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**History of the 6511 Test Group (Parachute)  
1 Jul 1971-30 Jun 1972  
Naval Air Facility, El Centro, CA  
AFFTC, AFSC, USAF**

**William H. Packard Jr,  
Unit Historian**

**AIR FORCE FLIGHT TEST CENTER  
EDWARDS AFB, CA**

**Nov 1983**

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**AIR FORCE FLIGHT TEST CENTER  
EDWARDS AIR FORCE BASE, CALIFORNIA  
AIR FORCE MATERIEL COMMAND  
UNITED STATES AIR FORCE**

RCS: HAF-D48  
(AFFTC-1)

AFSC HISTORICAL PUBLICATION

**HISTORY**  
OF THE  
**6511 TEST GROUP**  
(PARACHUTE)

**AIR FORCE FLIGHT TEST CENTER  
AIR FORCE SYSTEMS COMMAND  
UNITED STATES AIR FORCE**

**1 JULY 1971 — 30 JUNE 1972  
NAVAL AIR FACILITY, EL CENTRO, CALIFORNIA**

HISTORY OF THE 6511TH TEST GROUP (PARACHUTE)

Naval Air Facility, El Centro, California

1 July 1971 - 30 June 1972

RCS: HAF-D48  
(AFFTC-1)

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AIR FORCE FLIGHT TEST CENTER

AIR FORCE SYSTEMS COMMAND

UNITED STATES AIR FORCE

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## Chapter I

### MISSION AND ORGANIZATION

The mission of the 6511th Test Group (Parachute) is to perform development testing of human escape parachutes and aerodynamic systems, supply and cargo aerial delivery systems, guided missile and reentry vehicle parachute recovery systems, aircraft deceleration parachutes, and aerodynamic retardation devices performing functions similar to those of parachutes; and to accomplish the design, procurement, operation, and maintenance of test equipment and facilities.

The 6511th Test Group (Parachute), assigned to the Air Force Flight Test Center (AFFTC) at Edwards AFB, California, has been testing parachutes at the Naval Air Facility (NAF) El Centro, California since the Group's activation in July 1951. The 6511th and the Naval Aerospace Recovery Facility (NARF) comprise the Joint Parachute Test Facility (JPTF) which was established under DOD Directive No. 5154-1, dated 9 June 1951. Each organization provided certain functions as specified in the directive to accomplish the assigned mission. The Naval Air Facility (NAF) provided base support.

Higher Headquarters directed the reorganization of the 6511th Test Group (P) into two squadrons and an operating division. As in the previous organization the 6511th Test Squadron and the 6511th Support Squadron remained; however, the Engineering Division which had previously been a part of the Test Squadron, now reported directly to the Group Commander.

On May 8 1972, representatives of AFSC/DO visited AFFTC to present an AFSC proposed concept of operation for the 6511th Test Group. This proposed concept was based on:

a. Consolidating 6511th Test Group flight operations and aircraft maintenance functions at Edwards AFB, California, to support parachute test missions conducted at El Centro, California.

b. Staging Edwards based aircraft for parachute test missions out of El Centro.

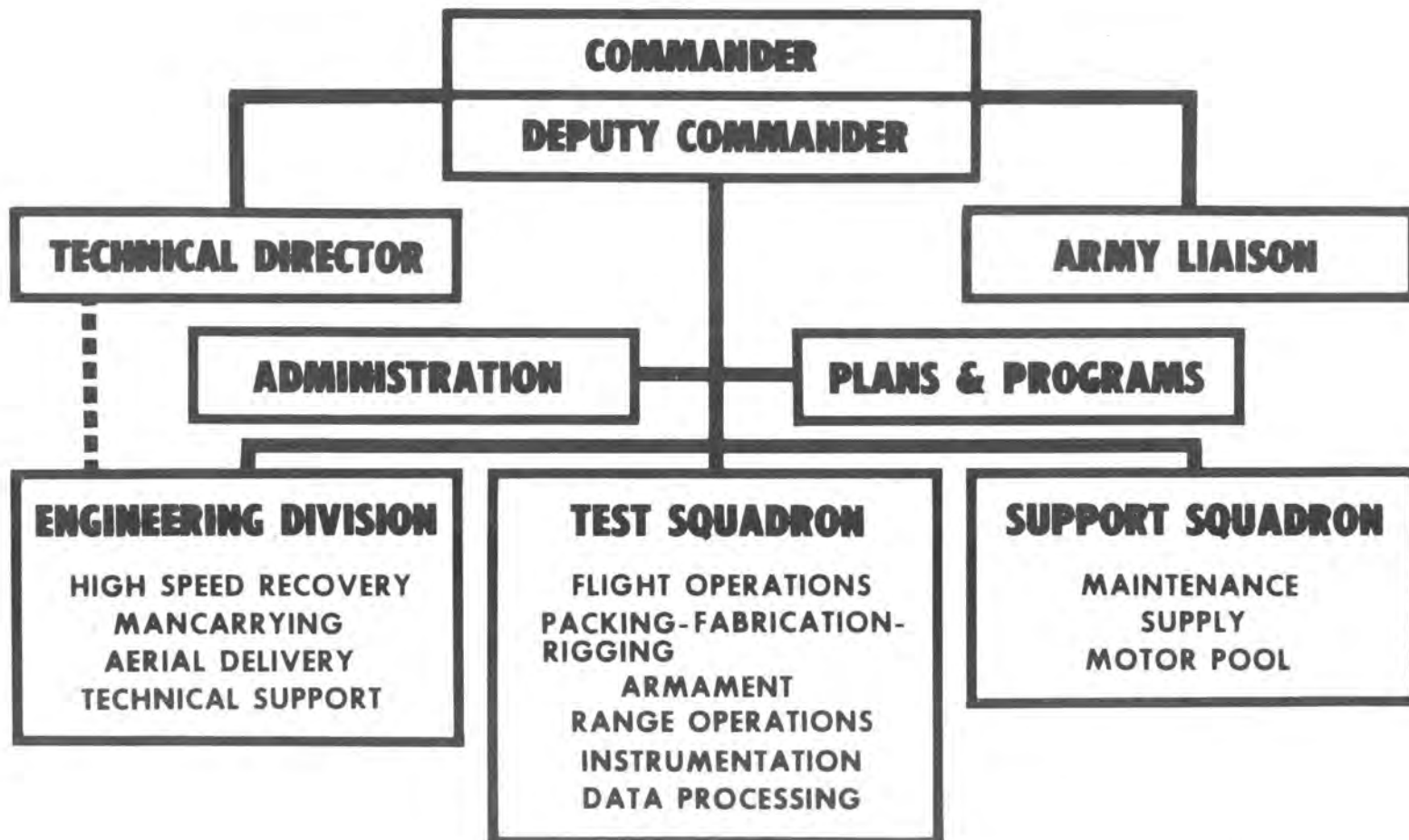
AFFTC was directed to determine a plan to implement this AFSC Concept of Operation. A Study<sup>1</sup> was initiated to examine the AFSC proposal and other concepts of operation to determine the optimum method of utilizing manpower and resources to accomplish the test mission. Organization, test operations, aircraft maintenance, and manpower were evaluated as they apply to each concept of operation. The study was completed and the results were published 23 May 1972.

Four special offices worked directly under the Group Commander, and included:

Technical Director (TGC), acted as the principal assistant and advisor to the Commander on all technical matters.

Group Administration Office (TGA), performed services for all personnel assigned to the 6511th Test Group (P), in the areas of administration, personnel, finance, security, promotion testing, mail room and reproduction. These services were performed by four personnel assigned; MSgt - 70270, Administrative Supervisor,

## 6511th Test Group (Parachute)



Civilian GS-3, Clerk Typist, Sgt - 70250, Administrative Specialist, and a Sgt 73250, Personnel Specialist. The volume of work during this reporting period necessitated obtaining personnel to work in the mail room and reproduction center, on an additional duty basis.

Plans and Programs Management Office (TGP), formulated, developed, and planned procedures for test, manpower, and budget control.

U.S. Army Materiel Command (AMC) Liaison Office (TGQ), operated under AMC Headquarters Letter of Instruction dated 8 May 1969. This letter directs that the Army Liaison Office provide technical coordination between the JPTF, the U.S. Army Materiel Command (AMC), and other interested Army agencies on all U.S. Army Programs and programs of Army interest.

This office also monitors all airdrop programs of the Air Test Division of Yuma Proving Grounds.

Protocol services were extended to visitors from the Department of the Army (OCDR); U.S. Army Materiel Command; U.S. Army Aviation Systems Command; U.S. Army Airborne, Communications and Electronics Board; U.S. Army Natick Laboratories; U.S. Army Yuma Proving Grounds; Andrews Air Force Base; Ft Lee; VITRO Laboratories.

