PSF: Subject File

Carter, John Franklin.
Report on Parachute Releases
Aug. - Sept. 1944

3490

BF J.F. Carter freder 3-44

THE WHITE HOUSE

WASHINGTON

C
O
P
Y

September 22, 1944.

MEMORANDUM FOR

JOHN FRANKLIN CARTER

In regard to Technical Report No. 4 ("I" Project), it is suggested that you take this up with the Coast Guard or the Navy.

Grace G. Tully
PRIVATE SECRETARY

No papers accompanied the original of this memorandum to Mr. Carter.

T-377

PSF J. F. Carter folder 3-44

THE WHITE HOUSE

WASHINGTON

September 22, 1944.

MEMORANDUM FOR

J. FRANKLIN CARTER:

In regard to the report on parachute releases, the President suggests you take this matter up with Admiral Brown.

Grace G. Tully
Private Secretary

JOHN FRANKLIN CARTER
(Jay Franklin)
1210 NATIONAL PRESS BUILDING
WASHINGTON 4, D. C.

"We, the People"
"The Week in Washington"

Metropolitan 4112
Metropolitan 4113

September 18, 1944.

MEMORANDUM FOR MISS TULLY: REPORT ON PARACHUTE-RELEASES.

Dear Miss Tully:

Here is the Army Air Force answer to the report on parachute-release equipment, which is herewith returned to your files. The Army statement seems to cover the situation, with the assurance that the single-point release is now in production and is replacing the old release equipment.

In this connection, it should be pointed out that the Navy's Bureau of Aeronautics is far behind the Army Air Forces in supplying this type of equipment and that, with the emphasis of the war shifting to the Pacific, something should be done to activate the Navy on this point. As I am without instructions on this point, I simply remark that I am informed that the Navy has ordered the magnificent total of six single-point parachute-releases to date. Such, at any rate, was the situation when this report was prepared and I have had nothing to the contrary since then.

J.F.C.

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Date-
Signature-

SAVE

[redacted]

HEADQUARTERS, ARMY AIR FORCES
WASHINGTON

FOR VICTORY BUY UNITED STATES WAR BONDS AND STAMPS

September 17, 1944

Mr. John Franklin Carter
1210 National Press Building
Washington 4, D. C.

Dear Mr. Carter:

In the temporary absence of General Arnold, the Chief of the Air Staff has directed me, at the request of the Chief of Staff, to return to you the discussion of parachute requirements and procurement which you recently forwarded to the Office of the Chief of Staff. The following additional facts are also furnished to you.

Satisfactory safety provisions having been developed for use with the quick-release mechanism, the Army Air Forces determined some months ago to convert future chute procurement to single-point release types. The procurement program necessarily involved tapering of production of previous types as the new production came in. It also included production of harnesses and release mechanisms for conversion of a portion of present equipment.

Tentative schedules for the new type equipment have not hitherto been met, but in this month new production should exceed established basic requirements and production of older types will be substantially at an end. Acceleration of production rates has been rapid in recent weeks and it is believed that from here out schedules will be met.

Your interest in this problem is appreciated. It is believed fair to say that this program is being aggressively pressed by Army Air Forces.

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Date- 7-18-70
Signature- [illegible]

Incl.

Sincerely yours,

Fred M. Dean

FRED M. DEAN
Colonel, Air Corps
Executive, CG/AAF

[redacted]

"T" Project Report No. 1. PSF Carter August 23, 1944

SINGLE-POINT RELEASE PARACHUTE HARNESS

It is reported that procurement of the single-point, quick-release parachute harness equipment for the air services and airborne troops is being given insufficient attention.

It is further reported that since March of this year (when the Army Air Forces Materiel Command at Wright Field ordered the shift to the much safer quick release) only 6,000 sets have been procured.

It will be recalled that nation-wide publicity regarding the hazardous character of the triple-point release parachute harness in use by U.S. airmen was responsible for the shift to the single-point release universally used by all other Air Forces of the world.

A brief survey of the history of the use of the quick-release harnesses shows that by 1935 every nation having military aircraft was using the quick-release with the exception of the United States. The British Navy adopted it for the Fleet Air Arm in 1936. The Japanese use it exclusively, having purchased several units from the Irwin Air Chute Company in 1932, after which they proceeded to copy it and manufacture it in Japan. The German factory of the Irwin Company was seized in 1936 by the Nazis, who proceeded to manufacture hundreds of thousands of

~~SECRET~~

quick-release harnesses. The Russian Air Force uses it exclusively, manufacturing it in the Soviet Union in their own factories.

It is stated that the lethargic attitude of the Material Command at Wright Field toward the problem of shifting over to quick-release harnesses is largely due to the fact that responsible Officers feel that they have been "pushed into" the adoption of the quick-release.

This feeling is undoubtedly due to the fact that the publicity given the unprogressive attitude of the Army Air Forces and the Bureau of Aeronautics, U.S. Navy, in the matter of adoption of quick-release harnesses was particularly pointed as contained in the newspaper column by Drew Pearson.

The facts, however, regarding attempts of responsible military personnel to secure effective action in this matter pointedly indict high-ranking Officers of the Navy and, in particular, Rear Admiral Julius A. Furer, Coördinator of Research and Development.

The general public had no knowledge of the parachute controversy until the early weeks of March of this year, when the first article by Drew Pearson appeared. However, more than six months prior to that time the matter was officially called to Admiral Furer's attention by Officers of the Emergency Rescue Equipment Section, who had available incontrovertible

evidence as to the dangerous character of the old triple-point release as well as data on the experience of the Royal Air Force and the 8th U.S. Air Force with the single-point release. Their recommendation that a strong letter be sent to Army Air Forces and the Bureau of Aeronautics went unheeded.

Captain Louis B. Olson, U.S. Coast Guard, assigned as Officer in charge of the Emergency Rescue Equipment Section and directly responsible for its operation to Admiral Furer, finally conferred with the Admiral on or about November 19, 1943, at which time the Admiral signed a modified letter, extremely mild in tone, recommending that consideration be given to the adoption of this equipment by the Bureau of Aeronautics.

In spite of the evidence which Admiral Furer had before him at that time in the form of a Memorandum from Brigadier General Longfellow of the 8th Air Force under date of June 1, 1943, consisting of four typewritten pages of incontrovertible argument for the quick-release (copy attached), he did not take any steps to bring this matter forcefully to the attention of the Materiel Command of the Army Air Forces.

Analysis of current conditions surrounding the procurement of this equipment strongly indicates that the present attitude is largely due to the failure of Admiral Furer to accept responsibility under Memorandum No. 58 of the Joint Chiefs of Staff.

Forceful action on this particular matter of the parachute

release was required under the provisions of the Directive covering Emergency Rescue Equipment, the responsibility for which had been placed with Admiral Furer by the Secretary of the Navy. His failure to carry out the responsibility under this Joint Chiefs of Staff Directive was the primary cause of the Navy's failure to take immediate action to procure this vital equipment. This stand further encouraged the lethargic attitude on the part of the Army Air Forces. Finally, continued inaction resulted in scathing publicity. This publicity, in turn, so infuriated Officer personnel in the Army Air Forces that no adequate attention is being given to the procurement of this important equipment.

Had proper investigation been made by Admiral Furer or had the facts available through the responsible Officers of the Emergency Rescue Equipment Section been examined, it would have been found that the history of the test given by the Army Air Forces and the Navy to quick-release equipment showed woeful and irresponsible action on the part of many of the Officers concerned.

In one case, for example, the Irwin Air Chute Company negotiated with Lieutenant General Lee of the Army Air Forces to equip the first battalions of airborne troops with quick-release harnesses.

Exhaustive trials at the Paratroop School at Fort Benning were held early in 1941 and 2,500 quick-release

chutes were ordered. After delivery of 700 had been made a Major "Tug" Wilson made a dummy test at the Fort Benning Field, utilizing the quick-release harness, and in conducting the test turned the dummy on its face on the floor of the plane in such a manner as to deliberately turn the quick-release mechanism and then dropped the dummy out to fall free of the harness in full view of the Officers and men. This test so prejudiced persons on the ground that the balance of the order was canceled and no further action was taken to provide quick-release equipment.

Action taken by the Materiel Command at Wright Field since March of this year to procure quick-release equipment has resulted in the "farming out" of 250,000 units of the quick-release mechanism to companies such as the Oneida Silver Company of Oneida, New York, the Highway Steel Company of Highland Park, Illinois, and L. A. Darling and Company of Ronson, Michigan. It is asserted that it has taken these Companies two and one half months to three months to tool-up for the job. To date no deliveries of quick-release units have been made by them.

It is reported that the Materiel Command did, after the publicity last Spring, proceed to draft a standard specification for the quick-release harness and turned the procurement of this equipment over to Captain Bashlu, a Reserve Officer, as Contracting Officer. It is stated that

he had been in the Service about seven or eight months and his previous experience had been solely with the May Company, a large department store in Cleveland, Ohio.

It is reported that no high level assistance was afforded to any Officers concerned in this matter nor was any assistance requested from any other branches of the Army such as the Ordnance Department or the Army Service Forces, which would have been able, it is believed, to arrange contracts with competent, large manufacturers for the production of hundreds of thousands of quick-release units.

Further, it is reported that procurement by the Army Air Forces of the quick-release equipment has been hedged around by the most minute considerations of price. A tabulation of the price of a triple-release parachute against the quick-release equipment shows that the quick-release costs about 5 to 6 per cent more.

Type	Cost
Standard parachute with triple-point release harness	$84.50
Standard parachute with quick-release harness	89.50
Standard triple-point release harness	20.00
Single-point, quick-release harness	24.00

It is estimated that approximately 1,500,000 parachutes are in use by the Army Air Forces alone. The modification

of these parachutes to the quick-release type would require that number of quick-release harnesses and release boxes. Best information indicates that on September 15, fourteen thousand, or less than 1 per cent, will have been manufactured.

The Bureau of Aeronautics of the Navy has not yet procured any quick-release harnesses as they are still experimenting with and "redesigning" releases. It is, however, in the water where the survivor has the most urgent need for extricating himself immediately from his parachute harness. In spite of this obvious urgency the Bureau of Aeronautics apparently still finds it necessary to "experiment."

In view of the inevitable growing intensity of air combat over water in all Theatres and, in particular, in and around the islands of the Japanese Empire, as well as in the China-Burma-India Theatre, the most expeditious procurement of quick-release parachute equipment should be made. Since a year has practically been wasted, the necessity for streamlined action with a sure-fire follow-through cannot be too strongly stressed.

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HEADQUARTERS VIII BOMBER COMMAND
APO 634

452.72

June 1, 1943.

SUBJECT: R.A.F. Single Point Quick Release Harness, Quick Attachable Chest Type Chute, Quick Attachable Individual Dinghy and U.S.A.A.F. Chest Type Chute.

TO : Commanding General, 1st Bombardment Wing,
Commanding General, 2nd Bombardment Wing,
Commanding General, 3rd Bombardment Wing,
Commanding General, 4th Bombardment Wing,
Commanding General, OCRC #11.

1. From a study made by this Headquarters during January, 1943, it was decided to equip each member of the heavy bombardment combat crews with the R.A.F. Quick Release Harness Ref. No. 15A/14b, Observer Parachute, Chest Type Pack Ref. No. 15A/141 and R.A.F. Quick Attachable Individual "K" type dinghy in "C" Pack or as a temporary substitute, the U.S.A.A.F. Chest Chute Pack Type AN6513-1, U.S.A.A.F. Q.A.C. Harness (modified) and R.A.F. Quick Attachable Individual "K" Type Dinghy in "C" Pack.

2. At the time of the investigation, the following facts were noted in regard to the practice and thoughts of the B-17 and B-24 crews. In order to differentiate working conditions, it was necessary to break down the various crew positions in the B-17E-F and B-24D airplanes. The practice with the B-17E-F crews were as follows:

a. Pilot and co-pilot wore seat type chute in most cases; few wore back type. However, it is almost impossible to get between the seats without unbuckling the leg straps.

b. Bombardier and navigator - half wore chutes and half did not; both seat and back type were used.

c. Top turret gunner could not wear chute except in a few rare exceptions.

d. Radio operator wore seat or back type.

e. Ball turret gunner could not wear chute at any time.

f. Waist gunners wore seat or back type.

g. Tail gunners wore back type.

B-24D crew were holding to the following practice:

a. Pilot and co-pilot wore seat type chute in most cases. Few preferred back type. It is almost impossible for them to get out of the seat without unbuckling leg straps.

b. Bombardier and navigator - half wore chutes and half did not; both seat and back type were used.

c. Top turret gunner could not wear chute.

d. Three lower gunners used back type chute.

e. Waist gunners used back type chute.

f. Tail gunners could not wear a chute of any type.

IT MUST BE REMEMBERED THAT THESE CONDITIONS WERE THE GENERAL RULE AND THAT THERE WERE RARE EXCEPTIONS WHERE A CREWMAN WAS SMALLENOUGH TO WEAR CHUTE IN ANY POSITION. At this time there were also a small supply of Army and Navy Chest Chutes type AN6513-1 which were usually worn by turret operators.

(1) Due to the lack of efficiency of operations at high altitude caused by additional weight and interference of pack, APPROXIMATELY 50% OF CREW MEMBERS WHO COULD WEAR CHUTES DID NOT. Parachutes were, therefore, left lying at the nearest handy spot; crew members trusting that they would have time to put on the harness chute in case of bail-out. It was evident however, that pilots and co-pilots of B-17s took a very fatalistic viewpoint, feeling that their chances were slim with the equipment used at that time.

(2) Heavy bombardment groups were at that time equipped with from three to five different types of parachutes as follows:

(a) Seat Pack, type S-1 or S-2 which are attached harness chutes.

(b) Back Pack, type B-7 which is also an attached harness chute.

(c) Back pack, type P3-M-24, also attached harness chute.

(d) Quick attachable barrel chest chute, type A-2. This equipment is regarded as unsatisfactory and dangerous.

(e) Quick attachable chest chute, type AN6513-1. This chute is similar in design to British "Parachute Observer", but is a poor substitute and unsatisfactory reports have been submitted as it does not hold up well under severe conditions. This type of pack is not as easily attached as the R.A.F. chest chute. None of these harnesses are equipped for attachment of individual life saving dinghies.

3. The R.A.F. Quick Release Harness, Quick Attachable Chest Chute and Quick Attachable Individual Dinghy have the following obvious advantages over our present types, particularly where crews are operating over water:

a. Main advantage is that both parachute and dinghy are detachable, so that harness may be worn at all times during operations by all crew members.

b. Harness is so designed that in one operation it can be completely removed. In our standard harness 3 or 4 steps are necessary. THE RAF USE THE QUICK RELEASE HARNESS ON ALL THEIR REGULAR PARACHUTES EXCEPT THOSE USED FOR TRAINING PURPOSES. THEY HAVE OPERATED CONTINUALLY OVER WATER, HAVE HAD HUNDREDS OF PARACHUTE DESCENTS INTO THE WATER AND THEY CONSIDER ANYTHING BUT A QUICK RELEASE HARNESS - MURDEROUS.

c. Harness and pack are so constructed that should only one snap hook be attached to chute, user will be safely lowered without injury.

d. Dinghy is as readily attachable as the chute. IN CASE OF DITCHING, IT IS RECOMMENDED THAT THE HARNESS AND DINGHY PACK BE KEPT ON FOR USE IN CASE MAIN RAFT FAILS TO OPERATE PROPERLY.

e. In case it becomes necessary to bail out over water both that parachute and dinghy can be easily attached. IT IS A KNOWN FACT THAT WE HAVE LOST CREWS WHEN THEY BAIL OUT OVER WATER WITHOUT THIS EQUIPMENT. A MAN WILL ONLY LAST 15 TO 60 MINUTES IN THE SEA IN THIS THEATRE UNLESS HE HAS SOME MEANS OF GETTING HIS BODY OUT OF THE COLD WATER.

f. R.A.F. reports show that in over 400 operational jumps no malfunctions have been evidenced, other than occasional scratches on face by chest pack releasing upwards.

The R.A.F. Bomber Command has equipped all their bombardment crews with the Quick Release Harness, Chest Type Chute and are in the process of equipping them with individual life-saving dinghies, (type K) in the C pack in addition to the regular life raft equipment.

4. There are always exceptions to the rule and some men might be small enough to wear a seat type and others believe they would rather wear a back type chute, but in order to standardize the parachutes and at the same time give our crews what is known to be the best all around safety equipment for operations over land and sea, it is directed that the following policies be adhered to by all Units of this Command:

a. All crew members of Heavy and Medium Bombardment Groups of this Command will be equipped with the R.A.F. Quick Release Harness, Ref. No. 15A/144, Observer Parachute, Chest Type Pack Ref. No. 15A/141 and Quick Attachable Individual Dinghy Type "K" in the "C" pack as soon as possible.

b. As a temporary substitute, the U.S.A.A.F. Chest Chute Pack Type AN6513-1, U.S.A.A.F., Q.A.C. Harness (modified) and Quick Attachable Individual "K" type Dinghy in "C" Pack will be used.

c. The U.S.A.A.F. Q.A.C. Harness will be modified by the Base, Group, or Squadron Parachute Departments in accordance with the attached instructions and drawings. This work will be accomplished at the earliest possible date.

d. The use of all Back and Seat type parachutes will be discontinued by all units of this Command while flying Heavy and Medium Bombardment Airplanes (B-17, YB-40, B-24 and B-26) as soon as Quick Attachable Chest Type is available.

e. All seat and back type parachutes will be turned in to the respective advance depots as soon as possible after the receipt of the R.A.F. Quick Attachable Chest Type Chute and Quick Release Harness. This is necessary so that American Canopies can be repacked in the R.A.F. chest pack and reissued along with the R.A.F. Quick Release Harness.

f. It is also directed that this information be brought to the attention of the "UNIT EQUIPMENT OFFICER".

By Command of Brigadier General LONGFELLOW:

2 Incls:
Incl #1 Modification Drawing No. 1
U.S.A.A.F. Q.A.C. Harness.
Incl #2 Instructions on Modification.

HEADQUARTERS VIII BOMBER COMMAND
APO 634

LETTER OF INSTRUCTIONS

1. Modification of U.S.A.A.F. Q.A.C. Harness (U.S.A.A.F. Chest Chute Pack Type AN6513-1) by addition of anchorage Rings (Ref. No. 15A/194) to main suspension strap for dinghy attachment. (See Modification Drawing No. 1)

2. This modification is to be made by the Base, Group or Squadron Parachute Departments.

3. To accomplish this modification the following equipment will be needed for each set of harness:

a. Two "D" Rings (Ref. No. 15A/194).

b. Nine (9) inches of webbing - Heavy white, 3000 pounds tensile strength, one and three quarters (1 3/4) inch wide (Ref. No. 15A/271,) four and one-half ($4\frac{1}{2}$) inches for each ring.

c. Number eight (8) cord Ref. No. 15A/108).

This equipment may be obtained from the local R.A.F. Equipment Officer.

4. It is necessary to dip the ends ($\frac{1}{4}$ to 3/8 inches) of the $4\frac{1}{2}$ inch strap into molten parafin to prevent brazing.

5. The $4\frac{1}{2}$ inch webbing straps are to be machine sewn to the harness with No. 8 cord (Ref. No. 15A/108) using six stitches per inch. They will be folded and sewn so as to have the ends pointing upwards. The strap ends will be eleven inches above the crossing of the leg straps at the seat. (See Modification Drawing No. 1).

U.S. parachutes that are regular Army equipment available from the AAF Matériel Command are, left to right, 1) seat pack with a standard U.S. harness; 2) seat pack with U.S. adaptation of the British quick-release harness; 3) back pack, standard; 4) back pack, quick-release; 5) chest pack, standard; 6) chest pack, quick-release; 7) quick attachable chest pack.

Different uses for packs are emphasized in these back and side views. First two fit into scooped-out seats of fighter planes, trainers and some bombers. Back packs are most comfortable to wear, make slimmest silhouette for leaving plane through tiny emergency exits. Chest packs clip onto harness of gunners after they get out of cramped turret just before jumping.

American-type parachute harness has clasps at airman's chest and thighs, which can be opened with one hand during descent. On landing, the flier slips out of the harness.

PARACHUTE CONTROVERSY

Newspaper Columnist Drew Pearson recently aired allegations that standard U. S. parachutes were unsafe for water landings and that the Army and Navy were remiss in not adopting the British quick-release chute. LIFE went to Wright Field to study this parachute controversy. There it found that, although the U. S. actually has three adaptations of the British harness, most airmen who have jumped with both types prefer the U. S. chute (*above*). They say that the quick-release design (*below*) is less reliable and less comfortable. They did not confirm the statement that the British type was easier to open in the water. Officers who had never jumped before and who were unable to swim have made jumps over water to prove the safety of standard U. S. parachutes (*pp. 114, 117*). Because some fliers do prefer a quick-release type, the Air Forces provides these men with American adaptations, improved with a safety lock copied from German chutes.

British-type harness has straps feeding into a central quick-release mechanism. On landing, flier opens harness by turning dial on chest, giving mechanism a sound slap.

