. 42) training bomber reconnaissance crews, stopped supplying crews for No. 2 Group after the middle of 1942 and concentrated on meeting overseas requirements. Some of its surplus training capacity was utilised to convert light bomber crews to Whitleys for airborne forces work and when, after July 1943, overseas requirements for Blenheim bomber reconnaissance crews ceased, No. 42 OTU concentrated solely on training crews for No. 38 Group.

Front Line Expansion Plans

In July 1942 a new target force - target force 'G' - was drawn up, which aimed at achieving a front line of some 2,500 aircraft (135 heavy and 9 medium squadrons) by December 1943. Of these, 125 heavy bomber squadrons

(1) AM File S.67148

(2) AM File S.77400/I

were to be in Bomber Command and the remaining 19 distributed in the Middle
 (1) East and India. The reduction of 1,500 aircraft of the former target force was due to the repercussions of America's entry into the war, namely, the decision that in future American aircraft would be flown by American crews. This was a considerable set back to Bomber Command's expansion, and by September, far from expanding, the bomber force had actually shrunk by six squadrons (to 38) in the past six months - a reduction largely due to the fact that more than a dozen squadrons had been sent overseas while two Wellington, three Whitley (two on temporary loan) and two Hampden squadrons had been transferred to Coastal Command to offset the shortage of GR and TB aircraft. It was this negative expansion that caused the Prime Minister, on 17 September, to rule that 50 heavy and medium squadrons should be formed by the end of the year.

The effect of these decisions on the training organisation was twofold. Firstly, as a result of the decrease in the projected front-line strength, it was planned to utilise a small force from the OTUs on nights of peak effort which, together with the American units operating in the United Kingdom, would, in effect, provide a combined bombing force of approximately 4,000
 (2) aircraft. Crews from OTUs had already been used on operations in May and Bomber Command were anxious to repeat the performance. The Air Ministry training and organisation staffs were strongly opposed to this procedure, however, and after a further raid on 16 September it was decided that OTU
 (3) crews should not in future be sent on operations.

This policy remained throughout the war, and the only modifications (apart from the use of No. 10 OTU for anti-submarine patrols, which will be discussed later) was the use of HCU and OTU crew on 'spoof' raids in 1944. These were feint attacks to alert the German radar and draw night fighters against an imaginary raid in an area remote from that in which main attack was intended. The feint forces did not actually make an attack, and since they were withdrawn at a safe time and distance from the enemy coast their crews
 (4) were not exposed to combat.

(1) ERP.203

(2) AC55(42)

(3) The use of OTU crews on operations is discussed more fully in AP 3233 Flying Training, Volume I Chapter 13.

(4) See AHB Monograph AP 3407 Signals, Vol VII. Radio Counter-Measures

Secondly the decision to expand the heavy and medium bomber force to 50 squadrons by the end of the year, meant that the OTUs and HCUs would have to be brought up to full strength immediately both in aircraft and ground crews, in order to provide sufficient crews for the new squadrons. The aerodrome shortage made it impossible to form new units but several existing OTUs were expanded and the flow of ex-OTU crews to the Middle East was restricted - in mid-1942 Bomber Command had been producing 148 pilots including 85 complete crews a month for overseas squadrons. In the event 51 squadrons were formed by the end of the year (although six of them were not operational) and in spite of bad weather which hampered training there were enough crews available to man all the squadrons.

Although the crew position was satisfactory by the end of the year, it had caused considerable concern a few months earlier when difficulties at the HCUs were causing a bottleneck in the supply of heavy bomber crews. Both the OTUs and HCUs had been suffering badly from serious deficiencies of aircraft, instructors and maintenance personnel. The aircraft shortage in the OTUs was made up by October, but heavy bomber production hampered the HCUs until the end of the year. Deficiencies in instructors were overcome by accelerating the return of tour experienced personnel from the Middle East, and the ground crew position was improved by giving Bomber Command priority in the posting of maintenance personnel.
(1)

The Training Organisation in December 1942

By the end of the year the Bomber Command training organisation stood at 22 OTUs and 10 conversion units (9 heavy and one Mosquito) together with the 5 target towing and gunnery flights. The OTUs and TT & G flights were administered by the three training groups but the conversion units came under the operational groups. Eight of the ten Whitley and Wellington OTUs that were undersized in September had been expanded to full size (with 54 aircraft) by December, and a ninth (No. 81) increased from half to three-quarter strength. The tenth (No. 18 OTU training Polish crews) had been reduced from 40 aircraft to half size (27 aircraft) in October when one flight was transferred to Coastal Command to provide crews for No. 304

(1) S of S Folder ID/7/2(A)

(Polish) Squadron transferred to Coastal Command. At the same time No. 1429 (Czech) OTU supplying crews for another transferred squadron (No. 311 Squadron) was also handed over to Coastal Command, and these two flights were merged into No. 6 (GR) OTU at Thornaby. The two Hampden OTUs (Nos. 14 and 16) had been re-equipped as full-sized Wellington units, but No. 25 OTU had ceased training during the construction of runways at Finningley and the unit was disbanded on 1 January. As already stated the two light bomber OTUs were reorganised in September to improve the standard of training. Thus, after the closure of No. 25 OTU in January, the Bomber OTU organisation contained 21 OTUs - equivalent to $18\frac{1}{4}$ standard medium OTUs and one-and-a-half light OTUs, each capable of producing 16 crews every 3 weeks during the winter months (increasing to 16 per fortnight during the summer).⁽¹⁾

In addition to transferring a number of bomber squadrons to Coastal Command, a detachment from No. 10 OTU Abingdon had been established at St. Eval in August 1942 to undertake anti-U-boat patrols over the Bay of Biscay. The detachment was equipped with 25 Whitleys and was supplied with crews from Nos. 10, 19 and 24 OTUs plus second pilots from No. 3 PRC. It was arranged that these crews should do only 70 of the normal 80 hours OTU syllabus, finishing their training with their second pilots at St. Eval, before undertaking operational duties at the OTU. The first operation took place on 12 August 1942 and subsequently over 1,800 sorties were flown for the loss of 45 aircraft before the unit was closed in July 1943 and the crews returned to Bomber Command. One U-boat was sunk, four others were known to have been damaged and a further twenty possibly damaged. Although losses were heavy for the results obtained, the C-in-C Coastal Command stated that through their work during their 12 months' detachment, crews of No. 10 OTU had enabled Coastal Command to force the enemy on the defensive in the Biscay area.

(1) AM File S.84814

No. 11 OTU at Bassingbourn (and later Westcott) was also expanded in September 1942 by the addition of an engine control demonstration unit although, as in the case of No. 10 OTU this did not interfere with the unit's training programme. The purpose of the ECDU which was equipped with one Wellington and staffed by two instructors, was to give instructions in fuel economy in bomber aircraft to instructors from OTUs and flight commanders from operational squadrons. Courses lasted two days and, until Coastal Command established their own unit, a proportion of instructors from Coastal OTU were included in the intake.

Training for the Pathfinder Force

A further unit had been formed during 1942, the Bombing Development Unit (BDU). Although not strictly a training unit, the BDU gave a certain amount of instruction on the various types of radar equipment used in the Command as well as developing bombing techniques and testing new equipment. On 6 January 1942, No. 1418 (SD) Flight had been formed at Marham, equipped with six Wellingtons for the development of radio aids to navigation. It subsequently moved to Gransden Lodge where, on 20 July 1942, it was expanded to become the BDU. A flight of four Halifaxes (and subsequently two Lancasters and one Stirling) was added for the purpose of carrying out trials and experiments with new navigational and bombing equipment produced for the Command. Later fighter aircraft were added for use in tactical trials.

One of the underlying reasons behind the formation of the BDU was to assist in the establishment of a special target finding force to improve the accuracy of night bombing. The Pathfinder Force, as the new force was called, was established in August 1942 within No. 3 Group. Originally it comprised three heavy and one medium bomber squadrons, and it was arranged that aircrew for these squadrons should be drawn from both operational squadrons and HCs. Two-thirds were to be selected experienced personnel from squadrons and the remainder chosen from volunteers amongst the best pupils passing out of OTUs and earmarked for Pathfinder Force (PFF) work while at the HC. In January 1943 the Pathfinder Force was divorced from No. 3 Group and reorganised on an independent basis as No. 8 (PFF) Group. It thus consisted of the BDU, together with five squadrons, each affiliated

to one of the five operational bomber groups: No. 156 (Wellington) Squadron to No. 1 Group; No. 109 (Mosquito) Squadron to No. 2; No. 7 (Stirling) Squadron to No. 3; No. 35 (Halifax) Squadron to No. 4; and No. 83 (Lancaster) Squadron to No. 5 Group. Subsequently No. 405 (Halifax) Squadron, affiliated to No. 6 Group, was added. The PFF squadrons were supplied with crews from squadrons or conversion units in the groups to which they were affiliated, except in the case of inexperienced Wellington crews who were drawn direct from the OTU. No. 109 Squadron had a special flight of three aircraft for the training of Mosquito crews in the specialist nature of their work, whilst both Nos. 7 and 35 Squadrons had extra flights (each of nine aircraft) for the training of crews in the use of H2S equipment.

In April 1943, three months after its transfer to No. 8 Group, the BDU was moved to Feltwell. Four months later it was again moved, this time to Newmarket where it remained until February 1945 when it returned to Feltwell. In addition to the development flight the unit contained a small training flight which ran various short specialist courses in radar and navigation (1) for personnel of the pathfinder squadrons.

Training for Special Duties

There were certain units within Bomber Command which, although operational, did not carry out bombing missions. Although not strictly appropriate to this chapter, their existence is noted in order to complete (2) the picture of the operational and training organisation of the Command.

The first special duty unit was No. 419 Flight, equipped with four Lysanders, which was formed at North Weald in Fighter Command in August 1940. Two months later it was transferred to No. 3 Group, Bomber Command, and after several moves it arrived, in March 1942, at Tempsford, where it remained until the end of the war. The strength of the flight increased considerably (Whitleys, Wellingtons and Hudsons being added to its establishment) and after being renumbered as No. 1419 (SD) Flight in February 1941, it was upgraded to squadron status and renamed No. 138 (SD) Squadron in August 1941.

(1) BDU ORB

(2) These units are dealt with in detail in AHB Monograph AP 3407 Signals Volume VII and the AHB Narrative "Special Duty Operations in Europe"

In February 1942 a second SD squadron (No. 161 Squadron) was formed, sharing Newmarket aerodrome with No. 138 Squadron until March 1942 when both units moved to Tempsford. By the end of the year both squadrons had been further expanded and re-equipped with new types: No. 138 Squadron with fifteen Halifaxs, and No. 161 with five Halifaxs, seven Lysanders, one Hudson and two Wellingtons. These two squadrons were formed to contact, co-ordinate and assist the resistance groups in enemy occupied territory, and their duties consisted chiefly of dropping by parachute both agents and supplies, and landing in enemy controlled territory to put down and pick up the former. The squadrons were operationally controlled direct from the Air Ministry.

Crews for the squadrons were specially selected personnel with considerable experience on the types of aircraft held by the squadrons. Lysanders and Hudsons were used for landing operations and both agents and aircrew needed special training, and this had to be given by the squadrons themselves. Not only did pilots have to be able to land at night in a small unknown field on a rough and ready flarepath of three dimlights, but they had to be able to navigate their way there, map reading across enemy country. Much depended on mutual confidence between pilot and the agent on the ground organising the reception, so special training was given to agents destined for such work, with the pilots as instructors, teaching the agent how to select suitable sites and how to describe them to London, how to lay flarepaths, and how to organise the rapid turnaround once the plane arrived. Similar specialist training was necessary for parachute operations by the Halifax and Wellingtons. In both landing and parachute operations, accurate navigation was the all important factor and special equipment known as Rebecca/Eureka equipment was used extensively to guide the aircraft to its target. It was a type of 'beam' navigational aid which enabled an aircraft fitted with 'Rebecca' (a visual receiver) to home on to a Eureka beacon (a portable transmitter). Training in the use of this equipment was also carried out by the squadrons themselves.

Similar specialist training was carried out in Nos. 148, 267, 301 and 624 Squadrons and No. 1586 Flight, which were used for special duty operations in the Mediterranean and Balkan areas.

Training for Radio Counter-measures (RCM)

In addition to the special duty squadrons a number of units were engaged in the operation and development of airborne radar equipment. These devices took two distinct forms: on the one hand were the radar aids to navigation, bombing, etc, such as Gee, Oboe, H2S, etc, and on the other were those used for radio counter-measures.

The task of investigating enemy radio counter-measures and the development of our own equipment had originally been carried out under No. 80 Wing by the Beam Approach Training and Development Unit which had been re-formed for that purpose at Boscombe Down in June 1940. The new unit subsequently became the Wireless Intelligence and Development Unit, and later No. 109 Squadron. In December 1941, when the first of the radio controlled navigational aids were tried out, No. 109 Squadron, the only squadron with beam flying experience, undertook the initial experiments, and by 1942 the squadron, equipped with Ansons and Wellingtons, composed three flights: a RCM investigation flight, a wireless investigation flight and an Oboe flight. In July 1942, the RCM and wireless investigation flights broke away to form Nos. 1473 and 1474 Flights, both equipped with Wellingtons and Ansons, and the remaining flight, which carried on as No. 109 Squadron, was expanded by the addition of six Mosquitos to concentrate on Oboe training and development. Nos. 1473 and 1474 Flights were eventually amalgamated to become No. 192 (Special Duties) Squadron. The former flight was upgraded to squadron status in January 1943 and eleven months later the second flight was absorbed into the new squadron.

These squadrons (and formerly the flights) undertook the training of crews in these specialist duties besides undertaking operational work, and as had already been described a number of aircraft were specially established for training purposes, No. 109 Squadron on Mosquitos and No. 192 on Wellingtons.

Failure of the Wellesbourne Mountford Experiment

The experimental establishment of 66 Wellingtons for a full sized OTU, which had been tried out at No. 22 OTU Wellesbourne Mountford, had proved a failure. It will be recalled that commencing in October 1942 - June was the

planned date but shortages of aircraft and maintenance personnel delayed the start - No. 22 OTU was to train 18 crews per fortnight (per three weeks in winter) instead of the standard 14. Before the experiment started it had been found possible to raise intakes at the standard OTUs to 16, and this of course prejudiced the scheme from the start since using 54 aircraft to train 16 crews per intake was obviously more economical than using 66 aircraft to train 18 crews. Nevertheless, even with 20 crews per intake at the experimental unit (which would have been the correct intake after the standard intakes had been raised - although it was never implemented at No. 22 OTU) it was considered that it was more economical to continue with the 54 aircraft per school basis. Although it was possible to operate 66 aircraft per school with a parent and satellite station, it was found that it overloaded the instructional and administrative staffs. In addition, accommodation, lecture rooms and training devices were overcrowded when larger intakes were introduced. The scheme was therefore discontinued after January 1943, and intakes standardised at 16 per three weeks (two weeks in summer) at all full sized schools.

(1)

By the beginning of 1943, the training organisation which had been built up with foresight and efficiency - and at considerable cost to the operational effort - was producing sufficient crews to man the front line and, more important, adequately trained crews. The training repercussions of the re-equipment of the front line with heavy bombers had been absorbed and heavy conversion units were now an established part of the bomber training organisation. Emergency measures to produce the new crew numbers had been successful, and by the spring of 1943 the first intakes of air bombers and flight engineers were coming forward into the squadrons. The air bomber training flights which had been converting surplus wireless operators/air gunner to air bombers were disbanded in March 1943, and the following month saw the first intake of direct entry flight engineers at No. 14 ITW. Formerly, flight engineers had been provided by passing fitters II through a special flight engineers' course at St. Athan.

(1) AM File S.77400/I

During the first six months of the year the strength of the Command was built up so that by the end of the summer there was a small surplus to allow for the reduced output of crews in the winter months. The accumulation of the surplus was helped by two factors. The first was that in February the old system of having six spare pilots per squadron was altered to one spare crew, although this was offset slightly in April when the squadron establishment was raised from 20 to 22 crews (plus one spare). The second factor responsible for the favourable balance of crews was the temporary increase in intakes to the OTUs and HCs in May and June made possible by the exceptionally good weather and the fact that an adequate supply of basically trained personnel was available from the overseas schools. OTU intakes were temporarily increased from 16 to 18 crews per fortnight and HCs from 32 to 36 and sometimes to even 40 crews per month (depending on the OTU output).

By October there were over 200 surplus crews in the Command, and as that surplus still remained in January 1944 authority was given for an increase in the aircrew establishment to 28 crews per squadron (plus one spare crew) and (1) this more than absorbed the surplus.

Standardisation of OTU Course Lengths

The fact that a slight surplus existed made possible the decision, taken in July 1943, to standardise the OTU course length through the year (at eight weeks flying plus two weeks ground school) and to reduce intakes during the (2) winter months. The old system of extending courses from eight weeks to twelve during the winter and of reducing intakes to three-weekly instead of fortnightly was unsatisfactory in a number of ways. For example, winter courses tended to drag out and trainees spent a lot of time doing little or nothing; and the change over from summer to winter courses, and vice versa, caused duplication of training effort. By standardising the flying course at eight weeks, these difficulties were overcome; the training of smaller intakes in winter would permit more intensive instruction, and with the increasing number of radio aids to bad weather and night flying it was hoped that interference through winter conditions could be reduced. The estimated

(1) AM File S.84014

(2) AM File S.77400/I

output of a full-sized OTU with 54 operational aircraft remained at 32 crews per month in summer (intakes of 16 per fortnight) falling to 22 in winter. This was the same as the old system, except that intakes and outputs were to remain fortnightly instead of three-weekly, which meant that if through any reason (bad weather for example) an entry had to be dropped it would be a loss of a fortnight only instead of three weeks. The winter period began with intakes in September and finished in February. For the HCU's which had always worked to a fixed four weeks course summer and winter, the winter period began and ended one month later. This reduced the overlap, when OTU outputs were at summer rates and HCU intakes winter rates, to four weeks, and a small pool was to be built up at the OTUs to allow for the resumption of summer intakes when the position would be revised, and HCU intakes would, for a month, be greater than OTU output. It was hoped to build up the pool to 100 surplus crews per group. The HCU intakes were revised at the same time; summer intakes were increased to 36 per month and winter intakes reduced to 24. This was in place of the old procedure of training 32 crews per month summer and winter, which invariably meant that crews trained in the winter had to complete the last 10 hours or so of their HCU syllabus at their squadrons. Later in the year it was found that the Stirling HCU's were unable to maintain the new rates without additional aircraft, and their intakes had to be reduced to 31 and 21 summer and winter respectively. To achieve the higher intakes it was estimated that an additional 5 aircraft (1)
per unit (bringing them to 37) would have been necessary.

Peak of the Bomber Training Organisation

At the beginning of 1943 the 22 bomber OTUs organised in three training groups, were equivalent to 18 $\frac{1}{4}$ full sized (with 54 aircraft) medium bomber OTUs, and one-and-a-half full-sized (with 48 aircraft) light bomber OTUs. It will be remembered that to conform to the expansion programme of Bomber Command, a total of 25 full-sized OTUs would be required (24 medium and 1 light) giving an annual output of roughly 8,500 crews per year (5,000 during the summer months and 3,500 during the winter). This figure was to

(1) OP2 Folder 3253

be achieved by December 1943, but as it took three months from the date of formation for an OTU to reach its maximum output, it was necessary to form the additional units by September. This was begun by moving No. 18 (Polish) OTU from Bramcote to Finningley and increasing it from half to three-quarter strength in March; by expanding No. 81 OTU Tilstock from three-quarter strength to full size in April; by disbanding No. 17 (light bomber) half-sized OTU at Upwood and re-forming it as a three-quarter sized Wellington OTU at Silverstone on 1 May; and by forming a new full-sized Wellington OTU (No. 82) at Ossington on 1 June. This brought the strength up to the equivalent of $20\frac{1}{2}$ medium bomber OTUs - four equipped with Whitleys and the rest Wellingtons - plus one light bomber unit. Two other OTUs were moved - No. 14 from Cottesmore to Market Harborough in June and No. 29 from North Luffenham to Bruntingthorpe in June - although this did not involve any change in size of the units concerned. To provide the additional three-and-a-half units, it was hoped to form three new units, (No. 83 at Childs Ercall (three-quarter size), No. 84 at Desborough (full-size) and No. 25 at Leicester East (full-size)) and to expand No. 18 OTU from three-quarters to full-strength. The outstanding half OTU was to be provided by adding a second satellite to No. 19 OTU at Kinloss and expanding that unit to the equivalent of a one-and-a-half sized unit. Owing to the non-availability of aerodromes, however, these plans did not materialise fully and various changes had to be made from time to time before the units were finally formed.

It had been possible to convert No. 17 OTU into a Wellington OTU because of the surplus of light bomber training capacity after an additional light bomber OTU had been opened in Canada. It was recognised that Canadian OTU trained light bomber crews would need a month's acclimatisation course and instruction in operational technique in Europe so No. 13 OTU at Bicester was expanded to undertake the additional training of Boston and Mitchell crews. At the same time it was decided to amalgamate No. 1655 Mosquito Training Unit with No. 13 OTU, bringing the latter up to a one-and-a-half sized OTU. This took place on 1 May 1943 when the strength of the unit

became 29 Blenheims, 10 Bostons, 9 Mitchells, 20 Mosquitos and 8 Oxfords, but a month later, with the transfer of No. 2 Group to 2nd TAF, No. 13 OTU was transferred to No. 70 Group and later No. 9 Group in Fighter Command (which was responsible for the provision of crews for 2nd TAF squadrons) to support 2nd Group squadrons. For the sake of continuity, however, the subsequent history of this bomber OTU will be continued in this chapter.

On its transfer to Fighter Command, No. 13 OTU lost its Mosquitos and Oxfords as they were needed in Bomber Command to train crews for the two Mosquito Pathfinder squadrons in No. 8 Group. They were used to re-form No. 1655 Mosquito Training Unit on 1 June. It was originally re-formed at Finmere in No. 92 Group, but a month later was transferred to No. 8 Group and moved to Marham. Its establishment became ten Mosquitos, plus eight Ansons (six more Mosquitos were added in September) and it trained eight crews every two weeks on an eight weeks (summer) course. The unit was, in effect, a small Mosquito OTU. It had originally been formed as a conversion unit, to convert Blenheim trained crews on to Mosquitos by means of a six weeks course, but in March 1943 it had been reorganised (and renamed (1) as No. 1655 MTU) to give an eight weeks all-through course on Mosquitos.

No. 13 OTU, which in August 1943 was equipped with 42 Blenheims, 16 Bostons and 15 Mitchells, provided normal 8 weeks (summer) courses on Blenheims and Bostons, training 24 Boston crews every 4 weeks, together with 4 weeks conversion courses on Mitchells for 15 crews at a time from the (2) Ventura OTU in Canada, with intakes of 25 crews every month. In November 1943 16 Mosquitos were added and 4 weeks conversion and acclimatisation (3) courses for 20 Canadian trained Mosquito crews per month were started. As in the case of the medium bomber OTUs, the basic eight weeks flying course was preceded by a two weeks ground course.

(1) AM File C.30574/40/I

(2) AM File S.92793/I

(3) AM File S.99536

By the beginning of July 1943 there were still three-and-a-half more medium bomber OTUs to form. No. 83 OTU formed as planned at Childs Ercall (later renamed Peplow) as a three-quarter sized Wellington OTU on 15 July, and No. 84, a full-sized Wellington unit, formed at Desborough on 1 September. No. 18 OTU at Bramcote was enlarged as planned in September, but the remaining plans for expansion were changed. The OTU for Leicester East (No. 25) was to be three-quarter instead of full sized and No. 17 OTU at Silverstone expanded from three-quarter to full size to make up for the deficiency. Instead of expanding No. 19 OTU a second satellite was added to No. 20 OTU so that that unit could be expanded by a further 50 per cent. No. 17 OTU was expanded to full size on 3 July and on 10 August Milltown was allocated as a Satellite to No. 20 OTU Lossiemouth which was then re-equipped with 81 Wellingtons and expanded to one-and-a-half size training 120 crews at a time. The projected OTU for Leicester East (No. 25) which was due to open on 1 November did not form after all as by that time a surplus of bomber crews was apparent and the existing capacity appeared adequate to meet future requirements. The aerodrome was subsequently utilised to house a new transport support OTU (No. 107). The bomber OTU organisation had thus reached its peak by the end of September with a total of 23 medium bomber units, one one-and-a-half sized, one three-quarter sized and the remainder full sized - equivalent to $2\frac{1}{4}$ standard units - together with No. 13 (Light Bomber) OTU and the Mosquito training unit. There was also No. 42 OTU, now equipped with 25 Whitley and Albemarle medium bombers, but this unit was training crews for airborne force squadrons under No. 38 Group. Four of the medium bomber OTUs (Nos. 10, 19, 24 and 81) were equipped with Whitleys and the remainder with Wellingtons. A full-sized unit continued to have 54 medium bombers together with four target towers (usually Martinets which had by 1943 replaced Lysanders). For reasons which will be explained later, the target tower establishment had been reduced from five, and the attack aircraft deleted in June 1943. The advanced trainer establishment - which used to be 10 Ansons per unit - had been deleted from the Wellington OTUs by the beginning of the year, after pupils began arriving at OTUs from

advanced flying units where they completed a course on twin-engined advanced trainers. It had been intended to remove them from the Whitley units also (they were badly needed at other training schools) but it was found that supervision of navigation training was difficult on Whitleys so that 10 Ansons per unit were retained so that each navigator under instruction could be given one check cross-country exercise by day and one by night (amounting (1) to about 10 hours flying) during his course.

Expansion of Conversion Units

The heavy conversion units, which totalled nine (one of which was half-size) at the beginning of 1943, underwent a parallelled expansion with the OTUs. In January 1943, to alleviate the congestion of ex-OTU crews awaiting conversion training, two new HCU's were formed, No. 1662 (with 12 Lancasters and 20 Halifaxes and Manchesters) at Blyton, and No. 1663 (with 32 Halifaxes) at Rufforth, and the half-sized unit at Leeming (No. 1659) brought up to full strength. This made a total of five Lancaster, four Halifax and two Stirling HCU's. This expansion had been preceded by several moves during the last two months of 1942, No. 1656 HCU moved from Breighton to Lindholme, No. 1654 from Swinderby to Wigsley and No. 1601 from Skellingthorpe to Winthorpe. In March 1943 No. 1659 HCU moved from Leeming to Topcliffe.

To train the OTU crews required for expansion it was planned in March to increase the number of HCU's to 16 by November 1943, seven of which were to train Lancaster crews, six Halifax crews and three Stirling crews. It was also arranged that the Lancaster units should revert to 16 Lancasters and 16 Halifaxes or Manchesters.

By July four more units had been formed: No. 1664 (Halifax) HCU at Croft, No. 1665 (Stirling) HCU at Mepal (which moved to Woolfox Lodge a month after its formation), No. 1606 (Halifax) HCU at Dalton and No. 1667 (Lancaster) HCU at Lindholme. Two heavy conversion flights, each equipped with eight Lancasters, were formed in May 1943, No. 1678 at East Writham

(1) AM File S.99536/I

/ and

and No. 1679 at East Moor: the former was formed from a special flight of four Lancasters that had been added to No. 1657 (Stirling) HCU a few weeks earlier in order to provide crews for the Stirling squadrons in No. 3 Group re-equipping with Lancasters; and the latter was formed in No. 6 Group (equipped with Halifaxes and Wellingtons) to train Lancaster crews for the Wellington squadrons re-equipping to Lancasters. This brought the total number of HCUs and flights up to three on Stirlings, six on Halifaxes and six-and-a-half (counting the two flights each as a quarter HCU) on Lancasters - only a half-sized Lancaster unit short of the November target.

In the middle of July, however, plans were slightly changed. The Stirling requirement remained at three HCUs, but the Halifax requirement was reduced from 6 to five-and-a-half units, while the Lancaster requirement was raised from seven to eight-and-a-half, although one of these was not required until 1944. Accordingly No. 1666 (Halifax) HCU was reduced to half size at the end of July and a new Lancaster unit, No. 1668, was formed at Balderton in August.

Apart from two minor changes - the Stirling units were temporarily increased to 36 aircraft on 1 October (until November when they reverted to 32) in order to build up a small surplus of Stirling crews; and the two heavy conversion flights were expanded from 8 aircraft to 12 in September - the position remained unchanged until November 1943. One further innovation was the decision to extend the HCU course for flight engineers (who did not pass through an OTU but joined their crew at the HCU stage) from four weeks to six in order to give them some flying experience before joining their crews. The Flight Engineers basic training course did not include any flying experience and it had been found that the first few flying hours of the course could not be counted as useful air training for them since it took up to 12 hours flying for the average flight engineer to become used to the sensation of flying. After October 1943 therefore flight engineers arrived at the HCU two weeks ahead of their crews, during which time they flew as second engineers with crews on senior courses.

(1) AM File C.36706/48/I

Withdrawal of Lancasters from HCUs

By November the Lancaster had proved itself to be the superior bomber aircraft, and the increasing wastage rates of Stirlings, and to a lesser extent Halifaxes, were causing serious concern. Moreover, with the heavier load it carried the Lancaster was economically a much better aircraft to use on operations. As a result, in the autumn of 1943, all Lancasters were withdrawn from the HCUs and used to replace the Stirlings of No. 3 Group. Two Stirling squadrons were transferred to No. 38 Group for airborne forces work, a third was transferred to the newly formed No. 100 Group and re-equipped with Fortresses for use on radio counter-measures, and the remainder were re-equipped with Lancasters. Stirlings and Halifaxes were to replace the Lancasters in HCUs, the former in Nos. 3 and 5 Groups and the latter in No. 1 Group. The HCUs in Nos. 4 and 6 Groups, which were predominantly Halifax groups, remained unchanged. To convert the Stirling and Halifax trained crews in Nos. 1, 3 and 5 Group to Lancasters, three new schools, each equipped with 18 Lancasters, were formed in each group.

This meant a considerable reorganisation of the heavy conversion units. The two HC Flights (Nos. 1608 and 1609) retained their Lancasters, but six of the seven Lancaster HCUs were re-equipped and the seventh disbanded. No. 1668 HCU at Balderton was disbanded on 21 November, and Nos. 1656, 1662 and 1667 HCUs re-equipped with 32 Halifaxes and Nos. 1654, 1660 and 1661 re-equipped with 37 Stirlings. On the same date Nos. 1, 3 and 5 Lancaster Finishing Schools were formed. No. 1665 (Stirling) HCU at Woolfox Lodge was transferred to No. 38 Group to supply crews for the Stirling squadrons transferred from Bomber Command and a new Stirling HCU, No. 1653, was formed in No. 3 Group to replace it. As a result of these changes the Group's conversion training organisation, comprising fifteen HCUs, two HCF and three LFS, were as follows at the end of the year:-

Group No.	HCU No.	LFS No.	HCF No.	Location	Aircraft Establishment	Crews to be trained per month
1	1656 1662 1667 -	- - - 1	- - - -	Lindholme Blyton Faldingworth Lindholme	32 Halifaxes 32 Halifaxes 32 Halifaxes 18 Lancasters	24 24 24 36 *
3	1651 1653 1657 - -	- - - - 3	- - - 1678 -	Wratting Common Chedburgh Stradishall East Writham Feltwell	32 Stirlings 32 Stirlings 32 Stirlings 12 Lancasters 18 Lancasters	21 21 21 8 24
4	1652 1658 1663	- - -	- - -	Marston Moor Riccall Rufforth	32 Halifaxes 32 Halifaxes 32 Halifaxes	24 24 24
5	1654 1660 1661 -	- - - 5	- - - -	Wigsley Swinderby Wenthorpe Syerston	37 Stirlings 37 Stirlings 37 Stirlings 18 Lancasters	24 24 24 36
6	1659 1664 1666 -	- - - -	- - - 1679	Topcliffe Dishforth Wombleton Wombleton	32 Halifaxes 32 Halifaxes 16 Halifaxes 12 Lancasters	24 24 12 8

* per fortnight

A few weeks after this reorganisation, the equipment of the six Stirling HCUs was standardised at 36 aircraft. It had originally been estimated that 37 aircraft would be needed to achieve the normal HCU output of 36 per month in summer months and 24 in the winter, and it was intended to increase the No. 3 Group units accordingly in January 1944. It was subsequently found, however, that 36 aircraft would suffice. Crews for Lancaster squadrons, apart from those trained at the two heavy conversion flights who continued on the old four weeks all-through courses, now underwent a four weeks HCU course (40 hours flying) on Halifaxes or Stirlings, followed by a 10 days LFS course with 10 hours flying. Crews for Halifax squadrons ~~went~~ straight to their (1) squadrons after completing their four weeks HCU training.

(1) AM File C.36738/48/I.

Formation of Aircrack Schools

The efforts to accumulate a surplus of OTU trained crews by the winter were crowned with such success that OTU training had to be slowed down in November 1943. Owing to bad weather in October, and the reorganisation of the HCUs the following month, both of which prevented full HCU intakes, the operational groups acquired more than the 100 surplus crews per group it was planned they should hold. These pools, originally known as battle schools and later as aircrack schools, were formed within Bomber Command without reference to the Air Ministry - Bomber Command became responsible for their own establishments and manning in December 1943 and, as no aircraft were required, reference to the Air Ministry was unnecessary - and were not therefore officially recognised as independent units. Five schools were formed, one each in Nos. 1, 3, 4, 5 and 6 Groups; they were numbered accordingly as Nos. 1, 3, 4, 5 and 6 Aircrack Schools and were located respectively at Lindholme, Shepherds Grove, Acaster Melbis, Balderton and Dalton. Nos. 1, 3, 4 and 5 Aircrack Schools were subsequently expanded to hold 180 crews, and No. 6, at the RCAF Group, 75. Originally it was intended to close these schools during the summer months, but in the event they remained in being until 1945. During the winter of 1943/4 the numbers in the schools remained fairly static; in March, however, when the HCUs started their summer intakes they were rapidly reduced. Crews stayed at these schools for about six weeks - sometimes as long as ten - during the winter and regular courses of instruction were arranged which, though primarily intended merely to keep crews employed, were soon found to be of training value and, as a result, even after March when HCU intakes accelerated, it was arranged that all crews should pass through the aircrack schools for a ground course lasting at least two weeks, before going on to their HCU. Training at these aircrack schools varied, of course, according to the length of stay, but it included a Battle course, usually under RAF Regiment supervision, synthetic training and lectures on such subjects as dinghy drill, escape and evasion procedure, etc.

(1) OP2 Folder 3253

Reduction of the OTU Output

As a result of this bottleneck at the HCU stage, all entries into OTUs on 30 November and 7 December 1943 were cancelled and crews outputting after those dates were retained for an extra fortnight which involved providing crews with about five hours extra flying to keep them in practice. A further two weeks delay in sending OTU crews to the operational groups was achieved by sending crews on leave at the end of their course - an extremely popular measure - before retaining them for the additional two weeks. By March the position eased and crews went direct to the aircrew schools on completion of their OTU training.

As a result of this over-production the OTU organisation ceased to expand after the autumn of 1943, and shortly after the cancellation of the projected OTU at Leicester East, it was decided to reduce the size of the existing organisation. The decision to establish three Wellington OTUs in the Middle East to supply all medium and heavy bomber crews required in the Middle East and India had also relieved the pressure on the United Kingdom OTUs - three units (Nos. 76, 77 and 78 OTUs) together with two Liberator Heavy Conversion Units (Nos. 1673 in India and No. 1675 in the Middle East) for converting Wellington trained crews to heavy bombers, were formed during the winter of 1943. A combined medium OTU and heavy conversion unit, equipped with Mitchells and Liberators, was projected for Canada to train crews for the Far East and, when that unit opened, United Kingdom schools would be further relieved. Accordingly the medium bomber OTU organisation in the United Kingdom which, at its peak in October, stood at 23 OTUs (equivalent to 23 $\frac{1}{4}$ standard units) was reduced to the equivalent of 22 units in January by reducing No. 23 OTU, Pershore, from full to three-quarter size and transferring No. 81 OTU at Tilstock, equipped with 54 Whitleys, to No. 38 Group, along with No. 1665 HCU to assist No. 42 OTU train crews for airborne forces work.

Development of Gunnery Training Flights

A good deal of attention was paid to the improvement of the standard of gunnery training during 1943. The five target towing and gunnery flights, which had been renamed as (bomber) gunnery flights towards the end of 1942,

were joined by two new units, No. 1499 (B) GF, equipped with six Martinets, which opened at Wyton on 31 March to provide gunnery training for new crews in No. 8 (PFF) Group, and No. 1691 (B) GF, equipped with ten Martinets, which was formed at Dalton on 30 June 1943 to serve No. 6 (RCAF) Group. Numerous moves had taken place after the formation of the original flights: No. 1481 moved from Lindholme to Binbrook; No. 1483 from Stradishall to Marham and thence to Newmarket; No. 1484 from Driffield to Leconfield; and No. 1485 from Scampton to Coningsby, Fulbeck and finally to Syerston. Similar flights were formed in the three OTU groups in June 1943 for the purpose of training crews at the OTUs in defensive tactics. Two flights, each equipped with six Tomahawks and known as (bomber) defence training flights, were formed in each group:-

No. 1681 Pershore)	
)	No. 91 Group
No. 1682 Abingdon)	
No. 1683 Bruntingthorpe)	
)	No. 92 Group
No. 1684 Wing)	
No. 1685 Ossington)	
)	No. 93 Group
No. 1686 Hixon)	

A few months after its formation, No. 1681 Flight serving the OTUs in Northern Scotland had its aircraft establishment increased to seven and in March 1944 Hurricanes replaced the Tomahawks at all six units. As a result of the formation of these flights, it was possible to remove the Defiant attack aircraft from the OTUs and to reduce the establishment of target towers from five to four aircraft per unit.

On 15 February 1944 it was decided to improve the training of bomber crews against enemy night fighters by disbanding the old (bomber) gunnery flights and replacing them by further (bomber) defence training flights, equipped with six Spitfires, twelve Hurricanes, eight Martinets, two Oxfords and one Tiger Moth. There continued to be one flight per group and the reorganisation took place as follows:-

(B) DF No.	Location	Replaced by (B) DTF No.	Group No.	Location
1481	Binbrook	1687	1	Ingham
1483	Newmarket	1688	3	Newmarket
1484	Leconfield	1689	4	Holme
1485	Syerston	1690	5	Syerston
1691	Dalton	1695	6	Dishforth
1499	Ipswich	1696	8	Ipswich

No. 1698 (B) DTF at Ipswich was slightly smaller than the other flights, having six Hurricanes and six Martinets instead of twelve and eight respectively and no Oxfords and Tiger Moths. These six flights were joined by a seventh, No. 1321 (B) DTF, at Bottesford on 1 September 1944, which was formed, equipped with eight Hurricanes, to supplement No. 1690, training crews (1) for No. 5 Group.

For various reasons two of the old gunnery flights were retained: No. 1482 Flight at West Raynham, serving No. 2 Group - now in 2nd TAF - continued to operate for a few weeks and was finally disbanded on 1 April. It was not replaced as a gunnery flight, although No. 2 Group Support Unit was opened on the same date to provide a reserve of aircraft and crews for the squadrons and crews in No. 2 Group and a certain amount of gunnery training was carried out there. No. 1481 Flight at Binbrook had a much longer life. It was retained in order to provide training on the Boulton Paul turrets of its Wellingtons for the HCU in No. 1 Group for air gunners destined for Lancaster squadrons. The Halifaxes in use at the HCUs had (2) different turrets from Wellingtons and Lancasters.

Expansion of Pathfinder Training Facilities

The Pathfinder Group continued to develop during 1943. Several of its squadrons were re-equipped while others expanded by forming additional flights; two more heavy bomber squadrons were added and two additional Mosquito squadrons were transferred from No. 2 Group to No. 8 Group in June 1943. Consequently the Group's training organisation underwent a parallel

(1) AM File S.73606

(2) AM File C.36572/48/I

expansion. Heavy and medium bomber crews continued to be drawn from the other operational groups, and only experienced crews were posted to the pathfinder force. After No. 2 Group had been transferred to Fighter Command there were no other Mosquito squadrons in the Command, and No. 8 Group had to undertake its own operational training of Mosquito crews. It was for this reason that No. 1655 Mosquito Training Unit was transferred to No. 8 Group in July 1943, and the training flight of No. 109 Squadron incorporated in it.

Two additional training units were formed in the Group during March 1943. One, No. 1499(B) GF (later No. 1696(B) DTF) has already been described. The other was the PFF Navigation Training Unit which was formed at Upwood on (1) 18 March, equipped with four Stirlings, four Halifaxes and eight Lancasters. Its object was to instruct aircrews of the Pathfinder Force in PFF technique and in the use of the special equipment used by the PFF squadrons. In August after the Stirling squadrons in the Group had been re-equipped the four Stirlings at the NTU were deleted and replaced a month later by five more Halifaxes and one more Lancaster. Subsequently, the Halifaxes were withdrawn and by the end of 1944 the unit was operating with 14 Lancasters. All replacement crews underwent a week's special training (with $12\frac{1}{2}$ hours flying) at the unit before joining their squadrons. Thirty crews per month were trained (three per squadron) together with eight reserve navigators, the latter undergoing a longer course with twenty-five hours flying.

These were not the only specialist schools formed in Bomber Command. A night bomber tactical school was formed at HQ Bomber Command, High Wycombe, on 17 August 1943 to give tactical instruction to HCU instructors, OTU flight commanders and squadron personnel by means of a week's course training eight (2) to ten pupils at a time. Instruction consisted entirely of lectures and (3) no flying was given. In March 1944 the school moved to Ingham.

(1) SD 155 335/43

(2) SD 155 1094/43

(3) AM File C.36572/48/II

A further specialist school was the Central Night Vision Training School at Upper Heyford. It had been set up by Bomber Command in November 1942 and worked on an experimental basis until 25 April 1943 when its value was proved and it was officially recognised by the Air Ministry. Originally it ran courses, lasting five days, for air gunners and air bombers, with the object of improving their knowledge of night vision by a series of tests and exercises, using specially designed equipment. After April, the CNVTS concentrated on the teaching of tour-experienced personnel so that they in turn could instruct crews under training at HCUs, and 15 small night vision training sections were established at all HCUs and gunnery flights in Bomber Command. By the end of 1943, the training had spread to Flying Training, Transport and Coastal Commands, and ADGB where small sections were established at OTUs and PRCs. In all, more than 80 sections were operating, each providing about (1) 10 hours instruction.

Formation of No. 100 Group

The development of radio counter-measures also made considerable progress during 1943. Most of this work, involving numerous types of special radio equipment, or other equipment designed to interfere with the enemy's radio control system, was in support of the bomber offensive. Much of it involved little additional training, and was carried out by the main force bomber squadrons. 'Tinsel', the use of the bomber's own transmitter as a jammer, and 'Window' the dropping of metallised strips to confuse the enemy RDF, were (2) examples of these measures. Some of the counter-measures, however, involved a certain amount of special training before they could be put into practice. One of these was the device known as 'Airborne Cigar' (or ABC). Aircraft of No. 101 (Lancaster) Squadron were fitted with equipment for jamming the enemy's R/T, and each aircraft carried a specially trained German-speaking operator as an additional crew member whose job it was ^{to} ~~was~~ find and jam the enemy frequencies. These aircraft accompanied the bomber force and carried a full bomb load.

(1) AM File S.96400

(2) AHB Monograph AP 3407 Signals Vol. VII "Radio Counter-measures"

Special attention had to be paid to the selection and training of the ABC operators. Volunteers, who could be of any aircrew category were recruited from within the Command; they had to be of quick intelligence and with a good working knowledge of German. A special training centre was established at Ludford Magna, No. 101 Squadron's base, where a fortnight's course was given; one week was devoted to a description of the 'Y' service - a system of control stations to interrupt the enemy's radio transmissions - and the second week to instruction on the manipulation of the equipment. Originally the first week of the course was given at the 'Y' control station at West Kingsdown, Kent, but this was soon dispensed with and all training centralised at Ludford Magna. The initial requirement was for thirty operators, and further courses were run from time to time to provide replacements. Training started in the summer of 1943 and the first operation took place in the following October. This was successful and further operations, with No. 101 Squadron carrying out an ABC function as well as operating as a normal component of the bomber force, continued until the end of the war.

By the autumn of 1943 the growing importance of these counter-measures had led to the belief that Bomber Command's interests could best be met by the formation of a special group for co-ordinating the work of the various units involved. In addition to Nos. 101 and 192 Squadrons of Bomber Command, a number of Fighter Command units had been employed on these operations. No. 515 Squadron (equipped with Defiants and subsequently Beaufighters) had been employed first on 'Moonshine' and then on 'Airborne Mandrel' operations (the interference of German early-warning radar) since early 1942, and No. 141 Squadron, equipped with Beaufighters, had begun 'Serrate' operations (using special equipment to 'home' on to the AI transmissions of the enemy night fighters) in June 1943.

As a result No. 100 (RCM) Group was formed in Bomber Command on 3 December 1943. The 'Mandrel' and the 'Serrate' squadrons were transferred to the new Group from Fighter Command, and No. 192 Squadron was transferred from No. 3 Group. It was at this time that No. 1473 Flight was absorbed into No. 192 Squadron. A further unit to be transferred from Fighter Command to

the new Group was the Radio Development Flight at Drem. This flight had been set up in the winter of 1942 for the development of airborne radar. After June 1943 it also undertook the training of three or four crews at a time of No. 141 Squadron in the art of homing on to airborne transmissions, using Defiants and Beaufighters supplied by the squadron. On its transfer to No. 100 Group, the unit was renamed No. 1692 (SD) Flight and was moved from Drem to Little Snoring. Six months later it moved to Great Massingham. Two more fighter squadrons (Nos. 169 and 239) were turned over to 'Serrate' operations, and No. 1692 Flight was given the task of converting the crews of these squadrons to the 'Serrate' procedure by means of a fortnight's course and was established with eight Beaufighters for that purpose. After these had been converted the flight was responsible for training reinforcement crews for the three 'Serrate' squadrons. Unlike the former trainees, who had been experienced night fighter crews, the replacement crews were drawn direct from No. 54 (Night Fighter) OTU in Fighter Command, and a longer course of instruction, lasting a month and including 20 hours flying, had to be given. Unfortunately the squadrons were re-equipped with Mosquitos on the transfer of No. 100 Group and as neither No. 54 OTU nor No. 1692 Flight had any Mosquitos, conversion training for new crews had to be given by the squadrons (1) themselves. Strangely enough, No. 101 Squadron - on ABC duties - was not transferred to the new Group although it continued its special duties until the end of the war. This was because it also operated as part of the main bomber force. A new squadron was to be formed in No. 100 Group, however, to undertake the work of airborne jamming, and No. 214 came into existence at Sculthorpe equipped with Fortresses. A second Fortress squadron, a USAAF squadron also operated under No. 100 Group control and carried out similar duties. Fortresses were used for this work in preference to the other four-engined aircraft in Bomber Command because they were best able to carry the necessary equipment and fly with the main bomber force, but at a higher altitude. Its powerful defensive armament was an additional favourable factor. Originally conversion of Stirling trained crews to Fortresses was

(1) ERP 335

carried out by No. 214 Squadron itself, but on 24 April 1944 a special Fortress Training Flight (No. 1699), equipped with three aircraft, was formed at Sculthorpe to undertake the conversion training of replacement crews. The Group was further expanded in 1944 by the transfer of two more Mosquito night fighter squadrons (Nos. 157 and 85) and the formation of Nos. 171 and 199 (Halifax) Squadrons. A special target towing flight of five Martinets was formed in the Group on 24 January. This flight (No. 1694) located at West Raynham, performed a similar duty to the (bomber) defence training flights in the other bomber groups. In May 1944 it moved to Great Massingham to join No. 1692 Flight.

Summary of the Bomber Training Organisation, December 1943

In view of the large number of training units formed within Bomber Command, a brief summary will not be out of place. By December 1943 there were a total of 69 units engaged on the training of bomber crews in the United Kingdom:-

- 23 (Medium Bomber) OTUs
- 1 (Light Bomber) OTU (under ADGB)
- 1 Mosquito Training Unit
- 16 Heavy Conversion Units
- 2 Heavy Conversion Flights
- 3 Lancaster Finishing Schools
- 1 SD Flight (Radar Training)
- 5 Aircrew Schools
- 7 (Bomber) Gunnery Flights
- 6 (Bomber) Defence Training Flights
- 1 PFT Navigation Training Unit
- 1 Night Bomber Tactical School
- 1 Central Night Vision School
- 1 Engine Control Demonstration Unit (in 11 OTU)

In addition to the work of these units, a certain amount of specialist training was carried out on some of the squadrons. The work of some of these has already been described but there is a further squadron which deserves mention, No. 617 Squadron, which was specially raised and trained in 1943 to carry out a low level attack with specially designed bombs on the Mohne, Sorpe and Eder dams. The squadron, which was equipped with

(1) AM File S.73606

20 Lancasters, was made up of selected experienced crews and spent the first two months of its existence practising low level flights at a height of 60 feet over the British Isles. The operation, 'Operation Chastise' was carried out in May 1943 and, although losses were heavy, it was a complete success.

Further Reductions of OTUs

The reduction of the bomber OTU capacity, started in the autumn of 1943, continued in the first half of 1944. The surplus of crews was partially reduced by temporarily increasing the aircrew establishment from 22 to 28 crews per squadron in January 1944. Even so, the existing training facilities were considered to be larger than was now required. In January, therefore, Bomber Command submitted proposals for the reduction of the OTU organisation. It was estimated that the Command's requirements amounted to 6,035 crews per annum. Two hundred and seventy-five of these, it was suggested, should be provided by a new heavy bomber OTU, while the remainder, 5,760 would continue to be provided by the HCU/OTU system. Sixteen HCUs (one more than was available at that time since No. 1655 HCU was transferred to No. 38 Group in January), together with the three LFSs were needed to produce that output and, allowing for wastage, an annual intake of 6,240 medium bomber crews would be needed. This represented approximately the output of 20 OTUs (six months at 32 per unit per month = 192; and six months at 22 per unit per month = 132: total 324 per unit per annum). The overseas commitment, which was expected to die out altogether by May when the overseas OTUs would be working at full pressure, could be met by temporarily retaining one OTU until that time. Thus of the 22 OTUs in existence in January (excluding No. 81 which was now in No. 38 Group) one could be disbanded immediately and another in six months time. Additional capacity at the LFSs could be provided by increasing their strength from 18 aircraft to 24, and their intake from 36 to 48 crews per month.

(1) AHB Narrative, Bomber Offensive Against Germany, Vol. V.

Not all of Bomber Command's proposals were accepted. The suggested heavy bomber OTU which was to be equipped with 54 Stirlings and train 30 crews per month (summer - 20 in winter) on a 12 weeks course, was not proceeded with, chiefly because the Air Ministry considered Bomber Command's claim that 54 aircraft were needed to train 120 crews at a time on a 95 hours syllabus, an underestimate, and that 75 Stirlings would be needed - a requirement which could not be met without using the HCU aircraft and with-
(1)
drawing Lancasters or Halifaxes from the front line to replace them.

Some reduction in OTU capacity, however, did take place. No. 15 OTU Harwell (a full-sized Wellington unit) and No. 23 OTU Pershore (a three-quarter sized Wellington unit) were both disbanded on 15 March in order to release their aerodromes for other purposes. To compensate for part of the capacity so lost, No. 22 OTU at Wellesbourne Mountford was expanded to the equivalent of one-and-a-half OTUs (81 Wellingtons and 6 Martinets in place of 54 and 4 respectively) on the same date. The following month No. 24 OTU Honeybourne was re-equipped from Whitleys to Wellingtons. These changes reduced the overall medium bomber OTU capacity to the equivalent of $20\frac{3}{4}$ standard units. A further reduction occurred in May when, because of the transfer of its satellite Harrington to the USAAF, No. 84 OTU Desborough had to be reduced to three-quarter size. Two more reductions to three-quarter size were also made on 9 May at Nos. 10 and 16 OTUs. These two reductions, however, were only a temporary measure estimated to last for not more than six months, while the construction of runways was in progress at Abingdon and Upper Heyford. Thus, by May 1944, there were the equivalent of 20 full
(2)
sized medium OTUs in existence.

Apart from a few minor alterations, the HCU position did not change materially during the first quarter of 1944. The half-sized HCU (No. 1666) and No. 1679 HC Flight, both located at Wombleton (the latter had moved there in November 1943) in No. 6 Group were combined, at the suggestion of Bomber Command, into one fullsized HCU (No. 1666) equipped with 24 Halifaxes and

(1) AM File S.77400/II

(2) AM File S.99536

eight Lancasters on 27 January 1944. When the Lancaster squadrons in the Group had been re-equipped with Halifaxes the unit would become a full Halifax HCU. The other heavy conversion flight (No. 1678 at Waterbeach) was reduced in size from 12 to 8 Lancasters, and its pupil population lowered from 15 crews to 10 in March 1944, after the number of Lancaster squadrons in No. 3 Group had been reduced to the equivalent of one-and-a-half squadrons. In June the unit was disbanded; and replacement crews for the Lancaster (1) squadrons converted on the squadrons. No. 1652 HCU had two more Halifaxes added to its strength in February and a third, three months later, in order to train a number of crew for the ATA and No. 41 Group, a commitment (2) which had formerly been carried out by No. 1475 (Training) Flight.

