

CMSI/EODWSI
STANDARD OPERATING PROCEDURES
FOR
EXPLOSIVE ORDNANCE DISPOSAL OPERATIONS
IN KUWAIT

This Manual must be returned to CMSI/EODWSI upon completion
of operations or termination of employment

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BASIC AND GENERAL SAFETY PRECAUTIONS

I. INTRODUCTION: This manual has been prepared for CMSI/EODWSI EOD personnel for field operations in Kuwait. It is provided as a guide and should not take the place of good judgment and common sense.

II. BASIC CONSIDERATIONS: The following should be taken into consideration when planning or conducting EOD operations.

a. Safety is paramount. It is the operational intent that all armed submunitions and dud fired ordnance be blown in place. These items should not be handled solely for operational, time or equipment reasons. Recommendations to handle dud fired ordnance or submunitions will be made by Zone Managers to the Director of Operations for approval on a case by case basis.

b. The preferred method for disposal of dud fired ordnance is BIP or SMUD.

c. When circumstances will not permit BIP or SMUD, attempts should be made to remove the ordnance remotely first.

d. ADAM/RAAMS, BLU 97s, GATORS, BELUGAs, BAP-100, MK 118 VECPS, and SCB-1s will be BIP or SMUD only. Additional items will be added to this list via safety bulletins.

e. FLAK protection and safety glasses should be worn when handling dud-fired ordnance and must be when working in minefields.

f. No live ammunition, ordnance, or weapons will be removed from the desert unless approved by Zone Managers.

g. No "WAR TROPHIES" are allowed to leave country.

III. BASIC SAFETY PRECAUTIONS. The following safety precautions are applicable to all explosive ordnance:

a. Observe hazards of electromagnetic radiation (EMR) precautions and grounding procedures when working with or on electrically initiated or susceptible ordnance items.

b. Record the location of and physically mark in the appropriate manner any ordnance item located and not immediately disposed of.

c. Do not dismantle, strip or handle unnecessarily any ordnance item.

d. Avoid inhalation and skin contact with smoke, fumes, dust and vapors of detonations and ordnance residue.

- e. Do not manipulate external features of ordnance items unless specifically called for in an EOD procedure.
- f. Observe booby trap precautions when inspecting bunkers, vehicles, tanks, and minefields.
- g. Incorporate appropriate property and personnel protective measures for blast and fragmentation when conducting EOD operations.
- h. Do not subject ordnance items to rough handling. Sand bag, chock and block appropriately when transporting. Place ordnance in vehicles so that fuses point to the side versus front or rear.
- i. Try not to subject ordnance items to extreme heat, including the direct rays of the sun.
- j. Carry explosives in an appropriate container. Blasting caps should be separated from bulk explosives as far as possible.
- k. Hand carry no more than two items (one in each bare hand) at a time and then only as required by the operation being performed.
- l. Destroy shaped charge munitions by crushing the cone to prevent formation of the explosive jet.
- m. Dispose of white phosphorous munitions by blowing them up into the air vice down into the ground.
- n. Do not transport smoking or damaged WP unless fully submerged in water.
- o. Avoid unnecessary movement of armed or damaged munitions items.
- p. Avoid the forward portions of munitions employing proximity fusing.
- q. Assume unknown fuses contain cocked strikers or anti-disturbance features.
- r. Do not handle any dud fired ordnance item that has not been positively identified and it's condition determined.

IV. GENERAL SAFETY PRECAUTIONS:

a. Bombs:

- (1) Do not remove damaged or impacted bomb fuses unless the procedure is done remotely.

(2) Exercise caution when packing fuze wells of bombs or projectiles with explosives.

b. Clusters, Dispensers, Launchers:

(1) Approach and work from the sides of a dispenser.

(2) Consider an intact dispenser as fully or partially loaded.

(3) Consider any payloads outside the container or dislodged inside the container as armed until determined otherwise.

(4) Take precautions for the most hazardous payloads until positively identified.

c. Projectiles:

(1) Determine if the projectile has been fired and if so consider it as armed.

(2) Check for the presence of unfired tracers, safety pins/caps on fuzes.

(3) Perform initial movement of imbedded projectiles remotely.

(4) Avoid the rear and front of rocket assisted projectiles.

(5) Handle projectile components such as powder increments, cartridges and primers with caution. Place powder increments and loose propellant in containers.

(6) Protect the open ends of projectiles or sheared projectile components with tape or other suitable material when handling.

(7) Large cartridge cases with primers will be burned or detonated.

(8) Do not remove fuzes from Iraqi projectiles.

d. Grenades:

(1) Do not disturb a grenade other than remotely until the fuze condition is positively determined.

(2) Do not attempt to remove the fuze from a dud fired grenade.

(3) Do not attempt to reinstall safety pins on a dud fired grenade.

- (4) Do not attempt to withdraw imaged firing pins from the fuze of a dud fired grenade.
- (5) Do not attempt to dispose of grenades by functioning them as designed.
- (6) Extract embedded grenades by remote means only as they may be fuzed with piezoelectric or graze sensitive fuzes.

e. Rockets:

- (1) Approach and work on rockets from the side.
- (2) Extract embedded rockets by remote means only.
- (3) Do not dismantle or strip dud fired rockets or rocket motors.
- (4) Do not expose electrically fired munitions to radio transmissions within 25 feet with portable radio or 100 feet with a mobile radio.
- (5) Do not transport an unfired rocket motor until having shielded the motor igniter from EMR.
- (6) Dispose of unfired rocket motors with or without warheads in such a manner as to prevent their becoming propulsive.

f. Guided Missiles:

- (1) When found, restrict vehicular movement in the area of a guided missile.
- (2) Avoid entanglement with guidance wires of wire guide missiles.
- (3) Restrict radio communications in the vicinity of a dud fired missile.
- (4) Approach and work on missiles from the side and rear quarter.
- (5) Extract embedded missiles by remote means only.
- (6) Do not dismantle or strip dud fired missiles or missile motors.
- (7) Do not expose electrically fired munitions to radio transmissions within 25 feet with a portable radio or 100 feet with a mobile radio.
- (8) Do not transport an unfired missile motor until having shielded the motor igniter from EMR.

(9) Dispose of unfired missile motors with or without warheads in such a manner as to prevent their becoming propulsive.

g. Land mines and booby traps:

(1) Handle all mines and fuzes with extreme care and do not stack recovered mines that are fuzed.

(2) Allow only one person to work on a single mine at a time.

(3) Probe and examine the ground around a mine before starting to work on a mine.

(4) Assume each mine is booby trapped until proven otherwise.

(5) Perform initial movement remotely or with mechanical minefield clearance equipment.

(6) Do not cut or pull a taut wire. Do not pull a slack wire. Investigate both ends of a wire before cutting it.

(7) Allow an adequate time period to lapse after performing any remote movement to allow delay firing devices to function prior to continuing to work on a mine.

(8) Exercise extreme care in the hand disarming of mines, replacing safety pins and tracing tripwires.

(9) Always work from the friendly or breached side of the minefield, moving slowly and deliberately.

(10) Flak jacket and eye protection will be worn.

(11) BIP or SMUD whenever possible.

DEMOLITION AND DISPOSAL
PROCEDURES

Demolition and Disposal Procedures

I. General: The following general company policies are not all inclusive nor are they applicable in all situations, however, unless the Team Leaders/Zone Manager on site deems that the specific situation dictates deviation, every attempt should be made to employ these basic procedures:

- a. The preferred firing system for field use is non-electric.
- b. Safe separation time will vary depending on size of ordnance, terrain, and available cover. Three (3) foot time fuze is the minimum on all non-electric shots.
- c. A separation time will be observed between multiple non-electric shots simultaneously initiated to ensure all shots functioned.
- d. A minimum 5 minute wait time will be observed before investigating a shot.
- e. For all buried charges do not bury caps and use a dual firing system.
- f. The Team Leader and one other person will go down range on misfires. The Team Leader will supervise or correct the misfire while the other person observes from a safe distance.
- g. Safety eye protection will be worn during capping evolutions.

II. NON-ELECTRIC DEMOLITION PROCEDURES:

- a. Assemble all equipment and explosives uprange.
- b. Test burn blasting time fuze.
 - (1) Cut and discard first six inches of fuse.
 - (2) Measure an appropriate length of time fuze and test burn to compute actual burn rate per foot, at least 25 feet from other explosives. Burn rate should be approximately 40 seconds per foot (+/-5 seconds).
- c. Compute and cut length required for safe separation time as required.
 - (1) Inspect cap for foreign matter and suitability. Do not tap the cap with or against a hard object or blow into the cap.
 - (2) Insert time fuze into the cap and crimp cap on time fuze 1/8 to 1/4 inch from base. Do not force the time fuze into the cap.

- (3) Attach fuze lighter if available.
- d. Carry non-electric system downrange.
- (1) Lay out and weight down time fuze.
 - (2) Prime and place charge.
 - (3) Initiate time fuze and return to safe area.
- e. Non-electric misfire procedures:
- (1) Wait a minimum of 30 minutes after maximum delay predicted for any part of the disposal shot to elapse before starting to investigate.
 - (2) Up range, prepare a new non-electric firing system.
 - (3) After the required wait time has elapsed proceed downrange. Insert the new non-electric firing system into the charge or prime and place a new charge close enough to the original charge to ensure detonation of both.
 - (4) When employing a detonating cord firing system, after the required 30 minute wait has elapsed, proceed down range. Cut the detonating cord between the cap and charge and attach a new firing system to the end of the detonating cord going to the original charge.
 - (5) Initiate the new fuze.
- f. Safety Considerations:
- (1) Observe explosive safety (i.e., do not strike, roughly handle, tamper with or attempt to remove or investigate the contents of blasting cap).
 - (2) Handle caps only by their open end except during attachment to time fuze and or detonating cord.
 - (3) Maintain positive control of caps.
 - (4) Do not force time fuze or detonating cord into caps.
 - (5) Always point the explosive end of caps away from body during handling.
 - (6) Handle primed safety fuze with care. Avoid contact between blasting caps and/or between caps and other hard objects.

- (7) Do not allow time fuze to coil up and contact itself or other time fuze after being ignited.

III. ELECTRIC DEMOLITION PROCEDURES:

a. Prior to going downrange, gather all equipment and explosives. The person setting up the shot will maintain control of the firing device at all times.

- (1) Lay out firing wire, from downrange to firing point and test for continuity or short circuit.

- (2) GROUND YOURSELF PRIOR TO BREAKING OUT BLASTING CAPS.**

- (3) Keep the explosive end of the cap pointed away from body during handling.

- (4) Grip cap lead wires 3" to 6" behind cap, pull initial arm's length of wire off of lead wire coil.

- (5) Barricade cap or place in safe area.

- (6) Unshunt and test blasting cap(s)

- (7) Splice cap lead wires to firing wire in a parallel circuit and insulate all bare wires at splice.

- (8) Prime shot.

- (9) Return to safe area and check circuit for continuity.

- (10) Fire shot.

b. Electric misfire procedures:

- (1) Make several successive attempts to fire.

- (2) Check firing wire connections to blasting machine terminals to insure good contact.

- (3) Test the firing circuit with galvanometer for an open circuit and correct any defects found.

- (4) Wait 30 minutes. Corrective action may be taken immediately if the misfire is strictly electrical.

(5) Remove the blasting caps from the main charge, disconnect the caps from the firing wire and short the blasting cap leg wires and firing wires.

(6) When employing a detonating cord firing system, cut the det cord between the blasting caps and main charge. Place defective blasting caps in safe area.

(7) Test the firing wire with galvanometer for breaks or short circuits and correct any defects discovered.

(8) If the problem was determined to be in the firing wire or the firing wire/blasting cap leg wire connections correct as required. Re-test the original blasting caps, if good reconnect them to the firing wire and reprime charge.

(9) If the problem was not determined to be in the firing wire or firing wire/blasting cap leg wire connections, test new blasting caps and connect the new blasting cap leg wires to the firing circuit and reprime the charge. Place defective blasting caps on the shot for disposal.

(10) Return to safe area, test the circuit and fire the charge.

c. Safety considerations:

(1) Electrically fired charges should not be set up in the presence of thunderstorms and take EMR precautions.

(2) Never hook up caps to unshunted wire.

(3) Never leave caps unshunted unless actually testing or hooking to firing wire.

(4) Observe explosive safety (i.e., do not strike, handle roughly, tamper with or attempt to investigate the contents of the blasting cap).

(5) Parallel circuits reduce line resistance. Use parallel circuits whenever possible.

d. Multiple Sensitive Munitions Destruction Trunk Line and Branch Line Procedures:

(1) Lay out Det Cord trunk line from the initiation point to the farthest munition, being careful not to bring the Det Cord in contact with any munitions and weighing down the Det Cord as you go.

- (2) Working from the farthest munition to the initiation point, cut Det Cord branch lines of sufficient length to reach from the trunk line to the munition.
- (3) Prepare one end of the branch line (i.e., sensitize with a non-electric blasting cap or a knot).
- (4) Attach the bare end of the branch line to the trunk line.
- (5) Utilizing the sensitized or knotted end of the branch line, prime a charge and place it as close as possible but not touching the munition.
- (6) Inspect the trunk line and branch lines to make sure none of the primed charges have moved and that no branch line exceeds 90 degree angle with the trunk line from direction of initiation.
- (7) Proceed to the initiation point and prepare the firing system either electric or non-electric.

IV. General Disposal Operations:

- a. Analyze explosive operations with a view towards reducing the number of personnel and quantity of explosive material subject to an accident. However, never allow one person to work alone.
- b. Prohibit tasks not necessary to the explosive operation in the immediate vicinity of such operations.
- c. Use sufficient warning signals when explosive operations are conducted. Yellow smoke is the standard in Kuwait to identify explosive operations.
- d. Comply with the authorized explosive limits and safe separation distances imposed by each specific task.
- e. Discontinue explosive operations when unforeseen hazard conditions develop and do not resume until the condition is corrected.
- f. Smoke only in designated areas.
- g. Plan for, provide for, and know the emergency procedures to be followed in the event of an accident.
- h. Use special care in the handling and disposal of damaged or deteriorated explosives, munition items and other hazardous materials.
- i. Disperse explosives awaiting destruction in small quantities at safe distances and protect them from unintentional initiation.

- j. Protect explosives and ammunition items from the direct rays of the sun, rain, excessive humidity and static electricity if possible.
- k. Provide an emergency vehicle outside the hazard area for response in the event of an accident.
- l. Post signs and/or road blocks at the entrance to and on the sides of disposal areas as required to restrict unauthorized entry and warn of the explosive operation.
- m. Perform disposal operations during daylight hours except in an emergency.
- n. Carry blasting caps in an appropriate container and keep them out of the direct rays of the sun.
- o. Do not use unexploded dud ordnance items for demolition purposes. They may be in an extremely sensitive and hazardous condition.
- p. Use caution when investigating post firing results. **SEARCH THE AREA AFTER EACH FIRING FOR ANY REMAINING EXPLOSIVES OR EXPLOSIVE COMPONENT.**

V. *Disposal Methods:*

a. **Burning:** Surface burning or pit/trench burning will be used to dispose of black powder, smokeless powder, rocket motors, pyrotechnics and small arms ammunition. Munitions to be burned will be examined carefully to make sure that detonators, blasting caps, or HE are not included. Burn like munitions together, such as small arms up to 30 mm except HE. Burn sites shall be clear of all combustible material to a radius of 200 feet and sites shall be a minimum of 150 feet apart. Combustible dunnage may be used and non-volatile flammable liquids (diesel fuel, used motor oil) may be poured over materials to be burned. Remote initiation is mandatory. Allow 24 hours between uses for burn site to cool.

(1) **Surface burning:** Surface burning is an expeditious method of disposing of munitions such as non-initiating high explosives and solid propellants.

(a) The distance between successive burns shall be a minimum of 30 feet (maximum of 50 lbs black powder per burn, no more than 2 inches wide or 2 inches deep. Maximum of 4,000 lbs of large web and 2,000 lbs of small web smokeless powder per burn). *The powder row shall not be more than 48 inches wide or 6 inches deep.*

(b) Rocket motors may be static fired in such a manner as to prevent their becoming propulsive.

(2) Pit/trench burning: Pits or trenches will be utilized if the possibility of propulsion exists or to limit fragmentation.

(a) Size of the pit or length of the trench will be determined by the quantity of the material being disposed of and by safety distances established for the burning site.

(b) Place combustible material, such as scrap wood, in the bottom of the pit at least 1 foot deep.

(c) Place munitions on combustible material, ensuring that the combustible material extends beyond the layer of munitions. Layers of combustible material and munitions will be alternated allowing an air space of not less than 1 foot between the top layer of munition and the top of the pit/trench.

(d) Pour fuel oil or motor oil over the entire pile and ignite remotely.

(e) Check burn after 24 hours for kick outs and live munitions. Reburn, if necessary.

b. Detonation: Disposal by detonation is required for bulk high explosives (HE), explosive loaded grenades and grenade fuzes, mines, bombs and bomb fuzes with boosters, projectiles and projectile fuzes with boosters, mortars, rocket war heads, and munition items with WP and PWP fillers. The detonation site will take into consideration the protection of personnel and property.

**GUIDE FOR
DAILY SAFETY AND EQUIPMENT BRIEF**

Guide for Daily

Safety and Equipment Brief

1. Zone Managers and/or Team Leaders will conduct a daily safety and equipment brief prior to the commencement of operations. It will include:
 - a. Scope of Operations
 - b. Personnel assignments.
 - c. Safety precautions on ordnance expected to be encountered.
 - d. Demolition procedures to be employed.
 - e. Identify safety, demolition and survey equipment required.
 - f. Review of basic first aid/location of Medic.
 - g. Procedures for requesting Medevac.
 - h. Radio procedures including frequencies and call signs.
2. Secure operations when the safety of personnel and/or the operation is jeopardized. Ensure Operational Control Center is notified.
3. Conduct post-operation brief to include lessons learned.

MINES:

ANTI-PERSONNEL

AND

ANTI-TANK

* NO AK
FEATURES
FOUND
ON AMY
MINES

MINES

Anti-Personnel

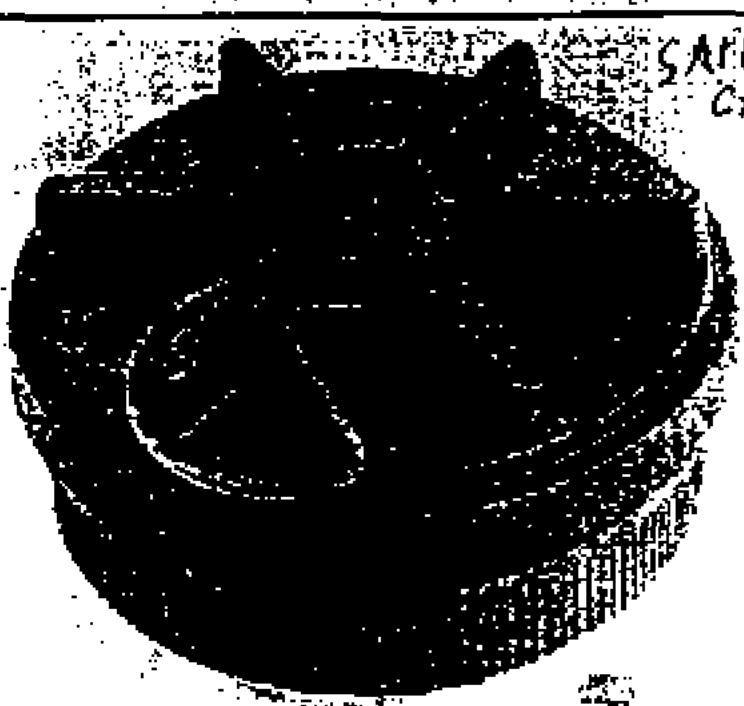
NR-409	Belgium
VALMARA 59/69	Italy
VS-50/VS-50 AR	Italy
TS-50	Italy
PMN	Soviet
TYPE 69	China
VAR/IG	Italy
VST ILLUMINATION	Italy
P40	Soviet
TYPE 72	China

Anti-Tank

VS-1.6	Italy
VS-2.2	Italy
PTMIBA-III	Czech
TM-57	Soviet
BAR MINE	U.K.
TYPE-72	China
VS-AR4 Antilift Device for VS-50/VS-69/VS1.2/VS1.6	Italy
TMN-46	Soviet
TM-62M	Soviet
P2 MK3	Pakistan
*Cast Explosive Mine	Iraq (No pub available)

**PRB M409
BELGIUM**

PICK UP

Belgium		Anti-Personnel		PRB M409
Kill Mechanism	Blast			
Case Material	Plastic			
Main Charge	Cast Triolene			
Booster Charge				
Main Charge Wt	0.08 kg	0.18 lb		
Booster Charge Wt				
Total Weight	0.183 kg	0.4 lb		
Height	2.8 cm	1.1 in		
Diameter	8.2 cm	3.23 in		
Anti-Disturbance Features				
Mine Counter-Counter	Detectability difficult with hand-held metallic detector;			
Emplacement	Buried (Hand or Machine)			

Fuze Type(s) - Initiation	Operating Force	Temp Operational Limits
Pull		

Functioning:

(RDA-Trf-Mn.106) Pressure applied to a membrane displaces a retaining bolt which uncovers the percussion caps (2) and releases a striker which explodes the mine. Fuze is held in place by a membrane.

(RDA-Trf-Mn.110) When pressure is applied to the fuze membrane the bolt is displaced and the two apertures uncover the percussion caps before the release of the strikers. The strikers hit the percussion caps, the detonator fires and the mine explodes.

Mine's Operational:

(RDA-Trf-Mn.106) The fuze membrane must be covered by a safety plate during transport. The PRB M409 is designed to be surface laid and camouflaged.

Comments:

(RDA-Trf-Mn.110) The weight of a wooden box containing 150 mines is 45kg. The fuze is of the double percussion type. Two steel spring strikers are held apart by a cylindrical bolt with two apertures. The bolt is connected to the pressure membrane of the fuze and moves freely along a slide in which there are two percussion caps pressed against each other. The bolt holds the two strikers apart and covers the percussion caps. The only metal components are the two steel strikers and the two aluminium primer-caps.

(RDA-Trf-Mn.106) Clearance is very difficult as a 1.5-3 mm displacement of the membrane will detonate the mine. The PRB M409 has only one gram of metal.

(RDA-Trf-MC.008) The color is green.

Jun 25, 1991

Remove Fuze

VALMARA 69

PIN-REMOVE FUZE

VALMARA 69

(U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of the Valmara, Valmara 59, and Valmara 69 landmines. The Valmara has a solid safety clip while the Valmara 59 and Valmara 69 have a spring-wire safety clip. There is a practice Valmara

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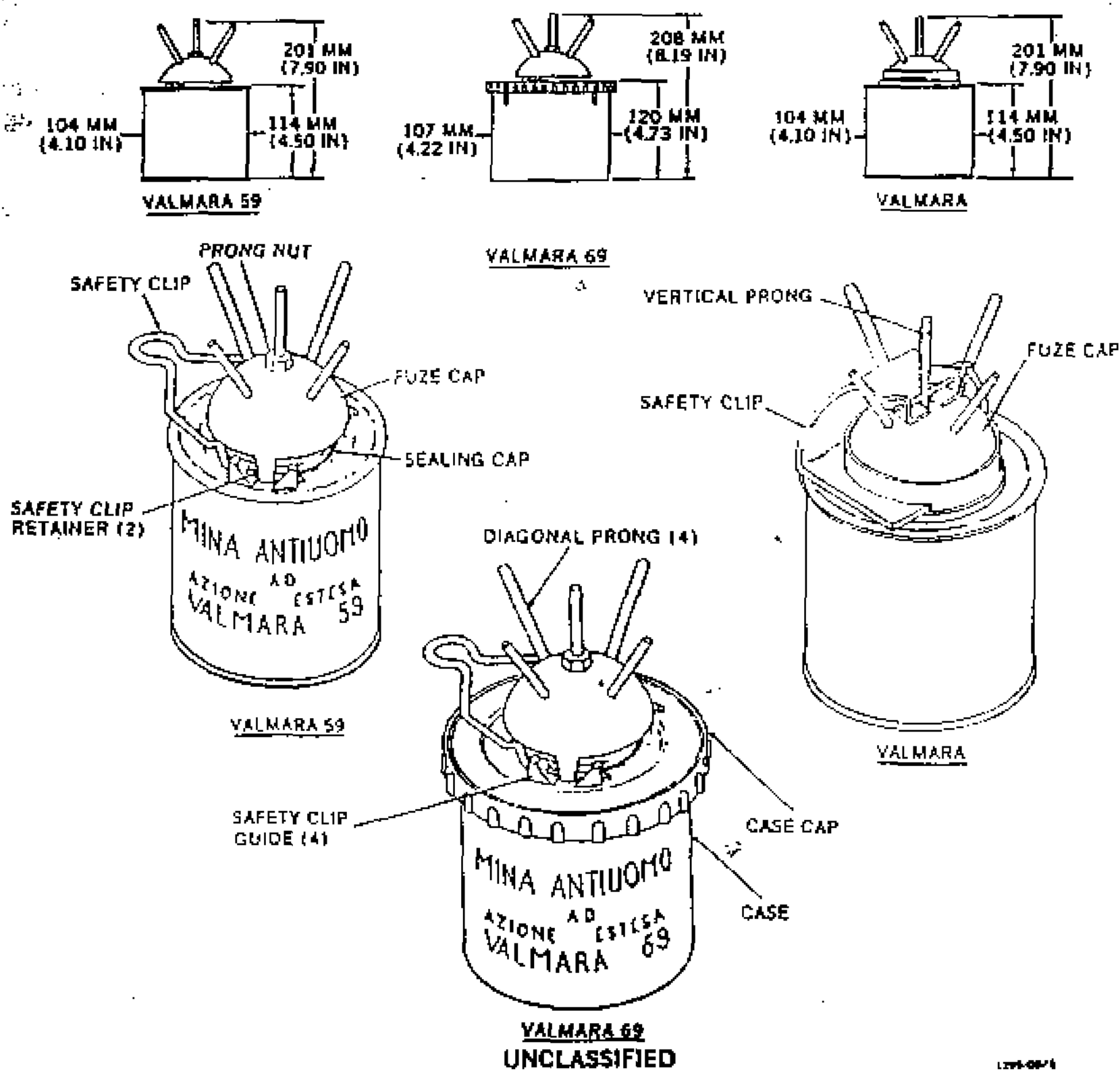


Figure 1. (U) Appearance and Dimensions of the Valmara, Valmara 59, and Valmara 69 Landmines.

a. (U) Type. These are bounding, fragmenting, antipersonnel (apers) landmines which are actuated by pressure, pull, or a combination of the two.

b. (U) Painting and Markings. The Valmara and Valmara 59 mines and fuze caps are olive drab. Identifying markings are stenciled in yellow on the case of the Valmara 59. The Valmara 69 mine case and fuze are gray and may or may not have markings. The practice Valmara 69 mine is painted the same as the service mine; however, the markings are blue.

2. (U) DESCRIPTION.

a. (U) Material. The Valmara and Valmara 59 mine cases may be plastic or sheet metal. The Valmara 69 and practice Valmara 69 cases are plastic. The precut fragments and fragmentation liner are steel. The fuze cap is aluminum.

b. (U) Weight. The Valmara and Valmara 59 mines weigh 3.6 kilograms (7.9 pounds). The Valmara 69 and practice Valmara 69 weigh 3.3 kilograms (7.2 pounds).

3. (U) HAZARDOUS COMPONENTS. The Valmara and Valmara 59 mines each contain a main charge of 544 grams (1.2 pounds) of composition B, a 5-gram tetryl booster, a 5-gram black powder propelling charge, a less-than-1-gram time fuze of black powder, a 4-gram percussion primer, and a 5-gram detonator of unknown composition. The Valmara 69 contains a main charge of 576 grams (1.3 pounds) of TNT/RDX, a 12-gram tetryl RDX booster, a 6-gram black powder propelling charge, a less-than-1-gram percussion primer, and a 2-gram detonator of PETN. The practice Valmara 69 contains a lactose potassium chlorate and dye smoke agent and a calcium silicide, potassium composition in the fuze; both are of unknown quantity.

4. (U) FUNCTIONING.

a. (U) Service Mines.

(1) (U) Arming. The emplaced mine is armed when the safety clip (figure 1) is removed.

(2) (U) Firing. A force of 10.0 to 12.7 kilograms (22.0 to 28.0 pounds) on a diagonal prong, or a pull of 5.9 to 7.7 kilograms (13.0 to 17.0 pounds) on a tripwire attached to the vertical prong, tilts the fuze cap.

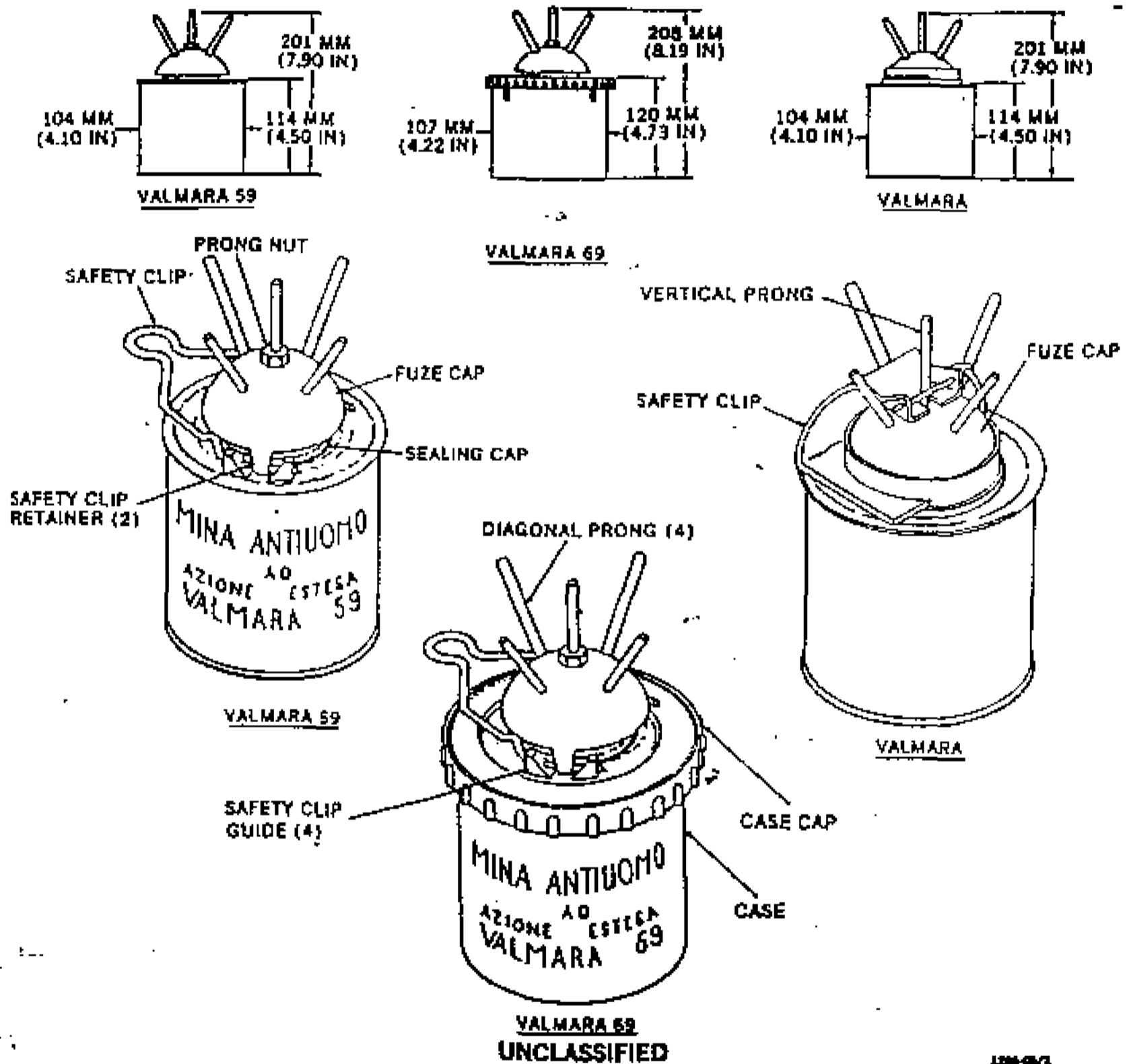


Figure 1. (U) Appearance and Dimensions of the Valmara, Valmara 59, and Valmara 69 Landmines (Repeated).

(2) (U) Firing - Cont. This causes the attached lockball assembly (figure 2) to rise, compressing the ejection-charge firing pin spring and releasing the lockballs.

