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This document consists of 2 pages, copy 1...
of 4, series #...

HEADQUARTERS, DETACHMENT D
1100TH USAF SPECIAL REPORTING GROUP
Campbell Air Force Base
Camp Campbell, Kentucky

7 April 1949

333.1

SUBJECT: Security Inspection

TO: Commanding General
Sandia Base
Albuquerque, New Mexico

1. Reference is made to secret letter, your headquarters, dated 1 April 1949, Subject: Security Inspection.
2. a. Guard Orders have been amended directing that the electric gate be closed between 1700 hours until 0700 hours the following day.
- b. Locks have replaced the bolts in all inspection access gates in the outer fence.
- c. Inspection ports on both bridges are now provided with locks.
- d. The final draft of our alert plan has been reviewed and will be published and distributed for study to operating personnel. It is desired to point out that the alert plan is incomplete. A stockpile custodian has not been assigned here; his part in the alert plan has been outlined only. Furthermore, since the 11th Airborne Division is not in place yet, only temporary arrangements for defense have been made. Final form of the overall alert plan will be submitted to your headquarters for approval as soon as conditions will allow. In the interim period, it is felt that the temporary alert plan we have prepared is adequate. A copy of this plan will be dispatched to your headquarters in the near future.
- e. All jeep radios are now installed in jeeps.
- f. Although not entirely satisfactory, radio communication with the Camp Campbell Military Police has been in effect for some time and was in effect at the time of the Security inspection. Permanent arrangements for radio communication with Camp Campbell Military Police are delayed pending the arrival of radio frequency crystals that fit the Military Police net frequency.

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NND 58378

Short Title BR-10-0-214

SHORT TITLE Campbell-5681

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7 April 1949

SUBJECT: Security Inspection

2. Cont'd.

g. Pressure has been exerted to get the Post Engineers to keep the drainage system clear and to take measures to check the erosion. These efforts will be continued but little progress on erosion control can be expected until the rains diminish. Ditches have been filled, dirt moved and replaced, native grasses planted, but the rains return too soon and much of the effort invested is therefore wasted. Plans are prepared for an interim erosion control effort, and a study is being made to estimate the cost of resloping the cuts in order that the rainfall may be drained with less damaging results. Initial estimates run in the neighborhood of twenty thousand dollars (\$20,000.00).

3. With the exception of halting the erosion, all deficiencies listed in the security inspection report have been cleared away. It is therefore requested that the monthly report of action taken required by cited letter be discontinued.

Richard W. Kline

RICHARD W KLINE
Lt Col, USAF
Commanding

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Short Title BC-10-0-214

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HEADQUARTERS
SANDIA BASE
Albuquerque, New Mexico

*Revised -
DF 21 Jan 62*

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1949

FILE NO. 333.5

SUBJECT: *Un-identified Flying Objects*

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353.5

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RESEARCH AND DEVELOPMENT DIVISION - NEW MEXICO SCHOOL OF MINES - SOCORRO, NEW MEXICO

10 August 1949

Dr. Lincoln LaPaz
Institute of Meteoritics
University of New Mexico
Albuquerque, N. M.

Dear Lincoln:

I am inclosing two copies of the report you asked for, and hope that they serve their purpose.

We have made a preliminary examination of the eighteen collections taken at nine locations on my Monday-Tuesday trip. There was a large number of copper-bearing particles on one collection (R-104L) taken on Highway 84, seventeen miles north of Highway 66, and scattered occasional particles throughout the series. The collection taken at the same location immediately following R-104L shows practically no copper. A large part of the R-104L is of a granular material unfamiliar to us, and the copper indications originate principally in what are apparently aggregations of finely (one-micron) granular material of overall sizes in the neighborhood of thirty microns. Some copper particles, however, appear to be solid and opaque. The passage of two automobiles while this collection was being made is a complicating factor. It is hard to see how they might have been a source of copper, however, unless it was a question of stirring up some from dust on the pavement.

We intend to do some further chemical work with these collections, but I doubt if much new relevant information will be obtained.

My tentative conclusion is that no widespread significant dispersion of copper-bearing particles was present in the atmosphere in the region covered at the time the collections were made. No definite statement is possible about the one heavy copper collection: it should be presumed to be of local origin until some evidence to the contrary is found.

The route of the collecting trip included Pastura, Santa Rosa, junction of Routes 66 and 84, and Las Vegas on Monday afternoon. On Tuesday morning it included Las Vegas, Canoncito, Glorieta and Pecos.

Yours very truly,

W.D. Crozier

WDC*TW

attachments (2)

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R/D-tw
8-10-49

AN ATTEMPT TO COLLECT AIRBORNE PARTICLES
ASSOCIATED WITH THE FIREBALL OF JULY 24, 1949.

By

W. D. Crozier
and
Ben K. Seely

NEW MEXICO SCHOOL OF MINES

M E T H O D

A fireball was reported to have passed over the general neighborhood of Socorro, New Mexico, at 8:26 p.m., July 24, 1949. Impactment equipment, developed in connection with the aerosol research project of the New Mexico School of Mines, was available, and it was decided to make systematic collections of airborne material in the hope of obtaining material that could be associated with the fireball. For the present report it is sufficient to state that the equipment processed air at the rate of about 34 liters per minute, the particles being separated from the air by impactment against an adhesive-coated plate in an air jet. Approximately ninety per cent of airborne particles with diameters greater than one micron are collected.

The adhesive used on the collecting plates (microscope slides) was a glycerin-gelatin mixture with an addition of rubeanic acid (dithiooxamide.) This reagent was used to enable identification of copper or copper compounds; it also enables identification of nickel and cobalt. After making the collections, the slides were covered with a Saran film, after which they were exposed to strong ammonia vapor for fifteen minutes to effect partial solution of any copper or copper oxide particles.

R E S U L T S

The first collection was made at 10:00 a.m., July 25, about thirteen and one-half hours after the fireball was seen. The air was taken about twelve feet above ground level, on the campus of the School of Mines. The first run was for three minutes, processing about 102 liters of air. Several large particles were found in it that gave positive copper tests. In at least one of these the copper reaction was seen before the ammonia treatment, indicating the presence of at least a trace of a soluble copper compound. The sizes of particles seen in the first collections ranged up to over one hundred microns in the largest dimension: the largest particles gave the impression of being fragments of a somewhat fibrous material, with the smaller

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dimension of the order of twenty or thirty microns. There were no small particles, that is, no particles with a maximum dimension below 15 microns.

Following the first collection, additional collections were made, under similar conditions, over a period of eight days.

The accompanying table summarizes the conditions and copper counts for all these collections, including the first one described above. A number of the runs were for periods longer than three minutes, but the counts have, in these cases, been reduced to the three-minute equivalent. One collection showing several large copper indications, taken July 25, is omitted from the table because it was damaged in course of a test for radioactivity by exposure of a nuclear track plate (with negative results) and a definite count could not be made.

The counts are exhibited in three size classifications, and attention is directed to the fact that particles in the smallest size group (1 to 15 microns) are practically absent from the early collections, while in the later collections, particles in the largest (30 microns) and middle (15 to 30 microns) groups have become quite scarce. At the same time, the counts have become quite large in the smallest size group.

SIGNIFICANCE OF RESULTS

If it were possible to say that particles giving a copper test are generally very rare in collections near ground level in this locality, the above facts would be highly significant. It happens, however, that collections have been made at Socorro over only a short period, and not much attention has been given to identification of copper compounds. However, after the copper indications had been found in the present series of collections, some collections were found on file that had been made on plain glycerin-gelatin on July 14, 1949. These were covered with the Saran film and rubeanic acid and ammonia were applied by diffusion through the film. A few copper indications were found, almost all the particles being in the 30 micron size group. Some other collections were made early in July that will be examined for copper when they are freed from other tests. In addition, occasional collections will be examined for copper in the future, and it may be possible eventually to add something to the information now presented.

CONCLUSIONS REGARDING COPPER

In view of the above facts, it seems very hazardous to draw any definite conclusion associating the copper-bearing particles collected with the fireball of July 24. There still is, however, a residuum of possibility of such associations when it is considered that particles of the smallest size group did not appear in large numbers until some 35 hours after the passage of the fireball.

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TABLE

Counts of Copper Particles in Collections at Socorro
During Period July 25 to August 1, 1949
= (Reduced to Particles per 102 Liters of Air)

Collec. Time Date Hour		Elapsed time	Wind* Direction knots	Copper Counts		
				1 - 15 Micron Range	15 - 30 Micron Range	30 Microns
7-25	10 AM	13.5	NNW - 9	1	4	1
	"	13.5	"	0	2	2
7-25	2 PM	17.5	? ?	4	1	1
	"	"	? ?	1	0	0
7-26	8 AM	35.5	W? - 9	8	0	0
	"	"	"	20	0	0
	"	"	"	0	2	2
7-26	2 PM	41.5	W? - 7	← 20 →		0
	"	"	"	18	1	0
	"	"	"	← 22 →		0
7-27	7:30 AM	71.0	NE - 8	1	0	0
7-27	1:30 PM	77.0	NE - 6	23	0	0
	"	"	"	8	0	0
7-28	7:30 AM	95.0	WSW - 3	0	1	0
	"	"	"	← 23 →		0
7-29	7:30 AM	119.0	S - 7	4	0	0
7-29	4 PM	127.5	ESE - 10	← 28 →		1
	"	"	"	15	0	0
7-30	10 AM	145.5	SE - 4	2	0	0
	"	"	"	83	1	1
7-31	10 AM	169.5	SSE - 5	4	0	0
	10 1/4 AM	" 1/4	"	3	0	0
	10 1/2 AM	" 1/2	"	2	0	0
8-1	9:30 AM	193.0	N - 6	17	0	0
	"	"	"	6	0	0

*Surface Wind recorded by Weather Station at time nearest collection time.

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Attention is called particularly to the large number of small particles in one of the 145-1/2-hour collections. The actual number in the collection was 140, for the five-minute run. Most of these were in the size range of two to five microns, and the principal difficulty in associating them with the fireball is that a five-micron particle cannot fall much more than 10,000 feet in 145.5 hours. These particles could have come down from a greater height only if some downward motion had taken place in part of the air involved.

It should be mentioned that collections were taken during the afternoon of July 27, at several points south and east of Socorro, the farthest being near Bingham. These collections contained particles giving copper indications, the particles being in the same range of sizes as those collected in Socorro at about the same time.

It is perhaps noteworthy that the copper-bearing particles in all these collections were of opaque material. Most of the copper minerals that have previously come to our attention in collections from the air have been colored material, blue, green, red, or yellow.

COBALT AND NICKEL TESTS

In the 2:00 p.m. collection of July 26, three quite remarkable particles were found that gave very strong cobalt indications. The particles were apparently perfect spheres (at least they were perfectly circular in cross section), twelve microns in diameter. The reaction with rubeanic acid, after ammonia treatment, produced a dense yellow-tan halo, sixty microns in diameter. The color was not quite so clear as with pure cobalt: the appearance suggesting a high-cobalt composition with some metal present. Such particles are quite unique in the experience of the present. If these particles were of meteoritic origin they could, in the absence of vertical air movement, have fallen a distance of the order of 20,000 feet in an interval of 41.5 hours.

Two particles giving nickel indications were found. This is quite normal, however. If anything, the number is smaller than might have been expected in material of surface origin. The collections were not given acid treatment: additional nickel indications might have been found if this had been done.

A SUGGESTION

While the results of the present investigation should be regarded as negative or inconclusive, it is desired to call attention to the fact that a means is at hand that should make possible a definite demonstration of the presence or absence of copper particles associated with events of the July 24th type.

Particle collection equipment, operating on the same principle as that used in the present investigation, and designed for airplane installation, is on hand and its successful operation has been demonstrated in numerous flights. Provision

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could easily be made for quickly mounting this equipment in an airplane capable of ascending above the 40,000-foot level, which could take off soon after an event of the July 24th kind, and fly a pattern that would include with reasonable certainty some of the material originating at the meteor trajectory. A quick approximate determination of the trajectory would be required, of course, and if winds aloft were of considerable strength it would be necessary to make due allowance for them in planning the flight.

NOTE ADDED ON AUGUST 10, 1949:

As this report was being finished, an attempt was made at an airplane collection following the event of August 6. The collecting equipment was installed in a B-25 from Kirtland Field and on the afternoon of August 8, a flight was made which it was hoped might intercept some of the meteoritic material.

An interval of 41 hours had passed before the take-off, and the maximum altitude reached was 23,000 feet. A rough attempt was made to include air that was under the trajectory, but distances of several hundred miles were involved. A few copper indications were obtained, but they seemed definitely to be associated with material of surface origin. No nickel or cobalt indications were found. An elaborate study, which may require more upper air data than is available, should be made before it is decided whether or not the flight did actually include air that should have borne particles from the meteor trajectory.

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August 17, 1949

TO: Colonel Doyle Rees

FROM: Lincoln LaPaz

SUBJECT: Anomalous Luminous Phenomena. Sixth Report (attempts to collect volatilization products from green fireballs)

(1) In an earlier report it has been pointed out that in spite of air and ground searches in early February along the well determined earth-trace of the green fireball of 1949, January 30th no fragments of this fireball were recovered. There remained the possibility that this fireball had been so completely volatilized during flight that only fine dust from it filtered down thru the atmosphere. Since, for several reasons, it seemed more probable that such dust would consist chiefly of copper or a copper alloy rather than of the ferromagnetic substances found for ordinary meteorites, the methods habitually employed by meteoriticists for the collection of "cosmic dust" (separation of the dust from the air by use of electromagnets or permanent magnets) would not be appropriate for use in connection with the green fireballs. It was therefore decided to enlist the aid of Dr. William Crozier, who was known to have developed a novel impactment dust collector for use on the Aerosol Project of the New Mexico School of Mines. (The writer had been closely associated, in 1943-44, with Dr. Crozier at New Mexico Proving Grounds while working on saboted and proximity fused shells and knew that he had satisfactory clearance.) Dr. Crozier not only agreed to participate in a ground-level search for dust possibly put down by the fireball of January 30th, but made the valuable suggestion that dust collections be made on plane flights routed back and forth at high altitudes through the air beneath green fireball paths as soon as possible after fireball fall. In this manner contamination of the dust collections by terrestrial particles would be reduced to a minimum. No immediate application was made of Dr. Crozier's dust collection techniques, in part because of the writer's return to full time academic work at the UNM on February 8th and in part because of Dr. Crozier's other research activities and the interruptions in Research and Development Division work incident to the A.E.C.'s taking over the Albuquerque quarters of the Division.

(2) When it was determined that the green fireball of July 24th had descended in the immediate vicinity of Socorro, it was decided to ask Dr. Crozier to attempt collections even though he and his staff were then engaged in the final stages of moving from Albuquerque to their new quarters on the Campus of the New Mexico School of Mines. A long distance call to Dr. Crozier on July 26th brought the welcome news that he had been alerted by an appeal for observations issued by the Institute of Meteoritics on the evening of July 24th and had already made dust collections on the campus at Socorro on the morning of July 25. These collections, to Dr. Crozier's evident surprise, were found to contain not only the first copper particles he had found in air dust collections but these particles were of unusually large size --- up to 100 microns in maximum dimensions. On receipt of this exciting information, a party was dispatched from 17th District O.S.I. Hdqs. to confer with Dr. Crozier and to make a field search for the fireball of July 24th. This party consisted of Major Charles L. Phillips (courteously made available for the trip by Colonel Harold A. Gunn, C.O. of Kirtland Field) Mr. Paul Taft of the U.S. Weather Bureau in Albuquerque, S/A Jack Boling and the undersigned. A conference with Dr. Crozier and Mr. Ben Seely was held on the School of Mines campus in Socorro between

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10:00 - 12:00 A.M. on July 26th. At this conference it became apparent that Dr. Crozier was inclined to attribute the unusually large copper fragments collected on July 25 at 10:00 A.M. ("which because of their size could not have been blown very far by surface winds") to particles blown off the roof or out of the gutters of the Assaying Building on the Campus. In answer to a question from the writer, Dr. Crozier replied that he would consider this possibility ruled out if copper particles showed up in collections made in the open country at considerable distances from the Campus. It was therefore recommended that such collections be made and Dr. Crozier and Mr. Seely rigged up a storage battery combination and small D.C. motor driven impactment collector which were loaded into the O.S.I. staff car and driven out through San Antonio, Carthage, and Bingham, New Mexico (this route passing, in Mr. Taft's opinion, through the region where particles from the fireball of July 24th would most probably have been carried by the very light winds prevailing in the region since the incident.) Four of the collections made on this trip were examined on the evening of July 26th by Mr. Ben Seely and all were found to contain copper particles indistinguishable from those collected in Socorro at about the same time.

(3) Full details on the methods of collection employed by Dr. Crozier and Mr. Seely and on later examinations of the dust particles collected after the green fireballs of both July 24th and August 6th are given in Dr. Crozier's report (R/D - tw, 8-10-49) copies of which are hereto appended. Dr. Crozier's tentative conclusion from study of the collections made, not only in connection with the incident of July 24th, but also that of August 6th, is that "the results of the present investigation should be regarded as negative or inconclusive." From analysis of his report (R/D - tw, 8-10-49) and from several phone conversations with Dr. Crozier, it is the writers belief that Dr. Crozier was led to the above conclusion by the following facts listed below in decreasing order of importance, and accompanied by critical comments:

(3.1) The discovery by tests made on or about August 1 of "a few copper indications" in dust collected at Socorro on July 14, 1949, i.e. ten days before the green fireball incident of July 24th. (Dr. Crozier has informed the writer that the collection of July 14th was carefully wrapped up and could not have become contaminated by copper dust which blew in through the open windows of the R.D. & D. Building at Socorro after the incident of July 24th. However, there remains the possibility that an unobserved or unreported green fireball occurring in the Socorro neighborhood shortly before July 14th put down the copper dust found in the July 14th collection. To one familiar with the almost uninhabited country around Socorro and the fact that green fireballs as bright as the half moon occurring at times as favorable for observation as 7:30 -- 8:30 P.M. have gone almost unreported, it seems quite likely that a green fireball that fell after midnight or during the daytime or while most of the sky was overcast might go entirely unreported.)

(3.2) The discrepancy between the computed and observed rates of descent of very fine copper particles. (As Dr. Crozier notes, such discrepancies are understandable "if some downward motion had taken place in part of the air involved." Precisely such downward motion occurred in the air near the real paths of the fireballs of July 24th and August 6th for these falls were nearly vertical. Furthermore the best observations of the endpoints of these fireballs place that of July 24th at a height of 10-12 miles and that of August 6th at 5-6 miles. The downward directed ballistic head wave therefore could very easily have carried Dr. Crozier's 145 hour particles to within 10,000 feet of the earth at

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the time of fall. Since we cannot assume complete stagnation of the air masses in the Socorro neighborhood for 145 hours, it must be supposed that such air motions as occurred were approximately compensating and resulted in the return of Dr. Crozier's tiny "five-micron particles" to the Socorro neighborhood in approximately 145 hours. Only a detailed study of air mass motions for the time interval involved can settle this point.)

(3.3) The long continued appearance of copper particles (however, as Dr. Crozier emphasizes, smaller and smaller in size) in the Socorro collections. (Precisely such a decrease in particle size has repeatedly been observed in connection with dust collections believed to be of meteoritic origin and is attributed to the slower and slower rate of descent of the particles as their average size decreases. Thus, L. Rudaux's results strongly indicate that particles from the Giacobinid shower of 1933, October 9, filtered down in smaller and smaller sizes for 100 hours or more. Furthermore, for the green fireballs of July 24th and August 6th, the nearly vertical real paths extended from altitudes of 100 miles or more down almost to ground level and therefore optimum conditions for long continued infall of dust particles were approached in these falls.)

(3.4) Failure of the airplane collection of August 8th to detect airborne copper particles definitely not of terrestrial origin. (However, the airplane collections were all made at great distances (hundreds of miles) from the Vaughn region in which the fireball of August 6th fell; and, as Dr. Crozier points out, at the moment it can not be determined "whether or not the flight did actually include air that should have borne particles from meteor trajectory." In this connection the results alluded to in paragraph 4, below, may be of considerable significance.)

(4) At the time the airplane collection of August 8th was planned the writer recommended not only that the flight traverse the area from Vaughn northward to Raton and then NW-ward into the Durango, Colorado region (a recommendation based on advice received from Mr. Paul Taft of the U.S. Weather Bureau) but also that simultaneously a ground search with the portable impactment dust collecting equipment rigged up on July 27th be run from Vaughn through Pastura to Santa Rosa. The latter part of this recommendation was followed by Dr. Crozier who reported on the results obtained in his letter to me under date of August 10, copies of which are hereto attached. Dr. Crozier's letter makes clear that ground collections in the subfinal regions of the fireballs of both August 6th and July 24th resulted in the detection of unusual aggregations of copper particles. Apparently the copper particle aggregate obtained in collection R - 104L, within the subfinal region of the August 6th fall was the only such aggregate found in Dr. Crozier's lengthy ground search of August 8-9. It seems particularly significant to the writer that Dr. Crozier suspects that the copper dust found in this particular collection R-104L may have been stirred up from the pavement on Highway 84 ----- a likely catchment surface for dust put down by the green fireball of August 6th, in view of the information given me by Mr. Taft in regard to the wind direction prevailing during the hours immediately following this incident.