Revised Estimate of Training Requirements, April 1944

In the spring of 1944, the wastage rates for Bomber Command squadrons were revised, making it necessary to provide for increased aircrew replacements during the summer months. In April, therefore, Bomber Command put forward their proposals for meeting the new requirements. With an expansion target of 84 squadrons by the end of the year and with wastage rates of seven crews per squadron per month during the summer and six per month during the winter, it was estimated that the equivalent of two new LFSs (making five in all), five new HCUs (making twenty in all) and six-and-a-half new medium OTUs (making $26\frac{1}{2}$ in all) would eventually be needed, although this was a long term programme and would need reviewing in a few months time after the effects of the new wastage rates, and the initial proposals for training expansion, could be assessed.

The Command proposed that capacity equal to the formation of two extra HCUs could be developed by adding four aircraft to each existing HCU and increasing its summer output from 36 per month to 44 (and from 22 to 27 in the winter), necessitating monthly intakes of 46 (summer) and 28 (winter). In addition, three new Halifax HCUs should be formed in June, September and (3) October respectively. To meet the higher HCU intake, Bomber Command

(1) SD 155/1278/44

(2) See Chapter 20

(3) AM File C.36738/48/I

proposed to increase the monthly medium bomber OTU intake of the existing 20 OTUs from 32 to 36 crews a month during the summer (with a proportionate increase during the winter months) which would produce an additional output equivalent to that of two-and-a-half new units, without increasing existing establishments, and by forming the equivalent of four new units between June
 (1)
 and November.

In response to these proposals the Air Ministry agreed that the existing HCUs and OTUs should be expanded as suggested, one OTU should be formed in June and one Halifax HCU in July. The remainder of the proposals, the formation of three more OTUs and two more HCUs by the end of the year were to be used as a tentative programme, to be reviewed as circumstances demanded. The HCU expansion took place on 1 May when all Stirling units were increased from 36 to 40 aircraft and those with Halifaxes from 32 to 36 (No. 1652 expanding to 39). On the same date the LFS expansion proposed earlier in the year, namely the increase from 18 to 24 aircraft per school, took place. In addition a LFS flight of six Lancasters was added to No. 1654 HCU at Dishforth to train replacement crews from RCAF Lancaster squadrons. The Halifax HCU was planned to open at Bottesford as No. 1668 HCU on 28 July.

The increased OTU intakes also started in May, and the additional OTU was provided on 15 June by reducing Nos. 14 and 82 OTUs at Market Harborough and Ossington to three-quarter size and utilising their satellites to form two new three-quarter sized units. Nos. 14 and 82 OTUs were reduced to 40 Wellingtons and 4 Martinets, training 60 crews at a time (summer); Nos. 35 and 86 OTUs were opened at Husband Bosworth and Ganston respectively, and were similarly equipped and organised. This brought the total number of OTUs up to 22, equivalent to 21 standard-sized units. Tentative plans were made for the formation of the other three OTUs; two new full-sized units were to be formed at Harwell (in August) and Tilstock (in September); Nos. 10 and 16 OTUs were due to be brought up from three-quarter to full-size by November (the former was also to be equipped from Whitleys to Wellingtons; No. 19 OTU was to be re-equipped from Whitleys to Wellingtons

(1) AM File C.36609/48/II

which would necessitate its reduction to three-quarter size since its satellite was unsuitable for Wellingtons: a new three-quarter sized OTU was to be formed at Leicester East in September after No. 107 OTU (a temporary transport support OTU located there) had been closed.

Further Changes in Training Requirements, July 1944

Before these plans could be implemented a major change of policy, which was to have drastic effects on the size of the training organisation occurred. For some time past it had been the practice in all Commands except Bomber Command that 50 per cent of crews successfully completing their first tour of operations were counted on to undergo a second tour. Because of the higher casualty rate in bomber squadrons this policy had not been applied to Bomber Command personnel, although numerous crews did in fact volunteer for and undergo a second tour of operations. For various reasons bomber casualties were, by the summer of 1944, considerably lower than in previous months and with the successful invasion of Europe they were likely to become even lower, since crews would gradually be flying over less enemy-held territory. By utilising second tour personnel (roughly two-thirds of whom would become flight commanders in heavy bomber squadrons, and the remainder used on SD or light bomber squadrons) a considerable saving in training units could be effected; so in July 1944 Bomber Command were informed of the new policy. In spite of strenuous opposition from the C-in-C Bomber Command, who considered it grossly unfair that crews who had completed one tour should be required to undergo a second while there were thousands of newly trained personnel stagnating in PRCs, the policy was enforced. The saving in manpower by closing a number of schools was the deciding factor.

Once the new policy was introduced the expansion plans for the Command was scrapped and a new survey of training requirements carried out. Four LFSs, 17 HCUs and 17 OTUs were considered necessary to meet future requirements - an increase of one LFS and two HCUs (one of which was due to form in July) and a reduction of four OTUs of the existing organisation. Arrangements were made to transfer 100 Wellington trained crews to meet urgent

(1) AM File S.97408

(2) AM File S.97408

demands in No. 2 Group and Transport Command, and to compensate for that loss one of the four OTUs due to close would be retained temporarily. Of the other three, one was to be transferred to Transport Command, the staff from another utilised to form a Command Instructors School, and the other disbanded.

The Halt of Bomber Expansion

In September, by which time the two HCUs had been formed (No. 1668 equipped with 36 Lancasters at Bottesford on 28 July, and No. 1669 with 36 Halifaxes at Langar on 15 August), No. 28 OTU earmarked for transfer to Transport Command, and plans made for the expansion of the three LFSs from 24 aircraft per school to 30 in lieu of forming a fourth, a further important decision was taken which affected the future of the bomber training organisation. The favourable development of the general war situation enabled the War Cabinet to rule that no further expansion of the Royal Air Force was to take place after December 1944. Bomber Command would cease to expand after its 84 heavy bomber squadron force had been reached, and after the end of the war with Germany (estimated for planning purposes as June 1945) it would be considerably reduced. It was therefore possible to make further reductions in the training organisation. Only three-and-a-half LFSs instead of four would be needed by December and these could be reduced to two by June 1945. The HCUs could be reduced from 17 in December to nine-and-a-half by May, and the OTUs could be reduced from the 21 existing units (four of which were already destined for disbandment) to 15 by December, and to 6 by March 1945.

Formation of No. 7 Group

Before tracing the effects of these measures, however, the general background of bomber training should be brought up to date. During the summer of 1944, while these momentous decisions were being taken, a number of changes took place in the organisation of training schools. The most important of these was the formation, on 23 September, of a new Group (No. 7), with headquarters at Grantham, to take over control of all the heavy conversion bases and units in Bomber Command. For some time past it had been apparent that these units, operating more than 600 four-engined aircraft, would be more

advantageously controlled by one central Group instead of being split between the six operational groups. Training could be standardised, and all groups would have adequate HCU backing which would obviate the need for transferring crews between operational groups, a practice which had grown up through the varying number of squadrons served by each HCU. It would also mean that, with the exception of No. 6 Group, all operational groups would be limited to one type of aircraft.

The HCUs, together with the five aircrew schools, were gradually transferred to the new group during the autumn of 1944, and by the beginning of November the Group comprised the following units:-

HCU No.	Aircrew School No.	Location	Transferred from
1656	-	Lindholme)	No. 1 Group
1662	-	Blyton)	
1667	-	Sandtoft)	
-	1	Sturgate) (moved from) Lindholme on) 5.11.44)	
1652	-	Marston Moor)	
1663	-	Rufforth)	
1658	-	Riccall)	No. 4 Group
-	4	Acaster Malbis)	
1660	-	Swinderby)	
1654	-	Wigsley)	
1661	-	Winthorpe)	
1668	-	Bottesford)	
1669	-	Langar)	No. 5 Group
-	5	Balderton)	
1659	-	Topcliffe)	
1664	-	Dishforth)	
1666	-	Wombleton)	No. 6 Group
-	6	Dalton)	

The units in No. 3 Group, which were also to be transferred to the new Group during the next few weeks, were first to be moved to stations nearer to Grantham, thus freeing their old stations for operational use:-

No. 1651 HCU Wratting Common to Woolfax Lodge on 10 November

No. 1653 HCU Chadburgh to North Luffenham on 27 November

No. 1657 HCU Stradishall to Saltby on 30 November

No. 3 Aircrew School Shepherds Grove to Gamston on 17 November

The (bomber) defence training flights, which worked directly with the squadrons remained under the control of the operational groups, and so temporarily did the Lancaster finishing schools, since plans were afoot to re-equip the HCUs with Lancasters and so disband the LFSs.

Shortly before the formation of No. 7 Group the course lengths at the HCUs and LFSs had been increased. When the LFSs were originally formed the course length was set at 10 days but experience had shown that this was inadequate and the course was extended to 14 days in July. The HCU course, which was officially four weeks, had for some months been extended to five by the addition of one week's ground training at the HCU stage. Bomber Command insisted that the period of ground training should now be increased to two weeks (making six weeks in all), one week of which would be carried out at the Aircrowd School. This arrangement was approved and put into practice in August 1944 and the five weeks HCU course recognised. Intakes, which had been running at 46 per month (summer) and 28 per month (winter) were now every five weeks. It was also agreed that the Aircrowd School should be reduced in phase with the requirements for the Japanese War, and when they had all been disbanded an extra week's ground training should be added to the HCU course bringing it up to six weeks.

Withdrawal of Stirlings from the HCUs

The shortage of Lancasters, which had necessitated the use of Stirlings for training purposes - which, compared with the Lancaster, was an uneconomical training aircraft - had now disappeared and plans were made to re-equip the Stirling HCUs with Lancasters. The higher serviceability rate of the Lancaster would enable a Lancaster HCU equipped with 32 aircraft to do the work being undertaken by the combination of Stirling HCUs with 36 aircraft and Lancaster finishing schools with 24. By re-equipping the six Stirling HCUs with Lancasters and disbanding two of the three LFSs - the third was required to convert Halifax crews to Lancasters - a saving of 144 aircraft and over 2,600 personnel would be effected. The three units in No. 3 Group were to be re-equipped as they moved to their new stations. Nos. 1651 and 1653 HCUs moved and were re-equipped according to plan, but Saltby, the new

aerodrome for No. 1657, did not become available in time, so the unit was disbanded on 15 December, the first of the reductions foreshadowed in the autumn. The remaining three Stirling HCUs were re-equipped a few weeks later, No. 1661 HCU on 6 December and Nos. 1660 and 1654 in January 1945. Half the output of No. 1651 HCU had previously gone to maintain the two special duty squadrons in the United Kingdom (Nos. 138 and 161 Squadrons) and No. 1586 Flight in the Middle East, but it was thought that sufficient crews for those units would be available from the crews returning for a second tour. The decision to re-equip the Stirling units was soon extended to those units equipped with Halifaxes which were training crews for Lancaster squadrons, and Nos. 1656, 1662, 1666, 1667 and 1669 HCUs had all been re-equipped with Lancasters by the end of the year. This re-equipment meant that the third LFS could be closed. No. 1 was closed in November and the other two were scheduled to disband early in 1945. At one stage it was contemplated using No. 3 LFS at Feltwell for the training of BOAC crews, but the aerodrome turned out to be unsuitable so the school was closed and a new one opened under Transport Command for that purpose. It was also arranged that those HCUs remaining on Halifaxes (Nos. 1652, 1658, 1663, 1659 and 1664) should be re-equipped with Halifaxes Mark III, which were easier to maintain than the Mark IIs and Vs in current use, and their establishment brought into line with the Lancaster units by reducing it from 36 per unit to 32. The small LFS flight attached to No. 1654 HCU was disbanded, but the three extra Halifaxes at No. 1652 HCU for the training of ATA and No. 41 (1)
Group crews were retained.

Further Reorganisation of Gunnery Training Flights

In August 1944 the six (bomber) defence training flights in the operational training groups were amalgamated with the target towing flights at the OTUs. As the Martinet target towers at the OTUs were being replaced by Hurricanes, and the Tomahawks in the (B) DTFs had already been replaced by Hurricanes, it was thought that the amalgamation would reduce overheads

(1) AM File C.36609/40/II

in maintenance staff, it was chiefly the difficulties over servicing and maintenance that had led to the establishment of separate flights in June 1943 when Tomahawks had been introduced. As a result of this amalgamation, Nos. 1681 - 1686 Flights were disbanded and the four Martinets or Hurricanes at the standard sized OTUs replaced by six Hurricanes and two Masters. The one-and-a-half sized OTU (No. 22 OTU) was given nine Hurricanes and three Masters and the three-quarter sized units (Nos. 10, 14, 16, 19, 83, 84, 85 and 86) established with five Hurricanes and two Masters. These various changes during the past 15 months were due to the revolutionary advance made in the training of air gunners. The introduction in early 1943 of the cine-gyro assembly, which enabled a highly realistic type of practice to be carried out and the marksmanship of the air gunner accurately assessed, marked the greatest advance in gunnery training since 1939. Later, in 1944, by using an infra red film, it was found possible to use the new equipment at night. As a result the use of target towers for air firing practice was replaced almost entirely by the system of employing aircraft for fighter attack exercises. Of the 10 hours gunnery training, only one-and-a-half were now taken up by air firing practice; the remainder were used to give the crew as a whole training in the tactics necessary to counter fighter attacks. Both Masters and Hurricanes were used for these exercises (Masters doing the elementary exercises) and the bomber aircraft in use at (1) the OTUs were used for the small amount of target towing now necessary.

A few months later, following the success of the amalgamation of the (B) DT flights with the OTUs, arrangements were made to reorganise those flights working with the HCUs and squadrons. In October, by which time the number of flights serving the HCUs and squadrons had been increased to nine (eight (B) DT flights and one (B) G flight) by the formation on 1 September of No. 1321 (B) DT Flight at Bottesford to serve the two new HCUs, the formation of the new HCU Group had been approved, so it was arranged to establish a number of aircraft for fighter affiliation at each of the 17 HCUs and to reduce the size of the (B) DT flights to meet only the needs

(1) AM File C.36572/40/I & II

of the squadrons in the groups they served. On 1 November, therefore, two Hurricanes and two Spitfires were added to the establishments of the 17 Heavy Conversion Units, and Nos. 1687, 1688, 1689, 1690 and 1695 (B) DFTs reduced to 12 Spitfires and Hurricanes and one Oxford; No. 1696 (B) DTF in No. 8 Group had 18 Spitfires and Hurricanes and one Oxford; and No. 1694 (TT) Flight in 100 Group was renamed as a (B) DTF and re-established with six Spitfires. Later, in 1945, Beaufighters replaced the Hurricanes at both the HCUs and the (B) DFTs. No. 1321 (B) DTF was surplus to requirements and was disbanded on 1 November, and No. 1481 (BG) Flight, which had been working with No. 1 LFS, was disbanded three weeks later.

Further Plans for Training Reduction, November 1944

After the decision, taken in September, to reduce the size of the bomber training organisation, arrangements for the closure of schools went ahead rapidly. In November further decisions were taken that reduced training requirements still further. Although it was assumed that the existing crew replacement rates would continue until June 1945, it was ruled that the front line would be reduced to conform with the revised MAP aircraft production programme, which meant that the total of 85 heavy bomber squadrons would be reduced to 82 squadrons by March and to 73 by June 1945. Training requirements were reduced proportionately: HCU requirements to 12 by March 1945 and to two-and-a-half by June; OTUs to 12 by December and to two-and-a-half by June 1945. By December one HCU (No. 1657) had been closed, reducing the total to 16, while at the OTU stage, the first link in the bomber training sequence, the 22 units in existence ~~in existence~~ in June (two one-and-a-half sized units, 12 full-sized units and 8 three-quarter sized units, equivalent to 21 standard units) had been reduced to 18 (equivalent to 16 standard units) by:-

- a. transferring No. 28 OTU Wymeswold (a full-sized unit) to Transport Command on 1 October 1944.
- b. disbanding Nos. 83 OTU Peplow, 86 OTU Gamston and 16 OTU Upper Heyford (all $\frac{3}{4}$ sized units) on 28 October, 15 October and 12 December respectively.
- c. reducing Nos. 20 and 22 OTUs (both $1\frac{1}{2}$ sized) to full size

(1) AM File C.36572/48/II

d. reducing Nos. 19, 29 and 30 OTUs (all full sized) to $\frac{3}{4}$ size.

No. 26 OTU at Wing has been temporarily reduced to three-quarter size in August but reverted to full size three months later.

Plans were in hand to reduce to the equivalent of 12 OTUs by disbanding two more full sized units (Nos. 18 and 27) and three three-quarter sized units (Nos. 29, 30 and 82) and expanding No. 10 OTU from three-quarter strength to full size during the first two months of 1945.

Light Bomber Training

Although the medium and heavy bomber crew requirements were reducing during the latter half of 1944, there was a growing demand for light bomber crews both in Bomber Command and the 2nd TAF. The Mosquito Training Unit which supplied crews for No. 8 Group had to be expanded several times during 1944. In April it was almost doubled in size; its intakes were increased from 8 crews per fortnight to 15 and its aircraft establishment raised from 18 Mosquitos and 8 Ansons to 28 and 10 respectively. Two months later, when the number of PFF Mosquito squadrons was to be raised from 7 to 10, intakes into No. 1655 MTU were increased to 30 per fortnight and a further 20 Mosquitos and 14 Oxfords added to its establishment. It was also arranged for the unit to train selected pupils direct from AFUs. Formerly intakes had comprised either second tour personnel or ex-instructors who had been given a short OTU course at one of the Wellington OTUs. At the end of the year, when a number of the medium OTUs were closing, the opportunity was taken to use one of the surplus units and convert the MTU into a full sized strategical light bomber OTU, and on 12 December, when the OTU at Upper Heyford was disbanded, the MTU was moved there from Warboys. It resumed training three weeks later as No. 16 OTU under No. 91 Group, equipped with 57 Mosquitos and 32 Oxfords and training 25 Mosquito crews per week on an (1) 8 weeks course, supplying replacement crews for No. 8 Group. The 'Oboe' and 'H28' training elements of No. 1655 MTU remained behind at Warboys where they were absorbed into the PFF Navigation Training Unit, which meant that in addition to its navigation flight of 14 Lancasters and 2 Oxfords, the unit

(1) AM File S.99536/II

comprised an 'Oboe' flight of 10 Mosquitos and 10 Oxfords and an 'H2S' flight
 (1)
 of four Mosquitos and three Oxfords.

The old light bomber OTU (No. 13 at Bicester) which was working under ADGB and training Boston, Mitchell and Mosquito crews for No. 2 Group in 2nd TAF, had also been reorganised. Its Mosquito syllabus was similar to that of the night fighter OTUs in ADGB and, to avoid confusion, a brief description of the various types of Mosquito training is given below. Long range fighter crews for Coastal Command were trained at No. 132 OTU; crews (2) for night fighter squadrons (both at home and overseas) and 'Serrate' squadrons in Bomber Command (No. 100 Group) were trained at Nos. 51, 54 and 63 OTUs; - those for No. 100 Group undergoing further training at No. 1692 Flight; crews for strategical light bomber squadrons in No. 8 Group were trained at the MTUs; those for intruders, long range day fighter and light bombers whose OTU syllabus was practically identical were trained in Canada at Nos. 31 and 36 OTUs. These Canadian trained crews needed an acclimatisation course in the United Kingdom before joining their squadrons: intruder and day fighter crews passed through No. 60 OTU and light bomber crews through No. 13 OTU. This was the position at the beginning of 1944. No. 13 OTU which was training 20 Mosquito crews (ex No. 36 (Canadian) OTU) every four weeks on a four weeks course, was altered two months later to train 18 crews every month on a six weeks course. In May the course was extended to eight weeks but three months later it reverted to six weeks. At the same time as the alteration of the Mosquito intakes the Blenheim/Boston/Mitchell courses were considerably reorganised. In February 1944 Blenheims were withdrawn from No. 13 OTU and the Boston commitment was reduced to eight crews per month, four of which were on a four weeks acclimatisation course ex No. 34 OTU in Canada, and four (French personnel) on a 12 weeks all-through course. The Mitchell conversion course intakes for personnel ex No. 34 OTU were increased to seventeen and the course extended from four weeks to six to allow for Gee training. Full, twelve week courses on Mitchells for six (3) Polish crews per month were also started.

(1) AM File S.84851/II

(2) See Chapter 18

(3) AM File S.94915/I

Mosquito light bomber requirements continued to grow and in March 1944 No. 60 OTU at High Ercall, which was working at half size, began training a few light bomber crews in addition to its intruder commitment to supplement those trained at No. 13 OTU. Eight crews a month were trained on a 12 weeks all-through course. In August, by which time arrangements had been made to carry out all Mosquito light bomber OTU training (except for a few Polish crews) in Canada (with an acclimatisation course in the United Kingdom), No. 60 OTU was expanded to full size and turned over completely to light bomber training. Its intruder training commitment was transferred to No. 54 OTU and intakes revised to 30 RAF crew (ex Canada) every month on an eight weeks acclimatisation course, together with three Polish crews per month on a full 12 weeks course.

On 1 April 1944, in common with the other groups in the 2nd TAF, a special group support unit was formed in No. 2 Group to provide a pool of light bomber crews from which to feed the operational squadrons and to provide a certain amount of post OTU training. No. 2 GSU which formed at Swanton Morley, came into operation on the day that No. 1482 (Bomber) Gunnery Flight disbanded and seven Martinets and three Hurricanes from that flight were utilised to make up part of the GSUs aircraft establishment, the remainder being ten Mosquitos, five Bostons and seven Mitchells. In July (1) an additional four Mitchells and five Mosquitos were established at No. 2 GSU in order to provide courses of instruction in the use of Gee-H equipment for Mosquito and Mitchell crews from Nos. 13 and 60 OTUs. This was an interim measure until sufficient Gee H apparatus became available for the training to be carried out at the OTU stage. Subsequently it was given only to Mitchell crews who carried a special Gee H operator. In December, because its airfield was required by No. 100 Group, No. 2 GSU had to be moved from Swanton Morley to Fensfield.

December also saw a slight alteration in the system of training light bomber crews for squadrons in No. 2 Group equipped with American types of aircraft. After May 1944, when the flow of crews from No. 34 OTU in Canada

(1) AM File S.12793/II

ceased, intakes into No. 13 OTU for Mitchell and Boston conversion and acclimatisation courses had to be drawn from surplus Baltimore and Wellington crews from the Middle East, and arrangements were made to supply additional crews from the United Kingdom Wellington OTUs should the flow of surplus crews from the Middle East cease. In December the long (12 weeks) courses were stopped, both for Polish crews on Mitchells and French crews on Bostons, and arrangements made to draw French and Polish crews from medium bomber OTUs and give them the normal acclimatisation and conversion courses. Mitchell intakes were therefore revised to eighteen every month on a six weeks (eight in winter) course, all drawn from medium bomber OTUs in the Middle East or Bomber Command, and Boston intakes altered to eleven every four weeks on a four weeks (six in winter) course. A number of Dutch and Belgian crews were also trained at No. 13 OTU on a ten weeks (twelve in winter) all-through course at the rate of five per month.

The Bomber Command Instructors' School

Although by the winter of 1944, the trend of the bomber training organisation was towards retraction, a number of new units were opened. Indeed, it was the closure of schools and the consequent throwing up of airfields, aircraft and instructional staff that made the formation of the new specialist units possible. The most important was the Bomber Command Instructors School which was formed at Finningley in December 1944, on the closure of No. 18 OTU at that station. Equipped with 22 Wellingtons, 10 Lancasters and five Halifaxes and 3 Hurricanes, the new school was formed to train instructors for the HCs and OTUs in Bomber Command. Pilots underwent a six weeks course of instruction and other aircrew categories four. Intakes were 25 pilots, 20 navigators, 20 air gunners, 16 air bombers, 15 wireless operators/air gunner and 15 flight engineers a fortnight, giving a total pupil population of 245. The course for pilots, which was intended to supplement the normal four weeks FIS course given to all pilots to be employed on instructor duties at OTUs, included 40 hours flying. Other categories, who did not undergo any other course of instruction, did not receive flying practice. The formation of this school had been recommended by Bomber Command as early as May 1944, but shortage of aircraft and manpower prevented its formation at that time.

When the BCIS was opened it was possible to amalgamate the following subsidiary instructors at the new school:-

- a. The Night Bomber Tactical School at Ingham
- b. The Engine Control Demonstration Unit at Westcott
- c. The Bombing Analysis School at Buntingthorpe

The latter school had been opened on 5 July 1944 to give training to bombing leaders and air bomber instructors in the analyses of bombing results. It had been intended as a subsidiary course of the BCIS but had been formed temporarily as a separate unit pending the opening of the Instructors (1) School.

Prior to the formation of the BCIS, the operational training groups had been running unofficial courses for their OTU instructors. In No. 92 Group, for example, pilots were given a month's course at No. 17 OTU Silverstone - a fortnight for conversion or refresher flying on Wellingtons and a fortnight learning the rudiments of instructing. Navigators and wireless operators were sent for a week's course of instruction at a special Navigation and Signals School at Little Horwood. These courses ceased when the new school was opened.

Other specialist units were established in November 1944 for the training of crews in the operation of automatic gun laying turrets (AGL(T)) - a device which using backward reading AI automatically sighted the turret. The first two squadrons to use the new equipment (No. 460 at Binbrook in No. 1 Group and No. 49 at Fulbeck in No. 5 Group), trained their own personnel starting in June 1944, using a few specially trained instructors provided by the BDU Newmarket which has been carrying out AGL(T) trials since 1943. Two Lancasters were added to each of these squadrons in November 1944 for training purposes, although in February 1945, when AGL(T) equipment was withdrawn from No. 1 Group, the four Lancaster trainers were concentrated at Fulbeck. November also saw the formation of a special training flight, No. 1323 Flight, at Bourne, equipped with 10 Lancasters, which was formed to undertake the training of air gunners for the three pathfinder squadrons (2) in No. 8 Group to be equipped with AGL(T). Training included 10 hours flying together with ground lectures.

(1) AM File S.101114

(2) AM File C36572/48/II

It was intended eventually to incorporate AGL(T) training into the HCU syllabus when more equipment was available, but this had not been fully implemented and only one unit (No. 1651 HCU) was carrying out such training when the war ended, and this was achieved merely by transferring the training commitment at Fulbeck to that HCU in March 1945, at the same time adding a Hurricane and a Spitfire for fighter affiliation exercises.

Another specialist unit was the Gee-H training flight which was formed at Feltwell on 29 December a few weeks before the disbandment of No. 3 LFS for the training of Lancaster crews in No. 3 Group in the use of Gee-H equipment (a radar navigational aid) so that they could undertake target marking duties for night attacks and act as formation leaders for daylight attacks. Previously this training was carried out by the squadrons concerned as their aircraft were fitted with the new equipment, but by December 1944 the stage had been reached when the squadrons could no longer train crews quickly enough. The new unit, equipped with eight Lancasters, trained twenty crews per week, giving each crew about six hours experience in the air using the Gee-H equipment. As in the case of the AGLT training, this flight was to be disbanded when there were sufficient Gee-H trainers to enable the training to be carried out at the HCUs.

Temporary Halt in Training Reductions

In the early months of 1945 two more OTUs were closed, No. 18 OTU at Finningley on 30 January and No. 82 OTU at Ossington on 9 January. The Polish flight from No. 18 OTU was transferred to No. 10 OTU bringing that unit up to full size. Before the remaining three units scheduled for disbandment could be closed the War Cabinet had decided that planning should allow for the defeat of Germany in October 1945 instead of June. Nos. 27, 29 and 30 OTUs were retained which left 14 OTUs still in existence but even so there was now a prospective shortage of crews after the summer of 1945. It was not practicable to re-open the units recently disbanded in time to make a reasonable return and the only alternative was to increase the length of the operational tour for Bomber Command crews. This was done in

(1) AM File S.84851/II

February 1945. Now that the armies were advancing on the continent and enemy air opposition had diminished, the Air Council felt justified in taking this step since an operational tour was no longer as strenuous as those in
 (1)
 the earlier years of the war. The projected training organisation for Phase 2 still remained at two-and-a-half HCUs and two-and-a-half OTUs but it was now delayed until October 1945.

Arrangements were made to reduce the HCU capacity to a level equal to the output of the $1\frac{1}{2}$ medium OTUs, plus second tour personnel, and during March and April 1945 four HCUs (Nos. 1664 (RCAF) Dishforth, No. 1658 Riccall, No. 1662 Blyton and No. 1669 Langar) were closed, bringing the number of HCUs down to 12 (9 Lancasters and 3 Halifaxes). The re-equipment of the Stirling units made the LFSs redundant and No. 3 at Feltwell closed in
 (2)
 January and No. 5 at Syerston three months later. Intakes into HCUs were slightly revised in February, summer intakes being increased to 12 a week and winter intakes to 8 a week, giving a population of 60 summer and 40 winter, in place of the five weekly intake of 46 and 28 respectively. Summer rates began with effect from 16 February 1945, and a monthly output of 42 crews per unit was aimed at. It had been suggested that the syllabus hours should be increased from 40 to 55 per crew and the course extended from 6 weeks (5 weeks HCU and one week aircrew school) to 8 (all at the HCU), but this entailed a 50 per cent increase in capacity and was not possible without opening new units, although it was to be borne in mind for when
 (3)
 Phase 2 training began. The surplus of crews between the OTU and HCU stage of training soon disappeared and after March 1945 the number of crews held in the aircrew schools had been reduced to one week's input for the 12 HCUs at the summer rates ie 144 crews. Three of the five aircrew schools were closed (No. 1 which had moved to Sturgate on 30 March, No. 3 which had moved to Gamston on 2 February, and No. 5 at Balderton on 23 March) and the other two were reorganised to take the required intake. No. 4 Aircrew School at Acaster Melbis took 112 crews per week, and No. 6 at Dalton
 (4)
 specialised on Canadian crews, taking 32 per week.

(1) AM File C.36738/48/I

(2) AM File C.36609/48/III

(3) AM File C.36609/48/II and III

(4) Bomber Command Folder IIH/241/7/133

Planning for Phase 2

While these steps were being taken to reduce the size of the training organisation to meet the requirements of the Phase 2 force, discussion was taking place on the re-deployment of Bomber Command after October and the final shape of the training organisation required to maintain it.

At the beginning of 1945 it was thought that of the 84 heavy bomber squadrons (exclusive of those bomber support squadrons in No. 100 Group and the two SD squadrons in No. 3 Group), 63 would be required after the German War, leaving 21 to be disbanded. ⁽¹⁾ The requirements were broadly as follows:-

- a. Two VLR forces for the Pacific, each of twelve heavy bomber squadrons (one comprising 10 RAF and 2 RAAF and the other 12 RCAF)
- b. Six RAF squadrons for ACSEA
- c. Two RAF squadrons for the Middle East
- d. 20 squadrons (16 RAF and 4 RCAF) for the UK Bomber forces
- e. 11 squadrons (9 RAF, 1 RAAF and 1 Polish) for Transport Command

The RAF VLR force (Tiger Force) was to be organised as a group, and move overseas when trained. Replacement crews for all 12 squadrons would be supplied from the United Kingdom. The six squadrons for ACSEA and the two for the Middle East, which would proceed as reinforcements and not as self-contained forces, would also need replacement crews from the United Kingdom. The Canadian VLR Force, on the other hand, which was to be provided by moving No. 6 (RCAF) Group to Canada for reorganisation and training, would be supplied with reinforcement crews from No. 5 (RCAF) OTU in Canada, while those squadrons transferred to Transport Command, which were to be converted to the transport role on their existing airfields, would thereafter be supplied with replacement crews from the transport training organisation. The RAF squadrons in the United Kingdom bomber force would, of course, continue to be maintained by the bomber training organisation, although Canada agreed to maintain the RCAF squadrons. The bomber OTUs in the Middle East were to be closed and, as No. 5 OTU in Canada would be required for Canadian crews, all bomber training for the RAF in Phase 2

(1) AM File MS 271/44

/ would

would have to be carried out in the United Kingdom. In addition to the sixteen home squadrons and the twenty destined to be sent abroad, Bomber Command would now have to provide replacement crews for the bomber squadrons already serving overseas (six Liberator and Halifax squadrons in the Middle East, plus two SAAF which were shortly to move there, and six Liberator squadrons in ACSEA). Thus the ultimate Phase 2 bomber training requirement was to support a total of 50 heavy bomber squadrons (including two RAAF and two SAAF), all of which were eventually to be equipped with Lancasters or Lincolns.

Crew requirements for these 50 squadrons were estimated to be as follows:-

24 Squadrons in the Far East (ACSEA and VLR Force) -			
3 crews per squadron per month			864 per year
10 Squadrons in the Middle East			
0.7 crews per squadron per month			96 " "
16 Squadrons in the UK			
0.7 crews per squadron per month			132 " "
	Total		1,092 crews per year

It was estimated that 204 of the 864 crews required for the Far East could be provided from personnel who had completed a first tour in Europe during Phase I, and who would not require OTU training. The annual OTU commitment was therefore reduced to that of providing 888 crews. Allowing for 4 per cent wastage at the HCU stage, an intake of 925 crews per annum was required, and after allowing a further 7½ per cent wastage at the OTU stage the intake into the OTUs became approximately 1,020 per year. Using the current course length and intake this requirement called for three OTUs (1) and three HCUs.

It was likely that a short HCU acclimatisation course would be necessary for Canadian trained crews for the four Canadian squadrons in the United Kingdom bomber force and this would be considered later in the year. Meanwhile, the Canadian HCUs would continue to train crews for No. 6 Group for eventual employment in the Pacific Area.

(1) MC.271/44

Renewed OTU and HCU syllabus

Plans for the Phase 2 reorganisation did not end with the mere adjustment of intakes to meet the reduced requirements for the Japanese War, however; once the War in Europe was over it was hoped to utilise part of the ensuing surplus training capacity to improve the standard of operational and conversion training, and to relieve the pressure on training staffs by reducing the tempo of training (by cutting down populations and extending courses) of the OTUs and HCUs. In particular it was hoped to reduce the working week from 60 hours to 48 for all ground personnel. Discussion over these proposals started at the beginning of the year and continued until May when the final decision on the ultimate size and shape of the Phase 2 training organisation was taken. As far as OTUs were concerned the proposal was to extend the syllabus from 80 hours to 90, and this was to be achieved by extending course lengths to 15 weeks (three weeks of which was to be ground training) with intakes of twelve crews every three weeks. This would enable the Wellington establishment to be reduced from 54 aircraft to 44. The HCUs needed rather more reorganisation. For some months past it had been represented by Bomber Command that the HCU syllabus of 40 hours was insufficient even for Phase I, since it consisted mainly of pilot conversion and made no allowance for instruction in the various radar, navigation and early warning devices introduced since the HCUs were first formed, and with the additional training necessary for operating in the Far Eastern area - second pilot training, additional astro and DR navigation, preparation for reinforcement flights, flight refuelling, etc - it was clear that an entirely new syllabus was required. The Phase 2 HCUs were therefore to be sub-divided into two types, those training crews for service in the active theatres (the Pacific and Far Eastern areas) and those training for inactive theatres (the United Kingdom, Middle East, etc). The former, requiring the longer syllabus, were to train 7 crews every two weeks on a 12 weeks course providing 80 hours flying, and the latter 11 crews every two weeks on an 8 weeks course with 80 hours flying. A few weeks later, when flight refuelling was deleted from the active HCU syllabus, the flying hours were reduced to 70 and intakes increased to eight. Courses at both types of school included two weeks ground training, all of which was to be provided

at the HCU in place of the existing system of giving the first week at an aircrew school and the second at the HCU and all units were to retain the old aircraft establishment of 32 Lancasters.

At both the OTUs and HCUs it was proposed that all these intakes should be standard throughout the year, in place of the existing system of working at maximum pressure in the summer months and reducing intakes by approximately one-third during the winter. It was still intended to retain an Aircrew School (No. 4) to act as a pool for HCU crews and the Bomber Command Instructors School.

These proposals meant that considerably more training would be given at both the OTUs and HCU stage, and consequently fewer crews could be trained at a time. Instead of a training organisation comprising two-and-a-half HCUs and two-and-a-half medium bomber OTUs, a total of seven HCUs (five for active theatres) and five OTUs would be needed. An additional HCU would probably be required for the training of RCAF crews in the United Kingdom Bomber Force. The new schools would necessitate the employment of considerably more ground crews and instructional staff than the original plan - 15,700 instead of 8,500 - and although the new scheme was approved in principle on 14 April, the approval had to be conditional upon the availability of manpower.

Further Training Reductions

Just before the German War ended arrangements were made to put these plans into practice. The medium bomber OTUs were reduced from sixteen to five by cancelling intakes in April and May and disbanding eight units in June (Nos. 12, 14, 19, 29, 30, 84 and 85 OTUs) and three more (Nos. 20, 22 and 24) in July.

The five remaining OTUs, all of which were full-sized units began training crews to meet Phase 2 requirements. Until the manpower question had been resolved it was impossible to alter aircraft and personnel establishments at these units although the 15 weeks courses were introduced.

(1) MS.271/44

(2) SD 155/1142/45

The reduction of the HCUs took place a few weeks later. All intakes were reduced from eleven per week to eight at the beginning of May, and three units were disbanded during the early summer months. No. 1663 HCU at Rufforth closed on 28 May, No. 1652 at Marston Moor on 25 June and No. 1651 at Woolfox Lodge on 13 July. With the closure of No. 1652 HCU the training of crews for No. 41 Group and the ATA finally came to an end. All the remaining HCUs were required for Phase 2 training. Five, Nos. 1653, 1654, 1660, 1661 and 1668 were to train crews for the active theatres, and two, Nos. 1656 and 1657, for the inactive theatres. The remaining two, Nos. 1659 and 1666, which were RCAF units training for No. 6 Group, were to continue training Canadian crews, both for the Canadian contribution for Tiger Force and for the United Kingdom bomber force. After No. 1666 HCU had been re-equipped from Halifaxes to Lancasters in May, all nine units were operating with Lancasters. Crews already in the HCUs were to complete the old Phase I syllabus and the Phase 2 courses were planned to start on
 (1)
 13 July.

Revised Light Bomber Requirements

These reductions in the bomber training organisation did not end at the medium and heavy bomber units, and a parallel reduction was being made both in the light bomber schools and in the various ancillary and specialist training units. The light bomber training requirements continued to be dealt with in a diversity of ways. Those required for the special duty squadrons in No. 100 Group, which in the past had been drawn from No. 54 (Night Fighter) OTU in Fighter Command and given further training at No. 1692 (SD) Flight at Great Massingham, would no longer be required after the end of the war in Europe and the latter flight was disbanded on 16 June 1945. The strategical light bomber crew requirements for No. 8 (PFF) Group, which were trained at No. 16 OTU, were reduced to 15 new crews, plus 9 second tour crews, per month, while tactical light bomber requirements for No. 2 Group in the 2nd TAF, supplied by Nos. 13 and 60 OTU, (which had been operating under the control of No. 2 Group, 2nd TAF since their transfer from No. 12
 (2)
 Group Fighter Command in February 1945) were reduced to 31 a month.

(1) AM File C.36609/48/III

(2) AM File A.782721/45

The possibility of merging the strategical and light bomber training into one school was not overlooked, but it proved to be impracticable, not only because of accommodation difficulties but because of the difference in crew composition and operational techniques. At No. 16 OTU crews comprised a pilot and navigator/bomber and training was for medium and high level bombing; while at Nos. 13 and 60 OTUs crews consisted of a pilot and navigator/wireless and training was chiefly for low level bombing. It was therefore decided that No. 16 OTU should continue training strategical light bomber crews for Bomber Command and No. 13 OTU (No. 60 was to be disbanded) tactical light bomber crews for 2nd TAF. Both units underwent a considerable reorganisation to meet the requirements of the Japanese War. At No. 16 OTU, arrangements were made to increase the course length from 8 weeks to 12 so that a higher standard of training could be achieved. Mosquitos were developing a bad reputation owing to the large number of accidents that were occurring - there were over 500 non-operational accidents in the Bomber, Fighter and Coastal OTUs and squadrons in the first six months of the year - and earlier in the year, in March, when crew requirements were reduced and intakes cut from 25 per week to 20, the old aircraft establishment was allowed to stand so that additional training could be given and the syllabus hours raised from 50 to 70 per crew. The extra four weeks envisaged for the Phase 2 course would allow a further 20 hours flying to be added to the syllabus. Besides enabling ferry training to be given to those crews going overseas, the extra training would help to make up for the closure of the PFF Navigation Training Unit. This unit, at Warboys, which had been providing a further 40 hours navigation training for specially selected crews from No. 16 OTU destined for No. 8 Group, was not required for Phase 2 and it was closed on 18 June. The Oboe and H2S training flights remained temporarily at Warboys and were attached to Nos. 105 and 139 Squadrons until their future policy could be decided - and this had not been done before the
(1)
War ended.

(1) AM File S.99536/II

A great deal of discussion over the exact size and shape of No. 16 OTU went on through the summer of 1945 and nothing definite had been decided when the war ended. The course length was extended from 8 weeks to 12 by Bomber Command in July and intakes were reduced to 14 every 2 weeks (giving an extended output of 24 per month after allowing for 15 per cent wastage), but this was done before Air Ministry approval had been obtained since the changes did not involve additional manpower or aircraft. In fact a slight saving was made and the aircraft establishment was reduced to 56 Mosquitos (1) and 20 Oxfords.

The tactical light bomber OTUs were similarly reorganised. Even before their transfer from Fighter Command to 2nd TAF was effected (which was done to allow the closest possible contact between the operational squadrons and their supporting training units) it had been intended to absorb No. 60 OTU into No. 13, and the cessation of Boston training at No. 13 OTU in March allowed this amalgamation to take place. No. 13 OTU, which had moved to Harwell from Bicester in October 1944, was split into two sections: the Mitchell section at Harwell and the Mosquito section at the satellite Finmere. No. 60 OTU, with Mosquitos, moved from High Ercall to Hampstead Norris which became a second satellite to Harwell and the whole unit became No. 13 OTU. The Mitchell section, equipped with 60 Mitchells and 7 Ansons trained 15 crews every two weeks on a 10 weeks course. Every other intake included five Dutch or Belgain crews and five French. The Mosquito section, equipped with 65 Mosquitos and 8 Ansons, operated at the satellites in two halves: the initial and intermediate training flights at Finmere and the advanced training flights at Hampstead Norris. Intakes were eleven English crews per week and five Polish crews every four weeks. The English courses lasted eight weeks, but the Poles, who had not undergone previous OTU training in Canada, were given a twelve weeks course. (2) The unit also included a gunnery flight of seven Spitfires.

(1) AM File C.36574/48/2

(2) No. 13 OTU ORB

After the end of fighting in Europe, the unit was reorganised to meet its Phase 2 commitments. Mitchell training was discontinued and the last course passed out on 28 May, and the Mosquito courses were reduced to training 31 crews a month on a 10 weeks course.

In addition to the PFF Navigation Training Unit and No. 1692 (SD) Flight, a number of other specialist training schools became redundant after the end of the war in Europe and were disbanded in the summer of 1945. The Gee-H training flight at Feltwell was closed on 5 June, and the training commitment transferred to the HCU stage, and No. 1699 (Fortress) Training Flight which had been training replacement crews for Nos. 214 and 223 Bomber Support (1) Squadrons in No. 100 Group was disbanded on the 29 June. The AGLT training flight (No. 1323) at Bourn was also planned to close although it did not (2) actually do so until six weeks after the end of the war.

The closure of so many units in a short space of time caused a large number of personnel in various stages of training to be rendered surplus to requirements, and special units had to be set up to accommodate them pending (3) their final disposal. Six such units, known as Aircrew Holding Units (ACHU), each capable of holding up to 1,500 personnel, were formed in Bomber (4) Command in June 1945:-

<u>ACHU No.</u>	<u>Location</u>	<u>Group No.</u>	<u>Formed 1945</u>
7	Blyton	7	7 June
8	Rufforth	6 (RCAF)	7 June
9	Gamston	91	7 June
10	Burn	7	15 June
11	Bruntingthorpe	92	7 June
12	East Moor	6 (RCAF)	15 June

Final Training Reduction

In July 1945, a final decision on manpower allocations for Phase 2 was given, and this reduced the size of both the front-line and the training organisation. Crew requirements were reassessed and the proposed training organisation reviewed, with the result that four medium bomber OTUs instead of five, and five HCUs instead of seven (excluding those for the RCAF) were

(1) AM File S.99536/II

(2) AM File C.36572/48/II

(3) AM File C.36609/48/III

(4) AM File A.782721/45

deemed sufficient to meet future requirements. The reduction was possible mainly because the units were to continue to be established at Phase I standards, which meant that training would be at a higher intensity than had been envisaged when the original Phase 2 requirements were worked out. It was also decided that the winter and summer basis of operation was to continue although the additional syllabus hours were approved, and the revised organisation was as follows:-

No. of Units	Summer Intakes - No. of Crews	Winter Intakes - No. of Crews	Course Length - Weeks	No. of Hours per crew	Aircraft Establishment
4 OTUs	16 (every 3 weeks) -	- 12 (every 3 weeks)	12))) 15)	90	40 Wellingtons 6 Hurricanes 2 Masters
4 HCUs for Active Theatre	10 (every 2 weeks) -	- 12 (every 3 weeks)	10))) 12)	70	27 Lancasters 2 Spitfires 2 Hurricanes
1 HCU Inactive Theatre	12 (every 2 weeks) -	- 11 (every 2 weeks)	8))) 8)	50	27 Lancasters 2 Spitfires 2 Hurricanes

This decision meant that one more OTU and two more HCUs could be disbanded, No. 11 OTU at Westcott was to be closed on 18 September, No. 1661 (1) HCU Wenthorpe on 24 August and No. 1654 HCU Wigsley on 1 September.

Although the revised aircraft establishment had not been formally introduced, training on the new syllabus started at the remaining schools during July, only to be interrupted a few weeks later by a further reorganisation consequent upon the termination of the Japanese War.

The RCAF Heavy Conversion Unit requirements in the United Kingdom were also considered in detail in July 1945 and it was decided that one HCU of 42 Lancasters would suffice to meet all RCAF needs. No. 1659 (RCAF) HCU at Topcliffe was expanded accordingly, and No. 1666 (RCAF) HCU at Wombleton disbanded. It was also possible to close the Canadian Aircrew School (No. 6) (2) at Dalton and these three events all took effect on the 3 August.

(1) AM File A.782721

(2) AM File S.84581/III

Reduction of Bomber Command Instructor's School

These reductions in the OTU and HCU organisation made it possible to effect a proportionate decrease in the size of the Bomber Command Instructors School. Its aircraft were reduced to 13 Wellingtons, 13 Lancasters, 4 Mosquitos and 4 Hurricanes or Spitfires, and intakes reduced to 24 pilots every 3 weeks on a 6 weeks course and 90 other aircrew per month on a 4 weeks course. The Night Bomber Tactical School at Ingham, which was controlled by the BCIS was closed on 25 May 1945, but the Engine Control Demonstration Unit and the Bombing Analysis School, both of which moved to Worksop in the spring of 1945, continued to operate under the control of the BCIS. A further school, the Bomber Command Central Night Vision School was brought under the control of the BCIS in June. By that time it had been considerably reduced in size. The major reduction took place in February when some of the other commands were allowed to train their own instructors. Originally when the school was first recognised the policy of the school was to train night vision instructors for all commands and to investigate and develop new ideas. Since that time, however, Fighter Command (and later Transport Command) had begun training their own instructors at their night vision training sections, and in February 1945, the Fighter Command School at Cranfield, the Transport Command School at Llandow (which later moved to Ossington) and the No. 38 Group School at Ashbourne, were all given independent status (formerly they were merely part of the main training units at those stations) and renamed Command Night Vision Instructors Training Schools. The Bomber Command School was accordingly reduced in size and moved from Upper Heyford to Workshop, and a few months later, in June 1945, it was affiliated to the BCIS. It continued to train instructors for the other commands, chiefly Coastal and Flying Training, and continued to be known as the Bomber Command Central Night Vision School. Shortly after the end of the war the Fighter, Transport and No. 38 Group Instructors Schools were closed and the school at Worksop was divorced from the control of the BCIS at Finningley to become the RAF Central Vision Training School. Apart from the training of instructors, night vision training was recognised as an integral part of operational training and continued to be undertaken by centres established at the various HCUs, OTU, etc within their existing resources.
(1)

The (bomber) defence training flights were also reduced in number. First to close was No. 1689 (B) D.T.F. at Holme which was disbanded on 7 May 1945 after arrangements had been made to transfer its parent Group (No. 4) to Transport Command. Next was No. 1695 (RCAF) (B) DTF at Dishforth - it had moved there from Dalton on 23 April 1945 - which disbanded on 28 July after all No. 6 Group squadrons had transferred to their Phase 2 locations. Two days later No. 1694 (B) DTF at Great Massingham, serving No. 100 Group, was disbanded. Two more units were scheduled for disbandment, but did not actually close until a few weeks after the end of the war. These were No. 1696 (B) DTF at Warboys in No. 8 (PFF) Group and No. 1690 (B) DTF at (1) Syerston in No. 5 Group - the projected Tiger Force Group. Thus, only two (B) DT flights were planned to remain for the Phase 2 training organisation: No. 1687 at Ingham and No. 1688 at Newmarket.

Before all the preparations for reducing the size of the training organisation to meet the requirements of the Japanese War had been completed, the Japanese War ended. Phase 2 training plans were thus superseded by those for Phase 3, the post war era.

By 15 August 1945 the Bomber training organisation comprised a total of (2) 29 units, six of which were scheduled for disbandment.

(1) AM File C.36572/48/2

(2) See Appendix 85

CHAPTER 18OPERATIONAL TRAINING IN FIGHTER COMMAND

On the outbreak of war Fighter Command was in the position of being the only Command to oppose the Air Ministry plans for establishing special units to train newly qualified pilots from the FTS up to an operational standard before posting them to squadrons, and at the same time being the only Command possessing such a unit. In spite of Fighter Command's objections, who considered that it was a waste of operational aircraft to use them for training purposes when such instruction could be given by the squadrons themselves, No. 11 Group Pool had been formed at Andover on 16 January 1939, using (1) four Demons to train eight pilots at a time on a four months course. The need for units of this type to bridge the rapidly widening gap between the aircraft of the training schools and those of the front line had been recognised for several years by the Air Ministry and it was considered that three group pools would be needed to back the 36 fighter squadrons. Shortage of aircraft, aerodromes and personnel had combined to delay their development, however, and even No. 11 Group Pool, which had been moved to St. Athan in March 1939 and re-established with more modern aircraft (11 Battles and 22 Hurricanes or Spitfires) was, in September 1939, seriously below establishment and its energies for the most part were devoted to the advanced training of volunteer reservists.

Directly war was declared the No. 11 Group Pool, which was then only five Hurricanes short of its authorised establishment of 22 Hurricanes and 6 Harvards (these latter had replaced the Battles a few weeks earlier) had its course length halved to 4 weeks and the syllabus hours reduced from 45 to 30 per pupil. With intakes of 24 pilots every 4 weeks, it was hoped to produce roughly 300 operationally trained pilots a year.

Army Co-operative Training

In addition to fighter squadrons, the army co-operation squadrons of No. 22 Group were administered by Fighter Command, and until November 1940, when Army Co-operation Command was formed, Fighter Command was responsible

(1) AM File S.46938

for training at the School of Army Co-operation, Old Sarum, a school which had been in existence since the first world war and was perhaps the forerunner of the operational training unit. On the outbreak of war this school, which was a specialist school responsible for training replacement crews for the tactical reconnaissance squadrons (Lysanders), the night reconnaissance squadrons (Blenheims) and the strategical reconnaissance squadrons (also equipped with Blenheims) of the Air Component of the Field Forces, which was then moving to France, was reorganised by adding a reserve pool. The combined school and reserve was planned to train 72 pilots, 37 observers and 72 air gunners at a time on a six weeks course which included 40 hours flying. Its aircraft establishment was increased to 12 Lysanders, 12 Hectors, 12 Ansons and 15 Blenheims, and the school was generally regarded as the Army Co-operation Group Pool.

(1)

It was soon found that Old Sarum was too small to carry out this additional training and the pool was split into two sections. Single-engined aircraft training remained at Old Sarum with an output of 20 pilots and 20 air gunners every two weeks and the twin-engined element (12 Ansons and 15 Blenheims) was moved to Andover where 10 crews every fortnight were trained. Courses remained at six weeks at both stations until January 1941, when courses at Andover were extended to eight weeks. The section at Andover commenced work on 15 November 1940 and soon became known as No. 2 School of Army Co-operation, the original school at Old Sarum becoming No. 1.

Formation of No. 12 Group Pool

Although Fighter Command were willing enough to see the development of the Army Co-operation Pool, they were still sceptical of the value of the fighter group pools mainly because these would have to be developed at the expense of the front line - the transformation of the School of Army Co-operation did not of course directly affect the strength of the first-line squadrons, and in any case it was essential to establish a pool to support the army co-operation squadrons in France - and the C-in-C Fighter Command vigorously contested the need for No. 12 Group Pool (which had originally been scheduled to open in the summer of 1939 but was delayed through shortage

(1) AM File S.1949/I

of aircraft). At conferences on 15 and 21 September he made it clear that he preferred newcomers from FTSs to be trained in the operational squadrons, using No. 11 Group Pool at St. Athan to deal only with reinforcements for France. He considered the second Group Pool for Aston Down to be unnecessary. While Fighter Command was still at long range from German fighters he considered it wiser, since there was so grave a need for additional squadrons, to put all available resources into the first line and undertake final training in squadrons, provided pilots from SFTSs had done some formation flying and night flying, and had fired their guns in the air. ⁽¹⁾ The Air Ministry contended that lack of group pools would mean lack of casualty replacements when fighting became intense, and that group pool aircraft could if necessary be taken for operational use. Eventually Fighter Command agreed somewhat reluctantly to the opening of Aston Down on a limited basis provided it did not absorb any Hurricanes or Spitfires. Training was to go on in squadrons; the need for it was impressed on group commanders, and each squadron continued to hold a dual-control aircraft for instructional work.

