PART ONE

DROPPED MUNITIONS

OBJECTIVES

To learn identification, operation, explosive fillers, hazards, related equipment, and the disposal procedures for dropped munitions.

INTRODUCTION

This text will provide a review of the older type bombs and a more detailed study of the newer type bombs being used in SEA. Most EOD technicians do not get involved in the build up of munitions and are not completely familiar with the installation, or removal of the bomb fins, or the set screws that physically lock items in place.

This text will also provide a review of the operation of arming lanyards and associated components for bombs equipped with internal conduits. The review will be helpful to those who have not been working with conventional weapons the last few years. This text will be used in conjunction with classroom discussion.

GP BOMBS

1-1. Type: Old Series Bombs (reference figures 2-1, 2-2, and 2-3)

1-2. Identification:

   a. Sizes: 100- to 2000-pounds

   b. Markings: In yellow or black. The number of yellow bands on the nose and tail indicate the explosive filler.

   c. Lugs and Fins: 14- and 30-inch suspension. These bombs may use box or conical fins.

1-3. Fillers: (50 percent weight ratio)

   a. TNT

   b. Tritonal

   c. Amatol

   d. Comp B

1-4. Hazards: The smoke and fumes from burning TNT is highly toxic. Comp B and tritonal are more sensitive to drop.

1-5. Related Equipment: (reference figure 2-3)

   a. Fuzes (nose and/or tail)

   b. Fin assembly
Bomb, GP, tritonal, 100-lb, AN-M30A1

Bomb, GP, tritonal, 250-lb, AN-M57A1

Bomb, GP, tritonal, 500-lb, AN-M64A1

Bomb, GP, tritonal, 1,000-lb, AN-M65A1

Figure 2-1. Bomb, General Purpose, Series
Figure 2-2. Bomb, General Purpose, w/Conical Fin
### Horizontal Dangerous Radius of Bomb Casing Fragments

<table>
<thead>
<tr>
<th>Bomb</th>
<th>Maximum Danger Radius of Fragments from Point of Detonation</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 lb GP</td>
<td>3000 feet</td>
</tr>
<tr>
<td>250 lb GP</td>
<td>3000 feet</td>
</tr>
<tr>
<td>500 lb GP</td>
<td>3000 feet</td>
</tr>
<tr>
<td>1000 lb GP</td>
<td>3000 feet</td>
</tr>
<tr>
<td>2000 lb GP</td>
<td>3000 feet</td>
</tr>
</tbody>
</table>

### Blast Effect on Personnel

<table>
<thead>
<tr>
<th>Bomb</th>
<th>Approximate Maximum Effective Distance on Personnel</th>
</tr>
</thead>
<tbody>
<tr>
<td>100 lb GP</td>
<td>40 feet</td>
</tr>
<tr>
<td>250 lb GP</td>
<td>55 feet</td>
</tr>
<tr>
<td>500 lb GP</td>
<td>75 feet</td>
</tr>
<tr>
<td>1000 lb GP</td>
<td>90 feet</td>
</tr>
<tr>
<td>2000 lb GP</td>
<td>110 feet</td>
</tr>
</tbody>
</table>

### Color Code

<table>
<thead>
<tr>
<th>Filler</th>
<th>Use</th>
<th>Base Color</th>
<th>Color &amp; No of Bands</th>
<th>Markings</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Explosive</td>
<td>General Purpose</td>
<td>Olive Drab</td>
<td>3 Yellow/Tritonal</td>
<td>Black</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>2 Yellow/Comp B</td>
<td>or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1 Yellow/Other HE</td>
<td>Yellow</td>
</tr>
<tr>
<td></td>
<td>Fragmentation</td>
<td></td>
<td></td>
<td>or</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1, 3&quot; Yellow/All</td>
<td>HE</td>
</tr>
<tr>
<td>Inert (w/</td>
<td>Practice</td>
<td>Blue (May</td>
<td>None</td>
<td>White</td>
</tr>
<tr>
<td>Spotting</td>
<td></td>
<td>also be</td>
<td></td>
<td></td>
</tr>
<tr>
<td>charges in</td>
<td></td>
<td>black,</td>
<td></td>
<td></td>
</tr>
<tr>
<td>most cases)</td>
<td></td>
<td>metallic,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>or orange</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inert</td>
<td>Drill</td>
<td>OD</td>
<td>1 Black</td>
<td>Black</td>
</tr>
<tr>
<td>Leaflets</td>
<td>Leaflet</td>
<td>OD</td>
<td>1 Aluminum</td>
<td>Black</td>
</tr>
</tbody>
</table>

Figure 2-3. Classification of Aircraft Bombs

2-4
c. Adapter booster

d. Arming wire and fahnstock clips

1-6. **Disposal:** Detonate

**DESTRUCTION BOMBS**

1-7. **Type:** New Series Bombs (reference figure 2-4)

1-8. **Identification:**

a. **Sizes:**
   
   (1) 750-lb M 117

   (2) 3000-lb M 118

b. **Markings:**

   (1) OD bomb body

   (2) Markings in yellow

   (3) 1 wide yellow band (3 inch)

c. **Lugs:** 14- and 30-inch

d. **Fins:** Conical or retarded (MAU 91/B for M 117)

1-9. **Fillers:** Normally tritonal; minol can be used.

1-10. **Hazards:**

a. Tritonal is sensitive to drop.

b. Minol—do not trepan and steam.

1-11. **Related Equipment:**

a. Nose and tail plugs.

b. Arming wires/lanyards with fahnstock clips.

c. Charging well for special fuzing (electrical/mechanical).

d. Adapter boosters: T 45 and T 46 for older fuzes, M 59 and M 134 for the new type fuzes. The latter incorporates electrical detonators.

1-12. **Disposal:** Detonate
Figure 2-4. M117, 750-lb. GP Bomb w/Plumbing
GP BOMBS

1-13. **Type:** Low Drag Bombs (reference figures 2-5, 2-6, and 2-7)

1-14. **Identification:**
   a. **Sizes:**
      1. 250-lb MK 81
      2. 500-lb MK 82
      3. 1000-lb MK 83
      4. 2000-lb MK 84
   b. **Markings:**
      1. OD bomb body
      2. Yellow markings
      3. 1 wide yellow band (3 inch)
   c. **Lugs:** 14- and 30-inch (screw-in type)
   d. **Fins:** Conical and snakeye

1-15. **Filler:** Tritonal

1-16. **Hazards:** Tritonal is sensitive to drop (12 inches).

1-17. **Related Equipment:**
   a. Nose plugs and tail plugs are used with some fuzing.
   b. Internal conduit and charging wells.
   c. Retaining screw-in nose.
   d. Interchangeable adapter boosters, dependent on fuzing.
   e. Arming wires/lanyard with fahnstock clips.

1-18. **Disposal:** Detonate

**NOTE:** Fuze Extenders: Fuze extenders may be used on all GP series bombs. These extenders contain either tetryl or Comp B. M 103 or M 904 can be used for fuzing.
Figure 2-5. Bomb, General Purpose MK 82 Mod 1
Figure 2-6. Bomb, General Purpose MK 81 Mod 1
Figure 2-7. MK 82 Snakeye, Retarded (High Drag) Configuration
DEMOLITION BOMB

1-19. **Type:** BLU 31/B (reference figure 2-8)

1-20. **Identification:**
   a. Size: 800-lb, bluff shape, anti-ricochet design.
   b. Markings: OD color, black markings with yellow band on nose.
   c. Lugs: 14-inch screw-in type suspension lugs. The rear suspension lug is positioned 29 inches forward of the base of the bomb.
   d. Fin: Uses an MK 82 low drag fin.