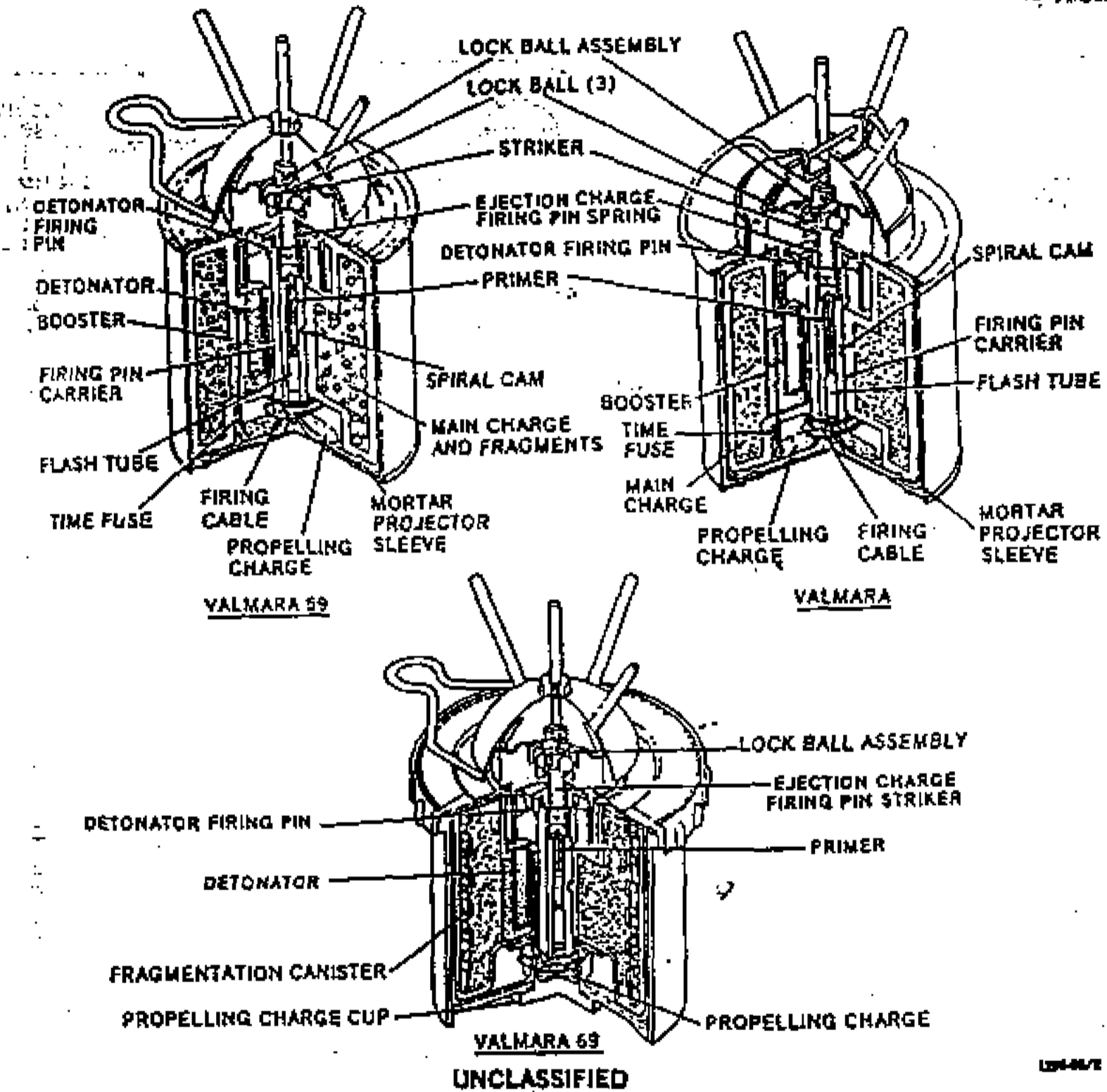
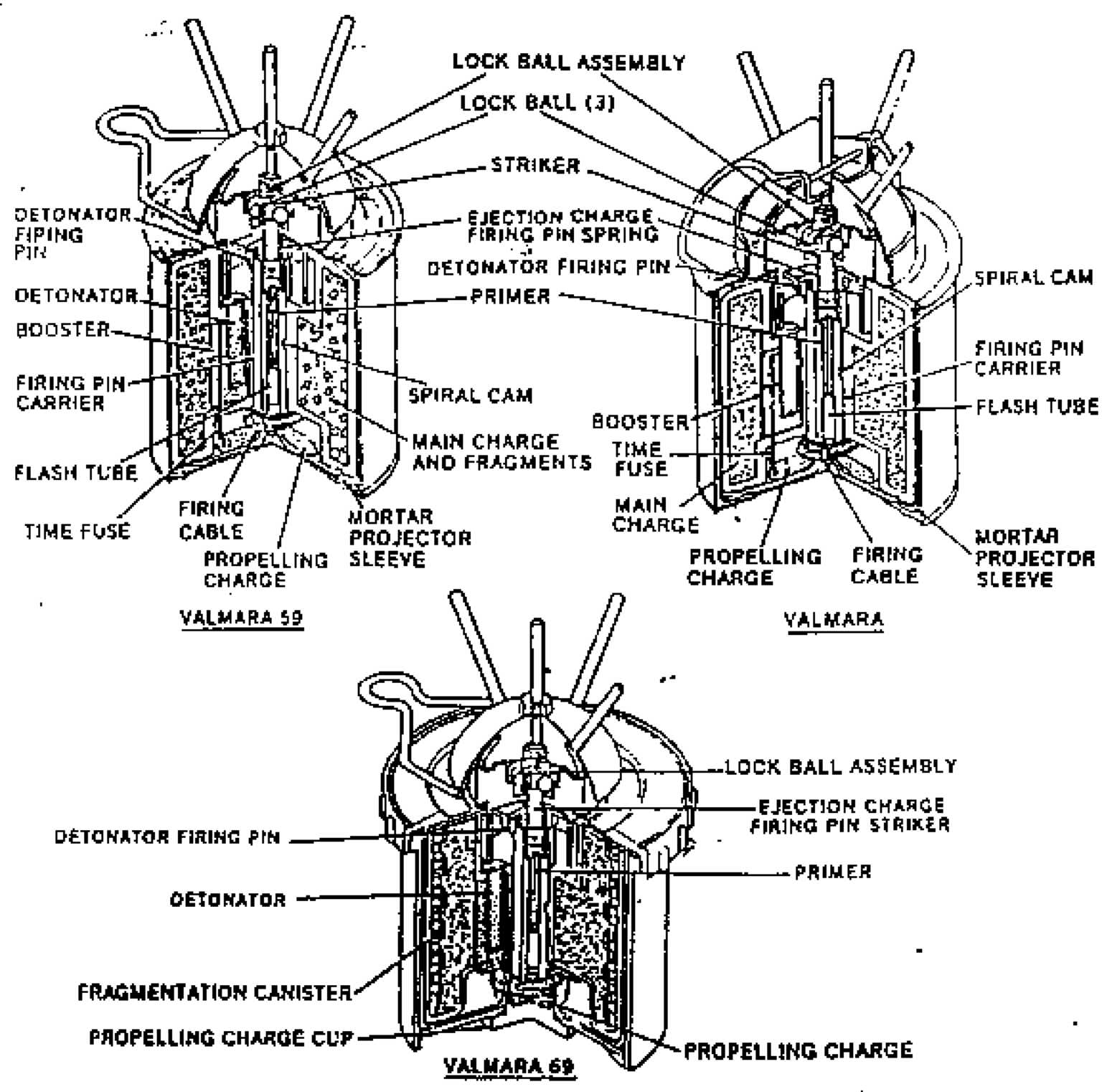


Figure 2. (U) General Arrangement of the Mines.

(2) (U) Firing - Cont. The ejection-charge firing pin spring (figure 2) drives the ejection-charge firing pin into the primer, which initiates the propelling charge. The propelling charge ejects the fragmentation canister from the mortar projector sleeve, and uncoils the firing cable. When the canister reaches the end of the firing cable, the detonator firing pin carrier is pulled. The detonator firing pin carrier rotates by means of the spiral cam in the canister fuze well to align with the detonator. The pull on the firing pin carrier forces the detonator firing pin into the detonator, initiating the explosive train.

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Figure 2. (U) General Arrangement of the Mines (Repeated).

NOTE

If the Valmara or Valmara 59 canister projects from the projector sleeve and the detonator fails to function, the time fuze will initiate the detonator in approximately 3 seconds.

Practice Mine: The practice Valmara 69 functions in a similar manner to the service mine. However, instead of causing the propelling charge to function, a percussion primer ignites a smoke charge. The mine canister remains in the case and emits red smoke.

SAFETY PRECAUTIONS

(U) Observe chemical precautions as given in the 60-series manual on chemical and biological (C/B) agents. (Army use FM9-15).

(U) Observe those precautions normally associated with landmines and boobytraps.

SPECIAL WARNING

(U) The disposal procedure for an armed mine with a VS-AR4 antilift device is untested and is based on the best technical data available. (Frame F2/page 11.)

WARNINGS

(U) Do not move an armed mine unless necessary. The fuze contains a spring-loaded, cocked ejection-charge firing pin that may be in a hung condition. (Frame D2/page 7.)

(U) Do not disturb an armed Valmara 69 mine except remotely. The mine may contain a VS-AR4 antilift device. (Frame D2/page 7.)

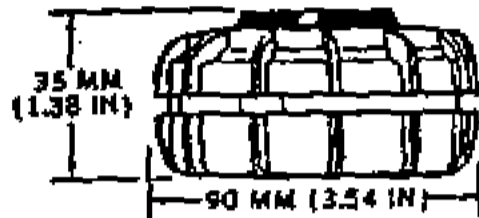
(U) Wait at least 30 minutes from time of ejection for the Valmara and Valmara 59 before approaching an ejected canister. This should provide ample time to observe any indication of further functioning since deterioration or dampness may prolong burning of the pyrotechnic time fuse. (Frame D4/page 9.)

US-50 NOT SCATTERABLE

1. (U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of the VS 50, and VS 50AR landmines.

a. (U) Type. The VS 50 is a high-explosive (HE) (blast), antipersonnel (apers) landmine which uses an integral, pressure-actuated, pneumatic fuze. The VS 50AR is a HE (blast), apers landmine which uses an integral, impact-delay armed, antidisturbance (mercury switch), battery-operated, electronic fuze. The VS 50 pneumatic fuze is designed to withstand explosive overpressure.

b. (U) Painting and Markings. The mine has a gray body, tan cases, black pressure plate, and a gray detonator plug. The VS 50 has a red safety pin and a blue shipping plug. The VS 50AR has an orange safety pin and orange shipping plug. The mines are unmarked.

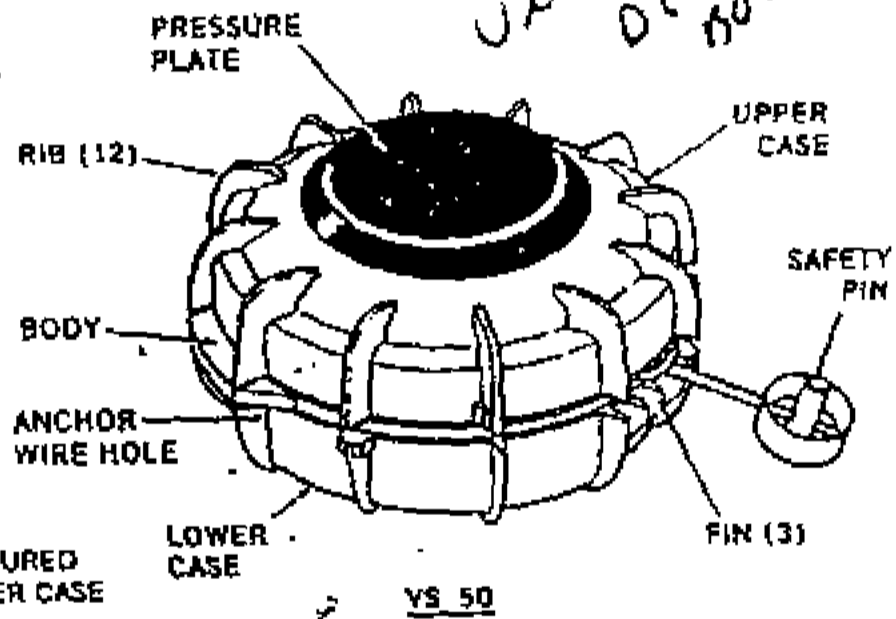


VS 50 AND VS 50AR

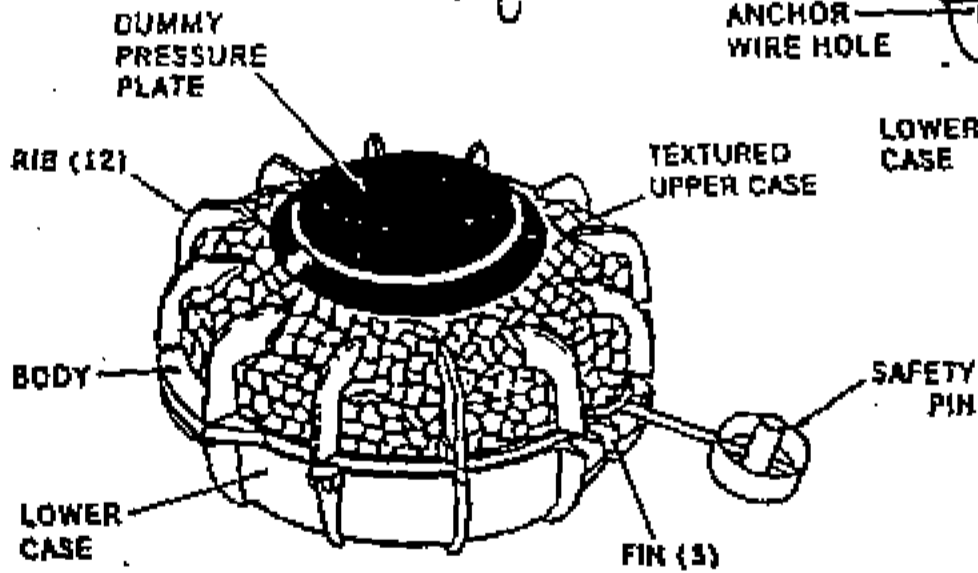
METAL PLATE EASY TO DETECT

PICK UP UNSCREW DET BOTTOM

BLUE SHIPPING PLUG DET IN IT GUESS RAN OUT TRAP GIVE DETS



VS 50



VS 50AR

UNCLASSIFIED

1284-101

Figure 1. (U) Appearance and Dimensions of the VS 50 and VS 50AR Landmines.

MAYBE DETONATOR SKIN NOT NECESSARILY SO

2. (U) DESCRIPTION.

a. (U) Material. The mines have plastic bodies, rubber pressure plates, and plastic or metal lower cases. The VS 50 mine may be equipped with a metal disk to aid in detection.

b. (U) Weight. The VS 50 mine weighs 177 grams (6.2 ounces); the VS 50AR mine weighs 203 grams (7.2 ounces).

3. (U) HAZARDOUS COMPONENTS.

a. (U) VS 50. This mine contains a 38-gram (1.3-ounce) RDX main charge and a detonator weighing less than 1 gram.

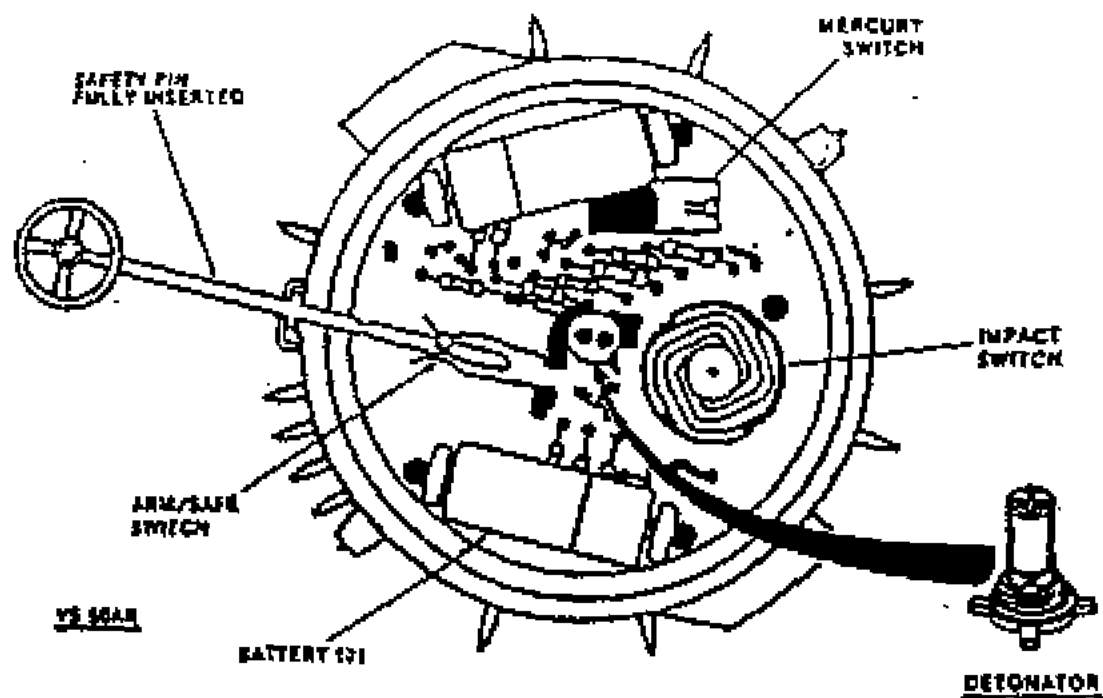
b. (U) VS 50AR. This mine contains a 22-gram RDX main charge and a detonator weighing 1 gram.

4. (U) FUNCTIONING.

a. (U) VS 50.

(1) (U) Arming. When the safety pin (figure 2) is removed, it removes a positive block from the trigger assembly, arming the mine.

(2) (U) Firing. Sustained force of approximately 14.0 kilograms (30.9 pounds) for 0.12 second on the pressure plate moves the firing pin housing downward, compressing the firing pin spring. The firing pin is restrained by the cocking shaft. Continuous downward movement of the firing pin housing permits the trigger assembly to pivot as the release shaft enters a groove (not shown) in the firing pin housing. As the trigger assembly pivots, air is forced out of the anticountermining (AMC) membrane, through a small pressure-release hole, and then removes the cocking shaft from restraining the firing pin. The firing pin spring drives the firing pin downward, initiating the detonator and explosive train.



UNCLASSIFIED

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Figure 2. (U) General Arrangement of the Mines.

UNSC
057
30/10/79

~~NO~~ ~~PLATE~~ ~~SCATTERABLE~~ ~~UNSCREW DET ON~~
TS-50 ~~ATTACKER~~ SCATTERABLE - BOTTOM
NO METAL PLATE - HARD TO DETECT

Italy		Anti-Personnel		TS-50	
Kill Mechanism	Blast				
Case Material	Non-Metal				
Main Charge	T4				
Booster Charge					
Main Charge Wt	0.05 kg			0.11 lb	
Booster Charge Wt					
Total Weight	0.186 kg			0.41 lb	
Height	4.5 cm			1.77 in	
Diameter	9 cm			3.54 in	
Anti - Disturbance Features					
Mine Counter-Counter	Resistant to explosive waves. It is also waterproof				
Emplacement	Buried (Hand or Machine)				
Fuze Type(s) - Initiation		Operating Force		Temp Operational Limits	
Pressure on Pressure Plate		12.5kg	28lb	-40 to +70°C	-14 to +18



Functioning:

(RDA-TRF-Mn 110) Actuation is by application of a 12.5kg force to a pressure plate

Mine's Operational:

(RDA-TRF-Mn.110) The mine can be laid by hand, to a maximum of 3cm, or by the Technovar DAT minelaying system for helicopters flying at a maximum speed of 200km/h and at altitudes of up to 100m.

Comments:

(RDA-TRF-Mn.110) A training version is available. This mine is produced in Egypt as the anti-personnel Plastic Mine T/79.

TS/50

Antipersonnel Scatter Drop Mine

The TS/50, homologated by the Italian Army, can be scattered rapidly both manually or automatically from trucks, boats or aircrafts.

Production: mass-produced.

Versions: two. Live-war. Inert-training.

Shape: cylindrical - $\varnothing = 9$ cm. - h. = 4.5 cm.

Weight: approx. 0.190 Kg. including explosive charge approx. 0.050 Kg. of RDX or other detonating explosive.

Impermeability: functions normally even if submerged in fresh or salt water or in marshy grounds. Non-buoyant.

Detectability: non metallic. It cannot be detected by traditional mine detecting methods. On request, it can be supplied with metallic parts so as to facilitate detection.

Mine Laying: it can be scatter-dropped from aircraft on medium compact ground or on water from altitudes up to approx. 100 mt. and at a speed of approx. 200 Km/h. It can be buried under 3 cm.

of earth, sand or fresh snow with no part protruding above the surface.

Operation: by pressure at the average load of approx. 12.5 Kg. corresponding to -4 mt. under water. The operational temperature range is from -40°C to +70°C.

Effectiveness: shock action against troops, action against vehicle tires.

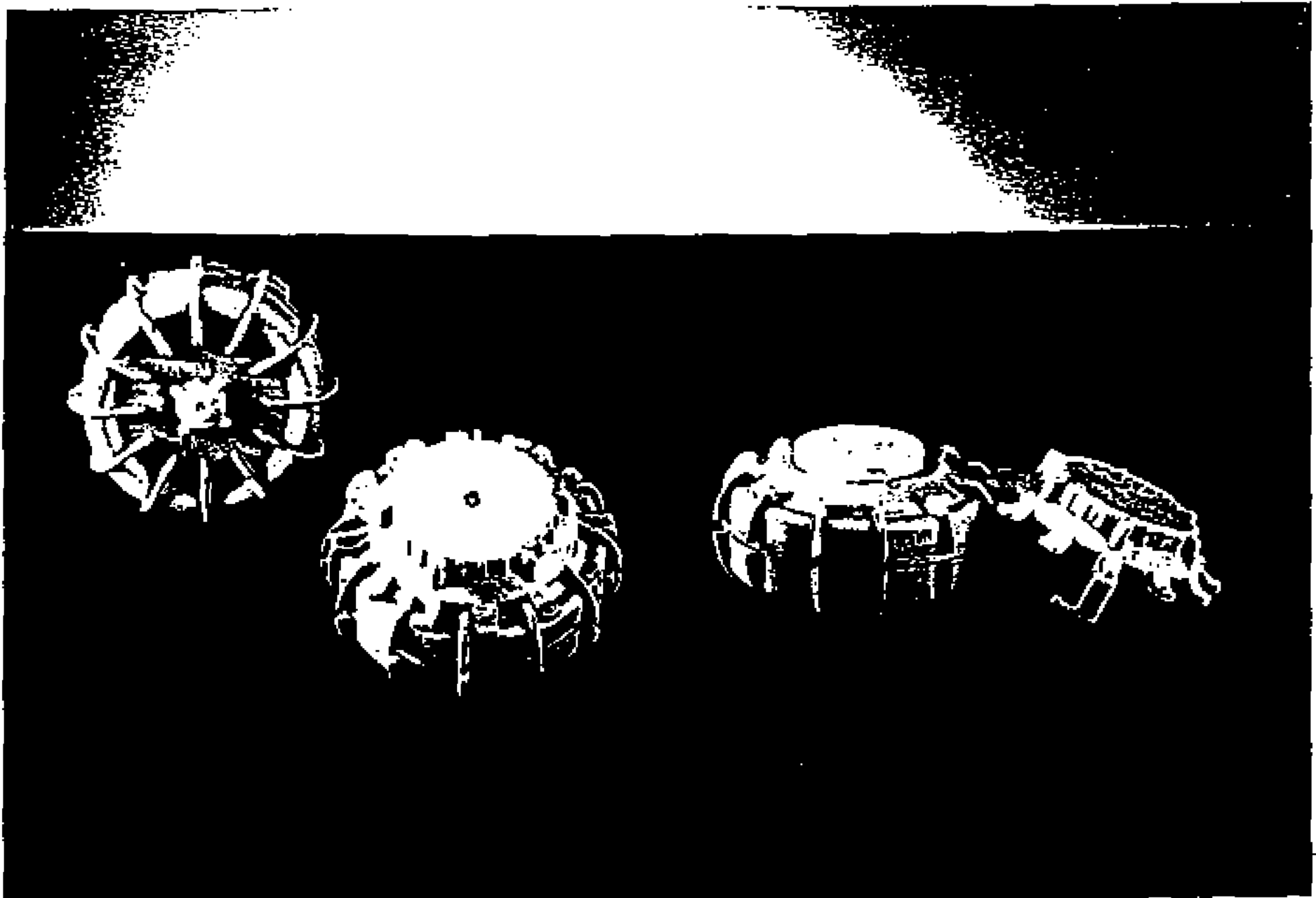
Safety: the mine is equipped with a safety cap that prevents the mine from exploding even under a load of more than 600 Kg.

Countermeasures: steel rollers, striking chains, explosion waves, FAE devices and magnetic detectors, have no effect on the mine.

Storage: normal functioning is assured even after a long storage at temperatures between -40°C and +70°C and at any degree of moisture.

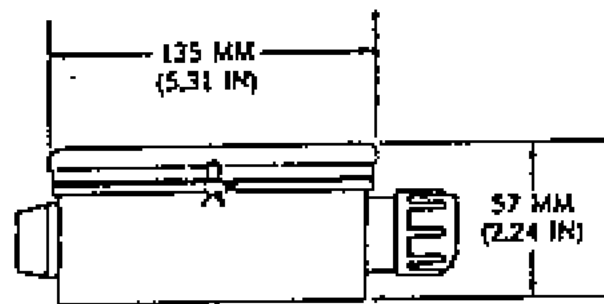
Packing: plastic case holding sixty mines. Gross weight 15 Kg.

Anti-lifting device: available.

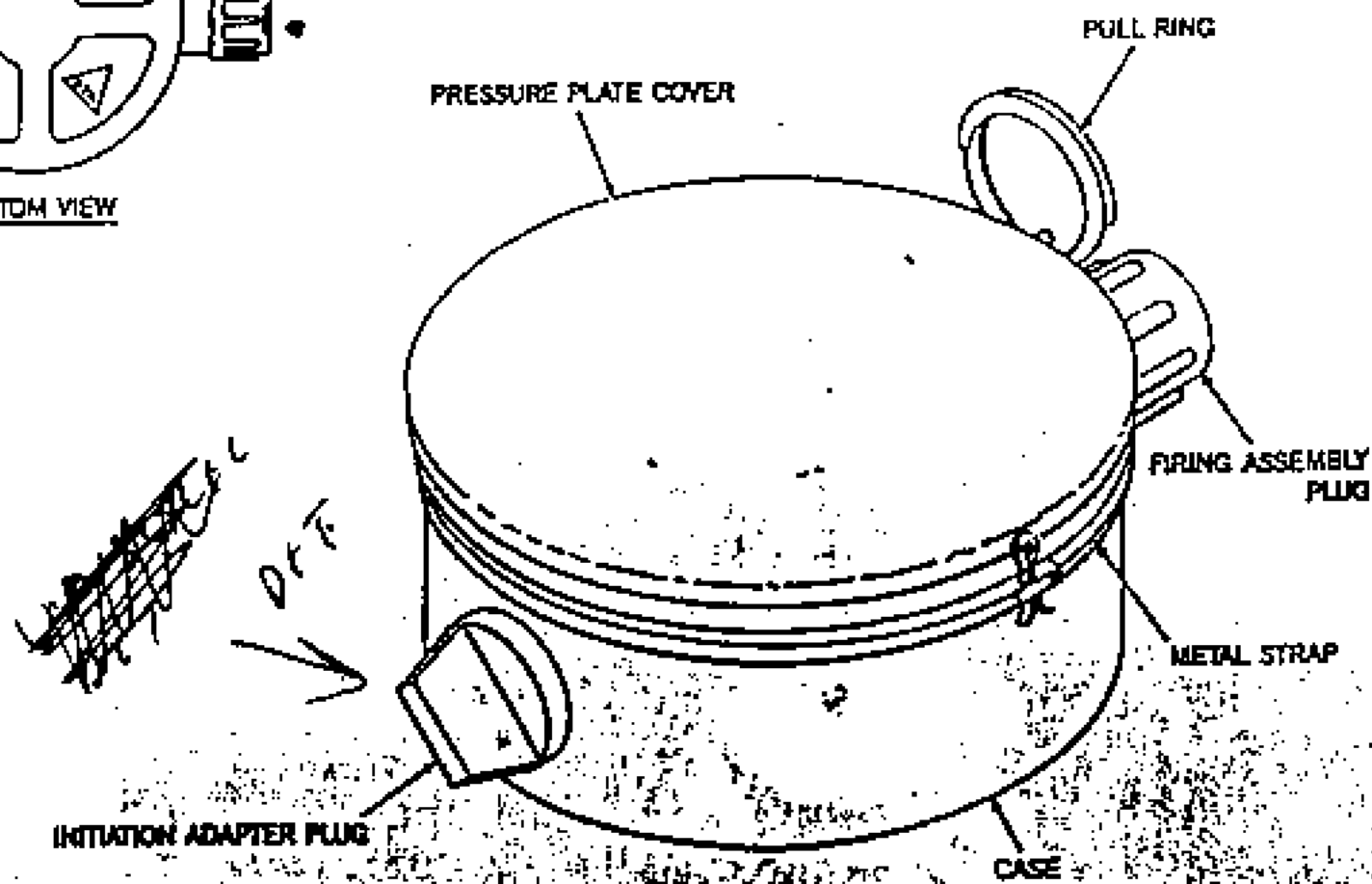
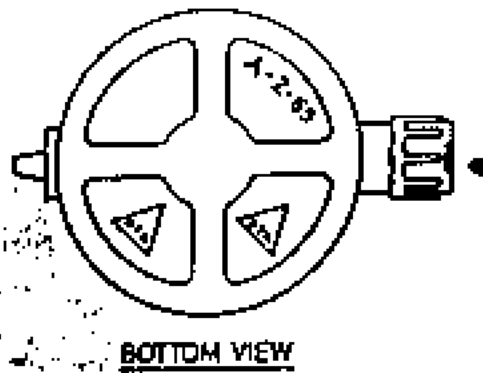


PMN-2

1. (U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of the PMN landmine. The Soviet designation ПМН transliterated to PMN.



BIP
SMUD



UNCLASSIFIED

Figure 1 (U) Appearance and Dimensions of the PMN Landmine.

a. (U) Type. This is a delay-armed pressure-fired high-explosive (blast) antipersonnel (apers) landmine.

b. (U) Painting and Markings. The mine case may be black, green, or brown. The black and green case has no markings, but the brown case has markings as shown in figure 1.

2. (U) DESCRIPTION.

a. (U) Material. The mine case is plastic and the pressure plate cover is rubber.

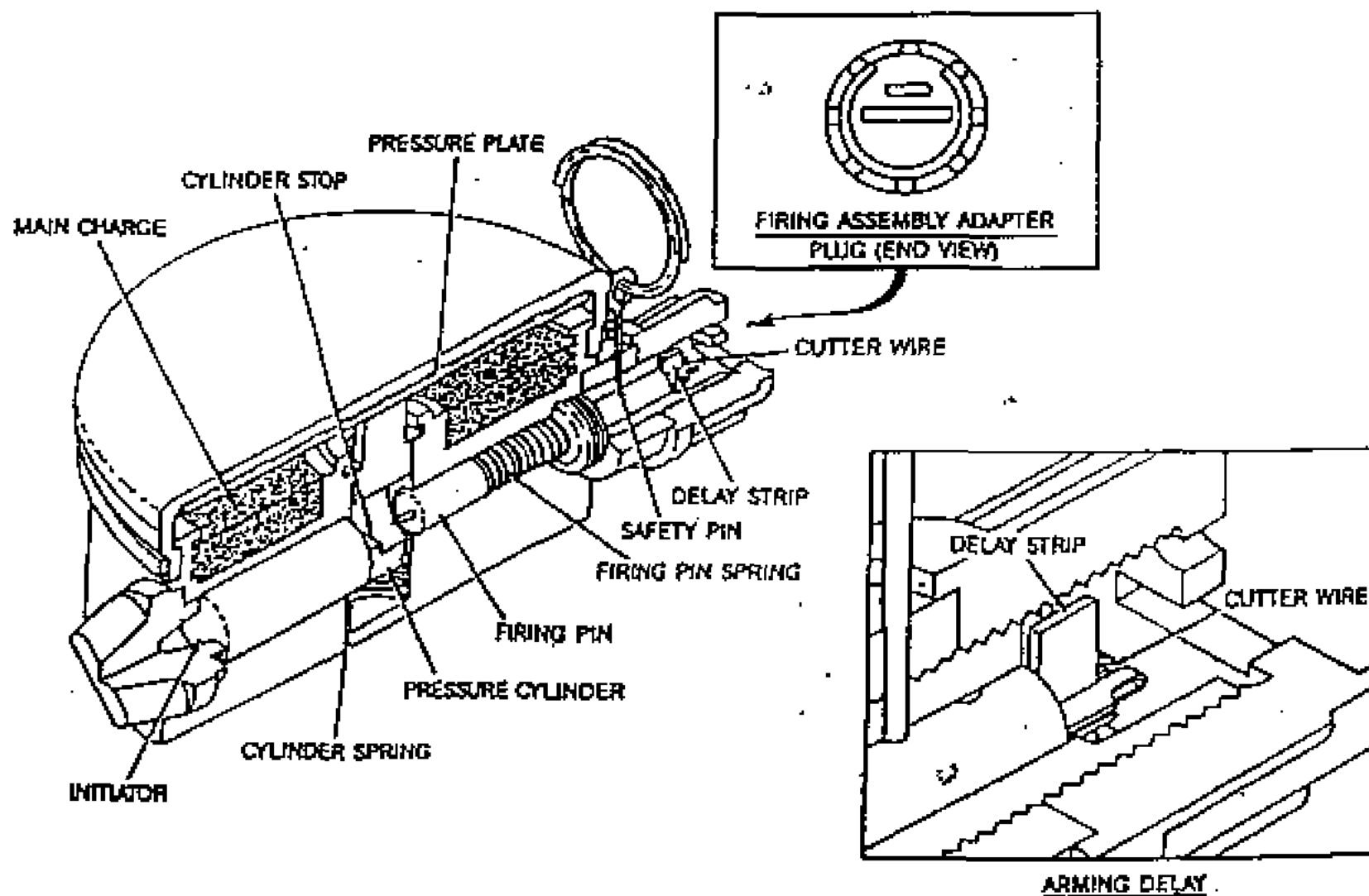
b. (U) Weight. The mine weighs approximately 454 grams (1.0 pound).

