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FOLLOWING ADDRESS PRESENTED BY MR. RUSS BANNOCK VICE-PRESIDENT MILITARY SALES. THE DE HAVILLAND AIRCRAFT OF CANADA, LIMITED TO AAAA FT. BENNING CHAPTER ON 27 Feb 64

I have been asked to tell you something of my World War II experiences in the hope they may be of some help to both fixed wing and rotary pilots engaged in low level day and night operations. And I am very pleased to hear today that you are now engaged in a great deal of night operations. To me this has always been the most interesting type of flying.

During the latter part of World War II in the European Theatre I had the interesting experience of doing two tours of low level day and night intruder operations on De Havilland Mosquito aircraft.

Although 20 years has elapsed since that time the problems encountered and the nature of the missions are remarkably the same as those you may expect today in any limited war or counterinsurgency operation in any part of the world. In fact, I was amazed when during a short visit to Vietnam last year I found the Mohawk test unit there engaged in exactly the same intruder operations as we often carried out over Western Europe and they tackled these operations with the same enthusiasm.

For these day and night intruder operations we used De Havilland Mosquito aircraft which had much the same performance as your Mohawk, except for the STOL characteristics. The Fighter bomber versions

were equipped with 4 x 303 machine guns and 4 x 20 mm cannons mounted in the nose and in the latter stages of the war we used a night fighter version which just carried the 4 x 20mm cannons and had search radar in the nose. Although this search radar was effective up to 10 miles at altitude, at low level it only had an effective range of 1 to 2 miles, and then only with a very skilled operator.

The Mosquito was remarkable in that it was a wooden aircraft made of laminated fir and balsam wood construction.

I mentioned the performance was similar to the Mohawk. At sea level we cruised about 265 mph and had an endurance at this speed of about 7 hours. Top speed at sea level was 365 mph - as fast as any aircraft at that time. It was two-place, side-by-side, carrying a pilot and a navigator. For communication equipment we had a 4-channel VHF and for navigation equipment nothing but a GEE set which was a fore-runner of the present LORAN system and Decca. During low level operations the GEE was ineffective once we were a few miles away from the English coast, but it was always helpful in getting back to base during the usual sour winter weather which prevailed in the UK. Navigation, therefore, was almost entirely by dead reckoning.

Based on air fields in southern England we intruded against German Air Force bomber and night fighter air fields as far in as

Poland. At the same time we sought out trains and road convoys, particularly at night, to harass them whenever possible.

Occasionally we were called upon to conduct clandestine operations, dropping agents or supplies to friendly guerillas. This usually meant flying up to 600 miles at low level to prevent detection in order to find a target which was one or two dim lights laid out in a clearing in mountainous country. All of this was achieved by map reading and dead reckoning.

Our main operations, of course, were to harass the bomber and night fighter bases whenever they were conducting their own operations As soon as our "Y" Service (listening intelligence) obtained evidence that bombers were taking off from their bases we immediately scrambled so as to be over and around the bases in an effort to catch them in their circuit after their return from their bombing missions.

Similarly, when our own bombers were bombing a specific target we sent Mosquito intruders to patrol around the German night fighter bases in an effort to catch aircraft shortly after take-off, or in the circuit after their return. Initially this was done visually as long as the German Air Force burned navigation lights. However, during the last year of the war they sensibly refrained and then we had to do our searching with what was known as cats' eye methods. Introduction of search radar helped a great deal, but again this was only effective when we had very skilled operators. Nevertheless, the harassment must

have been very unsettling to the German Air Force pilots who realized there was always an intruder in their circuit.

From a navigation standpoint our most interesting operations were day and night rangers which we accomplished alone or in pairs. The purpose of these rangers was merely looking for trouble and to disorganize enemy training fields deep into enemy territory where they regarded themselves as being safe, relying on speed and hugging the terrain to avoid detection. These operations had remarkable success. On one operation two members of our Squadron shot down 11 aircraft at one air field all in the circuit - this in the space of about 4 minutes.

Now I would like to outline what I think are some of the essentials of good DR navigation and preparations for night operations.

1. Good pre-flight planning. On a 500 mile radius of action we used to devote at least two hours to flight planning and route studying. With our navigators, which in your case would be with your co-pilots, we literally memorized all the details of the pin points, height of terrain, known flak areas, military installations etc. Preparation of map time scales, folding of maps in logical order are important. Selection of maps - 1:500,000 are still best.