1-21. **Filler:** 250 pounds of tritonal/destex.

1-22. **Hazards:** Tritonal is sensitive to shock (12 inch drop).

1-23. **Related Equipment:**
   a. Nose fuze (FMU 30/B)
   b. Tail plug
   c. Internal conduit and charging well
   d. Battery firing device

1-24. **Disposal:** Detonate

FRAGMENTATION CLUSTER, (Non-Aimable)

1-25. **Type:** M1A1, 100-lb (reference figures 2-9 and 2-10)

1-26. **Identification:**
   a. Size: AN-M1A1, 20 pound (5 each)
   b. Markings:
      1. OD bomb body
      2. Yellow band
      3. Black markings
   c. Lugs: One lug welded to the body at the center of gravity.
   d. Fins: A tail fin is threaded to the bomb and secured by a set screw.
Figure 2-8. Bomb, Demolition, 800 pound, BLU 31/B

Figure 2-9. Bomb, Fragmentation, 20-lb, M 41
1-27. **Cluster Operation:** Upon release, the arming wire is extracted from the cluster allowing the bombs to separate. Fuze vane rotation begins at cluster bomb separation.

**NOTE**

The arming wire (M141) must be disconnected prior to fuze removal.

1-28. **Filler:** TNT and Comp B (14 percent weight ratio)

1-29. **Related Equipment:** None. The AN-M41A1 bomb is issued assembled and completely fused in the M1A1 cluster.

1-30. **Hazards:** The smoke and fumes from burning TNT is highly toxic.

1-31. **Disposal:** Detonate

**CLUSTER FRAGMENTATION (Aimable)**

1-32. **Type:** AN-M28A2, 100-lb (reference figures 2-11 and 2-12)

1-33. **Identification:**

a. **Size:** M 83, 4-lb (24 each)

b. **Markings:**

   (1) OD bomb body

   (2) Yellow band on nose

   (3) Type of bomb fuze marked on cluster body; that is, M 129, M 130, M 131, or "mixed."

c. **Lugs:** 14-inch suspension; may be carried by single suspension (Navy).

d. **Fins:** Box-type fin with drag plate.

1-34. **Cluster Operation:** Upon release, the arming wire is withdrawn and the fuze is allowed to arm. The fuze functions, permitting the cluster to open. The 24 M 83 frag bombs are dispersed by spring action.

1-35. **Filler:** TNT

1-36. **Related Equipment:**

a. Nose fuze

b. Arming wire--fahnstock clip
Figure 2-11. Bomb, Fragmentation; 4-Pound, M83
Figure 2-12. Cluster, Fragmentation Bomb: 100-lb. M28A2, Cutaway
1-37. **Hazards:** The smoke and fumes from burning TNT is highly toxic.

**NOTE**

The M 131 fuze contains an anti-disturbance action.

1-38. **Disposal:** Detonate

FRAGMENTATION BOMBS

1-39. **Type:** M 88 and M 81 (reference figures 2-13 and 2-14)

1-40. **Identification:**

a. **Sizes:**

   (1) 220-lb M 88

   (2) 260-lb M 81

b. **Markings:**

   (1) OD bomb body constructed of spirally wound square steel wire. The size of the square steel wire is the only basic difference of the two bombs. The 220-lb is 13/16 inch and the 260-lb is 1 inch.

   (2) Yellow bands on nose and tail to identify the filler.

c. **Lugs:** 14-inch suspension; single suspension lug on opposite side.

d. **Fins:** Box or conical.

1-41. **Filler:** Comp B or TNT (220-lb may use ednatol).

1-42. **Hazards:** The smoke and fumes from burning TNT is highly toxic. Both bombs use auxiliary boosters.

1-43. **Related Equipment:**

a. Nose and tail fuzes.

b. Tail fins (box or conical).

c. Arming wire assembly with fahnstock clips.

1-44. **Disposal:** Detonate
Figure 2-13. 220-lb. Fragmentation Bomb AN-M88 Cutaway
Figure 2-14. 260-lb. Fragmentation Bomb AN-M81 Cutaway
LEAFLET BOMB

1-45. **Type**: M-129 series (reference figures 2-15 and 2-16)

6. **Identification**:

   a. **Sizes**: 750-lb, the external configuration is similar to the 750-lb demolition bomb.

   b. **Markings**: Olive green bomb body made of fiber glass. The bomb body is split in half longitudinally into two sections held together by four latches on each side.

   c. **Lugs**: Three recesses, the two outside recesses are for 14-inch suspension, the center recess is for single suspension.

   d. **Fins**: Four fiber glass sections glued and riveted together to form a cone. The fin assembly is attached to the bomb body with eight Dzus fasteners.

1-47. **Cluster Operation**: After release, the MT fuze functions at a predetermined time causing detonating cord to detonate, separating the two body sections, detaching the fin assembly and releasing the leaflets.

1-48. **Filler**: Leaflets

1-49. **Hazards**: Explosive components of the fuze, booster, and detonating cord.

1-50. **Related Equipment**:

   a. Nose fuze (MT) with adapter booster.

   b. Arming wire assembly.

   c. Fin assembly.

1-51. **Disposal**: Burn

---

INCENDIARY BOMB

1-52. **Type**: AN-M47A4, 100-lb (reference figures 2-17a and 17b)

1-53. **Identification**:

   a. **Size**: 100-lb AN-M47A4

   b. **Markings**:

      (1) Green body, yellow band with red markings.

      (2) Cylindrical body, round nose, tapered aft section with welded on box fin constructed of thin sheet steel.

   c. **Lugs**: Suspension bands equipped with heavy gauge suspension lugs. For single suspension, remove one band.

2-20
Figure 2-15. Bomb, 750-lb. Leaflet, M129 Series
Positioning of Detonating Cord Through Opening in Base of Fuze Well

Figure 2-16. Fuzing Components of Leaflet Bomb, M129 Series
100-lb Smoke or Incendiary Bomb AN-M47A4, Exterior View

Figure 2-17A

Figure 2-17B. 100-lb. Smoke or Incendiary Bomb AN-M47A4, Exploded View
d. Fins: Welded on box type.

1-54. Filler: WP or PWP. PWP is more effective than WP because of its longer burning time, reduced pillaring, and increased antipersonnel effect.

5. Hazards: WP precautions apply. Leakers could detonate from heat.

1-56. Related Equipment:
   a. Nose fuze.
   b. Burster M 18 or M 20 (black powder/tetryl).
   c. Arming wire assembly.

1-57. Disposal: Detonate

FIRE BOMB

1-58. Type: BLU Series (reference figure 2-18)

1-59. Identification:
   a. Sizes:
      (1) BLU 1/B series 750-lb
      (2) BLU 10/B series 250-lb
      (3) BLU 23/B 500-lb
      (4) BLU 27/B prefilled 750-lb
      (5) BLU 32/B prefilled 500-lb
   b. Markings: Unpainted aluminum alloy construction. No color code on the prefilled (napalm B). The BLU-1, T0, and 23/B may have a 3-inch red band on the nose fuze. All bombs are tip tank type configuration.
   c. Lugs: All BLU series fire bombs are equipped for 14-inch suspension.
   d. Fins: The use of fin assemblies is optional except for the BLU 10 series. No fin assembly is provided for the BLU 10 series.

1-60. Filler: The BLU-1, 10, and 23 use napalm; the BLU-27 and 32 use napalm B.

1-61. Hazards: Fire. When fused, all bombs will contain "ALWAYS ACTION" fuzing.