3. (U) HAZARDOUS COMPONENTS. The mine has a main charge of approximately 227 grams (8.0 ounces) of TNT and a 7-gram tetryl initiator.

4. (U) FUNCTIONING.

a. (U) Arming. The safety pin (figure 2) is removed, allowing the firing pin to move forward until the cutter wire rests upon the delay strip. After a delay of approximately 12 minutes, the delay strip is cut. The firing pin then moves forward to rest on the cylinder stop.

b. (U) Firing. A pressure of 4.1 kilograms (9.0 pounds) on the pressure plate forces a cylinder downward against its spring. As the cylinder moves down, it releases the firing pin which strikes the initiator to detonate the main charge.



UNCLASSIFIED

2520-101

Figure 2. (U) General Arrangement of the Mine.

5. (U) APPEARANCE.

a. (U) Unarmed Condition. The mine is unarmed if the safety pin is installed and extends through the hole.

b. (U) Armed Condition. The mine is armed if the safety pin is not installed or partially withdrawn.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION. None required. Proceed to disposal procedure.

SAFETY SUMMARY (U)

WARNING

(U) Do not disturb an armed mine. It contains a cocked firing pin. (Frame D3/page 5).



37

USSR LANDMINE, APERS, PMN

of but -
centro

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China		Anti-Personnel		Type 69
Kill Mechanism	Bounding Fragmentation			
Case Material				
Main Charge	TNT			
Booster Charge				
Main Charge Wt	0.105 kg	0.23 lb		
Booster Charge Wt				
Total Weight	1.35 kg	2.98 lb		
Height	16.8 cm	6.61 in		
Diameter	6.1 cm	2.4 in		
Anti - Disturbance Features	None			
Mine Counter-Counter	Detectability - visual by identification of trip/command			
Emplacement				



Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pull Release	1.5-4kg	3.3-8.8lb		

Functioning:

(RDA-TRF-Mn.110) The mine can be operated by a pressure or trip-wire fuze and when this is activated the mine body projects the main charge up to a height of 1.5m. It then bursts, to produce on average, 240 fragments each weighing 0.7g.

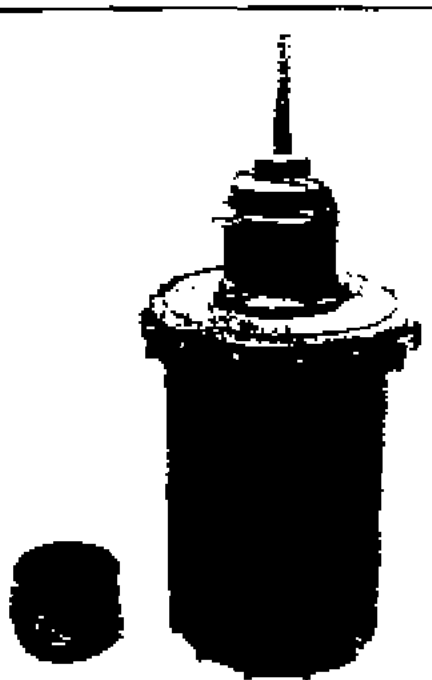
Mine's Operational:

~~TRIP~~
 PICK UP
 DON'T UNSCREW

Comments:

(RDA-TRF-Mn.110) The type 69 mines are delivered in wooden boxes each containing 10 mines weighing 22kg. The height of the burst is 1 - 1.5m. The height of just the body of the mine without the fuze is 11.4cm, while the total height (with fuze) is 16.8cm.
 (RDA-TRF-MC.008) Color is olive drab.

PIN
PICK
UP

Italy		Anti-Personnel		P40
Kill Mechanism	Bounding Fragmentation			
Case Material	Plastic			
Main Charge	TNT			
Booster Charge				
Main Charge Wt	0.48 kg	1.06 lb		
Booster Charge Wt				
Total Weight	1.5 kg	3.31 lb		
Height	20 cm	7.87 in		
Diameter	9 cm	3.54 in		
Anti - Disturbance Features	None			
Mine Counter-Counter	Detectability - visual by identification of trip wire;			
Emplacement	Buried			
Fuze Type(s) - Initiation		Operating Force		Temp Operational Limits
Pull (Trip Wire)		2-10kg	4.4-22lb	

Functioning.

(RDA TRF-Mn.110) The mine operates as follows when the tripwire is pulled the inside container is ejected into the air and when it reaches a pre-determined height it explodes and scatters the fragments in a radial path

Mine's Operational.

(RDA-TRF-Mn 110) The mine is buried with just the fuze showing above the ground. The fuze is attached to two tripwires which extend 15m from the mine

Comments.

(RDA-TRF-Mn 110) The MISAR P-40 anti-personnel mine was developed from early 1977 and entered production in 1978. It consists of a cylindrical casing, which can be made in any colour, inside which is another container holding the high explosive and fragments. The fuze is attached to the two tripwires which can be up to 15m from the mine. Trials conducted by MISAR have shown that this mine will cause injury to at least 55 per cent of men standing within a radius of 15m of the mine when it is ignited. The mine is waterproof, will not float and has a minimum maintenance-free life of 10 years. Smoke-producing and inert training models are available. The 20cm Height is with fuze Casing Height is 12cm. Packing case of 8 mines weighs 16kg

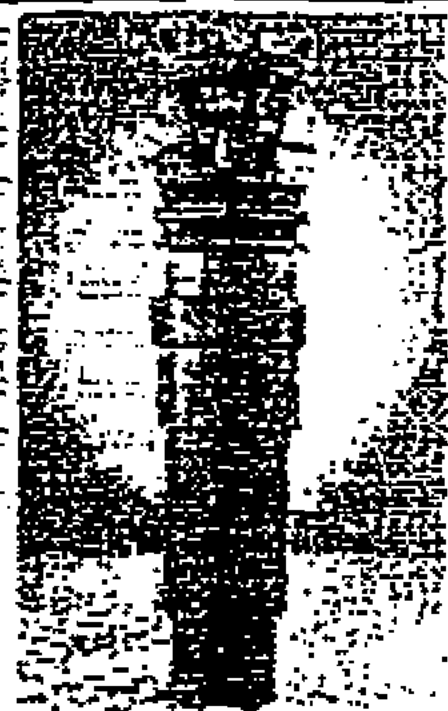
(RDA-TRF-MC.008) Color is green, sand brown

Jun 25, 1991

APC - 16

39 B

Kill Mechanism	None	
Case Material		
Main Charge		
Booster Charge		
Main Charge Wt		
Booster Charge Wt		
Total Weight	0.5 kg	1.1 lb
Height	21 cm	8.27 in
Diameter	6.6 cm	2.6 in
Anti - Disturbance Features	None	
Mine Counter-Counter	Detectability - visual, by identification of trip wire.	
Emplacement		



Fuze Type(s) - Initiation	Operating Force	Temp Operational Limits

Functioning:

PICK UP

Mine's Operational:

Comments:
 (RDA-TRF-HC.008) Color is sand brown, olive drab.
 Pressure - 12kg (26.4 lb)
 Tension - 6kg (13.2 lb).

pick up

Italy		Illumination		VS-T
Kill Mechanism	Warning/Visual Alarm			
Case Material	Resins			
Main Charge	Illumination			
Booster Charge				
Main Charge Wt.	0.24 kg	0.53 lb		
Booster Charge Wt.				
Total Weight	0.47 kg	1.04 lb		
Height	22 cm	8.66 in		
Diameter	7 cm	2.76 in		
Anti-Disturbance Features	None			
Mine Counter-Counter	Detectability - visual, by identification of trip wire.			
Emplacement	Stake or Buried			

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pull (Trip Wire)	8kg	18lb	-32 to +49°C	0 to +146°F
Pressure	11kg	24lb	-	-

Functioning:

(?) Manually emplaced. Fastened to a picket, if tactically required. Direct external pressure, on turret (11kg) or trip-wire pull (8kg) will initiate mine.


Mine's Operational:

(?) A tactical number of VS-T mines in a minefield of critical geography or any protected perimeter, enhance the protection of the minefield from night-clearing teams. Designed to provide both sound and visual warning.

Comments:

(?) The flare illuminates an average radius of 57 meters for a minimum of 40 seconds. Intensity in excess of 15 Lux (50,000 candlepower) reaches pyrotechnic signal flares to a height of 5 to 25 meters (RDA-TRF-MC-008). It has no kill radius, but does create a fire hazard out to 5 meters. Color is an olive drab, color of the signal stars within. The pyrotechnic flare lasts about 10 seconds, and the visible visual range is up to 500 meters. Color is olive drab.

PICK UP
UNSCREW DOT
BOTTOM

China		Anti-Personnel		Type 72
Kill Mechanism	Blast			
Case Material	Plastic			
Main Charge				
Booster Charge				
Main Charge Wt	0.032 kg	0.07 lb		
Booster Charge Wt				
Total Weight	0.15 kg	0.33 lb		
Height	3.7 cm	1.46 in		
Diameter	9.8 cm	3.86 in		
Anti - Disturbance Features				
Mine Counter-Counter	Detectability difficult for Type 72 (the only metal is in the			
Emplacement				

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pressure	3-7kg	6.6-15.4lb		

Functioning:
(RDA-TRF-MC 008) Antihandling - yes, in the Type 72B.

Mine's Operational:

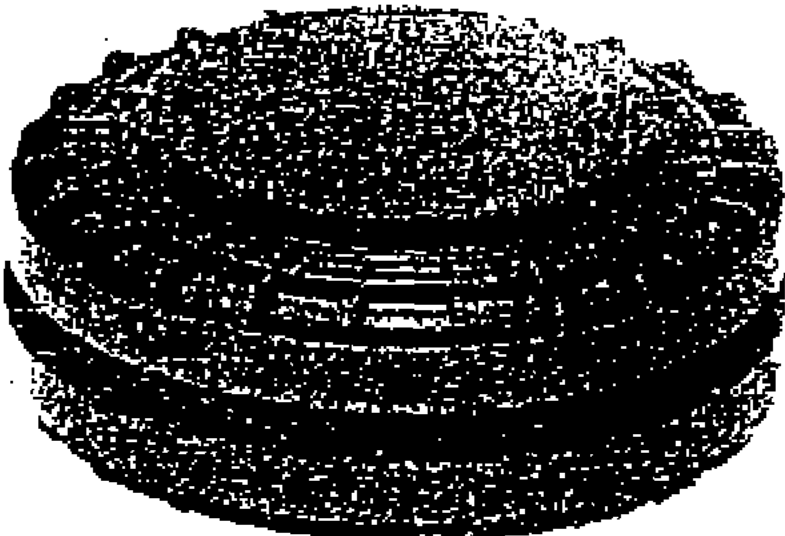
NOT
BLAST
RESIST

Comments:
(RDA-TRF-MC.008) The colors are light green cover, green body. Probing for small mines with antidisturbance features and/or low threshold pressure fuzing is very hazardous.
(RDA-TRF-Mn.114) The main parts of this mine are made out of plastic and thus not detectable by metal mine detecting devices.

TAN
COLORED
DET PLUG
CLEAR
SHIPPING
PLUG

AR
150710

Italy FOU

Italy		Anti-Tank		VS-1.6
Kill Mechanism	Blast			 <p>(U) ITALIAN VS-1.6 ANTI-TANK MINE</p>
Case Material	Plastic			
Main Charge	HE			
Booster Charge	Comp A3			
Main Charge Wt	1.85 kg	4.08 lb		
Booster Charge Wt				
Total Weight	3 kg	6.61 lb		
Height	9.2 cm	3.62 in		
Diameter	22.2 cm	8.74 in		
Anti-Disturbance Features	Anti-Shock Device			
Mine Counter-Counter	Claim undetectable by standard detectors, Double anti-shock			
Emplacement	Scatterable or Buried			
Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pressure	180-220kg	397-485lb	-32to+60°C	0to+166°F

Functioning:

(RDA-TRF-Mn.110) The mine is provided with a double anti-shock device operating mechanically and pneumatically

(RDA-TRF-MC.008) Antihandling (Scattered)- The VS-1.6 has no built in antihandling, self neutralization; The VS-1.6/AR yes, electronics package with antiremoval; The VS-1.6/AR no electronics package has self-neutralization Antihandling (buried) - The VS-1.6 yes, of MUM type or VS-AR-4 antilift fuze attached to bottom detonator well. The VS-1.6/AR: yes, built in capability for Mine's Operational:

(RDA-TRF-Mn.106) Designed for rapid laying from helicopters flying at an altitude of 100m and 200km/hr. Mine can also be scattered from trucks or by hand. Usually laid on surface but can be buried to 7.5cm.

(RDA-TRF-Mn.110) Either surface laid or buried down to 77mm below the ground surface, the VS-1 can cause an immobilising "kill" by cutting tank tracks or causing major damage to MBT suspensions

Comments:

(RDA-TRF-Mn.106) Is available with a self-neutralizing device.

(RDA-TRF-Mn.110) The bottom cover of the mine is provided with a plug housing the detonator. During transport and storage this plug is replaced by a dummy plug, colored blue, for extra safety

(RDA-TRF-MC.008) All the VS-1.6 antitank mines are helicopter deliverable by VS-MD-H system as well as other compatible Italian mine scattering systems. The colors are: sand brown and olive dr with black rubber cover.

(RDA-TRF-Eq.026) (Combines) the features of conventionally laid mines with those of the anti-shock fuze type, thus making them suitable for scatter-dropping from both tracked and wheeled vehicles, well as helicopters and aircraft. These mines can also be fitted with an anti-removal device which

Jun 25, 1991

VS-1.6

1.6 AR
NONE FOUND

BLAST
RESISTANT

TAN COLORED DET PLUG
CLEAR IS SHIPPING PLUG
UNSCREW DET BOTTOM

40

(U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of the Model VS 1.6 landmine.

(U) Type. This is a pressure-actuated, high-explosive (blast), nonmetallic, scatterable antitank (AT) landmine. It can be scattered from vehicles, helicopters, or fixed-wing aircraft.

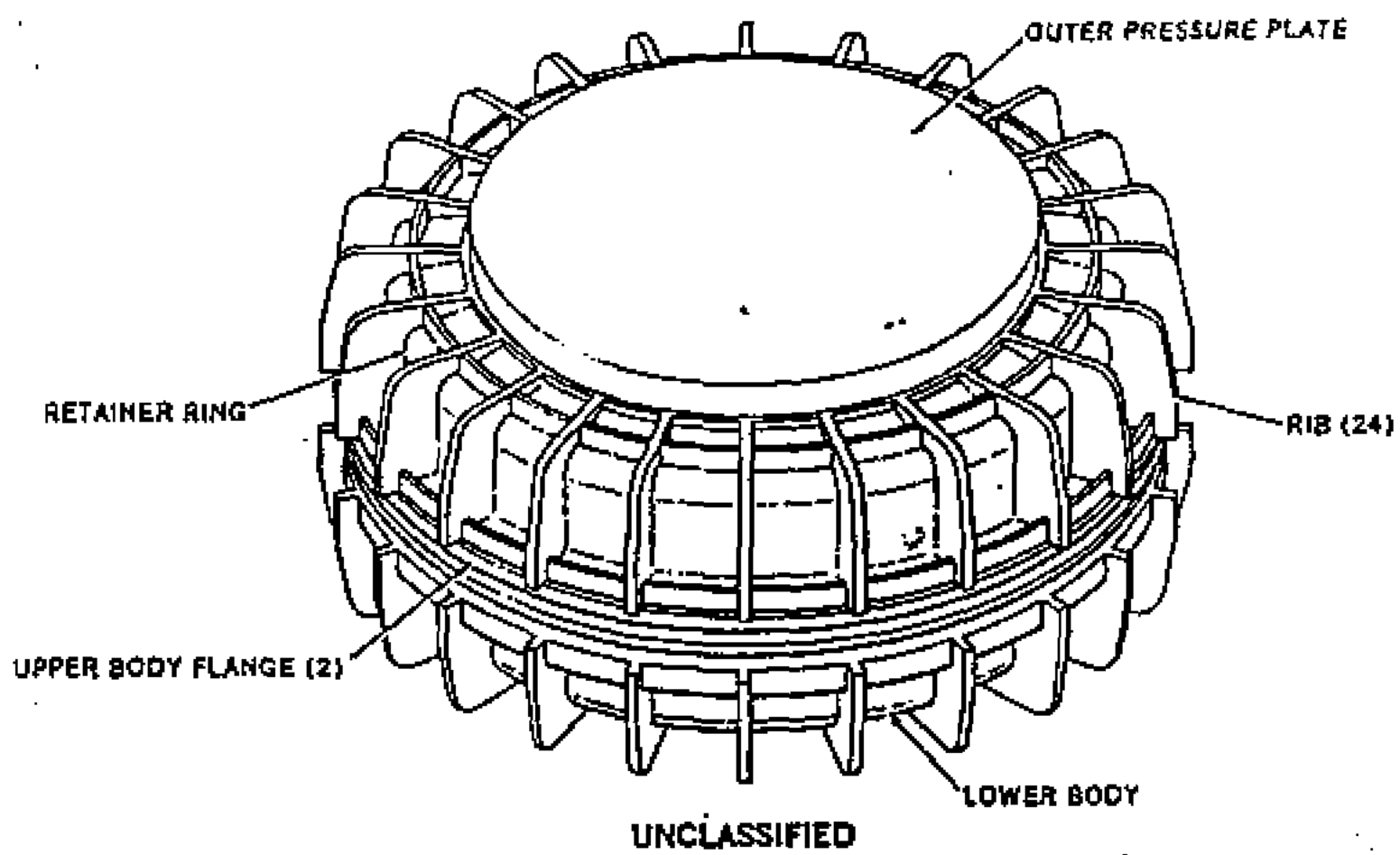
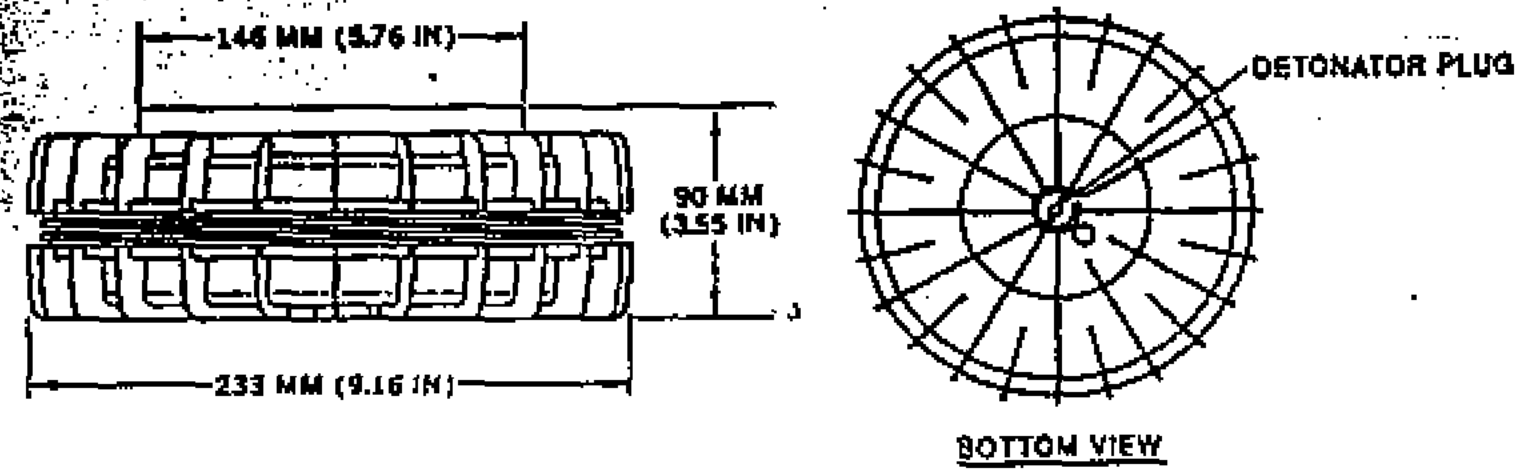


Figure 1. (U) Appearance and Dimensions of the Model VS 1.6 Landmine.

4. (U) FUNCTIONING. The mine is armed by replacing the shipping plug (figure 2) with the detonator plug. A pressure of 150.0 kilograms (330.7 pounds) is required to actuate the fuze. Pressure on the outer pressure plate depresses the inner pressure plate and breaks it into triangular segments. These force the pressure sleeve downward, compressing the spring. As the pressure sleeve moves downward, its lugs and the arms of the firing pin body ride in cam grooves in the release sleeve.

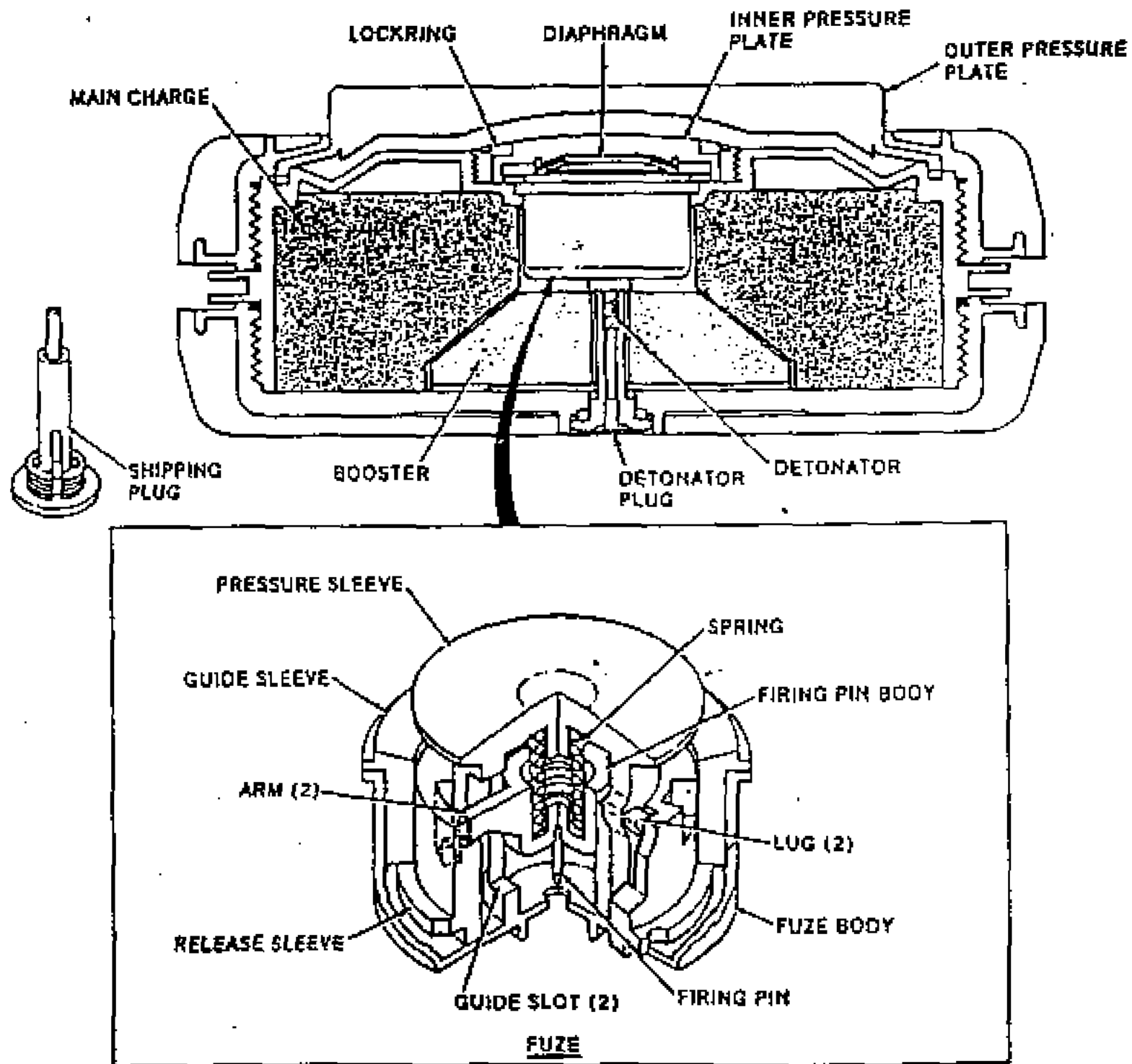


Figure 2. (U) General Arrangement of the Mine.

NOTE

(U) This mine can be fitted with an antdisturbance fuze which may also incorporate a selectable-delay self-destructing feature.

b. (U) Painting and Markings. The mine is olive drab. The detonator plug is olive drab and the shipping plug is blue.

2. (U) DESCRIPTION.

a. (U) Material. The mine is plastic.

b. (U) Weight. The mine weighs 2.9 kilograms (6.4 pounds).

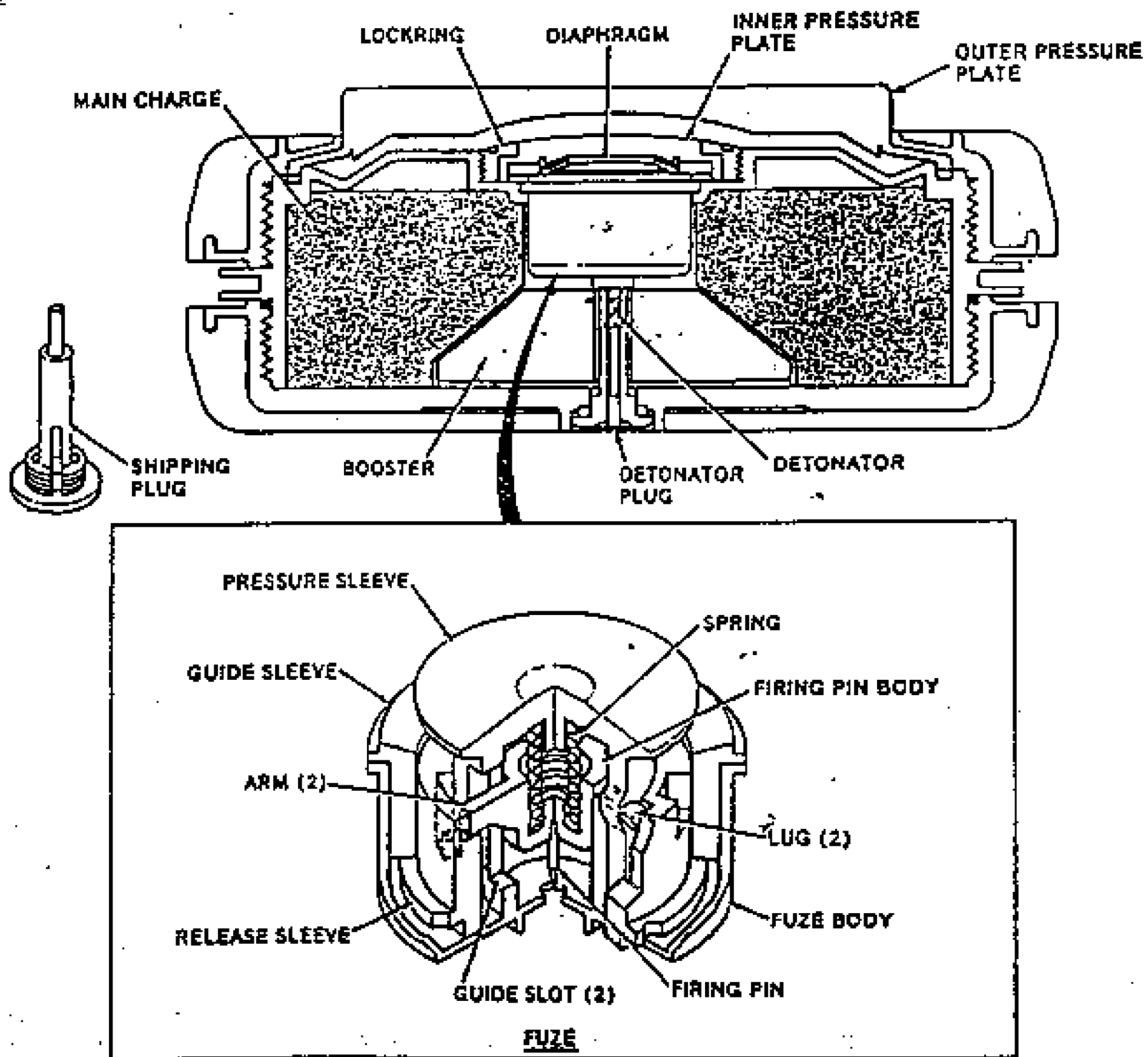
3. (U) HAZARDOUS COMPONENTS. The mine contains a 1.7-kilogram (3.8-pound) main charge of TNT and RDX, a 207-gram (7.3-ounce) RDX booster, and a detonator weighing less than 1 gram.

CLASSIFICATION

GROUP 1 (U) CONTROLLED INFORMATION

43 43

4. (U) FUNCTIONING - CONT. This causes the release sleeve (figure 2) to rotate. After one-eighth of a rotation, the arms drop into vertical slots in the release sleeve. The firing pin body is released and forced downward by the spring, driving the firing pin into the detonator to initiate the explosive train.



UNCLASSIFIED

Figure 2. (U) General Arrangement of the Mine (Repeated).

5. (U) APPEARANCE.

a. (U) Unarmed Condition. The mine is unarmed if the detonator plug/adapter is not installed.

b. (U) Armed Condition. Consider the mine armed if the detonator plug/adapter is installed.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION. None required. Proceed to disposal procedure.

SAFETY SUMMARY (U)

SAFETY PRECAUTION

(U) Observe those precautions normally associated with landmines and boobytraps.

SPECIAL WARNING

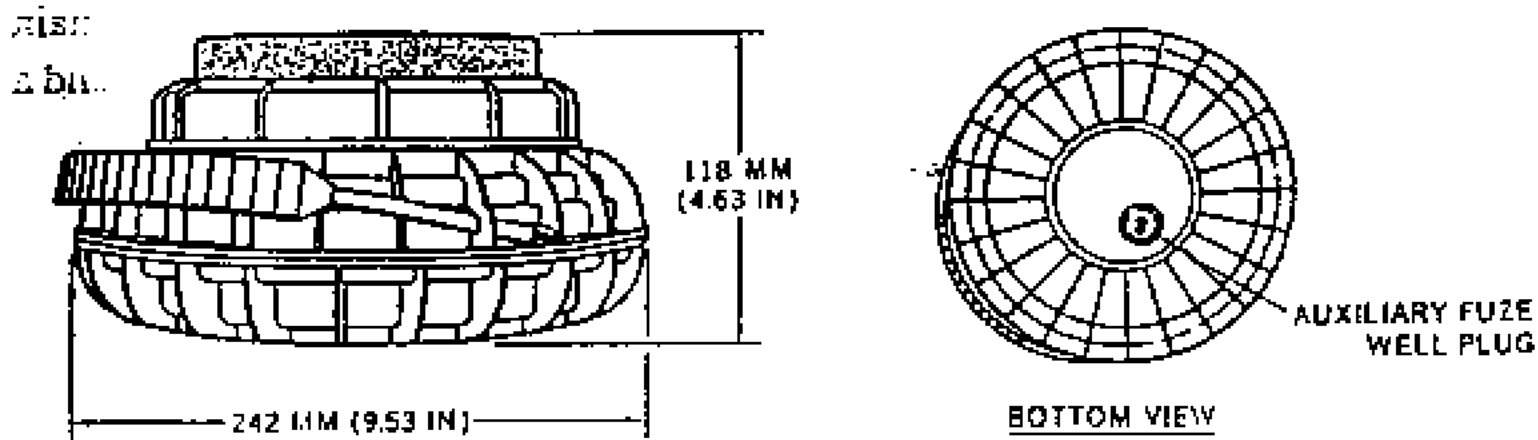
(U) The disposal procedure for the armed condition is untested and is based on the best technical data available. (Frame F2/page 7.)

