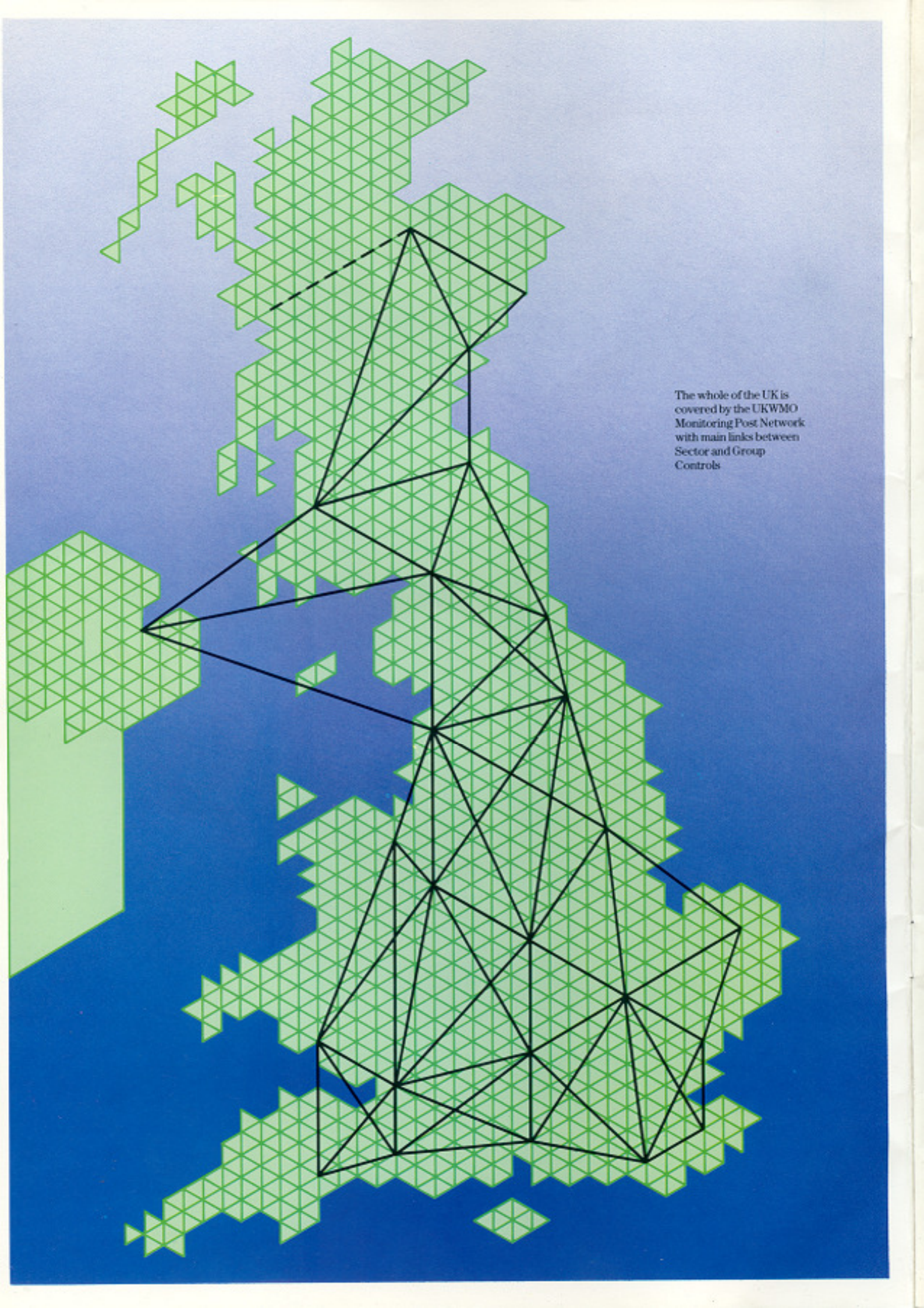




UKWMO

UNITED KINGDOM WARNING AND MONITORING ORGANISATION



The whole of the UK is covered by the UKWMO Monitoring Post Network with main links between Sector and Group Controls

PROTECTING BY WARNING

The United Kingdom is vulnerable to air attack and successive Governments, in their periodic reviews of the nation's defences, have given high priority to the maintenance of an effective air attack warning system covering the entire country. Such a system exists today, capable of giving timely warning of air attack whether by manned aircraft carrying conventional high-explosive bombs or by ballistic missiles with nuclear warheads. It is designed to be able to react swiftly to evidence of impending attack and to pass warning messages simultaneously to the civil population, to regional government HQs, local authority emergency centres and home defence forces.