CONTINUED ON NEXT PAGE

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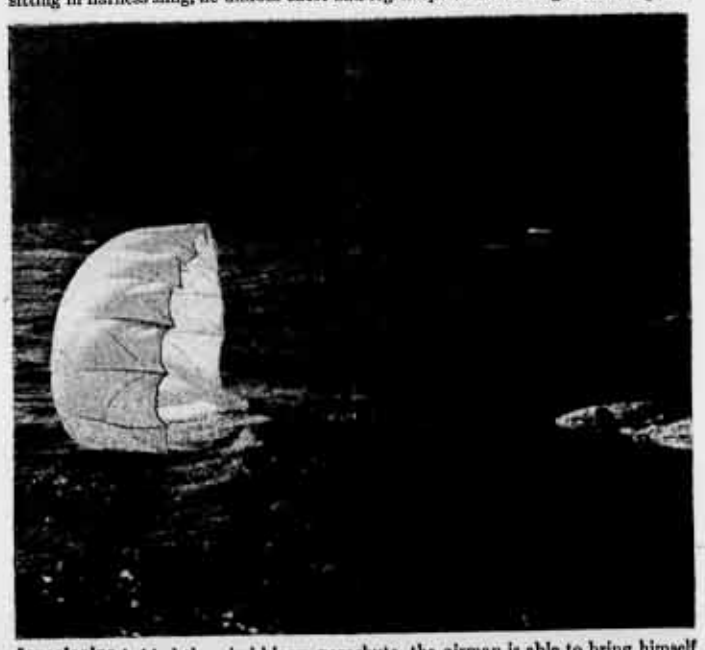
Out of the rear hatch of a B-24 tumbles tiny body of airman who is testing the safety of making a water landing with a standard U. S. parachute off coast of Florida.

Parachutist splashes into water with force of 12-foot free jump. During descent, while sitting in harness sling, he undoes chest and leg clasps without danger of falling out.



Aquaplaning behind the wind-blown parachute, the airman is able to bring himself nearer to shore. He collapses canopy by pulling on lower shroud lines to spill out air.

CONTINUED ON PAGE 117

IODENT

DON'T LET
Smoke Smudge
DIM YOUR *Smile Sparkle*

Choice of two textures—safety guaranteed—Made by a Dentist. Bears Good Housekeeping Seal. Gently cleans away even tobacco smudges. Restores natural enamel lustre. Delightful, refreshing flavor. Use Iodent and you'll smile with confidence.

Guaranteed by Good Housekeeping

WHICH **IODENT** DO YOU CHOOSE?

FLEAS IN MY EYEBROWS!

They stop at nothing! They'll ruin a dog's coat, nerves and general condition, if you give them a chance. I don't!

I slaughter fleas with the ONE-TWO system. *ONE*—regular weekly dusting with Sergeant's SKIP-FLEA Powder. It gets both fleas and eggs, and remains to kill new arrivals. And *TWO*—a bath with flea-killing SKIP-FLEA Soap—it cleans and soothes old itches, too.

Let SKIP-FLEA relieve your dog of the torment of fleas—and *keep* him free of them. The Sergeant's Dog Book tells about real flea control. Get it *free* at drug or pet stores—or with this coupon.

FREE Sergeant's, Dept. 2-F, Richmond 20, Va.
Please mail the NEW, 40-page, Illustrated Sergeant's Dog Book to:

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Sergeant's
DOG MEDICINES

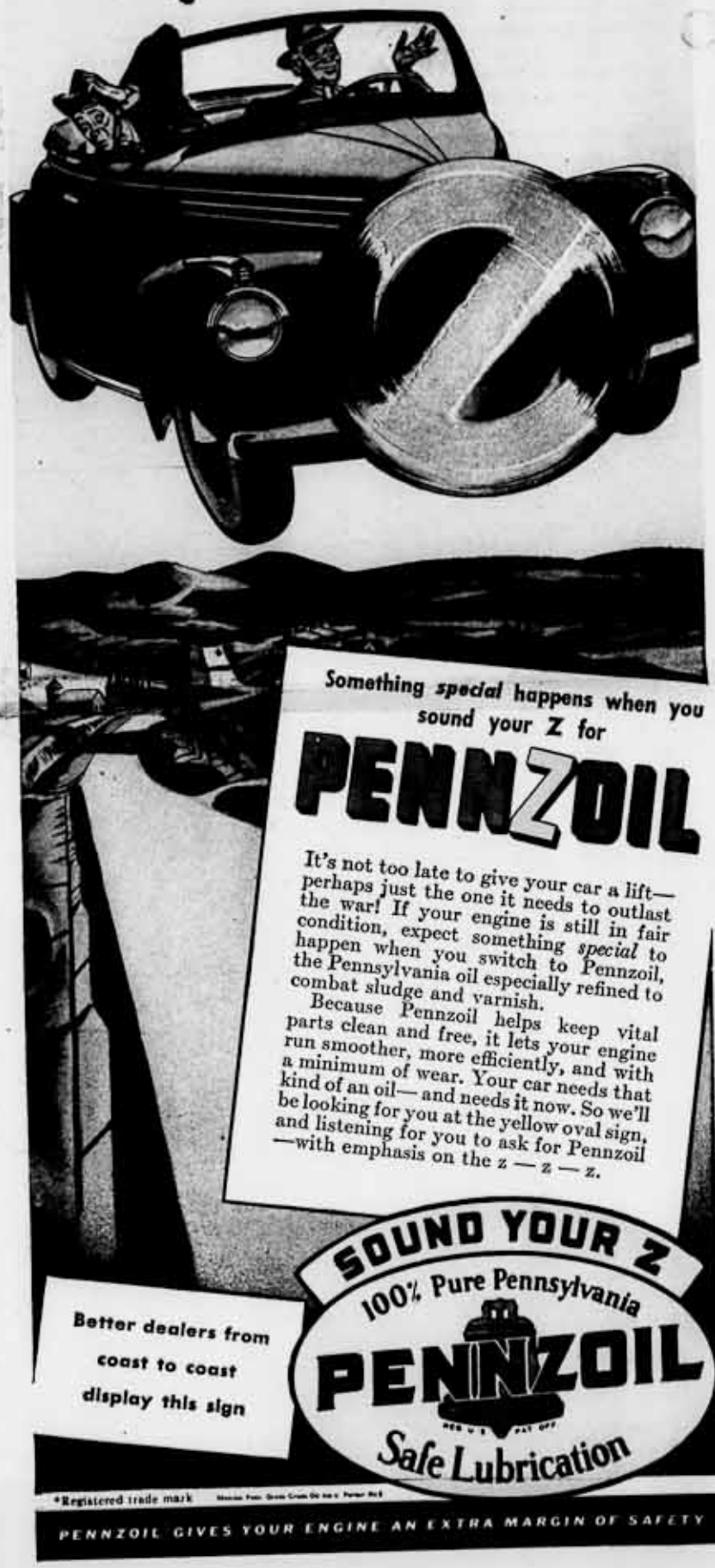
Airman is kept afloat by his "Mae West" life belt until he gets life raft from case attached to parachute. He inflates life raft in a few seconds by jerking on release cord.

Climbing into raft, jumper finds paddles, a bag for bailing out water, rations, drinking water. He can salvage parachute for use as a sail or for protection against sun.

Sea-marker dye, which is stowed in powdered form in the raft, makes a bright green spot as parachutist spreads it in water to attract the attention of search planes.

GASOLINE POWERS THE ATTACK!!! DON'T WASTE A DROP!

Probably an illusion, old man, I just had the oil changed!



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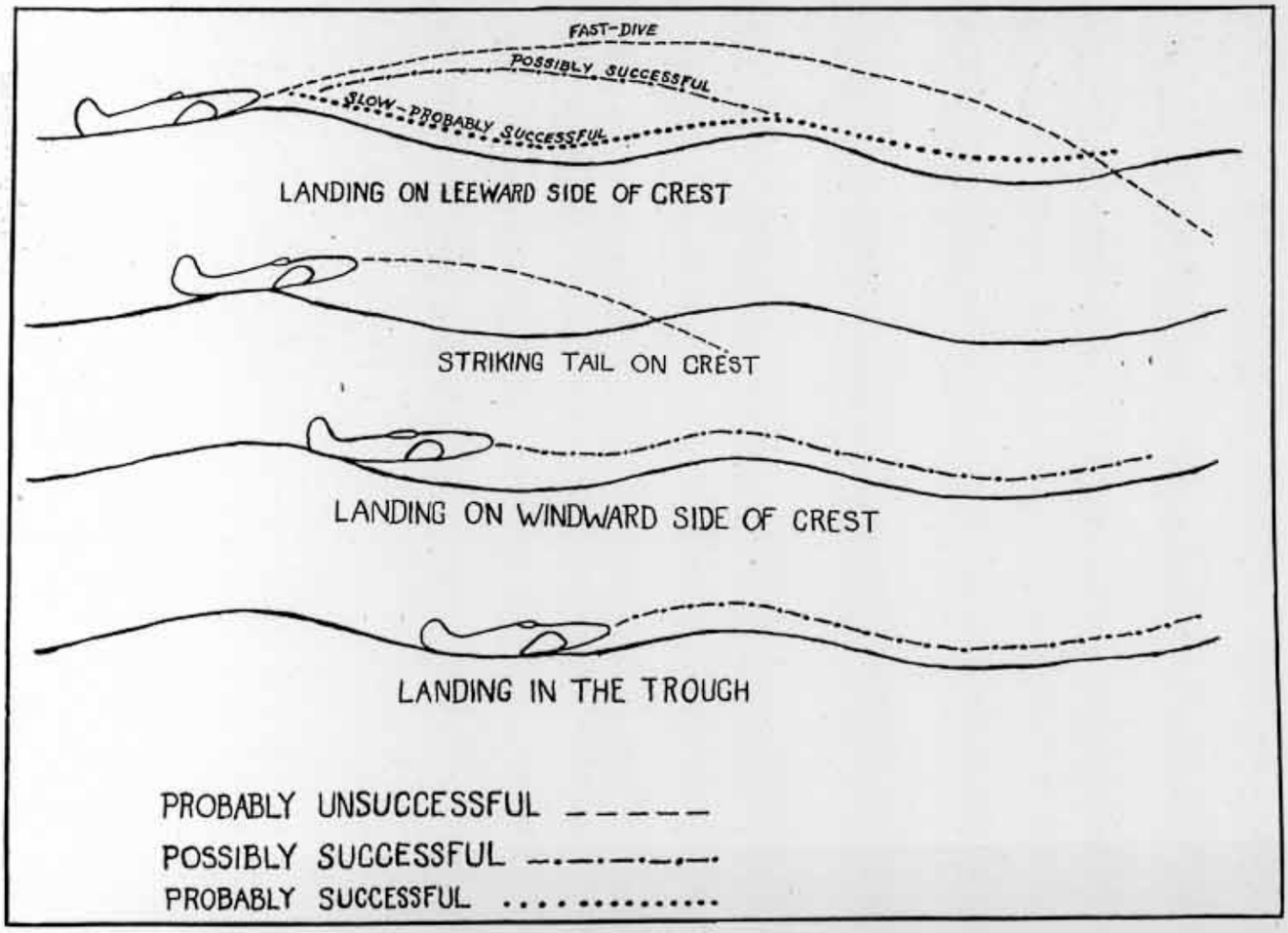


ILLUSTRATION 2.

CHOICE OF APPROACH DIRECTION

In choosing the direction of approach the height and distance apart of waves and swell in relation to the aircraft size is all important.

If a pilot ever has the opportunity of going at 35 knots in a high-speed launch, he will be amply impressed by the might of the sea and the damage it can inflict even on a boat. It should also be noted that the surface craft is traveling only at half the aircraft's lowest possible impact speed.

As previously stated, judgment of sea conditions from the air is not easy. It always looks more calm than it really is. Furthermore, it is always difficult to judge just how the waves are running in relation to swell. But the pilot, if he knows the wind speed and direction, can have forewarning of the wave conditions. It should be understood that swell conditions may complicate this rule.

A cut-and-dried ditching technique has not yet been instilled into all pilots. The best advise for the landplane pilot is to become familiar with the sea by flying low over the surface to watch wave and swell movements. From such study, the pilot should make his own choice.

Illustration 2, taken from an original report by D. C. MacPhail and J. C. Ross of the Royal Aircraft Establishment, shows clearly the possibilities of into-wind ditching. Upon studying this diagram, it will be appreciated that the execution of such a ditching calls for accurate judgment.

The C-47 would fare far better than the F6F Hellcat when ditching into wind because of the distance between crests for the C-47 is three wave crests within its own length, whereas the Hellcat only covers one-and-one-half waves. (See ill. 3.) Consequently the fighter is far more likely to dive. In such circumstances, the F6F Hellcat should be ditched crosswind and the C-47 would ditch better that way also, although it may survive ditching into the wind in waves of the size illustrated.

In illustration 3 a single-seated fighter is shown about to ditch into the wind near the top of an unruffled ocean swell which is running into the wind. This is obviously the best course. But, if this swell were running with a wind which caused waves of dangerous dimensions, ditching crosswind would appear the best course, unless the wind is so strong that the ground speed can be greatly reduced. In the case of the C-47 the distance between swell tops is not sufficiently great to allow safe into-wind ditching and therefore is shown ditching crosswind along the swell and waves. (See ill. 4.)

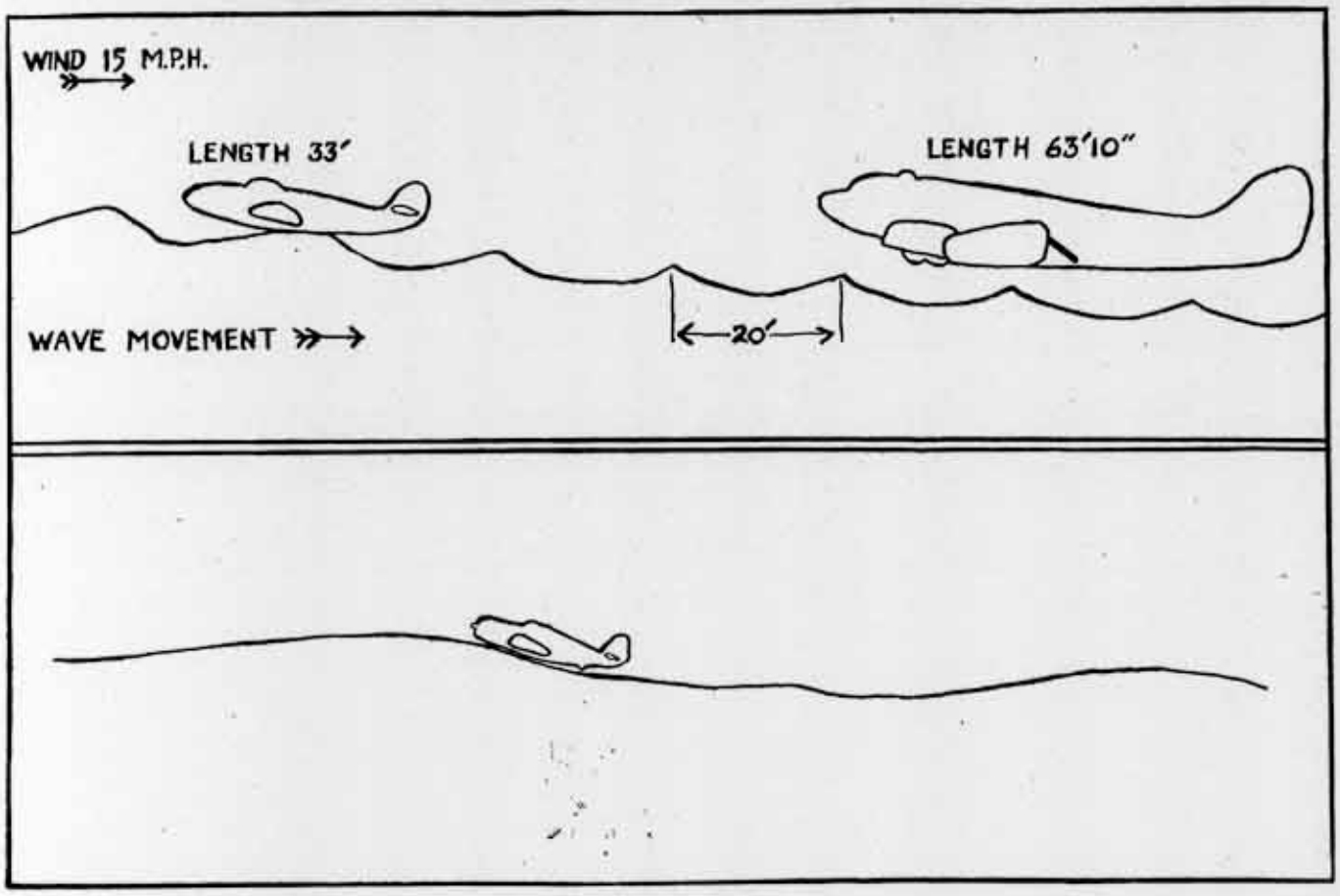


ILLUSTRATION 3.

Where waves *and* swell are present the pilot must choose whichever course appears to be the less formidable. If he is able, he may choose a direction of approach which is a compromise to both waves and swell.

It will be seen from the Wind and Sea Prediction Table (p. 4) that in a wind of 12 to 13 knots the wave height is four feet. Such seas would present a hazard to a fighter but less so to a heavy bomber. Any seas greater than four-foot waves present a serious hazard to all landplanes which attempt to ditch across them.

However, there are advantages that

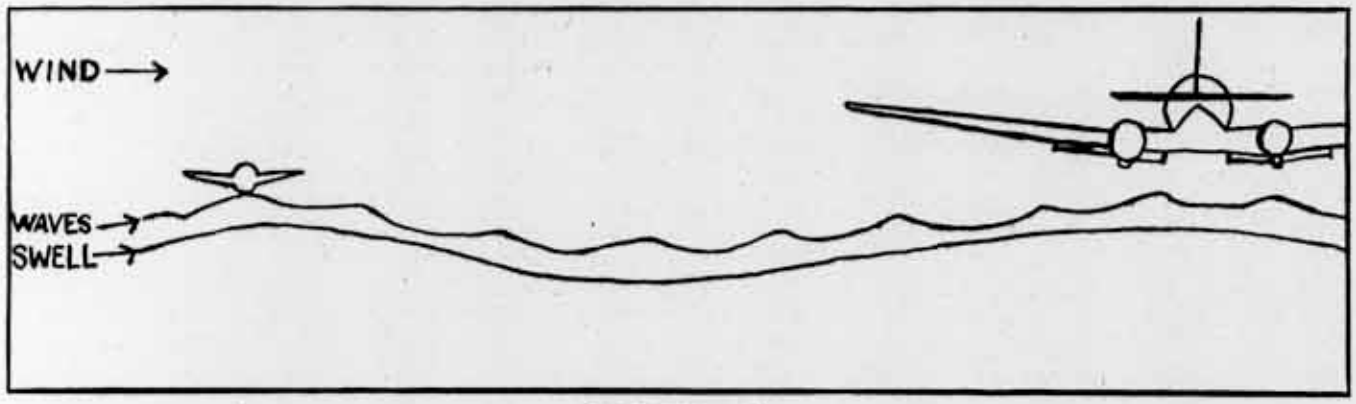


ILLUSTRATION 4.

accompany high winds. As the wind increases, the distance between wave crests lengthens, thus allowing the pilot greater opportunity for selecting a more favorable spot on the wave for the initial contact. Also an increase of wind permits a decrease in ground speed when landing into the wind.

It is necessary to point out that in a *high* wind condition whatever the distance between wave crests or whatever their size, an into the wind ditching is preferable because the impact speed is greatly reduced by reason of the high wind. Naturally where an aircraft's stalling speed is low, into wind ditching will be more frequently preferable owing to the even lower ground speed obtainable.

In other words, if the pilot commits himself to ditching into wind across the waves he commits himself to two grave disadvantages. In the first place, he may fly straight into a wave face, or secondly, the tail may bounce on a crest causing the nose to be thrown violently downward.

LANDING CROSSWIND

When it is decided to ditch crosswind or along the swells adopt the following technique:

1. Obtain the lowest rate of descent and forward speed made possible by use of flap and power if available.
2. Maintain the most advantageous nose up attitude of impact made possible by medium of flap and power.
3. Compensate drift by heading.
4. Endeavor to land on the downwind side of the swell top or wave crest.
5. In multi-engined aircraft that side of the aircraft which has maximum power available should be the upwind side, providing this does not involve a low turn near the water. (See ill. 5.)

LANDING INTO WIND

When it is decided to ditch into wind across waves adopt the following technique:

1. Obtain the lowest possible rate of descent. This is important because the relative rate of descent may be increased due to the impact occuring on a rising crest.
2. Obtain the lowest possible forward speed. This is important because the nose may strike a wave face. If the speed is low the impact will be less severe. Also at high speed if the tail strikes a crest pitching will be more violent.
3. Maintain the most advantageous nose up attitude thereby avoiding as far as possible the nose striking a wave face.
4. Endeavor to touch down just before a rising wave face.
5. Endeavor to hold the nose up until all speed is lost.

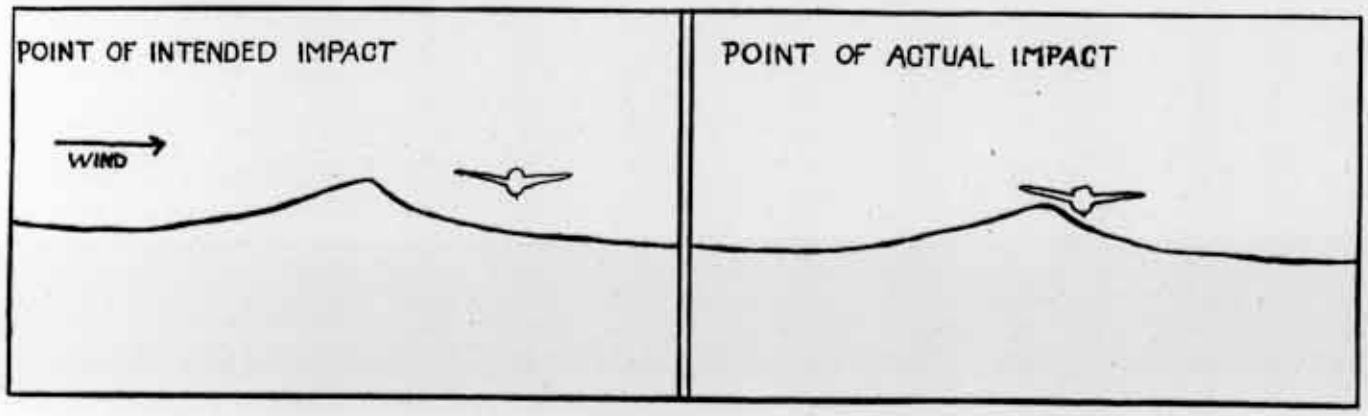


ILLUSTRATION 5.

