

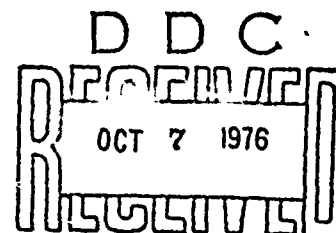
UNITED STATES ARMY AVIATION BOARD
Fort Rucker, Alabama

14 ATBG-DT-AVN-2160

17 OCT 1960

SUBJECT: Project Nr AVN 2160, "Service Test of the Army Aircraft Hot-Climate and Overwater Individual Survival Kit"

TO: Commanding General
United States Continental Army Command
Fort Monroe, Virginia



1. References:

a. Letter, ATDEV-6 428/30(17 Aug 59), Headquarters, USCONARC, 17 August 1959, subject: "Service Test of Army Aircraft Hot Climate and Overwater Individual Survival Kit."

b. Disposition Form, ATDEV-6, Headquarters, USCONARC, 20 July 1960, subject: "Service Test, Hot Climate/Overwater Survival Kits."

c. Letter, ATDEV-6 400.114, 25 August 1960, Headquarters, USCONARC, "Draft Military Characteristics for Survival Kits, Army Aircraft," with inclosure, and 1st Indorsement thereto with two inclosures.

2. Service test of the Army Aircraft Hot Climate and Overwater Individual Survival Kits was initiated in accordance with reference 1a and terminated in accordance with reference 1b. A summary is contained in the following paragraphs.

3. In January 1959, this Board received nine Individual Survival Kits (3 each, Arctic, Hot Climate, and Overwater) which had been developed by the Quartermaster Research and Engineering Command, Natick, Massachusetts. The Arctic Kits were subsequently shipped to the Arctic Test Board. Testing of the Hot Climate and Overwater Kits was initiated at this Board in early February 1959 and was terminated in May of 1959 because of existing discrepancies. Testing of modified Hot Climate and Overwater kits commenced in November 1959; however, these kits were further modified, after which one each of the kits was tested during the period of May-June 1960.

4. The Individual Hot Climate Survival Kit and the Individual Overwater Survival Kit with the latest modifications consist of two separate containers. Each kit consists of a seat pack and back pad. → CO 1

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a. Seat Pack.

(1) The seat pack for the Hot Climate Kit is designed to fit the bucket seat of Army aircraft (14" x 15" x 7"). It consists of a metal pan and a lid enclosed in a zippered fabric case. It has a flat top, as opposed to the contoured top of an earlier design. A two-inch thick cushion is attached to the top of the fabric case by five snap fasteners. Two slits are provided in the forward portion of the cushion. The parachute leg straps are fed through the cushion and buckled around the legs. Two nylon straps are attached to buckles which are located on each side of the kit. The nylon straps have a device which locks on the parachute attaching rings. The straps can be adjusted to assure that the seat pack is held snugly against the buttocks. The straps are locked in position (on the buckles) by a safety fastener, which, when removed, allows the entire seat pack to fall away from the pilot. A 21-foot lanyard is attached to the seat pack and to one of the nylon straps. During an emergency exit using the Hot Climate Kit, the pilot activates the parachute and removes the safety fasteners (one on each of the nylon straps) which releases the seat pack. The seat pack is then suspended 21 feet below the pilot, thus lessening the possibility of injury to the pilot during parachute descent and landing.

(2) The seat pack for the Overwater Survival Kit differs from that previously described in that only the metal lid is provided, thereby resulting in a semi-rigid configuration. In addition, a life raft CO2 cartridge is connected to a quick-release zipper of the fabric case. During an emergency exit, using the Overwater Survival Kit, the pilot activates the life raft by pulling the quick-release zipper on the fabric case and removes the safety fasteners which releases the seat pad. The life raft is inflated during the parachute descent. The life raft and the two individual equipment containers which were in the fabric case remain attached to the 21-foot lanyard.

b. Back Pad. The back pad for both kits is identical in design with, and the same length and width as, the sponge rubber pad located on the inside of the back pack parachute. When using the survival kit, the sponge rubber pad is taken out of the parachute and the survival kit back pad is inserted in its place.

