

PROJECT 10073 RECORD CARD

1. DATE 19 July 1964	2. LOCATION Albany, Oregon Condon, Oregon - Salem, Oregon Lebanon, Oregon - Hillsboro, Or.		12. CONCLUSIONS <input type="checkbox"/> Was Balloon <input type="checkbox"/> Probably Balloon <input type="checkbox"/> Possibly Balloon
3. DATE-TIME GROUP Local 20/0543Z GMT 20/0553Z - 20/0540Z	4. TYPE OF OBSERVATION <input checked="" type="checkbox"/> Ground-Visual <input type="checkbox"/> Ground-Radar <input type="checkbox"/> Air-Visual <input type="checkbox"/> Air-Intercept Radar		<input type="checkbox"/> Was Aircraft <input type="checkbox"/> Probably Aircraft <input type="checkbox"/> Possibly Aircraft
5. PHOTOS <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	6. SOURCE Civilian Police Officers		<input checked="" type="checkbox"/> Was Astronomical METEOR <input type="checkbox"/> Probably Astronomical <input type="checkbox"/> Possibly Astronomical
7. LENGTH OF OBSERVATION 10 Seconds Max 5 Seconds	8. NUMBER OF OBJECTS One Exploding	9. COURSE Descending	<input type="checkbox"/> Other _____ <input type="checkbox"/> Insufficient Data for Evaluation <input type="checkbox"/> Unknown
10. BRIEF SUMMARY OF SIGHTING 1. Intense white light trailing exhaust of white spots. North or East heading. Straight flight with flat trajectory. 2. Object breaking into pieces of different sizes, color of fire. Trailing sparks. Descending to horizon. 3. Aircraft shaped, rocket shaped object red and green with white light between moving through a descending arc of 45 degrees in 5 seconds		11. COMMENTS Multiple reports from area of object with meteor characteristics.	

*Compliments of the Author*

BOLIDE OF 1964 JULY 19, A.M.S. No. 2384

BY CHARLES P. OLIVIER  
*Narberth, Pennsylvania*

ABSTRACT

Over sixty visual observations of an unusually bright bolide, sighted over British Columbia on July 19, 1964, 9:44 p.m. P.S.T., have been analysed to determine the approximate parabolic path of the object.

SOMMAIRE

Plus de soixante observations visuelles d'un bolide particulièrement brillant aperçu dans le ciel de la Colombie Britannique le 19 juillet 1964 à 9:44 p.m. heure normale du Pacifique, ont été analysées pour déterminer la trajectoire parabolique approximative de l'objet.

ON July 19, 1964, at 9:44 p.m. P.S.T., an unusually brilliant bolide was sighted over British Columbia and, moving in a general south-easterly direction, ended over Washington. Mr. P. F. Brogan, regional director for the American Meteor Society, began collecting reports at once from residents in the states of Oregon and Washington. Eventually these were sent to the writer, who belatedly attempted to calculate the path. However, it became evident that sighting reports from Canada would vastly assist in the solution, hence Dr. P. M. Millman of the Meteor Centre, National Research Council, Ottawa, was asked for assistance. He promptly supplied over 30 Canadian reports as well as a drawing of a preliminary projected path, derived by Prof. W. F. Slawson, University of British Columbia, Canada, from observations he had collected. Three reports were received from the U.S. Air Force, so that over 60 observations with varying degrees of accuracy were available.

