PROJECT 10073 RECORD CARD

1. DATE
19 July 1964

2. LOCATION Albany, Oregon
Condon, Oregon - Salem, Oregon
Lebanon, Oregon - Hillsboro, Ore.

3. DATE-TIME GROUP
Local 20/0543Z
GMT 20/0553Z - 20/0540Z

4. TYPE OF OBSERVATION
☒ Ground-Visual ☐ Ground-Radar
☐ Air-Visual ☐ Air-Intercept Radar

5. PHOTOS
☐ Yes
☒ No

6. SOURCE
Civilian Police Officers

7. LENGTH OF OBSERVATION
10 Seconds Max
5 Seconds

8. NUMBER OF OBJECTS
One Exploding

9. COURSE
Descending

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.

12. CONCLUSIONS
- ☐ Was Balloon
- ☐ Probably Balloon
- ☐ Possibly Balloon
- ☐ Was Aircraft
- ☐ Probably Aircraft
- ☐ Possibly Aircraft
- ☒ Was Astronomical METEOR
- ☐ Probably Astronomical
- ☐ Possibly Astronomical
- ☐ Other
- ☐ Insufficient Data for Evaluation
- ☐ Unknown

ATIC FORM 329 (REV 26 SEP 52)

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 apperçu 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° 59′ W., latitude 49° 13′ N., saw it begin at α Ursae Majoris and cross over δ 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° or 20°. In this case some very distant observers gave altitudes of 30° to 45° 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°, which is reasonable if the bolide came from the asteroidal zone.

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Ended over	Long. 119° 34′ W., Lat. 46° 35′ N. at 54 km.
Projected path	507 km.
Path	509 km.
Duration	8.0 ± 4.2 sec. (32 observations used)
Observed velocity	62 ± 32 km./sec. (very uncertain)
Radiant uncorrected	$a = 140° \pm 2°$, $h = 4.0° \pm 2°$
Curvature correction	−2°.3
Zenith correction	−4°.9
Corrected radiant	$a = 140°$, $h = -3°.2$
	$\alpha = 132°.3$, $\delta = +29°.0$
	$\lambda = 126°.8$, $\beta = +10°.8$
Parabolic orbit	$i = 8°$
	$\Omega = 117°$
	$\pi = 227°$
	$q = 0.68$ A.U.

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

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

INCOMING
NMMMESSAGE

DEPARTMENT OF THE AIR FORCE
STAFF MESSAGE BRANCH

UNCLASSIFIED

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

ACTION: NIN-7

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

SMB B108

QB356ZCQJA205

PP RUAAHQ

DE RUWHKP 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 CNETER 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.

~~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. Ø85 DEGREES ELEV, HEADED TOWARD Ø9Ø DEGREES.

3. Ø3Ø DEGREES ELEV, Ø9Ø DEGREES AZIMUTH.

4. Ø85 DEGREES TO Ø3Ø ELEV, NO MANEUVERS.

5. ABRUPT.

6. 5 SECONDS.

PART III.

1. VISUAL GRD.

2. NONE.

PART IV.

1. 20/Ø543Z.

2 NIGHT.

3. 1 MILE SOUTH OF ALBANY OREGON

PART V. JAY CROOK, STATE POLICE.

PART VI. WEATHER: CLEAR VIS/15 MILES, WINDS 27Ø DEGREES AT
5 TO 1Ø 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

INFO : NIN-7, XOP-1, XOBX-5, SAFOS-3, DIA-15, SMB-1 (33)

SMB A013

SUSPRCTED DUPLICATE

CHQA382ZCQJA450

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

FO		CYS
	OS	
	OSA	
	OSP	
	OS	
	OR	
	IL	
	ILA	
	ILI	
	ILP	
	ILS	
	ILT	
	IM	
	RD	
	MP	
	MPP	
	MPR	
	AA	
	AAA	
	AAF	
	OI	
	LL	
	SS	
	OSMG	

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. APPOXIMATELY 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 DISCRIPTION 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

PRIORITY

Complimentary of the Author

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