PARACHUTE TECHNOLOGY

Volume I of II Volumes

A DDC BIBLIOGRAPHY

March 1954 - September 1970

DDC-TAS-70-871

Approved for public release; distribution unlimited.

May 1971

DEFENSE DOCUMENTATION CENTER
Cameron Station
Alexandria, Virginia 22314

UNCLASSIFIED
The references in this bibliography are sorted into seven sections. Section I pertains to the testing or the results of testing of parachutes as a whole configuration; Section II to the theoretical and empirical studies of parachute aerodynamics; Section III to the materials involved in parachute systems; Section IV to the release mechanisms; Section V to parachute jumping and packs; Section VI to air drop operations; and Section VII to miscellaneous references.
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FOREWORD

This bibliography is Volume I of a two-volume set on Parachute Technology. It contains 124 unclassified references with unlimited distribution that were processed into the Defense Documentation Center's data bank from January 1953 to March 1971. Entries are arranged by subject areas and sequenced by AD number within each subject area.

A LISTING OF IDENTIFIERS, or selected terms taken from the vernacular of the technical personnel doing the research, is provided with respective AD numbers on which the terms may be found. The computer-generated indexes are: Subject, Title, Personal Author, and AD Numeric.

Volume II, AD-515 800, is confidential.

BY ORDER OF THE DIRECTOR, DEFENSE SUPPLY AGENCY

OFFICIAL

ROBERT B. STEGMAN, JR.
Administrator
Defense Documentation Center
The following is a selective list of titles of bibliographies related to this topic. Additional titles of other *scheduled bib* also appear on the back cover.

- BASE FLOW
- AIRCRAFT LANDINGS
- ATMOSPHERE TURBULENCE
- LANDING FIELDS AND RUNWAYS
- GLIDER AIRCRAFT AND SAILPLANES
- DESERT TEST OF MILITARY AIRCRAFT

For more information on Scheduled Bibliographies, call 202-OX4-7307 or write to the Defense Documentation Center, ATTN: DDC-TAS.
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**HOW TO ORDER BIBLIOGRAPHIC REPORTS** *(Inside back cover)*

**PARTIAL LIST OF SCHEDULED BIBS** *(Back cover)*
LISTING OF IDENTIFIERS

Aerodynamics decelerators
AD-664 046, 670 984, 675 181, 675 182

Extraction parachutes
AD-570 965, 670 984, 671 682, 672 079, 672 081, 672 087

Alamo sling - shot systems
AD-609 366

Gas cannons
AD-695 086

Automatic uncouplers
AD-696 225

Gun launched projectiles
AD-666 746

Ballistic hatch release
AD-647 361

Halo parachutes
AD-639 342

Balloon parachutes
AD-681 455

High altitude research program
AD-666 746

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AD-625 785, 664 046, 666 021, 681 455, 670 984

Lapes platforms
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AD-691 005

Lift/drag ratio
AD-667 401

Brake parachutes
AD-621 777, 661 943, 661 954

Lift parachutes
AD-672 087

Canopy systems
AD-667 401

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AD-667 401

Cluster parachutes
AD-690 809

Lifting of aerodynamic decelerators
AD-669 665

Concave bodies
AD-693 355

Low altitude extraction
AD-691 436

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AD-696 644

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AD-606 569

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AD-683 066

Main parachutes
AD-693 466

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I. PARACHUTES
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SUPPLEMENTARY NOTE:

DESCRIPTIVE NOTE: FINAL REPT. MAY 69-DEC 65.

REPT. NO.: GEN-12317

CONTRACT: AF19(628)-4194

PHRASE: AF-6682

TASK: 6682D

MONIT. I.: AFML; 65-877

UNCLASSIFIED REPORT

A BALLUTE(A) RETARDATION SYSTEM FOR ARCAS
ROCKET-LAUNCHED METEOROLOGICAL INSTRUMENTS WAS
INVESTIGATED. VARIOUS BALLUTE CONFIGURATIONS WERE
FABRICATED, TESTED, AND EVALUATED IN FOUR STAGES:
AIROCK DROP TESTS; LOW-ALTITUDE HELICOPTER DRIP
TESTS; HIGH-ALTITUDE BALLOONBURN DROP TESTS; AND
ROCKET-LAUNCHED FLIGHT TESTS AT CAPE KENNEDY.
THE PROGRAM CULMINATED IN THREE SUCCESSFUL ROCKET-
LAUNCHED FLIGHTS OF THE FINAL CONFIGURATION WHICH
BECAUSE OF THE HIGH STABILITY OF THE SYSTEM, YIELDED
TELEMETRED TEMPERATURE DATA OF UNPRECEDENTED
QUALITY. THE BALLUTE SYSTEM THAT MEETS THE DESIGN
GOALS OF RELIABILITY, STABILITY, DESCENT RATE, AND
COST WILL BE MADE OF FRACTIONAL MIL PLASTIC FILM,
WILL BE ABOUT 16-1/2 FT IN DIAMETER, AND WILL WEIGH
ABOUT TWO POUNDS. FURTHER DEVELOPMENT AND SYSTEM
QUALIFICATION TESTING ARE RECOMMENDED PRIOR TO
INCORPORATION OF THE BALLUTE INTO THE OPERATIONAL
SOUNDOING SYSTEM. (AUTHOR)
UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL 407 2/0UN5

AD-620 305 19/6
NAVAL AIRCRAFT TORPEDO UNIT WUUNSET POINT R 1
TORPEDO STABILIZER MARK 31 MOD 0 DEVELOPMENT
PHASE.

DESCRIPTIVE NOTE: FINAL REPT.
JAN 60 37P FERRENS, A. R. I
REPT NO. NAVAIRTORPU-TM-189,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTES:

DESCRIPTORS: AIRCRAFT TORPEDOES, STABILIZATION
SYSTEMS, HELICOPTERS, TORPEDO LAUNCHERS, TORPEDO
TRAJECTORIES, DRAG PARACHUTES, TORPEDOES

THIS FINAL REPORT DESCRIBES THE DEVELOPMENT OF THE
PARACHUTE-TYPE TORPEDO STABILIZER MARK 31 MOD
0 CURRENTLY USED AS A TORPEDO MARK 46
HELICOPTER LAUNCHING ACCESSORY. THE STABILIZER
INCORPORATES A NOVEL RELEASE MECHANISM WHICH HAS
PROVEN TO BE A HIGHLY RELIABLE PRINCIPLE OF
OPERATION. CALCULATED AND EXPERIMENTAL DATA IS
PRESENTED TO VALIDATE THE DESIGN CONCEPT AND TO
PROVIDE A BASIS FOR AN IMPROVED MODEL DEVELOPMENT
PROGRAM. RECOMMENDATIONS ARE MADE FOR ITS USE WITH
TORPEDOES MARK 49 AND 46 MOD 1 AT EXTENDED
LAUNCHING CONDITIONS. (AUTHOR)
UNCLASSIFIED

DOE REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 7/3062

AD 690 704
FOREIGN TECHNOLOGY DIV ORIENT-PAULSON AFB OMNI
DRAG PARACHUTE
SEP 66
Ddr. KATZHEY, I. L. & KHAMILEV, S. G.
Do. VAKONIYAKHEV, I. 5.
REPT. NO. FLA-TT-66-109

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
PATENT (URSR) 171 275; APPL 702109/90-23; 14 A-10
59.

DESCRIPTORS: (DRAG PARACHUTES; ACTUATORS);
PATENTS; USSR; RELIABILITY; SPRINGS; SAFETY

THE OBJECT OF THE INVENTION IS A DRAG PARACHUTE.
TO INCREASE THE RELIABILITY OF THE PARACHUTE AND
JUMP SAFETY, IT IS MADE IN THE FORM OF A SPHERICAL
SPRING MECHANISM WITH THE UPPER PART COVERED BY A
DENSE FABRIC AND THE LOWER PART COVERED WITH A MESH
AND EQUIPPED WITH AN EXTERNAL CONICAL SPRING.
(AUTHOR)

4

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UDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 120466

AD=66, 1+3 1/2

ADVISORY GROUP FOR AERONAUTICAL RESEARCH AND DEVELOPMENT
PARIS (FRANCE)

ETUDE DE L'EMPLOI DU PARACHUTE-FREIN A L'AUTOMATISME
(STUDY OF THE USE OF THE BRAKE PARACHUTE IN AIRCRAFT
Landing), (U)

JOT 30 26P CREMON, J.

REP. NO. AGARD-227

UNCLASSIFIED REPORT

SUPPLEMENTARY VOTES: NATO FURNISHED TEXT IN FRENCH
PREPARED FOR PRESENTATION AT THE MEETING OF THE
WORKING GROUP ON "LOWERS AND MOCK-UP STUDIES"
(14TH), HELD 20-21 OCTOBER 1958 AT COPENHAGEN,
DENMARK.

DESCRIPTIONS: (AIRCRAFT LANDING, DRAG
PARACHUTES), BRAKING (U)

THE INCREASE IN WEIGHT AND LANDING SPEEDS OF
AIRCRAFT HAS FOR SOME YEARS BEEN SUCH AS TO MAKE THE
BRAKING OF AIRCRAFT AN INCREASINGLY DIFFICULT PROBLEM
TO SOLVE. ALTHOUGH NUMEROUS INVESTIGATIONS HAVE
BEEN MADE AND SOME NEW SOLUTIONS HAVE BEEN TRIED OUT,
FEW OF THESE HAVE BEEN ADOPTED IN PRACTICE. ONE OF
THESE SOLUTIONS - THE BRAKE PARACHUTE - IS NOW WIDELY
USED. THE REPORT REVIEWS A NUMBER OF FACTS ABOUT
THIS METHOD OF BRAKING, AND IS DIVIDED INTO THRE
PARTS. THE FIRST PART DISCUSSES THE PROBLEM
EXPERIMENTALLY, THE SECOND DEVELOPS THE THEORETICAL
ASPECTS AND THE THIRD CONTAINS OBSERVATIONS ON THE
VARIOUS RESULTS OF ITS USE IN SERVICE CONDITIONS.

(AUTHOR). (U)
The effect of various factors on the ground deceleration and stopping distance of aircraft is discussed. Sources of deceleration such as wheel braking, airplane drag, aerodynamic braking, parachutes, reversed turbojet thrust, and reversed thrust of turbopropeller engines are considered. The effect of tire friction, wheel load, and brake capacity on wheel braking and the effect on stopping distance of airplane handling techniques that involve the use of elevators, flaps, spoilers, and nose-high attitude angles are covered in some detail. An appendix includes a mathematical analysis of some of the factors affecting deceleration and stopping distance. (Author)
UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 74012

AU-664 U46 1/3 5/2
TECHNOLOGY INC CARYTON OHIO
COMPUTERIZED DATA CATALOG AND RETRIEVAL SYSTEM FOR
DEPLOYABLE AERODYNAMIC DECELERATORS.

DESCRIPTIVE NOTE: FINAL REPORT 15 DEC 66-JUN 67
NOV 67 48P MORGAN THOMAS J. JR.
SCHAUER J. J.;

CONTRACT: FJ361G-67-C-1232
PROJ. AF-6069
TASK: 605502
MONITOR: AFFUL T"=67-115

DESCRIPTIONS: (DECELERATION, PARACHUTES),
(DATA STORAGE SYSTEMS, DECELERATION),
(INFORMATION RETRIEVAL, DECELERATION), TEST
METHODS, BALLOONS, RUTORCHUTES, DATA PROCESSING
SYSTEMS, SHOP TESTING, CODING, NUCET-PROPELLED
SLEDS, COMPUTER PROGRAMS, DEPLOYMENT

IDENTIFIERS: PARACHUTES, AERODYNAMIC
DECELERATORS

IN THE DEVELOPMENT OF A COMPUTERIZED DATA CATALOG
AND DATA RETRIEVAL SYSTEM FOR DEPLOYABLE AERODYNAMIC
DECELERATORS, THE RESULTS WERE TROFUL: (1) A
LIST OF PARAMETERS WHICH COMPLETELY DEFINE THE
INFORMATION PERTINENT TO THESE DECELERATORS; A
(2) A DATA BASE (THE STRUCTURE TO ARRANGE THE
DATA ELEMENTS MAKING UP A UNIT OF INFORMATION) AND
THE COMPUTER PROGRAM TO MANIPULATE THE DATA BASE.
THE COMBINATION OF THESE RESULTS CONSTITUTES A
SYSTEM TO STORE AND RETRIEVE BY COMPUTER TECHNIQUES
ALL DATA RELATED TO DEPLOYABLE AERODYNAMIC
DECELERATORS. (AUTHOR)
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DOE REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /ZONCZ

UNCLASSIFIED

GOOD YEAR AEROSPACE CORP AKRON OHIO
BALLUTE DEVELOPMENT FOR LOKI-DART AND ARCAS
ROCKETSONDES

DESCRIPTIVE NOTE: FINAL REPT. FEB 66-AUG 66;
NOV 66 51P GRAHAM, JOHN R., JR.
REPT. NO. GER-1401U
CONTRACT: AF 19(62b)-5851
PROJ: AF-6682
TASK: 668203
MUNITION AFCRL 68-0622

UNCLASSIFIED REPORT

DESCRIPTIONS: (SOUNDING ROCKETS; PARACHUTES),
DECELERATION, RADIOSONDES; STABILIZATION,
ATMOSPHERIC SOUNDING; WIND; ATMOSPHERIC
TEMPERATURE; MANUFACTURING METHODS; COSTS; FLIGHT
TESTING; METEOROLOGICAL BALLOONS

IDENTIFIERS: RETARVATION DEVICES; BALLOON
PARACHUTES; ARCAS, LOKI-DART SOUNDING ROCKETS,
PNK-8J SOUNDING ROCKETS, BALLUTES

GOOD YEAR AEROSPACE CORPORATION COMPLETED A
PROGRAM TO DEVELOP A STABILIZING DECELERATOR FOR THE
ARCAS AND LOKI-DART METEOROLOGICAL
ROCKETSONDES DURING THE PROGRAM OF CYCLIC
MODIFICATION: TEST, AND EVALUATION; 53 DEVELOPMENT
UNITS WERE FLIGHT TESTED AT THE AIR FORCE
EASTERN TEST RANGE; THE DESIGN PERFORMANCE
GOALS WERE REACHED FOR BOTH SYSTEMS; FIFTY-FIVE
PREPRODUCTION UNITS OF THE LOKI-DART BALLUTE
WERE FABRICATED FOR FURTHER EVALUATION BY AIR
FORCE CAMBRIDGE RESEARCH LABORATORIES AS
A RESULT OF THIS PROGRAM THE LOKI-DART BALLUTE
(PARACHUTE, METEOROLOGICAL AF62V-5) HAS
INTEGRATED INTO THE STANDARDIZED FAN-66
METEOROLOGICAL ROCKETSonde CURRENTLY IN
PRODUCTION. (AUTHOR)

10

UNCLASSIFIED /ZONCZ
A PARACHUTE CANOPY WITH POCKETS: (U) SEP 69 4P
REPT: NO. FSTC-6T=23=39169
PROJ: FSTC-02R0500

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 193 941, 22 MAY 67.

DESCRIPTIONS: (PARACHUTE, DESIGN), STRUCTURAL
PARTS, CONSTRUCTION, SAFETY, PATENTS, USSR (U)
IDENTIFIERS: PARACHUTE CANOPIES, TRANSLATIONS (U)

THE DOCUMENT DESCRIBES A PARACHUTE WITH POCKETS ON
THE CANOPY AND HOLES BENEATH THE POCKETS DESIGNED TO
ADMIT AIR AT THE HOLES TO ASSURE THAT THE CANOPY WILL
OPEN FROM THE CENTRAL PORTION OUT. (AUTHOR) (U)
UNCLASSIFIED

UNCLASSIFIED REPORT BIBLIOGRAPHY

SEARCH CONTROL NO. /ZONC2

AU-54-2 2

RAYN FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

PARACHUTE CANOPY

SEP 69

OSMOLSKII, I.V.

REPT. No. FSTC-41-408469

PROJ. FSTC-0423100

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 205 611

16 JAN 60.

DESCRIPTIONS: (PARACHUTES; DESIGN; AUTOMATIC
OPERATION; LOADING (MECHANICS); CORDAGE;
CALIBRATION; PATENTS; USSR
IDENTIFIERS: PARACHUTE CANOPIES, TRANSLATIONS

THE INVENTION DESCRIBES AN IMPROVED PARACHUTE
CANOPY, EQUIPPED WITH A DEVICE WHICH AUTOMATICALLY
INCREASES THE SIZE OF THE CANOPY VENT UNDER A
SPECIFIED CANOPY LOADING CONDITION. (AUTHOR)
UNCLASSIFIED

UCR REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 7201642

AG-693 4 2y 1/3
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

A PARACHUTE CANOPY WITH POCKETS.

SEP 69 6p

REPT. NO.: FSTC-MT-23-391-69

PROJ.: FSTC-02RD500

UNCLASSIFIED REPORT


22 MAY 67.

DESCRIPTION: (PARACHUTES, DESIGN), STRUCTURAL

PANTS, CONSTRUCTION, SAFETY, PATENTS, USSR

IDENTIFIERS: PARACHUTE CANOPIES, TRANSLATION

THE DOCUMENT DESCRIBES A PARACHUTE WITH POCKETS ON

THE CANOPY AND HOLES BENEATH THE POCKETS DESIGNED TO

ADMIT AIR AT THE HOLES TO ASSURE THAT THE CANOPY WILL

OPEN FROM THE CENTRAL PORTION OUT. (AUTHOR)
UNCLASSIFIED

UNCERTAIN

DNC REPORT BIBLIOGRAPHY

SEARCH CONTROL No. /ZONCA

AU-69J 467 1/3

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D. C

PARACHUTE CANOPY, SEP 69... (U)

OSMOLOVSKII, I. V. I

REPT. No. FSTC-MT-43-408-69

PROJ. FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 205 611, 19 JAN 69.

DESCRIPTIONS: (PARACHUTES; DESIGN); AUTOMATIC

OPERATION, LOADING(MECHANICS); CORDAGE,

CALIBRATION, PATENTS, USSR

IDENTIFIERS: PARACHUTE CANOPIES, TRANSLATIONS (U)

THE INVENTION DESCRIBES AN IMPROVED PARACHUTE

CANOPY, EQUIPPED WITH A DEVICE WHICH AUTOMATICALLY

INCREASES THE SIZE OF THE CANOPY VENT UNDER A

SPECIFIED CANOPY LOADING CONDITION. (AUTHOR) (U)

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UNCLASSIFIED /ZONCA
SUPPLEMENTARY NOTE: TRANSLATION OF PATENT (USSR) 205,609, 19 JAN 69.

DESCRIPTIONS: (CARGO PARACHUTES, USSR), PATENTS, CONFIGURATION, ROTARY PARACHUTES

IDENTIFIERS: TRANSLATIONS

THREE ROTATING PARACHUTES ARE DESCRIBED. THEY CONSIST OF CONNECTED TRIANGLES WITH SHOUDERS ON TWO SIDES OF THE TRIANGLES ONLY. AIR FLOWS UNDER THE THIRD SIDE CAUSES THE PARACHUTES TO ROTATE.

(AUTHOR)
UNCLASSIFIED

LOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /204C2

AD-701-014 1/3
PIioneer Parachute Co Inc Manchester Con
Prototype Cluster-Parachute Recovery System for a
50,000-lb Unit Load Volume I Design Study

DESCRIPTIVE NOTE: Final rept., May 68-July 69
Jul 69 211P Thomas E. Wiemiller,
Wolfgang R. Knorr, Milan W. Gagov, Gradia Co.

CONTRACT: DAAG-17-66-C-0142
PROJ: DA-1-13F-162203-D-19Y
MONITOR: USA-NLabs TK-69-32-AD

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: See also volume 4, AD-701-005.

DESCRIPTIONS: (cargo parachutes, design), flight
testing, drop testing, parachute fabrics,
suspension devices, drag,
performance (engineering), air drop operations

IDENTIFIERS: G-114A parachutes, cluster
parachutes

The report covers a research and development
program to design and fabricate a prototype cargo-
recovery parachute assembly for airdropping heavy
unit loads in the order of 50,000 lb. The design
study covers the trade-off analysis and cost
effectiveness aspects for a complete parachute
assembly. From these studies, a design analysis
and complete detailed design were made based on the
specified performance and design requirements. Use
of data reduction on fullasscale cargo drops with G-
114A parachutes with vent-pull down configuration,
scale model wind tunnel tests and parametric studies
determined that it is feasible to use a cargo
parachute of 135 ft diam with a vent-pull down in a
cluster of six to recover a load unit of 50,000 lb.
(aut/40)

15
THE REPORT COVERS THE DIRECT DESIGN ASPECTS OF THE SELECTED PROTOTYPE CARGO RECOVERY ASSEMBLY FOR AIRDROPPING HEAVY UNIT LOADS IN THE ORDER OF 50,000 POUNDS. THE DETAILED DESIGN OF THE COMPONENTS IS COVERED AS WELL AS STRESS ANALYSIS TO DETERMINE THE MARGINS OF SAFETY FOR THE MATERIALS SELECTED. MATERIAL LISTS AND WEIGHTS FOR THE COMPONENTS ARE PROVIDED. LABORATORY TESTING OF INDIVIDUAL COMPONENTS AND STRENGTH EFFICIENCY OF STITCH PATTERNS ARE SHOWN. (AUTHOR)
II. AERODYNAMICS
A newly conceived gliding parachute, called the parafoil glider, and several existing glide parachutes have been examined with regard to their general stability, resulting stable angle of attack, and lift to drag ratio. The parafoil glider assumed stable angles of attack up to 50 degrees against the vertical, which represents a lift to drag ratio of approximately 1.2:1. The investigated existing parachutes had lift to drag ratios of less than unity. The tangential force coefficient of the parafoil glider amounts to approximately 1.2 at the position of the stable angle of attack.
UNCLASSIFIED

ADC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 7200C4

DOD 671

MICHIGAN UNIV MINNEAPOLIS INST OF TECH
THEORETICAL PARACHUTE INVESTIGATIONS

DESCRIPTIVE NOTE: PROGRESS REPT. NO. 23, 1 SEP 10 NOV 62

M. V. 62 64 P
HEINRICHS, G. E. ERIABOCHI, T.

CONTRACT: AF33 616 0340

PROJECT: 6093

TASK: 60252

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-605 144.