United States Army Air Forces, Navy, and British Develop

AIRBORNE LIFEBOAT

Versions To Be Dropped From Operational Aircraft

Airborne boats have been adopted by both the Army Air Forces and the Navy for expediting rescue operations. The boats may be dropped by operational aircraft to men downed near enemy waters or in regions where rescues by surface vessels and amphibious aircraft could not be carried out with safety, in waters too rough to land seaplanes, or places too distant to be reached by surface craft or naval vessels. The droppable boats are equipped with motors to enable the survivors to proceed under power to either friendly land or waters less hazardous where rescue might be more readily effected.

The Army and Navy have developed different versions of airborne boats required to conform to peculiarities of the types of aircraft available to the respective services for carrying the boats. The Air Force craft, Airborne Lifeboat, type A-1, is a 27-foot mahogany molded plywood sailing vessel with two inboard motors and sufficient food and water for a crew of twelve men to navigate for about 5 weeks. This boat is suspended under the fuselage of a B-17 aircraft.

The Navy AR-10 Rescue Assembly is especially designed for drops from carrier-based aircraft. This compact, nonrigid pneumatic boat with emergency equipment, outboard motor, and fuel packaged in five separate containers, is carried in the bomb bay of a TBF "Avenger." The rubber boat accommodates ten men, has sufficient fuel for a 50-mile journey under power, and, in addition, is equipped with a mast and sails.

BRITISH AIRBORNE LIFEBOAT

The idea of an airborne lifeboat was originated by an internationally known British boatsman, Mr. Uffa Fox. In 1941 Mr. Fox presented his proposal to Lord Brabazon of Tara, then the Minister of Aircraft Production in England, for dropping a lifeboat from the air by parachute. At the same time Group Captain E. F. Waring, Deputy Director of Air Sea Rescue, Air Ministry, made similar proposals. Few were better qualified to design such a boat than Uffa Fox, who had designed, built, and mastered nearly every type of craft, from the canoe to the yacht—an individual who had crossed the Atlantic in 60-foot, 40-foot, and 36-foot boats—the author of 8 or 10 very excellent and well-known books on the subject of small boats.

On May 5, 1943, the British Airborne Lifeboat, Mark I, was dropped operationally for the first time to an astounded crew of a plane forced to ditch off the Dutch coast. The second drop was made off the French coast on July 20, 1943. A Wellington returning from a night bombing mission over western Europe was damaged by flak. Oil began to leak from the port engine causing the pressure to drop immediately. The battered plane, flying at 4,000 feet over antiaircraft batteries along the French coast, headed for the open sea to ditch. The home base was notified that the ship was returning and as the French coast was approached the transmitter key was clamped down. The plane ditched at 0210 hours approximately 26 miles west of Cap de La Hève.

All six crew members boarded their dinghy, but they suffered from seasickness during the first night. On the morning of the sixth day, the crew had drifted east-south-east within sight of the enemy-held coast. To avoid drifting ashore, a long struggle with paddles began. At noon that day they were sighted by a fighter plane approximately 15 miles west of Le Havre. In spite of all their efforts to head north, the dinghy was drifting dangerously near the coast till they were only 7 miles off the coastline north of Le Havre. The plane had established a fix for the distressed crew so the following day a Hudson, with adequate fighter escort, appeared carrying an airborne lifeboat. The crew cast out sea dye marker and fired signal flares to indicate the direction of the wind. The drop was made at an airspeed of 120 miles per hour from an altitude of 700 feet. The lifeboat alighted upwind of the crew because it was dropped too late, but with vigorous paddling the dinghy crew soon came alongside.

The crew had seen air diagrams of the lifeboat, and had read news releases of its first rescue, but they had never seen the instructional booklet. They boarded the craft with ease and immediately performed the duties for getting under way described in the instructions. It was decided because of the proximity to enemy installations to proceed under power to the middle of the English Channel and then sail the remainder of the way. After covering 30 miles at an average speed of 7¼ knots, they were intercepted by two H. S. L.'s. The one boat took the crew aboard to return them to base, while the second vessel took the lifeboat in tow. It was estimated that if this crew had not been intercepted they would have reached the eastern Solent approaches within 6 hours if they had continued under power.

Although the rescue was outstandingly successful, there were a few functional faults in the drop which the inexperienced dinghy crew adequately overcame, and which have been corrected by modification of design and proper instruction to loading ground crews. The rocket drogue fell from the boat during the descent, the self-righting chambers failed to inflate, the rear canvas cover was split when released from the bomb bay, and the parachute failed to release automatically when the lifeboat was level in the water.

Since then many successful rescues have been carried out by dropping this boat to downed air crews in the North Sea, English Channel, and Bay of Biscay.

THREE 32-FOOT PARACHUTES

The original airborne lifeboat, Mark I, is suspended under the fuselage of a Hudson. The double skin mahogany boat has an "all-up" weight of approximately 1,600 pounds, is 23 feet long and 5½ feet beam, has a maximum speed of 6½ knots, and a maximum range of 100 miles at 4 knots on one engine, or 60 miles at 6 knots on both engines. The boat is designed and equipped for seven men.

Three 32-foot parachutes, rather than one 96-foot canopy, are used to drop the airborne boat in order to check oscillation during the descent. The boat strikes the water at a 30° to 40° angle. An automatic release gear disengages the parachutes as soon as the craft becomes waterborne. During the drop when the boat assumes an angle of approximately 40° a rocket is fired electrically by a level switch which ejects a drogue, or sea anchor, which will bring the boat's head to the wind and check its drift in the water. There are also two rockets which cast 175 yards of buoyant rope in opposite directions from each side of the boat when the boat is level in the water. This makes a length of about 350 yards on to which the distressed crew may drift, and is especially helpful when high waves and rough seas block the vision of the dinghy crew.

The self-righting feature of the airborne boat is the inflatable chambers at the fore and aft ends of the boat. The buoyancy tubes are inflated by a CO_2 cylinder which is activated as the boat leaves the plane. Thus, upon reaching the water these pneumatic V-shaped tubes provide buoyancy, and in the event the boat capsizes will turn it in an upright position. In addition to the automatically inflated bags, intermediate tubes along the sides are topped off with bellows and serve to prevent water from coming aboard and also help keep the craft stable when heeling over.

EQUIPMENT FOR BOAT AND MEN

The equipment carried may be divided roughly into two types—that for the use and navigation of the boat, and the gear stowed in lockers which is primarily for the use of the crew. The vessel has eight watertight compartments.

Equipment carried includes:

Quantity:	*Item*
1	Battery.
10½ gallons	Fuel.
3 gallons	Oil.
4	Rowlocks.
4	Oars.
2	Britannia Middy Motors.
1 set	Mast and sails.
1	Rudder and tiller.
1	Compass.
1 set	Charts.
1	Chart board with waterproof cover.
3	Pencils for use with chart board.
2 sets	Leak stoppers.
1	Topping-up bellows.
1	Boat repair mat.
1	Engine tool kit.
1	Bilge pump.
1	Radio set, T.1333.
1	Radio receiver.
1	Rocket launched kite aerial complete.
1	Auxiliary whip aerial.
1	Signaling lamp.
2	Filament lamps.
1	Signaling pistol in tin box.
54	Signaling cartridges in tin box.
4	Dinghy smoke floats.
1	Waterproof flashlight.
28 cans	Condensed milk.
7	Emergency flying rations.
49 cans	Drinking water.
3	Drinking cups.
1	First-aid kit.
14	Everhot bags.
1 pint	Massage oil.
7	Outer suits (seamen's protective suits).
7	Inner suits.
3 tins	Cigarettes.
3	Match containers with matches.
1 pack	Playing cards in waterproof pack.
1	Floating knife.
1	Instruction book.

Procedures for setting sail after the crew has boarded the lifeboat vary depending upon the circumstances; that is, after the parachutes have been released (if not completely cleared when the boat struck the water), when the rocket lines have been hauled and stowed, and after the side buoyancy bags have been inflated. If it is of supreme importance to get away from the area, both engines should be started immediately. If the distance to a friendly shore is within the fuel-range of the lifeboat (about 50 to 60 miles), both engines may be started and a course set with the intention of reaching home under power alone. However, if the distance "home" exceeds the cruising range of the boat, the mast and sail should be stepped as soon as possible.

Stowed, and marked plainly, in one of the lockers are simple, clear instructions for operating the boat under sails. Actual incidents show that the boat can be handled by a crew of untrained and inexperienced men.

Plans have been made for carrying the Mark I and Ia boats on the Warwick Rescue Aircraft. The British Air Ministry is at present conducting final tests on a 30-foot boat, the Mark II. It will accommodate 10 men, travel at a cruising speed of no less than 7 knots under power alone, and carry sufficient fuel for a 300-mile sea voyage.

AAF LIFEBOAT CARRIED ON B–17

In November 1943, Wing Commander R. Bicknell of the Deputy Directorate, Air Sea Rescue, Air Ministry, brought the line and arrangement drawings and sail plans of a 30-foot airborne lifeboat, plus a Mark Ia Airborne Lifeboat, to the United States. Development was immediately undertaken upon a directive from the Office of Commitments and Requirements of the U. S. Army Air Forces. Experimentation and research took place in the laboratories of the Emergency Rescue Unit, Matériel Command, at Wright Field.

The latest experimental model of the airborne lifeboat, as developed at Wright Field, has been successfully dropped from the B–17 aircraft a total of five times and has been sailed across the Gulf of Mexico for a total of 600 miles. During the sailing test a storm with winds up to 40 miles per hour and waves 20 feet in height were encountered without difficulty. The U. S. Airborne Lifeboat, Army Designation type A–1, Specification 40743, will be used

primarily for survivors afloat at sea as a result of a ditching or sinking.

The adopted boat is constructed of laminated mahogany plywood molded to give a hull thickness of five-eighths of an inch. It is 27 feet in length, 7½-foot beam, and has twenty watertight compartments. The weight of the lifeboat with equipment, parachutes, and fuel does not exceed 3,250 pounds. Similar to the British boat, it is equipped with carbon dioxide inflated self-righting chambers which prevent its capsizing in any weather. To avoid detection by enemy aircraft the boat is carefully camouflaged with blue to blend with the ocean. It is equipped with two air-cooled four-stroke engines which operate independently of each other.

Speed is 5 miles per hour under one engine and 8 miles per hour under both engines. Cruising range is 500 miles. It is equipped to transport 12 men, but as many as 36 men have been in the boat at one time.

The airborne boat is attached to the aircraft by four suspension cables running up to the standard bomb shackles. It is released by the mechanical bomb salvo lever which can be controlled by the bombardier or the pilot of the plane. When rescuing personnel the pilot flies into the wind at 1,500 feet with an air speed of 120 miles per hour and releases the boat when directly over the distressed crew. As the boat leaves the aircraft the parachutes are opened by means of a static line attached to the keel of the bomb bay catwalk. It descends into the water suspended by three standard Army 48-foot cargo parachutes. As the chutes develop the boat assumes a 50° bow-down attitude and descends at the rate of 25 feet a second. It enters the water at the 50° angle for about one-third of its length to reduce the impact force to a minimum. Upon striking the water, two 200-yard rocket projected side lines (adaptation from the British) eject from each side of the boat. The parachutes act as sea anchors to hold the boat in position so that it can be reached by the personnel floating downwind directly to the position where the boat was dropped. Upon reaching the boat the crew follows the exact procedure outlined in an instructional booklet stowed in one of the lockers. The first step is to release the parachutes. Next, the engines are started, sails are hoisted and the crew gets under way. When the boat is dropped, the aircraft crew include a map of the area indicating the exact position of the crew adrift and the approximate course they should navigate. The sails are small in area with adequate reef points to facilitate handling of the boat by totally inexperienced crews. The elements of sailing and operation of a small boat in open sea are explained in detail in the instructional booklet.

AAF BOAT EQUIPMENT

Equipment of this boat includes:

Quantity:	*Item*
2	Aircooled engines, 5 horsepower.
1 set	Mast and sails.
2	Oars and rowlocks.
1	Tiller and rudder assembly.
1	Heaving quoit with line.
1	Log, taffrail.
1	Compass, flush deck.
1	Raincatcher.
1	Sea anchor.
1	Bucket, 10-quart.
1	Tool kit.
1	Bilge pump.
1	Logbook.
1	Waterproof chart case.
6	Pencils.
1	Sail repair kit.
8	Plastic cups.
1	Can opener.
1	Inflation pump.
1	Clock.
1	Fire extinguisher.
1 set	Hydrographic charts.
1	Instruction book.
2	*The Raft Book*—Gatty.
2	Sponges.
1 hank	Cord.
250	Matches.
2	Floating knives.
4	Air mattresses.
8	Blankets.
30	Two-star, red, hand-held pyrotechnic signals, Mark III.
2	Waterproof flashlight with bulbs and batteries.
1	Lamp assembly, flashlight.
10	Hand-held smoke distress signals.
3	Emergency signaling mirrors.
3 cans	Sea marker dye.
2	Police whistles.
1	Abandon ship kit.
2 units	Human blood plasma.
2	Sunburn protective ointment.
2	Engine saltwater stills.
30	Desalination kits.
30 cans	Drinking water.
6 bars	Saltwater soap.
12 pair	Socks.
12 pair	Underwear, drawers.
24	Undershirts.
24	Hats.
6	Rubberized suits.
2 pair	Rubber boots.
2	Wrist compasses.
3 cartons	Chewing gum.
20 cans	Cigarettes.
60 boxes	Breakfast (2 meals each).
60 boxes	Suppers (2 meals each).
20 tins	Life raft rations.

The boat is equipped with food, water, and clothing sufficient for transporting 12 survivors about 5 weeks across any navigable waters of the world. In addition to the water supply of emergency drinking water and desalination kits, the water ration may be supplemented by using the heat of the engine exhaust to produce 2 gallons of distilled water for every gallon of fuel. The cylinder head of the engine is used to heat canned soup. The U. S. Signal Corps SCR-578 radio, popularly known as the "Gibson Girl," may be stowed in the boat at the discretion of the local air sea rescue squadrons, depending upon the use of radio in the particular locality of the mission.

It is anticipated that at least one boat will be stationed at each field where B-17's operate over water to be on hand for immediate use to rescue any personnel at sea. The boat is so designed that it can be attached to the standard operational B-17 in a period of 60 minutes. The 60 minutes is required in order to remove the bomb-bay doors of the aircraft and attach the suspension cables to the bomb shackles of the plane.

The Higgins Industries, Inc., New Orleans, La., have been put under contract by the Army Air Forces for the procurement of 600 airborne lifeboats. Delivery was to commence on 1 September 1944, at the rate of 50 boats per month.

NAVY AR-10

The Navy also regards airborne craft as important in its rescue work, but the choice in the type of aircraft available to carry a boat on its fuselage is limited. As a matter of fact, all Navy planes with the exception of the PBJ, used largely by the Marines, the PV, and the JM used for training, were ruled out. Since the Navy Air Force is at sea, the Navy turned first to development of a small, compact, non-rigid boat that could be carried on the TBF plane based on aircraft carriers. As a result of research and experimentation the AR-10 Rescue Assembly was designed to be dropped from the bomb bay of Avenger type aircraft. The equipment, packaged in five containers, includes a 10-man boat, 2 revised shipwreck kits, 1 outboard motor, and a fuel container with approximately 8 gallons of gasoline. The gear, dropped in train, is tied together with 35 yards of buoyant line between each container. When dropped, the time of the dropping is controlled by the intervelometer at a predetermined setting from an altitude of approximately 100 feet at an air speed of about 70 to 80 knots.

(*Continued on p. 20*)

FACTORS IN PYROTECHNICS VISIBILITY

(From U. S. War Department Technical Manual 9–1981)

The principal factors controlling the effectiveness of pyrotechnics are design, position, and atmospheric conditions.

Factors of design include candlepower, color, and degree of separation of the parts of a composite signal (blinker, cluster, or chain).

Factors of position include height at which the flare or signal functions, distance of observer from signal, distance of flare from objective to be illuminated, background, and relative position of flare, objective, and observer.

Atmospheric conditions include clarity of atmosphere, time (day or night), presence of haze, fog, dust, rain, or snow, and the color and brightness of the sky.

The visibility of signals and illuminating power of flares depends primarily on the candlepower of the pyrotechnic candle. Although there are minor variations to composition and density, there is a limit to the amount of light produced by a given weight of candle. Thus a short thick candle will give greater illumination for a shorter time than a long thin candle of the same weight, which will burn for a longer time with less brilliance.

TWO COLOR FACTORS

Variation in the visibility of signals due to color is due to the following two factors:

(1) The greater sensitivity of the eyes to colors in the middle of the spectrum, that is, to yellow and its neighbors, green and orange; and the greater ability of the longer light waves (reds and yellows) to penetrate haze and fog.

(2) Color and texture of an objective control the amount of light reflected by it and, consequently, its visibility. For example, barren ground, such as an airport, reflects three or four times as much light as woods or deep water and needs less illumination.

A light can be seen much farther than its pattern can be distinguished. At ranges of 2 miles or more, the various parts of such signals as chains or clusters blend into each other, giving the impression of a single spot of light. In addition, most colors fade or otherwise change at long range. Consequently, cluster and chain signals are apt to be misunderstood at distances greater than 1,500 yards in the daytime or 2 miles at night.

The closer a flare is to an objective, the greater will be the illumination and, hence, the greater the visibility, provided the flare is not so close to the line of vision as to blind the observer by its glare.

A flare above and behind the observer illuminates nearby objects well but is useless for long range observation.

A flare midway between the observer and objective loses effectiveness due to the distance its light must travel to the objective and back to the observer.

A flare placed behind the objective and almost in line of vision is useful in silhouetting the objective, especially when the atmosphere is slightly hazy.

BACKGROUND AND VISIBILITY

Backgrounds which offer contrast in color or brightness increase visibility; noncontrasting backgrounds materially reduce it.

Although light is diffused in all directions from an unpolished object, the maximum amount of light is reflected according to the same principle as that of a mirror. The angle at which the light leaves the reflecting surface is equal to the angle at which it strikes; this angle of observation will consequently give maximum visibility.

PYROTECHNICS' USE GUIDE

Particles of dust, moisture, or smoke in the air materially reduce visibility. All colors are affected, but reds and yellows less so than the greens and blues. Heavy fog, snow, or rain will totally obscure the light from pyrotechnics at distances so short as to make their use impractical. Sky background and direction alter color and distinctiveness materially, for example, looking toward the sun.

The following table will serve as a guide in the use of pyrotechnics. This table is based on a fixed distance. *Variation due to distance should be calculated by the use of the inverse square law.*

Candlepower of colored light necessary for visibility at 5,000 yards:

Atmospheric conditions	Red	Amber	White	Green
Night, clear	1.0	2.0	2.5	2.8
Night, rain, light	1.2	2.1	3.0	3.2
Night, overcast and haze	3.2	4.1	3.1	5.9
Night, rain, heavy	8.9	33.5	132.0	33.5
Night, snow, light	222.0	835.0	1,556.0	567.0
Day, overcast and haze	2,000.0	2,111.0	3,222.0	4,000.0
Day, clear	4,778.0	7,556.0	11,111.0	10,000.0

Distances at which, under averag weather conditions, the various type of signals may be recognized are governed by the following considerations Signals may be seen at greater distances but, due to the tendency of color to change with distance and the tendency of several lights to merge into one, reliable recognition of the TYPE of signal should not be expected at distances notably greater than 1,500 yards in DAYTIME, or 2 miles at NIGHT.

British Revise Desalination Kit

A new version of the W. P. R. B. (Water Pollution Research Board) kit, a chemical process for desalination of sea water, is now in production.

A description of the use and operation of the earlier model appeared in the June issue of the AIR SEA RESCUE BULLETIN. The new kit will be inclosed in a plastic container the same dimensions as the original container and will carry nine briquets which will yield approximately 5½ Imperial pints of potable water. The weight of the complete kit will be 2 pounds and the amount of water produced one-half that of the first model. The second container, pump, and filter papers have been removed, thus simplifying the operation. The principle of the operation of the kit is similar to the Navy-Permutit system of kneading the briquet and sea water in a flexible bag, and drawing the drinking water through a filter and tube at the bottom of the bag.

NEW LIFE PRESERVER CONSERVES KAPOK

A prospective shortage of kapok has stimulated efforts to conserve the present supply of kapok and to provide acceptable substitutes in quantity. The situation caused the War Production Board to issue Order M-85, dated 22 May 1944, limiting the use of kapok to life vests, life jackets and collars.

Designs of life preservers have been modified and new designs prepared aimed at using kapok to the best advantage. These designs also incorporate special features permitting the laundering of life preservers without affecting the kapok in the removable pads. Kapok, under suitable restrictions, is being reclaimed and used to replace a certain proportion of new kapok in the manufacture of preservers. The Foreign Economic Administration is arranging for purchase of kapok from sources not previously furnishing material acceptable for use in life preservers. Technical assistance from the Services will insure that any material obtained from these sources is suitable for life preserver use.

Investigations are under way in England, in Canada, and by various agencies in this country, aiming at the production of an acceptable substitute in quantity. Among these may be mentioned the activities of the War Production Board and the Department of Agriculture in the stimulation of the production of milkweed floss. Research investigation of all buoyant fibers is under way at Vanderbilt University. Another research project on development of a synthetic buoyant material as a substitute for kapok in the manufacture of life preservers recently has been initiated at the Mellon Institute by the National Research Council at request of the Air Sea Rescue Agency.

