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NORTH AMERICAN INSTRUMENTS, INC.
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FEASIBILITY STUDY OF AERIAL PICKUP SYSTEMS

Office of Naval Research Contract Nonr-1279(00)
Project NR 221-003

This document has been reviewed in accordance with the provisions of paragraph 5. The classification markings hereon are correct.

Date: 2/24/54 *J. C. Christian*
in direction of
Chief of Naval Research (Code 461)

Bibliography of Literature Pertaining to Aerial Pickup Systems

by

P. S. Chase

November 1953

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Abstract

A survey of literature pertinent to the field of aerial pickup has been made and a bibliography of references which were found is given.

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Introduction

A survey of literature pertaining to in-flight pickup has been made. The purpose of this review was to analyze previously existing schemes for use in the current feasibility study under Contract Nonr-1279(). In addition, information for the preliminary design of components for a specific system was collected.

General

The survey includes information gathered from the Pacific Aeronautical Library of the Institute of Aeronautical Sciences; the Aeronautical Library of the California Institute of Technology; the Technical Information Pilot Index of the Office of Naval Research, Pasadena Branch; and from an ASTIA search, which included literature catalogued at the ASTIA Document Service Center, Wright Field, the ASTIA Reference Center, Library of Congress, and the Technical Information Division, Library of Congress. Abstracts of approximately 5,000 documents were inspected for applicability to the pickup problem.

Captured German and Japanese technical documents, and published British Air Ministry documents were also investigated. Since the references to captured documents are often poor, the proper catalogue sequence number for the Catalogue of Aeronautical and Allied Technical Documents of the Air Materiel Command is given for each document listed.

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Although the literature search conducted was very extensive, it is realized that some material of interest is either unpublished or uncatalogued. Also in view of the classification of the current investigation, material searched has been of Confidential classification or below.

For convenience the bibliography has been divided into the following sections:

- A. Operational Descriptions
- B. Glider Pickup and Tow
- C. Search and Location
- D. Cable Form and Forces
- E. Stability of Towed Bodies
- F. Winches and Equipment
- G. Human Body Data
- H. Parachutes
- I. Physiology
- J. Miscellaneous

Summary

Very little information bearing directly on in-flight pickup of humans has been published. However, some information of a detailed technical nature exists which is applicable to the design and performance of aerial pickup systems.

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The effort of the United States in the field of human pickup has been the most extensive and has apparently been the only work which has resulted in successful operational systems. The systems developed in the past have been based on the standard All American Aircraft Company technique. British effort appears to have been sparse and no Japanese work in this field is evidenced. German experiments were preliminary and did not apparently progress beyond an early stage. However, objects up to 165 lbs. in weight were picked off the ground by a boom carrying aircraft, which hooked lines attached to a 100-foot tower. Use of a drag chute to improve trajectory of the object was investigated. Circling flight pickups in the P1 5C Storch (Liaison type craft), the FW 158 Weihe (Similar to Beechcraft JRB) were attempted. No details are available but such systems were abandoned due to the difficulty of flying in the fashion necessary to keep the end of a long line at a fixed point on the ground.

The United States, Britain, and Germany expended considerable effort in the pickup and tow of gliders, glide bombs, etc. and some applicable information is found in this work.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-4-

Bibliography

A. Operational Descriptions

1. "AAF Experiments Successfully in Human Pickup," U. S. Air Service, Jan. 48, pp. 20-22.
2. "All American Tests Deschcraft 18-C Equipped for Air Pickup," American Aviation, June 48, p. 28.
3. "Body Snatching," Flight, Mar. 29, 48, p. 338.
4. "Hitahhikung to Heaven," Flying, Feb. 48, pp. 43-47, 88.
5. "Human Pickup at Cruising Speed Found Practicable in A-48 Tests," Aviation News, Jan. 1, 48, pp. 11-12.
6. "BAE Engineers Analyze Cargo Airplane Designs," Bert, B. B., Automotive & Aviation Industry, Jan. 1, 48, p. 18, 7 pages.
7. "Current Cargo Trends," Klemen, A., Aero Digest, 18 Jan. 48, p. 68, 7 pages.
8. "Design Requirements for Pickup Aircraft," Schelle, A. B., (All American Aviation, Inc., SAE Journal, Jan. 48, pp. 1-17.
9. "Six Big Candles," (All American Aviation, Inc.) Air Transportation May 48, pp. 54-55.
10. "Sixth Anniversary of American Air Pickup Service" Aero Digest May 15, 48, pp. 54-55.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-6-

