

UNCLASSIFIED

AD NUMBER

AD020260

CLASSIFICATION CHANGES

TO: unclassified

FROM: restricted

LIMITATION CHANGES

TO:
Approved for public release, distribution unlimited

FROM:
Controlling Organization: British Embassy,
3100 Massachusetts Avenue, NW, Washington,
DC 20008.

AUTHORITY

DSTL, AVIA 18/3543, 29 Jul 2008; DSTL,
AVIA 18/3543, 29 Jul 2008

THIS PAGE IS UNCLASSIFIED

Armed Services Technical Information Agency

AD

20260

NOTICE: WHEN GOVERNMENT OR OTHER DRAWINGS, SPECIFICATIONS OR OTHER DATA ARE USED FOR ANY PURPOSE OTHER THAN IN CONNECTION WITH A DEFINITELY RELATED GOVERNMENT PROCUREMENT OPERATION, THE U. S. GOVERNMENT THEREBY INCURS NO RESPONSIBILITY, NOR ANY OBLIGATION WHATSOEVER; AND THE FACT THAT THE GOVERNMENT MAY HAVE FORMULATED, FURNISHED, OR IN ANY WAY SUPPLIED THE SAID DRAWINGS, SPECIFICATIONS, OR OTHER DATA IS NOT TO BE REGARDED BY IMPLICATION OR OTHERWISE AS IN ANY MANNER LICENSING THE HOLDER OR ANY OTHER PERSON OR CORPORATION, OR CONVEYING ANY RIGHTS OR PERMISSION TO MANUFACTURE, USE OR SELL ANY PATENTED INVENTION THAT MAY IN ANY WAY BE RELATED THERETO.

Reproduced by

DOCUMENT SERVICE CENTER

KNOTT BUILDING DAYTON 2 OHIO

RESTRICTED

The following **ESPIONAGE NOTICE** can be disregarded unless this document is plainly marked **RESTRICTED, CONFIDENTIAL, or SECRET.**

NOTICE: THIS DOCUMENT CONTAINS INFORMATION AFFECTING THE NATIONAL DEFENSE OF THE UNITED STATES WITHIN THE MEANING OF THE ESPIONAGE LAWS, TITLE 18, U.S.C., SECTIONS 793 and 794. THE TRANSMISSION OR THE REVELATION OF ITS CONTENTS IN ANY MANNER TO AN UNAUTHORIZED PERSON IS PROHIBITED BY LAW.

AD NO. 20260

ASTIA FILE COPY

THE RECIPIENT IS WARNED THAT INFORMATION CONTAINED IN THIS DOCUMENT MAY BE SUBJECT TO PRIVATELY-OWNED RIGHTS.

7th Part of AAE/843/1/P



MINISTRY OF SUPPLY

**AEROPLANE AND ARMAMENT
EXPERIMENTAL ESTABLISHMENT**

BOSCOMBE DOWN

HASTINGS C. 17.2 WD.476
(4 HERCULES 106)

DROPPING OF LIQUID FUEL IN DRUMS BY PARACHUTE

CONDITIONS OF RELEASE

THIS INFORMATION IS DISCLOSED ONLY FOR OFFICIAL USE BY THE RECIPIENT GOVERNMENT AND SUCH OF ITS CONTRACTORS, UNDER SEAL OF SECRECY, AS MAY BE ENGAGED ON A DEFENCE PROJECT. DISCLOSURE TO ANY OTHER GOVERNMENT OR RELEASE TO THE PRESS OR IN ANY OTHER WAY WOULD BE A BREACH OF THESE CONDITIONS.
THE INFORMATION SHOULD BE SAFEGUARDED UNDER RULES DESIGNED TO GIVE THE SAME STANDARD OF SECURITY AS THAT MAINTAINED BY HIS MAJESTY'S GOVERNMENT IN THE UNITED KINGDOM.

ATTENTION IS CALLED TO THE PENALTIES ATTACHING TO ANY INFRINGEMENT OF THE OFFICIAL SECRETS ACT.

THIS DOCUMENT IS THE PROPERTY OF H.M. GOVERNMENT.

It is intended for the use of the recipient only, and for communication to such officers under him as may require to be acquainted with the contents of the report in the course of their duties. The officers exercising this power of communication will be held responsible that such information is imparted with due caution and reserve.

Any person other than the authorised holder, upon obtaining possession of this document, by finding or otherwise, should forward it, together with his name and address, in a closed envelope to :-

THE SECRETARY, MINISTRY OF SUPPLY,

THAMES HOUSE, MILLBANK, LONDON, S.W.1. ST GILES' COURT, 1-13 ST GILES HIGH ST, LONDON, W.C.2.