No. 12 Group Pool opened at Aston Down on 25 September, equipped with 6 Harvards, 3 Blenheims and 11 Gladiators, training pilots at the rate of 230 per year. It was intended to expand the Pool as and when aircraft became available to an establishment of 16 Blenheims, 32 Hurricanes or Spitfires and 9 Harvards. Both pools were handicapped by shortage of cine-camera guns and reflector sights, and by lack of proper armoury and ground R/T facilities. Nevertheless, when the general adequacy of group pools to STFS output was examined in October the two fighter pools appeared satisfactory. Their planned capacity at full establishment almost matched the SFTS output rate of 1,100 fighter pilots per year, although in actual fact they were far below establishment, capable of dealing with less than half the planned numbers, ⁽²⁾ and able to do little Blenheim and no Spitfire training. To remedy the Blenheim training deficiency a few pupils were given conversion courses at Hendon in December 1939.

(1) AHB/IIH 1/18

(2) AM File S.46938

Planned Expansion of the Fighter Training Organisation

By December, too, the high proportion of accidents not due to enemy action in operational (particularly in Blenheim) fighter squadrons seemed to prove the need for an intermediate stage of training between the STFS and the squadron. It was becoming increasingly clear that squadrons would not be able to give adequate training if engaged in intensive operations; operational training schools were therefore a real requirement.

The following month it was agreed in principle that an adequate OTU organisation should be established for Fighter Command, and priority was to be given to Blenheim training. (1) The two existing group pools were renamed operational training units in March and were no longer to be affiliated to particular groups, although they continued to be controlled by those groups until June 1940 when they were placed under the administrative control of No. 10 Group. It was ultimately intended to provide OTUs specialising in the various types of aircraft serving all fighter requirements. The Fighter training organisation was to be expanded by 1 April 1940, and three OTUs with a total aircraft strength of 48 Hurricanes, 34 Spitfires, 20 Blenheims, 4 Defiants, 2 Gladiators and 24 Harvards or Battles were planned. This was only an interim enlargement; the planned first-line strength for 1 April was 57 squadrons, or 912 aircraft, which meant that the recently agreed policy of providing one training aircraft for every five squadrons in Fighter Command called for OTU backing by some 180 aircraft (three-quarters of which were to be operational types).

These decisions were not welcomed by Fighter Command who did not agree that the increase in accidents was due to inadequate training, and pointed out that there were other causes, such as unreliable engines, for the Blenheim accidents. They had successfully resisted Training Command's proposal to omit air firing from SFTS training and transfer it to OTUs, with the consequence that the difference between Group 1 and Group 2 pilot training at SFTSs became more marked. They now insisted that if the aircraft and personnel were available to provide 48 Hurricanes and 34 Spitfires for training they should be used to increase the number of fighter

(1) AM File S.1924

squadrons "rather than to increase the size of the Pools which are (except as regards the commitment for training pilots for France) a comparative luxury". In particular they objected to the opening of the third OTU before all first line requirements had been met.

These arguments were of no avail; the Air Ministry decided that OTUs should be gradually brought up to establishment as soon as the first line re-equipment then in hand had been completed. Blenheims were to be supplied at once; and Hurricanes and Spitfires as soon as the first line rearming was done. By the beginning of April, however, no expansion of the fighter OTUs had taken place. The total number of aircraft in the fighter OTUs was 37, only 20 of which were operational types, instead of 132 as the interim enlargement had planned, or 180 as the 20 per cent ratio provided. The combined output from both OTUs was barely enough to back the fighter squadrons in France and supply 90 Blenheim pilots a year to Fighter Command. The standard of Fighter OTU training was seriously criticised from France (by BAFF) at the beginning of April. Some pilots from No. 6 OTU (formerly No. 11 Group Pool) which had moved to Sutton Bridge on 6 March had reached France after having done only 10-12 hours on Hurricanes, and with no instruction in high altitude flying, the use of oxygen, or fighter attacks. Shortage of spares and maintenance personnel caused No. 6 OTU to have less than one-third of its 16 Hurricanes serviceable; and an even worse state of affairs existed at No. 5 OTU (formerly No. 12 GP) which had only four Blenheims. Lack of operational equipment was another handicap, and so was shortage of qualified instructors.

All this time new pilots for Fighter Command, except a few Blenheim pilots from Aston Down, were trained in squadrons. There had been steady pressure from Fighter Command for the dual Battles which squadrons held for this purpose to be replaced by Harvards or Masters, but advanced trainers were badly needed in SFTSs and few were available. At the end of April 1940, Fighter Command had a mixed bag of 23 battles, 5 Harvards, 9 Masters and 12 Hinds in use for squadron training.

(1) AM File S.5981

(2) AM File S.1924

(3) AM File S.1924

Opening of a Third OTU

The urgent need for fighter pilots which suddenly appeared in May and June of 1940 as a result of the invasion of France and the low countries could not be met by the two existing OTUs. At their exiguous "interim" strength they had a maximum output of 80 pilots per month against a monthly requirement of over 200 for immediate casualty replacements and nearly 300 more for raising squadrons' pilot establishments.

It was essential that the fighter OTU organisation should be made capable of replacing "sustained effort" wastage, and on 1 June it was decided to open the third OTU and to expand existing units until they could turn out (1) 3,000 trained fighter pilots per year. This plan could not be carried out at once chiefly because the full establishment of 153 operational and 51 trainer aircraft could not be provided. Nevertheless some progress was made. The third OTU (No. 7) opened at Hawarden on 15 June - Llandow had been the first choice but was not completed in time - and the "interim" strengths of the units were slightly increased:-

No. 5 OTU Aston Down	-	20 Spitfires, 20 Blenheims, 6 trainers
No. 6 OTU Sutton Bridge	-	34 Hurricanes, 6 trainers
No. 7 OTU Hawarden	-	20 Hurricanes, 20 Spitfires, 17 trainers

Measures to increase Output

This interim fighter OTU organisation was made to yield a theoretical output rate of some 2,300 pilots per year by cutting the course down from four weeks to a fortnight in May. The reduction, which was intended to be temporary, made fighter OTU training little more than conversion to the operational type. The Air Ministry was trying to frame a minimum syllabus and arrange for the OTUs work to be supervised and co-ordinated, but little could be done after the course was shortened, especially while there was (2) great urgency for pilot output. Each OTU in practice, trained according to its own ideas and discretion.

(1) AM File S.4928

(2) AM Files S.1924 and S.99458

During the lull between the fall of France and the start of the Battle of Britain the three fighter OTUs worked intensively with two objects - maximum output of pilots and minimum waste of the invaluable single seater fighters. Even so, although all the OTU output now went to Fighter Command, it was still necessary to fill the squadrons with many pupils direct from SFTSs. Maximum OTU output was helped by the keenness of the pupils: some pilots from New Zealand for example who had been trained on Gordons and Vincents reached Hawarden one evening, spent the night on Spitfire cockpit drill by the light of torches, and began flying the following morning. Salvage of aircraft was imperative: if a Spitfire from Hawarden made a forced landing near the Dee every available man from the station was rushed to the spot to drag it out of reach of the tide. When the Battle of Britain began, Hawarden added some private and unofficial operational sorties to its other duties, and shot down a few German raiders.

The two schools of army co-operation did participate in the desperate race for greater output during the summer of 1940. The Lysander and Blenheim squadrons of the Air Component returned to the United Kingdom after the fall of France. The Lysanders reverted to No. 22 Group control (under Fighter Command) and so did two of the four Blenheim squadrons, although they were subsequently loaned to Coastal Command for invasion strategical reconnaissance. The other two Blenheim squadrons were transferred to Bomber Command. These changes considerably reduced requirements at the two army co-operation schools. The Lysander squadrons were virtually non-operational and intakes into Old Sarum were reduced to 10 crews (comprising a pilot and air gunner) a fortnight on a six weeks course - the urgent pilot requirements in fighter squadrons made it essential to reduce Lysander replacements to the bare minimum and at times intake fell to five crews a fortnight - and No. 2 School of Army Co-operation at Andover was reduced to half size with intake of five crews (pilot, observer and air gunner) a fortnight, some of whom were used to reinforce Blenheim fighter and bomber squadrons when the reconnaissance squadrons of No. 22 Group were up to full strength.

(1)

(1) AM File S.1949/I

Defects in Training

Meanwhile the problems of standardising the fighter operational training syllabus were considered. Defects in pilots navigation training would have to be made good at the OTUs Night flying training and experience in cloud flying were also urgently needed, though the OTUs could not possibly cover (1) this during the 14-day course. Although the 14-day course was unsatisfactory because it gave inadequate training, it was not possible to go back to four-week courses while the first-line squadrons were short of pilots. When eventually it would become possible to revert to four week courses three OTUs would not be enough and a fourth OTU would be needed.

By the beginning of August the OTUs "interim" strength of aircraft had grown to 153 aircraft - an increase of 10 since June; so had their training capacity and the number of instructors (drawn from first-line pilots in need of a rest). It was planned to lengthen the course to four weeks and to re-arrange the OTUs so that each instructed on one main type - No. 7 training on Spitfires, No. 6 on Hurricanes, and No. 5 on Hurricanes and Blenheims. It was also planned to make a gradual increase in their strength of aircraft bringing them up eventually to 140 operational types, 50 trainers, and 18 target towers, and to pass all pilots through an OTU course before they (2) went to first-line squadrons.

With the Battle of Britain in progress, it was impossible to lengthen the course immediately and Fighter Command was given discretion to keep the course at 14 days. In practice, however, the first line's need for pilots became so urgent that course duration had little meaning and pupils were passed out as and when the OTUs considered them fit, and training was (3) completely ad hoc. Pilots were recruited from every possible source - experienced pilots, pilots straight from SFTSs, and Allied pilots who could speak little or no English - pushed through the OTUs and turned out after periods varying from 10 days to three weeks (with an average of 10-20 hours flying) barely converted to the operational type and with no tactical training. The OTUs gradually became crowded; about half the pupils sent to No. 7 OTU Hawarden, for example, were not passed out at the end of the nominal 14 days but were kept for further instruction.

(1) AM File S.1924/I.

(2) AM File S.1924/I

(3) AM File S.1924/I

Stabilisation Scheme

In spite of these measures the OTUs could not deal with all the training that the replacements needed. Fighter Command therefore devised what was known as the "Stabilisation Scheme", under which the squadrons were divided into three categories, A, B and C. The "A" squadrons were those (chiefly in No. 11 Group) which were constantly in action. The "B" squadrons were capable of being brought into action when required. The "C" squadrons were unlikely to be needed in the battle; and these gave practically their whole attention to finishing the training of pilots fresh from the OTUs. They dealt mainly with tactical instructions, and passed the pilots on to the "A"
 (1)
 and "B" squadrons.

In essence the Stabilisation Scheme reinforced Fighter Command's operational training resources by adding some 330 aircraft in the 19½ "C" squadrons to the 200 in the OTUs. Together, the "C" squadrons and the OTUs could produce pilots, trained to operational standard, at the rate of about 6,000 per year. This was enough to cover first-line wastage during the Battle of Britain (about 100 per week) and also go some way towards clearing
 (2)
 off the deficiency of 200 pilots in the first line. The standard of output, however, was not particularly high mainly because the "C" squadrons
 (2)
 were not properly equipped for instructional work.

When the demand for a flow of casualty replacements to the "A" and "B" squadrons fell off at the end of the Battle of Britain, the flow from OTUs to the "C" squadrons still went on. The "C" squadrons steadily became more congested until by the beginning of November they held 320 non-operational
 (3)
 pilots in addition to their own operational pilots. Their corporate entity and unit morale, already badly affected by the constant flow of pilots through them to the first line, suffered seriously. To remedy the situation the flow of men from OTUs was cut down and the standard at which they came forward raised by lengthening the OTU course to four weeks. The formidable number of non-operational pilots whom the "C" squadrons held for training was reduced by transferring 90 of them to the Middle East, and the Stabilisation Scheme nomenclature of "A", "B" and "C" squadrons was abandoned at the beginning of
 (4)
 December.

(1) AHB H/III/18

(2) AM File S.1924

(3) AM File S.6899

(4) AM File S.1924

The Lengthening of Courses

Lengthening the fighter OTU course to its originally planned duration of four weeks was no solution to the problem of providing an adequate flow of fully trained reinforcements. The Battle of Britain had shown that the 62 first-line squadrons needed to be backed by an organisation capable of producing 108 operationally trained men per week - a figure far in excess of the capacity of the three OTUs. Moreover the 'Third Revise' was being introduced which increased the output of pilots by transferring a fortnight's training from the SFTS to the OTU which meant that the fighter OTU course
 (1)
 would have to be six weeks.

Instead of three OTUs working on four-week courses, Fighter Command now had to plan nine OTUs working on six-week courses. Fortunately not all of these were needed immediately; the "C" squadrons were too busy training the pilots they already had and making themselves operationally fit again to accept any newly trained men for some months. In any case the SFTS output was not large enough to provide pilots for nine fighter OTUs and also meet the other demands of it. The target for fighter OTU expansion was therefore set in the autumn of 1940 at six OTUs (ie three more) by the spring of 1941.

Following the proposed expansion came the decision to form a specialist training group to control all fighter OTUs. It was not possible for No. 10 Group to continue with this growing commitment when it had a heavy operational responsibility, so No. 81 (Operational Training) Group was opened at Sealand on 28 December 1940. Six weeks later it was moved to Worcester. A further administrative change, which occurred in October 1940, was the renumbering of Nos. 6, 7 and 8 OTUs as Nos. 56, 57 and 58 respectively. This was done to avoid confusion with the coastal OTUs, which were being numbered between 1 and 10. In future fighter OTUs were to be numbered from No. 51 onwards.

The army co-operation schools were also affected by the "Third Revise". Two weeks were added to the course lengths at both schools in November, making No. 1 eight weeks and No. 2 ten weeks, and at the same time fortnightly intakes were increased to 12 crews and eight crews respectively. The schools

(1) AM Files S.192⁴ and S.59813

aircraft establishments had also been changed, Old Sarum had its Hectors replaced by Lysanders, making 24 Lysanders in all, and Andover was re-equipped (1) with 32 Blenheims and 2 Battles.

After November 1940, when the Army Co-operation Group (No. 22) in Fighter Command was upgraded to Command status, the training of crews for army co-operation squadrons was no longer the responsibility of Fighter Command. Instead, a special Group (No. 70) was formed in the new Command to administer its training units. Two-and-a-half years later, however, when Army Co-operation Command was disbanded, Fighter Command again undertook the training of army co-operation pilots and for purposes of continuity a description of the training carried out during this intervening period is included in this chapter.

Night Fighter Training

The first of the new fighter operational training units planned earlier in the year was No. 54 (Night Fighter) OTU which opened at Church Fenton on 16 December 1940. When Germany began night attacks on Britain early in September 1940, night defence became an urgent problem, and it was planned that a night fighter OTU should start at Grangemouth on 21 October with the Blenheim and Defiant flights from No. 55 OTU Aston Down forming its nucleus, but owing to difficulties over buildings and aerodrome construction, it existed only on paper, until it was transferred to Church Fenton and (2) officially opened as No. 54 OTU.

Ordinary OTU night flying training - apart from any question of specialised instruction in night flying - had gone by the board once the course lengths were shortened during the summer of 1940 and it was not restarted until the end of the year.

The other two new units were both opened as day fighter OTUs. Grangemouth, after being found unsuitable for night fighter training, had been opened as a half-size day OTU (No. 58) in December, but could not start training until 1 January 1941. The other unit, Hurricane OTU (No. 59) was held up for lack of an aerodrome; it could not be put at Turnhouse (as was

(1) AM Files S.1949/I and S.4928

(2) AC 46(40) and 50(40). SD 155 1032/40

at first intended) and had to wait until 24 March 1941 before a new aerodrome at Crosby was ready. Meanwhile the older OTUs continued working under difficulties. The aerodrome at Aston Down became unserviceable, and No. 55 OTU had to use Moreton-in-Marsh (which was being built for a bomber OTU). Eventually, in March 1941, it was moved to Usworth. No. 57 at Hawarden, which had used tents during the summer, found accommodation troubles in the
 (1)
 winter. Although it had been agreed in September 1940 that each fighter OTU should have its own night flying satellite none of the three units possessed one.

With all these difficulties and the lengthening of the course - to four weeks in November and to six weeks in December - the output from fighter OTUs was small during the winter of 1940-41. The demand for fighter pilots was still heavy; additional first line squadrons were being formed and over 100 experienced pilots had to be taken from the first line to serve as instructors in the expanding OTU organisation. The demand was also urgent: a renewal of the Battle of Britain, and possibly invasion, was expected in the spring of 1941; and Germany was making sustained night attacks which had to be countered.

Besides being small the output was inadequately trained. The maximum flow of pupils through the units was being maintained at the expense of their flying time, with the result that pilots still went forward to squadrons after only 10-20 hours flying at the OTU. As a result Fighter Command found at the end of January that some 300 of the 1,461 pilots in the first line were not fit for operational work. Squadron training was still the only solution, and a system by which training squadrons fed first-line squadrons began in February 1941. This virtual reintroduction of the Stabilisation Scheme, though distasteful, was the only way in which the expanded first line could
 (2)
 be brought into readiness by the spring. It was essential that sufficient OTUs to maintain Fighter Command at operational strength, even when casualties were heavy, should be established to ensure that pilots left OTUs adequately trained.

(1) AM File S.1924

(2) AM File S.1924

Additional OTUs

Accordingly, in January 1941, a fresh target was set for fighter OTU expansion. Nine units (seven day and two night) were to be in operation by April. No. 58 at Grangemouth was enlarged to full-size in February, and the following month, in addition to No. 59, new day OTUs were opened at Heston (No. 53 with Spitfires) and Debden (No. 52 with Hurricanes). By the beginning of April all seven day OTUs were in operation, and the full fighter OTU target was achieved on 19 May when the second night OTU (No. 60) started at Leconfield equipped with Blenheims and Defiants. By that time the average OTU flying time per pilot had gone up to 43 hours and by June the rate of output was over 5,000 pilots per year. The number of men turned out and the standard to which they were trained were at last satisfactory. The need for training squadrons disappeared, and the last relics of the Stabilisation Scheme vanished.

The situation in Fighter Command in 1940, when over one-third of the squadrons were relegated to what was, in effect, a training organisation, is a further instance of the struggle between immediate operational requirements and the long term needs of training. Had it been possible to establish an adequate OTU organisation, so that pilots from SFTSs did not have to go straight from Harts to Spitfires (an instance is recorded of a pilot arriving at a squadron having flown only a Tiger Moth) accident rates - to say nothing of operational losses - would have been lower, and there would have been a considerable reduction in operational aircraft requirements.

During all this period of growth and development the fighter OTU syllabus had been makeshift and unstandardised. In December 1940 Fighter Command had drawn up a detailed syllabus for the new six-week courses which made special provision for pilots who had been trained on Harts at their SFTSs and visualised each pupil completing 60 hours flying. After a three months trial period, during which time various improvements were made in the light of experience, it was issued as the standard syllabus for all day fighter OTUs. Even so, it was not fully implemented until considerably later, chiefly because the OTUs still had to give a certain amount of ad hoc

training to Hart-trained pupils still coming forward (the Hart was long overdue for replacement as an AFTS trainer) and because men trained overseas arrived "rusty" after the voyage. Throughout 1941 there was considerable variation between OTUs in their interpretation of the syllabus, and particularly in the balance between flying, ground instruction and synthetic training. In spite of many shortcomings the standard of training had improved considerably but it still left much to be desired. During the autumn first-line squadrons asked that more instruction information flying, high fighter tactics, and gunnery should be carried out at the OTUs and (1) emphasis began to be laid on the need for instruction in engine handling. By that time the number of day fighter OTUs had been increased to eight. In May it had been decided that although the existing seven units were sufficient to back the first line they could not provide for expansion as well. Accordingly, on 1 July No. 53 OTU was moved from Heston to Llandow, leaving half of its staff and pupils to form the nucleus of a new Spitfire OTU, No. 61. No. 52 OTU was also moved. The aerodrome at Aston Down had been enlarged since March when No. 55 OTU had left, and on 25 August No. 52 OTU (2) was moved there from its temporary home at Debden.

Measures to Improve Training

To raise the standard of gunnery in the squadrons of Fighter Command a number of target towing flights were formed on 20 May 1941. One flight was formed in each of the six fighter groups, its size depending on the number of units in the group it served. Originally they were known as group target towing flights but in November 1941, by which time two more flights had been formed, they were numbered consecutively after those in Bomber Command as follows:-

(1) No. 81 Group File S.9201

(2) AM File S.59813

T.T. Flight No.	Location	Group No.	Aircraft establishment - Lysanders
1486	Valley	9	4
1487	Warmwell	10	6
1488	Shoreham	11	10
1489	Coltishall	12	6
1490	Acklington	13	5
1491	Inverness	14	4
* 1492	Western Zoyland	70	10
+ 1493	Ballyhalbert	82	3

* Formed on 18 Oct 1941

+ Formed on 31 Oct 1941

Twelve months later these target towing flights were renamed (fighter) gunnery flights, and those in Bomber Command called (bomber) gunnery flights. The size of the flights was expanded as the groups increased in size and a number of Masters had been added to each flight by the end of 1941 so that dual instruction in air to air firing could be carried out. Their object was to provide each operational squadron in their group with a 10 days gunnery course (1) once every six months.

Night fighter training remained for some time a matter for the ideas and discretion of the night OTUs. It called for instruction not only in instrument and night flying, but also in navigation, night fighter tactics, and the newly-developing techniques of AI and GCI. In June, shortly after No. 60 OTU had moved from its temporary location at Leconfield to East Fortune it was decided to simplify training by concentrating all twin-engined (Blenheim) training at No. 54 OTU and carrying out single-engined (Defiant) training at No. 60. Shortly afterwards a third night fighter OTU, No. 51, was opened at Cranfield equipped with Blenheims and this unit was responsible for supplying crews for the newly formed "Turbinlite" flights in Fighter Command. The use of Blenheims and Defiants for training when the squadrons were equipped with Beaufighters and Havocs meant that final stages of training had to be done in the first-line squadrons. A detailed syllabus was laid down in August 1941 which expressly stated that the instruction required would be given partly in OTUs and partly in squadrons.

(1) AM File S.73607

There were thus eleven fighter OTUs at work in the autumn of 1941. Each day OTU (with 68 operational aircraft) had a pupil population of 90 pilots and worked on a six weeks course until November, when the duration was increased to seven weeks (and later to eight) because of the winter. Each night OTU had a pupil capacity of 60 crews (a crew comprised one pilot and one observer/radio) and took some 8 - 10 weeks to complete their training. The output was at the rate of about 4,500 day fighter pilots and 800 night fighter crews per year and the average overall wastage during operational training was 10 per cent. These eleven units were to be supplemented by an OTU in Canada, equipped with locally built Hurricanes and instructing Canadian-trained pilots for Fighter Command. Fighter pilots for overseas squadrons were no longer to be the responsibility of Fighter Command. Two OTUs were to be formed in the Middle East, and another in India to supply (1)
these needs.

Reorganisation of the Army Co-operation Schools

Fighter Command had also been relieved of the responsibility for training army co-operation pilots. When Army Co-operation Command had been formed in November 1940 the two schools of army co-operation had been transferred to No. 70 Group in the new Command. Nevertheless training at No. 1 School of Army Co-operation (S of AC), at any rate, was becoming increasingly similar to the syllabus of the day fighter OTUs. Both schools in fact had been completely reorganised during 1941. In February it had been decided to re-equip some of the Lysander squadrons with Tomahawks and to transfer the two Blenheim squadrons, already on loan to Coastal Command, permanently to that Command. These decisions led in May 1941 to the partial re-equipment of No. 1 S of AC, which was training crews for single-engined squadrons, with Tomahawks, and to the transfer of No. 2 S of AC, which was then redundant to army co-operation needs, to Coastal Command where it became No. 6 OTU, (2)
training crews for Blenheim GR squadrons. Andover was not really suitable (3)
for this training, and the new unit was moved to Thornaby later in the summer.

(1) See Chapters 21 and 22

(2) AM Files S.1949/II and CS 8697

(3) See Chapter 19 for the history of No. 6 OTU

Two months later further decisions were taken affecting the future of the training units. With the threat of invasion still present plans were made to expand the army co-operation squadrons to a total of 20, half of which were to be fighter reconnaissance squadrons equipped with Tomahawks, and the remainder dive bomber squadrons using Vengeances or Bermudas. This projected expansion meant a greater output of army co-operation crews - an eventuality which had not been foreseen when No. 2 S of AC was given up - and it was now necessary to re-open a second school. The need to re-equip the remaining Lysander squadrons was urgent, and as the American dive bombers could not be available for some months, these squadrons had to be re-equipped with Blenheims until the new types arrived. To make enough Blenheims available, some of the Blenheim GR squadrons in Coastal Command had to be re-equipped with Hudsons. These changes of plans meant that No. 2 S of AC had to be re-formed at Andover in July, equipped with 36 Blenheims, 10 Oxfords and 8 Magisters (the Blenheims to be replaced by Vengeances or Bermudas as soon as possible), and No. 6 OTU now at Thornaby re-equipped with 36 Hudsons, 12 Ansons and 6 Battles. At the same time it was decided to re-name the two army co-operation schools Nos. 41 and 42 OTUs respectively. After the summer of 1941 the two OTUs specialised in fighter/reconnaissance and dive bombing training. Equipped with 28 Tomahawks, nine Harvards, six Magisters and three Martinets, No. 41 OTU trained 10 pilots every two weeks on an eight weeks course, similar to that given to day fighter pilots; No. 42 OTU trained 12 crews every two weeks on a 10 weeks course which was based largely on the light bomber OTU syllabus of Bomber Command. This unit in fact was producing more crews than were needed to supply the needs of the three Blenheim squadrons in Army Co-operation Command and the surplus (about 30 per cent of the output) was sent to light bomber squadrons in No. 2 Group.

(1)

There was a further aspect of army co-operation training - the training of pilots for flying observation post (later known as air observation post) duties on behalf of the artillery. Trials in artillery spotting had been

(1) AM File S.1949/II

carried out at the School of Army Co-operation as early as February 1939 and twelve months later a special detached flight of the S of AC - known as D flight - was formed to undertake further trials in France. There was no training commitment at this stage - the necessary pilots were drawn from army co-operation squadrons - but after the flight returned from France it was decided to pursue the AOP project and to train selected Army officers as AOP pilots. 'D' Flight, now located at Larkhill, where it was assisting the School of Artillery, was expanded to undertake this training and pupils, having completed an elementary flying course at No. 1 EFTS Hatfield, were sent there for a six weeks advanced training course. The first course at Larkhill commenced in December 1940, using a few Taylorcraft and Stinson aircraft, and by August 1941 sufficient pilots had been trained to form the first AOP squadron, No. 651 Squadron. In September training requirements were increased and 'D' Flight was renamed No. 1424 Flight, re-equipped with ten Taylorcraft, (1) two Lysanders and one Tutor and expanded to train ten pilots every six weeks.

Standardisation of Day Fighter Training

In January 1942 the organisation of the day fighter OTUs was stabilised on the model of Hawarden which had an efficient and successful system, thus avoiding undesirable local variations in the syllabus. At some units for instance it had been the practice to sacrifice ground instruction and synthetic training to flying whenever the weather was good, thus dislocating programmes and unbalancing the sequence of instruction. Under the Hawarden system, courses were sub-divided into four squads working to a planned programme which put a comparatively steady load on each of the flying, ground, and synthetic sides of instruction. The duration of the course was increased to nine weeks and the flying hours per pupil raised to 58 with intakes of 32 pilots every three weeks. By this time a new link had been forged in the chain of pilot training by the introduction of the AFU stage, and this, together with the new OTU syllabus, meant that fighter pilots would have (2) completed roughly 300 hours flying before going to a squadron. Courses were divided into three phases of three weeks each: during the first phase pilots learnt to fly the aircraft; the second phase was devoted chiefly to

(1) AM File S.2982/I

(2) AMT Folder 512

gunnery training, particularly air firing which improved as target towing arrangements became more satisfactory; the third phase consisted of tactical training on a satellite (one of which was provided for each unit by March 1942). During the third phase trainees lived as nearly as possible as if they were on an operational squadron and their work consisted mainly of air firing, night flying and formation flying. This last phase was really a "polishing" and refresher period, and the nine weeks organisation was designed on a flexible basis so that it would be possible in an emergency to allow the posting of pupils direct to squadrons after the first six weeks of the course had been completed.

Once an effective standardised training scheme had been established, an adequate flow of trained personnel for the operational squadrons was assured. All courses were arranged to start and finish on a Tuesday (this was done to avoid the necessity for pupils having to travel at week-ends) and it was planned that intakes and outputs from the different OTUs were evenly spread with not more than two or three courses finishing on the same day so that the flow of pupils would be even and constant. The year 1942, as far as Fighter Command was concerned, became the peak year of OTU training, when the training effort was at its maximum. A total of 4,353 pilots was trained and more than 390,000 flying hours were carried out by the eleven OTUs.

By March, in fact, it was acknowledged that the eight day fighter OTUs were sufficient to meet all United Kingdom requirements, even when Fighter operations were at their maximum intensity.⁽¹⁾ All units were being provided with satellites, although to achieve this several units had to be moved to new aerodromes. No. 56 moved from Sutton Bridge to Tealing in March, and the following month Nos. 55 and 61 moved to Annan and Rednal respectively. Later in the year No. 59 OTU moved to Milfield and No. 57 to Eshott. In June, when it was intended that intakes should be increased to 44 pupils for the summer months (reverting to 32 for the winter) it was found possible to supply a number of fighter pilots for the Middle East. Even so, with the lull in fighter operations, it was soon found that the output greatly

(1) ERP 169

exceeded the demand, and on 28 July intakes were frozen for three weeks and current courses extended to a similar period. When intakes recommenced they reverted to 32 every three weeks, only to be increased to 44 again in September after the Dieppe raid when fighter losses proved heavier than had been anticipated. The following month winter intakes had to be resumed, and in November intakes were further reduced to 24 pilots every three weeks. It was preferred to reduce intakes and retain courses at nine weeks rather than maintain the higher intake and increase course lengths. The weather was an important factor in determining the duration of course lengths; in the Middle East, where weather conditions rarely interfered with flying, it was possible to complete the same syllabus in six weeks.

By 1942 the day fighter squadrons were being re-equipped with new types of aircraft. Later marks of Spitfires were replacing the older types, and Typhoons (and later Tempests) were replacing Hurricanes. There were not enough of the new types to re-equip the OTUs immediately, however, and conversion to the operational types had, for the most part, to be given on the squadrons. This presented no problems when it merely meant changing from one mark of Spitfire to another, but the change over from Hurricanes to Typhoons was more difficult, and towards the end of the year some Typhoons had to be provided for OTU training. No. 55 OTU Annan was the first to undertake (1) this training, followed a few months later by No. 59 OTU at Milfield.

Night Fighter Difficulties

Although by 1942 production of day fighter pilots was satisfactory, the night fighter OTUs were still labouring under many difficulties during the first half of that year. By the end of March all Blenheim and Defiants in night fighter squadrons had been replaced by Beaufighters and Havocs, and it was desirable that the three night fighter OTUs should be equipped with these types of aircraft. Shortage of aircraft, however, prevented this re-equipment. Defiant training was discontinued at No. 60 OTU but the only aircraft available for twin-engined training were Blenheims, and even these were in (2) such short supply that the OTU could only operate at half strength.

(1) AM File C 36509/48/I

(2) AM File S.5218/II

Fighter Command preferred to delay the re-equipment of its OTUs until the Beaufighter and Havoc squadrons had been brought up to full strength. By so doing they were prepared to accept the fact that crews from the OTUs would not be passed out fully trained and would have to complete their training on the squadrons. It was only the lull in night fighter operations that allowed Fighter Command to follow this policy and as night fighter OTUs were also responsible for training crews for Beaufighter squadrons in the Middle East, it meant that overseas requirements had to be taken from the United Kingdom
 (1) squadrons.

By March 1942 the total operational aircraft strength in the three night OTUs had grown to 104 Blenheims and five Beaufighters. These units had also been reorganised to train to a standard syllabus, and at full capacity each unit was planned to train 75 crews at a time on a 12 weeks course with intakes of 25 every four weeks. Shortly afterwards it was decided to equip No. 51 OTU with Havocs. In April four dual Beauforts were added to the establishment of the two Beaufighter OTUs to assist in the conversion of pilots to Beau-
 (2) fighters. After flying Oxfords and Blenheims all pilots did a few hours on Beauforts before going on to Beaufighters.

By midsummer the aircraft supply situation had improved somewhat and it was possible to re-equip the night OTUs with more operational types of aircraft. No. 60 OTU was brought up to full strength and that unit, together with No. 54 OTU was re-established with 39 Blenheims, 26 Beaufighters, four Beauforts and six Oxfords. No. 51 OTU was similarly re-equipped, except that it had 30 Havocs in place of the Beaufighters and Beauforts. This latter unit undertook the training of "Turbinlite" and "Intruder" crews as well as night fighter crews. Approximately one-third of its pilots was trained for intruder work, and arrangements were made for them to be crewed with observers/wireless in place of observers/radio. Turbinlite crews who comprised a pilot, observer/radio and wireless operator/air gunner underwent similar training to the night fighter crews. By mid-1942 in fact the three night fighter units were producing more crews than could be absorbed and it

(1) AHB/IIK/36/78

(2) ERP 170 and 210

was possible for No. 60 OTU to undertake the training of long range Beau-fighter crews for Coastal Command commencing on 23 June. In September intakes at the unit were increased from 25 to 34 and two months later, on 24 November, it was handed over to Coastal Command and renumbered No. 132
 (1)
 OTU.

Training of Navigators/Radio

Ever since the night fighter OTUs had been working there had been a good deal of criticism of the standard of training of the radio operators especially as the use of airborne radar was intensified. Under the original role of night fighter squadrons it was envisaged that aircraft would operate within AI or VHF control and therefore, in addition to the pilot, it was necessary to carry a man to operate these radio aids. The first squadrons used air gunners for this role, giving them a short radio course, but before long the policy was changed and the duties were carried out by an observer. The term AI Operator was dropped and replaced by observer/radio. Because of the radio aids navigation was of secondary importance and observer/radio pupils underwent a shortened AOS course (eight weeks compared with 14 for other observers) followed by a special five weeks course on AI operating at
 (2)
 No. 3 Radio School, Prestwick. Eventually in June 1942, because of the inadequacy of this radio training, a special OTU (No. 62) was formed at Osworth and equipped with Ansons; the unit provided five week courses in radar operating for 24 navigator (renamed from observer in May 1942) pupils every 2 weeks destined for night fighter squadrons. After their AOS course navigator/radio pupils went to No. 62 OTU before joining their pilots at Nos. 51, 54 or 60 OTUs. The training of navigators/wireless for the intruder squadrons was not carried out by No. 62 OTU. These personnel underwent a full wireless/operators course at a radio school before completing the normal navigator's training. From the AOS they went direct to No. 51 OTU.

(1) AM File S.5218/II. See Chapter 19 for the further history of this unit.

(2) AM File S.5218/I.

After No. 60 OTU had been transferred to Coastal Command (which allowed intakes at No. 62 OTU to be reduced to 20), the remaining two night fighter OTUs specialised in the training of Havoc and Beaufighter crews. No. 51 OTU undertook the training of all Havoc crews, and No. 54, which had been moved from Church Fenton to Charter Hall in May, continued training on Beaufighters. Intakes had been increased from 25 to 32 crews every four weeks, making the capacity of each school 96 crews.

The fighter reconnaissance OTU (No. 41) at Old Sarum was considerably expanded during 1942. In June intakes were increased from 10 to 18 pilots every two weeks, and six months later they were further increased to 28 per fortnight. Concurrently with the first increase the school was re-equipped from Tomahawks to Mustangs. At first one-third of the new Mustang establishment of 43 aircraft was temporarily made up with Tomahawks, but in August it was revised to 50 Mustangs. In addition, 12 Harvards and four Martinet target towers were established. In November 1942 the school moved to Hawarden, which had been vacated by No. 57 OTU. No. 42 OTU continued training bomber/reconnaissance crews for Army Co-operation and Bomber Commands. The projected re-equipment of these squadrons with dive bombers did not take place and the function of the school gradually changed to that of training glider towing crews. Training requirements of AOP pilots continued to grow and in July 1942 No. 1424 Flight was reorganised as a purely training flight with intake of 18 pilots every six weeks. At the same time it moved to Old Sarum, leaving at Larkhill the element co-operating with the School of Artillery which was then established as a separate flight (No. 1471). In October requirements were further increased to provide pilots to form a total of 12 AOP squadrons, and the flight was expanded to train a total of 30 pupils at a time and re-equipped with 45 Tiger Moths, Austers and Piper Cubs. The syllabus was revised to include 75 hours flying and arrangements were made to extend the course length to nine weeks during the winter months. Because of this expansion it was decided to upgrade the status of the flight to that of an OTU, and it was officially renamed No. 43 OTU on 1 October 1942. To supply

(1) AM File S.5218/II

(2) AM File S.1949/II

elementary trained pilots for the expanded school a second EFTS (No. 22) had
 (1)
 to be turned over to the training of army pupils.

During the first three months of 1943 plans were being made to amalgamate No. 81 Group with No. 9. For some time the operational scope of the latter had been steadily diminishing, particularly after enemy activity over north-east England ended. Accordingly, on 15 April 1943, No. 81 Group was absorbed into No. 9; the headquarters staffs of the two groups were amalgamated at Preston and No. 81 Group came to an end.

The Fighter Leaders School

While this reorganisation was going on the Fighter Command training organisation had been expanded by the addition of two new schools. On 15 December 1942 the C-in-C Fighter Command had recommended to the Air Ministry that a special unit for the tactical training of fighter pilots, particularly potential flight and squadron commanders, should be formed in order to raise the standard of leadership in the operational squadrons. At his suggestion, half the facilities of No. 52 OTU Aston Down were set aside for this fighter leaders training, and the first course began at Chedworth, the satellite of No. 52 OTU on 15 January 1943. At the same time the remaining half of the OTU was reorganised to train a maximum of 40 pupils (two courses of 20). The fighter leaders element comprised 24 operational pilots, on a three weeks course with 25 hours flying. Training was purely tactical, and ranged from section, squadron and wing tactics to army support exercises, the object being to give potential fighter leaders experience of leading formations under simulated active service conditions and to give some idea of the administration and training of a squadron under full service conditions. (2)

Originally the unit was established on a temporary basis and it was intended to close it in March after four courses had been completed. The first courses were so successful, however, that it was decided not only to retain the School as a permanent training unit but to expand it to train more pilots. One interesting feature of this school, known as the Fighter Leaders School - it was sometimes called the School of Air Tactics - was that

(1) AM File S.2982/II

(2) ERP 264

it was recognised as an operational unit and towards the end of their training students, led by their instructors, often took part in selected offensive operations.

After the first course had been completed, the School had moved to Charmy Down, although it remained an integral part of No. 52 OTU until the disbandment of that unit in August 1943. It was then moved to Aston Down and became a self-accounting unit.

The Specialist Low Attack Instructors School (SLAIS)

Parallel with the development of the Fighter Leaders School was the establishment of another specialist school, the Specialist Low Attack Instructors School, which was formed at Milgrove on 21 January 1943. The success of fighter-bombers in the Western Desert campaign led to the formation of this school with the object of providing instruction in the art of army close support flying, with particular reference to the use of 40-mm cannon and rocket projectiles for a nucleus of instructors who would thus supervise training in low level tactics in squadrons and OTUs. The school was equipped with ten Hurricanes and four Masters and trained six pupils at a time on a four weeks course (the course length was later reduced to three weeks). Although the school was operated by Fighter Command it was, for a time, regarded as a central school and its pupils included many drawn from other commands, both at home and overseas.

In January 1944, when No. 59 OTU at Milfield was disbanded, it was decided to absorb the SLAIS with the Fighter Leaders School, which was then moved to Milfield. The two original units became wings of the new school, and were re-equipped with RP and bomber Typhoon aircraft, as well as Hurricane RP aircraft. The main reason for this amalgamation was to allow the Fighter Leaders School to concentrate on teaching the latest ground attack methods, based on experience gained in North Africa and Italy, in preparation for the forthcoming 'Overlord' operations. Although Aston Down was capable of expansion to allow more pupils to be taught there were no suitable ranges there. Milfield, which had suitable ranges nearby, was ideal for such training.

(1) AMT folder 5/2

Over Production of Day Fighter Pilots

The fact that the development of specialist schools was possible was largely due to the surplus of day fighter OTU capacity. In January 1943 a new edition of the day fighter OTU syllabus was issued which took into account experience gained in recent fighter operations. The course length remained at nine weeks with intakes of 32 every three weeks in the winter and 44 in the summer, and the main feature of the new syllabus was the introduction of a new system of planned flying and maintenance so that the intensive flying programme could be completed regularly to schedule.

Accordingly, at all day units, except No. 52 OTU, intakes which had been reduced to 24 every three weeks, reverted to the normal winter schedule on 19 January and three months later, on 2 March, were increased to the summer programme of 44. Meanwhile the invasion of North Africa was taking place, and experience there soon proved that the fear of high fighter casualties, based on operations over Dieppe, were unfounded, and it was soon apparent that there would be a further over-production of fighter pilots. In June intakes were reduced to 40, and two months later it was decided that the number of day fighter OTUs should be reduced from eight to five. No. 52 OTU, which had been working at half strength since the beginning of the year was closed on 10 August, and two months later No. 56 at Tealing and No. 58 at Grangemouth both ceased training.

Formation of Tactical Exercise Units

These two units were not closed, however; instead they were converted into combat training wings - subsequently called tactical exercise units - where pilots who had completed their OTU training and were awaiting posting to squadrons could be kept in flying practice. Both units were designed to accommodate a maximum of 180 pupils and the average time spent there was about two months, during which time advanced refresher training was carried out. No. 1 TEU at Tealing was equipped with both Hurricanes and Spitfires and No. 2 at Grangemouth had Spitfires only.

(1) Revised Fighter Command Day OTU Syllabus, 1 January 1943.
 (2) AM File C.36509/II

Even these measures were not enough to stop the surplus of fighter pilots increasing. OTU intakes were reduced to the winter quota of 32 every three weeks at the beginning of September, only to be reduced still further, to 25, at the end of the month. In spite of these reductions and the lengthening of the day fighter course from 9 to 12 weeks in October, by the end of the year No. 9 Group held a single-engine pilot population of almost 1,200 either under training at OTUs or TEUs or waiting to go to the latter. As a result in January 1944 two more OTUs (Nos. 55 and 59) had to be closed and another TEU, No. 4, was opened at Annan to help accommodate the large number of pilots awaiting posting to squadrons. In addition, intakes into the remaining units were suspended for a week. These closures relieved the situation to some extent and the following month it was possible for the OTU courses to revert to nine weeks, and for the maximum intakes of 44 to be re-started.

A similar situation, though to a smaller extent, arose over the supply of fighter reconnaissance pilots, and No. 3 TEU was opened at Hawarden on 30 November 1943 to accommodate the pilots from No. 41 OTU who could not go straight to squadrons. At the same time intakes into the OTUs were reduced to 36 per month. This OTU (No. 41) equipped with Mustangs under No. 70 Group, together with No. 13 (Light Bomber) OTU training Blenheim, Mitchell and Boston crews for No. 2 Group squadrons, had been transferred from No. 70 (AC) Group to No. 9 Group as a result of the planning for 'Overlord'. Army Co-operation Command was abolished and a new formation, the Tactical Air Force (later known as the 2nd TAF) was formed on 1 June 1943 within Fighter Command. The TAF consisted of No. 2 Group transferred from Bomber Command, No. 83 (Composite) Group and No. 38 Wing. A second Composite Group (No. 84) was added a few weeks later. No. 70 (AC) Group was placed directly under Fighter Command and continued its training functions (with Nos. 41, 42 and 43 OTUs); it also took over from Bomber Command No. 13 (Light Bomber) OTU which was training crews for No. 2 Group, now in the TAF.

Five months later the Allied Expeditionary Air Force was formed, and Fighter Command renamed the Air Defence of Great Britain and placed under the Command of the Air Commander-in-Chief, AEEAF. The 2nd TAF and No. 38 Wing

were similarly placed under AEAFF with the latter upgraded to group status and reporting direct to AEAFF. They were no longer operationally controlled by ADGB although for training purposes No. 38 Group continued to come under ADGB. As a result of these administrative changes No. 42 OTU (which was now training exclusively for airborne forces work) was transferred to No. 38 Group in November and two of the other 70 Group OTUs (Nos. 41 and 13 OTUs training fighter reconnaissance pilots and light bomber crews respectively for 2nd TAF) were taken over by No. 9 Group. This meant that ADGB in addition to training day and night fighter crews for its own squadrons, was also responsible for the training of all crews needed by AEAFF. For the sake of continuity, however, the history of airborne forces training at No. 42 OTU and light bomber training at No. 13 OTU will be continued in the appropriate chapters (Nos. 20 and 17 respectively).

No. 43 OTU, training AOP pilots, remained in No. 70 Group. The size of this unit which was responsible for supplying all AOP pilots at home and abroad, fluctuated considerably during 1943. At the beginning of the year it had been expanded to train 45 pilots at a time, but six months later, when requirements dropped, it was reduced to training 32 pilots, and in November, when there was a surplus of pilots, it was reduced to training 17 pilots, and a special refresher flight added to keep the surplus personnel in flying practice. The course length had been extended in the summer to 10 weeks, and (1) when winter intakes started it was further extended to 12 weeks.

A further sequel to the replacement of Fighter and Army Co-operation Commands by the ADGB and the 2nd TAF was the reorganisation of the (fighter) gunnery flights. The formation of the TAF and the reorganisation of the old fighter groups and sectors made the old system of having one flight for each group impracticable and a new system had to be devised whereby all fighter squadrons (both ADGB and TAF) could be afforded adequate training facilities. The thirteen existing flights (five more had formed during 1942 - No. 1494 to No. 1498) nearly all of which had suffered several moves since their formation, were disbanded and replaced by eight armament practice camps with adequate

(1) AM File S.86575/I

range, aerodrome and domestic accommodation for not only fighter squadrons but for fighter bomber and RP squadrons. Each of the new APCs was equipped with four Masters and eight Martinets. They were located as follows:-

<u>APC No.</u>	<u>Location</u>	<u>Group</u>
11	Fairwood Common	for 83 Group
12	Llanbedr	for 84 Group
13	Llanbedr	for 84 Group
14	Ayr	for ADGB
15	Peterhead	for 83 Group
16	Hutton Cranswick	for 84 Group
17	Southend	for 83 Group
18	Eastchurch	for 86 Group

Squadrons were to spend 10 days at once of these camps once every six months, although after February 1944, when ground attack training was added to the APC syllabus, shortage of time and the large numbers to be trained made it (1) impossible for squadrons to remain more than a week.

A few months after the 2nd TAF had been formed, a new type of unit came into being - the Group Support Unit. These GSUs were peculiar only to 2nd TAF and their purposes was to hold an immediate reserve of pilots and aircraft ready to replace casualties and to go into immediate action in squadrons. They were responsible for the preparation of reserve aircraft to full operational standard and they included a training squadron where pilots from OTUs were given their final polish before going on operations. One GSU was established at each of the three operational groups in 2nd TAF and was designed to hold a reserve of three pilots and three aircraft for each squadron (including AOP squadrons) of the group they served. No. 83 (2) GSU at Bognor and No. 84 GSU at Lasham were both formed on 20 January 1944; each held approximately 100 aircraft of various types, including Austers, Mustangs, Spitfires, Tempests and Typhoons, and a similar number of pilots.

(1) AM File C.37284/48/I

(2) The third was No. 2 GSU serving No. 2 (Light Bomber) Group

Re-equipment of Night Fighter Units

Although the day fighter OTUs were producing embarrassingly large numbers of pilots the night fighter OTUs were still struggling to produce the numbers required by the night fighter squadrons. The Havocs in night fighter squadrons were being replaced by Mosquitos, and the role of the squadrons was widened to include offensive sweeps outside VHF range operations in support of Bomber Command and radio counter-measures under No. 100 Group. By the time, too, the Turbinlite squadrons had been disbanded and the use of the (1) Havoc for OTU training was redundant. No. 51 OTU therefore reverted to Beaufighter training in the spring of 1943. To improve the standard of night fighter training, arrangements were made for all pilots destined for night fighter squadrons to undergo their AFU training at No. 12 at Grantham. This unit had some Blenheims added to its establishment for lead-in conversion training, which left Nos. 51 and 54 OTUs free to devote their time to Beaufighter training. Dual instruction on Beauforts during the initial stage of the course was continued.

By this time other demands for night fighter crews had increased and more trained personnel were urgently needed for squadrons both at home and overseas. It was not possible for No. 132 (formerly No. 60) OTU to revert to night fighter training owing to Coastal Command's need for long range Beaufighter crews, and a new OTU had to be formed in Fighter Command. The intruder training echelon of No. 51 OTU was moved to High Ercall and formed the nucleus of a new No. 60 OTU in May 1943. This allowed No. 51 OTU to be brought into line with No. 54 so that both units were training 32 night fighter (AI) crews every four weeks. No. 51 OTU undertook the training of crews for overseas and a small AI conversion flight of two Beaufighters, fitted with Mark VIII AI, was formed at the OTU in April to convert pupils to the new type of AI equipment. Prior to that time overseas reinforcements had been drawn from fighter squadrons using that Mark of AI. Once the OTU aircraft were fitted with Mark VIII AI the conversion flight became redundant and it was disbanded (2) in April 1944. A similar conversion flight was formed to convert crews

(1) AM File S.5218/III

(2) AM Files S.5218/III and S.95966

in overseas night fighter squadrons to the new type of AI equipment. The flight formed in April 1943 and was originally attached to No. 219 Squadron which moved to North Africa the following month. After touring the other night fighter squadrons in MACAF (including three USAAF squadrons using Beaufighters) for the purpose of Mark VIII conversion, the unit moved to ACSEA and carried out similar duties there before returning to the United Kingdom. It left North Africa in February, commenced training in ACSEA the following month and returned to the United Kingdom in May. In September 1944, when a new type of AI (Mark X) was introduced, a similar conversion flight was formed, initially in North Africa, to convert squadrons to the new equipment. The flight moved to ACSEA in January 1945 and remained there until the end of the war.

The new OTU (No. 60) which was equipped with Mosquitos was originally formed as a half-sized unit training intruder crews but a few weeks later it was expanded to full size, the additional capacity (16 pupils every four weeks) being used to train night fighter (AI) crews. In spite of these efforts the deficiency in night fighter (AI) crews persisted, and in August 1943 the three night OTUs had to be reorganised to train more crews. Nos. 51 and 54 OTUs were expanded by 25 per cent (their intakes increased from 32 to 40 crews every four weeks), but as it was not possible to expand No. 60 OTU a new unit was formed to undertake additional AI training, leaving No. 60 OTU to concentrate on intruder work. Accordingly No. 63 OTU was formed at Honiley on 23 August training 20 AI crews every four weeks, and on the same date intakes into No. 60 OTU reverted to 16 intruder crews per month.

Revision of the Navigators/Radio Training Syllabus

All these developments affected the size of No. 62 OTU training navigators/radio which had been moved from Usworth to Ouston in July to allow for expansion. In May intakes were increased from 24 to 32 pupils every two weeks; in July they were raised to 48 and the following month intakes went up to 53 pupils every two weeks in order to supply the needs of Nos. 51, 54 and 63 OTUs.

(1) AM Files S.86652/I, II, III and IV

(2) AM Files S.5218/III and C.36509/48/I.

The exacting nature of the new duties for night fighter squadrons called for a high degree of navigation and made it essential that navigators/radio should be given the full course in basic navigation training. Accordingly, after July 1943, the old eight weeks AOS course for navigator/radio pupils was replaced by the full 14 weeks course, thus establishing a common standard of (1) basic training for all the navigator categories.

Navigation was not the only aspect of the navigator/radio training that had to be adjusted to meet the changing conditions. The re-equipment of night fighter squadrons with Mosquitos equipped with a new type of AI (Mark X AI) caused difficulties over the training of the AI operator since instructors could not be carried on Mosquitos. To overcome this difficulty a special flight of Wellington aircraft equipped for use as flying classrooms was established in July 1943. This flight, equipped with three aircraft - later increased to 10 - acted as a mobile "circus", visiting the operational squadrons and converting their crews to the use of the new equipment. It was attached to No. 63 OTU at Honiley, which was shortly to be re-equipped with Mosquitos, and after all squadrons had been converted the flight was to train (2) replacement crews at the OTU.

