
Radar-Visual Encounter at Bentwaters

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Originally published in:
Spemcer, J., & H. Evans (Eds),
'Phenomenon:
From Flying Saucers to UFOs - 40 years of Facts and Research',
Futura/Macdonald, London & Sydney, 1988 pp.82-96

DISTANT CONTACT: RADAR/VISUAL ENCOUNTER AT BENTWATERS

Martin Lawrence Shough

At nine thirty pm 13 August 1956, Bentwaters USAF/RAF air base, a few miles east north east of Ipswich in Suffolk, would have betrayed no sign of unusual happenings to the casual passer-by. But radar operators in the airfield's Ground Controlled Approach (GCA) unit were by this time alerted to something strange on their scopes. At a displayed range of twenty-five to thirty miles, out over the North Sea, a target was picked up on the ten centimetre CPN-4 surveillance radar. It was on a west north west heading into the airfield. The rate of closure was measured with each four-second scan of the radar antenna: each sweep showed the target between five and six miles closer. The target looked like a normal aircraft echo, but within about half a minute the target had crossed the centre of the scope (Bentwaters) and was lost fifteen to twenty miles inland. Airman John Vaccare's estimate of thirty seconds' total transit time, if rationalized to a multiple of the four-second scan rate – thirty-two seconds – suggests a speed of 4500–5000mph. The most accurate measure is likely to be the distance covered from scan to scan, leading to a mean speed of 4950mph. The consistency of these figures argues against careless observation. Vaccare, no doubt conscious of the difficulty of precise

measurement with a target of such unprecedented speed, settled for a cautious approximation of 4000 mph in the intelligence report sent to Project Blue Book, the US government study of UFO reports at the time.

The sightings: At about the same time another group of targets was noticed at a range of eight miles to the south west and moving towards Bentwaters. These 'appeared as normal targets' on the GCA scope manned by Training Sergeant Whenry, (whose detailed report forms the basis of the account of this event appearing in IR-1-56). Some twelve to fifteen echoes were approaching in a cluster, spread over a six to seven mile area and preceded by 'three objects which were in a triangular formation with an estimated 1000 feet separating each object. Moving at speed varying between 80 and 125mph, the group crossed the centre of the scope and proceeded north west, giving consistent returns, for a distance of about forty miles, fading somewhat as range increased. During this time 'normal checks made to determine possible malfunctions of the GCA radar failed to indicate anything was technically wrong', so a T-33 of the 512th Fighter Interceptor Squadron which was returning to Bentwaters from a training flight was vectored to the area and asked to search for the targets. The Lockheed trainer, unaided by airborne radar and without the benefit of height-finder information from the ground, searched the area visually at an unknown altitude without finding anything. Meanwhile, the target-cluster was forty miles north east, at which point it converged to form a single echo with a presentation several times the strength which would be given by a B-36 (one of the largest production aircraft ever built) under comparable conditions. This very strong echo now stopped its motion to the north east and maintained station for ten to fifteen minutes, after which it began to move again, still to the north east, for a further five to six miles,

before once more coming to rest, this time for only three to five minutes. Then it picked up speed once more and moved off the scope to the north.

A few minutes after this target had disappeared a blip appeared at 2200 hours due east of Bentwaters at thirty miles range; it was a high speed target similar to the first one detected thirty minutes earlier, crossing the screen at a speed estimated by Whenry as 'in excess of 4000 mph'. The return appeared, once again, 'normal' and resembled that of an ordinary aircraft except for its remarkable speed. Twenty-five miles west of Bentwaters the target 'disappeared ... by rapidly moving out of the GCA radiation pattern'.

For a further fifty minutes or so, nothing further happened at Bentwaters. At this time no visual sightings had been made, from the air or the ground. Staff Sergeant Lawrence S Wright, the control tower shift-supervisor, had seen nothing but Mars low on the eastern horizon. He watched the bright planet through binoculars as it rose. He didn't know that it was Mars, and reported it in case it might be relevant to the radar tracks. But he described it perfectly, so we can identify this light with confidence.

Suddenly, however, at five to eleven, three events happened simultaneously. According to telegraphic report BOI-485 radar recorded another high speed target, this time between 2000 and 4000mph. This time something definite was seen from the ground: control tower personnel saw 'a bright light passing from east to west over the field at terrific speed at about 4000 feet altitude' while simultaneously the pilot of a transport aircraft (identified by the Lakenheath ATC supervisor as a C-47) which was flying over the field saw a bright light 'streak under his aircraft', again at terrific speed. This independent visual corroboration seems to have stimulated Bentwaters personnel into action. A phone call was placed almost immediately to the GCA facility at Lakenheath 'to determine if unusual sightings were occurring'. *Thus*

began one of the most remarkable radar-visual sequences on record.