Letter postage need not be prepaid : other postage will be refunded.

All persons are hereby warned that the unauthorised retention or destruction of this document is an offence against the Official Secrets Acts, 1911-1939.

ENCLOSURE... 6 TO ASTIA 214.53

AIR ATTACHE, LONDON.

RECEIVED

7th Part of Report No. AAEE/843/1/P

AEROPLANE AND ARMAMENT EXPERIMENTAL ESTABLISHMENT
BOSCOMBE DOWN

- 7.10.1953

Hastings C Mk.2 WD.476
(4. Hercules 106)

Dropping of liquid fuel in drums by parachute

A. & A.E.E. Ref: 6615/20
M. O. S. Ref: 7/Acft/889
Period of Test: September 1952 - April 1953

Progress of issue of Report

Report No.	Title
2nd Part of AAEE/843/1/P	WD.476 Trials of Parachuting static cable installation.
3rd - do -	WD.476 Pennier dropping trials using Handley Page gravity type roller conveyor. (Second version).
4th - do -	WD.476 Performance and handling at 80,000 lb. A.U.W. under I.C.A.N. and Tropical conditions, when carrying external loads.
5th - do -	WD.476 Loading, carriage and dropping by parachute of heavy equipment and men. Tactical combinations with two Cars or Car and Trailer or Car and 75 mm Howitzer.
6th - do -	WD.476 Loading, carriage and dropping by parachute of heavy equipment and men. Carriage and dropping of one Car 5 cwt. 4 x 4, one Gun 6 pdr. Q.F. Mk. IV, Six CLE Mk. III containers and paratroops dropped before and/or after the stores.

Summary

The tests carried out show that liquid fuel in 40/50 gal. steel drums may be dropped satisfactorily by parachute from the Hastings C Mk.2 under similar conditions to those laid down for the Hastings C Mk.1 (9th Part of Report No. AAEE/843/P).

This Report is issued with the authority of



Air Commodore
Commanding A. & A.E.E.

List of Contents

	<u>Page</u>
1. Introduction	3
2. Description of Test Equipment	3
3. Preparation of Equipment	3
4. Tests carried out	3
5. Results of Tests	3
6. Conclusions	4
7. Recommendations	4

Appendix

Summary of Tests

/1. Introduction.....

1. Introduction

Tests having shown that liquid fuel in 40/50 gall steel drums may safely be delivered by parachute from the Hastings C. Mk.1, by manual ejection from either paratroop exit or simultaneously from both doors (Ref.1), check tests were made to prove that these stores could also be dropped from the Hastings C. Mk.2 aircraft using similar equipment and method of despatch.

2. Description of Test Equipment

2.1 Aircraft. The aircraft used for these tests was Hastings C. Mk.2 WD.476, fitted with the paratroop despatcher's intercommunication facilities, the paratroop lights for signalling purposes and two ejector platforms. The ejector platforms were those used in this application on the Mk.1 aircraft. (Ref.1).

2.2 Fuel Drums. The drums used were Barrels, Light Steel, 40/50 gall. (Ref. 40P/506).

2.3 Parachutes. The parachute system was that used in Ref.1 i.e. a pair of Type 'R' parachutes for each drum modified to apex tie deployment on an 18 ft. static line.

2.4 Parachute Harness. The harness used for all of the tests was the standard Army Pannier Harness (Army Stores Ref. AD. 0444).

2.5 Extension Lift Webs. On some of the drops an 11 ft. extension lift web was interposed between the parachute and the store to find out whether this would give better parachute conditions.

2.6 Liquid contents of Drums. AVTAG (Paraffin) was used as ballast for the drums and the gross weight of each drum was then 460 lb.

3. Preparation of Equipment

The equipment was prepared in a similar manner to that described in Ref. 1.

4. Tests carried out

4.1 Seven flights were made during which a total of 21 drums was dropped. The drums were dropped separately at first from each paratroop exit and then simultaneously from both doors. The aircraft was flown straight and level for each drop at speeds varying from 115 to 125 knots +S.I. with 20° flap. The dropping height was 400 feet above ground level. On some of the tests extension lift webs as described in para. 2.5 above were used. Details of the tests will be found in the Appendix hereto.

4.2 The loading, securing and despatch techniques were similar to those described in Ref. 1.

5. Results of Tests

5.1 Ejection and parachute deployment were satisfactory in all of the tests. On Test 3 one of the drums fell freely to earth due to the bursting of the pannier harness at full development of the parachutes. This harness however had been used repeatedly on previous tests and its failure was attributable to fair wear and tear.

5.2 The tests with the four drums on which the 11 ft. extension lift webs were used were all satisfactory, but the parachute development was not appreciably quicker than with those not fitted with the extension lift webs.

