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SC-M-68-701

JOINT TASK FORCE TWO<br>TEST 4.4<br>A-6A AIRCRAFT<br>DATA BOOK (U)

PART 1 OF 2

DEPARTMENT 9210

OCTOBER 1968

## Sandia Laboratory, Albuquerque, New Mexico UNCLASSIFIED

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## FOREWORD

1. Joint Tast Force Two (JTF-2) was organized by the Joint Chicfs of Staff to conduct a series of coordinated and integrated usts to determine the capabilities and vulnerabilities of offensive and de.ensive weapons systems in the low altitude flight regime. Test 4.4, Targe: Acquisition, Tactical Air Reconnaissance with Test 2.1 Penetration-Operationa! Systoms, was the fourth test in the series.
2. Joint Task Force Two Test 4.4 investigated the relationships among aircraft, altitude, speed, environment, and the air-to-ground tactical air reconnaissance task for representative operational aircraft and aircrew combinations. Additionally, through the incorporation of a low altitude navigation coursc, corollary objectives of Test 2.1, Penetration-Opzrational Systens, were investigated.
3. In the conduct of Test 4.4 extensive instrumentation data were collected, some of which were not directly related to the tactical air reconnaissance objectives. This volume presents those data which are reliable over a majority of the test sorties and of possible interest to agencies, other than those concerned with the target acquisition problem.
4. This volume contains plots of the aircraft position track in the target area. There are also plots of the aircraft altitude above the terrain, normal accelerations, roll angle, pitch angle and slant rarge from the navigation check points and the targets to the aircraft. These data are presented in volumes, by aircraft type, with a separate volume for each type.
5. A suppleinental volume of data summaries lists the results of each target engagement for each sortie. Operational data which include speed, altitude, and closest approach distance to each target are given. Reconnaissance performance data includes target acquisition, target location error, and accuracy and completeness of description scores.

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## SECTION 1

## INTRODUCTION

## 1. (U) BACKGROUND

a. Joint Task Force Two Test 4.4, Target Acquisition, Tactical Air Reconnaissance, was the fourth in a series of coordinated and integrated tests designed to obtain factual operational and technical data on low altitude offensive and defensive weapons system operations.
b. Test 4.4 was a test of visual and sensor target acquisition capabilities at low altitudes of representative aircraft weapons systems. It was designed to investigate the relationship between the air-to-ground tactical air reconnaissance task and aircraft type, altitude, speed, and environment for representative operational aircraft and aircrew cor inations. Included were ancillary excursions to investigate hunter-kil! i operations and the ability to acquire and convert to attack of certain selected targets.
c. In conjunction with the target acquisition test, a navigation test was conducted for tactical strike and tactical reconnaissance aircraft, in which aircrews flew a low altitude navigation course into the target complex. This portion of the test was that part of jTF-2 Test 2.1, Penetration-Operational Systems, pertaining to navigatiol ability over rolling terrain. Results of analysis of the navigation portion will be reported in a separate volume.
d. The test was conducted sequentially in three parts: controlled flight observations (CFO), the field test, and simulator extensions. Results of the CFO are reported in JTF-2-4.4 Volume 2. In the field test, aircraft and aircrews provided by operational units of the Army, Navy, and Air Force flew missions against a spectrum of field army targets typical of the kind that are distinctly visible from the air. The targets were deployed along three test courses at locations not known to the test subjects. A total of 623 sorties was flown by six aircraft types: three tactical strike aircraft ( $A-4 C / E, A-6 A$ and $F-4 C$ ), one tactical reconnaissance aircraft (RF-4C), and two observation/surveillance aircraft ( $0-1 \mathrm{E}$ and UH-1B). Of the 623 total sorties, 508 were successful for test purposes. Specjal 70-mm motion picture imagery of the test courses and targets was collected for use

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in a dynamic simulator to extend the knowledge gained in the field tes ${ }^{\dagger}$. However, the simulator tests were not conducted due to the disestablishment of JTF-2.
e. Target acquisition tasks for aircraft, aircrew, and photo interpreter combinations included search, detection, inspection, identification, and the collecting and reporting of information. Emphasis was on target acquisition associated with the reconnaissance or information-gathering phase of air-to-ground operations against typical field army targets of unknown location.
f. The principal reconnaissance data collection sources consisted of aircrew voice target reports recorded on tape recorders (real time reports), postflight air iatelligence officer (AIO) debriefing reports (near real time reports), and photo (imagery) interpreter reports.
g. The Test 4.4 report consists of a series of bound volumes, each addressing a particular facet of the target acquisition, tactical air reconnaissance test. All volumes will bear the title: Low Altitude Test 4.4, Target Acquisition, Tactical Air Reconnaissance, Volume $\qquad$ : (Identifying subtitle). Table $1-1$ is a tabulation of the documentation.

| Volume | Identifying Subtitle |
| :--- | :--- |
| 1 | Field Test Description |
| 2 | Controlled Flight Observation |
| 3 | Field Test Initial Analysis |
| 4 | Field Test Detailed Analysis |
| 5 | Navigation Over Rolling Terrain (Test 4.4/2.1) |
| 6 | VISTRAC, PHOTOTRAC, and ITRAC models |
|  | Data Books by aircraft type |
|  | Data Summary Book across all aircraft |

Table 1-1 (U) Component Documentation for Total Test 4.4 Report

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2.(U) PURPOSE OF THE DATA HANDBOOK
a. Provide those data collected during Test 4.4 which are considered pertinent in evaluating the participating weapons systems performance in visual target acquisition and other areas.
b. Assemble these data, by weapon system type, intc volumes which will facilitate data retrieval and application.
3.(U) TEST DESCRIPTION
a. Test objectives. The objectives of Test 4.4 were to:
(1) Determine the capability of representative tactical aircraft and aircrew combinations to obtain and report, both with and without the aid of reconnaissance sensors, intelligence information concerning a variety of targets, while penetrating at low altitude under visual flight conditions for two clearance altitude realms.
(a) Current operational low altitudes trained for and used by the military services. (Because of reduction in scope of the test as initially conceived, those current operational altitudes above 900 feet were investigated only to a limited degree.)
(b) Low altitude bands of 0-400 feet and 500-900 feet.
(2) Measure the relative capability to collect visually acquired and voice reported (real time and postflight debriefing) reconnaissance information atd information acquired through the use of sensor equipment requiring processing and interpretation (photography, infrared radiation (IR), and side looking radar (SLR) in terms of:
(a) Quantity of information as compared to ground truth.
(b) Quality of information as compared to ground truth.
(c) Accuracy of information as compared to ground truth.
(d) Time of availability of information. Side-lcoking radar imagery was subsequently deleted from the test based on recommendation
of the Tactical Air Command because of nonsuitability of SLR for the nature of the targets and at the low altitude programmed for Test 4.4.
(3) Determine the capability of representative tactical aircraft/aircrew combinations to perform armed reconnaissance against specified targets while penetrating at low altitude to:
(a) Acquire, convert to attack, and perform an attack maneuver on a target of opportunity, and
(b) Acquire, convert to attack, and perform an attack maneuver on a target identified by a simulated hunter aircraft.
(4) Develop and validate a mathematical model that will aid in:
(a) Developing tactical air reconnaissance doctrine, tactics, techniques, and equipment;
(b) Determining the relative probabilities of low altitude reconnaissance mission accomplishment or effectiveness; and
(c) Predicting results beyond the physical scope of the test.
(5) Determine the capability of representative tactical aircraft/aircrew combinations to acquire a prebriefed target comparable to those used in Test 4.1.
(6) Attain the specific major objectives of that part of Test 2.1, Penetration-Operationa: Systems, pertaining to navigational ability over rolling terrain that are to:
(a) Determine the distribution of navigation error to a terminal point over rolling terrain, including collection of descriptive statistics on acquisition of both intermediate check points and time of arrival at, and lateral displacement f:om, intermediate and final navigational check points.