DESCRIPTIONS: (PARACHUTES, AERODYNAMIC CHARACTERISTICS),
CARGO PARACHUTES, RIBBON PARACHUTES, CONFIGURATION,
ACCELERATION, FABRIC, DYNAMICS, WIND TUNNELS, PARACHUTE
PARAMETERS, MODELS (SIMULATIONS), STABILITY, STATISTICAL
ANALYSIS

CONTENTS: INVESTIGATION OF MAKE EFFECTS ON THE
BEHAVIOR OF PARACHUTES AND OTHER RETARDATION DEVICES
BEHIND LARGE BOGIES: INVESTIGATION OF BASIC
STABILITY PARAMETERS OF CONVENTIONAL PARACHUTES;
THEORETICAL STUDY OF SUPERSONIC PARACHUTE
PHENOMENA: THEORETICAL ANALYSIS OF THE DYNAMICS OF
THE OPENING PARACHUTE: STATISTICAL ANALYSIS OF
EXTRACTION TIME, DEPLOYMENT TIME, OPENING TIME, AND
DRAG COEFFICIENT FOR AERIAL DELIVERY PARACHUTES AND
SYSTEMS: GLIDING AERODYNAMIC DECELERATORS
EFFECTIVE POROSITY STUDIES: STUDY OF FLOA
PATTERNS OF AERODYNAMIC DECELERATORS BY MEANS OF THE
SURFACE HALE ANALOGY: STRESS ANALYSIS OF THE T-10
TREOP PARACHUTE: AERODYNAMIC CHARACTERISTICS OF THE
PARACHUTE STABILIZED A-21 CARGO CONTAINER;
AERODYNAMIC CHARACTERISTICS OF THE CROSS AND TRIANGULAR
WHEEL TYPE PARACHUTES: DETERMINATION OF MASS FLOA
THROUGH PARACHUTES WITH INHERENT GEOMETRIC POROSITY.

18
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GDC REPORT ARLIUNOGRAPgy SEARCH CONTROL NO. 115766

AD 607 J38

COOK ELECTRIC CO. NORTON GROVE I1L.

STUDY OF PARACHUTE PERFORMANCE AND DESIGN PARAMETERS

FOR HIGH DYNAMIC PRESSURE OPERATIONS

(U)

DESCRIPTIVE NOTE: DEPT. FOR 1 JUL 62-31 DEC 63,

KAY 64 141P PEDERSEN, P. C. 1

CONTRACT: AF33 657 9132

PROJ: 6043

TASK: 606505

MONITOR: FDL 1, TUR 64 66

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: LEGIBILITY OF THIS DOCUMENT IS IN PART

UNSATISFACTORY. REPRODUCTION HAS BEEN MADE FROM BEST

AVAILABLE COPY.

DESCRIPTORS: (PARACHUTES; PERFORMANCE [ENGINEERING];

DESIGN; AERODYNAMIC LOADING; AERODYNAMIC

CHARACTERISTICS; ROCKET PROPELLED SLEDS; TESTS; SHOCK

[MECHANICS]; DRAG; STABILITY; TEMPERATURE; DECELERATION)

PARACHUTE DESIGN AND PERFORMANCE DATA WERE OBTAINED

ON A SERIES OF 24 ROCKET-POWERED SLED TESTS:

PARACHUTE DEPLOYMENT VELOCITIES, RANGING BETWEEN

MACH 1.0 AND 1.5, WERE OBTAINED WITH THE TOMBANAK

PARACHUTE TEST SLED OPERATING IN EITHER SINGLE STAGE

OR DOUBLE STAGE, PUSHER CONFIGURATION. PARACHUTE

TYPES THAT WERE INVESTIGATED INCLUDED HYPERFLO,

HEMISFLO, REEFED CONICAL RIBBON; AND

SUPersonic GUIDE SURFACE DESIGNS. THE DATA

OBTAINED INCLUDED INFLATION CHARACTERISTICS, OPENING

SHOCK FACTORS; DRAG COEFFICIENTS; INFLATED AREAS;

STABILITY; CANOPY TEMPERATURES AND GENERAL STRUCTURAL

AND AERODYNAMIC DESIGN CONSIDERATIONS. FROM THIS

PARACHUTE DECELERATOR TEST PROGRAM, IT MAY BE

CONCLUDED THAT THE HYPERFLO TYPE PARACHUTE, BOTH

HEMISPHERICAL ROOF DESIGNS, AND THE HEMISFLO TYPE

PARACHUTE CAN BE FABRICATED TO WITHSTAND AND OPERATE

SUCCESSFULLY IN THE HIGH DYNAMIC PRESSURE REGION OF

3000 PSF. SUPERSONIC REEFED OPERATION AND DISREELF

TO FULL OPEN WAS ALSO DEMONSTRATED AS PRACTICAL WITH

A CONICAL RIBBON TYPE PARACHUTE DESIGN. THE

TEST VEHICLE SYSTEM INCLUDING ASSOCIATED DEPLOYMENT

AND RELEASE TECHNIQUES AND THE DATA ACQUISITION

SYSTEM ARE ALSO DISCUSSED. (AUTHOR) (U)
UNCLASSIFIED

AU-80/637

PHILCO REPORT BEACH CALIF AERONUTRONIC DIV
AERODYNAMIC CHARACTERISTICS OF THE HYPER-
ENVIRONMENTAL TEST SYSTEM DATA RECOVERY VEHICLE FOR
MACH NUMBERS 0.62 TO 0.96. (U)

DESCRIPTION: TECHNICAL OPERATING REPT.

FED 60 94P
WARDEN, H. V. J
REPT. NO. AERONUTRONIC U-826

CONTRACT: AF04-647 449

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COMPLIANCE WITH AFM
EXHIBIT 59-1, SECTION 3-11.4. LEGIBILITY OF THIS
DOCUMENT IS IN PART UNSATISFACTORY. REPRODUCTION HAS BEEN
MADE FROM BEST AVAILABLE COPY.

DESCRIPTION: (RECOVERY VEHICLES, STABILITY); TRANSONIC
FLIGHT, AERODYNAMIC CHARACTERISTICS, ENVIRONMENTAL
TESTS, MODEL TESTS, NOSE CONES, CONFIGURATION, PARACHUTE
JUMPING, WIND TUNNELS

THE REPORT PRESENTS THE RESULTS OF A SERIES OF
TESTS IN CONVAIR'S HIGH-SPEED WIND TUNNEL TO
EVALUATE THE STABILITY OF THE NETS 609A RECOVERY
VEHICLE IN THE TRANSONIC REGIME. THE TESTS WERE
RUN WITH TWO NOSE CONFIGURATIONS AT MACH NUMBERS
0.62, 0.64, 0.67, 0.82, AND 0.96. BOTH
CONFIGURATIONS WERE SUFFICIENTLY STABLE TO PERMIT
PARACHUTE DEPLOYMENT DOWN TO MACH 0.62.

(AUTHOR) (U)

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZUNCZ

AD-660 303
MINNESOTA UNIV MINNEAPOLIS
DRAG COEFFICIENTS OF SEVERAL BODIES OF REVOLUTION AT
TRANSONIC AND SUPERSONIC VELOCITY; (U)
SEP 64 54P HEINIKCH, H. G.; HESS, SHELDON
R; 1STUNBRIS, GUNNAR
CONTRACT: AF33 616 6310
PROJ: 6065
TASK: 606503
MONITOR: ASD ; TDR63 663

UNCLASSIFIED REPORT
SUPPLEMENTARY NOTE: JOINTLY SPONSORED BY THE GM RESEARCH
AND ENGINEERING COMMAND, DEPT. OF THE ARMY; AND
BUREAU OF AERONAUTICS AND BUREAU OF ORDNANCE,
DEPT. OF THE NAVY.

DESCRIPTIONS: (*DRAG, BODIES OF REVOLUTION), (BODIES OF
REVOLUTION, DECELERATION), (TRANSONIC FLOW, SUPERSONIC
FLOW, ATMOSPHERE ENTRY, AERODYNAMIC LOADING, REENTRY
VEHICLES, DRAG PARACHUTES, WAKE, WIND TUNNELS (U)

THE DRAG COEFFICIENTS OF SEVERAL BODIES OF
REVOLUTION WHICH ARE SIGNIFICANT FOR THE PURPOSE OF
AERODYNAMIC DECELERATION WERE MEASURED IN THE
TRANSONIC FLOW REGIME AND AT SUPERSONIC SPEEDS OF
MACH NUMBERS 4 AND 5. (AUTHOR) (U)
UNCLASSIFIED

DOE REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /UNCL-AS.

AU-6003 J05
MINNESOTA UNIV MINNEAPOLIS
PRESSURE DISTRIBUTION MEASUREMENTS OF CONVENTIONAL RIBBON PARACHUTES IN SUPersonic FLOW; SEP 49, 30P. HAAK, EUGENE L. (NICCU.

CONTRACT: AF33 616 8310
PROJ: 6065
TASK: 66503
MONITOR: ASD 1, TDR63 642

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: JOINTLY SPONSORED BY THE DEPT. OF THE ARMY AND THE DEPT. OF THE NAVY. LEGIBILITY OF THIS DOCUMENT IS 1% PART UNSATISFACTORY. REPRODUCTION HAS BEEN MADE FROM BEST AVAILABLE COPY.

DESCRIPTIONS: (RIBBON PARACHUTES, AERODYNAMIC CHARACTERISTICS, MODELS (SIMULATIONS), PARACHUTES, PRESSURE DISTRIBUTION, SUPersonic FLOW, TEST METHODS, HIGH-SPEED PHOTOGRAPHY, WIND TUNNELS, EXPERIMENTAL DATA.

CONVENTIONALLY SHAPED RIBBON PARACHUTES DO NOT FUNCTION SATISFACtORILY AS AERODYNAMIC DECELERATORS IN SUPersonic FLOW. THEIR UNSTABLE BEHAVIOR IS PARTICULARLY OBJECTIONABLE. TO DETERMINE THE CAUSE OF THIS STRUCTURAL AND DYNAMIC INSTABILITY, A SERIES OF PRESSURE DISTRIBUTION MEASUREMENTS WERE MADE ON RIBBON PARACHUTES AT MACH NUMBERS OF 0.6, 1.08, 1.2, 100, AND 4.3. THE RESULTS OF MEASUREMENTS AND ATTEMPTS TO INVERSE THE EFFECT OF SUSPENSION LINES AND FRIEDODIES ON THE PRESSURE DISTRIBUTION OF THE PARACHUTE CANDIE ARE PRESENTED. (AUTHOR)
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OH\U
AEROHYDROMECHANIC THEORY OF WING IN A NONSTATIONARY
FLO\U (SELECTED PARTS) (U)
JAN 65 17P NEKRASOV, A. I.
REPT. No. FTU-77-777
MONITOR: IT 65 61556

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF MJNO,
TEORETICHESKAYA I PRIKLADNAYA MEKHANIKA, SBORNIK

DESCRIPTION: (AERODYNAMIC CHARACTERISTICS, WINGS),
(PARACHUTES, LOADING (MECHANICS)), AIRFOILS,
NONEQUILIBRIUM FLO\U, PARACHUTE DESCENTS, ARRESTING GEAR,
MATHEMATICAL MODELS, LIFT, USSK (U)

A FORMULA IS OBTAINED FOR THE POWER OF LIQUID
PRESSURE ON A PROFILE SITUATED IN NONSTATIONARY
MOTION: A MATHEMATICAL THEORY IS OFFERED OF AN
ARRANGEMENT, PROPOSED FOR REDUCING THE RATE OF
LANDING OF PARACHUTE LOADS, (U)

23
UNCLASSIFIED

ANN BIBLIOGRAPHY SEARCH CONTROL NO. 1201

DEUTSCHE FORSCHUNGSANSTALT FUR LUFT- UND RAUMFAHRT - V
BRUNSAICH (WEST GERMANY) INSTITUT FUR FLUGMECHANIK
PARACHUTE CANOPIES DURING INFLATION

DESCRIBED NOTE: FINAL REP.,
SEP 65 137P MELZIG, H. G. SCHMIDT, P. K.

CONTACT: AF 61-(US)-881,

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (PARACHUTES, PRESSURE), AERODYNAMIC
CHARACTERISTICS, EXPERIMENTAL DATA, SURFACES,
PHOTOGRAPHIC ANALYSIS, TESTS, MATHEMATICAL MODELS,
CORRELATION TECHNIQUES

AN EXPERIMENTAL INVESTIGATION AND CORRELATIVE
ANALYSIS WERE CONDUCTED TO DETERMINE THE PRESSURE
DISTRIBUTION OVER THE SURFACE OF PARACHUTE CANOPIES
DURING THE PERIOD OF INFLATION FOR THE INFINITE MASS
CASE AND TO CORRELATE PRESSURE COEFFICIENTS WITH
INFLATING CANOPY SHAPES. PARACHUTE CANOPY MODELS
OF CIRCULAR FLAT, 10X EXTENDED SKIRT,
RING SLOT, AND RIBBON DESIGNS WERE TESTED UNDER
INFINITE MASS CONDITIONS IN A 9 X 12 FT LOW SPEED
WIND TUNNEL. EXTERNAL AND INTERNAL PRESSURE VALUES
WERE MEASURED AT VARIOUS LOCATIONS OVER THE SURFACE
OF THE MODEL CANOPIES THROUGHOUT THE PERIOD OF
INFLATION. AND GENERALIZED CANOPY PROFILE SHAPES WERE
OBTAINED BY MEANS OF PHOTOGRAPHIC ANALYSIS.
PRESSURE COEFFICIENTS DERIVED FOR THE STEADY STATE
(FULLY OPEN CANOPY) ARE QUITE COMPARABLE TO THE
RESULTS OF PREVIOUS MEASUREMENTS. PEAK PRESSURE
VALUES DURING THE UNSTEADY PERIOD OF INFLATION WERE
FOUND TO BE UP TO 5 TIMES AS GREAT AS STEADY STATE
VALUES. THE RELATIONSHIPS BETWEEN THE PRESSURE
DISTRIBUTION AND TIME FOR EACH OF THE CANOPY MODELS
DEPLOYED AT FREE-STREAM VELOCITIES BETWEEN 70 AND 100
FT/SEC ARE PRESENTED IN DETAIL AND CORRELATED TO
CHANGING CANOPY SHAPE. A COMPLETE SHAPE ANALYSIS IS
MADE AND A MATHEMATICAL MODEL IS PROPOSED.

(AUTHOR)
UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY: SEARCH CONTROL NO. 14ONIC

AD 663 185  4/2  22/2
TEXAS UNIV AUSTIN ATMOSPHERIC SCIENCE GROUP
DETERMINATION OF INDUS FROM METEOROLOGICAL
ROCKETSONDES,
NOV 65  34P  EDDY, ANUS (UUCHON,C. E.,)
HAASE, F., M.; HARRAN, D. R.;
REPT. NO. 2;
CONTRACT: DA-23-072-AMC-1564.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTES:

DESCRIPTORS: (#METEOROLOGICAL INSTRUMENTS, SOUNDING
ROCKETS); #WIND, #ATMOSPHERIC SOUNDING);
#SOUNDING ROCKETS, ATMOSPHERIC SOUNDING); #WIND-
DIRECTION INDICATORS, RADIOSONDES, PARACHUTE
DESCENTS, EQUATIONS OF MOTION

THE EQUATIONS OF MOTION ARE DERIVED FOR AN OBJECT
FALLING UNDER THE INFLUENCE OF GRAVITY AND
AERODYNAMIC DRAG. THESE EQUATIONS ARE USED TO
EXAMINE THE RESPONSE OF THE ARCAS PARACHUTE TO
HYPOTHETICAL WIND PROFILES IN THE REGION EXTENDING
FROM 30 TO 60 KMS. A COMPUTATIONAL SCHEME FOR
DETERMINING THE HORIZONTAL WIND FROM THE OBSERVED
MOTION OF ANY WIND SENSOR INFLUENCED ONLY BY THE
ABOVE FORCES IS PRESENTED, ALONG WITH AN EXAMPLE OF
ITS APPLICATION TO AN ARCAS PARACHUTE FLIGHT.
(AUTHOR)

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UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 76ONC

AD-643 703 1/3
FOREIGN TECHNOLOGY DIV ARTECH-PATTEN SUN AFB OH [U]
PARACHUTE
SEP 66 4F EFREMOCHEF G. V. ; MORDUNOV, I. K. ; I
REPT. NO. FTU-MT-65-104

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
PATENT (USSR) 171 274, APPL. 460905/40-23, 4 JA.
65.

DESCRIPTIONS: (PARACHUTES, PATENTS), USSR, DESIGN,
STABILIZATION SYSTEMS, LIFT, HEMISPHERICAL SHELLS,
BOOSES OF REVOLUTION, CONFIGURATION (U)

THE OBJECT OF THE INVENTION IS A PARACHUTE WITH
A CANOPY IN THE FORM OF A CIRCULAR BELT. TO INCREASE
ITS COEFFICIENT OF LIFT AND ITS STABILITY, IT IS
EQUIPPED WITH A SMALL HEMISPHERICAL CANOPY; THE
SHROUD LINES OF WHICH GO THROUGH AN EYE RING THAT IS
FASTENED TO THE CENTRAL SHROUD LINE AND THE EXTERNAL
RIM IS CONNECTED WITH THE INTERNAL EDGE BY FOUR
MUTUALLY PERPENDICULAR SHROUD LINES (AUTHOR). (U)

26
IN THIS PAPER, THE NON-SYMMETRIC, FREE, ELASTIC VIBRATIONS OF THIN DOMES OF REVOLUTION ARE STUDIED. IT IS ASSUMED THAT THE FREQUENCY IS LOW, THE ASYMPTOTIC APPROXIMATIONS PREVIOUSLY GIVEN BY THE WRITER ARE USED TO ESTIMATE THE GENERAL SOLUTION TO THE SHELL VIBRATION EQUATIONS AT LOW FREQUENCIES. APPROXIMATIONS FOR THE LOW NATURAL FREQUENCIES AND MURES ARE DERIVED SYSTEMATICALLY UNDER A VARIETY OF EDGE CONDITIONS. LOW NATURAL FREQUENCIES ARE FOUND ONLY WHEN THE EDGE CONDITIONS IMPOSE NO FORCES TANGENT TO THE SHELL SURFACE; WHEN THE EDGE IS FREE (AND ONLY THEN) RAYLEIGH'S INEXTENSIONAL FREQUENCIES ARE RECOVERED. FOR CERTAIN OTHER EDGE CONDITIONS NEW NATURAL FREQUENCIES ARE FOUND THAT ARE ABOVE RAYLEIGH'S FREQUENCIES BUT STILL LOW COMPARED, E.G., WITH THE LOWEST MEMBRANE FREQUENCY. THE DISPLACEMENT MODES ASSOCIATED WITH THESE NEW FREQUENCIES ARE MOSTLY OF INEXTENSIONAL TYPE. THE GENERAL RESULTS ARE APPLIED TO ESTIMATE THESE NEW FREQUENCIES FOR SPHERICAL DOMES. (AUTHOR)
UNCLASSIFIED

DOE REPORT #B3111645 SEARCH CONTROL No: 76G24

AU-66-969 1/3 12/7
STENCAL AERO ENGINEERING CORP "SHEVILLE, N Y.
LIFTING OF AERO DYNAMIC DECELERATORS;" (U)

DESCRIPTIVE NOTE: FINAL TECHNICAL REPORT;
CHARLES A. MARTINIAK; L. L.
CONTRACT: DA-19-129-AMC-850(N)
PROJECT: UA-1M1214010195
MONITOR: USA-NLAD5 TN-66-66-AD

UNCLASSIFIED REPORT

DESCRIPTIONS: (*) ORA: PARACHUTES, LIFT); (AIR
DROPOFF OPERATIONS; (CARGO PARACHUTES),
PERFORMANCE (ENGINEERING), COMPUTER PROGRAMS,
TRAJECTORIES, INFLATABLE STRUCTURES, WEIGHT,
GEOMETRIC FORMS, AVIATION SAFETY, COSTS,
LOGISTICS, TRAINING, RELIABILITY, LOW ALTITUDE,
ARMY OPERATIONS

IDENTIFIERS: PARACHUTE CANOPIES, *LOADS (LIFTING OF
AERODYNAMIC DECELERATORS); *LIFTING OF
AERODYNAMIC DECELERATORS

PROGRESS IS REPORTED FOR ALL WORK ACCOMPLISHED ON
THE FOLLOWING ACTIVITIES: (1) ANALYTICAL
STUDIES- PARACHUTE DYNAMICS, PARACHUTE PERFORMANCE
REQUIRED FOR LOW LEVEL CARGO DELIVERY; COMPUTER
TRAJECTORY PROGRAMS, PERFORMANCE SUMMARY AND
CONCLUSIONS; (2) DUMMY LEVEL TEST RESULTS OF
PARACHUTE INFLATION AND FORCE-TIME HISTORIES WITH
AERODYNAMIC ASSISTANCE AND LIFTING CANOPIES; (3)
WEIGHT AND SIZE LIMITS, FLIGHT SAFETY, SYSTEM WEIGHT
AND COSTS, LOGISTICS AND TRAINING; (4) FUNCTIONAL
RELIABILITY; [AUTHOR]

28

UNCLASSIFIED
UNCLASSIFIED

UNCLASSIFIED REPORT

BIBLIOGRAPHY

SEARCH CONTROL NO. •/ZONC2

AD-675 181

1/7. 20/4

GOODYEAR AEROSPACE CORP AKRON OHIO

ESTABLISHMENT OF AN UNSYMMETRICAL MAKE TEST CAPABILITY FOR AERODYNAMIC DECELERATORS. VOLUME I: TEST VEHICLE DESIGN MODIFICATION.

(U)

DESCRIPTIVE NOTE: FINAL REPORT; 1 MAR-15 OCT 69;

AUG 69 222P HEIKE DANIPE J.

