

AIRCRAFT SMOKE BOMBS



28 NOVEMBER 1945

This publication is RESTRICTED and shall be safeguarded in accordance with the security provisions of U. S. Navy Regulations, 1920, Article 76.

NAVY DEPARTMENT
BUREAU OF ORDNANCE
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28 November 1945

RESTRICTED

ORDNANCE PAMPHLET 1050 (SECOND REVISION)

AIRCRAFT SMOKE BOMBS

1. Ordnance Pamphlet 1050 (Second Revision) contains instructions for the stowage, handling, suspension, and use of aircraft smoke bombs used by the Navy.

2. This publication supersedes Ordnance Pamphlet 1050 (First Revision), which should be destroyed. The following publications contain information concerning related munitions:

OP 1042—Ships Chemical Smoke Munitions.

OP 1125—Aviation Ordnance—Chemical Spraying Equipment.

Army TM 3-250—Storage and Shipment of Dangerous Chemicals.

3. This publication is RESTRICTED and shall be safeguarded in accordance with the security provisions of U. S. Navy Regulations, 1920, Article 76.



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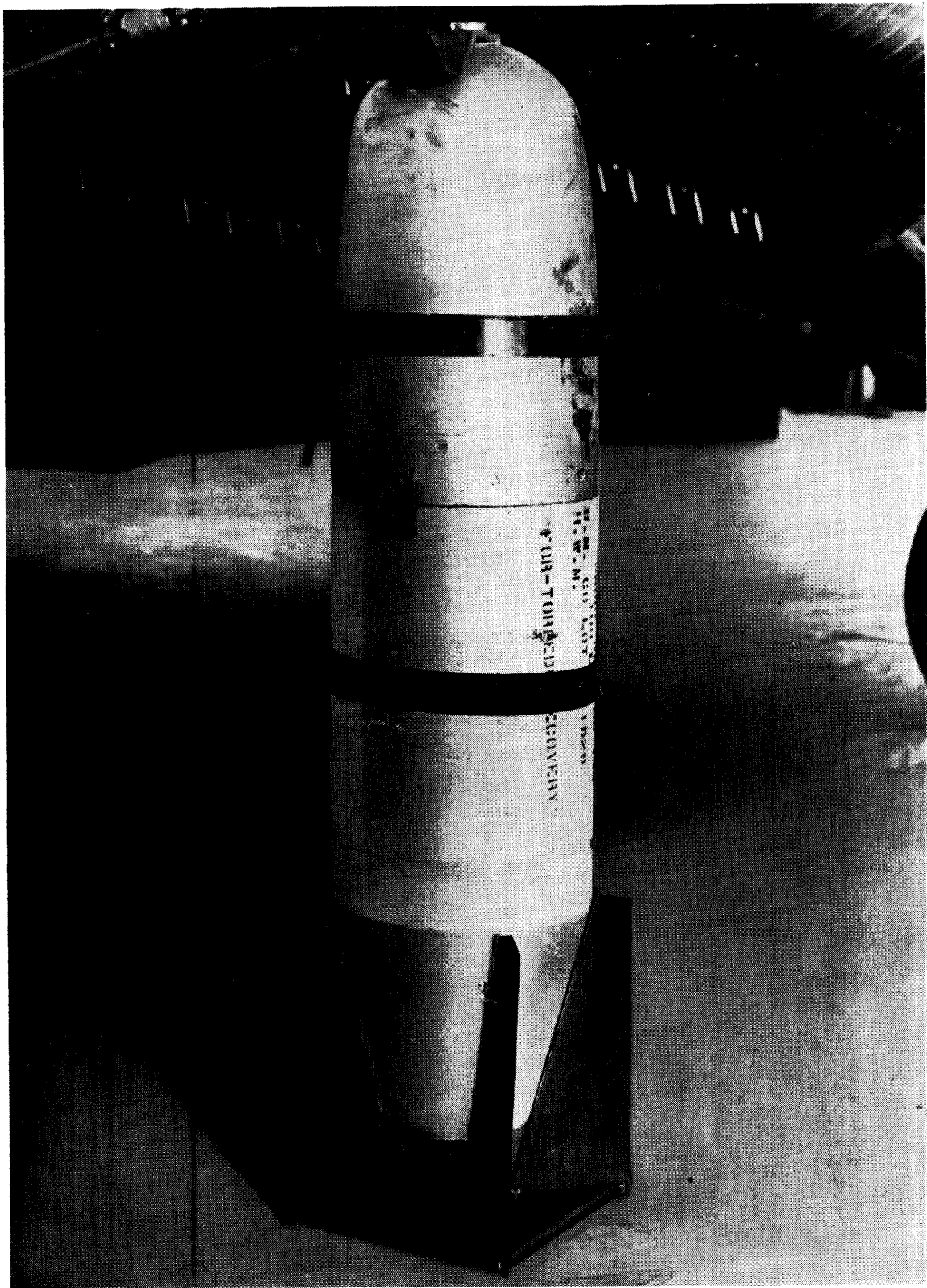


Figure 1—100-lb. Aircraft Smoke Bomb Mark 3

SECTION 1

INTRODUCTION

A. Purpose

This publication is intended to provide instruction for the installation, handling, stowage, suspension, and use of aircraft smoke bombs.

B. Scope

This publication covers the following smoke bombs available to the Navy:

1. The Aircraft Floating Smoke Bombs, of which there are two sizes. The 100-lb. Aircraft Smoke Bomb Mark 3 Mod 0 and the 50-lb. Aircraft Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2.

2. The 100-lb. Quick Opening Cluster E44 of fourteen 10-lb. HC Smoke Bombs M77.

3. The 100-lb. Smoke Bomb M47A2 and AN-M47A3.

SECTION 2

AIRCRAFT FLOATING SMOKE BOMBS

A. General

The aircraft floating smoke bombs for Naval use are filled with HC smoke mix (Type A, composed of hexachlorethane, zinc dust, ammonium perchlorate, ammonium chloride and magnesium carbonate), which upon burning produces a dense white smoke. The 100-lb. Smoke Bomb Mark 3 Mod 0 produces smoke for 6 to 10 minutes, the 50-lb. Smoke Bomb Mark 1 Mod 1 produces smoke for 3.0 to 5 minutes, and the 50-lb. Smoke Bomb Mark 1 Mod 2 produces smoke for 6 to 7.5 minutes. All floating smoke bombs are safe for take-offs and landings anywhere, including carriers. These smoke bombs are floating bombs designed for dropping from aircraft for the purpose of creating a smoke screen, primarily on the surface of a body of water. By means of the fuze adapter Mark 1 Mod 0 these bombs will also function on land impact.

B. Description of Bombs

1. **The 100-lb. Aircraft Smoke Bomb Mark 3 Mod 0 (Figs. 1 & 2).** The 100-lb. Smoke Bomb Mark 3 Mod 0 consists of an aluminum nose casting which carries the smoke charge, a hollow wood float to provide buoyancy, and four tail fins to provide good flight characteristics. The bomb is shipped with a water-impact Fuze Mark

3 Mod 1 in the nose. At the tail of the float is a valve cap with a valve to prevent water from leaking into the interior of the bomb and to act as a baffle giving lateral distribution to the smoke. The bomb weighs 102 pounds, loaded and fuzed, and contains 59 pounds of HC smoke mixture. The outside dimensions of the bomb are 48.5 inches long by 10.25 inches in diameter. The bomb has two movable suspension bands.