At Lakenheath, GCA personnel in turn phoned GCA at Sculthorpe RAF Station in Norfolk, some miles to the north. Whether anything was seen at Sculthorpe is not known as we have no access to documentation. However, either Sculthorpe GCA or Lakenheath GCA then notified the Air Traffic Control unit at Lakenheath and the Watch Supervisor there, although initially sceptical, 'immediately had all controllers start scanning the radar scopes.'

Lakenheath Air Traffic Control Centre, five to eleven GMT 13 August 1956. Training Sergeant Forrest D Perkins, Watch Supervisor, is at the Supervisor's Co-ordinating desk. The four or five other controllers on this five to midnight shift are keeping only a casual eye on the scopes. Things are quiet, with 'very little or no traffic' at this time. A phone rings; a controller answers and passes the call to his Supervisor. Because the call is routed through the Sculthorpe switchboard and because Perkins has missed the caller's introduction, he believes the message is from Sculthorpe RAF Station and will not discover his error for another twenty years. But the content of the message overshadows its origin: the caller asks whether Lakenheath ATC gave any 4000mph targets on their scopes!

Sergeant Perkins is understandably sceptical of this report, but instructs his controllers to start keeping a close watch, with all the scopes set on different range scales from 10-200 miles radius. All the scopes are using a moving target indicator (MTI) circuit, an analogue delay line which enables the frequency of successive reflected radar pulses to be compared and filters out returns from targets which are stationary (or nearly so), thus clearing the screen of inconvenient 'clutter' due to ground reflections. For 'ten or perhaps twenty minutes, certainly no more' the controllers watch for the reported high speed targets, seeing

nothing. Then, at about five past eleven, one controller notices something different, but almost equally strange: about twenty to twenty-five miles south west radar shows a stationary target which, with MTI switched in, should not be there. Having satisfied himself that this target appears 'on all the different scopes' Sergeant Perkins calls the Lakenheath Ground Controlled Approach (GCA) unit, who confirm that the target is 'on their scope in the same geographical location.' Twelve years later, the SECRET intelligence teletype BOI-485 will confirm this simultaneous detection and Sergeant Perkins' memory of the target range and azimuth, adding that GCA radar had tracked this target to its present position from a position only six miles west of Lakenheath (where it would have been within the minimum range of the CPS-5 ATC radar).

After several minutes ('five minutes' – BOI-485) the target begins to move, without any perceptible acceleration, at a speed between 400 and 600 mph to a position some twenty miles north north west of Lakenheath, where it suddenly stops. At this time, about ten past eleven, Perkins sets in motion a standard alert procedure. He calls the 7th Air Division Command Post, London, the 3rd Air Force Command Post, the Base Commander, and his Air Force Communications Squadron Commander, all of whom are hooked into the ATC switchboard. An RAF Liaison Officer is also patched in, together with 'possibly others' whose identity Perkins is 'not aware of'. A busy conference line is thus established at Lakenheath, with Sergeant Perkins as its eyes and ears, relaying the situation as it develops and fielding questions and theories. The conference line authorities receive 'a detailed report on the target's movements and location' as it continues its high speed, straight line movements around the area at 600 mph, punctuated by stationary periods of between three and six minutes. Finally, at about eleven forty, 'after, I imagine, about

thirty to forty-five minutes', Sergeant Perkins is made aware that a decision has been reached in consultation with the RAF to intercept the target; at this point the RAF coastal air defence and Ground Controlled Interception (GCI) radar at Neatishead, Norfolk, some forty miles north east of Lakenheath, enters the picture. Neatishead, however, is not the only RAF facility contacted.

In the underground concrete complex at Neatishead, the Chief Fighter Controller, Flight Lieutenant FHC Wimbledon, looks out from the controller's desk flanked by radar displays and communications equipment, through a glass partition and down on the large plotting board below, which shows a map of the north-eastern coastline of Norfolk. On the far wall an indicator board is ready to display details of any aircraft airborne, and the nature of the sortie. Off this room to the Controller's right are two isolated interception cabins, each equipped with a duplicate set of radar consoles fed from the cluster of radar antennae rotating ceaselessly above ground. Just after eleven forty Flight Lieutenant Wimbledon receives a call informing him of a situation at Lakenheath and the decision to scramble an interceptor. The controller relays the scramble authority to the duty airfield this night, RAF Waterbeach near Cambridge, mans both radar cabins with their four-man interception teams, and waits. The target, which they have taken no notice of before since their concentration is on the possibility of inbound targets to seaward, is clearly visible on their scopes. It will be some minutes before the aircrew at Waterbeach can run up the engine, get airborne and establish VHF contact with Neatishead, because of the airborne radio's poor range performance at low altitude and the unfavourable windward take-off pattern (a south-westerly climb and turn) which will take the aircraft initially in the opposite direction.

