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Aviation Safety in America – Spherical UAP

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Executive Summary

This paper represents a review of unidentified aerial phenomena (UAP) cases involving aviation safety for incidents where the shape of the UAP could be considered as spherical as contained in Appendix 2 of (Haines, 2000). Forty four spherical UAP cases are identified and reviewed and two photographic cases depicting spherical UAP are examined for a variety of factors relating to aviation safety and witness perceptions of the UAP. A variety of questions are engaged in an attempt to develop a general profile of spherical UAP. Certain trends are identified that should be compared with larger samples for validation or exclusion. For example, spherical UAP are not often detected on radar. The author explores several reasons why this may be a defining characteristic of these particular UAP. The author suggests that a misunderstanding has contributed to a “blind spot” in research that is overlooking atmospheric phenomena that may be quite coherent and unusual and yet not be detected on radar. Further, the author suggests that spherical UAP radiate energy and could be a threat to vital aviation systems.

Pilots and aviation professionals have reported safety-related incidents/observations of UAP that are spherical in shape. In some cases the spherical UAP are described as lights while other descriptions are of metallic or glowing objects. These spherical UAP are described as demonstrating complex trajectories, high rates of speed and unusual movements that are often regarded as a hazard by aircrews that report encounters with them. 15 of 44 aviation safety-related spherical UAP cases reviewed described near mid-air collisions (collision headings to less than 1,000 ft. of separation). Spherical UAP radiate energy in both visible and invisible wavelengths and photographic evidence is presented. Additional safety factors related to aviation safety incidents involving spherical UAP include CRM/crew distractions and concurrent temporary or permanent electrical equipment failures.

The focus of this paper then is to examine U.S. aviation safety-related cases where the witnesses describe objects of a spherical nature and singular lights when there is no witness description of a readily identified accompanying object. The source for the cases in question is the Appendices of a paper by NARCAP Chief Scientist Dr. Richard Haines titled “Aviation

Safety in America – A Previously Neglected Factor” published in 2000 (NARCAP TR-1). Additionally, two photographic cases will be examined¹

Introduction

Unidentified Aerial Phenomena (UAP) are continuing to be reported by aviators and other aviation professionals. When reviewing these reports there seem to be several threads of commonalities that might indicate specific and distinct UAP profiles. The primary differentiating descriptor is shape. UAP are reported in a variety of geometric forms as well as singular lights or patterns of lights. Oblate spheroids, elliptical shapes, triangles, cones, squares or diamonds, and spheres are the most commonly reported forms. Often the descriptions of these forms include various lighting patterns and effects ranging from: individual lights that appear to be on the surface of an apparently solid object; objects whose form becomes visible because the entire surface glows; and individual points of light of various frequencies and intensities. These unusual phenomena are described as ranging in size from less than 1 ft. to over 1 mile and seem to occur at any altitude. (Hall, 2000)

Pilots as Witnesses

The issue of the “quality” of a pilot as a UAP witness versus other types of UAP witnesses is occasionally raised.

The nature of professional aviators has changed since WWII and today’s aircrew tend to be both college educated and better trained. Indeed, a college degree is required to participate in U.S. military aviation programs.

In reviewing interviews with pilots as UAP witnesses it is clear that they are aware of their own perceptual shortcomings. Often they will refrain from presenting a clear estimate of distance from the UAP or its size, for example, because they know that their ability to judge distance and size while in the air is suspect. Pilots are aware that they are subject to perceptual failings and that awareness seems to make them more conservative in their engagement of UAP observations and reports

One might expect that higher education combined with a tangible fear of on-the-job recrimination (Roe 2003) would produce a “quality” witness with a bias against reporting any UAP observation or incident. Indeed, NARCAP has received many reports from aviation professionals after they retire.

In reality, there is no real difference between a pilot witness and other types of witnesses. It is the standardized approach to aviation incident investigations that are often supported by radar data, voice and other recordings, air traffic controller involvement, etc. that make aviation cases involving UAP particularly compelling.

1. Both cases are discussed from a different point of view elsewhere: 2.3.2 and 2.4.2, respectively.

The Problem of Database Analysis of UAP Descriptions

A primary problem in reviewing UAP databases for UAP descriptions lies in the variability of the terminology used and the lack of ancillary data to clarify that description. For example, a UAP may be reported as both a light and an object. A luminous UAP may be referred to as an object. A UAP that is glowing may be referred to as simply a light. In many cases it is difficult to determine whether the light was so intense as to mask an object or otherwise make the shape of that object indiscernible; nor do we know if it was merely *a light on an object*. In some examples we see that the matter resolves itself over the course of the encounter. In others, there is no resolution and the UAP is simply described in so many words as, for example, an indistinct glowing object.²

To further complicate the matter, the description of UAP shape is dependant on the position of the witness relative to the UAP. For example, objects seen as “round” could actually be disk shaped, spherical or cylindrical depending on the angle of observation. Additionally, a witness offering a description of “round” could imply a “round” sphere or a “round” disk or a “round” cylinder or a “round”, singular light.

Additional problems lie with almost every aspect of UFO reports where the researcher is forced to rely on witness perceptions and memory. Temporal issues as well as distance of UAP from witnesses are problematic. In cases where witnesses do not provide the duration of the sighting or a description of distance of the UAP from the witness it sometimes seems possible to offer approximations however the author has avoided doing it. This leaves some very important variables in question when reviewing historical UAP encounters and should motivate the investigator to push for exacting clarity when interviewing witnesses.

Indeed, an examination by NARCAP Research Associate Massimo Teodorani entitled “A Comparative Analytical and Observational Study of North American Databases on Unidentified Aerial Phenomena,” (2009) strongly suggests that while databases of UAP reports seem to indicate the presence of something as yet unresolved, simply reviewing databases for correlating information may not be as rewarding as one might hope given the inaccuracies in terminology by investigators and witnesses and the perceptual limitations of the witnesses themselves.

Given these difficulties the author has decided to treat cases where the witness describes an indistinct glowing object or simply a singular light as a spherical UAP. Further, the author has also included those cases described as round, spherical, balls or globes. While the accuracy of the study may be effected somewhat, the important point lies with how the witness perceives the UAP.

This report presents a review of 120 UAP cases involving aviation safety issues for those incidents where the UAP is described as a singular light or a round/spherical object. This includes cases where the UAP is described simply as a light or an indistinct glowing form. Additionally, two photographic cases will be reviewed. The primary concern is to identify

2. Paper 5.2 discusses this subject as well (Ed.).

characteristics of spherical UAP that may help define them as a specific profile of UAP encounter.

Part 1 – Spherical UAP

Distribution of Spherical Cases by Category of Aircraft

Of the 120 total cases reviewed, forty four involved descriptions that seem to indicate that the UAP was spherical in form. Witness descriptions included terminology like “round”, “ball-like”, “a round light”, etc. Of these 44 spherical cases, 11 involved military aircraft and crews, 15 involved commercial aircrews, 17 involved private aircraft and one case involved a police helicopter. (Table 1)

Police Helicopter	1
Private Aircraft	17
Commercial Aircraft	15
Military Combat A/C	4
Military Transport A/C	4
Military Trainer A/C	2
Military “Other”	1

Table 1. Distribution of Spherical Cases by Category of Aircraft

Witness Profiles

Of the forty four spherical cases reviewed, 38 involved single aircrews, 4 involved more than one aircrew and only 2 cases involved Air Traffic Control (ATC) as primary visual witnesses to the event. (Table 2)

	Single Aircrew	Multiple Aircrew	Aircrew and ATC
Police Helicopter	1		
Private A/C	15	2	1
Commercial A/C	12	1	1
Military Combat A/C	4		
Military Transport A/C	4		
Military Trainer A/C	2		
Military “Other” A/C		1	
Total	38	4	2

Table 2 - Cases involving single aircrews vs. multiple aircrews vs. aircrew and ATC as direct witnesses to the incident.

Daylight vs. Night Reports of Encounters with Spherical UAP

Of the forty four spherical UAP cases reviewed, 39 of those encounters occurred after dark and 5 of them occurred during daylight hours.

Many of these 39 cases involve a singular light that could be masking a solid form that is other than spherical. Also, in those cases where a singular light is reported, there is no way to be certain that the observations involved a “pure light form” versus a solid object that was brightly lit or glowing. The majority of observations either described the UAP as a round, spherical, glowing or luminous globe or ball-like object, or they were simply described as a light.

It is reasonable to assume that the majority of night observations of UAP reflect the stimulus of a light source rather than an observation of an unlit, solid object.

Size of Spherical UAP

Of the forty four cases reviewed 34 offered no estimate of the size of the UAP encountered. It is difficult to estimate size and distance while airborne, particularly at night, and it seems that many airmen are aware of this shortcoming and avoid offering it in their report(s).

In some cases the witnesses were able to make approximate statements of size based on the perception that they were in very close proximity to the UAP. Those size estimates ranged from one foot in diameter to “10 to 20 ft” in diameter. Other estimates were comparisons with the size of their own aircraft or simply words like “small”, “large”, or “huge”. In one example the estimate was merely angular: “the size of a basketball held at arms length” or an angular size of 20 degrees (cf., Case 45 Appendix 1) which would imply an imposing observation indeed. In some cases estimates of angular size were offered by investigators ranging from 2 degrees to 20 degrees arc but we have no accurate way of determining how large the UAP were in most cases as there is no way to accurately estimate distances from the witness.

Proximity of Spherical UAP to Aircraft at Closest Point

Of the forty four spherical UAP cases reviewed, 24 cases did not offer an estimate of closest distance between the UAP and aircraft and the remainder offered estimates ranging from “less than 10 ft” and “close enough that I ducked my head” to distances estimated at between one and one-half to three miles.

Again, it is difficult to estimate distances while airborne. However, it is important to take the perceptions of the witnesses as seriously as possible. In many of the 44 spherical UAP cases the witnesses describe very close encounters including dynamic and threatening trajectories. While the witness statements are subjective in nature, in many cases aircrews were forced to change headings or engage other control inputs based upon a perceived need to maintain separation from the UAP. Some of these control inputs resulted in injuries to crew/passengers. The issue of loss of separation and near mid-air collisions (NMAC) will be discussed later in this paper.

Altitude of the Spherical UAP Encounter

Of the forty four spherical UAP cases reviewed, 36 reported the altitude of the encounter and it ranged from 50 to 100ft AGL to above FL360. There does not seem to be any correlation between altitude and spherical UAP manifestations in this sample.

Duration of the Encounter

Of the forty four spherical cases reviewed, 28 did not provide an estimate of the duration of the UAP encounter. Of the 16 cases which did report this, the observations/incidents ranged from less than one minute to nearly one hour.

However, there is more information contained within the 28 cases which do not report durations that can provide some useful clues for the investigator. In some of these examples the aircrews were describing situations that they believed required their full attention and it is understandable that they did not have time to make an estimate. In many cases it is fairly clear from the description of the incident itself that the events ranged from mere moments to tens of minutes in duration. (Table 3)

Reported Durations	No. of Cases
Less than one minute	1
less than two minutes	
two to five minutes	7
five to fifteen minutes	3
fifteen to thirty minutes	2
thirty minutes to one hour	3
longer than one hour	
# Not Reporting duration	28

Table 3. Reported Durations of UAP Incidents

Descriptions of Spherical UAP

Of the forty four spherical cases reviewed, two of them referred to the UAP as “metallic” or “reflective” and one of those cases was a daytime incident. The remaining cases are described as lights or glowing objects.

Light vs. Object

As has been mentioned above, the problem of understanding spherical UAP is compounded by sloppy use of terminology used by both witnesses and investigators. In many cases the word “light” and “object” is used interchangeably. The author has made the assumption that night time observations involve light sources unless the witness used terms like “metallic” or “reflective”.

Single vs. Multiple Spherical UAP Seen Flying Together

Of the forty four spherical UAP cases reviewed 35 cases involved single UAP and 9 involved multiple UAP. Of the multiple UAP cases, 4 cases involved two UAP, 4 cases involved three UAP and one case involved 5 UAP.

Of the 35 spherical UAP cases reporting a single UAP, the distribution of UAP descriptions can be viewed in Table 4

Of the four cases involving two UAP at the same time and place, all cases represented a pair of similar lights or objects. These spherical UAP are described as, “two blue-green lights”, “two yellow spheres”, “two bright white lights”, and “two spheres.”

Of the four cases involving three UAP, three cases represented a trio of similar lights or objects described as, “three orange balls in formation”, “three brilliant white lights”, and “three elliptical/round gray objects.” One case reported a white light with two smaller orange “fireballs”.

The one case reporting five spherical UAP described five round orange objects, all similar to each other.

Spherical UAP Colors, Intensity and Variability

In reviewing the reported colors of UAP it is clear that there are some probable similarities between different cases. The author has attempted, below, to generally group those observations by similarity in descriptions. This should not be considered to be entirely accurate as the perception of the witness may not always be trustworthy. Some cases involve multiple UAP of different colors. Some cases are hard to define, for example blue-white lights vs. pale blue lights vs. white lights with a bluish tinge. So the author has grouped these reports of various colors several different ways. Further variables that might effect the observation of color include tinting in windscreen glass, sunglasses, weather, etc.