B. Glider Pickup and Tow

1. "Target Gliders," *Aeroplane*, Feb. 46, pp. 131-133.
2. "Glider Pickup," *Flight*, Mar. 43, pp. 280-281.
3. "Cargo Glider Pickup," *Mech. Eng.* Jan. 43, pp. 35-39.
4. "Towed Gliders," *Flight*, Aug. 43, pp. 204-205.
5. "Aerodynamic Performance of the Towed Glider," *Jour. Aero. Sciences* Jun. 43, p. 14.
6. "Twin Tug Towing of Gliders," Yates, A. H., Royal Aircraft Establishment Report, No. Aero. 1857, Sept. 43. Restricted.
7. "Stresses in Sail Plane Tow Ropes," *Royal Aeronautical Society Journal* No. 105, Aug. 42, p. 404.
8. "Streaming and Winching," *Aeroplane*, 1 Feb. 46, p. 136.
9. "Glider Snatching," *Aeroplane*, 15 June 45, pp. 686-687.
10. *Schweizer (Swiss) Aeronautical Revue*, Jan. 42, pp. 1-8 Supl. (French).
11. "Comparison between Calculation and Experiment of Assisted Take-Off with Winch and Cable," *Airring*, D. F. S., German Aero Technical Document Catalogue Sequence No. 962-12837, Aug. 44.
12. "Effect of Centrifugal Force on Rope Tension at Take-Off," Gaertz, German Aero. Technical Document, Catalogue Sequence No. 35-607, No date.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-7-

13. "Mechanism in Glider to Calculate and Give Glider Position Relative to Tow Plane by Cable Angle at Glider," Braun, Braunschweig, German Aero. Technical Document Catalogue Sequence No. 962-13289, Apr. 41. German Secret (probably now Unclassified).
14. "New Type Towing Apparatus," Kraus, German Aero. Technical Document Catalogue Sequence No. 45-545, Jan. 45. German Secret (probably now Unclassified).
15. "Performance Variation of Plane Towing Glider (Relation of Size of Plane to Glider)," Iida, S., Japanese Aero. Technical Document Catalogue Sequence No. 117-818, Feb. 41.
16. "Towing of One Glider by Several Aircraft (Forces on tow line, sag, oscillation, etc.)," Zitter, H., German Aero. Technical Document Catalogue Sequence No. 962-1201, Oct. 41. German Secret (probably now Unclassified).
17. "Development of Small Towed Cargo Glider," Lowing, R., German Aero. Technical Document Catalogue Sequence No. 962-1624, June 41. German Secret (probably now Unclassified).
18. "Development and Test of Method of Changing Tow Rope Length in Flight and Switch to Rigid Tow," Stamer, F., German Aero. Technical Document Catalogue Sequence No. 962-2981, Dec. 40. German Secret (probably now Unclassified).

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-8-

19. "Model Flight Investigation of a Non-Lifting Winged Tow Target,"
Shanks, R. E., NACA Research Memorandum L50H39, Oct. 50.
20. "Evaluation of Effect of Target Drag on Fighter (and Utility) Type
Aircraft," Kibbe, R. L., Naval Air Test Center, Patuxent, Sup-
plementary Report Project TED No. PTR-AR2932, Serial No. AT-
681, May 48. Restricted.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-9-