WARNING

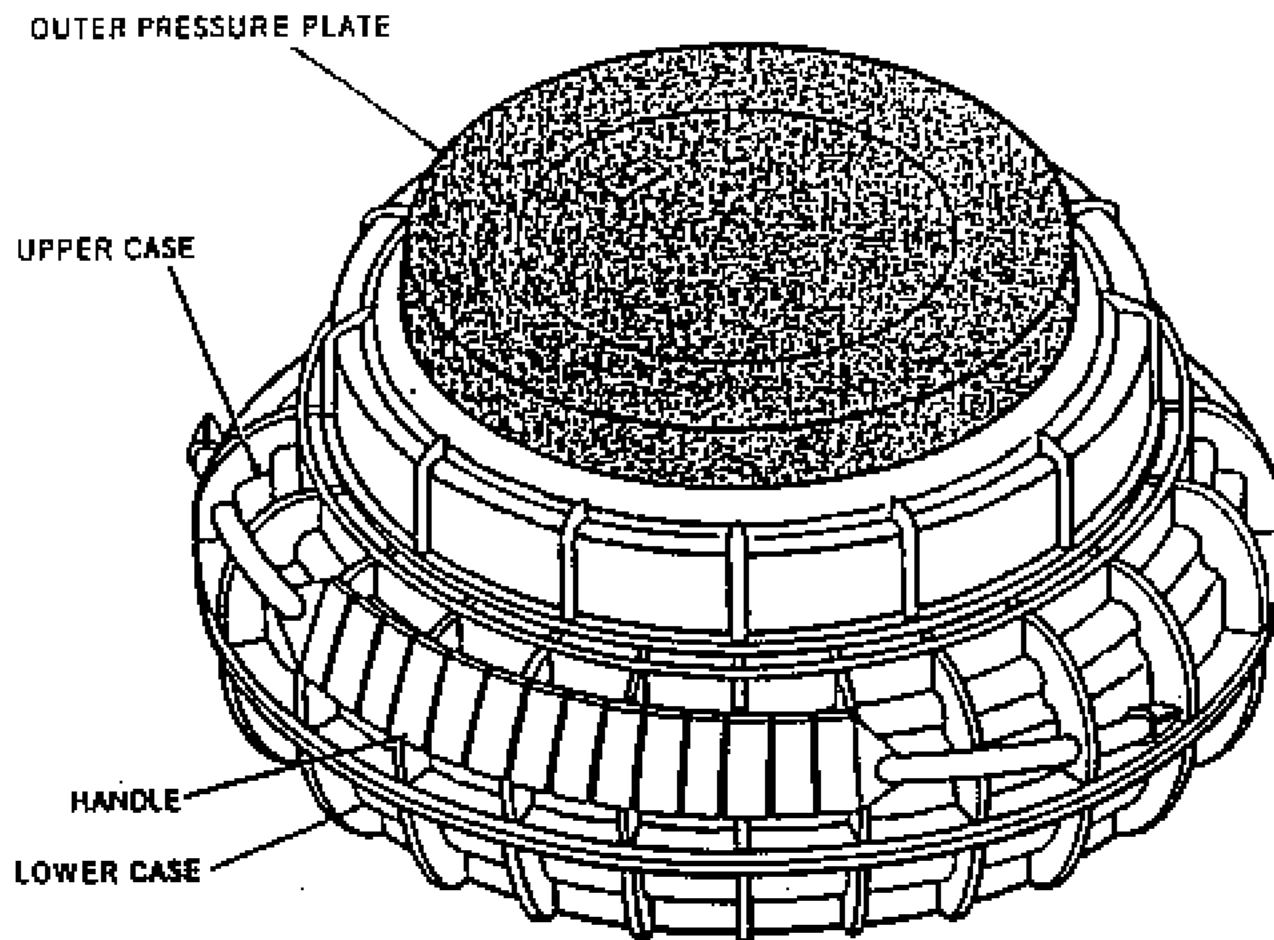
(U) Do not disturb an armed mine except remotely. The mine may contain an AR-VS4 antilift device. (Frame D3/page 6.)

PET INSIDE
VS-2.2 PRESSURE
PLATE
UNSCREW
DOT
Italy

b. (U) Painting and Markings. The mine may be either khaki or green. The letters VS-N may be embossed on the outer pressure plate.



NOTE: VS-N EMBOSING MAY OR MAY NOT BE PRESENT.



UNCLASSIFIED

Figure 1. (U) Appearance and Dimensions of the VS-2.2 Landmine.

2. (U) DESCRIPTION.

a. (U) Material. The mine is plastic.

b. (U) Weight. The mine weighs 3.5 kilograms (7.8 pounds).

3. (U) HAZARDOUS COMPONENTS. The mine contains a 1.9-kilogram (4.2-pound) main charge of cast TNT and RDX (pink in color), a 270-gram (9.5-ounce) booster pellet of RDX, and a 2-gram detonator of unknown composition.

4. (U) **FUNCTIONING.** Functioning of the electric antisturbance fuze is unknown. The VS-N pneumatic fuze functions as follows.

a. (U) **Arming.** The mine is armed by removing a shipping plug (figure 2) from the fuze and inserting the detonator.

b. (U) **Firing.** A pressure of 150 kilograms (330 pounds) on the outer pressure plate forces the inner pressure plate in, which pressurizes the diaphragm. The diaphragm and release sleeve move inward, compressing the firing-pin spring and aligning the lockball with the lockball release hole. This frees the firing pin, which is spring driven into the detonator to initiate the explosive train.

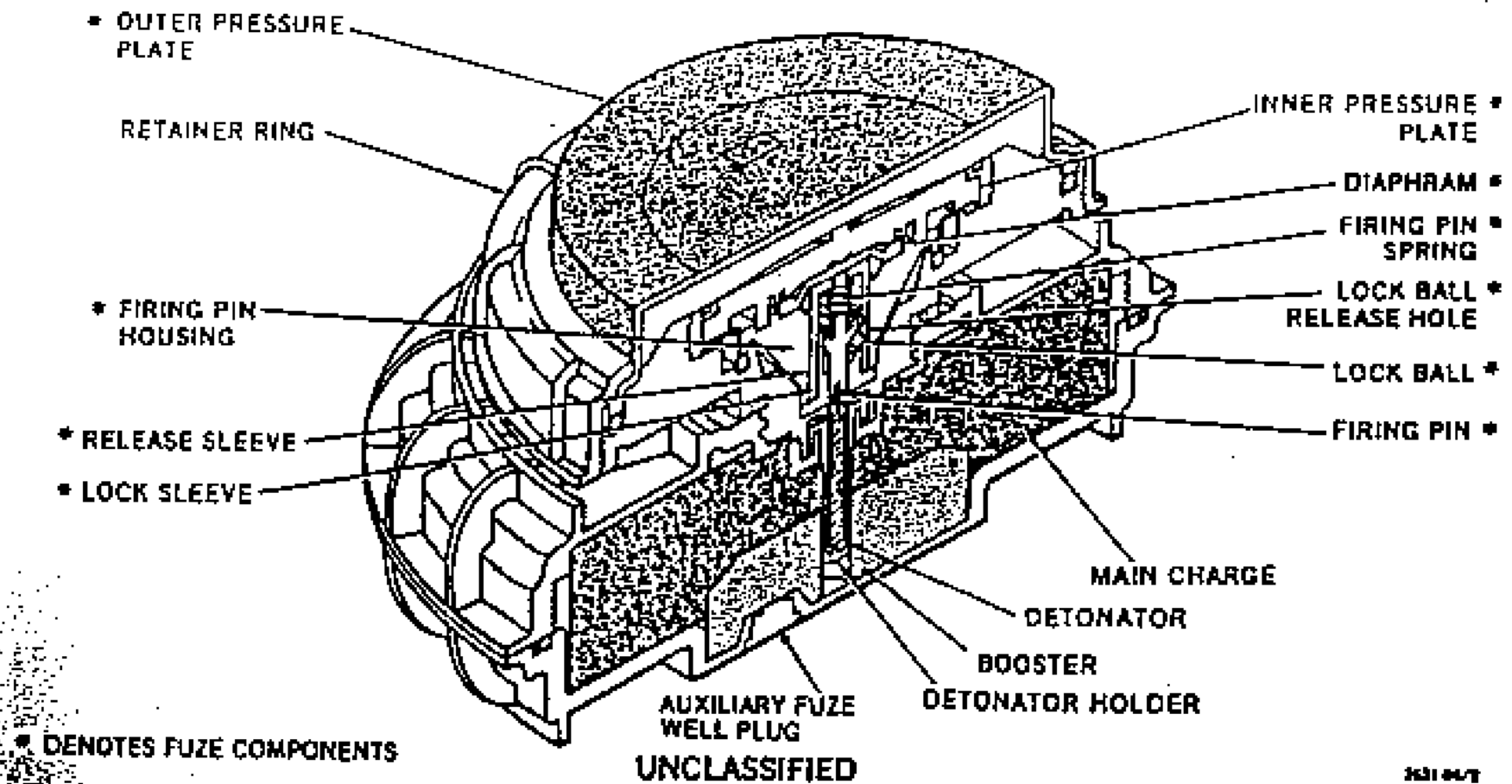


Figure 2. (U) General Arrangement of the Mine.

48

SAFETY SUMMARY (U)

SAFETY PRECAUTION

(U) Observe those precautions normally associated with landmines and boobytraps.

SPECIAL WARNING

(U) The armed disposal procedure is untested and based on the best technical data available. (Frame F2/page 6).

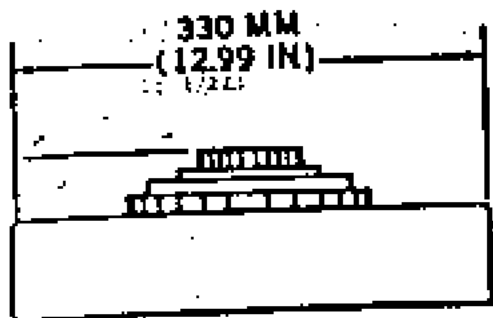
WARNINGS

(U) Do not disturb an armed mine. The mine may contain a hung cocked firing pin. (Frame D2/page 4.)

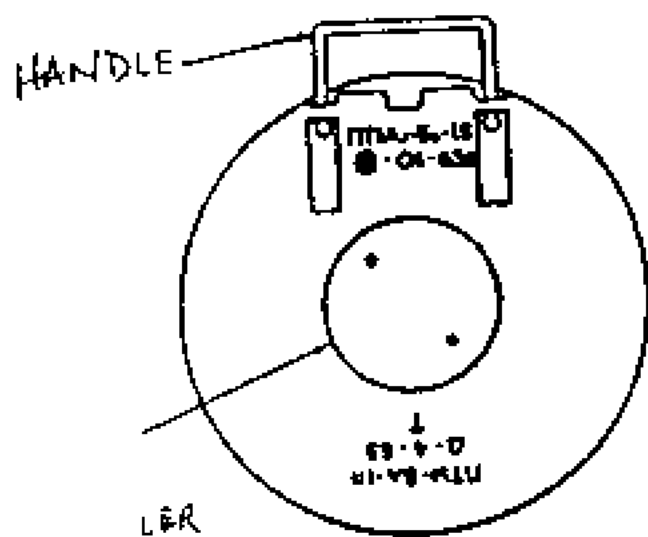
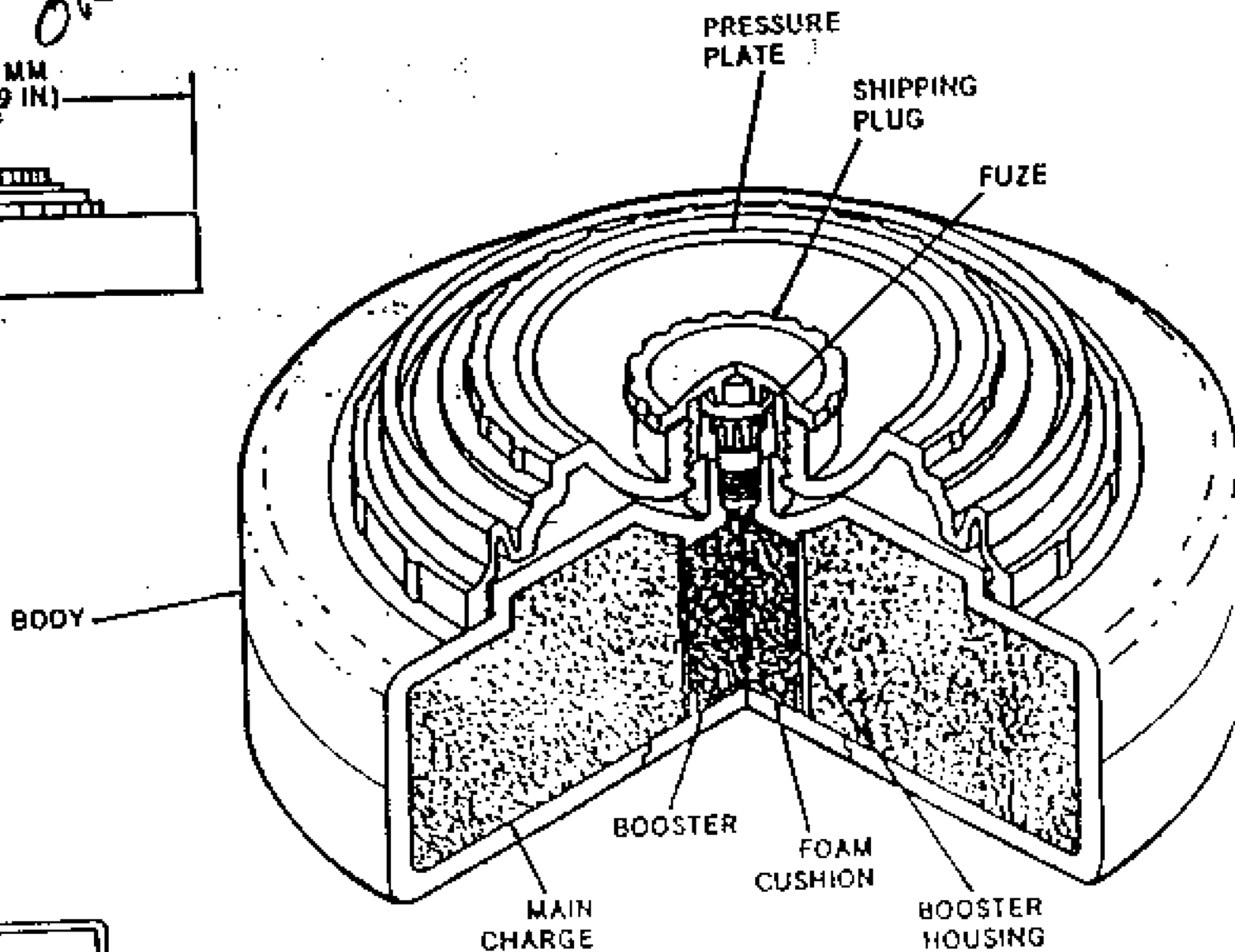
(U) Do not attempt to remove the fuze from an armed mine. Removing a VSN/AR-AN fuze may detonate the mine. (Frame D2/page 4.)

PT-MI-Ba III
(CZECH)

SMUD ONLY



mm 10



*L&R
uc*

BOTTOM VIEW

APPEARANCE, DIMENSIONS, AND GERNERAL ARRANGEMENT
OF THE PT-MI-Ba III Landmine

PT-MI-Ba III

1. Type: This is a high-explosive (blast), nonmetallic, antitank (AT) landmine. Fuze is pressure actuated.

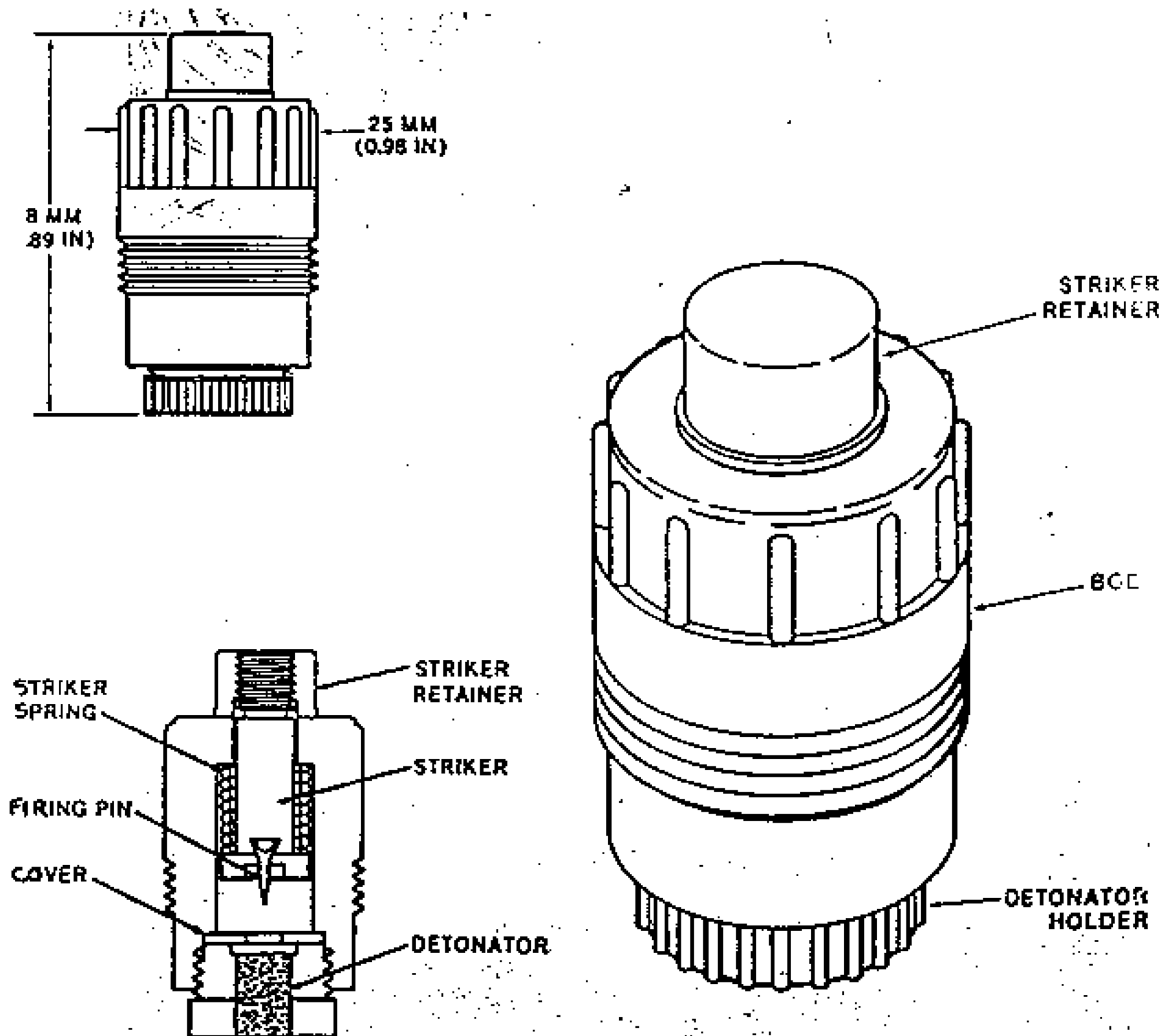
2. Painting and Marking: The mine is black plastic with white markings starting at the bottom. The fuze body and detonator holder are brown plastic and have no markings.

3. Description:

a. Material: The mine is plastic. The fuze is plastic with internal metal parts.

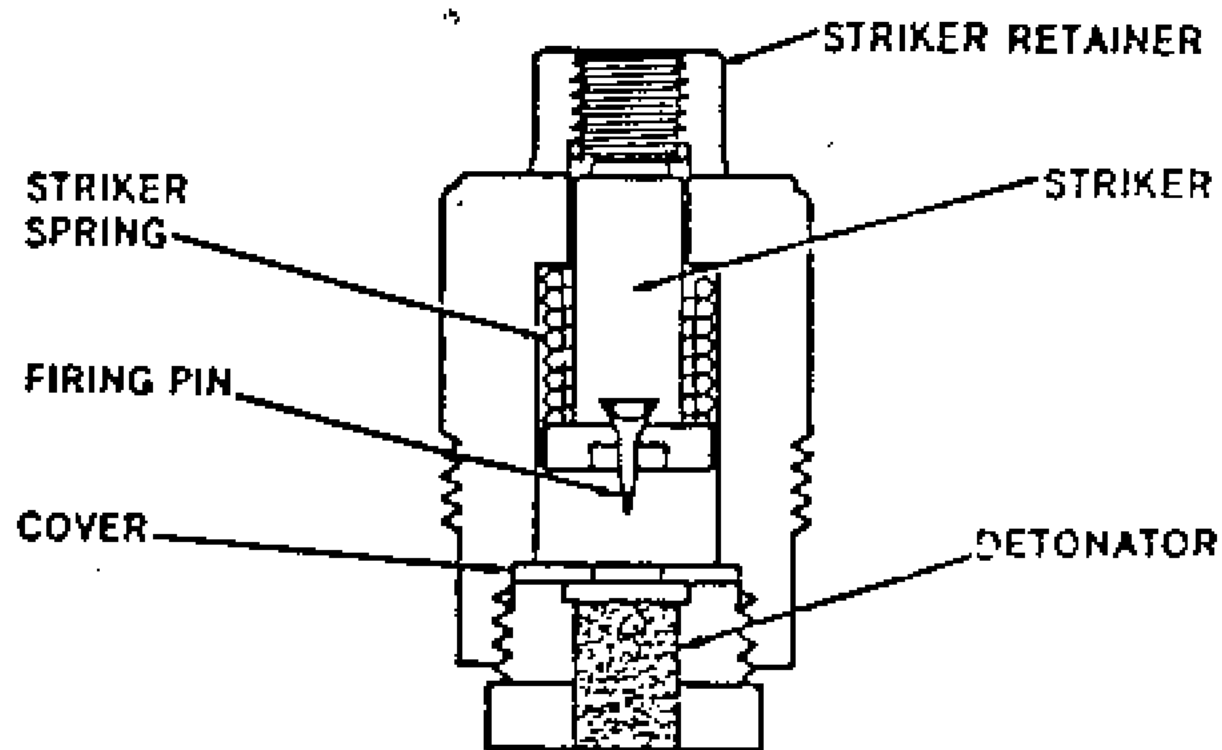
b. Weight: The mine weighs approximately 10.0 kilograms (22.0 pounds).

PT-MI-Ba III (Fuze)



PT-MI-Ba III
(Fuze continued)

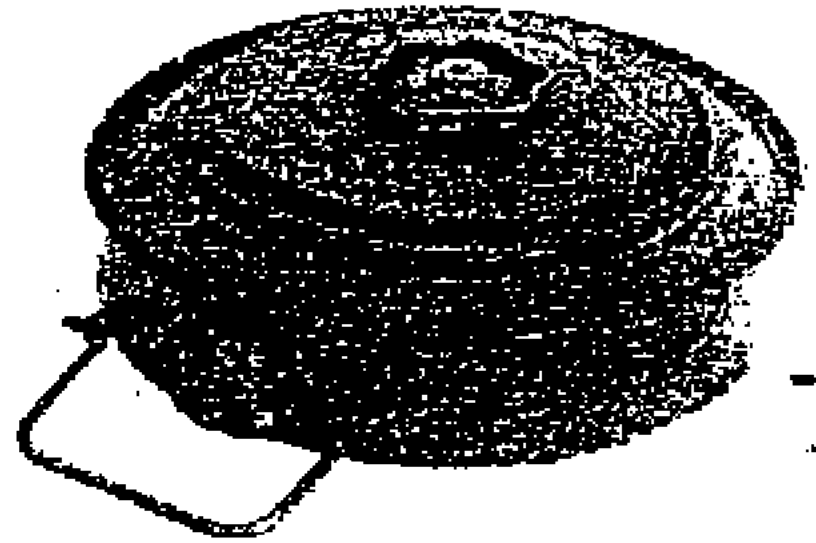
4. Functioning. Pressure applied to the mine pressure plate fractures the pressure plate and fuze striker retainer, releasing the spring-loaded firing pin to initiate the detonator and explosive train.



UNSCREW FUZE TOP

INSERT PIN
UNSCREW FUZE TOP

USSR		Anti-Tank		TMN-46
Kill Mechanism	Blast			
Case Material	Metal			
Main Charge	TNT			
Booster Charge	Tetryl			
Main Charge Wt	5.95 kg	13.12 lb		
Booster Charge Wt	0.07654 kg	0.17 lb		
Total Weight	8.98 kg	19.8 lb		
Height	11 cm	4.33 in		
Diameter	30.4 cm	11.97 in		
Anti - Disturbance Features	Anti-Lift			
Mine Counter-Counter				
Emplacement	Buried (Hand or Machine)			



Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pressure	1-1kg	2.2-2.2lb		

Functioning:

(RDA-TRF-Mn.108) Pressure forces the pressure plate downward to the head of the fuze. As the fuze is depressed the striker is released detonating the mine. (See TM-46 for full description)

Mine's Operational:

(RDA-TRF-Mn.108) Mine is machine laid with MVM fuze and hand laid with MV-5 and MVSh-46 fuze. May be emplaced under water, in creek and river beds, or in minefields.

Comments:

(RDA-TRF-Mn.108) Disarmament/Safing: Advise destroy in place.

Second fuze well used for booby trapping.

(RDA-TRF-Mn.110) There is a fuze well in the bottom of the mine for booby-trapping. In appearance, the TMN-46 is almost identical to the TM-46, which does not have the fuze well in the bottom of the mine for booby-trapping.

(RDA-TRF-Mn.009) The mine is now obsolete and not in service with Warsaw Pact armies. It is still available in abundance to African Terrorist Organizations.

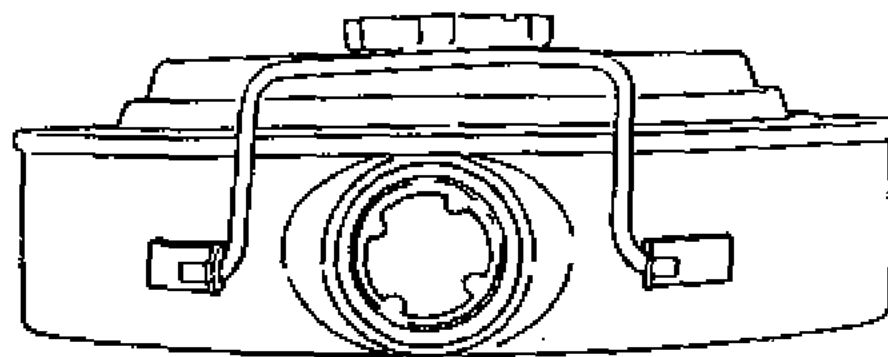


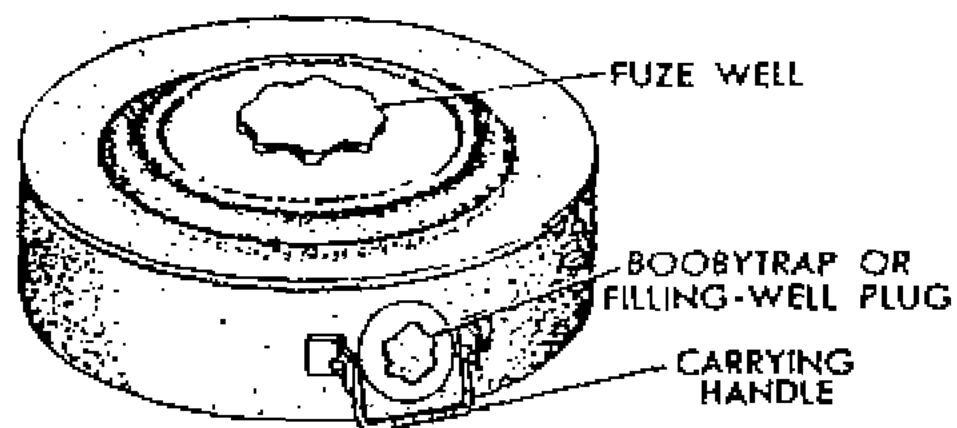
Figure 6-81. Mine Antitank TMN-46 Antilift.

Dimensions	Wt	Fuze	Operating force	Explosive	
				Main charge	Booster
Diameter: 12" Height: 8"	19.18 lb	MV-5 MV-47 MVM7	No data	TNT 13.06 lb	Tetryl 1.4 oz top fuze well 1.3 oz bottom fuze well

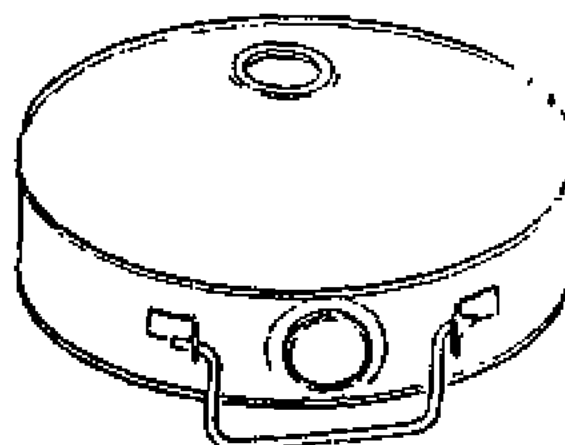
a. *General.* The mine body is sheet steel and the mine is assumed to be waterproof. The pressure plate is integral with the mine case. The mine has a centrally located fuze well on top and a filling hole directly beneath the handle. A second fuze well is located on the bottom, presumably for antilift or boobytrapping purposes.

b. *Use.* Same as Soviet TM-46 (para 6-50).

c. *Functioning.* Actuation pressure results from the deflection and/or shearing of the pressure plate with respect to the mine case. When the required load is applied on the pressure plate, it actuates the fuze, thus initiating the explosive train and the main charge.



TOP VIEW

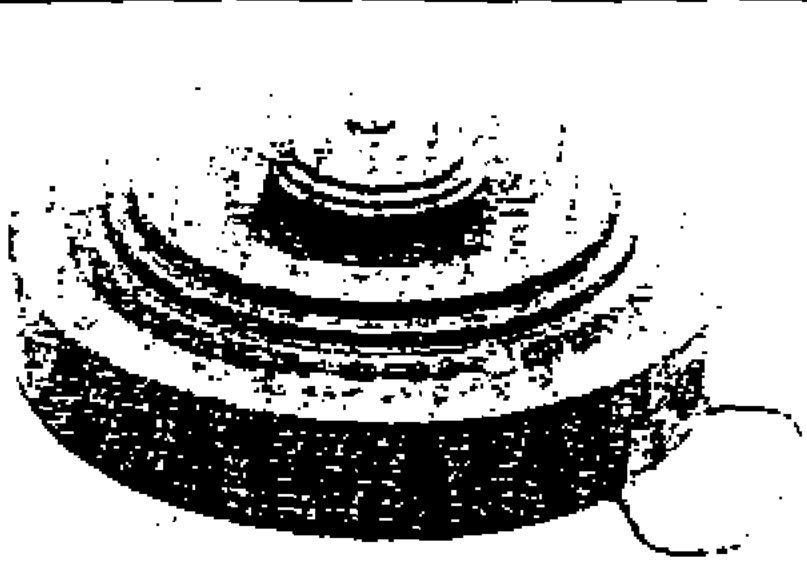


BOTTOM VIEW

Figure 6-82. Mine, Antitank TMN-46 Antilift.

U.S. FUZE TOP

Page 1

USSR		Anti-Tank		TM-57
Kill Mechanism	Blast			
Case Material	Metal			
Main Charge	Cast TNT			
Booster Charge				
Main Charge Wt	7 kg	15.43 lb		
Booster Charge Wt				
Total Weight	9.5 kg	20.94 lb		
Height	11.5 cm	4.53 in		
Diameter	31.5 cm	12.4 in		
Anti - Disturbance Features	Anti-lift provision			
Mine Counter-Counter	Detection visually (truncated till-rods) and hand-held			
Emplacement	Buried			

TM-57 anti-tank mine fitted with MVZ-57 fuze

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pressure	200-300kg	441-661lb		
Till-Rod				

Functioning:

(RDA-TRF-Mn.108) MVZ-57 fuze pressure applied to a plate compresses the striker spring pushing retaining ball into a recess releasing the striker and detonating the mine.

(RDA-TRF-Mn.110) A button on the fuze is then pressed and 45s later the detonator tilts upright into the operating position.

(RDA-TRF-Mc.008) Fuze type (1) delay-armed, blast-resistant, pressure initiated (2) truncated till-rod, contact initiated. Sensitivity 200kg (440.9 lb). Detectability visually (truncated till-rod).

Mine's Operational:


(RDA-TRF-Mn.108) With MUZ-57 fuze the mine can be hand laid and with MVSh-57 the mine is machine laid. Also, employment by helicopter via a chute. Mine is not camouflaged but is painted green to blend with grassy areas. The machine laying fuze has an adjustable delay 20-80 seconds.

Comments:

(RDA-TRF-Mn.110) 9.5 cm height is without fuze, mine is 11.5 cm in height with MVZ-57 fuze. In appearance, the TM-57 metallic anti-tank mine is very similar to the TM-46 and TMN-46 anti-tank mines. The TM-57 has a larger charge and improved fuzing, and can be laid by hand or mechanically. It can be recognized as it has no well in the bottom for an anti-lift device (although it does have one in the side) and has seven ribs underneath (the TMN-46 has five ribs) along with a carrying handle. Some TM-57 mines have two filling plugs in the base. The MVSh-57 till-rod fuze may be used with the TM-57.

(RDA-TRF-Mc.008) Color is olive drab.

U.K. CLEAR SAFE HOS

United Kingdom		Anti-Tank		Barmine
Kill Mechanism	Blast			
Case Material	Non-Metallic			
Main Charge	RDX/TNT 55/45			
Booster Charge				
Main Charge WL	8.4 kg	18.52 lb		
Booster Charge WL				
Total Weight	10.4 kg	22.93 lb		
Height	8.1 cm	3.19 in		
Width	10.8 cm	4.25 in		
Length	1.2 m			
Anti - Disturbance Features	Has Anti-Disturbance features			
Mine Counter-Counter	Double-impulse fuzed possible. Sustained impulse required.			
Emplacement	Buried (Hand or Machine)			

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Electronic				
Mechanical				
Electronic Fuze				

Functioning.

(RDA-TRF-Mn 106) Various fuzes can be attached before emplacement either singly or integrated (requires hand laying). Fuze types include single and double impulse pressure, and I III rod (FWAM)

(RDA-TRF-Mc 008) Fuze Type - both single- and double impulse pressure fuzes available

Detectability - single-impulse fuze is the transparent arming lever, double-impulse fuze is the black arming lever. Capability: Type III - blast effect. Antihandling - None, with above fuzes. However, an additional fuze does incorporate magnetic sensing and antidisturbance

Mine's Operational:

(RDA-TRF-Mn. 110) The mine is stored complete with its fuze, which saves time and man power in fitting the fuze before the mine can be laid.

(RDA-TRF-Mn. 106) The bar mine's long length serves three purposes: To facilitate laying, to reduce number of mines required in a minefield; and, offers an increased potential for actuation. Designed to be laid with the bar mine layer (600-700 per hour) or by hand. Practice mine is available.

Comments.

(RDA-TRF-Mn. 110) The L9 BARMINE is plastic with only a few metal components in the fuze and is difficult to detect using current electro-magnetic mine detectors.