(5) In spite of the critical comments made in paragraphs 3 and 4 above, the writer has no quarrel with Dr. Crozier's conclusion that the results so far obtained in the investigation of volatilization products possible put down by the green fireballs are negative or at best inconclusive. However, I do wish to stress most emphatically that if future more detailed work shows that the numerous copper particles found by Dr. Crozier and Mr. Seely are indeed floating down

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from green fireballs, then the fireballs are not conventional meteorites. Copper is one of the rarest of the elements found in meteorites (See G.P. Merrill, Memoirs National Academy of Science, vol. 14 (1925), Table facing p. 27; and Harrison Brown, Journal of Geology, vol. 56 (March 1948,) Table 1, p. 87.) In fact, I know of no case in which even the tiniest particle of copper has been reported in a dust collection supposedly of meteoritic origin. In view of present concern in regard to the true nature of the green fireballs, nothing could exceed in importance attainment of a definite conclusion in regard to the origin of the copper particles detected in the subfinal regions of the fireballs of July 24th and August 6th.

(6) The writer therefore wishes to make the following recommendations:

(6.1) That arrangements be made for dust collections on airplane flights at altitudes of 40,000 ft. or more through the region of the atmosphere lying beneath the real paths of green fireballs as soon as possible after the occurrence of such fireball incidents. Such arrangements presuppose a well coordinated observing network permitting the speediest possible determination of the location of the real paths in the atmosphere. (Dr. Crozier and Mr. Seely have both agreed to cooperate in carrying out dust collection at the highest altitudes attainable. In Dr. Crozier's opinion, a B-36 or B-50 should be made available for such work.)

(6.2) That ground-level dust collections be made along the well determined earth-trace of the green fireball of January 30th, using the portable impactment equipment already rigged up by Dr. Crozier and Mr. Seely and used in the ground searches of July 27th and August 8-9th. If copper particles can be recovered along this earth-trace but do not appear in collections made 50 miles or so away from the trace, the result would be of much significance if not indeed decisive.

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HEADQUARTERS, SANDIA BASE
ALBUQUERQUE, NEW MEXICO

THIS DOCUMENT CONSISTS OF 2 PAGE(S)
NO. 1 OF 5 COPIES, SERIES 299

5 DEC 1949

SBOP/4 333.1 *Gen*

REFER TO FILE NO.

SUBJECT: Board to Inspect Special Weapons Facilities
at Strategic Air Command Stations

TO: Commanding General
Strategic Air Command
Offutt Air Force Base
Omaha, Nebraska

1. Reference is made to Top Secret letter, your Headquarters, subject: "Special Weapons Training Facilities at Strategic Air Command Stations," dated 29 November 1949, Short Title: B-3000, which proposed an inspection tour of Strategic Air Command stations to determine adequacy of station plans for Special Weapons training facilities and recommend a priority and time schedule for Special Weapons Unit assignment to Strategic Air Command stations.

2. This Headquarters concurs in the basic objectives of the proposed board and its general plan of action. Capt. Barnes will represent the Plans and Operations Division of this Headquarters and Lt. Col. Olson, Commanding Officer of the 515th Aviation Squadron, will represent the 8460th Special Weapons Group. It is not possible at this time to comply with your suggestion that the 8460th Special Weapons Group be represented by the Commanding Officer of the Special Weapons Unit scheduled for assignment to the station being inspected.

3. It is recommended that the work of this board be supplemented by a similar board, to visit the station concerned about thirty (30) days prior to movement of a Special Weapons Unit to that station. This second board could then verify the rate of progress of facilities preparation and the adequacy of the plans at that time, and solve many of the administrative problems inherent in the transfer of

See - 353 (5 Dec 49)

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SHORT TITLE SBOP-0-3017

5 DEC 1949

Subj: Board to Inspect Special Weapons Facilities
at Strategic Air Command Stations

any unit to another command and station. It is suggested
that this second board be empowered to recommend readjust-
ment of movement schedule as circumstances indicate.

FOR THE COMMANDING OFFICER:



D. H. GUINN
LCDR USN
Executive Officer

Distribution:
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B/L from Sandia Base to SAC, dtd 5 Dec 49, subj: "Board to Inspect Special Weapons Facilities at SAC Stations"

SAC 353 (5 Dec 49)

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HEADQUARTERS STRATEGIC AIR COMMAND, Offutt Air Force Base, Omaha, Nebraska

19 DEC 49

TO: Commanding General, Sandia Base, Post Office Box 5100, Albuquerque, New Mexico

1. This headquarters concurs, in general, with basic communication.
2. Reference paragraphs 1 and 2, basic communication, inspection board has completed inspections.
3. Reference paragraph 3, basic communication, this headquarters is directing the Eighth and Fifteenth Air Forces to designate personnel from units concerned to inspect aviation squadron facilities immediately upon receipt of notification from this headquarters. Notification will be in the form of an information copy of Strategic Air Command request for movement of aviation squadrons. Your headquarters will receive a copy of subject requests. Inspection will be completed no later than fifteen (15) days after receipt of notification. Your command will be requested to furnish personnel for inspection teams.

FOR THE COMMANDING GENERAL:

J. B. Montgomery Col 05 AF

1 Incl

Cy of ltr fm SAC to 8 & 15 AF

for
J. B. MONTGOMERY
Brigadier General, USAF
Director of Operations

SHORT TITLE: SDOP-0-3012

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HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE
OMAHA, NEBRASKA

SECRET

CG SAC
DOEG

16 Dec 49

SUBJECT: Inspection of Special Weapons Facilities at Strategic Air
Command Stations

TO: Commanding General
Fifteenth Air Force
March Air Force Base
California

1. Your attention is invited to the inclosed basic communication and first indorsement thereto. It is requested that your headquarters designate personnel to inspect aviation squadron facilities of your command immediately upon receipt of notification from this headquarters. Notification will be in the form of an information copy of Strategic Air Command request for movement of aviation squadrons. Inspection is to be completed not later than fifteen (15) days after receipt of notification. Sandia Base will furnish representative personnel for inspections, upon your request.

2. Upon completion of inspections, any discrepancies noted will be forwarded to this headquarters together with any recommendations that would facilitate transfer of subject squadrons to this command.

3. Direct communication with Sandia Base is authorized for the purpose of coordinating this matter.

BY COMMAND OF LIEUTENANT GENERAL LEMAY:

2 Incls

1. b/1 from Sandia to SAC
2. 1st Ind from SAC to Sandia

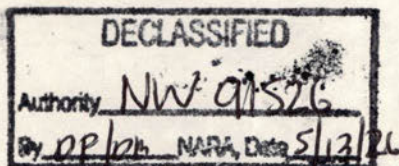
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SHORT TITLE 5130P-0-3012

Incl 1

~~CONFIDENTIAL~~

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON



THE INSPECTOR GENERAL USAF
17TH DISTRICT OFFICE OF SPECIAL INVESTIGATIONS
KIRTLAND AIR FORCE BASE, NEW MEXICO

DR/ms

File No: (24-8)-28

25 May 1950

SUBJECT: Summary of Observations of Aerial Phenomena in the New Mexico Area, December 1948 - May 1950

TO: Brigadier General Joseph F. Carroll
Director of Special Investigations
Headquarters USAF
Washington 25, D. C.

1. In a liaison meeting with other military and government intelligence and investigative agencies in December 1948, it was determined that the frequency of unexplained aerial phenomena in the New Mexico area was such that an organized plan of reporting these observations should be undertaken. The organization and physical location of units of this District were most suitable for collecting these data, therefore, since December 1948, this District has assumed the responsibility for collecting and reporting basic information with respect to aerial phenomena occurring in this general area. These reports have been distributed to the Air Materiel Command, USAF, in accordance with Air Intelligence Requirements No. 4, and to other interested military and government agencies.

2. There is attached, as a part of this summary, a compilation of aerial phenomena sightings that have occurred mostly in the New Mexico area and have been reported by this District Office subsequent to December 1948. This compilation of sightings is not a complete record of all reported observations, but includes only those in which sufficient information was available to justify their inclusion. The observers of these phenomena include scientists, Special Agents of the Office of Special Investigations (IG) USAF, airline pilots, military pilots, Los Alamos Security Inspectors, military personnel, and many other persons of various occupations whose reliability is not questioned. This compilation sets forth the most important characteristics with respect to each observation and evaluates each sighting into one of three classifications, (1) green fireball phenomenon, (2) disc or variation, and (3) probably meteoric.

3. There is also attached an analysis of the green fireball occurrences in this area made by Dr. Lincoln LaPaz. Dr. LaPaz is the

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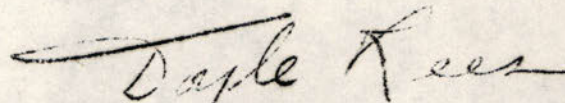
25 May 1950

Director of the Institute of Meteoritics and Head of the Department of Mathematics and Astronomy at the University of New Mexico. He was Research Mathematician at the New Mexico Proving Grounds under an OSRD appointment in 1943 and 1944, and Technical Director of the Operations Analysis Section, Headquarters, Second Air Force, 1944-45. Since 1948, Dr. LaPaz has served on a voluntary basis as consultant for this District in connection with the green fireball investigations.

4. On 17 February 1949 and again on 14 October 1949, conferences were held at Los Alamos, New Mexico, for the purpose of discussing the green fireball phenomena. Representatives of the following organizations were present at these meetings: Fourth Army, Armed Forces Special Weapons Project, University of New Mexico, Federal Bureau of Investigation, U. S. Atomic Energy Commission, University of California, U. S. Air Force Scientific Advisory Board, Geophysical Research Division Air Materiel Command USAF, and the Office of Special Investigations (IG) USAF. A logical explanation was not proffered with respect to the origin of the green fireballs. It was, however, generally concluded that the phenomena existed and that they should be studied scientifically until these occurrences have been satisfactorily explained. Further, that the continued occurrence of unexplained phenomena of this nature in the vicinity of sensitive installations is cause for concern.

5. The Geophysical Research Division, Air Materiel Command, Cambridge, Massachusetts, has recently let a contract to Land-Air, Inc., Holloman AFB, Alamogordo, New Mexico, for a limited scientific study of green fireballs. The results of this scientific approach to the problem will undoubtedly be of great value in determining the origin of these phenomena.

6. This summary of observations of aerial phenomena has been prepared for the purpose of re-emphasizing and reiterating the fact that phenomena have continuously occurred in the New Mexico skies during the past 18 months and are continuing to occur, and, secondly, that these phenomena are occurring in the vicinity of sensitive military and government installations.



DOYLE REES
Lt Colonel, USAF
District Commander

4 Incls

1. Summary of Sightings
2. Photo of Sighting No. 175
w/comments
3. Ltr fr Dr. LaPaz to Lt Col
Rees, dtd 23 May 50
4. Graph indicating maximums

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DISTRIBUTION:

~~6~~ cys, Director of Special Investigations, Headquarters USAF
~~1 cy, CG, Air Materiel Command, Wright-Patterson AFB, Ohio~~
~~ATTN: Director of Technical Intelligence~~
1 cy, CG, Special Weapons Command, Kirtland AFB, New Mexico
1 cy, CG, Armed Services Special Weapons Project, Sandia Base,
New Mexico. ATTN: J-2
~~1 cy, CG, Headquarters, Fourth Army, Ft. Sam Houston, Texas~~
~~ATTN: AC of S, G-2~~
1 cy, CO, Holloman AFB, New Mexico
~~1 cy, CO, Air Force Cambridge Research Laboratories, Cambridge, Mass.~~
1 cy, Director, Security Division, U. S. Atomic Energy Commission,
Los Alamos, New Mexico. ATTN: Mr. B. O. Wells
1 cy, Federal Bureau of Investigation, El Paso, Texas
1 cy, Federal Bureau of Investigation, Albuquerque, New Mexico
~~1 cy, Air Force Scientific Advisory Board, Pentagon Building~~
~~ATTN: Dr. Joseph Kaplan.~~
~~1 cy, Research and Development Board, Pentagon Building~~
~~ATTN: Dr. H. E. Landsberg, Executive Director, Committee on~~
~~Geophysics and Geography~~
1 cy, File

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SUMMARY OF SIGHTINGS OF UNKNOWN AERIAL PHENOMENA

Reported by the 17th District Office of Special Investigations (IG), Kirtland Air Force Base, New Mexico

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
1	1946 18 Jan	2300	1	R	Point of impact on line between Brest and Kiev	Almost vertical descent followed by "bouncing" N to S		35° above Horizon Descending	Brilliant white		2 - 3 secs.	None		Compare w/planet Venus on unusually clear night.		Disappeared	(1) (2)
2	Latter part 1947	App. 2000	1	R	Vaughn, New Mexico		400' - 500'	Descending slowly in vertical manner	Bright white			None	Round	Larger than basketball	Descending slowly	Exploded	(3)
3	1948 27 Jul	0835 0845	1	R	Albuquerque, New Mexico				Duralumin reflected light			None	Flat and round		Stationary at times		(2)
4	4 Aug	0200 & 0300	2	Unk	North Powder, Oregon	NW to SE	5500'	Horizontal line	Green					Softball	720 mph	Extinguished	(1)

LEGEND:

*Reliability of Observers: VR - Very Reliable R - Reliable Unk - Unknown Reliability

**Evaluation: (1) "Green Fireball Phenomena" (2) "Disk" or Variation (3) Probable Meteor

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
5	1948 24 Oct	Night	1	Unk	Phoenix, Arizona	E to W			Green		75 mts.			Star	Very slow	Became very bright and fell apart	(1) (2)
6	3 or 4 Nov	App 2200	1	R	Vaughn, New Mexico		400' - 500'	Descending slowly in vertical manner	Bright white			None	Round	Larger than basketball	Descending slowly	Exploded	(3)
7	23 Nov	App 2200	1	R	Vaughn, New Mexico		400' - 500'	Descending slowly in vertical manner	Bright white			None	Round	Larger than basketball	Descending slowly	Exploded	(3)
8	5 Dec	2135	2	R	Las Vegas, New Mexico	W to E	Slightly above 9,000'	Horizontal slightly descending	Whitish orange		Few secs					Disappeared	(1)
9	5 Dec	App 2200	2	R	Albuquerque, New	No movement noted	10,500'	Parabolic curve	Green	Yes	2 secs	None	Round			Faded out	(1)
10	6 Dec	2255	1	Unk	Sandia Base, New Mexico	E to W		Slight falling arch	Green	Yes	2--3 secs	None	Round	1/3 diameter of moon	Rapid	Vanished	(1)
11	8 Dec	1833	2	VR	Las Vegas, New Mexico	ENE to WSW	13,500'	Horizontal	Bright green	Yes	2 secs	None		Larger than a flare	Rapid rate of speed	Faded out	(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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12	1948 11 Dec	1930		Unk	Hood River, Oregon				Blue & white			Yes	Flash			Flash w/noise like thunder	(1) (2)
13	12 Dec	2102	5	VR	15 miles south of Las Vegas, New Mexico	E to W	3 - 10 miles	Horizontal	Very bright green		2.1-2.3 secs	None	Ball	Magnitude -4		Broke into 3 or 4 small fragments & disappeared	(1)
14	20 Dec	2054	4	R	Los Alamos New Mexico	W to E	Great height descending	20° to the horizon	Pale green or bluish white	Yes	1-1/2 secs	None	Ball	Basketball	High speed	Disappeared behind mountain	(1)
15	28 Dec	0431	1	R	Los Alamos, New Mexico	N to S	Descended from high alt to 6000'	Descending in vertical path	white		Sev. secs	None	Star	Star	Blower than falling star	Disappeared w/greenish flash	(3)
16	1949 6 Jan	1730	1	Unk	Albuquerque New Mexico	SE to NW	1500' - 2000'	Horizontal	Bright white			None	Diamond	App. 2' long	Much faster than a jet	Disappeared	(1)
17	6 Jan	0310	1	R	Los Alamos, New Mexico	E to W	3 to 5° from observer	Horizontal	Brilliant green		2 secs	None			High speed	Disappeared behind mountainous horizon	(1)
18	30 Jan	1754	App. 200	Unk	El Paso, Texas	NW to SE	3° - 5° above horizon	Horizontal	Green			None	Ball			Broke into pieces	(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
19	1949 30 Jan	1755	App 200	Unk	Roswell, New Mexico	W to E	2000'	Horizontal	Blue-green			None			Moving slowly	Disappeared to some. Disintegrated into shower of smaller lighted fragments	(1)
20	30 Jan	App 1800	App 200	Unk & R	Alamogordo, New Mexico	N to S	Angle of elev. 15°-30° from observer.	Gentle descent	Green		3 - 15 secs	None	Ball			Seemed to fizzle out	(1)
21	30 Jan	1854 1900	10	Unk	Ft. Worth, Texas	N to S	13° above horizon	30° downward from horizon	Green trailing sparks	Yes	1 - 7 secs	None		1/3 size of full moon		Disintegration	(1)
22	14 Feb	1840	2	Unk	Ganado, New Mexico		Somewhat above horizon	Stationary then fell in slight curve to W	Brilliant white slightly green color	Yes		None			Stationary then fell in slight curve to W.		(1)

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Summary of Sightings of Unusual Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
23	1949 17 Feb	1300	1	Unk	Grants, New Mexico	Southward		Vertical climb then leveled off Gradual ascent	White	Yes		None	Oval	Larger than meteor		Disappeared	(1)
24	17 Feb		App 100	VR	Albuquerque, New Mexico	W to E			Brilliant white shifting to peach color		6 mts	None	Round shift- ing to ellipse	1 lunar diameter		Disappeared	(2)
25	27 Feb	1905	1	R	Los Alamos, New Mexico	W to E		Parallel to earth	Green-white		2 secs	None			Not as fast meteor	Disappeared abruptly	(1)
26	2 Mar	0010	1	R	Los Alamos, New Mexico	N to S	"Low in sky"	Horizontal	Light		2 secs	None			Very fast	Disappeared behind trees	(1) (3)
27	3 Mar	0159	1	R	Los Alamos, New Mexico	Straight down		Straight down	Bright green							Disappeared	(1) (3)
28	6 Mar	2100	2	Unk	Camp Hood, Texas	From N 74° W N 81° W	From 6° 45' above horizon		Blue-white light	Yes		None	Oblong	2' by 1'	Not known		(1)

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Summary of sightings of Unidentified Aerial Phenomena, 1949 District One (00-0)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
29	1949 6 Mar	2020	2	Unk	Camp Hood, Texas	N 40° E	59° above horizon		Blue-white light			None	Ball like flash	Basketball	"Fixed flash"		(1)
30	6 Mar	2045	1	Unk	Camp Hood, Texas	From S 81° W to S 60° W	From 21° above horizon to 6°31' above		Light colored head orange trail	Yes		None	Round head with trail	About 10° in length			(1)
31	7 Mar	0115	1	Unk	Camp Hood, Texas	N 40° E	66° 15' above horizon		Brilliant blue-white			None	Like flash blub	Flash bulb			(1) (3)
32	7 Mar	0130	1	Unk	Camp Hood, Texas	N 16° W	27° 30' above horizon		Bright blue-white			None	Like flash bulb	Basketball	"Fixed flash"		(1) (3)
33	7 Mar	0130 0200	2	Unk	Camp Hood, Texas	S 20° W	26° above horizon		Bluish white			None	Ball like flash	Flash bulb			(1) (3)
34	7 Mar	0145	1	Unk	Camp Hood, Texas	N 60° E		Dropped vertically to ground	Orange		2 secs	None	Tear-drop	2' by 1'		Disappeared behind trees	(3)

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Summary of Observations of Unidentified Aerial Phenomena, 1949 District One (1949)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
35	1949 7 Mar	1810	1	Unk	Window Rock, N Arizona		40 - 45° to horizon		Red (fire) in center shading to blue at edge	Yes	6-8 secs	None	Ball round- spher- ical	3' in dia- meter	200-300 mph	Disintegrated	(1)
36	8 Mar	1836	1	R	Los Alamos, New Mexico	S to N	12,000' to 15,000'	Horizontal	Bright white with green- ish tint		1-2 secs	None			App 800 mph	Either went out or dis- appeared be- hind cloud	(1)
37	8 Mar	1835	1	R	Los Alamos, New Mexico	S to N	4,000 above terrain	Descending at 45° angle	Intense white light alumi- num colored		Very short	None	Ellipt- ical pointed at ends		Slower than twin-en- gined plane	Disappeared behind trees	(1)
38	8 Mar	0103	1	Unk	Camp Hood, Texas	from S 53° E to S 54° E	From 58° above horizon to 54° above	Traveled in arc	Pale white light	Yes		None	Round- ish head w/hazy smoke trail				(3)

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Summary of Observations of Unidentified Aerial Phenomena (UAP) for 1949

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Grain or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
39	1949 6 Mar	0103	1	Unk	Camp Hood, Texas	From N 56° W S 64° W	From 15° above horizon	Traveled in arc	Fale reddish nose whitish red trail	Yes		None	Lemon w/tail			Disappeared	(3)
40	13 Mar	2153	1	Unk	Albuquerque, New Mexico	NE to SW or SW to NE	20° above horizon	Descending slightly	Bluish or greenish white	Yes	2-4 secs	None	Length $\frac{1}{2}$ diameter of full moon				(1)
41	14 Mar	09-00-16Z	1	R	Airplane enroute fr Honolulu to Canton Is		6°-12° above airplane at 8,000	Horizontal			10 secs	None	Nose like bullet		65° in 9 secs		(1) (2)
42	27 Mar	1800-1805	1	Unk	Tucumcari, New Mexico	E to W	High in sky -app 30° above horizon		Amber	None	25 mts	None	Long & narrow			Faded out in distance	(2)
43	27 Mar	1800	1	Unk	Montoya, New Mexico	E to W	About 75° above		Orange flame	None	10 Hts	None	Long & narrow	Length-about 1/6 lunar diameter, width-about 1/5 length		Faded out in distance	(2)