C. Search and Location

1. "Evaluation of Ultra Search and Location Equipment," Royal Canadian Air Force Experimental Project Report CEPE 998. Restricted.
2. "Development of Infrared and Ultraviolet Radiation Sources," Westinghouse Corporation, 1953. Confidential.
3. "Final Report on Test of Maximum Range of SCR-578, Emergency Rescue Radio over Frozen Terrain, Project No. 4521C413.44," Altemeler, Clarence L., Air Proving Ground Command Report No. S-CW-7-44-1, Mar. 45.
4. "Cold Weather Test of Emergency Rescue Radar Beacon WALTER AN/CPT-2," Humphreys, J. S., AAF Proving Ground Report S-CW-5-45-9, Feb. 46. Restricted.
5. "Evaluation of Radar Beacon AN/CPN-19 (XA-1) as a Portable Rescue Unit," Russel, B. W., Jr. Wright-Patterson Air Force Base Memorandum Report MCRE5-49-22, May 49. (Includes infrared beacon).
6. "Illumination Characteristics of Portable Spotlights and Appendices A-C," Sutton, Merle E., U.S. Army Research and Development Labs., Fort Belvoir Report 730, Dec. 42. Restricted.
7. "Interim Engineering Report on Ground Portable Radio Direction Finder," Schulman, J. R., and Diehl, E. J., Melpar Inc. Report, Aug. 50. Restricted.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-10-

8. "A Design Study of an Automatic Crash Locating and Rescue Aid Apparatus Exclusive of its Communication Equipment and Appendix-Project BEACON-Final Report, "Williams, O. S., Goldman, L., and Sergan, A. J. Greer Hydraulics, Inc., Dec. 51. Restricted.
9. "Evaluation Trials of Crash Position Indicator - and Appendix," Kuhn, B.G., Experimental and Proving Establishment Report 979, Feb. 52. Restricted.
10. "German Emergency Transmitter NS.4," Palmer, C. M., Royal Aircraft Establishment, Radio Dept., Report TN-141, Aug. 43.
11. "Inspection and Test of Components of Radio Set AN/URC-2 (KA-1)," Horrigan, John S., Submitted by Hughes Aircraft Co., on Contract W-33-038-ac-13833, " Engineering Division, Air Materiel Command Report TSELCS-127, Jan. 47.
12. "Laboratory Tests of Radio Receiver-Transmitter RT-159/URC 4," Bailey, K. D., Horrigan, J. S., and Young, L. M., Engineering Division, Air Materiel Command Report S-MCREE-48-68, May 49. Restricted.
13. "Final Report on Development and Operational Suitability Test of Radio Sets AN/URC-2, AN/URC-4, and AN/CRN-16," Kovira, E. J., and Overton, B. H., Air Proving Ground, Eglin AFB Report 7498-5, Nov. 49. Restricted.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-11-

14. "Emergency Rescue Radar Beacon - Project Description as Presented at Electronic Subdivision Manufacturers' Conference, 26, 27, 28 June 1946 at Watson Laboratories, Red Bank, New Jersey," Engineering Division, Air Materiel Command, Dayton, Ohio. June 46. Restricted.
15. "Radar Beacons WALTER and WIRE BASKET," Reese, A. Royal Aircraft Establishment, Farnborough, Report RAD-346, Jan. 46. Confidential.
16. "Final Report on Acceptance Tests of the Emergency VHF Radio Communication Life Raft Equipment," Smith, E. D., U. S. Naval Air Test Center Electronics Test Division, Patuxent Report ET-77, June 47. Restricted.
17. "First Partial Report on Aircraft Drops of Life Raft Signal, MK. 24 MOD. O, - and Appendices A-C, Hall, E. B., U. S. Naval Proving Ground, Dahlgren Report NPG 624, Aug. 50. Restricted.
18. "Corner Reflectors for Life Rafts," Hudspeth, E. I., and Nash, J. P., Massachusetts Institute of Technology Radiation Lab. Report R-608. Aug. 44.
19. "Testing of WALTER Life Raft Beacon Project PTR-31434.0," U. S. Naval Air Station, Patuxent River Report S-1291, July 44. Confidential.
20. "A Study of the Efficiency of Search and Rescue Procedure Symposium 1950," Stanley, John, Defence Research Board, Ottawa, Canada, Paper 24, 1950.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-12-