Review of the Fighter Training Organisation

By the beginning of 1944 then, the operational training organisation under No. 9 Group had undergone many changes. The following is a summary of the types of schools existing on 31 January 1944, showing the various kinds of training undertaken:-

OTU No.	TEU No.	Location	Aircraft	Training
53	-	Kirton-in-Lindsay	Spitfire)	
59	-	Milfield	Hurricane)	Day fighter pilots
61	-	Rednal	Spitfire)	
41	-	Hawarden	Hurricane and Mustang	Fighter reconnaissance pilots
43	-	-	Auster	AOP pilots
51	-	Cranfield	Beaufighter)	
54	-	Chester Hall	Beaufighter)	Night fighter (AI) crews
63	-	Honiley	Beaufighter)	
60	-	High Ercall	Mosquito	Night fighter (intruder) crews
62	-	Ouston	Anson	Night fighter navigators/radio
-	1	Tealing	Hurricane)	
-	2	Grangemouth	Spitfire)	Refresher training
-	3	Hawarden	Mustang)	
-	4	Annan	Hurricane)	
Flight Leaders School	Milfield		-	Specialist training

(1) ERP 260 and 265

(2) ERP 273 and AM File S.5218/3 & 4

By March 1944 the situation in the day fighter OTUs was fairly satisfactory. The surplus had been wiped out and summer intakes of 44 pupils every three weeks had already been resumed. It was estimated that the three units in the United Kingdom, together with No. 1 OTU in Canada, could provide sufficient backing for the forthcoming operations on the continent. Squadrons in the Mediterranean area were being fed by Nos. 71 and 73 OTUs in the Middle East, together with No. 11 OTU in S. Africa and No. 151 OTU in India was meeting all requirements in ACSEA. The fighter reconnaissance unit (No. 41 OTU) was also turning out pilots in the required numbers for the United Kingdom squadrons, while MAAF and ACSEA squadrons were supplied by Nos. 74 and 151 OTUs respectively. No. 41 OTU had been reorganised in February to bring the training organisation more into line with the day fighter OTUs. Courses were increased from eight weeks to nine and intakes were changed to 22 pilots every three weeks. Owing to the shortage of Mustangs, the aircraft establishment had to be changed to 32 Hurricanes, 17 Mustangs, 12 Masters or (1) Harvards and six Martinets. The surplus of fighter reconnaissance pilots had been absorbed and it was possible to disband No. 3 TEU at Hawarden at the end of March. Concurrently, the TEU at Annan, formerly numbered No. 4 was renumbered No. 3 TEU.

Revised Night Fighter Requirements

The night fighter units had also made up the deficiency in crews. In fact at all four night OTUs intakes had to be reduced in December to avoid over-production; Nos. 51 and 54 intakes fell from 40 crews every three weeks to 36, then to 32, and eventually to 25; at No. 63 OTU, which was really a half-sized unit, intakes were reduced to 14 crews; and No. 60 OTU had its intake reduced to 21 crews.

In the spring of 1944, because of the lull in night fighter operations, the requirements of crews decreased and it was possible to disband No. 63 OTU in March and to reduce intakes into Nos. 51 and 54 OTU to 24 crews every three weeks in May. It was estimated that these two units could back the (2) entire night fighter force both at home and overseas. Navigator/radio intakes into No. 62 OTU had to be reduced to 36 per fortnight. On the

(1) AM File CS.1949/III

(2) ERP 324 and AM File S.5218/III

closure of No. 63 OTU the 10 Wellington flying classrooms were transferred to No. 51 OTU and in April 1944 four more were added. Twelve Hurricanes to act as target aircraft were also added at the same time to assist in this training. The requirement for Mark X AI crews was approximately nine per month and these could be produced by No. 51 OTU. No. 54 OTU trained only the earlier marks, and its output was destined mainly for overseas squadrons. When all the night fighter (AI) squadrons had been equipped with the new type of AI equipment all output of the two units would require this training and additional (1) flying classrooms would have to be provided for No. 54 OTU.

The requirements for night fighter (intruder) crews did not fluctuate in the same way as AI crew requirements, and No. 60 OTU continued to operate as a half-sized unit. In February 1944, however, it had started training a few light bomber crews for No. 2 Group to supplement the output from No. 13 OTU. By June 1944 the unit had been expanded to full size so that half its intake was being trained in the light bomber role, and in August No. 60 OTU was turned over completely to the training of light bomber crews. There were a variety of circumstances leading up to this changeover. The main reason was the urgent need for light bomber crews for forthcoming operations on the (2) continent. The only other light bomber OTU in the United Kingdom, No. 13, had to devote most of its energies in providing advanced training for crews from the two Canadian light bomber OTUs, and No. 60 OTU was used to make up the output so lost. It was a change in night fighter training policy that finally made it possible for No. 60 OTU to cease intruder training. By the summer of 1944 operational requirements had changed and both No. 100 Group and ADGB had decided that their squadrons should be trained both in the night fighter (AI) role and in the intruder role, which meant that all night fighter crews could be trained at Nos. 51 and 54 OTUs, leaving No. 60 free to concentrate on light bomber training. (3) The amalgamation of AI and intruder training was accomplished by a slight adjustment in the syllabus of the two remaining night fighter OTUs, and the loss of No. 60 OTU was made up by increasing intakes to the normal summer rate of 32 every four weeks.

(1) AM File S.5218/III

(2) AM File S.95966

(3) See Chapter 17

Re-equipment of the Night Fighter OTUs

In September both units received their first Mosquito aircraft. There were not sufficient Mosquitos available to re-equip the OTUs completely - they had to wait until March 1945 before they were completely re-equipped - and pilots had to go through a complicated series of stages; after training on Oxfords and Blenheims at No. 9 AFU, they did about nine hours on Beauforts, followed by 62 on Beaufighters and finally 33 hours on Mosquitos, making a total of 10⁴ hours flying at the OTU. It was not possible for crews destined for Mosquito squadrons to complete the combined AI and intruder syllabus as well as convert to Mosquito aircraft on the 12 weeks course, and in October course lengths for Mosquito crews were extended to (1) 16 weeks.

Conversion to Mosquito and intruder training was carried out in the last four weeks of the course. No. 51 OTU trained 30 Mosquito crews every four weeks on a 16 weeks course - owing to lack of accommodation the unit could not hold more than 120 crews so the extension of the course meant reducing intakes from 32 to 30. Navigators/radio received Mark X AI training in the Wellington flying classroom flight, and crews were trained as AI night fighters and also as intruders. No. 54 OTU trained 32 crews every four weeks on a 12 weeks course on Beaufighters, 10 of whom underwent a further four weeks Mosquito intruder training. This unit therefore produced 22 Beaufighter AI Mark VIII night fighter crews without intruder training and 10 crews fully trained as Mosquito AI Mark VIII night fighters (2) and intruders, most of whom were for overseas squadrons. These changes (3) relieved the pressure on No. 1692 Flight which was responsible for instructing the fighter crews provided by No. 51 OTU in "serrate" procedure (homing on the enemy's airborne radar) before they went to squadrons in No. 100 Group. Until Mosquitos had been provided at the OTUs it had been necessary for this flight to carry out conversion of Beaufighter crews to (4) Mosquitos before the specialist radar course could commence.

(1) AM File S.5218/III

(2) AM Files S.5218/III and S.95966

(3) The development of the Flight is described in Chapter 17

(4) ERP 335

Navigator/radio training was also modified by extending the course length at No. 62 OTU to six weeks in August to allow time for Gee training. Intakes were stabilised at 34 pupils every fortnight to feed the two night fighter units.

Reorganisation of the TEUs

Shortly after the ~~disbandment~~ of No. 3 TEU at Hawarden a new syllabus of training was drawn up and issued to the three remaining TEUs. The new syllabus covered gyro training, dive bombing tactics, and the use of rocket projectiles and was intended to raise the standard of the pilots arriving from the three day fighter/fighter bomber OTUs before they joined their squadrons. The new No. 3 TEU at Annan also undertook the conversion of pilots to Typhoons and Mustangs after April using the satellite at Honiley for this purpose. Nos. 1 and 2 TEUs were expanded to train 180 pupils each and No. 3 trained 150. A pilots replacement unit was formed at Cranfield on 1 June to act as a pool for pilots from the TEUs awaiting posting to squadrons. It provided conversion training for Tempest pilots, and provided flying practice for the Spitfire, Typhoon and Mustang pilots. The reorganisation of the TEUs and the formation of the PRU meant that, once the invasion of Europe started, all immediate fighter requirements could be supplied as soon as they arose. Pilots would be fully trained on the appropriate type of aircraft and would be able to go into action without further preliminary training, thus leaving the squadrons free to devote all their resources to operational flying.

It was soon discovered that casualty rates were far lower than had been anticipated, which meant that fighter pilot output could be considerably reduced. It was possible to disband No. 2 TEU on 25 June and No. 1 TEU on 31 July. Six days later the Pilots Replacement Unit was disbanded. All intakes into the three day fighter OTUs were suspended on 11 July and were not resumed until 8 August (25 into Nos. 53 and 61 OTUs and 44 into No. 57). A week later intakes were standardised at 32 per school and two weeks after that normal summer intakes of 44 pupils every three weeks were resumed. In October the winter programme was started and intakes dropped back to 32.

The requirements of fighter reconnaissance pilots were also changed after D-day. By August a large surplus had accrued and all intakes into No. 41 OTU were suspended on 15 August. Just prior to D-day the fighter reconnaissance squadrons in 2nd TAF had been re-equipped from Mustangs to Typhoons, but these aircraft with their short range and indifferent camera installation soon proved unsuitable for reconnaissance work and, because all available Mustangs were needed by the day fighter squadrons for long range bomber escort work, the fighter reconnaissance squadrons had to be re-equipped with Spitfire XIVs. As a result No. 41 OTU had been re-equipped from Mustangs to Spitfires in July 1944 and a new fighter reconnaissance training syllabus drawn up, although the course length remained at nine weeks. Normal intakes (of 32 every 3 weeks) were resumed on 5 September but the following month the unit was reduced to just over half-size with intakes of 18 pilots every three weeks.

(1)
(2)

These reductions in the fighter operational training units made it possible to effect economies in the administration organisation. On 15 September 1944 No. 9 Group was absorbed by No. 12 Group at Watnall, and all the fighter OTUs and TEUs were transferred to that group. Some months later, in February 1945, No. 12 Group was relieved of the responsibility for light bomber training and Nos. 13 and 60 OTUs handed over to No. 2 Group. A further administrative change was the disbandment of ADGB on 13 October 1944 and the reconstitution of Fighter Command.

(3)

The Central Fighter Establishment

On 4 September 1944 an important development in the fighter training organisation took place - the formation of the Central Fighter Establishment. The purpose of the new unit was to study both air defence problems in the light of technical aeronautical advances, and trends in future air attacks. Although it was mainly concerned with increasing tactical efficiency of fighter aircraft, it was also concerned with training in fighter tactics. It was formed by combining the three existing units carrying out these tasks:

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- (1) AHB Narrative Photograph Reconnaissance Vol. II
 - (2) AM File CS 1949/III
 - (3) See Chapter 17

the Air Fighting Development Unit which formed at Northolt in 1934, the Fighter Interception Unit which formed at Ford five years later, and the Fighter Leaders School at Milfield. The new unit had its Headquarters at Wittering and was organised into two wings, a day fighter wing and a night fighter wing, each wing being sub-divided into various specialist sections. The whole Unit comprised the following:-

Day Fighter Development Wing - Milfield

Wing HQ	- 2 Spitfires - 2 Typhoons
Fighter Training Squadron	- 37 Spitfires 5 Martinets
Fighter Bomber Training Squadron	- 21 Typhoons
Air Support Development Squadron	- 2 Spitfires 2 Typhoons 2 Proctors 2 Austers
Air Fighting Development Squadron	- 6 Mosquitos and Beaufighters 20 Typhoons, Tempests and Spitfires 1 Oxford 1 Proctor

Night Fighter Development Wing - Ford

Wing HQ	- 2 Mosquitos
Night Fighter Training Squadron	- 6 Mosquitos 3 Wellingtons 3 Oxfords
Fighter Interception Squadron	- 20 Mosquitos 5 Hurricanes

Expansion of the Day Fighter Training Organisation

By 1945 the day fighter units had to be reorganised once again. The Central Fighter Establishment had taken over the duties formerly carried out by the Fighter Leaders School at Milfield and that unit was therefore closed on 14 December. The aerodrome at Milfield was utilised to house No. 56 OTU, a new unit formed for the training of Typhoon and Tempest pilots. Operations on the continent since D-day had absorbed the reserve of pilots, especially when the establishment of pilots in 2nd TAF squadrons was raised from 23 to 27, and it became necessary to make provision for greater output. At one time it had been thought that the war in Europe would be finished by

December 1944 and that the pool of pilots would have been sufficient to meet all needs. Events proved otherwise, however, and after the flying bomb and rocket campaign started it became necessary to step up the output of fighter pilots to meet the increased needs of Fighter Command and 2nd TAF. No. 3 TEU at Aston Down which had been acting as a Typhoon conversion unit, was disbanded on 15 December and replaced by No. 55 (Typhoon) OTU. Because of the urgent need for Typhoon pilots, however, this unit had to be used to provide short conversion courses on Typhoons for selected Spitfire pilots from Nos. 53 and 57 OTUs. This was intended as a temporary measure only but full courses were never actually introduced as the unit ceased training in May after the capitulation of Germany. Another OTU (No. 59) for the training of Typhoon pilots was opened at Acklington as a half-sized unit on 26 February 1945. The first intake of 22 pupils started on March 20, and this turned out to be the only course to be fully trained there. A second intake was three-quarters of the way through the syllabus when the unit was disbanded. To help bridge the gap between the Harvards and Masters of the AFUs and the Typhoons and Tempests of the OTUs, a number of Hurricanes were added to the establishment of the single-engined AFUs in January 1945, and pilots selected for Typhoon and Tempest OTUs were given 15 hours flying experience (1) on Hurricanes at the end of their AFU course. The training of Mustang pilots, formerly carried out at the TEU, was undertaken by No. 61 OTU. After December 1944 intakes into that unit comprised 16 Spitfire and 16 Mustang pupils. To make up for the Spitfire capacity so lost, No. 41 OTU at Hawarden, which was still operating at only half strength, was temporarily expanded in February to full size by training day fighter pilots in addition to fighter/reconnaissance pupils. A month later this commitment was taken over by another new OTU (No. 58) which formed at Hawarden on 12 March as a full-sized school. No. 41 OTU reverted to half-size and was moved to Chilbolton to make room for the new Spitfire unit. March saw the change over to summer intakes at all the fighter OTUs: day fighters to 44 (22 at No. 52 OTU), night fighters to 34 and fighter/reconnaissance to 18.

(1) AM Files C.36503/48/II and S.71965

In January 1945 the armament practice camps were reorganised. After D-day a number of camps had dropped into disuse and by the end of 1944, by which time the 2nd TAF had moved to the continent only four of the eight camps were in use. Fighter squadrons had temporarily ceased to use them, and those still working (Nos. 11 and 17 at Fairwood Common and Nos. 14 and 18 at Warmwell) were utilised almost exclusively by 2nd TAF squadrons returning to the United Kingdom for refresher training. Arrangements were therefore made to disband Nos. 12, 13, 15 and 16 APCs and to expand the equipment of each of the remainder to 10 Martinets, four Masters and two Spitfires or Typhoons. When the war in Europe ended the camps were again reorganised. The four existing units (and No. 1494 TT Flight) were all closed and were replaced by new camps at Fairwood Common, Bradwell Bay and Hawkinge, each equipped with 16 Martinets, six Masters, two Tempests and two Mustangs. These three camps, which were unnumbered, were to serve only the (1) squadrons in Fighter Command. Two more APCs, both on the Island of Sylt, were opened on 15 July 1945 to serve the squadrons of 2nd TAF. They were slightly smaller than those in the United Kingdom, having 16 aircraft each instead of 26. These five camps between them provided a three weeks gunnery course once every four months for all fighter, light bomber, fighter bomber and tactical reconnaissance squadrons in the United Kingdom and (2) Germany.

By the spring of 1945 all night fighter squadrons in ADGB, No. 85 Group and No. 100 Group had been re-equipped with new AI equipment and plans were put into effect to reorganise night fighter training. All training on the old marks of AI came to an end and at all three OTUs (Nos. 51, 54 and 62) (3) training on the new Mark X equipment was started. At No. 62 OTU navigator/radio courses were extended to eight weeks and the unit was re-equipped from Ansons to Wellingtons and Hurricane aircraft established for target towing. Training courses at Nos. 51 and 54 OTUs which had been extended to 16 weeks reverted to their former lengths of 12 weeks, and four

(1) AM File C.37284/48/II

(2) AM File S.94915/II

(3) See AHB Monograph AP 3407 Signals Vol. VII

(1)

Wellington flying classrooms allocated to these two units for radar training. When the new courses started summer intakes of 34 pupils every three weeks were commenced. This new programme had just been put into effect when the end of the war in Europe caused a complete change in training policy and the drastic reduction in the number of OTUs.

War in Europe Ends

On the 8 May 1945, when Germany signed the surrender terms and the war in Europe ended, the Fighter OTU organisation was re-shaped to meet the requirements for the Japanese War and for the occupation of Europe. By the end of the month training had ceased at eight of the eleven OTUs and the remaining three units were reorganised to meet Phase 2 requirements. On 15 May training ceased at Nos. 53, 57 and 62 OTUs and the units formally disbanded a few weeks later. Kirton-in-Lindsay the home of No. 53 OTU was used as an aircrew holding unit for surplus aircrew from all the OTUs. When No. 62 OTU closed down the training of navigators/radio was taken over by No. 54 OTU. A week later training ceased at Nos. 58 and 59 OTUs and at Nos. 41, 51 and 55 the following week. No. 58 OTU continued with two special courses for allied pupils from all OTUs within the group who had not completed their training, in order that they might be fully trained, and the unit finally disbanded on 20 July.

The three remaining units were reorganised on 29 May to train for the new Phase 2 requirements. No. 56 OTU trained Tempest short range day fighter pilots on a nine weeks course with intakes of 44 pupils every three weeks. No. 61 OTU which had moved to Keevil on 26 May 1945 was expanded to provide nine weeks courses for 132 Mustang long range day fighter pilots and 108 Spitfire fighter reconnaissance pilots - the latter commitment being transferred from No. 41 OTU. Night fighter crews were trained at No. 54 OTU. In addition to the normal OTU course, which trained 22 crews every three weeks on a 12 weeks course, the radar training commitment for navigators/radio was transferred from No. 62 OTU, and intakes of 30 pupils every month on an eight weeks course. These three units continued to operate to this schedule until the end of the Japanese War.

(1) AM Files S.82437 and S.95966

In addition to these three OTUs there was No. 1335 (Meteor) Training Flight which had been formed at Colerne on 8 March 1945 to convert pilots from the fighter OTUs on to Meteors before they joined their squadrons. It had been formed as a temporary expedient until sufficient Meteors were available to form an OTU, but it was still in operation at the end of the war. Nos. 83 and 84 GSUs continued to function although they became little more than holding units and were finally closed at the beginning of August 1945 and converted into Disbandment Centres.

There was also No. 43 OTU at Andover (it had moved from Old Sarum) training AOP pilots. This unit had been expanded to train 34 pupils at a time in August 1944 in order to meet increased requirements for AOP squadrons on the continent, and three months later it was further expanded to train 60 pupils. It was still the policy to meet both home and overseas requirements from No. 43 OTU, including Canadian Army requirements in Europe, although a small OTU had been set up at Eboli in Italy in October 1944 to train a few Polish pilots for No. 663 (AOP) Squadron in that country, and No. 1587 Flight had been formed at Deolali, India, in July to provide operational training for a few pilots who received EFTS training in India. Neither school trained many pilots, however, and after initial requirements had been met the units were retained to provide refresher facilities for pilots from the United Kingdom. In January 1945 a helicopter training flight of nine aircraft was added to No. 43 OTU and after using them to train instructors, 10 pupils at a time were trained on eight week courses, beginning in April 1945. The following month Phase 2 training requirements were formulated and it was possible to reduce the capacity of No. 43 OTU to 40 pilots, plus 10 on the helicopter course, and this organisation continued until the end of the war.

There was one more unit training fighter pilots for service with the RAF in addition to these seven units. This was No. 80 OTU which was formed at Morpeth on 23 April 1945 (and moved to Ouston two months later) for the

(1) AM File C.36509/48/II

(2) AM File S.2982/II

(3) AM File S.2983/III

(4) AM File S.85673/I and II

training of French fighter pilots to support the four French Spitfire squadrons operating under 2ndTAF. It was smaller than the normal RAF unit, and trained only 39 pupils at a time (graduates from No. 7 SFTS) with an intake of 13 pilots every month on a 12 weeks course, having an aircraft establishment of 24 Spitfires, 14 Masters, four Martinets and one Dominie. Although staffed mainly by French Air Force personnel it was established as an RAF formation; the equipment remained RAF property, and training was provided as a service. In these respects the unit differed from some French training units that had recently been established in North Africa, which were French operated, even though the schools provided aircrew personnel for French squadrons in the RAF.

During the first half of 1945 an investigation was made into the efficiency of the day fighter OTUs. Although they were designed to train a maximum of 132 pupils at a time (44 every three weeks on a nine weeks course) it was found that in actual practice they very rarely achieved that maximum. Ever since 1943 courses had suffered from constant fluctuations chiefly because of the periodic surpluses of day fighter pilots. This meant that, until late 1944, the units were working against a background of accumulated reserves, and, apart from limited periods, their organisation and manning were never pressed to the maximum. When in early 1945 it was likely that the units would have to work at maximum pressure for a sustained period, Fighter Command were doubtful whether they could maintain the maximum planned intakes, especially with the added maintenance problems arising from the use of Typhoons and Tempests in the OTUs, and it was suggested that intakes should be reduced by 20 per cent at Spitfire and Mustang units, and 30 per cent at Typhoon and Tempest units. The Air Ministry could not agree to this reduction and it was arranged that an investigation of the OTUs should be carried out to ascertain whether increases in establishments or reductions in flying tasks were necessary. This investigation showed that inefficient servicing and erratic intakes were primarily responsible for the difficulties, and steps were taken to remedy these defects. Consequently it was decided to maintain intakes at their existing rate until the end of the Japanese War.

(1) AM Files A.773187/45 and S.104953

(2) AM File S.95966

CHAPTER 19COASTAL OPERATIONAL TRAINING

The outbreak of war found all 19 squadrons of Coastal Command mobilised and at their war stations and, unlike Bomber and Fighter Commands who were able to utilise the 'phoney war' period to transfer the responsibility for operational training from the squadrons to operational training units, squadrons of Coastal Command were operational from 3 September onwards and could not be used for training purposes. Indeed for the first 18 months of the war it was impossible to take a single squadron out of the line. A further problem peculiar to Coastal Command was that all pilots had to receive some form of specialist training, either on flying boats, torpedo dropping or general reconnaissance in addition to the normal conversion to operational flying.

Although, on the outbreak of war, there was no operational training (or 'Group Pool' as it was then called) organisation for Coastal Command there were three schools in existence to provide the various types of specialist training. Indeed there was a training group in the Command - the only one in the operational commands - to administer the three schools. First, there was the School of General Reconnaissance which had been formed at Thorney Island in April 1938 to provide navigation and reconnaissance courses for (1) pilots operating over the sea in GR or flying boat squadrons. The course lasted 16 weeks (13 weeks navigation plus three weeks reconnaissance and ship recognition) and six courses, each of 25 pupils, were trained every year. These courses had actually been started some two years earlier, at the School of Air Navigation at Manston, but the pressure of expansion and the decision to send all pilots on a navigation course after their FTS training had led to the transfer of the GR pilots training to a new school in order to allow Manston to concentrate on navigation training for all (2) other pilots.

(1) AM Files S.47629 and 325203/34

(2) See Chapter 2

The second unit was the Torpedo Training School at Gosport which had
 (1) been in existence since 1925. This School was responsible for the training of both RAF and Fleet Air Arm torpedo-bomber pilots. The RAF training commitment amounted to supplying pilots for four squadrons, two at home and two in the Far East, all of which were equipped with Vildebeestes. GR training was not an essential part of the TB pilot's syllabus, and few pilots in TB squadrons had passed through the School of General Reconnaissance.

Thirdly there was the Seaplane Training Flight at Calshot. This title was rather a misnomer since the flight was responsible for the conversion training of pilots destined for flying boat squadrons. The flight was a descendant of the old flying boat course at Calshot, which, prior to 1936, had provided 29 week courses in navigation and flying boat operation. When the School of Air Navigation was formed, it took over from Calshot the responsibility for navigation training, and thereafter only flying boat conversion training was carried out at Calshot.
 (2)

These three units were controlled by No. 17 (Training) Group in Coastal Command which had been formed at Lee-on-Solent on 1 December 1936 and subsequently moved to Gosport. At the time the Group was formed the Air Ministry was responsible for all Fleet Air Arm training and other training units under No. 17 Group included the School of Naval Co-operation at Ford and some Fleet Air Arm training units at Donibristle. After the Fleet Air Arm had passed to Naval control these units were taken over by the Admiralty, who after 1937 became responsible for the operational training of Fleet Air Arm personnel, except for torpedo bomber pilots who continued to be trained at Gosport. The Air Ministry, however, continued to provide basic training facilities for Naval pilots. New entrants received their elementary flying training at No. 23 E & RFTS Rochester and their service flying training at
 (3) No. 1 FTS Netheravon. This agreement continued even after the war started, although some pilots and observers were sent to America and Trinidad for their training under Admiralty arrangements.

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- (1) It originally operated as a flight of the base at Gosport and was upgraded to independent status in 1929.
 - (2) AM File S.47629
 - (3) See Chapter 2

Maritime Training on the Outbreak of War

Thus when the war began these three specialist units were the only training backing for the Command and these could provide very little operational training. There was a further difficulty; Coastal Command was in the process of re-equipping to new types of aircraft and this meant that the squadrons were busy converting their existing personnel to the new types and could not spare the time to train new crews. The three types of squadrons - general reconnaissance, torpedo bomber and flying boat - were all receiving new aircraft: DB.18s (later known as Hudsons) in place of Ansons; Bothas, and later Beauforts, instead of Vildebeestes; and Sunderlands and Lerwicks were replacing the old Londons and Stranraers. This re-equipment (which was badly overdue) besides entailing conversion training, brought additional training commitments in the shape of larger crews (and new crew members) and wider operational duties. The new GR aircraft were to be capable of bombing or, alternatively, of torpedo dropping; the new torpedo bombers which were twin engined had a longer range and therefore their crews needed GR training; the new flying boats were considerably larger and faster than their predecessors.

To overcome these many difficulties plans were drawn up for the formation of a group pool in Coastal Command. Plans had in fact been made for such a pool in 1938, but shortage of aircraft had prevented its formation and for the first months of the war the landplane squadrons of Coastal Command had to do all the operational and conversion training themselves and each squadron had a training flight added for that purpose. The projected pool was to deal only with land aircraft, since crew requirements for flying boats could be met by adding to the seaplane training squadron. Its work was defined as converting pilots to operational types and giving them operational training, and also instructing observers, wireless operators, and air gunners in their operational duties. Coastal Command drew up a syllabus which provided 40 hours flying per pilot, with another 20 hours as navigator, during a six week course. An aircraft establishment of ten Ansons, six (1) Hudsons, five Bothas and four Beauforts was agreed. Since all its pupils

(1) AM File S.1887

had to be GR trained the initial planning was based on the School of GRs output of 416 per year, less about 80 pilots per year who went to the seaplane training squadron.

Coastal Command were anxious to get the pool working quickly chiefly in order to deal with the partly-trained pilots and crews in auxiliary squadrons. It was proposed to provide Hudson instructors, move a Blenheim training flight from Thorney Island, and draw Ansons from the auxiliary squadrons.

Formation of the Landplane Pilots School

The Landplane Pilots Pool opened at Silloth on 1 November 1939, but was handicapped throughout the winter of 1939-40 by unserviceability of the aerodrome and the unfinished state of the buildings and ranges. A certain amount of conversion and ad hoc training was done, and an elaborate synthetic crew trainer for Hudsons developed, but it was not until the summer of 1940 that the pool was able to accept crews for normal operational training. In December 1939, when the ratios of operational training to operational first line aircraft were agreed, (1) 20 per cent was fixed as the proportion for GR landplanes. The Pool was renamed No. 1 OTU in February, and in April its establishment had grown to fourteen Ansons, eight Hudsons, seven Bothas, six Beauforts, and six Battles (TT).

Meanwhile the other three units in the Command were being reorganised to produce a greater output. The GR School course was reduced from 16 weeks to 12 in October 1939 and intakes increased to 32 every four weeks. Under the War Training Organisation Scheme (SD.138) it had been planned to use the school to provide the second half of the SFTS course for GR pilots in addition to reconnaissance training, on a 12 weeks course, training 78 pupils at a time, but this scheme was dropped in favour of 'straight' GR training for pilots ex SFTSs. The flying boat unit at Calshot was reorganised to train eight pilots at a time on a four weeks flying boat conversion course. It was equipped with four Stranraers, five Swordfish, three Singapores and two Scapas. The torpedo training unit at Gosport continued to train both RAF and Fleet Air Arm pilots. It was equipped with Vildebeestes and, under the War Training Organisation was planned to train 44 pilots every four

(1) See Chapter 17

weeks on a four weeks course. In March 1940 the unit moved to Abbotsinch as Gosport was considered unsuitable for training in war-time and the following month the School of GR was moved from Thorney Island to Guernsey. The fall of France and the decision to evacuate training schools from the southern parts of the British Isles caused a further move a few weeks later when it was transferred to Squires Gate, and the same reason caused the move of the flying boat training flight from Calshot to Stranraer. By that time it had been decided to open a second GR school and both schools were located at Squires Gate. Even after the new school had been opened the supply of GR trained pilots fell far short of the demand. The combined rate of output from Squires Gate was 64 pilots a month whereas the requirement was for nearly twice that figure, and roughly half of the intake into the OTU had to be accepted without GR training.

This was only one of Silloth's many difficulties. During the spring of 1940, when the OTU had to assist the squadrons in the conversion of their pilots to the new types of aircraft (Hudsons and Beauforts) few replacement crews were turned out - a serious situation since it was still the only OTU in the Command. The two specialist units dealt only with torpedo training and flying boat conversion and all operational training for all the types of landplane aircraft in the Command - Ansons, Hudsons, Blenheims, Bothas and Beauforts fell to Silloth. This training was confined largely to pilots; other aircrew categories were trained as opportunity served but there was no organised crew training.
(1)

Expansion of Training Facilities

In the summer of 1940 it was decided that Silloth should concentrate on training replacements. The course (which nominally lasted six weeks) was shortened to produce the numbers required, until Hudson and Anson crews were being turned out in three weeks and Botha and Beaufort crews in a fortnight. Silloth had also, in July, to undertake the training of Blenheim crews for long range fighter work, and this course was also shortened to the minimum for the sake of output. Previously this training had been carried out by

(1) AM File S.5668

Fighter Command, but they were now too busy training Hurricane and Spitfire pilots.

With this shortening of courses crews were inadequately trained for operational work. Pilots OTU instruction amounted to little more than conversion to the operational type, while there was no proper teaching for wireless operators. In September it was decided that the maritime OTU organisation should be expanded and made capable of dealing with the full flow of men for the first line and giving them adequate training. Long range fighter training was to be separated from the rest of Silloth's commitments and made into a specialised OTU, and the Torpedo Training School and the Flying Boat Training Squadron were to be converted into OTUs teaching crews as well as pilots.

Long range fighter training had already moved away from Silloth. Congestion there had compelled its transfer, by an unofficial temporary arrangement, to Prestwick, and it moved from Prestwick to Catfoss, where it became No. 2 OTU in October. Later in the year Chivenor was allotted to Coastal Command for operational training, and in December No. 3 OTU began training there on Ansons. It had also been intended to train Beaufort crews but this was delayed until January 1941 because all Beauforts were grounded. As a temporary measure, two Beaufort squadrons, Nos. 22 and 42 trained their own crews at Chivenor in the winter of 1940.

The Botha was rejected as an operational aircraft in December 1940 and Silloth was then able to concentrate on turning out Hudson crews. By that time Whitleys were being used by Coastal Command and the first squadron equipped with them (No. 502) had detached a flight to Kinloss in September for the conversion of pilots. This flight remained at Kinloss for some time, as a training detachment, to convert the pilots of other squadrons, and then moved to Kirkbride in May 1941. A similar Wellington training flight had been established at Kirkbride, the satellite of No. 1 OTU at Silloth in November - Wellingtons having come into use by Coastal Command a few months earlier - and the Whitleys joined this Wellington flight. The new combined Whitley-Wellington element, although working at No. 1 OTU satellite, was regarded as part of No. 3 OTU at Chivenor.

(1) AM File S.5668

The Flying Boat Training Flight which had moved from Calshot to Stranraer, and became a squadron in June 1940, began to train crews as well as convert pilots in October but made slow progress towards becoming a full OTU, mainly because there were not enough flying boats for its work. It was renamed No. 4 OTU in March 1941, and moved to Invergordon in June.

The Torpedo Training School was planned to develop into No. 5 OTU. At Abbotsinch, however, it could deal with nothing more than torpedo training, and the rest of Beaufort TB crews operational training had therefore to be given at No. 3 OTU Chivenor.

Thus by the end of the year the Command possessed the beginnings of (1) four OTUs, all training on an eight weeks syllabus.

OTU No.	Location	Training Crews For
1	Silloth Kirkbride	6 Hudson and 1 Wellington Squadrons
2	Catfoss	4 Blenheim squadrons
3	Chivenor Kinloss	3 Beaufort, 4 Anson and 2 Whitley squadrons
4	Stranraer	8 Flying Boat squadrons

Torpedo bomber crews received their Beaufort conversion training at Chivenor before going to the TTU at Abbotsinch for their torpedo training. Fleet Air Arm training had been transferred to Crail in October 1940 and this allowed the unit to be reorganised. It was re-equipped with 19 Beauforts and two Tiger Moths and provided four week courses including 48 (2) hours flying for 15 crews at a time. The GR training schools had also been reorganised. The threat of invasion had caused the transfer of both (3) schools at Squires Gate overseas. No. 1 moved to South Africa in October and No. 2 to Canada two months later. Both schools continued training pilots for Coastal Command, but to make up for the nine weeks loss

(1) AM File S.1887

(2) AM File S.4195

(3) ~~xxxxxxxxxx~~ See Chapter 23

of output (144 pupils) the transfer entailed, a third school (No. 3 GRS) was formed at Squires Gate in December 1940. It was intended that this school should disband as soon as the moves had been completed, but after the decision that all pilots (and subsequently observers) in Coastal Command should be GR trained, the need of GR training facilities was so great that the school was retained as a permanent unit, and in January 1941 its intakes were doubled,
 bringing the capacity of the School up to 192 pilots.
 (1)

Continued Shortage of Training Capacity

There was no material increase in the output rate of the maritime OTU organisation during the first half of 1941. It was about 600 crews per year at the beginning of the year, and the gradual development of flying boat and Whitley-Wellington training made little difference to the figure. The output from GR training, however, increased greatly once the two schools overseas started work, and maritime OTU capacity was soon too small to deal with the numbers turned out. It was also too small to supply the flow of replacements needed by squadrons, which increased considerably when calls for instructors, Middle East reinforcement, and tour-expiry were added to wastage requirements. The first line, which had enough crews at the beginning of the year - although many were inadequately trained - began to find an uncomfortable shortage by June.

More OTUs were needed, but the main difficulty in the way of expansion was finding the necessary aerodromes. Whitley-Wellington training was destined for Chivenor, but Chivenor had to train Beaufort crews until an OTU could be opened within easy reach of torpedo ranges. For some time it was thought that the Beaufort torpedo OTU (No. 3) might be put at Prestwick, but Coastal Command had objections to Prestwick which eventually prevailed. Beaufort training had then to go on, divided between Chivenor and Abbotsinch, until Turnberry was ready some time in 1942. Torpedo bomber crews completed their eight weeks Beaufort conversion at No. 3 OTU before going to Abbotsinch for a four weeks course in torpedo dropping.

(1) AM File S.64371

Formation of Additional OTUs

During the spring of 1941 two Blenheim squadrons (Nos. 53 and 59) were transferred from army co-operation to coastal work, and became GR squadrons. They had previously been backed by replacements from army co-operation training at Andover and in June No. 2 School of Army Co-operation, Andover, became a maritime OTU (No. 6) training Blenheim GR crews. This additional OTU brought another problem. The Blenheim squadrons were to be rearmed with Hudsons and, as Andover was not considered suitable for Hudson training, the unit had to be moved to Thornaby and converted to Hudson training. No. 6 OTU at Andover was closed on 18 July 1941. Half the staff remained there and formed the nucleus of a new army co-operation OTU (No. 42) and the remainder moved to Thornaby to form a new No. 6 OTU. Further changes in the Coastal OTU organisation took place in the summer of 1941. The Whitley-Wellington element of No. 3 OTU moved from Kirkbride to Cranwell where it was re-formed as a long range GR OTU and numbered No. 3 OTU. The remainder of the old No. 3 OTU, the Beaufort section, stayed at Chivenor and was renumbered No. 5 OTU. All of these moves were intended to be temporary: No. 6 OTU was to move to Milfield, No. 5 to Turnberry, and No. 3 to Chivenor (as soon as No. 5 vacated that airfield) but no further moves took place until well into 1942.

No. 4 OTU at Invergordon - the flying boat training squadron had been formally renamed in March 1941 and moved from Stranraer in June - was expanded to train 15 crews a month in July 1941 (an increase of six crews per month) and its aircraft establishment revised to 40 flying boats. Modern flying boats were in short supply and the unit had to operate with a miscellany of aircraft, including Catalinas, Lerwicks, London, Stranraers, Singapores and Sunderlands. No. 2 OTU Catfoss had also been re-equipped and one third of its 54 operated aircraft were made up of Beaufighters, the remainder being Blenheims. Once again, however, aircraft were in short supply and for some months the unit had to operate below its full aircraft establishment. The same applied to No. 5 OTU; In September 1941, for example, it had less than 50 per cent of its Beaufort establishment.

(1) AM File A.943193/47

(2) AM File S.1887 and SD 155/445/41 and 603/41

(3) AM File S.4183.

At the end of July, the problem of producing more crews without using more aircraft was solved by economising in pilots. It was decided that all medium range GR and TB aircraft (Hudsons and Beauforts) should carry one pilot and one observer instead of two pilots. As OTU training centred around the pilot this change meant that almost twice as many crews could now be trained, and the overall rate of output went up to roughly 1,500 crews a year. The long range GR squadrons did not adopt the new policy and the flying boat crews and Whitley and Wellington crews continued to have two pilots.

Changing the Hudson crew to one pilot and an observer was dependent on the supply of GR trained observers. Until the autumn of 1941 all intakes into the three GR schools had been filled with pilots. Output had been further increased by doubling the size of No. 31 GR School in Canada and by shortening course lengths from 12 weeks to nine. As a result of these measures the output of GR trained pilots rose to 160 every three weeks. By replacing a pilot by an observer in Hudsons the pressure on the GR schools could be reduced, since although it would now be necessary to give observers a GR course it need only be half that of pilots because their basic navigation training already covered much of the GR syllabus. Accordingly the course for observers was fixed at four weeks (although a few months later it was extended to five) and it was arranged that capacity of No. 3 GRS Squires Gate and No. 31 GRS Charlottetown should be 144 pilots and 48 observers in place of 192 pilots. The GRS in South Africa did not commence observer GR training until May 1942 when it was expanded and brought into line with the other two schools to supply additional crews for the Middle and Far East; prior to that time it continued training pilots and its capacity (1) had remained at 96 pupils.

Reorganisation of Syllabus and Training Sequences

All through 1941 there were considerable local variations in the work of maritime OTUs. Although a general syllabus had been drawn up early in the year, it had to be modified considerably to suit the various requirements of the OTUs, and as a result each OTU worked largely according to its own ideas.

(1) AM File S.64371

The general syllabus was drawn up at a time when many of the intakes to OTUs had not been to a School of GR and so included a good deal of GR instruction which became unnecessary later in the year. In November the syllabus was revised and much of the GR training cut out.

Drastic alterations in the training sequence were proposed by Coastal Command during the autumn of 1941. Pilots were arriving at OTUs with indifferent flying ability, and many accidents were happening. Lack of flying practice during the GR course was blamed, and Coastal Command put forward a scheme for combined GR and OTU training during a 12-week course at the OTUs. In spite of the economies which the scheme promised, it was considered that the right remedy was to improve pilots basic training, and that the principle of giving GR pilots a special navigation course should be maintained. No change in the sequence was made. Basic training was improved by the "New Deal", and the possibility of keeping pilots in flying practice at the School of GR was investigated. Coastal Command also proposed to start armament training flights because the standard of air gunners reaching OTUs was low, but once again the Air Ministry decided that the right remedy was to improve basic instruction.

Throughout the second half of 1941 it was hoped that the flow of crews from maritime OTUs would be supplemented by a flow from Canada. A Hudson OTU (No. 31) began work at Debert in the summer, but its output was small for some time. A Beaufort torpedo OTU (No. 32) was also planned in Canada, but was delayed in starting, and training did not start there until early 1942.

Thus, by the end of the year there were six Coastal OTUs in the United Kingdom, plus one in Canada, and three GR schools (in the United Kingdom, Canada and South Africa). These nine units, plus the TTU which was really part of No. 5 OTU were responsible for supplying crews for the following squadrons at home and overseas:-

<u>Aircraft</u>	<u>Home</u>	<u>Overseas</u>
Hudsons	14	3
Blenheim/Beaufighters	6	2
Whitley/Wellingtons	4	
Beauforts	6	2
Flying boats	6	4

Effects of the Japanese War on Maritime Training

In 1942 the outbreak of the war with Japan made it imperative to have far more reconnaissance and torpedo aircraft in the Eastern Mediterranean and the Far East, and the expansion of the maritime OTUs was planned as a matter of first importance. No additional units, however, came into operation during the first three months of the year and the immediate need for more crews was met by changing the crew of the long range GR aircraft and flying boats from two OTU trained pilots to one OTU trained pilot and one pilot direct from a GR school. Fully trained and experienced pilots for additional crews were then drawn from existing crews and a rapid increase became possible. This revised crewing, which was intended as a temporary measure, increased the output from the six units in the United Kingdom to nearly 2,000 crews a year. The second pilots who were sent to squadrons direct from the GRS's subsequently went to OTUs for training as captains of aircraft. For this reason the change was not applied to squadrons overseas since it would have been impracticable to send second pilots back to the United Kingdom for an OTU course; although 12 months later this decision was revised and second pilots for overseas squadrons were returned to the (1) United Kingdom for a captain's course. This policy, that second pilots should no longer be qualified to fly the aircraft on which they were operating, was necessitated by events but was unsatisfactory in so far as it meant that many pilots entering OTUs after 1942 had considerable experience as second pilots but could not, in theory, (in practice, of course, they were taught on their squadrons) take off and land the aircraft in which they had operated. Eventually the policy was modified slightly and second pilots joined their crews towards the end of the OTU course.

The latter half of 1942 saw considerable expansion. New OTUs were formed and existing units were re-equipped with new types. In addition, various new training commitments were undertaken by No. 17 Group, Coastal Command, namely the training of ferry crews and photographic reconnaissance crews. Until the formation of a special OTU for photographic reconnaissance training, the training of crews for that work had been somewhat haphazard.

(1) AM File S.71291/I

When the Photographic Reconnaissance Unit had been formed at Heston on 8 July 1940 under the control of Coastal Command, pilots for training on Spitfires were carefully selected from experienced personnel in bomber and army co-operation squadrons who needed little conversion training (about 10 or 12 hours was sufficient) ^{and} a training flight of two Spitfires was sufficient to carry out the task. The PRU (including the training flight) moved to Benson in December 1940 and nine months later when it was reorganised and expanded in the autumn of 1941 two training flights were established - one dealing with the elementary stages of training and the other the more advanced work. In January 1942 the elementary flight moved to Detling where it became known as "K" flight; it was equipped with 14 Spitfires and carried out a four weeks course which included 30 hours flying. A month later, when the supply of suitable experienced pilots ran short, specially selected pilots from the GR School were chosen for PR work. As they were less experienced than their predecessors, a special PR conversion flight of five Spitfires and two Masters had to be established at No. 3 GRS Squires Gate to convert the chosen pupils onto Spitfires at the rate of 10 per month. After conversion training at Squires Gate, prospective PR pilots went on to "K" Flight at Detling before passing to the advanced training flight at the PRU Benson where they finished their training either on Spitfires or Mosquitos. In May 1942 the conversion flight at Squires Gate and the operational training flight at Detling were moved to Fraserburgh and were merged to form No. 8 OTU. At the same time the advanced flight at the PRU was disbanded. The new unit, which continued to draw most of its pupils from the GR School, was equipped with 20 Spitfires, four Masters, three Mosquitos and two Oxfords, trained 52 crews at a time on an eight weeks course, and supplied crews for all PR squadrons at home and overseas.

Final OTU Expansion

By the summer of 1942 several other new OTUs had been formed and existing units expanded. No. 7 OTU was formed at Limavady in July to provide Wellington torpedo-bomber crews who were needed overseas, and it combined the function of an OTU and TTU, training 27 crews per month on a 12 weeks combined course. The existing torpedo training unit at Abbotsinch

(1) AM File S.71291/II

was moved to Turnberry to combine with No. 5 OTU which had also moved there
 (1)
 from Chivenor in March 1942. As a number of Hampden torpedo bomber squadrons had been formed in Coastal Command this unit had been reorganised to train Hampden crews as well as Beaufort crews. With an establishment of 47 Beaufighters, 29 Hampdens, 18 Ansons and six Battles the unit was now training 21 Beaufort and 12 Hampden crews every month on a 12 weeks course. It was hoped that No. 32 OTU in Canada would eventually supply all Hampden crews, and Turnberry was only training them as a temporary measure. In May the Hampden establishment was brought into line with the Beauforts and the unit was expanded to train 21 Beaufort and 21 Hampden crews every month. By September the supply from Canada was materialising, but it was found that they needed an acclimatisation course in the United Kingdom before joining their squadrons. In addition, more Beaufort crews for overseas squadrons were required and No. 5 OTU was reorganised to train six Hampden and 28 Beaufort crews per month on a 12 weeks course together with 12 Canadian trained crews every month on a four weeks refresher course. To meet this commitment the aircraft establishment had to be altered to 57 Beauforts and
 (2)
 21 Hampdens.

Beaufighters were also beginning to flow into the Command in greater numbers and the demand grew too much for No. 2 OTU at Catfoss which was gradually replacing its Blenheims with Beaufighters. By this time Fighter Command had a surplus of night fighter pilots (trained on Blenheims) and it was arranged that the night fighter OTU at East Fortune (No. 60) should assist Coastal Command by giving preliminary training on Blenheims for pupils destined for No. 2 OTU. Courses at No. 2 OTU were shortened to five weeks and with a training capacity for 68 crews. Operational conversion with 36 hours flying was provided for pilots and navigators/wireless. Pilots arrived at No. 2 OTU from No. 60 OTU when they had already carried out a five weeks course on Blenheims, and navigators/wireless arrived after completing a
 (3)
 five weeks GR course at Squires Gate. Eventually on 21 November 1942, No. 60 OTU was transferred to Coastal Command and became No. 132 OTU. It

(1) AM File S.71290

(2) AM File S.70949

(3) AM File S.4183

continued working in conjunction with No. 2 OTU and had a capacity for 72 crews. This arrangement was uneconomical because it meant that it took 10 weeks to train crews instead of the normal eight, and it was intended to combine these two units to form one Beaufighter OTU. Before this was done, however, requirements were changed, and in May 1943 both units were reorganised to train crews on a full Beaufighter OTU course lasting eight weeks (No. 2 training 60 crews at a time and No. 132, 42).
 (1)

In spite of the assistance given by No. 60 OTU in the summer of 1942, which almost doubled the output of Beaufighter crews, the supply still fell far short of the demand, and in August another new OTU, No. 9, had to be opened at Aldergrove to bridge the gap. This unit trained Beaufighter crews on the orthodox eight weeks course, with monthly intakes of 34 crews.

Flying Boat Training

Flying boat training was also expanded. After America's entry into the war it was no longer possible for the US Navy to go ahead with their plans for training RAF crews at Pensacola up to full operational standard, and the loss of this capacity of 30 crews a month had to be made up in the United Kingdom and Canada. It was planned to open a flying boat OTU in Canada in the summer of 1942 but it was not likely to produce many crews before the end of the year. In point of fact this unit, originally planned as No. 37 OTU and subsequently renamed No. 3 OTU, RCAF, did not open until November 1942, and even then it was under established in aircraft and could not cope with the planned intake of 12 crews per month for some time. To supply crews for the new Catalina squadrons being formed both at home and overseas, No. 131 OTU was formed at Killadeas on 20 July 1942 with an establishment of 18 Catalinas and capacity for training 22 crews at a time on a eight weeks course.
 (2) No. 4 OTU was strengthened slightly and re-equipped with Sunderlands and Catalinas to train a total of 24 Sunderland and 26 Catalina crews. To relieve the pressure on No. 4 OTU, a special training flight, No. 1447 Flight, had been formed at Hooton Park on 19 March, equipped with

(1) AM Files S.4183 and S.71291/II

(2) AM File S.4108

18 Oxfords, to bring wireless operators, tradesman gunners and air gunners up to the standard necessary for them to commence operational crew training at the OTU by providing a month's preliminary training. Previously the obsolescent flying boats at No. 4 OTU had been used to provide this training. Intakes into the new flight were regulated to feed No. 4 OTU; as a flying boat crew consisted of two pilots, one navigator/bomber, one flight engineer, two wireless operators/air gunner, one wireless operator mechanic/air gunner, one flight mechanic 'E'/air gunner, one flight mechanic 'A'/air gunner, and one air gunner in the case of Sunderlands (and the same, less the straight air gunner for Catalinas), intakes comprised 50 wireless operators/air gunner, 25 wireless operator mechanics/air gunner, 25 flight engineers, 25 flight mechanics 'A'/air gunner, 25 flight mechanics 'E'/air gunner and 11 air gunners per month. When No. 131 OTU was formed the flight had to be expanded by a further 50 per cent. ⁽¹⁾ This pre-crewing training continued to be given by No. 1447 Flight until December 1942, when it was transferred to Technical Training Command and undertaken by No. 4 Radio School which had been formed on 1 October 1942 to provide pre-OTU training for all wireless operators destined for Coastal Command. After No. 1447 Flight's commitment had been taken over, No. 4 Radio School trained 330 pupils at a time on a five weeks course and was equipped with 65 Ansons.

Training of GR Crews

The two Hudson OTUs (Nos. 1 and 6) were also reorganised during the year. At the beginning of the year they had been expanded to train a combined total of 160 crews (102 at No. 1 OTU and 58 at No. 6) to support the various Hudson squadrons at home and overseas, including the air/sea rescue squadrons and meteorological flights at home and transport squadrons overseas. This was a temporary expedient until the two Hudson OTUs in Canada were producing crews in sufficient numbers. By June No. 31 OTU was producing 18 crews a month and this allowed intakes into Nos. 1 and 6 OTUs to be reduced from 51 and 29 a month to 44 and 7 respectively. No. 36 OTU in Canada had also started training and it was hoped that by the end of the year these two units,

(1) AM Files S.4108, S.82404/I and S.71291/II

assisted by No. 75 OTU (due to form in the Middle East) would meet all requirements in Hudson squadrons, and, apart from acclimatisation courses, no Hudson training would need to be carried out in the United Kingdom.

No. 6 OTU began acclimatisation training for Canadian trained crews in June, on a five weeks course, training 12 crews at a time. After allowing for wastage 58 crews a month would be produced in the two British OTUs (40 at No. 1 OTU and six at No. 6, plus 12 on refresher course) and this was sufficient to meet all Hudson requirements at home and overseas, except No. 53 Squadron in America which was backed direct from the Canadian OTU. By October the first courses from No. 36 OTU were arriving in England, and it was possible to cease Hudson training altogether at No. 6 OTU and transfer the acclimatisation courses (which had risen to 27 a month) to No. 1 OTU.

No. 6 OTU was re-equipped with Wellingtons and was to assist No. 7 OTU training torpedo bomber crews for Wellington squadrons. Until it moved from Thornaby, however, torpedo training was impossible, so until March 1943, when it moved to Silloth, No. 6 OTU trained Wellington GR crews at the rate of 26 per month on an eight weeks course. Two flights of the OTU trained Czech and Polish personnel for the bomber squadrons transferred from Bomber to Coastal Command. No. 1429 (Czech OT) Flight was transferred from Bomber Command to Coastal on 27 October 1942 and merged into the OTU together with sufficient (1) Polish personnel from No. 18 OTU to form a Polish Flight.

Although Hudson crew requirements from No. 1 OTU were also reduced, it was decided to maintain existing intakes so that crews for Liberator and Fortress squadrons in Coastal Command could be trained. Ever since the middle of 1941, when the first Liberator squadron was formed in Coastal Command, the training of crews for these aircraft had presented special difficulties. There were insufficient four-engined aircraft available to form a special OTU or even a conversion unit in the United Kingdom and for some time crews had to undergo a medium range GR OTU course, and receive their conversion training in their squadrons. Originally these crews received their OTU training at No. 3 Wellington/Whitley OTU, but as the demand for Hudson training dropped in the

(1) AM File S.71291/II

United Kingdom the commitment passed, first to No. 6 OTU and then to No. 1. This was only a temporary expedient (although in fact it continued for over a year) and in March 1942 plans had been made to form a long range GR OTU in the Bahamas, as part of the scheme to provide operational training facilities on American types of aircraft in or near the USA. Originally this OTU (No. 111) was scheduled to open at Nassau in August 1942. It was to be jointly staffed by RAF and USAAF personnel and was to train 69 RAF crews at a time on a 12 weeks course, using Venturas and Fortresses, and would meet all crew requirements in long range GR squadrons at home and overseas. When the scheme for RAF OTUs in America collapsed, the Nassau project was retained, but, owing to revised allocation of American aircraft, it had to be considerably restricted. The unit was now to be entirely RAF manned, it was to train only 39 crews at a time (on a 12 weeks course) and was to be equipped with 23 Mitchells and 9 Liberators. Four additional Mitchells were established as target towers and two old Catalina amphibians were added for air/sea rescue purposes. The opening date was set as the end of September, but difficulties over aerodrome construction delayed the start and although the first staff for the school arrived in September, training did not commence until 30 December 1942. At one time it was intended to transfer No. 1653 (Liberator) HCU, which was surplus to Bomber Command requirements, to Coastal Command, but by the time it was available for transfer (October 1942) the temporary arrangements outlined above, to bridge the gap until the Bahamas OTU started work, had already been made, and the proposal was dropped (2) and the unit disbanded.