The USAMC Liaison Officer, CPT Jimmie C. Simpkins, departed 26 July 1971 and was replaced by CPT Carl L. Pate on 6 December 1971. During the interim period, the mission and administration of the Liaison Office was conducted by Mrs Randy Jensen.

Chapter II

Headquarters

Group Commander

Col Richard M. Corbett served as Group Commander during the reporting period.

Deputy Commander

Lt Col Theodore E. Workman served as Deputy Commander during the reporting period.

Key Personnel

Key personnel during the reporting period included:

Commander	Col Richard M. Corbett
Deputy Commander	Lt Col Theodore E. Workman
Technical Director	Mr York Y. Chen
Chief, Administration	MSgt R. J. Davidson (departed 20 Jun 72) MSgt Donald J. McGinty (assigned 18 Jun 72)
Chief, Plans and Programs	Mr Walter P. Peacock
Army Liaison	CPT Jimmie C. Simpkins (departed 26 Jul 71) CPT Carl L. Pate (assigned 6 Dec 71)
Commander, Test Squadron	Lt Col Barron Fredricks, III
Chief, Operations Division	Major Eugene C. Kennedy (departed 29 Jul 71) Lt Col Alfred N. Luttrell (assigned 29 Jul 71)
Chief, Instrumentation and Range Operations Division	Mr Thomas C. Raudebaugh
Commander, Support Squadron	Maj Thomas G. Bowen (departed 23 Jun 72)
Chief, Maintenance Division	Capt Donald L. Handley
Chief, Supply Division	1st Lt Peter N. Wilde (assigned 28 Dec 71)

Chief, Engineering Division

Chief, Aerial Delivery Branch

Chief, Man-carrying Branch

Chief, High Speed Recovery Branch

Chief, Technical Support Branch

Mr York Y. Chen

Mr Clifton W. Marshall

Lt Col Alvin E. Gilless  
(departed 5 Jan 72)

Mr Henry J. Hunter  
(assigned 5 Jan 72)

Mr James V. Waite

Lt Col Alvin E. Gilless  
(departed 5 Jan 72)

Mr Henry J. Hunter  
(assigned 5 Jan 72)  
Maj David T. Archino  
(assigned 10 Mar 72)

Chapter III

TEST SQUADRON

Squadron Commander	Lt Col Barron Fredricks, III
First Sergeant	MSgt Donald L. Givens MSgt William E. Powers

Instrumentation and Range Operations Division (TGII)

Division Chief	Mr Thomas C. Raudebaugh
Secretary	Mrs Rosalind Darnell

Instrumentation Branch (TGIII)

Branch Chief	Capt James W. Nye
--------------	-------------------

Capt Guillermo M. Alexander was separated from the service 1 June 1972. TSgt Ernest F. Kruger, NCOIC of the Instrumentation Branch left in April 1972 to work under the auspices of Project Transition. TSgt Edward E. Stapleton graduated from the NCO Academy at Kirtland AFB in September 1971, and assumed duties as Branch NCOIC in April 1972. Newly assigned personnel:

- A1C Donald L. Borders
- A1C George L. Hawley, Jr.
- A1C Terry C. See
- A1C Rick I. Yarger

Range Operations Branch (TGTIR)

Range Operations Officer	Capt Marcus O. Durham Capt James A. Dotzenrod
Data Processing Officer	Capt Roger P. Gaumont

Capt Marcus O. Durham was separated from the service 31 March 1972. Mrs Rosalind Darnell joined the Division in September 1971.

Bell Aerospace Company was awarded a contract to operate and maintain the test range and data processing facility. Transition from the previous contractor, Philco-Ford Corp. to Bell Aerospace occurred in October 1971. No testing delays occurred during the changeover.

Philco-Ford Corp., C&TS Division, completed installation of wideband data channels in the El Centro Data and Communications Microwave System. This allowed monitoring of live parachute test subjects at the Data Processing Facility and will eventually permit real-time digitizing of telemetry data.

New equipment added to the CDC 3300 computer configuration included two new tape drives (total of three) and one new disk drive (also total of three).

Operations Division (TGTO)

Division Chief	Major Eugene C. Kennedy Lt Col Alfred N. Luttrell
Inspector	Mr Kenneth F. Cunningham
Administrative Specialist	Mrs Billye D. Jones

Lt Col Luttrell reported for duty 29 July 1971. Major Kennedy departed PCS 29 July 1971. Mrs Jones was terminated 29 June 1972 when her position was abolished during a reduction in force action.

The Operations Division was responsible to the Commander for activities pertaining to flight operations and range safety, preparation and recovery of test vehicles and other test items, packing and fabrication of test parachutes and harnesses, motor transportation, and other associated functions. Operations Division supported the Group's overall test mission through the coordinated efforts of its four branches.

Flight Operations Branch (TGTOO)

Operations Officer	Major Vincent A. Prostko
Stan/Eval Officer	Major Robert C. Kovarik
Flying Safety Officer	Capt Roger L. Cogswell

Pilots assigned or attached during the period were:

Col Richard M. Corbett  
Lt Col Barron Fredricks, III  
Lt Col Theodore E. Workman

Major David T. Archino  
Major Thomas G. Bowen  
Major Eugene C. Kennedy  
Major Robert C. Kovarik  
Major Vincent A. Prostko  
Capt Roger L. Cogswell

Flight Operations flew 891 sorties for a total of 1,316 hours utilizing 8 test aircraft.

The following aircraft were assigned to the Group during the reporting period:

NF-106B	S/N 57-2507 (reassigned 30 June 1972)
NB-66B	S/N 53-488 (reassigned 30 June 1972)
C-130B	S/N 57-525
C-130E	S/N 61-2358 (reassigned 30 June 1972)
T-33A	S/N 57-754
T-33A	S/N 58-549
UH-1N	S/N 69-6660
YF-4E	S/N 65-713

#### Rigging Section (TGTOOR)

Section Chief

MSgt William E. Powers

The Rigging Section (subordinate to Flight Operations) assembles, rigs, and loads weight-test platforms, test vehicles, dummies, and similar items for aerial drop tests.

All key men retained their positions during this period. Five new men reported to the section, they were as follows: Sgt William Brautigan, Sgt James Peacock, Sgt James Anderson, Sgt Frank Adams, and A1C James Walker. However, during this same period there were 12 men grounded due to an Air Force-wide reduction of the load-master career field. There were no changes in facilities or equipment. We continued to support the C-5A program, however, there were no unusual problems or mission support requirements. Routine program objectives were accomplished.

Packing and Fabrication Branch (TGTOP)

Branch Chief

Mr Mitchell B. Kanowski

NCOIC

SMSgt C. O. Fryery

The Packing Section assembled and packed varied types and sizes of standard and experimental parachutes; charted parachute damage after cargo drop tests, dummy drop tests, and live parachute jumps; calibrated and inspected automatic parachute ripcord releases; and maintained all equipment used for premeditated parachute jumps for tests and proficiency.

During the reporting period, the following parachutes were assembled and packed:

Personnel Parachutes (for personal equipment)	174
Personnel Parachutes (for live jumps)	978
Personnel Parachutes (for dummy drops)	307
Deceleration Parachutes	255
Cargo Type Parachutes (15-ft to 135-ft dia)	626

Two thousand and twelve parachutes were damage charted after airdrop testing as follows:

Personnel Parachutes	1,406
Cargo Parachutes	606

The Fabrication Section manufactured, modified, or repaired 4,664 items such as deployment bags, cutter pockets, parachute packs, harness bridle lines, risers and parachute components or test support equipment required for test programs.

Seven hundred and fifty-five parachute jumps were made for proficiency training or in support of test programs. The following personnel participated in parachute jumps:

Col Richard Corbett  
Lt Col Barron Fredricks, III  
Capt Guillermo Alexander  
Capt Herbert Brown  
Capt James Dotzenrod  
Capt Robert McCollough  
Capt James Nye  
MSgt William Powers  
SSgt J. Bowyer  
SSgt E. Cherry  
SSgt Harry Gately  
SSgt Jettie Sallee

Armament and Test Vehicle Branch (TGTOV)

Branch Chief	MSgt Jack L. Miller
Assistant Branch Chief	Mr Henry E. Keltz

The mission of the Branch is to prepare test vehicles for launch. This included installation of wiring, explosive items, and vehicle-to-air cameras. Mr Frank Carruth retired 29 June 1972.