21. "Visual Range of Emergency Signaling Equipment," Air Sea Rescue Agency, Rescue Advisory Memo. No. 072, 1945. Restricted.
22. "1000 Mc. Air Sea Rescue Beacon," Lader, Leon J., Air Materiel Command, Watson Labs., Technical Report No. 35, Dec. 47. Confidential.
23. "Radio Beacon AN/CRN-16(XA-5) and Radio Beacon AN/CRN-16," Russell, B. W., Air Materiel Command, Engineering Division Memo. Report No. MCREE-49-36, Dec. 49. Restricted.
24. "The Development of Beacon, Radio AN/DFW-23(XE-1B)," Alba, C. J. and Butts, H. S., W. Melpar, Inc., Quarterly Report No. 2 Sept 1-Nov. 30, 1951. Confidential.
25. "Development of Smoke and Flame Floats and Flashless Flares," Stahl, S. S., Navy Dept., Bureau of Ordnance, NAVORD Report 150-45, Nov. 45. Restricted.
26. "Scotchlite Reflectorized Equipment, Request for Evaluation of," Dodson, H. L., and Larkin, J. C. Jr., Naval Air Test Center, Patuxent River, Final Report Dec. 20, 1950 - May 22, 1951. July 1951.
27. "Tests of Radio Receiver-Transmitter RT-159/URC-4," Bailey, K. D., and others, Hoffman Radio Corp., Air Materiel Command, Engineering Division, Memo. Report No. MCREE-48-68, May 49. Restricted.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-13-

D. Cable Form and Forces

1. "The Form of a Heavy Flexible Cable Used for Towing a Heavy Body Below an Airplane," Glauert, H., A.R.C. R and M 1592, 1934.
2. "The Effect of Wind on the Configuration of the Flying Cable of a Kite Balloon," Hollingdale, S. H. and Wild, N. E., RAE Report No. D. I. /67, 1937, (unpublished).
3. "Snatch Loads in Glider Cables," Fagg, AD Departmental Note No. 5, 1941. (unpublished).
4. "On the Action of Wind on Flexible Cables with Applications to Cables Towed Below Aeroplanes And Balloon Cables," McLeod, A. R., A. C. A. R and M 554, 1918.
5. "Measurement of the Forces Acting on Gliders in Towed Flight," Klemperer, W. B., NACA Technical Note 753, 1940.
6. "Investigation of the Forces Acting on Gliders in Automobile, Pulley, Winch, and Airplane-Towed Flight," Klemperer, W. B., NACA Technical Note 844, 1942.
7. "Tests on Smooth and Stranded Wires Inclined to the Wind Direction, and a Comparison of Results on Stranded Wires in Air and Water," Reif, E. F., and Powell, C. H., A. C. A. R and M 307, 1917.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-14-

8. "Discussion of the Results of the Measurement of Resistance of Wires, with Some Additional Tests on the Resistance of Wires of Small Diameter," Reif, E. F., A. C. A. R and M 102, 1914.
9. "The Measurement of Air Speed of Airplanes," Thompson, F. L., NACA Technical Note 818, 1937.
10. "The Force on a Circular Cylinder Set Obliquely to a Windstream," Taylor, G. I., Fluid Motion Sub-Committee Aeronautical Research Council F. M. 1634, 1951. Restricted.
11. "Note on the Drag Experienced by a Circular Cylinder at Small Reynolds Numbers," Tomotika, S and Aoi, T., Mem. College of Science A, Vol. XXVI, 1950.
12. "The Shape and Tension of a Light Flexible Cable in a Uniform Current," Landweber, L. and Protts., M. H., J. Applied Mechanics, June 47, pp. A121-126.
13. "Stresses in Sail Plane Tow Ropes," J. Royal Aero Soc., Nov. 42, p. 404.
14. "The Protection of Tow Cables by Parachutes and Drogues During Drooping," Whiting and Yates, RAE Technical Note No. Aero 1262 (airborne) Aug. 43.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-15-