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Summary

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
44	1949 27 Mar	1813	1	R	Tucumcari, New Mexico	E to W	Close to 45° above horizon		Bright orange	None	15 mts	None	Long & narrow			Faded out of sight in distance	(2)
45	27 Mar	1800	1	Unk	Tucumcari, New Mexico	E to W	60° above horizon		Orange fire	None	15 mts	None	Like kite tail	About size of C-47 at 10,000 ft.		Disappeared behind hills	(2)
46	31 Mar	2150	1	R	Camp Hood, Texas	SW	Est. 2,000'		Fire red to white	Yes		None	Spherical	App. size of basketball			(3)
47	5 Apr	2200	1	R	Los Alamos, New Mexico	S to N	App. 300' above S slope of Pejarito Mt.	Arc	Green w/red after glow		$\frac{1}{2}$ - 1 sec	None			Tremendous speed	Disappeared behind mountain	(1)
48	6 Apr	1205	1	R	Los Alamos, New Mexico	SE	About 15,000'		Between dk & lt green		3 - 5 secs	None			Very fast		(1)
49	7 Apr	0135	1	R	Los Alamos, New Mexico	W	About 200 yds fr top of hill		Green		App 45 secs	None			Moved very slowly		(1) (2)
50	7 Apr	0100	1	R	Los Alamos, New Mexico	S to N			Green		5 secs	None			Moving slowly		(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (contd)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
51	1949 12 Apr	1930	1	Unk	Albuquerque, New Mexico	SE to NW	20° above horizon		White	None	8 secs	None	Round	1/8 size of moon	15° in 8 secs	Extinguished	(1)
52	15 Apr	1630	1	Unk	El Paso, Texas	Straight up	About 30°		Grayish	Yes	15 mts	None	Thin smoke trail	Very thin		Dissipated	(2)
53	18 Apr	0148	2	R	Flagstaff & Williams, Arizona	NW	App 12,000' to one. 75 - 100 miles to other observer		Greenish blue		1 - 2 secs	None	Ball like	100 watt light bulb		Disappeared behind obstacle	(1) (3)
54	22 Apr	0905	1	Unk	Cliff, New Mexico	W to E	20° dropping slowly		Aluminum	None	2 mts	None	Round, flat thin, disc-shape	Over 15' in diameter		Disappeared behind mountains	(2)
55	24 Apr	1033	5	VR	White Sands, New Mexico	N	25-29°		White light yellow		60 secs	None	Ellipsoid		Tremendous rate of speed	Disappeared due to distance	(2)
56	25 Apr	0630	2	Unk	Springer, New Mexico	2 groups going W 2 groups going E	Well above 30,000'		Silvery white	None	4 grps totaling about 20 sec	Yes	Round	Very small	Very fast well above speed of sound	Disappeared from view	(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
57	1949 28 Apr	App 1745	3	Unk	Tucson, Arizona	NE to SE or SW			Silver	None	12 - 40 mts	None	Cigar or sausage shape	From B-29 to a city block	300 - 600 mph	Faded from view	(2)
58	30 Apr	2215	1	Unk	Albuquerque, New Mexico	E to W	59° above horizon		Blue green	None	2 secs 2°	None	Round	Tenth of moon	2 seconds 2 degrees	Went out	(1)
59	3 May	2143	1	R	Los Alamos, New Mexico	S to N	10° - 15° above horizon		Bright white light		10 secs	None			Very fast up to 1,000 mph		(1) (3)
60	3 May	2126 2143 2205	1	R	Los Alamos, New Mexico	S to N	10° - 15° above horizon		White		3 - 7 secs each time	None		Large - similar to size of airplane landing lights	Very fast		(1) (3)
61	3 May	2126 2140	1	R	Los Alamos, New Mexico	ESE to NWN	10° - 15° above horizon		2126-white 2140-red		5 sec 1st; 2 sec 2nd	None		2126-base-ball diamond lights. 2140-slightly larger than firebox lights	Same speed as aircraft landing		(1) (3)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
62	1949 6 May	2040 2130	1	R	Camp Hood, Texas	W and N	App 1200' dropping to 440'		Alternating pinkish to green	None	50 mts	None	Round	1/2 dollar diminishing to short quarter size	Very slow	Faded from sight	(2) (1)
63	6 May	0105	1	R	Los Alamos, New Mexico	N to S	5° above horizon	Was going down at an angle of 30 - 35°	Green		Fraction of a sec	None	Round	App 1/8 size of full moon	Very high rate of speed	Disappeared west of Jemez Mts.	(1)
64	7 May	2025 2105	4	R	Camp Hood, Texas	SE	1300'		Green-white	None	40 mts	None	Diamond shape	3 mls width	Covered 15 mls in 40 mins. horiz.	Dimmed and went out	(2) (1)
65	7 May	1940	1	R	Camp Hood, Texas	N and E	1000'		Reddish greenish white	None	57 sec	None	Diamond shape	3 mls width	Covered 20 mls in 57 secs horiz.	Dimmed and went out	(2) (1)
66	8 May	2008 2017	1	R	Camp Hood, Texas	N and E	1600'		Reddish greenish white	None	9 mts	None	Diamond	2 mls width	10 mls in 9 mts	Dimmed and went out	(1) (2)
67	8 May	0930 1100	4	Unk	Tucson, Arizona	W, 90° turn to the N	4000 to 20,000	Horizontal then rapid climb at 45° angle	White	None	10-20 mts	None	Metallic circular	40-75' in in diameter	Motionless to faster than jet	Climbed at 45° angle until out of sight	(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
68	1949 9 May	App 1430	1	R	Tucson, Arizona	SW to NE			Silvery	None	6-10 secs	None	Round & flat	25' in diameter	750-1000 mph	Faded from view	(2)
69	12 May	2115 2130	1	VR	Alamogordo, New Mexico		3° or 4° above horizon		White with green- ish tinge	None	4 mins	None	2 fuzzy stars	$\frac{1}{4}$ diameter of full moon		Vanished	(1) (2)
70	16 May	App 1700	1	Unk	Tucson, Arizona	E to W	5000'	Horizontal	Black	None	8-10 secs	None	Round solid flat	3 - 4' in diameter	800-1000 MPH	Behind air- craft hangar	(2)
71	2 Jun	0040	1	R	Los Alamos, New Mexico	E to N	7000' - 10,000'	Descending	Green	Yes	1 sec	None	Ball of light				(1) (3)
72	11 Jun	2057	1	R	Los Alamos,	SW to NE	25° above horizon		Green then red at end of flight	Yes	4 - 5 secs	None		Size of star			(1)
73	20 Jun	2010	1	R	Los Alamos, New Mexico	W to E			Green turned orange red be- fore va- nishing	None	3 secs	None	Round			Extinguished	(1)
74	20 Jun	2010	1	R	Los Alamos, New Mexico	W to E	Directly overhead		Blue green	None	1-1/2 secs	None				Vanished as the exting'd.	(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
75	1949 24 Jun	1545 1630	2	Unk	Mesa, Arizona	1 to SE 2 to E 3 to NE 4 vertical 5 to E		4 Horizontal 1 Vertical	Steel gray		4 at 30 mts 1 at 25 secs	None	Disc w/2 flanges		Max of 400 mph	Faded from view	(2)
76	27 Jun	0138	1	R	Albuquerque, New Mexico	W to E	30° to 90° above horizon		Similar to star Slightly more orange	Yes	2 mts	None	Round	Slightly larger than brightest star	140° in 2 mts.	Went behind building	(3)
77	29 Jun	2010	1	Unk	Flagstaff, Arizona	E to W	30° from vertical		Yellow in front Red be- hind	None		None	Bullet shaped	$\frac{1}{2}$ size of small air- plane	Relatively slow	Over a hill	(1) (2)
78	30 Jun	1630	1	R	Seligman, Arizona	N	30° above horizon		Dull grey	None	8 secs	None	Circle	Appeared $1\frac{1}{2}$ " dia- meter at 10,000' altitude	2,000 mph or faster	Disappeared in distance	(2)
79	11 Jul	2110	1	Unk	Camp Hood, Texas	W by SW	30° above horizon		Pale red	None	2 secs	None	Ball - but not a per- fect circle	Twice as large as evening star		Such as turning off flashlight	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
80	1949 28 Jul	2045	1	Unk	Killeen Base, Texas	N to S	300 above horizon		White w/tint of blue green	Yes	3-5 secs	None	Round w/tail	Size of evening star	Unable to estimate	Faded out	(1)
81	28 Jul	2259	1	Unk	Killeen, Texas	S to N	300 above horizon		2 pre-dominately white. 1 had orange glow to tail	Yes	#1 at 2-3 secs #2 at 10 - 12 secs	None	Round w/tail	Tennis ball		Faded out	(1)
82	28 Jul	2258	1	Unk	Killeen, Texas	N to NW	300 above horizon		Initially blue turning white	None	15 - 20 secs	None	Round	3 times size evening star		Went out like light	(1) (3)
83	30 Jul	2135	1	R	Camp Hood, Texas	SE to NW	350 to horizon	Climbed in arc	Blue-white	Yes	2 - 2½ secs	None	Like rocket tail		2 - 2½ secs to cover arc of about 150°	Faded out	(1)
84	30 Jul	2204	1	Unk	Camp Hood, Texas	SE to SW	App 300 above horizon	Straight flight losing altitude	Predominately white w/blue tint	Yes	2 - 3 secs	None	Round w/tail	Evening star or planet	Very fast	Gradually faded out	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
85	1949 6 Aug	2000	1	Unk	Las Cruces, New Mexico	E to W			Bluish green	Yes	1 - 2 secs	None	Round	Bigger than falling star		Disappeared behind building	(1)
86	6 Aug	2000	1	Unk	Las Cruces, New Mexico	E to W	3°28" to 9°40" above horizon	Curve going up then fell in almost vertical direction	Reddish blue & green	Yes	4 - 5 secs	None	Round	App 6" in diameter		Disappeared gradually	(1)
87	6 Aug	2000	1	Unk	Alamogordo, New Mexico	Vertical	2°20" to 7°35" above horizon	Straight vertical flight	Bright white slight reddish cast	None	3 secs	None	Round	½ size of moon		Exploded then pieces died out	(1)
88	6 Aug 2005	2000	1	Unk	Alamogordo, New Mexico	E to W	2°4" to 12°7" above horizon	10° off vertical	White		2 secs	None		Large as auto spotlight at arm's length		Disappeared behind building	(1)
89	6 Aug	2015	1	Unk	Alamogordo, New Mexico	SW		Straight flight app 20° vertical dec-line	Whitish yellow (red trail)	Yes	1 sec	None	Round	Twice size normal falling star	Extremely fast - twice as fast as falling star	Disappeared behind mountain	(1)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
90	1949 6 Aug	2030	1	Unk	Alamogordo, New Mexico	N		Constant slight curve earthward	White (bluish)	Yes	1 sec	None	Round	App small-er than clenched fist	Similar to falling star	Went out	(1)
91	6 Aug	2020	1	Unk	Albuquerque, New Mexico	Descend- ing to earth verti- cally	15° above horizon	Descending to earth vertically	Green	None	1 - 1½ secs	None	Round to pear shape	500 watt bulb about 1/5 mile away	10° in 1½ secs at 2 miles	Dissipated	(1)
92	6 Aug	2000	1	Unk	White Sands, New Mexico		40° above horizon	Straight line to earth	Obscr-ver color blind	None	1 sec	None	Round	Half size of finger-nail at arm's length	Slightly faster than ordinary falling star	Disappeared behind sand dune	(1)
93	6 Aug	2000	1	R	Alamogordo, New Mexico	200°	30° above horizon	Long slow curve to earth	Bluish green	Yes	1 sec	None	Round	Tip of thumb at arm's length		Burned out	(1)
94	10 Aug	0010	2	Unk	Killeen Base, Texas	E to W	30° ang- le headed down	30° angle headed down	Blue	Yes	3 - 4 secs	None	Oval	Head size		Sudden disappearance	(3)
95	10 Aug	2030	1	Unk	Killeen Base, Texas	N to S	30° above horizon		White	Yes	5 secs	None	Simi- lar to comet			Disappeared	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
96	1949 10 Aug	2035	1	R	Camp Hood, Texas	N to S		Level flight	Yellow to orange	Yes	1 - 2 secs	None		Like head-light of old car	60° in 2 secs	Cut out	(3)
97	10 Aug	2035 2207 2220 2240	1	Unk	Camp Hood, Texas	W to E	30° - 45° above horizon	Level flight	White	Yes	3 - 4 secs	None	Round w/tail	Large flare	Greater speed than plane	Burned out	(3)
98	10 Aug	2040	1	Unk	Camp Hood, Texas	N to S	30° above horizon	Horizontal w/ slight arc	Orange w/white tail	Yes	3 - 5 secs	None	Rocket	20 mm. tracer ammo.	Very great similar to falling star	Light gradually diminished	(3)
99	10 Aug	2100	1	Unk	Killeen Base, Texas	S	30° above horizon going up	Continued climbing at 30° angle until disappearance	Bright orange	Yes	5 secs	None	Reddish ball with long firey tail	Head size		Disappeared	(3)
100	10 Aug	2100 2120 2215 2250	1	R	Camp Hood, Texas		40° - 70° above horizon	#1, 3 & 4 almost horizontal #2 almost vertical	White with orange	Yes	1 sec for each one	None	Round with trail	Large star	Great speed	Went out like a light	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
101	1949 10 Aug	2200 2230	1	Unk	Camp Hood, Texas	S to N	30° above horizon	Level flight	White w/yellow trail	Yes	1 - 2 secs	None	Oval	Size of shooting star	300 mph or faster	Faded out	(3)
102	10 Aug	2240	1	Unk	Camp Hood, Texas	N to S	8,000' or more	Straight flight with gradual incline	Light red diminishing to light yellow	Yes	2 - 3 secs	None	Round w/jagged trail	Much larger than evening star		Burned up and disintegrated	(3)
103	11 Aug	2030 2045 2052 2105 0010	Sev	Unk	Camp Hood, Texas	N to S	45 - 60° above horizon	Generally a level flight	White	Yes	3 - 5 secs	None	Flash like a rocket or training flare	Star size	Faster than any plane observed	Went out like a light	(3)
104	12 Aug	0010	2	Unk	Killeen Base, Texas	Due W in arc	45° above horizon	Straight & level flight w/ascent descent describing arc	Bluish white	Yes	10 secs	None	Broken circle resembling signal flare	Head size		Sudden disappearance	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
105	1949 12 Aug	0445	1	Unk	Killeen Base, Texas	SE to NW	30° above horizon headed down	Headed down	Reddish	Yes	2 - 3 secs	Yes	Trail of flame	Fairly long streak of flame		Faded away	(3)
106	14 Aug	2135	1	R	Alamogordo, New Mexico		Appeared 25° Disappeared at 12°	10 - 15° off vertical	Reddish orange	Yes	2 secs	None	Round	Larger than Venus		Disappeared	(3)
107	20 Aug	2130	2	Unk	Douglas, Arizona	N to S	8,000' - 10,000'	Flat trajectory		None	6 - 10 secs	None	Round to ob-long like inverted saucer	About size of single engine airplane	3500 to 4500 mph	Disappeared in distance	(2)
108	21 Aug	2115 2150	5	Unk	Nogales, Arizona		45° at low level 90° at high level	Horizontal to earth's surface	Dull orange	None	10 secs	None	Wafer	App size of volley ball	10 times speed of jet planes	Disappeared in space	(1) (3)
109	26 Aug	1345	1	R	Davis-Monthan AFB, Arizona	SE to NW	App. 50,000	Horizontal at 50,000'	Brownish hazy color	None	60 secs		Similar to triangle with round edges	Est. to be app $\frac{1}{4}$ of inch when observed at 3 ft.	Terrific rate of speed	Faded from view	(2)

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110	1949 30 Aug	2300	1	R	Los Alamos, New Mexico	Almost straight fall	90° overhead	Almost straight fall	Bright green w/red-dish tail	Yes	1 - 2 secs	None		Much larger than meteor		Burned out	(1)
111	15 Sep	0025	1	Unk	Albuquerque, New Mexico		30° above horizon		Yellow red		6 secs	None	Round	Size of baseball		Burst & appeared to disintegrate	(3)
112	16 Sep	0230	1	R	Los Alamos, New Mexico	W to E	3,000'	Horizontal	Orange	None	15 secs	None	Ball shape	Larger than falling star	Faster than airplane slower than falling star	Dimmed then disappeared completely	(3)
113	18 Sep	2015	1	Unk	Sandia Base, New Mexico	W to S	45° above horizon		Dark yellow	None	3 - 4 secs	None	Round	Size of baseball		Unknown	(1)
114	19 Sep	0900	2	Unk	Tucson, Arizona	N	App 4000'		Grayish white	None	2 mts	None		2 to 3 ft across	600 mph	Faded from view	(2)
115	27 Sep	0300	1	Unk	Sandia Base, New Mexico	From SE	45° above horizon	Traveling tangent to earth	Bright blue to white	None	4 secs	None	Round	About size of softball at 300 yds.	45° in 4 secs.	Obscured by building	(3)
116	27 Sep	0300	1	Unk	Sandia Base, New Mexico	To the N	10° above horizon		Yellow	Yes	3 - 4 secs	None	Round	Size of baseball at 25 yds.	Same rate as shooting star	Died out	(3)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
117	1949 27 Sep	0300	1	Unk	Sandia Base, New Mexico	SE to NW	15° - 20° above horizon	Traveling in arc toward earth	Bright green	None	2 secs	None	Round	Same size as perimeter fence light at distance of about 200 yds.	45° in 2 secs.	Brightened then went out	(1)
118	27 Sep	0130	1	Unk	Sandia Base, New Mexico	S to N	20° above horizon	Made a gentle arc toward earth	Dark blue	Yes	2 secs	None	Coni- cicle w/tail twice its dia- meter	Looked like a sky rocket	50° in 2 secs.	Burnt out	(3) (1)
119	27 Sep	0130	1	Unk	Sandia Base, New Mexico		45° above horizon	Moving tangent to earth	Green	None	1 sec	None	Round	Fist at arm's length	20° in 1 sec	Burnt out	(3) (1)
120	30 Sep	2257	1	Unk	Sandia Base, New Mexico	S to W	55° to horizon		Yellow orange	None	2 - 3 secs	None		Slightly larger than shooting star	200 - 300 mph		(1)
121	2 Oct	2110	1	R	Los Alamos, New Mexico		20,000 - 30,000'	Went up & then down	Bright green	Yes	3 secs						(1)
122	6 Oct	1745	1	Unk	Mescalero, New Mexico		15 $\frac{1}{2}$ ° above horizon	Descended in slight arc	Dark green	None	30 secs	None	Round	Big ball		Disappeared behind hills	(1)

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123	1949 6 Oct	1800 1845	1	Unk	Mescalero, New Mexico		18° above horizon		Green	None	7 - 9 secs	None	Round	1/2 size of thumb at arm's len- gth	Moving slowly	Disappeared behind a hill	(1)
124	6 Oct	1758	1	R	Alamogordo, New Mexico	E to W		Straight angular descent	Bluish white possibly lt. green tinge	None	4 secs	None	Circu- lar	3 times the size of Jupiter or Venus	5° per sec.		(1)
125	6 Oct	1800	1	Unk	Alamogordo, New Mexico		4°20' to 7°5'		Green	None	5 - 6 secs	None	Round	Size of baseball at arm's len- gth			(1)
126	6 Oct	1750	1	R	Albuquerque, New Mexico	E to W		Curved des- cent ap- proaching vertical	Green- ish white	None	1 sec	None	Simi- lar to very flare	1/2 size of thumb at arm's len- gth		Abrupt	(1)
127	6 Oct	1750	1	R	Wagon Mound, New Mexico	E to W		Horizontal	Green- ish white	None	3 - 4 secs	None	Round	1 1/2" - 2" in diame- ter	App. that of meteor	Went out like like elec- tric light	(1)
128	6 Oct	1758	1	Unk	Albuquerque, New Mexico	NE to SW		At tail end of its course it arched over and fell	Brilli- ant green	None	10 secs	None	Tear drop			Seemed to burn out	(1)