5. The contents of the modified Hot Climate and Overwater Survival Kits are listed in inclosure 1.

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6. Summary of tests of the modified Hot Climate and Overwater Kits.

a. The seat pack is 14-3/4" x 14" x 4-3/4" without the cushion. The cushion is 16" x 16" x 2". The back pad is 21" x 13" x 2".

b. The weight of the Hot Climate Kit is 34 pounds--28 pounds for the seat pack and 6 pounds for the back pad. The Overwater Kit weighs 30.5 pounds--24.5 pounds for the seat pack and 6 pounds for the back pad.

c. Since parachutes are not normally worn in Army helicopters, consideration was not given to use of this kit in helicopters. The kits were not completely compatible with Army airplanes as indicated below.

(1) L-19. The standard seats would not accommodate either kit. In an effort to accommodate the kit, survival seats were substituted for the standard seat. By modifying the survival seat, the kits were then compatible with the front seat of the L-19E, TL-19A, and TL-19D, but not the L-19A because of reduced headspace. Installed radio equipment precluded modification of the rear survival seats in all the models of the L-19.

(2) L-20. The survival kits were compatible with the crew and center seats, but head clearance was not sufficient in the rear seats.

(3) U-1A. Head clearance was insufficient, particularly when the APH-5 helmet was worn. When the chest-type parachute harness is used, modification of the survival kit back pad is required in order to use the parachute harness (FSN 1670-245-0270) which will be replaced by parachute harness (FSN 1670-540-8208) within the 1960-62 time period. The latter harness is not suitable for attaching the survival kit back pad without modification of the survival kit back pad and parachute harness.

(4) YAC-1DH. The survival kit seat packs would not fit in the seat well of the airplane.

(5) AO-1. The configuration of the Martin-Baker Ejection Seat precludes the use of these survival kits.

(6) L-23. The seat configuration was not adaptable to the survival kits.

d. The kits were subjected to temperatures of /30°F. to /125°F. and altitudes from sea level to 15,000 feet MSL with no noticeable effects.

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e. The Hot Climate Kit was suitable as a seat pack and back pad as indicated above. The seat pack is rigid, and the back pad is padded with sponge rubber and compartmentalized to prevent shifting of the contents.

f. The seat pack of the Overwater Kit is not suitable as a seat. It is of a semi-rigid configuration. It is not stable in the seat well and some of the contents were squashed as a result of pressure and shifting.

g. Exit from the L-19 required that the survival seats be modified by reducing the depth of the seat well and removing the right hand side of the well. Exit from the L-20 and U-1A could be readily accomplished with either survival kit attached.

h. The kits were compatible with standard flight clothing and equipment including the proposed life preservers (Navy Mark II); head clearance was restricted when wearing the APH-5 helmet.

i. Subsequent to modification (the addition of the 21-foot lanyard) it was determined that the kits were suitable for parachuting when attached to personnel back-type parachute (see A&E Bd Report, incl 2).

j. The kit contents were composed of standard Armed Forces survival equipment. The Quartermaster Corps indicates the survival rations were designed to have a service life of two years.

k. The packaging of individual items was satisfactory.

l. The Hot-Climate and Overwater Survival Kits were unsatisfactory in the following areas:

(1) The Overwater Kit did not have a rigid container for the seat pack to provide a stable seat and prevent damage to the contents.

(2) In the Overwater Kit, the three waterproof containers of the seat pack leaked water at the zipper stop. Although the back pad was not waterproof, the survival manual was the only item affected by water.

(3) The safety fasteners used to lock the nylon straps to the seat pack were easily dislodged, allowing unintentional jettisoning. One fastener was broken during the test.

(4) The lanyard was not adequately secured between the cushion and seat pack.

(5) The snaps used for attaching the cushion to the seat pack were easily unsnapped.