Chapter IV  
SUPPORT SQUADRON

Squadron Commander

Major Thomas G. Bowen

First Sergeant

MSgt Jake D. Cox

Maintenance Division (TGSM)

Division Chief

Capt Donald L. Handley

Key personnel in the division were as follows:

SMSgt James L. Praytor

Maintenance Superintendent

TSgt Lyle J. Lander

Line Chief

TSgt Clarence P. Straub

A Flight Chief

TSgt John Panfil

B Flight Chief

TSgt Loraine Bauer

Field Maintenance Chief

MSgt Jerry L. Pinion

Maintenance Control Chief

Mr Jack C. Sadler

Quality Control Chief

The mission of the Maintenance Division is to maintain aircraft in a safe and mission-ready condition to support the Group's mission.

Operationally Ready Rate

The overall operationally ready (OR) rate was 64.5 percent for the reporting period. The OR rates for the aircraft were as follows:

<u>Aircraft</u>	<u>Serial No.</u>	<u>OR Rate</u>	<u>Hours Flown</u>
C-130B	57-525	60.2%	201.2
YF-4E	65-713	81.1%	130.3
UH-1N	69-6660	61.0%	216.6
T-33A	58-549	68.4%	334.4
T-33A	57-754	49.8%	145.6
NF-106B	57-2507	66.4%	52.9
C-130E	61-2358	47.6%	228.0
NB-66B	53-488	71.2%	144.8

### Supply Division (TGSS)

1st Lieutenant Peter N. Wilde served as the Chief, Supply Division, during the reporting period. Mrs Patricia Feeney served as Administrative Supervisor for the division. The division operated under the Standard Base Supply System utilizing the 1050-II computer located at Edwards AFB. The Supply Division maintained a direct link to Edwards AFB by the use of a remote device (KSR-35) and telephone lines. Major building improvements were completed on the supply facilities during this period. The warehouse was completely sealed and air-conditioned, latrine facilities were installed, and the offices were remodeled.

The following is a history of the average monthly transactions processed during this period.

- a. Transactions Processed - 10,259
- b. NORS Rate - 12.9%
- c. Issue Effectiveness - 38.5%
- d. Requisitions Processed - 798
- e. Dollar Value of Inventory - \$178,778
- f. Inventory Accuracy - 98%

### Management & Procedures Branch (TGSSP)

This branch remained vacant with the departure of SMSgt Willie Tyner to Vietnam. The inventory functions of this branch were assumed by the Materiel Facilities Section.

### Materiel Facilities Branch (TGSSM)

This branch was responsible for the operation of the inspection, storage, issue, receiving, pick-up, delivery, and Base Service Store Section. This branch monitored all due-in from maintenance with excellent results. SSgt Perry McGuire served as NCOIC of the Materiel Facilities Branch during this period.

Supplies Management Branch (TGSSS)

TSgt Bobby Wardlaw served as NCOIC of the Supplies Management Branch. This branch is the focal point for all phases of support such as stock control, maintenance support, bench stock, demand processing, NORS control, and the TCTO Section.

Item Accounting Branch (TGSSI)

SSgt Edward C. Beene served as NCOIC of this branch. This branch was responsible for operations of the remote device, research, document control, and local purchase section.

Equipment Management Branch (TGSSE)

This branch was responsible for equipment management and functioned as a review and authorization activity and operated Equipment Control and Operational Support Sections.

TSgt Ray Esquibel was NCOIC of the Equipment Management Branch and Mrs Opal Roe was in charge of Equipment Control.

Vehicle Operations Section (TGSV)

Vehicle Operations Supervisor

TSgt Harrel V. Whitmire

Ass't Vehicle Operations Supervisor

SSgt Edd B. Harrison

The Vehicle Operations Section was reassigned from the 6511th Test Squadron to the 6511th Support Squadron. The office symbol was changed from TGTOM to TGSV.

The section performs servicing and dispatching for 47 vehicles, consisting of general purpose and special cargo vehicles, cranes, tractors, and trailers. During this period there was a replacement of five station wagons. One multi-purpose step van was also received during this period. Vehicles logged a total of 235,467 miles during this period with no reportable accidents.

A chain link fence was installed around the motor pool yard to protect the vehicles from vandalism. Five civilian employee positions were terminated by a reduction in force action on 29 June 1972.

Chapter V

ENGINEERING DIVISION

Division Chief	Mr York V. Chen
Technical Writer/Editor	Mr William H. Packard
Clerical Assistant (Stenographic)	Mrs Jo Ann Gurunlian
Clerk Typist	Miss Vickie Davis Mrs Karen Overton

Miss Vickie Davis was transferred to the office of the Commander on 27 May 1971. Mrs Karen Overton reported to the Engineering Division on 12 July 1971 to replace Miss Davis. Mrs Overton was terminated on 29 June 1972 when her position was abolished during a reduction in force action.

During this period the division moved from its location in Building No. 539 to Building No. 535. The division is the sole occupant of the building.

Aerial Delivery Branch (TGEA)

Branch Chief	Mr Clifton W. Marshall
Project Engineer	Major David T. Archino
Project Engineer	Mr Henry J. Hunter
Project Engineer	Mr Marvin A. Tingdahl
Project Engineer	Capt George E. Boyer
Project Engineer	2nd Lt James B. Warren

Mr Marvin A. Tingdahl was appointed Acting Chief, Aerial Delivery Branch from 25 January 1972 to 24 March 1972 during Mr Marshall's period of sick leave.

Mr Henry J. Hunter returned in September 1971 from TDY assignment at Pope AFB/Ft Bragg, North Carolina as Aerial Delivery System Project Engineer for the C-5A Aircraft Category I and II Aerial Delivery System Testing. Capt Boyer also returned from TDY at Pope AFB in September 1971. Capt Boyer was released from active duty on 15 October 1971. Mr Hunter was assigned as Acting Chief, Man-carrying Branch and Acting Chief, Technical Support Branch, on 5 January 1972.

Mancarrying Branch (TGEM)

Branch Chief	Lt Col Alvin E. Gillless Mr Henry J. Hunter
Project Engineer	Mr Robert B. Calkins
Project Engineer	Capt Herbert R. Brown
Project Engineer	Capt Robert B. McCollough
Project Engineer	CMSgt Clarence W. Fisher

Lt Col Gillless departed PCS 5 January 1972, at which time Mr Hunter assumed duties as Chief, Mancarrying Branch.

High Speed Recovery Branch (TGER)

Branch Chief	Mr James V. Waite
Project Engineer	Mr Herbert Seaman
Project Engineer	Mr Laurence T. Byam
Project Engineer	Mr William H. Shao
Project Engineer	Capt John Krizauskas

Captain Krizauskas reported in to this Group and was assigned to the High Speed Recovery Branch 24 July 1971. Mr Shao departed in September 1971 for advanced study for a 12-month period at the University of Minnesota.

Technical Support Branch (TGES)

Branch Chief	Lt Col Alvin E. Gillless Mr Henry J. Hunter Major David T. Archino
Project Engineer (Test Vehicle Design and Modification)	Mr Ivo J. Svoboda
Project Engineer (Class II Aircraft Modifications)	Mr Clyde J. Herschberger
Project Engineer	Mr Robert S. Morrison

Film Librarian

SSgt Meril E. Richmond

Chief, Drafting and  
Reproduction

Mr Vernon A. Kramer

Draftsman

SSgt Eric S. Sutherland

Lt Col Gilless departed PCS 5 January 1972, at which time Mr Hunter assumed duties as Chief, Technical Support Branch in addition to his duties as Chief, Mancarrying Branch. Major Archino was assigned as Chief, Technical Support Branch on 10 March 1972.

Activities within the Technical Support Branch included:

a. Test Vehicle Design and Modification.

(1) Two parachute companies, the Pioneer Parachute Company and the Steinthal Parachute Company, conducted tests of midair retrieval systems under JON 468AJ0 and JON 468AK0 respectively, using triconical main parachutes and ring slot engagement chutes. In support of these parachute tests, seven new parachute test vehicles, ranging in weight from 2,000 lb to 6,000 lb, were designed and fabricated to be launched from B-66 and F-4 aircraft. To meet specific requirements, several of the parachute test vehicles underwent extensive modifications. In addition, a skid was designed and fabricated to enable launching of one of the vehicles from the C-130 aircraft.

(2) Testing of parachutes for an aerial recovery system were conducted for McDonnell Douglas Aircraft Corporation under Project JON 69AJC0. In accordance with the contractor's requirements, five parachute test vehicles were fabricated. In the course of testing, numerous modifications of the parachute test vehicles were performed. In addition, a steel skid was designed and fabricated for launching of the vehicle from the C-130 aircraft.