REPT. NO. GER-13526-VOL-I

CONTRACT: AF 33(615)-3595

PMJ: AF-6065

TASK: 6G0507

MONITOR: AFFDL TR-67-192-VOL-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO VOLUME 3; AD-675 182

DESCRIPTIONS: (*LIFTING REENTRY VEHICLES, DECELERATION); (*SOPersonic TEST VEHICLES, MAKE); SUPersonic CHARACTERISTICS, FEASIBILITY STUDIES, FREE FLIGHT TRAJECTORIES, AERODYNAMIC HEATING, INFLATABLE STRUCTURES, RECOVERY, DRAG PARACHUTES, DESIGN, WIND TUNNEL MODELS

IDENTIFIERS: *AERODYNAMIC DECELERATORS, ARAPAHO C TEST VEHICLES

(U)

THE RESULTS OF WIND TUNNEL INVESTIGATIONS, ANALYSES, AND PRELIMINARY DESIGN EFFORTS PERFORMED IN ORDER TO SHOW THE FEASIBILITY OF ACCOMPLISHING SUPersonic FREE FLIGHT TESTS OF DEPLOYABLE AERODYNAMIC DECELERATORS IN THE MAKE OF AN UNSYMMETRICAL FOREBODY ARE DESCRIBED. THE RESULTS SHOW THAT THE SIMULATION OF THE MAKE OF A NONSYMMETRIC LIFTING BODY IS FEASIBLE AND PRACTICABLE BY INTEGRATING INFLATABLE AFT-APPENDAGES ON AN ARAPAHOC TEST VEHICLE AND THAT THE RESULTANT MODIFIED VEHICLE RETAINS THE SAME TEST CAPABILITIES AS THE BASIC ARAPAHOC. THE MODIFIED VEHICLE DESIGN ALSO INCLUDES MODIFICATIONS REQUIRED FOR COMPLIANCE WITH EGIN/AFG/EGLIN GULF TEST RANGE SAFETY CRITERIA. THE RECOMMENDATIONS FOR FURTHER VEHICLE MODIFICATIONS THAT COULD IMPROVE THE TEST CAPABILITIES OF THE BASIC ARAPAHOC TEST VEHICLE, A VEHICLE MOCKUP, WAS CONSTRUCTED TO DEMONSTRATE FEASIBILITY OF THE APPROACH AND TO PRECLUDE MAJOR ASSEMBLY AND ACTUATION INTERFERENCE PROBLEMS.

(AUTHOR)

(U)

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UNCLASSIFIED

/ZONC2
A SERIES OF KIND TUNNEL TESTS WAS CONDUCTED TO DETERMINE PRESSURE DISTRIBUTION ON THE SURFACE OF AND IN THE WAKE OF AXISYMMETRIC AND ASYMMETRIC (ELLPTICAL) FOREBODIES. THESE TESTS WERE CONDUCTED IN SUPPORT OF BOUNDARY LAYER AND WAKE ANALYSES REQUIRED AS A BASIS FOR ESTABLISHING AN ANALYTICAL METHOD FOR PREDICTING THE DRAG OF PARASONIC PARACHUTES DEPLOYED IN THE MAKES OF THESE FOREBODIES. THE ANALYSIS OF THE DATA OBTAINED DURING THESE TESTS IS DESCRIBED IN VOLUMES I AND II OF THE REPORT. TABULATIONS OF THE DATA OBTAINED DURING THESE TESTS ARE PRESENTED IN THIS VOLUME. (AUTHOR)
A theory is presented for the stress analysis of a flat, circular parachute in steady, vertical descent. Unlike previous treatments of the problem, this theory does not assume that the shape is known. Instead, the theory presents relations between the pressure distribution in the opened condition and the shape, drag and stresses in lines and fabric. The theory results in a non-linear third order system of ordinary differential equations with boundary conditions at both vent and skirt. This system was solved by a computer program based on the Runge-Kutta method of numerical integration. The results are in fairly good agreement with measurements on parachutes. The computer program can be used for studies of effects of design changes on shape, drag and stress, and the results of a small study of this sort are included. (Author)
UNCLASSIFIED

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UNCLASSIFIED

UNCLASSIFIED

UNCLASSIFIED
UNCLASSIFIED

LOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1ZONC2

AD-A43 15X 1/2 1/2
TACTICAL AIRLIFT CENTER POPE AFB N.C. OFFICE OF OPERATIONS
ANALYSIS
MINIMUM DROP ALTITUDES AND HORIZONTAL DISTANCES FOR
HIGH ALTITUDE, RELFED PARACHUTE DROPS. (U)
DESCRIPTIVE NOTE: TECHNICAL MEMO.
JUL 69 36P HANSON A. R. J
REPT NO. TALC=0A-TRM-4

UNCLASSIFIED REPORT

DESCRIPTIONS: (PARACHUTE DESCENTS, MATHEMATICAL
PREDICTION), LOADING(MECHANICS), TIME,
RAILS(DISTANCE), ALTITUDE, COMPUTER PROGRAMS,
REGRESSION ANALYSIS, STATISTICAL PROCESSES,
OPERATIONS RESEARCH, TACTICAL AIR COMMAND
IDENTIFIERS: RING SLOT PARACHUTES, COMPUTER
ANALYSIS

THE PAPER GIVES A PRACTICAL METHOD OF PREDICTING
THE MINIMUM DROP ALTITUDE AND THE HORIZONTAL DISTANCE
FOR 4-12D, 2D-FOOT RING-SLOT, AND 22-FOOT RING-
SLOT PARACHUTES FOR LOADS USING 20, 30, AND 40 SECOND
5-WPS, DISSECTING CUTTERS. THE STATISTICAL METHODS
USED ARE THOSE OF MULTIPLE REGRESSION BASED ON THE
OBSERVED THEODOLITE DATA FROM 40 DROPS. SUFFICIENT
DETAIL IS GIVEN TO ALLOW EXTENSION OF THE TABLED
RESULTS TO PHYSICAL SITUATIONS NOT SPECIFICALLY
INCLUDED. (AUTHOR)
UNCLASSIFIED
LOC C REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /20NCZ

UNCLASSIFIED
A2-673 385 1/3 1/1 20/4
LOCKHED MISSILES AND SPACE CO SUNNYVALE CALIF
U.STEADY SOLUTION OF THE FLOW-FIELD OVER CONCAVE
BODIES,
DESCRIPTIVE NOTE: TECHNICAL NOTES,
OCT 69 3P BASTIANO,RICARDO A. I

UNCLASSIFIED REPORT
AVAILABILITY: PUB. IN AIAA JIL., V7 N3 PS31-533
MAR 69.
SUPPLEMENTARY NOTE: REVISION OF REPORT DATED 12 SEP 69,
PRESENTED AT AIAA AERODYNAMIC DECELERATION SYSTEMS
CONFERENCE (2ND) EL CENTRO, CALIF. 23-25 SEP 68,
PAPER 69-946, SPONSORED IN PART BY DEPARTMENT OF THE
NAVY, WASHINGTON, D.C.

DESCRIPTIONS: (PARACHUTES, FLOW FIELDS),
STABILITY, SUPersonic CHARACTERISTICS, CURVED
PROFILES, SHOCK WAVES, INFLATABLE STRUCTURES,
THREE-DIMENSIONAL FLOW, NUMERICAL ANALYSIS,
AXIALLY SYMMETRIC FLOW
IDENTIFIERS: UNSTEADY FLOW, PARACHUTE CANOPIES,
CONCAVE BODIES

THE FLUID FLOW AROUND A CONCAVE BODY IMMERSED IN A
SUPersonic FREESTREAM SHOWS AERODYNAMIC INSTABILITY.
THIS FACT HAS BEEN OBSERVED EXPERIMENTALLY IN
SUPersonic PARACHUTES WHERE A SHOCK WAVE MOVES BACK
AND FORTH AHEAD OF THE CANOPY TO AFFECT THE INFLATION
STABILITY. THE REPORT ATTEMPTS TO EXPLAIN THIS
INSTABILITY BY THE NUMERICAL COMPUTATION OF THE
ASYMMETRIC INVIScid FLOW OVER A NONPOROUS CAViTY.
(AUTHOR)

34
EQUATIONS ARE PRESENTED AND EVALUATED FOR
ESTIMATING THE WIND EFFECT ON THE APPROACH PATH AND
DESCENDING ORBIT OF GLIDING PARACHUTE SYSTEMS WITH
NON-PROPORTIONAL AUTOMATIC HOMING CONTROL; EXACT
EQUATIONS ARE PRESENTED FOR DETERMINING CERTAIN
CHARACTERISTIC FEATURES OF THE DESCENDING ORBIT;
ITERATION EQUATIONS ARE PRESENTED INCORPORATING
HOMING SIMULATION FOR CALCULATING POINTS AT EQUAL
TIME INTERVALS ALONG THE GROUND TRACK, THE CONTROL
RESPONSE TIME, EFFECT OF DEPLOYMENT POSITION; AND
IMPACT POSITION PROBABILITY ARE DISCUSSED; AN
EMPirical EQUATION FOR THE RADIUS OF THE CIRCLE OF
EQUAL PROBABILITY AS A FUNCTION OF TURNING RADIUS,
WIND VELOCITY, AND SYSTEM VELOCITY IS PRESENTED. A
PARAMETRIC ANALYSIS OF THE EQUATIONS IS GIVEN FOR
SYSTEMS WITH GLIDE RATIOS FROM 2:1 TO 3:1 AND TURNING
RADIUS OF 75 FT AND 100 FT IN WINDS OF FROM 4 TO 32
FPS. THE ANALYSIS SHOWS THAT ACCURACY IS MORE
DEPENDENT ON HIGH GLIDE RATIO THAN ON TURNING RADIUS.
(AUTHOR)
THE INTERNAL AND EXTERNAL FLOW FIELD ASSOCIATED WITH PARACHUTES DURING INFLATION, (U)

70 16P DE SANTIS, GREGORY C.

UNCLASSIFIED REPORT

DESCRIPTIONS: *PARACHUTES, *FLOW FIELDS, ANEMOMETERS, MODEL TESTS, WIND TUNNEL MODELS, AERODYNAMIC CHARACTERISTICS (U)

IDENTIFIERS: *INFLATING, C-9 PARACHUTE CANOPIES

A HOT-WIRE ANEMOMETER WAS USED TO OBTAIN DATA ON THE FLOW FIELD ASSOCIATED WITH AN INFLATING PARACHUTE. SEVEN MODELS SIMULATING VARIOUS STAGES OF INFLATION OF THE C-9 PARACHUTE WERE FABRICATED AND TESTED IN A SPECIALLY CONSTRUCTED TEST SECTION WHERE THE TEMPERATURE COULD BE HELD UNIFORM. USING THIS METHOD, IT WAS POSSIBLE TO ACCURATELY MEASURE THE INTERNAL AND EXTERNAL FLOW SURROUNDING THE CANOPY. SOME POSSIBLE APPLICATIONS OF THE DATA TO FULL-SCALE PARACHUTE SYSTEMS ARE PRESENTED. (AUTHOR) (U)
UNCLASSIFIED

DOCo REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /204C

AD-714 088
NAVAL ORDNANCE LAB WHITE OAK MD
A NEW APPROACH TO THE DETERMINATION OF THE
STEADY-STATE INFLATED SHAPE AND INCLUSION
VOLUME OF SEVERAL PARACHUTE TYPES IN 24-
GORE AND 30-GORE CONFIGURATIONS,
SEP 70  56P  LUDTKE WILLIAM P. ;
HPT. NO. NOLTR-70-178

UNCLASSIFIED REPORT

DESCRIPTIONS: (PARACHUTES, AERODYNAMIC
CONFIGURATIONS), INFLATABLE STRUCTURES, VOLUME,
Porous materials, model tests, stresses,
SHOCK (MECHANICS), RIBBON PARACHUTES
IDENTIFIERS: PARACHUTE CANOPIES

AD-702041 DOCUMENTED A NEW METHOD OF DETERMINING
THE STEADY-STATE INFLATED SHAPE AND INCLUDED VOLUME
OF SEVERAL TYPES OF PARACHUTES IN 12-GORE AND 16-GORE
CONFIGURATIONS. THIS REPORT USES THE METHODS AND
TECHNIQUE OF AD-702 041 TO EXTEND THE DATA TO 24-
GORE AND 30-GORE CONFIGURATIONS OF THE FLAT CIRCULAR,
10 PERCENT EXTENDED SKIRT, 16 PERCENT POURUS RING
SLOT AND 24 PERCENT POURUS RIBBON PARACHUTES. THE
INFLATED ELLIPTICAL SHAPES OF THE VARIOUS CANOPIES
WERE OBTAINED FROM PHOTOGRAPHIC RECORDS OF THE WIND-
TUNNEL TESTS AT VARIOUS VELOCITIES FROM 17 MPH TO 200
MPH USING PARACHUTE MODELS OF APPROXIMATELY 40-INCH
FLAT DIAMETER. THE STEADY-STATE CANOPY VOLUME
INCLUDES THE VOLUME OF THE BUILT-IN GORE PANEL AND AN
AIR VOLUME AHEAD OF THE CANOPY SKIRT HEM. THE
RESULTS OF THIS INVESTIGATION ARE PARTICULARLY
APPLICABLE TO STUDIES OF CANOPY STRESS ANALYSIS AND
DETERMINATION OF THE VOLUME OF AIR WHICH MUST BE
COLLECTED DURING CANOPY INFLATION PROCESS FOR USE IN
THE CALCULATION OF OPENING-SHOCK FORCE.
(AUTHOR)

37

UNCLASSIFIED /204C
III. MATERIALS
AD-603 129
MRD DIV GENERAL AMERICAN TRANSPORTATION CORP NILES ILL
INSTANTANEOUS LOCAL TEMPERATURES OF AERODYNAMIC
DECELERATORS: PART II: THERMAL PROPERTIES,
DESCRIPTIVE NOTE: REPT. FOR JUL 59-AUG 60.
FES 61-162P ENGHOLM, C. I. I. S. U. I.
BANG BENGAL R. A. I.
CONTRACT: AF 33 61 6673
PROJ: 7320
TASK: 73201
MONITOR: NADU IPA THGO 670 P2; 171954
UNCLASSIFIED REPORT
SUPPLEMENTARY NOTE:
DESCRIPTORS: (*PARACHUTE FABRICS, THERMAL CONDUCTIVITY),
(*RE-ENTRY VEHICLES, PARACHUTE FABRICS), NYLON,
STAINLESS STEEL, GLASS TEXTILES, GRAPHITE, FIBER
(SYNTHETIC), ORGANIC MATERIALS, LOADING (MECHANICS),
STRESSES, HEAT TRANSFER, TESTS, TEST EQUIPMENT,
SATELLITES (ARTIFICIAL), AERODYNAMIC HEATING
IDENTIFIERS: AF-1

MEASUREMENTS WERE MADE OF THE THERMAL CONDUCTIVITY
OF THE FOLLOWING CANDIDATE PARACHUTE FABRICS:
NYLON, STAINLESS STEEL, GLASS, GRAPHITE, AND AF-1
(AN ORGANIC FIBER). DATA WERE OBTAINED WITH A
CENCO-FITCH DEVICE IN WHICH THE EFFECTS OF
COMPRESSIVE LOAD HAS ESTABLISHED A SIMILARITY-
RELATION DERIVED FROM DIMENSIONAL ANALYSIS HAS
APPLIED TO THESE DATA AND RESULTED IN A SATISFACTORY
CORRELATION. A NEW APPARATUS HAS DEVELOPED IN
ORDER TO DETERMINE FABRIC CONDUCTIVITY UNDER VARYING
CONDITIONS OF TEMPERATURE (212 TO 600°F), AMBIENT
PRESSURE (1 TO 0.046 PSIA), BIAXIAL TENSION (1 TO
90 PSI), AND COMPRESSION (1 TO 100 PSI).
INITIAL DATA COLLECTED USING THE APPARATUS
DEMONSTRATED ITS CAPABILITIES AND ANALYSIS OF THESE
DATA INDICATE THE POSSIBILITY OF FURTHER
DIMENSIONLESS CORRELATIONS IN WHICH THE EFFECTS OF
BIAXIAL TENSION MAY BE NEGLIGIBLE. CONSIDERABLY
MORE DETAILED DATA WILL HAVE TO BE OBTAINED TO
ESTABLISH REPEATABILITY AND VERIFICATION OF THESE
HYPOTHESES. (AUTHOR)

UNCLASSIFIED

UNCLASSIFIED
THE OBJECTIVE OF THIS CONTRACT WAS TO DEVELOP A WOVEN MESH MATERIAL USING NOMEX AS THE RAW MATERIAL YARN, HAVING A 100 POUNDS PER INCH BREAKING STRENGTH IN BOTH DIRECTIONS AND A GEOMETRIC POROSITY OF 35% OR A PERMEABILITY OF 900-1000 CUBIC FEET/ MINUTE/SQUARE FOOT. TWIST LEVELS FROM 5 TO 20 TURNS PER INCH WERE EVALUATED IN BOTH ARMS AND FILLING DIRECTIONS TO DETERMINE THE EFFECT OF TWIST ON THE PERMEABILITY. VARIOUS CONSTRUCTIONS AND WEAVES RANGING FROM PLAIN WEAVE TO MOCK LENO WERE USED TO DETERMINE THE MAXIMUM PERMEABILITY WITH THE REQUIRED BREAKING STRENGTH. THE MOCK LENO WEAVE WAS DETERMINED TO BE THE MOST SATISFACTORY TO ACHIEVE A PROPER BALANCE OF PROPERTIES. THE LEVEL OF TWIST AFFECTED THE AIR PERMEABILITY FAR MORE DRAMATICAL THAN WAS EXPECTED WITH THE RESULT THAT A RATHER HIGH TWIST WAS USED IN THE FINAL PRODUCT. THIS STUDY DEMONstrATED THE FEASIBILITY OF DESIGNING AND WEAVING A FABRIC FROM NOMEX NYLON WHICH WOULD HAVE THE PROPERTIES FOR USE IN SPECIAL TYPE OF PARACHUTE APPLICATIONS. (AUTHOR)
THE STRESSES OCCURRING IN THE CLOTH OF A PARACHUTE DURING THE PERIOD OF INFLATION AND UNDER STEADY STATE ARE CALCULATED FOR A NUMBER OF INSTANTANEOUS SHAPES WHICH ARE CHARACTERISTIC OF THE OPENING PROCESS AND THE STEADY STATE. THE METHOD IS GENERAL AND MAY BE APPLIED TO ANY TYPE OF PARACHUTE BUILT OUT OF SOLID CLOTH, CONCENTRIC RINGS OR RIBBONS. THE PRESENTED ANALYSIS IS RELATED TO CANOPIES CONSISTING OF TRIANGULAR GORES BUT CAN BE EXTENDED TO OTHER GORE PATTERNS. A NUMERICAL CALCULATION IS MADE FOR A SOLID FLAT CIRCULAR PARACHUTE DURING THE PERIOD OF OPENING AND AT STEADY STATE. (AUTHOR)
UNCLASSIFIED

LOC REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. 160NC

AU-617  Y3U

PRUESCU INC PEBKUSIE PA

WEAVEN MESH FROM BRAIDED NYLON CORD.  

DESCRIPTIVE NOTE: KEPT. FOR 1 JAN-1 JUL 64.

APR 45  ZKP

BROCKMAN, M. C.  INGRATH, J.

Ct:  IRUS, J. M. ;

CONTRACT: AFY6 6557 12257

PROJ: 5768

MUNIT: ML  ;  TO-64-413

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (*NYLON, TEXTILES), (*WEAVING, NYLON), CORDAGE, PARACHUTE FABRICS, FIBERS, FIBERS(SYNTHETIC), TENTILE PROPERTIES, POROSITY, PERMEABILITY

THE OBJECTIVE OF THIS PROGRAM WAS TO DEVELOP A WEAVEN MESH MATERIAL USING MIL-C-5044, TYPE I CORD AND COMMERCIAL GRADE, HIGH TENACITY NYLON YARN IN ORDER TO ACHIEVE A 1000-1200 LBS./IN. BREAKING STRENGTH IN THE HARP AND FILLING DIRECTIONS AND A GEOMETRIC POROSITY OF 35%, OR A PERMEABILITY OF 600-900 CU. FT/SM FT*MIN IN YARNS FROM 1-200 DENIER TO 200 DENIER WERE EVALUATED IN ORDER TO ACHIEVE THE STRONGEST POSSIBLE BOND BETWEEN HARP AND FILLING CORDS. VARIOUS CONSTRUCTIONS, RANGING FROM 7 ENDS AND PICKS OF CORD TO 9 ENDS AND PICKS OF CORD, WERE EVALUATED TO ACHIEVE THE OPTIMUM COMBINATION OF BREAKING STRENGTH AND AIR PERMEABILITY. UNUSUAL PROBLEMS WERE ENCOUNTERED IN WEAVING THE CORD. BECAUSE OF ITS BULK AND STIFFNESS, CONSIDERABLE YARDAGE WOULD HAVE TO BE MANUFACTURED IN ORDER TO DETERMINE THE COMMERCIAL PRACTICABILITY OF THE MANUFACTURING TECHNIQUE. THIS STUDY DEMONSTRATED THE FEASIBILITY OF DESIGNING AND WEAVING A FABRIC USING A 100 LB. BREAKING STRENGTH CORD IN A CRIMPLESS GEAVE FOR USE IN SPECIAL TYPES OF PARACHUTE APPLICATIONS.

(AUTHOR)
UNCLASSIFIED

DDC REPORT STRATEGIC SEARCH CONTROL NR: 12ONC

AU-6618107 11/3 1974
ARMY NAVAL LABS "ASS CLOTHING AND ORGANIC MATERIALS"
LAB
THE APPLICATION OF THE CONCEPT OF RELIABILITY TO
TEXTILE PRODUCTS. (U)
DESCRIPTIVE NOTE: SUMMARY REPT. MAY 66-SEP 67
SEP. 47 3UP KENNEDY, STEPHEN J. H.E.I. ER.
LOUIS 16 1
REPT. NR. C/UM-153
PROJ. USA-1604-401A329
MONITOR: USA-41085 TR-68-23-CM

UNCLASSIFIED REPORT

DESCRIPTORS: (*TEXTILES, RELIABILITY), PARACHUTE
FABRICS; BODY ARMOR, STRESSES, MALFUNCTIONS;
STRENGTH, CLOTHING, FIBERS, CORDAGE,
TOLEANCE MECHANICS), QUALITY CONTROL,
REVIEWS (U)

IN COMMON WITH MANY OTHER NATURAL PRODUCTS, THE
NATURE AND USE PATTERNS OF ITEMS OF TEXTILE CLOTHING
AND EQUIPMENT ARE SUCH THAT DATA FOR FORMULATION: EXACT
MODELS FOR PREDICTING RELIABILITY IN TERMS OF
MISSION TIMES* AND MEAN TIMES BETWEEN FAILURES* ARE
NOT EASILY OBTAINABLE, HOWEVER, RELIABILITY
ANALYSIS BASED UPON THE PROBABILITY OF DETERMINING
WHETHER OR NOT A GIVEN CHARACTERISTIC FALLS WITHIN
THE USE REQUIREMENTS FOR THE MATERIAL OR MATERIAL
SYSTEM HAS BEEN FOUND FEASIBLE IN MANY CASES. A
CONSIDERABLE AMOUNT OF SUCH DATA IS AVAILABLE AND IS
PRESENTED IN THE REPORT TO SUGGEST POSSIBLE
APPROACHES FOR RELIABILITY ANALYSIS STUDIES. SOME
OF THE INHERENT PROBLEMS IN APPLYING RELIABILITY
ANALYSIS TO A BROAD RANGE OF TEXTILE END ITEMS ARE
EXAMINED AND DISCUSSED. (AUTHOR) (U)

43

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JDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 44670

APA: VATIC LABS ASS CLOTHING AND ORGANIC MATERIALS
LAB
STRENGTH LOSSES IN NYLON PARACHUTE MATERIALS WITH
TIME, EXPOSURE AND USE.

