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Unidentified Aerial Phenomena (UAP) in the UK Air Defence Region - Result of Internal Review

Following a request for an Internal Review to be conducted, which specifically asked for the decision to withhold information under exemptions s.26 and s.27 to be reviewed, some of the previously redacted sections from the UAP report have now been released.

- Executive Summary: Final Page
- Volume 1: Chapter 1, Page 1, paragraph 2
- Volume 1: Chapter 5, Page 4
- Volume 2: Introduction, Page 1
- Volume 2: Working Paper 5, page 5-1, paragraph 1 and 3h
- Volume 3: Executive Summary, Page 2, paragraph 4 and 7
- Volume 3: Executive Summary, Page 3, paragraph 11
- Volume 3: Chapter 1, Page 3, paragraph 11
- Volume 3: Chapter 1, Page 4, paragraph 13(d)
- Volume 3: Chapter 1, page 5, paragraph 21
- Volume 3: Chapter 1, page 8, paragraph 27
- Volume 3: Chapter 4, page 1, paragraph 4
- Volume 3: Chapter 4, page 3, paragraph 12

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- Announcements
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UAP in the UK Air Defence Region: Executive Summary

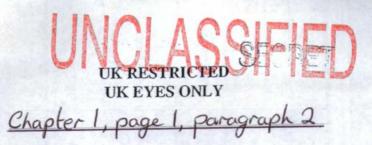
UAP in the UK Air Defence Region: Vol 1 UAP in the UK Air Defence Region: Vol 2 UAP in the UK Air Defence Region: Vol 3

Letter to Dr Clarke: UAP Internal Review

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"There seems to be a campaign building up to criticise government policy about the release of information on unidentified flying objects. The authors of the campaign are firmly convinced that extra terrestrial manifestations have appeared, whereas the Air Staff are by no means certain. As it is not possible to release official data which does not exist it is difficult enough to satisfy those with preconceived ideas to the contrary". Memo 19, August 1958

CHAPTER 1

HISTORICAL STUDY BACKGROUND & AIM

INTRODUCTION

- Historical Objects in the atmosphere, sometimes on the ground, but often much higher in visible space, have been reported for millennia. Reports from within UK airspace alone, number thousands since the 1950s, as shown at Figure 1.1. Clearly these reports are of something not being understood at the time by the observer. Since manned flight commenced and with the advent of outdoor laser displays, space flight, unmanned aircraft and greater public awareness, caused largely by media hype, the phenomenon of "unidentified flying objects" (UFOs) has reached heights of unprecedented public interest. In the past this has undoubtedly distorted the clarity of approach needed for a scientifically-based analysis. It has been recent MOD practice to refer to such phenomena, in the absence of rational explanation, as Unexplained Aerial Phenomena (UAP). Further, from the record, it is clear that it was MOD policy from the outset that any interest in UAP is only necessary as an assurance that any such object is not a threat to UK airspace or assets. In August 1950 a Working Party was set up (at the suggestion of Sir Henry Tizard) who thought "flying saucers should be investigated". Records show that the 11th meeting of the Joint Technical Intelligence Committee (Ref. DSI/JTIC(51) Item 8 (1951)) received the Chairman's Report of the "Flying Saucer Working Party". The Committee decided that "the document should be regarded as the final report and, in view of the conclusions the Working Party should be dissolved". The Chairman (Mr. G.L. Turney DSI3) went on to say that, "following the lead given by the Americans on this subject, the Report should have as little publicity as possible and outside circulation should be confined to one copy, for Sir Henry Tizard". The Report was approved. The Department does not possess a copy of this report (it may exist within Sir H. Tizard's papers), but it is implied that nothing important was found. Great Britain was happy to allow the US studies to answer any outstanding questions. However, there must have been further concern and the Prime Minister's request, quoted at the Preface, came the following year and the brief subsequent reply, produced a few days later, is shown here at the Historical Annex.(U)
- 2. The United States Air Force had started to take an official interest in 1948 (PROJECT SIGN), later changed to PROJECT GRUDGE and then to PROJECT BLUE BOOK. Such was the concern in the US that by 1952 the CIA instigated a covert study group to investigate the "10% of incredible reports from credible witnesses". In fact, over 10,000 reports, spanning 19 years, were processed by 1965 (of which it was reported that about 7% were unexplained). It was also questioned whether any use could be made of the phenomena for psychological warfare. The covertness of this investigation subsequently contributed greatly to charges of a government 'cover-up' a notion that has continued to this day. In 1952-3 the US had set up the Robertson Panel (Intelligence Scientific Advisory Panel) and observed that British experts (Prof. R.V. Jones and others) were taking the increase in UAP sightings seriously. Meanwhile, it is noted, the



