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... THE ROLE OF THE ROC

BY AIR COMMODORE WIGHT-BOYCOTT

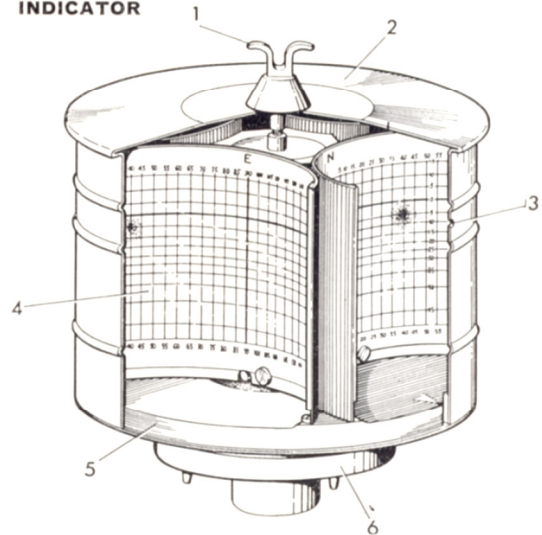
To many it comes as a surprise that in 1963 the R.O.C. plays an even more vital part in the defence of this country than ever before. Believe it or not, human eyes and ears can still compete with radar in the task of detecting, identifying and tracking low flying conventional aircraft over land. Today, the principal threat is from high flying bombers but future manned nuclear weapon carriers are almost certain to take advantage of difficulties presented to radar screens by "contour chasing". It is common knowledge that the next nuclear strike aircraft for the R.A.F. (the TSR2) will rely almost entirely on its low flying capability for penetrating anti-aircraft defences. If it is thought that the advent of the stand-off bomb makes it no longer essential for manned aircraft to cross our coasts to deliver their attack, it should be emphasised there are likely to be many occasions when the enemy would vastly prefer to do so, e.g. for reconnaissance purposes or because a high degree of accuracy in bombing is required and would certainly penetrate our air-space unless prevented by the knowledge of the existence of an effective low flying defence.

There is then, a cast iron case for the retention of the R.O.C. visual reporting system over land but at this moment, the defence against low flying attack has lower priority than two other quite new tasks assumed by the Corps. These are firstly, the provision of a "Bomb Alarm", and secondly, the detection of hostile nuclear detonations in this country, the measurement of their yield and subsequently the measurement of residual radioactivity likely to follow the nuclear detonations.

I would like to explain what is meant by a "Bomb Alarm". On the assumption that no NATO nation will be willing to release its atomic weapons until itself or an ally is first subjected to nuclear attacks, confirmation of hostile nuclear attack must be immediately available to those on whom will rest the decision to release the "deterrent" force, which then becomes the "retaliatory" force. There is more than one way of obtaining this confirmation, but none more reliable than the actual evidence of a man or woman on the spot. Over fifteen hundred Observer Posts of the Royal Observer Corps form a network throughout the United Kingdom spaced five

to eight miles apart. They are in underground bunkers equipped with Bomb Power Indicators to detect the blast waves of nuclear detonations, and connected to the Air Defence Operations Centre by land-lines, now being supplemented by short-wave radio. Thus confirmation of nuclear attack would reach the Air Defence Commander through the R.O.C. network in 30 seconds. To back up information

GROUND ZERO INDICATOR



which records the bearing, elevation and size of nuclear fireball photographically. 1 HANDLE. 2 COVER. 3 PIN HOLE. 4 CASSETTE. 5 BASE. 6 MOUNTING



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C.B.E., D.S.O. and BAR, B.A.

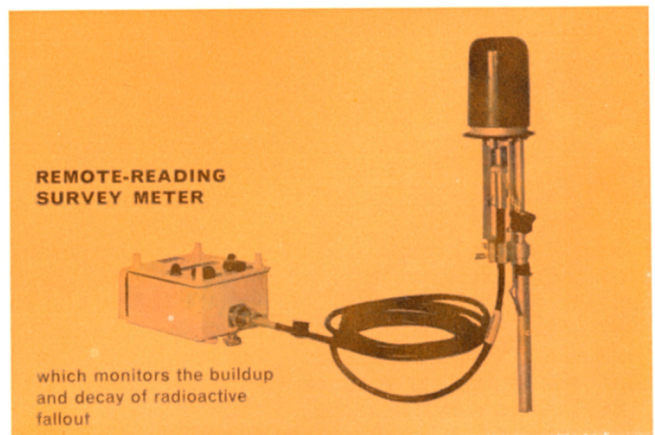
from Observer Posts electronic devices, which detect nuclear detonations at very much greater ranges by analysing their characteristics, are also manned by R.O.C. personnel. Undoubtedly any decision to release the "retaliatory" forces would depend greatly on the "Bomb Alarm" provided by the R.O.C., and recently the Air Defence Commander Designate acknowledged this by referring to the R.O.C. as "one of the triggers of Bomber Command".