2. **The 50-lb. Aircraft Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2 (Figs. 3 & 4).** These bombs are similar to the 100-lb. Smoke Bomb Mark 3 Mod 0 but are smaller in size. They weigh 54 pounds, loaded and fuzed, and contain 28 pounds of HC smoke mixture. The outside dimensions of this bomb are length 38.3 inches and diameter 8.85 inches. These bombs may have either one (Fig. 3) or two (Fig. 4) suspension bands; latest issue will have two bands. Ad interim issue will have one lug band with a forward lug attached by a metal strap to the band for double suspension. Either single or two lug suspension may be used.

The only difference between the characteristics of the Smoke Bomb Mark 1 Mod 1 and the Smoke Bomb Mark 1 Mod 2 is the burning time, the Mark 1 Mod 1 emitting smoke for 3.0 to 5 minutes and the Mark 1 Mod 2 for a period of 6 to 7.5 minutes.



3. Packing and Marking. The Aircraft Floating Smoke Bombs are shipped complete with fuzes and suspension bands packed in wire-bound cleated plywood boxes. The 50-lb. smoke bombs are packed two to a box. The 100-lb. smoke bomb is packed one to a box.

C. Installation

1. The 100-lb. Aircraft Smoke Bomb Mark 3 Mod 0 (Figs. 1 & 2). The 100-lb. Smoke Bomb Mark 3 Mod 0 has two movable suspension bands. It may be suspended from any bomb rack or shackle subject to the following:

(a) For external racks requiring two-lug suspension the nose baffle and suspension lugs should be in line with a plane bisecting two adjacent tail fins (Fig. 2). This is the normal position of the suspension bands.

(b) For internal bomb bay suspension from two-hook shackles or racks the suspension lugs and nose baffle must be rotated 45 degrees until they line up in the same plane as one fin of the tail.

(c) For single-hook bomb rack suspension, the leading band should be moved back to a position 20 inches behind the nose fuze. The other band should be rotated 90 degrees and positioned 8 inches behind the front band. This second band then provides a metal surface for the rear steadying fork of the bomb rack.

2. The 50-lb. Aircraft Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2 (Figs. 3 & 4). The 50-lb. smoke bombs have either one or two movable suspension bands or a movable band with an additional attached lug. They may be used with either single or double suspension.

3. TBF Type Aircraft Capacity. The capacity of TBF type aircraft with complete operational equipment is ten Bombs Mark 1 Mod 1 or Mark 1 Mod 2, or four bombs Mark 3 Mod 0. When bomb bays are equipped with bombs only, the capacity is twelve bombs Mark 1 Mod 1 or Mark 1 Mod 2, or six bombs Mark 3 Mod 0.

4. Arming Wires. Arming wires are required for the 100-lb. Bomb Mark 3 Mod 0 or the 50-lb. Bomb Mark 1 Mod 1 or Mark 1 Mod 2 only when the fuze adapter Mark 1 Mod 0 is used.

D. Ballistics

The Smoke Bomb Mark 3 Mod 0 has a ballistic coefficient of 0.882 and an approximate maxi-

mum striking velocity of 795 feet per second.

The Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2 have a ballistic coefficient of 0.627 and an approximate maximum striking velocity of 694 feet per second.

E. Ignition

The Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2 and the Smoke Bomb Mark 3 Mod 0 are all equipped with the water impact nose fuze Mark 3 Mod 1 (Fig. 5). This fuze, when installed in the bomb and the bomb released over water, functions upon impact as follows: The firing pin, which is held in place by a creep spring, is driven into a primer by fluid pressure. The spit of the primer ignites a length of time fuze which gives an 18-second delay. The time fuze ignites a quick match which ignites the starting mixture, and this initiates the burning of the smoke mixture. Gas pressure formed by the burning smoke mixture breaks the vent discs and opens the valve cap at the tail of the bomb, permitting the smoke to be emitted.

F. Fuze Adapter Mark 1 Mod 0

The Floating Smoke Bomb Fuze Adapter Mark 1 Mod 0 (Fig. 6) is an adapter designed for use with the 100-lb. Aircraft Smoke Bomb Mark 3 Mod 0 and the 50-lb. Aircraft Smoke Bombs Mark 1 Mod 1 and Mark 1 Mod 2. These smoke bombs are shipped with the water impact Fuze Mark 3 Mod 1. By means of the Fuze Adapter Mark 1 Mod 0 the Fuze Mark 3 Mod 1 will function on either land or water impact. The adapter may easily be installed over the fuze in the field without modification to the bomb. The adapter is installed over the fuze and secured by tightening three set screws on the base of the adapter. After the bomb is installed in the airplane, the arming wire is threaded into the adapter and adjusted to protrude about four inches. Two Fahnestock safety clips are slipped over the end of the arming wire, the safety wire is removed. The bomb is ready for take off. When the bomb is released from the plane the arming wire is pulled releasing the spring loaded guard which falls free and the adapter is armed. Upon impact the push pin is forced into the firing pin, which is driven into the primer. The ignition is then similar to that described in paragraph E above.