Subsidiary Recommendations

- Selection of a ten year UAP reporting period for detailed statistical studies, allowed material from both the Cold War and post-Cold War periods to be studied. No significant differences were discovered in the results from these two time periods. For this and other reasons it is not expected that further inputs to the database will significantly change the findings stated in this Executive Summary. Consequently, and in keeping with the key recommendation, it is recommended that there be no further requirement for maintaining the database.
- The flight safety aspects of the findings should be made available to the appropriate RAF Air Defence and other military and civil authorities which operate aircraft, particularly those operating fast and at low altitude.

In so advising:

- It should be stressed that, despite the recent increase in UAP events, the probability of encountering a UAP remains very low.
- No attempt should be made to out-manoeuvre a UAP during interception.
- At higher altitudes, although UAP appear to be benign to civil air-traffic, pilots should be advised not to manoeuvre, other than to place the object astern, if possible.

- It is suggested that the findings of this report could be used to provide the
 public with a balanced view of UAP reports and MoD involvement. It is
 recommended that this report be made available in a suitable form for public
 release. (R)
- 16. The Way Ahead. In view of the public sensitivity on the topic (and the media vested interests in keeping the topic in the public eye), it is suggested that the technical and other relevant knowledge gained in the Department as a result of this study may be of value in any wider policy decision on the way ahead. While this can be seen as ensuring accuracy and consistency in any statement which might be made, it would also protect the DIS involvement which has, unfortunately, become public knowledge due to





Volume 2 - Introduction page 1

INFORMATION ON ASSOCIATED NATURAL AND MAN-MADE PHENOMENA VOLUME 2

SPECIAL NOTE: Working Paper No 9 contains NATO and UK RESTRICTED information on the UK Low Flying Routes and Regulations. This information is included as an aid to the filtering and analysis of UAP reports and is NOT available to the general public (UKR).

DETECTION OF UAPS BY RADAR

- 1. The incidence of visual occurences of UAP sightings, together with their coincidental detection on radar is extremely low.

 Conventional theory and radar system operation suggests that (given a radar sightline), the following conditions should occur for radar (UAP) detection to take place:
 - (a) The target must be radar-reflective. (See Appendix A5)
 - (b) A minimum detectable signal must return to the radar receiver to satisfy the radar receiver - S/N requirements (i.e. minimum detectable signal).
 - (c) The signal must be displayed (i.e. in a modern system which uses preset thresholds the display/processing threshold must be adequate for the target being inspected).

For a target track to be formed (a), (b) and (c) must be repeated at the radar's inspection (i.e. update) rate. In modern systems supposed 'spurious' random responses are likely to be rejected/filtered and unless they fulfil 'plot' requirements, will never be declared from successive plots into 'tracks'. Hence, they will not be seen as targets.

- 2. There is a significant absence of radar plots/tracks on UAPs. It should be borne in mind that, statistically, it is inconceivable that all UAPs in the UKADGE are reported by direct (human) sightings). In fact, there must be many more UAPs unreported which are within radar coverage but not within human sightlines (e.g. due to cloud cover, reduction of observers in sparsely populated parts of the UK etc.). Why, therefore, are not at least even a reasonable proportion of these reported by military or civil radars, either at sea, over land or by aircraft radars?
- Possible Explanations A number of explanations are possible. The conditions at

para 1 above are not being met for one or more reasons:

- For some reason the radar reflectivities of these unidentified objects are extremely low.
- b. Because they do not 'communicate' or appear where aircraft are expected, they are ignored by the operators (or the automatic processing systems) as spurious/short-lived observations.
- c. Those seen are taken to be caused by flocks of birds.
- e. The target cannot be seen because there is no radar sightline (e.g. terrain screening/low altitude). This can only be the case on a limited number of occasions, subject to range.
- g. The object absorbs RF energy at least at the usual wavelengths in use and hence is not detected.
- h. The radar rotation rate is so slow that fast objects do not remain within detectable coverage from one scan to the next so as to produce a series of plots or remain within detectable range. (For example a XRPM (xx sec) update rate would have a detection opportunity at range differences of ~xxkm on a Mach X target).