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(6) The seals (lead and thread) were easily broken during normal operations.

m. In addition to the items contained in the survival kits, the inclusion of the following in future survival kits is worthy of consideration:

(1) Marker dye for the Overwater Kit - provides an additional supply to that furnished with the life preserver.

(2) Small magnifying glass - may be used to start fires if supply of matches is exhausted.

(3) Plastic balloon with 200 feet of wire and supply of gas - may be used as an aid in signaling and could be used as a radio antenna.

(4) "Varco" flexible steel pocket saw (one ounce) for Hot Climate Kit - provides a useful tool for cutting a large variety of materials.

(5) Survival radio - an item which will contribute immeasurably to rescue operations.

(6) Pain reliever - a non-narcotic analgetic agent would be of considerable benefit to injured personnel.

7. It is concluded that the Hot Climate and Overwater Type Individual Survival Kits as tested are unsuitable for Army use.

8. It is recommended that:

a. The military characteristics for individual survival kits, Army aviation (inclosure 1 to 1st Indorsement, paragraph 1c), be amended to include marker dye in the overwater kit and pain reliever in both hot-climate and overwater kits.

b. Survival kits be developed to meet the requirement expressed in the Military Characteristics (inclosure 1 to 1st Indorsement, paragraph 1c, and as amended in paragraph 2 above) for use in single-engine Army airplanes.

c. Consideration be given to a minimum individual survival kit for use in Army helicopters.

d. Consideration be given to a minimum individual survival kit for use in the light twin-engine airplanes.

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e. Consideration be given to a crew-type survival kit for use in cargo-type airplanes.

Jack L. Marinelli

JACK L. MARINELLI
Colonel, Artillery
President

2 Incl

1. List of kit contents
2. Report, USA A&E Bd,
subj: "Test of the
Army Aircraft Hot
Climate and Overwater
type Individual
Survival Kits"

KIT CONTENTS

<u>Item</u>	<u>Qty</u>	<u>Hot Climate Kit</u>		<u>Overwater Kit</u>	
		<u>Seat Pack</u>	<u>Back Pad</u>	<u>Seat Pack</u>	<u>Back Pad</u>
Compass, lensatic	1	X		X	
Fishing kit, survival	1	X		X	
Knife, pocket	1	X		X	
Insect repellent	2	X		X	
(a) First-aid kit, survival w/tablets water-purification	1	X		X	
Paraffinned roll 170 matches	1	X		X	
Ointment, sun protective	2	X		X	
Headnet, insect	1		X		X
(b) Hat, emergency, reversible, sun	1		X		X
Poncho, lightweight, w/hood	1		X		X
Mirror, signaling, search and rescue	1	X			X
Signal, distress, day and night		4		3	
Goggles, general purpose, type 1	1	X		X	
Flashlight, hand generated	1	X		X	
(c) Ration, survival, all purpose	5 days	X		X	

<u>Item</u>	<u>Qty</u>	<u>Hot Climate Kit</u>		<u>Overwater Kit</u>	
		<u>Seat Pack</u>	<u>Back Pad</u>	<u>Seat Pack</u>	<u>Back Pad</u>
Container, drink- ing water, size A	2		X		X
Spoon nonmetallic	2	X		X	
Manual, survival	1		X		X
Glove, cloth with leather palm, fingers and thumb, seal brown, large size	1		X		X
Pliers, slip joint cutting, with screw driver & adjustable wrench adaptations, 6" long	1	X			
Fuel ration, heat- ing, individual, trioxane	3	X			
Starter, fire (M2)	5	X			
Brass wire, 25 feet (.025)	1	X			
File, hand, flat, 8" type IV, style B	1	X			
Water, emergency, 10 oz. tin	11	X			
Socks, OD, w/ cushion soles, size 12	1		X		
Snake-bite survival kit	1	X			
Machete, emergency survival	1	X			