Figure 3

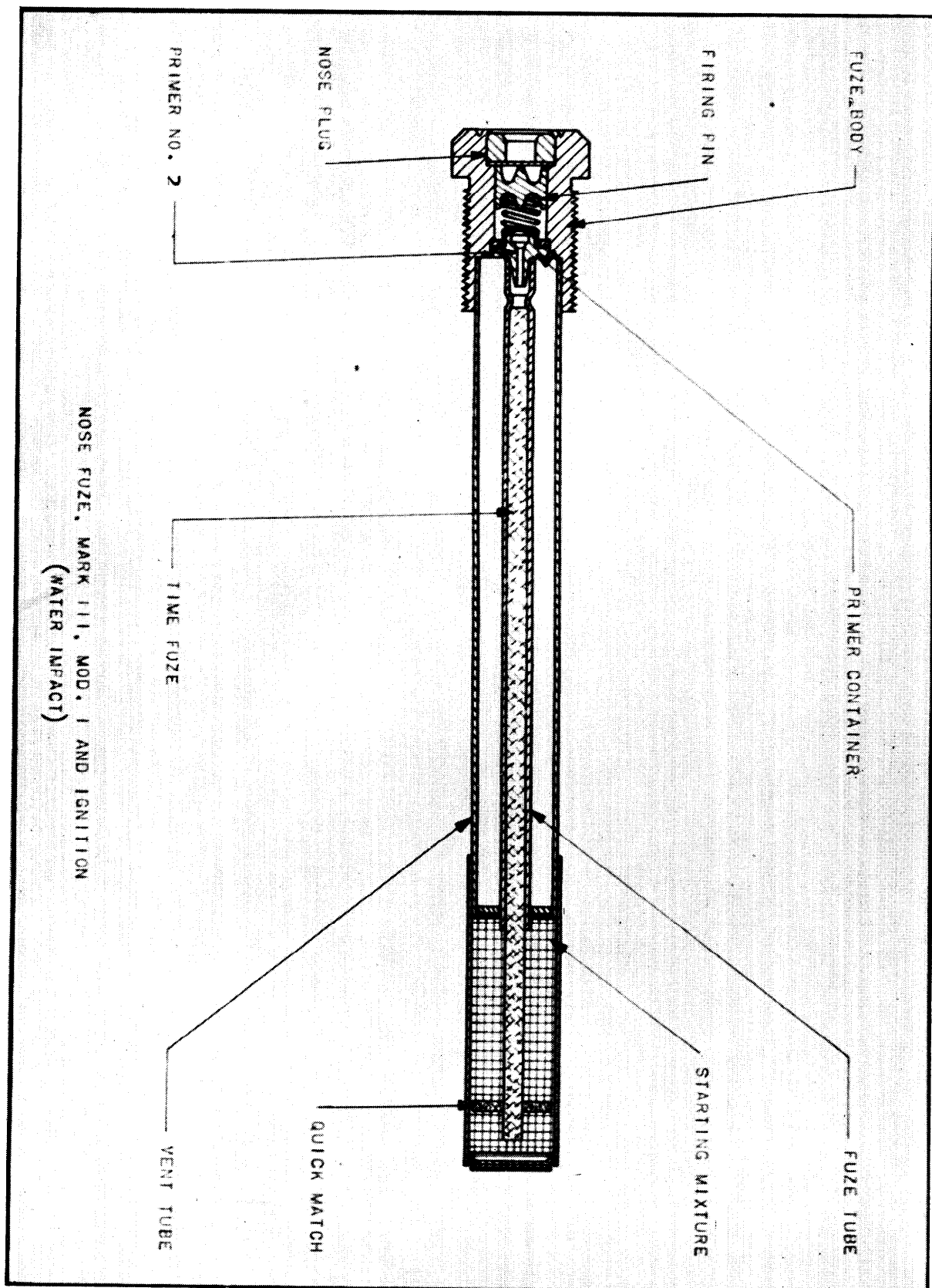


Figure 5

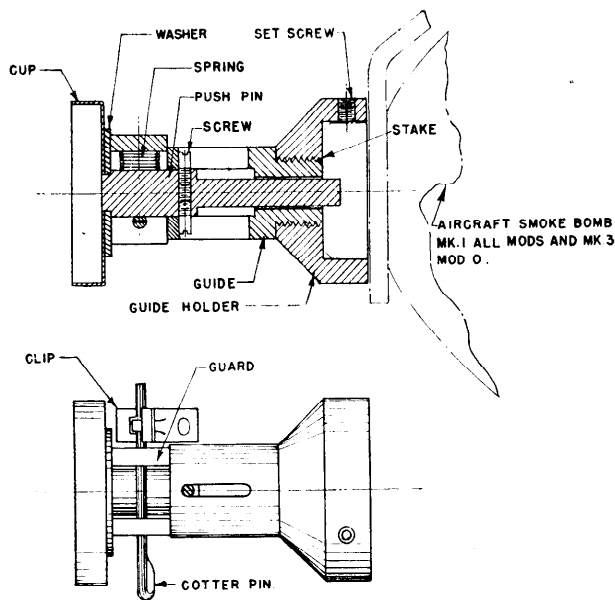


Figure 6—Adapter Mark 1 Mod 0 for Aircraft Smoke Bomb Mark 1 all Mods and Mark 3 Mod 0

G. Use

The Navy floating smoke bombs were originally designed for use over water only, and should not be used over land unless a Fuze Adapter Mark 1 Mod 0 is installed. Tests indicate that these bombs function satisfactorily when used under the following conditions:

<i>Altitude of Release in Feet (Level Bombing)</i>	<i>Minimum Depth of Water in Feet</i>	<i>Type of Bottom</i>
Over 5000	20-40	Sand
1500-5000	10-20	Sand
Below 1500	3-10	Sand
Up to 2500	5 or greater	Hard Coral

SECTION 3

100-LB. QUICK-OPENING CLUSTER E44 OF 14 10-LB. HC SMOKE BOMBS M77

A. General

The 100-lb. Quick-Opening Cluster E44 (designated as the M25 until January 1945), of 14 10-lb. HC Smoke Bombs M77 (Fig. 7) was designed to provide frontal or flank cover for amphibious operations or troop movements and to blanket large areas of enemy positions with smoke. They are for use over land only. Tests have shown that each cluster opens a few feet below the releasing plane and when dropped from 500 feet altitude disperses its bombs over a somewhat elliptical area about 50 yards across. The bombs require two to four minutes after hitting the ground to build up an effective screen, and will produce smoke from eight to twenty minutes. Instructions for the proper operational use of these clusters may be found in Cominch publication P-04 "Smoke Screens for Amphibious Operations." This cluster will function satisfactorily from altitudes of 50 feet to above 5000 feet. A small percentage of duds (10%) may be expected from all altitudes.

B. Description of the 10-Lb. HC Smoke Bomb M77

1. **Construction.** The 10-lb. HC Smoke Bomb M77 consists of a steel hexagonal case 2.87 inches across the flats and 19.5 inches long, weighing approximately thirteen pounds when filled. This bomb has no device for stabilization in flight, and therefore uses the "all-ways" type Fuze M150. Components of the bomb are as follows:

(a) **Body**—a sheet steel leak-proof casing extending the entire length of the bomb (Fig. 8).

(b) **Tail Cup**—A tail cup fits into the rear of the casing, having a dome which in turn houses the fuze.

(c) **Filling**—The bomb is filled with 9.5 pounds of Type "C" HC smoke mixture (Hexachlorethane-zinc oxide-aluminum mix).

(d) **All-ways Fuze M150** (Fig. 9)—This is an all-ways action type fuze. The body and head are zinc alloy castings. This fuze incorporates the primer M26. The booster cup is made of zinc alloy and is filled with a starter mixture.