It makes no sense, in this context, to talk of a warning of only a few minutes: while in certain circumstances, a very short warning might be all that is possible to give, in many other circumstances it is likely that a much longer warning could be given.

Warning could certainly save countless lives and this does not simply apply to warnings of air attack. If nuclear weapons were to be used against this country or anywhere in Europe, radioactive fallout could constitute a major hazard and warnings of its approach would need to be passed to those in its path.

As with warnings of air attack, so with warnings of the approach of fallout, a system covering the whole of the United Kingdom is already in existence — and has been for almost 30 years — under the control of the United Kingdom Warning and Monitoring Organisation (UKWMO).

UKWMO comes under the direct control of the Home Office. Although in peacetime it is run by a small full-time staff, during a national emergency it can be brought into full operation in a matter of hours. At peak strength, it is manned by many thousands of

personnel, the vast majority of whom are volunteers recruited by the Home Departments and the Royal Observer Corps (ROC), who train and exercise regularly for their vital tasks in the event of war.

To be effective, this system relies on good communications. Considerable expenditure has been devoted over recent years to ensuring that UKWMO telecommunications equipment is up-to-date, reliable and flexible, not only within the United Kingdom but also so that information on air attack and details of nuclear bursts and fallout can be exchanged with neighbouring countries.

A warning system can only really be effective if those for whom it is intended are able to recognise the warning signals and know what action they are required to take. This is being incorporated in revised Government publications on civil defence preparations for issue to the public.

This booklet describes just how the warning and monitoring systems in the United Kingdom can be an effective life-saving measure in the event of war in Europe.

THE ROLE OF UKWMO

The five main functions of UKWMO are:

- 1 Warning of air attack — conventional and nuclear.
- 2 Confirming any nuclear strike.
- 3 Warning of the approach of radioactive fallout.
- 4 Supplying government headquarters and home defence forces in the UK and neighbouring countries with details of nuclear bursts and with a scientific assessment of the path and intensity of fallout.
- 5 Providing a post-attack meteorological service.

Effective warning of air attack and of radioactive fallout is of vital importance. It is often claimed that UKWMO will have fulfilled its essential role in effectively carrying out its warning function.

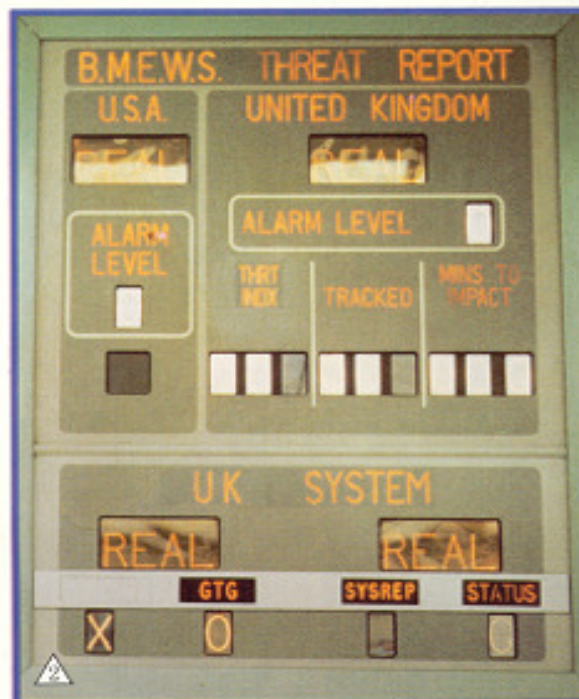
The task of monitoring fallout, calling for more resources of men and equipment, is another important service which would be carried out in support of Government measures to ensure public survival in areas affected by radiation.