## UNCLASSIFIED <br> (b) Determine the suitability of prechosen visual/radar

 check points used for navigation over rolling terrain, and(c) Determine how low specified aircraft/aircrew combinations will fly over rolling terrain while performing navigational task.

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b. TEST AREA DESCRIPTION. The test area included four test courses: a navigation course, a point-to-point reconnaissance course over rolling, wooded terrain, a road reconnaissance course over relatively flat, wooded terrain, and an area search reconnaissance course which was incorporated within the limits of the point-to-point course. Figure 1-1 is a map of the test area.
(1) Target Description. The targets emplaced within the reconnaissance courses were typical of those kinds of targets in a field army which would be distinctly vis:.ble from the air. Targets hidden among foliage or buildings and camouflaged targets were not included. Some of the emplaced targets were actual military equipment, but most were wood and metal mockups.
(2) Navigation Course. Reconnaissance sorties flown by tactical aircraft were preceded by a navigation mission approximately 150 nautical miles in length. Two separate navigation courses were established. Both started at Norfork Reservoir in northeastern Arkansas (start point was designated as point Alfa) and extended in a generally southwesteriy direction, terminating at final control checkpoints near the entry points to the point. to-point and road reconnaissance courses.


Figure 1-1 (U) JTF-2 Test 4.4 Test Area

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(3) Point to-Point Course. The point-to-point reconnaissance (north) course consisted of two parallel legs, each about 50 nautical miles in length. Each leg had clearly defined entry points ( $\mathrm{N}-1$ and $\mathrm{N}-3$ ) and exit points ( $\mathrm{N} \cdot 2$ and $\mathrm{N}-4$ ). Twenty-five targets were deployed along the two legs at varying distances from the flight path, ranging from 7 yards to 3960 yards. Figure 1-2 shows the general layout of the north course and Table 1-2 gives a brief description of each target on the course.


Figure 1-2 (U) Point-to-Point Reconnaissance Course

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| Target <br> Number | Target Name | Description |
| :---: | :---: | :---: |

Table 1-2 (U) Target List, North Course (Area and Point-to-Point) (Part 1 of 2)

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| Target Number | Target Name | Description |
| :---: | :---: | :---: |
| 14 | Petroleum, Oil and Lubricant (POL) Site | 300 each 55-gallon drums; stacked in two rows; 1 flat-bed truck; 1 jeep. |
| 15 | $\begin{aligned} & 203 \text {-mm Howitzers - } \\ & \text { SP (US } 8 " \text { How) } \end{aligned}$ | 2 SP How; 1 APC, revetted. |
| 16 | Helicopter Pad | 2 light helicopters; 50 each 55. gallon POL drums. |
| 17 | Armored Yehicle Launched Bridge (AVLB)* | 1 AVLB in launch position w/transporter detached and parked in area; 1 each 2-1/2 ton truck parked in center of bridge; 1 each 2-1/2 ton truck on approach end. |
| 18 | Storage Area | Open storage of stacked supplies; 5 stacks varying in size up to 30 feet $x 10$ feet x 6 feet; 1 each 2-1/2 ton truck. |
| 19 | Tanks, Deployed | 4 medium tanks in partial revetment; in line. |
| 20 | Anti-Tank Guns | 2 auxiliary powered anti-tank (APAT) guns; partial revetment, 2 each 2-1/2 ton trucks. |
| 21 | Communications Site | 3 each $2-1 / 2$ ton truck vans; 3 UHF (fly-swatter type) antennas; 1 jeep. |
| 22 | ```FROG (US Honest John) Site*``` | 1 surface-to-surface missile on launcher; 4 each $2-1 / 2$ ton trucks; 1 jeep. |
| 23 | 160-mm Mortars | 6 each $160-\mathrm{mm}$ mortars deployed on line; 2 each $2-1 / 2$ ton trucks parked in area. |
| 24 | Engineer Construction Equipment | ```2 dump trucks; 2 flat-bed trucks; 1 road grader; covered storage; 3 dirt piles; 1 front loader; l equipment trailer.``` |
| 25 | $\begin{aligned} & \text { Surface-to-Air } \\ & \text { Missile (SAM) } \end{aligned}$ | 6 SAM missiles on launchers; 1 missile control radar; 3 van type trailers; 7 truck vans. |

Table 1-2 (U) Target List, North Course (Area and Foirt-to-Point) (Part 2 of 2 )

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(4) Road Reconnaissance Course. The road reconnaissance (south) course also consisted of two legs, each following a state highway. These had clearly defined entry points (S-1 and S-3) and exit points (S-2 and S-4). Twenty-three targets were deployed alongside the higiways at distances up to 700 yards from the center line of the highway. Figure 1-3 shows the general layout of the south course. Table 1-3 gives a brief description of each target along the course.

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Figure 1-3 (U) Road Reconnaissance Course

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| Target <br> Number | Target Name | Description |
| :---: | :---: | :---: |
| 26 | Tank Convoy* | 5 medium tanks parked along road, 100 meters separation. |
| 27 | Vehicle Park | 13 each $2-1 / 2$ ton trucks parked in relatively open area, 50 meters off the road. |
| 28 | Light AAA Guns Towed | 4 towed $37-\mathrm{mm}$ guns revetted, with connecting personnel trench. |
| 29 | SAM Site | 4 positions with 2 missiles on launcher; 1 guidance radar; 2 each 2-1/2 ton truck vans; 2 generator trailers. |
| 30 | Armored Reconnaissance Platoon | 3 medium tanks, 3 APC's. |
| 31 | Truck Convoy* | 6 each 2-1/2 ton trucks parked along road; 100 meters separation. |
| 32 | Heavy AA Machine Guns | 2 quad mounted . 50 caliber machine guns, revetted. |
| 33 | Medium AAA Guns Towed, w/Radar | 4 each $57-\mathrm{mm}$ AAA guns ( 6 positions2 unoccupied) in circular pattern; 1 fire control director; 1 fire control radar; all revetted. |
| 34 | SAM Convoy | 3 missiles on truck transporters parked along road; 100 meters separation. |
| 35 | Signal Company (Minus) (Communications Site) | 3 each 2-1/2 ton truck vans; 1 each 3/4 ton radio truck; 1 jeep; 1 small GP tent; 1 UHF antenna. |
| 36 | Vehicle Park | 13 each 2-1/2 ton trucks parked in relatively open area, 50 meters off the road. |
| 37 | POL Site | 300 each 55-gallon drums (100 stacked and 200 not stacked). |
| 38 | Truck Convoy* | ```2 each }10\mathrm{ ton trucks w/semi- trailers; 4 each 2-1/2 ton trucks; 1 jeep. Parked along road, 100 meters separation.``` |
| 39 | Target deleted from | st. |

Table 1-3 (U) Target List, South Course (Road Reconnaissance) (Part 1 of 2 )