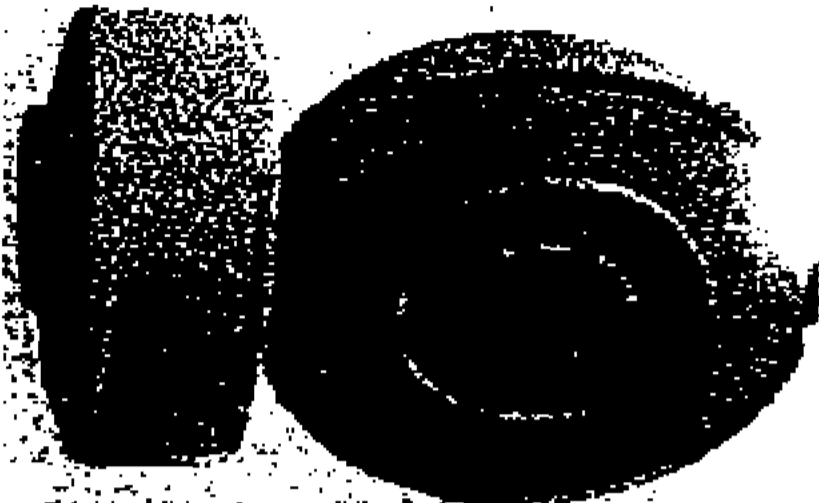
(RDA-TRF-MC.013) Utilizing LSI circuitry, the FWAM fuze incorporates anti-handling and counter-countermeasures features, the latter being intended it is thought to reduce the efficiency of Soviet KMT-4 plough and KMT-5 plough/roller combination clearing devices (RDA-TRF-Eq.022) The new bar mine has tough plastic casing housing the explosive charge and the fuze, which contains only very small metal parts. The mine cannot be detected by any current electro-magnetic mine detector. Extensive trials have shown that this mine is completely effective against any tank track and causes severe damage to suspension systems. The fuze is normally fitted before the mine is placed in store.

BARMINE

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CLEAR - ROTATE LEVER TO SAFE - CUT HOSE

PICK UP
TYPE 72
~~TYPE 72~~
CHINA

China		Anti-Tank		Type 72 Non-Metallic
Kill Mechanism	Plate			
Case Material	Non-Metallic			
Main Charge	RDX/TNT 50/50			
Booster Charge				
Main Charge Wt	5.4 kg	11.9 lb		
Booster Charge Wt				
Total Weight	6.5 kg	14.33 lb		
Height	10 cm	3.94 in		
Diameter	27 cm	10.63 in		
Anti - Disturbance Features				
Mine Counter-Counter				
Emplacement				
Fuze Type(s) - Initiation		Operating Force		
Double Impulse				

Functioning:

(RDA-TRF-Mn.110) The operating pressure causes the pressure plate to move downwards about 9.5mm (+/- 0.9mm) before the fuze actuates. The fuze sets off a booster charge which in turn detonates the main charge.

Mine's Operational:

(RDA-TRF-Mn.110) The Type 72 may be emplaced manually, or mechanically by a truck-towed minelayer (similar in overall appearance to the Soviet PMR series).

Comments:

(RDA-TRF-Mn.110) The type 72 non-metallic anti-tank mine is circular with a slightly domed pressure plate on top. This plate is slightly elastic and requires a pressure of between 300 and 800kg before it moves downwards far enough to contact the type 72 blast resistant fuze or Ty. double impulse fuze. The body is all plastic and a handle that folds inwards into the base is provided. Just above this handle is a plug that covers either an anti-lift device or a well for a remote control detonator. Type 72 mines are transported four to a wooden box weighing 34kg.

VS - AR 4
ANTI-LIFT DEVICE
FOR
VALMARA 69, VS-50, VS-1.6; VS-2.2 MINES
TECHNICAL MANUAL
TM 01.2



VALSELLA MECCANOTECNICA spa

BIP
M-076
PULL

1. GENERAL INFORMATION

1.1. General

The VS-AR 4 device provides the traditional mechanical mines VALMARA 69, VS-50, VS-1.6, VS-2.2 with anti-lift capability (AR), without modifying the basic operating features of the mines.

The device consists of one basic assembly to fit each model of mine with the addition of an adapter plug (see Figure 1). The basic assembly consists of:

- twin safe and arming mechanical-delay device
- electronic delay timer
- priming circuit with tilt sensor
- M84 electrical primer.

1.2. Technical Specifications

- a) The anti-lift device is screwed into the bottom of the mine by means of the proper adapter plug, after having removed the dummy detonator plug from the mine (on VALMARA 69 the plug containing the ejection charge shall be removed).
- b) The anti-lift device is armed by removing the safety pin (see Figure 1), and turning the device bottom to stop.
- c) The mechanical-delay consists of two independent stems pushed by two springs (loaded by rotation of the device bottom) against two lead disks, to perforate.
When the disks are perforated, after the proper delay, the two stems actuate two microswitches and cause a safety steel barrier, located between the primer and the mine's detonator, to rotate SAFE to ARM. One microswitch powers the electronic circuit, the other removes a short circuit across the primer M84.

1.3.1. Before Arming

The firing circuit is kept in SAFE by two redundant independent microswitches: one breaking the power supply, the other shorting the electrical primer.

In addition, when in SAFE, a steel barrier is placed between the primer and the mine's detonator to interrupt the explosive train.

The microswitches and the barrier are driven by two independent stems, locked in safe position when the device bottom is in SAFE. A split pin is also provided to lock the device bottom in SAFE.

1.3.2. After Arming

After rotating the device bottom to ARM the activation of the switches and the removal of the safety barrier is delay by the mechanical arming delay (perforation time).

After the mechanical delay has been expired, final arming is obtained only at the end of the electronic time delay.

2. OPERATING INSTRUCTION

- . Dig a trench in the ground of the proper shape and size to plant the mine VS-AR 4 combination.
- . Remove from the mine, in SAFE, the dummy detonator plug and replace it with the VS-AR 4 (on the VALMARA 69 remove the lower plug containing the ejection charge).
- . Remove the safety pin on the VS-AR 4 bottom (see Figures 6 and 9).

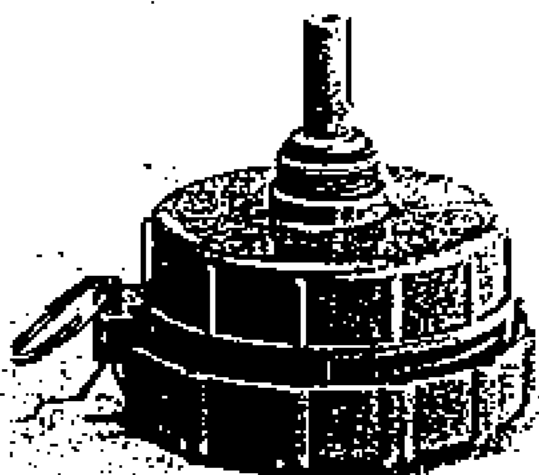


FIGURE 4/A

Anti-Lift Device VS-AR 4 fitted with Adapter for VS-1.6 a/t Mine

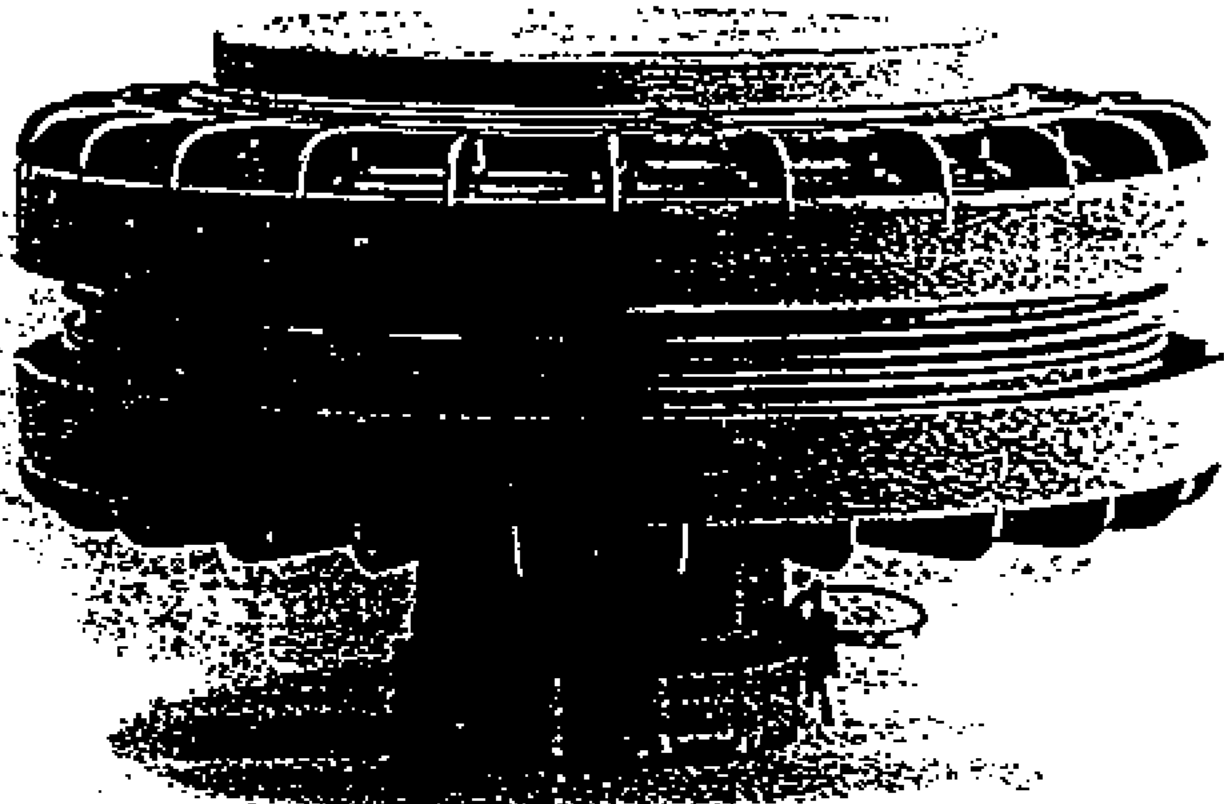


FIGURE 4/B
VS-1.6 a/t Mine fitted with Anti-Lift Device VS-AR 4

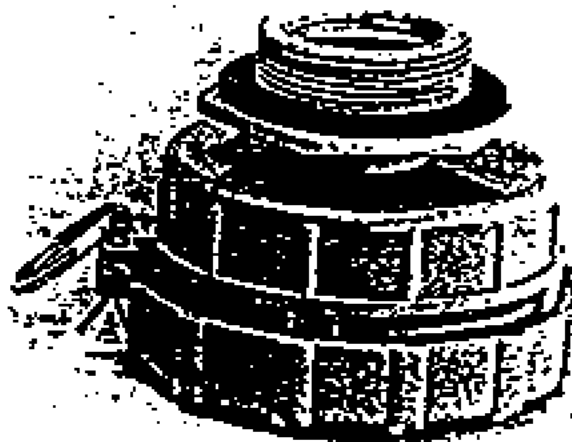


FIGURE 2/A
Anti-Lift Device VS-AR 4 fitted with Adapter for YALMARA ≡

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VS-AR 4 ANTILIFE DEVICE

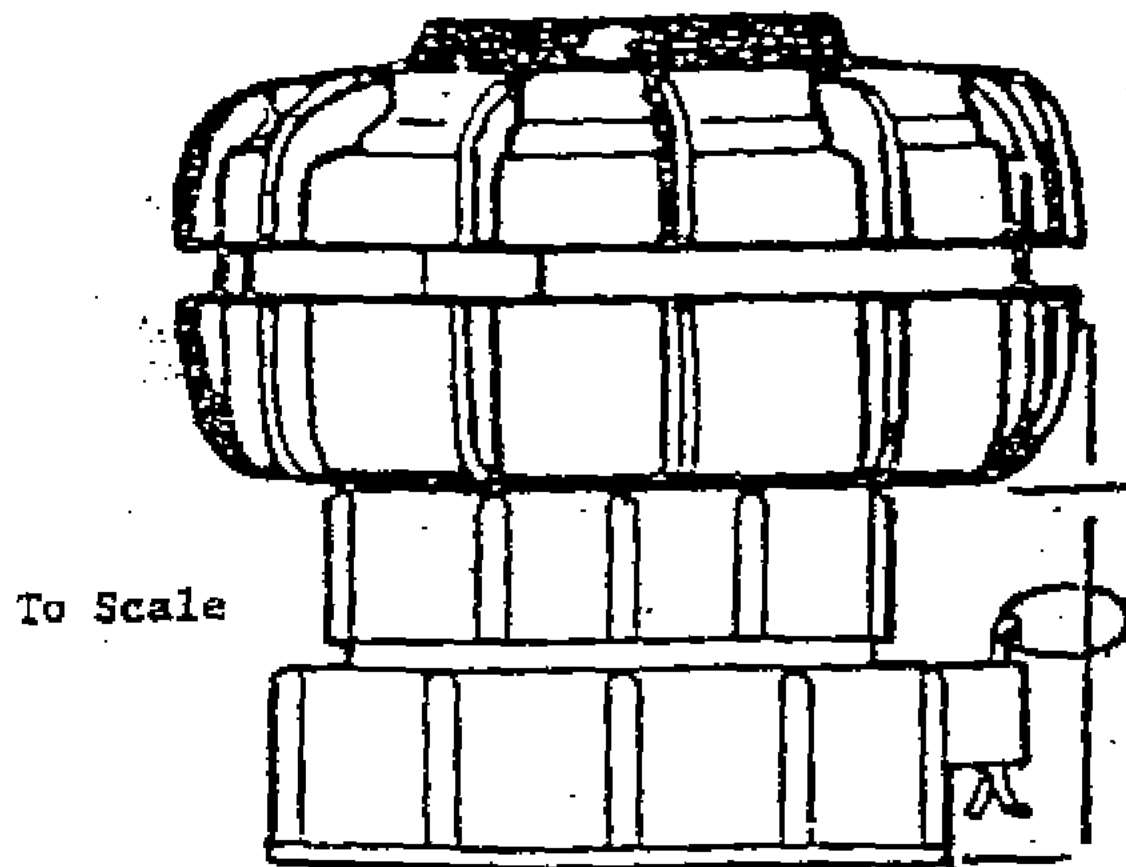
Functioning Mode: Tilt

Used with: VALMARA 69 APERS Mine
VS-50 APERS Mine
VS-1.6 AT Mine
VS-1.2 AT Mine

Arming Delay: 10 to 40 minute mechanical delay
30 minute electronic delay after mechanical delay

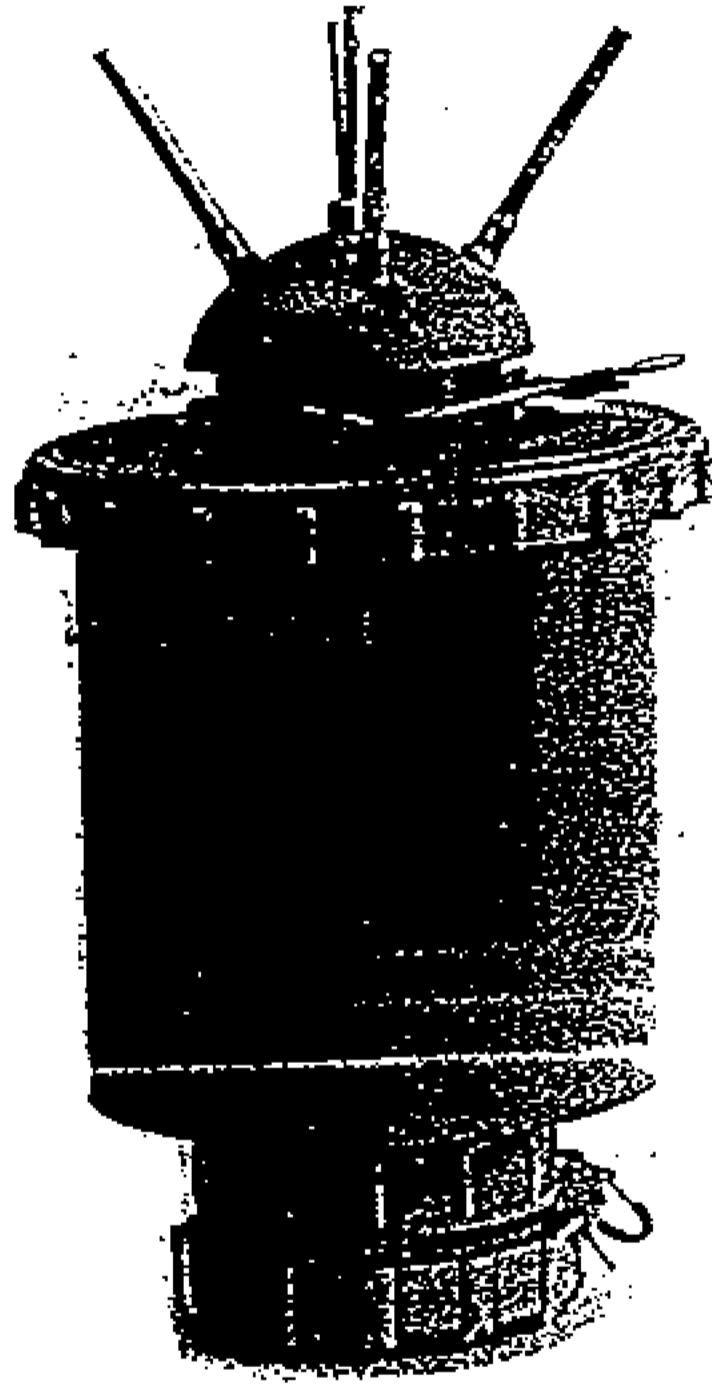
Power Source: Two 1.5v batteries

Operational Life: Longer than 1 year



VS-50 with ANTILIFT Device

VALMARA 69
Fitted with
VS-AR 4 Antilift Device



Kill Mechanism	Blast	
Case Material	Diff for ea Variant	
Main Charge		
Booster Charge		
Main Charge Wt	7 kg	15.43 lb
Booster Charge Wt		
Total Weight	9.65 kg	21.27 lb
Height	11.5 cm	4.53 in
Diameter	31.5 cm	12.4 in
Anti - Disturbance Features		
Mine Counter-Counter	Detection with hand-held detectors: significant amount of	
Emplacement	Buried	



TM-62M ANTITANK MINE

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits	
Pressure w/Time delay	175-600kg	386-1323lb		

Functioning:

(RDA-TRF-Mn.110) These mines all appear to have a built-in firing delay of approximately two seconds to ensure that the tank is well over the mine before it detonates.

(RDA-TRF-Mc.008) Fuze Type (1) delay-armed, blast-resistant, pressure initiated (2) delay-armed, magnetic influence fuze type (3) seismic influence fuze type. Sensitivity is 200 kg (440.9 lb). Detectability with hand-held detectors; significant amount of metal in mine body. Type kill blast effect. Antihandling is no secondary fuze wells. The magnetic and seismic fuze have inherent

Mine's Operational:

(RDA-TRF-Mn.110) The TM-62M uses a sheet metal casing, is similar in appearance to the TM-57 and has provision for a till-rod detonator. The central fuze well of the TM-62 has a diameter of 12.5cm and a depth of 8cm.

8.3cm height is without fuze. 11.5cm height is with MVCh-62 fuze.

Comments:

(RDA-TRF-Mn.110) The TM-62 is a progressive development of the TM-57, but it is also used as the "family" name for a group of mines that differ in their construction. These are:

- TM-62M - metal casing
- TM-62P - plastic casing
- TM-62D - rectangular wooden case
- TM-62B - water proof cardboard casing

The plastic-bodied TM-62 P2 and P3 both have a body diameter of 30.8cm. The TM-62 has a height of 8.2cm unfuzed while the TM-62 P3 has a height of 8.4cm also unfuzed.

(RDA-TRF-Mc.008) Color is olive drab.

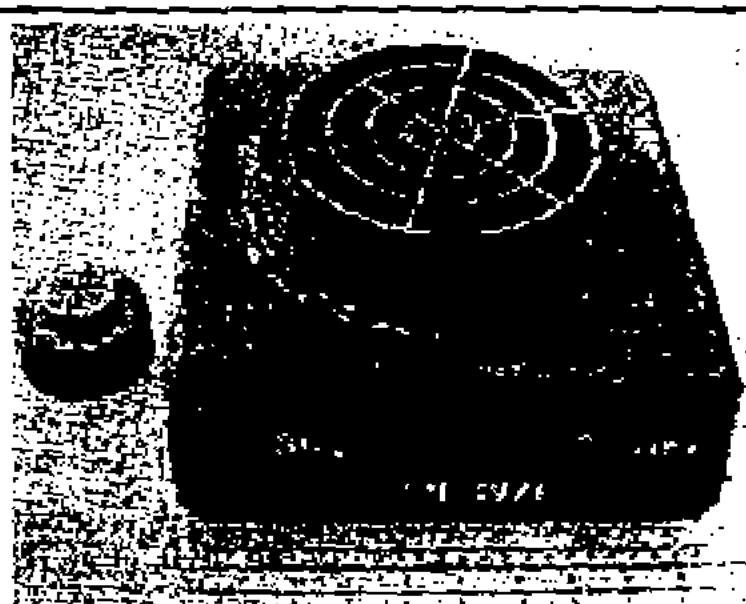
Jun 25, 1991

ATC-23

UNSCREW FUZE TOP 636A

~~SECRET~~

PAGE 40

Pakistan		Anti-Tank		P2 MK3
Kill Mechanism	Blast			
Case Material	Plastic			
Main Charge	Cast TNT			
Booster Charge	Pentolite; TNT/Tetryl			
Main Charge Wt	6.33 kg	13.96 lb		
Booster Charge Wt	0.155 kg	0.34 lb		
Total Weight	7.5 kg	16.53 lb		
Height	12 cm	4.72 in		
Width	27 cm	10.63 in		
Length	27 cm	10.63 in		
Anti - Disturbance Features	Anti-Lift provision			
Mine Counter-Counter	Detection difficult with hand-held detectors (Metallic)			
Emplacement	Buried			

P2 MK3 ANTITANK MINE

Fuze Type(s) - Initiation	Operating Force		Temp Operational Limits
Pressure	204-250kg	450-551lb	

Functioning:

(RDA-TRF-MC.008) Detectability is difficult with hand-held detectors (metallic content limited to spring, striker tip, and shear wire). Type kill is blast effect. Antihandling - secondary fuze well available for booby-trap purposes (located on the bottom of the mine body).

Mine's Operational:

(RDA-TRF-Mn.009) (a) Lay the mine body in the prepared hole allow for 50mm soil cover. (b) Remove the pressure plate by unscrewing anti-clockwise. (c) Arm by inserting an armed mine P4 Mk1 AP into the well. (d) Screw the pressure plate into position. (e) Replace soil and camouflage..

Comments:

(RDA-TRF-MC.008) Color is light greenish tan. The raised circular pattern on the pressure plate retains covering sand/earth. The ridges do not function as a blast-resistant pressure spider (as with the Czech PT-MI-K).

(RDA-TRF-Mn.110) The P2 Mark3 is similar to the P3 but uses a squared-off housing to surround the basic circular mine and facilitate mechanical laying and handling. The surround has a canvas carrying strap. If required this mine can be supplied with a steel disc to assist detection.

(RDA-TRF-Mn.009) Early British pattern markings on side of mine in yellow paint indicating mine type, year of manufacture, and lot number. Red paint band around upper corner of body. [Color - light brown; detection - visual or dogs].

Jun 25, 1991

ATC-15

63B

DISPENSERS AND PAYLOADS

CBU System Information

The following information will aid in identifying submunitions (Bomblets) from information on the dispenser (clam shell pieces).

1. If more than one series of similar CBUs were used, take precautions for the most hazardous (i.e., CBU-24 series and CBU-29 series). CBU-29 series contain BLU-36 Random Delay¹ Bomblets, which look like the impact fired BLU-26 Bomblets found in the CBU-24 series.
2. Some CBUs are listed as no longer in production (obsolete²), but again some of these items have been located³.
3. Bomblets of the same number designation but different letter designation (i.e., /B or A/B differ in that the A/B bomblet contain incendiary material [usually zirconium or titanium]). Take precautions against starting fires during disposal and avoid being downwind.
4. If you cannot identify the bomblets, treat as worst case (random delay, with hung cocked striker), any movement or jarring could cause bomblet to function.

NOTICE

Most bomblets have a lethal radius of 450 feet.

5. At this time we have not determined if random delay bomblets other than Gators (BLU-91/92) were used in Kuwait. Information will be provided as it becomes available. For now your best information will come from checking the dispenser pieces found in the area of bomblets.

NOTES:

¹ Random delay fuzing.

² "Listed as no longer in production" does not mean it was not stockpiled and used.

³ Have been found in-country (even though listed as obsolete).

CBU #	DISPENSER CLAMSHELL	PAYLOAD DESIG	QUANTITY	QUANTITY
CBU-29/B A/B - B/B C/B	S U U - 3 0 A/B - B/B C/B	BLU 36/B	670	A P / A M NOTES 1/2
CBU-49-B A/B B/B C/B	S U U - 3 0 B A/B B/B C/B	BLU 59/B	670	A P / A M NOTES 1/2
CBU 52 B/B	S U U - 3 0 H/B	BLU 61 A/B	217	A M NOTES 1/3
CBU 58/B 58 A/B	S U U - 3 0 H/B	BLU 63/B 63 A/B	650 650	A P / A M AP/AM
CBU 59/B	MK7 MOD 3	BLU 77 B	717	AP/AV
CBU 71/B 71 A/B	S U U - 3 0 H/B	BLU 86/B 86 A/B	650 650	A P / A M A P / A M NOTE 2
CBU-75/B	SUU-54/B	BLU 63/B	1800	AP
CBU 75 A/B	S U U - 5 4 A/B	BLU 63/B A N D BLU 86/B	1420 355	AP A P / A M NOTE 2
CBU 76/B	S U U - 5 1 B/B	BLU 61 A/B	290	AP NOTE 1/3
CBU 77/B	S U U - 5 1 B/B	BLU 63/B	790	AP NOTE 1
CBU 78/B	SUU-58/B	BLU 91/B AND BLU 92/B	45 15	AT/AU AP NOTE 2
CBU 87/B	SUU-65/B	BLU 97 B OR BLU 97 A/B	202	F R A G / HEAT
CBU 89/B	SUU-64/B	BLU 91/B AND BLU 92/B	92	AT/AU AP NOTE 2
M K 2 0 M O D S 2,3,4,6	MK 7 MODS 2,3,4,5,6	M K 1 1 8 MODS 0/1	247	AP/AM

Notes:

1. Listed as no longer in production. This does not mean that they weren't stockpiled and used.
2. Random delay fuzing.
3. Have been found in-country (listed as obsolete).

PAYLOADS OR BOMBLETS

BLU-26/B, 36/B, 59/B, 61A/B, 63/B, 63A/B, 86/B

BLU-91B, 92B GATOR

BLU-97B, 97A/B

MK-118 MODS 0/1

MK-118 (VECP), ISCB-1

M42, M46, M77

BELOUGA

U.S. BOMB UNITS, TAAU, BLU-20/B, BLU-00/B, BLU-00/B, BLU-00/B,
BLU-63A/B, BLU-86/B, AND BLU-86A/B; AND BOMB UNITS, TRAINING,
BLU-26(T-1)/B, BLU-36(T-1)/B, BLU-63(T-1)/B,
AND BLU-86(T-1)/B (U)

SAFETY SUMMARY (U)

BLU-26/B, 36/B, 59/B, 63/B

SAFETY PRECAUTIONS

(U) Unless the bomb can be positively identified, assume that it contains a random delay fuze. There are no external features that distinguish a BLU-26/B from a BLU-59/B or BLU-36/B, nor a BLU-63/B from a BLU-86/B bomb.

(U) Consider all bombs found outside the dispenser to be armed. There is no external indication of the safe or armed condition.

WARNINGS

(U) Wait at least 4 hours (preferably 24 hours) before approaching an armed bomb which may contain a random delay fuze. (Frame D2/page 8.)

(U) Take precautions against fire during disposal of BLU-63A/B and BLU-86A/B bombs. The incendiary material may scatter over a large area. (Frame F2/page 9.)

(U) Manually handle armed bombs only as a last resort and after all means of remote disposal have been considered. These bombs have a lethal radius of up to 137.0 meters (450.0 feet). (Frame F2/page 9.)

(U) Use extreme caution and hand carry when moving armed bombs. A bomb containing an armed impact fuze may detonate if dropped 25 millimeters (1.00 inch) onto a hard surface. Disturbing a bomb containing an armed random delay fuze may cause detonation. (Frame F2/page 9.)

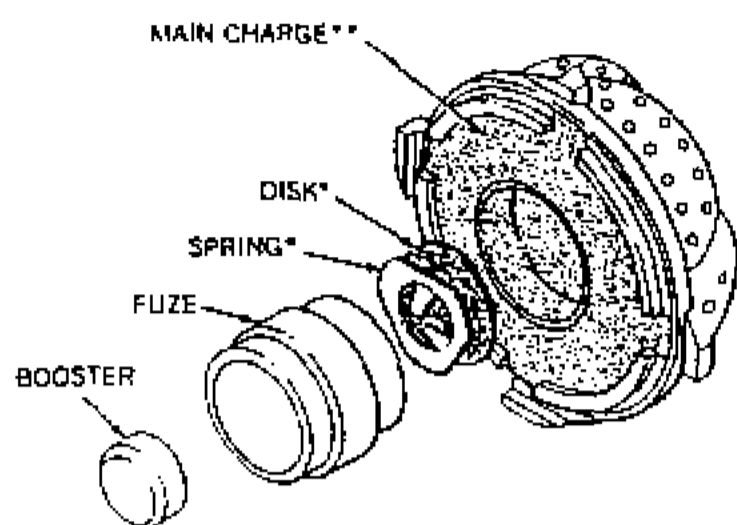
c. (U) Features. The bombs all consist of two hemispheres held together by a crimp ring (BLU-26/B, BLU-36/B and BLU-59/B), or crimp tabs/flange (BLU-63/B, BLU-63A/B, BLU-86/B, and BLU-86A/B). Each bomb has four aerodynamic flutes on the outer surface.

2. (U) DESCRIPTION.

a. (U) Material. The bodies of the BLU-26/B, BLU-36/B, and BLU-59/B are aluminum embedded with steel fragmentation balls. The bodies of the BLU-63/B, BLU-63A/B, BLU-86/B, and BLU-86A/B are steel.

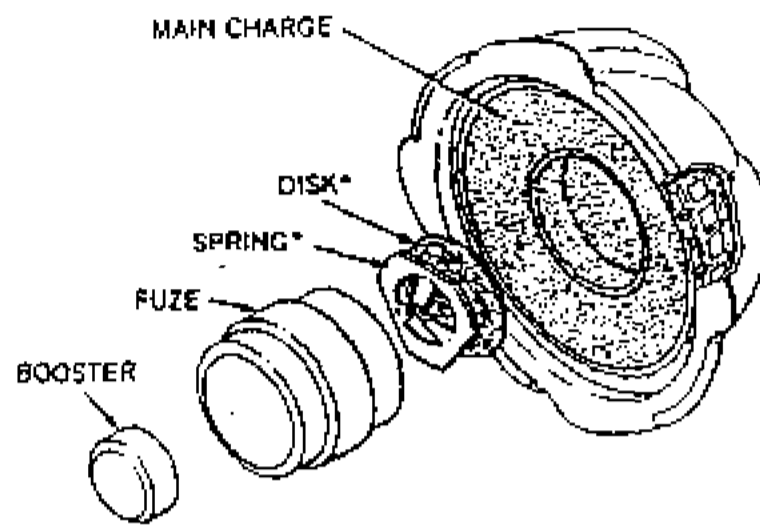
b. (U) Weight. Each bomb weighs approximately 454 grams (1.00 pound).

c. (U) Arrangement. The fuze and bomb combinations are shown in table 1. The BLU-26/B, BLU-36/B, and BLU-59/B bombs (figure 2) have steel balls cast into a matrix in the hemispheres. The BLU-63/B, BLU-63A/B, BLU-86/B and BLU-86A/B hemispheres house a prescored fragmenting steel liner. The BLU-63A/B and BLU-86A/B bombs have two titanium pellets for incendiary effect.