1-62. Related Equipment:
   a. Fuzes/igniters (nose and tail).
   b. Fin assembly (optional).
   c. Cable and initiator assemblies.
Figure 2-18. BLU Series Fire Bomb and Components (Typical)
I-63. Disposal: Burn

NOTE
Prefilled napalm B bombs have welded seams.

INCENDIARY CLUSTER

I-64. Type: M 36 Cluster / TH 3, 4-lb, M 126 bomb (reference figures 2-19a and 2-19b)

I-65. Identification:

a. Sizes: The M 36 incendiary bomb cluster (750-lb) consists of an M 30 cluster adapter loaded with 182 M 126 incendiary bombs (4-lb).

b. Markings: Olive green color, clam shell type body; red band on nose of cluster.

c. Lugs: Three threaded suspension lug mounting holes. The two outer holes or the center hole may be used, depending on suspension used.

d. Fins: A conical type attached to the cluster by a lock ring and tie rod.

I-66. Cluster Operation: At release, the arming wire is withdrawn from the mechanical time fuzes allowing vane rotation to arm the fuzes. The fuzes function, detonating the detonating cord in the upper and lower cluster casings hinge tube, allowing the casings to separate. The M 126 bombs fall free of the cluster, arm on separation, and function on impact.

I-67. Filler: 182, 4-lb, TH 3 incendiary bombs (MG bomb body with TH 3 filler)

I-68. Hazards: A 22-foot length of detonating cord is located in the hinge tube of the cluster.

NOTE

The AN-M50XA3, 4-lb, TH 3 incendiary bomb, contains an explosive charge. This bomb, minus its fin assembly, looks identical to the M 126 bomb.

I-69. Related Equipment:

a. Two MT tail fuzes.

b. Fin assembly.

c. Arming wire assembly with fahnestock clips.

I-70. Disposal: Burn
Figure 2-19A. Incendiary Bomb Cluster, M35 or M36, Exploded View

Figure 2-19B. Bomb, Incendiary: TH3, 4-Pound, M126 Cutaway View
CHEMICAL BOMBS, CS

1-71. **Type:** BLU 52/B and BLU 52 A/B (reference figures 2-20a, 2-20b, and 2-20c)

2. **Identification:**
   a. Sizes: 750-lb modified BLU 1C/B fire bomb.
   b. Markings:
      (1) BLU 52/B--OD bomb body constructed of aluminum. Three gray stripes located on the nose, tail, and center sections. These stripes are 3-1/2 inches wide with a 1/2 inch red stripe centered on the gray.
      (2) BLU 52 A/B--gray bomb body constructed of aluminum. Two decals, one each on nose and tail, 1-1/2 inches wide with two red stripes 1/2 inch wide centered in gray.
   c. Lugs: 14-inch suspension.
   d. Fins: Welded or bolted construction.

3-73. **Filler:**
   a. BLU 52/B--259 pounds of CS-1
   b. BLU 52 A/B--259 pounds of CS-2

-74. **Hazards:** CS is an irritation chemical agent.

1-75. **Related Equipment:** Tail fin assembly.

**NOTE**

The bombs do not contain explosive components. They function by bursting upon impact to disseminate the chemical agent.

1-76. **Disposal:** Decontaminate (Disaster Preparedness)

FLARE, AIRCRAFT PARACHUTE

1-77. **Type:** MK 24 series (reference figure 2-21)

1-78. **Identification:**
   a. Size: The flare is aluminum alloy construction, 35.9 inches long and 4.8 inches in diameter. Weight is 27 pounds.
   b. Markings: A brown band on white located at the aft end of flare body.
   c. Candlepower: 2,000,000

2-28
Figure 2-20A. Markings for Chemical Bomb, BLU-52 A/B
Figure 2-20B. Markings for Chemical Bomb, BLU-52/B

NOTE
1. Painted stripes on items lot TKL-1-11 to TKL-1-10 (3 places)
2. Segmented decals on items lot TKL-1-11 to TKL-1-13 (2 places)
Figure 2-20C. Chemical Bomb, BLU-52/B and BLU-52 A/B
Figure 2-21. MK24, Aircraft Parachute Flare
d. Burning time: 3 minutes, generates 3,500 degrees centigrade.

e. Launching method: Dropped, dispensed, or thrown by hand from aircraft.

1-79. **Operation:** Ignition and ejection settings are made on the fuze prior to launch. The safety pin is removed as last step prior to launch. At launch the ejection delay is actuated by the flexible steel cable when it receives 6 to 12 pounds of pull. At 50 pounds of pull the lanyard disconnect separates. When the parachute and illuminate composition are ejected, the ignition delay is initiated by hot gases from the ejection charge. The parachute opens and the illuminating composition is ignited upon expiration of the ignition delay.

1-80. **Filler:** 15 pounds of magnesium and sodium nitrate.

1-81. **Hazards:** Ejection charge, always approach and work from the side.

1-82. **Disposal:** Refer to AFTO 60K-2-2-4.

**FLARE AIRCRAFT PARACHUTE**

1-83. **Type:** MK 45 (reference figures 2-22a and 2-22b)

1-84. **Identification:**

a. **Size:** The flare is of aluminum alloy construction, 36 inches long and 5 inches in diameter. The weight is 28 pounds.

b. **Markings:** A brown band on white located at the aft end of the flare body.

c. **Candlepower:** 2,000,000

d. **Burning time:** 2.5 to 3 minutes, generates 3,500 degrees centigrade.

e. **Launching method:** Clamped on suspension lugs.

1-85. **Operation:** At release, the lanyard removes the safety clip and releases a cocked striker to ignite a positive 2 second safe separation delay. At the expiration of the preset delay, the ejection charge separates the parachute and candle. Two sets of cables are attached to the parachute shroud lines, one of which is shorter than the other. As the parachute is deployed, the short set of cables exerts a pulling force on the firing pin assembly, cocking and releasing the firing pin which ignites the firing train and candle. As the candle approaches burnout, the resultant heat functions an explosive bolt releasing 10 shroud lines, collapsing the parachute.

1-86. **Filler:** Magnesium, sodium nitrate, and a binding agent.

1-87. **Hazards:** Flare candle, igniter assembly, explosive bolt in the parachute assembly, and the fuze MK 364.

1-88. **Disposal:** Refer to AFTO 60K-2-2-10.
HELICOPTER TRAP WEAPON

1-89. **Type:** BLU-82/B. Bomb. Blast. Cradled

1-90. **Identification:**
   a. Slide Nrs: 
   b. ST Page 
   c. OD in color 
   d. 2 inch wide yellow band around the nose of the bomb. 
   e. Weight: 15,000 lbs (12,000 lbs of explosive DBA-22M gelled slurry). 
   f. Bomb and cradle weight: 15,600 lbs. 
   g. Approximately 11.5 feet in length; 4.5 feet in diameter. 
   h. Bomb has 9 external lugs. 3 lugs in a row on the horizontal centerline on each side of the bomb and 3 lugs in a row on the top centerline.

1-91. **Hazardous Components:**
   a. Nose and tail auxiliary boosters, BBU-23/B. 
   b. Nose adapter-booster, T45E7. 
   c. Tail adapter-booster, M147. 
   d. Nose fuze, M904E2. 
   e. Tail fuze, M905. 
   f. Fuze extension, M1 or M1Al. 
   g. Brush deflector - no hazard. 
   h. Fuze drive assembly (electric motor) - no hazard. 
   i. Bomb stabilization parachute - no hazard.