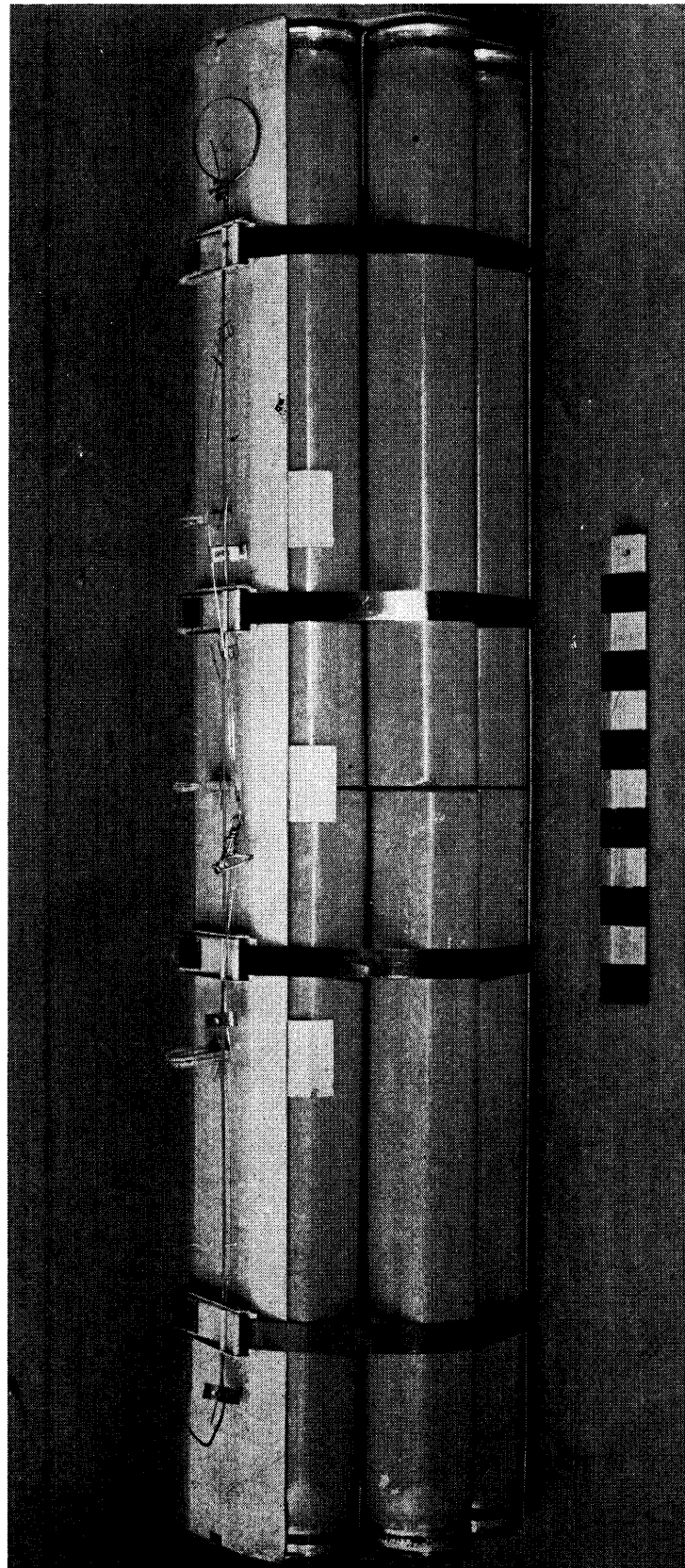
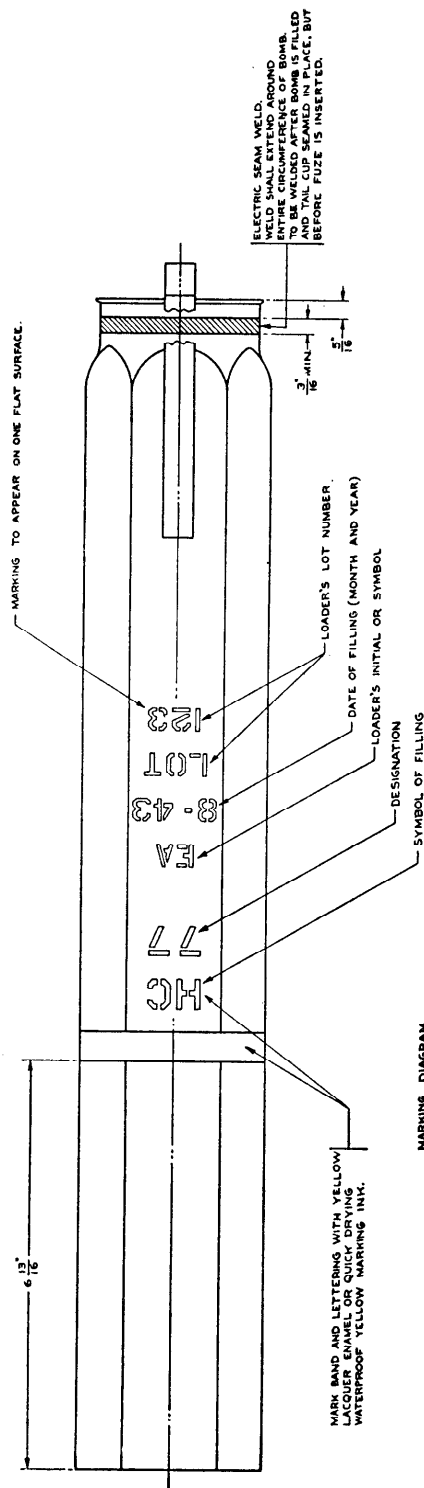
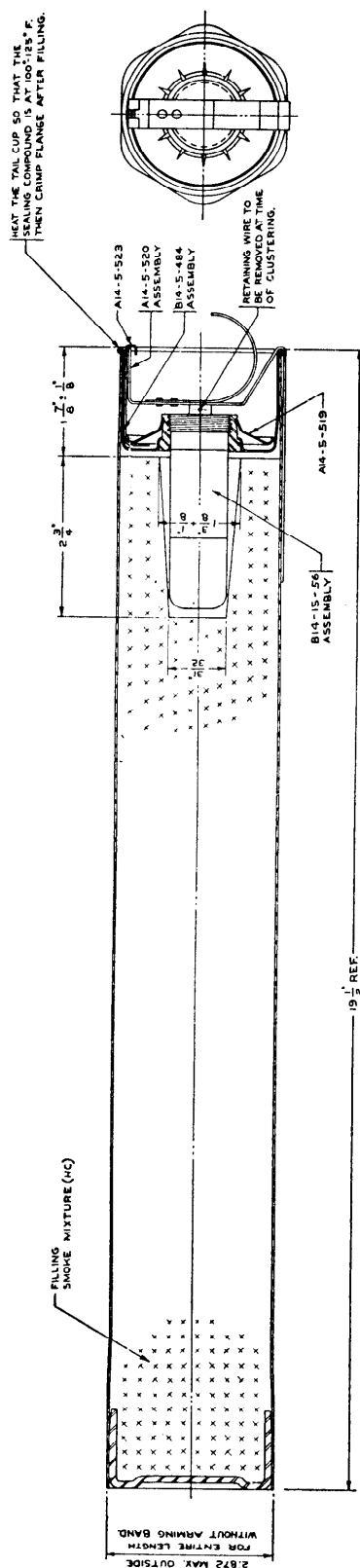


Figure 7—View showing side of 100-lb. Cluster E44 (quick-opening) made up of 14 HC Smoke Bombs M77

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NOTE:
BEFORE INSERTING FUZE APPLY ONE COAT OF BLUE LACQUER ENAMEL TO ALL SURFACES OF BOMB. AFTER ENAMELING ALL SURFACES OF BOMB, NOZZLE PREVIOUSLY LACQUERED. FUZE THREADS SHALL BE CLEAN AND FREE FROM LACQUER.

10 LB. HC SMOKE BOMB M77
BU. ORD. DR. NO. 473480
CWS DR. NO. C14-S-473 (REVISED FEB. 1944)

REN 9 DEC. 1944

Figure 8

2. **Operation.** A retaining pin is removed from the fuze when the fuzed bombs are assembled in the cluster. While the bombs are in the cluster, their proximity holds a release clip to the body of the fuze. When the bombs are released, the arming pin and release clip are forced out by the arming pin spring, permitting the safety pin to enter the cavity in the striker. Impact forces the striker and sleeve together, piercing the primer, which in turn ignites the first fire mixture, which ignites the HC smoke mix. The heat generated by the burning of the first fire mixture and the HC smoke mix melts the zinc alloy fuze body. The smoke is then emitted through the fuze hole in the tail cup. **CAUTION:** Once the arming pin jumps out, the fuze is armed and any attempt to reinsert it may cause the fuze to fire.

3. **Painting and Marking.** The 10-lb. Smoke Bomb M77 is painted blue gray overall with a 1/2-inch yellow band 6 1/8 inches from the tail. On one flat surface the symbol of filling, the designation, loader's initial or symbol, date of filling (month and year) and loader's lot number are stenciled in 3/8-inch yellow marking ink.

C. Description and Operation of the 100-Lb. Smoke Bomb Cluster E44

1. The Smoke Bomb Cluster E44 consists primarily of an M4 cluster adapter, in which fourteen 10-lb. HC Smoke Bombs M77 are secured. The complete cluster, weighing 193 pounds, is issued fully assembled and ready for installation in the airplane.