White UAP

Of the forty four spherical UAP cases reviewed, 27 of the UAP were referred to as a light or a white or whitish light. Of those 27 UAP cases, 12 reported the UAP(s) as white lights. These reports estimated size from one foot in diameter to “larger than a DC 10”. Descriptions of these white lights included “brilliant”, “intense”, “flashbulb bright” and “bright”. Additionally there are 11 reports of white lights tinged with green, blue, orange or yellow. Four cases simply described the spherical UAP as a “light”, “a bright light”, a “round light”.

Orange UAP

- Eight cases described orange lights, orange balls, orange “fireballs”, “orange objects” and one case described a “fast maneuvering round orange-red object”.

Red UAP

- Four cases described red lights, “like a blood red star”, “large red ball-like object”, “round red blob of not-metal like a blood red moon”.

Blue UAP

- Five cases describe a “single pale blue light”, “a round ball of blue-white light”, “a circular shape of glowing blue-white”, “a single bluish-white light”, “a single flashing blue white light”.

Yellow UAP

- Three cases describe “yellow lights”, “yellow spheres”, “a single yellow-white light”.

Metallic/Gray

- Three cases describe the UAP as “metallic”, “reflective” or “gray”.

Green UAP

- Two cases describe the UAP color as “a pale green light”, “greenish-white object”

# Reporting Single UAP	35
Single Light (no further description)	2
Round, Self-luminous object	1
Single Round greenish white object	1
Brilliant Greenish-white light	1
Single Pale green light	1
Single White Light	9
Single White light w/orange tinge	1
Single Yellow-white light	1
Single Pale blue light	1
Round Ball of Blue-white light	1
Circular shape glowing blue-white	1
Single Orange light	1
Single Orange Ball	1
Single Red light	1
Single Red Light "like a blood-red star"	1
Large metallic sphere	1
metallic ovoid/spherical object	2
Large Red ball-like object	1
Large Round White "thing"	1
Single Round Light (red, amber, green)	1
Round, red and white object	1
Round blob of not metal like a blood red moon	1
Single Bluish-white light	1
Gleaming White Ball w/gold ring around lower 1/3	1
Single flashing blue-white light	1
very bright round object w/red and white hues	1
fast maneuvering round orange-red object	1
# Reporting Multiple UAP	9
# Reporting Two UAP	4
Two Blue-green lights	1
Two Yellow luminous spheres	1
Two bright white lights	1

two spheres	1
# Reporting Three UAP	4
White light with two smaller orange "fireballs"	1
Orange balls in formation	1
Three brilliant white lights	1
Three elliptical/round gray objects	1
# Reporting Five UAP	1
Reporting Five "Orange Objects"	1

Table 4. Distribution of Spherical UAP Cases by Color and Number of UAP Reported

Intensity

Of the forty four spherical UAP cases reviewed 18 reported the UAP as “brilliant”, “intense”, or “bright”. In several cases the ambient light from the UAP was bright enough to illuminate the cockpit. It is appropriate to note the potential for flash-blindness from directly looking at large, brilliant UAP. In fact, in one example, after turning on his landing lights to advise a UAP of his proximity, a pilot was blinded by the UAP increasing in visual intensity and the resulting control inputs caused injuries to crew and passengers.

Variability in Color and Frequency

Of the forty four spherical UAP cases reviewed 9 reported the UAP as “flaming”, “flashing”, “strobing”, “flickering”, “changing intensity”, “pulsating or throbbing”. Two cases reported that the UAP changed colors. One case described the UAP as changing from red to green to amber. One case described the UAP as changing from bright white to pale green.

Spherical UAP Trajectories

Of the forty four spherical UAP cases reviewed, 8 reported single trajectories, 36 reported complex trajectories, 28 reported that the UAP accelerated and decelerated relative their aircraft, 27 reported that the UAP changed altitude, 30 reported that the UAP demonstrated high rates of speed relative their own aircraft, 10 reported that the last trajectory of the UAP was an ascent and 1 reported the last visible trajectory of the UAP as descending. (Table 5)

UAP Trajectories	#Reporting:
Stationary	
Single	8
Complex	36
Accelerations and Decelerations	28
Changes in Altitude	27
Relatively High Rates of Speed	30
UAP Ascends at Last Sight	10
UAP Descends at Last Sight	1

Table 5. UAP Trajectories

Radar Detection of Spherical UAP

Of the forty four spherical cases reviewed, only four reported radar detections as confirmation of the presence of a spherical UAP. Further, of the 5 cases where the pilot requested radar confirmation of the UAP, 3 did receive radar confirmation of UAP and 2 did not (some of the confirmations were acquired by investigators after the incident). None of the cases reviewed reported radar detections or warnings arising from ATC/ground radar regarding uncorrelated traffic. Further, for those cases that involved commercial aircraft in the 1980s and 1990s, there were no reports of TCAS warnings.³

Photographic Evidence that Spherical UAP Radiate Energy

In addition to the forty four spherical UAP cases derived from Dr. Haines' paper, NARCAP has conducted two analyses of photographs purporting to show the presence of a spherical UAP. The first case is NARCAP Technical Report 7 entitled "Analysis of a Photograph of a High Speed Ball of Light" (Haines, 2002).



Figure 1. Spherical UAP and Sailplane. (From: Haines, 2002)

3. See 2.3 and Shough (2002) for additional information on radar contact cases (Ed.).

This case involved an analog 35mm SLR photograph of a spherical UAP that was described by several airborne witnesses as looking like a polished “ball-bearing”. Its size was estimated to be between 60 and 300 ft. in diameter. While it appeared as a smooth, metallic ball to the observers, the film recorded the UAP as a white and energetic radiator that seemed to produce some unknown particles trailing behind it.

Solid vs. Radiating body

In the visual spectrum the spherical UAP of Figure 1 appeared solid and the camera detected it as an energetic body. This may provide a clue as to the potential for concurrent systems failures reported during some in-flight encounters between airplanes and spherical UAP. It may also offer an explanation for the failed radar detections mentioned in many spherical UAP reports. If these UAP are energetic radiating bodies, they may be able to affect aircraft systems and defeat radar detection, depending on the type of energies they are radiating.⁴

The second photographic case involving a spherical UAP is from NARCAP Technical Report 11 entitled “Small White Ball of Light Flies Near Airliner: Investigation of High Resolution, Digital, Color Photographs of July 3, 2005 at 2031 Hrs., Palo Alto, California” (Haines, 2007).

This case is significant for several reasons. It is a digital photograph that illustrates a ground-based observation of a white spherical UAP estimated to be about three feet in diameter, pacing an airliner on final approach into San Jose International Airport (SJC). It is important to note that there are many anecdotal reports of similar events and some are also supported by photographs.

4. Section 2.4 discusses similar issues in some depth (Ed.).

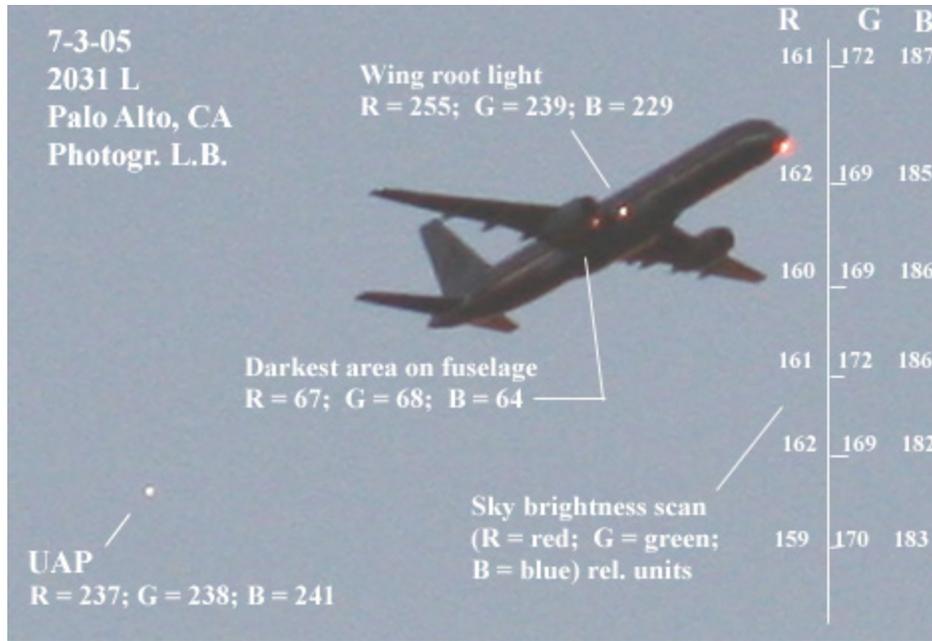


Figure 2. White Spherical UAP Trailing Airliner. (From Haines, 2007)

Based on sequential photographs and according to the two witnesses on the ground who photographed the incident; the airliner was paced from behind and at a distance by the white spherical UAP. Then the UAP accelerated relative the airliner to a position underneath the tail of the airliner. It then reduced its speed to pace the airliner before leaving by breaking away from the airliner at an oblique angle. It is interesting to note that in Figure 3 the UAP appears to be maintaining its pace while directly in the slipstream of the airliner, unaffected by dynamic pressure or buffeting.

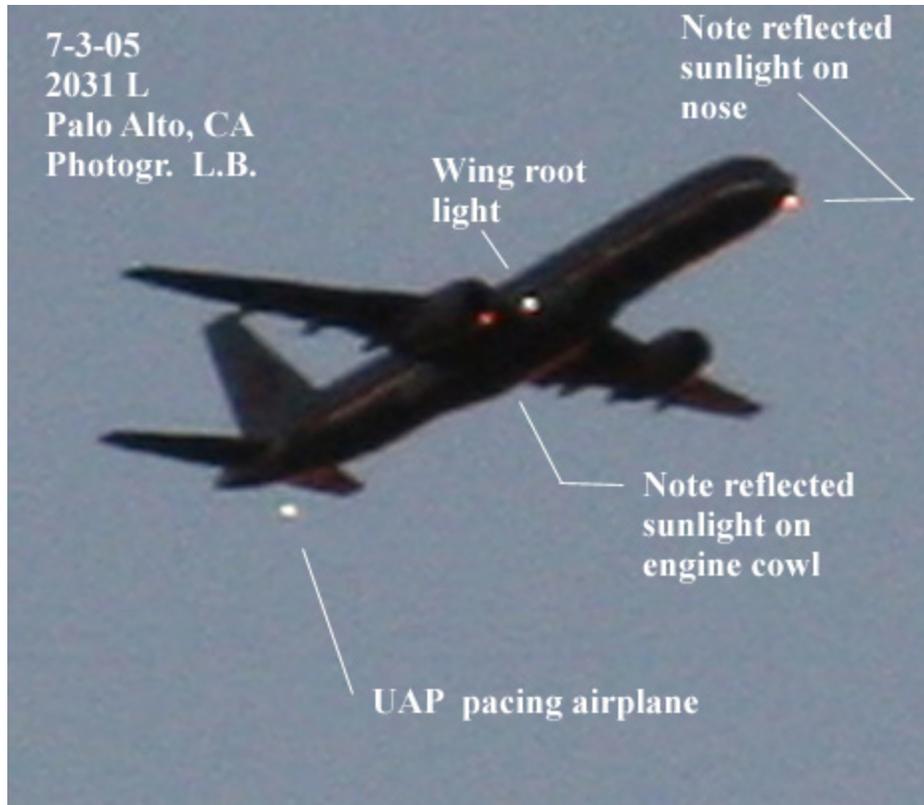


Figure 3. White Spherical UAP Pacing Airliner. (From Haines, 2007)

The most alarming aspect of this case, aside from the possibility that these phenomena may adversely affect vital avionic systems, is that the aircrew was probably unaware of the incident. These cases of ground-based observations of UAP pacing or following aircraft are rather common. It is important to note that these cases have the potential to trigger aviation security alerts and also might be misidentified as ordinance.

Some Spherical UAP Radiate Energy

In both of these photographic cases the spherical UAP appears as an energetic, radiating body. In the first case it is described as a metallic appearing solid that the camera detected as an energetic radiating body and in the second case the UAP is described as a white light, also an energetic, radiating body. *It is appropriate to question what frequencies and varieties of energies are being emitted and to determine if those emissions are capable of effecting vital aircraft systems and/or defeating radar detection.*

Profiling Spherical UAP

Based on the forty four spherical UAP cases reviewed, the following trends have been identified:

- Spherical UAP are dynamic, poorly understood and poorly documented phenomena.