A NEW LIFE PRESERVER

Meanwhile, in line with these efforts, a new life preserver designed to conserve critical kapok, developed through the Air Sea Rescue Agency, has been approved by the United States Coast Guard.

While kapok conservation was the principal objective of those working on the new preserver, it also embodies improvements in flotation and fit characteristics, features a body strap for hoisting unconscious wearers, and it is adapted for use with rubber lifesaving suits. These features are among those specified in designs, approved by the Coast Guard on the following models:

1. Coast Guard adult kapok life preserver Model 1 (CG drawing No. F-49-6-1, sheets 1 and 2, and specification dated June 10, 1944) (20 to 21 ounces kapok, removable pads enclosed within vinylite covering) (for general use).

2. Coast Guard adult kapok life preserver, Model 2 (CG drawing No. F-49-6-1, sheets 1 and 2, and specification dated June 10, 1944) (20 to 21 ounces kapok, removable pads not enclosed within vinylite covering) (for general use).

3. Coast Guard adult kapok life preserver, Model 3 (CG drawing No. F-49-6-1, sheets 1 and 2, and specification dated June 10, 1944) (23 to 24 ounces kapok, removable pads enclosed within vinylite covering) (for use with lifesaving suits).

Approval of these designs was reported in the Federal Register June 21, 1944.

Application for patent covering the design of the life preserver is filed in the name of R. E. Coombs, USCGR, inventor, and assignment of the invention to the Government of the United States has been made by Captain Coombs.

The simplicity and ruggedness of the new life preserver is said to result generally in improvement over kapok preservers now in use. It is the consensus of the subcommittee working with Captain Coombs that the models with 20 to 21 ounces of kapok should be recommended, to the services involved, as a standard life preserver for general use in all ocean and coastwise service for the duration of the war, and that those with 23 to 24 ounces of kapok should be recommended for use with rubber lifesaving suits used by Merchant Marine personnel. The subcommittee is aware, however, that this style of life preserver would not be suitable for all types of service. For example, it would not be suitable for soldiers engaged in invasion actions.

KAPOK PADS REMOVABLE

Officially designated as "Life preserver, kapok (jacket type) Style ASRA-10," the life preserver consists essentially of a vest-cut envelope containing pockets in which are enclosed pads of buoyant material. The envelope is fitted with tapes to provide complete reversibility and proper adjustment for close fit to adult bodies of various sizes. Flotation characteristics are incorporated into the design so that the wearer is held in an upright position in the water, but at a slightly backward angle, with head and face above the surface.

Removable kapok pads are utilized, permitting the use of kapok reclaimed from damaged or soiled jackets. This feature allows for removal of the pads for laundering covers when they become soiled (which may be especially desirable in cases where they are in troop transport use).

The new life preserver, after being submerged 48 hours in fresh water, supported the following net weights:

	Pounds
Life preserver with 20 ounces kapok	25.1
Life preserver with 24 ounces kapok	29.9

The principle of subdividing the kapok pads is incorporated in order to provide optimum buoyancy under all conditions of service.

Reversibility and adjustment is accomplished by enclosing the lower drawstrings across the back in a tunnel, so that when the tapes are pulled, the jacket gathers across the back and a snug fit around the waist results. It is held closely to the body of the wearer by the body strap webbing which, with its double D ring fastening arrangement, provides fastening and close adjustment in one pull of the webbing.

The jacket does not ride up on the wearer, when properly adjusted, because of the close fit around the waist accomplished by pulling and tying the crossed drawstrings and the close fit across the chest achieved by pulling the body strip tight.

The jacket is reinforced by stitching ¾-inch tape at critical points, such as around the back of the collar, the openings for the body strap reversible feature, and the drawstring tunnel openings.

The body strap may be used for hoisting from the water a wearer who is in a weakened or unconscious condition.

A tab provided on the left shoulder for easy attachment of the life preserver light.

The life preserver (Models 1 and 2) is suitable for use in conjunction with rubber lifesaving suits as well as for general purposes, but the model containing 23 to 24 ounces of kapok is

particularly recommended for use with the rubber lifesaving suits, whereas the models containing 20 to 21 ounces of kapok are suitable for general use without the lifesaving suits.

The envelope is to be not more than two pieces, one piece for either side, joined by seams and stitching. Three pockets are formed for insertion of kapok pads. The two front pads are removable from the envelope when portions of the lower longitudinal seam are open and the back pad is removable when a portion of the armhole seam is open.

DESIGNED FOR SUBSTITUTES

The kapok pads are formed from two pieces of material which are stitched in a manner to allow welting with kapok distributed as follows:

DISTRIBUTION OF KAPOK IN PAD INSERTS

	Type 1 life preserver		Type 2 life preserver		Type 3 life preserver	
	Min. (oz.)	Max. (oz.)	Min. (oz.)	Max. (oz.)	Min. (oz.)	Max. (oz.)
Permissible kapok	20	21	20	21	23	24
Front pad:						
Lower section	4¾	5	4¾	5	5½	5¾
Upper section	2¾	3	2¾	3	3¼	3½
Back pad	4¾	5	4¾	5	5½	5¾

The design of the life preserver is such that if kapok were no longer available, other material might be incorporated into the pockets for buoyancy without further changing the fundamental design of the jacket.

For conservation of kapok and manpower the removable pad inserts are covered with vinylite coated fabric, cemented or heat-sealed tight in a manner similar to the construction of the standard Navy kapok life jacket. It is acknowledged that certain classes of service might better utilize this design of life preserver without vinylite pad coverings and provision was so made in the specifications. It was recommended also that the pads with or without vinylite covering, properly secured in place, be used by the War Department in view of its successful experience in laundering Army life preservers.

Some characteristic details of the new preserver follow:

The tie tapes at the neck extend not less than 14 inches from the edge of the life preserver and are stitched to the envelope. The free ends are doubled and stitched according to Federal specifications.

The drawstrings at the waist are 52 inches cut length and are secured in the drawstring tunnel. The free ends are doubled over and stitched in accordance with Federal specifications. The body or lifting strap is secured in a tunnel formed between two pieces of the envelope. The outside edge of the double D rings are 20 inches from the center line of the jacket. The other end of the body strap is doubled over and stitched in accordance with Federal specifications.

The binding tape is stitched approximately 15 inches around the back of the neck and is stitched also around the openings for reversibility of the body strap and around the end-openings of the drawstring tunnel.

The tab for attachment of the life preserver light is securely stitched to the left shoulder. It is approximately 3½ inches cut length and the free end is doubled over and stitched according to Federal specifications.

The life preserver envelope or cover is of cotton drill, treated with an approved fire-resistive substance complying with Navy Department specifications.

The covering for the kapok pads is of unbleaced cotton print cloth with a minimum breaking strength of 40 pounds in warp and 25 pounds in the filling.

FLAME RESISTANT COVERING

The outer covering for the kapok pads consists of a coated fabric possessing flame resistance and other characteristics specified by the Bureau of Ships, U. S. Navy.

The tie tapes at the neck and the lower drawstrings are 1¼-inch cotton tape identical in color to the treated drill jacket, weighing not less than 0.3 ounce per linear yard and having a minimum breaking strength of 200 pounds. The tie tapes and drawstrings are not treated with a fire-resistive substance.

The body strap is of 1-inch cotton webbing, olive drab or equivalent in color to the cotton drill covering, weighing not more than 1.5 ounces per linear yard and having a minimum breaking strength of 400 pounds.

The D rings are of steel, ends welded to form complete ring. They are galvanized or otherwise suitably protected against corrosion. When assembled, the complete body strap with D ring fastening arrangement has a breaking strength of not less than 360 pounds.

The tab for attachment of the life preserver light is of 1-inch cotton webbing identical to that for the hoisting strap.

The reinforcing tape is of ¾-inch cotton equivalent in color to the treated drill jacket covering, weighing not less than 0.18 ounce per linear yard and having a minimum breaking strength of 120 pounds. This cotton tape is treated with an approved fire-resistive substance complying with Navy specifications.

Work on this life preserver, including design and testing, was done by an Air Sea Rescue Agency committee on design and testing of life preservers. The action followed a conference of representatives of all interested services called December 16, 1943, by the Coordinator of Research and Development, United States Navy. Economic utilization of kapok in life preservers and the finding of acceptable substitutes were of immediate concern of those who sponsored the meeting.

MODEL AND TYPES TESTED

A subcommittee was formed to undertake the task of designing and constructing a life preserver which would permit economic use of kapok, allow easier reclamation of used kapok from surveyed life preservers, provide ready utilization of substitute buoyant materials which might be used if kapok were not available and devise other improvements over present type kapok life preserver. The subcommittee sought also the development of a life preserver which would be suitable for use with rubber lifesaving suits as well as for general use.

Recommendations were made after comparative tests between experimental models and models of other types of kapok life preservers including the

(*Continued on p. 19*)

Additional Types of Equipment Received for Exhibit

(May 14 to September 30, 1944)

Catalog number	Object	Source
44.168.1.1-4	Mirror, distress signaling, Sav-A-Life.	C. H. Wilson, Los Angeles, Calif.
44.170.1.1-11	Kit, fishing and sewing (for C-1 vest).	Matériel Command Wright Fields, Dayton, Ohio.
44.172.1.1-12	Pencils (12) for crash boats	St. Louis Medical Depot, St. Louis, Mo.
44.173.1.1-5	Generator, Model LCPE-24F (Fighter pilot's rescue marker).	Lithaloys Corporation, New York, N. Y.
44.175.1.1-3	Markers "Taxiway" with Scotchlite (3).	Minnesota Mining & Mfg. Co., St. Paul, Minn.
44.178.1	Ration, Army Air Force, pocket individual operational (Strato Sweets).	U. S. Army Quartermaster Depot, Chicago, Ill.
44.181.1-10	Splints (2) with accessories (for crash boats).	Binghamton Medical Depot, Binghamton, N. Y.
44.185.1	Strap, litter securing (for crash boats).	Los Angeles Medical Depot, Los Angeles, Calif.
44.186.1-3	Sea anchors for pneumatic rafts (3).	AAF Supply Officer, Wright Field, Dayton, Ohio.
44.189.1-4.1-10	Kits, drinking water, Permutit, in water can type of container (4).	U. S. N., BuAer, Washington, D. C.
44.190.1-3	Ration U. S. Navy emergency life raft, Spec. NAVAER M-539b (3).	National Naval Medical Center, Bethesda, Md.
44.191.1	Tubing, luminous	John Mackler & Co., Chicago, Ill.
44.192.1-2.1-2	Lighters "Foxhole" (2)	Canadian Joint Staff, Washington, D. C. (Air Member's Office).
44.193.1.1-3	"Lifelite" Model A-3 (handmade).	Julian A. McDermott, Corporation, Elmhurst, N. Y.
44.194.1	Button strap, retroflective (plastic strap).	Continental Lithograph Corporation, Cleveland, Ohio.
44.196.1	Harness, survivor rescue	Air Sea Rescue Agency.
44.196.2-3.1-4 44.196.4-5.1-2	Suits, exposure, Naval EN-44, and cases (4).	B. F. Goodrich Co., Akron, Ohio.
44.199.1	Model, Liberty Ship, in glass case.	U. S. Maritime Commission, Department of Commerce Building, Washington, D. C.
44.200.1	Still, fuel, experimental (life raft).	Higgins Industries, Inc., New Orleans, La.
44.201.1-3	Fishing equipment, improvised hooks and lines, display boards (3).	Naval Aviation Training Division, Chapel Hill, N. C.
44.203.1-5	Sea markers (5)	NASD, Norfolk, Va.
44.205.1-45	Still, 10-gallon per hour, distillation unit, series D.	Higgins Industries, Inc., New Orleans, La.
44.206.1.1-7	Rude star finder and identifier, H. O. No. 21-02-B.	Hydrographic Office, Washington, D. C.
44.207.1.1-5	Still, solar, Model B-3, inflated type (experimental).	Gallowhur Chemical Corporation, New York, N. Y.
44.208.1	Signal, smoke, A. P., life jacket, Mark I, orange.	U. S. N., BuOrd, Washington, D. C.
44.209.1.1-23	Raft, life, one man parachute type, Spec. No. AN-R-2b.	Naval Air Station, Norfolk, Va.
	BRITISH EQUIPMENT, R. A. F.	
44.212.1-6	Cylinders, gas, CO2 (6) (6D/77, 6D/84, 6D/151, 6D/87, 6D/542, 6D/535).	United Kingdom (through British Air Commission, New York City).
44.212.7	Cover, weather apron, (27C/2035).	Do.
44.212.8.1-4	Mast, C/W guys, telescopic (27C/2067).	Do.
44.212.9-12	Heads, operating, CO_2 cylinders (6D/125, 6D/633, 6D/752, 6D/454) (4).	United Kingdom (through British Air Commission, New York City).
44.212.13.1	Container, Bircham supplying dropping (15B/82) (unopened; contents uncatalogued).	Do.
44.212.14	Pack, emergency, type 6 (27C/2094).	Do.
44.212.15	Signal, distress, 2 star red, MK. II.	Do.
44.212.16	Drogue, sea, small (27C/1890)	Do.
44.212.17	Cover, weather apron (27C/2034).	Do.
44.212.18	Marker, sea, fluorescent	Do.
44.212.19	Dinghy, type H, Mk. III (27D/1879).	Do.
44.212.20.1-8	Dinghy, single seater, type K (Fighter Pilot's, 27C/1890).	Do.
44.212.21	Dinghy, emergency, type M (27C/1916).	Do.
44.212.22.1-2	Covers, weather (27C/2036) (2)	Do.
44.212.23	Dinghy, type M (27C/1883)	Do.
44.212.24	Dinghy, type J, Mk. III (27C/1882).	Do.
44.212.25	Dinghy, type K (27C/1927)	Do.
44.212.26	Cover, weather apron (27C/2037).	Do.
44.212.27.1-6	Dinghy, type Q (27C/2065)	Do.
44.212.28.1-6	Dinghy, type D (27C/2115)	Do.
44.212.29.1-2	Dinghy, type L (27C/1897)	Do.
44.212.30	Water (drinking) (27P/8)	Do.
44.212.31	Torch, electric, waterproof Mk. II (5A/2910).	Do.
44.212.32	Inflator, breast type (27C/1880).	Do.
44.212.33.1-2	Mirror, heliograph (27C/2102)	Do.
44.212.34.1.1-2	Bag, "Ever-Hot" (22C/175)	Do.
44.212.35	Knife, floating (27C/2023)	Do.
44.212.36.1-9	Kit, repair, for dinghies (27C/1164).	Do.
44.212.37	Valise (27C/2066)	Do.
44.212.38	Pack, dinghy, type B (empty) (27C/1900).	Do.
44.212.39	Cup, drinking and bailer, graduated (27C/2033).	Do.
44.212.40	Whistle, air crew (23/280)	Do.
44.212.41	Bag, mast (27C/2091)	Do.
44.212.42	Bag, bellows (27C/2092)	Do.
44.212.43	Pistol, signal 1", No. 2 (Mk. V (7B971).	Do.
44.212.44	Head, operating, CO_2 cylinders, type B (6D/79).	Do.
44.212.45	Bag, felt (27C/2093)	Do.
44.212.46	Manometer (27C/1926)	Do.
44.212.47	Switch, immersion (6D/148)	Do.
44.212.48.1.1-2 44.212.48.2.1	Dinghy, Spitfire rescue (15B/92).	Do.

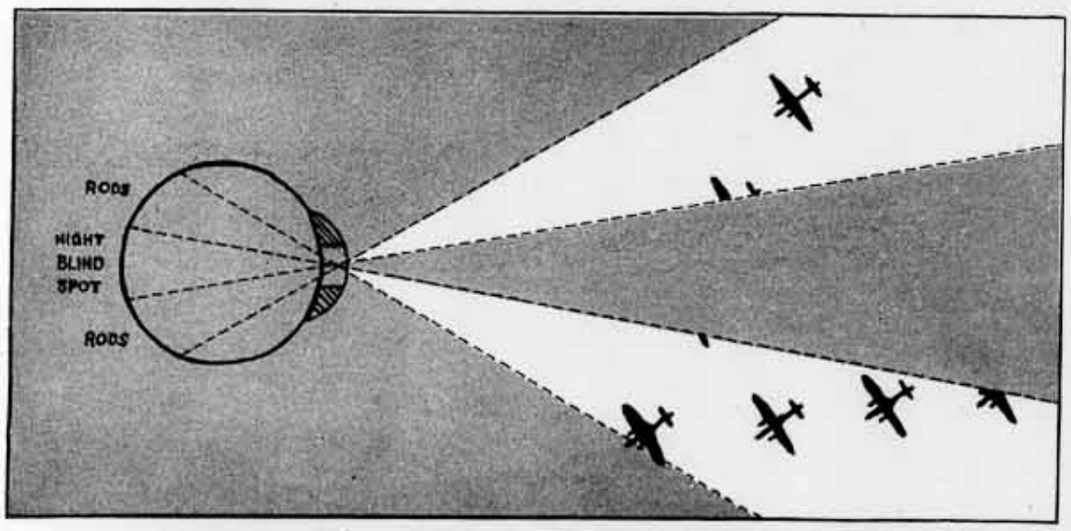
Catalog number	Object	Source
44.212.49	Pump, hand, concertina type.	United Kingdom (through British Air Commission, New York City).
44.212.50	Line, 5' 1½"	Do.
44.212.51	Line, in winding cylinder	Do.
44.212.52	Pack, dinghy, tropical, for type K dinghy (27C/2019).	Do.
44.212.53	Pack, dinghy, type C, for type K dinghy (27C/1920).	Do.
44.212.54	Pack, dinghy, type D, for type K dinghy (27C/2027).	Do.
44.212.55	Pack, dinghy, seat type "A," Mk. III, for type K dinghy (27C/2088).	Do.
44.212.56	Valise, for "C" or "M" dinghy (27C/1889).	Do.
44.212.57.1-3	Valise, for "H" type dinghy (27C/1893).	Do.
44.212.58.1-2	Valise, for Lindholme apparatus (15B/70).	Do.
44.212.59	Lindholme rescue dinghy apparatus (15B/71).	Do.
44.212.60	Inflator, dinghy, concertina type, British (27C/2083).	Do.
44.212.61	Pouch, to hold 3 signals (27C/2053).	Do.
44.212.62	Container, Nestor, waterproof, match (12D/460).	Do.
44.212.63	Rations, flying, Mark II (27P/7).	Do.
44.212.64.1-3	Stoppers, leak, nested (27C/1876) (3).	Do.
44.212.65.1-2	Stoppers, leak, small and medium (27C/1903).	Do.
44.212.66	Bailer, collapsible (27C/1902)	Do.
44.212.67	Case, for sail and mast (27C/2056).	Do.
44.212.68	Sleeve, protecting, for CO_2 cylinder (27C/2044).	Do.
44.212.69	Bag, sail (27C/2090)	Do.
44.212.70.1-2	Paddles, small, hand (27C/1906).	Do.
44.212.71	Unit, loading (aerial), type 6 (10B/1247).	Do.
44.212.72-73	Bulbs (2) (5L/1872, lamp filament).	Do.
44.212.74.1-2	Compass, magnetic, marching, Mark I (6E/374).	Do.
44.212.75	Head, operating, CO_2 cylinder, type G (6D/126).	Do.
44.212.76	Pack, emergency, type 3 (27C/1929).	Do.
44.212.77	Pack, emergency, type 5 (27C/1919).	Do.
44.212.78	Pack, emergency, type 4 (27C/1930).	Do.
44.212.79	Pack, emergency, type 7 (27C/1931).	Do.
44.212.80.1-2	Paddles, glove, drogue type (27C/1894) (2).	Do.
44.212.81.1-2	Thwart, wooden (27C)	Do.
44.212.82.1-2	Paddles, plastic (27C/1039) (2).	Do.
44.212.83	Pump, deflation, flotation (4G/1310).	Do.
44.212.84	Mainsail (27C/2069)	Do.
44.212.85	Foresail (27C/2068)	Do.
44.212.86	Rudder (27C/2070)	Do.
44.212.87	Kite, collapsible, Mk. II (incomplete) (51/162).	Do.
44.212.88.1-2	Aerial, mast, (10B/1162)	Do.
44.212.89	Sail, C/W mast, for one man pneumatic raft (27C/2055 and 27C/2054)	United Kingdom (through British Air Commission, New York City).
44.213.1-8.1-9	Rations, lifeboat and life raft, Merchant Marine type, 8 cartons.	U. S. Maritime Commission, Washington, D. C.
44.213.9-42.1-9	Water lifeboat and life raft, Merchant Marine type, 34 cartons.	Do.
44.215.1-6	Ration D, U. S. Army field (6).	O. Q. M. G., Washington, D. C.
44.215.7-12	Ration K, U. S. Army field (2 breakfast, 2 dinner, 2 supper—in new colored wrapping).	Do.
44.216.1-3, 1-4 44.216.4.1-3 44.216.5	"Var-Lite" sea sponge units (4).	The Varnition Co., Los Angeles, Calif.
44.216.6-18	"Var-Lite" grounds (3), light starter crystals (6), and paste (3).	The Varniton Co., Los Angeles, Calif.
44.216.19-21.1-2	Flags "Var-Lite" (3) and crystals (3).	Do.
44.217.1	Still, solar, for pneumatic life rafts (experimental), Higgins-Ushakoff model.	Higgins Industries, Inc., New Orleans, La.
44.220.1.1-	Kit, shipwreck (contents not catalogued).	Coast Guard Air Station San Diego, Calif.
44.220.2-7	Dye markers, fluorescein and aluminum powder (6).	Do.
44.221.1.1-24	Vest, emergency sustenance, type C-1.	Wright Field, Dayton, Ohio.
44.222.2	Projector, hand, Mk. IV	Navy Department, Washington, D. C.
44.223.2.1-42	Raft, Navy, Mark IV, type D, Spec. M-3Q.	SO. Naval Air Station Anacostia, D. C.
44.224.1	Pemmican, Wilson's (experimental emergency ration).	Arctic, Desert, Tropic, Information Center, Washington, D. C.
44.227.5-16	Manuals (12) "Survival on Land and Sea."	BuAer, Washington, D. C.
44.228.1-4	Insect repellents (dimethyl phthalate) (3) and one copy of the Technical Bulletin TB MED 31.	War Dept. A. S. F., Office of the Surgeon General.
44.229.1.1-29	Kits, back pad Spec. M-592	Naval Aviation Supply Depot, Philadelphia, Pa.
44.230.1	Hat-headnet (new standard Navy) Spec. M565A.	BuAer, Washington, D. C.
44.231.1-2	Signals (2) daytime distress (dummies) VK M-1.	Van Karner Chemical Arms Corporation, Marine Signal Division, Port Jervis, N. Y.
44.231.3-4	Lights (2), red distress (dummies) VK M-2.	Do.
44.231.5-6	Lights, (2), blue pilot (dummies) VK M-3.	Do.
44.231.7-8	Signals-aircraft distress (2) (dummies) VK M-6.	Do.
44.231.9-10	Lights, green, distress (2) (dummies) V K M-7.	Do
44.231.11-12	Lights, white, distress (2) (dummies) V K M-7.	Do.
44.231.13	Parachute gun V K M-12	Do.
44.231.14.1-2	Parachute shell, and charge (parachute signal) V K M-12.	Do.
44.233.1	Stokes litter	Commander LeBlanc, Medical Section, U. S. C. G. Headquarters, Washington, D. C.
44.234.1-4	Fuel tablets, ration heating (4).	OQMG, Washington, D. C.