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| Target <br> Number | Target Name | Description |
| :---: | :---: | :---: |
| 40 | Signal Company (Minus) (Communications Site) | 3 each $2-1 / 2$ ton truck vans; 1 each $3 / 4$ ton radio truck; 1 jeep; 1 small GP tent; 1 UHF antenna. |
| 41 | Heavy AA Machine Guns | 3 quad mounted . 50 caliber AA machine guns in box pattern. One position unoccupied, revetted. |
| 42 | Armored Vehicle Launched Bridge (AVLB) | 2 AVLB in assembly. Bridges on transporters. |
| 43 | Anti-Tank Guided Missile (ATGM) | 2 ATGM launcher vehicles with 3 missiles on each launcher, defending road approach. |
| 44 | Medium AAA Guns SP | 2 medium $57-\mathrm{mm}$ AAA guns deployed near road junction in revetted position; 1 each $3 / 4$ ton truck (ammo carrier) to rear of guns. |
| 45 | SAM Convoy | 3 missiles on truck transporters parked along road, 100 meters separation. |
| 46 | Engineer Bridge Unit | 5 each 27-foot flat-bed trucks loaded with pontons and treadway; all vehicles located in assembly area 50 meters off road. Approximately 30 meters between vehicles. |
| 47 | Light AAA Guns | 3 each $37-\mathrm{mm}$ AAA weapons in triangle position. All positions revetted. Interconnecting communication trenches between weapon positions. |
| 48 | Tank Convoy* | 4 medium tanks; 1 tank retriever. Parked along road, 100 meters between vehicles. |
| 49 | Vehicle Park | 4 each $2-1 / 2$ ton trucks; 3 APC's (towing 3 each $122-\mathrm{mm}$ How); 3 each $122-\mathrm{mm}$ How towed by $2-1 / 2$ ton trucks; 2 medium tanks, 20 meters between vehicles. |

Table 1-3 (U) Target List, South Course (Road Reconnaissance) (Part 2 of 2)

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(5) Area Search Course. The area search reconnaissance course established for the low-speed observation/surveillance aircraft ( $0-1 E$ and $U H-1 B$ ) was a $10-$ by $20-m i l e$ area contained within the north course. The aircraft flew an area search mission by flying six different specified tracks through this area. Two of the legs were 20 -nautical mile sections of the point-to-point legs; the other four legs were established by offsets of 1 nautical mile to either side of the point-to-point legs. The legs were flown in a racetrack pattern, starting in a westerly direction on the north leg of the point-to-point course. Figure 1-4 shows the general layout of the area search course and the search pattern established for the aircraft.

Figure 1-4 (U) Area Search Course

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a. Description. The instrumentation system for Test 4.4 included three C-130 aircraft (IA) instrumented to measure information is reported by the tesc aircraft pilot by voice communication, and to receive and record pulse coded modulated (PCM) telemetry (TM) data from ten instrumented pods simultaneously. The system also included fourteen instrumentation pods, seven distance measuring equipment (DME) ground stations, ten ground site instrumentation packages (GSIP), a radar ranging system a central timing system, a data playback station, and associated support equipment.

## b. Principles of Operation.

(1) The instrumentation system was capable of tracking ten pod-carrying aircraft simultaneously. Positions of the three C-130 aircraft were determined by slant range data from DME ground transponder stations, the positions of which were known. (Slant range is the radius of a sphere, the center of which is the DME ground transponder station.) Ordinarily, the intersection of three spheres would indicate the location of the $\mathrm{C}-130$ in space, but a total of six of the seven DME ground transponder stations were used to obtain better accuracy for each C-130 position.
(2) In addition to seven DME ground transponder stations, a ground radar transponder was positioned under one of the straight line legs of each $C-130$ orbit. Once during each orbit, slant range from the $C-130$ to the ground radar transponder was measured to provide a more accurate determination of $\mathrm{C}-130$ altitude. The DME slant ranges from the C-130 IA to the test aircraft were used to calculate the $x-y$ position of the test aircraft. Ir this case, slant range was the radius of a sphere the center of which was one of the $C-130$ IA. The intersection of these three spheres located the test aircraft. Clearance altitudes for the test aircraft were measured by radar altimeters in the pods.
(3) Slant range data, telemetry from the pod, telemetry from the GSIP stations, real time voice reconnaissance information from the test aircraft, and airborne operational communications were recorded on magnetic tape in the $C-130$ aircraft. All data were time-correlated with the IRIG-B time code. The communications and control complex at Little Rock AFB and at Paris, Texas, provided communication facilities between all aircraft and ground units and with other units not in the test area.

UNCLASMMHEDData tapes (other than voice tapes) from the c-130 aircraft were taken to the data playback station at Fort Smith, which converted PCM data on magnetic tape from the $C-130$ IA to a format ready for use by the data reduction center in Albuquerque. Voice tapes were sent directly to the data reduction center for transcription. The transcriptions were used by the scoring teams to determine performance measures.
(5) Real time voice reconnaissance information was also recorded by airborne recorders in the pods carried by the test aircraft. Tape from the recc lers was removed as soon as the test aircraft returned to the staging base, after completion of sorties. Tapes were delivered immediately to the debriefers to be used in debriefing of the crew.
5.(U) DATA UESCRIPTION.
a. Data Collection and Processing.
(1) Introduction. The electronic field test data for Test 4.4 collected on board three $C-130$ instrumentation aircraft were partially processed on the playback station at Fort Smith, Arkansas before being sent to Albuquerque. The reconnaissance data were collected via aircraft sensors, voice recordings, and pilot debriefing sessions.
(2) Data collected.
(a) The data collected on Test 4.4 were from three major scurces: reconnaissance data, electronically recorded data, and questionnaire data.
(b) The reconnaissance data consisted of real time reconnaissance data, near real time reconnaissance data, and sensory imagery data. The real time data was from inflight recorded voice reports (tape), a literal transcription, and the scoring books. The near real time data resulted from the AIO debriefings and included inflight recorded voice reports, a reconnaissance map, the AIO debriefing and the AIO scoring book. The sensory imagery data consisted of imagery from a panoramic camera, a forward oblique camera and an infrared camera. It also included three imagery interpreter (II) reports: the 1-, 3-, and 5-hour reports.
(c) The electronically recorded data were recorded on magnetic tape in the $C-130$ aircraft. These data consisted of DME range data, TM data from the MA-9B instrumentation pod, and the GSIP data.
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(d) The questionnaire data consisted of aircrew and imagery interpreter (II) personal data, mission performance information, and human factors interview results.
(3) Data processing.
(a) Electronically recorded data.

1 As indicated by the flow chart of Figure 1-5, the raw pulse code modulated (PCM) data, recorded on magnetic tape in the IA, were processed through the. playback station. An SDS-925 computer converted the encoded parallel PCM data to decoded surial data which were compatible for processing on a CDC-3400 computer. Data were also processed and passed to the DME plot facility which provided quick-look analog plots.
$\underline{2}$ The primary reduction and preanalysis sequences were performed on two CDC-3400 computers. Sortie identification was merged with test tracking and telemetry data in the primary reduction sequence.

3 The output of the primary reduction sequence was a series of data files, one per sortie for telemetry and position data and one for visibility data. Each file contained an identification record of 16 words followed by a series of data records. The ID record contained the following: ID block, operational day, generating program, sortie number, aircraft type, altitude code, speed code, course identifiers, weather code (not used), pod ID, aircraft tail number, pilot code, test range, sortie start time (target area), number of words per point, and number of points per record.

4 Telemetry data records included: time, radar altimeter information, vertical accelerations, longitudinal accelerations, lateral accelerations, pilot-recorded event information, gyro (bank), gyro (pitch), gyro (yaw relative), slant range (C-band radar), and pod status variables (temperature, voltage).

5 Position data records included: time, $x, y, z$ (edited and corrected), $x, y, z$ (smoothed), and velocity vectors.

6 Visibility data records included: time, site number, box-sky (photometer above horizon), telephotometer (looking into a black box), photometer downcourse, photometer barkground, illuminator $G_{1}$, illuminator $G_{3}, V_{m}$ (visibility index), sky/ground ratio, shadow contrast, illuminator sun.