The training of Wellington and Whitley crews was also reorganised during the year. In addition to the formation of No. 7 OTU for the training of Wellington crews, and the conversion of No. 6 OTU from Hudsons to Wellingtons, both of which were intended to train crews for torpedo bomber squadrons equipped with Wellingtons, No. 3 OTU at Cranwell was expanded. This unit, which had been training crews for the Wellington and Whitley GR squadrons, was increased in size in October 1942 to train a total of 72 crews on an eight

(1) See Chapter 23

(2) AM File S.82428/I

eight weeks course. Twenty of these were for the Whitley GR squadrons, and the remainder were trained for the newly forming Wellington "Leigh Light" squadrons. Cranwell was too small for the expanded OTU to work efficiently and it had been intended to move the unit to a larger aerodrome at Haverford West. This move proved impracticable, however, and it was not until March 1943 that a new home was found for this unit. In the meantime it had to function as best it could at Cranwell, and as previously stated the training of crews for Nos. 304 (Polish) and 311 (Czech) Squadrons, the responsibility for which had recently been transferred from Bomber Command to Coastal), had to be carried out temporarily at No. 6 OTU, instead of No. 3 as formerly planned.

(1)

Summary of OTU Expansion in 1942

As a result of these increases the planned capacity of the eleven OTUs in Coastal Command had grown to 678 crews by the end of 1942. The standard course length was eight weeks (extended to 10 in the winter months 1 October - 31 May) and the aim was to provide each crew with 72 hours flying. The exceptions were No. 2 OTU which carried out operational crew training only on a five weeks course with 32 hours flying, the pilots for this unit undergoing the first half of their training at No. 60 (Night Fighter) OTU on a five weeks course; Nos. 5 and 7 (Torpedo Bomber) OTUs which incorporated a four weeks TTU course and were therefore of 12 weeks duration (14 in winter) with 92 hours flying; and No. 1 OTU which provided a month's refresher and acclimatisation course (with 20 hours flying) for Canadian trained crews arriving in the United Kingdom. In addition three OTUs in Canada (Nos. 31, 32 and 36, training a total of 176 crews), one in the Bahamas (No. 111 - 39 crews) and one in the Middle East (No. 75 - 44 crews) were training general reconnaissance crews on courses lasting 12 weeks, and when working at full capacity these 16 units could turn out nearly 400 crews per month. Over one third of these were required for squadrons overseas, chiefly in connection with the North African landings, and as the majority of these were trained in the United Kingdom and had to fly their own reinforcement aircraft out, there arose the need for a ferry training organisation in Coastal Command. Prior

(1) AM File S.70942

to 1942 this training had been provided by units in Ferry and Bomber Commands, but as the overseas commitment grew (from 16 crews a month in 1941 to 120 per month by December 1942) it exceeded the capacity of those units, and Coastal Command had to form their own ferry training units. First to form were Nos. 302 and 303 FTUs at Lough Erne and Talbenny, training Catalina and (1) Wellington crews respectively. Courses at these units varied, but usually averaged about two weeks and included 20 hours flying. Two more units had formed before the end of the year: No. 304 FTU at Port Ellen, training Beaufighter crews and No. 306 at Maghaberry training Beaufort crews. In March 1943 a fifth Coastal FTU was formed, No. 308 at Pembroke Dock for Sunderland crews and the following month saw the formation of No. 309 FTU at Benson which took over from the PRU the ferry training of Spitfire and Mosquito PR crews.

General reconnaissance training facilities were also greatly expanded during 1942. The doubling in size of the South African GRS in May 1942 brought all three GR schools into line, each training 192 pupils (168 pilots on a 9 weeks course and 24 navigators/bomber on a five weeks course). This capacity was still insufficient to provide GR training for all pilots and navigators destined for general reconnaissance or torpedo squadrons, and in the autumn of 1941 plans had been made to form a second school in Canada. In March 1942 further arrangements had been made to form an additional two-and-a-half schools in Canada, making four-and-a-half altogether. This expansion was partially accomplished by the summer of 1942 but it did not relieve the desperate shortage of GR trained personnel in Coastal Command which existed at that time; in fact it aggravated the position since pupils from No. 31 GRS had to be "creamed off" to supply instructors for the additional capacity.

It became impossible to supply GR trained pilots and observers for all OTU courses, and between June and September many intakes had to be made up of non-GR personnel. An order of priority for the available GR trained personnel had to be drawn up. No. 4 (Flying Boat) OTU headed the list, followed by the two Wellington units (Nos. 3 and 7), the Hudsons (Nos. 1 and 6), and the PR OTU (No. 8); No. 5 (Torpedo Bomber) OTU on Beauforts came fifth, and lastly (2) was No. 2 OTU training long range fighter crews on Blenheims and Beaufighters.

(1) A detailed account of the Ferry Training organisation is given in Chapter 20.

(2) AM File S.71291/II

To overcome the shortage special ground GR courses were started at No. 7 PRC Harrogate on 22 June 1942 to train pilots on a six weeks course. The first course comprised 200 pilots drawn from (P) AFUs who went straight to Coastal OTUs after completing the GR training, but the second course of 200 pupils, which started training three weeks later, was drawn from the normal PRC intake and had to undergo AFU training after the GR course. All subsequent intakes, which took place at three weekly intervals and comprised 100 pilots, were also drawn from the PRC intake. A batch of 100 observers was also included with the first intake, for a course lasting four weeks, but subsequent courses comprised only pilots. These courses continued until the winter of 1942, the last course finishing their training on 12 December, after which it was possible to provide all GR training for pilots either in Canada or S. Africa. Few Coastal Command pilots received their basic training in the United Kingdom after 1941 and it was possible for No. 3 GRS Squires Gate to concentrate on the training of observers, training (1) 192 pupils on a five weeks course.

In April 1943, a further temporary shortage of GR trained pilots occurred and courses, similar to those carried out at Harrogate were run at Bridgenorth, the first intake of 100 commencing on 5 April. Intakes were every three weeks and the course length was seven weeks, a week longer than the Harrogate courses. The last output occurred on 28 August.

A small general reconnaissance and air navigation school had also been started in Ceylon in 1942, and this provided post OTU courses for small numbers of pilots and navigators from the Middle East needed for GR squadrons in South-East Asia.

Manpower Shortages and Maintenance Problems

The year 1943 was a year of reorganisation and consolidation. Thanks to a more plentiful supply of aircraft for operational training a great expansion in the operational training organisation had taken place. The era of shortages, however, was by no means over, and a shortage of manpower was becoming more and more acute. By the beginning of 1943 in fact the overall strength of the OTUs was nearly 30 per cent below establishment and in some

(1) AM File S.64371

trades the deficiency was nearly 50 per cent. To ensure that such personnel as were available were used as efficiently as possible - some men had been working as many as 14 hours a day with the result that the sickness rate went up and the OTUs output dropped - the establishments of maintenance personnel were re-assessed and a monthly flying task was calculated. This task laid down exactly how many flying hours were to be done each day (and how many serviceable aircraft were needed to do them). This system - Planned Flying and Planned Maintenance - which was put into operation at the beginning of 1943, overcame many of the difficulties which had previously beset the OTUs and, as a result, the training of crews in 1943 was carried out more systematically and efficiently than ever before, and actual outputs bore a much closer resemblance to the estimated figures.

Reorganisation of Torpedo Training

A large part of Coastal Command's ferrying commitment, which had recently necessitated the formation of a number of FTUs, was the result of the Air Ministry's decision to create a large torpedo force. This had been recommended in a report of 10 November 1942 by Admiral Phillips who had been (1) lent to the Air Ministry to make a survey of the RAF's torpedo strength. The object was to expand the torpedo force to a total of 31 squadrons. The (2) four Hampden squadrons in the United Kingdom were to be replaced by eight new squadrons: five torpedo fighter squadrons - Beaufighters were to be used in this role - and three torpedo bomber squadrons equipped with Wellingtons. In the Middle East, one Beaufighter, three Beaufort and three Wellington torpedo squadrons were to be in operation, plus one Wellington TB squadron in West Africa. Five Beaufighter, three Beaufort and seven Wellington squadrons were to cover India, Burma, Ceylon and the Indian Ocean. These figures excluded Beaufighter long range fighters, and Wellington GR squadrons. To back this force the torpedo training organisation in the United Kingdom would have to be expanded to produce a total of 126 crews per month, 40 of whom would be needed overseas - an output which could only be achieved by reorganising all the torpedo OTUs and revising the policy of

(1) AMT Folder 8/2

(2) This represented the entire TB force in Coastal Command in the autumn of 1942, all Beaufort squadrons having been sent overseas, and no Wellington TB squadrons had yet been formed.

(1)

providing torpedo training as part of the normal OTU syllabus. The Admiralty were anxious to economise in target recovery vessels by concentrating all torpedo ranges in the Firth of Clyde area and this meant divorcing torpedo training from the OTU and re-forming special torpedo training units. From the training point of view this was a retrograde step, since it meant that crews had to change units in the middle of their training thus causing delays between the two sections. The change was one of geographical and economic necessity, however, and the training organisation was accordingly revised.

The two existing combined units, Nos. 5 and 7 OTUs, were split into separate units, No. 5 OTU was moved from Turnberry to Long Kesh on 12 January 1943 and reorganised to train 56 Beaufort and 14 Hampden crews on an eight weeks course. The torpedo unit remained at Turnberry where it became, on 1 January 1943, No. 1 TTU with a training capacity for 60 Wellington and 16 Hampden crews on a four weeks course. No. 7 OTU at Limavady was reorganised to train 80 Wellington TB crews on an eight weeks course, and its torpedo training facilities utilised to form (on 19 December 1942) No. 2 TTU at Castle Kennedy which was to train 25 Beaufort and 24 Beaufighter crews on a four weeks course. The use of Beaufighters as torpedo fighters was a recent innovation and crews for these duties continued to be trained at Nos. 2 and 132 OTUs under the existing system of five weeks courses, until June 1943 when both units had to complete the normal eight weeks courses. No. 2 OTU then trained 60 Beaufighter fighter RP crews at a time, and No. 132 sixty torpedo fighter crews. No. 6 (Wellington) OTU at Thornaby also remained unchanged in size, although 40 of its population of 54 crews were to be trained as torpedo-bomber crews. It exchanged aerodromes with No. 1 OTU at Silloth in March 1943, as soon as that unit had gone over entirely to the acclimatisation training of Hudson crews. The remaining Coastal OTUs were unaffected by this reorganisation, with the exception of the other Beaufighter unit, No. 9 OTU at Crosby, training long range dive bomber crews, which was slightly reduced in size to train a total of 62 crews on an eight weeks course.

In addition to the OTUs and TTUs arrangements were made to provide refresher and advanced tactical torpedo training for operational squadrons, by forming a new unit, No. 1 Torpedo Refresher School, at Tain on 1 January 1943. Tain had actually been used as a training base for operational squadrons for the past six months, and a torpedo tactical flight had been established for that purpose as part of the Coastal Command Development Unit. This flight was converted into No. 1 TRS under the January reorganisation. Training in 1942 had been haphazard, however, and it was not until the TRS was formed that refresher facilities were available for all TB squadrons. Squadrons were then withdrawn from the line at regular intervals and it was intended to give all squadrons a month's refresher training every six months. In addition to synthetic training (mainly on the 'TA' or 'Crail' trainer), practice in dropping runner torpedoes was given, and each crew had to carry out six runner drops at the TRS. The course, in fact, was similar to the normal TTU course, where four runner drops per crew was carried out. The refresher school had no aircraft of its own (squadrons flew their own aircraft) but had a resident specialist staff for instructional purposes and to operate and maintain the unit's equipment. It had been intended to form a second TRS (No. 2) at Leuchars, which had also been used on a small scale for refresher purposes in 1942, but subsequent changes in requirements made (1) this school unnecessary.

Overseas torpedo training facilities were also expanded. In Canada, No. 32 OTU remained unchanged and continued to operate as a combined OTU and TTU sending its output to the United Kingdom, but in the Middle East No. 5 METS, which had been formed at Shallufa in June 1942 to provide torpedo training for Wellington and Beaufort crews arriving from the United Kingdom was expanded to undertake refresher training in addition to its TTU commitment. (2) Arrangements were also made to provide refresher training facilities for torpedo crews in the India/Burma/Ceylon area and No. 3 TRS (3) was formed at Ratmalana in Ceylon for the purpose.

(1) AM File S.82402/I and II

(2) See Chapter 21

(3) See Chapter 22

Provision of Additional LR/GR Crews

In addition to the reorganisation of torpedo-bomber training, it was necessary to provide for the growing number of long range GR squadrons in Coastal Command early in 1943. The flying boat crew production was satisfactory, and the expansion carried out in 1942 was now producing crews in the required numbers. By mid-summer, in fact, owing to a shortfall in American aircraft production a surplus of Catalina crews began to appear, and it was necessary to cease intakes at No. 131 OTU for a short time in order to keep trained crews in practice. No. 302 FTU also had to be used for this purpose. As it was necessary to convert many of the Catalina squadrons to British aircraft, thus reducing Catalina crew requirements, No. 4 OTU was completely re-equipped with Sunderlands, and its planned capacity set at 52 crews, although owing to difficulties over the construction of a second slipway at Alness, its actual capacity was reduced to roughly 36 crews. When Catalina production increased again the supply of crews from No. 3 OTU in Canada, together with the output from No. 131 OTU was sufficient to meet requirements.

(1)

Apart from flying boat crews, there was an urgent need for more landplane crews for long range GR squadrons. No. 111 OTU in the Bahamas had been formed with the intention of supplying all four-engined landplane GR crews, but its first output did not emerge until mid-1943 and even then most of the crews were sent direct to West Africa and India. In March 1943, it was decided to expand the long range force in Coastal Command from six squadrons (two Liberators, two Fortress and two Halifax) to ten, by re-equipping four medium range squadrons with Liberators, as the existing practice of converting Hudson crews to the four-engined types by the squadrons themselves was impracticable when whole squadrons had to be converted - it was necessary to make special provision for conversion training on to four-engined types.

(1) AM File S.82404/II

By that time No. 1 OTU at Thornaby had been reduced to providing acclimatisation courses for crews arriving from Canadian OTUs and was working considerably below its maximum capacity. Accordingly on 2 April 1943, the unit was reorganised to undertake four-engined conversion training and a special flight established at Thornaby for Halifax and Fortress training, together with a Liberator flight at the satellite Beaulieu, and its total training capacity increased to 27 Hudson crews, 7 Halifax/Fortress crews and (1) 10 Liberator crews every four weeks. All courses lasted four weeks and intakes were supplied chiefly from the Hudson OTUs in Canada, although subsequently a number of crews arrived from No. 111 OTU. A few months later the Fortress, Halifax and Liberator flights were moved to Aldergrove to form No. 1674 Heavy Conversion Unit, and an engine control demonstration flight, similar to that formed in Bomber Command, was added to the establishment of the HCU in September 1943. Its purpose was to improve "range flying" in long range squadrons, and selected pilots and flight engineers from operational squadrons underwent 10 days training at the flight.

The formation of the HCU meant that No. 1 OTU was again working far below its maximum capacity, and after May 1943 when No. 75 OTU began training in the Middle East, drawing its pupils direct from schools in Canada, No. 1 OTU was reduced to training only for Hudson squadrons in the United Kingdom - a mere 10 crews per month. As No. 5 OTU at Long Kesh had also been considerably reduced in size the two units were amalgamated on 30 October, and the new unit, located at Long Kesh and known as No. 5 OTU, was organised to train six Beaufort crews every four weeks on an eight weeks course together with twelve Hudson ex Canada every four weeks on a four weeks acclimatisation course. In addition, arrangements were made to give meteorological conversion courses, lasting four weeks to five crews at a time, for personnel destined for the (2) Ventura meteorological squadrons.

(1) AM File S.71228

(2) AM File S.70949

Reduction of Torpedo-Bomber Requirements

The reduction of No. 5 OTU had taken place as a result of a sudden drop in Beaufort torpedo-bomber crew requirements in the Middle East and the cessation of Hampden requirements in the United Kingdom. By August no more Hampden crews were required and the only requirement in Beaufort crews was four per month for India which, even allowing for TTU and FTU wastage, meant that intakes into No. 5 OTU could be reduced to six crews per month. The summer of 1943, in fact, saw a drastic reduction in the torpedo training organisation in the United Kingdom - little more than six months after it had been expanded. The chief reason for this sudden change of plans was the decision to transfer some of the Coastal OTUs training crews for the Middle East and SEAC to the Middle East. In the summer of 1943 twenty Wellington torpedo-bomber crews and 25 Beaufighter torpedo-bomber crews were being sent to the Middle East every month. They received OTU, TTU and FTU training in the United Kingdom and a further torpedo refresher and acclimatisation course on their arrival in the Middle East. By carrying out both OTU and TTU training in the Middle East considerable training economies could be effected. As a first step, it was arranged in August 1943 that No. 5 METS Shallufa should be expanded to undertake full TTU training for crews arriving from Wellington and Beaufighter torpedo OTUs in England, and later, in 1944, it was hoped to transfer both Wellington and Beaufighter OTU (1) training to the Middle East. By that time, however, the war situation in the Mediterranean had improved so much that no Wellington torpedo-bombers were needed and the transferred Wellington OTU was used as a GR OTU.

With the transfer of part of the TTU commitment overseas, it was possible to concentrate all the remaining TTU training in the United Kingdom into one unit. No. 2 TTU at Castle Kennedy was closed and No. 1 at Turnberry reorganised to undertake 12 Beaufighter, 8 Beaufort and 5 Hampden crews per month. The Beaufort and Hampden commitment gradually died and by the end of the year Turnberry was reduced to training nine Beaufighter crews a month.

(1) AM File S.82402/II

Air/Sea Rescue and Meteorological Training

The reduced Wellington torpedo-bomber requirements led to a revision of No. 7 OTU Limavady. Intakes ceased in November and the unit reduced to half size - this half being used to keep surplus trained crews in flying practice. Many of the surplus Wellington crews were absorbed into Warwick air/sea rescue squadron forming overseas. The importance of air/sea rescue work was becoming more and more apparent and a special air/sea rescue training flight was formed at Docking on 25 June 1943 which combined the functions of an OTU and FTU. In October the unit moved to Bircham Newton and a few weeks later it was moved again, this time to Thornaby. Eventually, in April the following year, the unit was disbanded and A/SR training was undertaken by No. 5 OTU.

Another new and temporary unit which was formed in 1943 was for training meteorological crews on Halifaxes. In June it was decided to expand and improve the meteorological flights by enlarging some of them into squadrons equipped with Venturas in place of Hampdens and by forming new squadrons equipped with Halifaxes. Converting to Venturas was not difficult; originally conversion training was provided by the flights themselves, although later it was carried out at No. 5 OTU. Halifax training however was a more difficult problem. All the existing training facilities were needed to support the two Halifax GR squadrons in Coastal Command and no additional aircraft could be supplied for conversion purposes. The only alternative was to use the first of the Halifax meteorological squadrons, No. 518 as a temporary OTU until sufficient trained crews were available to form new squadrons. When No. 1674 HCU was formed it took over this commitment and No. 518 Squadron became operational.

A further innovation introduced in 1943 was the decision to use crews under training at OTUs and FTUs on operational duties. In March 1943, when the anti U-boat war had reached its most critical stage, the C-in-C Coastal Command proposed that OTU crews should be employed on close-in routine patrols during the last stage of their training. Besides improving the standard of training

(1) AM File S.71291/2

(by putting into practice what had been taught at the training unit) the proposal would leave the long range and VLR squadrons free for intensive operations on threatened convoys. The proposal was welcomed by the training staff of the Air Ministry and approval was therefore given, subject to the proviso that output from the units did not suffer. It was arranged that each crew should carry out one patrol over an operational area (previously crews had been routed over non-operational areas) carrying depth charges and bombs. Torpedoes and similar strike weapons were not carried and, although crews were to patrol areas where submarines were likely to be found, they were only sent to areas where there was little likelihood of interception by enemy aircraft. Nos. 4 and 131 OTUs and Nos. 302 and 303 FTUs all equipped with flying boats, were the first units to be so employed, and the other short and long range OTUs and FTUs were subsequently employed, although when the latter were transferred (1) to Transport Command their operational duties were discontinued.

Transfer of Maritime Training to the Middle East

By the autumn of 1943 the decision had been taken to transfer some of the No. 17 Group training commitments to the Middle East. For the first four years of the war all GR, torpedo, coastal fighter and PR crews for the maritime RAF at home and abroad, as well as the bulk of the ferry crews required for delivering new aircraft overseas, had been trained by No. 17 Group, assisted by a few OTUs in the American continent. Unlike the other operational commands who trained only for their own requirements, Coastal Command was a maid of all work. The factor which had allowed a few OTUs to be located in Canada and the Bahamas - namely that since they were destined to operate chiefly over the sea training could be carried out in any coastal area - had also been responsible for centralisation of training for the Middle and Far East in Coastal Command. With the virtual end of the war in the Mediterranean, however, it was possible to relieve some of the congestion in the United Kingdom and at the same time avoid duplication of training and obviate the need for ferry training, by transferring some units to the Middle East. A start had already been made

(1) AM File CS.18613

earlier in the year by the formation of No. 75 (Hudson) OTU and two more new units - one training Beaufighter crews (No. 79) and the other Wellingtons (No. 78) - were to be formed early in 1944. In addition No. 74 OTU training fighter reconnaissance pilots was to undertake the training of Spitfire photographic reconnaissance pilots. These units would supply all the needs of the Middle East squadrons (except flying boat and long range GR squadrons) and would also train a number of crews for ACSEA. When they were in full operation it would be possible to reduce the number of OTUs in the United Kingdom. No. 132 OTU, which was being partially re-equipped with Mosquitos, would be able to meet all Beaufighter and Mosquito requirements and Nos. 2 and 9 OTUs could be closed. No. 6 OTU could similarly supply all the Wellington crews required and Nos. 3 and 7 OTUs were to be disbanded. Requirements in Canada were also reduced. The drop in torpedo bomber requirements rendered No. 32 OTU redundant and it was converted into a Transport OTU and the re-equipment of the short and medium range GR squadrons with long range four-engined aircraft meant that Hudson training in Nos. 31 and 36 OTUs could be given up, and both units were eventually equipped with Mosquitos, training crews for long range fighter squadrons. The only units that continued training crews for Coastal Command were No. 3 (RCAF) OTU training flying boat crews and No. 111 (Liberator) OTU in the Bahamas.

The Peak of Coastal Command Training

The year 1943 thus saw the peak of the training organisation in Coastal Command. In the summer of that year No. 17 Group, with over 1,000 aircraft on its charge, was one of the largest groups in the RAF. Over 11,000 aircrew were trained during the year, and of these 2,348 were trained crews, more than half of whom were for squadrons overseas. After August (when 238 crews were produced) the peak had been reached and output began to decline. The FTUs were transferred to Transport Command, except the flying boat and PR units which were retained because of their specialised nature, and arrangements were made to close a number of OTUs. No. 1 had been disbanded before the end of the year and two more, Nos. 2 and 3, were disbanded in the first six weeks of 1944. No. 7 OTU

ceased training in May 1944 and was converted into No. 4 Refresher Flying Unit, to provide refresher training facilities for Wellington crews awaiting posting to squadrons. No. 9 OTU whose lease of life was temporarily extended in order to provide replacements for casualties expected in the invasion, was finally (1) closed in August 1944. One of the FTUs still under Coastal Command control, No. 308 (Flying Boat) FTU, was also disbanded in the early part of 1944 and No. 302 FTU reorganised to undertake Catalina training. Once the surplus of Wellington crews was absorbed, No. 4 RFU was disbanded. Its aircraft and staff were utilised to form a specialised training flight for instructing certain operational crews in the use of Loran, a type of airborne radar. The Loran Training Flight, as the new unit was called, was formed on 5 October 1944.

It was not merely the transference of some training units to the Middle East that resulted in the reduction of the coastal training organisation. A more important reason was the favourable progress of the war. Expansion had ceased and wastage rates turned out to be considerably lower than had been feared. In particular torpedo requirements dropped from 126 crews a month at the beginning of the year to 22 a month by December. The elimination of the Wellington as a night torpedo bomber accounted for more than half this decrease and the re-equipment of Beaufort and Hampden squadrons and the introduction of the rocket projectile weapon in place of the torpedo in many Beaufighter squadrons, accounted for the remainder.

Improved Training Standards

Although by 1944 the output of the coastal training organisation was decreasing, the complexity of training was increasing as new types of equipment were introduced and courses were becoming more and more specialised. In 1943, for instance, No. 17 Group was training 26 different kinds of crews each requiring a different syllabus; by the following year the number had risen to 38. In January 1944 all OTU courses in No. 17 Group, except at No. 8 (PR) OTU were extended by two weeks (making them 10 weeks in the summer and 12 in the winter) in order to allow instruction in the use of radar equipment to be given

(1) AM Files S.79740, S.4183 and S.71291/IV & V.

at the OTU stage. When the earlier types of radar were introduced initial instruction was given in radio schools, but with newer and more complex equipment, such as ASV, Leigh lights, etc, that procedure was no longer practicable without increasing the size of those schools. With the decrease in OTU outputs it was possible to undertake this training of the OTU stage without additional facilities.

As a further means of improving the standard of instruction at the OTUs, it was decided to form a special school for the conversion of flying instructors to the particular task of the OTUs in No. 17 Group. It had been found in the past that part of the OTUs training facilities had to be used to convert new instructors to the particular aircraft of the OTU and to 'brief' them on the OTU syllabus. Concentrating this training at one unit would allow all the OTUs facilities to be used for crew training. Accordingly, on 1 May 1944, No. 17 Group Operational Instructors School (subsequently known as No. 12(O) FIS) was formed at St. Angelo with two Mosquitos, four Wellingtons and eight Beauforts, with the object of providing flying experience for new OTU instructors on the type of aircraft they would afterwards have to instruct. The course was supplementary to the normal FIS courses run by Flying Training Command and in (1) no way replaced or duplicated them. The first intake comprised two Mosquito, five Wellington and 10 Beaufort pupils every month on a 24 days course, to cover the requirements of Nos. 5, 6, 8, 9 and 132 OTUs, but a few months later the school was expanded to provide instructors for all seven Coastal OTUs, and four flying boats were added to its establishment. It also became necessary to make provision for the training of target towing pilots and some Masters had to be added for the purpose. Mosquito, Wellington and Beaufort requirements also changed slightly, and by August the School was equipped with five Beauforts, five Wellingtons, two Mosquitos, two Masters, three Sunderlands and one Catalina, and had a monthly output of six pilots trained on Beauforts, seven on Wellingtons, (2) two on Mosquitos, two on Masters, four on Sunderlands and two on Catalinas.

(1) AM File S.71291/V and SD 155/1053/44

(2) AM File S.71291/VI

Reduction in GR School Capacity

By the beginning of 1944 the requirements for GR School training capacity had changed and it was possible to close No. 31 GRS in Canada, leaving No. 1 GRS to undertake all GR training in Canada. The syllabus for both pilots and navigators had also been revised. With the growing need for economy, the Air Ministry had suggested in November 1943 that it was not really necessary for coastal fighter and torpedo pilots to undergo a GR course, since the limitations of Beaufighters and Mosquitos prevented pilots from taking an active part in navigation, signalling, etc. Coastal Command, however, did not agree that this training was a luxury and maintained that a high standard of pilot navigation was essential for those squadrons, although they did agree that it would be possible to omit part of the nine weeks syllabus. Eventually it was decided that these pilots should undergo a five weeks course - the same length as that given to navigators(B) and navigators(W). The GR course for other coastal pilots (long range GR pilots) was also revised and brought up to date, and it was found possible to reduce it from nine weeks to seven. The new syllabus and courses were introduced at No. 3 GRS Squires Gate in February 1944. Four courses were operated at a time; seven weeks course for GR pilots, and five weeks course for fighter and torpedo pilots, navigators/B and navigators/W. It was not possible to introduce the five weeks fighter and torpedo pilots course into the GR schools in Canada, South Africa and Ceylon owing to the difficulties in ensuring that the correct proportion of each type of pilot was available for feeding into the OTUs in various parts of the world. The new syllabus for GR pilots and for navigators was introduced but, because of the surplus of pilots awaiting entry into OTUs, the new pilots syllabus was carried out on the old (1) nine weeks courses. The schools in Australia and New Zealand, training for the Pacific area, were also notified of the new syllabus.

Further Reorganisation of Torpedo Training

By August 1944 the OTU organisation had been reduced to meet the revised front-line requirements. The TTU at Turnberry which had taken over from No. 1 TRS the responsibility for refresher training of torpedo squadrons in January

1944 was in turn absorbed into No. 5 OTU in May 1944. The A/SR training flight had also been combined with No. 5 OTU and that unit was now training eight Warwick air/sea rescue crews and five Hudson (3 meteorology and 2 A/SR) crews every month on courses lasting 10 weeks. The meteorology flights were being re-equipped with Hudsons, and the Ventura training commitment was therefore disappearing. Torpedo training for Beaufighter crews (from No. 132 OTU) was also provided. Intakes were 12 crews per month for a four weeks course. (1)
In addition refresher training for eight crews a month was provided. By this time, in fact, a remarkable reduction had taken place in the RAF torpedo training organisation. After February 1944 torpedo carrying aircraft were no longer required in the Mediterranean theatre, and No. 5 METS was reduced to training Beaufighter torpedo crews for ACSEA at the rate of six a month to back the two squadrons in that Command. Until August these crews were OTU trained in the United Kingdom before being sent out to the Middle East for their torpedo training, but when No. 79 OTU commenced training it was possible for it to provide Beaufighter crews for the METS. It was mainly for this reason that torpedo training for ACSEA was carried out in the Middle East rather than Ceylon, since both crews and aircraft were more readily available in the Middle East. In Ceylon, No. 3 TRS continued refresher training for 23 crews per month. In the autumn of 1944 this policy was revised; torpedo training was discontinued at No. 79 OTU and No. 5 METS and all torpedo training concentrated at No. 5 OTU Turnberry when intakes were increased from 12 to 18 crews a month to provide crews for the Far East. A few months later, when one of the two torpedo squadrons in the Far East was re-equipped with rocket projectiles, intakes were reduced to 15 per month and the refresher training commitment at No. 3 TRS (1)
halved.

The other five Coastal OTUs and the HCU underwent few changes and the planned output of the maritime OTUs at home and overseas totalled roughly 200 crews a month in October 1944. At home their capacity was as follows:-

(1) AM File S.82402/II

OTU No.	Aircraft	No. of crews
4	Sunderland	45
5	Warwick A/SR Hudson A/SR and Met Beaufighter T/F Beaufighter T/F	20 12 18 8 (refresher training)
6	Wellington M/GR	40
8	Mosquito PR Spitfire PR (pilots)	26 28
131	Catalina Sunderland	35 15
132	Beaufighter fighter RP Beaufighter T/F Mosquito fighter	5 49 14
1674 HCU	Liberator LR/GR Fortress LR/GR Halifax Met	9 3 6

These units were supplemented by the following overseas units:-

3(RCAF)	Catalina	36
111	Liberator LR/GR	52
74	Spitfire PR	16
75	Baltimore SR/GR Hudson SR/GR	30 25
78	Wellington MR/GR	70
79	Beaufighter fighter RP	50
3 TRS	Beaufighter T/F	23 (refresher training)

This organisation of 12 OTUs, one HCU and the Middle East Training School continued until the end of the war in Europe, although some of the roles were changed (torpedo training in the Middle East for instance was replaced by RP), and units were rarely working to full capacity. Just prior to D-day all units had been filled to their maximum capacity against expected high casualty rates, but fortunately losses did not turn out to be as heavy as had been feared and there was soon a temporary surplus of trained crews in the Command. It was possible to release some Beaufighter and Mosquito crews to Bomber and Fighter Commands and some Liberator crews for transport work. Schools began to work

at less than their full capacity, and after October 1944 No. 3 OTU in Canada concentrated solely on the training of RCAF flying boat crews. In spite of the progressive decrease in the output of this organisation since 1943, the number of different types of crews required still continued to grow, and the introduction of new equipment added to the complicity of training. By the beginning of 1945 there were 38 different syllabi in use compared with 26 in
(1)
1943.

Revised Crew Posting for GR Squadrons

The introduction of new and more complex types of radar equipment in the GR squadrons led to a revision of crewing policy in the middle of 1944. In July it was laid down that all GR crews should consist of a basic crew of two pilots, one navigator/B, and four wireless operators (two of whom were required as radar operators). Other tradesmen were added as necessary according to the particular aircraft requirements. Wellingtons, for example, had the basic crew of seven; Halifaxes had a flight engineer added; Catalinas had one flight mechanic (E), one flight engineer and one air gunner; Sunderlands one flight mechanic (E), one flight engineer and two air gunners; while Liberators in addition to having an extra flight engineer and air gunner, also had an additional navigator (bomber) in view of the long duration of their sorties. The justification for the policy of carrying a second navigator in Liberators was soon reflected by a marked increase in the standard of navigation in Liberator squadrons and in October 1944 Coastal Command proposed to extend that policy to the other VLR aircraft, namely, Sunderlands and Catalinas. It took some time to convince the Air Ministry that a second navigator was essential in these aircraft and it was not until March 1945 that approval was given. In Sunderlands the introduction of a second navigator made it possible to dispense with one of the air gunners, although in Catalinas (which had only one 'straight' air gunner) a compensating reduction was not practicable. The policy of having four wireless operators (two for radar operating) was never implemented for

(1) AM File S.71291/VII

flying boats and the standard crew for both Sunderlands and Catalinas thus became two pilots, two navigators/bomber, 1 flight engineer/air gunner, two wireless operators (air gunner), one wireless operator mechanic/air gunner, one ⁽¹⁾ ~~(E)~~ flight mechanic/air gunner and one air gunner.

It was arranged that the radar operators for the GR squadrons should be drawn from a higher aircrew category (up to this time they had been drawn from aircrew category of wireless operator) and as there was a surplus of navigators/wireless it was decided to utilise a 100 of these as radar operators. The first 25 started a four weeks pre-OTU signals course at No. 10 Radio School on 27 June; the remainder followed in batches of 25 per week. After training had started Coastal Command announced that these personnel could not be accepted unless they had completed a full air gunnery course, and arrangements had to be made for them to undergo four weeks training at No. 10 AGS before proceeding to an OTU. Subsequently it was decided that further navigators/wireless should be employed as radar operators and arrangements were made for these to undergo gunnery training prior to their pre-OTU signals training. Commencing in September, 15 navigators/wireless per week entered No. 10 AGS for the five weeks gunnery course. The training of wireless operators (air) was also resumed and weekly intakes into No. 10 Radio School comprised 15 navigators/wireless and ⁽²⁾ 25 wireless operators/air. This misemployment of navigators/wireless (they did not do any navigation when employed as radar operators) was an unwelcome posting from the point of view of the personnel concerned. The majority took some time to reconcile themselves in their new duties and particularly those in the early courses who were not warned of their future employment until they arrived at their OTU. The situation was somewhat improved when care was taken to explain the reason for their misemployment: the fact that they had been specially selected on account of their higher aircrew category to undertake important operations against the U-boats. Their rate of pay remained unchanged and it was pointed out that, with a large surplus of navigators/wireless, there were few openings for their employment as navigators for many months to come.

(1) AM File S.82404/IV and V

(2) AM File S.71291/V and VI

By the end of 1944 the increased operational effort of Coastal Command's fighter squadrons called for a greater output of Beaufighter and Mosquito crews. To achieve this without forming new units, all Mosquito training was centralised at No. 8 (PR) OTU. This necessitated moving that unit to a larger station, and on 16 January it was transferred to Haverfordwest, where it was augmented by the Mosquito element from No. 132 OTU and expanded to undertake the training of all Mosquito PR and fighter crews of Coastal Command in addition to Spitfire PR pilots - a monthly commitment of 16 Mosquito PR crews, 20 Mosquito fighter crews and 12 Spitfire PR pilots. This left No. 132 OTU training 24 Beaufighter crews per month, 12 for coastal fighter squadrons and 12 for torpedo fighter squadrons.

(1)

In February 1945 it was arranged that second pilots of flying boats returning to the United Kingdom from overseas squadrons for training as captains should undergo an AFU course immediately prior to their OTU training, instead of before serving as 2nd pilots. Many 2nd pilots had little chance to keep in flying practice, particularly as regards landing and taking off, and an AFU course, which was partly refresher and partly acclimatisation to United Kingdom conditions, was little use to 2nd pilots going abroad. By completing it after their tour as 2nd pilots they would more easily assimilate their OTU (captain's)

(2)

course.

Reduction of Training Capacity

In the spring of 1945 a review of the maritime OTU organisation was carried out to see what reductions could be made after the defeat of Germany.

(3)

Unlike Bomber and Fighter Commands, Coastal Command was still training many crews for the Far East, and this commitment would, of course, increase once Germany was defeated and the focus of the war centred in the Far East. Moreover, it was intended to roll up the OTUs in the Middle East as soon as the war in Europe was over, which meant that Coastal Command would have to meet the needs of the MAAF as well as take over the training of crews for the Far East formerly carried out in the Middle East.

(1) AM File S.71291/VI

(2) AM File S.82404/II

(3) AM File A.782722/45

/ Thus

Thus in May 1945, when Germany finally surrendered, although the first line strength of Coastal Command was very considerably reduced (chiefly by transferring squadrons to Transport Command) the OTU organisation was not contracted to the same extent. All units underwent some reduction, however - the average was about 50 per cent - but only two units Nos. 131 and 5 OTUs were disbanded and the latter had to be replaced by re-forming the torpedo training unit at Turnberry on 1 August 1945. The training policy for all units was considerably changed and special arrangements were made for the shortened OTU course to be given to crews undergoing a second tour of operations. It had also been hoped to alter training syllabi to meet the special needs of Coastal squadrons. Flying boat crews were to undergo a 15 weeks course instead of 12, and so would crews destined for landplane squadrons equipped with Leigh lights, ASV or other special equipment. Other courses would remain at 12 weeks. This policy, however, had not been introduced before VJ day.

By July all maritime OTU training had ceased in the Middle East and in Canada, and the only OTU remaining overseas was No. 111OTU at Nassau, and this was moved to Lossiemouth in the United Kingdom in August. It had been intended to amalgamate No. 1674 HCU with No. 111 OTU as soon as it returned to the United Kingdom, but the amalgamation had not taken place by VJ day and the HCU continued training Halifax crews for meteorological squadrons.

Intakes to the general reconnaissance schools at Squires Gate ^{and} in South Africa had ceased temporarily on VE day and were not resumed until after the war, while in Canada GR training had stopped when the EATS/ ^{agreement} expired in March 1945. Most of the specialist schools continued to operate, though usually on a reduced scale and only one unit was actually closed before the end of the war. This was the Anti U-boat Devices School at Limavady which had been formed from the old Loran Training Flight in April 1945 to provide a 10 days course of instruction for a number of operational crews in special devices for U-boat detection. These devices were not used in the Pacific war and the school was therefore closed in August 1945. The Coastal Command Flying Instruction School at St. Angelo was to be amalgamated with the Ground Instruction School

at East Fortune (which had been formed earlier in the year to train ex-operational aircrews as OTU ground instructors) although this did not actually take place until after the war. The School of Air/Sea Rescue at Calshot was reorganised to include instruction in jungle and terrain survival and rescue, and in July 1945 it was renamed the Survival and Rescue Training Unit. The Joint Anti-U-boat School at Maydown was also retained.

The two ferry training units that remained under the control of Coastal Command also continued to operate. It had been suggested that the function of these units should be undertaken by the OTUs, but the proposal had not been put into effect before the end of the war nor had the suggestion that they should be transferred to Transport Command been implemented and the two units (1) continued to work as independent formations under Coastal Command.

As a result of these changes the Coastal Command training organisation in (2) August 1945 had been reduced to ~~over forty~~ 14 units.

(1) AM File S.71291/VII

(2) See Appendix 86

CHAPTER 20FERRY AND TRANSPORT TRAINING

This chapter is a description of two separate, though closely allied, training organisations, each with its own configurations, facets and failings. On the one hand there was the question of training crews to ferry the various types of aircraft from the sources of supply to the theatres of operations - Hudsons over the Atlantic; Hurricanes over the desert; Beaufighters over the jungle - and on the other, the training of crews to transport men and materials by air - gliders to Sicily; paratroops to Arnhem; supplies to Burma. The fundamental difference between these two tasks was that transport training was merely a means to an end, to instruct crews in the art of operating transport aircraft, usually in the face of enemy opposition and nearly always in close co-operation with ground forces. Ferry training, on the other hand, was a means in itself, with the object of training a particular crew to fly a particular aircraft to a particular place. It was in fact little more than conversion to type together with detailed briefing and preparation for the journey. Both types of training were further sub-divided: on the transport side into air line flying and air-borne support; on the ferrying side into regular ferry crews and "one trippers".

On the outbreak of war the only transport aircraft in the RAF were a few ancient Bombays and Valentias of No. 70 Squadron in India and No. 216 Squadron in the Middle East, and these had to combine the task of bombing with their transport role. There was, in addition, No. 24 Squadron at Hendon equipped with a variety of museum pieces for the purposes of communications work. The Army had no glider borne or parachute troops and, although there was a School of Army Co-operation at Andover, it was confined to training fighter reconnaissance pilots and light bomber reconnaissance crews for close support work with the (1) Army in the field, and was under the control of Fighter Command. Transport training facilities were non-existent and all conversion training had to be undertaken by the squadrons themselves - a state of affairs that continued until

(1) See Chapter 18

well into 1943. Similarly, there was no special training organisation for ferry crews. Aircraft required overseas - those that had sufficient range to be flown out - were normally flown either by personnel from the squadrons concerned or by specially selected crews from home squadrons. Ferrying in the United Kingdom, from factories to the RAF, was undertaken by the RAF and two ferry pools (No. 1 at Hucknall and No. 2 at Filton) were established to provide a reserve of ferry pilots. Each pool contained 10 pilots - all experienced (1) pilots requiring no special training.

The United Kingdom Ferry Organisation, 1939-40

The outbreak of war saw no rapid growth of a ferry and transport organisation comparable to those of Fighter, Bomber and Coastal Commands. Within a few months internal ferrying was almost entirely taken over by the newly formed Air Transport Auxiliary and in April 1940 the RAF ferry pilots pool at Hucknall was closed and No. 2 at Filton moved to Kemble and undertook the ferrying of all replacement aircraft to France and overseas Commands. After the fall of France the pool at Kemble was retained to assist the ATA; the latter ferried aircraft from the factories to aircraft storage units, and Service pilots flew them from ASUs to the user units. This division was not always strictly adhered to, although Service pilots were always used to ferry aircraft overseas - not that there were many aircraft to spare for the overseas commands in the first 15 months of the war. Only three Blenheims and six Hurricanes reached Egypt before the collapse of France.

Overseas Ferrying: The Takoradi Route

The fall of France, followed by Italy's entry into the war, rendered the problem of reinforcing the Middle East more urgent and at the same time more difficult. Instead of flying aircraft across the continent or shipping them through the Mediterranean, arrangements had to be made to fly long range aircraft via Gibraltar and Malta and to ship smaller aircraft to Takoradi in West Africa, erect them and ferry them across Africa to Egypt - a distance of over 3,000 miles. A modified form of a ferry pilots pool (known as the Despatch Flight) was established at Takoradi in August 1940 as part of the

(1) AM File 851291/38

communication unit, staffed initially by 25 pilots sent out from Kemble. These pilots, and those that subsequently reinforced them (by the summer of 1941 the pool had grown to 120 pilots, 40 navigators and 40 wireless operators/air gunner) were all aircrew of considerable experience and they were permanently attached to the ferry pool. On completion of a flight they were returned by air (in either civil or RAF transport aircraft) to Takoradi. Nevertheless, a small training flight of two Blenheims and one Hurricane was established (supplemented by a Tomahawk and a Glen Martin ~~one~~ American aircraft started arriving in early 1941) to ensure that all pilots of the pool were qualified to fly any of the types of aircraft passing through Takoradi. In addition to the normal ferrying, several special reinforcement operations were carried out, in which aircraft carriers were used to transport aircraft to Takoradi where they were flown off and ferried to the Middle East. These aircraft, chiefly Hurricanes and Fulmars, were piloted by RAF and FAA pilots reinforcing Middle East squadrons who did not require training at Takoradi.

Because of the increase in the number of aircraft to be ferried overseas an Overseas Air Movement Control Unit (OAMCU) was formed at Gloucester on 9 September 1940 and the ferry pool at Kemble, which was brought under the control of the OAMCU, was renamed the Overseas Air Delivery Flight (OADF). The purpose of the OAMCU was to control all non-operational flights into and out of the United Kingdom including reinforcing flights to overseas commands, trans-Atlantic delivery flights of American aircraft for the RAF (which were scheduled to start before the end of the year); RAF air mail services; and long distance flights. The OADF at Kemble prepared aircraft for overseas delivery and briefed crews on flight procedure. The crews, for the most part, continued to be drawn from operational squadrons and the only training necessary was conversion to type. For this purpose a small training unit was established at Kemble. It was not long before new pilots ex SFTSs were being sent to Kemble and the training unit was extended to convert these personnel to operational types for ferrying and ASU test flying in the United Kingdom.

Trans-Atlantic Ferrying

Shortly after the OAMCU was formed the first Hudson bomber arrived in the United Kingdom by air from the USA. In the summer of 1940, after arrangements had been made to purchase American aircraft to reinforce the hard pressed RAF, plans were made to ferry these aircraft to the United Kingdom, and a ferry organisation was established operated by the Air Service Department of the Canadian Pacific Railway on behalf of the Ministry of Aircraft Production. A recruiting organisation to obtain the necessary aircrew was formed, and a small training flight set up at the CPR headquarters in Montreal, using St. Hubert (1) airfield for flying training. Training started in September and the first delivery flight took place two months later. The ferry personnel, nearly all civilians, were to be regularly employed in trans-Atlantic ferrying and a return ferry service had to be arranged to fly the crews back to Canada. It had originally been intended to use only civilian crews, but owing to the shortage of suitable personnel, some RAF and RCAF crews were loaned to the MAP to supplement civil crews.

The rapid expansion of the ferry service made it necessary for the British Government to assume direct responsibility for it, and in May 1941, the agreement with CPR was terminated and replaced by an ^{M.A.P.} ~~MAP~~ organisation known as "Atfero". This arrangement, however, was short lived. America offered to assist in the ferrying by releasing civil pilots for service on the trans-Atlantic route and by allowing US Army Air Force pilots to fly delivery aircraft into Canada on condition that the aircraft could be handed over to a military authority. Accordingly on 20 July 1941 Ferry Command came into existence and (2) took over from "Atfero" the organisation at Montreal. Although essentially a Service force, Ferry Command continued to employ many civilians, including aircrew for ferry duties. In October a new airport at Dorval was completed and the Command headquarters, together with the ferry training unit, was moved there (3) from Montreal.

(1) AM File S.62216/I

(2) Ferry Command ORB

(3) HMSO Pamphlet "Atlantic Bridge"

Formation of No. 44 Group

A month after Ferry Command had been formed a new Group, No. 44 Group, was formed in the United Kingdom and took over from the OAMCU both the responsibility of air movements in and out of the United Kingdom and the co-ordination of ferry training. The OAMCU at Gloucester was officially disbanded on 15 August, the date on which the new group was formed and the administrative control of the former OAMCU stations including the OADF at Kemble was transferred to No. 44 Group. By that time the training flight had grown somewhat and, in addition to the training of ferry pilots for work in the United Kingdom and the type training of test pilots for Maintenance Command, it had started (in June 1941) to train ferry pilots for the Middle East - not only the West African reinforcement route to Egypt but for ferry duties in other areas, such as Basra, Shaibah and Port Sudan. In this latter course each pilot underwent a month's instruction which included 40 hours flying on Masters, Harvards, Tomahawks and Hurricanes, or, in the case of TE pilots, Oxfords, Ansons, Blenheims and Marylands. Intakes to the course were 15 every two weeks (chosen from SFTSs) and the flight was equipped with a total of 53 aircraft. The training of ferry crews for the Middle East was also being undertaken by two Bomber Commands OTUs. In order to stop the drain of experienced crews required to ferry Wellingtons direct to Middle East, it was arranged in May 1941 that the entire output from No. 15 OTU at Harwell should be used for ferry duties, and so a special despatch flight was established to give an additional two weeks training (extended to three weeks in October) in the technique of ferrying. In September a similar flight was formed at No. 13 OTU Bicester for the training of Blenheim crews flying to the Middle East, although only 36 of the monthly output of 40 crews from Bicester (1) were needed for overseas ferrying. The formation of these two ferry training flights left the training unit at Kemble free to concentrate on the training of crews for Beauforts, Beaufighters and other miscellaneous types for despatch overseas - a monthly commitment of up to 50 crews - together with the training of ferry crews for the Takoradi route and test and ferry pilots for Maintenance Command and No. 44 Group.

Expansion of the Ferry Training Unit

The number of aircraft for despatch overseas by air was growing so fast that in October (by which time they had reached 200 per month) it became necessary to expand the ferry training facilities at Kemble and separate them from the OADF. The aerodrome at Kemble was not large enough to accommodate the expanded unit and, pending the availability of Lyneham (which was to become the home of the FTU when No. 14 SFTS was transferred to Canada), the unit was moved to Honeybourne. The move took place on October and the expanded FTU consisted for the following three flights:-

- No. 1 training overseas ferry crews on all types of aircraft except Blenheims and Wellingtons - 50 a month on a four weeks course.
- No. 2 training ferry crews for the W. Africa ferry route - 15 a month on a four weeks course.
- No. 3 training ferry and test pilots for No. 44 Group, Maintenance Command.

It was hoped that when the FTU eventually moved to Lyneham it would be possible to absorb the other two ferry training flights at Nos. 13 and 15 OTUs, but further increases in training facilities made this impossible. In December No. 44 Group was relieved of the responsibility for training ferry pilots for Maintenance Command by the formation of No. 1427 (Training) Flight at ThruXTon under the control of No. 41 Group. The training of test pilots, however, which amounted to the conversion of pilots to the latest operational types, was continued by No. 3 Flight of the FTU. The new flight at ThruXTon, which provided flying experience on new types of aircraft for both RAF and ATA ferry pilots was equipped with a Halifax, a Wellington and a Spitfire. It moved to Hullavington in May 1942 and to Marham three months later. In April 1943 the flight was disbanded. By that time the ATA had assumed responsibility for all ferrying in the United Kingdom and it had its own training organisation, which provided instruction in both single-engined and twin-engined flying. The small amount of four-engined flying necessary was provided by No. 1652 HCU in Bomber Command.

Training of ATA Personnel

Although this narrative is concerned only with RAF flying training, a brief note on the training of ATA pilots is not out of place. When the ATA first started in 1939, recruits were given a short conversion course at the CFS Upavon before joining the RAF ferry pools. After January 1940, by which time ATA had its own ferry pools, a special training school for ATA personnel was started at No. 1 Pool, White Waltham, and the training of ATA personnel at the CFS was discontinued. At White Waltham training was carried out on a variety of aircraft including Tiger Moths, Harts, Magisters, Blenheims and Oxfords. A Focke-Wulf Condor was allotted to the school for four-engined training in 1941, but was never used because of maintenance difficulties. In April 1943, by which time over 100 pilots were under training at White Waltham, the light aircraft, Magisters, Harts, Hinds, etc were moved to the pool at Luton, so as to leave White Waltham free to concentrate on advanced training. Shortly afterwards, when the ranks of ATA were opened to candidates with no previous flying experience, an ab initio school was started at Barton, a few miles from Luton, where they were given elementary training before going on to Luton and White Waltham. In 1944 the school at Luton was moved to Thame in Oxfordshire where it remained until training ceased.

The sequence of ATA training was as follows. First a few weeks elementary training at Barton, followed by a fortnight's course on intermediate single-engined types (such as Proctors, Swordfish, etc) at Luton (or Thame). Some ferrying experience on those types was then given before pilots learnt to fly high speed single-engined types. Further ferry experience was then provided, after which pilots left Thame and underwent similar training (instruction followed by ferry experience) on twin-engined types. Some pilots then went on to No. 1672 HCU to qualify on four-engine types and a few went to No. 4 OTU at Alness to train on flying boats. In addition to pilots, a few air gunners (twenty in all) were trained at White Waltham in 1940 in order to man a turret in the event of an attack by enemy aircraft. After a fortnight's course of

instruction they were posted to the various ferry pools. A number of flight engineers were also trained at the HCU in order to assist in the ferrying of four-engined aircraft. Recruiting for the ATA stopped at the beginning of 1945 and training ceased a few months later.