BLU-26/B, BLU-26 (T-1)/B, BLU-36/B,
BLU-36 (T-1)/B AND BLU-59/B BOMBS

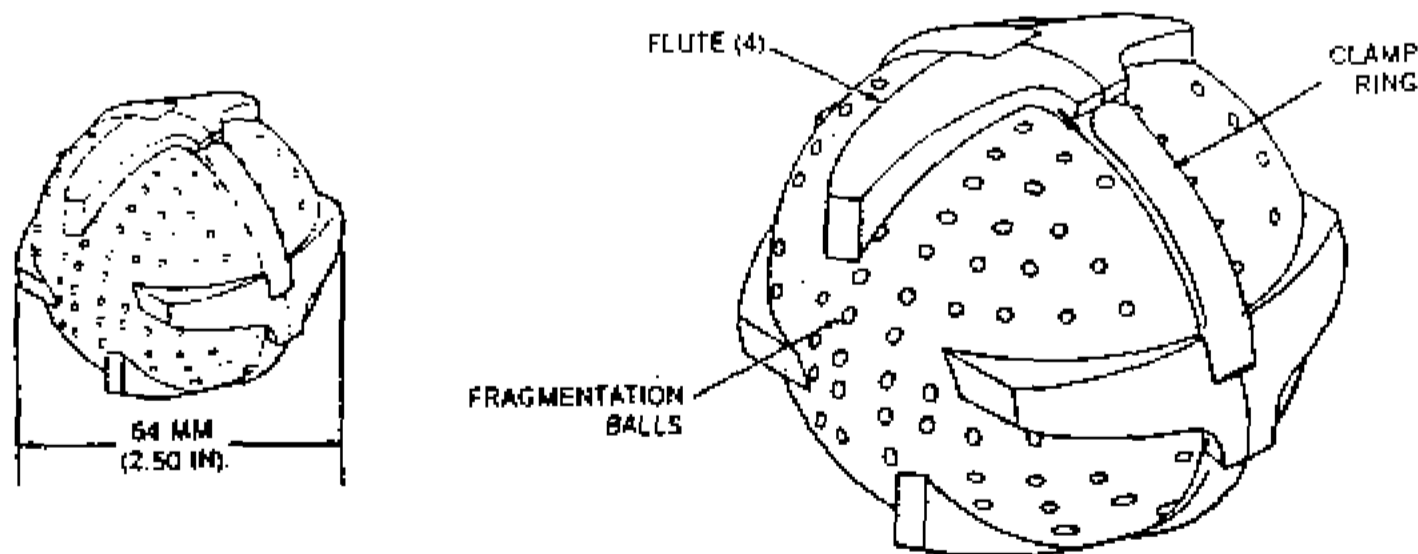
****NOTE**
THE BLU-26(T-1)/B AND BLU-36(T-1)/B
CONTAIN AN INERT MAIN CHARGE
FILLER AND A LIVE FUZE



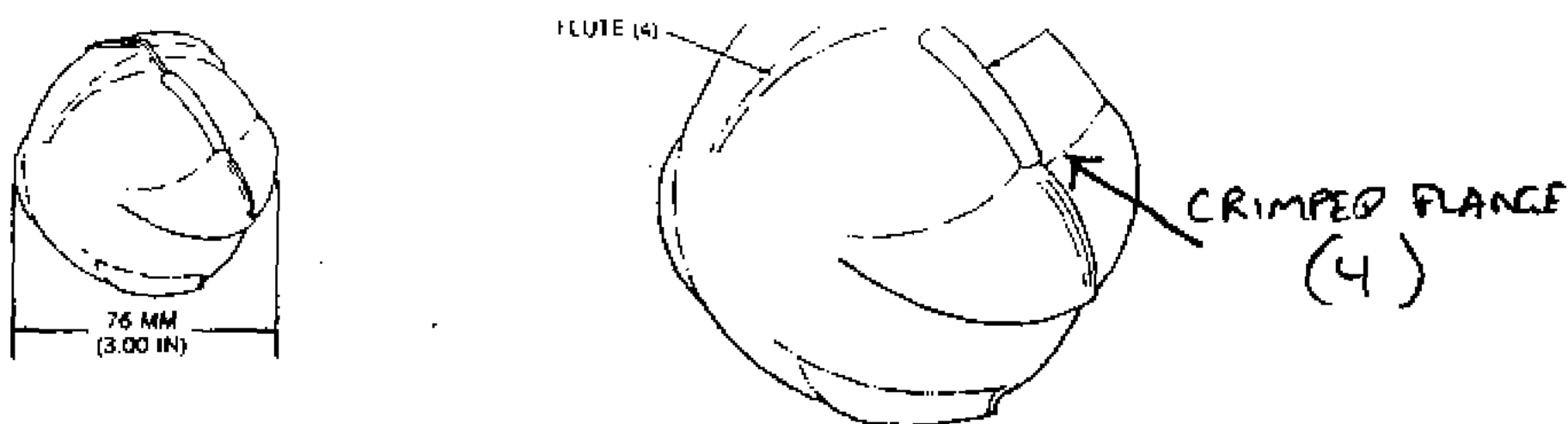
BLU-63/B, BLU-63 (T-1)/B, BLU-63A/B,
BLU-86/B, BLU-86 (T-1)/B, AND BLU-86A/B BOMBS

***BUTYL RUBBER SEALANT MAY BE USED
TO HOLD THE FUZE IN PLACE IN LIEU
OF THE SPRING AND DISK.**

4. (U) FUNCTIONING. As each bomb is released from the dispenser, the air-stream catches the flutes (figure 1) spinning the bomb to provide the centrifugal force required to arm the fuze. Each fuze requires from 2400 to 3200 rpm to arm. The functioning of the different fuzes is described in the following paragraphs. Refer to table 1 for the fuze/bomb combinations.



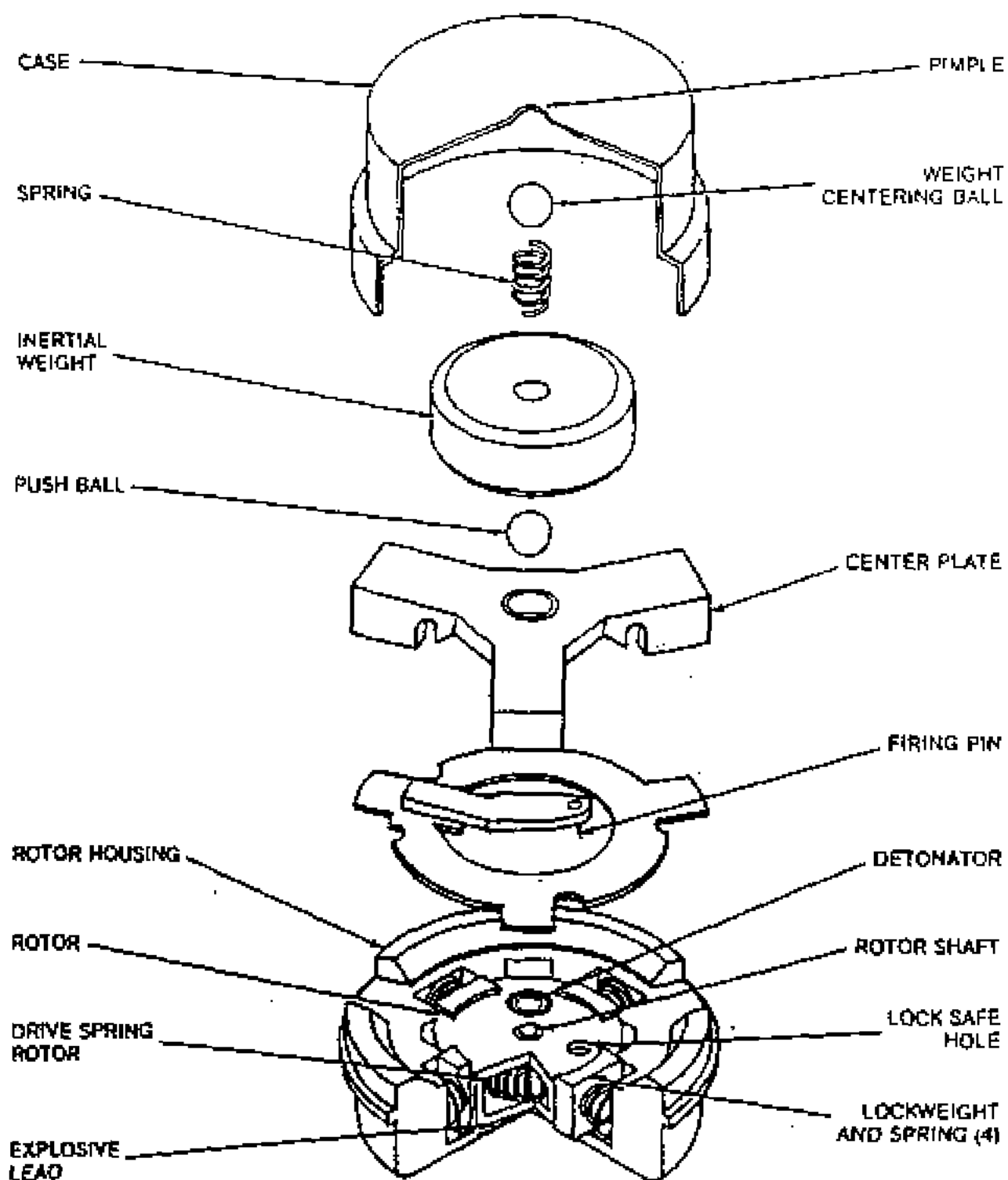
BLU-26/B, BLU-26 (T-1)/B, BLU-36/B,
BLU-36 (T-1)/B AND BLU-59/B BOMBS



BLU-63/B, BLU-63 (T-1)/B, BLU-63A/B,
BLU-86/B, BLU-86 (T-1)/B, AND BLU-86A/B BOMBS

Figure 1. (U) Appearance and Dimensions of the BLU-26/B, BLU-26(T-1)/B, BLU-36/B, BLU-36(T-1)/B, BLU-59/B, BLU-63/B, BLU-63(T-1)/B, BLU-63A/B, BLU-86/B, BLU-86(T-1)/B, and BLU-86A/B Bombs (Repeated).

b. (U) M219E1 Fuze (Figure 4). The arming sequence of this fuze is similar to the M219 except that the M219E1 contains an inertial weight and push ball instead of the three hammer weights. The same centrifugal force retracts the rotor lockweights into the rotor housing, allowing the rotor to align the detonator with the firing pin. Impact moves the inertial weight and cams the push ball against the firing pin to drive it into the detonator.



72

Figure 4. (U) General Arrangement of the M219E1 Fuze.

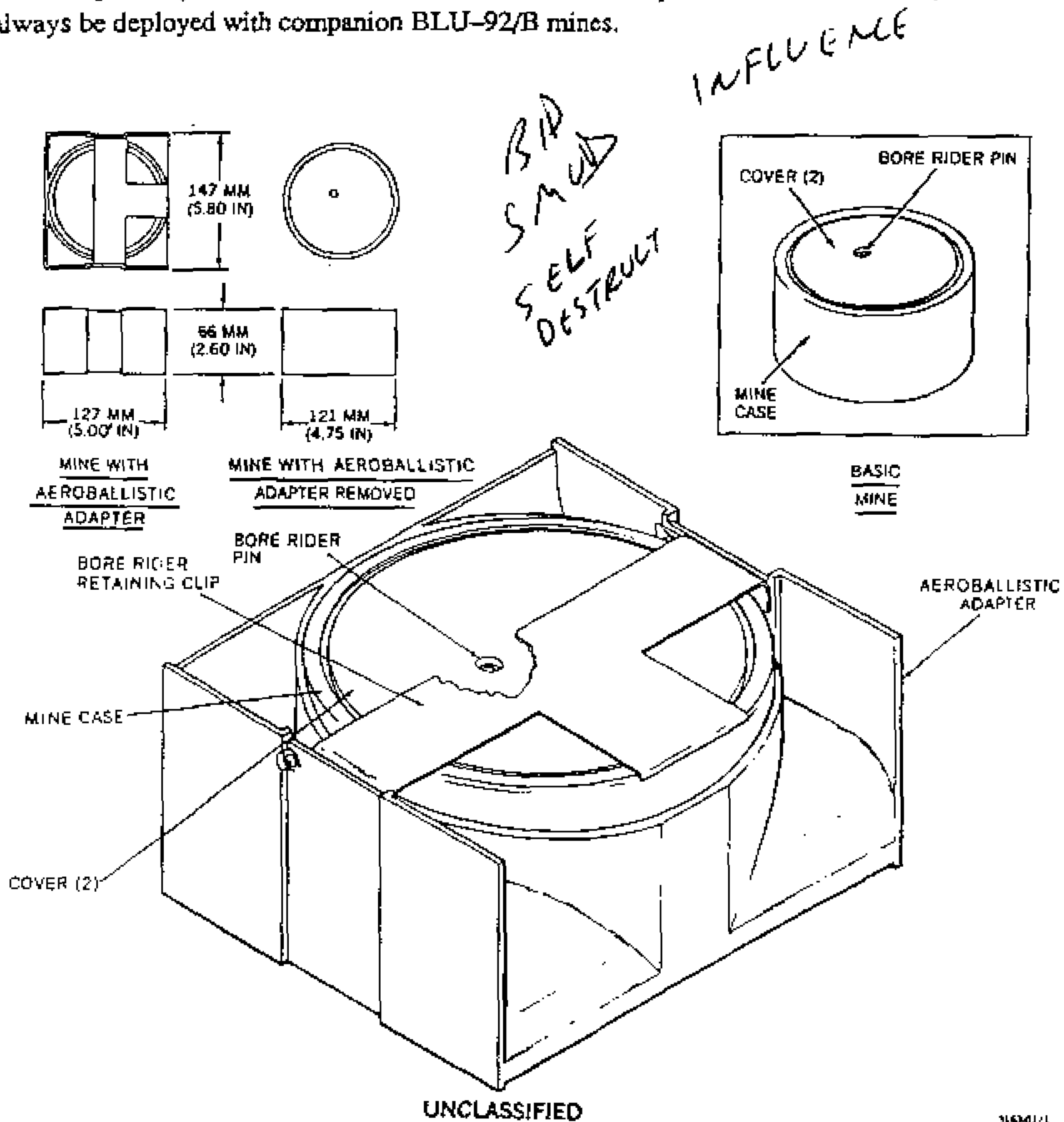
5. (U) APPEARANCE.

a. (U) Unarmed Condition. The bomb is unarmed if it is contained within an intact dispenser.

b. (U) Armed Condition. Consider the bomb armed if it is found outside its dispenser.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION. Perform the procedure for the loaded dispenser and dispenser fuze as prescribed in the applicable 60-series manual.

1. (U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of BLU-91/B landmine. The mine is illustrated with its aeroballistic adapter and bore rider retaining clip. These items may or may not be found with the mine. This mine is part of the Gator mine system, and will always be deployed with companion BLU-92/B mines.



U.S. LANDMINE, AT/AU BLU-91/B

Figure 1. (U) Appearance and Dimensions of the BLU-91/B Mine.

(GATOR)

a. (U) Type. This is an air-delivered, free-fall, bi-directional-ballistic-disc (Misznay-Schardin), electromechanically armed, magnetic influence- or self-destruct fired, antitank/antivehicular (AT/AV) landmine. It is used for rapid, large-scale mining, with the potential of being delivered deep behind enemy lines.

b. (U) Painting and Markings. The aeroballistic adapter is olive drab; the mine case, and a thin circumferential ring on the mine's covers are olive drab.

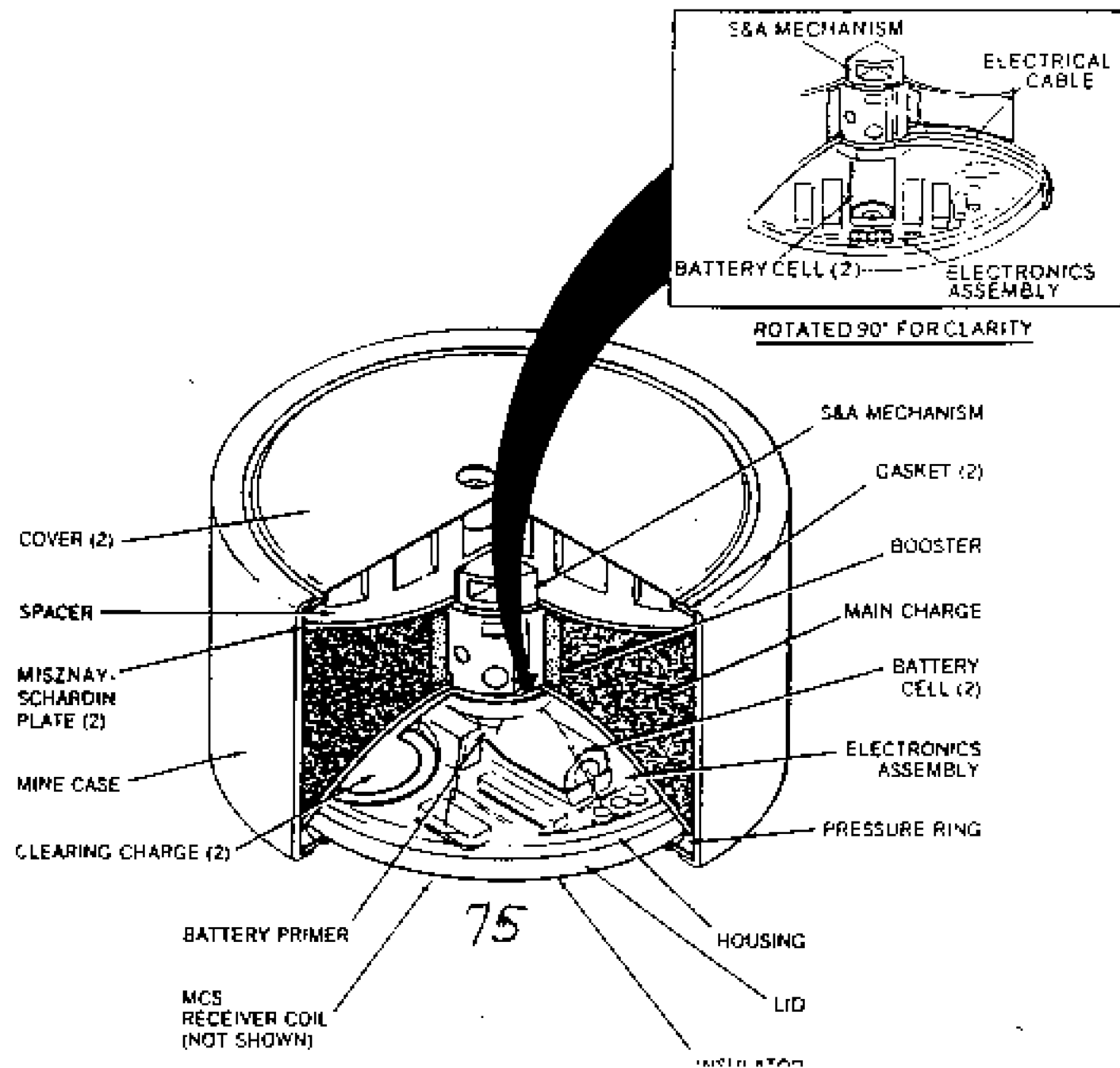
c. (U) Features. The mine is a metal cylinder which houses the electronic and warhead components. The cylinder is encased by a plastic aeroballistic adapter to enhance mine dispersion at release and reduce ground impact force by slowing freefall. A bore rider pin/housing is located slightly off-center on only one cover. The pin is retained in the compressed position by a bore rider retaining clip until release. The opposite cover is blank.

2. (U) DESCRIPTION.

a. (U) Material. The aeroballistic adapter is plastic, the mine case is steel, and the covers are stainless steel.

b. (U) Weight. The mine weighs 1.9 kilograms (4.2 pounds).

c. (U) Arrangement. The mine (figure 2) is comprised of a target sensor, a main charge, a lithium reserve battery power supply, a safe and arm (S&A) mechanism, a magnetic coupling system (MCS), and a mine self-destruct electronics. The magnetometer-type target sensor (not shown) functions the clearing charge prior to initiating the bi-directional Misznay-Schardin plate main charge. The power supply is two independent hermetically sealed battery cells connected in series, to provide a nominal 6.4 volts. The S&A contains dual interrupter locks on the detonator slider (not shown) and a dud-safe system that permanently locks the slider in the out-of-line position if the mine's arming criteria is not met.



3. (U) HAZARDOUS COMPONENTS. Table 1 lists the hazardous components of the mine.

Table 1. (U) Hazardous Components.

Major Component	Hazardous Component	Explosive Composition	Explosive Weight
Mine case	Main charge	RDX	594 g (1.3 lb)
	Booster	PBXN-5	13.6 g
	End cap (4)	HMX	Less than 1 g (each)
Clearing charge	MDF	PBXN-5	Less than 1 g
	Charge (2)	M5 propellant	Less than 1 g (each)
S&A	Micro piston actuator	Barium styphnate and potassium dinitrobenzofuroxane (KDNBF)	Less than 1 g
	M100 micro detonator	Lead styphnate, Lead azide and HMX	Less than 1 g
	Delay detonator	Lead styphnate, Lead azide, borachromate and HMX	Less than 1 g
	Center lead	PBXN-5	Less than 1 g
	Output lead (4)	PBXN-5	Less than 1 g (each)
	Transfer lead	PBXN-5	Less than 1 g
Battery	Primer	Barium nitrate, lead styphnate and lead azide	Less than 1 g

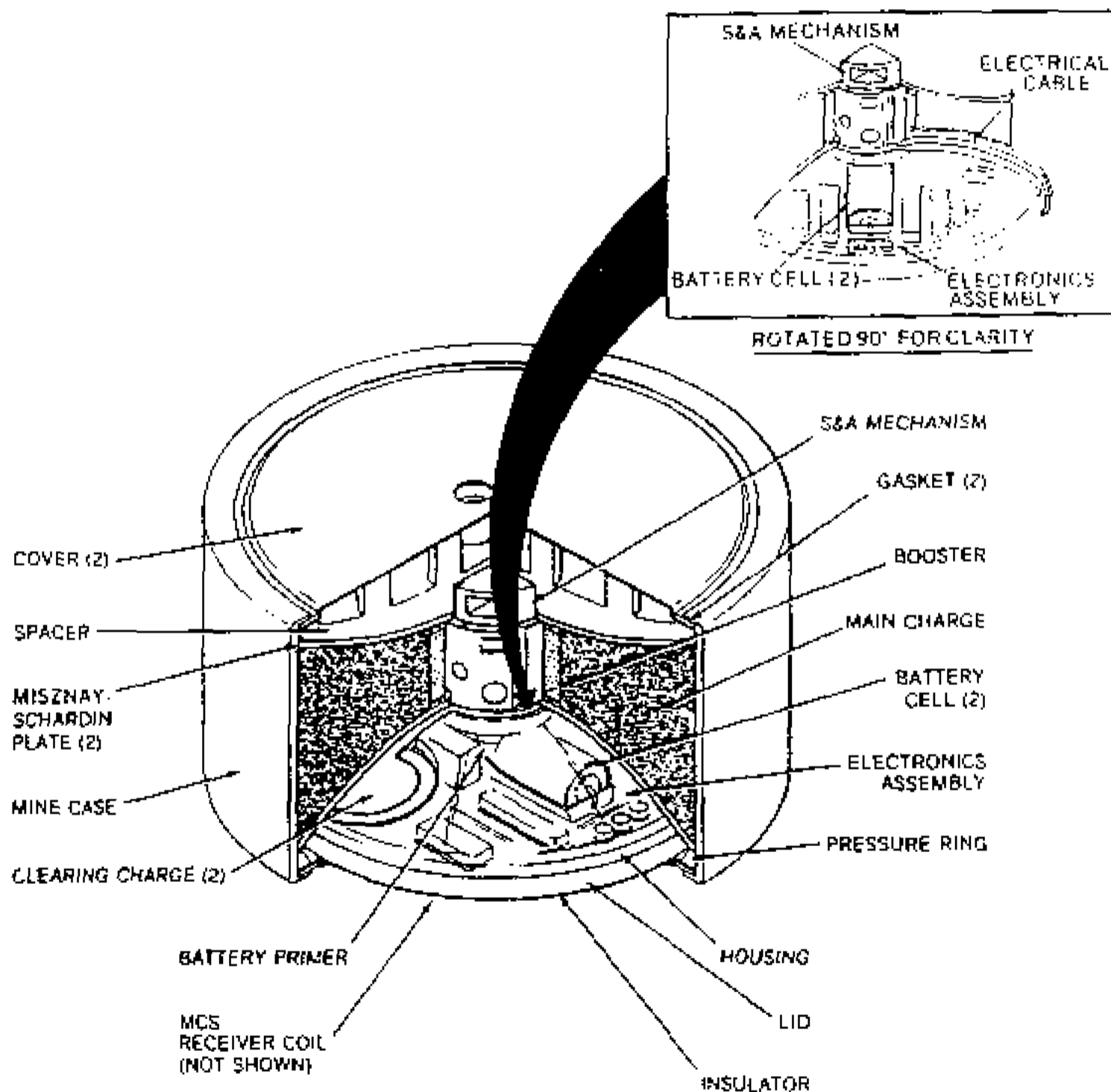
4. FUNCTIONING

(U) Dispensers are loaded with both BLU-91/B and BLU-92/B mines. If either mine is found, the other's presence should be suspected.

(U) Self-destruct time for the mine is preprogrammed prior to launch by rotating a dial on the dispenser to one of three numbered positions.

4. (U) FUNCTIONING - CONT.

a. (U) Arming. The mine receives an arming and self-destruct signal (at dispenser opening) by an electrical arming pulse. This pulse is induced into an MCS receiver coil (figure 2), and simultaneously initiates four events: (1) it initiates the battery primer, (2) it opens self-destruct fusible links, (3) it mechanically locks out a bore rider safety mechanism, and (4) it opens a short circuit (shorting bar) on a firing capacitor. When initiated, the battery primer activates two lithium battery cells. Subsequent battery power starts electronic timing circuits in the electronics assembly that controls arming and self-destruct times. A self-destruct time of either 4, 48, or 360 hours is selected and enabled by opening its fusible link.



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Figure 2. (U) General Arrangement of the Mine (Repeated).

NOTE

(U) As the mine is released from the dispenser, the airstream strips off the bore rider retaining clip (figure 1).

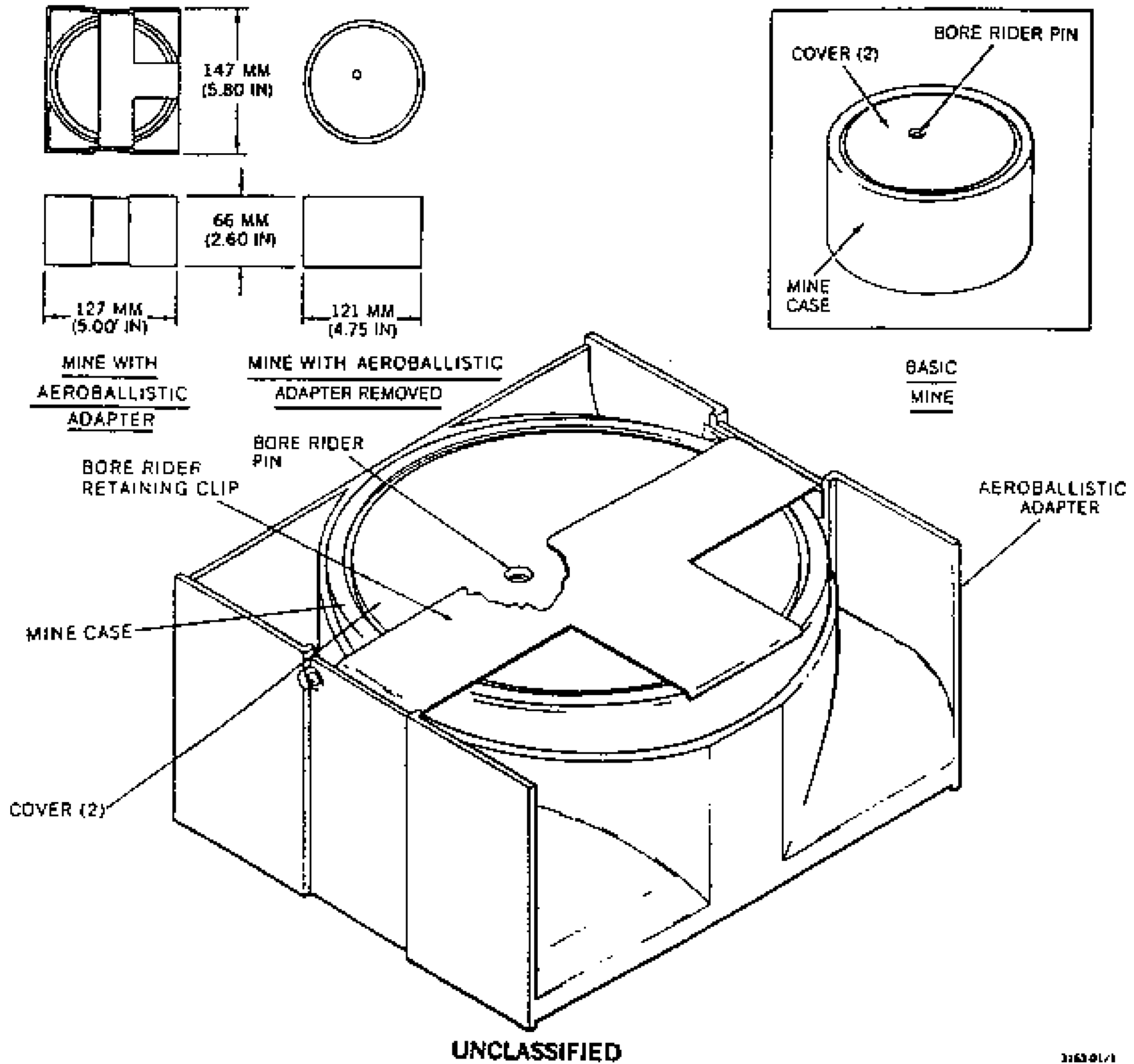
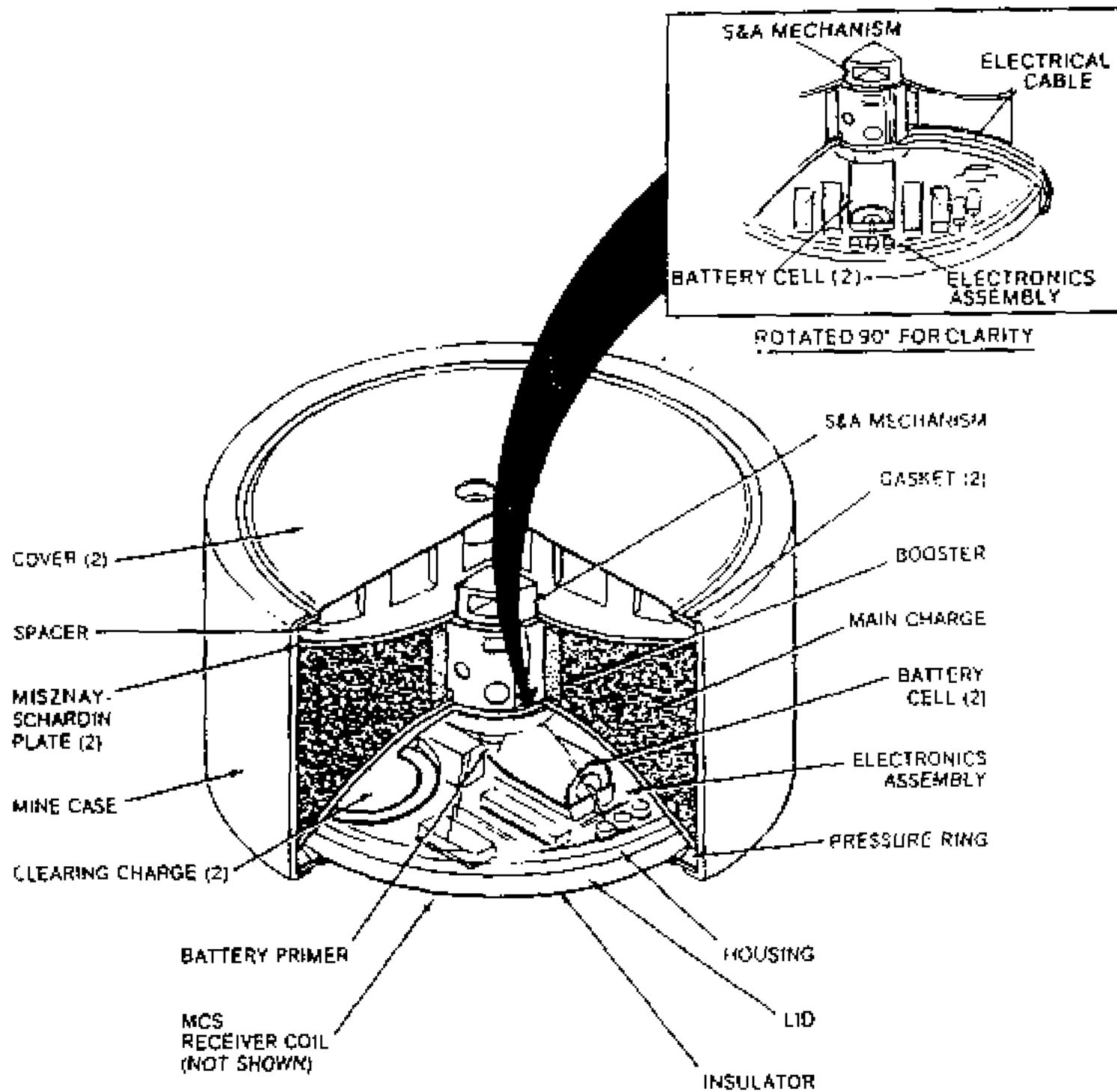


Figure 1. (U) Appearance and Dimensions of the BLU-91/B Mine (Repeated).

a. (U) **Arming** – Cont. Removal of the bore rider clip releases a spring-loaded bore rider pin, removing one of two restraints on a slider in the S&A mechanism (figure 2), enabling the mine to complete its arming cycle. The mine comes to rest on the ground. In approximately 105 seconds, after the initial arming pulse, a micropiston actuator fires and removes the second restraint on the slider (not shown), permitting the slider to move into explosive alignment. Ten seconds later, a firing circuit charges the firing capacitor (not shown) and a magnetic sensor (magnetometer) is enabled. The mine is now armed.