1 The Operations Room at Fylingdales



2 Ballistic missile threat display at Fylingdales

3 The Carrier Control Point receives and issues warnings of impending air attacks and the approach of fallout



WARNING AGAINST AIR ATTACK

Information on an impending air attack on this country would come from a number of sources, including the North American Air Defence System (NORAD) and the NATO European Air Defence Ground Environment System (NADGE) which includes the radars at our own RAF Sector Operations Centres (SOC) and early warning aircraft. In case of missile attack, warning would come from the Ballistic Missile Early Warning System (BMEWS) station at RAF Fylingdales, on the Yorkshire coast, backed up by further information from other stations of the system in Alaska and Greenland.

All these reports would be assessed by Home Office staff stationed at the United Kingdom Regional Air Operations Centre (UK RAOC). It would be for them to decide, in consultation with the air defence staff, whether to set the warning network in action. Turning a key in a special electronics box at UK RAOC simultaneously alerts 250 points — the Carrier Control Points (CCPs) — located in major police stations throughout the United Kingdom. By pressing a switch on the special communications equipment at each CCP, the police can activate powered sirens at strategic locations in urban parts of their warning area. In all, there are some 7,000 power-operated sirens installed throughout the country.

These are backed up by a network of some 11,000 other warning points in rural areas, located mostly at police, fire and coastguard stations, government and service establishments, hospitals, industrial centres, and monitoring posts manned by the Royal Observer Corps. Certain warning points are also to be found in shops, pubs and private homes, in areas where other suitable locations would not otherwise exist.



Each CCP is linked to the warning points in its area of responsibility by means of a unidirectional carrier line broadcast system, which superimposes signals upon the existing local British Telecom telephone cable network without interfering with normal traffic carried on that network. A warning message can be broadcast over this system and heard by the warning point operator on a receiver unit, which resembles a small loudspeaker.

Upon receiving a warning of an air attack from the CCP over this system, a warning point operator would sound the alarm by hand-siren. At the same time, warnings would be broadcast on TV sound and radio. Altogether, the vast majority of the population would be alerted in sufficient time to take action to protect themselves against the danger.

A simple but effective warning code has been devised as an integral part of the UKWMO system (see page 12). It covers warnings both against air attack and radioactive fallout, and gives a subsequent 'All Clear' signal. Public service broadcasts would explain the different warning sounds to the public. The code can be easily understood by the public and conveys a sense of great urgency.



WARNING AGAINST FALLOUT

Special procedures have been devised to provide effective warning of fallout, report nuclear bursts and, in the longer term, enable a scientific assessment of the paths and intensities of fallout to be made. These procedures are contained within a three-tiered, nation-wide structure which absorbs most of the personnel on the strength of UKWMO. At field level is a network of monitoring posts manned by members of the Royal Observer Corps. These are under the control of the second tier, known as Group Controls. In turn, Group Controls report developments in their areas to Sector Controls which, among other duties, are responsible for exchanging information with neighbouring countries.

As far as the general public is concerned, the key feature of this structure is the Group Control, for it is at this level that many basic decisions would be taken — and the intensity and likely behaviour of radioactive fallout assessed. It is here, also, that warnings of fallout would originate.

Altogether, there are 870 monitoring posts up and down the country. Each is responsible for sending information to one of the 25 Group Controls. In turn, there are five Sector Controls, four in England and one in Scotland, each with five Group Controls reporting to it. One of these, Western Sector Control, is also responsible for Northern Ireland.