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(b) Reconnaissance data were scored by a scoring team, and put on punch cards for computer processing.
b. Data Accuracies.
(1) Aircraft position data.
(a) The $x-y$ position plots were obtained from the DME system which included an instrumented pod on the aircraft, three C-130 aircraft orbiting the test area, and seven DME ground transponder stations. The raw DME data were processed by an electronic computer with considerable quality control by a man in the loop at various stages during the processing to obtain the final smoothed $x-y$ plots presented. A detailed description of the DME instrumentation and data processing system may be found in Reference a of the List of References.
(b) The accuracy of the $x-y$ position plots is $\pm 200$ feet of the actual positions.
(2) Terrain clearance.
(a) The data are obtained from a ridar altimeter located in the aircraft instrumentation pod. A vertical gyrc directed the radar altimeter antenna directly downward. The antenna gimbals had a range of $\pm 45$ degrees so that when the aircraft roll angle exceeded this limit the antenna would range off terrain not directly under the aircraft. Therefore, aircraft roll angle data should be considered when using radar altimeter data.
(b) The resolution of the terrain clearance rate is five feet. The nominal accuracy is $\pm 20$ feet.
(3) Normal acceleration.
(a) The aircraft's normal acceleration data shown is the acceleration on an axis perpendicular to the plane of the aircraft's lateral and longitudinal axis. Positive values indicate increasing velocity upwards.
(b) The data are obtained from a standard accelerometer located in the aircraft instrumentation pod. Its resolution is 0.012 g and advertised accuracy is $\pm 0.15 \mathrm{~g}$. In using these data it should be remembered that the measuring instrument was located on a main structure of the pod,

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which was connected to the aircraft by two mounting lugs generally at the standard bomb attachment station, and the mechanical coupling between the aircraft and pod is unknown.
(4) Roll and pitch angle.
(a) The roll and pitch angle data shown are the aircraft's angle change about its longitudinal and lateral axis, respectively, versus central daylight time. Positive values indicate clockwise roll angle and nose rising pitch angle.
(b) The angle is measured by the appropriate gimbal outputs on a vertical gyro mounted in the instrumentation pod. The roll angle has a resolution of 0.36 degrees and an accuracy of $\pm 2$ degrees. ihe pitch angle has a resolution of 0.17 degrees and an accuracy of $\pm 2$ degrees. If the aircraft made a maneuver over $\pm 85$ degrees about its lateral axis, the gyro would hit its gimbal stops and tumble. This would cause the gyro to lose its reference, after which the readings could be invalid for the remainder of the flight.

## (5) Slant range.

(a) The slant range data are the slant range from the test aircraft to selected navigation check points and targets (these targets are noted by a "c" on the $x-y$ position plot). Each of these check points or targets had a ground based C-band radar transponder which excited a transponder located in the aircraft instrumentation pod.
(b) The data collection system had a maximum range capability of 50,000 feet. However, the range of the radar system was limited to approximately 32,000 feet. The accuracy of the system was 50 feet $\pm 0.2$ per cent of the actual range.
(6) Other.
(a) Details on the collection and accuracy of other data gathered during this test are available in Reference a of the List of References.

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c. Data Format
(1) Data plots.
(a) The aircraft position data are presented in a series of seven or more plots.

1 The first plot is the track of the test aircraft over one of the reconnaissance courses starting with the last portion of the navigation course (Figure 1-6). Each square represents a distance of 60,000 feet or approximately ten nautical miles.
2. The remaining plots represent the same data as the first except on an expanded scale (Figure 1-7). Each square represents a distance of 12,000 feet or approximately two nautical miles. Time marks in Central Daylight Time (CDT) are provided for convenient cross reference to the telemetered data. The data points are plotted at the rate of one per second.

3 All plots show the actual path of the subject aircraft. The symbols on each map represent the following. (See Figures 1-6 and $1-7$ with notes).
a $x=$ The location of a target (Note A).
b $c=$ The location of a target which has a radar transponder at the site to provide slant range data (Note B).
c $N$ or $S=$ The entry and exit for each leg of the course. Note $C$ indicates exit from leg 1 of the south course and Note D indicates entry of leg 2 of the south course.
d $F$ or $Z=$ The final control check point at the end of the navigation leg (Note E), prior to entering the target area.

4 The direction of travel of the test aircraft may be determined by observing the time notations on the expanded plots. A vertical time mark is inserted each minute in the flight track. Figure 1-7 contains an example of the various ways in which the time marks can occur.

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FIGURE 1-6 (U) Sample of Overall Aircraft Position ata Plot, Road Reconnaissance (South) Course


FIGURE 1-7 (U) Sample of Expanded Aircraft Position Data Plot, Road Reconnaissance (South) Course

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a The 14 HR 7 MIN time mark occurs in the normal manner.
b The 14 HR 8 MIN time mark lies directly on a grid line.
c The 14 HR 9 MIN time mark does not appear because it occurs off of the plot.
d The 14 HR 10 MIN time mark lies within the data plot, making it difficult to distinguish.

5 Transparent overlays are furnished for use on each of the plots. The correct overlay to use is indicated on the plot. Some elongation in the horizontal direction may be noted. This is an unavoidable product of the process by which the plots were reproduced and is not present on the original microfilm.

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(2) The telemetered data are also presented in a series of consecutive plots. Each page covers a time period of ten minutes and data are plotted at the rate of 4 points per second. The time scales on each plot are coincident for convenient comparison of the parameters. Figure $1-8$ is a sample of these plots and covers a portion of the sortie shown in Figures 1-6 and 1-7.
(a) The mean and sigma for each variable are given below their respective plots. These figures cover only the portion of the data shown on that page.
(b) The plot of normal acceleration indicates that this instrument was malfunctioning. There is a bias of approximately 0.4 g in the negative direction as well as a lack of normal variations. These zases comprise only a small percentage of the data.
(c) A positive value of roll angle indicates a roll to the right and a negative value indicates a roll to the left.
(d) A positive value of pitch angle indicates a nose up attitude. An average value of greater or less than zero, as in the sample plot, does not indicate a malfunction but is a function of pod attitude relative to the aircraft axis.
(e) The slant range plot indicates that at approximately 14 hr 07 min 30 sec (Note A) the test aircraft flew directly over a radar transponder. This may be verified by referring to Figure 1-7 where Note $B$ indicates the target overflown.
(3) Real time voice recording. This is a transcription of the aircrew conversation as taken from the voice recorder. The time of each entry is noted. When a target was acquired, the notation in the left columns indicate the order in which the targets were reported and the actual acquired. The letter $F$ indicates that a false target was reported. Unintelligible portions of the recording are noted on the transcript with an underlined space and censored portions are recorded with the symbol ( $* * * \%$ ).

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FIGURE 1-8 (U) Sample of Telemetered Data Plot

## UNCLASSIFIED

(4) General.
(a) Sorties are arranged within aircraft type according to the data cell in which they were placed. The variables which determined a cell were course, assigned speed, and assigned altitude.

1 The course was either north (point to point) or south (road reconnaissance).
$\underline{2}$ Assigne' speeds were:
a Speed $3=320$ knots ground speed.
b Speed $4=420$ knots ground speed.
c Speed $5=550$ knots ground speed.