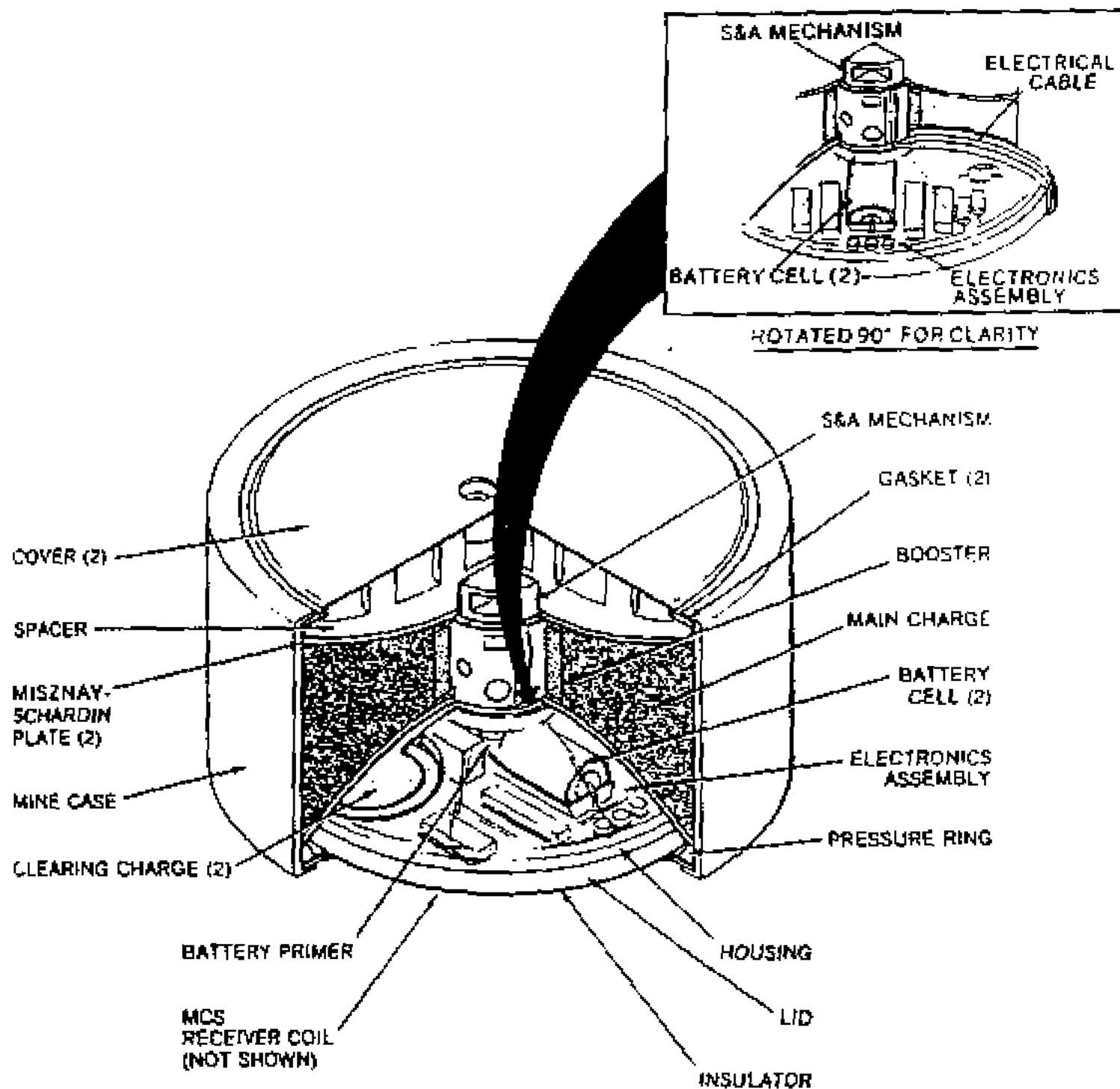
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314301/2

Figure 2. (U) General Arrangement of the Mine (Repeated).

4. (U) FUNCTIONING - CONT.

b. (U) **Firing.** The mine (figure 2) senses valid targets by sensing disturbances in the earth's magnetic field using the magnetometer and digital circuitry.

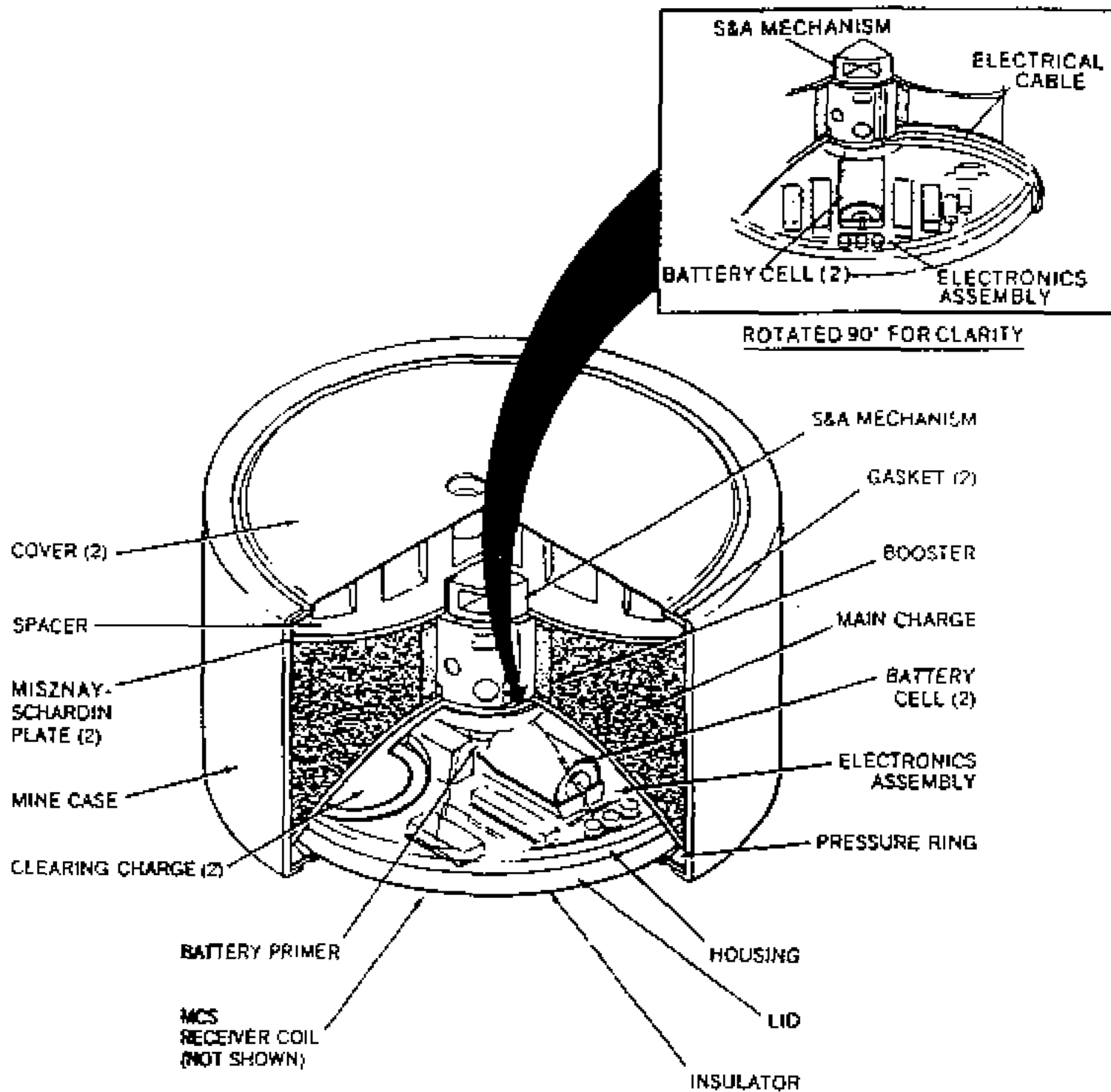


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Figure 2. (U) General Arrangement of the Mine (Repeated).

b. (U) Firing—Cont. The mine (figure 2) can be functioned by any of the following modes: The mine senses a proper signature of the target, the electronic timer circuit (not shown) malfunctions, the power supply drops below a predetermined value, or the self-destruct time setting expires.

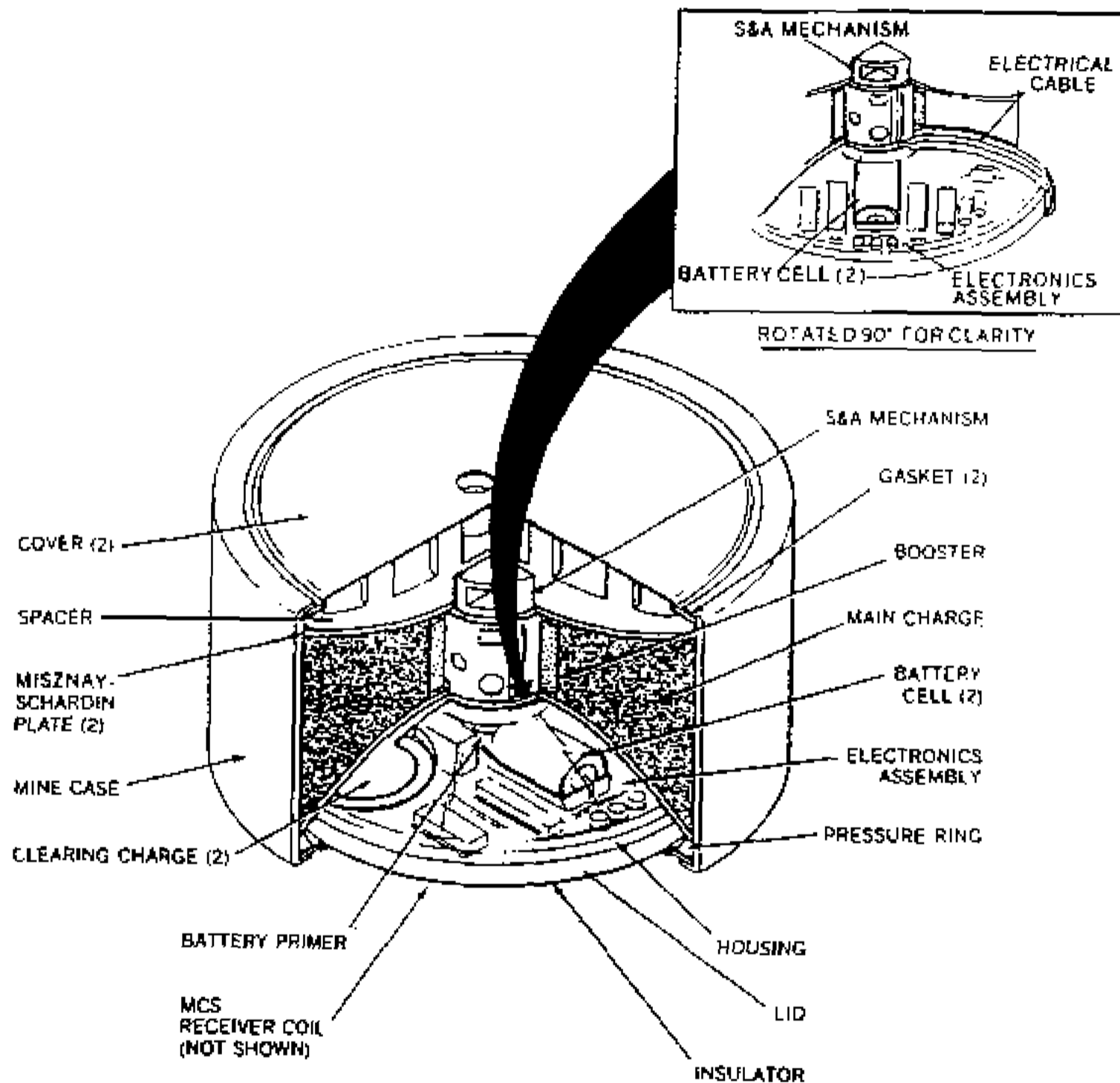


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3163-01/1

Figure 2. (U) General Arrangement of the Mine (Repeated).

b. (U) **Firing** – Cont. The firing circuit initiates the M 100 detonator (not shown) through a selector switch to the transfer lead and mild detonating fuze (MDF) assembly (not shown) which detonates the clearing charge (figure 2) on the up side of the mine. This removes the electronics assembly cover, and any overburden from the mine. The millisecond delay detonator (not shown) is initiated by the M 100 detonator, which initiates the center and output leads in the S&A mechanism, firing the booster and main charge. The main charge forms a Misznay-Schardin effect. The mine is designed to fire directly under its target.



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3143-01/2

Figure 2. (U) General Arrangement of the Mine (Repeated).

(U) Upon functioning, the mine is capable of penetrating 61 millimeters (2.40 inches) of armor steel plate.

Table 2. (U) Mine Self-Destruct Times.

Dispenser Setting	Destruct Times (Hrs)
T-1	3.2 to 4
T-2	38.2 to 48
T-3	288 to 360

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(Revision 1)

5. (U) APPEARANCE.

a. (U) Unarmed Condition. The mine is unarmed if either of the following conditions exist.

(1) (U) The bore rider clip is in place.

(2) (U) It is positively known that the MCS receiver coil has not experienced an arming electrical pulse.

b. (U) Armed Condition. Consider the mine armed if both the following conditions exist.

(1) (U) The bore rider clip is not in place.

(2) (U) It is suspected or known that the MCS receiver coil has experienced an arming electrical pulse.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION. None required. Proceed to disposal procedure.

7. (U) RENDER SAFE PROCEDURE FOR ARMED CONDITION.

WARNINGS

(U) Do not approach an armed mine with ferrous metal. The mine functions by magnetic influence.

(U) When possible, wait a minimum of 22 days after a mine is armed prior to commencing the render safe procedure. The mine contains a timed self-destruct circuit.

(U) Do not disturb an armed mine. Movement may cause the mine to fire.

U.S. LANDMINE, APERS, BLU-92/B (GATOR) (U)

1. (U) **IDENTIFICATION.** Figure 1 shows the appearance and dimensions of the BLU-92/B landmine. The mine is illustrated with its aeroballistic adapter and bore rider clip. These items may or may not be found with the mine. This mine is part of the Gator mine system, and will always be deployed with companion BLU-91/B mines.

a. (U) **Type.** This is an air-delivered, free-fall, bidirectional electromechanically armed antipersonnel (apers) landmine. It is fired by tripline sensors or self-destruct timers. However, some units have an additional antidisturbance feature. This mine is used for rapid large-scale mining, with the potential of being delivered deep behind enemy lines. It is designed to disrupt and disorganize troops, deny utilization of key areas, and thwart mine clearance operations.

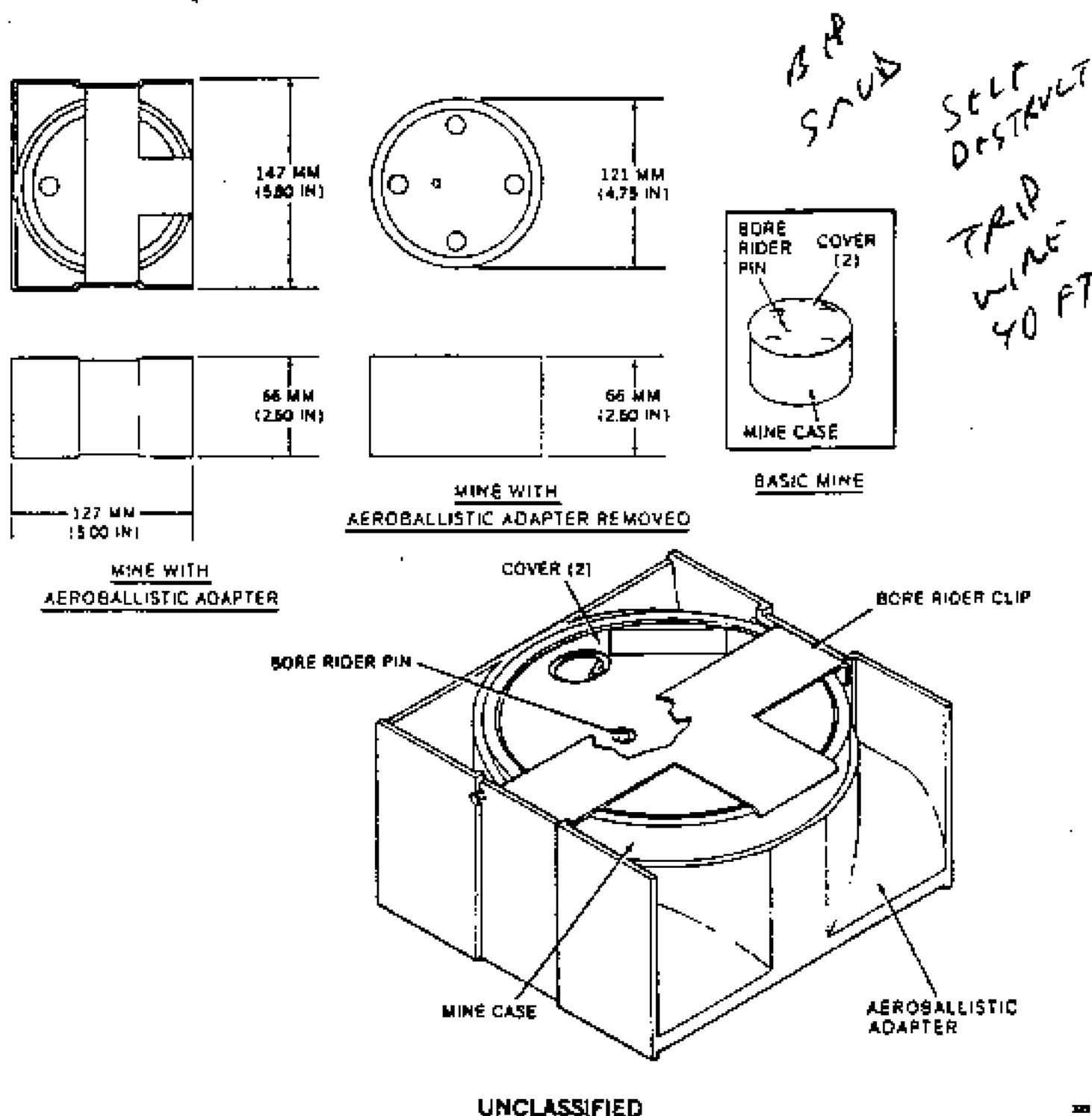


Figure 1. (U) Appearance and Dimensions of the BLU-92/B Mine.

b. (U) **Painting and Markings.** The aeroballistic adapter and mine case are olive drab. Each cover has a 51-millimeter (2.00-inch) yellow dot at its center.

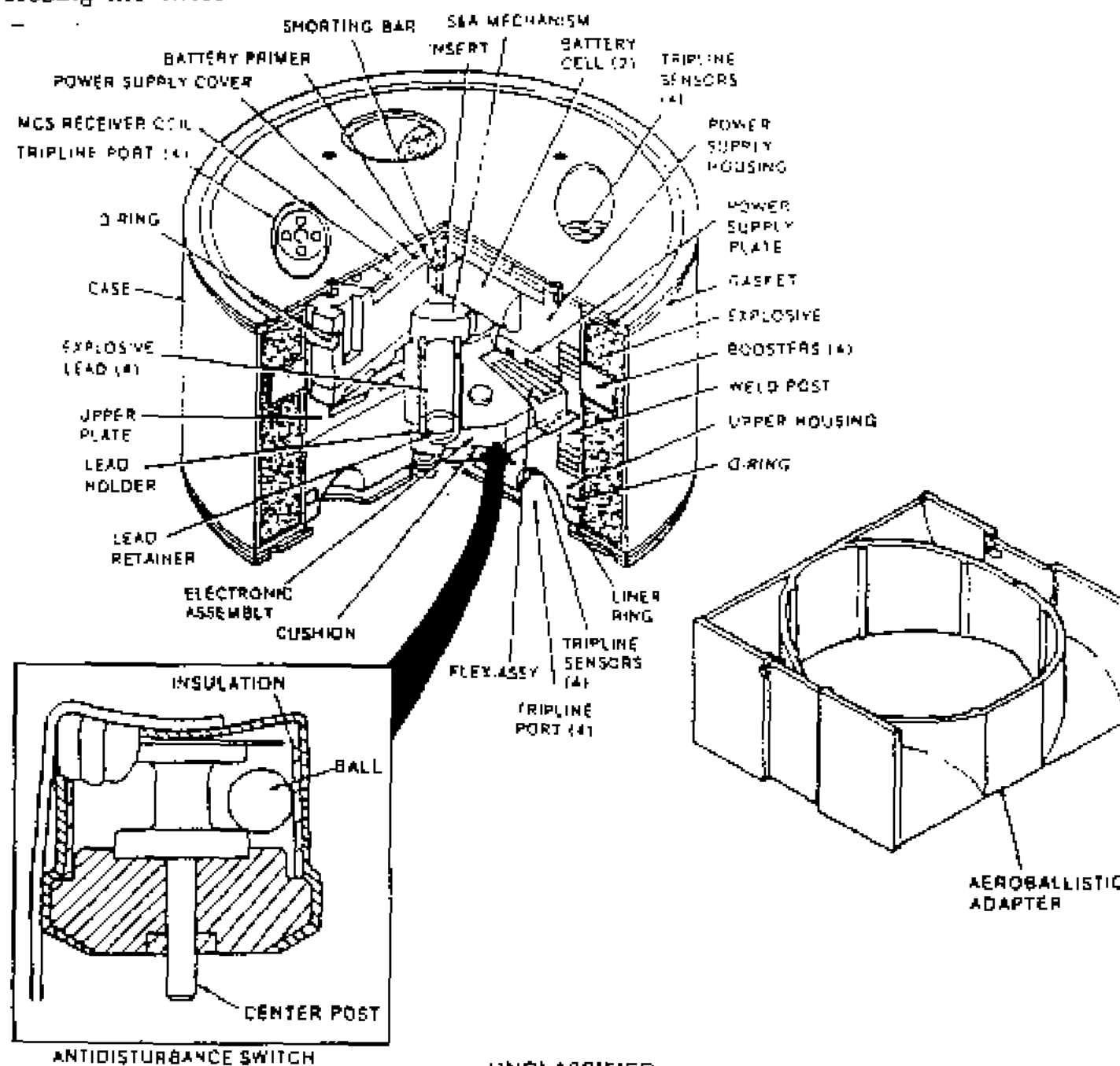
c. (U) **Features.** The mine is a metal cylinder which houses the electronic and warhead components. The cylinder is encased by a plastic aeroballistic adapter to enhance mine dispersion at release and reduce ground impact force by slowing freefall. A bore rider pin/housing is located slightly off-center on only one cover. The pin is retained in the compressed position by a bore rider retaining clip until release. The opposite cover is blank. Both covers have four tripline ports, located 90° apart.

2. (U) DESCRIPTION.

a. (U) Material. The aeroballistic adapter is plastic, the mine case is scored steel, and the covers are stainless steel.

b. (U) Weight. The mine weighs 1.6 kilograms (3.5 pounds).

c. (U) Arrangement. The mine (figure 2) is comprised of a tripline target sensor (four sensors per cover), a fragmenting type warhead, a lithium reserve battery power supply, a safe and arm (S&A) device, a magnetic coupling device, and a mine self-destruct electronics. Some mines contain an antidisturbance switch. Each target sensor consists of a locked spring-loaded bobbin with approximately 12.2 meters (40.0 feet) of tripline which is deployed when the pressure cartridge in the gas generator (not shown) is functioned. The warhead is a prescored fragmentation type. The power supply is two independent hermetically sealed cells connected in series, to provide a nominal 6.4 volts. The S&A contains dual interrupter locks on the detonator slider and a dud-safe system that permanently locks the slider in the out-of-line position if the mine arming criteria is not met. The mine self-destruct time is induced into the mine by the transmitter/receiver coil (magnetic coupling device). Destruct times are preselected by a positioning of the dispenser self-destruct setter switch. The antidisturbance switch is located in the fuze electronics. It consists of a moveable metal ball positioned between insulated and uninsulated sections in a switch can. Mine movement causes the ball to move, closing the switch.



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Figure 2. (U) General Arrangement of the Mine.

3. (U) HAZARDOUS COMPONENTS. Table 1 lists the hazardous components of the mine.

Table 1. (U) Hazardous Components.

Major component	Hazardous component	Explosive composition	Explosive weight
Mine case	Main Charge	Comp B4	408 g (14.4 oz)
	Booster	Comp A5	6.3 g
S&A	Micropiston actuator	PBXN5 Barium styphnate and potassium dinitrobenzofuroxane (KDNBF)	4 g Less than 1 g
	M100 micro detonator	Lead styphnate, lead azide, and HMX	Less than 1 g
	Booster lead (4)	PBXN-5	Less than 1 g ea
	Main charge lead (4)	PBXN-5	Less than 1 g ea
	Explosive lead	PBXN-5	Less than 1 g
Battery	Primer	Barium nitrate, lead styphnate, and lead azide	Less than 1 g
Gas generator	Pressure cartridge	Lead styphnate	Less than 1 g
		Calcium chromate	Less than 1 g
		Hercules propellant No. 2400	Less than 1 g

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4. (U) FUNCTIONING.

NOTES

(U) Dispensers are loaded with both BLU-91/B and BLU-92/B mines. If either mine is found, the other's presence should be suspected.

(U) Self-destruct time for the mine is programmed prior to launch by rotating a dial on the dispenser to one of three numbered positions.

(U) Some BLU-92/B mines are fitted with an antidisturbance feature (ball switch) whose presence cannot be visually determined by external examination of the mine.

b. (U) Firing. The mine can be functioned by any one of the following: the electronic timer circuit malfunctions; the power supply drops below a predetermined value; the opening of a tripline sensor; or the expiration of the self-destruct time (table 2). Additionally, mines that contain the antidisturbance feature will fire upon closure of the ball-switch.

NOTE

(U) A tug or line pull that produces a force of 136 to 397 grams (4.8 to 14.0 ounces) on the tripline will function the tripline sensor.

5. (U) APPEARANCE.

a. (U) Unarmed Condition. The mine is unarmed if either of the following conditions exist.

(1) The bore rider clip is in place.

(2) It is positively known that the MCS receiver coil has not experienced an electrical arming pulse.

b. (U) Armed Condition. Consider the mine armed if both of the following conditions exist.

(1) The bore rider clip is not in place.

(2) It is suspected or known that the MCS receiver coil has experienced an electrical arming pulse.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION. None required. Proceed to disposal procedure.

U.S. BOMB UNIT, LIVE, FRAG/HEAT, BLU-97/B AND BLU-97A/B; AND BOMB UNITS,
TRAINING, BLU-97(T-1)/B, BLU-97(T-1)A/B, BLU-97(T-2)/B, BLU-97(T-3)/B,
AND BLU-97(D-1)/B (U)

BIP

a. (U) Type. The bomb is a small, aerially dispensed, decelerator stabilized, shaped charge, antimaterial/antitank bomb. It contains a fuze system that provides a primary firing system for impact (standoff) firing and a secondary firing system for impact (semi-all-way) firing. The BLU-97(T-1)/B, BLU-97(T-1)A/B, BLU-97(T-2)/B, BLU-97(T-3)/B, and BLU-97 (D-1)/B bombs are practice and dummy bombs used for reliability testing, establishing delivery tactics and training.

b. (U) Painting and Markings.

(1) (U) The BLU-97/B and BLU-97A/B bombs are painted yellow. Nomenclature, loading data and identifying numbers are stenciled on the side of the standoff probe in 6-millimeter (0.25-inch) black markings.

(2) (U) The BLU-97(T-1)/B and BLU-97(T-1)A/B bombs are painted orange. The bomb designation PRACTICE BOMB LIVE FUZE INERT FILLED and identifying numbers are stenciled on the side of the standoff probe in 6-millimeter (0.25-inch) black markings. Two broken color bands, one yellow and one blue, are painted around the rear of the standoff probe.

(3) (U) The BLU-97(T-2)/B bomb is painted green. The designation PRACTICE BOMB LIVE FUZE ARMING INDICATOR and identifying numbers are stenciled on the side of the standoff probe in 6-millimeter (0.25-inch) black markings. Three broken color bands, one yellow, one light blue, and one white, are painted around the rear of the standoff probe.

(4) (U) The BLU-97(T-3)/B bomb is painted green. The designation PRACTICE BOMB LIVE FUZE FUNCTIONING INDICATOR and identifying numbers are stenciled on the side of the standoff probe in 6-millimeter (0.25-inch) black markings. Three broken color bands, one yellow, one white, and one light blue, are painted around the rear of the standoff probe.

(5) (U) The BLU-97(D-1)/B bomb is painted blue. The designation BALLISTIC DUMMY, and identifying numbers are stenciled on the side of the standoff probe in 6-millimeter (0.25-inch) black markings. It contains no color bands.

c. (U) Features - Cont. The support collar (figure 1) serves as a surface over which the standoff probe can slide. A channel is drilled into the collar to house and guide the firing pin and contain the M55 stab detonator of the primary firing system. The primary firing pin is a formed piece of spring steel sharpened to a point at one end. When the bomb is in the undeployed condition, the primary firing pin is folded into the channel recess in the support collar, and the standoff probe is compressed over the pin and collar and secured by the wind tabs.

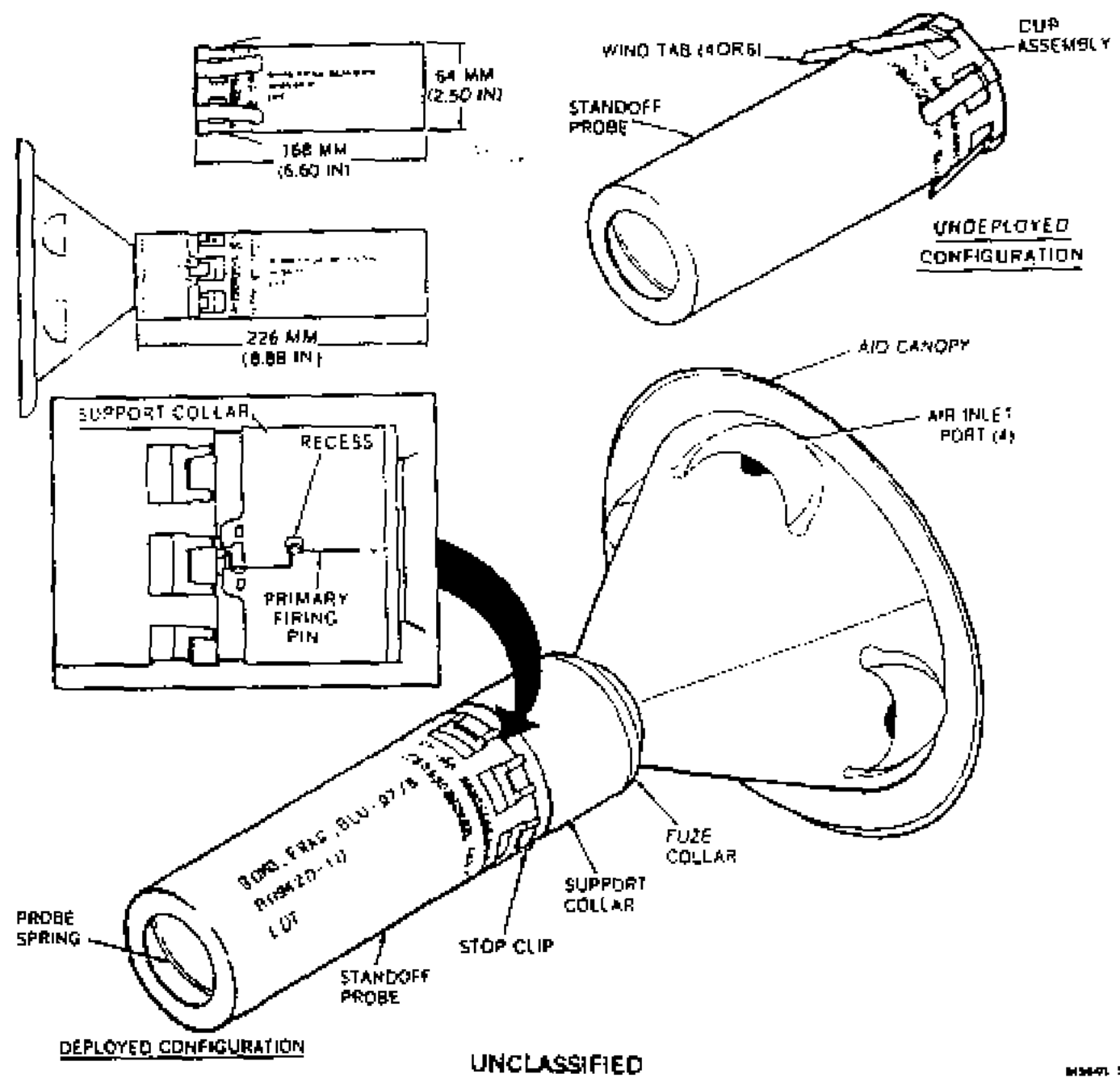


Figure 1. (U) Appearance and Dimensions of the BLU-97/B and BLU-97A/B Bombs (Repeated).