Frightful as would be the death roll from the immediate effects of nuclear weapons, casualties from the effects of the resultant radioactive fallout would be equally numerous and in the long run just as fatal unless the population can be given advance warning of its approach. A most elaborate and efficient Warning and Monitoring Organisation has been set up by the Home Office depending almost entirely on the R.O.C. for information on nuclear detonations and radioactive fallout: the same underground Observer Posts which supply the "Bomb Alarm" are also equipped with instruments to locate and measure the bomb and to monitor residual radioactivity.

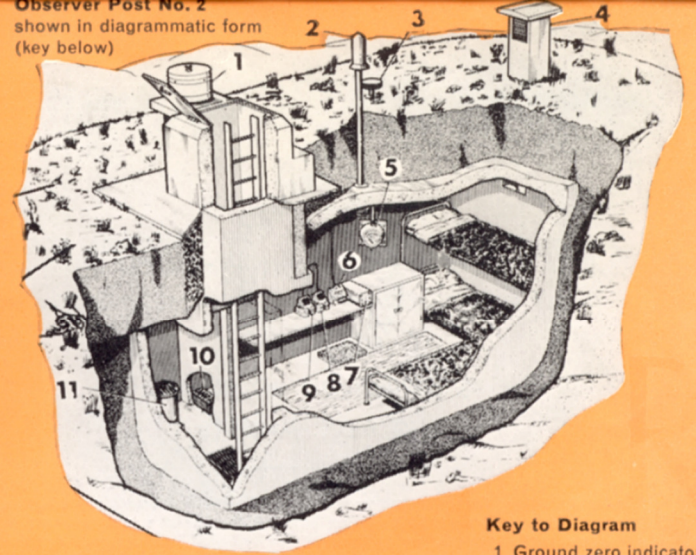
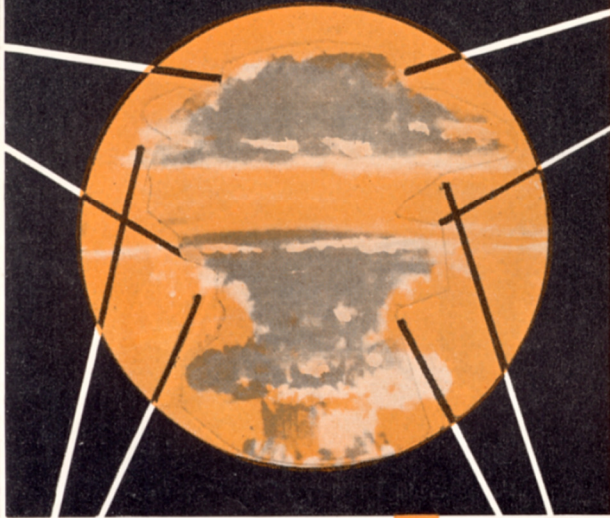
The bearing and elevation of the fireball is found by means of an ingenious but simple pinhole camera known as the Ground Zero Indicator, mounted on top of the bunker. Bearings from three adjacent Posts enable the position of a bomb to be obtained by triangulation. The actual height at which the bomb was detonated is required to establish whether the fireball will extend to the ground and suck up debris, which will later descend as radioactive fallout. It is found by relating the distance of the fireball from a Post to the elevation of the fireball as measured from the same Post. The power of the nuclear device can be assessed by relating the size of the fireball image, as it appears on the negative in the Ground Zero Indicator, to the distance from fireball to G.Z.I.

The position, height and power of a nuclear bomb, when related to the existing meteorological conditions, particularly

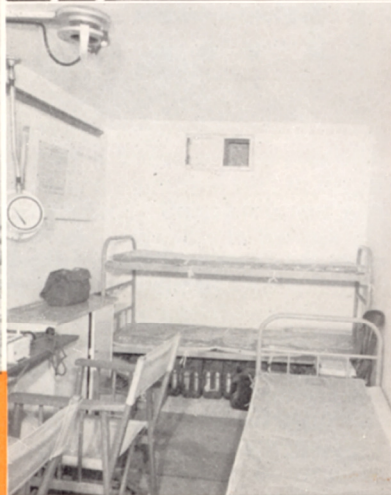
the upper winds, enables the Warning Teams of the Home Office Warning and Monitoring Organisation to work out the forecasted path of radioactive fallout and to issue warnings through a very large number of Civil Defence Warning Points which are equipped with sirens, maroons, etc., for alerting the population. The information provided by the R.O.C. makes it possible to give fallout warnings of differing



urgency, i.e. "Grey" which gives one hour's warning of arrival of fallout and "Black" which indicates that fallout is imminent. Incidentally, Observer Posts are themselves being equipped with hand sirens and maroons to increase the already very wide warning coverage afforded by the normal Warning Points. However, the task of the Observer is not finished with the issue of fallout warnings. He (or she) must remain in the Post to report the arrival of fallout, and by continually measuring its intensity with a remote reading instrument known as the Fixed Survey Meter, monitor its



- Key to Diagram**
- 1 Ground zero indicator
 - 2 Survey meter sensing head
 - 3 Bomb power indicator sensing head
 - 4 Air vent
 - 5 Bomb power indicator
 - 6 Fixed survey meter
 - 7 Stand-by radio set
 - 8 Tele-talk set
 - 9 Carrier receiver
 - 10 12 volt battery
 - 11 Chemical closet



Observer Post No. 4 showing (left to right) entrance turret with GZI, Survey Meter Probe, BPI Baffle and ventilation turret

Observer Post No. 3 showing interior. The Fixed Survey Meter probe and Bomb Power Indicator can be seen



Detection and Measurement of Nuclear Detonations

build-up and decay. Without this information the Civil Defence authorities would be unable to carry out their rescue operations without incurring unacceptable casualties and would not know when to allow the population to emerge from fallout cover.