(Continued on Page 24)

USE OF EYES *At Night May Be Difference Between Life and Death*

Written for AIR SEA RESCUE BULLETIN by Lieut. Harry J. Older, H-V(S), USNR,
Aviation Psychology Section, Bureau of Medicine and Surgery, U. S. Navy

Survival in modern warfare depends on knowing all the tricks of the trade that may give the fighting man an edge over the enemy or the elements. The efficient use of the eyes at night is one of those extra skills which may mean the difference between life and death. It is particularly important in air-sea-rescue operations that no search plane ever miss the opportunity to rescue lost personnel simply because of lack of visual contact, if such contact is possible. Conversely, no one adrift and awaiting rescue should be so unfortunate as to miss seeing a rescuer that is in visual range.



There is no simple formula which will enable one to see in complete darkness; even nocturnal animals require some light to make their way around. However, there are some facts about the use of the eyes at night which will produce results that are frequently gratifying, and occasionally lifesaving. These facts should be known, as they apply to the special problems of air-sea rescue.

There are two separate mechanisms in the eye for day and night vision—the cones and the rods. Cones, which transmit daytime visual impressions, are located in and around the fovea at the back of the eye and are sensitive to light intensities varying from brightest daylight down to moonlight. For intensities below that of full moonlight, the rods must be brought into play, since only they are capable of registering impressions at these low levels of illumination. The rods are located in and around the center of the back of the eye, the greatest concentration being a few degrees from the fovea.

Everyone knows that when lights are suddenly turned off, there is a period of relative blindness lasting for a few minutes. This is followed by a longer period of getting used to the darkness. This process is generally misunderstood. The general belief is that the increased sensitivity is caused by the enlargement of the pupil. While this is in part responsible, it contributes only a small fraction of the total increased sensitivity which comes after prolonged darkness. A far more important reason is a chemical process which takes place. As a result of this chemical change, the threshold for dim light is gradually lowered (over a period of 30 minutes) to a point where one can perceive a light about one-millionth as bright as that which was just barely perceptible immediately following the plunge into darkness.

In daytime lighting conditions, the most efficient way to see an object is to look straight at it. This is because the cones, which transmit such stimuli, are located at the center of the retina, in the fovea at the back of the eye. Therefore, the clearest view of an object is obtained when the image of that object falls exactly on this centrally located area. At night, however, the cones are not able to handle the situation, and the rods must be used. Consequently, in order to make sure that the image is falling on a concentration of rods, it is necessary to fixate to the right or left, or above or below the object.

Another important peculiarity of the rods is that they are relatively insensitive to red light (wave lengths beyond 600 millimicrons). Dark adaptation proceeds almost as rapidly when the subject is in red light as when he is in total darkness.

These are the basic facts which must be considered when attempting to give information on the use of the eyes at night. Following, are their practical applications.

SPECIAL PROBLEMS OF SEARCHING

1. *Dark adaptation.*—Since the eyes require about 30 minutes of dark adaptation before becoming efficient at low levels of illumination, any duties which will require almost immediate use of the eyes should not be undertaken until this period has elapsed. Fortunately, remaining in complete darkness is not necessary since it has been discovered that the rods are relatively insensitive to red light. Results which are obtained by wearing red goggles for 30 minutes, or remaining in a room lighted with dim red light, are very satisfactory. In most air-sea rescue work, a period of flight will usually precede any searching of the sea, and in most cases this period will provide a time quite adequate for dark adaptation, providing the interior of the aircraft is lighted very dimly—preferably with red light. If the instrument panel lights and the interior lighting are kept too bright while making the flight to the area, your night vision will be reduced greatly, and you may overlook objects on the sea which are well within the visual range of properly night-adapted eyes.

2. *Maintenance of dark adaptation.*—A few minutes of exposure to bright, white light will largely, if not entirely, destroy the results of many hours of dark adaptation. Therefore, men who have become dark-adapted must not spoil their vision by exposure to bright, white light. If maps and charts have to be used, or if other objects must be examined under light, use red light when possible (a red flashlight can easily be made by taking a red plastic lens from the preadaptation goggle and inserting it inside the glass lens of the flashlight). If white light must be used, keep it as dim as possible, use it for as brief a time as possible, illuminate the smallest possible area, and do not allow direct rays to enter the eye.

3. *Scanning.*—In order to make sure that no part of the surface of the sea is overlooked, and that every object within visual range is seen, certain basic facts about how to scan must be observed. First of all, the scanning pattern must cover the area as frequently as possible without becoming so coarse as to increase the possibility of overlooking an object. Any simple geometrical pattern is sufficient so long as it makes the best use of off-center vision. Perhaps the simplest method is to scan as if reading a book, moving the eyes *and head* in jumps of about 12° to 20°, allowing the eyes to pause for about 2 seconds at the end of each jump. Following a complete scanning sequence after the complete covering of the assigned sector, the eyes should be closed for about 10 seconds to allow them to rest.

4. *Visibility through plastic surfaces.*—All plastic surfaces absorb some of the light which passes through them. Consequently, when working at very low levels of illumination, it is necessary to make the best use of the small amount of available light which does pass through. First of all, it is extremely important that surfaces be kept very clean. In a plastic which permits the transmission of 90 percent of the available light, perhaps 50 percent of this light may be lost by having a slight film of oil or dirt on the surface. Similarly, scratched windscreens should be replaced immediately, due to the fact that they cut down on the amount of light and distort the visual image which reaches the eye.

Instrument panel lights and interior lighting fixtures may be kept very dim and still interfere with visibility outside the aircraft by producing annoying reflections in the plastic panels. If an attempt is made to look through a windshield which is illuminated by reflected light, the probability of seeing anything is very remote.

5. *Binoculars.*—The standard Navy 7X50 night-treated binocular is an excellent aid to night observation under all conditions except those of extremely low visibility brought on by fog or rain. When binoculars are used in scanning at night, the same principles of off-center vision apply. The binoculars should be held straight forward and the eyes turned off-center towards the periphery of the field. It will require practice to learn to do this effectively, but the final results obtained will more than justify the effort.

6. *Concentration.*—Scanning the sea at night for long periods of time is at best a dull job. It is extremely easy to make the fatal error of daydreaming while gazing into space. Many instances are on record where enemy ships were able to get well within visual range before being sighted, even though lookouts were "looking" in that direction all the time. Every effort must be made to keep the mind as well as the eyes on the job at all times if the all-important job is to be done properly.

SPECIAL PROBLEM OF THE SURVIVOR

Scanning.—In view of the multitude and complexity of the problems facing the survivor at sea in a life raft or open boat, it is fortunate that his visual task is relatively simple. He becomes dark adapted shortly after nightfall, with no effort, and the maintenance of his dark adaptation is the least of his worries. His only night vision problem is one of setting up an efficient searching scheme so that no possible rescuer will go unnoticed, and so that he will be able to signal any plane which he may be able to spot.

This is again a matter of an efficient scanning pattern. The same techniques apply here as those outlined above, except that it is a job of scanning the entire night sky. Particular attention should be paid to scanning the relatively lighter areas of the sky, such as light clouds, areas with many bright stars, and the general vicinity of the moon, because it is in these places that the contrast between an airplane and the background will be the greatest, and here that the most efficient use of the principles of night vision can be applied.

Navy Tablet Ration Developed by NMRI

The U. S. Navy emergency ration for life rafts developed by the Naval Medical Research Institute is now being included in the Navy Bureau of Aeronautics emergency kits. This ration will replace the former Bureau of Aeronautics life raft emergency ration, which consisted of chocolate, malted milk, and "pemmican." The new ration was designed to be easily edible and physiologically compatible when the water supply is limited, to provide a variety of items, and to be compact and easily stowable in parachute back-pack kits.

As should be the case with all items of emergency equipment, the development of a suitable ration for survivors requires considerable research and experimentation. The basic factors, plus those mentioned above, determining the adoption of a ration are:

> It should be concentrated, thus furnishing a large number of calories in the allotted space.

It should not cause nausea and vomiting.

It should consist of a food which can be swallowed with a minimum of difficulty when the mouth is dry.

It should not accentuate thirst.

It should produce a maximum volume of water of oxidation when assimilated.

It should entail loss of a minimum volume of urine in the excretion of metabolic end-products.

It should be so "divided" as to lend itself to easy distribution to survivors on the raft.

It should not deteriorate or change character after long stowage periods.

It should not be affected by great temperature extremes.

It should be packed in a container that will withstand the effects of salt water immersion.

Packed in a 3⅞ by 2⅛ by 1⅛ inch key-opening tin container are the following components:

Number	Item	Weight	Calories
		Grams	
5	Sucrose-citric acid tablets (fruit flavors)	20	80
10	Sucrose-lipid-citric acid tablets	38	195
8	Sucrose-malted milk tablets	27	110
2	Multivitamin tablets.		
2	Sugar-coated gum tablets.		
1	Waterproof cellophane bag.		
2	Clips for closing bag.		

The characteristics of the constituents of the ration are:

Sucrose-citric acid tablets are the commercial fruit-flavored Charm candy. Citric acid, which is added to all the tablets except the malted milk, tends to increase the flow of saliva in the mouth.

Sucrose-lipid-citric acid tablets closely resemble commercial butterscotch, but contain slightly over 20 percent fat rather than the 10 percent fat content of commercial butterscotch. Fat is the most concentrated source of calories and when oxidized in the body produces more water than other food constituents. In a report of tests conducted by Dr. Allen M. Butler, of the Office of Scientific Research and Development, it was indicated that the addition of fat (lipid) to sugar (sucrose) renders the ration less nauseating.

Sucrose-malted milk tablets, without the citric acid to provide variety of taste, were included in this new ration because of their reasonable acceptability with survivors. The addition of sugar tends to reduce the bitter flavor of the malted milk.

Chewing gum gives the mouth a "clean" taste and stimulates salivary flow.

Multivitamin tablets, although not essential, are provided so that in the event of an injury or perhaps a prolonged survival period they may make up for vitamin deficiency.

The sucrose-citric acid and the malted milk tablets each measure about ¾ by ¾ by 5/16 inches. The sucrose-lipid-citric acid tablets are provided for in the form of two segmented bars of five tablets, each measuring about 3½ by ¾ by ⅜ inches. All tablets are wrapped individually in cellophane and a waterproof cellophane bag is provided to give additional protection to uneaten tablets in the survivor's pocket.

At present three of these cans are supplied per man in Bureau of Aeronautics parachute seat type and multiplace rafts. A survivor consuming one-half a can a day will derive about 190 calories daily for 6 days.

New Life Preserver

(Continued from page 14)

standard type Navy kapok life jacket, the Navy knapsack type kapok life preserver, the standard type Merchant Marine kapok life preserver, the undersuit type Merchant Marine kapok life preserver, the Army invasion type kapok life preserver, and the kapok life preserver developed by the Army at the New York Port of Embarkation.

During the course of its study the subcommittee noted the observation that certain deficiencies exist in the fire-resistive treatments of the cotton drill covering material now available, and suggested that there is need for investigation and development in the field of suitable fire-resistive treatment for life preserver coverings. It was noted particularly that present treatments are "tacky" and rub off easily on the clothing, and that they are sticky and prevent proper pulling of the drawstring to make a tight fit.

Still Improvised by Survivor in Lifeboat

How a resourceful survivor constructed a fuel still from nondescript lifeboat and life raft gear and wreckage to provide drinking water for himself and 37 companions adrift 16 days is illustrated in the accompanying sketch.

Their ship had been attacked by a Japanese submarine. One torpedo missed its mark but two found their target. Three seamen were killed, and the ship was abandoned. One lifeboat was destroyed by an explosion and the others became targets for the submarine when it surfaced. The Japs smashed the portable radio, damaged water tanks in the remaining lifeboats and life rafts, and made prisoners of the freighter captain and three members of his crew.

The 38 remaining members of the crew climbed aboard one available raft and later picked up a capsized boat. Injured and wounded were treated and the remaining small water supply was rationed to 7 ounces per day per man. Later a second raft was sighted and taken in tow providing a little more water and food.

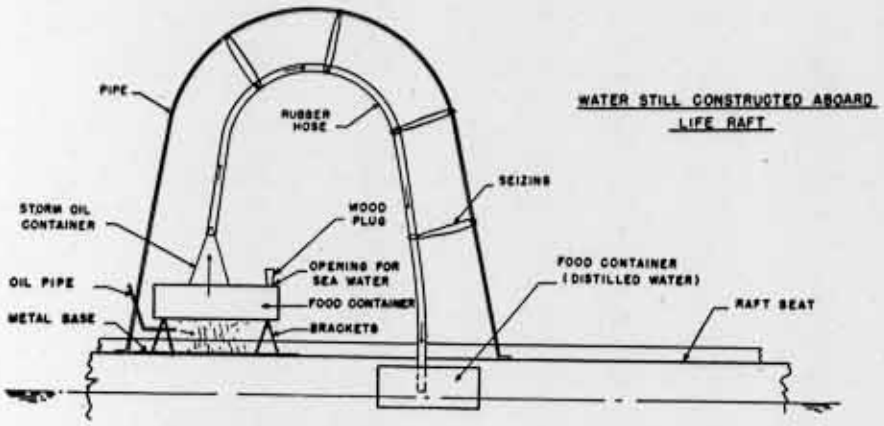
On the third day survivor John Arthur Drechsler, a junior assistant engineer, decided he could make drinking water and proceeded to build a still from salvaged lifeboat and raft pieces and gear. Drechsler's still involved the ordinary principles of steam distillation. He made his evaporator from an empty food container. Other parts included a cone-shaped storm oil can, a piece of rubber hose, odd lengths of pipe, and a food tank which was used as a condensor.

The effectiveness of the still was proved by its production of 60 gallons of potable water in less than 48 hours of operation. After the still was put in operation, it was possible to increase the water ration to 12 ounces each for those on board.

On the morning of the sixteenth day after the torpedoing a friendly vessel was sighted and rescue was accomplished. The survivors were put ashore 2 days later.

An excerpt from a letter by American Consul Stephen E. C. Kendrick to the Secretary of State, reported, in part, as follows:

"The legal representative at Bombay for the United States War Shipping Ad-



ministration has transmitted to his agency's war committee the view that Mr. Drechsler is deserving of special commendation. The consul heartily endorses this opinion and recommends that consideration be given to awarding to Mr. Drechsler the special medal which has been designed to give due recognition to meritorious acts of American Merchant Seamen. Not only did Mr. Drechsler devise and build the means which was to save the lives of his companions and his own but his conduct throughout the entire trying ordeal was, in view of his shipmates, deserving of the highest praise."

Drechsler has been notified of the Distinguished Service Medal award. The crew agreed that, if it had not been for the drinking water from the improvised still, many of the 38 crew members would not have survived 16 days adrift under a blistering sun.

AIRBORNE LIFEBOAT

(Continued from page 11)

The survivors drift to the boat, remove it from its container, and by pulling the release cable on the CO_2 cylinder, automatically inflate the main air chamber. The containers are hauled aboard, the outboard motor installed, the sails rigged. Enough fuel is provided to take the boat about 50 miles. The range is increased by the use of sails. Tests prove the boat to be very maneuverable and will sail into the wind. It will hold 10 men or more, is about 15 feet long and 8 feet wide, has 2 cross-seats inflated by a hand pump, 2 vertical bulkheads, and a top rail or "splash tube" which is inflated by a CO_2 bottle. The side pockets of the boat carry repair equipment, sailing instructions, hand pump, sails and oars, hammock-beds, canopy, patching equipment, and sea anchor. Two shipwreck kits are dropped with the gear, and the contents have been revised to meet the special need of the survivors. The newly proposed kit will include:

Quantity:	*Item*
1	Compass.
2	Emergency signaling mirrors.
4 cans	Drinking water.
7	Permutit kits.
1	Sponge.
4	Drinking cups, graduated.
2	Fishing kits.
1	Knife, scout type.
2 cans	Tomato juice, 12-ounce.
2 cans	Chicken broth, 12-ounce.
1	Plastic whistle.
3 cans	Sunburn ointment, 3-ounce.
50 feet	Cotton line, 75-pound.
1	Assortment safety pins; adhesive tape.
12	Life raft tablet rations.
1	Waterproof flashlight, 2-cell.
1	Spare bulb.
1 set	Extra batteries.
1	First-aid kit.
2	Pyrotechnic projector kits.
12 cans	Sea marker dye.
1	Woolen blanket.
1	Poncho.
1	5-quart plastic water bag.
210 feet	Floating rope.

The complete gear weighs approximately 700 pounds; separately approximate weights are: boat 350 pounds; motor 200 pounds; fuel 50 pounds; shipwreck kits, 60 pounds each.

There are 500 of these airborne rescue boats on order. Delivery was scheduled to begin 1 September 1944.

The Navy is working also on the development of a rigid airborne lifeboat.

BOMBER COMMAND DEVELOPS KIT FOR OVERWATER FLIGHTS

Many units in the field have had to develop their own emergency gear because of special missions or the inadaptability of available supplies. The improvisations of many have been well worth commendation, not only for meeting the needs of a serious situation, but for using their ingenuity in making proper use of the materials on hand.

For example, the Thirteenth Bomber Command at Kuli Field in Guadalcanal has developed an individual kit that will supplement life raft equipment or provide sustenance for survivors forced to bail out over water. The "Parachute Kit," as dubbed by its inventors, is demonstrated in the AAF Weekly Film Digest No. 46.

The contents of the kit include:

Quantity:	*Item*
4 cans	Emergency drinking water.
1 can	Sea dye marker.
3 units	D rations.
1	Emergency signaling mirror.
2	Carbon dioxide cylinders.
1	Very pistol, M-9.
2	Signal flares, M-11.
1	Compass.
2	First-aid kits, aeronautics.

All the items are tied together with a fishing line, and each item, with the exception of the pyrotechnic pistol, will float. The canvas container with a waterproof zipper is approximately 12 inches long, 7 inches wide, and 5½ inches high. Water resistant tape seals the zipper as an added precaution.

The kit is carried near crew stations aboard the aircraft so that when an overwater emergency arises, the kit will be easily accessible. The airman straps the kit to the right side of his parachute harness for which hooks and eyelets are provided. The kit fits behind the elbow and does not interfere with arm movements when the ripcord is pulled.

The gear is specially designed for bomber groups who decide to bail out rather than ditch their aircraft. It is estimated that the contents of the kit will provide sustenance and rescue aids for a period of 10 days. The compactness of the kit makes it useful for fighter pilots as well as bomber crews.

LAND AND SEA SURVIVAL PHASE

One Part of Navy's Survival Training Program for Aviators

[EDITOR'S NOTE.—Articles dealing with the various phases of the survival training program planned for Navy aviators will be published in Air Sea Rescue Bulletin.

The land and sea survival phase is discussed below. "Water survival" will appear in the next issue.]

The Navy has defined survival training as: "*Preparation of individuals or aircrew units for emergency situations occurring in operations which will afford them a better chance of safely returning to fight again.* It covers the knowledge and skills needed from the time an emergency arises until rescue is achieved, or the survivors reach their home base." To meet this objective instruction was first incorporated in the training program for Naval aviators.

The training syllabus is designed progressively; the elementary and basic instruction being given during the preflight stage, and more detailed and specialized information taught through primary, intermediate, and operation phases of training. The Navy has anticipated a training program that will cover instruction for the period of time an airman prepares to leave his plane, on the water or land, until he is picked up by rescue units and returned to base. The fundamentals of survival which fliers are taught include the operation of emergency rescue equipment, procedures of ditching aircraft and bailing out, techniques of water survival, adapted skills of hand-to-hand combat and gymnastics, methods of communicating with rescue units, precautionary measures and medical treatment for typical ailments, and principles of land and sea survival. At present, the complete plan is not in full operation, but as soon as this program is established, the centralized administration of a program of instruction for enlisted personnel of aircrews will be developed.

PREFLIGHT TRAINING

One phase of the Navy survival training program was started over a year ago at Chapel Hill Preflight School—The Land and Sea Survival Instruction. Provided that rescue facilities were ideal, instruction for living at sea and off the land would be unnecessary. However, survivors of an aircraft disaster must know what to do until rescue arrives, when rescue is delayed, or if rescue fails. This course has been designed to teach pilots the basic principles of living off the land and sea which may be applied to any part of the world. Emphasis is placed upon *individual* survival and consists of information and instruction of techniques and skills which enable men to survive with a minimum of emergency gear until rescued.