- They can manifest in wide variety of colors and sizes.
- Spherical UAP can appear as both solid objects and singular lights. They are often reported as brilliant lights, often white in color though other colors ranging from yellow, orange, red, green and blue to metallic and reflective are also reported.
- Spherical UAP that are described as objects have no openings and lack exhaust or thrust ports.
- They can be highly mobile and demonstrate complex trajectories and high rates of speed.
- They can quickly accelerate to very high speeds and decelerate to a hover.
- They can execute complete reversals of direction at very high speeds.
- Spherical UAP can range in size from a foot to hundreds of feet across.
- Spherical UAP can manifest in groupings of two or more.
- Spherical UAP can be quite brilliant and can affect the (dark adapted) vision of aircrews.
- Spherical UAP are not commonly detected by radar.
- The primary stimulus for an aviation report of a spherical UAP is a visual observation reported by aircrew or air controllers.
- Spherical UAP are often associated with aviation safety-related cases reporting loss of separation/collision headings, NMACs and concurrent failures of communications, navigation or electrical systems.
- Witness descriptions and examinations of photographs depicting spherical UAP demonstrate that the UAP radiate energy.

What are Spherical UAP? Some Considerations and Speculations

Spherical UAP have been described throughout history. Encounters with them have been documented in art and literature. For example, consider the woodblock prints related to an incident that occurred on August 7, 1566 over Basel, Switzerland. The illustration below accompanied the description of this incident by Samuel Coccius, reported in a contemporary Basel Broadsheet.

Samuel Coccius wrote, "...at the time when the sun rose, one saw many large black balls which moved at high speed in the air towards the sun, then made half-turns, banging one against the others as if they were fighting a battle..." He went on to write, "...many became red and fiery, ending by being consumed and vanishing." many citizens of Basel were quite frightened by this incident, which occurred for several hours in the skies over their city.



Figure 4. Block Print depicting Incident above Basel, Switzerland, August 1566

More contemporary descriptions of spherical UAP arose during WWII when spherical UAP encounters with aircraft were reported by all participating air forces. An article from the New York Times, Dec. 13, 1944 stated:

"Floating Mystery Ball Is New German Weapon.

SUPREME HEADQUARTERS, Allied Expeditionary Force, Dec. 13

-- A new German weapon has made its appearance on the western air front, it was disclosed today.

"Airmen of the American Air Force report that they are encountering silver colored spheres in the air over German territory. The spheres are encountered either singly or in clusters. Sometimes they are semi-translucent."

...and, "SUPREME HEADQUARTERS Dec. 13 (Reuters) -- The Germans have produced a "secret" weapon in keeping with the Christmas season.

"The new device, apparently an air defense weapon, resembles the huge glass balls that adorn Christmas trees. There was no information available as to what holds them up like stars in the sky, what is in them or what their purpose is supposed to be."

As is shown by many papers in the present report, these spherical phenomena continue to be reported by aviation professionals to this day.



Figure 5. Spherical UAP in Aircraft Formation

The UAP report published in 2006 by the United Kingdom Ministry of Defense, Unidentified Aerial Phenomena in UK Air Defense Region (aka The “Condign Report”) was a public acknowledgement that UAP exist and it offers a hypothesis for the source of UAP reports. This study can be reviewed on the website of the Ministry of Defense of the United Kingdom.

The most glaring of several weaknesses in their study is the attempt to paint all UAP with the same broad brush. The suggestion is offered that unusual, naturally occurring “plasmas” are responsible for UAP observations. It further suggests that these plasmas are so unusual as to cause a person to believe that they are seeing lights on a darker object and that groups of these UAP can actually present as a collection of bright lights surrounded by a dark space that is created by the unusual properties of these strange plasmas. This interesting but presumed characteristic is due to properties that the authors of the report neglect to describe.

While the study itself is somewhat brave in its assertions that UAP exist, it falls far short of an adequate explanation for their attributes and source(s). A very good critique of this study is offered by David Clarke and Gary Anthony, The British MOD Study: Project Condign.

Some studies of “ball of light” phenomena have been conducted at Hessdalen, Norway and other locations where UAP seem to manifest consistently.⁵ The EMBLA Project (www.itacomm.net) has a continuing and lively study underway to resolve the nature and characteristics of “ball of light” phenomena as reported at Hessdalen, Norway (and elsewhere).

5 This subject is also treated in 4.3 (Ed.).

While there has been no definitive work to resolve the exact nature of the UAP being studied in those locations, it has been strongly suggested that those so-called “Earth Light” phenomena represent some kind of “plasma”. Often Earth Light phenomena are mobile and do not reflect radar, in most cases. However, the comparisons between spherical UAP reported at Hessdalen and other spherical UAP are not “one-to-one” and there is good reason to resolve the question of whether the UAP documented at Hessdalen and other sites are at all related to those reported by aircrews.

Probably a more intriguing aspect of a spherical UAP is the energetic properties that allow it to maintain coherence and brilliance over tens of minutes and more. The relatively long durations and spatial stability of these phenomena seem to disqualify them as “ball lightning” which is commonly understood to last less than ten seconds.⁶

It is reasonable to conclude that none of the cases reviewed represent UAV (unmanned aerial vehicles). The range of cases reviewed predated 1997.

A “blind spot” may be responsible for the limited official acceptance of the existence of spherical UAP. The phenomenon may be radiating energy at frequencies that render it undetectable to most radar or it may simply not be dense enough to reflect a signal. In either case, it is probable that scientific understanding about these UAP has been inhibited by a failure to imagine that some atmospheric phenomena are not radar-reflective.

It is unlikely that spherical UAP represent a component in a larger dynamic system created by an interaction between the environment and the aircraft. Given the initial observations of UAP that arise at a distance and before closing range (with the aircraft) as well as the reports of UAP leaving the vicinity of aircraft at a great distance and speed, it is probable that UAP represent self-contained phenomena that exist independently of aircraft and observers.

In some cases it might be argued that spherical UAP demonstrate “intelligence”. The author is at a loss as to how one might prove that the trajectories of a ball of light are indicative of “deliberate behavior” or inherent “intelligence”. Nevertheless, many cases are quite provocative, in this regard.

It is possible that these spherical UAP are energetic phenomena, plasmas of some variety or some manner of a quantum system, that travel on paths of potential – ionized gas trails,⁷ for example and that they are natural and inanimate phenomena. It is also possible that these spherical UAP represent quantum technology or self-organized plasma of a very high order. It could be that spherical UAP are representative of several different varieties of natural phenomena or technologies arising from an unknown source.

Further, it is appropriate to note that many witnesses refer to spherical UAP as “objects” or “craft”, or use other terminology that imply a technical, artificial nature or source of UAP.

6. See 4.3 for further discussion (Ed.).

7. See 2.2 for an hypothesized mechanism of this type (Ed.).

It is also clear that spherical UAP are coherent energetic systems that are quite stable and mobile. They emit energy and appear to be able to affect aircraft systems and in many instances avoid radar detection. The U.K. Ministry of Defense's "Condign Report" (2000) also noted that UAP are not often detected on radar and have been known to effect automotive systems and other types of technologies and that physiological symptoms related to close exposure to spherical UAP have been reported and arises, presumably, from the energetic fields that the UAP are emitting.

It is unlikely that any one country on Earth had mastered the ability to fly spherical objects with the capabilities reported by the end of the Second World War. Given the prevalence of spherical UAP reports and the similarities in such reports over time, it is reasonable to suggest that spherical UAP represent: 1) one or more variety of poorly documented natural phenomenon or 2) technology that has remained consistent over, at least, the past 70 years of powered flight. The answer to either question remains open. That spherical UAP exist as a specific profile of UAP manifestation is, as the British Ministry of Defense asserts, "indisputable."

Part 2 - Spherical UAP and Aviation Safety

Of the forty four spherical UAP cases reviewed here 22 reported loss of separation. 19 cases reported loss of separation/collision heading. Eleven of these cases reported head-on trajectories and 8 reported collision headings from approach vectors other than head-on. 15 of the 19 cases reported near mid-air collisions. In the 19 cases reporting loss of separation/collision course, all of them reported concern for their safety. (Table 6)

Loss of Separation	22
Collision Course	19
Collision Course Head-on	11
Collision Course Other	8
NMAC	15

Table 6. Aviation Safety Incidents

Of the forty four spherical UAP cases reviewed, it could be said that all of them exhibit aviation safety concerns based on issues related to Cockpit Resource Management (CRM) and crew distraction. Additional concerns include loss of separation, near mid-air collisions, collisions, and systems failures.

Spherical UAP and Concurrent Electrical, Communication and Navigation Failures

Of the forty four spherical UAP cases reviewed, 5 cases reported concurrent avionic systems failures. (Table 7)

# Reporting Concurrent Electrical/Comm/Nav Failures	5
Magnasyn and magnetic compasses spinning	2
Autopilot failed to maintain heading	1
Both transponders failed, one permanently	1
Magnetic Compass and ADF spinning	1
Radio - heavy static in receiver, transient	2

Table 7. Concurrent Electrical/Communications/Navigations Failures

NARCAP Chief Scientist Richard F. Haines and International Technical Specialist – France, Dominique F. Weinstein conducted a study of aviation-related UAP encounters involving concurrent transient or permanent systems failures.”A Preliminary Study of Sixty Four Pilot Sighting Reports Involving Alleged Electromagnetic Effects on Aircraft Systems” (2001). Among the conclusions from this preliminary study was the observation that ‘ *Most of the UAP (in E-M effects cases) are circular/round in shape [emphasis added].*’

Provisional Conclusions

This preliminary report presents only a brief overview of pilots’ UAP sighting reports that have E-M effects on aircraft. Only the 33 highest EMCARM scoring "category 1" cases are presented here with a longer report in preparation. An in-depth study of these selected cases is called for.

From this overview we identified several interesting points that deserve further study:

1. *Private airplane are more likely to be affected by E-M effects than military or commercial aircraft.*
2. *Magnetic compasses seem not to be particularly affected on military aircraft (many of which tend to be specially shielded against various radiation.)*
3. *Radio systems and compasses are the most affected systems by UAP.*
4. *Most of the UAP (in E-M effects cases) are circular/round in shape.*
5. *Most of the E-M effects occurred when UAP were near the aircraft.*
6. *Magnetic compass deviation seemed to be correlated to the UAP position. An intense magnetic field appears to be associated with these UAP.*

Spherical UAP figure prominently in UAP reports involving concurrent electrical, communications and navigation system failures. It is imperative that UAP cases involving concurrent reports of transient or permanent failures of any vital system or equipment be treated with great concern and intellectual engagement.

Spherical UAP Are Not Commonly Detected by Radar

Of the forty four cases reviewed only 4 cases reported ground radar detections of the UAP. This is significant for several reasons. In several instances the aircrew specifically contacted ATC to ask if there were corresponding radar detections related to the UAP that they were witnessing visually and were told that *there was no detection*. This inability to detect UAP with radar was also noted in the U.K. Ministry of Defense Report (2000).

This fact seems to imply either that the aircrews were suffering illusions or delusions or that many spherical UAP are not detectable by radar. However, in those four cases where radar detections of UAP were reported those detections of uncorrelated targets provide confirmations that the aircrews were seeing real phenomena that they could not explain. In other incidents like case 85 (see Appendix 1) both aircrew and ATC personnel were able to visually confirm the presence of a spherical UAP operating in Class B airspace and successfully mitigate it as a hazard to aviation safety while there was no reported corresponding radar contact.

Spherical UAP may be difficult to detect with radar for several reason. It could be that spherical UAP are energetic phenomena, plasmas, and are simply not dense enough to reflect a radar signal. Yet four spherical UAP cases reported radar detection of the UAP which forces the consideration that some spherical UAP can be dense objects, and are radiating energies at frequencies that intermittently inhibit radar detection and cause concurrent electro-magnetic effects.

Radar reflectivity can be defeated either by passive, design related means or by active ways like plasma generators that dampen the reflection of a radar signal. *If one considers that spherical UAP are energetic radiating bodies that can effect electrical, navigation and communications systems, then it may well be that the energetic properties of these UAP, in addition to the low reflectivity of a spherical form, can render them nearly invisible to many radars.*

Detecting UAP around both aviation accidents and incidents and acquiring UAP data has been severely inhibited by the wide-spread expectation that (except for stealth aircraft) almost anything that flies must reflect radar.

This situation puts a great deal of responsibility on the aircrew to identify and properly respond with regard to the UAP. It also demands that the ATC personnel be aware of and responsive to reports of “traffic” that are not detected by ground radar. Further, it is questionable whether TCAS systems are adequate to prevent NMACs with UAP. Indeed, in cases like number 112 (Appendix 1), there was a reported NMAC with a spherical UAP yet there was no TCAS alarm.

Spherical UAP and Mid-Air Collisions

We have no way of knowing if UAP are involved in collisions or crashes of aircraft due to the low survival rate of aircrews experiencing mid-air collisions and the apparent radar transparency of some UAP. Even knowing that UAP were in the vicinity of an aviation emergency is very difficult to validate – or disqualify - without the ability to detect UAP on radar.

Spherical UAP and Aviation Security Alerts - Confusion with Ordinance/missile attack

Observers of spherical UAP in the vicinity of airborne aircraft may believe that they are witnessing a missile attack. In fact, at least one pilot-witness of a spherical UAP that was on a collision heading with his aircraft mentioned that he and his passenger initially believed that they were being attacked by a “sidewinder missile”.

Airport Incursions

Spherical UAP and other varieties of UAP do manifest in restricted airspace.⁸ With respect to their dynamic movements and unpredictable nature it is reasonable to assume that the presence of a UAP inside restricted airspace should be treated with the greatest caution.