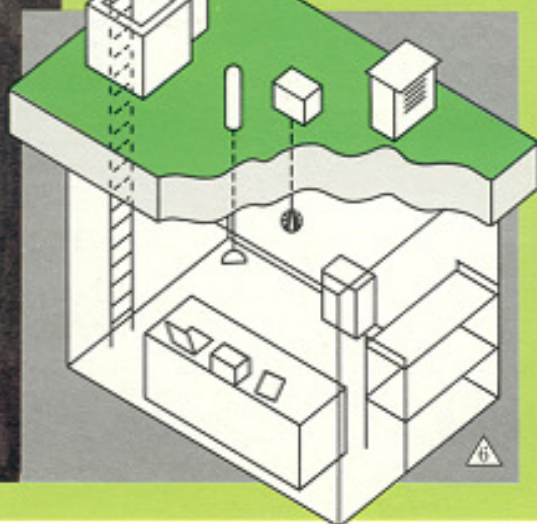
Neighbouring Group Controls are linked by telegraph, telephone and radio, with computer-controlled message-switching facilities. Each Sector Control is co-located with one of its Group Controls — for example, near Lincoln, in the case of Midland Sector Control, and near Dundee, in the case of Caledonian Sector Control.

Apart from the lack of windows, there is nothing very conspicuous about the buildings housing Group and Sector Controls, but each has been purpose-built to withstand a certain amount of blast and to give protection against radioactive fallout. Each has its own stand-by services, including power, ventilation, sanitation, and food and water supplies.

Overall control of UKWMO is exercised by one of the five Sector Controls. Each Sector Control is capable of functioning as an independent unit and, with full communications between component parts, there is great flexibility in decision-making if parts of the Organisation were to be destroyed.

Power-operated sirens are located in urban areas. In rural parts of the country hand-sirens sound the alarm.

- 1 Monitoring post observers at work
- 2 Loading a ground zero indicator which will show the direction and height of a bomb burst
- 3 Taking surface wind measurements
- 4 Most posts in rural areas are also Warning Points (see page 3)
- 5 A monitoring post above ground
- 6 A diagram of a monitoring post



GROUP CONTROL ...



1	ORG	GB	SU6391	PG5537	OXFA	1 M	0000	1708
2	ORG	AB	SP6050	PH5308	OXFB	1 M	5250	1709
3	ORG	GB	SP2060	PH1815	OXFC	200K	0000	1709
4	ORG	AB	SP1763	PH1516	OXFD	5 M	8800	1709
5	ORG	AB	SP4615	PG4149	OXFE	3 M	7500	1712
6	ORG	GB	SP8001	QG0944	OXFF	2 M	0000	1713
7	ORG	GB	SP4612	PG4048	OXFG	3 M	0000	1715
8	ORG	AB	SPO550	PH0709	OXFH	200K	3000	1719
9	ORG	AB	SU8495	QG1338	OXFJ	2 M	6500	1721
10	ORG	AB	SP3807	PG3345	OXFK	200K	3000	1721



TIME	CODE P	CODE P	TIME	CODE P	CODE P	TIME	CODE P	CODE P
07:45	30	35	07:45	CC 40	80	CC 45	90	50
	31	36		CC 41	85	CC 46	95	50
	32	37		CC 42	85	CC 47	10	





- 1 Monitoring post information plotted
- 2 Triangulation team in a Group Control pinpoints a bomb burst
- 3 Nuclear burst data
- 4 Monitoring post information displayed
- 5 Information for transmission through the computer controlled message switch
- 6 Information fed to the main displays
- 7 Monitoring post supervisor at work

SECTOR CONTROL ...



1 The Sector Operations Room

2 Assessing the radiological situation

3 Maintaining a national picture of bomb bursts and the threat they pose

4 Defining the area covered by fallout from each bomb burst



GROUP CONTROLS

The 25 Group Controls may be said to combine the functions of a post office with those of a data processing centre. Their main job is to evaluate reports of nuclear activity sent in by the monitoring posts. From these reports they would predict how fallout is likely to develop and issue warnings to the public on its approach. A second key job is to pass on findings and conclusions to other authorities, such as Sector Controls, regional government HQs, local authority emergency centres and home defence forces.

To do this, a typical Group Control would require about 50 trained personnel including some 40 ROC members and a team of warning officers, some of whom are scientists. It is these warning officers who make the decisions on whom to alert and when warnings should be issued.

Suppose, for example, a nuclear bomb were to explode in the Thames Estuary. Data on the burst would be sent in from various monitoring posts in the vicinity to Group Control at Maidstone. Here, using triangulation techniques, it would be determined whether it was an air or ground burst — the latter produces fallout. Its power and position would also be established.