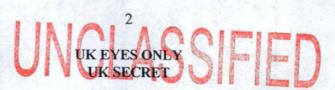
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Volume 3 - Executive Summary, Page 2. Paragraphs 4 x 7 speeds under the influence and balance of electrical charges in the atmosphere and they have a 5,26 ××××××××××××××××××××××××××× It is believed that the majority of 5.26 UAP targets are inherently variable in size, in radar terms. An analysis of the facts (reported at Volume 1) suggest that the majority, if not all, of the hitherto unexplained reports may well be due to atmospheric gaseous electrically charged buoyant plasmas.(S)

Foreign Military Interest

XXXXXXXXXXXXXX

- 10. Many other XXXX scientists have published papers on closely related subjects and \$.27 the conclusions from studying these are of importance to the UK findings. Several governments have also been sufficiently concerned to set up Commissions and Institutes to examine the phenomena. A brief examination of some of the open-press information and



scientific papers of topics (such as plasmas) when associated with reported UAP characteristics has shown that:

- Russian, Former Soviet Republics and Chinese authorities have made a co-ordinated effort
 to understand the UAP topic. Several aircraft have been destroyed and at least four pilots
 have been killed 'chasing UFOs'. The importance of the topic has resulted in appointment
 of astronauts and senior pilots, as well as senior scientists to carry out investigations.
- Russian investigators have measured (or at least detected) 'fields', which are reported to
 have caused human effects when they are located close to the phenomena.
- 11. Russian scientists have apparently connected their UAP work with plasmas and with the wider potential use of plasmas. They may have done considerably more work (than is evident from open sources) on the UAP-associated military possibilities of:
- The reflectivity/non reflectivity characteristics of plasmas and their potential use as reflector antennas, 'stealth' absorbers and for aerodynamic drag reduction.
- · The shaping of aerosol/dusty plasmas by an airflow to produce 'saucer' shaped volumes.
- Using UAP-type radiated fields as well as other RF fields to affect humans
- The possibility of producing and launching plasmas as decoys.

 (R)

XXXXXXXXX

Strategic Threats

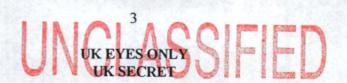
13. Although postulated in some quarters that the frequency and location of UAP events might be higher in the vicinity of important national assets and strategic military establishments, there is no evidence that this is the case for any reason other than a combination of the propensity of charged buoyant bodies to be atracted to mainly isolated assets, coupled with the presence of alert personnel at these sites. However, there appear to be good scientific reasons why higher numbers of UAP events occur (see also report Volumes 1 & 2). For example, they often occur where there are isolated electrically charged objects present, such as certain industrial and military buildings, power lines or cars in open countryside, or aircraft. (R)

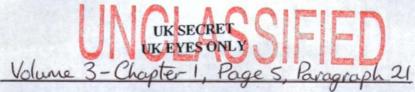


8. The reflected power measured by a radar system is the average integrated power reflected from a finite illuminated area. If the reflecting area is smooth, with no irregularities, then the reflection will be entirely coherent and specular and a one-dimensional model can be adequate. However, if there are large spatial irregularities then the signal will be completely incoherent and diffuse. In between these extremes the reflected signal will contain both coherent and incoherent components, depending on the physical structure of the irregularities. In the context of the 'multi-cored' UAPs this seems likely to be the case. In the near field, from these diverse reflectors, there will be interference patterns and, potentially, considerable variability of reflected signal strength. The far-field value will be the residual signal resulting from the incoherent combinations.(R)