(3) The 6511th Test Group (P) conducted performance tests of a 43-ft D<sub>0</sub> ring sail type parachute under Project Black Brant, JON 7659A0, to develop

an aerial recovery system for the Black Brant V-B sounding rocket. For one of these tests, the need arose for a skid to insure safe exit of the sounding rocket from the C-130 aircraft. In support of this requirement a skid was designed and fabricated locally.

(4) The North American Rockwell Corporation conducted various tests of the B-1 Aircraft Module Escape System under JON 139AJ0 and 139AK0. To enable the loading of a 9,000-lb parachute test vehicle on the wing pylon of the B-52 aircraft, an adapter for the North American MHU-33 trailer loader was designed and fabricated.

(5) Improvement of ground station tracking ability during high altitude drop tests was desired. To this end, a photo flash store to be carried by a drop aircraft flying at high altitudes was designed and fabricated under Project JON 1875D0.

(6) In support of the Naval Aerospace Recovery Facility's GRU-7A Escape System Qualification Tests (T. P. 10-71), the GENIE parachute test vehicle was modified for a preliminary parachute performance test at low supersonic speed launched from the F-106 aircraft. Although the test parachute was destroyed during deployment, the vehicle was recovered by its own specially designed parachute recovery system.

b. Class II Aircraft Modifications and Demodifications.

(1) NF-106B, S/N 57-2507, was converted to the ejection seat configuration in support of JONs 921NI0, 921BE0, and 412AD0. Following support of these programs it was partially demodified in preparation for IRAN where it was painted white and orange to improve ground-to-air camera acquisition. Upon return from IRAN it was converted to the two-seat configuration for high altitude/high speed photo missions. The aircraft was converted to the ejection seat configuration in support of the NARF F-14A ejection seat test program.

Following the completion of this program it was converted to the two-seat version in preparation for transfer to NASA.

(2) NB-66B, S/N 53-488, was prepared for transfer to Davis Monthan AFB by the removal of the photo flash system modification.

(3) C-130E, S/N 61-2358, was modified with the high speed, low level aerial delivery ramp system. Partial technical orders were written for the operation of this system. Removal of all existing Class II modifications was then accomplished in preparation for the transfer of this aircraft to WRAMA, Georgia.

(4) C-130B, S/N 57-525, was modified to increase the onboard communications by the installation of an additional UHF interphone system in the cargo compartment.

(5) YF-4E, S/N 65-713, was prepared for parachute testing by the procurement and installation of onboard camera mount adapters and by the writing of partial technical orders and check lists covering loading and drop procedures.

(6) MTU-51A/MTU-52A racks for UH-1N, S/N 69-6660, were procured for use in the dropping of cylindrical test vehicles.

(7) F-4C, S/N 63-7654, was demodified from the configuration used in support of JON 627AB0.

c. Miscellaneous Support.

(1) Engineering assistance was given AFSWC, Kirtland AFB, in the design of a TM system for the B-52 aircraft in support of JON 69AJA0.

(2) Assistance was given NARF in support of their T-33 ejection seat update program with tests made from the Air Force static hull and the Navy TF-9J, S/N 14-2448.

(3) Assistance was given NARF in the design and modification of F-4C, S/N 15-1473, for ejection seat testing.

(4) Support was given in the preparation and testing of the F-102 Dart ejection seat for JON SC8000.

d. Film Library.

(1) Five briefing films were prepared which included motion picture coverage of various test programs conducted in El Centro. These films were used during briefings held at Edwards AFB and to familiarize a group of Air Force Academy Cadets during a tour of the test facility.

(2) The film library shipped 400 reels of motion picture film to various contractors and government agencies.

(3) The film library received 824 reels of film from the NARF Photo Lab.

e. Drafting and Reproduction.

(1) One technical report was prepared for printing by Field Printing at AFFTC. A "Welcome to the Group" brochure, a "Study on the Group," and a technical report were initiated and printed locally.

(2) Seven slide projection briefings using view graphs, and one briefing using 35mm slides were prepared for use by Group personnel.

(3) Design plans and drawings were prepared for the following:

(a) Bridle attachment modification C-9 canopy with pull down vent line (TGEM).

(b) Break cord (TGEA).

(c) Activating lanyard (TGEA).

(d) Anchor web (TGEA).

(e) Bag deployment (TGEA).

(f) Riser assembly (TGOP).

- (g) Multipurpose static line (TGOP).
  - (h) Wiring diagram, GENIE test vehicle (TGES).
  - (i) Deployment bag (TGES).
  - (j) Knife restraint cutter (TGEM).
  - (k) 33 x 56 deployment bag (TGOP).
  - (l) 33 x 56 deployment bag, plies (TGOP).
  - (m) Bag deployment pilot chute (TGOP).
  - (n) Telemetry antenna (TGES).
- (4) Reproduction output for reporting period:
- |                      |               |
|----------------------|---------------|
| (a) Multilith        | 719,546 units |
| (b) Xerox            | 67,585 units  |
| (c) Blueline (Diazo) | 30,026 sq ft  |
| (d) Microfilm cards  | 313 units     |
| (e) Microfilm        | 2,525 units   |

## Chapter VI

### DEVELOPMENT AND TEST PROGRAMS

Number of test programs carried forward from previous reporting period.....	44
Number of new programs initiated during the reporting period.....	27
Number of completed test programs.....	24

In addition to the testing conducted at the Joint Parachute Test Facility in El Centro, the 6511th Test Group had two project engineers assigned to the C-5A aircraft TADJET Test Team conducting aerial delivery system tests at Pope AFB/Fort Bragg, North Carolina. A summary of the more significant test programs on which testing was conducted during the reporting period follows:

#### Aerial Delivery Branch (TGEA)

Program Title: Cargo Fuel Air Explosive (FAE)

JON: 1559E0

Priority: 01G

The Air Force Armament Laboratory (AFATL), Eglin AFB, Florida, requested engineering support from the 6511th Test Group (Parachute), El Centro, California, for a test program titled, "Cargo, Fuel Air Explosive (FAE)." This support, specifically requested by ADTC/Flame, Incendiary, and FAE Branch (DLIF), included development of an aerial delivery system to gravity airdrop BLU-76/B and CBU-55/B FAE bombs from C-123 aircraft. In response to this request, the 6511th developed an airdrop system for Cargo FAE. In the development of a safe, predictable, and functionally simple system for gravity airdropping FAE weapons from C-123 aircraft, the most important factor was aircraft safety. Other factors that were considered included: (1) determination of a suitable interface between the FAE weapons rigged for airdrop and the aircraft (aircraft/airdrop system interface), and (2) procedures and techniques which could



Airdrop Test of Cargo FAE (BLU-76B) from a C-130 Aircraft (JON 1559EO)

be used to airdrop the bombs in a predictable manner under operational conditions. Tactically qualified C-123 pilots were consulted concerning the procedures and techniques that could be used to airdrop FAE weapons. Pilot techniques similar to those used for airdropping container delivery system (CDS) bundles were used. The CDS airdrop procedures were modified to include the addition of emergency procedures for jettisoning the weapons either before or after the FAE arming lanyards were connected. Eight tests were conducted at Eglin AFB using a C-123 aircraft and five tests were conducted at El Centro using a C-130 aircraft.

Program Title: C-5A Aerial Delivery Systems Tests

JON: 410AJ0

Priority: 10B

This program was conducted for ASD(YAT). The purpose of the program was to develop and test extraction and recovery parachute systems and related hardware for use on the C-5A aircraft. One hundred and thirty-one tests were made. All testing was conducted from C-130 aircraft flying at 2,000 ft pressure altitude and at indicated airspeeds of 130 or 150 kt. The final tests were conducted in January 1971. This program has been terminated.

Program Title: C-5A TADJET Tests

JON: 410APO

Priority: 10B

This program was successfully concluded during this period. The program was conducted at Pope AFB/Fort Bragg, North Carolina for the C-5A SPO, YAT/ASD. A total of 312 personnel dummies were dropped on this program and the effects of the C-5A wake upon the dummies was evaluated on 5 of these. Fourteen hundred and fifty-eight test parachutists were airdropped



Torso Dummy Being Airdropped from C-5A Aircraft (JON 410APO)

Singly or in sticks ranging from 4 to 37 men from the C-5A airplane without serious injury. One hundred and fourteen single platform airdrops of cargo or vehicle loads weighing from 2,500 to 40,100 lb were made and forty-four sequential platform airdrop tests were made of up to seven platforms on a single pass over the drop zone. A total of 2,600,000 lb of cargo and vehicles was airdropped on this program. Small packages were manually ejected from the paratroop doors and a logistic pallet was jettisoned from the aft ramp to develop safe procedures for getting rid of dangerous cargo such as leaking acid drums, etc. A final technical report<sup>2</sup> was prepared by this Group and distributed by the C-5A SPO in November 1971. Certain deficiencies in the aerial delivery system kit are being corrected and follow-on testing to evaluate these modifications is scheduled for the first quarter of FY73.