15. "Drag of Circular Cylinders for a Wide Range of Reynolds Numbers and Mach Numbers," Gowen F. E., and Perkins, E. W., NACA Technical Note 2960, 1953.
16. "Tables for Computing the Equilibrium Configuration of a Flexible Cable in a Uniform Stream," Pote, Leonard, David Taylor Model Basin Report 687, Mar. 1951.
17. "Experimental Investigation of Hydrodynamic Forces on Stranded Cables," Pote, Leonard, David Taylor Model Basin Report 713, May 1950.
18. "Cable Fairing for High Speed Towed Sonar," Attinello, John, Bureau of Aeronautics D.R. Report 1173, May 1950. Confidential.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-16-

E. Stability of Towed Bodies

1. "Stability of a Whirling Gondola Suspended from a Parachute Testing Tower," Braun, Gerhard W., WADC Technical Report 52-78, 1953.
2. "Collected Researches on the Stability of Kites and Towed Gliders," Bryant, L.W., and Brown, W.S., A.R.C. R and M 2303, 1950.
3. "The Critical Velocity of a Body Towed by a Cable from an Airplane," Koning, C., and DeHaas, T.P., NACA Technical Memorandum 1132, 1937.
4. "Theoretical Analysis of Oscillations of a Towed Cable," Phillips, William H., NACA Technical Note 1796, 1949.
5. "Extension of Glider Tow Cable Theory to Elastic Cables Subject to Air Forces of a Generalized Form," O'Hara, F., A.R.C. R and M 2334.
6. "The Stability of a Body towed by a Light Wire," Glauert, H., A.R.C. R and M 1312, 1930.
7. "Stability of a Body Stabilized by Fins and Suspended from an Airplane," Phillips, W.H., NACA Wartime Report L-28.
8. "The Stability Derivatives of a Glider Towing Cable, with a Method for Determining the Flying Conditions of the Glider," Mitchell, RAE Report No. Acro. 1764, ARC 6151. 1942 (unpublished).

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-17-

2. "An Investigation into Factors Influencing the Performance of a Glider-Tug Combination," Wilkinson and Howell, RAE Report No. Aero. 1974, ARC 8219. 1944 (to be published).
10. "The Longitudinal Stability of a Hotspur Glider on Tow. I. Results for Loading 3459 lb. at 130 mph. I. A. S. "C. G. Tow," Mitchell, RAE Technical Note No. Aero. 898 (Flight) ARC 6071, 1942 (unpublished).
11. "Performance Data for the Hotspur Glider in Towed Level Flight at 130 mph. I. A. S.," Mitchell, RAE Technical Note No. Aero. 996 (Flight), 1942 (unpublished)
12. "Two Models of Caquot Kite-Balloons, Tests on," ARC R and M 247, 1916.
13. "Lateral Stability of Large Kites," ARC R and M 263, 1916.
14. "Wind Forces and Moments Acting on a Model of Mark III Type Kite-Balloon," ARC R and M 561, 1916.
15. "Investigation of the Wind Forces and Moments Acting on Models 1/50th Scale of the Caquot Kite Balloon," ARC R and M 753, 1920.
16. "Stability of Tow by Pole in Air, (Fiesler Pole)," Petrikat, K., German Aero. Technical Document Catalogue Sequence No. 962-13856, Mar. 43. German Restricted.
17. "Apparatus to Measure Forces in Tow Cable," Frank, K., German Aero. Technical Document Catalogue Sequence No. 962-14607, Mar. 35. German Restricted.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-18-