1-92. **Operation:**
   a. Bomb, bomb cradle and platform are pulled from the aircraft (cargo type) by an extraction chute. 
   b. A static line pulls on four mechanical knives to sever the nylon webbing securing the bomb to the cradle and platform. 
   c. Arming wire is withdrawn from the nose fuze, the motor shaft of the tail fuze drive assembly and the deployment line of the weapon stabilization parachute is pulled as the bomb separates from the cradle and platform. 
   d. Arming wire is pulled from the tail fuze drive assembly pullout switch as the weapon stabilization parachute deploys. 
   e. Nose and tail fuzes function upon impact.

1-93. **Filler:** Refer to AFTO 60B-2-2-23.

1-94. **Disposal:** Refer to AFTO 60B-2-2-23.
PART TWO
BOMB FUZES

IMPACT FUZE, NOSE

2-1. Type: Vane Armed M 103 through M 165 Series (reference figure 2-23)

2-2. Identification:
   a. Blunt nose vane cup with the words "DEEP SLOT DELAY" and "SHALLOW SLOT INST" stamped on the fuze body flange.
   b. With the exception of the M 148 fuze, the M 103A1 is typical in size and appearance of the M 103 series. The M 148 has different body threads and the contour of its booster resembles that of the standard Japanese Navy gaine.

2-3. Hazardous Components:
   a. Primer.
   b. Delay column.
   c. Detonator.
   d. Two detonator leads.
   e. Booster, approximately 7 ounces of tetrytol.

2-4. Function: At release, the arming wire is extracted allowing vane rotation, causing the arming screw to unthread, lifting the vane cup clear of the safety discs and allowing the detonator slider to position itself under one of the detonator leads. Impact causes detonation. The delay firing pin always strikes the delay primer, igniting the delay column which detonates the booster regardless of fuze setting.

IMPACT FUZE, NOSE

2-5. Type: Vane Armed M 904 Series (reference figures 2-24a, 2-24b, and 2-24c)

2-6. Identification:
   a. The M 904 has a two-bladed arming vane, which may or may not be secured to the nose assembly by a one-inch hex nut.
   b. The arming delay indicator plate is attached to the fuze body by four screws. Two flanges, 180° apart, extend outward from this plate.
Figure 2-23. Bomb Nose Fuze M103 Thru M165 Series
Figure 2-24A. Fuze Nose M904

Figure 2-24B. Fuze M904 Top and Bottom View
Figure 2-24C. Fuze M904 Cutaway View
2-7. **Hazardous Components:**

a. Delay element.
b. Relay element.
c. Detonator.
d. Detonator lead-in.
e. Booster.

2-8. **Function:** Rotation of the arming vane turns the governor drum which turns the arming stop assembly and the striker. The firing pin is keyed to the striker; as a result the firing pin and firing pin guide turn with the striker. When arming time has elapsed, the striker spring forces the striker against the bottom of the arming stop assembly and the spring loaded striker ball is forced into the space above the firing pin. Simultaneously, a longitudinal slot aligns with the stem of the rotor release. This allows the rotor release to clear the rotor, the rotor pivots and aligns the detonator.

**IMPACT FUZE, NOSE**

2-9. **Type:** Vane Armed M 110, M 126, M 158, and M 159 Series (reference figures 2-25a, 2-25b, and 2-25c)

2-10. **Identification:**

a. The M 110 has two arming wire guides, a "C" block, arming sleeve, and an in-line detonator.

b. The M 126 is identical to the M 110 except it has a steel cylinder the same size as the booster.

c. The M 158 and M 159 are similar to the M 110 except it has no "C" block; the striker moves up while arming and the detonator is held out of line. The difference between the M 158 and M 159 is the M 158 has a larger booster than the M 159.

2-11. **Hazardous Components:**

a. Detonator

b. Det lead (M 158 only)

c. Booster charge (except the M 126)

2-12. **Function:**

a. M 110 and M 126--vane rotation causes the movable gear and arming sleeve to move downward as the arming sleeve unthreads from the arming hub. When the arming sleeve clears the safety block, the block falls away, arming the fuze.

b. M 158 and M 159--vane rotation causes the movable gear, arming sleeve firing pin and striker to move upward as the arming sleeve threads into the arming...
Figure 2-25A. Nose Fuze AN-M158 and AN-159

Figure 2-25B. Nose Fuze AN-M126A1

Figure 2-25C. Nose Fuze AN-M126A1 thru M193
hub. After required vane rotation, the firing pin clears the det rotor allowing it to rotate to the armed in-line position. The det rotor is locked in position.

IMPACT FUZE, TAIL

2-13. **Type:** Vane Armed M 100 and M 189 Series (reference figures 2-26, 2-27a, 2-27b, and 2-27c)

2-14. **Identification:**

a. The M 100 series fuzes differ externally from each other in arming stem tube length.  
b. The M 189 series fuzes differ from each other in the length of the flexible drive shaft.  
c. The two groups of fuzes differ from each other in the type of arming vane mechanism employed.

2-15. **Hazardous Components:**

a. Primer detonator.  
b. Black powder delay column.

2-16. **Function:** Vane rotation causes the arming stem to unthread from the inertia plunger, arming the fuze. When the arming stem unthreads from the fuze body cap, the vanes, bearing cup assembly, and arming stem fall free from the fuze as a unit. The M 189 arming stem is unthreaded from the inertia plunger by rotation of the anemometer and the flexible shaft. The fuze is armed when the arming stem clears the inertia plunger.

IMPACT FUZE, TAIL

2-17. **Type:** Cocked Stricker, Vane Armed M 112 and M 115 Series (reference figure 2-28)

2-18. **Identification:**

a. The fuze designation may be printed or stamped on the cylindrical surface of the fuze body.  
b. These fuzes differ in their arming stem tube length. The M 115 series uses a gear reduction system identical to the M 100 series. The M 112 series uses a direct drive system.

2-19. **Hazardous Components:**

a. Primer detonator.  
b. Delay mixture and relay.
Figure 2-26. Tail Fuze, 100 Series
Figure 2-27A. Tail Fuze M190 and M191

Figure 2-27B. Tail Fuze M190 and M191 Cutaway View

Figure 2-27C. Fuze M190 and M191 Arming Drive Assembly

2-45
Figure 2-28. Tail Fuze AN-M115 and Cutaway View
2-20. **Function:** Vane rotation causes the arming stem to unthread from the inertia plunger, arming the fuze. Upon impact, the inertia plunger overcomes the creep spring and moves forward. When the plunger advances sufficiently, lockwheels are cammed outward into counterbored areas of the fuze, releasing the cocked striker.

**IMPACT FUZE, TAIL**

2-21. **Type:** Vane Armed M 905 (reference figures 2-29a, 2-29b, and 2-29c)

2-22. **Identification:**
   a. The fuze designation is stamped on the cylindrical surface of the fuze body.
   b. The fuze has selective arming time delays of 4 to 20 seconds in 2-second and 4-second intervals which are marked on the fuze body.
   c. An upper inspection window provides visual indication of the condition of the fuze.

2-23. **Hazards:**
   a. Delay element.
   b. Relay element.
   c. Detonator.

2-24. **Function:** Vane rotation causes rotation of the drive shaft, governor, reduction gear, and internal gear. The internal gear, firing pin and firing pin guide are keyed to rotate as a unit. Arming time is complete when the projection of the internal gear reaches a stop on the fuze body. Simultaneously, the firing pin is armed and the rotor release assembly allows the det rotor to align. The fuze functions on impact as inertia drives the firing pin into the delay element.