Spherical UAP and Dynamic Trajectories

Of the forty four spherical UAP cases reviewed, 8 reported single trajectories, 36 reported complex trajectories, 28 reported that the UAP accelerated and decelerated relative their aircraft, 27 reported that the UAP changed altitude, 30 reported that the UAP demonstrated high rates of speed relative their own aircraft, 10 reported that the last trajectory of the UAP was an ascent and 1 reported the last visible trajectory of the UAP as descending.

Spherical UAP are described as quite dynamic and agile. Complex trajectories including 360 degree passes around aircraft have been reported. Spherical UAP are often described as flying very, very fast and are capable of seemingly instantaneous reversals of direction at “impossible” speeds.

Particularly of concern is the perception by the aircrew of a collision heading undertaken by a fast-moving UAP. Of the forty four spherical UAP cases reviewed 15 spherical UAP encounters are described as near mid-air collisions (in which the separation on a collision heading is less than 1,000 ft). Spherical UAP can appear very suddenly and a situation can escalate quite quickly leaving split second decisions in the hands of aircrew that have not even been advised of the existence of such phenomena.

Spherical UAP as an Unexpected Safety Factor for Aircrews

The majority of spherical UAP reports involve initial visual detections by aircrews. It is uncommon for ATC to detect spherical UAP and vector aircraft around them though, in some instances, spherical UAP are detected on radar after aircraft request radar confirmations.⁹

8 One well documented instance that involved a non-spherical UAP took place directly above O’Hare International Airport, Chicago on the afternoon of November 7, 2006. Because the UAP was not detected by radar or seen from the tower it was ignored by FAA and TSA officials. Report of an Unidentified Aerial Phenomenon and its Safety Implications at O’Hare International Airport on November 7, 2006, NARCAP Technical Report 10, Haines, et al., 2007.

9. See 3.3.1 for further support of this statement, particularly with regard to U. S. military airplanes (Ed.).

Pilots and ATC who find themselves dealing with spherical UAP are in an unusual and difficult circumstance. Pilots and ATC are unaware, in general, of the existence of such phenomena and there is little in the way of guidance given them with respect to how to manage and mitigate the risks related to an unexpected encounter with a UAP. An aircrew that is confronted by a highly mobile UAP is faced with making judgment calls with respect to control inputs that are responsive to UAP trajectories.

Risk Avoidance and Safety-related Spherical UAP Encounters

Of the forty four spherical UAP cases reviewed, all of them involved UAP that were first witnessed by the aircrews and no cases arose from ATC warnings of uncorrelated radar targets. Twenty two spherical UAP cases involved loss of separation and 19 of those cases were described as collision headings. Fifteen of the cases described as “collision headings” were described as near mid-air collisions. Two of those cases involved control inputs by aircrews that resulted in injuries to passengers and crew. All 19 cases describing a collision heading expressed concerns for the safety of the aircraft and crew/passengers.

Mitigating Factors in Loss of Separation/Collision Heading Cases

Of the 19 spherical UAP cases described as “collision headings”, the hazard was mitigated by the UAP changing course in 7 cases and mitigated by control inputs by the air crew in 7 other cases with the remainder (5 cases) involving changes in heading by both UAP and aircraft. This seems to emphasize the role of risk management and judgment placed on aircrews by these unusual incidents.

Spherical UAP/White Lights vs. System Failures

Of the forty four spherical UAP cases reviewed 27 reported some variation of a white light while 12 reported the UAP(s) as a white light(s). These pilot witnesses estimated the size of the UAP being from one foot in diameter to “larger than a DC 10”. Descriptions of these white lights included “brilliant”, “intense”, “flashbulb bright” and “bright”. Additionally there are 11 reports of white lights tinged with green, blue, orange or yellow. Four cases simply described the spherical UAP as a “light”, “a bright light”, a “round light”. *In three of those encounters concurrent transient or permanent equipment failures were also reported.*

Aircrew Responses to Spherical UAP Sightings

Of the forty four spherical UAP cases reviewed, 29 (66%) reported simply observing the UAP and making no control inputs. Many of these cases involved “pacing” the aircraft by the UAP. Five cases reported pilot control inputs to evade or turn away from the UAP. One case reported that the UAP pursued the airplane; one case reported that the UAP veered away and three cases reported the UAP as unresponsive (maintaining its original heading).

Ten cases (23%) reported pilot control inputs to investigate or pursue a UAP sighting. Six of those cases reported that the UAP veered away, 4 cases described the UAP as pursuing or closing with the aircraft.

Landing Lights as Proximity Warnings

Of the forty four spherical UAP cases reviewed, 4 of these cases reported that the pilot turned on landing lights as a proximity warning to the UAP. In one of these cases the UAP unexpectedly changed intensity to become “quite brilliant” but there was no response to mitigate an NMAC by the UAP. The pilot was reported to be temporarily blinded. Crew and passenger injuries resulted from the control inputs by the pilot as he attempted to evade the UAP.

One case reported that the UAP corrected a collision heading and then paced the aircraft.

One case reported that the UAP was pacing their aircraft and when they turned on the landing lights, it moved upwards and away from them.

In one case the pilot reported turning on his taxi lights to warn a group of three UAP that they were on a collision heading. One UAP left the formation vertically, the other two continued and passed in front of the aircraft. When the pilot flashed his taxi lights the other two lights disappeared from sight although it’s unclear whether the lights just went out or they moved away very quickly.

Mitigating Spherical UAP-related Aviation Safety Factors

In the forty four spherical UAP cases reviewed, there is no reliable way to determine if UAP on a collision heading will always avoid the aircraft. The range of separation and high rate of closure in many cases represents a threat that can not be ignored. There is no reason for aircrews to simply expect that the UAP will avoid the aircraft “on its own”. Given the low survival rate of aircrews experiencing mid-air collisions and the reported radar transparency of many spherical UAP, it can not be said with certainty that UAP have not been primary factors in past catastrophic air crashes.

At this point it is advisable to prepare aircrews for potential spherical UAP encounters by informing them that various shaped UAP actually do exist. Further, it is appropriate to instruct air crews that are encountering something unusual (in real time) to maintain altitude and heading, use landing lights, etc. but be prepared to deal with a situation that can become very dynamic very quickly.

Based upon the body of evidence reviewed here it is strongly recommended that:

1. A vigorous international effort be undertaken to collect and develop data regarding aviation-related UAP incidents.
2. An outreach program be developed to educate aircrews, managers and aviation officials about UAP as a hazard to aviation. This was also recommended by the UK Ministry of

Defense “Condign Report”. It is also important to note that the governments of Chile, France, and Peru have ongoing official UAP research programs and are concerned with the risks to aviation safety posed by UAP.

Ultimately it is the air crew’s judgment and ability to assess risk that defines an appropriate response to danger. That ability to assess risk is dependant on education and adequate preparation.

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3.1.6

Appendix

This section presents forty four cases extracted from the Appendices of Haines (2000) where the witness description of the UAP seems to indicate a singular light or a spherically shaped object. These cases are numbered as they appear in the Appendices of this reference. Event time uses a 24 hour clock notation. L refers to local time, otherwise UTC. U refers to U.S.A. registered airplanes; F refers to foreign registered airplanes; C refers to (commercial); M (military); P (private) airplanes.

1. April 27, 1950 2025L UC Goshen, Indiana

This interesting sighting received a good deal of press coverage, probably because the passengers were alerted to the presence of the unidentified light flying near their commercial flight. Trans World Airways flight 117 (DC-3) was flying westerly toward Chicago at about 2,000 feet altitude over north central Indiana. FO Robert Manning was the first to sight a "strange red glow" below and behind them on their right side. It rose rapidly and grew in angular size looking like an "orange-red... round blob of not metal...". "It was similar in appearance to a rising blood red moon, and appeared to be closing with us at a relatively slow rate of convergence. I watched its approach for about two minutes, trying to determine what it might be." Manning then pointed the light out to Captain Robert Adickes who asked their hostess, Gloria Henshaw, to come up to the cockpit to see the object. At that point the UAP was at their 4 o'clock position and slightly lower in altitude keeping pace at their same speed. It was about 1/2 mile away. Captain Adickes sent the hostess back to alert the passengers to the light. He then banked his aircraft to the right to "...try to close on the unknown object." As Captain Manning's notes (April 27, 1950) indicate, "As we turned, the object seemed to veer away from us in a direction just west of north, toward the airport area of South Bend. It seemed to descend as it increased its velocity, and within a few minutes was lost to our sight..." (cf. McDonald, in Anon., Pp. 46-47, 1968)

3. November 7, 1950 1915L UM E. of Lakehurst NAS, New Jersey

This frightening series of near-air misses took place over the Atlantic Ocean but within sight of land under an exceptionally clear and dark sky. The heaven was filled with bright stars. Lt. jg Robert Haven was flying a Navy AD-4Q on a routine night radar navigation flight out of NAS Atlantic City, NJ. He was at 3,500 feet altitude on a westerly heading back to land. To his right-front side an estimated five miles away and somewhat above him was a steady white light which he thought was the fuselage light of another aircraft. He thought it was at 4,000 feet altitude at the time and was moving to the SE. Lt. Haven instructed a crewman to turn on their airborne radar to "intercept" mode and also began a slight climbing turn to the left "...in order to get on this object's tail." The motion of the other object was clearly visible in relation to the many background stars. As he rolled out on the same course as the object it turned somewhat more southerly so that the pilot thought he was directly behind it now. What follows is the pilot's narration of what happened next.

"In less time that (sic) it takes to tell, this light, without making any kind of reversal turn, bore down on me in a slight dive, passing directly over my canopy, at an incredible speed, about 100 to 200 feet above. Puzzled at this, my first reaction was that we had originally met head-on, and that this was some aircraft without running lights and that it had been a close miss for both of us." Lt. Haven deliberately pulled up into the flight path of the light just after it had passed to see if he would experience its wash or slipstream "...but there was none." The pilot then told the other crewman onboard what had just happened and he "...disregarded his radar operation and proceeded to witness the following events. I pulled into a tight "flipper" reversal turn in order to see this light again. As before, it was till (sic) slightly higher than I, and this time I was positive we were on his tail. Pushing to normal rated power and climbing, I attempted to hold the light in front of me, this object made another head-on pass, veering slightly port and below so that my crewman could see it too. Still nothing but a single white light, close to 10 to 12 inches in diameter, it moved with fantastic speed." The pilot then tried (twice) to radio Lakehurst on 142.74 MHz but without any success. The pilot then used another frequency to ask for assistance from any other Navy aircraft in the vicinity. "The Commanding Officer and his wingman in two F9F-2 (Panthers) answered, and set course for Lakehurst."

During his radio transmissions the light made five to six passages by his aircraft and then the light and the pilot's aircraft began a left-hand orbiting flight. He began a 60 degree climbing port (left) bank at 130 - 135 knots airspeed in order to gain altitude. But, much to his consternation, "This light continued to turn about me in wider climbing turns, making about two orbits to my one. " The pilot abandoned his climb upon reaching 11,500 feet altitude and only maintained his orbit so as to keep the light in sight. By the time his Commanding Officer arrived over McGuire AFB at 14,000 feet Lt. Haven turned his landing lights on bright and told the other air crew that the light was at about 18,000 feet and still climbing. When the other two jets arrived the object had risen to about 25,000 feet. Only the wingman of the other two jets saw the light. (USAF investigation file; handwritten note by pilot)

7. September 15, 1951 Twilight UM 50 mi. W of Knoxville, Tennessee

Pilot A.S., 34, was flying an Air Force C-45 from Standiford Field, Louisville, KY to Elgin AFB, Florida on an IFR flight plan with his FO and five passengers on board. They were cruising at 6,000 feet altitude west of Knoxville heading south when both pilots sighted "three large glowing orange colored "balls" (approaching) in a (equilateral) triangular pattern, (there was) no apparent connection between objects. (They were) first observed dead ahead (and) then suddenly observed along side, moving at the same (forward) speed as my aircraft. (They) streaked off as I dipped my left wing toward (the) formation." They were brilliant, emitting off their own throbbing or flickering light, and their edges were fuzzy in appearance. Each object subtended an angle of over twenty degrees at one point and never changed shape. They did not break up into parts, give off smoke or vapor or change color. They all disappeared from sight by becoming smaller and smaller. This incident is not in Project Grudge files. (Pilot report form)

13. May 8, 1952 0227L UC 600 mi. off Jacksonville, Florida

Pan-American Airlines Flight 203 from New York city to San Juan, Puerto Rico (heading 180 deg.) had just passed over the San Juan Oceanic Control boundary at 8,000 feet altitude well off the coastline of Florida. At the controls of the DC-4 was Captain Cent and FO