A number of selected Group Controls have been equipped with electronic instrumentation called AWDREY — an acronym for Atomic Weapon Detection Recognition and Estimation of Yield — to register and confirm a nuclear explosion. Information from this equipment can also be used in the triangulation process.



1 & 2 AWDREY equipment on a Group Control

3 Typical operational control above ground

4 AWDREY Display Unit

ASSESSMENT OF FALLOUT WARNINGS

Once the triangulation process has been completed at the Group Control, fallout warning assessments are made. These are based on two kinds of prediction. The first indicates the outer limit of the area within which fallout would be contained during the first hour or two after a nuclear burst. It is based on the information relating to the burst computed by the triangulation process, and also on meteorological forecasts compiled at the Sector Control, in particular the forecasts of speeds and directions of winds up to 100,000 feet.

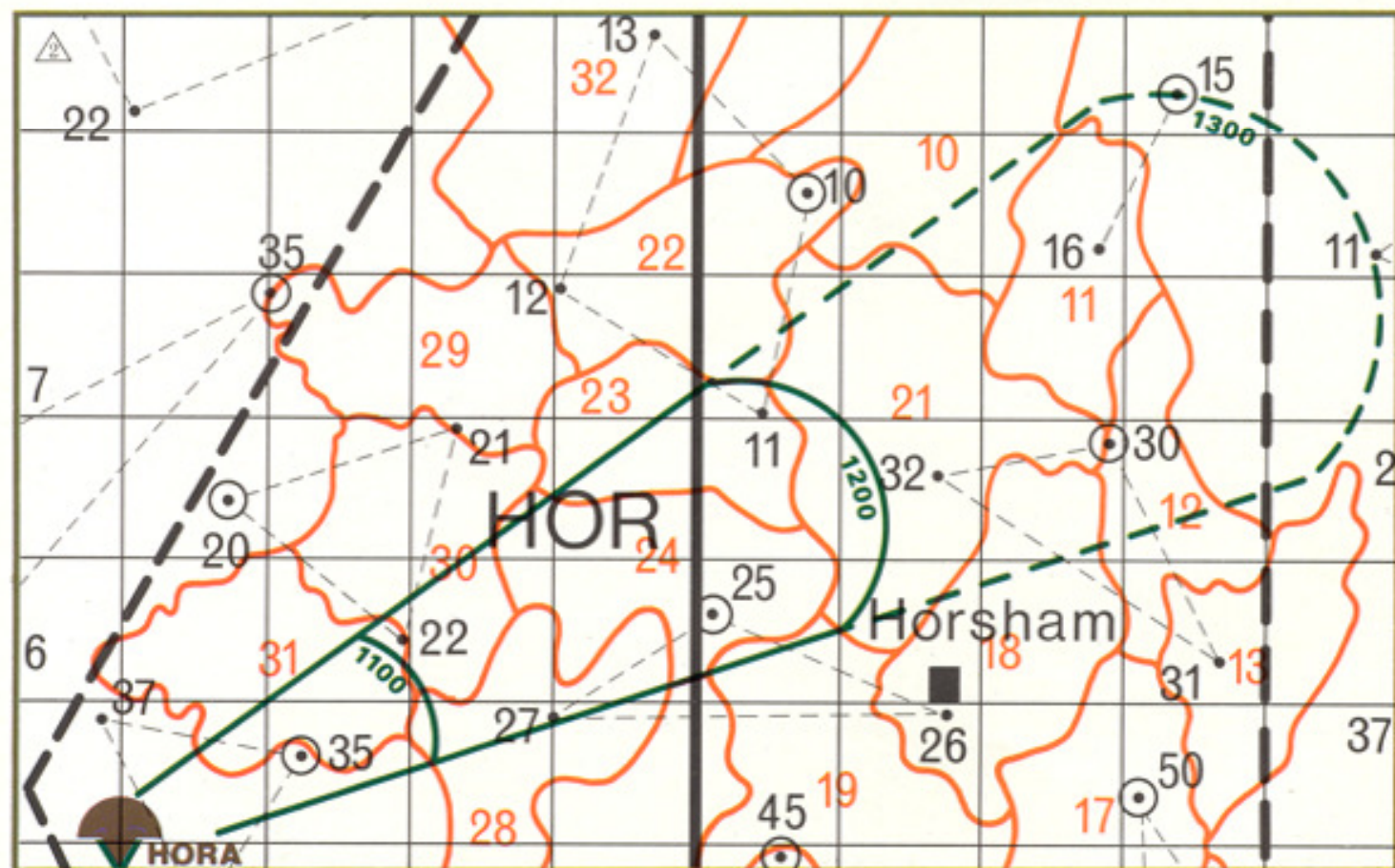
The fallout warning procedure is based on a pattern of warning districts: there are 750 in the United Kingdom, each with an area of about 100 square miles. The warning would originate with a message from a Group Control to Carrier Control Points, from which the warning would be relayed to the various warning points over the carrier line broadcast system. Each of these is equipped with a maroon for sounding the fallout warning and with a radiac survey meter for measuring the level of radioactivity. If a warning point should find itself isolated, the operator would fire his maroon when fallout was detected on the meter.

