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THE ROYAL AIR FORCE MAGAZINE



Vol 19, No 6

**MARCH, 1965**

# OPERATION PONTIFEX

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"PONTIFEX" was the code name allocated to the 1964 overseas task for the Valiants and crews of No 543 Squadron, the RAF's photographic and radar reconnaissance unit. The need to keep maps up-to-date for military and civil uses is an ever present one in a changing world, and aerial survey, the first stage in the eventual production of maps, is a lengthy and expensive business. Since it received its Valiant aircraft in 1955, the squadron has carried out a number of overseas surveys, and it was in the nature of a continuation of the normal pattern for 543 to be ordered to send a detachment to Southern Rhodesia.

*(As this issue went to Press, it was announced that Valiant aircraft have been withdrawn from service because of a metal fatigue fault in the wing structure. The first of the V-bombers, the Valiant has a fine record of efficient operations over nine years of squadron service, and this is one of its "success stories".)*

The objective was the survey of the greater part of the Rhodesias and Bechuanaland. To fulfil the task the detachment had to obtain in 11 weeks 400,000 square miles of photographic cover, an area greater than the UK, France and Germany, with a modest force of three Valiants, four crews and 100 support personnel.

A survey detachment is no mean undertaking, involving not only aircraft, crews and servicing manpower, but specialist teams of photographic and survey liaison experts demanding facilities and working accommodation, not readily available at the average overseas base. The reconnaissance party which preceded this operation had negotiated the use of the Royal Rhodesian Air Force base at New Sarum, Salisbury, for domestic facilities, and the civil Salis-



Servicing efficiency for Operation Pontifex enabled 18 sorties to be mounted in six days from two aircraft. Here the ground crew are meeting a No 543 Squadron Valiant immediately on its arrival after completing a task sortie.

bury Airport for aircraft parking, technical and administrative accommodation. The civil airport provided the largest and most suitable airfield for mounting Valiant operations and is a modern joint-user base, operating a diversity of military and civil aircraft ranging from DC3s and Canberras to Comet IVs, Viscounts,

Boeing 707s and DC8s.

On 21st June, the main party of Operation Pontifex left RAF Wyton in two Britannias of Transport Command, bound for Salisbury. It was mid-summer day in these northern latitudes—and it was slightly wet. This was the inauspicious start to what was to prove the most extensive



Group Captain H. G. Slade, AFC, (centre) of the British Defence Liaison Staff at Salisbury, with Squadron Leader J. D. Clayton, the detachment commander, and Flying Officer B. Poppit, detachment technical officer. The British Defence Liaison Staff were responsible for negotiating the requirements of the detachment before its arrival.

and successful aerial survey ever undertaken by No 543 Squadron.

The Britannias duly arrived at Salisbury and the Valiants followed close behind. Some measure of the co-operation and support given by both the military and civil authorities at Salisbury can be gained from the fact that, within 24 hours of the arrival of the Valiants from UK, the first task sorties were flown. Acclimatising the detachment to their new home at 5000 feet was a lengthier process. The more elderly found walking a breath-taking experience and the Squadron's soccer team gasped its way to a first victory within days of arrival.

For those visiting this part of Africa for the first time, the most vivid impression was its vastness and emptiness, with mile after mile of stunted bush growth, interspersed with large tracts of Savannah grassland. During the planning of the operations it was appreciated that accurate flight-line navigation by visual means would be difficult over such featureless terrain, since the maps were totally inadequate for the purpose. Available mapping was the 1:1,000,000 World Aeronautical Chart which was incomplete and inaccurate. This fact of a map-maker's life was brought home to the crews early on, when it was discovered that the famous Kariba Dam was not marked. This dam, which members

of the detachment were able to visit later, on week-end recreational runs, was built in 1958 to provide the bulk of the hydro-electric power for the existing industries in the Rhodesias and sufficient power to attract new ones; it has created a lake covering an area of 6000 square miles.

Having rejected the existing mapping as a reference for the flying of accurate flight lines, the navigation teams turned to maintaining their correctly spaced and straight paths over the ground, by reference to a specially prepared mosaic of radar photography. This brought its own problems in the early days of the detachment. The results from the radar technique proved discouraging. In all but one of the first nine sorties large gaps were revealed in the new coverage when the prints were laid down by the survey team. This was attributed to the scale inaccuracies in the mosaic, combined with unacceptable errors in the smaller scales of the radar equipment.

#### New technique

After some head-scratching, the radar mosaics were discarded and a new technique was put into operation. The initial track in an area was flown using the doppler and GPI combination only. At the same time the radar operator selected easily identifiable responses and measured their displacement. On subsequent flight lines the GPI Mk 4 tracking was corrected by reference to these same responses to maintain the correct spacing. Using this system, single sorties were soon producing average claims in excess of 1000 miles of overlapping line photography.

Another problem encountered on the task during this period was a heavy discharge of static onto the film in the rear camera of the bomb-bay, and a consequent loss of cover-

age. Although the experts were not sure of the cause, it was found that the static could be reduced to acceptable proportions by careful control of the humidity and temperature in the film storage cans and the aircraft magazines.

#### Importance of Met

The daily routine for the job began to run smoothly—the early morning flight, the film processing and printing, the plotting of the prints, and, finally, the analysis of successful cover. This provided the basis for the afternoon planning of the following days' sorties along with a careful assessment of the meteorological situation, a most important factor in the success of photo reconnaissance operations.