The stations were plotted on a specially prepared map of the region, and azimuth lines were drawn for the directions in which the bolide was first and last observed from each station. As always there were great divergencies but fortunately the Canadian observer at longitude  $122^{\circ} 59'$  W., latitude  $49^{\circ} 13'$  N., saw it begin at  $\alpha$  Ursae Majoris and cross over  $\delta$  Aquilae—actually it went much further. This observation gave fundamental points on the path and a very fine projected path since it passed almost through his zenith. Several other Canadians saw it near their zeniths and could tell on which side it passed. These observations confirmed the above projected path. The sub-end point was based mostly on American reports and a large proportion of these gave estimated

altitudes. One Canadian gave the path plotted among the stars, but his calculated altitudes could not be reconciled with other observations used to define the path. To derive the heights of the beginning and end points of the path was very difficult. First, it is well established that most casual observers greatly over-estimate altitudes if these are more than  $15^\circ$  or  $20^\circ$ . In this case some very distant observers gave altitudes of  $30^\circ$  to  $45^\circ$  which would give unreasonable heights and contradict nearer and apparently more accurate reports.

The heights finally adopted are the result of a series of approximations, too lengthy to describe in detail. A vertical plot was made of many intermediate points as well as the beginning and end points. (One intermediate point was almost certainly taken for the end point by many observers since a great outburst of brilliancy took place there.) A line was then drawn which conformed as well as possible to these various points. This choice is confirmed by the statement from many observers that the path was almost or exactly horizontal. The adopted heights of beginning, end, and the intermediate burst point, are given in the table. On account of the great length of path, an error of a few kilometres will have little effect on the radiant point and the orbit. This latter can be considered to have a greater accuracy than the heights. The opinion of most observers was that the colour was either blue, white or green, or a combination of these colours and blue-green is probably correct. The bolide was very brilliant with the zenithal magnitude at least  $-12$ ; even for distant observers the brightness is given as that of the quarter moon.

In deriving the duration of flight, estimates were omitted of those observers who stated that they saw only part of the path. In addition, one of 60 seconds was left out as being much too discordant; indeed it may conceivably refer to the train, though statements as to the latter are few and contradictory and most observers apparently saw none. The duration of from 3.5 to 5 seconds given by many observers indicates that they saw only part of the path or underestimated duration, but these values were included. There were several bursts; one observer states there were six. It is unfortunate that no report was received from the region near the end point, but that part of Washington is sparsely populated. If our end height is nearly correct, any chance of recovering meteorites is small despite the bolide's unusual brightness. The *parabolic* orbit which follows shows direct motion and an inclination of  $8^\circ$ , which is reasonable if the bolide came from the asteroidal zone.

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Projected path	507 km.
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Parabolic orbit	$i = 8^\circ$ $\Omega = 117^\circ$ $\pi = 227^\circ$ $q = 0.68$ A.U.

This bolide has been assigned No. 2384 by the American Meteorological Society.

The writer expresses his most sincere thanks to Dr. Millman for so generously lending the thirty-odd Canadian reports; any solution would have been very uncertain without these. We also wish to thank Mr. Brogan, whose personal work is responsible for most of the American reports, and the U.S. Air Force for their co-operation. Lastly, we thank more than 60 individuals who made the observations and took the time to report; without such co-operation the calculation of orbits would be impossible.

INCOMING  
MESSAGE

DEPARTMENT OF THE AIR FORCE  
STAFF MESSAGE BRANCH

UNCLASSIFIED

AF IN : 19043 (20 Jul 64) GF/bfb

PAGE 1 of 2

ACTION: NIN-7

INFO : XOP-1, XOPX-5, SAF-OS-3, DIA-15 (32)

SMB B108

QB356ZCQJA205

PP RUAHQ

DE RUWHP 11 20/2047Z

ZNR

P 202135Z

FM POADS ADAIR AFS OREGON

TO RUWGALE/AIR DEFENSE COMMAND ENT AFB COLORADO

RUWHBH/25 AIR DIV MCCHORD AFB WASHINGTON

RUCDSQ/AIR TECHNICAL INTELLIGENCE CENTER WRIGHT PATTERSON AFB OHIO

RUEAHQ/HEADQUARTERS USAF WASHINGTON

RUEAHQ/SECRETARY OF THE AIR FORCE WASHINGTON

BT

UNCLAS POODC-I 20-G-5

FOR AFCIN-HQ USAF; SAFOI - SECRETARY OF THE AIR FORCE. UFOB  
REPORT. THE FOLLOWING UFOB IS FORWARDED IN ACCORDANCE WITH AFR  
200-2: PART I.