Formation of Ferry Training Flights

The formation of No. 1427 flight was followed a few days later by the opening of No. 1428 Flight at Horsham St. Faith for the training of Service crews to ferry Hudson aircraft to the Middle and Far East. The monthly commitment was for 12 GR type Hudsons for the Middle East and W. Africa and 16 bomber type for the Far East. (1) Coastal Command could provide GR crews, but there was no source of supply for Hudson bomber crews, (Coastal Command could not spare additional GR crews for bomber conversion) and the primary purpose of the new flight was to convert 18 Blenheim crews per month from No. 17 Bomber OTU on to Hudsons by means of a four weeks course. This flight was only a stop-gap measure, and when in June 1942 the flow of Hudson trained crews from the Canadian OTUs materialised the flight was disbanded. In addition to the conversion flight, a second flight was established (on a permanent basis) at Horsham St. Faith to provide a ferry training course for this output (16 of the intake of 18 were expected to be suitable) together with the 12 GR crews per month from Coastal Command. A month later this ferry training flight was divorced from the bomber conversion flight and numbered No. 1444 Ferry Training Flight. At the same time, the ferry training flights of Nos. 13 and 15 OTUs (2) became Nos. 1442 and 1443 (FT) Flights respectively.

By the spring of 1942 the organisation for the training of ferry crews, and for the preparation and despatch of reinforcement aircraft overseas was reorganised in order to standardise procedure and standards. The FTU was moved from Honeybourne to Lyneham in March, and eventually concentrated on the training of overseas ferry crews (No. 1 Flight). No. 3 Flight was disbanded

(1) AM File S.73211

(2) AM File S.76997/I

in May and No. 2 a month later. When No. 3 Flight was disbanded the training of test pilots was undertaken by No. 41 Group and split between several aircraft storage units. Subsequently, in November 1942, No. 1475 (Training) Flight was formed in No. 41 Group for the purpose of training ASU test pilots and ATA ferry personnel on Halifaxes. It was located at Pocklington and equipped with three aircraft. Six months later when No. 1427 Flight was disbanded it was decided on grounds of economy to close this unit. The training commitment was very small and it was possible to train the number required (usually not more than two or three a month) at No. 1652 HCU at Marston Moor in Bomber Command. In February 1944, when greater HCU output was needed, two additional Halifaxes were established at No. 1652 HCU so that these test and ferry pilots could be trained without detriment to the unit's normal output.

The work of these test pilots, whose duty it was to flight test every new aircraft delivered to the RAF should not be confused with that of those pilots employed by the aircraft manufacturers for the purpose of testing experimental and prototype aircraft. Before the war there were always ex-Service or civilian pilots of great experience available for this work, but with the enormous war-time expansion of the aircraft industry it was difficult to find sufficient pilots qualified for the work, and so on 15 January 1943 a Test Pilots School had to be formed at Boscombe Down where it operated under the control of the Ministry of Aircraft Production and within the organisation of the Aeroplane and Armament Experimental Establishment. It was equipped with a great variety of aircraft and trained both civilian and service pilots of many nationalities. It was renamed the Empire Test Pilots School on 18 July 1944.

Reorganisation of Ferry Training

In June 1942 the training of crews for the Takoradi route was discontinued at the FTU. There were sufficient personnel available to meet all immediate requirements, and since there was now a surplus of pilots in the Middle East

(1) AM File S.76997/II

(2) SD 155/1065/43

Command, it was hoped that future needs could be met from within the Command, leaving Lyneham to concentrate on the training of crews required in the United Kingdom. Although it was not possible to centralise all ferry training at Lyneham, No. 1444 Flight was moved there from Horsham St. Faith in June, and at the same time a new flight (No. 1445) was established there to train Liberator ferry crews. This flight took over the responsibility for training Liberator crews for No. 511 (Transport) Squadron from No. 1653 (Liberator) Conversion Unit, Burn, which had been formed in Bomber Command in January 1942. It also undertook the training of crews required for No. 159 Liberator Squadron in India. Another ferry training flight, No. 1446, was formed at Moreton-in-Marsh in April 1942 to train crews for additional Wellingtons for despatch overseas. Although the aircraft were largely GR and TB types, Bomber Command continued to meet most of the initial crew requirements (No. 3 OTU in Coastal Command provided a few) and in addition to the output of No. 15 OTU part of No. 21 OTU's (1) output was earmarked for the Middle East. Steps were taken to standardise training by introducing a 14 days course for all flights, and by establishing a few "hack" aircraft at each flight to allow crews to become familiar with the type of aircraft they were to ferry, and to help them in flying practice. Previously all flying at the FTU and FT flights had been carried out on the aircraft to be ferried. As a result of this change the ferry training organisation in June 1942 comprised the following flights:-

FTU (No. 1 Flight) Lyneham	training 15 Beaufighter, 15 Beaufort, 10 Misc crews per month - 2 Beaufort and 2 Blenheim hack aircraft.
No. 1444 Flight, Lyneham	training 28 Hudson crews per month - 2 Hudson and 2 Oxford hack aircraft.
No. 1445 Flight Lyneham	training 15 Liberator crews per month - 2 Liberator hack aircraft.
No. 1442 Flight Bicester	training 36 Blenheim and Bisley crews per month - 4 Blenheim hack aircraft.
No. 1443 Flight Harwell	training 40 Wellington crews per month 4 Wellington hack aircraft.
No. 1446 Flight Moreton-in-Marsh	training 20 Wellington crews per month - 4 Wellington hack aircraft

Aircraft for despatch overseas were prepared at Overseas Aircraft Preparation Units (OAPUs) and crews from the ferry units were responsible for collecting their aircraft, flying them to the training flights for flying practice, final adjustments and running in. When training was completed crews flew their aircraft to an overseas aircraft despatch unit in S.W. England where they were briefed for their journey and their aircraft given a final check-up and servicing before taking off on their ferry journey. The crew as well as the aircraft they flew were intended as reinforcements - they were essentially "one trippers" - and there was no question of crews returning to the United Kingdom to ferry additional aircraft out. The OAPUs and OADUs were all controlled by No. 44 Group, and the syllabus of training at the training flights was laid down by No. 44 Group even though some of the flights (Nos. 1442 and (1) 1443) were administered by Bomber Command.

By July 1942 the light bomber situation in the Middle East had changed; American aircraft (Marylands and Baltimores) were being delivered via the W. African route (see below), and as crews were being trained locally by Nos. 70 and 72 OTUs, it was possible to discontinue the despatch of Blenheims by air. No. 13 OTU therefore reverted to the training of crews for No. 2 Group, Bomber (2) Command, and No. 1442 Flight was disbanded on 1 August 1942.

Ferry Training in the United States and Canada

Meanwhile, on the other side of the Atlantic, Ferry Command continued to grow. As the pressure of air warfare built up in the Mediterranean arrangements were made to ferry American built aircraft across the South Atlantic to West Africa, and thence via the Takoradi route to Egypt, supplementing the flow from Great Britain. The chief needs in the Middle East were for light bombers such as Marylands, Baltimores, Bostons and Mitchells (Tomahawk and Kittyhawk fighters were also needed but these had to be shipped by sea to W. Africa) and the pattern of Atlantic ferrying by 1942 fell into two distinct phases - the

(1) AM File S.76835

(2) AM Files S.78249/I and S.76997/II

North Atlantic route, ferrying chiefly GR aircraft for Coastal Command (Hudsons, Venturas, Liberators and Fortresses) and the South Atlantic route, ferrying light bombers for the Middle East.

To supplement the permanent ferry crews (many of whom were RAF and RCAF personnel), arrangements had been made to establish OTUs in Canada training on Hudsons, the output from which would be entrusted with the job of delivering American aircraft to the United Kingdom. These "one-trippers" as they were called - although many crews actually did two or three crossings before being posted to an operational squadron - were given a special ferry training course by Ferry Command, after completing their OTU, to prepare them for their journey. This meant that the ferry training and conversion school at Dorval had to be expanded, and after June 1942 a relief aerodrome at North Bay had to be utilised to undertake part of the additional commitments. A nearby seaplane base at Boucherville was also utilised for flying boat conversion, using Catalina amphibians because there were no slipways available. In addition to these three stations, a flying boat base at Darrells Island in Bermuda was used for flying boat conversion for crews going to Elizabeth City, North Carolina to collect delivery aircraft.

These four stations were responsible for the training of both civilian and Service personnel. Although, by mid-1942, the recruitment of civilian pilots had practically ceased, refresher and conversion flying was constantly necessary for the 200 civil pilots in the Command, and three Hudsons were established at Dorval for that purpose. The training of Service personnel fell into two categories; the conversion to permanent ferry crews of SFTS and AOS graduates from Canadian schools, and the ferry and conversion training of "one-trippers" (1) from the Hudson OTUs in Canada. There were 721 permanent Service crews (both RAF and RCAF) and between 100 and 200 "one-trippers" in Ferry Command in the summer of 1942, and their training was carried out as follows:-

(1) AM File S.72835/II

North Bay	: basic landplane training of ex-SFTS graduates	(8 Hudsons (2 Venturas (2 Mitchells
Dorval	: landplane training and conversion of "one-trippers" and regular ferry crews	(6 Hudsons (9 Venturas (2 Mitchells (1 Liberator
Boucherville	: Flying boat conversion	2 Catalina amphibians
Bermuda	: flying boat conversion	2 Catalinas

With the opening of the South Atlantic route, Nassau, in the Bahamas, was also used for conversion training of regular ferry crews. The station was opened in March 1943 and two Hudsons were established for training purposes.

In West Africa, although the volume of traffic had grown enormously, there was little change on the training side. The opening of the South Atlantic air delivery route, in addition to the shipment of aircraft by sea from both the United Kingdom and the USA, meant that nearly 1,000 aircraft per month were being ferried to the Middle East over this route, and to control these movements, No. 216 Ferry Group was established at Heliopolis in May 1942. This Group in fact was responsible for the movement of all reinforcing aircraft to or through the Middle East, including those using the Gibraltar-Malta air route from the United Kingdom.

Reorganisation of Ferry Training Flights

In November 1942 the three ferry training flights at Lyneham were consolidated into one unit and numbered No. 301 Ferry Training Unit. The old No. 1 Flight and Nos. 1444 and 1445 Flights were disbanded on 3 November and their aircraft - two Beauforts, two Blenheims, two Hudsons, two Oxfords and two Liberators, utilised to form the new unit, although a few weeks later the (2) Beauforts, Blenheims and Hudsons were replaced by six more Oxfords. At the same time a ferry training flight, which had been formed by Coastal Command at Lough Erne on 30 September 1942 as part of No. 131 OTU to train crews to reinforce the large number of flying boat squadrons forming overseas, was renamed (3) No. 302 FTU. A month later this unit moved to Stranraer.

(1) AHB Narrative 'The West African Reinforcement Route'

(2) AM File S.76835

(3) AM File S.82404/I

Shortly after the successful invasion of North Africa, it was decided that all twin-engined aircraft were to be flown out to the Middle East (and beyond) via the Mediterranean instead of being shipped via Takoradi. A total of 210 aircraft per month was to be ferried to the Middle East or India and to provide the additional crews four new ferry training units had to be formed. The first of the new units, No. 303 FTU was opened at Stornaway on 15 December 1942 (it moved to Talbenny three months later) training Wellington GR crews ex-Coastal Command OTUs. The entire commitment of 20 crews a month was met by this unit. The training of Wellington medium bomber crews continued to be carried out by Nos. 1443 and 1446 Flights in Bomber Command, each flight training 20 crews per month. The second new unit to open was No. 307 FTU in Bomber Command, which formed at Finmere, the satellite of No. 13 OTU, on 24 December equipped with seven Blenheims for the training of 30 Blenheim light bomber crews per month ex No. 13 OTU. This FTU was in effect a revival of No. 1442 (FT) Flight. To train 35 Beaufighter (Coastal) and 25 Beaufort crews per month, Nos. 304 FTU, Port Ellen and 306 FTU Maghaberry was formed on 31 December in Coastal Command. The remaining Blenheim and Beaufighter requirements - 10 army co-operation Blenheims and 10 fighter-type Beaufighters - were met by No. 301 FTU, which also trained four Halifax and three Liberator crews per month as well as any miscellaneous commitments arising from time to time. No. 302 FTU at Stranraer trained 36 Catalina crews per month. Apart from No. 301 FTU which was in Ferry Command, all the units were formed in the commands responsible for producing the reinforcement crews, nearly all of which were now supplied direct from OTUs. Nevertheless, all ferry training flights and units were operationally controlled by No. 44 Group on behalf of Ferry Command, as were the actual delivery flights, and a standard 14 days ferry training syllabus was laid down for all units.

(1) AM File S.87843

In addition to these units a second FTU had been formed in Ferry Command on 14 December 1942. This was No. 305 FTU at Erroll which was opened on a temporary basis for the purpose of training crews to ferry the 200 Albemarles supplied to Russia. Ferry crews were provided by the Russians. Sixteen crews (each of four officers) were sent in all and given 10 hours training at Erroll. Eight were trained at a time on a 14 days course, after which the training section of the FTU was closed. These crews ferried all 200 aircraft, and the briefing and despatch section remained in being until November 1943
(1)
when the last aircraft left the United Kingdom.

The number of reinforcement aircraft despatched overseas continued to increase during the first half of 1943 and the ferry training organisation had to be expanded accordingly. Nearly all units undertook the training of additional crews and three new units had to be opened. A second flying boat FTU was opened at Pembroke Dock in Coastal Command on 22 March and numbered No. 308, and a month later No. 309 FTU was opened at Benson (also in Coastal Command) for the ferry training of Photographic Reconnaissance Spitfire pilots and Mosquito crews. The two ferry training flights in Bomber Command, Nos. 1443 and 1446 Flights, training Wellington crews, were re-formed as Nos. 310 and 311 FTUs respectively and a third Wellington FTU, No. 312, was opened at Wellesbourne Mountford on 24 April. The re-equipment of Blenheim squadrons in the Middle East with Bostons and Havocs caused a similar re-equipment of No. 307 FTU and that unit had to undertake conversion training on to the new types in addition to ferry training.

As a result of these numerous changes, the ferry training organisation in the United Kingdom had grown by June 1943 to the following units:-

(1) AM File S.78249/I

FTU No.	Aircraft Type	Location	Crew Capacity	Length of Course - days	Aircraft Establishment
301	Miscellaneous (includes Mosquito, Blenheim, Halifax, Liberator, Beaufighter, Hudson)	Lyneham	100	14	2 Liberators 8 Oxfords (2 Hudsons 1 Beaufighter 1 Beaufort were added a few weeks later)
302	Catalina	Stranraer (moved to Oban on 22.7.43)	18	14	-
303	Wellington	Talbenny	50	14	4 Wellingtons
304	Beaufighter	Port Ellen	42	14	4 Beauforts
305	Albemarles	Errol	8	14	-
306	Beaufort	Maghaberry	16	14	2 Beauforts
307	Boston	Finmere	10	14	4 Bostons
308	Sunderland	Pembroke Dock	6	14	-
309	PR Spitfire and Mosquito	Benson	20	14	2 Masters
310	Wellington	Harwell	32	14	2 Wellingtons
311	Wellington	Moreton-in-Marsh	32	14	2 Wellingtons
312	Wellington	Wellesbourne Mountford	18	14	2 Wellingtons

In spite of this expansion in the first half of 1943, there was a shortage of crews to fly reinforcement aircraft overseas and a number of permanent ferry crews, formerly employed only in the United Kingdom was used to ferry aircraft overseas. The Coastal Command FTUs were the chief defaulters, mainly owing to the shortage of suitable airfields in southern England, which led to the formation of these units in N.W. Scotland, a long way from the main ferry organisation. It was the failure to achieve the planned output that was eventually to lead to the centralisation of the bulk of ferry training under
 (1)
 No. 44 Group.

Formation of Transport Command

Early in 1943, after negotiations with the Americans for the delivery of transport aircraft to the RAF had been successfully completed and arrangements made for the production of the first British transport aircraft (the York), it was decided to set up a new central organisation to control the substantial transport force which would soon be operating in the RAF. The new organisation, known as Transport Command, formed on 25 March 1943 with its headquarters at Harrow, and it became responsible for the operation of all transport aircraft, reinforcement flights and ferry flights by the RAF. It took over the control of Ferry Command, which reverted to group status as No. 45 Group, No. 44 Group in the United Kingdom, No. 216 Group in the Middle East and No. 179 Wing in India.

Training facilities for transport squadrons had been non-existent until the spring of 1943; both training in transport techniques and conversion to type had continued to be carried out by the squadrons themselves. With the formation of the new Command, however, it was decided to set up an operational training organisation for transport crews. Two units were formed: No. 104 OTU (which opened at Nutts Corner on 12 March 1943 and No. 105 which formed at Bramcote on 5 April. Unfortunately there were not sufficient transport

(1) AM File CS17391/II

aircraft available for training purposes and the units had to manage with Wellingtons, conversion to type still taking place at the squadrons. No. 105 OTU was established with 54 Wellingtons and trained 96 crews on a 12 weeks course, and No. 104 OTU was half that size. (1) The latter, however, was destined to have only a short lease of life; by utilising crews trained in No. 111 OTU Nassau and bomber OTUs in Canada as reinforcement crews, ferrying their own aircraft, Transport Command's aircrew requirements were reduced and it was possible to disband No. 104 OTU on 18 January 1944. Arrangements were also made to convert No. 32 OTU in Canada from Hampden torpedo bombers to Dakota transports later in the year. In addition to these units, the old Ferry Command school at North Bay was operating virtually as an OTU. It trained personnel from the Canadian SFTSs and AOSs on a 12 weeks course, with intakes of 18 crews every four weeks for service on the trans-Atlantic ferry route. It was, in fact, numbered as No. 106 OTU in July 1943, but this was cancelled almost immediately in case Canada objected to the formation of an RAF OTU in Canada - it had been agreed in June 1942 that the RCAF should control all OTUs in Canada. In spite of this cancellation the unit continued to operate as a temporary OTU; 22 Hudsons and four Oxfords were established for the training of crews for No. 45 Group at Dorval. It was scheduled to convert to a FTU once No. 32 OTU in Canada started producing transport crews, and the conversion actually took place on 1 March 1944. The old unit carrying out OTU training was disbanded and replaced by No. 313 FTU which trained 20 pupils at a time (supplied by No. 32 OTU) on a four weeks course (two weeks conversion training and two weeks ferry training) and was equipped with 14 Hudsons for ferry training and five Baltimores and four Mitchells for conversion training.

Shortly after the first transport OTU had been formed, Transport Command proposed that as transport work called for considerable experience of long distance work, trainees from the OTUs should serve a tour of duty in a ferry pool where they could be given conversion training to transport types and would

(1) AM Files S.91806 and S.90100

gain experience of long distance flights before joining transport squadrons. The proposal was agreed, and three such pools were established in July 1943. The old ferry pool at Filton (and later Lyneham) was expanded to become No. 1 Ferry Crew Pool, Lyneham with a capacity for 150 crews and an aircraft establishment of three Wellingtons. It was moved to Melton Mowbray two months later and by the end of the year its aircraft establishment had been increased to 14 by the addition of three Beauforts, three Beaufighters, one Halifax, three Mosquitos and one Warwick. The Service aircrew pool at Dorval was split into Nos. 2 and 3 Ferry Crew Pools, located at Dorval and Nassau respectively each containing 100 crews. The training units at those places were absorbed into (1) the new pools, No. 2 having three Hudsons and No. 3 Pool two. Flying boat conversion training was continued unchanged at Boucherville and Bermuda.

Transfer of FTUs to Transport Command

Training in the newly formed Transport Command involved preparing crews for ferry work as well as for transport squadrons, and it was eventually agreed in August 1943 that most of the FTUs should be transferred to Transport Command. By so doing it was hoped to accelerate the despatch of reinforcement aircraft overseas, since the whole organisation for the preparation of aircraft, ferry training of crews and despatch of aircraft and crews would be centralised in one authority and so avoid "buck passing" which had been a feature in the past at many of the units in Coastal Command. Nos. 303, 304 and 306 OTUs from Coastal Command were transferred to Transport Command in September, but Nos. 302 and 308 (training on flying boats) and No. 309 (PR training) were retained in Coastal Command for the time being because of their more specialised nature. No. 307 FTU which had been transferred from Bomber Command to Fighter in June 1943 (on the transfer of No. 13 OTU which supplied its crews), was also transferred to Transport Command in September. The Wellington ferry training commitment which had been running smoothly was left undisturbed in Bomber Command until April 1944 when it was taken over by No. 44 Group.

(1) AM File S.91806

These transfers involved considerable reorganisation of the FTUs. No. 303 FTU remained at Talbenny but took over the Hudson training commitment from No. 301 FTU; two Hudsons were transferred to Talbenny and the capacity of the unit increased to 60 crews, ten of which were Hudson crews. The capacity of No. 301 FTU was consequently reduced to 60 crews (36 Beaufighter, four Halifax, six Mosquito and 14 miscellaneous) and its aircraft reduced to eight Oxfords, one Beaufort and one Beaufighter. No. 304 FTU was moved from Port Ellen to Melton Mowbray in January 1944, when it absorbed Nos. 306 and 307 FTUs, both of which had been moved to Melton Mowbray in October 1944. The new No. 304 FTU was expanded to train 40 Beaufighter crews, 10 Boston crews and 10 Beaufort (1) crews and was established with five Beauforts and two Bostons. In Coastal Command No. 308 FTU was moved to Oban on 12 January 1944 where it was absorbed into No. 302 and was expanded to train 18 Catalina crews and 6 Sunderland crews. The Wellington ferry training commitment decreased gradually during the latter half of 1943, and it was possible to disband No. 312 FTU on 26 July and No. 310 on 17 December. The commitment continued to decrease in 1944, and on 1 May No. 311 FTU was closed and Wellington training transferred to No. 44 Group where (2) it was carried out by No. 304 OTU.

Training for Airborne Forces

In addition to ferry and transport training, it was assumed, when Transport Command was first formed, that it would eventually assume responsibility for the training of crews for airborne assault operations, ie glider towing and (3) parachute dropping. At that time the training was carried out under Army Co-operation Command by No. 38 Wing, which has been formed in January 1943. Originally there was no special training organisation for the training of crews for glider towing and parachute dropping; only a few crews were required and these were chiefly experienced crews, usually drawn from Bomber Command Whitley squadrons, although some were taken straight from OTUs and a few straight from SFTSs. Two squadrons, No. 296 (Glider Exercise) Squadron and No. 297

(1) AM File S.91806

(2) AM File S.87843

(3) This volume is concerned only with the training of crews for the aircraft which towed gliders and dropped parachutists. The training of the glider pilots and paratroops is described in AHB Monograph AP 3231 "Airborne Forces".

(Parachute Exercise) Squadron, both equipped with Whitleys were formed in November 1941 for collective training of the airborne force, but it was not until July 1942 that any special training backing was arranged for the RAF side of this work. This was accomplished by establishing a special Whitley flight (1) of 12 Whitleys at No. 42 OTU Andover, so that crews destined for these squadrons could be given a Whitley conversion course after completing the normal Blenheim syllabus. A third training squadron, No. 295 Parachute Exercise Squadron, was formed in August 1942. The Whitley flight of No. 42 OTU, which was moved to Ashbourne in October, was responsible for replacing wastage in these three squadrons, which between them had a total of 60 Whitleys, and so avoided drawing on Bomber Command reserves. In May 1943 the Whitley flight was increased to 19 aircraft and the output of crews for No. 38 Wing raised from six to nine per month. A few weeks later six more Whitleys were added and the output of Whitley crews raised to 14 per month during the summer months (10 a month in winter). By August, the requirement of Blenheim reconnaissance trained crews for N.W. Africa had died out owing to the re-equipment of squadrons and No. 42 OTU was allowed to concentrate on Whitley training. The 24 Blenheims were deleted from the aircraft establishment and the number of Ansons (2) reduced from 16 to ten. Albemarles were subsequently used in place of Whitleys and in November 1943 the unit was expanded to 40 Whitleys or Albemarles, 11 Ansons, six Martinets and two Horsas, and its output increased to 22 per month (summer) and 15 a month during the winter months. The Horsas were added to provide glider towing experience for OTU crews. Previously this experience had to be given by attaching crews to heavy glider conversion units (3) for a week's course of instruction.

(1) AM File C40445/49/I

(2) AM File S.99536

(3) The primary purpose of the HGCUs was to convert glider pilots to heavy types of gliders. See AHB Monograph AP 3231 "Airborne Forces"

It was not until the beginning of 1944 that Transport Command was actively concerned with airborne operations. The successful employment of airborne forces in Sicily led to the expansion of the forces in preparation for the liberation of Europe and as No. 38 Group (No. 38 Wing had been expanded to group status in October 1943) was not large enough to meet all demands it was supplemented by the formation of a new Group (No. 46) on 17 January 1944. No. 38 Group was transferred to the newly constituted Air Defence of Great Britain for administrative purposes when Army Co-operation Command was disbanded, but came directly under operational control of the AEAFC. Because of its static nature the Group was not incorporated into 2nd TAF. No. 46 Group on the other hand was formed within Transport Command, and when not training for, or employed on, airborne operations (when it worked under No. 38 Group) it was to be used for (1) normal transport duties.

Training in No. 38 Group

By the beginning of 1944, by transferring two squadrons from Bomber Command, and by expanding and re-equipping existing squadrons, the strength of No. 38 Group had been increased to 10 squadrons with 248 aircraft, and it was urgently necessary to expand the training backing of the Group. No. 42 OTU had by that time concentrated on the training of Whitley crews so that its output could all go to No. 38 Group (previously a number of crews had to be supplied to No. 38 Group without OTU training) and on 1 October 1943 it had been transferred from No. 70 Group to No. 38 Group. On 1 January 1944 it was arranged that No. 81 OTU and No. 1665 HCU should be transferred from Bomber Command to No. 38 Group to assist No. 42 OTU. All three units were then reorganised to train crews in the airborne role. No. 42 OTU at Ashbourne was re-equipped with 20 Whitleys and 15 Albemarles and 10 Horsas and trained 24 Whitley and 18 Albemarle crews on 12 weeks courses (14 weeks in winter). An extra Albemarle conversion flight of six aircraft was also added to the unit to convert Whitley trained crews to Albemarles at the rate of six a fortnight on a two weeks course. The flight

(1) AHB Monograph AP 3231 "Airborne Forces"

was subsequently expanded to eight aircraft and trained 10 crews at a time. Intakes were supplied partly from the Whitley crews of No. 42 OTU and partly from No. 81 OTU. No. 81 OTU at Tilstock was reduced to half its former size (ie to 27 Whitleys, eight Ansons and two Martinets) but had 20 Horsa gliders added to its establishment which it shared with No. 1665 HCU to give practice in glider towing for pupils under instruction. It trained 48 crews at a time on a four weeks (later extended to six) airborne conversion course. Pupils were supplied by Bomber and Coastal Commands, having completed a normal OTU course, and after their airborne training, were sent either to No. 42 OTU for conversion to Albermarles or No. 1665 HCU for training on Stirlings. The latter unit was moved from Woolfox Lodge to Sleap (the satellite to Tilstock) on its transfer to No. 38 Group and as a result training was not resumed until February 1944. Equipped with 36 Stirlings, No. 1665 HCU trained 32 crews at a time (ex Whitley courses at Nos. 42 or 81 OTUs) on a four weeks conversion course. This unit supplied all four-engined crews for No. 38 Group, although this was done indirectly since crews for the two Halifax squadrons were always drawn from experienced crews in the four Stirling squadrons and converted by the Halifax (1) squadrons.

Transport Support Training

When No. 46 Group was formed there was no OTU organisation to back the five squadrons in the Group, although their crews, most of whom were drawn from Bomber Command, needed training in the transport support role. Even those supplied by Transport Command (ex Nos. 104 and 105 OTUs) had no experience of airborne forces work, and all five squadrons had to devote their energies to training. In the early months of 1944 this training consisted of conversion to Dakotas and combined exercises with the Army airborne units. Originally it was intended that the squadrons in the Group should be self trained but by April it was clear that a special Transport Support Training Unit would have to be formed if they were to be fully operational in time for 'Overlord'. The

(1) AM File C.40445/49/I

three units of No. 38 Group were too busy supplying the needs of that Group to help and the No. 46 Group squadrons themselves did not possess sufficient facilities to train all their aircrew - they were in fact unable to train more than 35 of their establishment of 48 crews. Consequently, on 1 May 1944, No. 107 OTU was formed at Leicester East on a temporary basis to train crews for No. 46 Group. The new unit was established with 24 Dakotas, 10 Horsas and nine Oxfords and trained 24 crews per month (usually drawn from the 'airline' (1) OTUs) on a six weeks course on glider towing and parachute work.

Training in transport support duties with airborne forces was also carried out in India. Parachute training had been started in July 1941, followed, within 12 months, by glider training. An airborne forces wing, comprising of four transport squadrons was formed in September 1943, and in April 1944 a transport support training unit was formed at Chaklala for the conversion of crews to Dakota aircraft, and the training of crews in supply and parachute dropping and glider towing. The training of parachute troops was also carried out by the TSTU. A number of parachutist crews also trained at No. 4 METS in the Middle East, but no training of RAF crews was carried out there.

Summary of the Transport Training Organisation: Spring 1944

Thus by the spring of 1944 the pattern of the transport training was taking a more definite shape. Ferry training, which had been the main pre-occupation in the preceding three years, was now declining, as a direct result of the victories in the Mediterranean, and the accent was now on transport support training. This, however, was a temporary measure; once the airborne force had been brought up to full strength the main task of Transport Command would be the operating of transport squadrons in their role of trunk air route services and air supply services.

(2)

By May 1944, the transport training organisation consisted of six ferry training units (one of which was in Canada), three ferry crew pools (one in the

(1) AM File S.99211

(2) The word is used loosely and includes training for airborne forces and ferry training

United Kingdom, one in Canada and one in the Bahamas), five OTUs, one HCU and one TSTU (located in India). Only two of the OTUs (No. 105 in the United Kingdom and No. 32 in Canada) were 'pukka' transport OTUs training for airline work; two of the others together with the HCU were devoted to airborne forces work, and the third was in reality a conversion unit for airborne forces crews trained at Bomber or Transport (airline) OTUs.

Although the training system was becoming more regularised, the administrative organisation of transport training was extremely complicated. Transport Command itself, which was ultimately responsible for all ferry and transport training, contained only two groups wholly under its control: No. 45 in Canada to deal with Atlantic ferrying, and No. 44 in the United Kingdom to deal with all other ferrying and for ferry and transport training in the United Kingdom. There were three more transport groups within the Command for which there was a dual responsibility: No. 46 Group came under AEAF (via No. 38 Group); No. 216 Group was in MAAF; and No. 229 Group in ACSEA. In addition, there was No. 38 Group which was outside the jurisdiction of Transport Command, although Transport Command was responsible for supplying many crews for airborne operations. The division of responsibility as regards the overseas commands was fairly straightforward so far as training was concerned - the entire responsibility rested with Transport Command. The overseas commands were concerned only with the operation and maintenance of transport aircraft, although both No. 216 Group in the Middle East and No. 229 Group in India had established small check and conversion units, similar to that operated by No. 45 Group at Dorval, to meet conversion training requirements from the local transport squadrons. At home, however, the position was different. Ferry and transport training were controlled by Transport Command, but airborne assault training of transport crews was the responsibility of No. 38 Group.

Reduction of the Ferry Training Organisation

By the summer of 1944 the number of reinforcement aircraft despatched overseas by air from the United Kingdom had diminished considerably and it was possible to reduce the ferry training organisation. No. 301 FTU at Lyneham and No. 1 Ferry Crew Pool at Melton Mowbray were both disbanded on 16 March 1944 and their aircraft utilised to form a new unit, No. 1 Ferry Unit at Pershore. The new unit was, in fact, a combination of the two disbanded units, and although its main purpose was to ferry aircraft - it contained a pool of 150 crews and was capable of ferrying 240 aircraft per month - it had 24 hack aircraft established for conversion and refresher training purposes, including (1) Wellingtons, Beaufighters, Mosquitos, Warwicks, Halifaxes, Oxfords and Bostons. A few months later, when No. 303 FTU was disbanded, it was decided to divide the ferry unit at Pershore into two halves, and Talbenny, the location of No. 303 FTU was utilised to house the new unit, No. 11 FTU, which was formed on 8 August 1944. Each FU had 12 hack aircraft and contained a pool of 75 crews. Two months later, on 9 October, the remaining FTU in No. 44 Group, No. 304 FTU (2) at Melton Mowbray, was disbanded and replaced by No. 12 Ferry Unit. The two ferry crew pools in No. 45 Group were also renamed ferry units, No. 2 FCP at Dorval becoming No. 6 FU and No. 3 FCP at Nassau No. 7 FU. In the Middle East the ferry crew pools in No. 216 Group - or air delivery units as they were called - were renamed ferry units, Nos. 1, 2, 3 and 4 ADUs becoming Nos. 2, 3, 4 and 5 FUs. Similarly, the ferry control units in No. 229 Group, India, were renamed Nos. 8, 9 and 10 FUs. The purpose of these overseas units was to provide ferry crews for movement of aircraft within the commands abroad and, apart from those in No. 45 Group, little training was carried out in them. These twelve ferry units did not represent the entire ferry training organisation. There were still three ferry training units in existence, Nos. 302 and 309 in Coastal Command, training flying boat crews and photographic reconnaissance

(1) AM Files S.99650 and SD 155/600/44

(2) SD 155/2306/44

crews, and No. 313 FTU at North Bay, Canada, which provided ferry training for the crews from the Canadian OTUs destined to ferry reinforcement aircraft across the Atlantic. In addition there were the two flying boat conversion units at Bermuda and Boucherville, each training three or four crews per month. This was the position at the end of 1944 and, apart from the formation of No. 15 FU at Filton on 1 July 1945 and a few minor changes, it remained as such until the end of the war. As a result of this reorganisation it was arranged that crews to be regularly employed on ferry duties should be trained at the 'airline' OTUs (No. 6 in Canada and No. 105 in the United Kingdom) and ferry units and FTUs would train only reinforcement crews flying their own aircraft. These ferry units, however, continued to be responsible for the conversion to new types of the regular ferry crews, although overseas this was usually carried out at the check or conversion units. After the end of the war against Germany, however, it was possible to use experienced crews from the other commands for ferry (1) duties and OTU training of ferry crews ceased. The question of transferring the two FTUs in Coastal Command to Transport Command continued to be a bone of contention with the latter who considered that they should be responsible for all ferrying and ferry training. Because of the specialised nature of these two units, however, it was decided to leave them under the control of Coastal Command until the end of the war with Germany, and, as it turned out, although it had been agreed to transfer them to Transport Command after that time, they had not been so transferred before Japan surrendered.

Although a greater volume of ferrying was to be expected after the defeat of Germany, since Bomber, Fighter and Coastal Commands were due to move many of their squadrons to ACSEA by air, it was not necessary to expand the ferry training organisation. Transport Command would continue to be responsible for the actual movements, but it was decided that as Transport Command would have much larger training commitments whilst the other three would have comparatively few, the latter should be able to devote part of their effort to ferry training

(1) AM File S.104089/I

and the OTU or HCUs should undertake the preparation of crews and aircraft for overseas flights. The respective Commands were responsible for ensuring that their crews were capable of undertaking the flight and Transport Command was responsible only for the final briefing and despatching.

(1)

Expansion of Transport Training Facilities

Although ferry training requirements remained fairly static the need for transport crews continued to grow as the war progressed. In the summer of 1944 after a review of transport training requirements had been carried out, it was decided that, if Transport Command's target of 32 squadrons by the end of the year was to be achieved, more OTUs would have to be formed. The existing airline and transport support training organisation consisted of:-

- a. No. 105 OTU in the UK producing 32 airline crews per month.
- b. No. 6 OTU (formerly No. 32) in Canada producing 32 airline crews per month.
- c. No. 107 OTU in the UK training 24 ex OTU crews per month in the transport support role.
- d. TSTU in India (subsequently No. 1334 TSTU) training 14 ex OTU crews per month in the transport support role.
- e. Check and Conversion Unit in the Middle East (subsequently renamed No. 1330 Conversion Unit) meeting conversion requirements of local transport squadrons, trained 100 pilots a month on conversion courses and 16 a month on captain's courses.
- f. Check and Conversion Unit in India (subsequently renamed No. 1331 Conversion Unit) meeting conversion requirements of local transport squadrons, training 20 pilots a month.
- g. Check and Conversion Unit in Canada, meeting conversion training requirements for No. 45 Group. Only a small amount of training carried out.

It was decided to expand this organisation by increasing the size of No. 107 OTU by 50 per cent (thus producing 36 crews a month) and by forming two new OTUs at a heavy conversion unit. No. 107 OTU was expanded in June and a few weeks later a special flight of five Dakotas and 16 Hudsons was added to

(3)

(1) AMT Folder 5

(2) AMT Folder 6

(3) AM File S.100308/I

the unit to undertake glider pickup training of certain crews, a commitment which had formerly been carried out experimentally at the ATTDU. No. 108 OTU equipped with 40 Dakotas and training 96 crews on a 12 weeks' course, opened at Wymeswold (on the closure of No. 28 Bomber OTU) on 10 October, and No. 109 OTU (a half-sized unit) also equipped with Dakotas, opened at Crosby (after No. 9 Coastal OTU had disbanded) on 11 August. In September 1944, it had been decided that three Horsas should be added to the airline OTUs (Nos. 105 and 6) so that basic training in air support work could be provided at all transport OTUs, and this policy was therefore applied to the new OTUs (Nos. 108 and 109) when they formed, although after a few months experience the policy was found (1) unsatisfactory and support training was dropped at airline OTUs. The heavy conversion unit, No. 1332, equipped with 15 Stirlings, two Yorks and two Liberators, was formed at Longtown on 11 August to convert experienced Dakota (2) crews to four-engined transports. It trained 15 crews at a time on a three weeks' course. Three months later the York and Liberator establishment was doubled and the capacity increased to 25 crews. It was arranged that 15 crews in each intake should be drawn from the twin-engined transport squadrons and the remaining 10 from four-engined squadrons in Bomber and Coastal Commands. Originally it was intended that this unit should train a number of crews for BOAC, but on 1 December 1944, owing to the output of the unit falling below its planned figure, a special school had to be set up to meet BOAC requirements. This unit, No. 6 Lancaster Finishing School, equipped with eight Lancasters, three Oxfords and one Dakota, trained experienced RAF personnel who had volunteered to serve with BOAC. Intakes were six crews every three weeks on a course lasting nine weeks (extended to 12 weeks in May 1945). It was originally located at Burn, but it moved a few weeks later to Ossington.

(1) AM File S.100308/II

(2) AM File S.90100

In October 1944, to foster liaison between the British and American methods of transport training, the United States Air Transport Command offered to allow RAF crews to attend their OTU courses in America. There were two types of courses, twin-engined and multi-engined, both of which were of four weeks duration. The multi-engined course, at Homestead, Florida, trained a crew of five (two pilots, navigator, wireless operator and flight engineer) and the twin-engined course at Reno trained a four-man crew (two pilots, navigator and wireless operator). One RAF crew was sent to each school and training (1) commenced in December 1944.

Training Requirements of Phase 2

In January 1945 Transport Command's requirements for Phase 2 was revised and laid down as follows:-

	No. of Squadrons	
	Long Range	Medium Range
ACSEA	1	20
United Kingdom	18	6
Occupation	-	6
Lines of Communication	-	4
TOTAL	19	36

These excluded the 10 squadrons of No. 38 Group (seven in the United Kingdom and three in ACSEA). All of the ACSEA squadrons except five were to be trained in the air support role; three of the remainder were to be airline squadrons and two for employment with 'Tiger' Forces. Four of the LR squadrons shown under the United Kingdom were also to support the 'Tiger' Forces. Air support training would not, of course, be required for the 34 squadrons outside ACSEA. These squadrons, equipped with over 1,000 aircraft, were needed chiefly for trunk route operations. It was hoped to move 10,000 troops by air between the United Kingdom and India in each direction during the next six months, and future

(1) AM File S.101406/I

movements might exceed that figure. In addition, the need to carry freight for rehabilitation and other civil purposes in Europe was foreseen. To support all 55 squadrons an annual output of just over 1,000 crews would be required. The existing transport OTUs (Nos. 6, 105, 108 and 109) were capable of producing slightly more than that number (three units producing 32 crews every four weeks and one producing 16) but as their output had also to supply the needs of ferry units and BOAC (eight per month) there was, in theory, a deficiency of crews. In practice, however, there was no shortage of OTU capacity since crews for the two conversion units in the Command (No. 107 OTU for transport support conversion and 1332 HCU for heavy transport conversion) were not, as a rule, supplied from transport OTUs, but were supplied chiefly by bomber and coastal OTUs in the case of No. 107 OTU and by operational transport squadrons in the case of the HCU, which meant that the output from these two units was, in reality, additional to (1) that of the four airline OTUs. Although the OTU position was considered to be fairly satisfactory, it was clear, in January 1945, that additional conversion training facilities would be needed in Phase 2 to convert to the transport role the large number of bomber and coastal crews that were to be transferred to Transport Command.

Two other factors had to be taken into account when planning the requirements of transport squadrons. One was the decision taken in December 1944 to increase the size of 46 of the 55 Phase 2 transport squadrons from 25 aircraft and 40 crews to 30 aircraft and 48 crews - the remainder, three RCAF and six Allied squadrons were to be equipped with 20 aircraft per squadron - and the other was the policy of providing 2nd pilots for all transport squadrons operating in ACSEA, although this did not affect OTU requirements since 2nd pilots could be supplied from surplus pilots in the other operational commands or direct (2) from AFUs.

(1) AM File S.100308/I

(2) AM File S.100308/II and MS 217/44

Reorganisation of No. 38 Group's Training Organisation

The airborne forces training organisation in No. 38 Group was considerably reorganised in early 1945. It had been slightly changed in July 1944, when No. 81 OTU was re-modelled as a normal OTU, training 36 Whitley crews at a time on 12 weeks courses in place of the special airborne courses for ex-OTU crews from Bomber and Coastal Commands, and so making No. 38 Group independent of those commands for the supply of their crews. At the same time No. 42 OTU had been reorganised by doing away with the Albemarle conversion courses, and training 54 crews on the normal 12 weeks courses - two-thirds on Whitleys and the remainder on Albemarles. Those two units, producing between them 30 crews a month, supplied all replacements for the 10 squadrons in the Group. There was a surplus of crews by the summer of 1944; in fact it had always been intended to build up a small reserve of trained crews in preparation for D-day, and in December 1943 a special unit, known as the Operational Refresher Training Unit, had been established at Thruxton to provide refresher training for No. 38 Group personnel. Its primary purpose was to provide flying practice for glider pilots and, prior to December 1943, the unit had been operating as the Glider Pilots Exercise Unit (this had formed in September 1942) for that specific purpose, but, with the formation of the ORTU, refresher training for tug crews was also provided for and a number of Whitleys and Albemarles accordingly established.

By January 1945 there was an obvious over-production of crews, due to operational losses proving smaller than had been feared, and it was decided to reduce the planned wastage rate for No. 38 Group squadrons from three to two-and-a-half per squadron per month, thus reducing requirements for the 10 squadrons from 30 to 25 crews a month. This reduction, coupled with the re-equipment of all squadrons with four-engined aircraft, led to a reorganisation of training

(1) AM File C.40445/49/I

(2) AHB Monograph AP 3231 "Airborne Forces"

units. No. 81 OTU was expanded to meet all requirements, and was re-equipped with Wellingtons - they were a better lead-in type for Stirlings and Halifaxes than Albemarles and Whitleys - and No. 42 OTU was disbanded. These changes took place on 20 March, after which time No. 81 OTU, equipped with 51 Wellingtons, 10 Ansons, five Spitfires (for gunnery training) and one Oxford, trained 75 crews at a time on a 12 weeks course (14 in winter). The entire output of No. 81 OTU went to No. 1665 HCU whose capacity was reduced to 25 crews on a ~~few~~⁽¹⁾ weeks conversion course and the aircraft equipment of that unit was altered to 13 Stirlings and 17 Halifaxes. The ORTU was also reorganised to train four-engined crews and arrangements were made for the unit to hold a pool of up to 35 Stirling and Halifax crews, with eight Stirlings and 12 Halifaxes established for flying practice. This expansion made it necessary for the ORTU to move to
 (1)
 a larger airfield and it moved to Matching on 15 February 1945. To reduce the surplus of trained crews, a number of Albemarle and Whitley crews were allocated to Transport Command and sent to No. 107 OTU for transport support
 (2)
 training.

A few months later, in June 1945, when No. 38 Group's requirements for Phase 2 were calculated, it was possible to reduce the OTU output from 25 crews a month to 22, and in August the figure was reduced to 13. The HCU requirement however remained unchanged at 25 crews a month - the balance of three crews (and later of 12 crews) was made up by utilising crews who had already completed a tour of operations in Bomber Command and did not therefore require OTU training. The strength of No. 38 Group remained at 10 squadrons, although three of these were to be sent to ACSEA, and the No. 38 Group training organisation continued to be responsible for training crews for all ten
 (3)
 squadrons.

(1) AM File S.95966

(2) AM File C.40445/49/II

(3) AM File C.40445/49/II

Transfer of Bomber and Coastal Squadrons to Transport Command

The projected expansion of Transport Command to a total of 55 squadrons for
 (1)
 Phase 2 represented an increase of 24 squadrons over its Phase I strength.

One of these squadrons was to be supplied by Canada (the transport squadron attached to the Canadian VLR force), and the remainder were to be transferred from Bomber and Coastal Commands. Bomber Command's contribution was to be met by transferring the whole of No. 4 Group, containing 11 Halifax squadrons, leaving 12 squadrons to be supplied by Coastal Command.

No. 4 Group was accordingly transferred to Transport Command in May 1945, and remained in being as a training group converting its squadrons to the transport role. One squadron was to remain on Halifaxes to undertake long range transport work and two were to be re-equipped with Stirlings for airline work (trooping); the remainder were to be re-equipped with Dakotas. The squadrons earmarked for transfer from Coastal Command were to be converted on their existing stations and transferred to Transport Command control when ready for transport duties. Most of them were equipped with Liberators which were considered suitable for transport work, and those squadrons using Wellingtons and Sunderlands were also to be converted to Liberators, although eventually it was
 (2)
 envisaged that the Liberators would be replaced by Yorks.

To undertake the conversion training of both coastal and bomber squadrons two mobile transport training parties, each commanded by a wing commander and comprising a team of flying, navigation, signals and engineer instructors, were formed. Their purpose was to tour the squadrons concerned, spending five weeks at each, converting the crews to their new types of aircraft when necessary and instructing them in the transport role. They were a temporary expedient and were to be disbanded once the squadrons had all been converted. One of the bomber squadrons destined for airline work (No. 102) was sent to the Middle East for its conversion training, where the reduced ferrying commitments made it possible to use the facilities of No. 1330 CU thus easing the pressure on the

(1) The planned strength of Transport Command in May 1945 was 32 squadrons, but one of these, a SAAF Squadron, was excluded from the Phase 2 force.

(2) AM File S.104089/I

(1)

mobile parties in the United Kingdom. In addition to the mobile parties, a support training party, equipped with 10 Oxfords and 20 Horsas was established at Broadwell on 25 July - also on a temporary basis - to provide three weeks courses in transport support work for those Dakota squadrons (six in all) (2)

destined for transport support duties in ACSEA. It dealt with two squadrons at a time and after all six squadrons had been trained the unit was to be disbanded. So much for the conversion of squadrons; as it turned out, training had only just started when the Japanese war ended.

Further Training Considerations

Although squadrons were transferred complete with their aircrew personnel, which meant that Transport Command did not have to supply the initial requirements of the squadrons, the resultant expansion of the Command meant that the existing training capacity would be unable to meet the greatly increased demand for replacements. Large surpluses of experienced aircrews would be available in the other commands, however, and it was therefore decided that, apart from 2nd pilots in No. 38 Group, intakes of pilots ex basic training would cease and, in view of the higher standard of future entrants, only conversion (as opposed to operational) training would be necessary.

The squadrons operated by Transport Command fell into four main classes:-

- a. Long range (multi-engined) airline squadrons (Liberators, Yorks, etc)
- b. Medium range (twin-engined) airline squadrons (Dakotas)
- c. Transport support squadrons (Dakotas)
- d. Ferry units (all types)

The training arrangements for the latter class, which have already been discussed, were not directly affected by this decision; the immediate concern was for the air training of crews for airline and transport support squadrons. Crews for the long range airline squadrons would all be supplied from tour experienced personnel from heavy bomber or LR/GR squadrons and would need only a nine weeks heavy conversion unit course (ie conversion to type and instruction in airline procedure). Those for medium range airline squadrons would be supplied from heavy bomber, medium bomber or MR/GR squadrons (either tour

(1) AM File S.104089/I

(2) AM Files S.104089/I and C.44086/52/I

experienced or first tour crews) and these too would need only conversion to type and training in transport procedure. This could be provided by means of a shortened OTU course of eight weeks in place of the usual 12. Crews for transport support squadrons would also be drawn from heavy and medium bomber squadrons, MR/GR squadrons or possibly twin-engined fighter squadrons. Conversion to type and transport support training would be supplied by a four weeks TSCU course. The existing training facilities, three OTUs (Nos. 105, 108 and 109 - the fourth in Canada was obviously unsuitable for conversion training, and RAF intakes ceased in May 1945) one HCU (No. 1332) and two TSCUs (No. 107 which had been renamed No. 1333 on 12 March the TSTU at Chaklala which was numbered No. 1334 four days later) would be capable of meeting the immediate needs of the airline squadrons, although the necessity for expanding some of them later was foreseen, but the TSCU capacity was well below requirements and an additional unit would have to be formed. The three OTUs, all equipped with Dakotas (No. 109 was re-equipped for Wellingtons in June and expanded in July) undertook the conversion training of crews for medium range transport squadrons and were renamed transport conversion units on 10 August 1945. No. 81 OTU, training crews for No. 38 Group squadrons, was also converted, since there were sufficient experienced crews available to meet the requirements of the airborne squadrons.

(1)

These four units operating eight weeks courses were renamed as follows:-

OTU No.	Location	Renamed TCU No.	Producing Every 4 weeks
81	Tilstock	1380	25 crews
105	Bramcote	1381	32 crews
108	Wymeswold	1382	32 crews
109	Crosby	1383	26 crews

(1) SD 155/1861/1945

No. 1332 Heavy Conversion Unit, which had moved from Longtown to Riccall on 28 April 1945 was expanded slightly to train 20 crews at a time on a four weeks course, and was renamed 1332 Heavy Transport Conversion Unit. No. 1665 HCU, (1) training for No. 38 Troup, was similarly renamed at the same time.

To provide additional TSCU capacity in the United Kingdom a second unit, No. 1336 TSCU, equipped with 34 Dakotas, 15 Horsas, 14 Oxfords and one Proctor, was opened at Welford on 20 June 1945, and the existing unit, No. 1333 at Leicester East, was slightly expanded (from 36 pupils a month to 40) by detaching the specialist glider pick-up section, comprising five Dakotas and 16 Hadrians, to a separate new airfield, Ibsley, where it became known as the GPU (2) flight of No. 1333 TSCU. It trained 15 crews per month from the TSCU. The combined output of the two TSCUs (80 per month) plus 20 a month from No. 1334 TSCU in India, was estimated to be sufficient to meet all transport support (3) crews required in ACSEA.

In addition to these units, a number of ancillary units had to be formed, or taken over from other commands, to complete the training of the transferred crews. A night vision training school was formed at Llandow, a school of air transport at Netheravon, and an air traffic school at St. Mawgan had all been formed by the beginning of 1945. There was also the Air Transport Tactical Development Unit at Tarrant Rushton. The unit, originally the Airborne Forces Tactical Development Unit, had been formed under No. 38 Group to investigate tactical problems connected with the operation of airborne forces. It was transferred to Transport Command and renamed the AFTDU in January 1944 and its (4) direction enlarged to cover all aspects of air transport operations.

Several new units were planned to open in the summer of 1945. An aircREW holding unit (No. 17 ACHU) was formed at Snaith on 20 June, to accommodate crews (5) thrown up from other commands suitable for transfer to transport squadrons.

(1) SD 155/1861/45

(2) AM File S.104089/I

(3) AM File C.44086/52/I

(4) AM File C.404444/49

(5) AM File C.44259/51

It was intended to establish a small testing and grading flight at this unit to vet crews before sending them to OTUs and conversion units, but this had not been done by August 1945. Similarly a flight and squadron commanders school, which was proposed by Transport Command in July 1945, had not been established when the war ended. The training of transport crews in instrument flying and in the use of special radio devices called for special attention. Originally beam approach training was carried out in BAT flights under Flying Training Command, but the introduction of radio range flying necessitated specialist training within the Command and Nos. 1513 and 1527 BAT Flights at Bramcote and Prestwick respectively were taken over by Transport Command in 1944. Subsequently two more were formed (No. 1528 at Valley on 1 November 1944 and No. 1529 at St. Mawgan on 1 December 1944 and two others (Nos. 1516 Odiham and (1) 1521 Wymeswold) transferred to Transport Command in May 1945. These six flights were responsible for training in numerous types of instrument flying devices including Rebecca/Babs, Rebecca/Eureka, Gee, SBA, SCS, Loran and the Radio Range. It was likely, when the extent to which these facilities would be used was determined, that other special schools would be required, but none was (2) established before the end of the war.

The growth of the transport training organisation led to the suggestion, first made in April 1945, that a special training group should be established to control all transport training units in the United Kingdom, thus reducing the pressure on No. 44 Group. Already the burden had been relieved by the formation in January 1945 of No. 47 Group to take over all airline squadrons, leaving No. 44 Group responsible for ferrying and training. It was then proposed to form No. 48 (Training) Group and allow No. 44 Group to concentrate on ferrying. The transfer of No. 4 Group from Bomber Command, and No. 38 Group from ADGB in May 1945 caused a change in this plan, and it was decided that No. 4 Group should eventually assume responsibility for all training in Transport

(1) AM File S.101406/II

(2) AM File A.782724/45 and S.104089/II

Command except ferry training. The ferry units remained under No. 44 Group but all the remaining training units in that Group were transferred to No. 4 Group on 1 June. The control of the airborne forces training organisation under No. 38 Group was also destined to be transferred to No. 4 Group, but only No. 81 OTU (subsequently No. 1380 TCU) and No. 1665 HTCU had actually been transferred when the war ended. See Appendix 87 for the Transport Command Training Organisation at the end of the war.