Gallagher. A solid overcast above 10,000 feet and the sky was unusually dark because of it. Since they had been informed that there were no other aircraft flying in the area they were not being particularly alert for other traffic. The FO spotted a white light ahead and slightly to the left of them as he turned to look out at their number four engine. It looked like a taillight on an airplane and he was very surprised at its presence. It seemed much whiter than a normal tail light. Then he looked at the number four engine and back at the light which had not changed appearance in any way. Then he checked the propeller controls, synchronized the engine rpm, and looked outside again. As Ruppelt writes, "In the few seconds that he had glanced away from the light, it had moved to the right so that it was now directly ahead of the DC-4, and it had increased in size." The FO then alerted the Captain to the light by pointing toward it. "Just at that instant the light began to get bigger and bigger until it was "ten times the size of a landing light of an airplane." It continued to close in and with a flash it streaked by the DC-4's left wing" by an estimated 1/8th to 1/4 mile. Then two smaller (orange) "balls of fire" streaked by them. The two men just sat there with a "...sort of sick, empty feeling" all over. Captain Cent (later) told the Air Force investigator, "I always thought these people who reported flying saucers were crazy, but now I don't know." The Air Force investigator on this case could not find any records of missile, aircraft, or ocean going traffic at that time or location. Meteors also were ruled out because of the overcast and low altitude. (Ruppelt, The Report on UFOs, Pg. 133-135, 1956)

16. July 13, 1952 0300L UC SW Washington, D.C.

National Airlines DC-4 flight 611 was under the command of Captain W. Bruen and was some sixty miles SW of National Airport and northbound from Jacksonville, FL. The sky was clear with 15 miles visibility and only slight winds. The flight crew saw a "round ball of bluish-white light... hovering to the west of the aircraft." The light then rose to the same altitude as the aircraft (11,000 feet) and stopped its climb; it then began moving parallel with the aircraft's direction of flight off its left wing at the same speed. There were separated by about two miles distance. When Captain Bruen turned on all of his lights the object "...took off up and away like a star" at an estimated velocity of 1,000 mph. Neither the FAA nor the Air Force identified other air traffic in the area nor other conditions which might account for the sighting. And according to the official Air Force report of this incident, "no attempt to intercept or identify the object, has been reported." The flight crew made this report in accordance with JANAP 146. (USAF Air Intelligence Report IR-410-52)

18. July 22, 1952 2200L UP 10 mi. W. of Crossett, Arkansas

Private pilot A. Hanks was flying a light aircraft from Little Rock, Arkansas to Monroe, Louisiana and had reached the state border almost due north of his destination. There he sighted a "blood red star" some 2,000 feet higher than his own altitude approaching on his left-hand side. It traveled in a generally SW direction at about 100 mph but unexpectedly changed its course to parallel that of his aircraft (approx. heading of 175 degrees). He said (later to a reporter), "I thought at first it was an illusion. To test my theory, I made a 90 degree right turn. The "flying saucer" did the same. The thing followed my course for about 10 minutes, then suddenly swooped down approximately 2,000 feet below my plane. At first, I believed it to be a jet. After that swift drop, I changed my line of thinking." The red light followed his airplane flying beneath it, then, several minutes later, it suddenly rose back 2,000 feet above him. Then

"it" began to accelerate at a tremendous rate of speed in its original SW heading. (Monroe, La. World, July 25, 1952)

20. August 13, 1952 Night UP near Dallas, Texas

This encounter was reported by Max Jacoby, Chief Pilot for Pioneer Airlines who, with Captain J. McNaulty, FO, was flying an empty commercial aircraft on a routine test flight. Unfortunately, not many details are given. When his aircraft was 15 to 25 miles from Love Airfield, Jacoby spotted a strange looking light in the distance. He decided to chase it to find out what it was. But each time he drew near to it "it eluded him and finally disappeared." The light turned and dove down but the appearance of its body "...did not change when it turned... I couldn't tell whether it was just a light or a light coming from some object," he said. Jacoby said he delayed telling about the incident "because he feared he would be ridiculed." (United Press wire story, August 15, 1952)

23. December 4, 1952 2046-2053L UM 8 mi. SW, Laredo, Texas

This very near-air miss event took place after Lt. Robert Arnold, piloting an Air Force T-28 aircraft had been carrying out a training flight for two hours. He was tired and radioed Laredo tower for permission to land. But due to other conflicting air traffic he had to circle at 6,000 feet outside of the traffic pattern several miles away. Then he saw a bright bluish-white glowing light source below him (at about normal traffic altitude) which climbed rapidly to his level. It had no position or navigation lights of any kind. In order to keep it in sight he "steepened his turn to the left." Then it suddenly rose to about 9,000 feet in several seconds and dove back to his level. The astonished pilot then added full power and tried to chase the light. At one point he realized that the object was flying straight toward him at such a high rate of speed he didn't have time to turn out of the way. As author Keyhoe (Pg. 26, 1954) described the event, "Three hundred feet away, the machine wavered for a split second. Then it flashed to one side, hurtling past his right wing, so fast it was only a blur." According to the Air Force's investigative report, at one point, "The object then turned Eastward and immediately descended to the pilot's altitude of 6,000' again and proceeded Eastward until approximately 6 miles SE of the base again and it seemed to stop as if it were hovering, going straight away or coming straight toward the pilot's aircraft. At this time the pilot added full power and proceeded directly SE toward the object. The pilot's intentions were merely curiosity. Approximately 2 seconds after this action was taken by the pilot, the object appeared to close at a terrific rate in a head-on approach. At approximately 100 yards in front of the pilot's a/c the object seemed to waver slightly in a vertical plane as if determining on which side of his aircraft to pass. The object passed very closely off the left wing of the a/c within 50 yards distance and the pilot noted a blurred reddish-bluish haze of undetermined size and shape but definitely no larger than his a/c. This action happened so rapidly that the pilot was unable to take any evasive action.... At this point, out of sheer fright, the pilot turned off all his running lights and spiraled steeply to the left, keeping the object in sight and leveled off at 1500." The object then appeared to level off from a descent towards the pilot's aircraft, turned sharply to the right and then rose up into the atmosphere until it was out of sight. Other intriguing details are omitted here except to point out that the Air Technical Intelligence Center's conclusion was that the pilot had seen another aircraft! In a letter dated April 12, 1961 from the skeptic and noted astronomer, Dr. Donald Menzel, to Maj. Robert Friend (ATIC) he wrote, "... I think he (the pilot) was still

seeing Venus." (USAF Blue Book file; Keyhoe, D., Flying Saucers from Outer Space. Hutchinson, London, 1954)

25. February 13, 1953 2030L UM Vichy, Missouri

The three witnesses to this pacing incident were Captain Robert Bailey, his FO, and the crew chief of their C-47 Air Force aircraft. They were at 7,000 feet altitude, 170 kts. airspeed, and on a heading of 43 degrees. The captain first sighted a small diameter, round light as they neared the Vichy Radio Range Station. The light changed intensity and looked like it was on a converging course (238 degree bearing from aircraft's position) and would (eventually) collide with their aircraft. He turned his landing lights on to try to signal to it and pointed it out to the other two men present. The light then stopped its approach and flew off their left wing at an estimated range of one mile while changing color from red through amber to green. After between five and ten minutes the light dropped back, increased its speed, "... and made three dives and zooms on a course parallel to that of the aircraft before disappearing." When contacted about the sighting Vichy radio indicated no aircraft in that area. The official Air Force explanation was that the three trained observers had been misled by the planet Venus. (Gross, L. UFOs: A History, 1953, January - February, Pg. 83; USAF Blue Book file)

28. October 19, 1953 0010L UC 33 mi. NE Baltimore, Maryland

An American Airlines DC-6 was en route to Washington, D.C. from Philadelphia at cruise altitude (8,000 feet) just after midnight. The lights of Baltimore were clearly visible below and to their right side. The FO first saw a light ahead of them which was alternately covered by wisps of cloud and then visible again. It seemed to gleam in the moonlight. The object had no running lights and was closing rapidly at their own altitude. Captain J. Kidd yelled, "Give him the landing lights!" He also reduced his power. As soon as the FO had switched on their own landing lights the oncoming object sent a "blinding light back at the DC-6." Now temporarily blinded by the intense light the captain pushed forward on the control wheel and the aircraft went into a rapid dive. "Caught unaware, the passengers were tossed about the cabin, several suffering (minor) injuries." After he pulled out of the dive (at 5,000 feet) he angrily radioed to Washington National Airport air traffic control to complain about the near miss. He was told that "...no known air traffic was supposed to be in his vicinity and said medical personnel would meet the plane upon arrival." Both crewmen said that the object was huge, at least as large as their own aircraft. (Washington Post, October 20, 1953; Keyhoe, Flying Saucer Conspiracy, Pp. 60-62)

30. March 25, 1954 1520L UM NE of Ft. Lauderdale, Florida

Capt. Dan Holland, 33, was flying a U.S. Marine jet of the Third Marine Aircraft Wing at an altitude of about 26,000 feet over the Air Force's guided missile range near Banana River in the afternoon. The flight of three aircraft he was a part of were passing to the east over the Atlantic Ocean coast at Ft. Lauderdale when he sighted a "round unidentified object" about twice the size of his own aircraft. It seemed to descend vertically out of the sky "like a falling star." Later he said, "I moved out of the way - thought the thing was going to hit us, and called to the others to look... It startled me by suddenly stopping 3 or 4 thousand feet above us. It looked like a gleaming white ball with a gold ring around the lower 1/3 of the ball... Then the thing accelerated faster than anything I've ever seen before and disappeared to the East at an amazing speed in about 15 seconds. We were doing over 400 and it made us look slow. I always thought

anyone who said he saw a flying saucer should have his head examined, but I'm damned convinced now that saucers exist."

At one point he allegedly banked toward it and activated his gun camera but the UAP suddenly flew away toward the east "at a tremendous speed." The other pilots in his flight who were flying ahead of him did not see it. (UP wire story, News, Washington, DC, March 25, 1954)

32. June 23, 1954 2100L UM 10 mi. SE of Columbus, Ohio

The pilot of an Ohio Air National Guard F-51 fighter, Lt. Harry Roe, Jr. was flying from Dayton to Columbus, Ohio at 240 mph on routine training flight when he said he was "followed in close formation by a (round, white) light for more than 30 minutes. He performed various maneuvers in an attempt to either lose the light or collide with it; however, it remained in relatively the same position to the aircraft ("a little above and behind him")." The sky was still illuminated by some twilight but there was no moon. The unidentified light eventually departed to the SE. During the sighting Lt. Roe thought he was seeing a jet aircraft but he never observed any exhaust flame or light. The Air Force investigators concluded that he had seen a light reflected into his eyes off the surface of his own canopy. Due to intense interest in the case shown by the local press the Air Force carried out "a complete investigation." The results of this complete investigation are not a part of the official Blue Book file, however. If the light had been an Air Force aircraft they would have likely offered that explanation to the press. (USAF Blue Book file)

34. November 19, 1954 2104L UC 130 mi. SE New Orleans

A National Airlines flight (Aircraft N918) was at 17,500 feet altitude flying direct to Tampa, FL. on a heading of about 105 degrees. The night was dark but forward visibility was not particularly good (about 10 miles) when the flight crew saw a light flashing blue and white and moving up and down and remained directly in front of their aircraft at an unknown distance. They watched this phenomenon from between three to five minutes when it then disappeared by moving to the NE until it was out of sight. Later the captain was contacted by Air Force investigators and he claimed he had seen a star. This explanation is found wanting if the light actually moved to the NE as the captain claimed. (USAF Blue Book file)

36. January 29, 1955 2107L UM Winterset, Iowa

This sighting involved two air national guard pilots, Major A. Packer (132nd. Fighter Bomber Group) and Lt. D. Myers in a T-33A jet (52-9590). It was a clear (100 mile visibility), dark night. The Iowa ANG report stated that they were traveling on a heading of 030 degrees at 290 kts. near Des Moines, Iowa when they sighted a white light which varied in intensity at a constant frequency and which subtended an angle of about 1.5 degrees arc. It made a direct, head-on pass at the jet in level flight at 20,000 feet altitude. At the last instant the object rose and flew over the jet, "climbing rapidly to 35,000 feet." When the pilot tried to chase the object it out climbed and out turned him. The sighting lasted about 25 seconds. An Air Force investigator wrote, "It would appear in retrospect that the object was able to maintain contact with the observer aircraft by other than visual means...". "The object was highly maneuverable and showed some understanding of tactical maneuvers and used the excess speed and altitude to his advantage in every case." (USAF Project 10073 Record Card and file)

37. February 1, 1955 0655L UM 20 mi. E. Cochise, Arizona

An instructor pilot and his student in a TB-25 bomber (44-86894) were in level flight at 13,000 feet altitude on airway Green 5 under a bright moonlit night sky. Their ground speed was 238 mph. Then they saw a very bright, round object showing red and white hues about five degrees arc above the local horizon. At one point it subtended an angle of between six and ten degrees arc diameter. It approached them and hovered off their left wing for about five minutes before departing at an "extremely high speed" in a steady climb maintaining its parallel track (it took about three minutes to disappear from sight). This is another USAF Unidentified object. (USAF Blue Book file)

39. December 11, 1955 2100L UC,UM Jacksonville, Florida

The crews of two separate airlines and witnesses on the ground saw a "fast-maneuvering, round, orange-red object." When two U.S. Navy jets (on a practice night-flying mission) were vectored to the area by a Jacksonville NAS controller they tried to approach it. But the object suddenly rose up to 30,000 feet altitude and then dove back down in a circle, buzzing the jets. Everything was detected on military radar. (Hall, The UFO Evidence, pg. 32, 1964)

41. August 16, 1956 0145L UC Azores (Atlantic)

This near miss incident took place at 4,000 feet altitude while Eastern Airlines flight 49 (DC-4) was en route to Laguardia, NY from POU. Their westerly heading carried them over the Atlantic Ocean. The flight crew sighted the strange light for from 20 - 25 minutes time and then radioed a near miss with the "bright white light" which was seen initially to the west of their course. According to the CIRVIS report (No. 170232Z) received through New York ARTCC," the object passed within 40 ft. of aircraft coming in from above and below. The meaning of this is unclear but suggests multiple passes made by the UAP. The pilot took "evasive action" according to the report.