1. ACFT AT FIRST AND THEN ROCKET SHAPED.
2. PENCIL.
3. RED AND GREEN WITH WHITE LIGHT BETWEEN.
4. ONE OBJECT.
5. NOT/APPLICABLE.
6. APPEARED TO BE AIRCRAFT THEN ASSUMED APPEARANCE OF A ROCKET.

INCOMING  
MESSAGE

DEPARTMENT OF THE AIR FORCE  
STAFF MESSAGE BRANCH

UNCLASSIFIED

PAGE 2 of 2

AF IN : 19043 (20 Jul 64)  
PAGE 2 RUWHKP 11 UNCLAS

7. HAD EXHAUST TAIL.

8. NO SOUND.

9. N/A.

PART II.

1. BRIGHTNESS.

2. 085 DEGREES ELEV, HEADED TOWARD 090 DEGREES.

3. 030 DEGREES ELEV, 090 DEGREES AZIMUTH.

4. 085 DEGREES TO 030 ELEV, NO MANEUVERS.

5. ABRUPT.

6. 5 SECONDS.

PART III.

1. VISUAL GRD.

2. NONE.

PART IV.

1. 20/0543Z.

2 NIGHT.

3. 1 MILE SOUTH OF ALBANY OREGON

PART V. JAY CROOK, STATE POLICE.

PART VI. WEATHER: CLEAR VIS/15 MILES, WINDS 270 DEGREES AT

5 TO 10 KNOTS, TEMP 67 DEGREES.

PART VII. RATING ASSIGNED IS F-6.

BT

NOTE: ADVANCE COPY DELIVERED TO DIA & NIN

INCOMING  
MESSAGE

DEPARTMENT OF THE AIR FORCE  
STAFF MESSAGE BRANCH

UNCLASSIFIED

AF IN : 24720 (24 Jul 64) M/sah

Pg 1 of 2

INFO : MIN-7, KOP-1, XOPX-5, SAFOS-3, DLA-15, SMB-1 (33)

SMB A013

SUSPECTED DUPLICATE

CHQA832ZCQJA450

PP RUEAHQ

ZNR ZFH-1

VV HEA996

PP RUCDSQ RUEAHQ RUWGALE RUWHBH

ZFD RUWHBHE

VV HEA968

PP RUCDSQ RUEAHQ RUWGALE RUWHBH

DE RUWHBHE 2 23/0331Z

ZNR

P R 230330Z

FM 636 RADAR SQ CONDON AFS ORE

TO RUCDSQ/AFSC WRIGHT PATTERSON AFB OHIO

INFO RUEAHQ/SAF WASHDC

RUEAHQ/HQ COMD USAF WASHDC

RUWGALE/ADC ENT AFB COLO

RUWHBH/WT AIR DIV MCCHORD AFB WASH

BT

UNCLAS 6360AC-7-56.

FOR AFSC, FTD. INFO: SAFOI, USAF, AFCIN. SUBJECT (UFO) THIS  
MESSAGE IN TWELVE PARTS. PART I. SPHERICAL 2. SIZE OF DIME AT

TO	CZS
OS	
OSA	
OSP	
US	
RR	
IL	
TLA	
TLI	
ILP	
ILS	
ILT	
IM	
RD	
MP	
MPP	
MPR	
AA	
AAA	
ABZ	
<del>OC</del>	
OI	
LL	
SS	
DSMG	