DESCRIPTION NOTE: TECHNICAL REPORT
MAN 58 59P
FRANK W. H. HELLS
RICHARD J.
REPT. NO. C/44-68-156
MONITOR: USAF LABS TK45-45-CH

UNCLASSIFIED REPORT NOT REPRODUCIBLE

DESCRIPTIONS: (PARACHUTE FABRICS; NYLON, LIFE
EXPECTANCY, STRENGTH, PARACHUTES, EXPOSURE;
STORAGE, HEAT RESISTANCE, PARACHUTE JUMPING,
PERFORMANCE ENGINEERING), DEGRADATION
IDENTIFIERS: PERSONNEL PARACHUTES

THE FINDINGS OF RECENT TES OF AGED AND USED NYLON
PARACHUTES ARE REVIEWED WITH RESPECT TO SERVICE LIFE
LIMITS AND TO IMPLICATIONS AS TO THE TECHNICAL NATURE
OF THE DEGRADATION PROBLEM. THE DATA TEND TO
CONFIRM THAT THE CURRENT 10 YEAR OR 100 JUMP LIMITS
AND RELATED REPAIR COST LIMIT SCHEDULES DO NOT
PRESENT A HAZARD. HOWEVER, THE SCATTER AND
CONSISTENCY OF RESULTS MAKE QUESTIONABLE THE VALIDITY
OF SMALL SAMPLING AND EXTENDED PREDICTIONS. A
CONSISTENT AND PERSUASIVE TRENDS WERE FOUND TO
DIRECTLY RELATE TO TIME IN STORAGE OR SERVICE, OR TO
JUMP HISTORY EXCEPT FOR INITIAL MECHANICAL EFFECTS ON
SUSPENSION LINES. THE RESULTS EVIDENCE MARKED
DIFFERENCES IN THE SPECIFIC SUSCEPTIBILITIES OF
VARYING MATERIALS, AND A NUMBER OF DEGRADING
INFLUENCES AND TYPES OF EFFECTS ON PHYSICAL
PROPERTIES. IT IS CONCLUDED THAT A HIDE
DISTRIBUTION OF STRENGTH LEVELS IS TO BE EXPECTED IN
OLDER PARACHUTE POPULATIONS, AND THAT THE HAZARD
PROBLEM IS WITH THE EXCEPTIONAL CASES RATHER THAN
WITH THE AVERAGE CONDITION. A NUMBER OF POSSIBLE
CHEMICAL AND STRUCTURAL CHANGE MECHANISMS ARE
DISCUSSED. [AUTHOR]

(2)
FOURNEWLY DEVELOPED FIBERS (PBI-10 X 101, PBO-14 AND BETA GLASS) WERE EVALUATED IN WEBBING FORM
(3000-9000 LBS BREAKING STRENGTH) FOR RUPTURE ENERGY ABSORPTION CAPACITY AT 200, 150, AND 700 FT/SEC
AND STRAIN RATES OF 5, 300, 20,000 AND 20,000 FT/SEC BASED UPON AN INITIAL 2.5 FOOT GAGE LENGTH. THE DYNAMIC ENERGY ABSORPTION CAPACITY OF THE PROMINENT WEBBING IS ESSENTIALLY UNCHANGED OVER THE ENTIRE SPEED RANGE STUDIED. THE RUPTURE ENERGY OF THE X-121 WEBBING IS DIMINISHED BY 20% AS TESTING SPEED IS INCREASED UP TO 500 FT/SEC AND THEN 25-35% AT SPEEDS OF APPROXIMATELY 700 FT/SEC. THE PBI SHOWS A 50% LOSS FROM QUASI-STATIC UP TO 500 FT/SEC TESTING SPEEDS AND DIMINISHES TO APPROXIMATELY 15% OF QUASI-STATIC AT 700 FT/SEC. THE ENERGY LEVEL OF THE BETA GLASS IMPROVES OR REMAINS ALMOST UNCHANGED IN THE ENTIRE SPEED RANGE.

FABRICATION FABRICS. MECHANICAL PROPERTIES, GLASS TEXTILES, FIBERS SYNTHETIC; NYLON, BENZIMIDAZOLEs, Heat-Resistant Materials; Rupture; Tensile Properties; Stainless Steel; Tapes; Impact; Strength Mechanics; Thermodynamics
IDENTIFIERS: HOMEX, PBI FIBERS, PBO-14 FIBERS, X-121 FIBERS
UNCLASSIFIED

UNCLASSIFIED REPORT BIBLIOGRAPHY

Atkins Lab Report

CONSTRUCTIONAL EFFECTS ON IMPACT BREAKING STRENGTH OF PARACHUTE SUSPENSION LINES.

DESCRIPTIVE NOTE: MATERIAL EXAMINATION REPORT

JUL 66 14P  FIGURES 4, INGERTY, L.

UNCLASSIFIED REPORT

DESCRIPTORS: (*PARACHUTES, CORDAGE, FIBERS, NYLON, IMPACT, IMPACT TESTS, STRESSES, FAILURE (MECHANICS), TENSILE PROPERTIES, ELONGATION, SPECIFICATIONS, EXPERIMENTAL DESIGN)

IDENTIFIERS: *PARACHUTE SUSPENSION LINES

THIS REPORT INVESTIGATES THE EFFECTS OF STRUCTURE (YARN PLYING AND BRAIDING) ON THE OVERALL STRENGTH OF NYLON SUSPENSION LINES (MIL-C-5040B, TYPE I AND TYPE II) WHEN TESTED AT HIGH STRAIN RATES. (AUTHOR)

46
A new chemical lighting system has been developed, which comprises an essentially dry, treated fabric and an activator fluid. Light is produced by spraying the activator fluid on the treated fabric. A brightness on the order of 1 foot lambert or greater is provided for periods exceeding one-half hour. The activator fluid was formulated to remain mobile at temperatures at least as low as -30°F to permit activation of the system at low temperatures. Both components of the new system have sufficient storage stability for demonstration and feasibility testing purposes. Design criteria for substitute chemical lighting systems developed in the program indicate that substantially brighter systems can be developed.

(Author)
UNCLASSIFIED

UC REPOI'T 311111101010 13101001 CON110 R10 /2ONC2

AU-69J 179 11/6 1/3

MIGHT AIR DEVELOPMENT CENTER MIGHT-PATTERSON AFB

OHIO

BRIDLE LINE-PILOT CHUTE, PERSONNEL. (U)

DESCRIPTIVE NOTE: TECHNICAL NOTE.

MAR 55 LIP ENGLISI 1 JR

RPT. NO. MADC-TH-ICAL-55-6

PROJ: AF-6468

UNCLASSIFIED REPORT

DESCRIPTORS: (PARACHUTES, CORDAGE), (CORDAGE,

SAFETY), STRENGTH, DROP TESTING, NYLON (U)

THE PURPOSE OF THE TEST WAS TO SELECT A NEW PILOT

CHUTE BRIDLE LINE DESIGNED TO OPERATE WITHOUT FAILURE

DURING HIGH SPEED PARACHUTE DEPLOYMENT. (AUTHOR) (U)

48

UNCLASSIFIED /2ONC2
A SERVICE LIFE EVALUATION PROGRAM WAS INAUGURATED IN JANUARY 1957 TO DETERMINE THE BREAKDOWN IF ANY, OF THE FIBROUS MATERIALS USED IN DECELERATOR ASSEMBLIES. TEN (10) TYPE T-14 PERSONNEL DECELERATORS, STORED UNDER NORMAL WAREHOUSE STORAGE CONDITIONS, WERE OBTAINED FOR THE EVALUATION. THE DECELERATORS HAD THE OLDEST MANUFACTURING DATES (2-4 YEARS OLD) AVAILABLE FOR DECELERATORS WHICH HAD NEVER BEEN USED. EACH YEAR, FOR A PERIOD OF FOUR YEARS, FIVE DECELERATORS WERE TAKEN AT RANDOM FROM THE TEN AND SAMPLES OF CLOTH AND SUSPENSION LINES REMOVED FOR PHYSICAL PROPERTY EVALUATION.

(AUTHOR)
IV. RELEASE MECHANISMS
A LOW-COST RADAR ACTUATOR FOR USE AS A COMPONENT IN A DELAYED-OPENING PARACHUTE AERIAL-DELIVERY SYSTEM HAS BEEN DEVELOPED. THIS DEVICE IS KNOWN AS HADOPAD (HIGH-ALTITUDE DELAYED-OPENING PARACHUTE ACTUATING DEVICE). THE DEVICE, BASED ON RADAR PRINCIPLES, WILL OPEN A MAIN RECOVERY PARACHUTE AT EITHER OF TWO PRESET HEIGHTS (100 OR 1700 FT) ABOVE THE GROUND. THE COMPLETE SYSTEM UTILIZES A DROGUE-PARACHUTE STABILIZING STAGE FOR FREE FALL FROM HIGH ALTITUDE FOLLOWED BY A MAIN PARACHUTE RECOVERY STAGE WHICH IS INITIATED AT LOW ALTITUDE BY THE RADAR ACTUATOR. LIMITED FIELD TESTING OF THE RADAR ACTUATOR AT FORT DEVENS HAS SHOWN THE FEASIBILITY OF THE DEVICE AS A PARACHUTE ACTUATOR, BUT SOME ADDITIONAL ENGINEERING AND COMPLETE ENVIRONMENTAL TESTS ARE NECESSARY BEFORE INITIATION OF QUANTITY PRODUCTION. FORTY ACTUATORS WERE CONSTRUCTED BY HOL DURING THE RESEARCH AND DEVELOPMENT PHASE. (AUTHOR).
UNCLASSIFIED

UNCLASSIFIED

DESCRIPTIVE NOTE: TECHNICAL REPORT

A METHOD OF INVESTIGATING THE DEPLOYMENT CHARACTERISTICS OF MAN-CARRYING PARACHUTES

DESIGNATION: PARACHUTES, DEPLOYMENT

TEST METHODS: ACCURACY

PERFORMANCE (ENGINEERING)

TEST RELEASES OF MAN-CARRYING PARACHUTES FROM BALLOONS OR AIRCRAFT DO NOT PERMIT OF ANY DETAILED EXAMINATION OF THE PROCESSES OF WITHDRAWING THE RIGGING LINES AND CANOPY FROM THE PACK (I.E., DEPLOYMENT). IRREGULARITIES DURING THIS PHASE MAY CAUSE MALFUNCTIONS TO DEVELOP DURING OPENING. THE METHOD OF TEST DESCRIBED PERMITS EXAMINATION OF THE DEPLOYMENT FROM THE PARACHUTE PACK AND REVEALS INFORMATION LACKING IN FLIGHT TESTS. IT IS PROPOSED THAT THIS TEST METHOD MAY BE USED TO INVESTIGATE THE BEHAVIOUR OF NEW OR MODIFIED PARACHUTE SYSTEMS. (AUTHOR)

NOT REPRODUCIBLE

UNCLASSIFIED

52
A TILT-TYPE CARGO PARACHUTE RELEASE ASSEMBLY HAVING SUSPENDED CARGO CAPACITY OF 12,000 POUNDS WAS DEVELOPED. STATIC AND DYNAMIC STRUCTURAL TESTS PLUS A SERIES OF AIR DROP TESTS WERE CONDUCTED WITH THREE 12,000-POUNDS CAPACITY RELEASE FABRICATED FOR TEST. THESE TESTS DEMONSTRATED THAT THE DEVELOPED UNITS MET ALL THE DESIGN, PERFORMANCE, AND SERVICE REQUIREMENTS. (AUTHOR)
A PARACHUTE UNCOUPLING LOCK IS DESCRIBED, CONSISTING OF AN ANEROID-TIME MECHANISM; A TRIGGER APPARATUS WHICH CONTAINS A GUIDE WITH A SPRING-ACTUATED BUSHING; A DRIVE APPARATUS CONTAINING A CYLINDRICAL PLUNGER WITH A STOP TOOTH; AND AN OPERATING MECHANISM EQUIPPED WITH HOOKS FOR ENGAGING THE EYE RING OF A PARACHUTE, A LEVER TRANSMISSION, AND A FORK HAVING A STOP GUIDE, IN ORDER TO HEIGHTEN THE RELIABILITY OF ACTION, IN IT THE TRIGGER APPARATUS IS EQUIPPED WITH A SPRING-ACTUATED GUIDE WHICH HAS AT ONE END A PROJECTION UPON WHICH THE END PLANE OF THE PLUNGER OF THE DRIVE MECHANISM OPERATES, AND AT THE OTHER END A LUG ATTACHED BY A FORK TO THE STOP GUIDE OF THE OPERATING MECHANISM.
UNCLASSIFIED

AUC REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /ZONC2

AU-693 173  13/9  1/0
LIGHT AIR DEVELOPMENT CENTER LIGHT-PIITERSO AFB
ONIO
PARACHUTE CANOPY RELEASE

DESCRIPTION NOTE: TECHNICAL NOTE
MAY 54 E P  CARROLL C. E

REPT. NO. MAD-PS-5CLE-54-25

UNCLASSIFIED REPORT

DESCRIPTIONS: (*PARACHUTES: RELEASE MECHANISMS),
MAINTENANCE, DESIGN, PARACHUTE JUMPING, SAFETY
HANESS, LANDINGS, DRAG, REVIEWS

IDENTIFIERS: *PARACHUTE CANOPY RELEASE DEVICES

THE PURPOSE OF THE STUDY WAS TO REVIEW AND RECORD
THE SERVICE REQUIREMENT FOR A PARACHUTE CANOPY
RELEASE DEVICE. (AUTHOR)

55

UNCLASSIFIED /ZONC2
A parachute final release mechanism in which the last section of the lines attaching the basic shrouds from each parachute to the load is kept coiled, until the desired altitude is reached. At this point the release mechanism permits these lines to run out to their full length. (Author)
UNCLASSIFIED

AD-693 447 1/3

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

DEVICE FOR RELEASING ACTUATOR CABLE FROM PARACHUTE ASSEMBLY,

SEP 69 7P GANIN V. P. IZHURA'LEV A.

N. PRUSIakov V. V. IOPUKHOVSKI L. Y.

REPT. NO. FSTC-MT-23-405-69

PROJ: FSTC-D423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 210 673, 2 APR 68.

DESCRIPTIONS: (PARACHUTES, RELEASE MECHANISMS),

ACTUATORS, AUTOMATIC CONTROL SYSTEMS, BUSHINGS,

PISTONS, GASKETS, HERMETIC SEALS, BELLows,

PATENTS, USSR

IDENTIFIERS: TRANSLATIONS

THE INVENTION DESCRIBES A HERMETICALLY-SEALED

DEVICE EQUIPPED WITH A MOVEABLE PISTON, DESIGNED FOR

USE IN AUTOMATIC PARACHUTE ACTUATION SYSTEMS.

(AUTHOR)
The invention describes an improved parachute design which provides for the release of the parachute from aircraft traveling at higher speeds. This is accomplished by means of delayed opening of the canopy through the use of a device and a braking parachute. (Author)
TRANSLATION OF PATENT (USSR) 207 440, 14 Feb 60.

DESCRIPTION: CARGO PARACHUTES; DESIGN; AIR DROP OPERATIONS; RELEASE MECHANISMS; CORDAGE; PATENTS; USSR IDENTIFIERS: TRANSLATIONS, PILOT PARACHUTES, MAIN PARACHUTES, TIME DELAY MECHANISMS, PARACHUTE CANNONIES

THE INVENTION DESCRIBES A CARGO PARACHUTE WHICH IS DESIGNED TO BE RELEASED FROM AIRCRAFT TRAVELLING IN EXCESS OF 450 KMPH IN ORDER TO AVOID CARGO DAMAGE. A TIME-DEVICE IS EMPLOYED WHICH DELAYS OPENING OF THE PARACHUTE BY A PREVIOUSLY ESTABLISHED TIME INTERVAL. THE TIME-DELAY DEVICE IS ACTUATED BY A PILOT PARACHUTE.
UNCLASSIFIED

AUC REPORT BIBLIOGRAPHY
SEARCH CONTROL NO: 72NC2

AAP-694 Am 1/3 15/7
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.
A DEVICE FOR DROPPING PARACHUTE MODELS, SEP 69
GLUSHKOV, I. 180100G
RPT. 1. FSTC-HT-23-394-69
PROJ. FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 184 629,
15 SEP 69.

DESCRIPTORS: (*AIRMOBILE OPERATIONS, PARACHUTE DESCENTS), (*PARACHUTES, DROP TESTING), AIR DROP OPERATIONS, PATENTS, CUTTING, CONDAGE,
RELEASE MECHANISMS, REMOTE CONTROL SYSTEMS, USSR.

IDENTIFIERS: TRANSLATIONS

THE PROPOSED DEVICE FOR DROPPING PARACHUTE MODELS IS DISTINGUISHED BY THE FACT THAT THE CUTTER IS DESIGNED TO ENCRIBE THE BRAKING HALYARD WITH INCANDESCENT FILAMENTS FROM THE POWER SOURCE, WHICH IS LOCATED IN THE COMMAND STATION. IN ADDITION, AT THE CENTRAL PART OF THE KNOT OF THE CANOPY, A PIVOT IS ATTACHED WHICH ELIMINATES TAILSTING OF THE BRAKING HALYARD, RELEASE CORD, AND RETAINING LINE.

(AUTHOR)

NOT REPRODUCIBLE

60
UNCLASSIFIED

UNCLASSIFIED NAVY 1/3
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.
A PARACHUTE DEPLOYING APPARATUS,
SEP 69 6P
RLPT: AC. FSTC-MT-23-409-69
PHQI: FSTC-24231UO

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 20S 615;
16 FEB 66.

IDENTIFIERS: *PARACHUTE DEPLOYING MACHINISMS;
TRANSATIONS

A INDIVIDUAL PARACHUTE DEPLOYING APPARATUS IS
DESCRIBED; THE APPARATUS IS LENGTHENED BY A FABRIC
BELT WHICH IS TO BE CAUGHT BY THE AIRSTREAM DRAWING
THE PARACHUTE AWAY FROM THE EDGE OF THE DOOR OF THE
AIRCRAFT; (AUTHOR).

NOT REPRODUCIBLE

61

UNCLASSIFIED /ZONC2
SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 190 797, 15 FEB 67.

DESCRIPTORS: (*PARACHUTES, LANDINGS),
(*LANDINGS, RELEASE MECHANISMS), PATENTS, WSSM

IDENTIFIERS: TRANSLATIONS

A MORE RELIABLE MECHANISM FOR RELEASING A PARACHUTE AFTER LANDING IS DESCRIBED. THE MECHANISM WILL NOT LACK UP UNDER LOADS UP TO 400 KILOGRAMS.

(AUTHOR)
UNCLASSIFIED

LOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZONC2

AD-695 457
1/3
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D C
PARACHUTE SYSTEM,

JUN 69 6P TKACHEV, F. D.
REF: NO. FSTC-MT-23-389-69
PROJ: FSTC-991700309U6; FSTC-92236264301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 213 595,
21 MAY 65.

DESCRIPTION: CARGO PARACHUTES; RELEASE
MECHANISMS; PATENTS; CORDAGE; CUTTING; DRAG
PARACHUTES; USSR
IDENTIFIERS: TRANSLATIONS

A PARACHUTE SYSTEM IS DESCRIBED CONSISTING OF A
RELEASE PARACHUTE, A MAIN PARACHUTE, THE CANOPY OF
 WHICH IS HELD CLOSED BY A CIRCULAR REEFING SHROUD,
PASSING THROUGH HOLES WITH METAL EYES DISTRIBUTED
AROUND THE PERIMETER OF THE CANOPY, AND HELD BY A
RELEASING DEVICE, CONNECTED WITH THE RELEASE
PARACHUTE AND WITH AN UNFURLING MECHANISM SET UP ON
THE CANOPY. (AUTHOR)
UNCLASSIFIED

UCG REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /ZONC2

AU-696 225  1/2  13/5  14/2
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  WASHINGTON D.C.
AUTOMATIC UNCOUPLER-INCLINOMETER. (U)
69 SP KACHALKO, V. V. 1
VLETSKHUSTSEV, V. K. 1
REPT NO. FSTC-HT-23-404-69

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 142 156
156

DESCRIPTORS: (*CARGO PARACHUTES; LANDINGS); (*CABLE ASSEMBLIES; DEFORMATION); (*DISCONNECT FITTINGS; TEST METHODS); PATENTS; PARACHUTE DESCENTS; CARGO; AUTOMATIC STRUCTURAL PARTS, OPERATION, USSR (U)
IDENTIFIERS: INCLINOMETERS, TRANSLATIONS; *AUTOMATIC UNCOUPLERS, ANGLE OF DEFORMATION, PARACHUTE CANOPIES. (U)

AN AUTOMATIC UNCOUPLER-INCLINOMETER IS DESCRIBED FOR DISENGAGING THE PARACHUTE SYSTEM FROM THE DROPPED LOAD UPON LANDING, CONSISTING OF A CYLINDRICAL BODY WITH A LUG FOR ATTACHING THE LEVER-CLAMPS OF THE CLAMPING DEVICE AND BRAKING BUSHINGS WITH A LUG OF THE LOAD SUSPENSION. (U)

64

UNCLASSIFIED /ZONC2
UNCLASSIFIED

U.S. DEPARTMENT OF COMMERCE

AUGUST 1965

LATCH FOR THE EXTRACTION FORCE TRANSFER
DEVICE OF A CARGO PARACHUTE SYSTEM,

A. IMO

U.S. DEPARTMENT OF COMMERCE

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 190 794,
29 DEC 66.