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129	1949 7 Oct	2120	1	Unk	Albuquerque, New Mexico	Straight vertical drop	35° above horizon		Yellow to green	None	1 sec	None	Round	Half a moon	Dropped 15° in 1 sec	Behind Sandia Mountains	(1)
130	10 Oct	0406	1	R	Los Alamos, New Mexico	SE to NE	3,000' above observation pt.	Parallel to surface of earth	Brilliant white	Yes	4 - 5 secs	None		Small	Appeared to be slower than a meteor	Disappeared	(3)
131	10 Oct	0107	1	Unk	Sandia Base, New Mexico	W to E	45° above horizon		Bluish green	Yes	15 secs	None	Round	Size of fist at arm's length	Slow	Died out	(1)
132	10 Oct	0107	1	Unk	Sandia Base, New Mexico	SW to NE	45° above horizon	Executed dives	Greenish blue w/red sparks trailing	Yes	4 secs	None	Round	Size of fist at arm's length	Slow	Faded out	(1)
133	10 Oct	0107	1	Unk	Sandia Base, New Mexico	N to NE	45° above horizon		Green	None	15 secs	None	Round	Size of fist at arm's length	Slow	Burned out	(1)
134	11 Oct	2010	6	Unk	Roswell, New Mexico	Appeared moving to N & angling slightly to E		Maneuvered up & down	Light green turned orange	Yes	45 mts	None	Round	Size of baseball			(1)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
135	1949 11 Oct	1045 1100	2	Unk	Alamogordo, New Mexico	NW to SE	If size of B-29 appeared to be 150,000'		White	None	10-15 secs	None	Round dish shape	2" in diameter at arm's length	Very fast compared w/falling star	Faded from view	(2)
136	12 Oct	1115	3	Unk	Roswell, New Mexico	S to NE	3,500'	Smooth arc	White (silver)	None	45-60 secs	None	Round probably elliptical		Faster than jet aircraft	Went beyond range of vision	(2)
137	12 Oct	1115	3	Unk	Alamogordo, New Mexico	Appeared from S & veered off to NE	If size of B-29 appeared to be 35,000'	Smooth arc	White or aluminum	None	45-60 secs	None	Round ball	35,000' 4" in diameter	1,500 mph	Faded from view	(2)
138	12 Oct	1340	4	R	Tucson, Arizona	From NE to SW	30,000'	Horizontal	White or silver	None	15 secs	None	Round	50 - 100' in diameter	1,000 mph	Faded from view	(2)
139	14 Oct	1420	3	R	Los Alamos, New Mexico	W to E	20,000'	Level flight just above horizon	Greenish blue-white trail	Yes	2 secs	None	Round	Appeared as a 12" disc		Burned out	(1)

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140	1949 14 Oct	2021	2	R	Albuquerque, New Mexico	N to S		Horizontal	Red orange	Yes	10 secs	None	Round	1/3 - 1/4 size of moon		Broke into 2 pieces & disappeared	(1) (3)
141	14 Oct	1410 1415	1	Unk	Los Alamos, New Mexico	S to N			Front - green & silver Rear - Pale blue	Yes	3 - 4 secs	None		1/8 size of full moon	500 mph or more		(1)
142	21 Oct	2130	1	Unk	Roswell, New Mexico	SE to NW	30° above horizon		Very bright white	None	20-30 mts	None			Unknown		(2)
143	22 Oct	0228	1	R	Los Alamos New Mexico	NW to SE	On horizon		Bright green		2 secs	None		4 times size of a flare	150 mph	Disappeared behind a hill	(1)
144	22 Oct	0220	1	R	Los Alamos, New Mexico	Vertical	50 - 100 ft.		Green		1 sec	None	Like flare	Small		Went out	(1)
145	16 Nov	1950	1	R	Los Alamos, New Mexico	Disappeared to N			2 objects bluish green			None			Stationary but disappeared with speed of meteor	Disappeared from view	(1)
146	19 Nov	2152	1	R	Los Alamos, New Mexico	Vertical			Green then yellow		2 secs	None					(1)

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147	1949 19 Nov	2152	1	R	Los Alamos, New Mexico	Vertical			Green		2 secs	None					(1)
148	25 Nov	2000	5	R	Los Alamos, New Mexico	E to W	15° - 10° above horizon	Downward 10° from the horizontal	Yellowish green		2 secs	None				Disappeared behind mt.	(1)
149	27 Nov	1800	1	Unk	McIntosh, New Mexico	Vertical	Less than 2,000'	Vertical descent	Green	None	1 sec	None	Shaped like a flare	Same as a signal flare	Same as falling signal flare	Same as signal flare	(1)
150	27 Nov	1730	1	Unk	Winslow, Arizona	E to W	30° above horizon		Bright blue-white	Yes	3 - 4 secs	None	Egg shape	Egg held at arm's length	3 - 4 secs to cover 15° - 20° of horizon	Dwindled out	(1)
151	27 Nov	1749	1	R	Albuquerque, New Mexico	E to W	3° - 5° above horizon	Sloping descent	Blue-white	None	1 - 2 secs	None	Round	Pencil eraser at arm's length	5° - 7° in 1 or 2 secs	Went out then on then out again	(1)
152	27 Nov	1749	1	R	Socorro, New Mexico	E to W	10° - 40° above horizon	Arc	Pale green to pale blue	Yes	5 secs	None	Round	Quite large	Slower than meteor	Faded out gradually	(1)

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153	1949 3 Dec	1805	1	R	Alamogordo, New Mexico	E to W		In an arc downward	Green fringe of orange light	None	2 secs	None	Circular	Somewhat larger than Venus		Disappeared behind building	(3)
154	4 Dec	1935	1	Unk	Albuquerque, New Mexico	E to W		Nearly horizontal	Green	None	2 - 3 secs	None	Round	Marble at arm's length		Went out like a candle	(1) (3)
155	4 Dec	1935	2	Unk	Los Alamos, New Mexico	E to NE		Sloping descent	Green		1/5 sec	Yes	Round			Disappeared behind mt.	(1) (3)
156	5 Dec	1930 1945	3	Unk	Carrizozo, New Mexico		40° above horizon	In dive	Blue-green			None	Tear-drop		Very slow	Disappeared	(1) (3)
157	5 Dec	2240	1	Unk	Tularosa, New Mexico	E to W		Smooth arc downward	Blue w/yellowish red toward tail	Yes	1 sec	None	Streak of light	Appeared little longer than length of lead pencil at 6'		Appeared to hit ground near Tularosa, New Mexico	(1) (3)
158	9 Dec	1330	1	Unk	Farmington, New Mexico	Dropping vertically	500 ft.	Vertically down				None	Charred parachute or cargo net			Disappeared	(2)

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159	1949 13 Dec	2005	3	R	Alamogordo, New Mexico	Stationary then began to move downward slowly and to right	5,000'		White amber red green	None	9 mts	None	Circular	1 - 1½ times size of average st. light at a distance of 8 miles		Object took on brilliant green color, picked up speed and faded from view	(1) (2)
160	1950 6 Jan	2230	7	R	Alamogordo, New Mexico	E to W		Up & down and horizontal	White changed to green & red	None	45 mts	None	Star like	Slightly larger than planet Venus	Moved app. 15° to 20° from E to W during 45 mins it was observed	Stopped observation	(1) (2)
161	7 Jan	2215	2	Unk	Corona, New Mexico	From SW to SE		Descending	Yellowish white orange blue gr.	Yes	10 secs	None	Round ball shape	Same as cup 6" in diameter at arm's length	Compared w/fast jet fighter	Disappeared behind mt. range	(1)
162	9 Jan	2226	1	R	Los Alamos, New Mexico		80° - 40° above horizon	Horizontal	Incandescent green	Yes	2 secs	None	Oval with trail			Disappeared behind trees	(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 30

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
163	1950 9 Jan	2220	1	R	Los Alamos, New Mexico	Due W	60° above horizon	Straight course	Bluish white	Yes	2 secs	None	Point- ed	Appeared as a point	10° per second	Luminosity stopped suddenly	(1)
164	9 Jan	2225	1	R	Los Alamos, New Mexico		75° - 80° above horizon	Straight line	Green- ish white	None	3 secs	None	Round	-4 to -5 compared to Jupiter	25° per second	Behind horizon	(1)
165	12 Jan	1900	3	Unk	Holloman, New Mexico	To W		Changed altitude erratic- ally	White changed to green & red	None	5 mts	None	Star like	About same size of Venus		Discontinued watching	(1) (2)
166	13 Jan	0605	3	Unk	Holloman AFB, New	E to W		Erratic- ally up & down	White changed to green & red	None	Short time	None	Star like	About same size as Venus		Disappeared w/daylight	(3)
167	27 Jan	1715	1	Unk	Scullville, New Jersey	NW		Ascending at about 60° angle	White streak		30 mts				$\frac{1}{2}$ that of a fireworks rocket at close range	Faded gradually	(2)
168	7 Feb 1950 2015		2	R	Albuquerque, New Mexico	SSE to E	40° - 45° above horizon	Horizontal	Reddish green	Yes	4 - 6 secs	None	Round elon- gated trail	Twice size of evening star	About same as falling star	Faded out in atmosphere	(1)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 31

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
169	1950 7 Feb	1945 2000	2	R	Between Tucumcari & Kirtland AFB, New Mexico			Flat Trajectory	Fire- ball white	Yes	2 - 4 secs	None			Over 1,000 mph	Faded out suddenly	(1)
170	15 Feb	1530	1	Unk	Sandia Base, New Mexico	From NW to W	45° downward above horizon		Appear- ed red & green	Yes	30	None	Round	That of a normal marble	Like shooting star trail	Faded out	(1) (3)
171	18 Feb	0510	5	R	Holloman AFB, New Mexico			Climbed	White and orange	None	1 hr 44 mts	None	Round to cone shape	Size of coffee cup at arm's length		Stopped observation	(2)
172	20 Feb	0530	2	Unk	Holloman AFB, New Mexico	Station-	1,000' above 9,000' mt.	Stationary	White	None	5 mts	None	Round	App size of 1/2 dollar held at arm's length	Stationary	Disappeared from view behind cloud	(2)
173	24 Feb	1355	1	R	Albuquerque, New Mexico	To W or SW	20° to 23° above horizon	Straight flight	White	None	1 1/2 mts	None	Round	Compared in size to up- per dark portion of moon as it rises in E	1 1/2 mts. to cover 2°		(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 32

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
174	1950 24 Feb	1400	1	R	Albuquerque, New Mexico	E by SE	About 20° above horizon		Bright white	None	20-30 secs	None	Round	Compared w/size of weather balloon as it disappeared in distance	Very slow	Faded out of sight	(2)
175 ***	24 Feb	1930	1	R	Datil, New Mexico	NW			White changing to red & green	Yes	2 hrs 30 mts	None	Round		1° per 2 mts.	Disappeared	(1) (2)
176	24 Feb	1345	1	Unk	Los Alamos, New Mexico	E then turned W	25,000-30,000'	Straight up	White, kept flashing like mirror in sun	None	20 mts	None			Very fast	Went straight up out of sight	(2)
177	24 Feb	1340	1	Unk	Los Alamos, New Mexico	E to W W to E then st. up	30,000'	Straight up	Silvery white	None	20 mts	None				Went straight up out of sight	(2)
178	24 Feb	1315	1	R	Los Alamos, New Mexico	Erratic generally NE	20,000-30,000'		Silvery	None	15 mts	None	Saucer-shaped	100' across if at 20,000-30,000'	As fast or faster than sound	Disappeared	(2)

***See attached photograph.

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 33

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
179	1950 24 Feb	Between 1315 1400	1	R	Los Alamos, New Mexico	Circled then E	Considerable altitude		Aluminum	Yes	2	None	Spherical	Rather large	Erratic	Unknown	(1)
180	25 Feb	1545 1555	12	R	Los Alamos, New Mexico	Heading toward ground	30° - 35° above horizon		Flashing silver	None	3 secs to 2 mts	None	Circular like plane fuselage	Small airplane	From very slow to very fast		(2)
181	25 Feb	2115	1	Unk	Albuquerque, New Mexico	Toward S	App. 20° above horizon	Almost vertical	Bright greenish white	Yes	1½ secs	None	Tear-drop	3 times size of a shooting star	Slightly slower than falling star	Appeared to burn out	(1)
182	25 Feb	0200	1	R	Datil, New Mexico	NW			White changing to red & green	Yes	30 mts	None	Round		1° per 2 mts	Disappeared behind mountain	(2)
183	25 Feb	1410	1	R	Los Alamos, New Mexico	S to N	1 to 3 miles at 30° above horizon		Metallic	None	2 mts	None	Oblong	10 - 15'	40 mph	Went below horizon	(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 34

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
184	1950 25 Feb	1545	1	R	Los Alamos, New Mexico	N to SWS	Very high		White to silver	None	30 secs	None	Circular	About size of 50¢ piece at its height	Very fast	Disappeared into glare of sun	(3)
185	25 Feb	1550	1	R	Los Alamos, New Mexico	S or SW	12,000'		Metallic	None	Few secs	None		As large or larger than average plane	Fast	Faded from view	(2)
186	25 Feb	1545 1555	14	R	Los Alamos, New Mexico	NE to SW	Overhead at from 4 to 10 miles	Traveled w/a fluctuating motion	Silver	None	Few secs to 2 mts	None	Round	Vary from 1/4" to small airplane	Very fast 500 - 1500 mph		(2)
187	25 Feb	1655	1	R	Los Alamos, New Mexico	E to W			Shiny silvery		10-15 secs	None	Round	About size of B-25 fuselage	Slow speed	Disappeared behind tree	(2)
188	10 Mar	1800 1830	6	Unk	Phoenix, Arizona	SE	40,000-50,000'	Moved upward at 60° angle	Aluminum or quick silver	Yes	10 mts	None	Oval or ob-long	Size of moon	Extremely high	Disappeared	(2)
189	5 Mar	1135 1300	4	R	Vaughn, New Mexico	Traveled 195°		Straight flight	White	None	1 hr 25 mts	None	Round	Ping pong ball at arm's length	180 to 200 mph	Ceased observation	(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 35

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal or Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
190	1950 11 Mar	0100	1	R	Holloman AFB, New	App 270°	About 30° above horizon at distance of 50 miles	Straight flight	Changed from light orange to blood red to amber to light green	None	5 mts	None	Ping pong ball	Ping pong ball held at arm's length		Disappeared from view	(1) (2)
191	16 Mar	1100	10	Unk	Farmington, New Mexico	N to NE		Turned on their axis & maneuvered up & down	Bright luminous as tin foil	None	3-5 mts	None	Flat spheriodic	1 to 6"	Faster than conventional aircraft	Discontinued observation	(2)
192	16 Mar	1000	10	Unk	Farmington, New Mexico	NE	Over 20,000'	Skyward at 60°-80°	Bright aluminum	None	30 mts	None	Oval & oblong	1/16" - 1/2" held at arm's length	Faster than conventional aircraft	Gradually disappeared	(2)
193	17 Mar	0310	1	R	Los Alamos, New Mexico	Toward earth		Toward earth	Reddish then green	None	1 sec	None				Appeared to fall to earth	(3)
194	17 Mar	0308	1	R	Los Alamos, New Mexico	NE		Level flight	Greenish yellow	None	3 secs	None	Round	1/4 size of full moon	Moderate	Like light going out	(3)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 35

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal or Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
190	1950 11 Mar	0100	1	R	Holloman AFB, New	App 270°	About 30° above horizon at distance of 50 miles	Straight flight	Changed from light orange to blood red to amber to light green	None	5 mts	None	Ping pong ball	Ping pong ball held at arm's length		Disappeared from view	(1) (2)
191	16 Mar	1100	10	Unk	Farmington, New Mexico	N to NE		Turned on their axis & maneuvered up & down	Bright luminous as tin foil	None	3-5 mts	None	Flat spheriodic	1 to 6"	Faster than conventional aircraft	Discontinued observation	(2)
192	16 Mar	1000	10	Unk	Farmington, New Mexico	NE	Over 20,000'	Skyward at 60°-80°	Bright aluminum	None	30 mts	None	Oval & oblong	1/16" - 1/2" held at arm's length	Faster than conventional aircraft	Gradually disappeared	(2)
193	17 Mar	0310	1	R	Los Alamos, New Mexico	Toward earth		Toward earth	Reddish then green	None	1 sec	None				Appeared to fall to earth	(3)
194	17 Mar	0300	1	R	Los Alamos, New Mexico	NE		Level flight	Greenish yellow	None	3 secs	None	Round	1/4 size of full moon	Moderate	Like light going out	(3)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

Page 37

Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal to Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
200	1950 21 Mar	1320	1	Unk	Sandia Base, New Mexico	E to SW	App 45° above horizon		2 objects silver	None	10 mts	None	Round	App size of dime at arm's length	Excessive to jet flight	Gradually faded from view	(2)
201	21 Mar	1300	1	Unk	Sandia Base, New Mexico	NE to SE	40,000-60,000'		Varied from shiny silver to shady gray	None	30 mts	None	Round	Size of end of thumb at arm's length	About same as jet aircraft	Disappeared	(2)
202	21 Mar	1315	1	Unk	Sandia Base, New Mexico	E	75° above horizon		White	None	5 mts	None	Round	Smaller than fist at arm's length	App. 600 - 700 mph	Disappeared from range of vision	(2)
203	21 Mar	1300 1330	4	Unk	Kirtland AFB, New Mexico	SE to S	40° - 50° above horizon	Zig-zag motion up & down	Bright silver	None	1 mt	None	Round	Size of dime at arm's length	About same as fast jet aircraft	Disappeared from range of vision	(2)
204	22 Mar	1100	11	Unk	Kirtland AFB, New Mexico	NW changing to N	25,000 to 30,000'	Horizontal	Tan to brown	None	5 - 6 secs	None	Flying wing	About size of golf ball held at arm's length	Extremely high speed	Disappeared	(2)

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Summary of Sightings of Unknown Aerial Phenomena, 17th District OSI (cont)

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Number	Date	Time	Number of Observers	*Reliability of Observers	General Area of Occurrence	Apparent Direction of Flight	Apparent Altitude	Course Horizontal or Vertical	Color	Train or Trail	Duration of Observation	Sound	Shape	Apparent Size	Apparent Speed	Manner of Disappearance	**Evaluation
205	1950 22 Mar	0010	3	Unk	Sandia Base, New Mexico	SE to NW		Line parallel w/line tangent to the earth	Blue center with orange exterior	None	1 1/2 - 3 secs	None	Round like ball from roman candle		1 1/2 secs 30° azimuth	Burned out	(3)
206	1 Apr	0420	1	R	Los Alamos, New Mexico	S to N	75° above horizon		White light	None	1 sec or less	None	Round			Disappeared behind building	(3)
207	17 Apr	1530	10	R	Los Alamos, New Mexico		2,000' above horizon	Maneuvered up & down & from side to side	Light green bright as tin foil	None	20-30 secs	None		1/16" at arm's length		Gradually went out of sight	(1)
208	20 Apr	1530	1	R	Los Alamos, New Mexico			Maneuvered up & down	Bright metallic	None	15-30 mts	None	Roughly circular	Est. 9' in diameter	Faster than conventional aircraft	Lost sight of object	(2)
209	1 May	1510	2	Unk	Kirtland AFB, New	SW to NE	Apparently a few thousand feet	Was angling downward	Silver lucid metallic object	None	Not quite a sec	None	Cylindrical		Tremendous	Flash of brilliant white light	(2)

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Sighting No. 175

Photograph of Unknown Aerial Phenomena taken at Datil, New Mexico by Cpl Lertis E. Stanfield, Holloman Air Force Base, New Mexico on 24 and 25 Feb 1950. An analysis of the above photograph was made by Dr. Lincoln LaPaz, Head of the Institute of Meteoritics, University of New Mexico, Albuquerque, New Mexico, who reached the following conclusions:

- a. The angular diameter of the perfectly round luminous object Stanfield observed was approximately $1/4$ of a degree.
- b. The angular velocity of the object in the sky was greater than half a degree per minute.

Dr. LaPaz stated that on the basis of the results (a) and (b) above, the object seen by Stanfield was not the moon (for the angular diameter is too small), it was not Venus or any other planet (for the angular diameter was too large), and it was not a bright fixed star slightly out of focus (for the observed rate of motion is double that due to the diurnal rotation of the earth).

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THE UNIVERSITY OF NEW MEXICO
ALBUQUERQUE

INSTITUTE OF METEORITICS

May 23, 1950

To: Lt. Colonel Doyle Rees, Commanding Officer
17th District, O. S. I.

From: Lincoln LaPaz, Director
Institute of Meteoritics

Subject: Anomalous Luminous Phenomena (Seventh Report)

1. In the second report of this series, dated 1948, December 20, the writer listed ten significant differences between the bright green horizontally-moving fireballs observed in the interval 1948, December 5-20, and typical meteors. These differences were the following:

(1) The horizontal nature of the paths of most of the December fireballs is most unusual. Genuine meteors are rarely observed to move in horizontal paths.

(2) Again the very low height of the December fireball discussed in section 2 above sets it off in sharp contrast from the genuine meteors for which heights of the order of 40 or more miles are normally observed.

(3) The velocity determined for the fireball of December 12 is much less than the velocities determined from typical meteors (and yet is considerably greater than the speeds of the V-2 Rockets or jet planes or of conventional flares).

(4) In the case of meteorites that penetrate to as low levels as that determined for the fireball of December 12, the observed luminous phenomena are always accompanied by very violent noises. No noises whatever have been observed in connection with the various December fireballs so far investigated. (Note added on 1950, May 23: Possible exceptions to the noiselessness of green fireballs are the incidents of 1949, January 30, and 1949, December 4.)

(5) Genuine meteors normally show remarkable variations in brightness, beginning as fine thin hair lines, which are scarcely visible to the observer, and then brightening up to flash out near the end of their paths. In the case of the December fireballs most of the observers have reported that the green balls appeared almost instantly at their full brightness.

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Subj: Anomalous Luminous Phenomena (Seventh Report) May 23, 1950

(6) In the case of genuine meteors the paths are directed toward all points of the compass with equal frequency. On the contrary in the case of the green fireballs, plots of admissible approach sectors show that there is a very pronounced tendency for the paths to come in from the north half of the sky.