CHAPTER 21OPERATIONAL TRAINING UNITS IN THE MIDDLE EAST

Operational training in the Middle East endured many disadvantages that did not afflict its counterpart in the United Kingdom. The chief of these - the distance factor - could not be improved, and it tended to get worse until the autumn of 1943 when the allied forces regained control of the Mediterranean Sea. In fact, during the months of pressure from Rommel's forces on the Egyptian frontier in 1941, Nos. 70, 71 and 72 OTUs were transferred to the Sudan and Kenya, thereby doubling the distance from their sources of supply of crews and equipment, and of contact with the operational squadrons. While the air forces in the Middle East were on the defensive, the Hurricanes allotted to No. 73 OTU were diverted suddenly to Singapore in December 1941, thereby retarding the working of that unit for six months. Until mid-1944 there was a shortage of efficient aircraft for training units, particularly of modern types with which squadrons were re-equipped; and maintenance problems in acutest form abounded. To a much greater degree than those who received operational training in the United Kingdom, crews in the Middle East suffered through the long delays caused by the general position in shipping. After a voyage lasting at least three months, they arrived from England, Australia, Rhodesia or Kenya, in an unpredictable stream having lost their keenness and forgotten the skills acquired on basic courses in those countries. Although efforts were made in aircrew reception centres to counter this drawback, it remained a constant (if necessary) evil in the system, more difficult to overcome than the non-runway sand airfields on which most pilots were trained.

In the early part of the war in Africa the canal zone was not safe for training; moreover all stations were wanted for operational squadrons. Having formed at Ismailia in November 1940, No. 70 OTU (medium bomber) moved in August 1941 to Nakuru in Kenya. The fighter OTU - No. 71 - joined its

(1) RAF Mediterranean Review Nos. 5 and 6

/ partner

partner at Ismailia in June 1941 for four months on its way to Gordon's Tree in the Sudan where it remained for nine months from October 1941 to June 1942. This unit's next location at Carthage (Sudan) lasted one year until it settled in its final home back at Ismailia in June 1943. A second fighter OTU - No. 73 - formed at Sheik Otham, Aden in November 1941. At Wadi Cazouza (Sudan) in November 1941 No. 72 (MB) OTU formed but it was removed to Nanyuki (Kenya) in June 1942 where it stayed for ten months. As the site was required by the Army this OTU disbanded. No. 74 (Army Co-operation) OTU started training at Aqir in October 1941 but the imminent threat of invasion caused its removal first to Rayak (Lebanon) in September, then back to (1) Palestine at Muqeibila in December 1942. Three months later it returned to Aqir and in November 1943 it found a firm standing at Petah Tiqva for the rest of the war.

These frequent changes in location severely interrupted the output of trained crews which ought to have been 24 per month from the bomber and 60 per month from each fighter OTU. Deficiencies had to be made up by depleting the stocks of crews in the United Kingdom - to the chagrin of the commands affected. During the critical period of Rommel's advance to Alamein shortage of aircraft reduced both fighter operational training units to half strength; and, after a few weeks, caused a temporary closing of No. 73 in order that its aircraft could help No. 71 to turn out 45 pilots per month. Throughout the year 1942 No. 74 maintained an output averaging 15 pilots a month, just enough to supply the army co-operation squadrons.

As the tide of battle receded the operational training units gradually filtered back to the Canal zone or the Levant and the organisation improved and expanded. No. 71 concentrated solely on Hurricane training and raised its output to near 70 pilots per month in March 1943. In the same month No. 73 re-opened at Abu Sueir, being equipped with Spitfires, Tomahawks and as many Kittyhawks as could be spared, so as to produce the target figure of 70 pilots per month. While to No. 74 OTU was added a photographic reconnaissance flight of four Hurricanes to give an output of three P/R pilots monthly. At

(1) Aqir lies 14 miles south of Jaffa. Muqeibila and Ein Shemer are adjacent on the south-east edge of the plain of Esdraelon, ie approximately 20 miles east from Caesarea and 16 miles south of Nazareth. Rayak lay 30 miles east of Beirut. Petah Tiqva is 8 miles east of Tel Aviv.

the same time No. 70 increased its output to 35 crews monthly, 15 Baltimore and 20 Blenheim, the latter destined for India. This unit stayed in Kenya (Nakuru) until June 1943 when it came north to the west of the canal at Shandur for the remaining war period. Also in March 1943 No. 75, the first of the new operational training units began training GR crews at Gianaclis on Hudsons, Baltimores and Ansons. The work was seriously handicapped by scarcity of operational types of aircraft; too much flying on Ansons involved considerable further training being given in the squadrons.

No. 203 (Training) Group formed

The creation of No. 203 (Training) Group in May 1943 to take charge of all training in the Middle East Command began the expansion and reorganisation of the OTUs with the aim ultimately to relieve pressure on similar establishments in the United Kingdom, so that actual needs in aircrew could be supplied from local output. This grandiose scheme included a big expansion in the armament, signals and navigation sides of training as well as increasing the amount of operational training all round.

During the winter of 1943 three new OTUs and one heavy conversion unit formed. Despite the hold-ups caused by unsuitable weather that retarded works services, by shortages of aircraft and equipment and of instructors, two medium bomber and No. 1675 Liberator Conversion Units opened almost on time. No. 76 OTU began preparing crews for night bombing on 15 October at Aqir: the HCU opened on 15 November at Lydda (Palestine) to convert 24 crews after a month's course; and No. 77 OTU started training crews for Wellington night bombers in Italy on 31 January 1944 at Qastina (Palestine), only one month behind schedule. (1) No. 78, a medium range GR OTU began to train its first intake, numbering 18 crews, on 28 February 1944 using a new station and airfield at Ein Shemer in Palestine. In addition to normal general reconnaissance, six crews per month were trained in the Leigh-Light role. The last OTU to be built, No. 79, was devoted to long-range fighter (rocket projectile and torpedo) training located at Nicosia (Cyprus). The first course began on 15 May 1944 with an intake of nine crews. Later in the year

(1) Qastina 20 miles due S of Jaffa

it increased to pass-out from a course lasting 10 weeks 30 crews each month, of whom 10 crews went to the Middle East Torpedo School to be trained for South East Asia Command.

Until July 1943, when no further Blenheim crews were required, No. 70 OTU had been preparing crews for that type and for Baltimore squadrons on an eight weeks course. After that the intake fell to nine RAF, nine South African and four Turkish Air Force crews per month. Marauder aircraft were added to its establishment in the autumn and the first course of four crews for this type began on the last day of December 1943. Owing to the re-armament so many squadrons with Spitfires instead of Hurricanes during the second half of 1943, the two fighter OTUs - Nos. 71 and 73 - were deprived of the former; for a few months the output from No. 71 dropped to 48 Hurricane pilots a month, two-thirds capacity. In accordance with the Air Ministry general expansion scheme, in November 1943 the monthly requirement from this unit was fixed at 30 Spitfire and 40 Hurricane pilots and it was decided that No. 73 OTU should produce 50 Spitfire and 25 Kittyhawk pilots each month. The maximum output from these units was almost reached a year later. The shortage of Spitfires in the Middle East also forced No. 74 OTU to contrive its fighter-reconnaissance training on Hurricanes, though Spitfires were available for the photo-reconnaissance pilots in sufficient numbers to back the photographic reconnaissance squadrons in the Mediterranean area. The number of fighter-reconnaissance trainees increased to 24 per month. And at the end of 1943 the commitment for No. 75 (GR) OTU was raised to 38 crews monthly under the expansion scheme. But, owing to shortage of suitable aircraft, it was possible only to produce 12 crews on Baltimores and 10 on Hudsons per month (or Venturas when they arrived in 1944).

During the second half of 1944 plans were made to organise production from the operational training units as shewn in Appendix 88. Unfortunately, owing to the disabilities outlined in the preceding paragraphs the full commitment for these units was not achieved by the end of the war.

Nevertheless a valiant effort was made to achieve this target. By the end of 1943 three new operational training units were opened, albeit in some discomfort during the months while runways and buildings remained in an unfinished state. Because a spirit of enterprise and resolution inflamed

all ranks, the difficulties created by climate or circumstances were overcome and by the summer of 1944 training proceeded at full swing in all units. Details of the actual output by each OTU year by year are given in Appendix 89. Within a few weeks of the end of war in Europe operational training in the Middle East ceased. With all celerity the special equipment was despatched to the Far East, and stores in the United Kingdom and the camp sites that had known a high degree of co-operative activity were evacuated.

CHAPTER 22OPERATIONAL TRAINING IN INDIA AND THE FAR EAST

Prior to the outbreak of war in the Pacific no serious attempt had been made to establish operational training facilities in the Far East. Although there were RAF squadrons in India, Burma and Malaya as well as a few IAF squadrons and flights in India, the old peace-time procedure of giving operational training on the squadrons continued, and the only personnel to have special operational training were a few of the meagre trickle reinforcement crews from the United Kingdom who had passed through an OTU before proceeding overseas. Indeed, the situation was worse than in peace-time since as new squadrons formed the existing squadrons were milked of their experienced pilots and crews to man the new units. This meant that both old and new units were encumbered by a heavy conversion training commitment - the old units training new crews, usually direct from FTSSs in Australia or New Zealand, and the new ones training both new crews and converting experienced crews to different types of aircraft.

Owing to the lack of aircraft and equipment, especially modern aircraft - biplanes were still the vogue east of Suez - and the absence of suitable instructors, little 'operational' training was in fact carried out and even by December 1941 few personnel had been trained operationally beyond peace-time standards.

This state of affairs was not entirely the fault of the local commanders; it was largely the result of Air Ministry policy which placed both India and the Far East low on the list for reinforcements and supplies - a reasonable enough policy at that time since they were still far removed from the scenes of operations.

By September 1941 there were such large numbers of personnel in need of operational training in Malaya that even the capacity of the squadrons was outstripped and a small makeshift OTU was formed at Kluang (without Air Ministry authority) using some Wirraways thrown up when No. 21 Squadron was re-equipped with Buffalos, and a few Blenheims borrowed from No. 34 Squadron. It had to be disbanded on 8 December, but during its short life valuable, though small,

results were accomplished: a number of New Zealand pilots from FTSs were trained for fighter and bomber squadrons, and the personnel of Nos. 36 and 100 Squadrons were converted from the antiquated Vildebeestes to Blenheims in preparation for their re-equipment with Australian built Beauforts - a waste
 (1) of effort as it turned out since Beauforts never arrived.

An armament training station was also opened in the Far East, at Kuantan, in November 1941, in order to improve the standard of gunnery training of the squadrons, but it was too late to be really effective and only two squadrons had been trained before Japan attacked.

In India the situation was even worse. There were no operational training facilities for the Indian Air Force which was in process of expanding, albeit slowly, and many of the experienced RAF squadrons were moved from India to the Middle or Far East during 1940 and 1941. Operational training facilities were non-existent and there is no evidence that the establishment of such facilities had even been considered before 1942. For a time armament training was carried out at Drigh Road near Karachi, but towards the end of 1941 the passage of reinforcement aircraft through the station hampered training to such an extent that the unit had to close.

Effects of the Outbreak of War

The outbreak of war in the Pacific brought home the inadequacy of the air forces and underlined the need for better training. With the loss of Hong Kong, Malaya and Burma, the problem confined itself to India and Ceylon, where two training aspects had to be considered: the development of the Indian Air Force and the expansion of the Royal Air Force.

At the beginning of 1942, before S.E. Asia had been lost, a review of operational training requirements outside the United Kingdom was carried out. India, Australia, New Zealand and the Far East were considered as one theatre since the problem of aircraft and aircrew requirements and supplies were to a large extent identical, and it was estimated that six OTUs in all were required to support that area: two fighter, one long range fighter, one GR, and two light bomber OTUs. One fighter and one light bomber OTUs were to be

(1) AHB Narrative The Campaign in the Far East, Vol. I.

located in India with the remainder in Australia, although it was envisaged that if Pacific communications became difficult all except the GR unit might have to be located in India.

Within a month the military situation had deteriorated so much that these plans had to be changed. With the loss of the Far East, Australia and New Zealand went their own ways and India had to be treated as a separate theatre of war. It was decided that OTUs should be developed in India to back squadrons of types which could not be flown out from the United Kingdom. Crews for flying boat, heavy and medium bomber squadrons and GR squadrons would be trained in the United Kingdom and flown out with their aircraft, and plans for the formation of the fighter and light bomber OTUs were to go ahead, although it was stressed that deliveries of aircraft for operational purposes would take precedence over training requirements and it would be some time before sufficient aircraft would be available for full-sized units. In the meantime it was hoped to press on with the formation of two small scale units.

AHQ India had suggested that four OTUs might be established, training general reconnaissance and army co-operation as well as fighter and light bomber crews, but the Air Ministry ruled that GR training should not be carried out in India (although it might possibly be done at Aden) and suggested that army co-operation training could be carried out at the fighter OTU.

This decision to restrict training in India to short range aircraft was later to have repercussions on the size and shape of the Indian Air Force. Basic training facilities for the IAF were being expanded so that more squadrons could be formed, but the development of OTUs was given priority over basic training and consequently the formation of new IAF squadrons was retarded. Moreover, since operational training for Indian Air Force personnel would have to be provided by the two RAF OTUs in India, it was impracticable to form squadrons on types which could not be supplied with locally trained crews. This meant that earlier plans for the expansion of coast defence flights into GR squadrons had to be abandoned and fighter and light bomber squadrons formed in their place. At one time it had been thought that it might be possible to send Indian crews to the projected GR OTU in the Middle

(1) ERP 169 and 170

East and India) but the opening of the unit was so delayed that this was impossible, so only RAF crews were trained there.

Formation of the OTUs

Although plans for the formation of the two OTUs were made in March 1942, it was some months before they were able to start effective training, and even then only on a very limited scale. The disappointing results of the four Middle East OTUs were partly responsible for this delay, since all efforts had to be centred in improving the existing units in the Middle East before the formation of further units could be contemplated.

It was hoped eventually to have a standard fighter OTU equipped with 75 Service types, 22 advanced trainers and six target towers, and training 32 pilots every two weeks on a six weeks course, and a standard light bomber OTU equipped with 48 Service types, 16 advanced trainers and two target towers, training 20 crews every two weeks on an eight weeks course, but many months were to elapse before these plans came anywhere near to fruition. The fighter OTU commenced work in April using as a nucleus some aircraft of No. 155 Squadron at Risalpur: Hurricanes, Mohawks, Harvards, Harlows and Audaxes, all of which were short of spare parts. The squadron had since reverted to operational duty but the OTU remained - it was officially numbered No. 151 OTU on 28 July - and it was hoped to build it up to half size as more aircraft became (1) available. As it was, with a total of 18 aircraft, the most the unit could do was to train 20 pilots at a time, and even so training had to be spread over 14 weeks. With nearly 300 pilots awaiting training the outlook was indeed black and the only possible source of additional aircraft was a shipment of 50 Hurricanes on their way out for operational squadrons.

The establishment of the light bomber OTU (No. 152) had been started a month earlier, in March, using No. 20 Squadron at Peshawar as a nucleus with a few Lysanders and one Blenheim for training purposes. In June, however, by which time training had hardly started, the squadron reverted to operational duty and, as there were no further aircraft available for training, the formation of the OTU had to be deferred. There was no immediate prospect of aircraft becoming available, and its re-formation was abandoned until later in the year.

(1) No. 151 OTU, ORB

A new armament training unit was also started in March 1942 at Peshawar, moving to Bhopal three months later. Equipped with five Wapitis, the unit provided courses lasting three weeks for pilots and observers from operational squadrons.

Little progress was made during the rest of 1942 and in the early part of 1943 renewed efforts were made to develop the planned capacity. The fighter OTU was unable to train any RAF pilots before March 1943; prior to that date it had been concentrating on training the output from the IAF SFTS. Training of army co-operation crews (or fighter reconnaissance crews as they were later called) commenced in September 1942, but this was at the expense of and not in addition to the normal fighter intake; about 25 per cent of the pilots underwent the fighter reconnaissance course. Courses had been reduced from 14 weeks to 10 (compared with six as planned) but intakes were still only 20 every five weeks instead of 32 every fortnight. No. 152 Light Bomber OTU restarted at Peshawar on 25 November 1942 training IAF crews, but it was unable to train RAF crews before August 1943. Its capacity was limited to 50 crews and intakes were 25 every six weeks on a 12 weeks course - four weeks longer than the official syllabus. (1) A small Blenheim conversion flight of five aircraft was added to the unit in February to convert a few crews by means of a two weeks course. Five months later it moved to Poona.

In June 1943, following a review of fighter pilot requirements for India, it was planned to increase the fighter OTU capacity so that it was capable of producing 100 pilots a month, which was reckoned to be sufficient to back the target force of 19 day fighter, six fighter reconnaissance and four fighter bomber squadrons planned for India. Intakes were to increase from 32 to 54 a fortnight on a six weeks course (raising the capacity from 96 pupils to 162). This was long-term planning, dependent upon deliveries of Hurricanes and Harvards from the United Kingdom and was not expected to be achieved until early 1944. The actual capacity of the unit in June was only 50 pilots (40 IAF and 10 RAF) and courses were still lasting 10 weeks.

(1) AM File C.36505/48

Light bomber requirements, on the other hand, showed a decrease, the latest target force provided for only five light bomber squadrons instead of ten, so OTU requirements were halved to 20 crews per month which, in the summer of 1943, was just about the maximum capacity of No. 152 OTU.

Revised OTU Policy

In December 1943, following the Chiefs of Staff directions that the fullest use should be made of the Middle East as a base for SEAC operations, in order to free India of as many training units as possible, it was decided to transfer all OTU training for India to the Middle East except Mosquito, transport and heavy bomber training which would continue to be carried out either in the United Kingdom or Canada. No further OTUs were to be opened in India and the existing units would be reduced to meet only the needs of the IAF, although it was envisaged that a number of conversion or refresher units (1) might be needed to acclimatise new RAF crews to local conditions.

This decision, though it prevented the expansion of the Indian OTU organisation, had little effect on the existing units. Although they had been intended to meet both RAF and IAF fighter and light bomber requirements, they had in practice done little more than meet IAF needs and even by the end of 1943 No. 151 OTU had not reached its full planned size. It was therefore arranged that the two units should cease expanding but should be retained at their existing capacity and concentrate solely on IAF training. A few months later it was found possible to amalgamate the two OTUs into one composite unit. No. 151 OTU was moved from Risalpur to Peshawar on 11 March where it absorbed No. 152 OTU. The expanded No. 151 OTU now comprised two flights: a Hurricane flight to provide a 12 weeks course for 48 pupils at a time (16 every four weeks) for IAF day fighters, ground attack and fighter reconnaissance pilots, and a Vengeance flight to provide a 10 weeks course for six IAF light bomber crews at a time. Six of the monthly output of the Hurricane flight underwent a further four weeks specialist fighter reconnaissance training; (2) the remaining 10 went to day fighter or ground attack squadrons.

(1) AM File C.36505/48/I

(2) AM File C.36505/48/II

Development of Specialist Training Facilities

Concurrently with the laborious development of OTU facilities was the establishment of a number of other training units. One of the first requirements was for gunnery training facilities to replace the armament training unit at Bhopal which had been converted into an air gunners school in May 1943, and it was decided to follow the practice in the United Kingdom of having gunnery flights established in each fighter and bomber group, except that as groups in India were geographical and not functional in character, the gunnery flights would have to be composite to deal with both fighters and bombers. Three such flights were formed: No. 1571 at Ratmalana on 13 July, No. 1572 at St. Thomas Mount on 10 July, and No. 1573 at Armada Road on (1) 7 October, each equipped with four Harvards and five Defiants or Vengeances. Their purpose was to provide each squadron with two weeks air firing practice every six months. Squadrons visited the flights when operational conditions permitted and used their own aircraft for training. It had been intended to form a fourth flight, but it was found that the air fighting training unit which had been formed at Armada Road on 23 February could undertake the work of one flight in addition to its other duties. These other duties consisted of a variety of gunnery courses: 10 pilots on a three weeks pilot gunnery instructors course; six navigators on a five weeks bombing leaders course; and six air gunners on a five weeks gunnery leaders course. To undertake these three courses and the squadron air firing training, the unit was equipped with four Blenheims, five Harvards, four Fulmers (subsequently replaced by three Hurricanes and three Vengeances) and eight Defiants.

In addition to the development of gunnery training facilities, it was necessary to form a special school to accommodate crews arriving in the Command from the Middle East and United Kingdom pending their posting to operational units. This school, originally named the Surplus AircREW Centre (and renamed the AircREW Transit Pool two months later) was formed at Poona on 13 April 1943. Its function was to accommodate and provide refresher training facilities for up to 370 pilots and crews at a time, and 12 Harvards were established for flying practice. In June a few Hurricanes were added and the

(1) AM Files S.80788 and S.79290

following month the Blenheim conversion flight from the OTU at Risalpur was
 (1) moved to Poona and absorbed into the ATP. By the end of 1943, the pool had been expanded to accommodate 450 pupils.

On 1 June 1943 a school of jungle training was formed at Poona within the ATP to instruct personnel in the pool in the technique of jungle survival. It moved to Kas six months later as a self-contained unit, known as the School for Jungle Self Preservation Training, and was expanded to train 280 pupils at a time on a three weeks course. Kas proved unsuitable and four months later the School moved to Mahableshwar, a place in the jungle about 70 miles from
 (2) Poona. Apart from the few fighters and light bomber crews trained in India, all reinforcement crews arriving in India passed through the ATP at Poona and all were required to undergo a jungle training course.

By this time, with one exception, all RAF crews were arriving fully trained and, after jungle training, were ready to join their squadrons. Some fighter pilots were trained in the Middle East and some short and medium range GR crews and light bomber crews came from the Middle East or Canada, while long range GR crews were supplied from No. 111 OTU in the Bahamas. All the remainder came from OTUs and HCUs in the United Kingdom. The only exception to the rule that all crews should arrive fully trained was in respect of crews for Liberator heavy bomber squadrons. Crews for the first squadron (No. 159) were trained at No. 1653 HCU in the United Kingdom, but in August 1943, when a second squadron was due to form, the HCU had been closed and as there were no other training facilities for Liberator bomber crews - an OTU was under consideration in Canada - part of No. 159 Squadron's facilities had to be used as a conversion flight instructing Wellington trained crews from Bomber Command
 (3) OTUs on Liberators. On 1 September when No. 159 Squadron moved from Salboni to Dukhkurdi, the conversion flight equipped with eight Liberators remained at Salboni and was numbered No. 1584 Conversion Flight. Most of its intakes continued to be supplied from the United Kingdom, but in early 1944,

(1) No. 227 Group, No. 152 OTU and ATP Poona ORBs

(2) Unit ORB

(3) AM Files S.82429/I and II and S.78249/II

after No. 76 OTU in the Middle East started producing Wellington crews for heavy bomber squadrons, a number were supplied from that area. The flight was established on a temporary basis training eight crews a month and was intended to close once the Canadian OTU began producing crews for India, the first of whom were due to start in August 1944.

A further post-graduate training unit to be established in India was the General Reconnaissance School at Andheri. This School, which had been formed in June 1942 (training 16 pupils at a time on a five weeks course) when it was still the intention to form IAF GR squadrons, was later combined with the Air Navigation School to become the GR and ANS and concentrated on the training of RAF personnel. In April 1943 the GR courses were reorganised to conform with the syllabuses in the United Kingdom. A 10 weeks course for four pilots at a time was introduced, and a seven weeks course for eight navigators/bomber. The course lengths were slightly longer than those in the United Kingdom (one week in the pilots course and two weeks in the navigators/bomber) to allow for interruption through monsoons and hot weather, although subsequently a common nine weeks course was arranged for both pilots and navigators/bomber, training 12 pupils at a time. Simultaneously with the revision of the GR courses, a 14 weeks staff navigators course for 12 pupils (1) at a time was introduced. Shortly afterwards two more courses were started at the School: a ship recognition course of two weeks duration for 10 pupils at a time, and a five weeks Astro course for 12 pupils at a time. Towards the end of the year the School moved to Colombo and four months later, in (2) March 1944, it suffered a further move, to Koggala.

By August 1944 the need for both GR and specialist navigation training in ACSEA had disappeared, and the School was disbanded on the 5th of that month. The ship recognition courses were continued, however, and a new unit known as No.2 School of Ship Recognition was established at Koggala, training 12 pupils at a time on a three weeks course. This unit continued until 15 June 1945.

(1) SO Folder I/6

(2) AMT Folder 4/9

Ferry and Transport Training

In addition to the training facilities so far described, a number of specialist training units were formed to undertake the training of ferry and transport crews. Three different types of training were involved: training for air supply and airborne forces operations; training for internal air communications ("air lines") in India; and training for the ferrying of reinforcement aircraft. Until the autumn of 1943, however, there was little provision made for any of these requirements. The only transport squadron in India (No. 31) had to undertake its own conversion training in addition to carrying out its normal airline and supply dropping duties. An air landing school had been formed at New Delhi as long ago as 1 October 1941, equipped with five Valencias, but its task was primarily to train parachute troops and glider crews. Twelve months after its formation the ALS moved to Chaklala, near Rawalpindi, a more suitable location for training purposes than the busy airport at Delhi; by that time Hudsons and Lodestars had replaced the Valencias, and six months later the first Dakota arrived and research into the techniques of supply dropping was started, though on a very small scale with no organised training programme. Beginning in June 1942 the ALS also undertook a number of clandestine operations and carried out the training of agents on behalf of Force 136, the Special Operation Organisation in the Far East. Twelve months later this commitment was divorced from the ALS and a new unit, No. 1576 (SD) Flight was formed at Chaklala. This flight was subsequently expanded to form two SD squadrons, Nos. 357 and 628 Squadrons.

On 2 September 1943, by which time two more transport squadrons had arrived in India, No. 177 (Transport) Wing was formed to control the units engaged on airborne training. Two months later two more transport squadrons arrived making five in all; three were engaged on airborne training (in preparation for Wingate's forthcoming operations), one was employed on supply dropping operations over Burma, and the other on airline services in India. There was still no transport training organisation, however - apart from what could be carried out at the ALS - and the squadrons themselves still had to undertake the training of new crews, although by the end of the year a few airline crews were being trained at a newly formed check and conversion unit at Mauripur.

It was not until April 1944 that arrangements were made to train crews for transport support work. The Air Landing School at Chaklala was renamed the Transport Support Training Unit and reorganised and re-equipped with 14 Dakotas to provide the following courses:-

- a. the conversion of crews to Dakotas
- b. the training of crews in supply dropping, parachutist dropping and glider towing
- c. the training of parachute troops and glider crews

Later, the training of parachutists was divorced from the TSTU and a special (1) parachute training school established. Conversion training of crews to Dakota crews was transferred to No. 1331 CU at Risalpur (see below), and the TSTU concentrated on the training of Dakota crews in the technique of supply and parachutist dropping and glider towing, training 14 crews at a time on a six weeks course.

The Check and Conversion Unit which has already been mentioned was originally established as a training section of the Ferry Pilots Pool at Karachi to train crews for ferry duties in India. The pool itself had been established in October 1942 under the control of No. 179 (Ferry) Wing, a newly created wing to take charge of all aircraft reinforcing operations in India. In addition to the FPP at Karachi, three ferry controls were formed, each containing a number of ferry flights: No. 21 at Mauripur on 7 November 1942, No. 22 at Allahabad on 4 January 1943 and No. 23 at Santa Cruz on 1 May 1942 moving to Nagpur eight months later. The pool was the parent unit of all crews posted to the ferry controls and contained a small training flight to convert crews to the various types of aircraft to be ferried.

As the volume of traffic grew, so did the size of the ferry controls, and, in turn, the size of the training flight at the Ferry Pilots Pool. Gradually, as the ferry controls became more self contained, the need for the main pool disappeared and by October 1943 only the training flight remained. This was renamed the Check and Conversion Flight and it continued to undertake the conversion training of ferry pilots. No. 179 Wing had by that time grown into No. 229 Transport Group, responsible for all transport work in India, and

(1) SD 155/50/42 and No. 179 Wing ORB

it was natural that a number of transport crews from the airline squadrons should be sent to the CCU at Mauripur for captains courses. By the summer of 1944 the flight was training roughly 60 crews a month, both ferry and transport personnel, half on refresher courses and half on conversion courses, using a variety of aircraft including Harvards, Spitfires, Mosquitos, Thunderbolts, Liberators, Dakotas, Hurricanes and Vengeances. The commitment continued to grow and, in September 1944, it was necessary to move the unit to a larger airfield at Risalpur. At the same time it was decided to rename the units in conformity with other similar units under Transport Command. The Check and Conversion Unit became No. 1331 Conversion Unit, and Nos. 21, 22 and 23 Ferry Controls became Nos. 8, 9 and 10 Ferry Units at Mauripur,
 (1)
 Allahabad and Nagpur respectively. In June 1945 No. 8 FU moved from Mauripur to Drigh Road, another airfield near Karachi.

Formation of Conversion Units

Although it had been intended that India should be relieved of all operational training responsibilities, apart from those required to back the Indian Air Force, it was inevitable that as the size of the front line expanded so the number of training units supporting it increased. It was still the policy that all crews should arrive in India trained to full operational standard and ready to take their place in the front line, but certain types of American aircraft used in ACSEA were not employed elsewhere by the RAF, so it was not always possible to give crews experience on the types of aircraft they were eventually destined to fly, at the OTUs in the United Kingdom, Canada or Middle East. This problem had already occurred in respect of Liberator bomber crews and had resulted in the formation of No. 1584 Heavy Conversion Flight at Salboni until No. 5 OTU in Canada started producing Liberator bomber crews. In January 1944, because of increasing requirements, the flight was expanded into a full sized Heavy Conversion Unit (No. 1673) and moved to Kolar. Equipped with 12 Liberators it trained 12 crews every two weeks on a four weeks course. Six months later courses were extended to six weeks and the aircraft increased to 23 so that intakes could be increased to 20 every two weeks. The crewing of personnel for Liberators

(1) Unit ORBs

was a complex problem, especially after April when a new crew policy was introduced. Originally when the Liberator crew composition was one pilot, one navigator/bomber, one wireless operator/air gunner, two air gunners and one flight engineer, intakes were supplied from Wellington OTUs in either the United Kingdom or Middle East (less an air bomber), the additional crew member, a flight engineer, joining his crew at the HCU. After April crews for ACSEA were increased by the addition of one pilot, one air bomber, one wireless operator/air gunner and three air gunners and dropping the flight engineer, thus making 11 in all, five of whom, the new additions less the air bomber, had to join the Wellington trained crews at the HCU. The special duty squadrons in ACSEA, however, continued with the old six-man crews while in the Middle East. In the Middle East a seven man crew was carried (one pilot, one navigator, one air bomber, one wireless operator/air gunner, two air gunners and one flight engineer), so it was essential that crews should be earmarked (1) for their respective squadrons before commencing OTU training.

In the first half of 1944 three more conversion units were formed. First to be formed was No. 1671 Conversion Unit at Baigachi which arrived from the Middle East on 1 February 1944 equipped with four Beaufighters. Its purpose was to convert night-fighter crews to the use of Mark VIII AI equipment. It (2) was disbanded on 5 June after all the squadrons had been converted. Twelve months later a similar unit was formed to convert crews to Mark X AI equipment and was still in operation at the end of the war.

No. 1672 Conversion Unit was also formed on 1 February 1944. Located at Yelahanka (it moved to Kola in June but returned to Yelahanka four months later) the unit undertook the conversion training of Vengeance squadrons rearming with Mosquitos by means of a six weeks course, training one squadron at a time. Most of the training was carried out on the squadron's own aircraft, but seven Mosquitos, two Blenheims and two Ansons (later replaced by Oxfords) were established on the Conversion Unit. In February 1945, after all squadrons had been converted, the training of reinforcement crews on a nine weeks course was commenced and the aircraft establishment raised to sixteen (3) Mosquitos and six Oxfords.

(1) AM File S.78249/IV

(2) AM File S.86652/III

(3) Unit ORB

The third unit was No. 1670 Conversion Unit which was formed at Yelahanka on 20 June to provide conversion training on Thunderbolts for personnel of the Hurricane squadrons rearming with the Thunderbolts, and to train reinforcement pilots who had received their operational training at No. 73 OTU in the Middle East. In both cases the conversion course lasted six weeks. Two squadrons were converted at a time mainly using their own aircraft. Twelve reinforcement pilots were trained every six weeks for whom (1) twelve Thunderbolts and six Harvards were established.

Development of Gunnery Training

In addition to the formation of conversion units, a number of schools were utilised to provide gunnery training and practice. No. 1 Air Gunners School at Bairagash had started giving refresher gunnery training to RAF air gunners destined for Liberator squadrons in May 1943, training 50 at a time on a two weeks course. A two weeks gunnery training course for pilots was started later in the year, training 20 pilots at a time. In 1944 a six weeks (2) air gunnery instructors course was started, training 12 pupils at a time.

The Air Fighting Training Unit at Amarda Road had been expanded and by June 1944 was training 18 pilots on a four weeks gunnery instructors course, 12 air gunners on a five weeks gunnery leaders course and eight navigators on a bombing leaders course. A low attack instructors school was formed at Ranchi on 5 November 1943 to provide a three weeks course for 10 fighter (3) pilots at a time in the use of rocket projectiles. During 1944 the School was expanded to train 32 pilots at a time, but as only a quarter of them were to be employed as instructors - the remainder were reinforcement crews for operational squadrons - the title of the school was rather a misnomer and in December 1944 it was renamed the Ground Attack Training Unit. At both Amarda Road and Ranchi development units were established to carry out trials and testing of new aircraft and equipment under local conditions, and in March 1945 these two units, the Air Fighting Development Unit and the Ground Attack Development Unit (sometimes called the Tactical Development (4)

(1) Unit ORB

(2) AM File C.36505/II

(3) Unit ORB

(4) AM File S.86652/IV

Unit), together with the Jungle Target Research Unit at Sorbhog, were amalgamated to form a new unit at Amarda Road called the Tactical & Weapon Development Unit. The new unit, which was responsible for all development work in South East Asia and was in reality an outpost of the Central Fighter Establishment, was equipped with a total of 18 aircraft including Thunderbolts, Spitfires, Hurricanes, Beaufighters, Mustangs, Mosquitos, Liberators and Austers.

The three gunnery training flights had been renamed armament practice camps on 1 February 1944 in conformity with the United Kingdom practice - No. 1571 Flight at Ratmalana (it moved to Sigiriya in April 1944) becoming No. 20 APC; No. 1572 (which moved from St. Thomas Mount to Yelahanka in March 1944) No. 21; and No. 1573 at Amarda Road No. 22. On 10 March 1944 a fourth APC, No. 23, was formed at Digri, moving to Salboni a few months later. These camps continued to provide refresher training facilities for both fighter and bomber squadrons, but the course length had been increased from two weeks to three.

Training facilities were also established for torpedo bomber and torpedo fighter crews in the shape of No. 3 Torpedo Refresher School which was opened at Ratmalana in Ceylon in July 1944. Originally it had a capacity for training 24 crews at a time on a four weeks course, but four months later, when requirements were reduced, the school's capacity was halved. Pupils were sent to the school from operational squadrons and brought their own aircraft with them for training purposes, but one Beaufort and one Wellington were established for the use of instructors.

Formation of Refresher Flying Units

With the increasing number of crews arriving in India to reinforce the front line, which by 1944 was rapidly expanding, it became necessary to make some provision to keep crews in flying practice while awaiting posting to squadrons. This had already been done more or less unofficially on an ad hoc basis at the Aircrew Transit Pool at Poona, and a few Harvards, Vengeances and

(1) AM File CS.24259

(2) AM Files S.99128 and S.79290

(3) S8 Folder I/I

Blenheim had been established for that purpose. In March 1944 the Pool was renamed No. 3 Refresher Flying Unit and reorganised to give organised courses to all crews passing through the school. The capacity of the school remained at 480 pupils and two courses were arranged - a two weeks refresher course for bomber crews and a six weeks course for fighter pilots.

Later in the year as the volume of reinforcements increased it was necessary to open more schools, and this was done by utilising the facilities of those conversion units which became redundant as soon as crews fully trained on their particular types of aircraft arrived from outside the Command. No. 1673 HCU at Kola, training Liberator crews, was the first to be reorganised and was renamed No. 6 RFU on 8 November 1944, following the arrival in India of Liberator trained crews from No. 5 OTU in Canada, and No. 760 TU and No. 1673 HCU in the Middle East. Two months later, on 23 January, after No. 73 OTU in the Middle East had started training on Thunderbolts for ACSEA it was possible to transform No. 1670 Thunderbolt Conversion Unit at Yelahanka into No. 8 RFU, equipped with 18 Thunderbolts, (1) two Harvards and two Vengeances.

In July 1945, after specialised training had ceased, the Ground Attack Training Unit at Ranchi was utilised for refresher training purposes on (2) Beaufighters and renamed No. 9 RFU. In addition to these refresher flying units, a refresher school for ground training was established. This unit, the AircREW Synthetic Training Refresher School, was formed at Calcutta on 24 August 1944 for the purpose of providing navigation, bombing, air firing and link training, etc for all categories of aircREW serving in South East Asia. Using a variety of synthetic equipment including link trainers, DR instructors, training turrets, deflection trainers, estimation shadow graphs and bombsight trainers, the unit provided various refresher courses, usually lasting a week, for both complete crews and individual aircREW categories, (3) training about 100 pupils at a time.

(1) AM File C.36505/48/II

(2) AM File S.86652/IV

(3) S8 Folder I/6

Long before the formation of this school, the need arose for aircrew, particularly navigators, to be given periodical refresher courses and, as there were no aircraft available, the only alternative was to use synthetic devices. Training first started in November 1942 at Salboni at the headquarters of No. 170 Wing where lectures in navigation were given. After the move of No. 170 Wing in February 1943 to the forward area, the school was transferred to Calcutta and placed under No. 221 Group. Training courses for air bombers, air gunners, wireless operators, pilots and finally complete crews were gradually introduced during 1943, although the accent continued to be on navigation training. In March 1944 the school was transferred to No. 231 Group and the title changed from Refresher School to Group Navigation School, and remained as such until the formation of the Air Synthetic
 (1)
 Training Refresher School.

A further school, which might be termed a refresher school, although its object was to improve the physical and mental fitness of aircrew personnel and it did not provide flying or ground instruction, was the Aircrrew Mountain Centre which was opened at Nagim Bagh just outside Srinagar in Kashmir in October 1944. Training varied according to the time of year - ski-ing courses were run during the winter season and trekking and mountaineering in the summer - but at all times the primary purpose was the welfare of operational aircrew sent there for recuperation and refresher purposes. In both cases the course lasted four weeks. In the winter, after a few days at the main base, Nagim Bagh, pupils went up to Gulmang for their ski-ing instruction. In the summer months (from May to September) after a few days at Nagim Bagh, pupils climbed up the Sind Valley via two small transit camps, until they reached the advanced base at Sonamang. From there they had a choice of journeys, some of which took them into Little Tibet and involved a good deal of mountain climbing. Courses comprised 12 pupils and intakes took place every week. While on the course pupils were attached to No. 1 Hill Depot at Lower Topa, which acted as a reception depot for pupils proceeding
 (2)
 to and from the Centre.

(1) Unit ORB

(2) ACSEA File ACC/107

Front Line Expansion Policy

As has already been explained, the training organisation in India was not directly related to the size of the front line in SEAC since all reinforcements, apart from IAF personnel, were supplied from outside the Command, and the majority of these received operational training prior to arriving in South East Asia. This was the policy at the beginning of 1944 when the front line target was set at about 80 squadrons - a target which was unlikely to be changed until Germany was defeated. After Germany had been defeated it was planned to send large reinforcements to fight the Japanese war and to expand (1) the front line to roughly twice its former size.

This projected increase of the front line did not mean that the training organisation would undergo a similar expansion. Crews would continue to be trained in the United Kingdom or Middle East, and the only increases necessary would be in the units serving as transit pools and acclimatisation units. Similarly, the force of VLR aircraft, which became known as Tiger Force, comprising two groups each of 12 heavy bomber squadrons and six long range fighter squadrons, supported by Transport A/SR and PR squadrons which was to be sent to the Pacific to participate in the bombing of Japan, would be raised and trained in the United Kingdom and Canada and would not involve the expansion of training facilities in ACSEA.

Thus, in India, the training schools continued to concentrate on refresher and acclimatisation training. The one and only operational training unit, No. 151 OTU at Peshawar, still trained only RIAF personnel, although it was slightly reorganised in the spring of 1945 to coincide with the RIAF re-armament programme. The obsolete Vengeances were being replaced with Spitfires - these were chosen in preference to Mosquitos and Beaufighters so that navigators did not have to be provided - and the OTU was reorganised as a Hurricane and Spitfire day fighter OTU: the Hurricane course remained at 12 weeks but intakes were reduced to 18 every six weeks; the specialised ground attack course for fighter reconnaissance pilots was extended to six weeks and intakes increased to 12; and a six weeks Spitfire conversion course was (2) introduced training six pilots at a time.

(1) AM File C.32333/46/I

(2) AM File S.78249/V

The conversion training of Thunderbolt pilots and Liberator crews had come to an end by the beginning of 1945 - it had only been carried out in India until facilities could be established elsewhere - and the only conversion training carried out after that time was a small amount of Mosquito training at No. 1672 CU.

The supply of Liberator crews caused some anxiety during the summer of 1945. Originally it was envisaged that Liberators would be replaced by Lancasters and Lincolns by September 1945 and that trained crews would be supplied from the United Kingdom. No. 5 OTU in Canada, which had been training 11 RAF crews a month for ACSEA was to concentrate on the training of crews for the RCAF contribution to Tiger Force and No. 1675 HCU in the Middle East which had been supplying ACSEA with nine crews a month was to be disbanded. It was apparent that the Liberators would have to be retained in ACSEA for a longer period than originally intended, which meant that No. 1673 HCU in the Middle East had to continue training and it was still operating at (1) the end of the war. After the end of hostilities in Europe it had been proposed that Lancaster crews for Bomber Command should be sent to the Middle East for a short Liberator conversion course in place of Wellington crews from the OTUs - it had also been suggested that No. 6 RFU should undertake this training but this proved impracticable - but none had actually been sent before the war ended.

Reception of Reinforcement Crews

To accommodate the increased flow of reinforcement crews, the refresher flying units had to be expanded. By the spring of 1945 the monthly flow of crews into ACSEA was in the neighbourhood of 150 per month, and this figure was (2) likely to be almost doubled within the next few months.

All aircrew personnel arriving in India - except those in squadrons which moved en bloc to India - were sent first to the aircrew reception centre which had been established at Poona on 13 February 1945 alongside No. 3 RFU. Formerly reinforcement aircrews arriving by sea passed through a small aircrew reception flight at Werli, near Bombay - a special section of the Base Personnel Depot set up in early 1944 to deal with aircrew personnel - before going to No. 3 RFU Poona, while those arriving by air went straight to Poona

(1) AM Files S.78249/V and S.102724/I

(2) AM File C.36505/48/II

from the PTC at Karachi. The establishment of the ARC at Poona meant that new arrivals passed through the crew centre and thus relieved No. 3 RFU of the responsibility for allocating reinforcements and allowed it to concentrate on (1) the work of refresher flying. While at the ARC all aircrew were detailed for a three weeks course at the School of Jungle Self-Preservation training at Mahableshwar (after the move of this School to Bhopal on 15 May courses were reduced to two weeks) before being posted to one of the refresher flying units for a four weeks acclimatisation and refresher course. Spitfire and Hurricane pilots and Beaufighter crews were sent to No. 3 RFU Poona; Thunderbolt pilots to No. 8 RFU, Yelahanka; Liberator crews to No. 6 RFU Kolar; and Mosquito crews and those destined to be converted to Mosquitos to No. 1672 CU at Yelahanka. Hurricanes and Beaufighter crews destined for ground attack squadrons went from No. 3 RFU to the OTU at Ranchi for a further four weeks course, but after July, when the OTU was converted into No. 9 RFU, all Hurricane and Beaufighter training was carried out at Ranhi (pupils proceeding there direct from the ARC) and No. 3 RFU concentrated on the training of Spitfire pilots. Each RFU contained a small pool to accommodate crews who had completed the course and were awaiting posting to operational units. Normally the period spent in the pool was between one and four weeks, although in some cases personnel remained in these pools for periods up to 12 weeks. It was not the policy - as it was in the Middle East and the United Kingdom - to hold large reserves of aircrews in India awaiting posting to squadrons, and it was hoped that no one would spend more than one month in either the ARC or one of the RFU pools before posting. It was essential to allow some latitude so that sudden demands for replacements could be met, but with long distances involved and numerous courses to pass through, it was important that the time spent between leaving basic training schools and joining operational squadrons should be as short as possible. Even so, in the spring of 1945, excluding time spent in pools in the Middle East, Canada or the United Kingdom and the time in transit to India, it was taking anything up to six months for a crew to reach their squadron after graduating from their basic training schools. If the time spent in transit and in other parts outside India is included, this period would usually be more than doubled. In India, up to a fortnight was usually spent at Karachi or Bombay awaiting railway reservations to the ARC Poona, and the journey itself

to Poona took five days from Karachi or two from Bombay. Up to four weeks were spent at the ARC, to which must be added a further three weeks spent at the Jungle School. The refresher unit course lasted four weeks and another four weeks was usually spent awaiting posting and train reservations. The journeys to the RFU and from the RFU to the squadron might take up to 10 days each, and Hurricane and Beaufighter ground attack crews also went to the GATU at Ranchi which lasted four weeks, plus up to two or three weeks travelling time to and fro.

Ferry and Transport Training

The only aircrew personnel who did not normally pass through this pipeline were those required for ferry and transport duties. Since casualties were small and operational tours were long there was no longer demand for these personnel, especially as most transport reinforcements arrived in the shape of complete squadrons transferred from the Middle East. Individual reinforcements were usually supplied by Transport Command in the United Kingdom.

The normal policy of transport tours under No. 229 Group was as follows: new arrivals spent their initial periods in ferry units delivering single-engined aircraft. Later they were progressively trained on twin-engined aircraft and ultimately on Dakotas or Liberators. Later they would be employed on airline squadrons. Personnel or transport support squadrons were also employed (1) on airline duties after completing their initial tours.

There was a considerable expansion of the transport forces in ACSEA during 1945 and this involved a certain amount of reorganisation within the training units. The increasing flow of reinforcements added a heavy load to the ferry organisation and on 20 March 1945 a fourth ferry unit had to be formed. This was No. 14 FU at Agartala, formed when two of the ferry flights from No. 9 FU had been moved there to ferry aircraft to and from the forward areas. The great distance between these flights and their parent units, which was at Allahabad, made it impossible for No. 9 FU to exercise operational or administrative control over them, so they were combined to form a new ferry unit. (2)

This ferry expansion, together with the development of internal air routes in India, and the projected air trooping scheme which aimed at moving 10,000 men per month to ACSEA by October 1945, meant that a large network of staging

(1) No. 229 Group ORB

(2) No. 229 Group ORB

posts had to be set up all over India and Burma. In June 1945, in order to save manpower by reducing the number of small units, it was decided to roll up the ferry units and ferry flights by incorporating them as ferry sections of staging posts. This took place on 25 June as follows:-

FU No.	Location	Incorporated into SP No.	Location
8	Drigh Road	202	Drigh Road
8	Allahabad	36	Allahabad
10	Nagpur	59	Nagpur
14	Agartala	209	Agartala
Ferry Flight (formerly under No. 8 FU)	Jodpur	46	Jodpur
Ferry Flight (formerly under No. 8 FU)	Lahore	47	Lahore
Ferry Flight (formerly under No. 10 FU)	Santa Cruz	56	Santa Cruz
Ferry Flight (formerly under No. 10 FU)	Trincomalee	156	Trincomalee

At the beginning of August new ferry sections were established at Barrackpore (under No. 158 SP) and Hmawbi (No. 69 SP) - the latter for the purpose of ferrying aircraft for the forthcoming "Zipper" operation.

Although the ferry units, or later the staging posts, carried out a certain amount of conversion training for new pilots and crews, the bulk of the training of ferry personnel continued to be given at No. 1331 Conversion Unit at Risalpur. Equipped with a variety of aircraft, ranging from single-engined types (Hurricanes, Spitfires, Thunderbolts and Vengeances) to twin-engined bombers and transports (Beaufighters, Mosquitos, Oxfords and Dakotas) and four-engined Liberators, the unit carried out conversion courses lasting four weeks for up to 60 pilots at a time. A few Harvards and Oxfords were also established and these, besides being used for conversion purposes, were often used to provide refresher courses, lasting two weeks for up to 12 pilots at a time.

The other transport training unit, the Transport Support Training Unit at Chaklala, which was training crews for supply dropping operations in Burma and for the projected airborne operations involving the use of gliders and

parachute troops by means of a six weeks course, was expanded to train 30 crews at a time by April 1945. To enable this expansion to be achieved, the School had been moved from Chaklala to Gujrat on 21 March. On 12 April it was renamed No. 1334 (TS) CU to bring it into line with the other transport units in the United Kingdom. Three days before the end of the war the unit moved to Baroda.

In addition to training transport crews for airborne operations, No. 229 Group had to undertake the training of glider crews. Glider pilots, 75 per cent of whom were RAF personnel and 25 per cent were Army pilots, had been sent out from the United Kingdom towards the end of 1944 to form six glider squadrons to take part in airborne operations in Burma in January 1945. These operations did not take place as planned and a comprehensive training scheme had to be drawn up to keep crews in flying practice (in the case of RAF personnel both on glider and powered aircraft) and to fit them for future operations.

Each squadron had 10 light aircraft (Tigers, Moths and Austers) for refresher flying, and further flying practice was given by attaching the RAF pilots to transport squadrons in Burma as second pilots. Glider flying practice was carried on by the glider squadrons themselves. Ground training consisted of a three weeks jungle training course either at the school at Mahableshwar or at a similar school operated by 'E' Group (an SOE organisation) at Silchar; a six weeks infantry training and battle course at an Indian Army Officers Training School at Belgaum; and various specialist courses with the 44th Indian Airborne Division.

Another Army commitment - although this was not under No. 229 Group - was to provide operational training for a number of AOP pilots for No. 656 Squadron, and this was done by forming No. 1587 AOP Flight at Deolali on 16 October 1944, equipped with one Tiger Moth and two Austers. Originally a full eight weeks AOP operational training course was carried out, training six pupils at a time, but after May 1945 courses were reduced to four weeks and refresher flying was given to pupils who had previously passed through No. 43 OTU in the United Kingdom.
(1)

(1) Unit ORB and AM File S.2982/II and III

End of the War

This then was the position in South East Asia when the war ended in August 1945. Although the front line was expanding rapidly the operational training organisation was in a static position. Operational training was provided for RIAF personnel and refresher conversion training courses for RAF crews. In all there were some 17 units concerned with operational training in being on 15 August 1945. ⁽¹⁾ In addition there were the 10 ferry sections of staging posts, which though not primarily training units, undertook a certain amount of conversion training.

(1) See Appendix 90

CHAPTER 23OPERATIONAL TRAINING IN THE DOMINIONS AND THE UNITED STATES

Although the outbreak of war saw the rapid expansion of basic training facilities in the Dominions, that expansion was not accompanied by a parallel development of an organisation for operational training. No such development was possible in the early months of the war when the operational training spotlight was focused solely on the United Kingdom, and every available aircraft was required for the war against Germany, and later when the supply position was improving - in fact until Japanese entry into the war extended the operational areas - the Dominions were excluded from the programme of OTU development by the policy of locating operational training units only in the
 (1)
 theatres of operations.

Prior to 1942 therefore conversion to operational flying for personnel destined to serve in the Home Defence squadrons of the Dominions was carried out by the squadrons themselves in much the same way as in the RAF before the war, while Dominion trained personnel serving in or with the RAF underwent the operational training in RAF units either in the United Kingdom or the Middle East.

Transfer of GR Schools Overseas

There were some slight exceptions to this rule confining operational training to the operational commands. In 1940 when plans were made to transfer certain RAF schools to the Dominions to relieve congestion in the United Kingdom, three schools, Nos 1 and 2 General Reconnaissance Schools (both located at Squires Gate) and the Torpedo Training School at Abbotsinch, all of which were part of Coastal Command's operational training organisation, were earmarked for transfer. It was not essential, as it was for bomber and fighter operational training, to carry out maritime training in the theatre of operations, since most of it involved flying over the sea. Moreover, crews underwent further training in OTUs after torpedo or GR training, where they could become accustomed to United Kingdom conditions. As a result No 1 GRS was moved to George in South Africa where it resumed training on 1 December 1940, and No. 2 went to Charlottetown in Canada and began training on

(1) AM File S.4603

(1)

20 January 1941. Both schools, equipped with 36 Ansons and training 96 pilots on a 12 weeks course, continued to provide instruction in general reconnaissance for pilots destined for Coastal Command. In August 1941, in order to increase output, the course length was shortened to nine weeks and the pupil population doubled. In Canada half of the additional capacity was utilised for the training of observers on a five weeks course, which meant that that School trained a total of 144 pilots and 48 observers at a time. It was the original intention that all RAF GR training should be carried out at these two schools, but a third school was temporarily established at Squires Gate to cover the loss of output involved by the transfers (nine weeks were lost in the move of No 1 GRS to South Africa and a further six weeks elapsed before it was operating at full capacity, and five-and-a-half weeks were lost in the case of No 2 GRS) and it was subsequently retained as an

(2)

additional GR training unit. The projected move of the Torpedo Training School never materialised; instead it was decided to form a Beaufort OTU in Canada, training torpedo bomber crews for Coastal Command. Unfortunately the formation of this OTU was delayed for nearly twelve months by an unfinished aerodrome and lack of equipment. It was August 1941 before its first staff arrived - by which time the operational training policy had been further modified and another OTU had already been formed in Canada and two more planned - and although it was officially formed at Patricia Bay on 13 October 1941, training was not scheduled to commence until January 1942. Before training started war had broken out in the Pacific, and for a few weeks the unit operated as No 32 Operational Squadron patrolling the Western seaboard of Canada. By the time it was ready to start training, it had been decided to replace the Beauforts with Hampden torpedo-bombers which were being built in Canada, and when the first course started training on 2 February, the unit

(3)

was operating with both Beauforts and Hampdens.