AF IN : 24720 (24 Jul 64) M/sah

Pg 2 of 2

ARMS LENGTH, 3. INTENSE WHITE LIGHT, 4. ONE, 5, N/A 6, NONE, 7,  
TRAILING EXHAUST, SMALLER WHITE SPOTS TRAILING BEHIND SEEN BY MRS  
MCELLIGOTT. TRAIL NOT OBSERVED BY MR MCELLOGOTT. 8. NONE 9. EXCEPT  
IONAL BRIGHTNESS, MOST UNUSAL FEATURE. PART II. 1. HAPPENED TO  
LOOK OUT FRONT PICTURE WINDOW. 2. APPROXIMATELY TEN (10) DEGREES  
ABOVE HORIZON AND THREE FORTY (340) DEGREES AZIMUTH 3. SAME ELEVA  
TION AND THREE FIFTY FIVE (355) DEGREES AZIMUTH 4. STRAIGHT FLIGHT  
NO MANEUVERS, FLAT TRAJECTORY. 5. DISAPPEARED BEHIND HILLSIDE TO  
NORTH. PART III. 1. GROUND VISUAL 2. NONE 3, N/A PART IV. 1. 0555Z  
20 JULY 1964 2. NIGHT. PART V. TWENTY FOUR (24) MILES NNE OF CONDON  
ORE PART VI. [REDACTED], AGE 45 [REDACTED], IONE ORE FARMER  
RELIABLE OBSERVER SERVED IN ARMY AIR CORPS. 1942-1945. CAPT PILOT  
C-47 AND C-54 A/C. [REDACTED], AGE 39, (WIFE) RELIABLE  
OBSERVER PART VII. NO WIND, CLEAR, BEFORE MOON RISE SURFACE WINDS CALM.  
OBSERVER. WINDS ALOFT 5,000 FT 280 DEGREES AT 10 KNOTS 10,000 FT, 280  
DEGREES AT 18 KNOTS. . UNLIMITED. R. UNLIMITED. 5. NONE 6. NONE 7. NOT  
AVAILABLE PART VIII. NONE. PART IX. NONE KNOWN. PART XI. INTELLIGENCE  
OFFICER 6360AC-OP CONDUCTED ON THE SPOT SURVEY. OBSERVER (MR [REDACTED])  
BELIEVES IT COULD HAVE BEEN A FIREBALL BUT FLAT TRAJECTORY OF TRAVEL  
MADE HIM WONDER. FROM THE ANALYSIS OF OBSERVER'S DISCRPTION  
AND INTELLIGENCE OFFICER'S INSPECTION OF THE LOCATION OF  
SIGHTING, OBJECT SEEN IS BELIEVED TO BE A METORITE. FLAT TRAJECTORY  
COULD HAVE BEEN AN OPTICAL ILLUSION TO OBSERVER SINCE HE SAW IT FOR  
SUCH A BRIEF PERIOD OF TIME. PART XII. NONE.

NOTE: Original transmission not received in SMB.

BT

1-57 (AF3)

**PRIORITY**

PART I.

1. BREAKING INTO PIECES.

2. SEVERAL SIZES.

3. COLOR OF FIRE.

4. SEVERAL PIECES.

5. DESCENDING IN PIECES.

6. EXPLOSION.

NOT GIVEN,

III. NOT GIVEN.

IV. NOT GIVEN.

V. DOWN TO HORIZON.

VI. IN SECOND.

PART III.

1. VISUAL.

2. NOT D.

3. N/A

PART IV.

1. C. W. B. W. T.

2. N/A

PART V. 3. DISCOVERED IDENTIFI. LOCATED. HILLSBORO, OREGON.

GREEN, OREGON POLICE DEPARTMENT, HILLSBORO, OREGON.

PART VI.

PART VII. 1. WINDS

2. HILLSBORO POLICE DEPARTMENT, NO NAME GIVEN; SALEM STATE

POLICE, NO NAME GIVEN; LEDAUCH POLICE DEPARTMENT, NO NAME GIVEN.

PART VII. CLEAR, VIS/12 MILES, WINDS 270 DEGREES 40 TO 1.

KNOTS, TEMPERATURE 57 DEGREES.

PART VIII. P-3

1. N/A

III

*Calculations of the Author*

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