2. The cluster adapter consists of two parallel channelized bars; one forms the base of the adapter while the other, termed the suspension bar, affords means for attaching the cluster to a rack or shackle. Two twin steel end plates at right angles to the bars complete the adapter frame. The bombs are held within the adapter in two bundles of seven, each bundle being supported by two steel bands circumscribing the cluster. The ends of the bands are brought together above the suspension bar and secured by a buckle-type fastener. When packed for shipping the buckles are prevented from opening by both the arming wire and safety wire. Upon installation, the safety wire is withdrawn and the swivel loop of the forward arming wire is

attached to the arming mechanism of the rack or shackle.

3. Three suspension lugs are set in reinforcing plates directly below the upper suspension bar. The lugs are held up by cotter pins inserted just above the suspension bar. When packed in the shipping box, these cotter pins are removed, allowing the lugs to assume a lowered position. The three cotter pins will be found wired to the center suspension lug. Before installation of the cluster is attempted, the cotter pins must be removed from their shipping position and inserted to hold up the desired suspension lugs. That is, if the cluster is to be suspended from a double hook rack or shackle, the center lug will be left in the lowered position and cotter pins inserted through the fore and aft lugs only. If suspension from a single hook rack or shackle is desired, only the center lug is raised and positioned by a cotter pin.

4. When the cluster is released armed, the arming wire is withdrawn, freeing the strap buckles and allowing the bombs (and the cluster adapter) to fall independently toward the intended target. When released safe, the whole cluster plus arming wire is dropped from the rack or shackle and, as the bombs are retained in the cluster, the fuzes cannot arm. If the cluster is not dropped, the safety wire should again be inserted through the holes provided in the buckle-type fasteners and the entire cluster stowed in its original shipping box.

5. **Painting and Marking**—On one end of the 100-lb. Quick-Opening Cluster E44 the following is stenciled in black:

Cluster Adapter M4 (100-lb. size)
Cluster, Smoke Bomb, E44 (100-lb. size)
14 10-lb. (HC) M77
FRONT
WT. 193 lbs.

6. **Packaging** — The 100-lb. Quick-Opening Cluster M25 is packed in a watertight cylindrical steel container 40 7/8 inches long and 10 3/4 inches in diameter (the total weight of the container and contents is approximately 223 pounds). The container is painted olive drab with a 1/2-inch yellow band painted around the container. The

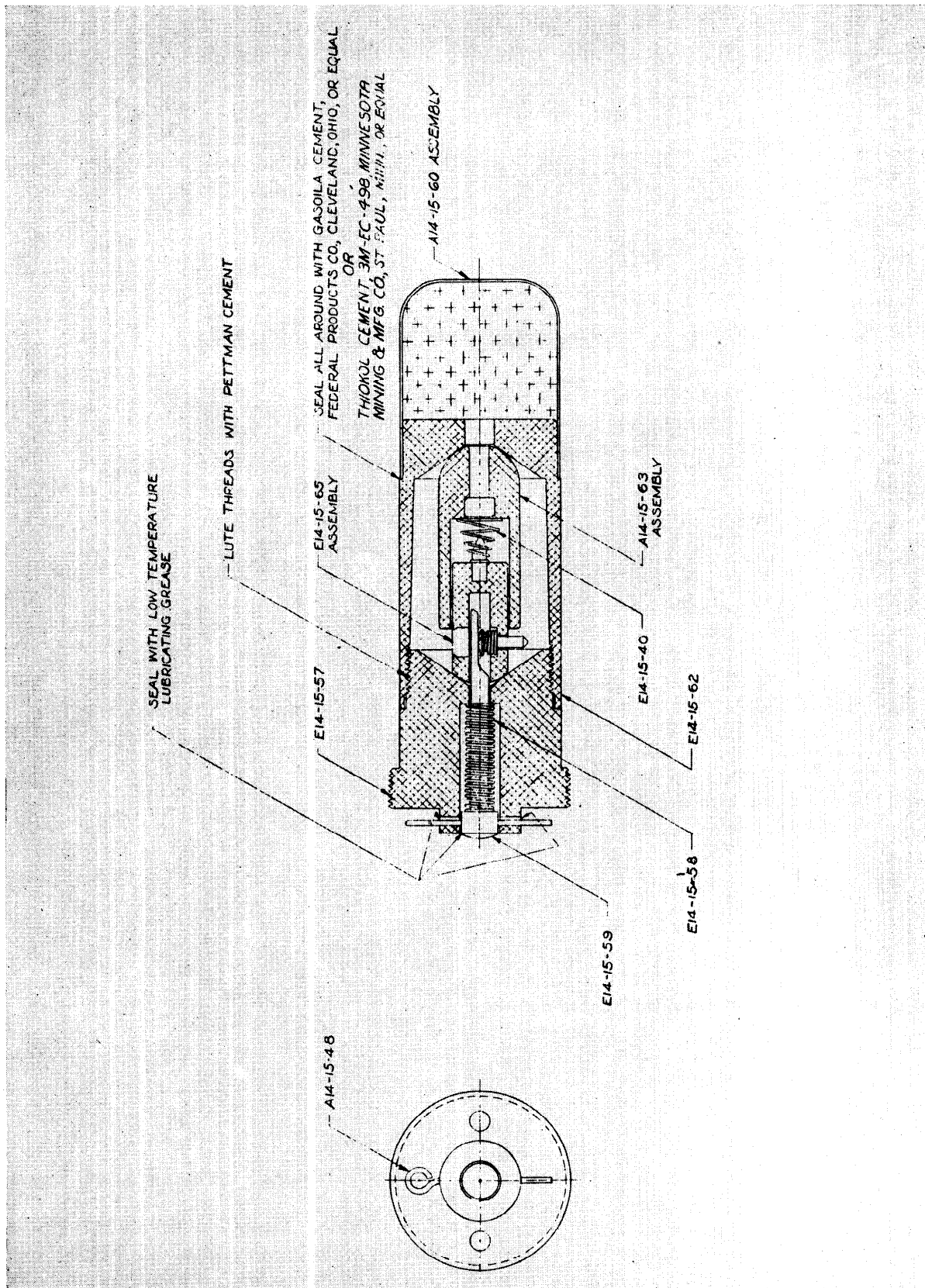


Figure 9—M150 All-Ways Fuze

following is stenciled in 1/2-inch letters on the container:

1-cluster, Smoke Bomb E44 (100-lb. size)
 14 10-lb. (HC) M77
 Name of contractor
 Contract Number—and/or Purchase Order
 Number

Date Packed
 Inspection Number
 Case Number
 Lot Number
 Navy Requisition Number
 CWS Mfg. Order No. 1

Dated

SECTION 4

100-LB. SMOKE BOMB M47A2 AND AN-M47A3

A. General

The 100-lb. Smoke Bomb M47A2 and AN-M47A3 (Figs. 10 & 11) consists of a 100-lb. Bomb Body M47A2 filled with either 100 pounds of WP (white phosphorus) or 72 pounds of PWP (plasticized white phosphorus—a mixture of white phosphorus and synthetic rubber in xylene). This bomb is equipped with a tetryl or black powder burster, and an instantaneous functioning, air-arming nose Fuze AN-M126A1. The only difference between the M47A2 and the AN-M47A3 is in the length of the tail fins. The tail fins of the AN-M47A3 are three inches longer for increased flight stability.