Program Title: C-5A ADS Kits Follow-on Tests

JON: 410ARO

Priority: 10B

A final phase of a three-phase C-5A test program was initiated jointly by the U.S. Air Force and the U.S. Army Airborne Communications and Electronics (AC and E) Board for the C-5A System Program Office, ASD, WPAFB, Ohio, at the 6511th Test Group (P), El Centro, California. This phase of the program was conducted to qualify contractor modifications made to correct deficiencies noted in the Aerial Delivery System during Phases I and II. The items being tested were: (1) the paratroop jump kit platform, (2) the ADS kit left-hand restraint rail master control, (3) the aft ramp teeter roll fairings, and (4) the ADS kit extraction line guard. Just prior to the initiation of testing a joint U.S. Air Force/Army decision was made to eliminate the use of the ADS kit anchor cable assemblies because of deficiencies previously noted in Phases I and II. A decision was also made to substitute two different extraction force transfer assemblies which operate independently of the anchor cable

assembly. One of the force transfer couplings was not compatible with the method of activation of an open link safety clevis considered mandatory for flight safety of the aircraft necessitating additional development during testing. Twenty-five airdrop tests were made to evaluate modifications made to the ADS kits. Five ballast loads were dropped in separate passes on one flight. Seven ballast loads were dropped and 13 parachutists jumped in one pass on another flight. All passes were to be controlled by the navigator using a Computed Air Release Point (CARP). Ballast loads were airdropped at 150 KCAS and 1,200 ft AGL. The parachutists were airdropped at 130 KCAS and 1,000 ft AGL. Three flights remain with 19 ballast loads and 37 jumpers to be airdropped.

Program Title: Lance Emergency Extraction System

JON: 921AAO

Priority: 07A

This program was conducted for AFSC/SDML (Acquisition Logistics). The purpose of the program was to investigate the opening characteristics and total forces of reefed and unreefed extraction parachutes at high altitude. Testing was conducted to determine an optimum parachute configuration to be incorporated in an emergency jettison extraction system for use with the U.S. Army Lance Missile System when transported by C-130 aircraft. A total of nine parachute tow tests was made using unreefed 22- and reefed 28-ft  $D_0$  parachutes as the test items. Reefing line lengths of 37.5 and 40 ft were used. All tests were conducted at 18,000 ft pressure altitude and at indicated airspeeds ranging from 130 to 160 kt. This program has been completed.

Program Title: LAPES Training Program

JON: 921ABO

Priority: 81P

This program was used to maintain the currency and proficiency of C-130 pilots in LAPES deliveries for future LAPES programs. Single loads weighing 13,000 lb and tandem loads weighing 18,000 lb were dropped. Five tests were made at 5 to 10 ft AGL and at 130 KIAS. A 35-ft D<sub>0</sub> SS parachute was modified with a 6-ft diameter RGS attached to the centerline of the 35-ft parachute. One test was made from a C-130 aircraft flying at 2,000 ft pressure altitude and 130 KIAS. This program was cancelled on 1 June 1972.

Program Title: U.S. Coast Guard Special Airdrop Techniques

JON: 921WAO

Priority: 81P

The purpose of this program was to obtain trajectory data for two test load configurations that deliver components used by the Coast Guard to rapidly offload and store oil from a distressed tanker. The Coast Guard system is called Air Deliverable Anti-Pollution Transfer System (ADAPTS). During this period Air Force support of ADAPTS was expanded to test a pyrotechnic parachute release cutter that will be used in the ADAPTS. Two tests were made from a C-130 aircraft at 130 KIAS and 2,000 ft pressure altitude.

Mancarrying Branch (TGEM)

Program Title: SR-71 Personnel Parachute Tests

JON: 134ADO

Priority: 31B

This program was conducted for AFLC/MEIA, Det 51 SMAMA, Norton AFB, and Lockheed Aircraft Corp. The purpose of the program was to conduct tests on the personnel



Low Altitude Parachute Extraction System (LAPES) Delivery of an  
18,000-lb Tandem Load (JON 921ABO)



Live Subject Test of SR-71 Personnel Parachute (JON 134ADO)

parachute to be used in the SR-71 aircraft. The system consists of a T-10, 35-ft D<sub>0</sub> canopy modified to incorporate suspension line release lanyards to give air-crewmembers the capability of releasing six suspension lines after parachute opening and the ability to steer the parachute during descent. Eight tests were made. Two of the tests were made from the whirl tower at 175 or 300 knots launch speed. Six tests were made from a C-130 aircraft flying at 125 KIAS and 10,000 ft pressure altitude. The suspended load for two tests was a 300-lb torso dummy. Six tests were conducted by parachutists wearing high-altitude pressure suits. Testing was completed on 9 July 1971.

Program Title: B-1 Crew Module Escape Systems Tests

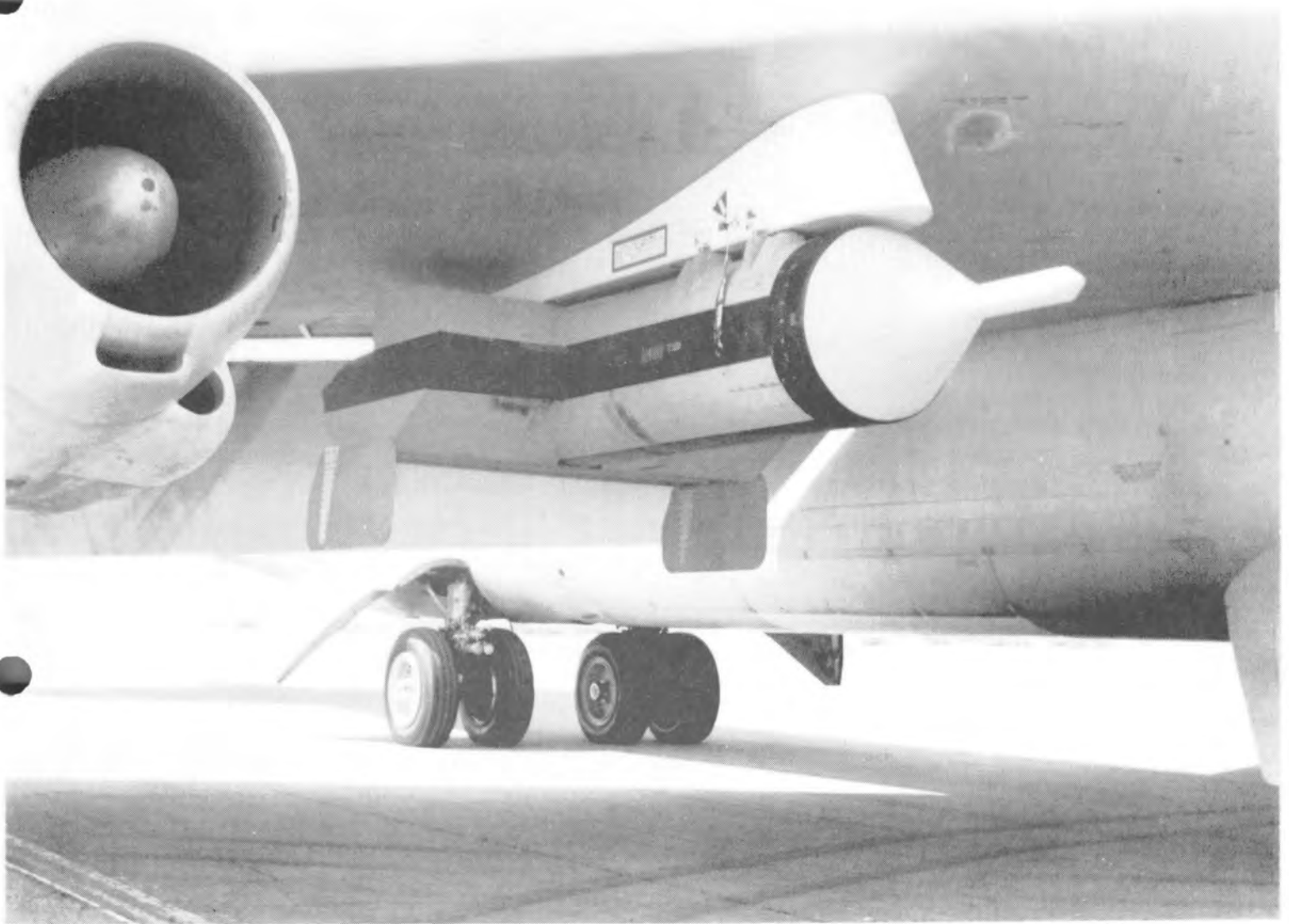
JON: 139AA0, AJ0, AK0, AL0, AM0, AN0

Priority: 19

The B-1 crew module escape systems test program is being conducted by the 6511th Test Group and the North American Rockwell Corp. for the B-1 System Program Office (SPO) Wright-Patterson AFB. The Pioneer Parachute Co has development responsibility on the parachute systems. The escape system testing at El Centro consists of the following five phases:

- I Drogue and Main Parachutes Development Tests
- II Pilot and Main Parachutes Qualification Tests
- III Drogue Parachute Qualification Tests
- IV Weighted Shell Recovery Tests
- V Prototype Module Recovery Tests

Testing was initiated on the first two phases during this reporting period and test planning efforts continued on the remaining phases. Thirty-five of thirty-eight programmed drogue and main parachutes development tests were conducted with modified weight-bombs ranging in weight from 2,900 to 8,700 lb.