**IMPACT FUZE, TAIL**

2-25. **Type:** Vane Armed M 906 (reference figures 2-30a, 2-30b, and 2-30c)

2-26. **Identification:**
   a. The fuze designation may be printed or stamped on the cylindrical surface of the fuze body.
   b. The fuze has no provision for selective arming delay. The arming time of $1.97 \pm 0.4$ seconds is predetermined by design.
   c. The T5 and T6 delay elements provide impact firing delays.
Figure 2-29A. Tail Fuze M905

Figure 2-29B. Fuze M905 Arming Assembly

Figure 2-29C. Fuze M905 Cutaway View
Figure 2-30A. Tail Fuze M906

Figure 2-30B. Fuze M906 Drive Assembly

Figure 2-30C. Fuze M906 Cutaway View
2-27. **Hazardous Components:**

a. T5 or T6 series delay elements.

b. Rotary detonator.

2-28. **Function:** Vane rotation is transmitted through the flexible shaft to the input drive assembly and reduction gear train which drive the plunger release screw. Rotation of the plunger release screw causes the screw to be withdrawn from the plunger assembly. As the plunger release screw rotates, the rotor release screw, which is keyed to the plunger release screw, withdraws from the rotary assembly cavity and frees the rotor to move to the aligned position. Upon impact, the plunger assembly moves forward. When the annular groove in the plunger aligns with the steel ball that restrains the firing pin, the ball is forced into the plunger groove and frees the firing pin.

**TAIL, CHEMICAL LONG DELAY, ANTI-WITHDRAWAL, BOOBYTRAPPED**

2-29. **Type:** M 123 Series Vane Armed (reference figures 2-31a and 2-31b)

2-30. **Identification:**

a. This series fuze can always be identified by the two flat shoulders on the fuze body.

b. The M 123, M 124, and M 124 fuzes are delay arming; the A1 and A1(A2) are direct arming.

c. The M 123 series fuzes have a four-bladed arming vane and arming head assembly. The M 123A1 series have an eight-bladed arming vane and a direct drive arming mechanism. The A1(A2) series fuzes have a four-bladed arming vane, direct drive arming mechanism, and a reach rod that is coupled to the arming stem by a pin.

2-31. **Hazardous Components:** The detonator is the only explosive component of the fuze.

2-32. **Function:** Vane rotation causes the arming stem to thread into the fuze and into the solvent filled glass ampoule, breaking the ampoule and releasing the solvent to the absorber and delay collar. The solvent dissolves the delay collar sufficiently to allow the lockballs to be cammed inside and clear the firing pin screw. When this occurs, the firing pin spring drives the firing pin into the detonator. The anti-withdrawal booby trap feature of the fuze is armed as soon as the safety clip is removed. Any action which separates the body extension from the fuze body 3/32 inch (about 1-1/5 turns) will fire the fuze. When an attempt is made to unthread the fuze from the bomb, the anti-withdrawal ball binds the fuze body extension to the adapter booster in the bomb causing the fuze body to separate from the fuze body extension. As a result, the sleeve balls move outward releasing the spring-loaded firing pin.
Figure 2-31A. Fuze, Tail, Long Delay Anti-Withdrawal M124A1 and Cutaway View
B. FIRING PIN RELEASED WHEN CELLULOID DELAY COLLAR IS DISSOLVED BY FLUID CONTAINED IN AMPouLE (ONLY FIRING PIN SNAPS FORWARD)

C. FIRING PIN RELEASED BY ANTI-WITHDRAWAL DEVICE (COMPLETE FIRING PIN ASSEMBLY SNAPS FORWARD)

Figure 2-31B. M123A1 - Operation
TIME FUZE NOSE

2-33. **Type:** M 447 Series (reference figures 2-32a and 2-32b)

2-34. **Identification:** This series fuze is mechanical time, vane armed, aerial burst type. A graduated time scale is stamped on the head of the fuze. The fuze designation may be stamped on the fuze body.

2-35. **Hazardous Components:**
   a. Booster
   b. Primer
   c. Detonator

2-36. **Function:** When the arming wire is extracted, the arming pin is ejected and vane rotation is allowed. When the arming pin is ejected, the time mechanism starts. After 4.5 seconds, the time mechanism allows the detonator to align with the explosive train. Fuze will airburst at the preset time. The arming vane assembly operates the delay arming mechanism to remove the safety block between the striker and the vane nut. If the fuze is armed and the preset firing time is greater than time of fall to target, the fuze will function at impact.

TIME FUZE NOSE OR TAIL

2-37. **Type:** M 907 Series (reference figure 2-33)

2-38. **Identification:** The M 907 is a mechanical time, delayed arming (vane and pin armed cocked striker) fuze. Fuze markings are stamped on the fuze body near the fuze seating surface. Fuzes may be set from 4 to 92 seconds.

2-39. **Hazardous Components:**
   a. Booster
   b. Primer
   c. Detonator

2-40. **Function:** When the arming wire is extracted, vane rotation occurs and the arming pin is ejected. This allows the timing disc assembly to rotate. Rotation of the timing disc allows the firing pin to retract to the firing position. When the arming gear slot is aligned with the arming stem, the arming stem moves upward allowing the slider to move to the in-line position. Continued rotation of the timing lever releases the cocking pin, which, in turn, releases the spring-loaded firing pin. If the fuze fails to function on airburst, it will function on impact.
Figure 2-32A. Tail Fuze AN-M147A1
Figure 2-32B. Fuze, Tail, Mechanical Time AN-M147A1
Cutaway View
Figure 2-33. M907, M908, M909 Mechanical Time Fuzes and Applicable Boosters
AIR BURST FUZE

2-41. **Type:** M 914 (reference figures 2-34a and 2-34b)

2-42. **Identification:** This fuze is of the bar type, incorporating a transmitter and receiver. It is vane armed and proximity fired. Fuze designation and loading information is stenciled on the lower portion of the fuze body.

2-43. **Hazardous Components:**
   a. Electric detonator.
   b. Explosive lead-in.
   c. Booster.

2-44. **Function:** When the arming wire is extracted, the vanes turn a generator supplying power to transmitter/receiver circuits and firing capacitor. An arming rotor is attached to the generator shaft and is aligned to the armed condition at Min SAT. When a material object enters the zone of influence of the fuze, a reflected radio wave causes the receiver to close a firing switch, discharging the capacitors through the detonator.

IMPACT, AIRBURST, CLOCKWISE LONG DELAY AND ANTI-DISTURBANCE FUZES

2-45. **Type:** Vane Armed Fuzes used in the M 83, 4 pound, Butterfly Bomb M 129, M 130, and M 131 (reference figures 2-35a, 2-35b, 2-35c, 2-35d, and 2-35e).

2-46. **Identification:** All three types of fuzes (M 129, M 130, and M 131) are direct arming. The M 129 is an impact or airburst mechanical time fuze. The M 130 is a clockwise long delay fuze with delays from 10 to 60 minutes in 10 minute increments. The M 131 is a mechanical anti-disturbance fuze.

2-47. **Hazardous Components:**
   a. Primer.
   b. Detonator.
   c. Booster.