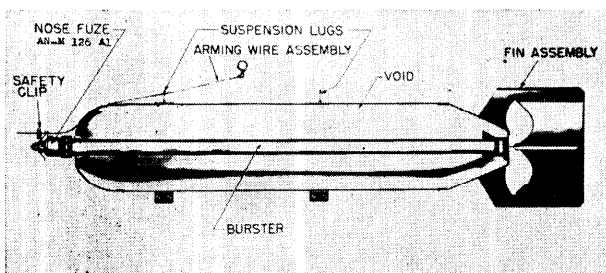


Figure 10—M47A2 WP-filled bomb, breakdown

When the bomb is released from the aircraft, the arming wire is withdrawn and the arming vanes of the fuze are free to rotate. After 725 feet of air travel the fuze is fully armed. Upon impact the striker overcomes the creep spring and strikes the detonator, exploding the burster, which scatters the white phosphorus over a circular area of approximately 30 to 50 yards in radius. An effective white smoke screen is produced for 1 to 2 minutes (WP) and three in five minutes (PWP).



Figure 11—M47A2 WP-filled bomb, exterior

The Smoke Bomb Bodies M47A2 and AN-M47A3 are 46 inches long (49 inches long including spacer, sleeve, shipping plug and tail) and 8 inches in diameter. The body is made of

$\frac{1}{8}$ -inch lap-welded steel and is threaded at the nose to take an axial burster well, which extends to the tail of the bomb body. A sheet steel box-type tail assembly is welded to the bomb body. With the burster well installed, the bomb empty weighs approximately 26 pounds. Two suspension bands of sheet steel, each equipped with a suspension lug, circumscribe the bomb body. The bomb ready for dropping weighs approximately 126 pounds when loaded with WP and 98 pounds when loaded with PWP.

The Smoke Bombs M47A2 and AN-M47A3 may be suspended from any two-hook or single-hook racks or shackles. For suspension from single hook racks or shackles, one suspension band is removed and the remaining band loosened, slid up to approximately the center of gravity of the bomb and then retightened.

B. Complete Round Assembly

The complete round assembly for the 100-lb. Smoke Bomb M47A2 and AN-M47A3 consists of the following components:

1. 100-lb. Smoke Bomb M47A2 or AN-M47A3 filled with 100 pounds of WP (white phosphorus) with burster well installed and burster well cavity plugged with a cork.
2. Burster M4 (1.56 pounds of tetryl) for high altitude bombing; or Burster M18 (260 grams of Black Powder and 260 grams Sand) for low altitude bombing; or Burster M7 (520 grams of Black Powder) may be substituted for either Burster M4 or M18. All bursters are 37.5 inches long by 1.0 inch in diameter. When loaded with PWP this bomb takes the Burster M20 (400 grams of tetryl) 37.5 inches long by 0.75 inch in diameter.
3. Arming wire assembly.
4. Bomb Nose Fuze AN-M126A1.

C. Installation of Fuze AN-M126A1

The nose fuze AN-M126A1 is installed in the 100-lb. Smoke Bomb M47A2 as follows:

1. Thread the arming wire through the front suspension lug of the bomb. The bomb is now ready to be installed in the airplane.
2. After the bomb is installed in the airplane, the fuze AN-M126A1 is screwed into the nose of the bomb, hand-tight, until it seats. Use no tools.

3. Thread the arming wire through the arming wire guide and tab on the vane of the fuze and adjust the wire to protrude four inches beyond the vane.

4. Slip two safety clips (Fahnestock connections) over the arming wire and push them up to the arming wire tab on the vane of the fuze.

5. Remove the seal wire from the fuze.

6. Remove adhesive tape from the fuze collar if present.

D. Special Precautions for Fuze AN-M126A1

The nose Fuze AN-M126A1 lacks certain desirable safety characteristics, because this fuze, although air arming, is constructed with the firing pin in line with the detonator. If the 100-lb. Smoke Bomb M47A2 equipped with this fuze is dropped nose down onto a hard surface from a height of several feet or more, the fuze, although unarmed, is liable to detonate the burster because the fuze body can be crushed sufficiently to force the firing pin into the detonator of the fuze.

The fuze AN-M126A1 may be used in the 100-lb. Smoke Bomb M47A2 by both land-based and carrier-based Naval aircraft providing that the fuze is installed only after the bomb has been installed in the aircraft, and providing that all bombs equipped with fuze AN-M126A1 are jettisoned before landing.

A new fuze, the M159, has been developed to replace the fuze AN-M126A1. The fuze M159 incorporates a detonator safe feature and may be installed in bombs prior to their installation in the aircraft. The fuze M159 is safe for all takeoffs (including catapult) and landings (including arrested) anywhere.

E. Painting and Marking

The body of the 100-lb. Smoke Bomb M47A2 is painted blue-grey. All marking and lettering on the bomb is in yellow lacquer enamel or water-proof yellow ink. The bomb has 1-inch wide yellow band, denoting smoke filling, 5 $\frac{1}{2}$ inches forward of the rear suspension band. The words "100-LB SMOKE BOMB M47A2" are printed in 1-inch letters beginning 1 inch aft of the forward suspension band. Immediately aft of this lettering is "BURSTER M4" and "WP FILLING" in $\frac{3}{4}$ -inch letters. One-half inch for-

ward of the rear suspension band in $\frac{1}{2}$ -inch letters is the lot number, date of loading, and the identification mark of the loading facility.

F. Packaging

The 100-lb. Smoke Bomb M47A2 is shipped unfuzed and without burster or arming wire in a wooden box, one bomb to a box. The dimensions of the box are $9\frac{3}{8}$ inches by $10\frac{1}{2}$ inches by $50\frac{3}{8}$ inches. The shipping weight is approximately 150-170 pounds. The shipping box is marked with the same information which is on the bomb body.

The markings on the shipping box are for identification of the material, and to comply with Interstate Commerce Commission Regulations. If smoke bomb shipping containers are repainted, they should be marked with a facsimile of the original markings.

The Bursters M4 are packed fifty to a wooden box. The dimensions of the box are 3.44 feet by 1.09 feet by 0.69 foot. The approximate weight of the box and contents is 148 pounds. The Bursters M7 or M18 are also packed fifty to a wooden box of similar dimensions, weighing 128 pounds per box.

The Fuzes AN-M126A1 are packed twelve to a cardboard carton, four cartons to a wooden box. The dimensions of the box are $11\frac{3}{8}$ inches by $9\frac{1}{2}$ inches by $23\frac{1}{8}$ inches. The approximate weight of the box and contents is 80 pounds.

Arming wire assemblies are shipped in individual water-proof envelopes, 100 envelopes to a carton, six cartons to a wooden box. The dimensions of the boxes may vary. The approximate weight of the box and contents is 75 pounds. The Navy will furnish Mark 3 arming wire assemblies to replace arming wires supplied by the Army.