So far I have only mentioned the Observer Posts in protected bunkers scattered throughout the country. The control of these Posts is decentralised to 29 Operations Rooms. These Operations Rooms are located as far as possible outside potential target areas, and housed in protected accommodation specially constructed for the purpose. In addition to protection from blast, heat and gamma rays, they have air conditioning, filters to prevent ingress of radioactive fallout, stand-by power, reserves of water and food, sleeping and cooking facilities, so that the Operations Room crew can continue to carry out their work in severe fallout conditions.

In view of the fact that the Corps is what the Government spokesman in the House of Lords debate on Civil Defence referred to as the "key to Civil Defence", is there any change in the close relationship of the Corps with the R.A.F.? The answer is emphatically "NO". The Corps, as it has been since 1939, is under the operational control of the A.O.C.-in-C., Fighter Command, who becomes Air Defence Commander in war. The Commandant of the R.O.C. is a

serving R.A.F. officer on the staff of the A.O.C.-in-C. with his Headquarters at Bentley Priory alongside Headquarters Fighter Command. Important as is the R.O.C. contribution to Civil Defence, it must always be remembered that not only does the Corps contribute to the Air Defence Commander's low level defence and provide him with his very important "Bomb Alarm", but through the Air Defence Operations Centre, keeps Military Commanders informed on the fallout situation in this country.

The internal organisation of the Corps has remained virtually unchanged. Under R.O.C. Headquarters there are six Areas (Metropolitan, Southern, Western, Eastern, Northern and Scottish), each being sub-divided into Groups, every Group having an Operations Room and on average controlling 50 Observer Posts. It is in these Operations Rooms that all information from the Posts is filtered and displayed. The triangulation and assessment of the power of nuclear detonations and discrimination between surface/ground bursts (those which produce radioactive fallout) and air bursts (fallout free) is also made here, so that teams from the Warning and Monitoring Organisation in the Operations Rooms can initiate the "Grey" and "Black" fallout warnings.

The Operations Rooms and Posts are manned entirely by part-time volunteers. This is the aspect which has astonished

visitors coming from other NATO countries to see the R.O.C. and the Warning and Monitoring Organisation. They cannot bring themselves to believe that the responsibility for issuing fallout warnings on which in nuclear war will depend the life of the Nation, can be entrusted to "amateurs", or that sufficient volunteers would be prepared to give up the time necessary for training for their vital role. Fortunately, such is the reputation of the Corps, made in the Battle of Britain and maintained ever since, that no one in this country doubts the ability of an Observer to meet any task. On the other hand, although the strength of the Corps is currently some 16,000, to sustain the effective manning of the R.O.C. reporting system over a period requires almost double this number.

No passing of medical or educational tests is required for would-be Observers. Uniform is provided and travelling expenses paid, in return for which attendance twice a month for two hours' training with the rest of your crew at some mutually convenient place is expected. Observers qualify for an Annual Grant of between £5 and £12 depending on rank and proficiency. There are voluntary Annual Training Camps on R.A.F. Stations and Specialist Courses available if you can spare the time. Those who have close associations with the R.A.F. should find service in the R.O.C. more rewarding than in any other voluntary service, since the Corps is so closely identified with the R.A.F. But perhaps the most compelling reason is that there will be no "Battle of Britain" fought in the skies by "the Few" in any nuclear war.

The next Battle of Britain will be fought on the ground by all of us for the survival from fallout of those who have escaped destruction from the blast and heat of nuclear bombs. How many will survive? Estimates of immediate casualties vary from five millions to 20 millions, leaving between 45 millions and 30 millions, who will require warning of approach of fallout. The R.O.C. and Warnings and Monitoring Organisation have been given all the equipment to provide this warning at the cost of millions of pounds of your money.



"Forewarned, forearmed;
to be prepared is half the victory"

Cervantes in Don Quixote

HEADQUARTERS

ROC Group Headquarters. The Radio aerial and GZI are shown



Messages received at Group Headquarters



Operations Room. General view showing horizontal main table and vertical long range board

Triangulation Team fixing the position, power and height of a nuclear bomb burst

Observer Post No. 1

Bearing 073 Elevation 08
Pressure 0.7

Observer Post No. 2

Bearing 095 Elevation 12
Pressure 1.2

Observer Post No. 3

Bearing 260 Elevation 13
Pressure 1.1

Observer Post No. 4

Bearing 315 Elevation 08
Pressure 0.8

**"Nuclear Air Burst
located at XY1234
at 7,000 ft.
Power 100 Kilotons
Time 1030 Hrs"**