Meanwhile, the various authorities who are coordinating their reactions to this event through the

Lakenheath RATC centre switchboard have a separate problem. In routine airspace-penetration situations the primary concern is defence. On one level the detection of an unidentified intruder has to be an air defence issue, but the normal *operational* utility of interception procedure may not satisfy the needs of *intelligence* on another level. In the case of a 'UFO' which is clearly not a hostile or stray foreign aircraft in the usual sense, the usual strict rules for engagement will be subsumed by those of a more open-ended intelligence situation.

At Lakenheath in 1956 the concerns of USAF intelligence, RAF intelligence, and more especially the CIA, conflict with the air defence responsibilities of Neatishead GCI and Fighter Command, in as much as the narrowly defined role of the GCI system makes it useless for the purpose of gathering real-time intelligence. Neatishead's function is simply to guide the interceptor onto the tail of its target with only the bare minimum of radio communication; a different responsibility has been levied on the intelligence agencies, and so a different channel of communication must be set up.

At some time around eleven forty-five, a phone rings in the Operations briefing room of RAF Waterbeach. Outside, the crews of the night duty Flight of 253 Squadron, No 11 Group, Fighter Command, wait out the night in the cockpits of their aircraft, ready to press the starter buttons and take off at a few minutes notice. They are oblivious to the situation now being explained to the operations controller, who, almost certainly, is given no idea of the significance of the instructions he is receiving. The controller puts the phone back in its rest and switches on the telebriefing microphone, which connects the briefing building by a secure landline to the aircraft waiting at the operations readiness platform. In one of the eight de Havilland Venom NF.2a night fighters standing ready-fuelled on the dark airfield, the pilot

and radar operator are startled by a warning lamp on the port-side instrument panel, and the voice of the operations controller in the pilot's headset instructs the pilot to pre-select a frequency on one of the Venom's two ten-channel VHF units, then stand by for further instructions. Moments later the controller's phone rings again, and the Chief Fighter Controller at Neatishead authorizes a scramble. Immediately, the operations controller gives the Venom pilot his interception frequency, advises him on the special discretionary use of his second frequency, and clears the aircraft for take off. The telebriefing landline connection, which automatically disconnects the Venom's VHF transmitter for security, is automatically released as the jet moves away from the operations platform towards the runway.

By eleven fifty pm the Venom is airborne to the south west of Waterbeach and executing a climb and turn back towards the north east in the direction of Lakenheath. Because of the limited range of the VHF transmitters at low altitude the pilot is not yet able to talk to Neatishead, over seventy miles away, so he takes this opportunity of using his discretionary frequency to get more information. Lakenheath ATC established radio and radar contact with the Venom inbound from the south west at a range of thirty to thirty-five miles and 2-3000 feet altitude. At this time Sergeant Perkins gives the pilot 'all the background information' and relays the current movements of the target. The time is eleven fifty-two.

Four minutes later the Venom is approaching the area of Lakenheath and its range and altitude permit the pilot to talk to his interception controller at Neatishead. The pilot flicks his VHF selector switch to the second of his pre-selected frequencies and opens the channel to Neatishead. However, because neither Neatishead nor Lakenheath can hear anything unless the pilot depresses his press-to-transmit footswitch, regardless of the frequency to which he is tuned, there

is no way for the Lakenheath controllers to tell that the pilot has ceased listening to them, nor any way for Neatishead to tell that the pilot was recently listening to somebody else. Nor will either party ever be told; it is a question of having no 'need to know'. Consequently, Sergeant Perkins and his team continue to issue headings to the interceptor in the belief that they are in control as they watch the blip on their screens closing towards the UFO under the real direction of Neatishead GCI.