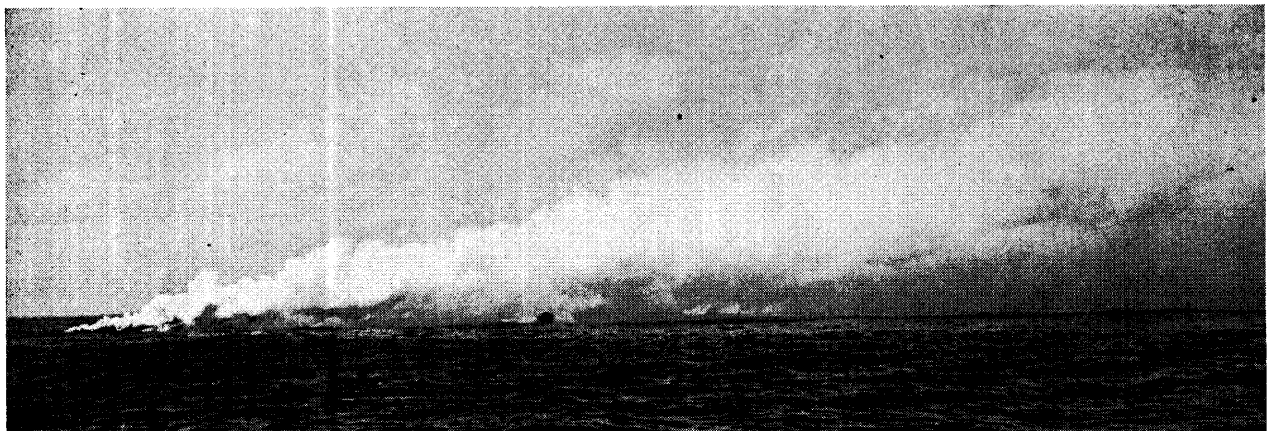


Figure 12—Foreground: typical smoke emission of Floating Smoke Bomb Mark 3 Mod 0 five minutes after initiation

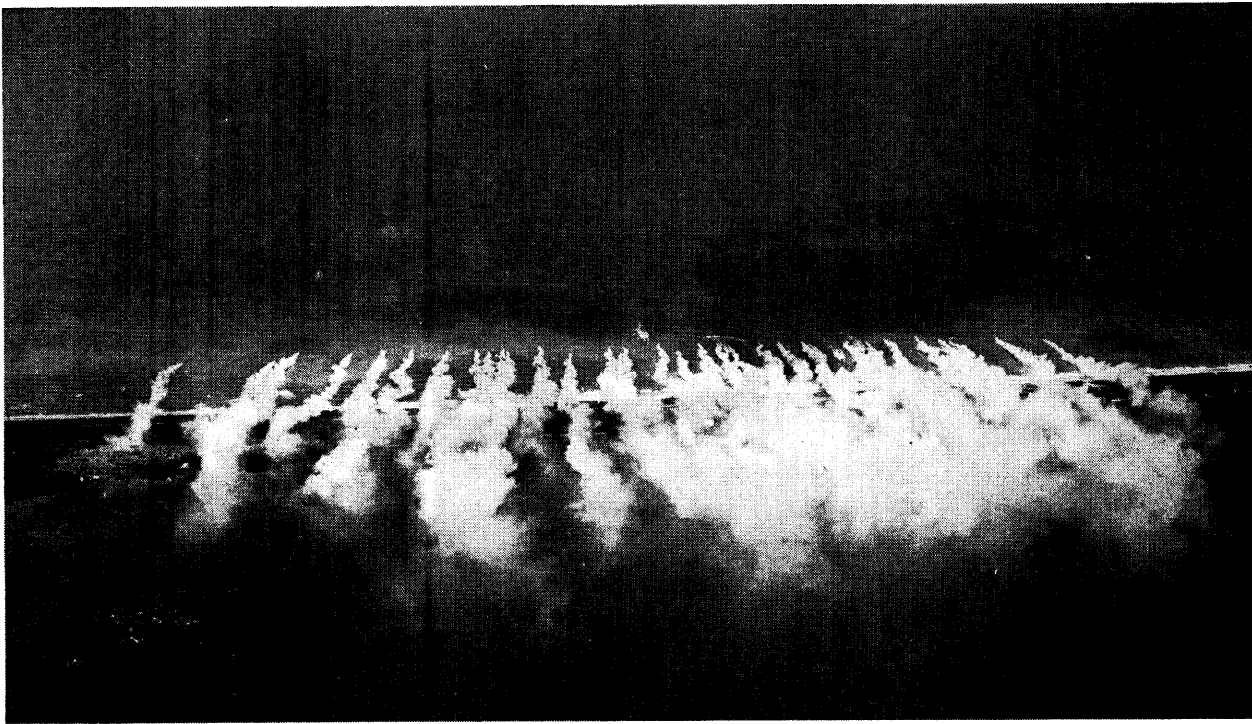


Figure 13—Frontal screen (onshore wind conditions) from Floating Smoke Bombs Mark 1 Mod 2 over 1,000 yards of beach

SECTION 5

PRECAUTIONS IN MAINTENANCE

A. HC Munitions

1. **Handling.** Because the addition of even small amounts of moisture or water to the HC smoke mixtures in floating smoke bombs can cause spontaneous ignition of the smoke mixture, the watertight integrity of these bombs must be preserved. Therefore, smoke bombs should be handled with care during shipment and they should not be dropped, skidded, or rolled. Although the smoke mixture in the bombs M77 will not ignite from the effects of moisture or water, clusters of these bombs should also be handled with care to maintain the integrity of the clusters.

2. **Stowage Ashore and Afloat.** HC smoke bombs should be stowed on shipboard during shipment in a tight cargo hold equipped with facilities for flooding, and they should not be overstowed with other cargo. Stowage in a hold in which no other ammunition or cargo is stowed is preferable. HC smoke bombs should be

stowed aboard warships and ashore in magazines containing other HC smoke munitions only, such as HC smoke bombs, pots, floats or grenades. Stowage of HC smoke bombs aboard warships should be above the waterline near the stern, with provisions made so that the smoke bombs may be readily jettisoned. HC smoke bombs must be protected from sea spray and high temperature (above 100 degrees F). If a smoke bomb ignites accidentally, the principle danger is from spreading of the fire to adjacent crates and subsequent ignition of these bombs. **Water in large volume** should be used in fighting HC smoke fires. Foamite and carbon dioxide extinguishers or fog nozzles are much less effective than water as HC smoke mix does not require atmospheric oxygen for its combustion.

3. **Special Precautions.** HC smoke has toxic effect on unmasked personnel subjected to strong concentrations and some toxic effect is noticed from long exposure to light concentrations. Gas masks should be adjusted when HC

smoke is released in enclosed places, and also when personnel are subjected to prolonged exposures, however light.

B. WP Munitions

1. **Handling.** As WP munitions ignite spontaneously in contact with air they should not be handled roughly lest their air-tight integrity be destroyed. If a fire does occur, personnel should wear gloves and keep both the gloves and their shoes wet. WP smoke is toxic on prolonged and repeated inhalation, but is not likely to be harmful in the concentrations found in smoke screens in the open. Gas masks afford complete protection from concentrated WP smoke, but they tend to become clogged, and therefore they should not be worn except where serious exposure in enclosed spaces is involved.

2. **Stowage.** Since any bomb leakage or malfunctioning in stowage would result in generation of quantities of acrid smoke and fires which are difficult to permanently extinguish on board ship, the 100-lb. Smoke Bombs M47A2 or

AN-M47A3, WP filled or PWP filled, should be stowed, protected from rain, spray, and direct sunlight, and topside where jettisoning is readily possible. Ashore the bombs should be stowed in fireproof magazines away from all other types of munitions. No WP munitions should be stowed at temperatures exceeding 100° F.