You must be in the position of a good football quarterback so that you can mentally visualize every detail of the play without map reference.

2. In pre-flight planning you must pick good pin points, then once you are en route don't waste time trying to map read in between.

Water bodies of one type or another are by far the best pin point on night operations; even small reservoirs are superior to the usual daylight pin points, such as a road and railway intersection. Heights of land are also good pin points on night operations.

3. You must fly accurate headings - at least within 3o.

4. Although cranking-in your wind factor is important we never found on low level night operations that this created any problem flying at low level at speeds over 250 mph.

5. You must be sure of your compass and, in your case, using today's modern Gyroscopetype compasses this is really very little problem. In our case, where we had to use the old marine type compasses with directional gyros, we swung our compass at least once a week and after every mission where we fired our guns. The latter was enough to throw the compass off one or two degrees.

6. If you miss your pin point, i.e. you arrive at your ETA and the pin point is not evident, then it is often best to carry on your next heading - don't mess around. This is particularly the right action if your next pin point is a prominent one, such as a river which you are crossing at right angles. If you are unsure of the following pin point then, of course, you must do a square search.

Work out close crew co-operation in scanning different areas when hunting for a pin point. Remember on moonlight nights your best vision is looking up-moon, contrary to daylight practice.

7. Your visual capability of finding your pin point is of paramount importance. By this I mean your ability to exercise maximum night vision. At the risk of repeating most of the things you already have been told about night vision from your Aviation Medical people, I would like to relate a few points that were of importance to me :-

a) It takes about 25 minutes to get your eyes dark-adapted after you leave the flare path and, of course, this is assuming you are flying over reasonably blacked-out terrain. Because of this, it is advisable to avoid strong white light half an hour before take-off. Wearing of red goggles during this period is worthwhile. One careless flash of brilliant white light, such as a flashlight in the cockpit, will nullify this.

b) This means a minimum, or preferably no lighting in the cockpit. I did most of my night flying throughout Europe with the cockpit lighting turned off completely, except for a small ultra violet eyebrow light over the Directional Gyro and a small dim red light over the marine compass which was mounted

opposite the seat near the floor and this red light was only turned on at the necessary intervals to reset the gyro. As I approached a pin point, or the eventual target area, I would turn off the gyro light to completely darken the cockpit. The fluorescent activation of the gyro would allow me to maintain the proper heading for 10 or 15 minutes. Under these conditions it is remarkable what you can see - we were able to pick up parked aircraft hidden in bomb dispersal areas, convoys on roads burning no lights, railway trains, etc.

Today red lighting is perfected and easier on the eyes. But remember, one flash of white light in the cockpit will destroy night vision for 25 to 30 minutes.

c) On a very dark night when it is difficult to pick up a pin point or aerial target, you must continually scan. The average individual has a 5o to 10o blind spot straight ahead.

d) Sudden loss of night vision due to blowing up fuel installations on the ground, ammunition trucks or an aerial target can and does cause vertigo - particularly on a very dark night. We noticed this particularly when attacking and blowing up the VI Flying Bombs during night operations over the English Channel. The main hydrogen peroxide tanks blew up with

quite a flash.

To overcome this problem it is a good tactic to close one eye prior to pressing the trigger and then keeping it closed until you have turned your back on the source of light. Then you will still have good night vision in one eye. You can simulate this experience when walking out of a lighted building into complete darkness - close one eye a few minutes before emerging into the darkness, then you will soon notice the difference when you open that eye after getting out-doors.

e) Other factors in attaining good night vision are adequate sleep, good physical fitness and use of oxygen.

I am afraid this is sounding more and more like typical hangar flying of World War II 'has beens'. However, I hope that some of these things I have related may be of some interest and help. If I may make one or two suggestions, they would be :-

1. Do as many of your cross-countries as possible at the lowest level feasible and consistent with air regulations and employing dead reckoning methods. Using omni and ADF is too easy and, as you no doubt have learned from your colleagues who operated in the terrain in Viet Nam, is simply not available.

2. To the Officers conducting training programmes I can only highly recommend a maximum number of low level day and night cross-countries employing only DR navigation. During my operational training days on Mosquitos we had competitions on night exercises. We employed 4 to 5 targets on a cross-country, were pledged to fly no higher than 500 feet and we were rated on the basis of 'time on target'.

— QUESTIONS —