F. Winches and Equipment

1. "Air Pickup Handbook," All American Aviation, Inc.
2. Free and Captive Balloons, Upson and Chandler, Ronald Press Co., 1929
3. "How to Choose Winch Wire," Scaring Magazine, May-June 1950.
4. "Design Requirements for Pickup Aircraft," Schultz, A. B., Soc. Auto. Engineers National Air Cargo Meeting Preprint, Dec. 44.
5. "Testing of Electric Tow Target Winch," Fleischaker, T. W., German Aero. Technical Document Catalogue Sequence No. 962-13486, Jan. 41.
6. "Electric Winch for Tow Target Line Including Release," German Aero. Technical Document Catalogue Sequence No. 97-4518, Oct. 41.
7. "Development of Electric Winch Installed in Aircraft with Automatic Release for Towing Gliders," Fleischaker, T. W., German Aero. Technical Document Catalogue Sequence No. 962-13476, Oct. 41.
8. "Aircraft and Anti-Aircraft Target Reels and Aerial Target Release Devices," Navy Bureau of Ordnance Pamphlet 726.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-19-

G. Human Body Data

1. "Free Falls and Parachute Descents in the Standard Atmosphere," Webster, A. P., NACA Technical Note 1315, 1947.
2. "Pilot Escape from Spinning Airplanes as Determined from Free-Spinning Tunnel Tests," Scher, Stanley H., NACA Technical Note 2485, 51.
3. Handbook of Human Engineering Data, Tufts College Technical Report SDC 199-1-1, 1949.
4. "Anthromorphic Test Dummy Mark II," Alderson Research Laboratories, 1952.
5. "Determination of Centers of Gravity of Man," Swearingen, J. J., Civil Aeronautics Medical Research Lab. Final Report CAA Project No. 53-203, May 53.
6. "Semi Annual Progress Report on Project NR 118-074 and 118-074A, Explosive Decompression Studies," King, B. G., Civil Aeronautics Administration, Medical Division, July 52.
7. "Preliminary Trials of Determination of Minimum, Maximum, and Mean Drag Coefficient for the Free Falling Fully Clothed Aviator," Allman, T. L., and others, Marine Corps Air Station, Cherry Point, Aug. 47.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-20-

H. Parachute

1. "Aerodynamic Characteristics of Parachutes," Jones, R., ARC R and M 862-1523.
2. "Experimental Work on Parachutes Used in Air Defence Apparatus," Stevens, C. W. H., Royal Aircraft Establishment Report Exe 114, Jan. 42. Restricted.
3. "A Phase of the Parachute Problem," Jarnagin, L. B., ATITechnical Data Digest 13:7-12 Jan. 15, 49. Restricted.
4. "The Effects of Stability of Spin-Recovery Tail Parachutes on the Behavior of Airplanes in Gliding Flight and in Spins," Scher, Stanley H., and Draper, John W., NACA Research Memorandum L8E19.
5. "Wind Tunnel Investigation of the Opening Characteristics, Drag, and Stability of Several Hemispherical Parachutes," Scher, Stanley H., and Gale, Lawrence J., NACA Technical Note 1869, Apr. 49.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-21-

I. Physiology

1. German Aviation Medicine World War II, Vols. I, II., Surgeon General U. S. Air Force, U. S. Government Printing Office, 1950.
2. Physics and Medicine of the Upper Atmosphere, White, Clayton S., and Benson, O. O., University of New Mexico Press, 1952.
3. "Engineering the Cockpit for Man," Mayo, A. M., Douglas Aircraft Co., El Segundo Division, 1953.
4. "Human Tolerances to Forces Produced by Acceleration," Lombard, C. F., Douglas Aircraft Co., El Segundo Division Report No. ES-21072, 49.
5. "How Much Force Can Body Withstand?", Lombard, C. F., Aviation Week, Jan. 17, 49, pp. 20-28.
6. "The Limiting Effect of Centripetal Acceleration on Man's Ability to Move," Codr., Charles F., Wood, Earl H., and Lambert, Edward H., Jour. Aero. Sc. Vol. 14, No. 2, Feb. 47, pp. 117-123.
7. "The Supine Position as a Means of Increasing Tolerance to Acceleration," Martin, Ernest, and Henry, James P., AF Technica. Report 6025, 1950. Confidential
8. "Studies of the Physiology of Negative Acceleration, an Approach to the Problem of Protection," Henry, James P., AF Technical Report 5953, 1950. Confidential.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-22-