At midnight, the pilot has visual contact with a 'bright white light' (BOI-485) and calls Neatishead: 'Contact'. Shortly afterwards the code 'Judy' informs the interception team that the Venom's radar operator has the target firmly on his own scopes and requires no further help from the ground. Following instructions, the pilot is now free to open his radio channel to Lakenheath; this is of no importance to the radar operator, since his instructions to the pilot automatically override the VHF link when he presses the intercom press-to-talk switch. As the Venom closes rapidly on the now-stationary target, the pilot has time only to report to Lakenheath: 'I've got my guns on him', before his transmission is interrupted by the radar operator reporting the sudden loss of the target from his radar. This pause is noted by Sergeant Perkins, who then hears the pilot say: 'Where did he go? Do you still have him?' The reply goes back: 'Roger, it appeared he got behind you and he's still there.' The swift circling of the UFO target behind the interceptor has also been seen by the interception teams at Neatishead, to whose frequency the pilot now switches back for fresh instructions in order to evade his pursuer. (The Lakenheath air traffic controllers are neither trained to deal with this sort of situation nor are they properly equipped to do so, lacking the vital assistance of height-finding radar). The terse message, 'Lost contact - more help' alerts the Neatishead controller to the pilot's need for guidance;

the controller confirms the new situation, and for the next five minutes the pilot tries to shake the target from his tail, without success. A second Venom is now scrambled from Waterbeach, but it will not arrive in time to make contact with the target.

At about five minutes after midnight the Neatishead radar scopes lose the target in a manner which the Chief Fighter Controller interprets as a rapid descent out of the radiation pattern.¹ The target is not seen again by GCI radar, and shortly the interceptor is released from its mission. But Lakenheath is at this time still painting both the UFO and the interceptor, because Lakenheath's low-altitude radar coverage in its own immediate vicinity south of the field (the area of the chase) is far better than that of Neatishead, many miles to the north east. Thus, whilst for Neatishead the incident is over within five minutes, at Lakenheath Sergeant Perkins estimates a duration nearer ten minutes because the target is still visible during the time the Venom breaks off the action and starts on the journey home. At this time, the Venom pilot calls Lakenheath for the last time, informs them that he is returning to base and requests that they let him know if the UFO is still following. On the ATC scopes, the controllers watch the target tail behind the departing Venom on a south south west heading for a 'short distance', then stop at a position ten miles south of the field.

It is now ten minutes past midnight on the morning of 14 August, more than an hour since the target was first detected at Lakenheath. In the air traffic control centre the midnight relief shift have joined Sergeant Perkins' team in watching the radar scope. In the controller's headsets the voices of the two Venom pilots, one still inbound, the other on his way home, are heard in conversation: 'I saw something, but I'll be damned if I know what it was ... It's the damndest thing I've ever seen.' The radar operator in Venom number one depresses his press-to-transmit footswitch

and adds: 'Clearest target I've ever seen on radar' (BOI-485). The second Venom crew are denied the opportunity to see for themselves, however; as far as Neatishead GCI is concerned, the incident is over.

Shortly, the target begins to move. At a steady 600mph it crosses the scope in a northerly direction, finally being lost at a range of about fifty to sixty miles. An image on a radar scope, seen by few human eyes, has vanished; and all that is left of the Lakenheath UFO is the product of investigation, debriefings – reports and analyses that few will ever read. Years later, but for one chance letter, it would be as though the whole affair had never happened.

The implications: To study a case such as Lakenheath is now a kind of historical enquiry. Not exclusively, for we can discuss the details with some of those who were present and there is quantitative information in contemporary documents; but the meaning of the recorded facts will forever remain rooted in an historical context to which we cannot have direct access. There can never be direct experimental proof of the Lakenheath UFO, no matter how suggestive the *prima facie* evidence may be. Does this make the case useless as scientific evidence?

Oddly, the inevitable missing fragments and apparent contradictions which show up in enquiries of this nature can *increase* our confidence in the source material. Many small problems may take a great deal of painstaking trial and error to resolve, rather in the manner of reconstructing a jigsaw puzzle. Some pieces are found to be missing and the process is often frustrated by the discovery that some interpretation of a sequence of events fails to fit other parts of the picture. But twenty years later enough of the pieces can now be assembled to convince us that they are parts of an intelligible picture.

Many UFO puzzles do *not* work when we try to fit the pieces together but in the case of Lakenheath, the

emerging picture begins to look very much like the picture on the box.

If the *prima facie* story hangs together well, what does it tell us about the UFOs? Can they be explained? There is no space here to attempt a detailed analysis of the many factors involved in interpreting radar-scope images or to embark on a critique of the arguments of the last twenty years; these technical issues are more fully addressed elsewhere. But we will touch on some of the less implausible interpretations here, and summarize the reasons why the Lakenheath case is held to be of rare scientific importance.