The fundamentals taught at Pre-Flight Schools include:

a. Travel in all types of terrain.

b. Orientation to their situation.

c. Collection and identification of plant and animal food.

d. Location of water and water substitutes.

e. Construction of shelters.

f. Preparation of food, including firemaking and cooking.

g. Knowledge of the biological and physical hazards in the area in which the training is given, and the relationship of these hazards with similar ones in other parts of the world.

Instruction is divided into classroom lectures to acquaint the cadets with the principles outlined above, and field trips planned to put into actual practice the techniques and information learned in lectures. The classroom work consists of 12 lectures supplemented by colored lantern slides. The basic text for the course is the Naval Aviation physical training manual, *How to Survive on Land and Sea.* Survival movies, such as *Castaway, Land and Live in the Jungle, Land and Live in the Desert,* and *Land and Live in the Arctic,* are screened in the evenings. A demonstration room with the latest emergency equipment for individual fliers is set up at each preflight school for interested students. Also included in this display may be an exhibition of improvised equipment pertaining to special areas, such as articles made from the tropical coconut and bamboo, or an exhibit of fishhooks, fishing line, and miscellaneous items. A permanent demonstration camp is constructed near the base to enable instructors to teach techniques quickly. This area usually includes types of bough beds, snares, shelters, fires, and ovens.

The cadets are taken on three one-half day field trips on which they are taught special techniques such as rappelling, construction of rafts, travel, search for plant and animal food, and similar problems. After receiving a foundation of survival techniques and procedures, the class goes on one 3 to 5 day trip which is especially planned to simulate emergency situations as much as possible. A battalion of cadets, consisting of 200 to 300 men, is under the supervision of four or five survival officers, plus as many platoon and battalion officers as can be spared to assist in maintaining discipline. The men are in excellent physical condition to stand up under the rigid and rugged trek through the wilderness. They carry a 40- to 45-pound pack made up of only the essential items for living off the land, such as sleeping bag, canteen, compass, mess gear, headnet, signaling mirror, and machete. A supply of K rations is taken, but the men are largely dependent upon the available plant and animal food for their subsistence.

SELECTING DEMONSTRATION AREA

The survival program emphasizes the value of actual activity and experience of each individual cadet, and therefore the selection of a demonstration area that would incorporate as many of the fundamentals of land survival is very important. It must be situated in a large area with many natural materials for food and shelter, have streams for water supply, fishing and navigation, and include a variety of terrain to demonstrate methods of orientation and travel. The field work at Chapel Hill resembles jungle training as closely as possible in the temperate regions. The area selected is very densely wooded, similar to a tropical forest in relation to travel, orientation, and so forth. The men make a continuous trip through forests, along ridges and valleys, into swamps, and across large rivers.

TRAINING AT ST. MARY'S COLLEGE

The field area at the preflight school at St. Mary's College, California, consists largely of vast, untouched mountainous country, with a large lake, mountain streams, and heavily wooded redwood canyons. The men make a 35- to 40-mile trip. To illustrate the application of the principles taught, a synopsis of the trip is related. The first lap of the journey is through redwood canyon country where men make camp for overnight. The following morning the battalion is divided into groups and instruction is rotated. One group goes to the lake for instruction on fishing, signaling with mirror, and crossing the lake in rubber rafts. The other group of four platoons hikes through the canyon, learning from the instructors the edible plants of the region with emphasis placed on the similarity of these plants to ones found in other parts of the world. They proceed on farther down the stream. Here they fish, using the various methods discussed, and employing improvised hooks and lines.

During the afternoon the entire party crosses the lake and hikes to a second camp area. In the evening they set snares for game, do some night fishing, set night lines, and swim for recreation. The following morning they again break up into three groups. Group I receives instruction and experience in lake and stream fishing and swimming; group II has a snaring demonstration, and the third group has map and compass work. Throughout the morning and part of the afternoon this instruction is rotated. Then they break camp and hike to the third campsite. The fourth morning, after lifting snares, eating, and breaking camp, the group hikes to the top of the ridge for rope work. At four that evening the entire battalion returns to the base. Unlike training at other preflight schools, the program at St. Mary's does not include night hikes because of the dense growth of poison oak throughout this mountainous country. At each campsite every cadet makes his own bed, shelter, and fire, and prepares his own meal.

STATE PARK CAMPSITE AT IOWA

The area in the immediate vicinity of the preflight school at Iowa consists of open corn fields unsuitable for land survival instruction. The battalion hikes 16 miles along the Iowa River to a State Park, which provides ideal surroundings. Large wooded areas furnish natural foods and materials for shelters and fires, the lake and streams serve for training in river crossing, swimming, and fishing, and the mud flats at one end of the lake give the cadets experience in crossing simulated swamp and bog areas. At this station the men make a permanent camp and take daily field trips and night hikes through the park area.

The terrain at Georgia Preflight School, with its woods, rivers, and swamps, is similar to that at Chapel Hill, except that it is a little more open. It is interesting to note that, although the schools are located in the temperate regions of the world, the over-all survival program is little affected by the change of seasons. During the winter emphasis is placed upon warmth, shelter, and securing game. During the spring and summer the training tends to be more or less jungle in characteristics. The availability and identification of plants is the part of the training most affected by seasons. The men are kept out and continue their work regardless of the weather. Several hospital corpsmen travel with the group to give first-aid treatment. However, the cadets are in very

good physical condition, and only 5 or 6 of the 300 return to camp before the trip is completed. The first class of naval aviation cadets began their survival training course over a year ago at the U. S. Navy Preflight School at Chapel Hill, N. C. From the first class of 300 students, the program of instruction has been expanded to meet the needs of thousands of men at the four schools described above.

INTERMEDIATE TRAINING

Plans for the extension of land and sea survival training have been proposed for inclusion in the intermediate stage of the aviators' course. The purpose of this advanced course is to give the pilots more specific information and specialized instruction about particular areas. The program of instruction emphasizes the most important information learned in preflight and does not duplicate the instruction previously learned. This advanced course, now partially underway at Pensacola, includes four lectures on the topographical areas of the world:

1. Survival at sea.
2. Survival along the seashore.
3. Survival in the arctic.
4. Survival in the tropics, with special emphasis on plant life.

The group is then taken on a 2-hour tour through a survival exhibit designed to illustrate visually survival procedures, emergency equipment, and technical information. The following exhibit rooms for this purpose have been constructed at the Naval Air Station at Pensacola, Fla.

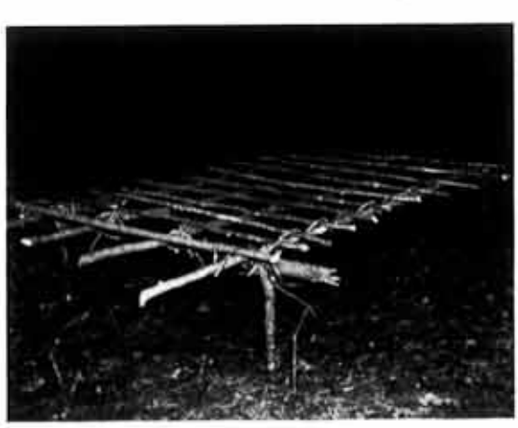
A *lobby* contains survival literature and training pictures. Wall maps show battle theaters, native peoples, and vegetative regions, such as deserts, jungles, etc., of the world. Lecture in this room includes a discussion of the best procedure for dealing with natives in the various parts of the world, and the relationship of survival techniques in similar topographical areas around the globe.

The *Flight Room* is constructed around the actual hull of a PBY. One half of the aircraft with the "skin" removed is inside the flight room where students can actually view the internal structure of the craft, the stowage of emergency equipment, escape hatches, and ditching positions. The other half of the hull, with the "skin," extends outside the building. The PBY is completely manned and equipped. Oxygen equipment and an anoxia display are also part of this exhibit.

The *Chute Room* is especially designed with an aerial view of the ground marked to indicate the proper and improper place to land when bailing out. Mannequins are used to exhibit parachutes with the regular Navy chute harness, and back, seat, and chest packs. The room contains diagrams of free fall and chute fall.

The *Float Room* is to demonstrate survival at sea. A one-man raft and four-man raft with mannequins and complete raft equipment are to be adrift in the tank. On the wall are displays of emergency equipment, food and water available at sea, improvised fishing gear, simple navigation instruments, and illustrations of ocean birds. Plans have been designed for one large saltwater aquarium which will contain poisonous and dangerous fish, and another for common edible fish. Instruction here covers birds and lagoon glare as indicators of land, and means of obtaining food and water at sea and along the seashore.

The *Arctic Room*, depicting a scene above the timber line and in timber, is designed to illustrate the principles of



survival in subzero weather. Emphasis is placed upon improvisation of equipment, such as snow cave, bough lean-to and bed, make-shift foot gear, and bird and rabbit snares. Lecture also includes personal health, arctic food plants, fire building, and preparation of emergency food.

In the *Tropic Room* are found shelters, snares, cooking utensils, fishing gear, and other emergency equipment made from tropical materials. This room also includes a greenhouse with tropical food plants, such as coconut, pandanus, candlenut, pigweed, papaya, plantain, yams, and other emergency food plants to train the students to identify plants in their natural habitat. In addition, a survival scene with a palm lean-to, parachute hammock, fire, etc., has been constructed. A tidal pool contains common crustacean and shell fish found along the seashore.

In an area outside the building is the *Field Exhibit*. This consists of a semipermanent camp that might be constructed in the tropics. In addition to the shelters, displays include clay ovens, latrines, drip food coolers, fox holes, smoke house, mess table, and snares. The area, which is the conclusion of the lecture tour through the Survival Training Exhibit, is designed to illustrate the foregoing lectures and demonstrate the fundamentals of survival at sea, in the arctic and tropics. A special work area will be set up so that the cadets may handle the equipment and fashion such items as fish spears, husking sticks, bark shoes, and fish nets.

The last phase of the land and sea survival program in intermediate aviation training is a 1½-day field trip especially planned to give the cadets and pilots experience in survival at sea and along the seashore. Men travel in groups of 25 to 50, and carry a minimum of equipment in order to simulate actual conditions and develop the skills necessary to perform on their own initiative in an emergency. A detailed outline of the field trip conducted at Pensacola illustrates the completeness of training planned for aviators.

1530—Leave wet basin in barge with the following equipment: "Mae West," one-man rubber raft, one canteen of water, machete, fishing kit, one box emergency aircraft rations, matches in waterproof container, dark glasses, hat, jacket, mosquito dope and headnet, flashlight, knife, signaling mirror. Go fully clothed.

1630—Anchor 1 mile off Santa Rosa Island opposite Biological Station. Inflate "Mae West," jump overboard and inflate pararaft; paddle to given landmark on shore. Select campsite. Dry out equipment. Instructions and practice in: Securing bait; fishing from shore and rafts; crabbing; setting lines for sharks; fish traps; setting snares; preparing fish and crabs; cooking and steaming; meal of prepared food and rations; floundering and crabbing at night (using makeshift spears and torches). Sleeping on sand or rubber raft—preparation of bed. Use of mosquito dope and headnet.

0500—Saturday (reveille). Digging for fresh water. Fishing. Breakfast. Seashore food and water plants—recognition and use. Observation of stingrays and sharks. Preparation of a trench shelter.

1000—Paddle down bay side of island to given location. Fish en route. Signal other rafts with mirrors. Rig up sail on raft.

1300—Prepare meal of wild plant and animal foods obtained during morning. Observation of animal tracks and signs.

1530—Picked up by barge and return to base.

Additional Types of Equipment

(*Continued from page 15*)

Catalog number	Object	Source
44.235.1.1-4	Raft book, chart, and tape for emergency navigation by Harold Gatty.	OQMG, Washington, D. C.
44.236.1-2	Rationers, plastic for water, 10-ounce (2).	BuAer, Washington, D. C.
44.237.1	Shark chaser, life jacket (in experimental package) Spec. No. R51848 (INT) BuShips.	Do.
44.239.2.1-2	Suit, exposure, and bag (yellow), British.	Squadron Leader E. A. Pask, R. A. F. Delegation, Washington, D. C.
44.239.3	Pillow, inflatable, with duckbill automatic closing flapper valve.	Do.
44.239.4.1-3	Suit, exposure (experimental) and gloves.	Do.
44.240.1.1-8	A. E. F. Waterlight (automatic electric floating light).	A. E. F. Waterlight Corporation, 453 West 47th Street, New York City.
44.241.1-2	Morner life jacket	Watertight Slide Fastener Corporation, New York City via Count Morner.
44.244.1.1-37	Fishing kit, one man NAVAER-M-627.	BuAer, Washington, D. C.
44.245.1-3	Light, electric, for life preserver (3).	SO. Norfolk Navy Yard, Portsmouth, Va.
44.246.1-2.1-54	Shipwreck kit, Aircraft, NAVAER M-594A.	Naval Aviation, Supply Depot, Philadelphia, Pa.
44.247.1	Flashlight USN type A 2066	BuAer, Washington, D. C.
44.248.1	Stretcher, hospital, semi-rigid.	U. S. Naval Medical Supply Depot, Brooklyn, N. Y.
44.249.1	Hammock, jungle	Manufacturer.
44.251.1-13	Transmitter set SCR-578-B "Gibson Girl."	Coast Guard Radio Repair Shop, Berkley, Norfolk, Va.
44.252.1.1	Preserver, life, pneumatic, oral-inflated, German.	Technical Staff, Office of Chief of Transportation.
44.252.2.1	Vest, life, oral-inflated, German.	Do.
44.254.1	Litter, metal poles	Bureau of Medicine and Surgery, Washington, D. C.
44.255.1	Very's pistol Mk. 3	N. A. D., Saint Juliens Creek, Portsmouth, Va.
44.255.2	Pyrotechnic pistol AN-M8	Do.
44.259.1.1-2	Mirror, reflex button and case, M-580-A.	Signal Service Corporation Irvington, N. J.
44.263.1-2.1-17	Raft, pneumatic, one-man parachute type AN-R-2B (2).	USN, Pawtucket, R. I.
44.264.1	Pistol, Very's, Mk.2	NAD (25), Fort Mifflin, Philadelphia, Pa.

The field of survival training is comparatively new. There has been a lack of trained instructors and training literature. From July to September the Navy conducted two 4-weeks survival courses especially designed for instructors. The purpose of the instructors' school was to broaden the background of officers who had been teaching some phase of survival and to train additional officers to meet the needs of the expanding program. The scope of the course included the complete training program given pilots plus additional reading assignments and field work.

BOOK REVIEWS

SURVIVAL, by Army Air Forces

The Army Air Forces Survival Manual, prepared by the Arctic, Desert, and Tropic Information Center, is a concise pocket edition of survival information applicable to the various climatic and topographical zones. This small manual is stowed in life raft equipment and all emergency vests and back pads so that it will be available at the scene of the disaster. The emergency aids and instructions aim to help the survivor avoid hardships and maintain health, to find the two essentials—food and water, and ultimately to come back alive.

The first section of the booklet deals with the emergencies to be met on land. General topics such as the immediate action to be taken after crash landing or ditching, first aid, shelter, clothing and others are discussed by telling the pilot how to meet these problems in the order in which they will most likely appear. It instructs him by first giving the general methods and principles of doing them, followed by special instructions for particular areas—jungle, desert, arctic.

In the same concise and comprehensive manner, the second section discusses the considerably different problems to be met at sea.

SURVIVAL, Air Forces Manual No. 21W, may be obtained upon request to Training Aids Division, Office of the Assistant Chief of Air Staff, Training, Headquarters Army Air Forces, 1 Park Avenue, New York City 16; or Publications Section, Matériel Command, Army Air Forces, Patterson Field, Dayton, Ohio.

SURVIVAL ON LAND AND SEA, by Navy

The Bureau of Aeronautics has included special information for aviation personnel in the revised edition of the O. N. I. Survival Manual prepared by the Ethnigeographic Board and the Staff of the Smithsonian Institution. The pamphlet points out that the five prerequisities of survival are drill, equipment, knowledge or survival techniques, geographic features, and natives, common sense or adaptability to the sit-

PUBLICATIONS RECEIVED

Air Sea Rescue Agency Technical Library

June 7–October 10, 1944

ABSTRACTS

Design of an Individual First Aid Kit for Aviation Personnel.
Report on project gives development of a compact two-unit plastic container packaged to afford moisture resistance, and shock and abrasion protection for essential first-aid equipment for personal use by pararaft borne individuals. Each item (tablet, bandage, etc.) retains its moisture resistant protection after seal is broken. Contents are limited to essential items for use by individual aircrew persons. Approximate dimensions of container are 4 by 3 by 1.5 inches and approximate weight filled but excluding the carrying case and triangular bandage is 4.7 ounces. Appendices include directions for use and specifications with drawings.
Source: Design of an Individual First Aid Kit for Aviation Personnel. Naval Medical Research Institute, Bethesda, Md. 31 May 1944. (Research Project X–371)

Causes and Control of Deterioration of Matériel in the Wet Tropics. (RESTRICTED.)
Report covers the effects of moisture, fungi, insects, mites, and marine borers on all classes of matériel, with particular reference to Air Forces equipment. The first section discusses the problem from the layman's point of view, with as few technicalities as possible. Topics covered are: Causes of deterioration, materials subject to damage and types of damage, and control. The second section is an appendix carrying detailed and technical information.
Source: Causes and Control of Deterioration of Matériel in the Wet Tropics. Arctic, Desert and Tropic Information Center, The AAF Tactical Center. 18 July 1944. (ADTIC Project No. T. 25.)

Flying Safety; Air-Sea-Land Rescue. (RESTRICTED.)
Manual covering procedure and facilities as developed in Third Air Force. Discusses control sectors, functions, and procedure of air sea rescue control, aircraft for search and rescue, communications, radar, crash boats, and coordination. Charts included are: A crash is reported, Overwater ranges and flying areas—Rescue boat installations, VHF D/F installations, Air sea rescue areas, HF D/F installations, Flight control communications (CAA), and Search and rescue operations.
Source: Flying Safety; Air-Sea-Land Rescue. Third Air Force Manual 62–1. Tampa, Fla., Headquarters Third Air Force, 15 July 1944.

Pacific Ocean Handbook.
A manual of essential science and underlying knowledge pertaining to the Pacific area. Body of work is a geographic discussion divided into American and Asiatic sections. Appendices present quick information on area and population, sea and air distances, wind velocity and visibility scales, land and sea life, foreign weights, measures and currency, and a chronology. Global maps are inserted. The author is Professor of geography and international trade, Stanford University.
Source: Pacific Ocean Handbook, by Eliot G. Mears. Stanford University, Calif. James Ladd Delkin (c1944).

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LIFE RAFTS AND LIFEBOATS

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BOOK REVIEWS

uation, and the will to live. It is designed primarily for instructing pilots of single-seated landplanes the correct procedures for bailing out, ditching, crash landing, and water safety. The prescribed methods of preventing body dehydration by rigging sunshades, dunking clothing, and performing a minimum of duties are discussed. The supplement stresses the importance of rationing the water supply, preventing loss of water stored in the body tissues, means of increasing the water supply with desalination equipment, if available, and collection of rainwater, and the relationship of fish, emergency rations, and water requirements when adrift.

SURVIVAL ON LAND AND SEA, first published in the fall of 1943, includes general, yet detailed, information of survival at sea and living off the land in similar topographical areas of the world; that is, arctic, desert, and landfalls, wet forests, clearings, swamps, grasslands, and river margins of the tropics. This 200-page, 4- by 5-inch booklet is distributed by the Publications Branch of the Office of Naval Intelligence upon requests from commanding officers. To date, 700,000 copies have been made available. BuAer has ordered that 14,000 copies of the manual, with the supplement, be distributed by Air Combat Intelligence officers.

PNEUMATIC RAFT CEMENT

Navy Bureau of Aeronautics Technical Order 112-44 cautions that rubber cement, ASO stock numbers R 52-C-1476 and R 52-C-1478, procured to Army-Navy Aeronautical Specification AN-C-54, type B, is intended only for use in cementing seams, constructing and attaching patches and fabrics and rubber accessories in the manufacture of airships, balloons, floating bags, and pneumatic life rafts. The order emphasizes that it is not for use as a general utility cement in repair and maintenance work. The restriction is said to have been necessary to conserve the critical crude rubber contained in AN-C-54 cement.

FILM REVIEWS

PERSONAL HEALTH IN THE JUNGLE (MA–4586 or TF 8–2057).—This is an Army Medical Corps training film designed to instruct all troops and personnel serving in the jungle areas of the world the individual treatment and sanitary measures for keeping physically well. Weapons are of little help to individuals overcome by tropical ailments. The film discusses each—symptoms, treatment, preventives, and sanitary measures. The soldier carries, as an individual item of equipment, the M–2 Jungle Kit which contains iodine applicators, dressings, wound tablets, band-aids, athletes foot powder, insect repellent, atabrine, and halazone tablets. A typical ailment of personnel unaccustomed to the torrid zones is heat exhaustion. The soldier who travels by foot must guard against athletes foot. All wounds and scratches must be treated immediately in the tropics to ward off infection. Jungle pests, such as ticks, leeches, centipedes, and scorpions add to the discomfort of men and may lead to serious trouble. Field sanitation is extremely important in preventing tropical diseases transmitted by impure water and dysentery-bearing flies. Malaria, its transmission, prevention, and treatment are illustrated.

MALARIA DISCIPLINE (MA–4176 or TF 1–3343).—This comprehensive indoctrination training film prepared by the First Motion Picture Unit of the Army Air Forces, realistically demonstrates the importance of strict control measures for the prevention of the incapacitating tropical disease—malaria. Statistics show that 9 out of 10 men taken prisoner by the Japs from Corregidor were afflicted with malaria; 50 percent of the personnel of a task force in the Southwest Pacific were hospitalized with malaria; only 24 planes of 35 requested by General Montgomery in the North African Campaign were able to be sent out because the crews were down with malaria. Malarial regions are found round the globe within the tropical zones where our military forces are operating—India, West Africa, Burma, Southwest Pacific, and the Caribbean. The film shows by animation how the malaria parasite is transmitted from a diseased individual to a well airman by the blood-sucking anopheles mosquito.