Take-off times were so arranged that the aircraft arrived on task at first photographic light. Allowing for a final brief and the transit time, fortunately never more than an hour and a half on this operation, meant that the first crew was getting up around 0430 local time. In the first week, Rhodesia suffered from the coldest spell for many years with several degrees of frost each night and, like the citrus fruit farmers of the region, those early crews suffered too. Arrival at the aircraft coincided with the brief and spectacular transition from night to day in these latitudes and soon a Valiant was uttering its familiar scream as it climbed away to the task area, leaving its characteristic fuel trail in the early morning sky.

Then back and forth across the allotted area at 30,000 feet with the cameras busily clicking, taking advantage of the cloudless sky until empty film magazines forced a return to Salisbury and a slot in the busy traffic streams of the airport. Once again it was the turn of the techni-





Flight Lieutenant D. L. Crane, the squadron navigation leader, and Flying Officer B. Poppit (second from right), explaining some of the operational problems associated with a task of Pontifex size, to visiting officers from the Royal Rhodesian Army and Police.

cians, resplendent in their white overalls, who quickly robbed the aircraft of its full magazines which were rushed to the photo processing section, while the aircraft was prepared for the next sortie. At the end of each day, the heap of prints and the shaded area of claimed territory on the map were further increased.

With the initial problems solved, the claims converted to acceptable coverage became a very high proportion of the whole effort, and in four weeks some 46 per cent of the task was completed, as compared with only 18 per cent in the first fortnight. The optimists began to think of total completion of the job, a state of affairs which weather had prevented on all previous survey detachments. In the sixth week alone 21 per cent of the task was covered in an all-out effort on the difficult eastern areas, following a fortunate clearance of cloud prevailing in this region. Such an achievement was only made pos-

sible by a servicing organisation which not only kept the aircraft remarkably serviceable, but enabled 18 sorties to be mounted in six days from two aircraft. The groundcrew averaged 40 minutes for an aircraft turnaround. On one occasion an aircraft landed with a cracked window, and was turned round, refuelled and was airborne again within 70 minutes, with a new window fitted.

### Like clockwork

It was an outward sign of the technical efficiency that some 93 per cent of all sorties took off on time, the regularity of which was frequently commented on by the many visitors to the squadron, a feature of the detachment. It was of great encouragement to the detachment to see these visitors taking such a genuine interest in the work being carried out. The visitors included the Deputy Chief of Air Staff of the Royal Rhodesian Air Force, the General

Officer Commanding the Royal Rhodesian Army, and Air Officer Commanding Central Reconnaissance Establishment who piloted himself out in a Valiant from the UK and contributed his bit to the survey during the outbound and return flights. A special mention must be made of Group Captain H. G. Slade, AFC, of the British Defence Liaison Staff, who was always at hand to help us during our stay. Without his assistance both on and off duty the detachment could not have been such a success.

With the weather remaining fine around Salisbury, and the spur of the detachment commander, who stood to win five dozen beers in a small side bet with a doubting Wing Commander Operations at New Sarum, an early finish was certain. On 12th August, seven weeks after arrival, the final sortie was flown to cover the last few task miles and the job was done—100 per cent coverage.

*(concluded overleaf)*

*Pictures from left to right show: Flt Lt E. H. Hunter completing the F700 after a flight, with the assistance of Chf Tech P. Benson and Chf Tech R. Belding.*

*SAC G. M. MacFarlane marking the sortie details on a freshly filled magazine following the return of an aircraft.*

*Sgt J. R. Payne, Survey Liaison Staff (UK) RE, marking the plot of a completed sortie on the wallchart for the Task Areas. The Survey Liaison Staff is attached to Wyton and is commanded by Major J. H. Bazely, RE, who was also on the detachment.*

*Cpl P. B. Yeardley examining the processed film for satisfactory washing and drying. The bulk photographic processing equipment was sent out ahead of the detachment to Salisbury.*

*L Cpl D. Spalton, Survey Liaison Staff, plotting fresh coverage from one of the earlier sorties.*





Air Commodore B. P. Young, CBE, Air Officer Commanding Central Reconnaissance Establishment, and crew standing by their Valiant at Wyton before taking off for Salisbury, Southern Rhodesia, to visit the Pontifex detachment.

*(Continued from previous page)*

A detachment of this size in Salisbury created much local interest and members were able to enjoy the hospitality showered upon them, accepting invitations to visit game parks, citrus estates, tobacco farms and, under their own steam, took in the delights of Salisbury itself. For its part, the detachment found it possible to repay in some measure the hospitality received at the parties, both official and private, held in the various messes at New Sarum. The final fling, considered by most to be the highlight of the detachment, was four trips to Livingstone in Dakotas of the Royal Rhodesian Air Force, a splendid gesture which enabled most of the party to see the magnificence of the Victoria Falls, where the Zambesi drops over a 340 foot precipice into a gorge nine miles long.

Thus ended an entirely successful operation with a total of 110 sorties flown, over 27,000 photographs taken, processed and printed, plotted and assessed, and the promise of new and accurate maps of another section of the vast continent of Africa.

A line-up of four Valiants at Salisbury airport. The additional aircraft was flown out by the AOC Central Reconnaissance Establishment on his visit.



Pontifex finale. The detachment commander and his crew on return to RAF Wyton.