DESCRIPTIONS: (CARGO PARACHUTES; RELEAS
MECHANISMS), (PINS MECHANICAL); PATENTS,
STRUCTURAL PARTS, FASTENINGS, SPRINGS; DESIGN,
UPFENTS, LOKING FASTENER DEVICES, USSR, PATENTS
IDENTIFIERS: TRANSLATIONS

THE INVENTION APPLIES TO THE LATCHES OF EXTRACTION
PARACHUTES IN CARGO PARACHUTE SYSTEMS, THESE LATCHES
BEING INTENDED FOR FASTENING OF THE CARGO PLATFORM TO
THE FLOOR OF THE AIRCRAFT, FOR PULLING OF THE
PLATFORM OUT OF THE AIRCRAFT, AND FOR DISCONNECTION
OF THE EXTRACTION PARACHUTE, THE PECULIARITY OF
THE PROPOSED LATCH CONSISTS IN THE FACT THAT THE LIFT
LEVER OF THE PIN IS SET UP ON AN AXLE FIXED INTO THE
CASE OF THE LATCH AT BOTH ENDS, WHEREBY
11. SEPARABILITY OF THE LEVER FROM THE LATCH IS BROUGHT
ABOUT. (AUTHER)
UNCLASSIFIED

DEPARTMENT OF THE ARMY

FOR SALE BY THE GOVERNMENT PRINTING OFFICE

UNCLASSIFIED

TITLE: SUPPLEMENTARY REPORT

AUTHOR: PATENT (USSR): 205 613

DESCRIPTORS: [PARACHUTES; RELEASE MECHANISMS], STABILIZATION SYSTEMS, CORDAGE, TEXTILES, AERODYNAMIC CHARACTERISTICS, SUPPORTS, USSR, PATENTS

IDENTIFIERS: PARACHUTE PULL-OUT APPARATUS, TRANSLATIONS, PARACHUTE CANOPIES

A DESCRIPTION IS GIVEN OF A PROPOSED PARACHUTE PULL-OUT APPARATUS DESIGNED TO AVOID IRREGULAR MOVEMENT OF THE PARACHUTIST AS THE CANOPY OF THE STABILIZING PARACHUTE IS FILLED, WHICH MAY LEAD TO TANGLING OF THE PARACHUTE. IN ORDER TO KEEP THE PARACHUTE AS HIGH AND AS DISTANT AS POSSIBLE FROM THE AIRCRAFT, THE PULL-OUT CORD IS EQUIPPED WITH A HOLD-UP ELEMENT IN THE FORM OF A STRIP OF ROPE MATERIAL.

66

UNCLASSIFIED
V. JUMPING
Soviets astronauts were observed during their preliminary parachute jumping training s before employing, in the plane and after landing, the heart rate was measured and the dynamometry of hands was carried out as well. The registration of changes of hands' strength and those of the heart rate disclosed the dynamics of the emotional turning of astronauts to the coming parachute jumpings. On the first day of parachute jumping the emotional reactions were significant and were markedly different from emotional reactions of well-trained parachutists. Subsequently, the reactions became more adequate and due to the training of volitive processes the emotional manifestation at the repeated parachute jumpings became near. The emotional reactions to danger are characterized by sthenic excitation which is evoked by the activation of the conscious regulation of behavior. All astronauts had the most stable positive emotions at the second stage of parachute jumping trainings (jumping onto the water, during nights, in the diving suits).
UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. 4400CZ

AD-616 945

ARMED FORCES INST OF PATHOLOGY WASHINGTON D.C.

SURVEY OF MILITARY SPORT PARACHUTING DEATHS, (U)

65-3P  KIEL, FRANK N.

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PUBL. IN AEROSPACE MEDICINE V36 N4

P361-2 APR 1965 (COPIES NOT AVAILABLE TO DDC OR

CLEARINGHOUS CUSTOMERS).

DESCRIPTIONS: (AVIATION ACCIDENTS, PARACHUTE

JUMPING), (SPORT PARACHUTE JUMPING, ACCIDENTS),

SOURCES, PARACHUTES, MALFUNCTIONS, HAZARDS,

RECREATION, ANALYSIS, INJURIES, IMPACT SHOCK,

TRAINING, WIND

IDENTIFIERS: DEATH (U)

SPORT PARACHUTING HAS BECOME A POPULAR ACTIVITY

WITH MILITARY PERSONNEL, AND MANY CLUBS HAVE BEEN

ORGANIZED AND SPONSORED ON BASES THROUGHOUT THE

WORLD. AS THE NUMBER OF JUMPERS HAS INCREASED SO

HAS THE NUMBER OF DEATHS INCREASED. THERE HAVE

BEEN 27 MILITARY PERSONS KILLED IN SPORT PARACHUTING

THROUGH JUNE 1964, IN ADDITION TO THE LARGE

PROBLEM OF FAILURE TO ACTIVATE THE PARACHUTE THAT

ARE OTHER HAZARDS ALSO, SUCH AS HITTING THE AIRPLANE,

COLLIDING WITH ANOTHER JUMPER, MALFUNCTIONING OF THE

CHUTE AND LANDING IN THE WATER. ANALYSIS OF THE

ACCIDENTS SHOWS THAT ONE-THIRD OCCURRED DURING THE

PRELIMINARY TRAINING PERIOD BUT IN OTHERS JUMPERS

WITH LONG EXPERIENCE HAVE DIED ALSO. WIND APPEARS

TO BE A FACTOR IN INADVERTENT WATER LANDINGS, BUT

OTHER WEATHER FACTORS LACK IMPORTANCE. (AUTHOR) (U)
UNCLASSIFIED

FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO

WORKING DAY OF A SPACE PIONEER, YA. G. GAGARIN ENTERS SPACE TRAINING,

MAR 64 BELIKOV, V.

REPT. NO. FTU-TT-64-149

UNCLASSIFIED REPORT

UNCLASSIFIED

MUNITOR: TT 64-15307

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. FROM
IZVESTIYA (USSR) 9 AUG 64 1963.

DESCRIPTION: (#ASTRONAUTS, USSR), PARACHUTE JUMPING,

PARACHUTE JUMPING OF RUSSIAN COSMONAUT, Y. GAGARIN.

69
UNCLASSIFIED

DOE REPORT BIBLIOGRAPHY
SEARCH CONTROL NO. J2ONC4

AD-617-389
BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D.C.
FEAR AND ENTHUSIASM IN SPORT PARACHUTING; (U)
MAY 66 35P KLAUSNER, SAMUEL Z. I
CONTRACT: AF49 638 992
MONITOR: AFOSR 65-1329

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR INCLUSION IN
MOTIVATIONS IN SPORTS BY RALPH SLOVENKO AND JAMES
A. KNIGHT TO BE PUBLISHED BY CHARLES C. THOMAS,
SPRINGFIELD, ILLINOIS.

DESCRIPTORS: (*PARACHUTE JUMPING, RECREATION),
(*FEAR, PARACHUTE JUMPING), EMOTIONS, MOTIVATION,
ATTITUDES, PERSONALITY, PSYCHOMETRICS, SOCIAL
SCIENCES, ANALYSIS OF VARIANCE, STATISTICAL DATA (U)

REPLIES TO A MAIL QUESTIONNAIRE BY 425 SPORT
PARACHUTISTS AFFILIATED WITH 103 PARACHUTE CLUBS ARE
THE DATA OF THIS STUDY. QUESTIONNAIRES WERE
ADMINISTERED BY OFFICIALS OF THE INDIVIDUAL CLUBS AND
ASKED ABOUT THE EXPERIENCE OF FEAR AND ENTHUSIASM,
PERSONAL AND SOCIAL CHARACTERISTICS OF THE
PARACHUTISTS, ATTITUDES RELEVANT TO SPORT
PARACHUTING, AND INCLUDED THE HA AND MY SCALES
FROM THE MMPI, A DRAW-A-PERSON TEST, AND
FOUR STORYSTIMULUS PICTURES OF PARACHUTING
SITUATIONS. ONLY THE JUMP EXPERIENCE, AN ANALYSIS
OF THE STORIES TOLD ABOUT ONE PICTURE, AND A FEW
SOCIAL CHARACTERISTICS ARE REPORTED IN THIS PAPER. (U)

70

UNCLASSIFIED /ZONC4
UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY - SEARCH CONTROL NO. /GONCZ

AU-62U 37U
NAVAL SCHOOL OF AVIATION MEDICINE PENSACOLA FL.
COMPARISON OF DIFFERENT TYPES OF PARACHUTE HARN ESS
WITH PARTICULAR REFERENCE TO EASE OF RELEASE.

REPT. NO. NSA 4766
MONITOR: NAVal MED.
X-292 (AV-168-U)

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: AVAILABLE COPY WILL NOT PERMIT FULLY
LEGIBLE REPRODUCTION, REPRODUCTION WILL BE MADE IF
REQUESTED BY USERS OF DDC. COPY IS AVAILABLE FOR PUBLIC
SALE.

DESCRIPTIONS: (PARACHUTES, SAFETY HARN ESS),
(DESCONNECT FITTING, PARACHUTES), TESTS,
SIMULATION, ENVIRONMENTAL TESTS, AVIATION SAFETY,
RELEASE MECHANISMS.

THE U. S. NAVY TYPE AND THE BRITISH QUICK
RELEASE TYPE OF PARACHUTE HARN ESS WERE TESTED WITH
RESPECT TO THE EASE AND SPEED OF RELEASE UNDER THE
FOLLOWING CONDITIONS: (1) ON LAND UNDER GOOD
CONDITIONS, (2) ON LAND IN SIMULATED BAD
WEATHER, (3) IN HIGH WIND, (4) WITH WET
HANNES AND HARN ESS, (5) AT 0 F, (6) WITH
HEAVY FLYIN MITTENS, (7) IN THE WATER AND
SUSPENDED ABOVE THE WATER, (8) IN THE WATER;
(9) SUSPENDED 8 FT. ABOVE WATER, (10) IN THE
WATER; LIFE JACKET INFLATED, (11) USING ONE
HANNES: (1) DRY, (2) WITH WET HANNES AND
HARN ESS. TWO EXAMPLES OF ACCIDENTAL JAMMING ARE
DISCUSSED AND THE SUBJECT OF ACCIDENTAL RELEASE IS
CONSIDERED. (AUTHOR)

71

UNCLASSIFIED / ZONCZ
PARACHUTING HAS EXISTED FOR 180 YEARS BUT HAS
GAINED MANY ADHERENTS ONLY IN RECENT YEARS. SPORT
PARACHUTING IS ESTIMATED TO HAVE 50,000 PARTICIPANTS
IN 1964, ALTHOUGH PARACHUTING IS A POTENTIALLY
DANGEROUS ACTIVITY, FATALITIES ARE RARE—APPROXIMATELY
1 IN 17,000 JUMPS. FATALITIES, THOUGH USUALLY
THOUGHT OF AS THE RESULT OF MULTIPLE EXTREME INJURIES
SUSTAINED IN ABRUPT GROUND DECELERATION, HAVE MANY
OTHER CAUSES, AMONG THESE CAUSES OF DEATH HAVE BEEN
COLLISIONS OF JUMPERS, LANDING ON A POWER LINE,
HEART ATTACK DURING DESCENT, AND DROWNING. MAJOR
FACTORS BEHIND MANY OF THESE ACCIDENTS HAVE BEEN
(1) LACK OF PROPER REPETITIVE TRAINING BY
QUALIFIED INSTRUCTORS AND (2) LACK OF ADEQUATE
SUPERVISION, PARTICULARLY OF STUDENTS. ANALYSIS OF
THE ACCIDENTS HAS SHOWN THAT ONE THIRD OCCURRED
DURING THE PRELIMINARY TRAINING PERIOD, BUT IN
OTHERS, JUMPERS WITH LONG EXPERIENCE HAVE DIED ALSO
TEMPERATURE, CLOUD CONDITIONS, AND WIND HAVE NOT
BEEN SHOWN TO BE MAJOR FACTORS. A FEW MIRACULOUS
ESCAPES ARE KNOWN IN PARACHUTING—SURVIVAL OF A FALL
FROM GREAT HEIGHT WITHOUT THE AID OF A PARACHUTE.
SUCH EVENTS USUALLY HAVE THE BENEFIT OF A LONG
DECELERATIVE INTERVAL BECAUSE OF LANDING IN FLOODED
FIELDS OR TREES AND AN OPTIMAL DIFFUSION OF BODY
IMPACT, AS IN LANDING ON THE BACK IN A SPREAD-EAGLE
POSITION. (AUTHOR)
UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 120472

AD-630 446  6/7  6/14
NAVAL AVIATION SAFETY CENTER NORFOLK VA
BODY-BUILD AND SURVIVAL IN EJECTIONS FROM NAVY
AIRCRAFT.
69   IOP LODGE: GEORGE T. I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (SURVIVAL, PHYSICAL FITNESS),
(PARACHUTE JUMPING, SURVIVAL), (ANTHROPOMETRY,
SURVIVAL), AVIATION ACCIDENTS, NAVAL AIRCRAFT,
ESCAPE SYSTEMS (AEROSPACE), EJECTION, PILOTS

73

UNCLASSIFIED  120472
UNCLASSIFIED

BUREAU OF SOCIAL SCIENCE RESEARCH INC. WASHINGTON D.C.

WORSHIP AND THE DANGEROUS LIFE: A STUDY OF CHURCH ATTENDANCE AMONG SPORT PARACHUTISTS.


DEC 66 55P KLAUSNER, SAMUEL Z. I

PROJECT: AF 49(63)-1510

TASK: 97799

MONITOR: AFOSR, 66-012

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTION: (RELIGION, PSYCHOLOGY), (PARACHUTE JUMPING: RELIGION), RECREATION, EMOTIONS, FEAR, MOTIVATION, BEHAVIOR, ANXIETY, ATTITUDES, PERSONALITY, PROJECTIVE TECHNIQUES, REACTION (PSYCHOLOGY), ANALYSIS OF VARIANCE, STATISTICAL ANALYSIS, SOCIAL SCIENCES

THE DATA FOR THIS STUDY WERE DRAWN FROM 825 QUESTIONNAIRES RETURNED BY MEMBERS OF AMERICAN SPORT PARACHUTING CLUBS AMONG PROTESTANT RELIGIOUS GROUPS. THE EMOTIONALLY VOLATILE ARE MORE FREQUENT CHURCH ATTENDERS THAN THE RELATIVELY CALM. AMONG CATHOLICS THE REVERSE IS TRUE; THE CALMER TYPES GO TO CHURCH WHILE THE MORE VOLATILE TEND TO STAY AWAY. SKYDIVERS WHO AVOID THINKING ABOUT THEIR FEAR OF JUMPING ARE, ESPECIALLY AMONG PROTESTANTS, MORE FREQUENT CHURCH ATTENDERS THAN THOSE SKYDIVERS WHO EXPRESS THEIR FEAR. CATHOLICS WHO EXPRESS THE FEELING OF FREE FALL IN SENSORY AND ESTHETIC TERMS ARE MORE FREQUENT CHURCH ATTENDERS THAN THE CATHOLICS WHO CONFRONT THIS EXPERIENCE IN A SIMPLE, DESCRIPTIVE, MATTER-OF-FACT WAY.

PROTESTANTS WHO GRASP THE FREE FALL EXPERIENCE IN A MATTER-OF-FACT WAY ARE MORE FREQUENT WORSHIPPERS IN THEIR CHURCHES THAN THOSE PROTESTANTS FOR WHOM FREE FALL IS AN ESTHETIC OR SENSORY EXPERIENCE.

PROTESTANTS WHO FELT THAT HARM BEFALLING A SKYDIVER WAS DUE TO FATE—THAT IS, PREDESTINED OR DETERMINED, RATHER THAN A RESULT OF THE JUMPER'S IRRESPONSIBLE BEHAVIOR, ARE MORE FREQUENT CHURCH ATTENDERS. CATHOLICS FOR WHOM SKYDIVER INJURY IS DUE TO HIS OWN RESPONSIBILITY ARE MORE LIKELY THAN FATALISTIC CATHOLICS TO BE FREQUENT ATTENDERS AT MASS.

(AUTHOR)
MANY SKYDIVERS ARE RECRUITED BY FRIENDS; RELATIVELY FEW ARE RECRUITED THROUGH THE MASS MEDIA. WRITTEN MATERIALS ARE LIKELY TO ATTRACT OLDER AND MORE EDUCATED INDIVIDUALS TO THE SPORT. INDIVIDUALS RECRUITED BY THEIR FRIENDS TEND TO PLACE THE SOCIAL GROUP AHEAD OF THE SPORT AND MAY SHIFT TO ANOTHER SPORT RATHER THAN CHANGE THEIR GROUP WHEN FACED WITH A CHOICE. THOSE WHO ARE RECRUITED THROUGH WRITTEN MATERIALS TEND TO BE MORE ACTIVE AND ENTHUSIASTIC SKYDIVERS. THOSE RECRUITED THROUGH TELEVISION ARE MORE INTERESTED IN THE EXHIBITIONISTIC ASPECTS OF SKYDIVING AND, IN THEIR PERSONALITIES, TEND TO BE MORE PASSIVE. THOSE RECRUITED BY FRIENDS ARE MORE LIKELY TO BE 'LOCALS', CONCERNED WITH THE ACTIVITY OF THEIR IMMEDIATE SKYDIVING GROUP, WHILE THOSE RECRUITED THROUGH THE MASS MEDIA ARE MORE LIKELY TO BE 'COSMOPOLITANS', CONCERNED WITH NATIONAL ASPECTS OF SKYDIVING. (AUTHOR)
UNCLASSIFIED

SUPPLEMENTARY NOTE:

HYPOTHESIS: (1) FEAR AND ENTHUSIASM ARE NEGATIVELY CORRELATED COMPONENTS OF AFFECTUAL EXCITEMENT; (2) IN ACTING DESPITE FEAR, FEAR IS TRANSFORMED INTO ENTHUSIASM (THE AFFECTUAL VALENCE SHIFT FROM NEGATIVE TO POSITIVE); I.E., FEAR AT ONE POINT IS POSITIVELY CORRELATED WITH ENTHUSIASM AT A LATER POINT IN THE ACT. A SAMPLE OF 825 AMERICAN SPORT PARACHUTISTS INDICATED THE DEGREES OF FEAR AND ENTHUSIASM EXPERIENCED DURING THEIR FIRST JUMP. THE DATA WERE EXAMINED BY REGRESSION ANALYSIS OF THE FEAR AND ENTHUSIASM SCORES DURING THE JUMP PREPARATION, BOTH FEAR AND ENTHUSIASM INCREASE AT THE START OF THE JUMP RUN, FEAR DECREASES AND ENTHUSIASM INCREASES A NADIR AND ZENITH, RESPECTIVELY, ARE REACHED WHEN THE PARACHUTE IS OPENED, FEAR AGAIN INCREASES AND ENTHUSIASM DECREASES NEAR LANDING, UPTON TOUCHING THE GROUND, FEAR DROPS TO A NEW NADIR AND ENTHUSIASM RISES TO A ZENITH ABOVE THE FIRST. THE MEAN SCORES FOR FEAR AND FOR ENTHUSIASM AT SUCCESSIVE POINTS DURING THE JUMP ARE NEGATIVELY CORRELATED AT SINGLE POINTS, INDIVIDUAL FEAR AND ENTHUSIASM SCORES ARE ALSO NEGATIVELY CORRELATED. THESE FINDINGS SUPPORT THE FIRST HYPOTHESIS, THE INDIVIDUAL FEAR SCORES AT THE FIRST ZENITH OF FEAR ARE LESS NEGATIVELY AND THEN MORE POSITIVELY CORRELATED WITH INDIVIDUAL ENTHUSIASM AT SUCCESSIVE SUBSEQUENT POINTS; THIS FINDING SUPPORTS THE SECOND HYPOTHESIS, A DEVIANT CASE ANALYSIS SHOWED THAT THOSE WHO TRANSFORM THEIR FEAR INTO A RELATIVELY GREAT AMOUNT OF ENTHUSIASM TEND TO BE INDEPENDENT, ENERGETIC PERSONALITIES, WHILE THOSE WHO FAIL RELATIVELY, TO TRANSFORM THE FEAR INTO ENTHUSIASM (U).
UNCLASSIFIED

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (*PARACHUTE JUMPING, RECREATION*), UNITED STATES, DISTRIBUTION, ATTITUDES, PUBLIC OPINION, NEWSPAPERS, ANXIETY, MOTIVATION, PERSONALITY, FEAR, SOCIAL SCIENCES, STATISTICAL DATA

IDENTIFIERS: VOLUNTEERS

SPORT PARACHUTISTS TEND TO BE OVER-REPRESENTED IN THE WESTERN REGION OF THE UNITED STATES. THEY ARE, BY AND LARGE, RELATIVELY YOUNG MALES WHO LOOK UPON THE SPORT AS A MASCULINE EXPRESSION. THE SPORT IS OBJECTIVELY DANGEROUS, AS MEASURED BY THE ACCIDENT RATE, AND IS SUBJECTIVELY PERCEIVED AS SUCH. SPORT PARACHUTISTS TEND TO BE SINGLE-MINDED IN THEIR ATTITUDE TO THE SPORT, SOMETIMES GIVING IT PRIORITY OVER THEIR COMMITMENT TO FAMILY ROLES. PRESS REPORTAGE EMPHASIZES THE SPECTACULAR AND EXHIBITIONISTIC ASPECTS OF PARACHUTING RATHER THAN ITS COMPETITIVE SPORT ASPECTS. NEWSPAPERS SEE THE ACTIVITY AS EXHIBITING FUN AND "GUTS" AND AS DANGEROUS. (AUTHOR)
AD-633 63u 1/2
ARUN MEDICAL RESEARCH UNIT FORT RUCKER ALA
EXPECTED INJURY RATES FOR EXPERIMENTAL AIRBORNE
OPERATIONS;
JUN 66 13P AVNER, K. A. I
REPT. NO. USAARU-66-7,
PROJ: DA-300-256u-1A-915;
TASK: U36;
UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTION: (I PARACHUTE JUMPING, AVIATION
INJURIES), (I AVIATION INJURIES, MATHEMATICAL
PREDICTION), PROBABILITY, CASUALTIES,
EXPERIMENTAL DESIGN, STATISTICAL ANALYSIS, ARMY
PERSONNEL

PROBABILITY OF INJURY FOR ARMY PARATROOPERS UNDER
CONDITIONS OF FULL COMBAT LOAD AND UNPREPARED DROP
ZONE HAS ESTIMATED TO BE .006 (STANDARD ERROR =
.002, N = 5,253). TABLES WERE COMPUTED TO ALLOW
TESTS OF DEPARTURE FROM THIS RATE UNDER EXPERIMENTAL
CONDITIONS INVOLVING UP TO 50 JUMPERS. (AUTHOR)

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UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 120NC2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTION: (5) PARACHUTE JUMPING, (0) TRAINING), HIGH ALTITUDE, STRESS (PHYSIOLOGY), AVIATION MEDICINE

THE REPORT REVIEWS THE ENVIRONMENT IN WHICH A HALO PARACHUTIST OPERATES, INDICATES SOME AREAS IN TRAINING WHICH DESERVE SPECIAL ATTENTION, AND MAKES SOME SPECIFIC OPERATIONAL RECOMMENDATIONS WHICH, IF ADOPTED, WOULD REDUCE THE POSSIBILITY OF INJURY OR DISEASE CAUSED BY THE MAN-ENVIRONMENT INTERACTION. (AUTHOR)

79
UNCLASSIFIED
DOC REPORT PUBLICATION SEARCH CONTROL NO. 40NC2

AD-650-629 5/10 5/11
BUREAU OF SOCIAL SCIENCE RESEARCH INC WASHINGTON D.C.
THE PASSION FOR SKYDIVING
HARR 47 14TH KLAUSNER, SAMUEL Z. I
CONTRACT: AF 49(638)-151U
PROJECT: AF-977Y
TASK: 977901
MONITOR: AFSER 67-0392

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: SEE ALSO AD-630 793, AD-631 019,
AD-631 020, AND AD-631 049.