3 Assigned altitudes were:
a Altitude $1=400$ feet or less above terrain.
b Altitude $2=500$ to 900 feet above terrain.
c Altitude $3=2500$ to 2900 feet above terrain.
(b) It should be remembered that the data presented in this Handbook are raw data. In gathering the large quantities of data presented, a small percentage will be invalid due to malfunctions in the sensing, transmitting, or recording equipment. Close inspection of the data will disclose such areas of poor quality data. An example of this would be a plot of normal acceleration which consistently averages greater or less than one $g$ or a roll angle indicating a continuous turn. Such anomalies are included for completeness and potential value to the user.
6. (U) HUMAN FACTORS DATA. The human factors questionnaires used during Test 4.4 are summarized in these paragraphs. The data resulting from these questionnaires may be obtained at the JTF-2 Low Altitude Data Bank.
a. Preflight/Postflight Navigation Questionnaire. This question naire asks the pilot to describe the navigation method he planned to use and

## UNCLASSIFIED

the percentage of targets he expected to acquire. After the mission was flown he was asked to report any deviations from his plan. The questionnaire contained 3 questions.
b. Postflight Questionnaire. The postflight questionnaire asi:s the rilot to describe his mission in detail. He is requested to evaluat. the aircraft, targets, and navigational aids, and to answer questions regarding his ability to perform assigned tasks while flying at low altitude. The tactical aircraft questionnaire contained 73 questions, the night flights 85 questions, and the area search 62 questions.
c. Mission Abort Questionnaire. The questions relate to acquisition and performance of mission prior to abort and the reasons for the abort. This questionnaire contains 19 questions.
d. Aircrew Experience. This questionnaire obtained data pertaining to rank, pilot and observer experience, current aircraft experience, and amount of low level experience. There are 43 questions. The first 18 contain the data on aircraft types and the remaining on low level experience.
e. Observer Interview Form. This form contains the scores of the laboratory vision test and information on the observer's smoking, drinking, and .sleeping habits.
f. Confidential Interview Form. The civilian scientist interviewer used this form in asking questions of the pilots as to their opiaioas of the test, their navigational and reporting techniques, combat experience, etc.
g. Record Form for Sighting Report Quantification Scale. A form used to obtain data to quantify statements such as a bunch of guns, a group of tanks, etc.
h. Air Intelligence Debriefing Form. This form contains data obtained by the debriefing officer while reviewing the voice tape with the pilot. Data such as target name, number of units at target, and target details were recorded.
i. Air Intelligence Format Questionnaire. This form contains 8 questions on the clues the pilot used in acquiring a target and the ease or difficulty in acquiring the targets.

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j. Imagery Interpreter Postmission Questionnaire. The questionnaire was in two parts, first and second mission. The questions asked the II about his use of briefing materials and interpretation aids and techniques as well as his opinion of task loading and other factors which affected the imagery interpretation. First mission questionnaire contains 34 questions; the second contains 38.
k. Imagery Interpreter Experience Form. Ihis form contains 52 questions relating to education and experience of the photo interpreter personnel.

1. Image Interpreter Reporting Form. This form was used by the interpreters to describe the target observed on the film and its coordinates.
2. (U) AVAILABILITY OF ADDITIONAL DATA.
a. All data collected in connection with JTF-2 tests have been catalogued and stored. These data include computer tapes, microfilm plots and written questionnaires. Access to these data can be arranged through WSEG, who is to be custodian of the JTF-2 Low Altitude Data Bank. Detailed instructions, for obtaining all or particular portions of the data stored, are available in the data cataloging documentation.
b. For convenience a volume containing data summary listing has been prepared. This volume, classified Secret, is furnished in conjunction with this and other handbook volumes.

## 8. (U) LIST OF REFERENCES.

a. Low Altitude Test 4.4, Target Acquisition, Tactical Air Reconnaissance, Volume 1: Field Test Description; JTF2-4.4, Report to the Joint Chiefs of Staff; February 1968 (OUO).
b. Low Altitude Test 4.4, Target Acquisition, Tactical Air Reconnaissance, Volume 2: Controlled Flight Observation; JTF2-4.4, Report to the Joint Chiefs of Staff; May 1968 (OUO).

## UNCLASSIFIED

c. Low Altitude Test 4.4, Target Acquisition, Tactical Air Reconnaissance, Volume 3: Field Test Initial Analysis; JTF2-4.4, Report to the Joint Chiefs of Staff; February 1968 (Secret).
d. Low Altitude Test 4.4, Target Acquisition, Tactical Air Reconnaissance, Volume 4: Field Test Detailed Analysis; JTF2-4.4, Report to the Joint Chiefs of Staff; October 1968 (Secret).

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## UNCLASSIFIED

## SECTION 2

## A-6A CELL 1 DATA

1.(U) DESCRIPTION.
a. This section contains data from A-6A sorties with the following flight parameters:
(1) North course, point to point
(2) 420 knots ground speed
(3) Altitude 0-400 feet above terrain
b. The data are presented as described in the Introduction, Section 1, and are arranged as listed below.
2. (U) CELL 1 FIGURE NUMBERS

| Sortie | DME Plots | TM Plots | Voice Transcript |
| :--- | :---: | :---: | :---: |
| 126 | $2-1$ | $2-2$ | $2-3$ |
| 133 | $2-4$ | $2-5$ | $2-6$ |
| 135A | $2-7$ | $2-8$ | $2-9$ |
| 166 | $2-10$ | $2-11$ | $2-12$ |
| 174A | $2-13$ | $2-14$ | $2-15$ |
| 182A | $2-16$ | $2-17$ | $2-18$ |
| 182B | $2-19$ | $2-20$ | $2-21$ |
| 192 | $2-22$ | $2-23$ | $2-24$ |
| 205 | $2-25$ | $2-26$ | $2-27$ |
| $205 A$ | $2-28$ | $2-29$ | $2-30$ |
| 213 | $2-31$ | $2-32$ | $2-33$ |
| 231 | $2-34$ | $2-35$ | $2-36$ |

## UNCLASSIFIED



SORTIE NUMBER 126
OPERATIONAL DAY 26 JULY 1967
NORTH COURSE
FIGURE 2-1
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 126

FIGURE 2-1
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



FIGURE 2-1
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 126

FIGURE 2-1
AIRCRAFT POSITION DATA (U) (4 OF 8)

UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 126

FIGURE 2-1
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



FIGURE 2-1
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 126

FIGURE 2-1
AIRCRAFT POSITION DATA (U) (7 OF 8)

UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-1
AIRCRAFT POSITION DATA (U) (8 OF 8)

UNCLASSIFIED


FIGURE 2-2 (U) TELEMETERED DATA (1 OF 5)

UNCLASSIFIED


FIGURE 2-2 (U) TELEMETERED DATA (2 OF 5)


FIGURE 2-2 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED



FIGURE 2-2 (U) TELEMETERED DATA (4 OF 5)

UNCLASSIFIED


FIGURE 2-2 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 133
OPERATIONAL DAY 27 JULY 1967
NORTH COURSE
FIGURE 2-4

## UNCLASSIFIED



FIGURE 2-4

$$
\begin{gathered}
\text { AIRCRAFT Posititon data (u) (2 of } 6 \text { ) } \\
\text { UNCLASSIFIED }
\end{gathered}
$$

## UNCLASSIFIED



FIGURE 2-4
AIRCRAFT POSITION DATA (U) (3 OF 6) UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 133

FIGURE 2-4

## UNCLASSIFIED



SORTIE NUMBER 133

FIGURE 2-4
AIRCRAFT POSITION DATA (U) (5 OF 6)

## UNCLASSIFIED



SORTIE NUMBER 133

FIGURE 2-4

## UNCLASSIFIED



FIGURE 2-5 (U) TELEMETERED DATA (1 OF 4)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-5 (U) TELEMETERED DATA (2 OF 4)

## UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-5 (U) TELEMETERED DATA (3 OF 4)

## UNCLASSIFIED



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FIGURE 2-5 (U) TELEMETERED DATA (4 OF 4)


## UNCLASSIFIED



SORTIE NUMBER 135A
OPERATIONAL DAY 28 JULY 1967
NORTH COURSE
FIGURE 2-7
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



FIGURE 2-7

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 135A

FIGURE 2-7

## UNCLASSIFIED



FIGURE 2-7
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 135A

## UNCLASSIFIED



SORTIE NUMBER 135A

FIGURE 2-7
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 135A

FIGURE 2-7
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 135A

FIGURE 2-7
AIRCRAFT POSITION DATA (U) (8 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



## UNCLASSIFIED



FIGURE 2-8 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-8 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED



FIGURE 2-8 (U) TELEMETERED DATA (4 OF 5)

## UNCLASSIFIED



FIGURE 2-8 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 166
OPERATIONAL DAY 1 AUGUST 1967
NORTH COURSE
FIGURE 2-10
AIRCRAFT POSITION DATA (U) (1 OF 7)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (2 OF 7)

## UNCLASSIFIED



SORTIE NUMBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (3 OF 7)

## UNCLASSIFIED



SORTIE NUMBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (4 OF 7)
UNTT.ASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (5 OF 7)

## UNCLASSIFIED



SORTIE NUMBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (6 OF 7)

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## UNCLASSIFIED



SORTIE NUNBER 166

FIGURE 2-10
AIRCRAFT POSITION DATA (U) (7 OF 7)

## UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-11 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 2-11 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-11 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-11 (U) TELEMETERED DATA (4 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-11 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 174A
OPERATIONAL DAY 2 AUGUST 1967
NORTH COURSE
FIGURE 2-13
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



## SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (6 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-13
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 174A

FIGURE 2-13
AIRCRAFT POSITION DATA (U) (8 OF 8)

## UNCLASSIFIED



## UNCLASSIFIED



FIGURE 2-1.4 (U) TELEMETERED DATA (2 OF 4)

## UNCLASSIFIED

UNCLASSIFIED


FIGURE 2-14 (U) TELEMETERED DATA (3 OF 4)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-14 (U) TELEMETERED DATA (4 0F 4)


## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 182A
OPERATIONAL DAY 3 AUGUST 1967
NORTH COURSE
FIGURE 2-16
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (7 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 182A

FIGURE 2-16
AIRCRAFT POSITION DATA (U) (8 OF 8)
UNCLASSIFIED



FIGURE 2-17 (U) TELEMETERED DATA (2 OF 4)


UNULASSIFIED


FIGURE 2-17 (U) TELBMETERED DATA (4 OF 4)

## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 182B
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 2-19
AIRCRAFT POSITION DATA (U) (1 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA. (U) (2 OF 8)
UNCLASSIFIED


SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (3 OF 8) UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 182B

FIGURE 2-19
AIRCRAFT POSITION DATA (U) (8 OF 8)

UNCLASSIFIED


## UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-20 (U) TELEMETERED DATA (2 OF 5)

## UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-20 (U) TELEMETERED DATA (3 OF 5)


FIGURE 2-20 (U) TELEMETERED DATA (4 OF 5)


FIGURE 2-2C (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED




## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (2 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (5 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (6 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (7 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 192

FIGURE 2-22
AIRCRAFT POSITION DATA (U) (8 OF 8)

## UNCLASSIFIED



FIGURE 2-23 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 2-23 (U) TELEMETERED DATA (2 OF 5)

# UNCLASSIFIED 



FIGURE 2-23 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED

# UNCLASSIFIED 



UNCLASSIFIED

## UNCLASSIFIED



FIGURE 2-23 (U) TELEMETERED DATA (5 OF 5)


FIGURE 2-24 (U) VOICE TRANSCRIPT (1 OF 2)

## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 205
OPERATIONAL DAY 4 AUGUST 1967
NORTH COURSE
FIGURE 2-25
AIRCRAFT POSITION DATA (U) (I OF 10)

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (2 OF 10)

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (3 OF 10)

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (4 OF 10)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (5 OF 10)

UNCLASSIFIED


SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (6 OF 10)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (7 OF 10 )

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (8 OF 10)

UNCLASSIFIED


SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (9 OF 10)

## UNCLASSIFIED



SORTIE NUMBER 205

FIGURE 2-25
AIRCRAFT POSITION DATA (U) (10 OF 10)


FIGURE 2-26 (U) TELEMETERED DATA (1 OF 5)



FIGURE 2-26 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



FIGURE 2-26 (IJ) TFITEMFTERED DATA (5 OF 5)


${ }^{1} 2$| $2: 48: 50$ |
| :---: |
| $9: 49: 27$ |

4 | $9: 49: 45$ |
| :---: |
| $9: 50: 10$ |

Push the event button? Affirm. Look for some targets now. Okay, it feels just about right.
Okay, I sce a power line coming up here at a minute and a half, ah, are you on hot mike? Affirmative.
Dkay your headin; is ah okay, $\qquad$ - Got that. Uhuh. Man, if they got stuff duwn here you'll never see it You get a cycle on the clock? Yeah, we re a minute and a half out coming out on three and a half. Okay, what's that down there. Okay looks like ah,
This is Intruder 19 we nave looks like ah $\qquad$ we have $3,6,9,12$ we have 3 , $6,9,12$ tanks at or twelve tents, ah they were targe it was just before we crosset the river just about a half mile. All right that's at Charlie Hotel 24.
okay we ie coning up on two minutes out and we should be crossing a road at about two ahi i half akay, the road's off to our right. Yeah, we're parallel to it just crossim, it now, on the right side of the bridge.
Okay, this is tanks, ah trucks over there to our right, looks like command post arui two tanks. four ieeps (the two pilots are talking at the same time) at Charlie Golf 7, Ah Charlie Golf 27.
Okay we're coming up on three minutes, keep your hoading, looks good. Heading looks sond. Okay now.
okay, Boks pretty good, Hank.
Okay, i.ilroad, just down in this valley.
Okay, 1 got a railroad, right down here. Coming up on four minutes now, look out. Okay found the railroad.
Okay, speed's looking good, heading's looking good,
We're coring on five. Coming down into a little cinaring here. okay there's a rrunning west southwest. Rog, I don't have it.
Okay, we got another road, between this valley and I don't see any targets here. That's five thi=ty just going over a ridge, okay, now there's gotta be sonething in this valley. Okay, there's a cleared area just before we get to our check point, is that affirmative? I don't think so, no, we're just coming up on six minutcs. Hank, we got seven minutes to go, this, is another cleared area, okay, here's, there's some APC's over there at three o'clock it looks like an armored unit there must be fifteen APC's in a random manner, look like a camp. Coordinates Alpha Delta 92.
Okay, good shot Hank, okay we're six minutes out right now, we should be just, okay there's a tower up ahead now, okay just passed our check point, okay we want the right side of that tower, over there. Check into we should be coming, up, okay there's the farmhouses right here, no, no I don't think so Hank, this a lake' No, I don't think so I don't think that's our GCI I think it's a little bit further down.
Okay, here, ah is this it over here? Okay, there's our GCI site right over there, where? Right there co your left, see it. Okay, yeah I see it, okay, N2. We got our GCI site. Stay to the left of this tower.
Road, where you turn up here. Did you hit your event button" Affirm, okay, start your 180, about a thirty degree right turn. Okay, there's a lake down there, okay right on top of the lake, northern end of lake and ah mag heading out of
there, mag heading will be 100 , to 108.
Okay, and we're gonna have. Got two pylons, okay here's a road coming on into now, I don't hold cross the edge of the lake, and find the
This compass is terrible, it's not cracking around. okay, now look I got a, okay you see coming up on the road here. Intruder 19 departing November 3. Okay you want 1082 or 1005 (?).
Okay, Hank I have a road, just about on track nor, coming up. Okay, looking good, you're looking good.
Keep your eyebalis out. Get that get that SAM site. Okay, here's a storage area over there, there's a two rows of drums, both sides of the road, one jeep and i sec. approximately 150 barrels. Rog. That's at Pol. Bravo Charlie, 5, Bravo Charlie 45.