43. November 14, 1956 2210L UC 60 miles from Mobile, Alabama

This close encounter received wide press coverage and intensive investigation and still remains as a classic example. Captain W. Hull had 17 years of flying experience and 15,000 hours flying time when he and his FO Peter MacIntosh were flying Capital Airlines flight 77 from Laguardia Airport, NY to Mobile, Alabama in a Viscount aircraft. Their heading was to the SSW and they were above a cloud layer only broken occasionally. Then they saw what looked like a "brilliant meteor" falling diagonally downward from left to right. The light decelerated rapidly but did not burn out or explode as they had expected. Rather, it came to an abrupt halt directly ahead of them. Hull said, "It was an intense blue-white light, approximately 7 or 8 times as bright as Venus when this planet is at its brightest magnitude. Pete shouted, "What the hell is it, a jet?" His first thought, of course, was that the object was a diving jet fighter which had turned sharply away from us and in departing, was giving us a view right up its glowing tailpipe. Instantly I knew that could not possibly be an airplane. "

Captain Hull then radioed Mobile Control Tower asking about their visibility of his aircraft and the strange light. They cannot due to the cloud cover. He went on, "It is directly ahead of us and at about our altitude, or slightly higher. We are right over Jackson, Alabama and have descended to 10,000 feet." He then requested that Mobile contact the USAF tower at Brookley Field some 20 miles to the SE to see if their military radar showed anything. "Just after this

exchange, the object began to maneuver. It darted hither and yon, rising and falling in undulating flight, making sharper turns than any known aircraft, sometimes changing directions 90 degrees in an instant. All the while the color remained constant, a brilliant blue-white, and the object did not grow or lessen in size. MacIntosh and I sat there completely flabbergasted at this unnerving exhibition." Very soon thereafter the light "...began another series of crazy gyrations, lazy 8's, square chandelles, all the while weaving through the air with a sort of rhythmic, undulating cadence, the likes of which neither Pete nor I had ever seen." The light then "shot out over the Gulf of Mexico, rising at the most breathtaking angle and at such a fantastic speed that it diminished rapidly to a pinpoint and was swallowed up in the night." Captain Hull completed his signed statement with these words, "I am seeking no publicity. I didn't report this sighting to the press and not a word has ever been printed about it until this moment." (Hull, W.J., Personal statement, 1957; USAF Blue Book file, reel 27)

45. March 9, 1957 0345L UC Atlantic Ocean, NE Jacksonville, Florida

Capt. Matthew A. Van Winkle, First Officer (FO) Dion W. Taylor, and Flight Engineer (FE) John Washuta were flying Pan-American DC-6 flight 257 with forty four passengers from New York to San Juan, Puerto Rico. They were on autopilot flying at 19,000 feet altitude, 290 kts. airspeed and were about 350 miles NE of Jacksonville, FL [32 deg. 35'N; 80 deg. 30' W]. Bound for a stop in Miami, the aircraft was on a southerly heading. Suddenly to their right front all three flight crewmen sighted a glaring, white, dazzling light with a pale-green tinged (core) with "an outer ring which reflected the glow from the center." (NICAP report) It approached them at high speed. Several passengers who weren't asleep also saw the approaching light. The light source was variously described as a "round," "large, glaring spot light," "magnesium-flash white," "burning greenish-white appearance," "brilliant, greenish-white object," "clearly circular-shaped object," "not a meteor." "When it got closer," (Van Winkle) said, "he had noticed it was not shaped like any known jet." (UP wire story, March 9, 1957)

"It appeared to fly in level flight from the SW to the NE Capt. Van Winkle later said, "Instinctively, I thought it might be another plane heading straight toward us (so) I pulled the plane up and to the side... Since it was on automatic pilot, apparently I forced it too much and all the forty-four passengers except one or two who had belts fastened, came out of their seats and rolled on the floor." (Ibid.) Another account stated that three passengers and a stewardess were injured when the pilot "took violent evasive action" climbing sharply about 1,500 feet to avoid a possible collision with the object. The air crew radioed a CIRVIS report (following Joint Chiefs of Staff regulation J-146). According to Air Force report UFOB-702-101, their investigators found that the luminous object was roundish (sic) or oval in outline and the angular size of a basketball held at arm's length, or about 20 degrees diameter! It appeared "bright green" with four exhausts protruding downward, the angular length of each being about one-fourth the diameter of the object.

The pilots of at least seven other aircraft spanning 300 miles all en route to Puerto Rico also saw the luminous object with sightings that ranged from seconds to three minutes. Air Force officials said that it was not a missile but rather a "seldom-seen form of a meteor, a 'bolide,' often referred to as a fireball." (USAF Blue Book Report). Interestingly, an article in the New York Journal - American stated that an unofficial report said a jet intercept task force accompanied by a radar plane was sent aloft to investigate from a strategic air command fighter

base in the south. Reports from the air crew of the other six aircraft flying along the same route to Puerto Rico also were analyzed by Air Force investigators.

46. March 27, 1957 2035L UM Roswell, New Mexico

The pilot of an Air Force C-45 (Lt. Sontheimer) was flying near Roswell at an unknown altitude when he looked out his left-hand window and noticed three bright lights in a tight formation. Each was round and brilliant white and about the angular size of an aircraft landing light (at an unspecified distance). His official USAF report submitted to the Project Blue Book office stated: "The pilot of the C-45 claims that when he realized the objects were on a collision course with him he immediately flashed his taxi lights on. One of the objects shot straight up in the air above him the other two continued on passed in front of aircraft. When the pilot flashed his taxi lights the objects immediately blacked themselves out thereby disappearing from sight." (USAF Blue Book files)

47. June 3, 1957 2135L UC Shreveport, Louisiana

Trans-Texas Airlines flight 103 had departed Shreveport Airport headed for Lake Charles, 166 miles to the south. They were climbing to 9,000 feet altitude in the dark night sky when the control tower operator called the Captain's attention to a small white light nearby the airplane. Its captain was Lynn Kern, 34, and FO, Abbey Zimmerman, 32. The time was about 2135L. The pilots saw an "unidentified object" approaching them from their 2 o'clock position "at a tremendous speed and 10 o'clock high. It then "...settled down and paralleled his course all the way to Lake Charles. Soon a second object appeared on the opposite side of his aircraft. Each appeared as a blue-green pulsating light and kept pace with their aircraft which was flying at 165 mph.; these objects paced the airplane for virtually its entire trip at a slightly higher altitude. "Captain Kern blinked his lights at the objects, objects lights flared extremely bright then went back to normal." Upon reaching Converse, LA the pilot radioed ground radar at England AFB (Alexandria, LA) and reported the objects. Air Force personnel said that they had two targets in his approximate area at 9,700 feet. A radar controller stated that since he saw "...nothing unusual about (the) sighting," he did not file a report. The Air Force summary pointed out that there was heavy B-47 aerial refueling operations in the area at the time. Interestingly, a tower operator at Shreveport Municipal Airport viewed both objects through binoculars until the aircraft and accompanying objects were out of sight. The lights disappeared from sight in a cloud deck to the SW. This report is one of the USAF's Unidentified Cases. (USAF Blue Book file)

54. July 4, 1961 2215L UP NW of Akron, Ohio

Private pilot Ernest Stadvec, a B-29 bomber pilot in WW-2 and owner of a flying service had strange encounters on two consecutive nights. He was flying NW of Akron with two passengers on Tuesday night, July 4th at about 2215 local time when they saw a brilliant green and white light appearing above them and to their right side. They were at 5,000 feet altitude. He said, "The object we saw dived at us on a collision course to the extent that I actually called out to my passengers that the object was going to ram us... After the object came at us it reversed course and climbed rapidly into a clear night sky." He went on, "This happened again the next night [about the same time and altitude] when the object flashed up in front of us and again climbed into a clear sky. In both instances, the object climbed at tremendous speeds, leveled off and disappeared to the northwest." Radar at Cleveland Hopkins Airport detected a

"meteor-like" object for several minutes. (Hall, R., The UFO Evidence, pg. 43, NICAP, Wash. D.C., 1964)

55. February 7, 1963 2345L UP Charlottesville, Virginia

Carl Chambers, pilot, and his passenger John Campbell were about 95 miles SW of Washington, DC en route to Pennsylvania in a light aircraft when they noted a star like light in the night sky which seemed to be flying toward them. After his encounter the pilot estimated the yellow-white light was about three feet in diameter. Concerning its flight dynamics he wrote, "After noting that its altitude and position changed rapidly, I radioed the Washington FAA and reported the incident.... For nearly an hour after, we stayed in contact with Washington. During that time, the object hovered off the right wing [easterly] and moved toward, under, and above the aircraft. Then it dropped off and a few minutes later appeared about 35 miles south of Washington...". Chambers was told by the FAA that another pilot in the area had reported a similar event at that time. (Hall, The UFO Evidence, NICAP, Pg. 43, 1964)

56. August 18, 1964 0529L UM 200 miles E. Dover (Atlantic Ocean)

This USAF Project Blue Book air-visual case is interesting because of the apparently intelligent responsive behavior of the UAP to the behavior of the pilots of a C-124 cargo (aircraft 31007 assigned to the 31st. ATS, 1607 ATW). Briefly, at least four crew members on a flight out of Dover AFB at 9,000 feet altitude, 200 mph true airspeed, sighted a round, diffuse-edged self-luminous object ahead of and about 500 feet below them on a collision course. The object was visible for about two minutes as they were flying between layers of scattered clouds. Lt. J. F. Jonke and a Major who were in control executed an evasive maneuver, turning from 260 degree heading to 340 degree heading while maintaining their altitude. As the airplane turned the UAP turned right and disappeared. They called Boston Center and were told no other aircraft were in the area and no radar contact was made with the other object. [AF IN : 10417 (20 Aug 64)E/der] (Unclassified: RUEASB 118)

58. April 25, 1966 2052L UP Near Ocala, Florida

Captain Fred Sharrer, Herbert Bates (FO), Frank Stockton, (executive assistant to the Governor of Florida), Governor Haydon Burns, Capt. Nathan Sharron, State Patrol Officer, four newspaper reporters, and three others were the witnesses to this prolonged close encounter at 6,000 feet altitude. They were in a Convair, propeller driven aircraft flying at 230 mph during a campaign-related flight. It was a clear, moonlit night. Two yellow-orange luminous spheres of light side-by-side (dumbbell shape) kept exact pace on the right side of their aircraft for about forty miles distance during their flight from Orlando to the Capital at Tallahassee. Passengers in the rear of the airplane saw the luminous globes for from three to five minutes while the flight crew watched them for about ten minutes duration. At one point Governor Burns asked his pilot to "turn into it." As the pilot did so the thing rose at a steep angle and quickly disappeared from sight. Its distance from the airplane wasn't determined but some of those on board estimated the UAP to be at a near distance while others at a great distance. (Clearwater (Fl.) Sun, April 26, 1966; Kalamazoo Gazette, April 27, 1966)

63(a). September 15, 1968 0031L UP Gulf Mexico, W of Cross City, Florida

Two men were flying in a Twin Beech C45H (N36H) at about 9,500 feet altitude on a heading of 120 degrees over the Gulf of Mexico. Mr. Ray Cole, 39, was a missionary pilot. His

passenger was a Ray Rushing, also a pilot. Cole was flying from Dallas, TX to Nassau and had stopped in New Orleans to pick up his passenger. The witnesses reported two separate sightings. Upon reaching a point several miles from the Florida coast in perfectly clear weather they first sighted a light at their altitude which Cole first thought was a jet trainer, a single pale green light that flashed at less than one pulse per second (perhaps a brief flicker every other second) with an intensity equivalent to an aircraft landing light seen from five to eight miles away. The light "would go straight up and then over the top and straight down to maybe 500 - 1000 feet below us, below our altitude..." said Cole in a recorded interview soon after the event. The light did not seem to follow an arc at the top or bottom of its motion but went "straight up and then straight down and then straight back up again." With the aircraft flying at 200 mph true this part of the sighting took place over a distance of about 50 miles and yet the light maintained the same apparent distance ahead of the airplane. The UAP departed by turning about ten degrees right (relative to the aircraft's heading) and climbed at a 15 degree elevation angle until it was out of sight.