DESCRIPTION: (*PARACHUTE JUMPING, *FEAR),
RECREATION, ANXIETY, PERSONALITY, PROJECTIVE
TECHNIQUES, PERSONALITY TESTS, EMOTIONS, GROUP
DYNAMICS, ATTITUDES, SOCIAL PSYCHOLOGY, BEHAV-
IORS, QUESTIONNAIRES, DEFENSE MECHANISMS (PSYCHOLOGY)

THE REPORT IS COMPOSED OF SIX PAPERS ON THE
EMOTIONAL ASPECTS OF SPORT PARACHUTING AND ITS
MEANING FOR THE SELF-EVALUATION OF THE INDIVIDUAL:
SOME MECHANISMS SKYDIVERS EMPLOY TO MANAGE THE
FEARFUL COMPONENT OF THE SKYDIVING EMOTION, AND
MECHANISMS ENABLING THEM TO ACT DESPITE IT, ARE
DISCUSSED. THE FIRST PAPER EXAMINES SOME EMOTIONAL
QUALITIES WHICH SKYDIVERS ASSOCIATE WITH FREE FALL.
THE SECOND PAPER ATTEMPTS TO ASSESS THE IMPACT OF
THE ACT OF PARACHUTING ON THE SKYDIVER'S EVALUATION
OF HIMSELF. THE THIRD PAPER EXAMINES SOME OF THE
CONDITIONS UNDER WHICH AN INDIVIDUAL WILL RECOGNIZE
OR FAIL TO RECOGNIZE HIS FEAR. THE FOURTH PAPER
STUDIES FEAR OF FAILURE AS ONE SIGNIFICANT SOURCE OF
FEAR. THE FIFTH PAPER DEALS WITH SOME RATIONAL AND
NONRATIONAL MECHANISMS FOR MANAGING BEHAVIOR, AND THE
LAST PAPER DESCRIBES SOME DIFFERENCES BETWEEN
SKYDIVERS WHO ADOPT AN ATTITUDE OF FATALISM OR USE
EFFECTIVISM TOWARD THE OUTCOME OF SKYDIVING.

(AUTHOR) 1

80

UNCLASSIFIED
UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY: SEARCH CONTROL NO. 120174

AD 653 598
ARMY AEROMEDICAL RESEARCH UNIT FORT RUCKER ALA
CONTINUOUS EKG RECORDING DURING FREEFALL PARACHUTING;
JUN 67, 32P SCHANE, P. ISLING.

REPT NO. USAARU-67-7
PROJ DA-31-025DC-11-614
TASK U36

UNCLASSIFIED REPORT

DESCRIPTIONS: (PARACHUTE JUMPING, ELECRUCARDIOGRAPHY, STRESS PHYSIOLOGY, PULSE RATE, HEART RESPONSES

AN ATTEMPT WAS MADE TO DETERMINE HEART RATE AND RHYTHM OF EXPERIENCED PARACHUTISTS DURING FREEFALL AND DURING THE PERIODS IMMEDIATELY BEFORE AND AFTER THE JUMPS. CONTINUOUS EKG RECORDINGS WERE MADE OF 19 EXPERIENCED PARACHUTISTS WHILE EACH PARTICIPATED IN FREEFALL PARACHUTING EXERCISES. A TOTAL OF 98 INDIVIDUAL EXITS FROM AIRCRAFT IN FLIGHT WERE RECORDED. MEAN R-R INTERVAL WAS 0.403 SECONDS JUST PRIOR TO EXIT FROM THE AIRCRAFT, 0.363 SECONDS DURING FREEFALL, 0.336 SECONDS IMMEDIATELY AFTER PARACHUTE OPENING, 0.369 AT LANDING, AND 0.465 5 MINUTES AFTER LANDING. ALTHOUGH THERE WAS VARIATION IN THE R-R INTERVAL AMONG INDIVIDUALS, THE PROGRESSIVE DECREASE OF R-R INTERVAL THROUGHOUT THE EXIT AND FREEFALL WITH A MAXIMUM AT PARACHUTE OPENING, WAS THE COMMON THING. THERE IS MARKED INDIVIDUAL DIFFERENCE IN THE DURATION OF TACHYCARDIA BEFORE AND AFTER JUMPS, OVER THE ENTIRE GROUP, MEAN DURATION PER SUBJECT WAS 19.4 MINUTES OF TACHYCARDIA PRIOR TO EXIT, AND 30.4 MINUTES OF TACHYCARDIA AFTER PARACHUTE OPENING. IN THE INDIVIDUALS WHO MADE AT LEAST 2 JUMPS ON ANY ONE DAY, THE R-R INTERVAL MEASURED ON A SINGLE INDIVIDUAL ON THE FIRST AND SECOND JUMPS WERE REMARKABLY SIMILAR, AND WITHIN THE GROUP NOT STATISTICALLY DIFFERENT. A CORRELATION MATRIX AS COMPUTED TO SHOW RELATIONSHIPS BETWEEN VARIOUS PARAMETERS STUDIED. THE CORRELATION BETWEEN R-R INTERVAL AND TOTAL NUMBER OF JUMPS WAS OPPOSITE IN DIRECTION TO THAT WHICH WAS EXPECTED AND NEARLY ATTAINED VALUES THAT WERE STATISTICALLY SIGNIFICANT. (AUTHOR)
UNCLASSIFIED

UNCLASSIFIED BIBLIOGRAPHY

DEPARTMENT OF THE ARMY
FOREIGN SCIENCE AND TECHNOLOGY CENTER
WASHINGTON, D.C.

DETACHABLE PULL-LOOSE PARACHUTE PACK OUTFIT, (U)

FED 69 6P

LYAKHOV, I. S. AND STEPANENKO, V. B.

REPT. NO. FSTC-HT-23-1020-68

PROJECT FSTC-9509033A0906, FSTC-922362a2301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 205 616 13

NOV 67.

DESCRIPTIONS: (PARACHUTES, USSR), RELEASE
MECHANISMS, RUBBER, RELIABILITY, CORDAGE
IDENTIFIERS: DETACHABLE PULL-LOOSE PARACHUTE PACK

A DETACHABLE PARACHUTE PACK PULL OUTFIT, IS
DESIGNED INVOLVING A MULTI-PIN PULL CORD THE
UPPERMOST PIN OF WHICH IS OF L-SHAPED, A MANUAL
OPENING CORD, AND A PULL CORD, THE LOOPS OF WHICH ARE
ATTACHED TO THE SADDLE OF THE L-SHAPED PIN, A
SAFETY DEVICE FASTENED TO THE PARACHUTE PACK, AN
ARRESTOR COUPLING SIT UP ON THE PULL CORD, AND A
POCKET FOR THE L-SHAPED PIN, SEWED TO THE PACK.
BEING DISTINGUISHED THROUGH THE FACT THAT WITH A VIEW
TO ENHANCING RELIABILITY OF OPERATION, IN IT THE L-
SHAPE PIN IS FITTED WITH A PLIABLE LINK, MADE (FOR
EXAMPLE) OF PACK RUBBER AND ATTACHED AT ONE END TO
THE PIN AND AT THE OTHER TO THE PACK BENEATH THE
POCKET. (AUTHOR)

82
UNCLASSIFIED

JAR REEPORT BIBLIOGRAPHY SEARCH CONTROL NO: 730NC3

AD: 69 2 322 1/2 5/9
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

F JUMPS EARLIER, (U)
AUG 69 11 ICHORNIK, V. I

REP: NO: FSTC-HT=23-122-69
PROJ: FSTC-04231002301

SPLERIMENTARY NOTE: TRANS. OF UNIDENTIFIED RUSSIAN LANGUAGE ARTICLE.

DESCRIPTIONS: (PARACHUTE JUMPING, TRAINING), DESCENT, STABILIZATION SYSTEMS, TRAINING DEVICES, USSR

IDENTIFIERS: TRANSLATIONS (U)

A NEW TRAINING PROGRAM FOR BEGINNING PARACHUTISTS INTRODUCES THE STABILIZED FALL AND MANUAL OPENING. THE THIRD JUMP, A DESCRIPTION OF GROUND AND THEORETICAL TRAINING IS GIVEN; THE PRO VICHY TRAINING WITH ADAPTATIONS IS DESCRIBED AND ILLUSTRATED. (AUTHOR) (U)

S3

UNCLASSIFIED 720NC2
UNCLASSIFIED

WRIGHT AIR DEVELOPMENT CENTER WRIGHT-PATTERSON AFB
OHIO

TEST OF PACK - PARACHUTE, AUTOMATIC OPENING
QUICK ATTACHABLE CHEST

DESCRIPTIVE NOTE: TECHNICAL NOTE
MAN 54 13P PARKER, C. G.

REPT. NO. WADC-TR-64-654

UNCLASSIFIED REPORT

DESCRIPTORS: (PARACHUTE JUMPING, HIGH ALTITUDE),
(PACKS(PARACHUTE)),
PERFORMANCE(ENGINEERING), AUTOMATIC,
OPERATION, DROP TESTING, RELEASE MECHANISMS

THE PURPOSE OF THE STUDY WAS TO TEST AN AUTOMATIC
OPENING CHEST STYLE PARACHUTE FOR AIR CREW MEMBER USE
IN HIGH ALTITUDE BAIL OUT. (AUTHOR)

UNCLASSIFIED

S4
UNCLASSIFIED

UNCLASSIFIED

NRC REPORT BIBLIOGRAPHY SEARCH CONTROL NO: /ZCONC2

AD-A793 226 1/3

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

PURPOSE/NO DESIGN OF PARACHUTES

AUG 67 14P

REPT. NO: FSTC-HT-23-1098-68

SUBJECT: FSTC-HQ-231002301

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANSLATIONS FROM KRYLYA NODINY (USSR)

V19 Nov 68

DESCRIPTION: PARACHUTES, DESIGN, STRUCTURAL PARTS, PACKS (PARACHUTE), PARACHUTE JUMPING.

IDENTIFIERS: TRANSLATIONS

THE TRANSLATION GIVES A BRIEF HISTORICAL SKETCH OF THE DEVELOPMENT OF THE PARACHUTE AND THEN GOES ON TO DESCRIBE, IN DETAIL, THE DESIGN OF PRESENT-DAY PARACHUTES, USING THE D-1-6, SERIES 3 PARACHUTE USED BY THE SOVIET AIRBORNE TROOPS AS AN EXAMPLE.

(AUTHOR)

85

UNCLASSIFIED /ZCONC2
THE PATENT INVOLVES A PARACHUTE SUSPENSION SYSTEM WHICH PERMITS ONE MAN TO PUT ON AND TIGHTEN THE COMPLETE PARACHUTE AND PACK AS A UNIT WITHOUT OUTSIDE ASSISTANCE. (AUTHOR)
DESCRIPTION: (HELIPTERS, PARACHUTES),
COCKPITS, COMPATIBILITY, AIRCRAFT SEATS,
CONFIGURATION, SURVIVAL KITS, BODY ARMOR,
SAFETY, ARMY AIRCRAFT
IDENTIFIERS: RESCUE PARACHUTES

THE STUDY EVALUATED THE PRESENT EMERGENCY RESCUE PARACHUTES IN ARMY HELICOPTERS. AN INVESTIGATION WAS CONDUCTED WITH EACH EMERGENCY RESCUE PARACHUTE TO DETERMINE COMPATIBILITY WITH COCKPIT GEOMETRY AND SEAT DESIGN, COMPATIBILITY OF THE AIRCREW PROTECTIVE ARMOR AND OVERWATER SURVIVAL KIT WITH THE EMERGENCY RESCUE PARACHUTES HAS ALSO TESTING.

(AUTHOR)
UNCLASSIFIED

UOUC REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /ZONC2

AU-700 943  15/7

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

PARACHUTISTS = AIRBORNE LANDING, (U)
DEC 69  287P  LISOVI, I.
REPT NO. FSTC-HT-23-27-7)
PR0VI FSTC-0423100

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF MONO. DESANTNIKI -

DESCRIPTIONS: (TACTICAL AIR SUPPORT, AIRMOBILE
OPERATIONS), (PARACHUTE JUMPING, REVIEWS),
MILITARY TACTICS, HISTORY, AIRMOBILE OPERATIONS,
USSR

IDENTIFIERS: TRANSLATIONS, AIRBORNE TROOPS,

(U)

THE AUTHOR OF THE BOOK INVOLVES HIMSELF IN HEROIC
CASES OF COMBAT EMPLOYMENT OF SOVIET AIRBORNE
TROOPS AT VARIOUS STAGES OF THE GREAT PACTHIOIC
WAR. MUCH EMPHASIS IS PLACED UPON THE IMPORTANCE
OF THE AIRBORNE AS A MAJOR COMBATIVE STRATEGEM.

(AUTHOR)

88

UNCLASSIFIED /ZONC2
UNCLASSIFIED

FOREIGN TECHNOLOGY DIV "RIGHT-PATTERNSUN AFB OHIO
THEORETICAL BASES OF JUMPING,
DEC 69 14P
KRAVTSOV, I. I.
REPT. NO. FTD-MT-24-314-69
PROJ. FTD-4160002

SUPPLEMENTARY NOTE: EDITED MACHINE TRANS. OF KRYLTSA
ROVNY (USSR) V20 N5 P26-29 1969, BY RAY E. ZARZA.

DESCRIPTIONS: (PARACHUTE JUMPING, THEORY),
PILOTS, OPERATION, PARACHUTE DESIGNS, LANDING
IMPACT, USSR, TRANSPORT PLANES, UTILITY PLANES,
ALTITUDE, TRAINING
IDENTIFIERS: COLT, TRANSLATIONS

PARACHUTING TECHNIQUES FROM AN AN-2 AIRCRAFT AT
900 M AND 800 M ARE DESCRIBED. DIRECTIONS ARE GIVEN
FOR CHUTE PLACEMENT BEFORE THE JUMP, OPENING THE
CHUTE, CHUTE MANEUVERING, DESCENT RATE, AND LANDING.
(AUTHOR)

UNCLASSIFIED
UNCLASSIFIED

UNCLASSIFIED REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /20NC2

AU-706 159 1/3
FOREIGN TECHNOLOGY DIV WRIGHT-PATTERSON AFB OHIO
PARACHUTE PACKING
FEB 70 10P
SHTENNIKOV, YU.
RLPT. NO.: FTU-MT-23-586-69
PKOY: FTU-9140004

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: EDITED TRANS. OF KRYLYA MODINY
(USSR) V20 N1 P26-29 FEB 69, BY H. PLCK.

DESCRIPTORS: (PARACHUTES, PACKAGING), RIBBON
PARACHUTES, VISUAL INSPECTION, ASSEMBLING, USSR
IDENTIFIERS: TRANSLATIONS

THE ARTICLE IS A SEQUENCE TO STUDY NO. 11 DATED
1969, WHICH DESCRIBED A PARACHUTE, INTERACTION OF
PARTS, SEQUENCE AND RELIABILITY. THE AUTHOR NOW
DISCUSSES, IN DETAIL, PARACHUTE PACKING FOR SAFETY
PURPOSES. SOME HINTS ARE GIVEN TO SKYDIVING
INSTRUCTORS FOR CONDUCTING PARACHUTE PACKING CLASSES.
(AUTHOR)

(UNCLASSIFIED /20NC2

90
THIS ARMY SERVICE TEST PROCEDURE DESCRIBES TEST METHODS AND TECHNIQUES FOR EVALUATING THE PERFORMANCE AND CHARACTERISTICS OF PARACHUTES, HARNESS, RELEASE DEVICES, AND OTHER ITEMS FOR AIRDROPPED PERSONNEL — AND FOR DETERMINING THEIR SUITABILITY FOR SERVICE USE BY THE U. S. ARMY. THE EVALUATION IS RELATED TO CRITERIA EXPRESSED IN APPLICABLE QUALITATIVE MATERIAL REQUIREMENTS (QMR), SMALL DEVELOPMENT REQUIREMENTS (SDR), AND TECHNICAL CHARACTERISTICS (TC), OR OTHER APPROPRIATE DESIGN REQUIREMENTS AND SPECIFICATIONS.
VI. AIR DROP OPERATIONS
UNCLASSIFIED

DOEC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 71050072

AD-600 741

ARMY NATICK LABS MASS AINDROP ENGINEERING LAB

MINIMUM AIRDROP ALTITUDES USING STANDARD PARACHUTE

EQUIPMENT.

APR 64 2IP LEWIS, WILLIAM K. I

REPT NO: AED-64-2

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: PARACHUTE DESCENTS, LOW ALTITUDE,
AIRDROP OPERATIONS, PARACHUTES, AIRDROP OPERATIONS,
TRANSPORT PLANES

REQUIREMENTS OF THE AIR FORCE COMPUTED AIR
RELEASE POINT SYSTEM (CARP), PARACHUTE BALLISTIC
DATA INPUT TO THE CARP SOLUTION, AIRDROP CAPABILITY
OF TROOP CARRIER AIRCRAFT, PRESENT AND RECOMMENDED
AIRDROP ALTITUDES, PERFORMANCE CAPABILITY OF EXISTING
STANDARD PARACHUTE EQUIPMENT AND CHANGES TO EXISTING
STANDARD PARACHUTE EQUIPMENT HAVING POTENTIAL FOR
IMPROVING ITS CAPABILITY FOR USE AT LOWER AIRDROP
ALTITUDES WERE REVIEWED; MINIMUM AIRDROP ALTITUDES
CONSIDERED FEASIBLE USING EXISTING UNMODIFIED
STANDARD PARACHUTE EQUIPMENT WERE DETERMINED.

(AUTHOR)

(U)
SUPPLEMENTARY NOTE:

THE AIRDROPPD IMPACT CAPABILITY OF THE FUEL-HEATED PRESSURE AUTOCLAVE DRESSING STERILIZER WAS EVALUATED. SIX AND STATIC AND ONE AIRDROPP WERE CONDUCTED. RESULTS INDICATE THERE WAS NO EVIDENCE OF STRUCTURAL DEFORMATION OR FUNCTIONAL DEFECTS. IT WAS CONCLUDED THAT THE STERILIZER DESIGN IS ADEQUATE FOR AIRDROPP ON A PARACHUTIST AND BY STANDARD AIRDROPP TECHNIQUES, USING PAPER HONEYCOMB AS AN ENERGY DISSIPATING (AUTHOR)
A study was made of the extraction of loads by parachute from the CV-7 Caribou aircraft. Two FORTRAN programs are included to show the calculation of the maximum safe envelope for the loads; various conditions with a wide range of adjustable parameters are considered. In the programs, the parameters may be set as data to simulate any values, such as those for the ejection force of the parachute, for the coefficient of sliding friction between the floor and the load, and for the length of the pallet on which the load is mounted. The conclusions reached are negative in character, but they can be of value as a basis for further studies. The load tips 30 little at the sill of the floor with the ramp up that the maximum safe envelope departs only slightly from the rectangular form. It is believed that the effects of gust disturbances and of possible jamming in the rail restraint and release system should be investigated. Since, from time to time, these influences will cause the load to tip through angles of inclination of a higher order of magnitude than those due to dynamical considerations. (Author)
The objective of this operational test was to evaluate the capability, suitability, and training requirements of the "Alamo Sling-Shot System" for aerial delivery from C-119 aircraft. It was determined that C-119 airdrop capability was greatly improved by use of the "Alamo Sling-Shot System," due to a vast improvement in airdrop accuracy, reliability, ease of loading, rigging, versatility, and minimum aircrew training required to obtain proficiency. It is recommended that the "Alamo Sling-Shot System" be approved for operational use in airdropping A-22 containers, and other similar loads for which rigging procedures have been established. (Author)
UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY
SEARCH CONTROL NO. 160422

AD-633 249 1 7/7 1/2
LOCKHEED-GEORGIA CO MARIETTA
C-141A ENGINEERING FLIGHT TEST RESULTS OF THE AERIAL
DELIVERY SYSTEM TESTS
(AU)
REPT. NO. ER-5473

- UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (FLIGHT TESTING, AIR DROP
OPERATIONS), (JET TRANSPORT PLANES, FLIGHT
TESTING, PACKAGING, EXPERIMENTAL DATA, CARGO,
EJECTION, PERFORMANCE ENGINEERING), HANDLING,
CARGO PARACHUTES, LOADING (MECHANICS),
MECHANICAL FASTENERS, DISCONNECT FITTINGS

IDENTIFIERS: C-141 AIRCRAFT

AERIAL DELIVERY SYSTEMS TESTS WERE ACCOMPLISHED
WITH THE C-141A, AF63-8077 (LAC 6004) AT
THE NAVAL AIR FACILITY, EL CENTRO,
CALIFORNIA. THESE TESTS CONSISTED OF PERSONNEL
DELIVERY DROPS (DUMMY DROPS), EXTRACTION LINE
LENGTH TESTS, EXTRACTION PARACHUTE TOA TESTS, SINGLE
PACKAGE CARGO DROPS, AND MULTIPLE PACKAGE CARGO
DROPS, QUALITATIVE EVALUATIONS, AIRPLANE RESPONSE
PARAMETERS, AND AIRPLANE LOADS OBTAINED DURING THESE
TESTS ARE CONTAINED IN THIS REPORT. (AUTHOR)
UNCLASSIFIED

ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZONCZ

AD-640-576 1/3
ARMY AVIATION MATERIAL LABS FOR "STIS VA
INVESTIGATION OF DEPLOYMENT AND LANDING LOADS WITH A
LIMP PARAGLIDER. (U)

DESCRIPTIVE NOTE: FINAL REPT.
SEP 66 51P  SOBCZAK, JOHN W. I
REPT. NO. USAAVLABS-TR-66-82
PROJ. DA-1LO13D01A5/1

UNCLASSIFIED REPORT

DESCRIPTIONS: (PARACHUTES, GLIDERS), LANDING IMPACT, WINGS, LOADING(MECHANICS), PARACHUTE JUMPING, DROP TESTING
IDENTIFIERS: PARAGLIDERS (U)


98

UNCLASSIFIED /ZONCZ
UNCLASSIFIED

DOE REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 160164

AU-66/401 15/7
GOODYEAR AEROSPACE CORP AKRON OHIO
PRELIMINARY INVESTIGATION OF CONCEPTS FOR LOW-
ALTITUDE AIRDROPPING OF PERSONNEL - EXPLORATORY
DEVELOPMENT.