Okay, we're one minute out Hank, and your heading is looking good, real good, okay, we re breaking out along this road, right here along this highway cross it about one

9:57:18
9:57:57
9:58:28

9:59:10
9:59:33
10:00:11
$10: 00: 19$
10:00:33
10:00:45
10:01:15
10:01:34
thirty. okay, we're crossing right about here.
Look for that SAM site it's bound to be in here somewhere.
Coming up on two minutes out.
(Mumbling can't understand what he is saying.) Second place to the right of coursa Okay, I was holding a little shy of 100 . Coming up on three, over this ridze, hit the railroad again, I'd sore of check down these dirt roads when you get a chance, there might be some trucks or something.
Okay, here's a railroad coming up this stream.
Okay, what we go. Something over there? I can't, I don't think so, I can't see. A barn right in tront of us Hank, okay, he cleared it okay coming across a road here okay, coming across a road here, might be something around this area, about four

We'te aight on track, right on heading.
We're coming up on five minutes here.
Boy, there's a lot of roads, running through these woods, you can't see anything in them though.
Okay, I'm coming up about a minute and a half to go. Hank, okay, okay, cross in front of the road here. I see some buildings but they don' took military. Okay, we're six out right now. We got one minute to go? Affirm. Man, let's see we got a tower with a building alongside of it right? Right. Okay, there's a little lake, bend in the stream.

## UNCLASSIFIED




SORTIE NUMBER 205A
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 2-28
AIRCRAFT POSITION DATA (U) ( 1 OF 6)

## UNCLASSIFIED



SORTIE NUMBER 205A

FIGURE 2-28
AIRCRAFT POSITION DATA (U) (2 OF 6)

## UNCLASSIFIED



SORTIE NUMBER 205A

FIGURE 2-28
AIRCRAFT POSITION DATA (U) (3 OF 6)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 205A

FIGURE 2-28
AIRCRAFT POSITION DATA (U) (4 OF 6)

## UNCLASSIFIED



SORTIE NUMBER 2C5A

FIGURE 2-28
AIRCRAFT POSITION DATA (U) (5 OF 6)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 205A

FIGURE 2-28
AIRCRAFT POSITION DATA (U) (6 OF 6)

## UNCLASSIFIED


2000
$8 \quad 1300$
$8 \quad 1000$
T 1000

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FIGURE 2-29 (U) TELEMETERED DATA (2 OF 5)


FIGURE 2-29 (U) TELEMETERED DATA (3 OF 5)
UNCLASSIFIED


UNCLASSIFIED

## UNCLASSIFIED




## UNCLASSIFIED



## UNCLASSIFIED



## UNULASSIFILE



SORTIE NUMBER 213
OPERATIONAL DAY 4 AUGUST 1967
NORTH COURSE
FIGURE 2-31
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (3 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED



FIGURE 2-31
AIRCRAFT POSITION DATA (U) (5 OF 8)

UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (7 OF 8)

UNCLASSIFIED


SORTIE NUMBER 213

FIGURE 2-31
AIRCRAFT POSITION DATA (U) (8 OF 8)
UNCLASSIFIED


FIGURE 2-32 (U) TELEMETERED DATA (1 OF 5)


FIGURE 2-32 (U) TELEMETERED DATA (2 OF 5) UNCLASSIFIED


FIGURE 2-32 (U) TELEMETERED DATA (3 OF 5)

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FIGURE 2-32 (U) TELEMETERED DATA (4 OF 5)
UNCLASSIFIED

UNCLASSIFIED.


FIGURE 2-32 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED




## UNCLASSIFIED



SORTIE NUMBER 231
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 2-34
AIRCRAFT POSITION DATA (U) (1 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (2 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

## UivLLASSIFIED



SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UiNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UnclLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITIJN DATA (U) (7 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 231

FIGURE 2-34
AIRCRAFT POSITION DATA (U) (8 OF 8)


FIGURE 2-35 (U) TELEMETERED DATA (1 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



## UNCLASSIFIED



## UNCLASSIFIED




## UNCLASSIFIED



## UNCLASSIFIED

## SECTION 3

## A-6A CELL 2 DATA

1.(U) DESCRIPTION.
a. This section contains data from $A-6 A$ sorties with the following flight parameters:
(I) North course, point to point
(2) 420 knots ground speed
(3) Altitude 500-900 feet above terrain
b. The data are presented as described in the Introduction, Section 1, and are arranged as listed below.
2. (U) CELL 2 FIGURE NUMBERS

| Sortie | DME Plots | TM Plots | Voice Transcript |
| :--- | :---: | :---: | :---: |
| 107 | $3-1$ | $3-2$ | $3-3$ |
| $107 A$ | $3-4$ | $3-5$ | $3-6$ |
| 115 | $3-7$ | $3-8$ | $3-9$ |
| 123 | $3-10$ | $3-11$ | $3-12$ |
| 141 | $3-13$ | $3-14$ | $3-15$ |
| 158 | $3-16$ | $3-17$ | $3-18$ |
| $165 B$ | $3-19$ | $3-20$ | $3-21$ |
| 179 | $3-22$ | $3-23$ | $3-24$ |
| $216 A$ | $3-25$ | $3-26$ | $3-27$ |
| 225 | $3-28$ | $3-29$ | $3-30$ |
| 227 | $3-31$ | $3-32$ | $3-33$ |

## UNCLASSIFIED



SORTIE NUMBER 107
OPERATIONAL DAY 25 JULY 1967
NORTH COURSE
FIGURE 3-1
AIRCRAFT POSITION DATA (U) (1 OF 5)

## UNCLASSIFIED



SORTIE NUMBER 107

FIGURE 3-1
AIRCRAFT POSITION DATA (U) (2 OF 5)

## UNCLASSIFIED



SORTIE NUMBER 107

FIGURE 3-1
AIRCRAFT POSITION DATA (U) (3 OF 5)

UNCLASSIFIED


SORTIE NUMBER 107

FIGURE 3-1
AIRCRAFT POSITION DATA (U) (4 OF 5)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 107

FIGURE 3-1
AIRCRAFT POSITION DATA (U) (5 OF 5)
UNCLASSIFIED


## UNCLASSIFIED



FIGURE 3-2 (U) TELEMETERED DATA (2 OF 3)
UNCLASSIFIED

## UNCLASSIFIED

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## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 107A
OPERATIONAL DAY 26 JULY 1967
NORTH COURSE
FIGURE 3-4
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (3 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (4 OF 8)

## Unclassified



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (6 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 107A

FIGURE 3-4
AIRCRAFT POSITION DATA (U) ( 8 OF 8)

## UNCLASSIFIED



FIGURE 3-5 (U) TELEMETERED DATA (1 OF 5)


FIGURE 3-5 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-5 (U) TELEMETERED DATA (4 OF 5) UiicLASSIFIED

## UNVCLASSIFIED



FIGURE 3-5 (U) TELEMETERED DATA (5 0F 5)
UNCLASSIFIED


## UNCLASSIFIED



SORTIE NUMBER 115
OPERATIONAL DAY 25 JULY 1967
NORTH COURSE
FIGURE 3-7
AIRCRAFT POSITION DATA (U) (1 OF 7)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 115