(*Continued on page 28*)

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Navy Suggests Raft Manifold Testing Device

A life raft testing device designed to check the proper functioning of the manifold prior to closing the raft seams is described in detail in Navy Bureau of Aeronautics Technical Note 84-44, 19 September 1944.

The device is for the benefit of service activities concerned with the overhaul and maintenance of life rafts. The technical note says the device can be fabricated locally, and illustrates the fabrication. A note on the illustration says:

"The entire tester can be made from parts of life raft pump R LL-P-562 or 558 as shown in U. S. Navy Air Base and supply office, Philadelphia, catalogue with the exception of Part No. 7. This part was designed to make a tighter connection more quickly with nozzle on air supply value which should have a short rubber tube stretched over the end of the nozzle."

The life raft manifold testing device consists of a cup with an air-pressure attachment. The cup is held over the outlet check connection, hand pressure being sufficient to prevent leakage between the cup rim and the manifold rubber pad. Air under pressure is let in at the end of the rubber hose connection. An application of soap solution at the manifold inlet indicates whether the unit is leaking.

The device permits testing of the manifold while the raft is undergoing internal repairs.

The technical note, signed by Rear Admiral J. B. Richardson, acting chief of the Bureau of Aeronautics, says "inasmuch as the use of this device will result in a saving of man-hours and will insure proper functioning of the raft manifold after the raft has been repaired, it is recommended that all life raft overhaul and maintenance facilities investigate the use of this device."

Previously it has not been possible to test life raft manifolds until the raft was fully repaired and all seams closed. If a manifold leak was discovered after the raft had been repaired, seams had to be reopened and a new manifold installed.

Learned Aiming Device Adopted

The Bureau of Aeronautics has adopted a new glass mirror employing the aiming device developed by Learned. The mirror is known as the Standard Navy Signal Mirror Spec. M-508. It is made of glass with metal backing, on which are mounted eight yellow retro-directive reflex buttons for reflecting a light beam to searching craft at night.

The mirror, stowed in a metal case, is 5 by 4 by 3/16 inches. Another mirror, the M-508a, is being developed by the Bureau of Aeronautics and made by the same manufacturer, the Signal Service Corporation of Irvington, N. J. This signaling mirror is fitted with lugs into which colored filters may be clipped. The total assembly includes mirror, lugs attached, and three filters—orange-red (international orange), red, and green.

FILM REVIEWS

(Continued from page 27)

Collective control measures are taken by a survey squad which thoroughly investigates the area where an Air Force camp will be constructed—the case histories at hospitals, number of natives affected, climatic factors, breeding places, native habitations, etc. Once constructed the interiors of all buildings, tents, and barracks are sprayed regularly with the aerosol bomb or hand sprayer and every possible crack or opening is finely screened. However, much of the control of malaria depends upon the individual precautionary measures. To emphasize the importance of wearing protective clothing at dusk and night, carefully inspecting the tent and bed netting before retiring, and taking atabrine regularly, the film shows the routine of two men stationed somewhere in a malaria-infested area. Because of negligence to take his atabrine one of the men was overcome by malaria on a reconnaisance flight and unable to cope with a squadron of attacking Zeros. Although he successfully bailed out a short distance from his home base, he never made it back to camp.

Arctic, Desert, Tropic Branch At Orlando

The offices and personnel of the Arctic, Desert, Tropic Information Center of the Army Air Forces, formerly located in New York City, have moved to the AAF Tactical Center, Orlando, Fla. The unit is now known as the Arctic, Desert, and Tropic Branch of the Tactical Center. As outlined in AAF Regulation No. 20-14, 30 September 1944, the mission of the Branch will be to collect, evaluate, and disseminate information pertaining to AAF activities in arctic, desert, and tropic regions. Under the consolidation, the AAF Tactical Center is charged with the following functions:

1. The AAF Board is charged with the responsibility of testing new matériel, organizations, and equipment used or proposed for use by the Army Air Forces for operational and tactical suitability under simulated combat conditions.

2. The AAF School of Applied Tactics will test new and different tactics and techniques of aerial warfare under simulated combat conditions; and instruct Army and Navy personnel, as assigned, in AAF tactics, techniques, doctrine, and organization.

3. As indicated above, the Arctic, Desert, and Tropic Branch will continue its work in disseminating information concerning the climatic zones in which AAF personnel are operating.

The Assistant Chief of Air Staff, Operations, Commitments, and Requirements, will exercise for the commanding general, AAF headquarters responsibility for coordinating and supervising the activities (including training activities) of the Tactical Center.

BOMB BAY DOOR SUPPORTS

Acting on reports of difficulty in landing the B-24 on the sea, Col. Carl F. Greene, AAF, Matériel Command liaison officer with NACA, and Capt. William P. Carl, Jr., of the same office, have been working on a support system for Liberator bomb bay doors to be fitted when necessity to ditch becomes apparent.

FROSTBITE SEASON

Revival of winter operations emphasizes the importance of a report, from one overseas theater, that frostbite casualties in one week totaled 244.

COMMITTEES FOR AIR SEA RESCUE

1. Committee to Study the Preparation of Emergency and Survival Publications.
   (A. Chm) CG: Lt. J. H. Bell, USCGR[1] ADams 2003 1516 14th St. NW.
   Army: Capt. Thomas Dunn, AC[1], Army 73538 Room 4E 144 Pentagon
   Alt: Maj. K. O. Bennington, Army 74687 AC[1], Room 4E 144 Pentagon
   Navy: Lt. Norville W. White, USNR, Navy 4038 2W30 Bg-W.

2. Committee to Study Adequacy of Air Sea Rescue Facilities.
   (Chm) CG: Comdr. A. E. Harned, ADams 2003 USCG, 1516 14th St. NW.
   Army: Maj. T. J. Borgman, Army 73538 AC, 4E 144 Pentagon.
   Alt: Maj. William J. Small, Army 73538 AC[1], 4E 144 Pentagon.
   Navy: Lt. C. W. Brown, USNR, Navy 61178 Corcoran Annex, Rm. 305.

3. Committee to Study the Communication Facilities and Requirements for Air Sea Rescue.
   (Chm) CG: Capt. E. M. Webster, Navy 4444 USCG, Rm. 7300 CG HQ.
   Army: Capt. J. M. Sherman, AC, Army 4847 4E 144 Pentagon.
   Alt: Maj. T. J. Borgman, AC[1], Army 73538 Rm. 4E 144 Pentagon.
   Navy: Comdr. C. L. Harding, Navy 63636 USCG, Room 2541 Navy Bldg.

4. Committee to Study Special Aircraft Equipment for Rescue and Survival.
   (Chm) CG: Lt. Comdr. J. D. McCubbin, USCG, 1516 14th St. NW. ADams 2003
   Army: Capt. Wilfred Hines, AC[1], Army 74687 4E 144 Pentagon.
   Alt: Capt. Knute Flint, AC[1], Army 4847 4E 144 Pentagon.
   Navy: Lt. (jg) R. J. Willingham, Navy 4038 USNR, 2W32 Bg-W.

5. Committee to Study Primary Life Saving Equipment on Heavily Loaded Transports.
   (Chm) CG: Comdr. R. A. Smyth, Navy 4374 USCGR, Room 8012 CG HQ.
   Army: Major P. P. Fenwick, Army 4665 3C 738 Pentagon.
   Navy: Lt. Comdr. J. L. Caillouet, Navy 4575 Jr., USNR, T4-2503.

6. Committee to Study the Medical and Physiological Aspects of Air Sea Rescue.
   CG: Sr. Surgeon Paul A., Neal— WIscon 7000 USPHS, National Institute of Health, Bethesda, Md.
   Army: Maj. Frederick Fink, M.C. Army 76227 ASF, Room 421, 1818 H St. NW., Chief, Medical Safety Division[1], Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Alt: Major Richard Follis, MC,[1] Asst. Chief, Medical Safety Div., Office of Flying Safety, HQ, AAF, Winston-Salem, N. C.
   Navy: Capt. John H. Korb (MC), Navy 4171 USN, Room 28 PotAnn Bg-3.
   (Chm) Lt. Comdr. C. F. Gell Navy 2732 (MC), USN, Room 2906 Navy Dept.
   RAF: Wing Comdr. P. O. Lee, DE 9000, 1424 16th St. NW.

7. Committee to Study Ditching Procedures.
   (A. Chm) CG: Comdr. A. E. Harned, ADams 2003 USCG, 1516 14th St. NW.
   Army: Maj K. O. Bennington, Army 74687 AC, 4E 144 Pentagon.
   Alt: Capt. Thomas Dunn, AC[1], Army 73538 4E 144 Pentagon.
   Navy: Comdr. Harry R. Horney, USN, Room 1802, Navy Bldg. Navy 63159
   RAF: Wing Comdr. R. Bicknell, 1424 16th St. NW. DE 9000

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[1] These officers have not yet been approved by the Board for Air Sea Rescue.

PSF J. F. Carter folder 3-44

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file personal

~~SECRET~~

December 18, 1944.

REPORT ON "TRENCH FEET" IN THE U.S.ARMY.

The attached report on the development of "trench feet" among American troops in Europe (reported to run about 87% in combat areas along the Rhine), is submitted because it may become a serious public issue. The responsible officer appears to be Major General Littlejohn, and to a less extent, General Somervell. I have no recommendation to make, other than to suggest that appropriate measures should be initiated before the return of the members of the House Military Affairs Committee who have been touring European battlefronts.

J.F.C.

December 16, 1944

Technical Series Report No.26

"TRENCH FEET" IN U.S. ARMY

It is reported that a lack of foresight in providing adequate protective footgear for U.S. Armies on the Western Front has resulted in continued and increasing suffering and incapacitation. It is further reported that the growing seriousness of this situation has resulted in General Eisenhower cabling to General Marshall an urgent request for immediate action of the highest priority looking toward an alleviation of this condition.

It is stated that the Quartermaster Corps and in particular the Research and Development Section having reviewed the records of U.S. Forces in World War I as regards trench feet considered the possibility of the development of a "warfare of position" in Europe as a situation not to be overlooked.

As a consequence steps were taken about two years ago to develop special and simple supplementary footgear to prevent to a large degree the condition now dubbed, for World War II, "immersion foot."

It is stated further that upon completion of the development of suitable supplementary footwear, funds for procurement were denied by the Army Service Forces under General Somervell. It is further stated that in spite of repeated requests for a reconsideration of the need for this equipment Major General Littlejohn, now acting as

Quartermaster General in the European Theatre flatly and unequivocally refused to sanction procurement.

It is stated further that the present condition is of such a serious nature in U.S. Armies on the Western Front that any publicity might develop to the proportions of a national military scandal. It is stated that at the present time "cover up" activities including the assignment to the Quartermaster Corps of two high-powered writers to explain away the present difficulties are in full swing.

It is further reported that the lack of proper foot-gear for men participating in the occupation of Attu Island caused much suffering and subsequent amputations.

It would appear that there is a definite lack of liaison between the Operational Ground Forces Staff and Army Service Forces policy-making general officers. It would further appear that this condition--not unusual between supply and operational branches of military or civilian organizations of any magnitude and commonly known as the "tail wagging the dog"--needs re-orientation to allow the fighting portion of the Armies of the United States to get what they need and want from the Services of Supply.

PSF J.F. Carter folder 3-44

~~SECRET~~ December 19, 1944

file

MEMORANDUM FOR MISS TULLY: TECHNICAL REPORTS TAKEN UP WITH ADMIRAL BROWN.

Dear Miss Tully:

Herewith attached is a copy of a memorandum to Admiral Brown concerning the two reports which you directed me to take up with him.

I discussed these with Admiral Brown briefly over the telephone, and he seemed to be somewhat irritated and inclined to question my authorization and stated that he was going to take it up with the President.

In this connection, he made a blanket assertion that these Technical Reports were without value and had caused the Navy to engage in "wild goose chases". By contrast, I am informed that early in November, about a month after we had submitted a report calling attention to the situation, the Navy issued General Order No. 236 directing all Naval vessels to use luminous materials such as luminous tape for emergency marking for operation and access purposes.

Naturally, I do not wish to get into an argument with Admiral, with whom my relations have hitherto been friendly, so I am simply offering this one statement in evidence, in case there is any blanket condemnation of the utility of these reports.

J F Carter
J.F.C.

~~SECRET~~ December 19, 1944

MEMORANDUM FOR ADMIRAL BROWN: TWO REPORTS.

Dear Admiral Brown:

I have been directed by the Office of the President to take up with you the two attached reports:

1) "Service Procurement of "Shark Chaser" (No. 24, December 5, 1944), to the effect that Navy procurement of shark-repellent kits has been delayed by failure to have the units inspected and that there is wide discrepancy between Navy and Army Air Force procurement of these kits;

2) "Air Sea Rescue Agency, U.S. Coast Guard" (No. 25, December 14, 1944), outlining the alleged unsatisfactory status of this work with a suggestion that appropriate personnel of the Navy and Army Air Forces be assigned to investigate and report on the facts.

Both of these matters would appear prima facie to have a bearing on both morale and on conservation of trained Navy personnel.

In our telephone conversation yesterday, I understood you to state that previous reports submitted by me to the President had been without value and had led to "wild goose chases" by the Navy. I should greatly appreciate being advised as to which reports were without substance or were otherwise inaccurate, in order that I may take prompt action to guard against further misinformation of this character. Naturally, it is no part of my duties to burden any responsible government official with trivial matters or inaccurate information or to withhold from the President any information which appears to have a direct bearing on the successful conduct of the war.

J.F.C.

PSF J. F. Carter folder 3-44

Take up with Secy of the Treas office 12/23/44

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December 21, 1944.

REPORT ON GOVERNMENT POLICY CONCERNING LONG-TERM LOANS AND INVESTMENTS.

Last summer, I had a number of discussions with Judge Rosenman and Maury Maverick on various aspects of the problem of post-war finance and investment policies. At the time, it seemed wisest to postpone further discussion until after the election.

The attached report to me from Shreve Cowles Badger on the subject indicates a wide area of acceptance for the idea that the Government should foster the creation of a long-term loan and investment banking system, parallel to though not necessarily dissociated from the present Federal Reserve System.

My suggestion is that, at this present time, you should advise me of the individual official or White House aide who should consider these matters and make general recommendations for consideration of Administration policy on this basic problem.

At my suggestion, no discussions or contacts have taken place with members of the appropriate Congressional Committees, in order to avoid possible confusion and cross-purposes. I am convinced, however, that there will be strong political support (as well as the anticipated opposition) for any well-rounded plan to provide a vigorous and effective government-fostered mechanism for long-term loans and credits in connection with post-war reconversion and employment policies.

J.F.C.

3214 O Street, N.W.
Washington, D.C.

December 20, 1944

Dear John:

On June 8, 1944 I wrote you regarding the need for a privately owned, government supervised, long term credit and equity capital system. This you forwarded to the proper parties in the Executive Office of the President. It was agreed that it would be wise to hold the suggestion in abeyance until after the election. Mr. Lauchlin Currie wrote you sometime in July that he, as Deputy Administrator of the F.E.A., was interested and that he would be glad to have Mr. James Angell consult with me on the matter. I have seen Mr. Angell and have left copies of my letter and Mr. Bishop's memorandum.

During the past months, I have informally discussed the matter with certain officials of the Federal Reserve System both here and in New York; with officials of certain New York trust companies; with Mr. Robert Lamb, legislative representative of the Steel Workers Union and formerly secretary of the Senate Small Business Committee; with officials of the American Bankers Association; certain investment bankers; and with officials of the National Association of Security Dealers.

My informal findings are:

1. There is practically a complete unanimity of opinion that private investment must gradually replace government financing of private industry.

2. That something must be done to encourage private investment.

3. That revisions must be made in the tax laws so that:

a. There will be an incentive for investors to put money into new and comparatively small enterprises.

b. That new and small enterprises can grow through the plowing back of earnings into capital.

December 20, 1944

4. That there is much confused thinking as to differentiating between "long term loans or credits" and "equity" or "grub stake" financing, especially in the government.

As to the advisability of setting up a privately owned, government supervised, long term credit system, I found a difference of opinion.

The Federal Reserve officials were certainly cool to the idea.

The officials of the American Banking Association have their own scheme of setting up credit pools throughout the country. That this will accomplish any considerable good is considered unlikely by everybody except themselves due to their accepted methods of judging loans and that their funds represent demand deposits.

The Trust Company officials were mildly approving.

Robert Lamb approves of the idea and believes labor is whole-heartedly for anything which will help the financing of business.

All of the Investment Bankers consulted agreed that the idea was in the right direction and that the executive branch of the government should thoroughly investigate the matter.

The same was true of the officials of the National Association of Security Dealers.

All who were asked were emphatic in their agreement that the Securities and Exchange Commission should not be allowed to act on matters of policy.

Naturally the problem has only been investigated informally and a relatively small number of persons have been consulted. I sincerely believe the inquiry should go further.

Very sincerely yours,

Shreve Cowles Badger

Shreve Cowles Badger

Mr. John Franklin Carter
1210 National Press Building
Washington, D.C.

Yes — take up with Gov Hurley 12/23/44

PSF: J. F. Carter folder 3-44

December 21, 1944

MEMORANDUM FOR MISS TULLY

Dear Miss Tully:

I enclose what seems to be an intelligent plan for disposal of surplus machine tools. This was prepared by Mr. Donald S. Sampson, 1101 Vermont Avenue, N.W., who is the Washington representative of a number of small industrial concerns. He assures me he has no personal financial interest in this subject but believes that after a study of the act, this procedure would be calculated to get machine tools into the hands of small industries which need them. Perhaps Governor Hurley would be interested in this suggestion.

J.F.C.

J.F.C.

Yes Gov Hurley

December 12, 1944

PLAN FOR DISPOSAL OF SURPLUS MACHINE TOOLS

I. DOMESTIC

(a) Award of prime contracts (30 to 35 in number) on a predetermined fixed percentage basis of override on all sub-contractor sales.

(b) All other machine tool dealers (to be named by Machine Tool Dealers Association) to be, automatically, declared sub-contractors.

(c) Prime contractors to be confined to fixed areas and sub-contractor confined to area over which his prime contractor has jurisdiction.

II. EXPORT - COMMERCIAL

(a) Award of 10 - 15 prime contracts (same basis as domestic)

(b) All recognized exporters automatically become sub-contractors for export.

(c) Prime contractors and sub-contractors confined to specific areas, as in domestic sales.

III. FOREIGN - SALES - GOV'T.

(a) Exploration of above procedure. Pending study, recommend sales to foreign governments be handled by D.P.C.

PROCEDURE

I.(a) All declared surplus machine tools to be immediately removed from contractor's plant, except specific items for which contractor has negotiated purchase--under Clayton formula.

(b) Contractor to tag, catalog, each machine as to year of manufacture, size, condition, where sent for storage, (including proper record of items retained), and secure receipted delivery voucher, properly notarized and witnessed.

(c) All standard, or near standard, tools (of which prime and sub-contractor are jointly to judge), to be forwarded, government expense to warehouses of prime and sub-contractors on consignment. Government pays warehouse insurance— no storage fee.

(d) All cut-back, Gov't. owned, war plants to be utilized as primary warehouse facilities. Overflow, to private warehouses of all contractors.

(e) All non-standard machine tools, of strictly war character, to be forwarded, for storage, to cut back war plants, which by their layout, geographical location, or extreme size, fall into a class, classified as of doubtful commercial value. The government agencies to be responsible for promptly naming these sites to machine tool contractors. Cut back plants sold or under negotiations indicating fair return on government investment, to be excluded as warehouses. Sales under negotiation to be limited as to period of negotiation, after which the plant becomes eligible government warehouse or privately owned property.

(f) Copies of all cataloged tools to be supplied sub-contractors and government, including where located and by whom held.

RECOMMENDED BASIS OF SALES

I. (a) Clayton formula (to 3 years of age)

(b) Joint Government-prime contractors-Machine Tool Association appraisal— over 3 years, or, tools already partially depreciated at time of government purchase.

II. (a) Example of Government allowed sales commissions:

$3,000.00 unit, 36 mos. old = $3,000.00 less 36%.

2% overide to prime contractor on all sales

15% to sub-contractor, of which 5% goes to salesman consummating sale

Balance of depreciated value passed along to purchaser, irrespective of quantity purchased.

II. (b) Main source of prime contractor revenue to be his function as a sub-contractor in competition. Prime keeps 2% over-ride on own sales.

III. All sub-contractors notify prime daily as to sales. All prime contractors report daily to the government on sales.

* All additions to surplus list and all deletions (sales or otherwise) reported daily by Government to all contractors direct.

*NOTE - To prevent strangulation of data by primes.

METHOD OF SALE

(a) Cash

(b) Financed (local bank) or otherwise

(c) Rented - 5 years or more - at roughly 10% per year, of government cash recovery value

(d) Sale or rental documents to be handled by sub-contractor, notarized; copies to prime contractor and government.

(e) Purchaser pays freight, purchase point to own shop, or, government may pay freight and add to purchase price.

BENEFITS OVER PRESENT GOVERNMENT PLAN

I. (a) Smaller plants secure floor space almost immediately, with consequent saving in loss of labor layoff.

(b) Consumer goods start to find commercial market much faster, due to above.

(c) Discharge of military personnel speeded up due to prompt removal of government machinery from private plants and consequent earlier domestic recovery of labor demand.

(d) Government funds, now being spent for storage warehouses, or to be spent in the future, unnecessary.

(e) Government owned munitions producing factories utilized instead of becoming ghost area or near total loss due to character of present activity and its lack of adaptability to peacetime use.