DESCRIPTIVE NOTE: FINAL REPT. 30 NOV 65-1 NOV 66
UDEC 66. 177P LAU, RICHARD A.
REPT. NO: GEN=12688
CONTRACT: DA-19-015-AMC-855
PROJ.: DA-19-015-AMC-855
MONITOR: USA-NLAM

UNCLASSIFIED REPORT

DESCRIPTORS: (INFANTRY, AIRBORNE), (ARMY
PERSONNEL, AIR DROP OPERATIONS), DESCENT,
DECELERATION, LOW ALTITUDE, PARACHUTES, ROTARY
KINGS, GLIDERS, RING RINGS, PIRAMIDS,
PERFORMANCE (ENGINEERING), STABILITY, RECOVERY,
VELOCITY, DRAG, AERODYNAMIC LOADING,
MATHEMATICAL ANALYSIS.
IDENTIFIERS: DRAG CONES, LIFT PLATFORMS, CANOPY
SYSTEMS, LIFT/DRAG RATIO.

THE REPORT PRESENTS THE RESULTS OF AN ANALYTICAL
STUDY THAT WAS CONDUCTED OF VARIOUS AERODYNAMIC
DECELERATORS TO DETERMINE THE FEASIBILITY OF USE
DURING HABS TROOP JUMPS, AT ALTITUDES OF 50 FEET OR
BELOW, FROM FIXED AND ROTARY WING AIRCRAFT FLYING AT
SPEEDS OF 40 TO 150 KNOTS. (AUTHOR)

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DEPARTMENT OF THE AIR FORCE

UNCLASSIFIED REPORT

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DESCRIPTIONS: (1) TRANSPORT PLANES; (2) AIR DROP OPERATIONS; (3) VERTICAL TAKE-OFF PLANES; (4) AIR DROP OPERATIONS; (5) CARGO, AIRSPEED, PAYLOAD, HOVERING, GROUND EFFECT, CARGO PARACHUTES, MILITARY PERSONNEL, TILT RINGS, SIMULATION, MATHEMATICAL MODELS

IDENTIFIERS: XC-142A AIRCRAFT; C-142 AIRCRAFT; TRANSITION FLIGHT; EXHAUST PARACHUTES

GRAPHICS/CHARTS

THE POTENTIAL ABILITY OF VSTOL AIRCRAFT TO PERFORM ARMY DROP MISSIONS AT VARIOUS ALTITUDES WHILE FLYING AT SPEEDS FROM HOVER TO CONVENTIONAL FLIGHT COULD PROVIDE A BASIS FOR PRECISION IN-FLIGHT DELIVERY AND COULD OVERCOME MANY OF THE OPERATIONAL RESTRICTIONS ASSOCIATED WITH THE CONVENTIONAL AIR-DROP TECHNIQUES. THE STUDY WAS PARTIALLY BASED ON ACTUAL AIR-DROP DEMONSTRATIONS. SINGLE CARGO LOADS OF UP TO 3,200 POUNDS WERE GRAVITY DROPPED IN HOVER AND AT 30 KNOTS, AND LOADS OF UP TO 4,000 POUNDS WERE EXTRACTED BY PARACHUTE AT 127 KNOTS. USING THESE FLIGHT DATA TO SET UP A REALISTIC SIMULATION, A MATHEMATICAL MODEL OF THE XC-142 AIRPLANE AND A HUMAN PILOT WERE USED TO EXAMINE THE AIRCRAFT'S RESPONSE TO CARGO HEIGHTS UP TO THE AIRPLANE'S MAXIMUM PAYLOAD OF 8,000 POUNDS IN THE LOW-SPEED PORTION OF TRANSITION AND 12,000 POUNDS AT A 147-KNOT FLIGHT CONDITION. THE STUDY SHOWS THAT THE MAXIMUM PAYLOAD COULD BE SUCCESSFULLY DROPPED WITH PROPER PILOT TECHNIQUES, MEANS OF EXTENDING THE AIRPLANE'S AIR-DROP CAPABILITY THROUGH THE USE OF SPECIAL EXTRACTORS; FORCES AND PARAMETERS APPLICABLE TO THE AIR-DROP SYSTEM WERE STUDIED.

AUTHOR

100
The Lockheed trolley low altitude airdrop concept employs a towed parachute to maintain tension in a long cable from which a load may be suspended until it contacts the ground, after it is extracted by the force of the parachute, the load slides beneath the cable until it contacts the ground. Rate of descent is controlled by a winch in the aircraft that reels in the cable as needed to minimize impact velocity. This preliminary concept-oriented investigation has undertaken to determine the feasibility of developing this system for operational use. The study consists of analytical evaluation of the operational parameters, limited component testing, and consideration of basic hardware requirements. Digital and analog computer simulations of trolley airdrop are among the analytical methods employed. The tests of a parachute towed on a trolley cable behind a C-130 aircraft are evaluated. Laboratory tests of certain components are analyzed with respect to flight safety. Results of the study indicate no problems which preclude the development of the trolley airdrop concept into an operational system for airdropping individual loads of 2,000 to 10,000 pounds from a C-130 below 500 feet. Comparison of trolley to conventional airdrop shows: (1)
UNCLASSIFIED

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UNCLASSIFIED REPORT

BIBLIOGRAPHY SEARCH CONTROL NO. 7Z0NC2

AU-672 CRI 1/3 15/7
AAI CORP. COCKEYSVILLE MD
PARACHUTE REEL-OUT REEL-IN LOW ALTITUDE AIRDROP
EXPLORATORY DEVELOPMENT,
DESCRIPTIVE NOTE: FINAL REPORT
AUG 66 242P MILLS, R. R.; JR.; PAYNE, R. S.; JR.; CRITCHER, J. L.; IRWIN, L. M.; V.
CONTRACT: DA-19-128-AMC-847 (N)
PROJECT: DA-151124D-ID195
MONITOR: USA-NLABS TR-69-13-A0

UNCLASSIFIED REPORT

DESCRIPTORS: (*AIR DROP OPERATIONS, LOW ALTITUDE),
(*CARGO PARACHUTES, REELS), LANDING IMPACT,
DESCENT, CARGO, PERFORMANCE (ENGINEERING),
RELIABILITY, SYSTEMS ENGINEERING, DESCENT
TRAJECTORIES
IDENTIFIERS: EXTRACTION PARACHUTES

RESULTS AND CONCLUSIONS ARE REPORTED FOR WORK
ACCOMPLISHED ON THE PROGRAM, DURING THE PERIOD 30
NOVEMBER 1965 THROUGH 31 AUGUST 1966, OF
EVALUATING PARACHUTE REEL IN/REEL OUT SYSTEMS
DESIGNED TO PERMIT AIRDROPS TO BE MADE FROM ALTITUDES
OF 500 FEET OR LESS AND WITH VERTICAL VELOCITIES OF
THE CARGO AT GROUND IMPACT NOT EXCEEDING 28.5 FPS,
WITH AS LITTLE HORIZONTAL MOTION AS POSSIBLE. THE
WEIGHT RANGE OF THE CARGOS OF INTEREST IS BETWEEN
2000 AND 3500 LBS. CARGO DESCENT TRAJECTORY DATA
AND CANDIDATE REEL SYSTEM DESIGNS ARE PRESENTED AND
DISCUSSED IN THE REPORT; A REVIEW OF THE PROGRAM
REQUIREMENTS IS ALSO INCLUDED. (AUTHOR)

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UNCLASSIFIED 7Z0NC2
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OC REPORT BIBLIOGRAPHY  SEARCH CONTROL NO. /ZONC2

UNCLASSIFIED REPORT

THE REPORT DISCUSSES THE APPROACHES PURSUED, AND THE RESULTS AND CONCLUSIONS REACHED, DURING THE PRELIMINARY STUDY CONDUCTED TO INVESTIGATE THE FEASIBILITY OF ELEVATING THE MAIN RECOVERY PARACHUTE ABOVE THE FLIGHT PATH OF AN AIRDROP AIRCRAFT BY MEANS OF AUXILIARY LIFTING PARACHUTES. PRELIMINARY ANALYTICAL STUDIES AND EXPERIMENTAL TESTS WERE CONDUCTED DURING THE EVALUATION PERIOD. THE OVERALL OBJECTIVE WAS TO DETERMINE THE TECHNICAL, OPERATIONAL, AND ECONOMIC FEASIBILITY OF ELEVATING THE MAIN RECOVERY PARACHUTE TO ACHIEVE A LOW-ALTITUDE AIRDROP CAPABILITY OF 500 FT (ABSOLUTE) ALTITUDE OR LESS, AS A BASIS FOR DETERMINING IF FURTHER IN-DEPTH STUDY WERE WARRANTED. THE RESULTS INDICATE THAT THE ELEVATION OF RECOVERY PARACHUTES BY AUXILIARY LIFTING PARACHUTES IS NOT FEASIBLE.

(AUTHOR)

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---|---|---

AU-690 868 | 1/3 | 1/4

ARMY NATICK LABS MASS AIRDROP ENGINEERING LAB

Mth 5240 Trajectory Analysis of a Parachute Cargo
Airdrop System

DESCRIPTIVE NOTE: RESEARCH REPT.

APR 69 46P  GIOFRIDU, MAURICE P.

REPT. NO. TR-69-80-AD

PROJ. DA-1-F-162203-D-195

UNCLASSIFIED REPORT

DESCRIPTIONS: (1) CARGO PARACHUTES, (2) AIRDROP OPERATIONS, (3) PARACHUTE DESCENTS, (4) DESCENT TRAJECTORIES, (5) EQUATIONS OF MOTION, ALTITUDE, OPTIMIZATION, DRAG, AERODYNAMIC CHARACTERISTICS, NUMERICAL ANALYSIS

IDENTIFIERS: (1) CLUSTER PARACHUTES

EQUATIONS OF MOTION FOR A THREE-DEGREE-OF-FREEDOM, TWO-BOYD AIRDROP SYSTEM WERE DERIVED AND NUMERICAL SOLUTIONS OBTAINED BY USE OF A DIGITAL COMPUTER. IT WAS ASSUMED THAT, FOR GIVEN INITIAL CONDITIONS, THE PARACHUTE DRAG AREA WAS A FUNCTION OF TIME ONLY. THE RESULTS INDICATED THAT: (1) THE DERIVED EQUATIONS OF MOTION RESULT IN CALCULATED TRAJECTORIES WHICH ARE GOOD REPRESENTATIONS OF ACTUAL AIRDROP TRAJECTORIES; (2) THE PARAMETER WHICH MOST AFFECT ALTITUDE LOSS TO EQUILIBRIUM ARE PARACHUTE-CARGO LINE LENGTH AND PARACHUTE OPENING TIME; (3) THERE IS AN OPTIMUM PARACHUTE OPENING TIME WHICH RESULTS IN MINIMUM ALTITUDE LOSS TO EQUILIBRIUM; (4) LONGER OR SHORTER OPENING TIMES WILL RESULT IN GREATER ALTITUDE LOSSES TO EQUILIBRIUM; (5) MODERATE VARIATIONS OF AIRCRAFT FLIGHT PATH INCLINATION, INITIAL CARGO ACCELERATION, AND INITIAL CARGO VELOCITY HAVE ONLY A SMALL EFFECT ON ALTITUDE LOSS TO EQUILIBRIUM; (6) FOR A GIVEN EQUILIBRIUM VELOCITY, A CLUSTER OF SMALL PARACHUTES APPEARS TO BE A BETTER CHOICE THAN A SINGLE LARGE PARACHUTE FOR OBTAINING MINIMUM ALTITUDE LOSS TO EQUILIBRIUM.

(AUTHOR)

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UNCLASSIFIED /ZONC2
A SHOCK ABSORBER IS PROPOSED, WHICH IS PRIMARILY DESIGNED FOR PARACHUTE AIRDROPPING OF BARRELS OF FLUID. THE INVENTION IS DISTINGUISHED BY THE FACT THAT THE LOAD IS PROTECTED AT THE MOMENT OF LANDING BY A BEARING MADE OF WOOD OR OTHER ELASTIC MATERIAL, ATTACHED BY MEANS OF A BAND, THE CENTER OF THE SPHERICAL SURFACE OF THE BEARING IS PLACED ABOVE THE CENTER OF GRAVITY OF THE VESSEL. (AUTHOR)
UNCLASSIFIED

JOC REPORT BIBLIOGRAPHY SEARCH CONTROL, NO. 1-ZONCZ

AU-691 436 1/2 15/7
TACTICAL AIRLIFT CENTER POPE AFB N C OFFICE OF OPERATIONS
ANALYSIS
A COMPUTER PROGRAM FOR DETERMINING THE TRAJECTORY
AND PLATFORM ATTACK ANGLE OF A LAPES PLATFORM DURING
FREE FALL.

DESCRIPTIVE NOTE: TECHNICAL MEMO. JUN 69 20P LINK, DAVID A + 1
REPORT NO. JALC-0A-TM-3

UNCLASSIFIED REPORT

DESCRIPTORS: (CARGO, AIR DROP OPERATIONS),
(PARACHUTE DESCENTS, DESCENT TRAJECTORIES),
TACTICAL AIR SUPPORT, MATHEMATICAL MODELS, FREE
FALL MODELS, EQUATIONS OF MOTION, ANGLE OF ATTACK,
ATTITUDE CONTROL SYSTEMS, ROTATION, CENTER OF
MASS, PROGRAMMING (COMPUTERS),
IDENTIFIERS: LAPSE (LONExtraction SYSTEM),
LOC ALTITUDE EXTRACTION SYSTEM, LAPES PLATFORMS,
COMPUTER ANALYSIS, COMPUTERIZED SIMULATION.

THIS MEMORANDUM CONTAINS A DYNAMIC ANALYSIS OF THE
FREE-FALL PORTION OF THE LAPES TRAJECTORY. THE
ANALYSIS WAS MADE IN RESPONSE TO A REQUEST FOR A MORE
EXACT METHOD FOR LOCATING THE ATTITUDE CONTROL BAR
FOR UNUSUAL SINGLE-PLATFORM LOADS, SUCH AS VEHICLES.
RESULTS ARE PRESENTED IN THE FORM OF A PROGRAM IN
THE CONTINUOUS SYSTEM MODELING PROGRAM
(CSMP) LANGUAGE FOR SOLVING THE EQUATIONS OF MOTION
AND GRAPHS FOR AN EXAMPLE CALCULATION. (AUTHOR)

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UNCLASSIFIED /ZONCZ
A CONTAINER FOR AIRDROPPING CARGO, CONSISTING OF A CYLINDRICAL HOUSING WITH A REINFORCED BOTTOM AND DETACHABLE LID, WITH A CHAMBER FOR A PARACHUTE INSIDE A PORTABLE CASE FOR PACKING THE CARGO AND STABILIZING THE PARACHUTE, WHICH IS ATTACHED TO THE LID OF THE CONTAINER, IS DESCRIBED. (AUTHOR)
UNCLASSIFIED

AD-693 176
11/5 15/5 15/7
KRENCH AIR DEVELOPMENT CENTER BRIGHT-PATTERSON A.F.D
OHIO
THE DESIGN AND FABRICATION OF AERIAL DELIVERY SLING
SUSPENSIONS FROM WOVEN NYLON WEBBING.
DESCRIPITIVE NOTE: TECHNICAL NOTE:
AUG 54 SUP INGERSOLL, H. J. URI
REPT. NO. WADC-TN-46-1644-40
TASK: 61547

UNCLASSIFIED REPORT

DESCRIPTION: (CARGO, AIR DROP OPERATIONS;)
(WEAVING, DESIGN), STRENGTH, COSTS,
MANUFACTURING METHODS, NYLON, THICKNESS, CARGO
PARACHUTES, LOADING(MECHANICS), TENSILE
PROPERTIES, ELONGATION

THE PURPOSE OF THE STUDY WAS TO REDESIGN THE
EXISTING SLING SUSPENSIONS CURRENTLY USED FOR AERIAL
DELIVERY PURPOSES IN ORDER TO REDUCE THE HIGH COST OF
MANUFACTURE AND TO INCREASE THE STRENGTH EFFICIENCY
OF THE SLING. (AUTHOR)
UNCLASSIFIED

JOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 1Z0NC2

AU-7179 342  12/1  21/8

ARMY NATICK LABS MAN

A PARACHUTE RETROMOCKET RECOVERY SYSTEM FOR AIRDROP
OF HEAVY LOADS.

DESCRIPTION NOTE: TECHNICAL REPORT

NOV 69 33P  CHAKIAN, GEORGE

REPT. NO. USA-NLABS-TR-70-34-AD

PROJ. DA-1-F-16220-0-195

UNCLASSIFIED REPORT

DESCRIPTIONS: (*AIR DROP OPERATIONS, CARGO
PARACHUTES), (*CARGO PARACHUTES, *RETRO
ROCKETS), LOW ALTITUDE, RECOVERY, DEPLOYMENT,
SENSORS, DROP TESTING, DESCENT TRAJECTORIES,
LAUNCH IMPACT, DESIGN, LOGISTICS

IDENTIFIERS: PRAD5IPARACHUTE RETROMOCKET AIR
DROP SYSTEMS), PARACHUTE RETROMOCKET AIR DROP
SYSTEMS

THE REPORT PRESENTS THE RESULTS OF AN IN-DEPTH
EXPLORATORY DEVELOPMENT STUDY OF A PARACHUTE
RETROROCKET RECOVERY SYSTEM FOR THE AIRDROP OF CARGO
LOADS HEAVYING UP TO 50,000 POUNDS AND THE RESULTS OF
ACTUAL DROP TESTS OF LOADS HEAVYING FROM 3000 TO 35,
000 POUNDS. THE STUDY INDICATES THAT A PARACHUTE
RETROROCKET RECOVERY SYSTEM IS PARTICULARLY FEASIBLE
FOR THE RECOVERY OF AIRDROPS LOADS AND MAY PROVE TO BE
THE ONLY PRACTICAL SYSTEM FOR HEAVY LOADS, ESPECIALLY
IF LOW ALTITUDE IS A REQUIREMENT. (AUTHOR)
UNCLASSIFIED

UNCLASSIFIED REPORT

AEROSPACE MEDICAL RESEARCH LAB WRIGHT-PATTERSON AFB
OHIO

LONG LINE LOITER

REPT. NO.: AMRL-TR-70-2
PROJ.: AF-7164
TASK: 716495

DESCRIPTION: (AERIAL PICKUP SYSTEMS, RESCUES),
CABLES (MECHANICAL), AIR DROP OPERATIONS,
TURNING FLIGHT, TOVED BODIES, HOISTS, PARACHUTE
DESCENTS

IDENTIFIERS: LLL (LONG LINE LOITER), LONG
LINE LOITER, LONG LINE LOITER SYSTEMS

MANEUVERING TECHNIQUES FOR FIXED WING AIRCRAFT
POSITIONING A TOVED MASS NEAR THE CENTER OF AN
PYLON TURN ARE DISCUSSED. POSSIBLE RESCUE USES OF
THE CIRCLING LINE TECHNIQUE ARE SUGGESTED.

(AUTHOR)
UNCLASSIFIED

AIRCRAFT, MILITARY

ATTACKERS FROM THE SKY

10/7

ARMS CONTROL

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANSLATION FROM KRAHYAYA ZVEZDA

USSR). P2, 20 FEB 68.

DESCRIPTIONS: ARMED FORCES, FOREIGN, AIR DROPCARGO PARACHUTES, TRANSPORT PLANES, HISTORY

OTHER IDENTIFIERS: AIRBORNE FORCES, TRANSLATIONS,

PARATROOPERS


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UNCLASSIFIED
UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO.: ZONC2

DO-851 494 15/7 1/2
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON D.C.

SOVIET AIRBORNE FORCES, (U)
APR 69 103P
REPT 40
FSTC-N-3-564-74
PHOU: FSTC-62238282301

UNCLASSIFIED REPORT


DESCRIPTORS: (#ARMED FORCES (FOREIGN)), (#AIR DROP OPERATIONS, PARACHUTE JUMPING), TACTICAL WARFARE, MILITARY TACTICS, PARACHUTES, COMMUNISTS, CLOSE SUPPORT, TRANSPORT PLANES, PROPAGANDA, USSR
IDENTIFIERS: TRANSLATIONS, SKYDIVING


(AUTHOR)

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UNCLASSIFIED /ZONC2
UNCLASSIFIED

UNCLASSIFIED REPORT

DESCRIPTIONS: (AIR DROP OPERATIONS, CONTAINERS),
(CONTAINERS, COLD WEATHER TESTS), ARCTIC
REGIONS, SIMULATION, VISUAL INSPECTION,
ASSEMBLING, REACTION KINETICS, HANDLING, IMPACT
SHOCK, PERFORMANCE (ENGINEERING)
IDENTIFIERS: AIR DROP PLATFORMS

THIS ENVIRONMENTAL TEST PROCEDURE DESCRIBES
TEST METHODS AND TECHNIQUES FOR EVALUATING THE
PERFORMANCE AND CHARACTERISTICS OF AIR DROP
PLATFORMS UNDER ARCTIC WINTER ENVIRONMENTAL
CONDITIONS. EVALUATION IS RELATED TO CRITERIA
ESTABLISHED BY QUALITATIVE MATERIAL
REQUIREMENTS (MR), SMALL DEVELOPMENT
REQUIREMENTS (SDE), TECHNICAL CHARACTERISTICS
(TEC), AND OTHER DESIGN REQUIREMENTS OR
SPECIFICATIONS (AUTHOR)
VII. MISCELLANEOUS
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ODC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. P44NC1

ACD-OM-OV

CODA ELECTRIC CO. KUNTAN GROVE ILI
STUDY AN EXPLOREATORY FREE-FLIGHT INVESTIGATION OF
DEPLOYABLE AERO DYNAMIC DECELERATORS OPERATING AT HIGH
ALTITUDES AND AT HIGH MACH NUMBERS, JUL 64 209P NiCkEL Fo . 2015 T1NS 1 1:

PROJ: 6086

TASK: 045505

MONITOR: FDL . TDRN 35 41

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SPECIALMENTARY NOTE: LEGIBILITY OF THIS DOCUMENT IS IN PART
UNSATISFACTORY, REPRODUCTION HAS BEEN MADE FROM BEST
AVAILABLE COPY.