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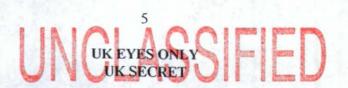
- 9. Since the plasma (or 'linked-plasmas' in a multi-core type UAP) will be, (according to witness reports of motion and colour change in the lights), in almost constant motion, it is reasonable to suggest that either regular or irregular field modulations could be present not only in the self-radiation of the body, but in its radar-reflective properties. In basic terms, its RCS is likely to be fluctuating, probably for most of the time. This may not be the case where single-coloured ball lighting is reported which seems to be more stable than the multiple colour, multiple 'core' system that frequently form 'triangular', 'rectangular' or 'stacked' assemblies, often with an apparent shaped black coloured void between the bounding 'hot spots'. It may well be the case that quite apart from variable scatter from a large proportion of the total apparent reflecting area, that the variation of the reflectivity of the core itself may be below a particular radar's minimum detection capability.(R)
- 10. The scattering of EM waves from a variable surface has been long studied for more conventional radar targets. For a fluctuating plasma a number of variations will be evident dependent, for example, on the RMS coherent scattering coefficient, the RF in use, the ripple and curvature on the plasma surface, the electron density, correlation length, etc. Refraction effects, additionally, could cause smearing of the beam profile and absorption further weaken the radar returns, even if the electron density is theoretically adequate for the incident RF to be reflected under ideal conditions.(U)
- 12. Plasma Cylinders & Vortex Rings Occasionally UAP reports describe a circular, cylindrical or 'boomerang' shape. These are sometimes oriented horizontally and sometimes vertically and various models are proposed. Entities are sometimes described as "a row of balls touching each other" or "a stack of discs one above the other"; the radius differs at various points along the 'cylinder' length. In some ways the resultant RCS can be expected to

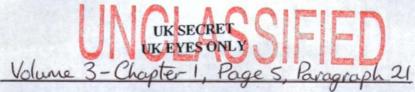




be moving at some velocity, whereas the 'UAP' can either be stationary or moving. Hence, there appear to be conditions occurring where the charges do not come together but reportedly parallel the aircraft course or follow it. When (conducting) flying vehicles enter a non-uniform field (E) a current dependent on $\partial E/\partial t$ arises in the vehicle. The balance of the charge with the UAP charge dictates the UAP subsequent motion. It is further reasonable to assume that the charged (phenomena) body may be either gaining or loosing energy hence it may dissipate and disappear (U)

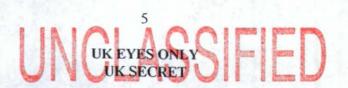
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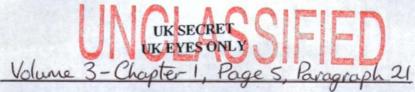




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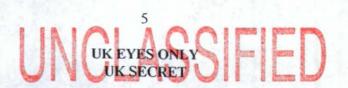
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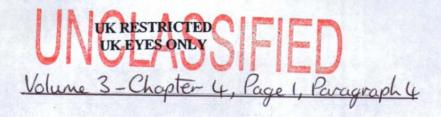
The search beam (with, say, an azimuth beam-width of 1.5 Deg.) takes ~40m.seconds to pass through the UAP target. However, the velocity of the target may be 10km per second, travelling some 400 metres in this scan time. If UAP travel is across the beam and the radar detection range, due to the small target size, is only, say, 20km, (at which range the beam is only ~525m wide), the actual beam velocity is also travelling (at that range) at over 13km per second. Hence, depending which way the target is moving, either the radar beam is chasing the target and just overtakes it or, if the target is moving in the opposite direction to the beam, the dwell time on the target is seriously curtailed, as the time-on-target could easily be halved. Either way a relatively small number of pulses hit the target. With a PRF of, say 265pps about 11 pulses are designed to hit the target in normal operation against aircraft. Against a UAP, not only is it a small target in all probability, it may only receive half the number of pulses XxxxXxxxxxxxxxxxxxxxxxxxxxx 5.26

27. Several other factors are important:

favourable.(R)

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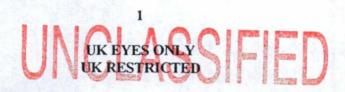
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CHAPER - 4 UAP WORK IN OTHER COUNTRIES