(1) AM Files S.62894 and S.62905

(2) See Chapter 19

(3) AM File S.78773

Formation of No 31 OTU

Meanwhile, in March 1941, it had been decided to set up an OTU in Canada to train crews for the various types of aircraft which America were supplying in ever-increasing numbers and which would have to be ferried across the

(1)

Atlantic. Some months earlier Canada had suggested that OTUs should be formed in the Dominions to match the SFTSs there, but the proposal was directly counter to the policy of keeping operational training in the operational commands and could not be accepted, although the prospect of establishing an OTU in Canada to train for trans-Atlantic ferry work was

(2)

foreseen. This in many ways was a most attractive proposition. Besides meeting Canada's wishes to undertake more training the formation of an OTU in the area of manufacture would solve many supply difficulties and would provide crews for ferrying which, in turn, would reduce both the operational training commitment elsewhere and the number of aircraft to be ferried for

(3)

training purposes.

As a start it was decided to open an OTU training Hudson crews. It was opened as No. 80 OTU at Debert on 3 June 1941 and drew its pupils from the output of the training schools in Canada. Some pupils were to be given the full OTU course as well as instruction in ferry work so that they could

deliver their aircraft and then go straight to squadrons in Coastal Command, while others were to receive sufficient instruction to enable them to ferry their aircraft across the Atlantic but would receive their full OTU training

(4)

in the United Kingdom. Lack of equipment, instructors and information on the Coastal OTU syllabus delayed the start of training, and for a time the ground staff were employed in assembling Oxfords for the new transferred SFTSs. When it did start the first course was marred by a series of accidents, and it was soon apparent that a considerably longer period of training was necessary. The short "conversion" courses were dropped and all pupils underwent the full 12 weeks OTU course. The responsibility for ferry training was transferred to the newly-formed Ferry Command, and a small ferry training unit was opened at Dorval to prepare ex-OTU crews for the Atlantic

(5)

crossing.

(1) AM File S.69934

(2) ETS 166/41

(3) AM File S.69934

(4) AM File S.74134

(5) See Chapter 20

Formation of Additional OTUs in Canada

Once the policy that operational training units could not be located away from the operational areas had been modified, Canada was quick to press for the formation of further units. Arrangements were being made to establish more RAF basic training schools in Canada - nominally 'transferred' schools although the word had now lost its original meaning - and in May 1941 it was agreed that three more OTUs training on Hampdens, Hurricanes and Bostons respectively should be established. These were still exceptions to the general rule of establishing OTUs only in operational areas, and their formation was approved on the grounds that they were near the production areas - Hurricanes and Hampdens were being manufactured in Canada while (1) Bostons were supplied from the USA. It was also decided to form a second GR school in Canada (No 32 GRS at Charlottetown).

As a result of these decisions the planned operational training organisation in Canada had grown by the middle of 1941 to two GR schools and five OTUs. The Hudson OTU was renumbered from No 80 to No 31 OTU, the Beaufort/ (2) Hampden OTU (formerly the TTS) was formed as No. 32. The new units were to form as No 33 (Hurricane), No 34 (Hampden) and No 35 (Boston) OTUs. A few months later, when the prospect of increased allocation of American aircraft to the RAF seemed imminent, it was arranged to save shipping space and ferry work by equipping No 34 OTU with Venturas instead of Hampdens and utilising the latter to replace the Beauforts at No 31 OTU. It was also decided to equip No 35 OTU with Liberators instead of Bostons. In December 1941 the programme was increased to six OTUs, when it was decided to form a second Hudson OTU in Canada (No 36 - at Greenwood). These were essentially long term plans, however, and by the end of the year only two schools had opened (3) and only one of these had actually started training.

(1) ETS 198/41

(2) This was to bring the OTUs into line with other RAF units in Canada, which were numbered from 31 onwards to distinguish them from RCAF units.

(3) ETS 410/41

Effects of Japan's Entry into the War

Japan's entry into the war, with the consequent extension of the war into former non-operational areas, had a two-fold effect on the shape of the operational training organisation. Firstly, it meant that the Southern Pacific embracing Australia and New Zealand had been transformed into an operational area, and that these two Dominions would need their own operational training organisation, and secondly it led to a revision of the policy for the location of RAF OTUs. America's entry into the war meant that American forces would soon be operating in the United Kingdom, thus aggravating the problem of aerodrome congestion - a problem which had already caused some concern - and it also opened up the prospect of additional deliveries of American aircraft to the RAF with the consequent operational training and ferrying commitments. By locating OTUs in North America near the source of supply of both aircraft and trained aircrews airfield congestion at home would be relieved and the ferrying commitment reduced. Moreover, weather conditions there would be more favourable for training than in the United Kingdom - although this latter consideration was counterbalanced by the fact that it was desirable for crews to have some experience of flying in the (1) weather conditions of their operational area before starting their operations.

These factors led to a revision of policy, and in February 1942 it had been decided to proceed with plans for the establishment of more OTUs in North America. By June 1942 arrangements had been made to form two more OTUs in Canada: No 37 (Flying Boat) OTU at Shelburne and No 38 (Marauder) OTU at (2) Chatham, making eight in all; and 10 OTUs (five heavy bomber and five medium bomber) in the USA; together with a GR OTU in the Bahamas. Plans had also been made to increase the Canadian GR School capacity by the equivalent of two-and-a-half schools. Within a few weeks of these plans being made the Arnold/Towers/Portal agreement, drastically reducing the allocation of American aircraft to the RAF was signed. As a result plans for the formation of OTUs in America were abandoned, and only the GR OTU at Nassau in the (3) Bahamas was formed, while in Canada plans for two of the eight OTUs to be formed were temporarily suspended.

(1) ERP 169 dated 17 February 1942

(2) AM File S.78773

(3) See Chapter 19

While these various developments were taking place, a revised EATS agreement relating to training in Canada was signed. One of the clauses in the new agreement of 6 June 1942 provided that all RAF units in Canada should be unified with the EATS schools to form the British Commonwealth Air Training Plan which was to be operated under RCAF control. Existing RAF units would retain their identity but all future units, including those already planned, would form as RCAF units. So far as the OTUs were concerned - and these were brought into the new BCATP even though the original EATS agreement had been confined to basic training schools - the new agreement meant that those already formed (Nos 31, 32, 34 and 36 OTUs - the last two forming on 1 June 1942 and 13 April 1942 respectively) would retain their identity, while those planned before June but not yet formed (Nos 33, 35, 37 and 38) would open as Nos 1, 2, 3 and 4 OTUs respectively. A further outcome of the new agreement was the decision that part of the output of the OTUs in Canada should be utilised to back the 49 Canadian Home Defence squadrons. This chiefly
 (1)
 affected the fighter, medium bomber and flying boat OTUs.

The expansion of the GR training capacity by the equivalent of two-and-a-half schools (each of 192 pupil capacity) was to be achieved by forming a new school (No 1 GRS) with a total capacity of 480 pupils. This would bring the total capacity up to the equivalent of four-and-a-half schools. Only one school (No 31 GRS at Charlottetown) was actually in existence. The second school (No 32 GRS) planned some months earlier had not yet been opened and it was now decided that No 31 GRS should be doubled in size (to 384 pupils) in lieu of opening No 32 GRS. These two schools (training a total of 864 pupils) would also supply Canada's Home Defence needs as well as the RAF. Their output proceeded either to one of the two Hudson (GR) OTUs (Nos 31 and 36), the Hampden (TB) OTU (No 32) or, after November 1942, No 3 Flying Boat OTU or
 (2)
 No 111 (Liberator (GR) OTU in the Bahamas.

When, less than three weeks after the Canadian agreement had been drawn up the ATP agreement was signed, the formation of two of these four OTUs was postponed, leaving only Nos 1 and 3 OTUs scheduled for formation. No 1 opened at Saguenay on 20 July 1942 as a day fighter unit equipped with Hurricanes,

(1) AM File S.78773

(2) AM File S.64371

and No 3 (Flying Boat) OTU formed at Patricia Bay on 9 November 1942 and took over the duties and facilities of No 13 Operational Training Squadron, RCAF
 (1)
 which formerly carried out flying boat conversion for the RCAF. Arrangements for the 250 per cent expansion of the GR school capacity were also suspended although No 1 GRS was formed at Summerside on 6 July 1942, training 288 pupils instead of the 480 originally planned. In 1943 however both units were considerably expanded; No 31 GRS training a total of 552 pupils (408 pilots and 144 navigators/wireless) and No 1 GRS training 576 pupils (360 pilots and 216 navigators/bomber).

Operational Training in Australia

In the S.W. Pacific both Australia and New Zealand took immediate steps to build up their home defence forces. The number of operational squadrons was to be more than doubled, and in both Dominions operational training organisations were established to supply trained crews for the front line squadrons. Originally Australia, New Zealand, India and the Far East were considered as one theatre as the problems of supply, both of aircraft and aircrew was largely the same and it was hoped to form six OTUs to serve the whole area, two in India and the rest in Australia, but after Malaya and Burma had been lost to the Japanese the S.W. Pacific and S.E. Asia areas fell
 (2)
 into two separate theatres of war. Consequently, the OTUs in Australia and New Zealand were established to train only personnel destined for operations in the Pacific area. Australian and New Zealand aircrews operating with the RAF in Europe, the Middle East and South East Asia would continue to be trained either in RAF OTUs in those areas or in Canada. Because the RAF
 (3)
 was not involved in operations in the S.W. Pacific area to any great extent, a detailed history of the Australasian operational training organisation is not strictly appropriate to this narrative, but since it is a natural sequence to the basic training organisations in that part of the world, a brief summary of its development is included in this chapter.

(1) ETS 510/42 and 559/42

(2) ERP 169 and 170 of 17 February 1942

(3) All personnel for those RAF fighter and transport units that operated in Australia were trained in the UK.

In Australia it was decided, in March 1942, to expand the size of the RAAF at home and in the S.W. Pacific from 32 to 73 squadrons, and a programme for the development of six OTUs to back this force was drawn up:-

No of OTUs	No of Aircraft	To Support - No of Squadrons
1	75	12 Day Fighter 5 Army Co-operation
1½	72	12 Long Range Fighter
1	55	4 Heavy Bomber
1	70	7 Torpedo Bomber
½	27	4 Medium Bomber
½	24	12 Dive Bomber
½	20	7 Flying Boat

No operational training arrangements were made for the 10 transport squadrons due to be formed; it was hoped that the squadrons themselves would be able to provide the necessary conversion training. When the decision to establish these OTUs was taken there was only one such unit in existence in Australia - a small unit improvised to provide reinforcements for the Far East. Prior to that date operational training for Australian Home Defence squadrons and for the RAAF squadrons in the Far East was given to graduates from the SFTSs by the squadrons themselves. In November 1941 when the possibility of war breaking out in the Far East was foreseen investigations were started with the idea of forming a small, if rather sketchy OTU to back RAAF squadrons in the Far East. When the Japanese war began that unit was formed at Nowra and the training of Beaufort crews commenced. Pupils were drawn from EATS schools in Australia, although at first some RAF personnel from the Far East, who had had no operational training were sent there.

By 1 May 1943 all the six projected OTUs had been formed. Their functions had been changed slightly since the original plan had been drawn up and the units were considerably smaller than had been visualised. This was due to the fact that aircraft deliveries fell below expectations, so far short in fact that the expansion programme had to be reduced from 73 to 51 (1) squadrons.

(1) Report on the Australian Air War Effort, May 1943

The six OTUs were located as follows:-

OTU No	Location	Type of Training	Aircraft	Pupil Capacity
1	East Sale	General Reconnaissance	Hudson/Ventura	480
2	Mildura	Day-Fighter	Spitfire	155
3	Rathmines	Flying Boat A/SR	Catalina) Walrus)	184
4	Williamstown	Dive-Bomber	Vengeance	90
5	Wagga	LR Fighter	Beaufighter	48
6	Nowra	Torpedo-Bomber	Beaufort	96

Later in the year the composition of the 53 squadron force was revised, and heavy bomber squadrons were to be formed in place of the torpedo bomber and dive bomber squadrons. The OTU organisation was accordingly reshuffled, and by August 1944 Nos 4 and 6 OTUs had been disbanded, and Nos 7 and 8 formed. No 7, located at Tocumwal, undertook the training of Liberator heavy bomber crews, training 648 pupils at a time, and No 8 at Narromine, was an additional school for the training of day fighter pilots. The formation of the latter, which was equipped with Kittyhawks and Boomerangs and trained 71 pilots at a time, made it possible to reduce the capacity of No 2 OTU to 81 pilots. The other remaining OTUs had all been slightly expanded, and No 5 had moved to Williamstown when No 4 OTU disbanded, where it undertook the training of Mosquito photographic and reconnaissance crews as well as long range fighters. These six units continued to function until the end of the war.

In addition to the operational training units there were two other RAAF units which provided post-graduate instruction and could be regarded as part of the operational training organisation. First there was the General Reconnaissance School which was formed on 29 April 1940, at Launceston. Later it moved to Cressy and shortly afterwards it moved yet again, to Bairnsdale. Under the expansion plans of 1942, the school was to be reorganised to train 90 pilots and 160 observers at a time and its aircraft establishment was increased to 120 Ansons. The other unit was the Central

(1) Report on the Australian Air War Effort, August 1945

Gunnery School at Mildura (it subsequently moved to Cressy) which trained approximately 18 wireless operators and air gunners at a time as gunnery leaders.

Operational Training in New Zealand

In New Zealand a parallel development had taken place. The number of squadrons in the S.W. Pacific and New Zealand was increased to 25, and a GR School and two OTUs formed within a few months of Japan's entry into the war. The GR School at Blenheim was equipped with nine Oxfords and trained 20 pupils on a nine weeks course; No 1 (Bomber) OTU which was formed at Levin from a former operational training squadron, was equipped with Hudsons and Oxfords and trained 12 crews on an eight weeks course; and the fighter OTU (similarly formed from an operational training squadron) which was located at Ohakea and designated No 2, was equipped with Harvards and trained 12 pilots at a time on a four weeks course. Later, as more aircraft became available, these units were re-equipped with operational types. In 1944 these three schools were joined by three more - Nos 3 and 4 OTUs located at Lauthala Bay and Ardmore respectively, and a gunnery training school at Ohakea. No 3 OTU trained flying boat crews; six Catalinas were used to provide eight crews at a time with instruction on courses lasting 12 weeks. No 4 OTU which later moved to Levin supplemented No 2 OTU; it provided fighter operational training for 30 pilots at a time on a six weeks course, using 10 Harvards and five Vincents. The Gunnery Training School functioned as an OTU for courses of 38 air gunners and 12 navigators destined for bomber squadrons. It was equipped with a miscellany of aircraft including Oxfords, Hudsons, Harvards and Vincents. In 1945 a further OTU (No 5) was formed at Ohakea to provide operational training for Transport crews.

Operational Training in South Africa

Thus, by 1942, the three Dominion partners in the Empire Air Training Scheme had all widened their training facilities to cover operational training. The other Dominion operating a large scale basic training organisation, was not so directly concerned with the Pacific War, and Japan's entry did not serve as

(1) ETS 449/42 and Reports on the Australian Air War Effort, August 1944 and August 1945

(2) RNZAF Organisation Memoranda No 20 dated 31 July 1942

an impetus for the growth of a South African operational training organisation. The Union continued to provide GR courses for RAF and SAAF personnel trained in Africa - as in Canada it had been expanded (in May 1942) to train 48 observers and 144 pilots - but other operational training was carried out either in the Middle East or in SAAF squadrons in the Union. For operational purposes S.Africa was related to the Middle East Command, and any development of OTU facilities was dependent on the situation in that Command.

By the middle of 1943 South Africa had started operational training for the RAF, in order to relieve the pressure on the Middle East OTUs, and although this training was theoretically provided in utilising South Africa's home defence squadrons, it was tending to re-cast the squadrons on the lines of OTUs. In July 1943, in fact, two small units (No 11 (Fighter) OTU at Zwartkop and No 29 (GR) OTU at Nigel) were established and although neither was adequately equipped South Africa was anxious to expand them to give greater assistance to the RAF in the Middle East. If established and maintained effectively they could, South Africa insisted, by continuing to fulfill a dual role of defence as well as training, provide all OTU training for SAAF fighter pilots and GR crews needed in both the Union and the Middle East.

The following month, when the new Joint Air Training Scheme Agreement, covering all flying training in South Africa, was signed, the existence of the two OTUs was officially recognised, and they were brought under the terms of the new agreement. For the purposes of the agreement it was laid down that the maximum conceivable requirement was for one fighter OTU training 108 pilots and one GR OTU with a training capacity for 160 crews. This did not signify that the existing facilities would necessarily be expanded; it simply meant that while they were directly supporting the RAF they were a United Kingdom responsibility and any aircraft required would have to be supplied by the British Government.

With Italy's capitulation the strength of the Middle East forces was likely to be reduced in the near future and there was therefore little justification for departing from the general rule of concentrating operational training in the operational areas. Nevertheless, there were advantages in expanding the fighter OTU (which at that time represented roughly one half-sized RAF OTU) since pupils from S African schools could go straight to the

OTU without transit delays. It would also permit an equivalent saving in the Middle East OTU capacity. Accordingly, in February 1944 No 11 OTU which had been training 54 pilots at a time on a six weeks course using 38 Kittyhawks and 15 Masters, was moved to Waterkloof, expanded to train 54 pilots every three weeks on a nine weeks course and re-equipped with 75 Hurricanes. The GR OTU was not extended to train RAF personnel. Heavy building costs and crewing difficulties rendered this step impracticable and the unit continued to train only for SAAF Home Defence requirements, using eight Venturas and four Oxfords taking 30 crews at a time on a 10 weeks course. Shortage of aircraft prevented the efficient operation of the unit, and it did little more than provide conversion training on Venturas. Even that commitment did not continue for very long and the unit was finally disbanded on 21 June 1944. Operational training for South Africa's four GR squadrons (three of which were operating in the Mediterranean theatre) was provided by No 75 OTU in the Middle East.

Towards the end of 1944, when plans for the reduction of the basic training organisation in South Africa were being considered, it was decided that the RAF would not require post-graduate training facilities in the Union after the end of the war in Europe. The fighter OTU would still be required to meet SAAF needs and, although RAF intakes ceased in November 1944 the unit continued to operate although its capacity was reduced by 50 per cent and its course length increased from nine weeks to 12. After the German war this unit was no longer required and it was disbanded on 4 July 1945. SAAF GR school requirements did not justify the continued use of the GR School and intakes were therefore ceased in April and the School was disbanded on 4 July 1945. A small GR flight was established at Saldanha Bay on 30 April 1945 to meet SAAF needs with a training capacity of 24 pupils. It was intended eventually to combine this flight with a school training navigators and air gunners forming a composite GR observer and armament school, but these plans collapsed with the end of the war, and the flight was disbanded in August 1945.

(1) AM File S.97416 and SD 155

(2) ETS 774/45

(3) ETS 813/45

Thus, OTU training for the RAF in the Dominions was in reality confined to Canada with Australia and New Zealand training only for their own local needs and with S Africa assisting to a limited extent in the Middle East.

Difficulties of OTU training in Canada

In Canada a special operational training group (No 12) was formed at Halifax in September 1942 to administer all operational training in the Dominion - amounting at that time to five OTUs (increased to six two months later with the formation of No 3 OTU) and two GR Schools. Experience soon proved that it was impossible for the Group to administer efficiently the two units located at Patricia Bay on the western seaboard and the units concerned (Nos 3 and 32 OTUs) were placed under the control of the Western Air Command in June 1943, leaving No 12 Group to administer the remaining four OTUs and two GR Schools, all of which were located in Eastern Canada.

Administration was not the only problem confronting the OTUs in Canada. For many months to come shortages of aircraft, equipment and experienced staff (particularly ex-operational instructors) were to severely handicap all operational training at all units. Lack of accommodation and very adverse weather during the winter of 1942-3 combined to worsen the already bad situation. Aircraft and equipment shortages were slowly made good as local production increased, and, as it was impossible to supply instructors from the United Kingdom, the staff shortage had to be overcome by screening selected crews off courses at Nos 34 and 36 OTUs and employing them as instructors.

The lack of aircraft and spares, with the consequential low serviceability rate, was particularly bad at the two Hudson OTUs (Nos 31 at Debert and 36 at Greenwood), where production difficulties in the USA and the over-riding priority of operational squadrons delayed the delivery of Hudsons to these units. At both schools the serviceability rate was rarely over 50 per cent and the situation never really improved until the latter unit was re-equipped with Mosquitos thus enabling No 31 to be built up with the aircraft so released. In spite of these difficulties both units managed to achieve nearly three-quarters of their planned output of 12 crews (comprising a pilot, navigator/bomber and

(1) ETS 541/42 and 578/43

(2) ETS 623/43

(1)

two wireless operators/air gunner) every two weeks on a 12 weeks course. The position at the Hampden and Ventura OTUs (Nos 32 and 34 respectively) was little better. No 32 at Patricia Bay, carrying out torpedo bomber training was, handicapped for some time because many of its Hampdens were not equipped to drop torpedoes, and No 34 at Penfield Ridge suffered from a lack of drogue towing gear in its initial stages. The latter unit, established with 36 Venturas and 18 Mitchells, which opened at Penfield Ridge on 1 June 1942, had originally been planned to open at Yarmouth but shortage of suitable accommodation there caused its transfer to Penfield Ridge which had once been the projected location of No 35 (later No 2) OTU. Hangar and domestic accommodation were also inadequate at Penfield Ridge, though to a lesser extent than Yarmouth, and for a time part of the unit was detached at Yarmouth, while the main part operated at Penfield Ridge. Later, when Yarmouth was selected as the home of the Naval Air Gunners School the detachment moved back to the parent station. Six months after the unit started training, the syllabus was revised. Pilots and wireless operators/air gunner continued to undergo a 12 weeks course but 'straight' air gunners had their courses reduced by half, joining the course at the beginning of the seventh week, while the course length for navigators/bomber was increased from eight weeks to ten so that they arrived (2) at the beginning of the third instead of the fifth week.

No 1 OTU Saguenay, was also operating below full capacity because of the shortage of Hurricanes. No 3 OTU on the other hand, which shared station with No 32 at Patricia Bay, was hardest hit by the instructor shortage and it was many months before its establishment was filled. It was formed using 20 Canadian built Stranraers but it was intended to re-equip it with Canso's (Canadian built Catalinas) as soon as possible. It trained crews on a 12 weeks course, with intakes of 12 crews every four weeks, giving a total population of 324 trainees (there were two pilots, a navigator/bomber, two wireless operators/air gunner, one flight engineer, two flight mechanics and a wireless operator mechanic to every crew). The flight engineers, flight mechanics and wireless operator mechanics were recruited from qualified ground tradesmen (3)

(1) ETS 569/43

(2) ETS 541/42

(3) ETS 559/42

and sent to No 9 B & GS for their air gunnery training as part of the normal air gunners intake. The first of these trainees were sent there on 23 November 1942.

Only the GR schools had their full complement of aircraft and instructors, but even these units had their difficulties - in the form of complaints from the GR OTUs that the standard of navigators/bomber training in DR navigation over the sea was inadequate. As a result the course lengths for this personnel was increased from five to six weeks in December 1942 at No 31 GR School. It was not possible to make a similar extension at No 1 GRS until four months later owing to the need to maintain maximum output to meet OTU requirements.

Re-equipment of the GR OTU

By the spring of 1943 the instructor shortage had been overcome, although difficulties over the supply of aircraft prevailed throughout the year at most of the OTUs. It had originally been intended to re-equip No 34 OTU entirely with Mitchells, but deliveries were subsequently cancelled and even those Mitchells at the unit had to be replaced with Venturas in March. These aircraft too, as well as ^dHudsons, were in short supply, especially after they went out of production in the United States, and in the summer of 1943 it was planned to replace all these aircraft with Mosquitos, Canadian built unarmed bombers and fighter bombers, supplemented by a few dual control aircraft supplied from the United Kingdom. When the possibility of carrying out Mosquito training in Canada was first considered (in the autumn of 1942) it was envisaged that this would involve the formation of an additional OTU and it was not until difficulties over the replacement of the Hudsons and Venturas arose that plans were made to convert the OTUs concerned to Mosquitos. ⁽¹⁾ No 36 OTU was actually re-equipped in July, but shortage of Mosquitos prevented the re-equipment of Nos 31 and 34 OTUs in 1943. ⁽²⁾ No 31 was not re-equipped until April 1944 by which time operational requirements had changed so that No. 34 OTU became redundant and was disbanded in May 1944.

The closure of No 34 OTU at Penfield Ridge brought to an end the story of a continuous struggle against heavy odds. Apart from accommodation difficulties the unit had never had the fortune to operate with its full complement of aircraft. When in March 1943 its Mitchells were withdrawn the unit had a

(1) AM File S.78773

(2) ETS 624/43

strength of 35 Venturas against an establishment of 54. Although the situation improved slightly later in the year it was never satisfactory and was always made worse by shortage of spare parts. Meanwhile, in the summer of 1943, plans were approved for the formation of a heavy bomber OTU at Buctouche equipped with Liberators and Mitchells. Due allowance was made for aircraft supply difficulties and the unit, to be numbered No 5 OTU was not scheduled (1) for formation until the beginning of the following year.

The projected formation of Nos 2 and 4 OTUs was still under consideration in the first half of 1943. No 2, which as No 35 OTU had originally been planned as a Boston OTU at Sydney (Patricia Bay), and later changed to a Liberator/Mitchell OTU at Penfield Ridge, was finally planned to open at Chatham (after plans for opening No 4 OTU there were finally scrapped) as a dive bomber OTU equipped with Bermudas. Shortage of aircraft had been the main cause of the numerous changes and the continued postponement of the opening date, but it was the failure of the Bermuda as a successful dive bomber which ultimately led to the abandonment of the school. No 4 OTU (formerly No 38) planned to open at Chatham as a Marauder OTU medium bomber OTU suffered a similar fate, and in this case too the limiting factor was the (2) familiar one of aircraft shortages.

Similar difficulties had prevented the expansion of No 3 Flying Boat OTU into a full sized unit. It continued to be handicapped by lack of experienced staff and with the anti-submarine warfare at its height there was little likelihood of any relief being forthcoming for some considerable time. For that reason, and because further flying boats were similarly at a premium, plans for the development of Shelburne as a home for the expanded OTU were abandoned. In any case weather conditions there were bad, and it was likely to be icebound for four months out of the year. Consequently the unit (3) remained at Patricia Bay and continued to operate as a half-sized unit.

(1) ETS 581/43

(2) ETS 624/43

(3) ETS 589/43

Introduction of Transport and Heavy Bomber Training

Later in the year, No 32 OTU became surplus to requirements as a torpedo bomber OTU and plans were made to convert it into a transport training unit equipped with ~~B~~^{ee}chcraft and Dakotas. This would necessitate the move of the unit from Patricia Bay because of inadequate facilities there, and a new site at Comox was selected. It was hoped to complete the transformation of the unit by the end of the year, but although the new aircraft arrived on schedule, building delays prevented the move of the unit until May 1944. When the unit finally moved it was agreed that it should be re-formed as a RCAF unit and it officially became No 6 OTU on 1 June 1944. The delays at Comox did not prevent the reorganisation of the OTU and transport training was begun at Patricia Bay in December 1943, although the unit had to operate considerably below its planned intakes of 32 crews (comprising a pilot, navigator, wireless operator and flight engineer) every four weeks on courses lasting 12 weeks, (1) and it did not reach its full capacity until the summer of 1944.

The conversion of No 32 OTU to the transport role made it possible to disband the small training school at North Bay which had been set up by Ferry Command in 1942 (and later taken over by Transport Command) to train graduates from the Canadian SFTSs as ferry crews. This unit had been operating as an unofficial OTU - if it had been officially recognised as an OTU the Canadian authorities would have taken it over - but once No 32 OTU started producing transport crews North Bay was converted into a ferry training unit to provide (2) ferry training facilities for the output from the Canadian OTU.

Accommodation difficulties had also delayed the formation of No 5 (Heavy Bomber) OTU until 1 April 1944. Buctouche had been ruled out as a suitable site and a new airfield at Boundary Bay was constructed to accommodate the unit. No sooner had training started - with intakes of 23 crews every four weeks on a 12 weeks course - than a request was received from the Air Ministry asking that the crew composition should be changed from six personnel to eleven as the crews would be employed in long range heavy bomber squadrons in South East Asia and so avoid the need to form additional training units in that area. This modification entailed a heavy training commitment, especially

(1) ETS 693/43 and 739/44

(2) See Chapter 20

(1)

as the unit was already functioning as a combined OTU and conversion unit. The aircraft establishment had to be considerably increased and the course length extended to 14 weeks. Part of the unit had to be detached at Abbotsford (necessitating the closure of No 24 EFTS) and the last six weeks of the course had to be carried out there. The new eleven-man crew courses were (2) started with the course beginning on 3 July 1944.

Courses at No 3 (Flying Boat) OTU also underwent several modifications. In October 1943, to avoid duplication of training, it was arranged that pilots should be posted direct from the GR school at the end of the eighth week of the OTU course; after completing four weeks training as second pilots they served for three months as 2nd pilots in Canadian Home Defence squadrons (3) before returning to the OTU to undergo the full 12 weeks captain's course. Six months later the training sequence was again revised and 2nd pilots joined the course at the end of the 2nd week and so underwent 10 weeks training, during which time they were fully converted to type. In addition it was arranged that uncrewed 2nd pilots, eight at a time, straight from the GR School would receive a special six weeks conversion training course, and nine extra aircraft had to be established to carry out this additional commitment. These personnel would replace pilots from Home Defence squadrons posted to the (4) OTU for 1st pilot courses. By April this OTU had been fully equipped with its full establishment of Cansa flying boats - all Stranraers having been removed - and, when two months later No 32 OTU moved from Patricia Bay to Comox (which incidentally enabled that unit to accept its full intake of 32 crews every four weeks for the first time) it was possible for intakes at No 3 (5) OTU to be increased from eight crews every four weeks to 12 crews.

Reduction of the Training Organisation

The decision taken at the end of 1943 to commence a reduction in the size of the basic training organisation in Canada had its repercussions on the operational training organisation. First to go was No 31 GR School, Charlottetown, which was closed on 18 February 1944. The closure of this school was actually planned when an increase in basic training facilities for

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- (1) All heavy bomber crews trained in the UK were trained at a medium OTU followed by a heavy conversion unit
 - (2) ETS 743/44, 734/44 and 725/44
 - (3) ETS 657/43
 - (4) ETS 725/44
 - (5) ETS 735/44

navigators was visualised to allow the formation of No 2 ANS at Charlottetown, and it was agreed that no replacement for the GR school was necessary. Nevertheless, when the school closed a review of No 1 GRS, Summerside, became necessary in order to maintain a balanced output. Formerly No 31 GRS had been training 408 pilots and 144 navigators/wireless, while No 1 GRS had been training 360 pilots and 216 navigators/bomber (the pilots undergoing a 12 weeks course and navigators six). After February, although no increase in capacity was involved, courses at No 1 GRS comprised 408 pilots, 96 navigators/bomber (1) and 72 navigators/wireless. This was followed by a review of the future operational training requirements in Canada. A reduction in the basic training facilities was agreed and a parallel reduction in the post-graduate school was drawn up. In March 1944 the operational training organisation existing or planned amounted to seven OTUs training 2,067 pupils and one GR School training 516 pupils:-

OTU No	Location	Type of Aircraft	No of Crews	Crew Complement	No of Pupils
1	Saguenay	Single Seat Fighter	-	-	135
3	Patricia Bay	Flying Boat	36	9	324
5	Boundary Bay	Heavy Bomber	69	8	552
31	Debert	Long Range Fighter	96	2	192
32	Patricia Bay	Medium Range Transport	96	3	288
34	Penfield Ridge	Medium Bomber	96	4	384
36	Greenwood	Night Fighter	96	2	192
No 1 GRS	Summerside	-	-	-	516

It was planned ultimately to reduce this organisation to four OTUs, training 1,224 pupils, comprising one heavy bomber, one transport and two night fighter/LR fighter OTUs, together with one GR School training 456 pupils. Two of the three redundant units were not planned to cease training until mid-1945, and only No 34 OTU at Penfield Ridge was to be disbanded immediately. This closure did not mark the end of training at Penfield Ridge. After 19 May 1944, when No 34 OTU was formally closed, half of the school's facilities were utilised to form a Ventura training squadron, training replacements for the five RCAF Ventura squadrons in the Dominion and the other half was formed into

(1) ETS 675/44 and 703/44

a transport conversion squadron, training crews for transport squadrons in
 (1) Canada. It was also arranged that all the RAF OTUs in Canada should be taken over by the RCAF in order that RAF personnel employed in Canada could be repatriated and so alleviate the acute manpower shortage in the United Kingdom. Accordingly, a month after No 32 OTU had been converted into No 6 OTU, Nos 31
 (2) and 36 OTUs at Debert and Greenwood became Nos 7 and 8 OTUs respectively. By that time (July 1944) in spite of a shortage of aircraft, both units had been re-equipped with Mosquitos and were operating as long range fighter intruder training units. No 8 OTU (formerly No 36), in fact, had been operating with Mosquitos for over a year, but even so it had not reached its full aircraft establishment. When, on 8 May 1944, No 7 OTU (then No 31) converted to Mosquito training an interim establishment of 43 unarmed bombers (Mosquito BXXs) and 13 dual trainers (Mosquito T IIIIs) was laid down for both units, and it was planned to expand them to 41 unarmed bombers, 24 fighter bombers and 14 duals as more aircraft became available. The actual strength of the two units, however, in May 1944, was ten unarmed bombers short of even
 (3) the interim establishment. With that establishment it was impossible to carry out gunnery training in Canada, and the syllabus therefore had to be reduced from 12 weeks to eight and capacities reduced to 48 crews (a pilot and a navigator/wireless) instead of the 60 originally planned. Gunnery training
 (4) had to be provided in the United Kingdom in No 13 OTU.

Final Reduction of Training in Canada

Later in 1944, after the decision had been taken to bring the BCATP in Canada to a close on 31 March 1945, further steps were taken to reduce the size of the operational training organisation in Canada. Requirements for Stage 2 (the Japanese war) were drawn up and it was decided that after the defeat of Germany only two OTUs (one heavy bomber and one night fighter) would be required in Canada, besides a small GR School training a maximum of 48 pupils. All other units could be closed on the defeat of Germany.

(1) ETS 734/44 and 758/44

(2) ETS 739/44

(3) ETS 734/44 and 718/44

(4) ETS 685/44 and 769/44

Meanwhile, steps were being taken to implement the decision taken earlier in the year. No 1 (Fighter) OTU had already been reduced in size in January 1944 (from 135 to 90 pilots) and the course length extended from nine weeks to 12 to retard output. Later in the year intakes were temporarily increased to the former level, but in August the unit was curtailed to supplying only those pilots required for Canada's home defence squadrons. A few months later all training ceased and the unit disbanded on 31 January 1945. ⁽¹⁾

In July 1944 the capacity of No 1 GRS was reduced to 288 pilots, 96 navigators/bomber and 24 navigators/wireless. At the same time the course length for pilots was reduced from 12 weeks to nine, although the navigators remained unchanged at six weeks. ⁽²⁾ Later in the year intake requirements were so reduced that it was uneconomical for the School to continue as a separate unit. Accordingly, No 1 GRS was closed on 3 February 1945 and replaced by No 1 Reconnaissance and Navigation School, which undertook the basic training of navigators as well as GR training. The GR part of the School was no longer required to train personnel for service outside Canada and accordingly no further RAF pupils were sent there for training. It had a maximum capacity for training 288 pilots and navigators/bombers to meet GR requirements on the North American continent. ⁽³⁾

When the BCATP agreement expired in March 1945 the five existing OTUs concentrated largely on the training of RCAF crews. A few RAF crews passed through the unit after that date, but with the end of the war in Europe all RAF training in Canada came to an end. No 6 OTU closed in June, and No 5 OTU trained Canadian heavy bomber crews for the Canadian VLR force to be sent to the Pacific. The remaining units were reduced to training for Canadian home defence squadrons and were closed after the summer of 1945.

Plans to form OTUs in America

All attempts to obtain operational training facilities in America for British crews for American heavy and medium bomber aircraft were crowned with failure. The first request, made in July 1941, for OTU facilities for Fortress, Liberator, Mitchell and Marauder aircraft was dependent upon the

(1) ETS 758/44 and 791/44

(2) ETS 743/44

(3) ETS 809/45

(1)

aircraft for these units being supplied by the United States. The American heavy bomber production, however, fell below expectations and the US Air Corps could only supply OTU training on condition that they withheld the necessary aircraft from their deliveries to the RAF - an unacceptable solution since the diversion of deliveries to the United Kingdom would start a vicious circle and would, in itself, obviate the need for crews for them. In order to establish a nucleus organisation for OTU training in America, however, it was proposed, with the concurrence of the Canadian authorities, to transfer the formation of a Boston OTU from Canada to America. The diversion of Boston aircraft to the Middle East and Russia in October 1941 prevented this scheme from materialising and the whole question of OTU facilities in America was dropped for the time being.

(2)

With America's entry into the war, the position changed, and it was hoped to establish OTUs in America even though it meant the retention of aircraft off the British allocations. The new policy of carrying out most of the operational training of heavy bomber crews on medium bombers and converting them to heavy bombers towards the end of the course improved the position providing suitable medium bomber lead-up types could be found. In January 1942, therefore, America was again approached with the proposal that crews for all American heavy and medium bomber aircraft allocated to the RAF should be trained in North America so that the aircraft could then be ferried to the United Kingdom by RAF crews. To back the force projected from the promised deliveries of American aircraft, it was suggested that eleven OTUs should be located in the USA (as well as three others, equipped with American medium bombers in Canada). They were to be Royal Air Force units identical to those in the United Kingdom, staffed by British personnel and supplemented by as many American personnel as the USAAF was willing to supply and equipped with American aircraft off British allocations. The staff was estimated to amount to roughly 17,000 personnel and approximately 730 aircraft would have to be retained in America for this commitment. The entire scheme, apart from the pay and transportation costs of the RAF personnel, was to be financed by Lease-Lend.

(1) ETS 316(41). (AHB/IIIC/1)

(2) AM File S.73954

The Americans proved most co-operative. They realised the need for an efficient operational training organisation and offered to reduce the British manpower commitment by about 6,000 by supplying all the personnel required except instructors, trained ground crews and essential RAF supervisory and administrative staffs.

By May 1942 aerodromes had been selected for all the units. Four of the heavy bomber and all five medium bomber OTUs were to be located in America, with the fifth heavy bomber OTU in Cuba, but the General Reconnaissance OTU had to be put in the Bahamas owing to the American policy of barring all training units from coastal areas. Arrangements were made to open the first three units in August 1942 and to have the remainder in operation before the end of the year. A summary of the projected units is shown at Appendix 91. The pilots for the first courses were to be supplied from the 'Arnold' scheme and the USAAC arranged to send 60 per cent of the output from the basic schools (420 every $4\frac{1}{2}$ weeks) to twin-engined advanced schools at Albany and Valoosta. The first entrants into these schools started training on 2 June 1942 and were due to complete their training nine weeks later, in time to start OTU training. The remaining 40 per cent of the Arnold pupils continued to go to the single-engined advanced schools at Selma and Dothan (Montgomery was no longer required).

In anticipation of the OTU outputs and to provide earlier experience on the new types of American bombers (Liberators, Fortresses, Mitchells and Marauders) four RAF ex-operational crews were sent to America in the spring of 1942. One crew was trained on each type of aircraft at squadrons of the USAAC. In May twelve pupils from the BFTS output were sent on a similar specialist course at the US Naval Air Station at Miami, where they were given a three weeks dive bomber course. Reciprocal arrangements were made to give US Army and Navy personnel similar specialist courses at RAF stations in England.

On 21 June, however, only a week before the advance parties for the first units were due to sail the Arnold/Towers/Portal agreement was signed which drastically reduced the allocation of American aircraft to the RAF and the

(1) AM File S.70902

Royal Air Force was faced with the alternative of abandoning all the bomber OTUs in the United States and the three projected for Canada, or equipping them with British types of aircraft. A review of the whole American aircraft position was rapidly carried out, and in spite of the advantages of locating OTUs in America, it was decided that the idea was no longer a practicable one,
⁽¹⁾ especially as training requirements were now considerably reduced. Instead, OTUs to back squadrons equipped with American aircraft were to be formed in the Middle East and in Canada (although only two of the three formerly planned were now required). The only RAF crews to receive OTU training in America at
⁽²⁾ that time were two crews sent to Transport OTUs in October 1944.

The GR unit at Nassau in the Bahamas was established but did not commence training until December 1942 and it was changed from a Fortress to a Liberator OTU and was manned entirely by the Royal Air Force. It was also slightly smaller than originally visualised, training 13 crews every four weeks on a 12 weeks course, and equipped with nine Liberators, 23 Mitchells and four target towers. It supplied both Liberator and Fortress crews for Coastal Command, the latter receiving conversion training when they reached their
⁽³⁾ squadrons in the United Kingdom.

(1) AM File S.73954

(2) See Chapter 20

(3) The history of this unit will be found in Chapter 19

APPENDIX 85

BOMBER COMMAND TRAINING ORGANISATION - AUGUST 1945

Unit	No. of Units	Due for Disbandment
OTU (medium bomber)	5	1
OTU (light bomber)	2	-
HCU	8	2
(B) DTF	4	2
ACHU	6	-
BCIS (including ECDU, BAS & BCCNVTS)	1	-
No. 1323 (AGLT) Flt	1	1
No. 2 GSU	1	-
No. 4 Airscrew School	1	-
Total	29	6

APPENDIX 86

COASTAL COMMAND TRAINING ORGANISATION
AUGUST 1945

OTU No.	Location	Aircraft	Capacity - Crews
4	Alness	Sunderland	33
6	Silloth	Wellington Warwick	41
8	Benson	Spitfire Mosquito	29
111	Lossiemouth	Liberator	39
132	East Fortune	Mosquito Beaufighter	31
<u>HCU No.</u>			
1674	Longtown	Halifax	24
<u>FTU No.</u>			
302	Oban	Sunderland	-
309	Benson	Mosquito	-
<u>TTU No.</u>			
1	Turnberry	Beaufighter	12
<u>GRS No.</u>			
3	Squires Gate	-	202 (pupils)
Survival and Rescue Training Unit, Calshot Coastal Command FIS St. Angelo Coastal Command GIS East Fortune Joint Anti U-boat School, Maydown			

APPENDIX 87

TRANSPORT COMMAND TRAINING ORGANISATION AT THE END OF THE WAR

Group No.	TSCU No.	TCU No.	HTCU No.	LFS No.	BAT Flt No.	ACHU No.	Location
4	1333	-	-	-	-	-	Leicester East
	1333(GPU Flt)	-	-	-	-	-	Ibsley
	1336	-	-	-	-	-	Welford
	-	1380	-	-	-	-	Tilstock
	-	1381	-	-	-	-	Bramcote
	-	1382	-	-	-	-	Wymeswold
	-	1383	-	-	-	-	Crosby on Eden
	-	-	1332	-	-	-	Riccall
	-	-	1665	-	-	-	Marston Moor
	-	-	-	6	-	-	Ossington
	-	-	-	-	1510	-	Melbourne
	-	-	-	-	1513	-	Bramcote
	-	-	-	-	1516	-	Snaith
	-	-	-	-	1521	-	Wymeswold
	-	-	-	-	1527	-	Prestwick
	-	-	-	-	1528	-	Valley
	-	-	-	-	1529	-	St. Mawgan
	-	-	-	-	-	17	Snaith
	Support Training Party						Broadwell
38	ORTU TCDU No. 22 HGCU (Glider Pilot Training) No. 5 GTS (Glider Pilot Training)						Matching Netheravon Blakehill Farm Blakehill Farm
	No. 1 FU No. 11 FU No. 12 FU No. 15 FU						Pershore Talbenny Melton Mowbray Filton
45 (Canada)	No. 6 FU No. 7 FU No. 313 FTU Flying Boat Training Flight Flying Boat Training Flight						Dorval Nassau North Bay Boucherville Bermuda
	No. 1330 CU No. 2 FU No. 3 FU No. 4 FU No. 5 FU						Bilbeis - - - Heliopolis
229 (India)	No. 1331 CU No. 1334 (TS) CU No. 8 FU) No. 9 FU) Staging Posts No. 10 FU)						Risalpur Bawda Mauripur Allahabad Nagpur
	No. 302 FTU No. 309 FTU						

APPENDIX 88

OTUs IN THE MIDDLE EAST 1944/45

OTU No.	Function	Length of course - weeks	Monthly output	Location	Closed 1945
70	Light bomber	8	32 crews	Shandur	July
71	Fighter	9	72 pilots	Ismailia	June
73	Fighter	9	72 pilots	Fayid	Oct
74	Tac/Recce	8	24 pilots)	Petah Tiqva	July
	Photo Recce	6	8 pilots)		
75	GR	10	22 crews	Gianaclis	June
76	Night bomber	10	22 crews	Aqir	Aug
77	Night bomber	10	32 crews	Qastina	July
78	Medium range GR	8	18 crews	Ein Shemer	July
79	Long range fighter	10	24 crews	Nicosia	July

APPENDIX 89

OTUs IN THE MIDDLE EASTOUTPUT 1941-1945

OTU No.	Year	Months	Location	Output		Remarks
				Crews	Pilots	
70	1941	Feb-Aug Sept-Dec	Ismailia Nakuru	4 11	- -	- -
	1942	12	Nakuru	110	-	(estimated)
	1943	Jan-Jun Aug-Dec	Nakuru Shandur	89 75	- -	Moved in July
	1944	12	Shandur	343	-	-
	1945	Jan-Jun	Shandur	153	-	Training ceased June
71	1941	Jun-Dec (Oct)	Ismailia) Gordons Tree)	-	138	-
	1942	Jan-Apr May-Dec	Gordons Tree) Carthage)	-	264	-
	1943	Jan-May Jun-Dec	Carthage Ismailia	- -	183 168	(Plus 48 SAAF pilots (converted
	1944	12	Ismailia	-	787	Plus 116 SAAF pilots converted: course ceased Sept
	1945	Jan-May	Ismailia	-	310	Training ceased 20 May
72	1942	Jan-Mar Mar-Dec	Wadi Gazouza) Nanyuki)	136	-	Opened Nov 1941 for Blenheim and Boston Sqns (MB)
	1943	Jan-Apr	Nanyuki	83	-	Disbanded May 1943
73	1942	Jul-Aug Sept-Dec	Sheik Othman Sheik Othman	- -	17 40	Formed Nov 1941 (estimated)
	1943	Feb-Dec	Abu Sueir	-	370	-
	1944	Jan-Jun Jul-Dec	Abu Sueir Fayid	- -	405 312	- -
	1945	Jan-Sept	Fayid	-	442	Unit disbanded Oct
74	1941	Nov-Dec	Aqir	-	15	Formed Oct 1941
	1942	Jan-Nov Dec	Aqir and Rayak) Muquebila)	-	160	Moved 26 Nov
	1943	Jan-Sept Oct-Dec	Muquebila Petah Tiqva	- -	97 44	includes 8 for P/R
	1944	12	Petah Tiqva	-	368	includes F/R and P/R plus 15 SAAF pilots converted
	1945	Jan-Jun	Petah Tiqva	-	196	plus 43 SAAF pilots converted. Training ceased June

APPENDIX 89 CONTINUED

OTU No.	Year	Months	Location	Output		Remarks
				Crews	Pilots	
75	1943	Mar-Dec	Gianaclis	111	-	Arrived from UK 14 Dec 1942
	1944	12	Gianaclis	235	-	-
	1945	Jan-Mar Apr-Jun	Gianaclis) Shallufa)	36	-	Night armed reconnaissance Training ceased June
76	1943	Dec	Aqir	33	-	Opened Oct 1943
	1944	12	Aqir	245	-	-
	1945	Jan-Jul	Aqir	144	-	Training ceased 30 July 1945
77	1944	Feb-Dec	Qastina	219	-	Wellington and Liberator
	1945	Jan-Jun	Qastina	124	-	Training ceased 18 June 1945
78	1944	Feb-Dec	Ein Shemer	219	-	Opened Jan 1944. Included 41 crews trained in Leigh-Light.
	1945	Jan-Jun	Ein Shemer	130	-	including 50 crews Leigh-Light. Training ceased 28 June
79	1944	Jul-Dec	Nicosia	101	-	Opened Mar 1944
	1945	Jan-Jul	Nicosia	152	-	Training ceased 15 July

Authority. The tables of output were obtained by noting from the Operations Record Book of each unit the number of pilots or of crews posted away as each course ended.

The monthly diaries at No. 70 OTU during the whole year 1942 contained no statement of output nor of courses being posted. Therefore an estimate was based on the intakes that were recorded. In the case of No. 73 OTU during four months from September to December 1942 the item of output was ignored and later resumed when its move to Abu Sueir had been completed.

ORB IIM/D - N18, E,17, QI and others.

APPENDIX 90

SOUTH EAST ASIA TRAINING ORGANIZATION
15 AUGUST 1945

OTU No	RFU No	CU No	APC No	Location
151	-	-	-	Peshawar
-	3	-	-	Poona
-	6	-	-	Kolar
-	8	-	-	Yelahanka
-	9	-	-	Ranchi
-	-	1672	-	Yelahanka
-	-	1331	-	Risalpur
-	-	1334(TS)	-	Baroda
-	-	-	20	Ratmalana
-	-	-	21	Cholavarum
-	-	-	22	Armada Road
-	-	-	23	Dhubalia

ARC Poona
S of JSPT Bhopal
AMC Srinagar
ASTRS Calcutta
AFTU Armada Road

PROPOSED OTUs IN AMERICA - 1942

OTU No	LOCATION	OPENING DATE 1942	AIRCRAFT ESTABLISHMENT	COURSE LENGTH - WEEKS	INTAKE	CREW COMPOSITION	PUPIL CAPACITY	STAFF	
								RAF	USAAC
110 (Heavy Bomber)	Alamogordo New Mexico	8 August	16 Fortresses (B.17) 39 Venturas (B.34) 4 Target Towers	12	16 crews every 3 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners 1 Flt Eng	448	985	1,079
111 (General Reconnaissance)	Nassau Bahamas	15 August	21 Fortresses (B.17) 44 Venturas (B.34) 6 Target Towers	12	23 crews every 3 weeks	2 Pilots 1 Navigator/B 2 WOs/AG 1 Flt Eng 1 WOM	644	985	1,079
112 (Medium Bomber)	La Junta Colorado	8 August	54 Mitchells (B.25)	8	14 crews every 2 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners	336	985	1,079
113 (Medium Bomber)	Las Cruces New Mexico	12 September	54 Venturas (B.34) 4 Target Towers	8	14 crews every 2 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners	336	985	1,079
114 (Heavy Bomber)	Lourdsbourg New Mexico	19 September	16 Liberators (B.24) 39 Mitchells (B.25) 4 Target Towers	12	16 crews every 3 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG	448	985	1,079
115 (Medium Bomber)	Pratt Kansas	15 October	54 Marauders (B.26) 4 Target Towers	8	14 crews every 2 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners	336	985	1,079
116 (Heavy Bomber)	Liberal Kansas	15 October	16 Liberators (B.24) 39 Mitchells (B.25) 4 Target Towers	12	16 crews every 3 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners 1 Flt Eng	448	985	1,079
117 (Medium Bomber)	Garden City Kansas	1 October	54 Marauders (B.26) 4 Target Towers	8	14 crews every 2 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners	336	985	1,079
118 (Heavy Bomber)	Dodge City Kansas	15 October	16 Fortresses (B.17) 39 Venturas (B.34)	12	16 crews every 3 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners 1 Flt Eng	448	985	1,079
119 (Medium Bomber)	Wink Texas	12 November	27 Mitchells (B.25) 27 Venturas (B.34) 4 Target Towers	8	14 crews every 2 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners	336	985	1,079
120 (Heavy Bomber)	San Antonio Cuba	12 November	16 Liberators (B.24) 39 Mitchells (B.25) 4 Target Towers	12	16 crews every 3 weeks	1 Pilot 1 Navigator 1 Air Bomber 1 WO/AG 2 Air Gunners 1 Flt Eng	336	985	1,079

Total Aircraft requirements:-

Fortress (B.17)	-	53
Liberator (B.24)	-	48
Ventura (B.34)	-	193
Mitchell (B.25)	-	198
Marauder (B.26)	-	108