<u>Item</u>	<u>Qty</u>	<u>Hot Climate Kit</u>		<u>Overwater Kit</u>	
		<u>Seat Pack</u>	<u>Back Pad</u>	<u>Seat Pack</u>	<u>Back Pad</u>
Combination bottom pan and cooking pot	1	X			
Desalter kit, sea water, Mark 2	3			X	
Life raft, one man PK-2	1			X	
Cup, bailing	1				X
Paddle assembly life raft	1			X	
Repair kit	1			X	
Sponge, type II, size 8	1				X
Packing slip	1		X		X

NOTES:

- (a) Antiseasickness medicine contained in overwater first-aid kit
- (b) Reversible (bright color and camouflage).
- (c) Rations designed to provide a minimum of 570 calories per day in the hot climate kit and 760 calories per day in the overwater kit.

HEADQUARTERS
US ARMY AIRBORNE AND ELECTRONICS BOARD
Fort Bragg, North Carolina

REPORT OF PROJECT NR IAB 81-59

"TEST OF THE ARMY AIRCRAFT HOT CLIMATE
AND OVERWATER TYPE INDIVIDUAL SURVIVAL KITS"
(US Army Aviation Board Project Nr AVN 2160)

Tests were conducted by First Lieutenant James E. Fiscus, Infantry,
and other personnel of this Board.

TEST NR - Parachute Jumps

1. Part 1: (Conducted with kits originally furnished)

a. Purpose: To determine the suitability of the kits for para-
chute jumps.

b. Method:

(1) Personnel were fitted with free-fall parachutes and the kits
(Annex A.1). A study was made concerning safety of jumpers.

(2) Personnel equipped with free-fall parachutes and the kits
made parachute jumps. Motion pictures were taken and studied.

(3) The kits were inspected for damage after each drop.

(4) Opinions of test personnel as to non-essential features
and improvements were evaluated.

c. Results:

(1) Both kits were compatible with personnel back type
parachutes. The Hot Climate Kit should be equipped with a lowering line
and lowered to avoid injury to the jumper on landing. Initially, this
kit was modified locally. Subsequently, a modified kit was furnished
for test (See Part 2).

(2) Results using the personnel back type parachute and the
Pioneer free-fall type "Ski-Diver," Model P-SD-2 Parachute, each equipped
with a reserve:

(a) Hot Climate Kit:

<u>Jump Nr</u>	<u>Type Aircraft</u>	<u>Type Parachute</u>	<u>Damage</u>
1	H-21	Back type	None
2	H-21	Back type	None
3	AC-1	Pioneer	None
4	AC-1	Pioneer	Kit was extensively damaged when the attachment points on the parachute failed.

(b) Overwater Kit:

<u>Jump Nr</u>	<u>Type Aircraft</u>	<u>Type Parachute</u>	<u>Damage</u>
1	H-21	Back type	None
2	H-21	Back type	One of the canvas packages tore at the drop line attach- ment point. The case was bent on landing.
3	AC-1	Pioneer	The quick release zipper be- came unserviceable.
4	H-21	Pioneer	The first aid kit became water-soaked.
5.	H-21	Pioneer	The first aid kit became water-soaked.

NOTE: Jumps 1, 2, and 3 were made over land. Jumps 4 and 5 were made over water.

(3) No difficulty was encountered in activating the overwater kit. Difficulty was encountered in boarding the life raft.

(4) The test item has no non-essential features with respect to parachute jumping.

(5) Modifications required:

- (a) Equip the Hot Climate Kit with a lowering line.
- (b) Stow the life raft anchor and anchor line of the Overwater Kit.

2. Part 2: (Conducted with modified kit) After completion of Part 1, a Hot Climate Kit modified to include a lowering line assembly was furnished this Board.

a. Purpose: To determine the functionability of the lowering line assembly on the modified survival kit.

b. Method: Personnel equipped with the Pioneer parachute and the modified survival kit (Annex A.2) jumped twice from US Army L-20 aircraft.

c. Result: The lowering line assembly functioned satisfactorily.