2-48. **Function:**
   a. M 129: The arming stem is withdrawn allowing the segment gear to turn until stopped by the segment gear stop. Impact releases the inertia pellet clear of the stop allowing the segment gear to continue turning; thereby turning the half-round cam to a position that will allow the striker to impinge the primer. Airburst is selected by turning the selector to "AIR"; thereby depressing the inertia pellet allowing the camshaft to rotate until the half-round notch will allow the striker to impinge the primer.
Figure 2-34A. Proximity Fuze M914 Cutaway

Figure 2-34B. Proximity Fuze M914

2-58
Figure 2-35A.
Fuze M129 Impact and/or Airburst

Figure 2-35B.
Fuze M130 (Clockwork Long Delay)
M131 (Anti-Disturbance)
Figure 2-35C. Fuze M129, Cutaway View
Figure 2-35D. Fuze M130A, Cutaway View
Figure 2-35E. Fuze M131Al Cutaway View
b. **M 130:** The arming stem is withdrawn removing the positive block between the firing pin and the primer and the clockwork mechanism is started. When the preset time expires, the release cam releases the striker and impinges the primer.

c. **M 131:** The arming stem is withdrawn removing the positive block between the firing pin and primer and allows the fuze to become partially armed. Final arming occurs at impact. Any disturbance of the fuze will allow the timing gear to resume its rotation. The release arm pivots so that the half-round section of its shaft clears the firing pin, which is driven into the primer.

**ALL-WAYS ACTING, IMPACT FUZE**

2-49. **Type:** M 173, Fuze (reference figures 2-36a, 2-36b, and 2-36c)

2-50. **Identification:** This fuze is used with fire bomb igniters. It is vane armed and impact fired. The vane is of the anemometer type. The fuze may or may not be marked.

2-51. **Hazardous Components:**

a. Primer.

b. Detonator.

c. Booster.

2-52. **Function:** When the arming wire is extracted, the arming vanes rotate and unscrews the arming pin from the fuze; thereby completing the arming sequence. When the fuze receives impact in any direction it will function.

**FMU SERIES FUZE ASSOCIATED EQUIPMENT**

2-53. **Type:** FMU Series Fuze Associated Equipment (reference figures 2-37a and 2-37b)

2-54. **Physical and Functional Description of Components:**

a. The battery firing device contains a firing pin, a compression spring, a spring-loaded ball release mechanism, and a lanyard cable with a ball at one end. When the lanyard cable is pulled at release, a firing pin in the battery firing device impacts the primer in the fuze battery initiating the battery.

b. The lanyard lock is a cylindrical plug with holes for passage of the lanyard cable and setscrews for anchoring the cable to the plug. The lanyard lock serves as a guide for exit of the lanyard cable from the bomb's plumbing and has an anchor point for the free end of the lanyard cable after it is threaded through the swivel and link assembly.

c. The lanyard lock nut is an externally threaded spanner nut used to secure the lanyard lock within the charging well of the bomb.

d. The retaining clip is a clip designed to hold and retain the battery firing device in position in the fuze well.

2-63
Figure 2-36A. Fuze Cutaway View (All-Ways Acting Impact)
Figure 2-36B. Igniter AN-M23A1, Cutaway View

Figure 2-36C. Igniter AN-M23A1
Figure 2-37A. New Series Bomb Components

2-66
Figure 2-37B. Assembly of the Lanyard Lock, Lanyard and Swivel and Link Assembly
e. The swivel and link assembly consists of a circular wire ring and an oblong wire ring interconnected by a swivel, designed to serve as the mechanical link between the battery firing device lanyard and the ejector rack arming solenoid.

f. The fuse retainer is a metal ring installed over the end of the fuse to inhibit turning of the fuse in the bomb fuze well.

g. The bomb nose is a heavy metal cap which is threaded into the nose of the bomb after fuze installation. The bomb nose protects the fuze and streamlines the bomb.

h. The booster fuze holder is a copper plated spring steel clip used to hold the booster in place and to hold the safety switch selector in the airburst position on the FMU 26A/B and FMU 26B/B.

i. The safing plug is inserted into the hole at the rear center of the fuze container and provides protection against accidental initiation of the primer cap on the fuze battery. The safing plug is removed just prior to installation of the fuze.

FUZE SETS, BOMB, ELECTRIC

2-55. Type: FMU 7/B, FMU 7A/B, and FMU 7B/B, (reference figures 2-38a, 2-38b, 2-38c, 2-39a, 2-39b, and 2-39c)

2-56. Identification: These fuze sets are fire bomb fuzing systems, each consisting of an initiator; two electrically armed, impact inertia fired, all-ways acting fuzes; and a cable assembly.

2-57. Hazardous Components:

a. Thermal battery w/precussion primer.

b. Explosive bellows.

c. Precussion primer and detonator.

d. Tetryl burster charge.

2-58. Function: Upon release, the initiator sends an electrical pulse to the fuze which initiates an explosive bellows. As the bellows expands it withdraws the arming pin from the all-ways action feature arming the fuze. Impact from any direction will function the fuze.

FUZE, BOMB, ELECTRIC

2-59. Type: FMU 72/B is a long-delay, anti-disturbance, electronically timed bomb fuze used with GP bombs with internal plumbing. May be used either nose or tail. (reference figures 2-40a and 2-40b)

2-60. Identification: The FMU 72/B is 3 inches in diameter and 7 inches in length. The nomenclature is painted on the face of the fuze and the identification plate is on the side.
Figure 2-38A. Fuze FMU-7A/B

Figure 2-38B. Igniter AN-M23A1 with Fuze FMU-7A/B

Figure 2-38C. Initiators FMU-7A/B and FMU-7B/B
Figure 2-39A. Fuze FMU-7/B

Figure 2-39B. Igniter AN-M23A1 with Fuze FMU-7/B

Figure 2-39C. Initiator, FMU-7/B
Figure 2-40A. Fuze, Bomb, FMU-72/B

Figure 2-40B. FZU-2/B Booster and Tape, Assembly
2-61. **Hazardous Components:**

a. Taped on booster.

b. Detonator.

c. Ammonia battery.

2-62. **Function:** The ammonia battery is fired by the BFD as the bomb leaves the aircraft providing electrical power for the fuze. The fuze arming timer fires a bellows motor which rotates the out-of-line detonator to the armed position. The fuze timing and counting circuitry provides the final event signal at the set event times after impact. If an attempt to move the fuze/bomb is made, an anti-disturbance switch will close and detonate the bomb.

**NOTE**

This fuze incorporates the following safety features:

a. Impact switch: Initiates the preset long delay after the bomb impact.

b. Safing switch: Inactivates the fuze if bomb impact occurs before 6.0 (+1.5 -1.0) seconds, such as an accidental drop to the ramp or an aircraft takeoff.

c. Detonator enable switch: Shorts the detonator until subjected to a shock input equal to or greater than a half-sine wave input of 375 ± 125 "g" (3 microseconds duration). Switch actuates when acceleration causes the slug to move either in a direction parallel to the longitudinal axis of the bomb or in a direction toward the center of the fuze.

**FMU 26/B, FMU 26A/B, FMU 26B/B**

2-63. **Type:** Electrically functioned multi-purpose fuzes used for air or impact functioning, (reference figures 2-41a, 2-41b, 2-41c, and 2-41d)

2-64. **Identification:** All three series of fuzes are cylindrically shaped, approximately 3 inches in diameter and 7 inches long. These fuzes may be used in either nose or tail and are completely enclosed within the bomb. The FMU 26/B is used for impact medium delay or skip bombing and impact short delay or dive bombing. The FMU 26A/B is used for impact medium delay or skip bombing, impact short delay or dive bombing and airburst. The FMU 26B/B is used for impact short delay or dive bombing and airburst.