FORMER SOVIET UNION

- 1. It is clear that the Former Soviet Union has taken the study of UAPs seriously and that this may well be related to a programme of understanding and exploiting certain UAP-related natural phenomena, such as plasmas. A 'UFO' Commission was created under the USSR Union of Scientific and Engineering Societies in 1989; together in 1990 with an Inter-Industry Ufology Research Centre (SOYUZUFOSENTR) to co-ordinate records. This Centre had the rights of an Institute under the USSR Academy of Sciences, and was headed by V.G. AZAHAZHA (or AZHAZHA) an eminent researcher and former naval submariner. A school was set up with the Terms of Reference to study "ufology as a science of unidentified flying objects and their inter-relations with the universe and, in particular, with the biotechnosphere of the earth". The ten week course, reportedly studied, observation, characteristics, astronomy and psychophysical aspects of the problem. The russians use the acronym UFO in all their references, course names etc., and this is used here rather than UAP, while discussing their work(U)
- 2. V.V. ALEXANDROV and Y.N. GLAZOV, respectively Senior Project Engineer and Astronaut (Hero of Soviet Union) both of the Test Centre (Tsenatr Podgotovki Kosmonatov) at the Scientific Production Association (Geophysics), have been involved in research into UFO activity in 'abnormal zones' and landing places(!). A laboratory to support this work is reportedly located at AKHTUBISK (on the Volga). Glazov was Deputy Head of the Cosmonaut Training Centre in charge of science and testing.(U)
- 3. Plasma Research. Annex A summarises two russian scientific papers where, it appears, 20-30 scientists have pursued research for the prevention of air target detection. **\times\
- Former Soviet Union Ufology Commission 4. The Commission Head, Azhazha, was also a member of the USSR Union of Scientific and Engineering Societies Ufology Commission. The geographical features of zones in which UAP reports have been particularly frequent have been studied. Russian open reports attribute UFO activity as being 'purely terrestrial in origin', according to some theories. The Institute have reportedly developed light filters, instrumentation, IR and UV photography to pursue the topic. Unexplained imagery has reportedly been obtained including "peculiar spheres, humanoid figures (perceived as cylinders, circular objects and man-like beings in visible light). If the imagery exists, it has never been published. It seems more likely that images may have been seen but not recorded. Some theories, Azhazha reported, attribute these to "manifestations of some substance whose nature is little known at present. This substance may be capable of forming organic matter and temporarily becoming visible to the unaided eye". [COMMENT: The reader is referred to the unusual effects on humans apparently caused when in proximity to some aerial phenomena, reported at Volume 2 Working paper No 25.] It is known that prior to the 1990's the USSR had a small team working on the 'UFO' topic at Ramenskoye (Zhukovskiy). (C)
- 5. Near Field Effects In 1991 a group of Russian Researchers, having collected soil samples from an alleged UFO landing place noted an unusual field (NFI). V. KHZOPOV (a member of an Applied Biolocation Group), reported that other samples were obtained from other reported landing sites. In all cases a local field developed over a period of three hours. Impairment of human senses were reportedly observed in every person studied who had been 'in the field'. The main effect was that the thought processes were degraded in some way, but that 'energy was also added'. The report published in 1991 states that the energetics of the upper human



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OTHER NATIONAL ACTIVITY

- 10. CHINA In the early 1990s China announced an interest in Unexplained Aerial Phenomena, and in May 1993 set up a 'Scientific Institute for the Study of UFOs. This Institute numbers more than 300 cooperating specialist members over 24 Industrial and Municipal Departments centred on Peking/Beijing and other large cities. The TORs are to determine whether UFOs represent unusual or unconventional astronomical phenomenon. Some articles have appeared in the Chinese News Media (in UKHAMI), together with UFO photography. The Chinese had contact with Russian officials on the topic of UAP in the setting-up of the organisation described briefly above, specifically Academicians Frolov, Kasmacheev and Pitrovich.[1][(U)
- 11. SPAIN The Spanish MoD have taken the 'UFO' phenomenon seriously. Sixty six files have reportedly been released to the public. DI 55 Staff have not seen these files.(U)
- 13. The medical experiments which unexpectedly replicated 'UFO' effects on humans took place at the University of Ontario, Canada. No papers have been seen which directly relate these to an intention to replicate UFO effects obtained in Ontario,. (U)

[1] Comment: Source is translation of barely readable text on a document visible during a video interview





Executive Summary - Final Page

SCIENTIFIC & TECHNICAL MEMORANDUM 55/2/00

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