FIGURE 3-7
AIRCRAFT POSITION DATA (U) (2 OF 7)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-7
AIRCRAFT POSITION DATA (U) (3 OF 7)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 115

FIGURE 3-7

AIRCRAFT POSITION DATA (U) (4 OF 7)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 115

FIGURE 3-7
ATRCRAFT POSITION DATA (U) (5 OF 7)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-7
AIRCRAFT POSITION DATA (U) (6 OF 7)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 115

FIGURE 3-7
AIRCRAFT POSITION DATA (U) (7 OF 7)
UNCLASSIFIED


FIGURE 3-8 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 3-8 (U) TELEMETERED DATA (2 OF 5)

## UNCLASSIFIED



FIGURE 3-8 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED



FIGURE 3-8 (U) TELEMETERED DATA (4 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-8 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 1.23
OPERATIONAL DAY 26 JULY 1967
NORTH COURSE
FIGURE 3-10
AIRCRAFT POSITION DATA (U) (1 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (2 OF 8)
UNCI, A SSIFIED

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFTं POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (6 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 123

FIGURE 3-10
AIRCRAFT POSITION DATA (U) (8 OF 8) *

## UNCLASSIFIED



FIGURE 3-11 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 3-11 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED



FIGURE 3-11 (U) TELEMETERED DATA (4 OF 5)
UNULANSIHIED




## UNCLASSIFIED



SORTTE NUMBER 141
OPERATIONAL. DAY 28 JULY 1967
NORTH COURSE
FIGURE 3-13
AIRCRAFT POSITION DATA (U) (1 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 141

FIGURE 3-1.3

UNCLASSIFIED


SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (3 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (6 OF 8)

UNCLASSIFIED


SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 141

FIGURE 3-13
AIRCRAFT POSITION DATA (U) (8 OF 8)

UNCLASSIFIED


FIGURE 3-14 (U) TELEMETERED DATA (1 OF 5)
UNCLASSIFIED

FIGURE 3-14 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED


FIGURE 3-14 (U) TELEMETERED DATA (3 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-14 (U) TELEMETETED DATA (4 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FTGURE 3-14 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



UNCLASSIFIED


SORTIE NUMBER 158
OPERATIONAL DAY 31 JULY 1967
NORTH COURSE
FIGURE 3-16
AIRCRAFT POSITION DATA (U) (1 OF 7)
UncLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (2 OF 7)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (3 OF 7)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (4 OF 7)
UNCLASSIFIED
$3-70$

## UNCLASSIFIED



SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (5 OF 7)

## UNCLASSIFIED



SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (6 OF 7)

UivcLASSIFIED


SORTIE NUMBER 158

FIGURE 3-16
AIRCRAFT POSITION DATA (U) (7 OF 7)

## UNCLASSIFIED

UNCLASSIFIED


FIGURE 3-17 (U) TELEMETERED DATA (1 OF 5)
UNCLASSIFIED



## UNCLASSIFIED



FIGURE 3-17 (U) TELEMETERED DATA (4 OF 5)
UnuLASSIFIED


FIGURE $3-17$ (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 165B
OPERATIONAL DAY 4 AUGUST 1967
NORTH COURSE
FIGURE 3-19
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITION DATA (U) (2 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE $3-19$
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITION DATA (U) ( 6 OF 8)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 165B

FIGURE 3-19
AIRCRAFT POSITITN DATA (U) (8 OF 8)



FIGURE 3-20 (U) TELEMETERED DATA (2 OF 5)

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## UNCLASSIFIED



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## UNCLASSIFIED



FIGURE 3-20 (U) TELEMETERED DATA (4 OF 5)

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## UNCLASSIFIED




## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 179
OPERATIONAL DAY 1 AUGUST 1967
NORTH COURSE
FIGURE 3-22

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAF'T POSITION DATA (U) (3 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (6 OF 8)

UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (7 OF 8)

UNCLASSIFIED


SORTIE NUMBER 179

FIGURE 3-22
AIRCRAFT POSITION DATA (U) (8 OF 8)
UNCLASSIFIED


FIGURE 3-23 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 3-2.3 (U) TELEMETERED DATA (2 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-23 (U) TELEMETERED DATA (3 OF 5)
UNCLASSIFIED

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FIGURE 3-23 (U) TELEMETERED DATA (4 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-23 (U) TELEMETERED DATA (5 OF 5)



## UNCLASSIFIED



SORTIE NUMBER $216 \Lambda$
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 3-25
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 216A

FIGURE 3-25<br>AIRCRAFT POSITION DATA (U) (2 OF 8)



SORTIE NUMBER 216A

FIGURE 3-2.5
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 216A

FIGURE 3-25
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 216A

FIGURE 3-25
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 216A

FIGURE 3-25
AIRCRAFT POSITION DATA (U) (6 OF 8)

UNCLASSIFIED


SORTIE NUMBER 216A

FIGURE 3-25
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 216A

FIGURE 3-25
AIRCRAFT POSITION DATA (U) (8 OF 8)
UNCLASSIFIED



FICURE 3-26 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED



FIGURE 3-26 (U) TELEMETERED DATA (2 OF 5)

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FIGURE 3-26 (U) TELEMETERED DATA (3 OF 5)

## UNCLASSIFIED



UNCLASSIFIED


FIGURE 3-26 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED

## UNCLASSIFIED




SORTIE NUMBER 225
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 3-28
AIRCRAFT POSITION DATA (U) (1 OF 8)

UnCLASSIFIED


SORTIE NUMBER 225

FIGURE 3-28 AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (3 OF 8)

## UNCLASSIFIED

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SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (4 OF 8)
UNCLASSIFIED


SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (5 OF 8)

UNCLASSIFIED


SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (6 OF 8)
UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (7 OF 8)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 225

FIGURE 3-28
AIRCRAFT POSITION DATA (U) (8 OF 8)

## UNGLASMIHIHD

TNTT, ASSIFIED


FIGURE 3-29 (U) TELEMETERED DATA (1 OF 5)

## UNCLASSIFIED

## UNCLASSIFIED




## UNCLASSIFIED



## UNCLASSIFIED



FIGURE 3-29 (U) TELEMETERED DATA. (4 OF 5)

## UNCLASSIFIED



FIGURE 3-29 (U) TELEMETERED DATA. (5 OF 5)

# UNCLASSIFIED 



## UNCLASSIFIED



## UNCLASSIFIED



SORTIE NUMBER 227
OPERATIONAL DAY 5 AUGUST 1967
NORTH COURSE
FIGURE 3-31
AIRCRAFT POSITION DATA (U) (1 OF 8)

## UNCLASSIFIED



SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (2 OF 8)

## UNCLANSIFIED

## UNCLASSIFIED



SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (3 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (4 OF 8)

## UNCLASSIFIED

UNCLASSIFIED


SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (5 OF 8)

## UNCLASSIFIED



SOR'TIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (6 OF 8)

UNCLASSIFIED


SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (7 OF 8)
UNCLASSIFIED

## UNCLASSIFIED



SORTIE NUMBER 227

FIGURE 3-31
AIRCRAFT POSITION DATA (U) (8 OF 8)
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FIGURE 3-32 (U) TELEMETERED DATA (2 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED



FIGURE 3-32 (U) TELEMETERED DATA (4 OF 5)
UNCLASSIFIED

## UNCLASSIFIED



FIGURE 3-32 (U) TELEMETERED DATA (5 OF 5)

## UNCLASSIFIED



## UNCLASSIFIED

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