**NOTE**

The airburst mode is used to open latches of clusters having 3-inch diameter nose fuzes.
Figure 2-41A. Fuze FMU-26 A/B

Figure 2-41B. Fuze FMU-26 B/B

Figure 2-41C. Fuze-26/B

Figure 2-41D. Fuze FMU-26 Series and Components
2-65. **Hazardous Components:**
   a. Explosive bellows.
   b. Electric detonator.
   c. Thermal battery with percussion primer.
   d. Booster (either FZU 2/B or FZU 1/B)

2-66. **Function.** The arming sequence is the same for all fuzes. The primer in the thermal battery is initiated by lanyard pull and retracts and pinlocks, unlocking the rotor and safin switch. Thermal battery power activates the arming circuits and the explosive bellows through the safin switch. The explosive bellows turns a rotor which aligns the fuze explosively. The thermal battery applies power to the impact circuit.

**NOTE**
If the ordnance impacts or is jarred within 1.35 seconds after its release, the safin switch opens the circuit to the explosive bellows and prevents fuze arming.

The airburst is accomplished with an electronic counter set before takeoff. Medium delay and short delay are accomplished by the use of varying delays contained in the fuze.

**FUZE, BOMB, ELECTRIC**

2-67. **Type:** FMU 81/B Short delay, impact, nose and tail (reference figures 2-41E and F)

2-68. **Identification:**
   a. A 2-inch yellow identification band encircles the housing of each fuze.
   b. The fuze body is cylindrical and the nose is a conical section.
   c. The nose section contains an arm selector switch, delay selector switch, and a clear plastic seal plug (arm enable indicator window).
   d. An integral BFD is located on the rear of the fuze.
   e. A clear plastic safin-pin viewing window is located in cylindrical surface near the rear of the fuze.

2-69. **Hazardous Components:**
   a. Two explosive bellows.
   b. An electric squib switch.
   c. An electric detonator.
   d. A thermal battery that contains a percussion primer.
   e. Booster (FZU-2/B)

2-70. **Basic Operation:**
   a. Lanyard pull at drop.
      - Initiates thermal battery.
      - Battery power applied to circuit.
   b. Preset arm time elapses.
      - Rotor moves det to in-line position
      - Impact of 500-Gs functions fuze at end of preset delay.
2-71. **Type:** FMU 30/B (reference figure 2-42)

**Identification:** The FMU 30/B consists of a heavy machine steel forging, called the nose, and a cylindrical steel container which encloses the rear section of the fuze. The nose is hexagonal in shape and contains target sensors in three of the hexagonal sides. Two delivery mode setting switches are located in the nose, the target selector switch and the sensitivity switch. A cavity at the rear end of the cylindrical container is for installation of the booster. A hole at the rear center of the fuze contains the safing plug.

2-72. **General Information:** The fuze contains a safe/arm rotor that holds the electronic detonator in an out-of-line position until mechanical arming takes place. An arm/safe (A/S) rod passes through the rotor and holds it in the unarmed position until an axial impact of sufficient magnitude is experienced. After the A/S rod is released, the rotor is free to turn. At a given time after release of the A/S rod, two electrically initiated bellow motors drive the rotor into the armed position. Electrical contacts on the rotor assembly disconnect the dud circuits and connect the fire circuits when the rotor is driven to the in-line position.


**FUZE, BOMB, IMPACT**

2-74. **Type:** FMU 54/B, mechanically operated retardation sensing device that is used as a tail fuze and functions on impact only (reference figures 2-43 and 2-44).

2-75. **Identification:** The FMU 54/B is approximately 3 inches in diameter and 7 inches long. A timing indicator with delays of .75 through 3.5 seconds and an arming indicator window is located on the face of the fuze.

2-76. **Hazardous Components:**
   a. Detonator.
   b. Booster lead-in.
   c. Booster.

2-77. **Function:** At release, the lanyard pull unlocks three release pins to permit operation of the retardation sensor, timer, and slider. The retardation sensor functions when the snakeye fins are deployed, permitting the arming timer to run. At the end of the arming time (.75 to 3.5 seconds), the slider release shaft permits movement of the spring-loaded slider; thereby lining up the fuze explosively. Upon impact, the spring-loaded striker impinges the detonator and causes the bomb to detonate. If, however, the bomb should impact prior to completion of the arming cycle, the slider would be prevented from moving to the armed position.

**PROXIMITY FUZE**

2-78. **Type:** FMU 56/B (reference figures 2-45 and 2-46).

2-79. **Identification:** The FMU 56/B is a self-powered Doppler radar proximity fuze used to function a free falling munitions cluster bomb unit (CBU).

2-80. **Hazardous Components:**
   a. Thermal battery.
   b. Detonator.
   c. Booster.
Figure 2-41E. Internal Arrangement FMU-81/B Fuse
Figure 2-41F. Dimensional Characteristics
Figure 2-42. BLU-31/B Bomb with FMU-30/B Fuze
Figure 2-43. FMU 54/B Fuze Components
Figure 2-45. FMU-56/B Rear View
Figure 2-46. FMU-56/B, Front View
2-81. Function: Upon release, the battery firing device actuates the thermal battery which applies power to the fuze circuitry and starts the arming timer. The arming timer runs for its preset time, arming the fuze. When the CBU has reached the preset height of burst, as determined by the fuze radar, the detonator fires through the booster, opening the CBU.

PROXIMITY FUZE

2-82. Type: FMU 56A/B and FMU 56B/B (reference figures 2-47 and 2-48).
2-83. Identification:
   a. The FMU 56A/B and FMU 56B/B are self-powered Doppler radar proximity fuzes used to function a free falling munitions cluster bomb unit (CBU).
   b. The FMU 56A/B has a shorting pin receptacle.
   c. The FMU 56B/B has a safing pin receptacle and an integral BFD (Battery Firing Device).
2-84. Hazardous Components:
   a. Thermal battery.
   b. Detonator.
   c. Booster.
2-85. Function: Upon release, the battery firing device actuates the thermal battery which applies power to the fuze circuitry and starts the first step of the two-step arming timer. At the end of the first step, the Pitot tube is extended to actuate the velocity sensor system. At the end of the second step, the fuze will arm, providing the velocity sensor switch has closed. When the CBU has reached the preset height of burst, as determined by the fuze's radar, the detonator fires through the booster, opening the CBU. Should the fuze impact prior to the preset arm time, the impact switch prevents the fuze from arming.