"I was on an instrument flight plan, and it irritated me because Jacksonville Center had not warned me of this traffic. And so I called them and I said, "Have you got traffic at our twelve o'clock position?" And he said, "Negative." But the ATC personnel there "were very interested." We were exactly 12 miles DME from Ocala at that time.

63(b). approx. 0045L

Then the second phase of this encounter took place. Cole noticed not only the lights of Ocala ahead of him but also a very bright white light that was below his altitude (estimated at 5,000 feet AGL). Cole asked Jacksonville Center if they had traffic over Ocala and they replied "negative." Following is the pilot's narrative.

"And I said, "Well, we have a bright light there," and in the same transmission I said, "And he's moving toward us," and then I just hollered at the microphone, "We're on a collision course," and threw the microphone down (sic) to try to take evasive action. This one moved directly at us. And I was quite certain that we had been victimized by a sidewinder, [an air-to-air missile] because, and both of us, it scared us to death. We were ready to leave the airplane, if we could have. But the thing came straight at us and I'd say at a distance of, I don't know, maybe two miles, you can't tell those distances at night, but he made an instantaneous 90 degree left turn and at our altitude. [Note: This turn prevented the object from colliding with the airplane according to the pilot] Well, I wouldn't say just, he was maybe 500 feet below us." Then the UAP descended and receded away from us. "...at that point I knew it wasn't a missile because they have no control...". "It went a distance, I told them, 15 miles, but I couldn't tell the distance. It went some distance west of Ocala and he just parked out there, and sat there (shining steadily), and we flew on past it." As the light departed it flashed with the same pale green color as the first one. "...I looked diligently for any aircraft identification type of lights, and there were none." Also, the light was so angularly large that it appeared not as a point but as a circle at all times during this sighting. Other interesting facts are not included here to save space. (Transcript of witness interview by J. A. Hynek, September 1968; USAF Form 117)

67. November 1970 Night UC 70 mi. S New York City

FO Kenneth Duncan was flying a B-737 jet at FL240 when he and the captain spotted a

"bizarre pale blue light.... It wasn't blinding but it was changing intensity at a beat per second.... It looked like a semi-round sphere. We thought that it was another plane and what really upset us most was that it looked like it would strike our aircraft. The UFO was between one-half and three miles from us. It stabilized at our speed and altitude. Then it accelerated and made a 90 degree turn across our front and disappeared over the ocean in just a few seconds. We were flying at 480 knots and the UFO's speed was up to eight times greater. I've never seen anything like it before or since," he said. (Press release, Feb. 8, 1977)

68. February 1, 1971 1910L UP 10 mi. E Douglas, Georgia

Will Burt, 36, was piloting a Piper PA-28-180 with a passenger (also a pilot) in the right front seat from Rome to Waycross, GA when this event took place. They were on a heading of 115 degrees, an altitude of 3,500 feet, and about 25 to 30 miles NW of their destination airport under dark skies. In the pilots own words, "my right seat passenger called my attention to a large red ball like object about 1000 or 1500 yards away off the right wing at the same alt. I can't remember if there was a moon out at that hour, but the weather was clear. The object stay (sic) right with me off the right wing with every heading and alt (sic) change." This encounter lasted about five minutes before the light "just disappeared." The light was bright red with "orange shades of yellow" in it. It subtended about eleven degrees arc diameter and never changed shape, never flickered or broke apart, never gave off smoke or vapor. No E-M effects or buffeting was experienced. (Pilot report form)

70. April 12, 1973 2230L UP 20 Mi. N. Farmington, Missouri

This near miss incident involved a commercially rated pilot, Kenneth Pingle, 23, and his passenger Marvin Colyer who was also a licensed pilot. They were in a Piper Cherokee flying at 3,500 feet altitude (under 150 mph) toward the Farmington airport when they saw a "strange light off the left wing tip." Pingle said the light was bright white with an occasional orange tinge; it "...seemed to give off heat waves." The circular shaped object did not seem to spin as it paced the small aircraft at the same forward velocity as both approached the north runway at Farmington. Then they saw a white beam of light emanate from the object. Pingle also said that the object had moved directly ahead of his aircraft on final approach so he added full power and performed a go-around maneuver. He said, "It looked like it was moving at us at a high rate of speed, so I pulled back up and flew toward it. It immediately stopped, reversed its direction and flew away from us at a high rate of speed." The pilot then changed his mind about landing and chased the aerial object for several miles at full speed before it disappeared into the dark night sky. Both pilot witnesses were experienced in night flying. Pingle said, "This was definitely not a star or any kind of airplane...." Other witnesses on the ground also reported seeing the strange light that same night. (UFO Investigator, Pg. 2, June 1973, Center for UFO Studies, Chicago, Ill.)

75. January 7, 1978 2000L UC N. of Grand Canyon, Arizona

Capt. Leonard H. was flying a commercial flight to the NE from Phoenix to Salt Lake City, Utah at 35,000 feet altitude. Although the sky was perfectly clear he and his FO noticed a broad sky glow visible over "most of the western sky." "The glow approached the aircraft rapidly, in a period of about 30 seconds the glow lighted the airplane on the outside and (also) lit up the cockpit on the inside.... as this glow approached the airplane, a sphere was in the center of the glow. A sphere that appeared to be about the (angular) size of the moon when it comes over the

horizon. And at this particular time the moon was half full, directly overhead. And so this had nothing to do with the moon, but it did appear to be something like the moon in that light metallic coloring with a little bit of mottled effect. And this object came in at 90 degrees to us (on the left side) and it stopped about a quarter of a mile away from the aircraft.... And it paced us -- we were traveling along at normal jet cruise speed of about 600 miles an hour." Capt. H. called Los Angeles ATC to ask if they had a report of "any glowing objects in the sky. ATC's immediate return was "We have a rocket off of Vandenburg." I said, "This is no rocket. Do you have anything else?" They said, "No, you're cleared to Salt Lake control"." Capt. H. then called Salt Lake control who gave him the same basic information. He then stated, "And about this time, this object started to recede from our position and angled up about 45 degrees and disappeared, in about 5 seconds. And the next day I called the FAA and asked them if they wanted a report. They said there was no agency at this time taking reports of this nature. And that was the end of the incident." (Interview by J. Timmerman, CUFOS, June 17, 1989) [Author's comment: Once again, we find disinterest on the part of FAA officials with no follow-up. It is little wonder that pilots feel disinclined to report such encounters.]

76. January 15, 1978 1910L UP 22 mi. N. Louisville, Kentucky

This event took place at 5,500 feet altitude when an instructor pilot and his girlfriend were flying in a single engine 'Sundowner' from Evansville, IN to Cincinnati, OH. While above Washington County, IN (approximately half-way to their destination, nearing Interstate 65) the private pilot was the first to spot two bright lights approaching them directly. The separation distance could not be determined. Then the antics began. One of the lights flew horizontally away from the other and "made a perfect circle, and then another, while remaining at the same distance... (this) continued for several minutes, then the animated object became brighter, looking like a "blob" and began what appeared to the pilot to head in a collision course with the Sundowner. As the blob came menacingly closer, the pilot, fearful of collision dove his craft down 1,000 feet. In an instant, the white blob streaked overhead and out of view." Upon landing in Cincinnati the pilot phoned the Standiford Control Tower in Louisville (about 25 miles S of their encounter) and learned that there had been no confirmed radar contacts at that time. They had received phone calls from people who had seen a UFO in that general area, however. (Ridge, F.L., Regional Encounters - The 1994 FC Files, Mt. Vernon, Indiana)

79. June 11, 1978 1315L UP North central Los Angeles, California

Private pilot and flight instructor Robert W. was flying a Cessna 150 with a student (A.S.) near the Mt. Wilson observatory NE of Los Angeles in calm air. There was heavy smog below him and bright sunlight above. Horizontal visibility was about 15 miles. The outside air temperature was 70 - 80 deg. F. Here is the pilot's own story. "I witnessed a small ovoid shaped object fly literal circles around our aircraft. I first spotted the object underneath us on a northeasterly heading and about 500 ft. below our altitude (5,000 ft. MSL). At first I saw the overhead sunlight reflect off it and thought it was a reflection off something on the surface. After a few seconds I realized that it was definitely a small spherical aircraft travelling at a speed of about 200 - 300 mph. My student, who was on his third lesson, though it was a balloon but I have never seen a balloon maneuver at high speeds and maintain a constant altitude in calm air. I turned right to follow the object and by the time I turned it was climbing to my altitude and was on a westerly course in a matter of seconds. It went by us very fast and turned in front of us to the south at a range of about 2 - 3,000 feet. Then it took up an easterly heading

on our left doing a complete circle around us quite a few times."

"On one of the object's easterly passes... I could see that it definitely was a solid metallic aircraft of ovoid shape having a definite axis about which it moved... with a continuous highly reflective surface with no visible seams, markings, bolts.... (it) was no more than 3 ft. in length and slightly smaller in height. When it turned it banked on its axis much like a conventional aircraft, however, it had no wings or any visible means of propulsion." When the pilot radioed Ontario approach control he was told they had no radar contact with any unidentified traffic "... only our transponder reply," he said. He (later) discovered from tower personnel that they had no knowledge of any weather balloons being released. No buffeting was ever experienced. (Pilot report form)

80. August 27, 1978 1340L UP 10 mi. NNW Provincetown, Massachusetts

Mr. Arthur Silva, 55, and a passenger, Harold Johnson, 62, had just taken off from Beverly Airport, Mass. and were above Massachusetts Bay heading for Provincetown, Massachusetts on the tip of Cape Cod. They were flying in a Cessna 150 (N5907G). Visibility was reported as 15 miles with thin scattered clouds at 25,000 feet and the wind was at 10 kts. from the ESE. Soon after reaching their cruising altitude Silva received an ATC (Logan International Airport, Boston) warning of traffic near him at his 8 o'clock position but neither witness saw anything. The unknown traffic did not respond to ATC radio calls. Then, at about 1340 EDT, they saw an object thought to be some four miles directly ahead of them at their altitude of 2,500 feet (sic). As they closed on the object the veiling atmospheric haze effect was reduced and it became visually darker than before. They also noticed it had a "vague (oval) outline" with no wings, and was not a helicopter or other known type of airplane. The UAP suddenly began moving faster than a helicopter and looked like it was heading directly toward them. "Silva wondered why ATC was not warning him." It passed them at about 600 mph an estimated 1,000 feet away on their right side. The object was seen clearly as it passed. It was spherical in form with a silvery-white metallic surface (like "burnished aluminum"). "Johnson had the impression that it could have been an upended silver disc, some of which seemed translucent." Silva radioed ATC informing them of the near miss and they confirmed that their radar had shown that traffic had just passed him. Fowler, the field investigator systematically eliminated all of the known or suspected aeronautical objects from consideration. (Fowler, R.E., The MUFON UFO J., No. 129, Pp. 5-7, August 1978).

85. February 9, 1981 2240L UP San Jose, California

Two young pilots (Gary Rounds and passenger C.S.) were in a Cessna 150 (N16032) doing touch-and-go practice flights at San Jose International Airport under warm, calm-air conditions. After touching down on one of their landing approaches, adding full power, and climbing through 600 feet MSL, both witnesses spotted "another aircraft entering the (right-hand) traffic pattern." Its estimated altitude at that moment was about 1,700 feet and Rounds, who was flying, extended his upwind leg to avoid a collision. In his own words, "As the other aircraft paralleled me, I turned crosswind. As I was turning downwind, the aircraft turned toward my plane. It flew over mine and then fell into a position behind my plane. We got the best look at it while it was flying over. The object was red and very large. It seemed to be a light that pulsated as a heart would go in and out. It was also very bright" Passenger C.S., also a licensed pilot, provided much the same information, independently, with the addition of the following: The

unidentified object stayed about 800 feet above us. It appeared to be about ten feet in diameter and was extremely bright." ATC personnel at the San Jose airport tower also saw the red light, timed the incident (two to three minutes), and helped the pilot cope with the near-miss overflight. The pilot and his passenger "stopped looking (at it) after tower advised (us that) traffic was no (further safety) factor." After interviewing both ATC tower personnel and the two young men it was clear to me that, since the identity of the red object could not be determined, no one was going to officially report this incident. Fortunately (for me) a newspaper reporter found out about the event and wrote an article about it in the San Jose Mercury News soon thereafter. (Pilot report form)

89. February 20, 1985 2000L UC Charleston, West Virginia

This interesting close encounter involved one "large white circle" which paced the commercial airplane and then performed three separate 360 deg. vertical CW loops around the Beechcraft King Air TC263 while remaining in formation, i.e., while matching the aircraft's forward velocity. Capt. Mark Savage, 63, and his FO were carrying eight passengers all of whom watched the unidentified object hover some distance off their right wing for between five and eight minutes. The Captain had 4,100 hrs. flying time in this type aircraft. The King Air was at 19,000 feet altitude (MSL), 210 mph IAS, and 260 mph (DME) ground speed. Only stars were visible as there was no moon and the aircraft was flying above a solid under cast. One by one, passengers in the rear of the airplane asked the Captain various questions about helicopter flight behavior. Only then did he and his FO see the "bright white light" beside them. He radioed to Atlanta Center to ask about traffic in the area and was told there was none. It was then that the "light" made one full, 360 deg. CW horizontal orbit around his airplane. It then made two more identical loops (each about ten seconds apart) while staying abreast of the two engine aircraft at all times. He estimated each loop's diameter to be from 4,000 to 5,000 feet. Its flight path would have been a symmetrical (constant radius) corkscrew. The UFO then accelerated very rapidly to the south and disappeared from sight. No air turbulence or unusual electromagnetic effects were experienced at any time and the unidentified light source did not flicker, change shape, break apart, give off a trail, change colors, or stand still. He estimated its diameter to be about 1.2 degrees arc. (Pilot report form)

98. August 13, 1959 1600L UP Roswell and Corona, New Mexico

Jack Goldsberry was piloting his Cessna 170 on a heading of 313 degrees from Hobbs to Albuquerque, New Mexico on business at 8,000 feet altitude and 135 mph. He was a former Navy PBY pilot during WW-2 with about 6,000 hrs. flight time. The weather was warm, clear and calm with unlimited visibility. Suddenly his Magnesyn compass needle began to rotate slowly through 360 degrees over a four to five second period. He looked outside to try to orient himself relative to known landmarks, thinking that his aircraft had flown off course. Then he checked his second (magnetic) compass and noticed that it was "spinning crazily" Its needle was spinning so fast he could not read it! It was only then that he caught sight of something through his windshield.