(7) The three groups of anomalous greenish luminous phenomena show a curious association with well known meteor showers, although none of these meteor showers normally produce extremely bright green fireballs, such as those recently observed. For example, the observation mentioned by Mr. Konig appeared near the maximum of the Quadrantid shower of early January, Mr. McCullough's observation of August was near the time of the Persid shower and the December observations all fell in the interval covered by the Geminid shower. This relationship might indicate an attempt to render the green fireballs less conspicuous by causing them to appear only when there is considerable meteoric activity.

(8) As noted in an earlier communication, the remarkably vivid green color reported for most of the December fireballs is rarely observed in the case of genuine meteors. By laboratory test this peculiar color seems to be identical with that given off by copper salts in the blowpipe flame. If this identification is correct, the wave length of the radiation from the green fireballs is near $\lambda = 5218\text{\AA}$.

(9) The duration estimates of between 2 and 3 seconds reported for the green fireballs are considerably longer than those (0.4 - 0.5 seconds) for the ordinary visual meteors, but shorter than the duration estimates invariably reported in the case of a genuine meteorite fall (5 to 30 seconds or even longer).

(10) For none of the green fireballs has a train of sparks or a dust cloud been reported. This contrasts sharply with the behavior noted in case of meteoric fireballs--particularly those that penetrate to the very low levels where the green fireball of December 12 was observed.

2. In the year and a half since this list was prepared, many additional observations have been made, the total number of objects now accepted as belonging in the green fireball category being 72. (Although this number constitutes nearly 50% of the incidents listed in the accompanying Summary, it constitutes less than 5% of the total number of unscreened observations reported to the writer.) Critical analysis of all green fireball reports now available shows that only one of the statements in the list given in paragraph 1 needs to be modified, namely, item (1). Within the last year, a considerable number of the green fireballs have appeared to fall vertically downward rather than

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Subj: Anomalous Luminous Phenomena (Seventh Report)

May 23, 1950

to move horizontally. However, a strictly vertical infall is also very rarely observed in the case of genuine meteor falls.

3. An analysis just completed of the time distribution of the green fireballs so far observed permits us to add an 11th item to the list of differences given in paragraph 1 above. The graph of frequency versus local time which accompanies the present report shows that the maximum frequency of sighting of green fireballs (occurring at approximately 2030) coincides in time with neither the frequency maximum for ordinary meteors (occurring at approximately 0300) nor the frequency maximum for meteorite falls (occurring at approximately 1600).

4. Inspection of the graph referred to in paragraph 3 also will show that most of the green fireballs have been sighted in a time interval extending from about 5 p.m. to 11 p.m. (MST). This concentration might be even more pronounced if it were possible to screen out of the secondary maximum, around 2 a.m. (MST), all ordinary meteors which have been mistakenly identified as green fireballs. That such misidentification has occurred is strongly suggested by the near coincidence in time of the secondary maximum of the green fireballs and the well established early morning maximum of the ordinary meteors.

5. Some significance may attach to the fact that the time interval alluded to in paragraph 4 extends from about 7 a.m. to 1 p.m. in the Ural region of the USSR. Since missiles moving with velocities of the order of those found for the green fireballs for which real path determinations have been possible would travel from the southern Urals to New Mexico in less than 15 minutes, a possible interpretation of the concentration of sightings referred to in paragraph 4 is that the green fireballs result from guided missiles launched from bases in the Urals in the morning hours before cloudiness due to convection or blinding afternoon dust storms can interfere with non-radar tracking, such as has been used by the Optical Trajectory Section at White Sands Proving Ground.

6. There is also a pronounced concentration of green fireball incidents on the four days, Friday, Saturday, Sunday, Monday, almost all of the most widely observed incidents having occurred on Saturday or Sunday.

7. It is a curious and fairly well-established fact that there has been a distinct decline in the number of green fireball sightings during the last two months, within which the number of so-called "flying saucer" incidents in this region has attained an all-time high.

8. Although I have recently received from Dr. Joseph Kaplan of the Scientific Advisory Board a letter containing the statement "Frankly, I don't know of any U. S. experiments that would result in the appearance of these unconventional objects, and neither does Von Karman". I still

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To: Lt. Colonel Doyle Rees - Page 4
Subj: Anomalous Luminous Phenomena (Seventh Report) May 23, 1950

consider the most probable explanation of the green fireballs to be the one given in the first of the three paragraphs below which are quoted from my letter of 1950, February 20, to Dr. P. H. Wyckoff, Chief Atmospheric Physics Laboratory, Base Directorate for Geophysical Research. The last two paragraphs quoted below well summarize my recommendations concerning the green fireball problem:

"As a preliminary to setting down the project recommendations which you requested, I have very carefully reviewed all available fireball data (observers' reports, transit measurements, calculated real paths, etc.) covering incidents from those of December 5, 1948 to the extraordinary incident of February 7, 1950, which has been under intensive investigation for the last two weeks. As a result of this comprehensive review, particularly as it relates to the incident of February 7, 1950, I feel compelled to write you in somewhat different terms concerning my own part in the proposed fireball project than I had in mind when we last discussed this matter. In brief, I have come to the conclusion that, on the basis of the evidence now available to me, I would not be justified in recommending a fireball project. In my opinion, this evidence proves conclusively that the fireballs reported on fall into one of two categories: Those of the first category (the majority) are meteorite falls of unusual, but certainly not of impossible, magnitude, frequency and other characteristics; those of the second category (the minority) are U. S. guided missiles undergoing tests in the neighborhoods of the sensitive installations they are designed to defend. This interpretation of the latter category is the one that I proposed in answer to a question raised by Dr. Teller at the first Los Alamos conference on February 17, 1949. It was not taken seriously then and I doubt that it will be taken seriously at the present time. However, even if my interpretation of the unconventional fireballs is the correct one, it is obvious that those in position to confirm it should refuse to do so."

"Only one other point need be stressed, namely, that if I am wrong in interpreting the guided missiles as of U. S. origin, then certainly intensive, systematic investigation of these objects should not be delayed until the termination of the present academic year. Recent international developments compel one to sense the imperative necessity of immediate investigation of the unconventional green fireballs, in case you are in possession of information proving that they are not U. S. missiles."

"If such an immediate investigation were to be undertaken, I would recommend that Dr. Fred L. Whipple, of Harvard College Observatory, be placed in charge of the photographic phase of the investigation; that Dr. Peter M. Millman, of the Dominion Observatory, be placed in charge of the spectrographic phase of the investigation;

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To: Lt. Colonel Doyle Rees - Page 5

Subj: Anomalous Luminous Phenomena (Seventh Report) May 23, 1950

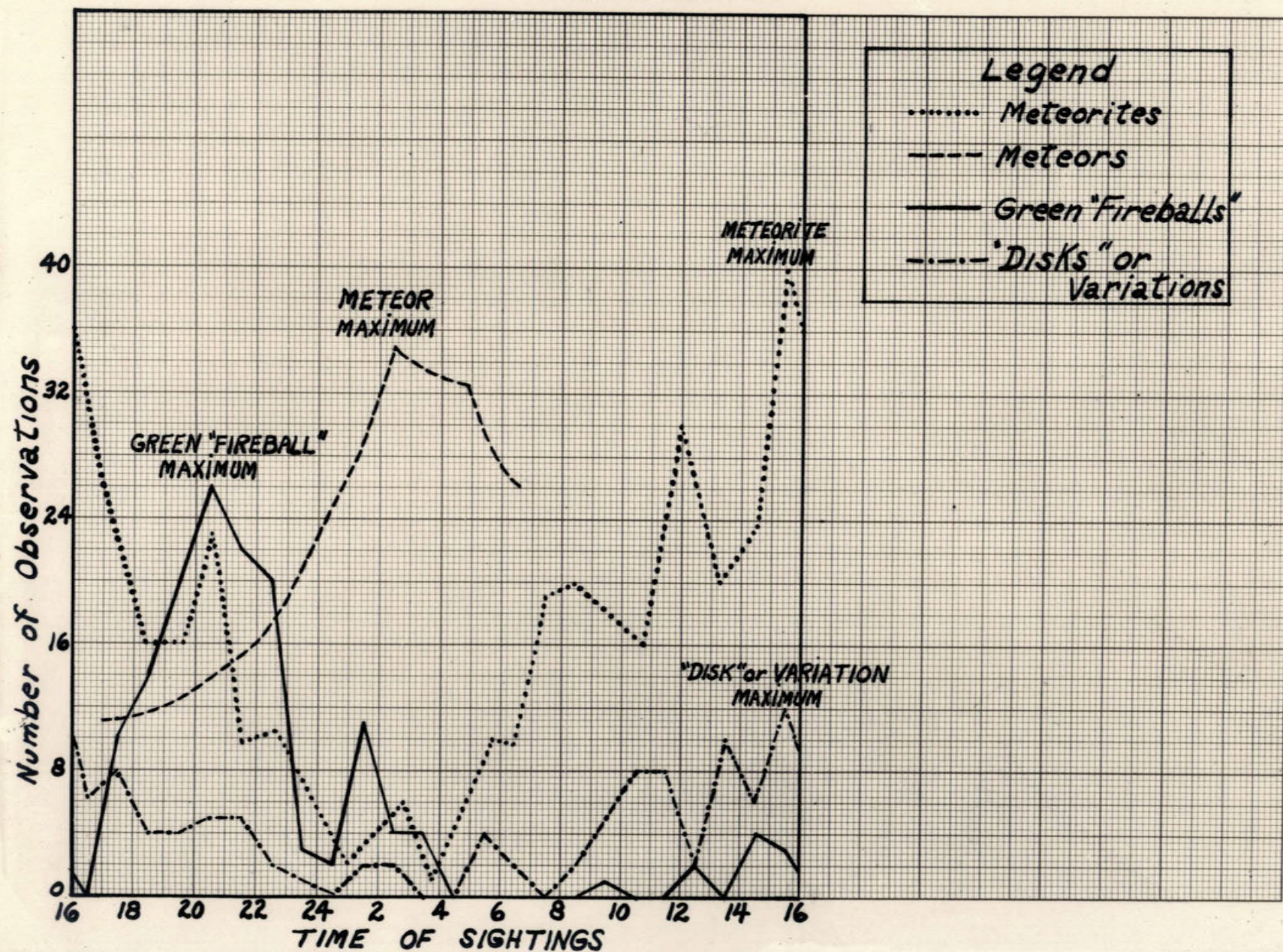
that Dr. L. A. Manning, of Stanford, and Dr. Millman be placed in charge of the radar investigation; and, finally, that Dr. William Crozier, of the New Mexico School of Mines, be placed in charge of dust collection and identification. On the basis of many intensive field surveys, I do not anticipate that ground search will lead to any recoveries, but in case such ground search is to be attempted, it should be carried out on the scale stressed in my conversations with you and Major Oder last month."

9. Although the above paragraphs were written some months ago, the recommendations contained in them are the ones I would urge you to consider at the present time. In conclusion, I should like to repeat the offer made at the end of my letter of February 20 to Dr. Wyckoff, namely to serve, if needed, as consultant on the green fireball project as suggested in Major Oder's letter to me under date of November 29, 1949, with the stipulation, however, that my service be on a voluntary basis rather than on the \$40 per day contract specified in Major Oder's letter.

Lincoln LaPaz

Lincoln LaPaz, Director
Institute of Meteoritics
University of New Mexico

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON

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THE INSPECTOR GENERAL USAF
17TH DISTRICT OFFICE OF SPECIAL INVESTIGATIONS
KIRTLAND AIR FORCE BASE, NEW MEXICO

DR/JLB/web

File No: 24-8

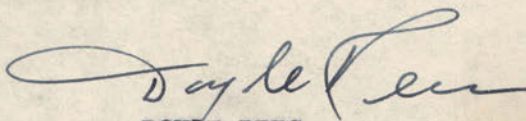
18 May 1949

SUBJECT: UNKNOWN (Aerial Phenomena)

TO: Commanding General
Sandia Base
Albuquerque, New Mexico
ATTN: Intelligence Officer

1. Transmitted herewith is a Summary of Information relative to the aerial phenomena which have been observed in the New Mexico -- West Texas area.

2. This investigation is being continued and your office will be kept informed of future developments.



1 Incl
Summary of Information

DOYLE REES
Lt Col, USAF
District Commander

DISTRIBUTION OF SUMMARY:

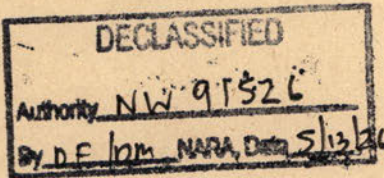
- 2 - Hq OSI
- 1 - 3d OSI Region
- 1 - CG, AMC
- 1 - CO, Kirtland AFB
- 1 - CO, 636th Acft Control & warning Sq
- 1 - AF Guided Missile Project
- 1 - AF Field Office for Atomic Energy
- 1 - CG, Sandia Base
- 3 - Atomic Energy Security Service
- 1 - CG, Fourth Army
- 1 - BIO, Ft Bliss, Texas
- 1 - FBI, Albuquerque
- 1 - Dr Lincoln LaPaz, UNM
- 12 - File

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SHORT TITLE: KF-5977

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON



THE INSPECTOR GENERAL USAF
17th DISTRICT OFFICE OF SPECIAL INVESTIGATION
KIRTLAND AIR FORCE BASE, NEW MEXICO

19 April 1949

SUMMARY OF INFORMATION:

1. This is a comprehensive summary of all observations of unidentified aerial phenomena possessing similar characteristics which have been observed in the New Mexico-West Texas area. The common characteristics of most of the incidents are:

- a. Green color, sometimes described as greenish-white, bright green, yellow-green, or blue green.
- b. Horizontal path, sometimes with minor variations.
- c. Speed less than that of a meteor, but more than any known type of aircraft.
- d. No sound associated with observations.
- e. No persistent trail or dust cloud.
- f. Period of visibility from one to five seconds.

2. All of the incidents reported do not possess all of the above characteristics, but in each case one or more are present. In none of the reported incidents has any natural or man-made object been determined to be responsible.

3. The body of this summary consists of a tabulation of observations with notes attached to clarify or amplify certain of the more important observations. Note numbers 1, 3, and 5 are taken directly from reports compiled by Dr. Lincoln LaPaz, University of New Mexico. Dr. LaPaz is internationally known and respected as a meteoriticist, and has taken a great interest in these phenomena.

4. The tabulation of sightings is not a complete record of all reported observations, but comprises only those in which interviews were conducted by OSI personnel. Many other persons were interviewed by Dr. LaPaz and his colleagues, but inasmuch as complete data is not available, these interviews are not taken into account in this summary. In addition, numerous reports have been received from individuals who could not provide

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SUMMARY OF INFORMATION (Cont)

19 April 1949

sufficient information to warrant inclusion of such facts as they did possess. Any interview where the veracity of the interviewee was doubted was discounted in the preparation of reports for transmittal.

1 Incl

Tabular Summary w/notes

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NW 91526

<u>Date</u>	<u>Time</u>	<u>Color</u>	<u>Course</u>	<u>Seen From</u>	<u>Seen By</u>
5 Dec 48	1930	Green	NE to SW	Las Vegas, N.M.	Civilian
5 Dec 48	2000	Green	N/S	Albuquerque, N.M.	Univ. of N.M. Student
5 Dec 48	2105	Green	N/S	Near Las Vegas, N.M.	Military Pilots
5 Dec 48	2115	Green	N/S	Las Vegas, N.M.	Civilian
5 Dec 48	2115	Green	N/S	Las Vegas, N.M.	Civilian
5 Dec 48	2115	Green	N/S	Lucy, N.M.	Civilian
5 Dec 48	2127	Green	N/S	East of Albuquerque	Military Pilots
5 Dec 48	2135	Green	N/S	Near Las Vegas, N.M.	Pilots, Pioneer Airlines
5 Dec 48	2200	Green	N/S	Near Las Vegas, N.M.	Civilian Pilot
5 Dec 48	2220	Red-white	NE to SW	Levy, N.M.	USAF Photographer
5 Dec 48	2220	N/S	N/S	Onava, N. M.	Railway Worker
5 Dec 48	2315	Green	N/S	Near Las Vegas, N.M.	Univ. of N.M. Student
6 Dec 48	2255	Green	N/S	Sandia Base	AEC Security Agent
7 Dec 48	2145	Green	N/S	Los Alamos	AESS Inspector
8 Dec 48	1835	Green	N/S	Near Las Vegas, N.M.	OSI Personnel
12 Dec 48	2102		Note 1		
12 Dec 48	2102		Note 1		
13 Dec 48	2130	Note 2			
13 Dec 48	2215	Green	N/S	20 mi. East of Las Vegas	Civilian
14 Dec 48	0100	Green	N/S	Wagon Mound, N.M.	Civilian
20 Dec 48	2054	Note 2	Note 3		
28 Dec 48	0431	White	N to S	Los Alamos	AESS Inspector
6 Jan 49	0310	Green	E to W	Los Alamos	AESS Inspector
6 Jan 49	1730		Note 4		
30 Jan 49	Note 5				
14 Feb 49	1840	White-Greenish	NE to SW	Near Ganado, Ariz.	Dr. Salsbury
17 Feb 49	Note 6				

<u>Date</u>	<u>Time</u>	<u>Color</u>	<u>Course</u>	<u>Seen From</u>	<u>Seen By</u>
27 Feb 49	1905	Green	W to E	Los Alamos	AESS Lieutenant
2 Mar 49	0010	N/S	N to S	Los Alamos	AESS Inspector
3 Mar 49	0159	Green	Down	Los Alamos	AESS Sergeant
3 Mar 49	1836	White- Greenish	275 to 289	Los Alamos	AESS Inspector
8 Mar 49	1835		Note 7		
13 Mar 49	2153	Greenish- White	NE or SW	Sandia Base	MPs
27 Mar 49	1800	Note 6			
5 Apr 49	2200	Green	S to N	Los Alamos	AESS Inspector
6 Apr 49	0005	Green	NW to SE	Los Alamos	AESS Inspector
7 Apr 49	0100	Green	S to N	Los Alamos	AESS Inspector
7 Apr 49	0135	Green	E to W	Los Alamos	AESS Inspector
12 Apr 49	1930	White	E to W	Sandia Base	MP

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EXTRACT FROM REPORT SUBMITTED BY DR. LAPAZ ON 20 DECEMBER 1948:

December 14:

1:00 a.m., Mr. Mimo Sanchez (Wagon Mound, N.M.)

2. The Real Path of the Only Green Fireball so Far Observed at Two Separate Stations. Among the numerous observations so far made, there is only one pair of corresponding observations i.e., those made simultaneously by different groups of observers at widely separated stations. The only such observations are those obtained on the night of December 12 by one group of observers near Starvation Peak (Bernal, New Mexico - see report on incident of 1948, December 12, 9h 2m plus or minus 30s), and a second pair of observers stationed within the Los Alamos reservation. By graphic reduction of the simultaneously made observations, the following facts have been determined: The green fireball of December 12, 9h 2m plus or minus 30s appeared very near a point with the coordinates latitude $35^{\circ} 50'$, longitude $106^{\circ} 40'$ and disappeared near a point with the coordinates latitude $35^{\circ} 45'$, longitude $107^{\circ} 50'$, traversing a nearly or exactly horizontal path with a length of very nearly twenty-five (25) miles at an altitude above the surface of the earth of approximately 8 to 10 miles, depending on the estimate of angular altitude employed in the reduction; the velocity with respect to the earth works out at between 8 and 12 miles a second, depending on the duration estimate used. It should be observed that the above results are obtained under the assumption that the points of appearance and disappearance of the fireball were seen simultaneously by both the Bernal and Los Alamos groups. In case this assumption is not fulfilled, the real path could very easily be no more than 10 to 12 miles long, the velocity with respect to the earth then working out at between 3 and 6 miles a second. While there is thus considerable uncertainty because of the lack of confirming azimuth observations from a third station, concordance in the five (5) different estimates of angular elevation make it most unlikely that the linear height of the fireball was much less than 8 miles and much more than 10 miles. It is interesting to observe that the backward extension of the 25-mile path first given passes almost centrally across the Los Alamos reservation.

3. Significant Differences Between the Fireballs Observed in the Interval December 5-13 and Typical Meteors.

3.1 The horizontal nature of the paths of most of the December fireballs is most unusual. Genuine meteors are rarely observed to move in horizontal paths.

3.2 Again the very low height of the December fireball discussed in section 2 above sets it off in sharp contrast from the genuine meteors for which heights of the order of 40 or more miles are normally observed.

3.3 The velocity determined for the fireball of December 12 is much less than the velocities determined from typical meteors (and yet is considerably greater than the speeds of the V-2 Rockets or jet planes or of conventional flares).

NOTE 1

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TO: Colonel Doyle Rees

December 20, 1948

3.4 In the case of meteorites that penetrate to as low levels as that determined for the fireball of December 12, the observed luminous phenomena are always accompanied by very violent noises. No noises whatever have been observed in connection with the various December fireballs so far investigated.

3.5 Genuine meteors normally show remarkable variations in brightness beginning as fine thin hair lines, which are scarcely visible to the observer, and then brightening up to flash out near the end of their paths. In the case of the December fireballs most of the observers have reported that the green balls appeared almost instantly at their full brightness.