Subsequently the warning team would work on a second type of fallout prediction: one derived from actual times of fallout arrival, as observed from

ground readings, supported by further meteorological forecasts. Predictions of this type would give a more accurate picture of the probable path of fallout up to some three hours ahead of its arrival. Meanwhile, ROC personnel in the monitoring posts would be transmitting details of radiation dose-rate readings at regular intervals. These readings would be plotted on graphs, making it possible both to map areas of high radiation risk and to predict later arrivals of fallout. This information, together with the earlier fallout predictions, would also be passed to regional government HQs, local authority emergency centres, home defence forces and, through Sector Controls, to neighbouring countries.

1 Firing maroons provides an audible warning of the approach of fallout

2 Display charting predicted and actual path of fallout



SECTOR CONTROLS

Each Sector Control co-ordinates the activities of the Group Controls under its responsibility and controls communications within its territory. Another key function is to offer high-level scientific advice and generally to ensure that UKWMO's operational responsibilities are being met.

It is also responsible for liaison with specific neighbouring countries, the Channel Islands and the Isle of Man. For example, Midland Sector liaises with Denmark, Germany and the Netherlands, while Metropolitan Sector liaises with France and Belgium. In the event of an emergency, specially trained British Liaison Officers resident in adjacent countries would report to Warning and Monitoring Headquarters, and Liaison Officers from adjacent countries would report to Sector Controls in the United Kingdom. These officers would be responsible for reporting to their respective countries information on air attacks and details of nuclear bursts when resultant fallout may affect them.

When fully operational, each Sector Control would need a staff of about 80 including sector scientific advisers whose job would be to advise on any unexpected developments.



FOR SURVIVAL. IN CRISIS

UKWMO is maintained at a high state of readiness through the use of a comprehensive but simple, robust and flexible system. In the final analysis, even if the structure of the UKWMO were extensively damaged, there should still exist sufficient alternative means of issuing warning messages and serving the Government's emergency control network responsible for advising the public on survival under fallout.

UKWMO is only one of a number of services planned by the Government to go into action in time of national emergency — and each of these has a vital contribution to make. As far as the system described in these pages is concerned, experts have calculated that its contribution could amount to the saving of millions of lives — simply by warning enough people in time.

WARNING CODE

The following types of warning will be given:

RED:

Air Attack Warning:

given by siren (rising and falling note) and by BBC broadcast.

This means imminent danger of attack from the air.

BLACK:

Fallout Warning:

given by maroon, gong or whistle (three bangs or blasts in quick succession); reinforced by information messages broadcast by local BBC stations wherever possible.

This means imminent danger of fallout.