Goldsberry saw three elliptical-shaped, gray, fuzzy-edged objects in "close echelon formation" moving from left to right directly ahead of him. The lead object was low and the next two were successively higher. Their outline shape was almost round and were from ten to twenty feet in diameter. He thought their distance was from 150 to 200 yards from him and

each object had a diameter of about 2.5 degrees arc and left a short "wispy trail" behind them. As he watched them fly completely around him in a horizontal plane he noted that the needle of his Magnesyn compass pointed at them. The three UAP circled his aircraft three times while maintaining the same rigid formation and then disappeared somewhere behind him. Then he noted that his Magnesyn compass was, again, pointing in the correct direction. Finally, his magnetic compass also settled down and pointed correctly. The postscript to this event is equally familiar.

When the pilot radioed the air traffic controller at Albuquerque he asked if there was a procedure for reporting a UFO. As soon as he admitted he had seen something unusual he was instructed to land at Kirtland AFB (south of Albuquerque) immediately; his flight plan was canceled. After landing at the air base he was escorted to an office and interrogated for several hours by an officer who handled UFO sighting reports for that base. As he left he was told "to say nothing of the incident to anyone except (to) his wife." The Major said that if he should experience "anything unusual" (e.g., felt ill) within the next six months to immediately go to a U.S. government hospital for treatment. Fortunately, no such symptoms showed up. (other details are found in the NICAP file) See Haines, (1999) for details of a very similar event which took place on August 13, 1976 in northern Germany.

101. March 12, 1977 2105L UC S of Syracuse, New York

This unexpected UAP event involved an uncommanded heading change of a United Airlines DC-10 (flight 94) from San Francisco to Boston's Logan International Airport at FL370. The jumbo jet was flying at 275 kts. indicated airspeed on airway J-94. The FO, H.E., 45, was flying and had coupled the number 2 autopilot to the "to" radial heading (288 degrees) from the Albany VOR ahead of them. Suddenly the airplane started a gradual, smooth (15 degree bank angle) turn to the left by itself. Within five to ten seconds both captain Neil Daniels, 57, and the FO turned and looked to their left side and saw an "extremely bright white light at about their own altitude." It was perfectly round and was almost three degrees arc in apparent diameter. Captain Daniels estimated its distance to be about 1,000 yards and probably as big or bigger than a DC-10 in size. Its intensity was like that of a flashbulb, viz., very very great. Then Boston center called them and asked, "United 94, where are you going?" Capt. Daniels replied, "Well, let me figure this out. I'll let you know." Then they noticed that "the three compasses were all displaying different readings. The FO's compass was within twenty degrees arc of the compass in front of the captain and was not rotating. It was then that the FO uncoupled the autopilot and flew the airplane manually. Meanwhile, the UAP "followed right along with us" for about four or five more minutes then "it took off and picked up speed very rapidly and just disappeared, over about fifteen seconds, back towards our 8:00 o'clock position and slightly upward." Captain Daniels asked ATC if they had any radar traffic in the area and they replied, "no." He told me later, "So whatever it was, we don't know. But it did cause a disruption in the magnetic field around the aircraft to the point where it did pull the aircraft off course." It may be noted that the magnetic sensor that provided the input to the FO's compass was located on the tip of the left wing nearest the UAP. The sighting was not reported. Other details are found elsewhere (Sturrock, Pp. 199-199, 1998) (Pilot report form)

102. November 18, 1977 2117L UP 50 mi. W of St. Louis, Missouri

Private pilot Gregory Barnett and two passengers (both asleep) were in a Seneca 2 (1975) en

route from Vichy to Troy, MO and were almost due west of St. Louis on a heading of 60 degrees flying at 13,000 feet altitude. The aircraft had just completed a 100 hour check. Unexpectedly, he saw a brilliant white light was behind, above, and to his right side. It seemed to accelerate ahead on a parallel course until it reached his 2 o'clock position where it slowed to his speed and remained for three minutes before moving away at high speed. During the pacing the pilot said (later), "I pressed IDENT (on transponder no. 1) and nothin' happened... I turned on my other transponder and nothing happened. It was really weird. Then it took off on a one-twenty, one-thirty heading. It shot out of my eyesight... (then) the second one (transponder) started working OK... I never could get the first one to work again." No radio static was experienced at any time and his DME continued to work fine throughout this incident. It should be noted that one of his two transponders stopped operating several hours before this UAP sighting for some unknown reason. (NUFORC Case No. 1027-77) (Pilot report form and taped interview)

103. May 26, 1979 0005L UP S. Central Utah

James Gallagher had left Blackfoot, Idaho before midnight and was at 10,000 feet altitude in his light airplane just south of the Challis National Forest intent upon landing at Friedman Memorial Airport, Hailey at Idaho, 14 miles south of Sun Valley. In his own words, "I looked up in front of me and saw these five orange objects in a horizontal formation in front of me and then they tilted - like an airplane would dip its wings - and I thought it was (lights on) some kind of aircraft. Then they spread out and I knew damn well it wasn't an aircraft." At one point the objects regrouped, formed a vertical line, then moved around randomly, apparently coming closer (to me). Then all five came to the left side of the aircraft... "my magnetic compass started spinning and my ADF [automatic direction finder] started spinning. At that point they were in a straight line formation and then they just blinked out... I did have trouble receiving on the radio because of heavy static and my engine started running rough.." It is also of interest to note that a Braniff flight crew also reported seeing orange objects below their altitude that same morning (0240L) while flying at 35,000 feet altitude only 120 miles south of Gallagher's sighting and again at 0253L when they were some 70 miles NW of Ogden, Utah. Ground radar also tracked the objects during this encounter. (Hall, Pp. 21-22, 2000)

105. March 1, 1986 2030L UP Western Washington (state)

An instructor pilot and his student (Shawn Kiaer) were flying near Snoqualamie Pass east of Seattle at 2030 when they both noticed two spheres approaching them on a collision course. The pilot "went into evasive action to avoid the collision. After the pilots had leveled off, two objects turned around and started to follow their plane. The instructor pilot tried to his radio and said it was inoperative due to heavy static. The pilot said that one object was on one side of the wing and one on the other. The objects then accelerated at phenomenal speeds heading due west... at which time the pilot's radio became operative again." (Goudie, D., MUFON UFO J., pg. 13, July 1986)

106. December 22, 1977 0400L UP Bay City, Texas

William Lupinski was flying a light plane from Alice, TX to Bay City, TX and was passing over the Port LaVaca bridge at Matagorda Bay when he saw a light off his right wing. Since it appeared to be pacing him (and he was traveling only 125 mph) he deduced that the light could not have been running lights on a commercial jet aircraft [of course it could have been a jet

airplane at a much greater separation distance than he first thought]. Now more curious, the pilot banked in the direction of the light "to take a better look at the object." The UAP also made an almost instantaneous 45 degree turn to the right towards the southern horizon and then disappeared "over the ocean" (sic) [Gulf of Mexico]. He called the tower at Palacios airport NE of his present position to inquire about other air traffic in the area. They answered "no." He continued on toward his destination some 26 miles farther to the NE. Suddenly he saw a UAP about 500 feet below his aircraft, "just over the Palacios airport runway. He became confused and didn't know if there were two objects or if it was the same one from two different directions." He had (recently) been turned over to Houston ATC. He flew on and was about 4 to 5 miles from the Bay City airfield when he saw yet another "glowing" object as he entered the traffic pattern. "This time it was 50 to 100 feet above the ground and dead square over runway 31, this flipping thing hovers." It had an intense blue-white glow overall was "pretty much circular shaped (and) aerodynamically lousy... weird."

The now very concerned pilot radioed Houston control again who called to several aircraft in the same area. Lupinski lined his airplane up with the runway centerline and "was watching the ground and the glowing object. I made a backwards approach and didn't care... I actually landed my plane from the wrong direction and at the wrong end of the runway." The UFO was still hovering over the other end of the runway... that's how I knew it was approximately 60 feet in diameter." As his wheels touched down the UFO backed directly away about 1/4 mile and turned right and then flew out toward the gulf and disappeared from sight.

The pilot stated later that "the first time it was thrilling and the second time it is terribly exciting... and now (during his final approach) I'm getting a little bit worried about this thing." Later he also admitted that all he wanted to do was to get down on the ground. The multiple appearance of unidentifiable lights in the air seemingly near to him had affected his personal self-confidence. Fortunately, this incident ended happily. (The Daily Tribune, Bay City, Texas, Nov. 26, 1978)

107. March 31, 1999 0039L UP Carson (12 mi. SE LAX), California

The pilot and police officer observer in a Los Angeles Police Dept. helicopter were working a call in Carson just after midnight. They were circling at between 400 and 500 feet AGL when the pilot noticed (and called out) an orange ball of light apparently at their own altitude passing from west to east in front of them at that moment. Its distance was estimated at two miles and appeared to be closing with them. Its airspeed was an estimated 150 kts. During part of the sighting the pilot flew straight and level to the north and noted that the object passed from the 10 o'clock to 2 o'clock position and then changed its flight path more southerly, now passing to their right side. After the pilot turned right another 30 degrees and stabilized his heading the object suddenly accelerated, changed its direction of travel and sped directly toward them. "The object got within 200 feet of the aircraft and then (instantaneously) changed directions again, flying to the north at a very high rate of speed and out of view." (National UFO Reporting Center (NUFORC) Rept. Dtd. 3/31/99 14:47).

It is problematical whether air safety was directly impacted here, but both observers were clearly captivated (and engaged) by this close aerial encounter over urban Los Angeles to the extent that they abandoned their official assignment in order to keep the unidentified light in

sight. Another similar police helicopter encounter took place in the early morning hours of October 12, 1999 over north Phoenix, AZ. (National UFO Reporting Center, Rept. 101299 2200)

112. August 9, 1997 1707L UC between Philadelphia and New York

This near-miss incident occurred between Philadelphia and New York and involved a Swissair Transport Co. Ltd. B-747-300 (HB-IGF) at about 1707 EDT. Flight 127 was in level flight at FL230 en route to Boston in VMC weather on an IFR flight plan. Its heading was 060 deg. and it was abreast of New York city to their left. The aircraft was flying at 340 kts indicated airspeed. Currently in radio communication with the Danbury sector of the Boston air route traffic control center, the captain radioed, "...sir, I don't know what it was, but it just over flew like a couple of hundred feet above us. I don't know if it was a rocket or whatever, but incredibly fast, opposite direction." Maybe "2, 3, 4 hundred feet above... the three of us saw a light object, it was white and very fast." The airplane wasn't damaged and there were no injuries to the occupants. The observation time was very short (about a second or less). The captain saw no wings on the object and he "was not sure it was an aircraft. He thought it was cylindrical in shape." There was no TCAS warning. [This is a highly automated collision-avoidance system on-board the aircraft that prompts pilots about what is the most effective mid-air collision avoidance maneuver to use]. The FO said he also caught a glimpse of the object as "it passed overhead very quickly. It was close enough that he ducked his head because he thought it would hit them. He said it was white and had a round shape. There was no smoke or fire visible from the object." It had no visible markings. Its angular size was about 1.5 deg. diameter. The FO said he had seen a weather balloon previously in his career and this object didn't look like a balloon. When Boston ARTCC radar data was examined for this time and place either beacon nor non-beacon data moving in the opposite direction were found. (Rept. No. NYC97SA193, Local Date: 08/09/1997) (Swissair 'Air Traffic Incident Report Form, RAC1-2App B1)

Also see Durant, R.J. (1999) for an excellent, in-depth discussion of why the object could not have been a weather balloon, missile, or part of the Perseid meteor shower. Based upon a private interview with the pilot, Durant discovered several facts which U.S. authorities either accidentally disregarded or deliberately chose to ignore. The NTSB still has no conclusion concerning the identity of the object and considers the case officially closed!