3. **Decontamination.** White phosphorus fires are easily extinguished permanently with a 5 per cent copper sulfate solution. If this solution is not available, water or wet sand may be used to temporarily extinguish the fires. Fires thus extinguished will re-ignite when the phosphorus has dried out. Therefore, they must be kept wet until all the white phosphorus has been removed. WP in contact with the skin will cause severe and lingering burns. Places of contact should be immediately washed and kept wet until the phosphorus has been removed. Washing the affected area with soda solution, followed with a 5 per cent copper sulfate solution, is very effective, but greasy ointments should never be used as such ointments merely spread the contamination.

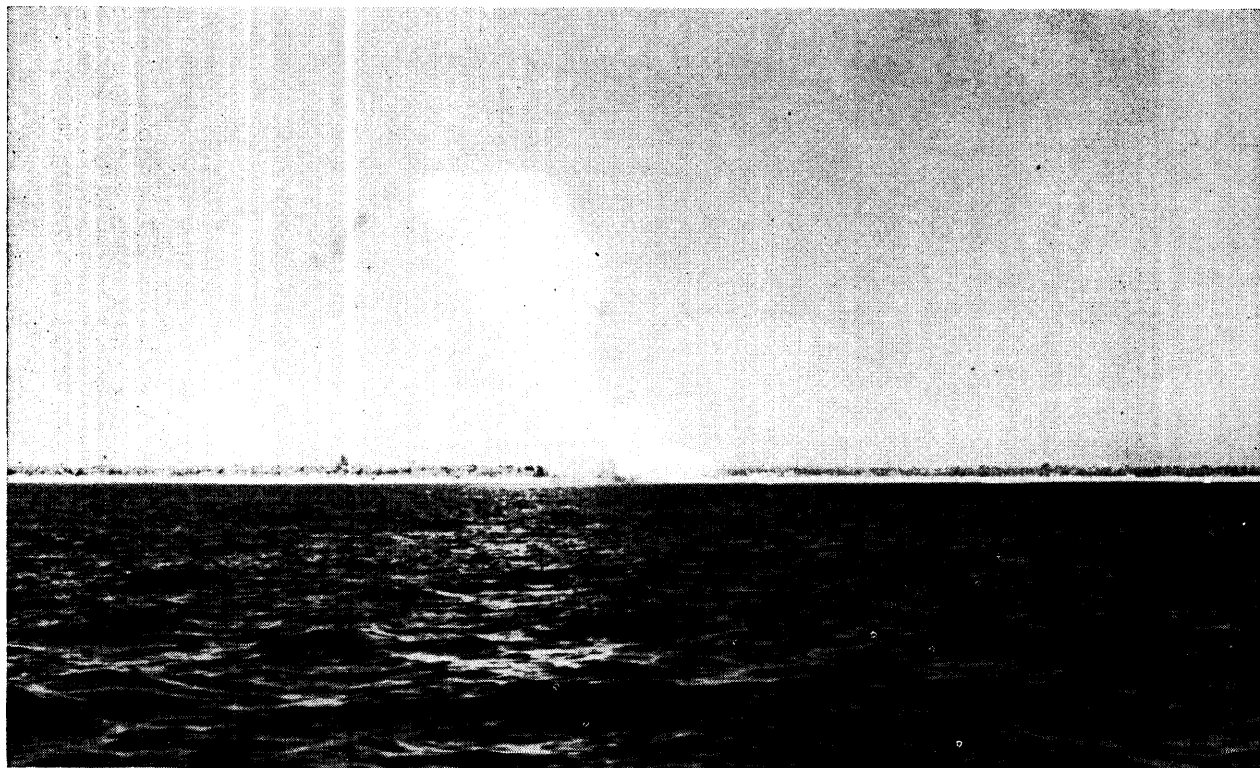
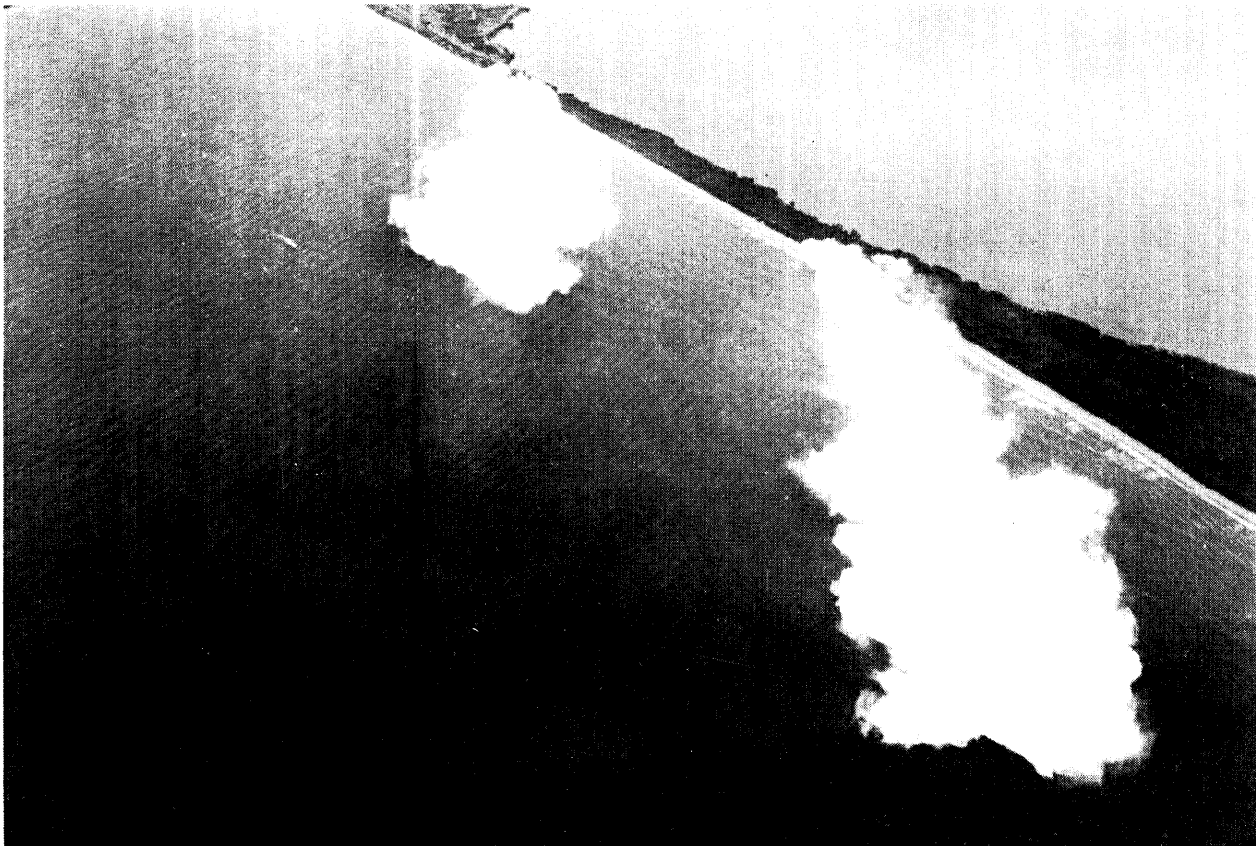


Figure 14—Smoke from M47A2 WP-filled smoke bombs



**Figure 15—Flank screens each produced by six bombs M47A2, PWP-filled, 2¼ minutes after burst.
Screens were being maintained by burning pieces of PWP and were effective for 10 minutes**

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