3.6 In the case of genuine meteors the paths are directed toward all points of the compass with equal frequency. On the contrary in the case of the green fireballs, plots of admissible approach sectors show that there is a very pronounced tendency for the paths to come in from the north half of the sky.

3.7 The three groups of anomalous greenish luminous phenomena show a curious association with well known meteor showers, although none of these meteor showers normally produce extremely bright green fireballs, such as those recently observed. For example, the observation mentioned by Mr. Tomlin appeared near the maximum of the Quadrantid shower of early January, Mr. McCullough's observation of August was near the time of the Persid shower and the December observations all fell in the interval covered by the Geminid shower. This relationship might indicate an attempt to render the green fireballs less conspicuous by causing them to appear only when there is considerable meteoric activity.

3.8 As noted in an earlier communication, the remarkably vivid green color reported for most of the December fireballs is rarely observed in the case of genuine meteors. By laboratory test this peculiar color seems to be identical with that given off by copper salts in the blowpipe flame. If this identification is correct, the wavelength of the radiation from the green fireballs is near 5,218 Angstrom Units.

3.9 The duration estimates of between 2 and 3 seconds reported for the green fireballs are considerably longer than those (0.4 - 0.5 seconds) for the ordinary visual meteors, but shorter than the duration estimates invariably reported in the case of a genuine meteorite fall (5 to 30 seconds or even longer).

3.10 For none of the green fireballs has a train of sparks or a dust cloud been reported. This contrasts sharply with the behavior noted in case of meteoric fireballs--particularly those that penetrate to the very low levels where the green fireball of December 12 was observed.

4. On the basis of the various differences to which attention is called in section 3, the writer remains of the opinion that the fireball of December 12 was definitely non-meteoritic and that in all probability the same is true of most, if not all, the other bright green fireballs, which the OSI has had under investigation.

LINCOLN LAPAZ

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INCIDENTS OF 13 AND 20 DECEMBER 1948:

The unusual feature of these two incidents is that there were reported two red lights trailing the green fireball. In each case observers agreed that the trailing lights retained a constant position with respect to each other and to the green light. Also, these two sightings are the only two of all the green fireballs where a sharp change of direction in the vertical plane was observed. One of these incidents, that of 20 December, was observed by Atomic Energy Security Service Inspectors, while the other was observed by a truck driver and his wife. That of 20 December was observed in the Los Alamos area, while that of the 13th of December was observed southwest of Las Vegas.

NOTE 2

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INCLOSURE #6

The University of New Mexico

Albuquerque

Institute of Meteoritics

December 30, 1948

TO: Lt. Colonel Doyle Rees, Commanding Officer
District No. 17
Office of Special Investigations

From: Lincoln LaPaz, Director
Institute of Meteoritics

Subject: Anomalous luminous phenomena (Third Report)

In the second report of this series, a description was given of the real path through the atmosphere of the green fireball of 1948, December 12, 9^h 30^m (plus or minus 30^s). On the basis of corresponding observations made from one station near Starvation Peak, New Mexico, and a second station near Los Alamos, New Mexico, this fireball was found to have appeared near a point with the coordinates: latitude 35° 50' N, longitude 106°, 40' W, and to have disappeared near a point with the coordinates: latitude 35° 45' N, longitude 107° 05' W, traversing an almost horizontal path, at an elevation of about 10 miles above sea level, with a length of about 25 miles, at a velocity of approximately 10 miles per second. (The minimum path length consistent with the observations was found to be about 11 miles, the corresponding velocity then falling between 3 and 6 miles per second, depending on the duration adopted.)

On the basis of corresponding observations of the greenish-white fireball of 1948, December 20, 8^h 54^m p.m. made by two pairs of Los Alamos observers, it has now become possible to work out another approximate real path. As will be apparent from the original accounts of the observations made by AESS Inspectors William D. Wilson, Buford G. Truett, Clifford E. Strang, and Physical Security Inspector George S. Skipper, the fireball of 1948, December 20 was observed under less favorable conditions than the green fireball seen by five persons on the night of December 12. However, on the basis of the original accounts of the observers named above, of sketches supplied by these four individuals on December 29 and of transit observations made by Captain M. E. Nease and the undersigned on the same date at the points of observation (viz., 35° 48' .9, 106° 18' .4 for Strang and Skipper and 35° 55', 106° 23' .4 for Wilson and Truett), it has been possible to establish reasonable concordance between various points on the fireball path as seen by the two groups of observers. Because of the very short baseline (only 8 miles long) between the two points of observation and the difficult conditions under which the fireball of December 20 was observed, it is my opinion that the real path derived from the December 20 observations deserves considerably less weight than that obtained from the December 12 observations.

NOTE 3

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Lt. Col. Doyle Rees

-2-

December 30, 1948

It is found that the fireball doubly observed by Messrs. Wilson, Truett, Strang, and Skipper appeared at a height of at least 10 miles and descended at an angle of about 45° to the vertical (according to Truett's estimate) to point C at an elevation of only 2.3 miles above the horizontal plane through the point from which Strang and Skipper observed. As the fireball approached the point C, its path levelled off and from C to its point of disappearance, E, the fireball followed a nearly horizontal path approximately 7.5 miles long, moving with a velocity of between 3.75 and 7.5 miles per second, depending on the duration estimate adopted. The coordinates of the projection of C on the earth are $35^{\circ} 56'$ N, $106^{\circ} 30'$ W, and those of the projection of E are $35^{\circ} 57'$ N, $106^{\circ} 23'$ W. The forward extension of the fireball's trace on the earth as determined by the above projections, passes some six miles to the north of the town of Los Alamos.

It should be noted that the descending branch of the path of the fireball was observed by Inspector Truett alone, but he was absolutely certain that his observation of this portion of the path was correct. It should also be noted that no sound was heard, although the distance from the observers to the fireball and from the fireball to the earth could have been only a few miles at most. I have no hesitancy in testifying that an object possessing the path and the other peculiarities observed by Messrs. Wilson, Truett, Strang, and Skipper was not a falling meteorite.

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TO: Director, Intelligence & Security Division 7 January 1949

FROM: Chief, Physical Security Branch

SUBJECT: Reported Observation of Unidentified Light or Flare Moving Across the Sky on 6 January 1949

1. On 7 January 1949, the writer interviewed Pfc. Meredith J. Everitt, ASN 38552954, Headquarters, 8450th M.P. Group, concerning the unidentified light or flare which he had reportedly seen moving across the sky.

2. Pfc. Everitt advised that on 6 January 1949 he was guarding a C-97 airplane at the landing strip, located adjacent to the Ordnance Area, when at approximately 1730 hours he noticed a bright object travelling across the sky, from the Southeast towards the Northwest. He related that the object was diamond shaped, approximately two feet long, and appeared to be much brighter in its center than at the edges. He estimated that the object was approximately 1500 to 2000 feet in the air and travelled approximately 500 feet, horizontal to the earth's surface, before he lost sight of it. Pfc. Everitt was unable to estimate the speed of the object but stated that he has seen low flying jet planes, and that this object travelled much faster than the jets that he has observed. There was no smoke or other vaporous material visible to Pfc. Everitt around or following the object.

3. At the time Pfc. Everitt witnessed the object, he stated that the sky was clear, furnishing a light blue background, and that the object appeared to be a bright white light, with no other apparent visible color.

4. Standing guard with Pfc. Everitt were Sgt. Richard Woleslegoe and Cpl. Wilson, and according to Pfc. Everitt, neither of the other men saw the object. Everitt explained that he called to Sgt. Woleslegoe, who was standing at the other end of the plane, and told him to look at the object in the sky, but by that time it had disappeared.

5. Pfc. Everitt stated that he attended Flight School, under the G.I. Bill of Rights in Houston, Texas, during the year 1947, and that he has had some experience in observing aircraft.

/s/ MATTHEW J. DOYLE
Chief, Physical Security Branch
Intelligence & Security Division

NOTE 4

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THE UNIVERSITY OF NEW MEXICO

ALBUQUERQUE

Institute of Meteoritics

February 21, 1949

TO: Lt Colonel Doyle Rees, Commanding Officer
District No. 17
Office of Special Investigations

From: Lincoln LaPaz, Director
Institute of Meteoritics

Subject: Anomalous luminous phenomena (4th report)

1. Several additional sightings of unexplained aerial light phenomena have occurred since the third report in this series was prepared. Outstanding among the as yet undescribed incidents was the green fireball of Sunday evening, January 30, 1949, 5:54 p.m. MST. Within less than one minute after the appearance of the fireball, an eyewitness (Mr. Nesbitt) called to report the impression of a group of persons who saw the fireball through an east window while seated about the dinner table in a brightly lighted room. Within twelve hours after the fireball appeared, more than 100 eyewitness accounts had been obtained by its director through personal interviews. An unusually high percentage of the reports came from military personnel (waiting out under the sky for Post Theaters to open), from guards and other special agents already alerted to watch for anomalous luminous phenomena and from airplane pilots, control tower men and oilwell workers working on the late afternoon to midnight shift.

2. On February 1st, a staff car was placed at the writer's disposal by Major William Godsoe of the Fourth Army and a field survey was begun of the region in New Mexico and Texas in which the majority of the observer's reports during the fall lived. This survey, carried out under unusually severe weather conditions, included visits to the following localities: Moriarty, Estancia, Vaughn, Ramon, Mesa, Roswell, Caprock, Tatum and other towns in New Mexico; and Lamesa, Brownfield, Plains, Lubbock, Muleshoe and other towns in Texas. (Several of these towns were visited two or more times.) At Roswell, where very effective cooperation was provided by the OSI group at Walker Air Base under Lt Paul Ryan, and the local CAP unit under Lt H. K. Cobean, Special Agent Bill Rickett was added to the survey party and gave much aid in later work. At Lamesa, Texas, the ground survey party was joined by an air search party consisting of Major Charles Phillips, USAF, Captain Melvin E. Neef and Special Agent Jack L. Boling, from the 17th District OSI office at Kirtland Field, and Corporal Cochran. On February 4th, the four persons just named flew a low-level air reconnaissance mission in a T-11 aircraft over the area surrounding the earth-point of the fireball of January 30th. At the same time a second ground survey party under Lt Paul Ryan made a careful field search along a route extending from Lamesa through Amherst, Texas, to Clovis, New Mexico.

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3. As a result of the ground and air searches referred to above, and of an analysis of the very large amount of information obtained from eyewitnesses by personal interviews, by telephone conversations and by letter, it has now (three weeks after the fall) become clear that several thousand persons in New Mexico and Texas saw this great fireball leisurely traverse the sky. It has been possible to determine that the January 30th fireball became visible at an altitude of approximately twelve miles over a point at latitude $34^{\circ} 3'$ longitude $102^{\circ} 5'$, and disappeared at an altitude of approximately eight miles over a point at latitude $32^{\circ} 48'$, longitude $102^{\circ} 22'$, after traversing a nearly horizontal path approximately 143 miles long at a velocity of from seven to fourteen miles per second. Although the January 30th fireball must be ranked among the brightest observed in the last quarter-century, and in spite of the fact that its real path lay closer to the earth throughout its entire extent than any other meteorite path of which the writer has knowledge (excepting the anomalous green fireballs of December 12th and 20th, 1948), the meteoritic detonations and long continued rumblings which without exception accompany large meteorite falls were not observed on January 30th by anyone in the very large region covered by the various ground surveys. However, what may have been Udden noises (anomalous whizzing and hissing sounds frequently reported by very distant observers as having been heard at the same time that a meteoritic fireball was seen) were heard at Roswell, New Mexico, and near Muleshoe, Texas.

4. In addition to the absence of noise anomaly referred to in the last paragraph, the fireball of January 30th, 1949, shows several other features (e.g. nearly horizontal path, absence of long enduring luminous train or dust clouds, North to South direction, etc) characteristic of the green fireballs earlier described in this series of reports. However, the January 30th fireball was much brighter than any of those earlier reported and differed from other green fireballs in that many of the Texas observers who were situated nearest its path reported its color as blue, orange, red and even purple instead of green.

5. Up to the present time (February 21st), no evidence whatever supporting the belief that solid fragments fell to earth from the January 30th fireball has been discovered. However, as promptly as possible, a much more thorough ground search should be made in the probable area of fall as outlined by the earlier surveys, for, in my opinion, the fireball of January 30th is the only one of the anomalous luminous objects under investigation which gives any indication of having been a meteorite fall.

6. With the present report, the writer's participation in the OSI's investigation of the puzzling fireball question must, to his regret, terminate. During the time I was on leave of absence from the University of New Mexico, I was glad to donate my time and services to this investigation. Now that I am again serving as Head of the Department of Mathematics with a full time teaching load, it is impossible for me to continue cooperating with the OSI.

LINCOLN LAPAZ
Head of Dept of Mathematics

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INCIDENTS OF 17 FEBRUARY AND 27 MARCH:

In each of these incidents the following description applies:

- a. Color - Red, orange, pink, or amber
- b. Shape - Elongated, about five to ten times as long as wide.
- c. Consistency - Apparently solid, but flexible. Did not appear to be vapor or smoke trail.
- d. Luminosity - Appeared to be self-luminous, and the varying rate of flight and changes of position caused no change in either degree or color of emitted light.
- e. Flight - Both objects performed various maneuvers, consisting of climbing and diving, with turning movements.
- f. Speed - Not accurately estimated, due to variation in time factors.
- g. Termination - Both objects appeared to disappear in the distance.
- h. Location - The 17 February incident was observed from the area of Albuquerque, New Mexico. The 27 March observations were made from the Tucumcari-Clovis area.
- i. Course - The 17 February object appeared to move from west to east; that of 27 March, from east to west.
- j. Sound - No sound was reported in conjunction with either incident.
- k. Remarks - In each case, reports indicated that the objects flowed around corners in vertical maneuvers, rather than swung around as would a rigid object. In neither case did investigation produce any evidence of a jet-propelled craft in the area. Observers in each case were found whose credibility is above average.

NOTE 6

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INCIDENT OF 8 MARCH 1949:

This incident was reported by an AESS Inspector on duty at Los Alamos. The object appeared to be an elliptical, rather stubby, aluminum body surrounded or covered with billowy flame. There may have been projections similar to stubby control surfaces and wings, but the observer could not be sure of this. The observer described the object as looking rather like the part of a war time German airplane from the cockpit aft. It disappeared behind the clouds. The path was slightly descending; there was no noise.

NOTE 7

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ALBUQUERQUE. NEW MEXICO

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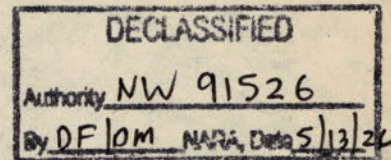
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MAR 31 1949

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c/s
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REFER TO FILE NO.
SBID/1

SUBJECT: Unidentified Flying Objects

TO: The Chief
Armed Forces Special Weapons Project
P. O. Box 2610
Washington 25, D. C.



ATTENTION: Chief, Intelligence & Security Division

1. Reference is made to letter this Headquarters, file SBID/1, dated 31 December 1948, subject as above.

2. Inclosed herewith are three (3) summaries of information from Fourth Army, dated 16 March, 18 March, and 24 March 1949, dealing with the reports of unidentified lights appearing in the vicinity of Camp Hood, Texas.

3. A conference was held at Los Alamos on 16 February 1949, to consider the unnatural phenomena that have been reported. Commander Richard Mandelkorn represented this Headquarters at this conference. His report of this conference as well as a transcript of the minutes of the conference are attached hereto.

4. It is requested that these inclosures be returned to this Headquarters for file, after they have served their purpose, inasmuch as they are the only copies on hand.

FOR THE COMMANDING GENERAL:

Marvin F. Pound

5 Incls:

1. Memo, 18 Feb. 49 (SBRD-O-2173)
2. Sum. of Info, 24 Mar 49 w/sketch
3. Sum of Info, 18 Mar 49 w/sketch
4. Ltr 17 Mar 49 (HQS-4th 5557)
w/4 Incls
5. AEC Ltr 22 Mar 49 (in dup) w/Incl
(HILL-5577)

MARVIN F. POUND
Capt., Infantry
Adjutant

Distribution:

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SHORT TITLE: SBID-O-2224

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WASHINGTON, D.C.

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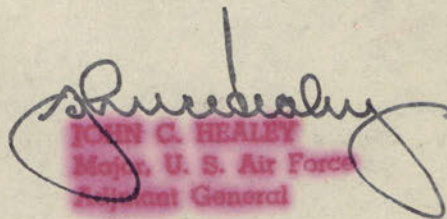
Headquarters, Armed Forces Special Weapons Project, P. O. Box 2610,
Washington 25, D. C., 27 April 1949.

TO: Commanding General, Sandia Base, P. O. Box 5100, Albuquerque, N. M.

Inclosures listed in basic communication have been noted and are
returned herewith.

BY COMMAND OF MAJOR GENERAL NICHOLS:

5 Incls:
n/c


JOHN C. HEALEY
Major, U. S. Air Force
Adjutant General



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SHORT TITLE: SBID-0-2296

NW 91526

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This document consists of 4 Page.
No. 1 of 1 copies, Series B

18 February 1949

REPORT OF TRIP TO LOS ALAMOS, NEW MEXICO, 16 FEBRUARY 1949, BY COMMANDER RICHARD S. MANDELKORN, U.S.N., RESEARCH AND DEVELOPMENT DIVISION, SANDIA BASE.

Subject: Project "Grudge".

1. On 16 February, a conference was held at Los Alamos to consider the so-called green fireball phenomena which commenced about 5 December 1948. The following were present:

For Los Alamos:

Mr. N. E. Bradbury
Mr. Marshall Holloway
Mr. Fred Reines
Mr. John Manley
Mr. Edward Teller
Mr. Elmo Morgan (AEC)
Mr. Sidney Neuberger (Security)
Mr. Maxwell (AESS)
Mr. Hoyt

For the Fourth Army:

Major William A. Godsoe
Major Wynn

For the U. S. Air Force:

Captain Neef

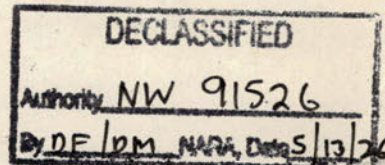
For the University of New Mexico:

Dr. Lincoln LaPaz

For Sandia Base:

Commander Richard Mandelkorn

2. Captain Neef opened the meeting by saying that the problem was being presented to Los Alamos scientists in hopes that they would be able to indicate some mode of attack on the problem and offer some explanations for the phenomena observed. He stated that this question had been classified military SECRET under the name, Project "Grudge", and that the investigation was now the primary responsibility of USAF, Air Materiel Command, T-2. He then turned over the discussion to Dr. LaPaz.



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Report of Trip to Los Alamos, 16 Feb 49 (Cont.)

18 February 1949

3. Dr. LaPaz stated that he had been assisting the Military for the past two months at their request in the investigation of the subject problem, and went on with the general discussion of phenomena attending normal meteorite fall, postulating the following important characteristics:

- a. Random path of fall.
- b. Color and intensity variations in light emitted.
- c. Sound.
- d. Frightened animals.

4. Dr. LaPaz then went on to discuss the number of observers reporting the subject phenomena and the diversity of their backgrounds, including commercial airlines' pilots, military pilots, special intelligence agents, Los Alamos personnel (Mr. Hoyt), and himself, as well as various and sundry previously uninformed citizens.

5. Dr. LaPaz then described the "Starvation Peak Incident" which he observed himself, detailing the following characteristics which indicate that the phenomenon can not be classified as a normal meteorite fall:

- a. Initial bright light (no period of intensity increase) and constant intensity during the duration of the phenomenon.
- b. Yellow-green color (about 5,200 angstroms).
- c. Essentially horizontal path.
- d. Trajectory traversed at constant angular velocity.
- e. Duration about two seconds.
- f. No accompanying noise.

6. Since about 5 December 1948, there have been more than ten incidents analogous to the "green fireball" described, and some twenty more presenting minor deviations to the above, which should be considered in connection with them. In addition, there have been a number of normal shooting stars and meteors observed.

7. There ensued a general discussion in which it was brought up that the majority of the observers whose reports were here under consideration were not subject to previous psychological influences or prior knowledge as to what they should look for. Furthermore, "seeing" conditions for meteor observation throughout the continental United States were at least

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Report of Trip to Los Alamos, 16 Feb 49 (Cont.)

18 February 1949

average during December, January, and February, yet no green fireballs have been reported in any other areas. They seemed to be confined to the Los Alamos, Las Vegas, and West Texas triangle.

8. Mr. Teller then took over the discussion and showed that a material object travelling with the velocity of the subject phenomenon (about eight miles per second) would have to have a mass of about twenty grams, assuming all the kinetic energy could be converted to light, under the assumption that the light output is in the vicinity of 10^{14} ergs per second. He then went on to show that the shock wave produced by the passage of an object of these dimensions or greater passing through the atmosphere at a height of eight to ten miles (the observer figures) with a velocity of eight miles per second would produce a loud noise easily audible ten kilometers from the source. No sound has been observed. Therefore, Mr. Teller has the tentative opinion they are not material objects passing through the air. We should look to electronics and optics for an explanation rather than in the field of hydrodynamics. In any event, it was apparently agreed by those present that it was almost incredible that a large object such as a guided missile or informer vehicle could pass through the atmosphere at a height of eight miles at a velocity of seven to eight miles per second without producing a loud noise which would have been audible to observers. Mr. Bradbury demurred so far as the electronic explanation was concerned, saying if it were assumed that the answer lay in that region, many more difficult problems would have to be solved.