WHITE:

All Clear:

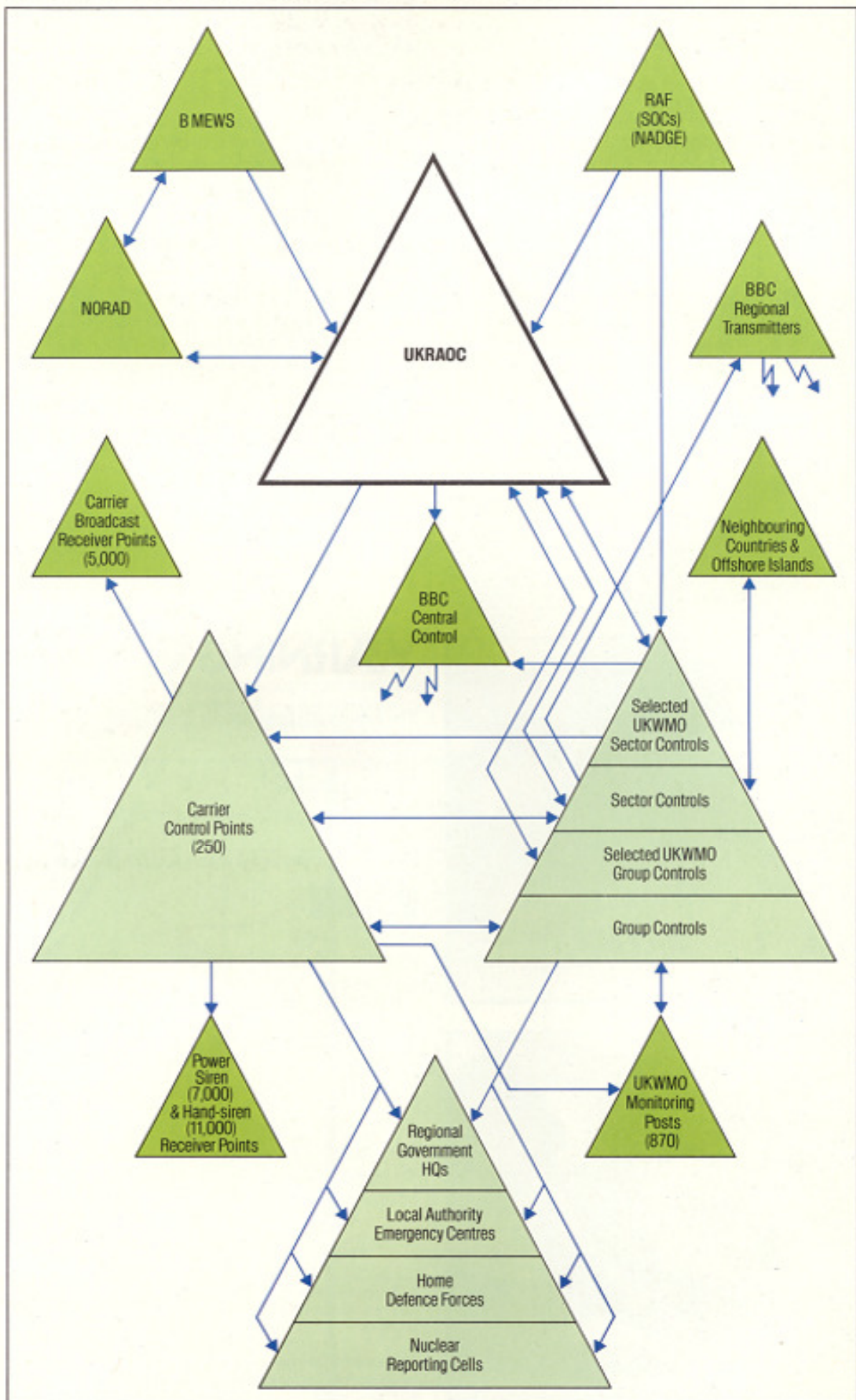
given by siren (steady note) and by BBC broadcast.

This means no further danger from air attack or fallout.