Firstly, the events at Bentwaters. Close study of the eleven-thirty slow cluster of targets has been made in terms of the following hypotheses: aircraft, birds, insects, balloons, surface vehicles/anomalous propagation, orbital bodies, meteors, microscale clear air turbulence, ionization phenomena, precipitation cells, sidelobe returns and multiple reflects effects, radio-frequency interference, electronic countermeasures techniques and spurious internally generated signals. None of these hypotheses can explain the reported target behaviour. The only hypothesis so far considered which can claim any degree of plausibility is that of reflections due to waves propagating across an inversion surface under the influence of winds, but this too requires considerable violence to be done to major features of the description.

An inversion is a stable, layered automatic structure capable of reflecting radar waves and giving an illusion of movement. However, in the case of the Bentwaters targets there are discrepancies of direction, moreover the two stationary episodes during which no movement was observed for a total period of many minutes are unintelligible in terms of such reflection. Most serious of all, is the objection that the signal strength of returns due to partial reflection is *inversely* proportional to elevation (and thus proportional to range), so that such echoes drop below the noise level

of the receiver at close displayed ranges, becoming stronger as range is increased. In this case the targets were first noticed at close range, crossed the site with the appearance of 'normal' echoes, then began to fade as they *receded*. This type of behaviour is much more understandable in terms of real, radar reflective point targets (such as aircraft) than in terms of inversion reflections.

The three rapid targets detected at Bentwaters are equally difficult to explain, bearing no relation to known types of propagation anomaly. The speeds are an order of magnitude too high for meteorological explanations and unattainable by any known aircraft. The possibility of returns from the ionization wakes of meteors has been considered, but the geometry of the tracks, the improbability of three *radial* overflights on two *different* headings, and the simultaneous visual confirmation of the last track from above and below, all make this hypothesis extremely unlikely. Only a very brilliant fireball would have much chance of being detected at all on the CPN-4 in a radial orientation, and if such a fireball was somehow responsible for the five minutes to midnight radar visual report it is curious that not one single report of it is known to have been generated elsewhere in the UK. It has been pointed out that the event took place close to the maximum of the Perseid meteor shower, but the celestial co-ordinates of the Perseid radiant for that date and time are nowhere near the azimuths of these radar tracks.

Another possibility which deserves close attention is that of spurious internal signals which have been known to create fast tracks on radar scopes, but it can be shown that such an effect is essentially impossible for 1950s analogue technology.

When we come to the Lakenheath events, the multiple radar combined with visual contacts makes any hypothesis other than a 'real UFO' almost impossible to support. In the early stages, correlating

returns were displayed on ATC and GCA radars of different design whilst ground personnel reported 'round white lights' displaying 'substantially the same' behaviour (which, they were careful to point out, bore no relation to the Perseid meteors simultaneously visible). When Neatishead was alerted a further ground radar channel was introduced, and the GCI system itself is a multiple radar array using different frequencies and pulse rates. At this stage, the added confirmation of the Venom interceptor's airborne radar, plus the pilot's eyes, seems almost superfluous. There is also a report from civilian observers on the ground at Ely, a few miles west of Lakenheath, of what may have been the object and the Venom in pursuit.

By any ordinary standards of evidence, the probability that something was in the air over Suffolk that night must be rated very high. Its scope presentation was strong and consistent, comparable to that of an aircraft, according to both USAF and RAF sources, and correlating returns on radar scopes of different characteristics many miles apart rule out any other currently available theory. The same very singular sequence of manoeuvres was watched on these radars, perfectly matching the simultaneous experience of the intercepting aircrew. Every significant aspect of the case so far investigated is consistent with the reality of the UFO, and it is impressive that this consistent picture emerges as the confluence of independent and corroborative sources of testimony. This corroboration exists *in spite of* what they themselves might feel to be fundamental *disagreement* on certain issues, and their testimony is supported with quite remarkable exactness by contemporary documents of which neither had any knowledge.

After twenty years of study and debate, no serious doubts have been cast on the credibility of this case; on the contrary, new information has increased its significance very considerably, and Thayer's 1968 conclusion now seems more apt than ever: 'The

apparently rational, intelligent behaviour of the UFO suggests a mechanical device of unknown origin as the most probable explanation of this sighting.² In a purely logical way this conclusion ought to be easy to accept. But the astonishing implications of accepting it, as well as the courage needed to accept it, may for a long while to come remain beyond our grasp.