9. The following action seems in order:

a. Recalculation of the data outlined by Mr. Teller with a more accurate treatment to verify his tentative conclusions.

b. The establishment of well-equipped and organized observation stations to give as thorough photometric and photographic coverage as is possible in the geographic area involved.

c. Assuming that Mr. Teller's theories are borne out by recalculation, declassification of the Project to permit participation and thinking by scientists throughout the country.

10. Dr. LaPaz and Captain Neef have fruitlessly attempted to obtain information from a meteorite observers' group now at White Sands, said to be performing work under contract for the Navy. Commander Mandelkorn offered to assist them in their endeavor to enlist the services of the group for observations in connection with Project "Grudge".

11. Conclusion: It is my belief that these phenomena, *particularly if there are any further incidents, are deserving of serious consideration

*See next page.

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Report of Trip to Los Alamos, 16 Feb 49 (Cont.)

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B
18 February 1949

until their source and meaning have been satisfactorily explained. Although Mr. Teller's discussion tends to disprove the hypothesis that guided missiles or informer vehicles are responsible, there is cause for concern of the continued occurrences of unexplainable phenomena of this nature in the vicinity of sensitive installations.

*Captain Neef reports blue fireball visible from Sandia at 0530, 17 February 1949, and a yellow-orange cigar-shaped light at 1759, visible until 1806, 17 February.

/s/ Richard Mandelkorn

RICHARD MANDELKORN,
Commander, U.S.N.

Copy Furnished:

Fourth Army, G-2 -- Major William A. Godsoe (2)
USAF -- Captain Neef
USAF FOFAE -- Brig. Gen. Howard G. Bunker

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Report of Trip to Los Alamos, 18 Feb 48 (Cont.) 18 February 1948

until light source and meaning have been satisfactorily explained. Although Mr. Teller's discussion tends to disprove the hypothesis that guided missiles or other vehicles are responsible, there is cause for concern of the continued occurrence of unexplainable phenomena of this nature in the vicinity of sensitive installations.

*Captain Neel reports blue fireball visible from Santa at 0830, 17 February 1948, and a yellow-orange cigar-shaped light at 1738, visible until 1808, 17 February.

/s/ Richard Mandelkern

RICHARD MANDELKERN
Commander, U.S.N.

Copy furnished:
Fourth Army, G-3 -- Major William A. Godson (2)
USAF -- Captain Neel
USAF F-4 -- Brig. Gen. Howard G. Barker

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SUMMARY OF INFORMATION

DATE

24 March 1949

PREPARING OFFICE

Office of the AG of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas

SUBJECT

Unusual Lights
452.1 AKADB

CODE FOR USE IN INDIVIDUAL PARAGRAPH EVALUATION

OF SOURCE:

COMPLETELY RELIABLE A
USUALLY RELIABLE B
FAIRLY RELIABLE C
NOT USUALLY RELIABLE D
UNRELIABLE E
RELIABILITY UNKNOWN F

OF INFORMATION:

CONFIRMED BY OTHER SOURCES . . . 1
PROBABLY TRUE 2
POSSIBLY TRUE 3
DOUBTFULLY TRUE 4
IMPROBABLE 5
TRUTH CANNOT BE JUDGED 6

SUMMARY OF INFORMATION

The following information has been received in a report from the Office of the AG of S, G-2, Headquarters 2d Armored Division, Camp Hood, Texas:

On 181947 March 1949, four unidentified lights appeared in the vicinity of 915.26 - 855.19, the lights noticed at this time were three yellow and one red. A patrol of Killeen Base, in the "Q" Area noticed two of these lights. A patrol located on Crossville Mountain, which consisted of four enlisted men of the Alert Force saw four. Immediate investigation in the general area failed to reveal any cause or anything which would indicate that some person or thing had been in the area. (B-3) (see Exhibit I, Point #1)

At 181930 March 1949, another yellow light was seen in the approximate vicinity of 910.41 - 855.10. This light was reportedly seen by only one man. There was no indication from reports that these lights were moving, there was no noise, and the persons reporting were unable to make an estimate of the height. (B-3) (see Exhibit I, Point #2)

At 181947 March 1949, what appeared to be blinking lights appeared in the vicinity of the Rock Quarry, located at 905.82 - 855.61. Investigation by the Alert Force and patrols of Killeen Base failed to reveal any cause or person in that general area. Again at 181955 March 1949, lights were seen in this general area. (B-3) (see Exhibit I, Point #3)

At 190048 March 1949, blinking lights were seen in the same general area 905.82 - 855.61. Investigation failed to reveal the cause of these lights. All of the lights which appeared in the proximity of 905.82 - 855.61 were seen by patrols located in the "Q" Area and were seen from points between 910.20 - 855.36 and 905.44 - 855.41. (B-3) (see Exhibit I, Point #4)

Captain Horace McCulloch, Headquarters 2d Armored Division, and Mr. Raymond Schmiedieke, Special Agent, Killeen Base, spent several hours from an observation point located in the "Q" Area in an attempt to see these blinking lights.

DECLASSIFIED

Authority NW 91526

By DP/bm mma 5/13/26

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TANK DESTROYER CENTER CAMP HOOD, TEXAS
SCALE 1:62,500 FIRST EDITION 1943

Exhibit I

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SUMMARY OF INFORMATION

DATE 18 March 1949

PREPARING OFFICE

Office of the AC of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas

SUBJECT

UNUSUAL LIGHTS
(452.1 AKADB)

CODE FOR USE IN INDIVIDUAL PARAGRAPH EVALUATION

OF SOURCE:

COMPLETELY RELIABLE A
 USUALLY RELIABLE B
 FAIRLY RELIABLE C
 NOT USUALLY RELIABLE D
 UNRELIABLE E
 RELIABILITY UNKNOWN F

OF INFORMATION:

CONFIRMED BY OTHER SOURCES . . 1
 PROBABLY TRUE 2
 POSSIBLY TRUE 3
 DOUBTFULLY TRUE 4
 IMPROBABLE 5
 TRUTH CANNOT BE JUDGED 6

SUMMARY OF INFORMATION

Eight moving "lights" appeared in the atmosphere over or in the vicinity of the "Q" area, AFSWP, Camp Hood, Texas, on the evening of 17 March 1949. At the time of these sightings, the alert guard of the 2nd Armored Division, under the Assistant AC of S, G-2 of Camp Hood, was in the area concerned and prepared to fire flares and record instrument readings of elevation and azimuth. The purpose was to check the powers of observation of observers who had previously reported the phenomena observed on 6-7-8 March 1949 and heretofore reported in Summary of Information, this headquarters, dated 17 March 1949, subject: "Unusual Lights." However, before this operation could be begun, the series of 8 unusual "lights" appeared.

Coordinates of lights and time of sighting follow:

	<u>Coordinates</u>	<u>Time</u>
1.	910.40 - 855.14	1952
2.	910.39 - 860.13	1958
3.	910.42 - 860.14	1958
4.	910.38 - 860.15	2000
5.	910.32 - 855.20	2000
6.	910.30 - 855.17	2010
7.	910.36 - 855.06	2024
8.	910.37 - 855.35	2152

Coordinates were based on dual sightings of each light by sights on tanks of observers. Time was clocked at instant of sighting. Captain McCullough, the Assistant G-2, personally observed three of the lights. Physical characteristics of these "lights" were reported as "quite different" from those reported on 6-7-8 March 1949. One burst into a green cluster. One was reddish, another white. One observer described some of them as similar to Very Pistol flares. While this phenomena was occurring, a security detachment from the "Q" area arrived in the vicinity of the alert crew from the 2nd Armored Division.

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SUMMARY OF INFORMATION

DATE

18 March 1949

PREPARING OFFICE

Office of the AG of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas

SUBJECT

UNUSUAL LIGHTS
(452.1 AKADB)

CODE FOR USE IN INDIVIDUAL PARAGRAPH EVALUATION

OF SOURCE:

COMPLETELY RELIABLE A
USUALLY RELIABLE B
FAIRLY RELIABLE C
NOT USUALLY RELIABLE D
UNRELIABLE E
RELIABILITY UNKNOWN F

OF INFORMATION:

CONFIRMED BY OTHER SOURCES . . . 1
PROBABLY TRUE 2
POSSIBLY TRUE 3
DOUBTFULLY TRUE 4
IMPROBABLE 5
TRUTH CANNOT BE JUDGED 6

SUMMARY OF INFORMATION

It was then determined that no one in the "Q" area was responsible for the phenomena. "Q" area then went on alert status. Ordnance check has shown that nothing in the way of pyrotechnic missiles has been issued or used in months. Investigation of whole area by ground crews is being made and additional reports will be rendered. As in the case of the 6-7-8 March "lights," those of the 17th "bracket" the "Q" area. One group of 3 lights being North of the area and one group of 5 lights just South of the area. Overlay showing locations is attached. (EXHIBIT I)

Federal Bureau of Investigation, San Antonio, Texas, Office of Naval Intelligence, San Antonio, Texas, have been notified. Director of Intelligence; Air Materiel Command; Office of Special Investigations, Kirtland Air Force Base; and Commanding General, Sandia Base, are on distribution of this Summary.

DISTRIBUTION

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To
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MAP:

TANK DESTROYER CENTER, CAMP HOOD, TEXAS

SCALE: 1:62500

(First Edition 1943)

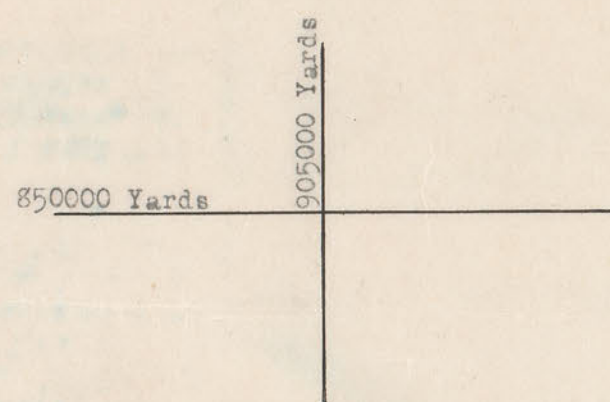
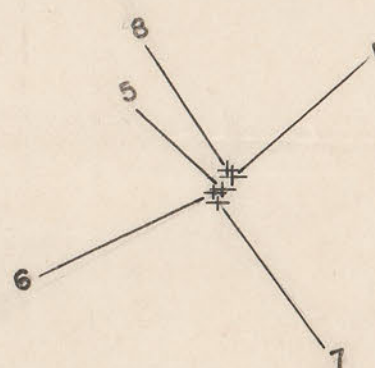
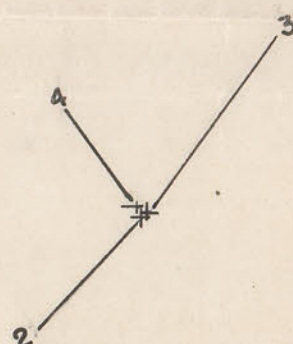
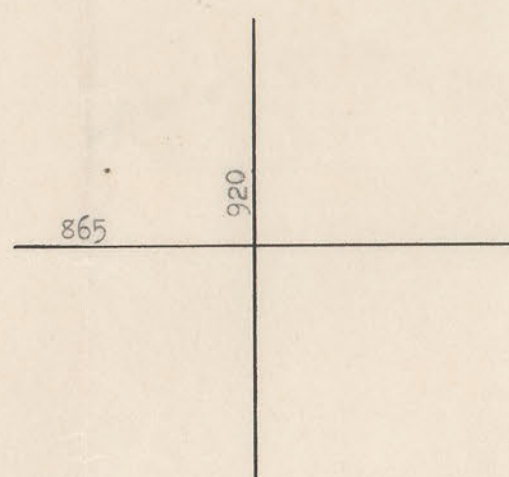


EXHIBIT I

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EXHIBIT I

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452.1 AKADB

17 March 1949

SUBJECT: Unusual Lights

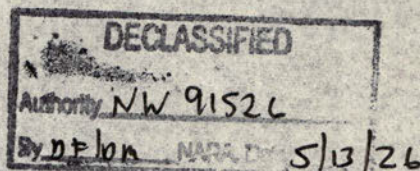
TO: Commanding General
Sandia Base
P. O. Box 5100
Albuquerque, New Mexico
ATTN: AC of S, G-2

The attached Summary of Information, this office, subject as above, 16 March 1949, re reports of "lights" observed over Camp Hood, Texas, is forwarded in duplicate for your information and any action deemed necessary.

FOR THE COMMANDING GENERAL:

1 Incl (dup)
As stated, w/EXHIBITS I, II,
III, and IV

EUSTIS L. POLAND
Colonel, GSC
AC of S, G-2



Encl # 4

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NW 91526

SHORT TITLE Ref 4th 5537

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SUMMARY OF INFORMATION

DATE

16 March 1949

PREPARING OFFICE

Office of the AC of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas

SUBJECT

Unusual Lights
452.1 AKADB

CODE FOR USE IN INDIVIDUAL PARAGRAPH EVALUATION

OF SOURCE:

COMPLETELY RELIABLE A
USUALLY RELIABLE B
FAIRLY RELIABLE C
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RELIABILITY UNKNOWN F

OF INFORMATION:

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PROBABLY TRUE 2
POSSIBLY TRUE 3
DOUBTFULLY TRUE 4
IMPROBABLE 5
TRUTH CANNOT BE JUDGED 6

SUMMARY OF INFORMATION

Following is an interim summary predicated on request of the Fourth Army Liaison Officer at Sandia Base for this headquarters to investigate and report on "fireball" phenomena reported to the Commanding General, Sandia Base, by AFSWP installation at Camp Hood, Texas. Report stated that several sightings of unusual "light" phenomena in the atmosphere above Site Baker (Q Area) had been made by security personnel there during the period 6 - 8 March 1949.

AT CAMP HOOD, it was determined that this type of phenomena, hitherto unreported from the Camp Hood Area, has the same general characteristics of the phenomena observed during the past several months at Sandia Base. Because observers were in different locations and some were not certain as to time, it is possible that observation reported within the same hour on the same date are duplications. It should be noted that none of the observers had been instructed to look for or report any sort of atmospheric phenomena. All stated without equivocations that they had never before seen anything resembling the reported phenomena. All claimed to have seen "falling stars" nearly every night on the Camp Hood Reservation; but all were emphatic in stating that this phenomena was quite different. All men were interrogated separately and had no advance notice that they would be questioned. After the interrogation they were taken to the spot where the observations had been made. These points were numbered and then plotted on map, Camp Hood and vicinity, 1/62 500 1943. Overlays have been made and a copy is hereto attached. The observer was then told to aim a surveying instrument, brought along for the purpose, at the celestial points of origin and of termination of the phenomena. Vertical angles and magnetic azimuth of each point was then recorded. In most cases, the observer was able to fix azimuths by some terrain features. Vertical angles were of course estimated except where elevations of observations coincided with ridge on tree lines.

Observations on 6 March 1949:

1. From observation point #6 (see attached overlay)
 - a. Location of point: 909.7 - 857.5; Time: 2100 hours.
 - b. Weather: Overcast (see attached weather report).
 - c. Witnesses: Sgt Hubert J. Vickery, AF 34932926
1st Provost Security Sq
Killeen Base, Camp Hood, Texas

Pfc John C. Ransom, AF 15252814
1st Provost Security Sq
Killeen Base, Camp Hood, Texas

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SHORT TITLE: 34904-5557

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S/I, Office of the AC of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj, "Unusual Lights"

d. Object sighted:

- (1) Number: 1
- (2) Shape: Oblong
- (3) Size: Described as "about 2 ft by 1 ft"
- (4) Color: Pale blue-white light
- (5) Speed: Not known
- (6) Direction: From N 74° W to N 81° W
- (7) Maneuverability: No deviation from course
- (8) Altitude: From 6° above horizon to 45° above
- (9) Sound: None
- (10) Exhaust trail: Sgt Vickery reports none. Pfc Ransom reported a faint pinkish red trail extending about three times the length of the body.

2. From observation point #1 (see attached overlay).

a. Location of point: 914.3 - 855.7; Time: About 2020 hours.

b. Weather: Overcast (see attached weather report).

c. Witnesses: Pvt Martin M. Fensterman, US 57122075
1st AIB, Company A
Camp Hood, Texas

Pvt Frank (RMI) Luisi, US 57100167
1st AIB, Company A
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Ball like flash
- (3) Size: Looked like basketball
- (4) Color: Pale blue-white light
- (5) Speed: Not known
- (6) Direction: N 40° E
- (7) Maneuverability: None--was a "fixed flash"
- (8) Altitude: 59° above horizon
- (9) Sound: None
- (10) Exhaust trail: None

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S/I, Office of the AG of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj. "Unusual Lights"

3. From observation point #3 (see attached overlay).

a. Location: 914.5 - 856.1; Time: About 2045 hours.

b. Weather: Overcast (see attached weather report).

c. Witness: Pvt Harold D. Moore, US 57410066
42nd AIB, Company A
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Roundish head with trail
- (3) Size: About 10° in length
- (4) Color: Light colored head, orange trail
- (5) Speed: Not known
- (6) Direction: From S 81° W to S 60° W
- (7) Maneuverability: No deviation from course
- (8) Altitude: From 21° above horizon to 6° 31' above
- (9) Sound: None
- (10) Exhaust trail: Orange trail about 10° long
- (11) Remarks: Appeared to be going over Q area

Observations on 7 March 1949:

1. From observation point #1 (see attached overlay)

a. Location: 914.3 - 855.7; Time: 0115 hours.

b. Weather: Clear (see attached weather report).

c. Witness: Pfc Robert Gardner Black, US 57112155
42nd AIB, Company A
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Like flash bulb
- (3) Size: Flash bulb
- (4) Color: Brilliant blue-white
- (5) Speed: None
- (6) Direction: N 40° E
- (7) Maneuverability: None--fixed flash
- (8) Altitude: 66° 15' above horizon
- (9) Sound: None
- (10) Exhaust trail: None

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S/1, Office of the AC of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj, "Unusual Lights"

(11) Remarks: This observer is a Harvard graduate. Used stars to mark bearing and elevation of sighting. Stated he had never seen anything like this phenomena before.

2. From observation point #2 (see attached overlay).

a. Location: 915.1 - 856.1; Time: 0115 - 0130 hours.

b. Weather: Clear (see attached weather report).

c. Witness: Pvt Paul C. Bryant, US 57204806
42nd AIB, Company A
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Like flash bulb
- (3) Size: Basketball
- (4) Color: Bright blue-white
- (5) Speed: None
- (6) Direction: N 16° W
- (7) Maneuverability: None---fixed flash
- (8) Altitude: 27° 30' above horizon
- (9) Sound: None
- (10) Exhaust trail: None.

3. From observation point #5 (see attached overlay).

a. Location: 914.6 - 856.7; Time: 0130 - 0200 hours.

b. Weather: Clear (see attached weather report).

c. Witnesses: Pvt Francesca (NMI) Leonardo, US 57175045
42nd AIB, Company A
Camp Hood, Texas

Pvt Savino E. Digni, US 57175036
42nd AIB, Company A
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Ball like flash
- (3) Size: Like flash bulb
- (4) Color: Bluish white

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S/I, Office of the AC of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj, "Unusual Lights"

- (5) Speed: Not known
- (6) Direction: S 20° W
- (7) Maneuverability: None---fixed flash
- (8) Altitude: 26° above horizon
- (9) Sound: None
- (10) Exhaust trail: None

4. From observation point #7 (see attached overlay)

- a. Location: 909.0 - 856.9; Time: 0145 hours.
- b. Weather: Clear (see attached weather report).
- c. Witness: Pfc Max Eugene Manlove, AF 15418997
1st Provost Security Sq
Camp Hood, Texas
- d. Object sighted:

- (1) Number: 1
- (2) Shape: Teardrop
- (3) Size: "About 2 ft by 1 ft"
- (4) Color: Orange
- (5) Speed: Not known
- (6) Direction: N 60° E
- (7) Maneuverability: No deviation
- (8) Altitude: 4 when first seen---dropped vertically
- (9) Sound: None
- (10) Exhaust trail: None
- (11) Remarks: Witness said this "light" dropped vertically to ground and disappeared behind trees directly in front of him. In view "about 2 seconds."

Observations on 8 March 1949:

1. From observation point #1 (see attached overlay).

- a. Location: 914.3 - 855.7; Time: About 0103 hours.
- b. Weather: Clear (see attached weather report).
- c. Witness: Pvt Charlie H. Payne, US 57211002
42nd AIB, Company A
Camp Hood, Texas

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S/I, Office of the AG of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj. "Unusual Lights"

d. Object sighted:

- (1) Number: 1
- (2) Shape: Roundish head with hazy smoke trail.
- (3) Size: Not known
- (4) Color: Pale white light at head
- (5) Speed: Not known
- (6) Direction: From S 58° E to S 54° E
- (7) Maneuverability: No deviation
- (8) Altitude: From 58° above horizon to 54° above
- (9) Sound: None
- (10) Exhaust trail: Left hazy white smoke trail
- (11) Remarks: Travelled in arc and visible "long enough to snap your fingers."