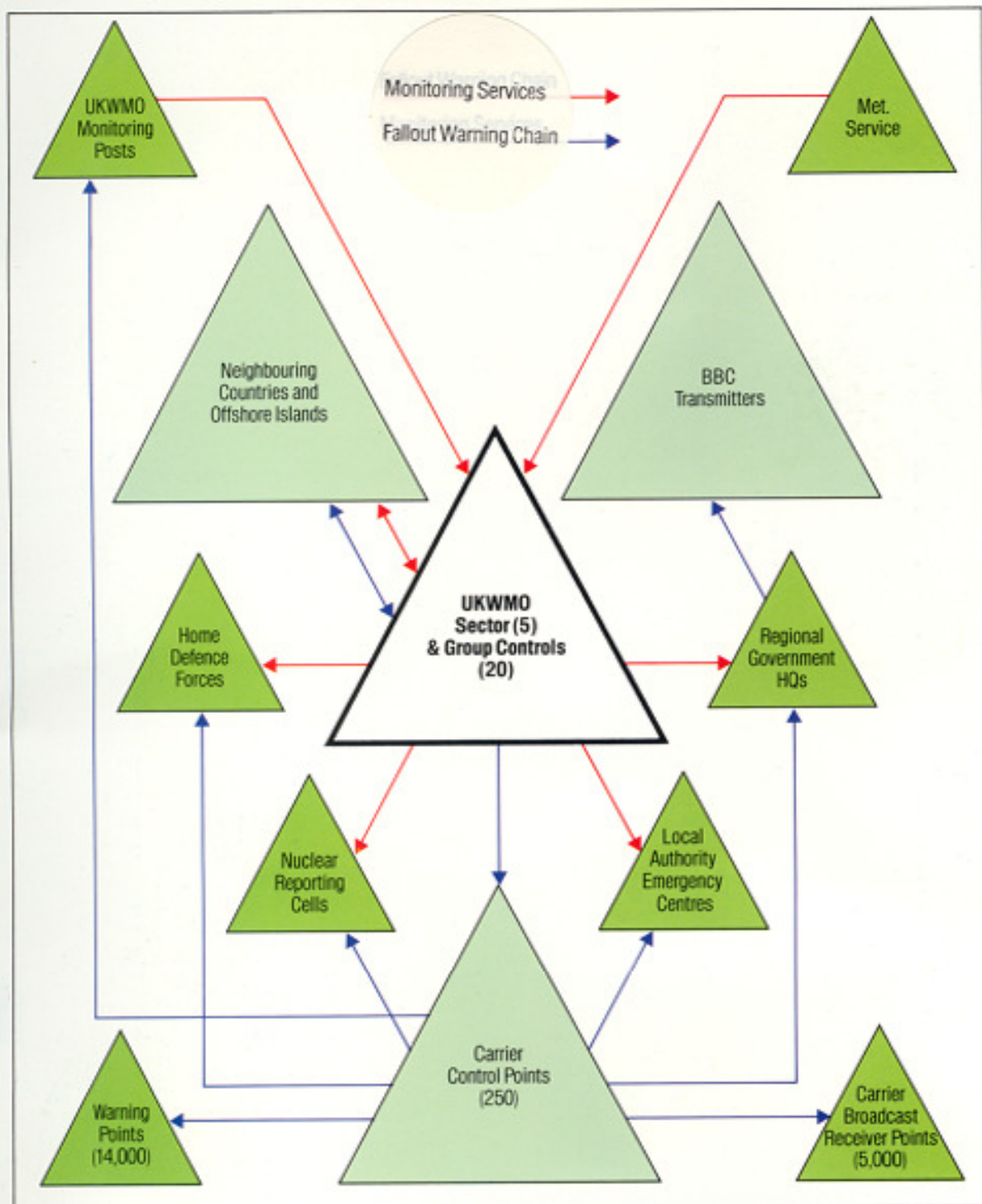
1 Sector Scientific Advisers consider a problem

2 Liaison Officers from neighbouring countries in a Sector Control

UKWMO AIR ATTACK WARNING SYSTEM



UKWMO FALLOUT WARNING AND MONITORING SYSTEMS



Further information regarding UKWMO – including the Royal Observer Corps – can be obtained from:

In case of difficulty, contact HQ UKWMO at:
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 OXFORD
 OX4 2PT