DESCRIPTORS: (PARACHUTES, REENTRY VEHICLES), (REENTRY
VEHICLES, PARACHUTES), (PARACHUTE DESCENTS, SUPERSONIC
CHARACTERISTICS), PARACHUTE FABRICS, ATMOSPHERE ENTRY,
AERO DYNAMIC HEATING, DECELERATION, HIGH ALTITUDE,
HEAT RESISTANT MATERIALS, STAINLESS STEEL, TELEMETRY,
OSCILLATION, TEMPERATURE, REYNOLDS NUMBER, AND TUNNEL
MODELS, HEAT TRANSFER COEFFICIENTS, FREE FLIGHT
TRAJECTORIES, STRESSES, ENVIRONMENTAL TESTS

IDENTIFIERS: MACH NUMBER, CREE VEHICLE, NOMEX YARNS,
PERLON

THIRTEEN PARACHUTE DECELERATOR TESTS WERE PERFORMED
AT THE GULF TEST RANGE OF THE AIR PROVING
GROUND CENTER AT EGLIN AIR FORCE BASE,
FOLSOM. THESE TESTS WERE ACCOMPLISHED THROUGH
THE USE OFF MUL TISTAGE ROCKET BOOSTERS, THE
CREL PAYLOAD VEHICLE WAS USED AS THE TEST PLATFORM
AND DATA GATHERING SYSTEM. THESE TESTS WERE
CONDUCTED USING BOTH HYPERFLO AND HEMISFLO
PARACHUTES WHICH WERE DEPLOYED AT PREDETERMINED
MACH NUMBERS ALTITUDE REGIMES. TESTS WERE
ACCOMPLISHED OVER A MACH NUMBER RANGE OF 0.4 TO 4.4
AND AN ALTITUDE RANGE OF 40,000 TO 190,000 FEET.
THE DATA PRESENTED INCLUDES DRAG COEFFICIENTS
VERSUS MACH NUMBER, DYNAMIC PRESSURE, REYNOLDS
NUMBER AND VELOCITY, CANOPY ANGLES OF OSCILLATION,
CANOPI TEMPERATURES AND GENERAL DESIGN
CONSIDERATIONS. FROM THIS PARACHUTE DECELERATOR
TEST PROGRAM IT MAY BE CONCLUDED THAT PERLON ROOF
HYPERFLO PARACHUTES PERFORM SATISFACTORILY
THROUGH MACH 2.1, THAT NOMEX RIBBON HYPERFLO
PARACHUTES PERFORM SATISFACTORILY THROUGH MACH 4.3
AND THAT NOMEX HEMISFLO PARACHUTES PERFORM
SATISFACTORILY THROUGH MACH 3.4* (AUTHOR)

115
AD-610 885
AEROSPACE CORP. EL SEGUNDO CALIF
PERFORMANCE AND CHARACTERISTICS OF 57.2 FT EXTENDED
SKIRT CANNOPY PARACHUTE WITH SINGLE CONICAL EXTENSION

APK 85 JBP EPPLE: H. LINICH K-1
REPT: NO. 46-462 (3110-61)-2
CONTRACT: AF-44 465 469
MONITOR: NSD 1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTORS: (PARACHUTES, AERIAL PICKUP SYSTEMS),
PERFORMANCE (ENGINEERING), CONICAL BODIES,
AERODYNAMIC CHARACTERISTICS, PAYLOAD, DROP
TESTING, RECOVERY, STABILITY, DRAG

THE DETAILS AND RESULTS OF TWO PARACHUTE DROP TESTS
MADE AT EL CENTRO, CALIFORNIA, ON 22 OCTOBER
1964, ARE DISCUSSED. THE PARACHUTES WERE A
MODIFICATION OF A BASIC DESIGN TO PERMIT THE AERIAL
RECOVERY OF PAYLOADS UP TO APPROXIMATELY 1500 POUNDS.
DISCUSSIONS AND CONCLUSIONS PERTAINING TO THE
DYNAMIC PERFORMANCE OF THESE MODIFIED PARACHUTES
DURING DESCENT AND THEIR PHYSICAL CONDITION AFTER
ENGAGEMENT WITH THE AIRCRAFT RETRIEVAL SYSTEM
HARDWARE ARE INCLUDED. (AUTHOR)
UNCLASSIFIED

DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /5ONC4

AD-620 205 6/7 1/2
DEPUTY INSPECTOR GENERAL FOR INSPECTION AND SAFETY (AIR FORCE) NORTON AFB CALIF LIFE SCIENCES DIV
TRENDS IN USAF AIRCRAFT ESCAPE.
DESCRIPTIVE NOTE: SEPT. FOR 1 JAN 50-30 JUN 64.
JUN 64 16P
SHAHNOX. ROBERT M.; CHU R.; SAMUEL P. IDETTICK; ALLIAR R. I

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE:

DESCRIPTIONS: (*)AVIATION PERSONNEL, SURVIVAL); (* AIR FORCE PERSONNEL, *ABANDONMENT); (*SURVIVAL, AIR FORCE PERSONNEL), AIRCRAFT, JETTISONABLE COCKPITS; AVIATION SAFETY, AVIATION ACCIDENTS, AIRCRAFT FIRES, PARACHUTE JUMPING, EJECTION SEATS; REVIEWS, BAILOUT, EJECTION

THERE HAS BEEN VERY LITTLE CHANGE IN THE BASIC
EQUIPMENT AND METHOD OF UTILIZATION FOR ESCAPE FROM
INFLIGHT EMERGENCIES FROM THE INTRODUCTION OF THE
PARACHUTE DURING WORLD WAR I TO THE END OF
WORLD WAR II. ESCAPE FROM HIGH PERFORMANCE
AIRCRAFT, HOWEVER, REQUIRED THE USE OF AN EJECTION
SEAT TO INSURE CLEARANCE OF THE COCKPIT AND EXTERNAL
STRUCTURES FOLLOWING WORLD WAR II EJECTION
SEATS WERE TESTED AND INSTALLED IN USAF AIRCRAFT
AND FIRST USED AS A MEANS OF ESCAPE IN 1949. THE
LARGEST SINGLE CAUSE OF ESCAPE FATALITIES REGARDLESS
OF METHOD OF SEPARATION FROM THE AIRCRAFT WAS VIOLENT
IMPACT WITH THE GROUND, INABILITY TO SURVIVE
PARACHUTE WATER LANDINGS WAS THE SECOND LEADING
CAUSE. THE MAJORITY OF MAJOR INJURIES REGARDLESS
OF METHOD OF ESCAPE OCCURRED DURING PARACHUTE
LANDING. THE MOST CRITICAL FACTOR IN DETERMINING
THE OUTCOME OF THE ESCAPE IS THE AMOUNT OF TIME
AVAILABLE FOR COMPLETION OF THE SEQUENCE; THIS IS
BORNE OUT BY THE HIGH FATALITY RATE IN ESCAPE
ATTEMPTS AT LOW ALTITUDES PARTICULARLY BELOW 5000
FEET. WITH THE SEAT EJECTION SYSTEM, HOWEVER, MANY
SUCCESSFUL ATTEMPTS HAVE BEEN MADE AT LOW ALTITUDE
THAT WOULD NOT HAVE BEEN POSSIBLE WITH CONVENTIONAL
BAILOUT. (AUTHOR)
UNCLASSIFIED

DOCUMENT BIBLIOGRAPHY

UNCLASSIFIED

N0. 647 161

1974

FRANKFORD ARSENAL PHILADELPHIA PA PROPPELLANT ACTUATED

DEVICES MTY

FEASIBILITY STUDY OF A BALLISTIC HATCH RELEASE (XMS)

FOR THE HIGH SPEED AERIAL DELIVERY CONTAINER

(CONTAINER, AERIAL DELIVERY, CTU-1/A), (U)

DESCRIPTIVE NOTE: (ENG. REP. ,)

JAN 67 19P TRAVELS IN PACE no 1

FRANKFORD ARSENAL PHILADELPHIA PA MTY-11-1

UNCLASSIFIED REPORT

DESCRIPTORS: (EXPLOSIVE ACTUATORS, HATCHES),

FEASIBILITY STUDIES, CONTAINERS, AIRBORNE, DELAY

ELEMENTS (EXPLOSIVE), PARACHUTE DESCENTS, RELEASE

MECHANISMS, (U)

IDENTIFIERS: CTU-1/A CONTAINER

(U)

A STUDY HAS CONDUCTED TO DETERMINE THE FEASIBILITY

OF USING A MODIFIED MY LEFTING LINE CUTTER AS A

BALLISTIC HATCH RELEASE ON THE CTU-1/A HIGH SPEED

AERIAL DELIVERY CONTAINER (FORMERLY THE MB) TO

OBVATE THE POSSIBILITY OF A COLLISION BETWEEN THE

JETTISONED PARACHUTE HATCH AND THE AIRFRAME. THE

MODIFICATIONS REQUIRED WERE DETERMINED AND ASSOCIATED

NEW HARDWARE WAS DESIGNED AND FABRICATED; THE UNIT

WAS DESIGNATED "RELEASE, CARTRIDGE ACTUATED"

XMS-5. THE MECHANICAL INTEGRITY OF THE BALLISTIC

HATCH RELEASE TO SUSTAIN AN INITIAL LOCK LOAD OF 500

LB. WAS DETERMINED. A BALLISTIC CHARGE CAPABLE OF

PRODUCING A 500-30 THRUST OVER A 1-1/2 INCH STROKE

AND A 0.3-SEC DELAY ELEMENT CHARGE WERE ESTABLISHED.

THE NEW CARTRIDGE WAS DESIGNATED XMS-28.

VERIFICATION TESTING (PHASE I) AND TYPE I

CERTIFICATION TESTING AS ESTABLISHED BY THE NAVAL-

WEAPONS LABORATORY (PHASE II) WERE

SATISFACCTORILY ACCOMPLISHED. (AUTHOR) (U)

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UNCLASSIFIED

DOE REPORT RIBLIOGRAPHY SEARCH CONTROL NO. 120424

AU-654 43U 1/3
TEXAS UNIV AUSTIN ELECTRICAL ENGINEERING RESEARCH
LAB

REFLECTING CHARACTERISTICS OF POGO PARACHUTE MODELS
D-3550, D-3550-6, AND P/N 509-330

DESCRIPTIVE NOTE: TECHNICAL REVIEW

JAN 60 29P
BRITT, G. & KRAUSE, L.

C. B. A. H.: 1.5

REPT. NO. EEML-3-28
CONTRACT: NORD-16478
TASK: JTA-1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED IN COOPERATION WITH JUNIUS
HOPKINS UNIV., SILVER SPRING, MD.; APPLIED
PHYSICS LAB., CF-2847*

DESCRIPTORS: (PARACHUTES; RADAR ECHO AREAS;)
MODELS (SIMULATIONS; ROTATION; DATA; RADAR;
SCATTERING, TRANSMITTER-RECEIVER; REFLECTION;
BALLOONS, SUSPENSION DEVICES; ANTENNAS;
FREQUENCY, MEASUREMENT

IDENTIFIERS: POGO

THE REPORT CONTAINS THE MEASURED RADAR SCATTERING
CROSS SECTIONS OF THREE MODEL POGO PARACHUTES,
DESIGNATED AS D-353-6, D-3550 AND P/N 509-330.
OBSERVATIONS MADE WITH 1/6 SCALE MODELS WILL PERMIT
THE RESULTS TO BE SCALABLE FROM A MODELING FREQUENCY OF
35 KMCS TO A SIMULATED FREQUENCY OF 6.83 KMCS.

(AUTHOR)
UNCLASSIFIED

FOREIGN TECHNOLOGY JIV & RIGHT-PATTERSON AFB OH I
THE ART OF OUTER-SPACE PILOTING
7 JUL 67 14P NYKOLYH
REPT No. FTU-MT-23-491-67

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: UNEDITED ROUGH DRAFT TRANS. OF
TEKHNICA HOLONIZMI (USSR) NI P20-3 1966.

DESCRIPTION: (SPACECRAFT, USSR) SPACECRAFT
COMPONENTS: ASTRONAUTICS, GUIDANCE, STABILIZATION
SYSTEMS, LANDING GEAR, DECELERATION, SOFT
LANDING, DRAG PARACHUTES

SPACECRAFT GUIDANCE, CONTROL, STABILIZATION,
CORRECTION, DECELERATION, AND LANDING SYSTEMS ARE
DISCUSSED. IT IS NOTED THAT THE EXHAUST VELOCITY
OF A SPACECRAFT IS 2000 - 4000 M/SEC AND THAT A
PARACHUTE-LANDING ENGINE SYSTEM WAS EMPLOYED IN THE
SOFT LANDING OF THE 'VOSKHOD' SPACECRAFT. THE
ENGINE WAS SWITCHED ON WHEN THE SPACECRAFT WAS CLOSE
TO THE EARTH'S SURFACE SO THAT IT DECELERATED THE
DROP OF THE PARACHUTE REDUCING THE VELOCITY TO A
NEGligible value AT THE MOMENT OF LANDING.

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DDC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 40209

AUG 1971

MCGILL UNIV MONTREAL (QUEBEC) SPACE RESEARCH INST.
AEROSPACE APPLICATION OF GUN LAUNCHED PROJECTILES AND ROCKETS. (U)
FEB 68 46P MURPHY, CHARLES H. (BULL)
REPT. NO. 561R-24

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: PREPARED FOR PRESENTATION AT THE
AMERICAN ASTRONAUTICAL SOCIETY SYMPOSIUM "FUTURE
SPACE PROGRAMS AND IMPACT ON RANGE NETWORK

DESCRIPTORS: (SABOT PROJECTILES, ATMOSPHERIC
SOUNDING), GUN LAUNCHED, SENSORS, TERRESTRIAL
MAGNETISM, TEMPERATURE, ELECTRONS, DENSITY,
PAYLOAD, ACCURACY, SYMPOSIUM, IONOSPHERE, WIND,
PARACHUTES, SOUNDING ROCKETS, ACCELERATION,
COSTS, MODIFICATION KITS.

IDENTIFIERS: *HIGH ALTITUDE RESEARCH PROGRAM;
HARP, *GUN LAUNCHED PROJECTILES.

PROJECT HIGH ALTITUDE RESEARCH PROGRAM
(HARP) IS DIRECTED TOWARD THE USE OF GUNS FOR
SCIENTIFIC PROBING OF THE UPPER ATMOSPHERE. THE
ATTRACTIVE FEATURES OF GUNS FOR THIS PURPOSE ARE THE
BASIC ECONOMY OF SUCH A SYSTEM AND THE HIGH INERENT
ACCURACY OF GUNS FOR PLACEMENT AT ALTITUDE AS WELL AS
ACCURACY IN GROUND IMPACT. THE BASIC LIABILITY FOR
SUCH AN APPROACH LIES IN THE VERY HIGH ACCELERATIONS
EXPERIENCED BY GUN-LAUNCHED PAYLOADS. THE GUNS
USED IN PROJECT HARP VARY IN SIZE FROM 5-INCH AND
7-INCH EXTENDED GUNS ON MOBILE MOUNTS TO
TRANSPORTABLE FIXED 16-INCH GUNS. ALTITUDE
PERFORMANCE VARIES FROM 20 POUND, 5-INCH PROJECTILES
REACHING 243,000 FEET TO 188 POUND, 16-INCH
PROJECTILES REACHING 590,000 FEET. SCIENTIFIC
RESULTS TO DATE ARE PRIMARILY "IND PROFILES MEASURED
BY HUAR CHAFF, ALUMINIZED BALLOONS AND PARACHUTES,
AND TRI-METHYL ALUMINUM TRAILS, ALTHOUGH A NUMBER OF
SUCCESSFUL 250 MHZ AND 1750 MHZ TELEMETRY FLIGHTS
HAVE BEEN MADE. (AUTHOR)

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DDC REPORT BIBLIOGRAPHY
SEARCH CONTROL NO. 770419

AD-667 908 4/1
ATMOSPHERIC SCIENCES LAB WHITE SANDS MISSILE RANGE N
HEA
GUN LAUNCHED PROBES = PARACHUTE EXPLOSION TESTS UNDER
SIMULATED ENVIRONMENT (U)
JED 92 3JF WILLIAMSON L. EMNIV.
PROJ: JA-116-SLZ-AM-127
TASK: 170-SLZ-AM-127-03
MONITOR: ECOM 5179

UNCLASSIFIED REPORT

DESCRIPTION: (ATMOSPHERIC SOURCING, SABOT
PROJECTILES), (METEOROLOGICAL INSTRUMENTS, GUN
LAUNCHED), (SABOT PROJECTILES, PARACHUTES),
PONDS (PARACHUTE), HIGH-SPEED CAMERAS, PAYLOAD,
EJECTION, METEOROLOGICAL PARAMETERS, ENVIRONMENTAL
TESTS, SIMULATION, VACUUM, SPHERES, RELIABILITY,
RADIONUCLIDES, MATERIALS, DAMAGE, PHOTOGRAPHS,
NEW MEXICO
IDENTIFIERS: GUN PROBE PROJECT

EXPERIENCE GAINED DURING THE EARLY PHASES OF
PROJECT GUN PROBE AT WSR REVEALED EVIDENCE
THAT THE PARACHUTE PACKAGING AND/OR EXPLOSION
TECHNIQUES USED AT THAT TIME WERE UNSATISFACTORY.
TESTS WERE PLANNED TO EVALUATE THE TECHNIQUE
VISUALLY, UTILIZING HIGH-SPEED CAMERAS AND SIMULATED
ENVIRONMENTS, THE 60-FOOT VACUUM SPHERE AT THE
NASA FACILITY AT LANGLEY RESEARCH CENTER WAS
MADE AVAILABLE, AND SIX TESTS WERE SUCCESSFULLY
CONDUCTED. RESULTS OF THE TESTS INDICATED THAT
ONLY MINOR MODIFICATIONS TO THE EXISTING TECHNIQUE
WERE NECESSARY TO PRODUCE A COMPLETELY ACCEPTABLE
SYSTEM. (AUTHOR) (U)

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AD=693 174 19/1 1/3
WRIGHT AIR DEVELOPMENT CENTER WRIGHT-PATTERSON AFB
OHIO
NON-EXPENDABLE REEFING LINE CUTTER.
DESCRIPTION NOTE: TECHNICAL NOTE;
AUG 54 29P INGAMINE, H. M.; JRI
REPT. NO. WADC-TN-4CLE-54-34

UNCLASSIFIED REPORT

DESCRIPTIONS: (PARACHUTES, CORDAGE), (CORDAGE,
cutting), EXPLOSIVE ACTUATORS, NYLON, TENSILE
PROPERTIES, DROP TESTING, ENVIRONMENTAL TESTS
IDENTIFIERS: REEFING LINES, REEFING LINE
CUTTERS

A REEFING LINE CUTTER WAS DEVELOPED FOR USE IN ALL
ENVIRONMENTS COMMONLY EXPERIENCED IN PARACHUTE DROP
CONDITIONS. THE REEFING LINE CUTTER AS TESTED CUTS
ANY NYLON LINE UP TO AND INCLUDING A 3,000 POUND
TENSILE STRENGTH; IT IS OPERABLE WITHOUT SPECIAL
TOOLS AND IT IS NON-EXPENDABLE. (AUTHOR)
A PARACHUTE TEST PROJECTILE FOR GAS AND PNEUMATIC CANNONS IS DESCRIBED. THE SYSTEM TO BE TESTED IS FASTENED TO A FACE PLATE OUTSIDE THE BARREL OF THE CANNON AND NEED NOT FIT WITHIN THE BARREL.
A DEVICE FOR CUTTING A PARACHUTE REEFING CORD, (U)
SEP 69 6P

FLEX-OREAGN SIC'N. TECHNOLOGICAL CENTER
REPT NO: FSTC-MT-23-398-69
PROJ: FSTC-0423100

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 199 690, B
SEP 67.

DESCRIPTION: (*PARACHUTES, CORDAGE, CUTTING), PATENTS, ACTUATORS, USSR (U)
IDENTIFIERS: TRANSLATIONS, *REEFING CUTTERS (U)

A device for cutting the reefing cord of a parachute, which includes a time lag mechanism and actuating lever mechanism; supplied with a flat cutter, is distinguished by the fact that the purpose of insuring dust protection of the time lag mechanism; the cutter is located in a groove which is separated from the internal cavity of the apparatus by the chassis wall, on which the axis of rotation of the cutter is mounted. (AUTHOR) (U)

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UC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. 126C2

AJ-69 000 1/3 13/12
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER WASHINGTON, D.
C.

AUTOMATIC DEVICE FOR PARACHUTE RESCUE SYSTEM.

V. TASTEDEV, L. IOKUBAKOV, V.

CONF. 69 SP 1115294 V.

RPT. NO. FSTC-HT-23-403-69

PROJ. FSTC-04231002J1

UNCLASSIFIED REPORT

SUPPLEMENTARY NOTE: TRANS. OF PATENT (USSR) 132 957.

DESCRIPTIONS: (*ESCAPE SYSTEMS (AEROSPACE); EJECTION SEATS); (*PARACHUTES; RELEASE MECHANISMS); CATAPULTS, TIMING DEVICES, DEPLOYMECHANISMS; REACTION KINETICS, PATENTS (U)

IDENTIFIERS: TRANSLATIONS (U)

THE REPORT DESCRIBES A DEVICE FOR AUTOMATICALLY ACTIVATING A PARACHUTE RESCUE SYSTEM DURING CATAPULTING, WHICH INCLUDES ACTUATING MECHANISMS, membrane-blocking and latch mechanisms. (AUTHOR) (U).
UNCLASSIFIED

DOC REPORT BIBLIOGRAPHY SEARCH CONTROL NO. /ZONC2

AD-702 752 1/3 1971

NAVAL AMMUNITION DEPOT CHINA LKE IND
MK 45 AIRCRAFT PARACHUTE FLARE OPTIMIZATION
PROGRAM PRELIMINARY EVALUATION OF EXPERIMENTAL
PARACHUTES AND PARACHUTE MATERIALS FLIGHT TEST
SERIES NO. 1, NOV 69 26P KOCH,CLENNETH R. J
RPT. NO. NAD-CR-RUTR-163

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DESCRIPTORS: (*PARACHUTE FLARES, PARACHUTES),
(*PARACHUTE FABRICS; RELIABILITY), FLIGHT
TESTING, PARACHUTE DESCENTS, OSCILLATION,
CONFIGURATION, STABILITY, OPTIMIZATION, BURNING
RATE
IDENTIFIERS: MARK-45 FLARES

THIS REPORT DEPICTS THE RESULTS OF MK 45
AIRCRAFT PARACHUTE FLARE FLIGHT TESTS
(Experimental Parachutes) conducted at Naval
Weapons Center, China Lake, California, on
26 June 1969 through 7 October 1969. This work
was performed as authorized by Airtask No. AOS-
532-657/323-1/4403-03. Data obtained from these
flight tests indicate the cross type parachute
possesses the most advantageous characteristics for
incorporation into MK 45 aircraft parachute
flares. (Author)
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Original Document

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*ACTUATORS
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AD-632 572

*AERIAL PICKUP SYSTEMS
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*AERODYNAMIC CHARACTERISTICS
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