FUZE, BOMB, IMPACT

2-86. Type: FMU 68/B, delayed arming, all-ways acting, impact fuze designed for use in conjunction with igniters, M23A1, in the nose and tail sections of fire bombs (reference figures 2-49 and 2-50).
2-87. Identification: The FMU-68/B fuze consists of the arming pin collar, the fuze case, and fuze adapter. Fuze designation, lot number and date of manufacture is stenciled in black on the fuze case. The exterior surface of the fuze is yellow anodized.
2-88. Hazardous Components:
   a. M23A1 igniter (1.25 pounds of W.P.)
   b. Lead-in
   c. Booster (12 grams of tetryl).
2-89. Function: Upon bomb release, the arming wire is withdrawn from the arming pin collar. Withdrawal of the arming wire frees the arming pin assembly to be ejected from the fuze by the compressed arming spring. Ejection of arming pin assembly unlocks the centerplate assembly, frees the three hammerweights, releases the detonator rotor to rotate the detonator into alignment with the firing pin and booster lead-in. The fuze is armed. Impact from any angle causes one or more of the hammerweights to overcome the hammerweight spring and depress the push pin, forcing the firing pin into the detonator initiating the explosive and incendiary train.
Figure 2-47. FMU-56 A/B, Front View.
<table>
<thead>
<tr>
<th>MODEL</th>
<th>IDENTIFICATION</th>
<th>DELAYS TO ARM</th>
<th>REVOLUTIONS TO ARM</th>
<th>AIR TRAVEL TO ARM</th>
<th>SAFETY DEVICES</th>
<th>THREAD DIAMETER</th>
<th>BOMBS IN WHICH USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>M103A1</td>
<td>Silver face, with no black</td>
<td>1.0 sec. &amp; inst.</td>
<td>180 delay or 200 inst.</td>
<td>510 – 765</td>
<td>Safety blocks and detonator safe</td>
<td>2&quot;</td>
<td>Nose position of all GP; 90-, 220-, and 260-pound frags; and 500-pound chemical bomb</td>
</tr>
<tr>
<td>M158</td>
<td>Arming vane, hub &amp; firing pin showing</td>
<td>None</td>
<td>375 to 512</td>
<td>Detonator safe</td>
<td>1.5&quot;</td>
<td>Nose position of 20-pound frag bomb</td>
<td></td>
</tr>
<tr>
<td>M159A1</td>
<td>Arming vane, head and arming pin showing</td>
<td>None</td>
<td>400 to 500</td>
<td>Detonator safe; seal wire</td>
<td>1.5&quot;</td>
<td>Nose position of AN-M47A3/A4, 100-lb., chemical bomb</td>
<td></td>
</tr>
<tr>
<td>M914</td>
<td>VT bar type</td>
<td>None</td>
<td>1550</td>
<td>2000</td>
<td>Detonator safe, safety pin, and vane lock pin</td>
<td>2&quot;</td>
<td>Nose position of all GP's; 90-, 220-, and 260-pound frags and 500-pound chemical bomb</td>
</tr>
<tr>
<td>M904</td>
<td>Windows to determine arming</td>
<td>Inst., .1, .01, .05, .25, or .025 second</td>
<td>1800</td>
<td>4, 6, 8, 12, 16 and 20 seconds</td>
<td>Detonator safe</td>
<td>2&quot;</td>
<td>Nose position of all GP bombs</td>
</tr>
<tr>
<td>M907</td>
<td>Mechanical time</td>
<td>Airburst Arming time is 1/2 the function time</td>
<td>4-92 seconds</td>
<td>Detonator safe, warning windows &amp; seal wires</td>
<td>1.5&quot;</td>
<td>Nose or tail position of M120/120A1 photoflash bombs</td>
<td></td>
</tr>
<tr>
<td>M909</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Nose or tail position of M129/129E1 leaflet bombs</td>
</tr>
</tbody>
</table>

Table 1. Bomb Fuze Chart
<table>
<thead>
<tr>
<th>MODEL</th>
<th>LENGTH IN INCHES</th>
<th>ACTION</th>
<th>METHOD OF ARMING</th>
<th>REVOLUTIONS TO ARM</th>
<th>DELAY ON IMPACT (Seconds)</th>
<th>SAFETY DEVICES</th>
<th>THREAD DIAMETER</th>
<th>BOMBS IN WHICH USED</th>
</tr>
</thead>
<tbody>
<tr>
<td>FMU-54/B</td>
<td>N/A</td>
<td>Impact</td>
<td>Retardation</td>
<td>0.75 - 3.50</td>
<td>N/A</td>
<td>Safety wire</td>
<td>N/A</td>
<td>Tail position of 750-lb, MK-81 and MK-82 GP bombs</td>
</tr>
<tr>
<td>FMU-56/B</td>
<td>N/A</td>
<td>Airburst</td>
<td>Doppler radar</td>
<td>Preset</td>
<td>Airburst action</td>
<td>N/A</td>
<td>N/A</td>
<td>Nose position of CBU-24R/B cluster</td>
</tr>
<tr>
<td></td>
<td></td>
<td>proximity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMU-7/B</td>
<td>N/A</td>
<td>Impact</td>
<td>Bellows</td>
<td>N/A</td>
<td>None</td>
<td>Pin</td>
<td>1.5&quot;</td>
<td>Fire bombs</td>
</tr>
<tr>
<td>FMU-7A/B</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>FMU-30/B</td>
<td>N/A</td>
<td>Signature sensitive device</td>
<td>Axial impact</td>
<td>N/A</td>
<td>N/A</td>
<td>Safing plug</td>
<td>N/A</td>
<td>BLU 31/B</td>
</tr>
<tr>
<td>FMU-72/B</td>
<td>N/A</td>
<td>Long delay anti-disturbance</td>
<td>Bellows and impact</td>
<td>36.5 ± 10 seconds</td>
<td>Impact switch, safing switch, detonator enabling switch</td>
<td>N/A</td>
<td>GP bombs (nose or tail)</td>
<td></td>
</tr>
<tr>
<td>FMU-81</td>
<td>N/A</td>
<td>Short Delay Impact</td>
<td>Bellows</td>
<td>N/A</td>
<td>Impact switch</td>
<td>N/A</td>
<td>GP bombs (nose or tail)</td>
<td></td>
</tr>
<tr>
<td>FMU-68</td>
<td>Impact</td>
<td>Arming pin</td>
<td>Arming pin</td>
<td>N/A</td>
<td>None</td>
<td>Arming wire</td>
<td>N/A</td>
<td>M23A1 igniters</td>
</tr>
</tbody>
</table>
Figure 2-49. General appearance and dimensions of the FMU-68/B fuze

2-90
Figure 2-50. General arrangement of the FMU-68/B fuze
3. IMPACT OF STRIKER F ON TARGET DRIVES FIRING PIN INTO DETONATOR. BLAST OF DETONATOR EXPLODES BOOSTER LEAD B AND BOOSTER A WHICH AMPLIFIES THE BLAST AND EXPLODES MAIN CHARGE OF BOMB.

1. AIR STREAM SPINS ARMING VANE E WHICH DRIVES GEAR TRAIN G. ACTION OF GEAR TRAIN WITH-DRAWS FIRING PIN D FROM SHUTTER C.

2. SHUTTER "SNAPS OVER" LINING UP DETONATOR H WITH FIRING PIN AND WITH BOOSTER LEAD B.
This group of fuzes is known as a series. Fuzes of one series—that is, fuzes with the same mechanism and action, but designed for bombs of different sizes—are distinguished among themselves by the length of arming stem.

TAIL FUZE SERIES
The AN-M100A2 is an arming vane type impact fuze used with GP and frag bombs. Except for their greater length, the other fuzes of this series, the AN-M101A2 and AN-M102A2, are identical to the AN-M100A2.

The M12A1 is a fast arming fuze for low level bombing. It is similar to the AN-M100A2 except that it has no gear train and it utilizes the primer detonator M16A1 instead of the M14. The M113A1 and M114A1 are identical in action but have longer stems.

The M115 consists of the AN-M100A2 type arming head and the M112 type body. The M116 and M117 are identical in action but have longer stems.

The M123A1 is a long delay fuze. A definite length of delay (from 1 hr to 6 days) is stamped on each fuze as part of its nomenclature. This fuze contains a booby trap. Once the fuze is inserted in the bomb it cannot be removed without detonating. The M124A1 and M125A1 are identical in action but have longer stems.

The M132 is similar to the M123A1 but has a nominal delay of 10 minutes. This fuze also is booby trapped. The M133 and M134 are identical in action but have longer stems.

The M160 is similar to the AN-M100A2 but requires a longer air travel to arm. The M161 and M162 are identical in action but have longer stems.
NOTE: THE BOOSTER SAFETY PIN CANNOT BE IN POSITION WHEN THE ROTOR IS IN THE POSITION SHOWN. THE SAFETY PIN IS SHOWN FOR COMPLETENESS ONLY.

RA PD 58763