9. "The Effect of Acceleration on the Living Organism," Armstrong, H. G. Heim, J. W., Army Air Corps Tech. Report 4361, Dec. 37.
10. "Effects of Acceleration in Relation to Aviation," Wood, E. H., Lambert, E. H., Blades, E. J., and Code, C. F. Fed. Proc. 5:327, 1946.
11. "Effect of High Acceleration on the Human Body," Ruff, Siegfried. German Aero. Technical Document Catalogue Sequence No. 962-12520, Jan 38
12. "To What Extent Can the Human Body Withstand Centrifugal Forces," Diringshoffen, Heinz von, German Aero. Technical Document Catalogue Sequence No. 97-1917, 1939, German Confidential (Probably now unclassified).
13. "Acceleration Tolerance of the Human Body," Andrews, A. H., German Aero. Technical Document Catalogue Sequence No. 97-3188, no date. German Restricted.
14. "Times Available for Protective Measures in Emergencies at High Altitudes," King, B. G., Civil Aeronautics Administration Medical Division, Apr. 51.
15. "High Altitude-High Velocity Flying with Special Reference to the Human Factors. III. Bare Skin Hazard from Frostbite in Escape from Aircraft," W.oster, A. P. and Smedal, H. A., Naval Medical Field Research Lab., Camp Lejeune, Project NM 006-014.02.02, Sept. 1950.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-23-

16. "The Cardiovascular and Respiratory Responses of Personnel Suddenly Exposed to Very Low Temperature Windblast," Hetherington, Albert W. Luft, Ulrich, C., and others, School of Aviation Medicine, Randolph Field, Project No. 21-231028, July 1951.

CONFIDENTIAL
SECURITY INFORMATION

CONFIDENTIAL
SECURITY INFORMATION

-24-

J. Miscellaneous

1. "Paths of Target Seeking Missiles in Two Dimensions," Watkins, Charles E., NACA Wartime Report L-735, 1946.
2. "The Calculation of the Path of a Jettisonable Nose Section," Goodwin, Roscoe H., NACA Research Memorandum L50G18, 1950. Confidential.
3. "An Analysis of the Effect of a Curved Ramp on the Take-Off Performance of Catapult Launched Airplanes," Reed, Wilmer H. III, NACA Research Memorandum L52I05. Confidential.
4. "Drag of Flags," ARC R and M 1345, 1930.
5. "Device for Cubing Barrage Balloon Cables," J. Royal Aeronautical Soc. No. 119, Jan. 44, p. 72.
6. "An Empirical Criterion for Fix Stabilizing Jettisonable Nose Sections of Airplanes," Scher, Stanley H., NACA RM L9I28, 1949.
7. "Motion of a Transonic Airplane Nose Section when Jettisoned as Determined from Wind Tunnel Investigations on a 1/25-scale Model," Scher, Stanley H., and Gale, Lawrence J., NACA Research Memorandum L9L08a, 1950. Confidential.
8. "Path and Motion of Scale Models of Jettisonable Nose Sections at Supersonic Speeds as Determined from an Investigation in the Langley Free-Flight Apparatus," Gale, Lawrence J., NACA Research Memorandum L9J13a, 1950. Confidential.

CONFIDENTIAL
SECURITY INFORMATION

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SECURITY INFORMATION

-25-

9. "Notes on a Demonstration of Buoyant Line Throwing Rockets Distress Signals and Flares," Marine Aircraft Experimental Establishment, England, Report F/Eq/307, Mar. 1950. Restricted.
10. "Pentolite Cable Cutters," Skinner, W. F., Naval Mine Depot, Locktown, Rand D Division Report 6, July 1947. Confidential.
11. "Anti-aircraft Evaluation Courses (Aerial Target Paths)" University of Pennsylvania, Moore School of Electrical Engineering, Navord Report 152, June 48. Restricted.
12. "Containers, Aerial Delivery, Rotary," Army Air Force Proving Ground, Eglin Field, APGC Report 4741, Mar. 46.

~~CONFIDENTIAL~~
SECURITY INFORMATION