

WP/32

B. O. S. S.

BIRD OBSERVATION SYSTEM SEMMERZAKE

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AT RADARSTATION SEMMERZAKE

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The BELGIAN AIR FORCE started the POLAROID Bird Observation System in 1965, using it's 2 D - radars situated at the Military Air Traffic Control Centre of SEMMERZAKE.

In 1980, when new 3 D - radars were installed, bird observation (B.O.) by means of Polaroid pictures, became impossible. 3 D - radar, although excellent for AIR TRAFFIC CONTROL purposes, has some disadvantages for B.O., the main problem being the lack of afterglow which we had with the old 2 D - radar. After each radar sweep, plots disappear completely, making history display impossible.

During the spring of this year, a new system called B.O.S.S.: "BIRD OBSERVATION SYSTEM SEMMERZAKE" was developed which again enables us to observe bird movement by means of 3 D - radar.

The BOSS is based on the following principles: during a certain time, called the RUNTIME, the incoming plots are stored in the system file while remaining visible on the scope. These plots are submitted to well-defined criteria so that only the returns of the primary radar are accepted, with other words: only plots without IFF.

To eliminate the effect of ground clutter, a range filter, excluding all plots within a range of 10 N.M., has been installed.

On the bottom of the display you will see RUNTIME and below it, 5 figures. The RUNTIME is selectable by the operator, we usually select 5 minutes. The figures represent the number of plots which are counted in the different height-layers during the RUNTIME. They are cumulative and count each plot, answering the defined criteria.

The height-layers are as follows:

- 0 - 2.000 feet
- 2.000 - 4.500 feet
- 4.500 - 8.000 feet
- 8.000 - 10.000 feet
- > 10.000 feet

They can be changed, by system programmer, if required by FLIGHT SAFETY STAFF.

On the video tape, you will see that after a certain time, PLOTLINES are developed. You will also notice that not all plotlines can be considered as birdtracks. The higher the speed, the more the plots are spaced, indicating that we're dealing with an aircraft without IFF. During the RUNTIME, the observer can track the plots via KEYBOARD in order to acquire, heading, altitude, speed.

The picture we'll see was taken in March '84.

In the North-West, above the NORDSEA, you will easily detect a bird movement. During the selected RUNTIME, the plotfile is build up. After 5 minutes, the plotfile is filled up and from that moment on, we are starting the real observation period.

By means of computer action, the picture can be replayed at very high speed. This fast replay gives us: time information, direction of the movement and the altitude, which was already verified during the build-up phase. In fact, the system replays 5 minutes RUNTIME in 2 seconds, giving us a moving display. This moving display can be presented as long as required for observation. We usually select 30".

Since the 3 D - radar and computer system are used, in the first place, for ATC purposes, the supplementary "bird file" creates capacity problems.

The display has one disadvantage. We need one of the two computers to perform the B.O. It is a so-called "OFF LINE" configuration and it could lead to a decrease in the ATC-capability. We have solved this by integrating the BOSS in an "ON LINE" configuration, allowing us to perform B.O. without influencing the ATC-capacity.

The display and plot-storing problems have been solved by dividing the radar scope into 4 quadrants, which are successively examined during the 5' RUNTIME.

This has the advantage that the plot-file will never be saturated.

Due to the fact that BOSS is using the computer in an ON-LINE configuration simple keyboard action permits tracking of the plots and display H-A-5 on a special screen, called TABASCOPE.

After 5 minutes, the building-up phase is stopped, the figures indicating the number of plots detected are stabilised and the file is automatically switched to the "FAST REPLAY" mode during 30 seconds. After this FAST REPLAY, the system starts examining the next quadrant.

The BOSS can be called at any time and any position and is NOT influencing the ATC-capability at all. Once the observation is finished the normal picture can be immediately displayed.

We have to draw your attention to the fact that the BOSS system is not yet calibrated.

Using the plot counts in the height-layers and the picture of the moving plots, we will proceed to the calibration of the BOSS-system during the fall migration '84 in order to finish with a calibration of the bird-intensity from 0 to 8.

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#### PROJECT IN THE FUTURE

PLOTTER: has a very high resolution and can display lines.

##### Advantages:

1. A hard copy of the picture is made.
2. No observation necessary during the actual picture, but can be done immediately after.
3. Bird movement which happened during non-observation periods can be examined by specialist afterwards.
4. Comparing the intensities is possible by means of the hard copies and stay available forever.