2. From observation point #4 (see attached overlay).

- a. Location: 914.6 - 856.7; Time: About 0103.
- b. Weather: Clear (see attached weather report).
- c. Witness: Cpl Luke Burke Sims, RA 38753146
Company A, 42nd AIB
Camp Hood, Texas

d. Object sighted:

- (1) Number: 1
- (2) Shape: Lemon with tail
- (3) Size: Not known
- (4) Color: Pale reddish nose, whitish red trail
- (5) Speed: Not known, but very fast
- (6) Direction: From N 56° W to S 64° W
- (7) Maneuverability: No deviation
- (8) Altitude: From 15° above horizon at beginning and end of arc.
- (9) Sound: None
- (10) Exhaust trail: Whitish red trail
- (11) Remarks: Good observer. Stated that "light" started from point above horizon then arced upward and down to 15° when it disappeared. Was perfect arc. He was able to run 10 paces toward field telephone to report light before it vanished.

The following incident may or may not be connected: At about 1930 hours on 7 March 1949, a flashlight was seen moving about the Q Area fence line near the air strip. It could not be told by the observer whether the light was within or

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S/I, Office of the AG of S, G-2, Headquarters Fourth Army, Fort Sam Houston, Texas,
16 March 1949, subj, "Unusual Lights"

without the fence. The Security Officer of Site Baker is investigating. He stated the light was not carried by any of the AFSWP personnel.

Investigation continues in an effort to determine cause of the "lights." Last information is that 32 trip flares have been put into the general area by the 2nd Armored Division and that some may have been set off by wild animals. Subsequent summary will be rendered when more exact evidence on flares is obtained. It is presently known, however, that these flares explode on the ground and do not shoot into the air.

No conclusion is drawn from the data on attached overlay other than to note that the "lights" form a rough circle about the "Q" Area. Copy of surface weather observations for Camp Hood on the 6, 7, and 8 March 1949 are attached as a possible aid in analysis. This report covers only day hours since the USAF weather service at Camp Hood closes at 1700 hours and opens at 0730 hours.

(B-2)

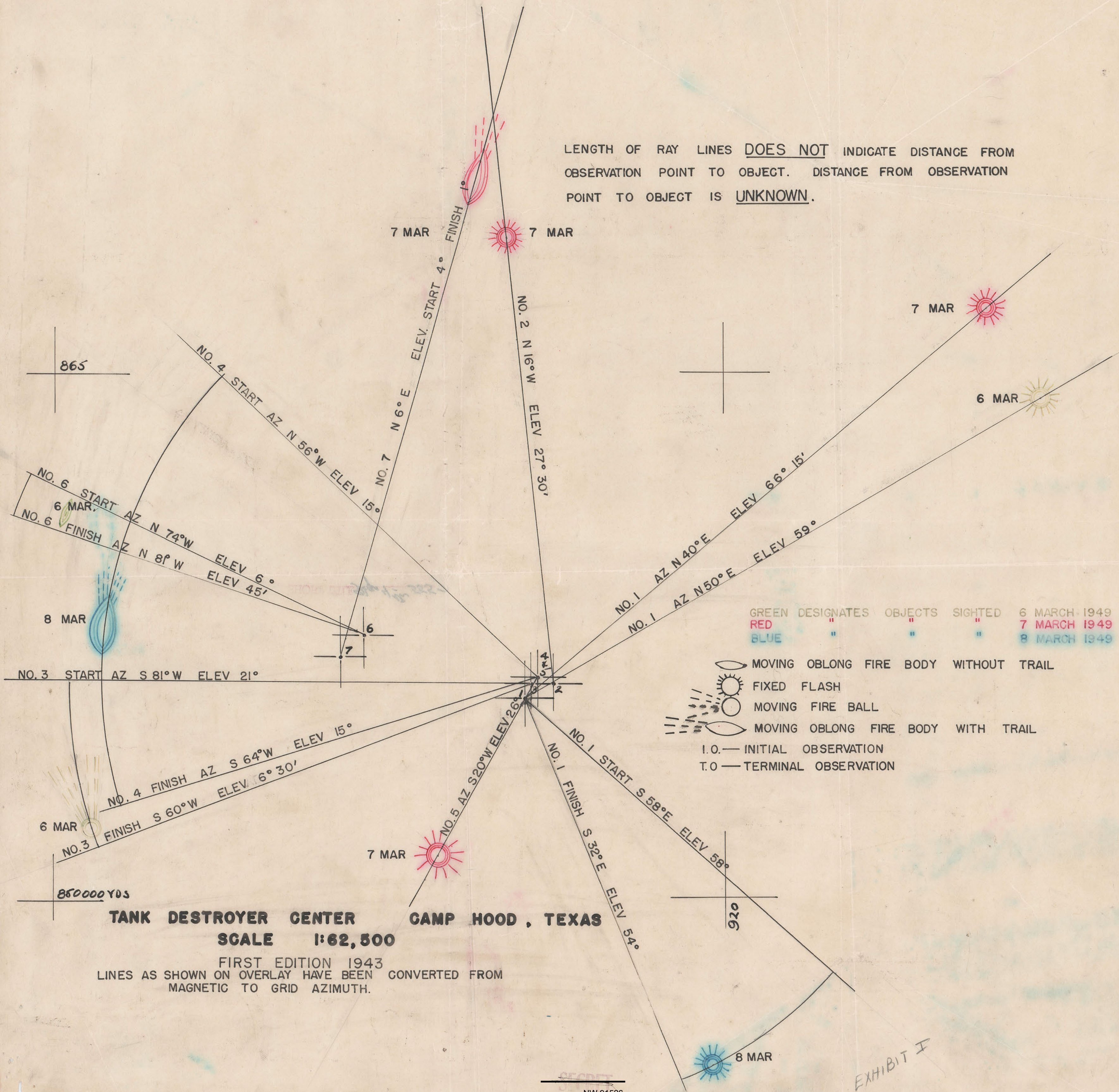
EXHIBIT I - Overlay, Tank Destroyer Center, Camp Hood, Texas
EXHIBIT II - Weather Report, 6 March 1949, Camp Hood, Texas
EXHIBIT III - Weather Report, 7 March 1949, Camp Hood, Texas
EXHIBIT IV - Weather Report, 8 March 1949, Camp Hood, Texas

Encl (dup)

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LENGTH OF RAY LINES DOES NOT INDICATE DISTANCE FROM
OBSERVATION POINT TO OBJECT. DISTANCE FROM OBSERVATION
POINT TO OBJECT IS UNKNOWN.

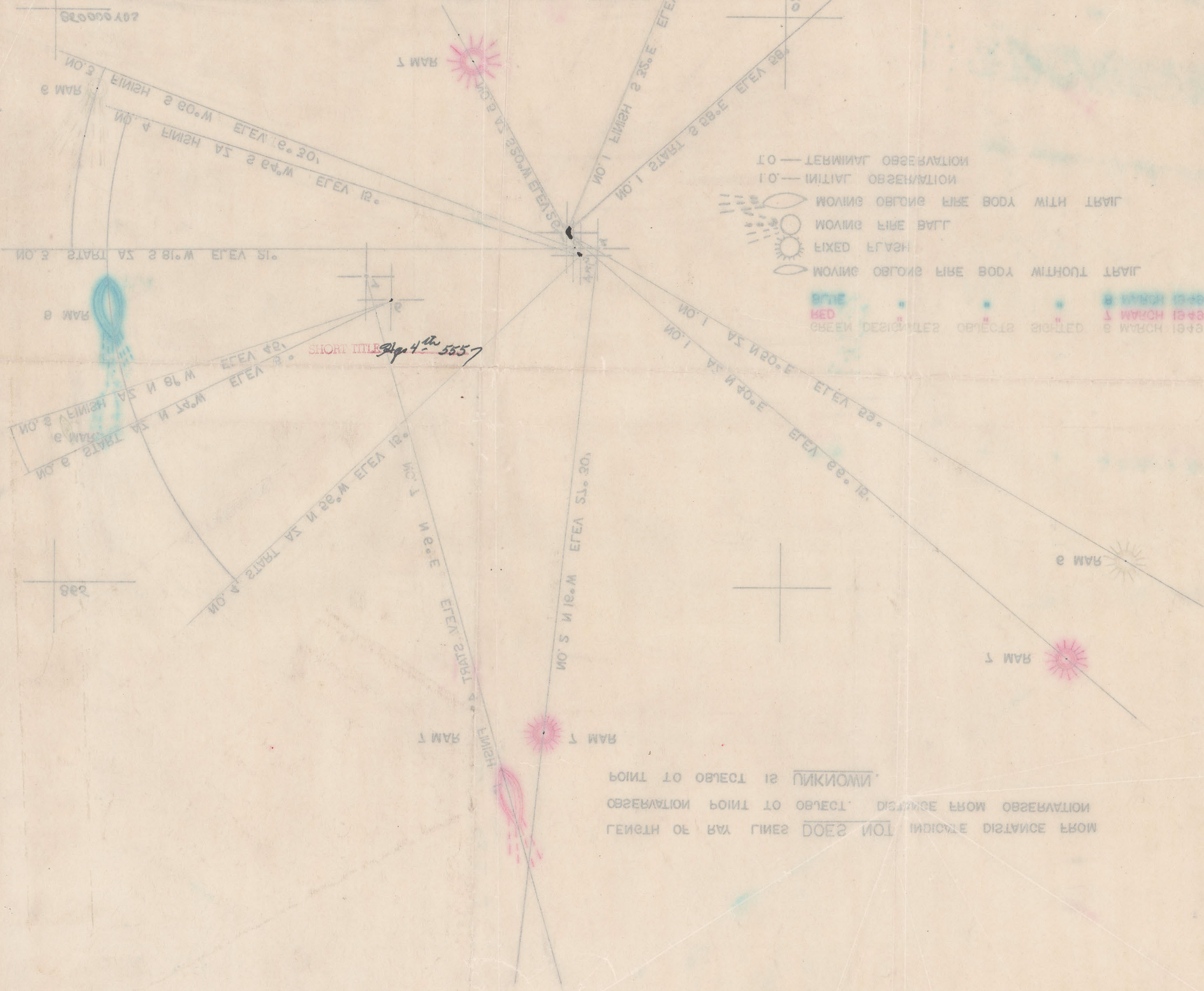


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MAGNETIC TO GRID AZIMUTH
 LINES AS SHOWN ON OVERLAY HAVE BEEN CONVERTED FROM
 FIRST EDITION 1943

SCALE 1:85,000
 TANK DESTROYER CENTER

CAMP HOOD, TEXAS



SHORT TITLE *Sign 4-5557*

POINT TO OBJECT IS UNKNOWN.
 OBSERVATION POINT TO OBJECT DISTANCE FROM OBSERVATION
 LENGTH OF RAY LINES DOES NOT INDICATE DISTANCE FROM

Time entries on this form are 90 in meridian time
To convert to G.C.T. (GMT) 6 hours
Height of Barometer 726 Ft (MSL)

U.S. AIR FORCE AIR WEATHER SERVICE
SURFACE WEATHER OBSERVATIONS

STATION DET 24-27
MONTH MAY DAY 6 YEAR 49
LAT _____ LONG _____

WBAN FORM 10A														WBAN FORM 10B																										
TYPE	TIME (LST)	CEILING (Hundreds of Feet)	SKY	VISIBILITY (Miles)	WEATHER AND OBSTRUCTIONS TO VISION	SEA LEVEL PRESS (mb)	TEMP (°F)	DEW PT (°F)	WIND			CHARACTER AND SHIFTS	ALTIMETER SET (in)	REMARKS AND SUPPLEMENTAL CODED DATA	OBSERVER INITIALS	TIME (LST)	STATION PRESSURE (in)	DRY BULB (°F)	WET BULB (°F)	REL HUMIDITY (%)	TOTAL SKY COVER	CLOUDS AND OBSCURING PHENOMENA												NET 3-HR CHANGE	38	39	40			
									DIRECTION	SPEED (knots)	SPEED (mph)											LOWEST LAYER	SECOND LAYER	SUMMATION TOTAL	THIRD LAYER	SUMMATION TOTAL	FOURTH LAYER	SUMMATION TOTAL												
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	
R	0730	E200	☉	10		112	57.55	→	3			988				00																								
R	0830	E200	-☉	15		125	62.57	→	4			990				01																								
R	0930	E150	☉☉	15		132	66.57	→	5			992	E200 ☉/304	1577		02																								
R	1030	E150	☉☉	15		112	70.54	→	10			992	E200 ☉			03																								
R	1130	E170	☉	15		139	72.62	→	15			994				04																								
R	1230	E170	☉☉	15		139	73.49	→	20			996	E200 ☉/20 E200 1577	56		05																								
R	1330	E170	☉☉	15		139	75.54	→	15			996	E200 ☉			06																								
R	1430	E170	☉☉☉	15		146	70.57	→	15			998				07	28.904	56.8	55.8	94	8	8	CS	E200	0			8	0			8	0							
R	1530	E170	☉☉	15		149	72.52	→	15			999	E200 ☉/404	1577		08	28.905	62.5	59.7	84	10	10	CS	E200	0															
R	1630	E200	☉	15		156	70.51	→	20			1001				09	28.905	65.9	60.2	73	10	9	AC	E150	10	CS	E200	0							3	025				
																10	28.940	69.9	60.5	58	19	8	AC	E150	19	CS	E200	0												
																11	28.965	72.1	60.1	49	19	9	AC	E120	0															
																12	28.965	72.7	59.4	44	8	7	AC	E120	8	CS	E200	8	0						8	0		3	050	
																13	28.965	75.0	62.0	48	8	6	AC	E120	3	CS	E200	8	0						8	0				
																14	29.000	70.5	63.0	63	7	3	CU	E30	7	CS	E170	7	0						7	0				
																15	29.010	70.1	60.1	49	9	7	AC	E120	9	CS	E200	9	0						7	0			4	025
																16	29.030	69.9	59.9	52	8	8	CU	E200	0				8	0					8	0				
																17																								
																18																								
																19																								
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																23																								
<div>TRUE CERTIFIED COPY William S. [Signature] HWSO, USAF Staff Weather Officer</div>																SYNOPTIC OBSERVATIONS																								
																TIME (G.C.T.)	TIME (L.S.T.)	NO.	PRECIP (in)	SNOW FALL (in)	SNOW DEPTH (in)	MAX TEMP (°F)	MIN TEMP (°F)	HEIGHT (ft)	STATE OF SURFACE	SEA STATE	SWELL HEIGHT	SWELL PERIOD	SURFACE WIND	WATER TEMP	SOIL TEMP	STATION PRESSURE COMPUTATION								
																41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	TIME (L.S.T.)	59	1230				
																NO. TO																		ATT THERM	60	72.0				
																1																		OBSVD BAR	61	29.154				
																2																		TOTAL CORR	62	-167				
																1230	3	0.00	0.00	0.0	72.7	54.0		0									STA PRESS	63	29.963					
																4																		BAROGRAPH	64	29.770				
																NO																		BAR CORR	65					
																SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)																								
																24-HR MAX TEMP (°F)	24-HR MIN TEMP (°F)	24-HR PRECIP (in)	24-HR SNOWFALL (in)	SNOW DEPTH (in)	PEAK GUST (mph)	DIRECTION	TIME (L.S.T.)	THICKNESS OF ICE ON WATER (in)	FROZEN GRND LAYER (in)	RIVER GAGE							PRECIP AND THORSTM	BEGAN	ENDED	DUR (min)	OBSTR TO VIS	BEGAN	ENDED	DUR (min)
																66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90
																REMARKS, NOTES AND MISCELLANEOUS PHENOMENA																								
																SUNRISE----- SUNSET-----																								

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EXHIBIT II

SHORT TITLE *2404-5057*

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EXHIBIT III

SHORT TITLE Page 4th 5557

Time entries on this form are 90 in meridian time
To convert to G.C.T. (add or subtract) 6 hours
Height of Barometer 926 Ft (MSL)

U.S.A.F. AIR WEATHER SERVICE
SURFACE WEATHER OBSERVATIONS

STATION Det 24-27
MONTH March DAY 8 YEAR 49
LAT 32° 59' LONG 91° 00'

WSAN FORM 10A

TYPE	TIME (LST)	CEILING (Hundred of Feet)	SKY	VISIBILITY (Miles)	WEATHER AND OBSTRUCTIONS TO VISION	SEA LEVEL PRESS (mb)	TEMP (°F)	DEW PT (°F)	WIND			CHARACTER AND SHIFTS	ALTIMETER SET (Inch)	REMARKS AND SUPPLEMENTAL CODED DATA	OBSERVER INITIALS
									DIRECTION	SPEED (Knots)	SPEED (Mph)				
R	0220	106	⊕	4	F	123	56	55	↑	6			791		
S1	0245	R3	⊕	4	R-F				↑	7				OCNL R-	
S2	0210	E3	⊕	4	F				↑	10					
R	0300	E2	⊕	4	R-F	122	56	55	↑	8			790	OCNL R- / 05428 10720 20920	
S4	0200	W4	⊕	4	R-F				↑	5					
R	0230	W5	⊕	4	R-F	119	57	56	↑	7			781	703 6/19/05615 10220 20920	
S5	0240	W5	⊕	1 1/2	F				↑	4					
S6	1003	W2	⊕	3/4	F				↑	3					
R	1030	W1	⊕	1/2	L-F	119	57	57	↑	3			789	05314 10136	
R	1120	W2	⊕	1 1/2	R-L-F	108	58	58	↑	3			786	05317 10726	
R	1220	W3	⊕	2	R-L-F	108	58	58	↑	3			786	80604 6/19/52-10636 05284	
S9	1310	W4	⊕	7	L-				↑	4				E10 ⊕ / 10720 20720 05264	
R	1320	W4	⊕	6	R-	091	59	59	↑	4			782	E10 ⊕ / INTMT L-R-	
S11	1400	W4	⊕	1 1/2	L-				↑	3				10910 20920 05264	
S11	1400	W4	⊕	1 1/2	L-				↑	3				E12 ⊕ / VIS UNCL 1 1/2 to 4 L- INTMT	
R	1420	E5	⊕	7		091	60	60	↑	4			771	E12 ⊕ / 11141	
S13	1505	E20	⊕	8					↑	7				AW SE	
S14	1515	E6	⊕	8					↑	7				E20 ⊕ / CIG ⊕ V D	
R	1530	E20	⊕	8		078	62	62	↑	7			776	UNCL V D / 811 6/19 / 10664 02134	
S16	1600	E120	⊕	9					↑	9				E200 ⊕ / 50 / scud AT	
R	1620	E120	⊕	9		064	64	62	↑	9			773	8 HND / 10434 02134	

WSAN FORM 10B

WBAN FORM 10B

CLOUDS AND OBSCURING PHENOMENA

TIME (LST)	STATION	PRESSURE (Inch)	DRY BULB (°F)	WET BULB (°F)	REL HUMIDITY (%)	TOTAL SKY COVER	CLOUDS AND OBSCURING PHENOMENA														NET 3-HR CHANGE	38	39	40								
							LOWEST LAYER			SECOND LAYER			SUMMA- TION TOTAL	THIRD LAYER			SUMMA- TION TOTAL	FOURTH LAYER														
							AMT	TYPE AND DIR	HEIGHT	AMT	TYPE AND DIR	HEIGHT			AMT	TYPE AND DIR		HEIGHT		AMT	TYPE AND DIR	HEIGHT										
20	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37											
10	147710	55.6	55.6	97	10	10	30	W6	U				U				U															
10	24720	55.9	55.5	97	10	10	30	E2	U				U				U															
10	23912	56.8	56.5	97	10	10	30	W5	U				U				U				9	020										
10	23910	56.9	56.9	100	10	10	30	W1	U				U				U															
10	23925	57.7	57.7	100	10	10	30	W2	U				U				U															
10	23925	58.4	58.4	100	10	10	30	W3	U				U				U				8	035										
10	23925	57.0	57.0	100	10	7	30	W4	10	30	W10	10	U				U															
10	23905	60.0	60.0	100	10	7	30	W4	10	30	E12	10	U				U															
10	23970	62.0	62.0	100	9	4	30	E10	9	30	E20	10	U				U				8	065										
10	23960	64.1	63.0	95	8	3	30	E25	6	AC	E120	6	8	C1	E200	8	0															

SYNOPTIC OBSERVATIONS

TIME (LST)	NO	PRECIP (Inch)	SNOW FALL (Inch)	SNOW DEPTH (Inch)	MAX TEMP (°F)	MIN TEMP (°F)	HEIGHT (Feet)	STATE OF SURFACE	SEA STATE	SWELL HEIGHT AND DIR	SWELL PERIOD	SURFACE WIND	WATER TEMP	SOIL TEMP	STATION PRESSURE COMPUTATION
1230	3	0.07	0.0	0.0	58.7	52.5	1								
1230	3	0.07	0.0	0.0	58.7	52.5	1								

SUMMARY OF DAY (MIDNIGHT TO MIDNIGHT)

24-HR MAX TEMP (°F)	24-HR MIN TEMP (°F)	24-HR PRECIP (Inch)	24-HR SNOWFALL (Inch)	SNOW DEPTH (Inch)	PEAK GUST (Mph)	THICKNESS OF ICE (Inch)	FROZEN GRAND LAYER (Inch)	RIVER GAGE	PRECIP AND THORSTM	BEGAN	ENDED	DUR	OBSTR TO VIS	BEGAN	ENDED	DUR
52																

REMARKS, NOTES AND MISCELLANEOUS PHENOMENA

SUNRISE-----SUNSET-----

TRUE CERTIFIED
COPY
William S. Fortman, Jr.
WO 56, USAF
Station Weather Officer

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~~SECRET~~

(14)
34377373

EXHIBIT IV