5.3 The tail clearance was satisfactory in all cases. Where drums were ejected simultaneously from port and starboard doors there was no interference between either parachutes or stores. Detailed results of tests will be found in the Appendix.

6. Conclusions

Liquid fuel may be safely dropped by parachute in Barrels, Light Steel (Ref. 40P/506) from Hastings C. Mk.2 aircraft under the same conditions as when dropped from the Hastings C. Mk.1 (Ref.1).

These conditions are as follows:-

(a) Each drum to be filled with fuel to its standard capacity and to be prepared for dropping as described in Ref. 1. (although these tests were made using AVTAG the differences of weight with other fuels are not significant in the present consideration).

(b) The parachute system for each drum to be a pair of Type 'R' assemblies modified for apex tie deployment on an 18/22 ft. static line as described in Ref. 2.

(c) The drums to be despatched singly from either door or as a pair by dropping one drum from each door simultaneously by means of ejector platform(s) as described in paras. 2.1 and 4.3 of Ref.1, the static lines being secured to freight floor lashing points, one forward and one aft of the doorway.

(d) The aircraft to be flown straight and level for the drop at speeds within the range 115 to 125 knots A.S.I. using 20° flap. The normal minimum height above ground level should be 400 ft. but heights down to 300 ft. may be used accepting some damage to drums with possible minor loss of fuel.

7. Recommendations

It is recommended that the Hastings C. Mk.2 aircraft be cleared for the dropping of liquid fuel in 40/50 gall. steel drums under the conditions outlined in para. 6 above.

References

1. Report No. AEE/843/P - 9th Part. Dropping of liquid fuel in drums by parachute.
2. Report No. AEE/Tech/84/P. Tests on a modified Type 'R' parachute. (Valetta C. Mk.1 - VL. 262).

Circulation List

D.A.R.D. 1 Copy
A.D.R.D.L.2 2 Copies 1 for Action
R.D.A.E. 1 Copy
T.P.A.3/T.I.B. 75 Copies
R.T.O. Handley Page 2 Copies
O.C. 47 Company R.A.S.C. (Air Despatch) 1 Copy

Summary of Tests

Flight No.	No. of Tests made.	Aircraft		Tail clearance	Remarks
		Speed (knots)	Height in feet A.G.L.		
1	4	115	400	Satisfactory	Drums ejected singly from port door. Exit and landing satisfactory in all tests.
2	3	115	400	Satisfactory	as above.
3	3	115	400	Satisfactory	Drums ejected singly from port door. One drum fitted with 11 ft. extension lift webs. All exits and landings satisfactory.
	3	125	400	Satisfactory	Drums ejected singly from port door. One drum fitted with 11 ft. extension lift webs. All exits satisfactory. One drum fell freely due to harness bursting on development of parachutes. Remaining two drums landed safely.
4	3	115	400	Satisfactory	Drums ejected singly from starboard door. One drum fitted with 11 ft. extension lift webs. All exits and landings satisfactory.
5	2	125	400	Satisfactory	Drums ejected singly from starboard door. One drum fitted with 11 ft. extension lift webs. Both exits and landings satisfactory.
6	1	115	400	Satisfactory	Drums ejected from port and starboard doors simultaneously. Exits and landings satisfactory.
7	1	125	400	Satisfactory	Drum ejected singly from starboard door. Exit and landing satisfactory.



*Information Centre
Knowledge Services*
[dstl] Porton Down,
Salisbury
Wiltshire
SP4 0JQ
22060-6218
Tel: 01980-613753
Fax 01980-613970

Defense Technical Information Center (DTIC)
8725 John J. Kingman Road, Suit 0944
Fort Belvoir, VA 22060-6218
U.S.A.

AD#: AD020260

Date of Search: 29 July 2008

Record Summary: AVIA 18/3543

Title: Hastings C Mk 2 WD.476 (4 Hercules 106): dropping of liquid fuel in drums by parachute

Availability Open Document, Open Description, Normal Closure before FOI Act: 30 years

Former reference (Department) 843/1/P Pt 7

Held by The National Archives, Kew

This document is now available at the National Archives, Kew, Surrey, United Kingdom.

DTIC has checked the National Archives Catalogue website (<http://www.nationalarchives.gov.uk>) and found the document is available and releasable to the public.

Access to UK public records is governed by statute, namely the Public Records Act, 1958, and the Public Records Act, 1967.

The document has been released under the 30 year rule.

(The vast majority of records selected for permanent preservation are made available to the public when they are 30 years old. This is commonly referred to as the 30 year rule and was established by the Public Records Act of 1967).

This document may be treated as UNLIMITED.