(f) Machine tools of strictly war character, are preserved for period of any desired length.

(g) Prompt sale of surplus machinery, achieved by this plan enables industry to get tools at a rate absolutely impossible of achievment, if industry must wait on production of machine tool manufacturers.

(h) Through utilization of machine tool dealers personnel, government is supplied with upwards of 15,000 machine tool salesmen, grounded in industry practices and procedure for years, as representatives who will take the goods to the customers door.

(i) Small, prospective purchaser will not be burdened with the job of searching for a piece of equipment he may need—traveling to nearest government agency in pursuit of such equipment, etc. His needs may be small, the time and expense great. The machine tool salesman is in position to give expert, authentic, on-the-spot advice.

(j) The government recovery value connot avoid being greatly increased, due to disposal of equipment during the period of greatest need.

(k) Government has full and complete check on all sales, prices, inventories. Data even available as to contractor profits for assessment of income and excess taxes.

(l) Protracted selling operations, under present plan, will lose the present and nearby market, with consequent huge losses due to eventual obsolesance.

(m) Government running inventories (similar N.Y. Stock Exchange Board) provides easy daily check on types and quantities unsold. Provides visual check on stagnant items, items unpopular or ones having reached sales saturation point, with consequent indication of price reduction probabilities.

(n) Political pressure groups will not form, to promote acquisition of prime contract, as prime contractor's overriding commission is set at actual overhead expense.

All contractors, prime and subs, have equal incentive, by virtue of government allowed 1%.

CONCLUSIONS

I.(a) The best machine tool brains in the country will be given a chance to do a job only they know how to do.

(b) The government cannot conceivably do a sales job of this magnitude and character.

(c) The government cannot lose - has everything to gain by this plan, including elimination of present warehouse construction costs.

(d) The taxpayer will benefit by highest liquidation value being received and application of same to public debt.

(e) Logical thinking points unerringly to the fact that industry, having armed the government, has not the remotest competition in the "know how" of disarming the government.

PSF J. F. Carter folder 3-44

Take up with Gen Marshall's office 12/23/44

P75 L Marshall

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December 21, 1944.

MEMORANDUM FOR MISS TULLY: CANVAS TENT SHORTAGE IN A.E.F. (TECHNICAL SERIES NO. 27)

Dear Miss Tully:

The attached Technical Series Report No. 27, concerning the alleged shortage of canvas shelters for U.S.Troops in Western Europe, should be handled with care. The indicated facts are that due to administrative decisions, for which Colonel Georges F. Doriot, of the Quartermaster Corps, is allegedly responsible, about 1,500,000 American troops in Europe are without shelter in this winter campaign.

My specific recommendation is that General Marshall's Office should direct the Office of the Inspector General to make an investigation to establish both the facts and the responsibility. Under present procurement, canvas shelters will be available in from 60 to 90 days and should reach the front about the time they are no longer needed. In this connection, it is alleged that Colonel Doriot is a cousin of M. Jacques Doriot, the notorious French collaborator with the Nazis. Whether the alleged relationship has any bearing on the situation which has developed as a result of Colonel Doriot's supposed decisions is not a matter on which I can offer any opinion, since this type of relationship does not presuppose identity of attitude or interest and often indicates the opposite.

J.F.C.
J.F.C.

Technical Series Report No. 27
December 19, 1944

CANVAS SHELTERS FOR U.S. TROOPS

It is reported that there is a serious and continuing shortage of canvas shelter duck for temporary and permanent shelter use in the United States Army.

This shortage is presently reported to be so serious that 1,500,000 men on the Western Front will be without adequate protection from the weather. Present efforts to rectify this condition are stated to have resulted in high priority procurements which, however, are reported to be impossible of completion and consequent availability for at least 60-90 days.

It is stated that the serious shortage of shelter duck among other things is the direct result of a situation involving the Quartermaster Corps of the Army Service Forces. It is reported that, while Major General Edmund B. Gregory is the designated Quartermaster General, Colonel Georges F. Doriot,[1] assigned on the organization chart as Director of the Military Planning Division, is for all intents andpurposes actually responsible for the policy, procurements, and decisions affecting major equipment problems of the Quartermaster Corps.

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1. According to Who's Who in America, vol. 22, 1942-1943, Colonel Doriot is listed as a "corporation official," formerly President of the McKeesport Tin Plate Corporation, now (1942-1943) Chairman of the Board, National Can Company, successors.

SECRET

In this connection it is stated that Colonel Doriot while Professor of Business Administration at the Harvard Business School had General Gregory as a pupil, with the result that despite the present difference in rank General Gregory in effect remains in a student role. It is stated that this status allows Colonel Doriot free rein to exercise wide authority throughout the Quartermaster Corps by means of a far-reaching "Gestapo" and "hatchet man" system, which results, it is reported, in situations typified by the present shelter duck shortage.

The background picture of the canvas duck shortage is stated to begin generally with the infiltration into the Jeffersonville Quartermaster Depot of some of Colonel Doriot's civilian aides. This Depot, long responsible to the Army for canvas duck shelter and tentage equipment in general, was at this time--November-December, 1943--commanded by Brigadier General Allen R. Kimball. The activities of Colonel Doriot's aides are stated to have resulted in the establishment of Doriot's men within the Jeffersonville Depot, which in effect resulted in a condition of "Colonel Doriot talking to himself."

It is reported that thus in the early months of 1944 long prior to D-Day, when major decisions regarding shelter and tentage had to be made, the Doriot group at Jeffersonville prepared for General Kimball's endorsement

a report on shelter duck. This report, it is stated, was duly approved and forwarded to Washington, where Colonel Doriot in turn OK'd it and sent it to General Gregory for final approval and transmittal to the Army Service Forces Staff.

During this time, while this report was in channels, responsible technologists of the Quartermaster organization in Washington disagreed with its findings and protested verbally and in writing that the estimated requirements for shelter duck, etc., were basically unsound.

It was then reported that a maneuver took place which resulted in General Kimball's being relieved of the command of the Jeffersonville Depot as, it is reported, there was some indication that he might receive evidence which would cause him to investigate his original decision. In his place General Gregory assigned Brigadier General Guy L. Rowe, alleged to be a Doriot choice and picked for his lack of knowledge of specialized equipment handled by Jeffersonville. In the meantime, it is stated, the reorganization of Jeffersonville by the Doriot group had been completed to eliminate half of the officers formerly assigned to the "Duck and Webbing Pool," which was also abolished as a section.

In order, it is reported, to provide a means of quieting protests of Quartermaster personnel under his

direction in the Military Planning Division and particularly the requirements and Procurements Branch, Colonel Doriot is stated to have appointed Lieutenant Colonel Stephen J. Kennedy to be responsible for shelter duck.

Recent developments which are reported to have occurred, when the Armies in Western Europe reported the shelter duck shortage as extremely acute, included a meeting under the chairmanship of Lieutenant Colonel Kennedy in New York to endeavor to establish future policy, and a discussion between Colonel Doriot and General Somervell last week regarding the shelter duck shortage. The results of the meeting held by Kennedy are stated to be practically nil. Colonel Doriot's discussion with General Somervell is said to have resulted in the General's "pinning his ears back" for arguing that he was only "trying to save the Army money."

In connection with all of the above it is reported that Lieutenant General Somervell has established a satisfactory working relationship with Major General Clifford L. Corbin (present Director, Procurement, Q.M.C.) and Colonel R.B. Stevens, Deputy Director of Purchases.

At the present time it is reported that procurement action as previously stated will result in deliveries of the needed shelter duck in approximately 60-90 days.

In view of the particular situation regarding shelter duck and the general procurement and distribution

organization in the Quartermaster Corps, it is seriously recommended that the Inspector General be directed to investigate and report his findings to the Chief of Staff, U.S. Army.

J. F. Carter folder 3-44

PSF

Take up with Gen Arnold's office 12/23/44

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December 21, 1944.

MEMORANDUM FOR MISS TULLY: MISCELLANEOUS REPORTS ON ARMY AIR FORCES (T. SERIES NO. 22)

Dear Miss Tully:

The attached report (Technical Series No. 22) lists a number of items bearing on the equipment, training and morale in the Army Air Forces. These subjects--which are of varying importance--would not appear to be a basic criticism of the A.A.F. but might be helpful suggestions and are offered in that spirit. I suggest that they be forwarded through the usual channels for any action which may be indicated.

J.F.C.

Technical Series Report No. 22

December 1, 1944

INFORMATION CONCERNING THE PRESENT STATE OF EQUIPMENT, TRAINING, AND MORALE IN THE ARMY AIR FORCES

Oxygen.- It is reported that present oxygen bottles used for "walk around" purposes in bombing planes are unsatisfactory in that the period of availability ranges from forty-five seconds to one minute. As a consequence it is reported that the large heavy walk-around bottle (about 4' high and fitted with shoulder-carrying strap) has to be used.

Pyrotechnics.- It is further reported that all Army aircraft are equipped with a pyrotechnic signal projector of the single-shot variety which consists (in many cases) of a plunger-striker mechanism for ignition and which when fired seriously injures the operator's hand.

G.I. Shoes.- It is reported further that bomber squadrons are briefed to the effect that a most necessary preparation for "walk out" escape, if it is necessary to bail out over enemy territory, is the wearing of GI shoes. However, it is reported that air crews continually interrogate briefing officers as to how they are going to bail out with GI shoes when they are unable to wear them under present heated flying boots.

It is stated that it appears obvious to air crews that they can not bail out with a pair of GI shoes hanging around

their neck! As a consequence this presents a major contradiction in instructions due to the inability of the equipment to lend itself to the edicts of higher authority as expressed in briefing periods.

Ditching.- It is further reported that bomber crews continually are reiterating the need for some type of automatic marker and light (of a parachute flare or other suitable nature) to be installed in all types of military aircraft to provide immediate and temporary light surrounding the scene of a night ditching or crash landing. It is contemplated by air crews that some type of fluoroscein dye marker automatically actuated (fitted with mechanical stop mechanism if military reasons dictate), together with a firing tube for high-candle power parachute flare, should be provided all military planes.

Gasoline Dump Valves.- It is further reported that American military planes (in spite of continued successful British practice) are not yet equipped with any dump valves to jettison gasoline when it becomes necessary to crashland. It is stated that bomber crews are well aware of the added safety afforded by the reduction in weight by the consequent lightening of the mass impact which is allowed by dumping, say, 3,000 gallons of gas (6 lbs. per gallon or 18,000 lbs. or 9 tons).

Equipment Officers.- It is further reported that at present "equipment officers" in the field are not "flying officers" and that, until they are flying officers, operating military air crews will not listen seriously to their orders and recommendations in the theatres of war.

It is also reported that until equipment officers are flying officers and thus able to enforce "ditching" drill instructions to bring all the air crews up to a forty-five-second standard under blindfold or simulated darkness conditions losses due to poor "ditching" techniques will remain high.

Radio Auto-Alarms.- It is further reported that, in spite of the fact that it is technically feasible to equip large military and transport aircraft with lightweight radio auto-alarms to automatically warn pilots of the reception of a signal on the distress frequency, no steps to provide such equipment have yet been taken. Unless such auto-alarms are provided or available, pilots and radio operators listening to their base (departure or arrival station) will be completely unaware that aircraft survivors, operating emergency "Gibson Girl" radios, are even in their immediate vicinity.

Raft Lights.- It is further reported that air crews are aware that rubber rafts carried in planes need small automatic lights for night use in order that survivors leaving the plane may be enabled to locate the jettisoned rafts immediately, before they are swept away be seas and lost.

PS7, J. F. Carter folder 3-44

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December 27, 1944.

MEMORANDUM FOR MISS TULLY: COMMUNICATION FROM PUTZI.

Dear Miss Tully:

Perhaps the President would be interested in the following except from a letter of November 8, from Putzi Hanfstaengl, written at the British prison camp on the Isle of Man:

"Will you kindly tender my most sincere and respectful congratulations to Egon's Commander in Chief. Tell him that his former collaborator as lend-lease prisoner of war celebrated his victory in spite of all by smoking ten 'Players' cigarettes won from a fellow captive, by an election bet. Assure him, please, of my ever grateful regard and transmit to him my best wishes for the future."

JFC.
J.F.C.

DECLASSIFIED
By Deputy Archivist of the U.S.
By W. J. Stewart Date MAY 1 1972

Dec. 28, 1944.

file

MEMORANDUM FOR

D. J. B.

Suggest to Mr. Carter that he talk with the Secretary of the Treasury about this.

G. G. T.

done 12/29/44

J. F. Carter folder 3-44
PSF

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December 26, 1944.

REPORT ON SUPPLY DIFFICULTIES ON THE WESTERN FRONT.

The attached report indicates that part of the problem of supplies on the Western Front, apart from possible defects in the organization of supply under General Littlejohn, is due to the Treasury policy of paying American troops in "occupation dollars".

The Treasury policy was designed to protect the French economy from depletion by private purchases on the part of American service personnel, and hence to protect tonnage. However, soldiers in all wars--especially on short leave from the front--want wine, women and souvenirs, and hence there is a strong human impulse to sell supplies and equipment of all kinds to the French Black Market in order to get exchange for these inevitable purposes.

My suggestion is that the Chief of Staff should be requested to investigate and report on the work of General Littlejohn and that the Treasury should be asked to review its policies with respect to the short-circuiting of American troops out of the French and Belgian economic system.

J.F.C.

Technical Series Report No. 29

December 26, 1944

SUPPLY ORGANIZATION ON THE WESTERN FRONT

It is reported that the transport of supplies from channel ports and beachheads to the combat zone on the Western Front is seriously hampered by lack of proper organization.

In many cases, for example, it is reported artillery organizations are receiving consignments of shells of the wrong caliber.

It is further reported that pilferage as now reported by the press is of such character that a truck arriving with 75 per cent of its initial load is regarded by the consignee as nothing short of a miracle. It is further reported that Military Police and other army personnel participate in and generally "wink" at the pilferage and sale of military material.

It is further reported that the pilferage, now known to be widespread, is the direct result of the established policy of the Treasury Department in the issuance of "occupation currency" to American troops in the European Theatre. The basis for this, it is stated, is the desire on the part of Treasury officials to reduce the buying of French and Belgian goods.

It is further stated that to accomplish this purpose high-level Treasury recommendations to the

Army commanders regarding the maintenance of a status of financial isolation of troops from the peoples of these countries are now in effect. For all practical purposes this appears to have resulted in soldiers and officers being unable to purchase the commodities considered vital and necessary by the soldiers of all armies since Caesar.

It would further appear that in order to obtain French and Belgian francs for the purchase of civilian food, wine, and amusements pilferage and consequent barter of all types of military supplies including ammunition has become widespread.

It is further stated that the Treasury officials had considered that a plan and organization regarding a widespread system of post exchange stores would alleviate the necessity for army purchase of civilian goods.

It is recommended that immediate investigation be made of the conduct and organization of the supply system by the present Quartermaster of the European Theatre, Major General Littlejohn.

It is recommended further that investigation of the present financial policy of the Treasury Department in the Occupied Countries (France and Belgium) be made with a view to providing U.S. troops with adequate currecny for the purchase of civilian goods.

To talk with Kang about this

BF

J. F. Carter folder 3-44

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December 28, 1944.

REPORT ON COLUMBIUM DEPOSITS IN BRITISH GUIANA.

After several conferences with F.E.A., as instructed, it now appears that F.E.A. is powerless to act to acquire this ore, due to a directive from the War Production Board which leaves acquisition of strategic minerals outside the United States to private industry.

Since title now appears to be passing to corporate controls outside the United States, I suggest that the Chairman of the War Production Board should look into this situation immediately, in order to safeguard for American industry the only supply of this metal located in the Western Hemisphere.

J.F.C.
J.F.C.

Technical Series Report No. 30
December 26, 1944

COLUMBIUM DEPOSIT IN BRITISH GUIANA

Reports definitely show that there is a large columbium-tantalite deposit of great strategic value to the United States in British Guiana. (See report of October 2, 1944.)[1]

Analyses of the samples brought to the United States by a subsidiary of the Union Carbide and Carbon Corporation indicate that in richness this deposit equals any known in the world.[2]

In size it is reported to be at least two to three times as large as the deposits in the Sierra Leone and Nigeria, Africa--the only present sources for American war industry. While present U.S. stock piles of this important mineral are not stated to be critical, future needs for both war and peace necessitate most careful and considered action looking toward certain availability of this South American deposit for the United States.

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1. As directed, this report was discussed with Mr. Leo Crowley on October 7, 1944, who then advised that he would immediately issue instructions for proper action.

2. A carefully prepared map and brief describing the location, character, and extent of the deposits is now in the hands of Mr. R.W. Bridgman of the Alloy and Rare Minerals Section, Foreign Economic Administration. Recent reports do not indicate that any action which Mr. Bridgman might take could in any way succeed due to the dominance of War Production Board direction and policy.

It is stated that at the present time a directive of the War Production Board issued in January, 1944, completely restricts the Foreign Economic Administration from purchasing or arranging for the purchase for Government use of strategic minerals or metals. It is further stated that the basis of this order rests on the belief that industry alone will be competent and capable of procuring supplies of such minerals and metals for the future use of the United States.

It is further reported that at the present time negotiations are being carried on between the London office of the Electromet Corporation (a subsidiary of the Union Carbide and Carbon Corporation) and the British owners through the Colonial Office of British Guiana. Other negotiations are being carried on by a Canadian Company through Dr. James of Pioneer Gold, Vancouver, B.C.

It is further stated that successful conclusions of these negotiations may result in the purchase by the London branch of the above Corporation with the result that the title will remain outside the United States.

It is recommended that an immediate investigation be conducted under the direction of the Chairman of the War Production Board to determine that the best interests of the United States are not being prejudiced by the peacetime affiliations of the members of the Minerals and

Metals Section and, further, that steps be taken to negotiate a permanent purchase or other stable arrangement whereby access to this columbite deposit may be assured for the United States.

Dec. 28, 1944. file

MEMO FOR

D. J. B.

Will you tell Mr. Carter to talk with Dr. Bush about this?

G. G. T.

Done 12/29/44

J F Carter file
3-44
PSF

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December 26, 1944.

REPORT ON V-WEAPON DEVELOPMENT.

The attached report recommends that prompt measures be taken to coordinate all so-called "V-weapon" or long range missiles and rocket developments under Vannevar Bush and Karl T. Compton of NDRC. A number of conferences of an exploratory nature indicate that the program so far developed is extremely uncoordinated and may ignore important developments in the rush to duplicate the German V-1 weapons.

With your permission, I should like authority to discuss this with Dr. Bush and Dr. Compton, as the work of this Unit indicates that it would be possible to develop superior types of weapon without interfering with the current program.

In this connection, the Myers engine--the subject of many previous reports--is now being rapidly developed by Higgins at New Orleans and has already made an important contribution. If this device had been taken up seriously when first proposed, we would have had a year's start over the Nazis instead of lagging a year behind.

JFC
J.F.C.

Technical Series Report No. 28

December 20, 1944

STREAMLINED U.S. V-WEAPON DEVELOPMENT

Reference is made to previous reports of June and July of this year on Long-Range Missiles and Rocket Development, as well as the more recent Technical Series Report No. 19, Jet Propulsion by Resonant Combustion, (November 15, 1944).

A recent conference with Dr. Arthur H. Compton confirmed that at this time there is still no high-level coördination looking toward adequate research, development and production of adequate, powerful long-range "V-weapons" of a missile character for U.S. military forces.[1]

It is reported further that all research groups concerned are now recognizing the need for prompt and effective action.

It is further stated that a recent conference in New York resulted in the agreement that Dr. Karl T. Compton of NDRC should head up research in this field. It is further reported, however, that it is the private opinion of all parties that only by the creation of a separate and high-level research group with adequate funds, priorities, and staff can the problem be properly approached.

It is therefore recommended that immediate action be taken to create such a separate research group to

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1. The attached clipping from the New York Times, December 19, 1944, would indicate that some competent scientific personnel in the subject field are presently abroad in London.

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promptly review present status of U.S. development of missile weapons and to energetically push toward U.S. production, distribution, and use by U.S. forces. It has been reported that only under the direction of the present head of scientific research in the American war effort, Dr. Vannevar Bush, can necessary staff, priorities, and clearances looking toward swift action be obtained.

It is therefore recommended that the Chief of Staff of the United States Army be directed to review the immediate present status of V-missile research, production, and distribution as related to previous reports on this subject and further that he be directed by investigation to satisfy himself as to the present status of this work in the United States--all for the purpose of the prompt establishment of adequate research organization and a production plant.

NEW YORK TIMES, December 19, 1944

U. S. SCIENTISTS HELP ALLIES TO RULE AIR

LONDON, Dec. 18 (AP)—A group of American scientists, including a Nobel prize winner, who were flown overseas to help solve the problem of the rocket bombs, contributed to the Allies' domination of the skies over Europe, it was disclosed today.

The scientists, brought from the United States at the request of Maj. Gen. Hugh J. Knerr, commanding the Strategic Air Service Command, were credited with vital assistance in developing the accuracy of strategic bombing. The professors worked out intricate bombing tables for twenty-eight different types of Allied bombs, including Russian. The result of hundreds of tests, these tables give complete data on fuse settings, dropping points and wind drift at all altitudes and conditions—all enabling the bombardiers to hit their targets with still greater accuracy.

The scientists are Dr. John L. Synge, chairman of the mathematics department of Ohio State University; Dr. Howard M. Jenkins, chairman of the electrical engineering department of Swarthmore; Dr. Oswald Veblen, Professor of Mathematics at Princeton; Dr. H. H. Germand, Professor of Applied Mathematics at the University of Florida, and Dr. D. L. Webster, chairman of the physics department of Stanford.

In addition, Dr. Carl Anderson, Nobel prize-winning Professor of Physics at the California Institute of Technology, was recently flown overseas on a special mission in connection with rocket bombs.