B-1 Parachute Test Vehicle Mounted on Inboard Wing Pylon of  
B-52 Aircraft (JON 139AKO)

High speed drogue parachute tests were made from B-66 and F-4 aircraft at speeds of MACH 1.3 and 45,000 ft altitude. Eight main parachute qualification tests were made from B-52 aircraft using a special recovery parachute test vehicle at speeds up to 230 KEAS and altitudes up to 25,000 feet. Testing of the B-1 crew module escape system is expected to extend through 1975.

Program Title: "ACES" (Advanced Concept Ejection Seat)

JON: 412ADO

Priority: 08B

Testing continued on this program, which was conducted for ASD (ASWL). The McDonnell Douglas Corporation escape system was tested in 5 phases consisting of 124 tests. Phase I, Parachute Development Tests; Phase II, Parachute Qualification Tests; Phase III, Seat Airdrop Tests; Phase IV, Parachute Harness Tests; and Phase V, Inflight Ejection Seat Tests. One hundred and eight tests were made in Phases I and II and were reported previously. The remaining 16 tests were made on Phases III, IV, and V. Phase III consisted of dropping ejection seats with articulated dummies installed from the aft cargo ramp of a C-130 aircraft. Phase IV consisted of parachute harness tests conducted from either the drop tower or a C-130 aircraft using torso dummies. Phase V consisted of six inflight ejection tests made from F-9 or F-106 aircraft.

Program Title: Configuration II BA-18/22

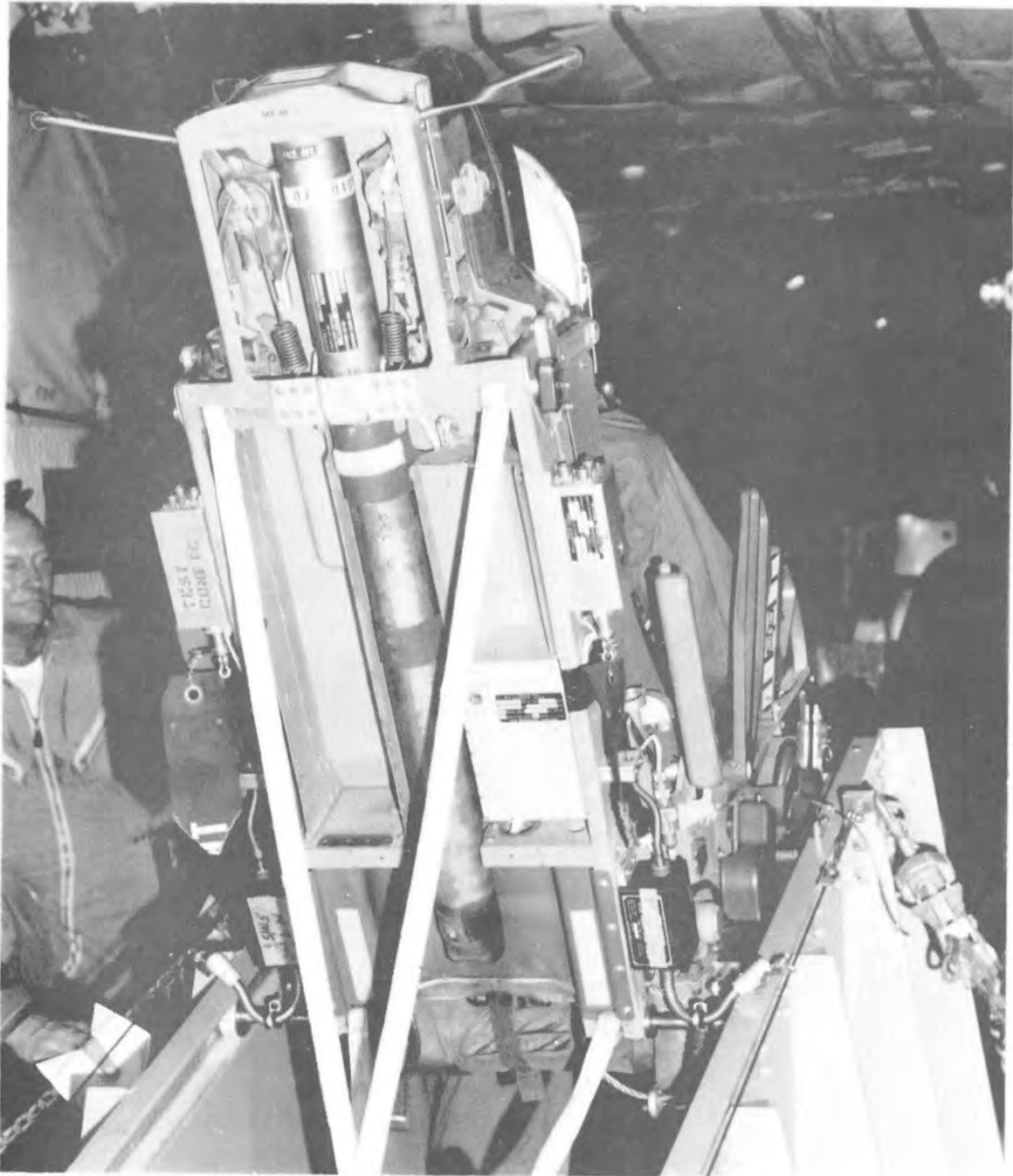
JON: 412AMO

Priority: 31A

This program was conducted for ASD/SML. The purpose of the program was to define the performance of the modified BA-18/22 personnel parachute. The test item was a BA-18/22 parachute modified by the addition of the Stencel external pilot chute system and the incorporation of a pull-down vent line. Nine tests



Advanced Concept Ejection Seat (Front View) on Launching Ramp Used  
During Phase IV Tests (JON 412ADO)



Advanced Concept Ejection Seat (Rear View) on Launching Ramp Used During Phase IV Tests (JON 412ADO)

were made from a C-130 aircraft flying at 110 or 150 KIAS and 1,000 ft pressure altitude. The suspended load was a 215-lb torso dummy.

Program Title: Frost Parachute Hardware

JON: 412APO

Priority: 31A

This program was conducted for ASD (SML). The purpose was to qualify new parachute hardware. The test item was parachute canopy and harness release hardware developed by Frost Engineering Development Corporation. The hardware was installed on a torso harness and attached to a 24-ft D<sub>0</sub> low porosity canopy. Eight tests were made from the whirl tower using 250-lb torso dummies. Airspeeds ranged from 150 to 195 knots. Ninety-three additional tests are planned.

Program Title: F/RF Harness, Quick Release, Single Point Activation

JON: 412ARO

Priority: 31A

This test program was conducted at the request of ASD (SML) and consisted of 23 torso dummy drops made under 4 test conditions. Test procedures conformed to test methods T112 and T105 as described in MIL-STD-858. All canopies were static line deployed. The test item was a single point activation quick release hardware. Testing was completed in April 1972 and a letter report was submitted to ASD (SML).

Program Title: OV-1 Ejection Seat Tests

JON: 921CJO

Priority: 42

The OV-1 ejection seat system test program was conducted for the Army Aviation Systems Command. Its purpose was to qualify a modified MK-J5 ejection seat



Articulated Dummies on Special Launching Ramp Used During OV-1 Ejection Seat Tests from a C-130 Aircraft (JON 921CJO)

for the OV-1 aircraft. Grumman Aircraft was the contractor modifying the MK-J5 ejection seat. The test item consisted of the modified MK-J5 ejection seat which was equipped with a 28-ft D<sub>0</sub> FC parachute, a 5-ft drogue chute, and a survival kit. Test loads consisted of articulated dummies and test parachutists. Twenty-two tests were made. Four of these were ejection tests made from F-9J or F-106 aircraft.

Program Title: Modified T-10 Troop Type Parachute Tests

JON: 921CT0

Priority: 81A

This program was conducted for the U.S. Army Natick Laboratories. The purpose of the program was to acquire data for comparison with other modified T-10 parachutes. The test item was a T-10 parachute with a 35-ft D<sub>0</sub> canopy modified to incorporate a 1.25-in.-square mesh or a 1.75-in.-square mesh net attached to the canopy skirt. The suspended load was a 200- or a 267-lb torso dummy. Sixty tests were made from a C-130 aircraft flying at 110 KIAS and 1,000 ft pressure altitude. Testing was completed on 21 January 1972.

Program Title: HC-130 Parachute Deployment Procedures

JON: 921NF0

Priority: 81P

This test program was conducted for San Antonio Air Materiel Area through Aeronautical Systems Division (ASD). The purpose of the program was to evaluate the use of the 15-ft static line used with the pararescue A/P 28S-17 parachute in the HC-130 aircraft and to determine if the apex of the parachute canopy would strike the overhead delivery system (ODS) rails, located on the undersurface of the aft cargo door, during parachute deployment. The test item was a back-style personnel parachute, type A/P 28S-17, equipped with a

15-ft static line. Fifteen tests were made from an HC-130 aircraft flying at 1,000 or 3,000 ft pressure altitude and at 125 knots indicated airspeed. The suspended load was either a 200-lb articulated dummy or a test parachutist. This program was terminated by letter from ASD dated 1 March 1972. The last test was made on 4 February 1972.

Program Title: Human Air Tow Tests

JON: SC7100

Priority: 81P

This program was conducted by the Naval Aerospace Recovery Facility. The 6511th provided aircraft and crew, instrumentation, and instrumentation personnel. The purpose of the program was to develop equipment and techniques to be used in retrieval of pilots and/or aircrewmembers following ejection from stricken aircraft. This phase of testing was to determine the maximum airspeed at which a man can be towed beneath an aircraft in flight. Two tow tests were made using articulated dummies. These tests were made from a C-130 aircraft flying at altitudes ranging from 4,500 to 8,000 ft and at indicated airspeeds ranging from 110 to 200 kt. Eight tow tests were made using live subjects. The tests were made from a C-130 aircraft flying at 8,000 ft pressure altitude and at indicated airspeeds ranging from 110 to 175 kt.

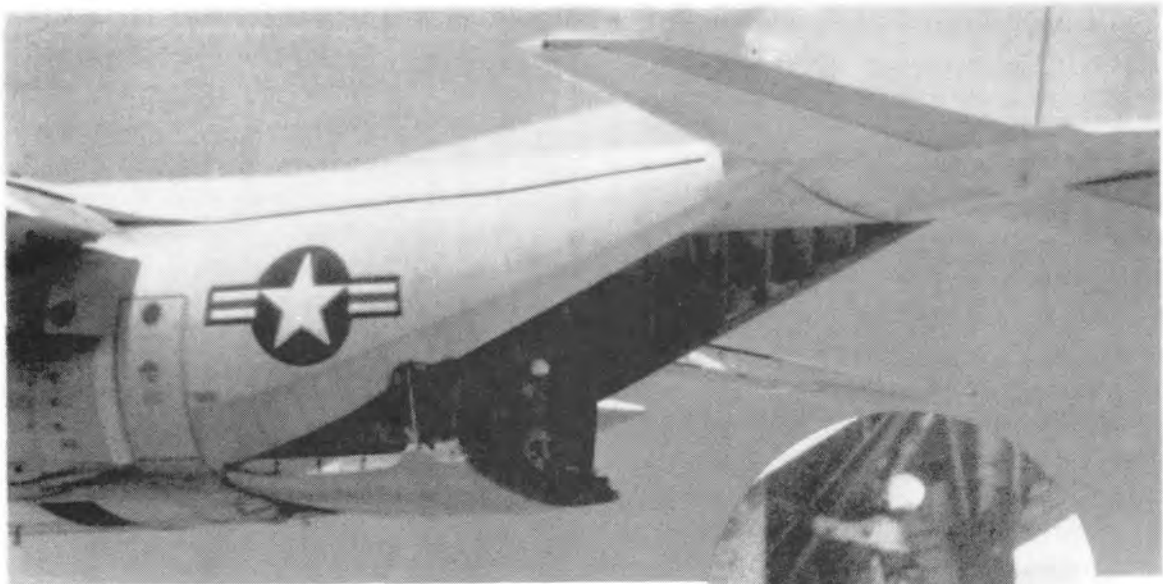
High Speed Recovery Branch (TGER)

Program Title: RGS Parachute Performance Data Acquisition

JON: 1875C0

Priority: 38N

The purpose of this in-house program is to compile performance data on RGS parachutes used for test purposes. Eleven tests were made. One test was made



Live Subject Being Towed Behind and Boarding a C-130 Aircraft (JON SC7100)

with a 6-ft diameter RGS parachute and ten tests were made with a 5-ft diameter RGS parachute. A 750- or a 1,000-lb cylindrical test vehicle was used as the suspended load. The vehicle was dropped from a B-66 or an A-4 aircraft flying at indicated airspeeds ranging from 120 to 412 kt and at pressure altitudes ranging from 10,000 to 40,000 ft. Four hundred and fifty-six tests are authorized. The first test was made in May 1966 and testing is expected to be completed in the last quarter of CY73.

Program Title: Midair Retrieval System II Product Improvement Program  
(Pioneer)

JON: 468AJ0

Priority: 01A

This program is being conducted for AFSC (ASD/RWDD). The purpose of the program is to increase system reliability and performance. Thirty-three tests were made. The basic system consists of a 24-in. vane pilot chute, an 8.8-ft  $D_0$  conical ribbon drag chute, a 24-ft  $D_0$  ring slot engagement chute, and a 100-ft  $D_0$  triconical main chute. Test loads are cylindrical test vehicles weighing between 1,700 lb and 6,000 lb. Tests were made from A-4, B-66, C-130, and F-4 aircraft at indicated airspeeds ranging between 110 kt and M 0.9 and at pressure altitudes between 10,000 ft and 42,000 ft. Sixty-five tests are authorized. The first test was made in October 1971 and testing is expected to continue through November 1972.

Program Title: Midair Retrieval System II Product Improvement Program  
(Steinthal)

JON: 468AK0

Priority: 01A

This program is being conducted for AFSC (ASD/RWDD). The purpose of the program is to qualify a system for use with the BQM-34E/F remotely piloted vehicles.

Thirty-two tests were made. The system consists of an 8.8-ft  $D_0$  conical ribbon chute, an 18.75-ft  $D_0$  engagement chute, and a 79.6-ft  $D_0$  triconical main chute. Test loads have been cylindrical test vehicles, BQM-34 bomb test vehicles, and dummy vehicles. Tests were made from A-4, B-66, C-130, and F-4 aircraft at indicated airspeeds ranging from 130 kt to M 0.9 and at pressure altitudes of 5,400 ft to 27,050 ft. Thirty-seven tests have been authorized. The first test was made in July 1971 and testing is expected to continue through September 1972.

Program Title: Parachute Performance Similarity

JON: 6065F0

Priority: 55T

This program was conducted for AFFDL/FER. The purpose of the program was to develop laws of similitude for 24-, 32-, and 64-ft  $D_0$  ring slot parachutes and for 28-ft  $D_0$  flat circular parachutes. Ten tests were completed. Three tests were made on a 64-ft  $D_0$  ring slot parachute using a 1,490-lb cylindrical vehicle as the suspended load. The load was dropped from a B-66 aircraft flying at 125, 130, or 161 KEAS and at 6,000, 7,000, or 12,000 ft pressure altitude. Seven tests were made on a 28-ft  $D_0$  FC (C-9) parachute using a 250-lb cylindrical vehicle as the suspended load. The load was dropped from a T-33 or an A-4 aircraft flying at 130 or 150 KEAS and at 6,000 ft pressure altitude. The program was terminated in March 1972.

Program Title: Opening Dynamics of Extended Skirt Type Parachutes

JON: 6065H0

Priority: 55T

This program is being conducted for AFFDL/FER. The purpose of the program is to acquire experimental data relating to the opening and steady state descent

characteristics of two kinds of 35-ft  $D_0$  10 percent extended skirt parachutes. The parachutes under test are the standard troop type T-10 and a high strength canopy, fabricated in accordance with Exhibit FDFRR-7. Seven tests were completed. Three tests were made on the T-10 type parachute using a 250-lb cylindrical vehicle as the suspended load. The load was dropped from a T-33 or an A-4 aircraft flying at 120 or 150 KEAS and at 1,000 or 3,000 ft pressure altitude. Four tests were made on the Exhibit FDFRR-7 canopy using a 250-lb cylindrical vehicle as the suspended load. The load was dropped from a T-33 or B-66 aircraft flying at 130, 140, or 150 KEAS and at 1,000, 10,000, or 36,000 ft pressure altitude.

Program Title: Performance Similarity of Ring Slot Parachutes

JON: 6065J0

Priority: 55T

This program is being conducted for AFFDL/FER. The purpose of the program is to acquire experimental data relating to the opening and steady state descent characteristics of various kinds of 24- and 32-ft  $D_0$  ring slot parachutes. These parachutes are varied according to the number of gores and geometric porosity. Ten tests were completed. Four tests were made on a 24-ft  $D_0$  ring slot parachute using a 250-lb cylindrical vehicle as the suspended load. The load was dropped from a T-33 or an A-4 aircraft flying at 130, 135, 145, or 150 KEAS and at 12,000, 13,500, 24,000, or 25,000 ft pressure altitude. Six tests were made on a 32-ft  $D_0$  ring slot parachute using a 250-lb cylindrical vehicle as the suspended load. The load was dropped from a T-33, A-4, or B-66 aircraft flying at 145, 150, or 160 KEAS and at 1,500 or 8,000 ft pressure altitude.

Program Title: McDonnell Douglas Aerial Recovery System

JON: 69AJCO

Priority: OIA

This program is being conducted for the Space and Missile Systems Organization (SAMSO). In the last History, this program was noted to have been terminated in March 1971. However, in July 1971 it was reactivated under Job Order Number 69AJA0. In September 1971 it was changed to JON 69AJCO. The purpose of this program is to improve the deployment and opening characteristics of the present McDonnell Douglas aerial recovery system. The system consists of an 8.1-ft  $D_0$  hemisflo drogue chute and a 56.3-ft  $D_0$  10 percent extended skirt main recovery parachute having a 15-ft high conical extension at the canopy apex. Fifty tests were documented with thirty-eight acceptable tests required to complete the program. Later revisions increased the total number of tests required to 80. Sixty-one tests have been completed. Tests were made from B-52, B-66, F-4, and C-130 aircraft flying at airspeeds ranging from 120 to 255 knots and at altitudes ranging from 18,000 to 50,000 ft. The suspended loads ranged from inert weight bombs weighing 689 lb to cylindrical test vehicles weighing 1,330 lb. Of the total tests, eight terminated in successful aerial retrievals by a JC-130 aircraft. The JC-130 was a SAMSO support aircraft. One test was a tow test in which a 9-ft diameter hemisflo drogue chute was towed behind an F-4 aircraft at a speed of 255 knots at 50,000 ft for a period of about 45 seconds. In one test, the strain gage link in the main riser system broke during opening and the load free fell to ground impact. In one test the main canopy was heavily damaged during parachute opening. All other tests were acceptable.



Midair Retrieval of 1,200-lb Weight Bomb (JON 69AJCO)

Program Title: SAMSO Aerial Recovery System

JON: 69AJFO

Priority: 01A

This program is being conducted for the Space and Missile Systems Organization (SAMSO). The purpose of the program is to evaluate the deployment and opening characteristics of a midair recovery system. Three types of recovery systems were tested: (a) a 53-ft  $D_0$  extended skirt parachute with a 15-ft high conical extension at the apex, (b) a 57.8-ft  $D_0$  extended skirt parachute with a 15-ft high conical extension, and (c) a 51.8-ft  $D_0$  ring sail parachute with a 16-ft  $D_0$  ring slot pickup chute. Forty tests were made using a weight bomb or cylindrical test vehicle ranging in weight from 690 to 1,330 lb as the suspended load. The load was launched from B-52 or C-130 aircraft flying at airspeeds ranging from 120 to 204 knots and at altitudes ranging from 10,000 to 50,000 ft. Four tests terminated in midair retrievals by a JC-130 aircraft furnished by SAMSO. The B-52 used to support this program was obtained from AFSWC, Kirtland AFB. Twenty of the missions were flown by the B-52.

Program Title: SAMSO MK-9 Retrieval System

JON: 69AJMO

Priority: 01A

This program is being conducted for the Space and Missile Systems Organization (SAMSO). The purpose of the program is to evaluate the retrieval characteristics of a single large chute. The test item was a 64-ft  $D_0$  combination ring slot/ring sail parachute. Four tests were made using a 1,200-lb weight bomb as the suspended load. The load was dropped from a C-130 aircraft flying at 120 KIAS and at altitudes ranging from 19,300 to 25,000 ft. Midair retrieval of the system and load was accomplished in three tests. In one test, the grappling hooks tore through the canopy and retrieval was not

accomplished. A JC-130 aircraft furnished by SAMSO was used to retrieve the system.

Program Title: Project Black Brant

JON: 7659A0

Priority: 56F

This program is being conducted for AF Cambridge Research Laboratories. The purpose of the program is to evaluate the performance and aerial retrievability of an aerial recovery parachute system designed to be used in the aerial retrieval of a Black Brant MK-VB sounding rocket payload. The aerial recovery system consisted of a 6.5-ft nominal diameter ( $D_0$ ) hemisflo drogue parachute and a 43-ft  $D_0$  modified ring sail recovery parachute. Fifteen tests were completed using weight bombs, cylindrical test vehicles, and special test shapes weighing 343 or 454 lb as the suspended load. The load was launched from B-52 or C-130 aircraft flying at airspeeds ranging from 120 to 215 knots and at altitudes ranging from 6,560 to 40,000 ft. Midair retrieval of the payload was accomplished on eight of the tests using a JC-130 furnished by Space and Missile Systems Organization/Air Force Satellite Control Facility/Directorate of Recovery (SAMSO/AFSCF/RE) as the retrieval aircraft. The test program at this Group was completed; however, a rocket launched systems test at Eglin AFB range complex is scheduled for July 1972. The final report to be prepared by this Group will include data from the rocket launched systems test.

Program Title: NASA Viking Low Altitude Drop Program

JON: 921ENO

Priority: 81P

This program is being conducted for the National Aeronautics and Space Administration (NASA). The purpose of the program is to develop a mortar-deployed

decelerator system to be used for the Viking Project, which is scheduled to land an unmanned vehicle on Mars in 1975. Ten tests were made. The test decelerator is a 53-ft D<sub>0</sub> disk-gap-band parachute. The test load is a cylindrical test vehicle weighing between approximately 1,000 and 3,000 lb. One test was a captive flight test to verify operation of support equipment. Nine drop tests were made from a B-57 aircraft flying at 145 knots indicated airspeed and at 48,500 ft pressure altitude. Fourteen tests have been authorized. The first test was made in August 1971 and the final test is expected to be made in late CY 1973.



Test of Decelerater System to be Used in Landing an Unmanned Vehicle  
on Mars (JON 921ENO)

FOOTNOTES

1. 6511th Test Group Study of Proposed Aircraft Relocation and Reorganization, 23 May 1972.
2. Hunter, Henry J. and Boyer, G. E., Capt, USAF, Evaluation Tests of C-5A Airplane Aerial Delivery System, Phase II Airdrop and Jettison Capability, FTC-TR-71-47, November 1971.

## GLOSSARY

AERCAB	Aircrew Escape Rescue System Capability
AFFTC	Air Force Flight Test Center
AFLC	Air Force Logistic Command
AFSC	Air Force Systems Command
AMC	Army Materiel Command
ASD	Aeronautical Systems Division
CARP	Computed Air Release Point
D <sub>o</sub>	nominal diameter
DO	Deputy Commander for Operations
CR	conical ribbon
DIFM	due in from maintenance
ES	extended skirt
FC	flat circular
JON	job order number
KEAS	knots equivalent airspeed
KIAS	knots indicated airspeed
LAPES	low-altitude, parachute-extraction system
NAF	Naval Air Facility
NASC	Naval Air Systems Command
NORS	not operationally ready--supply
OR	Operationally ready
REMS	Registered Equipment Management System
RGS	ribless guide surface
RS	ring slot
RS'	ring sail
SAMSO	Space and Missile Systems Organization
SEA	Southeast Asia

## GLOSSARY (Continued)

SMAMA	Sacramento Air Materiel Area
SPO	Systems Program Office
SS	single slot
TCTO	time-compliance technical order
TM/TO	technical manual/technical order
TR	technical report
UHF	ultra-high frequency
WB	Wage Board
WRAMA	Warner-Robins Air Materiel Area

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