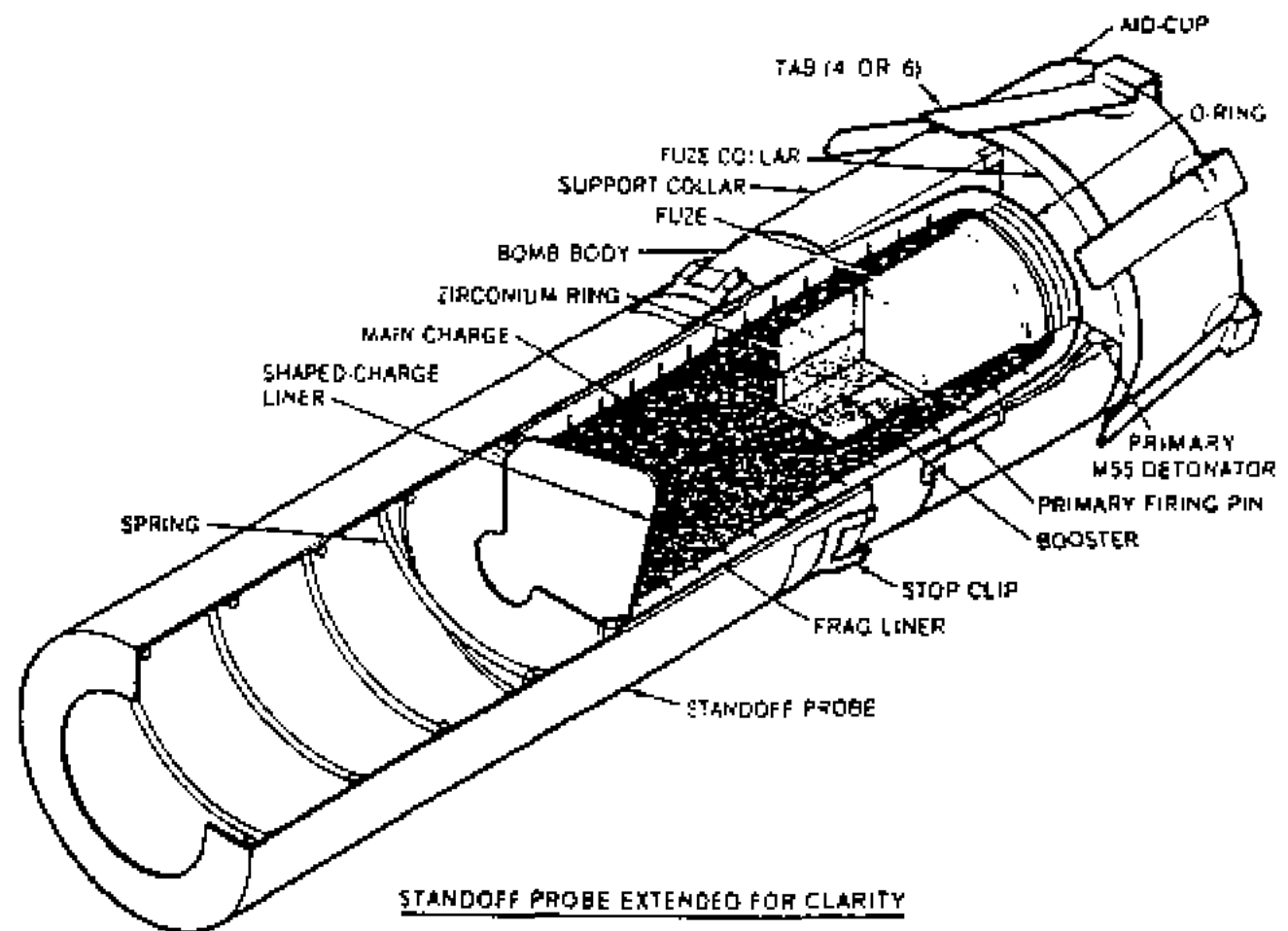
2. (U) DESCRIPTION.

a. (U) Material. The standoff probe is steel, the fragmenting bomb body is carbon steel, the shaped charge liner is copper, the AID cup is aluminum, the wind tabs are stainless steel and the AID canopy is nylon fabric.

b. (U) Weight. The bombs each weigh approximately 1.5 kilograms (3.4 pounds).

c. (U) Arrangement.

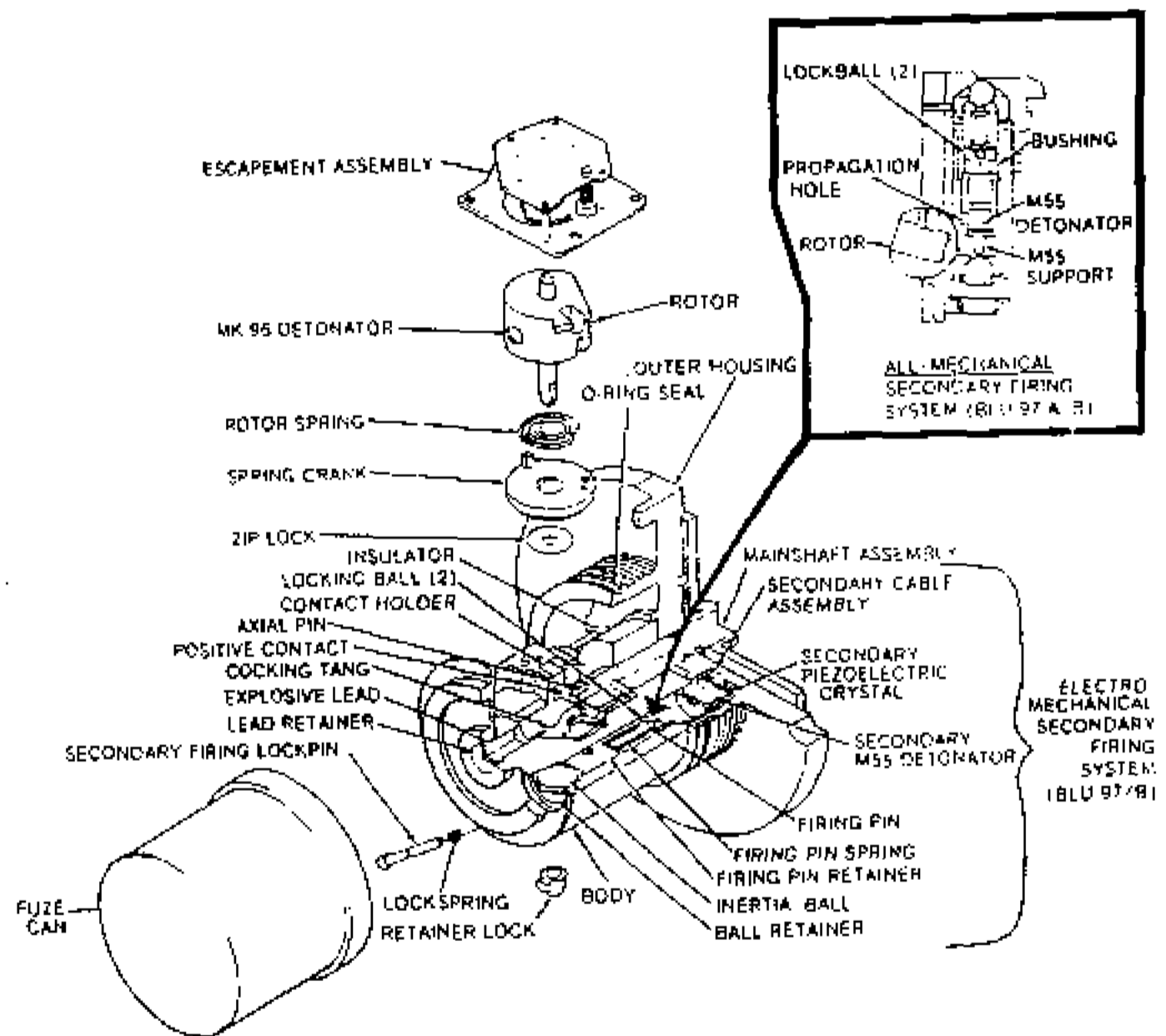
(I) (U) Figure 2 shows the general arrangement of the bomb. The bomb body is prescored on the inside surface for improved fragmentation. A 70° copper cone is attached to the forward end of the bomb body to form the shaped charge liner. The booster is housed in a sealed aluminum cup at the bottom of the fuze well and surrounded by a concentric ring of zirconium to provide the bomb with an incendiary capability.



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Figure 2. (U) General Arrangement of the Bomb.

(b) (U) The electromechanical secondary firing system (Figure 3) used in the BLU-97/B bomb has a semi-all-way graze sensitive feature, and consists of the firing pin, firing pin spring, lockballs, firing pin retainer, inertia ball, secondary cable assembly, piezoelectric crystal, and M55 detonator, all located in the fuze body. It is electrically connected, in the armed condition, to the same Mk 96 detonator as the primary firing system. The firing lockpin for this firing system interfaces with the detonator rotor shaft.



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FORM 1

Figure 3. (U) General Arrangement of the Bomb Fuze (Repeated).

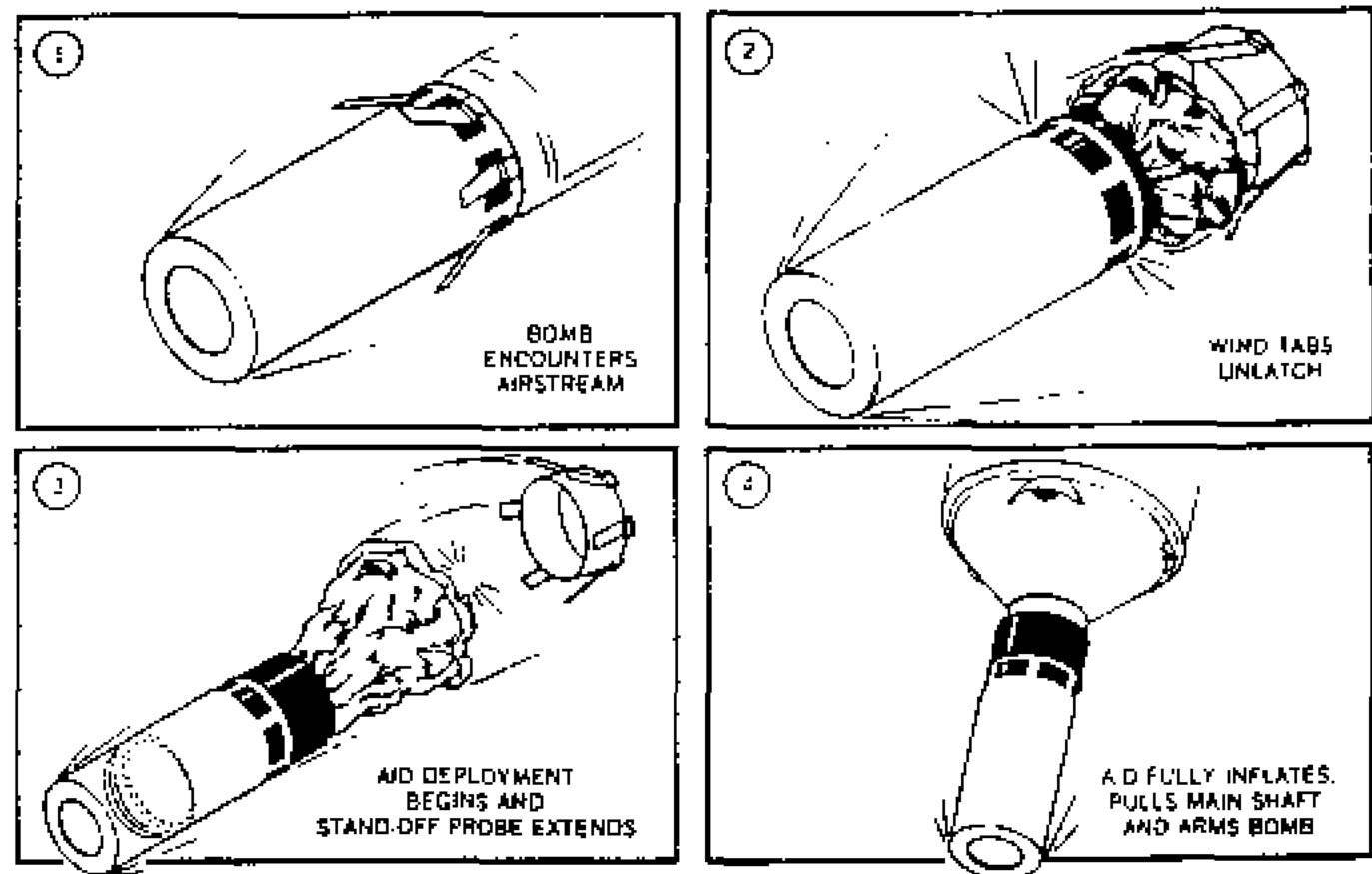
3. (U) HAZARDOUS COMPONENTS. The hazardous components are listed in table 1.

Table 1. (U) Hazardous Components.

Type Bomb	Major Component	Hazardous Component	Material	Explosive Weight	Remarks
BLU-97/B and BLU-97A/B	Fuze	Mk 96 Mod 0 detonator	Lead Azide PETN	Less than 1g	
		M55 detonator	NOL Primer Mix No. 130	Less than 1g	Two M55 detonators per fuze. One detonator in primary and one in secondary firing system.
			Lead azide RDX		
		Lead	PBXN-5	Less than 1g	
	Booster	RDX	2g		
	Warhead	Zirconium ring	Zirconium	40g (1.4oz)	
		Main charge	Cyclotol 70/30	287g (10.1 oz)	
BLU-97(T-1)/B and BLU-97(T-1)A/B	Fuze	Mk 96 Mod 0 detonator	Lead azide	Less than 1g	Two M55 detonators per fuze. One detonator in primary and one in secondary firing system.
			PETN		
		M55 detonator	NOL Primer Mix No. 130	Less than 1g	
	Lead azide				
Lead	PBXN-5	Less than 1g			

4. (U) FUNCTIONING.

a. (U) Arming. As the bomb (figure 4) is released from the dispenser and experiences airstream velocities of 175 knots or greater, the airflow catches the wind tabs releasing the cup assembly and the standoff probe. The airstream pulls the cup assembly rearward, discarding the cup and exposing the air inflated decelerator (AID). Simultaneously the standoff probe is extended by its spring and locked in the extended position by the stop clip. As the standoff probe extends, it permits the primary firing pin to rotate out of its recess to the armed position. Ram air entering the air inlet ports, deploys the AID. AID deployment transmits the air-induced loads to the main shaft assembly in the fuse.



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Page 1

Figure 4. (U) Operational Sequence of the Bomb.

a. (U) Arming - Cont. Movement of the rotor to the inline position also releases a restraint on the lockpin (figure 6) in the secondary firing system, allowing its spring to retract the pin from the firing pin retainer and lock it in the retracted position. The primary and secondary firing systems of the bomb are now armed.

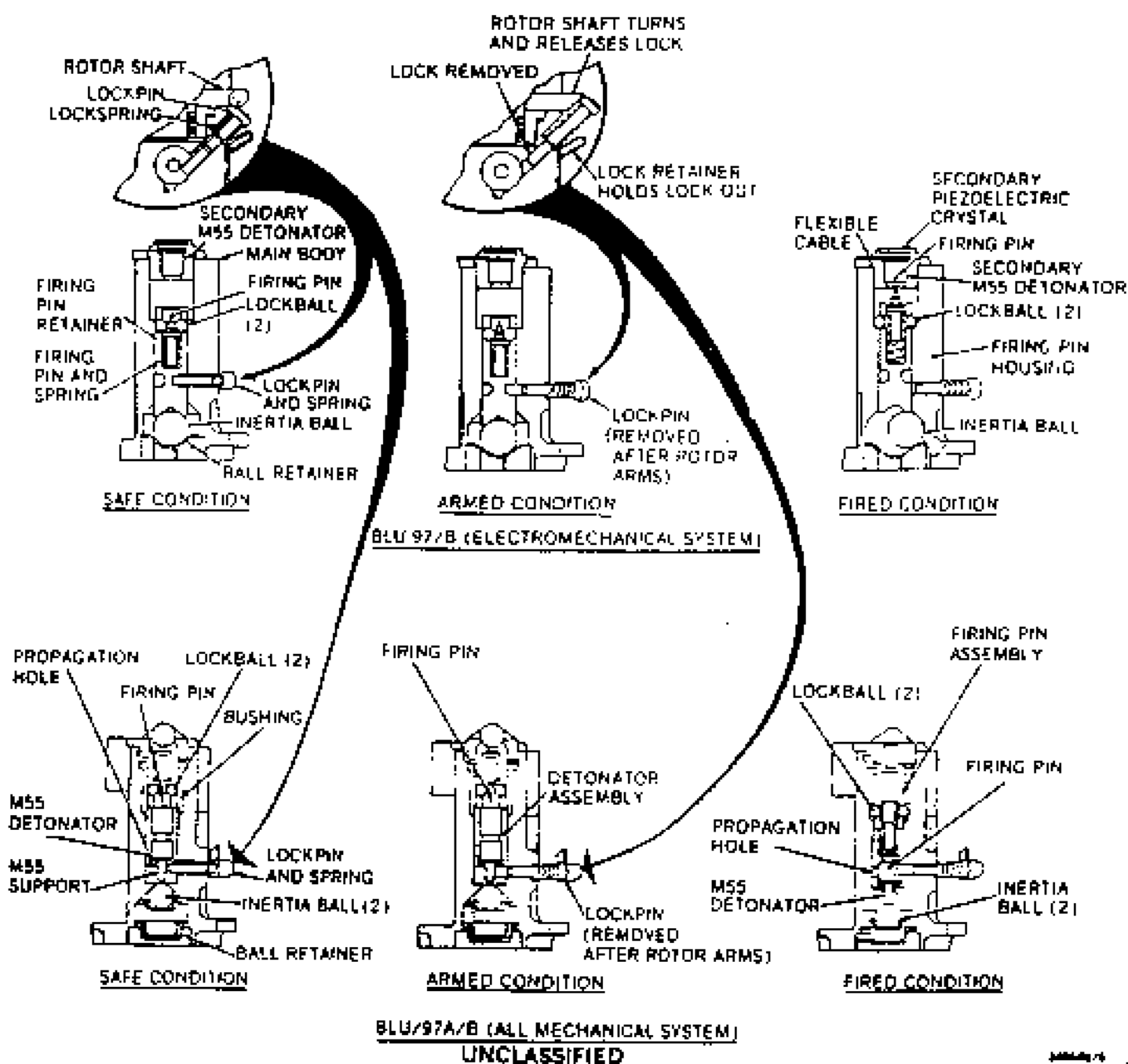
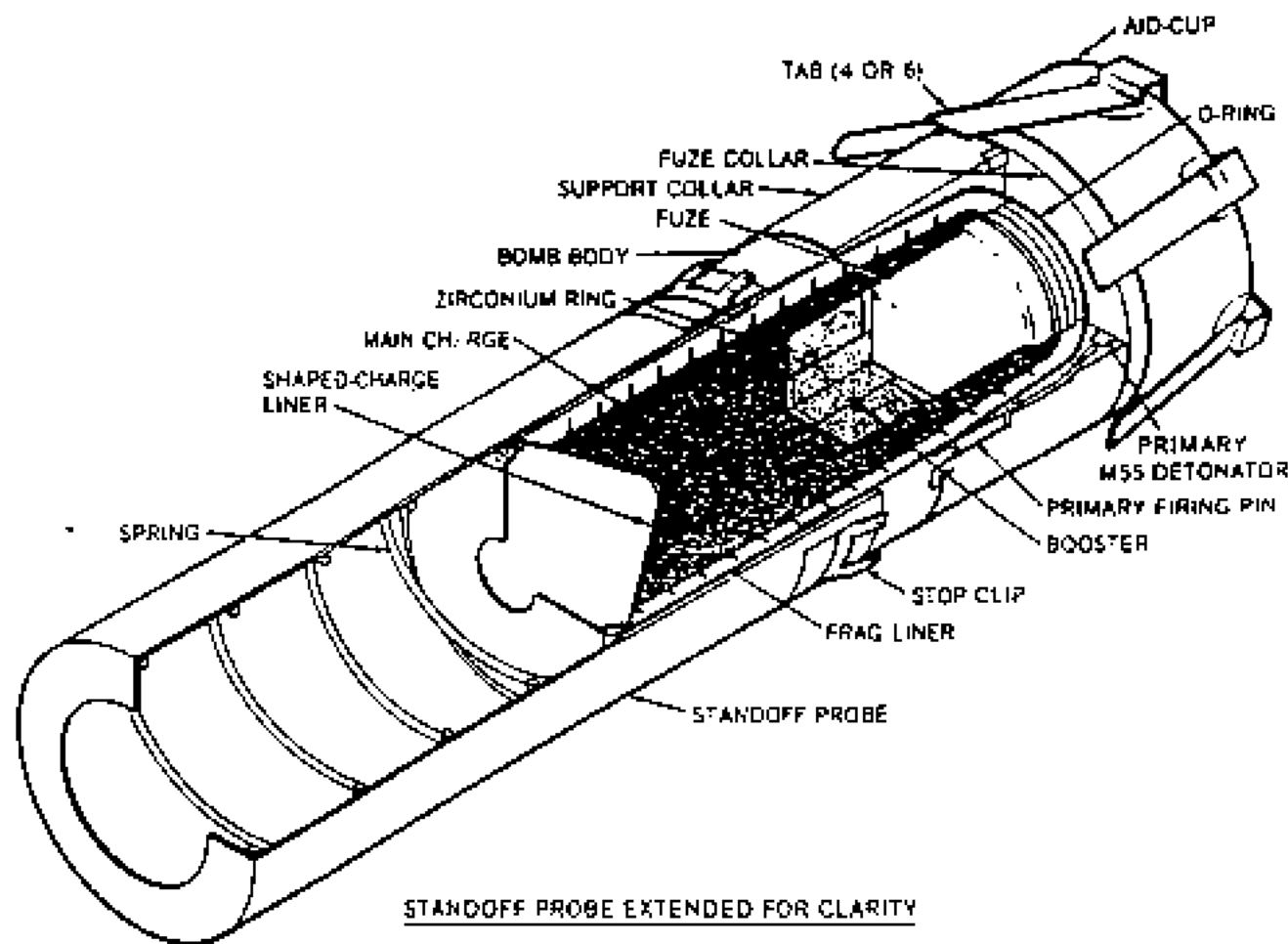


Figure 6. (U) Fuze Operational Sequence for the Secondary Firing Systems.

b. (U) Firing. At impact, the bomb is initiated by one of two modes of functioning.

(1) (U) Primary firing system. On probe (figure 2) impact, the stop clip is overcome and the standoff probe is driven rearward, compressing the spring and driving the primary firing pin into, and initiating the primary M55 detonator.



UNCLASSIFIED

pr4401.2

Figure 2. (U) General Arrangement of the Bomb (Repeated).

(2) (U) BLU-97/B secondary firing system. If the primary firing system fails, on bomb impact the inertia ball (Figure 6), in the secondary firing system, forces the firing pin retainer forward until the two firing pin lockballs are cammed outward into a recess in the firing pin housing. This releases the spring-loaded firing pin, driving it into the secondary M55 detonator. Shock from the explosion of the detonator stresses the secondary piezoelectric crystal. The electrical current generated by the crystal is transmitted through a secondary flexible cable to a positive contact, initiating the Mk 96 electric detonator. Initiation of the remaining firing train is the same as for the primary system.

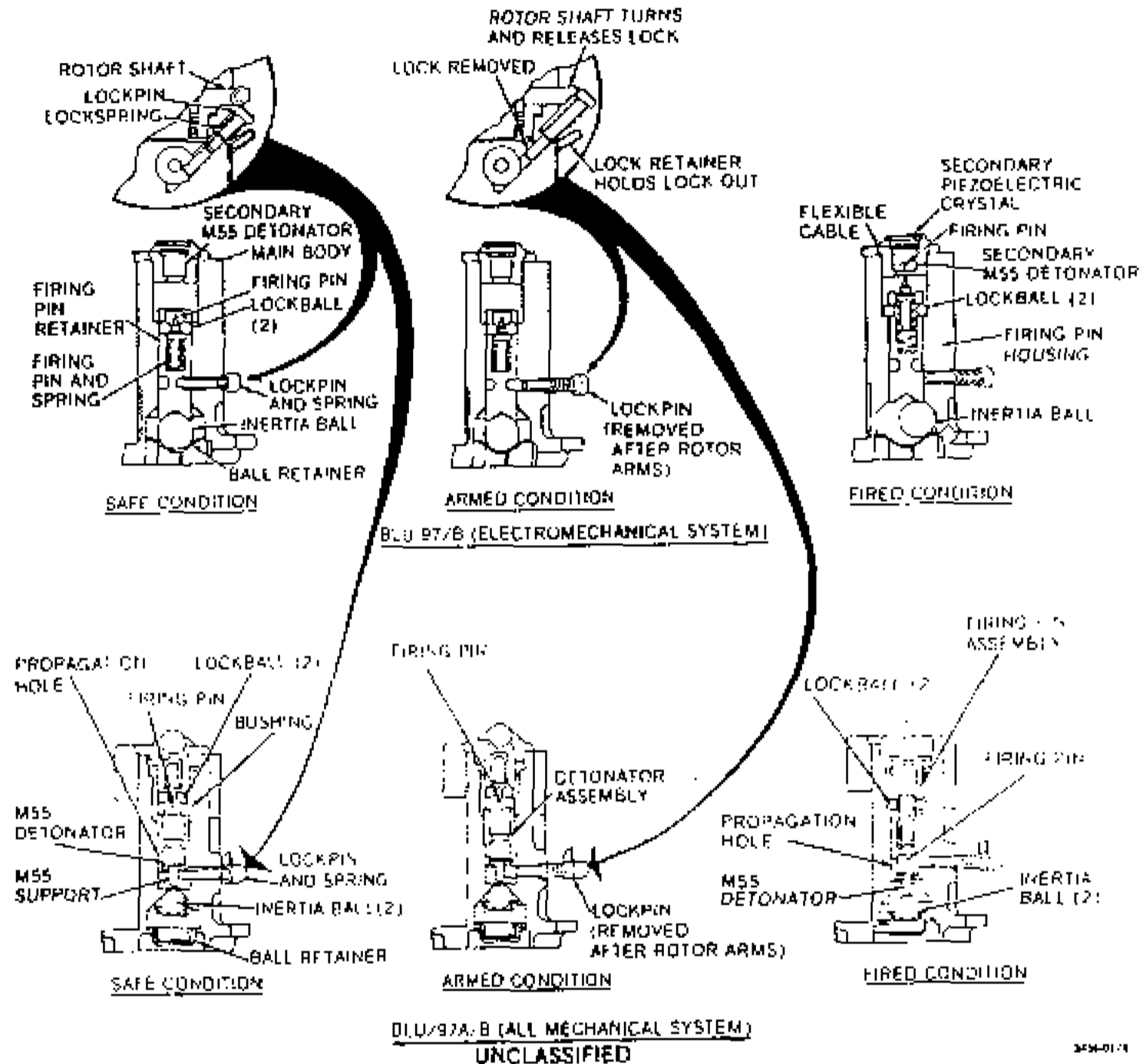


Figure 6. (U) Fuze Operational Sequence for the Secondary Firing System (Repeated).

5. (U) APPEARANCE.

NOTE

(U) External appearance of the BLU-97/B and BLU-97A/B is identical except for nomenclature markings.

a. (U) Unarmed Condition. The bomb is unarmed if the wind tabs and cup assembly are in place preventing AID canopy deployment and probe extension.

b. (U) Armed Condition. Consider the bomb armed if the AID canopy is deployed and probe extended.

6. (U) RENDER SAFE PROCEDURE FOR UNARMED CONDITION.

- a. Secure wind tabs (figure 1) to standoff probe.
- b. Proceed to disposal procedure (paragraph 8a).

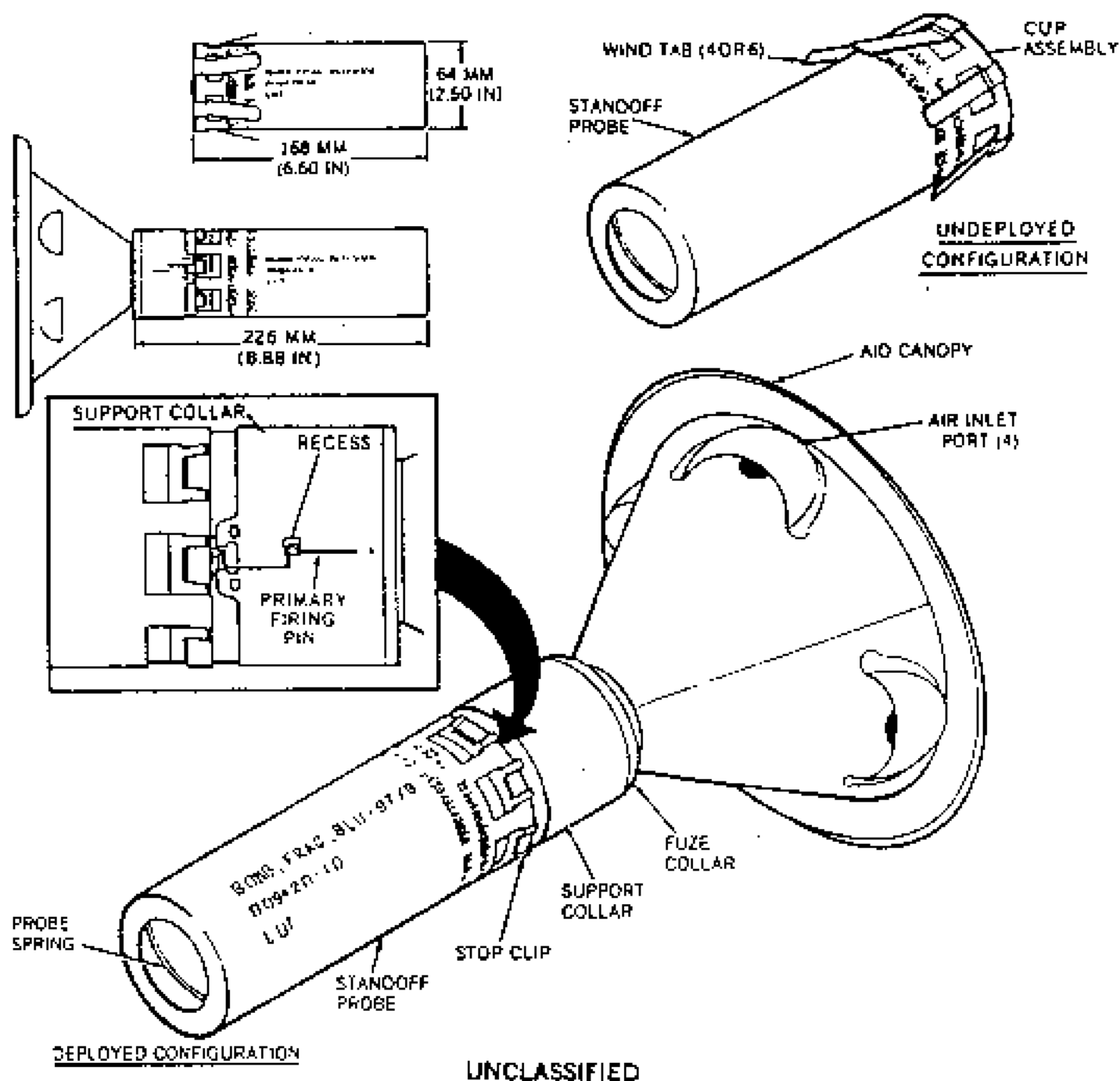


Figure 1. (U) Appearance and Dimensions of the BLU-97/B Bomb (Repeated).

8. (U) DISPOSAL PROCEDURES.

NOTE

(U) Take precautions to prevent fire during disposal operations. The zirconium ring will break up and scatter over a large area.

a. (U) Unarmed and Rendered Safe Bomb (BLU-97/B or BLU-97A/B).

- (1) Transport hazardous components to a disposal area.
- (2) Place not less than 0.5-pound of plastic explosive, or equivalent, midway on top of bomb body.
- (3) Detonate charge.

U.S. BOMBS, AT, MK 118 MODS 0 AND 1 AND MK 118 (VECP MODIFIED) (U)

SAFETY SUMMARY (U)

SAFETY PRECAUTION

(U) Review electromagnetic radiation (EMR) hazards and precautions, and electrical grounding procedures, as given in applicable 60-series manuals, prior to conducting EOD operations.

WARNINGS

(U) Do not confuse the Mk 118 VECP modified bomb with the bombs contained in the ISCB-1 dispenser. The ISCB-1 bombs and dispenser are manufactured in the U.S. for the United Arab Emirates (UAE). Both bombs are externally identical except for an entrance hole in the forward portion of the UAE bomb. This hole provides access for an electrical cable/fuze module interface to transmit electrical current to remotely set bomb fuze function time (10 seconds to 24 hours) and bomb fuze battery initiation. (Frame D2/page 14.)

(U) Perform any initial movement of an armed bomb remotely. The firing pin may be embedded in the detonator. (Frames D3 and F3/pages 15 and 19.)

(U) Exercise extreme caution when moving or handling an armed Mod 0 or 1 bomb. The Mk 1 fuzing system in the Mod 0 and 1 bombs contains a piezoelectric impact sensing element which requires striker impact for detonator initiation to stress the piezoelectric crystal, and a base fuze element with an impact firing pin that is restrained only by a creep spring. (Frame F4/page 20.)

a. (U) Type. These are aerielly dispensed, antitank (AT) shaped charge, target-discriminating, fin-stabilized bombs that use the MK 1 fuzing system. The fuzing system provides for impact firing after contact with either a soft or hard target. An inert loaded bomb, containing a live fuze but no main explosive charge, is used for fuze reliability testing and establishing delivery tactics.

b. (U) Painting and Markings. The impact sensing element (Mods 0 and 1 bomb) and base fuze vanes are unpainted. The standoff probe, bomb body, and base fuze element cover are anodized gold. The fins are white plastic. A 15-millimeter (0.60-inch) yellow band is stenciled around the base of the bomb body. A metal foil decal, with the words SAFE and ARM in silver letters on a green and red background is affixed to the base fuze element cover just above the safe/arm indicator window. On some bombs, the decal is replaced with the words ARMED WHEN RED stenciled in black in the same location. The assembly drawing number and loading data are stenciled in black on the base fuze element cover and the forward portion of the bomb body.

2. (U) DESCRIPTION.

a. (U) Material. The bomb body is steel and the fin assembly is plastic.

b. (U) Weight. Each bomb weighs approximately 590 grams (1.3 pounds).

3. (U) HAZARDOUS COMPONENTS. The main charge of the bomb consists of 170 grams (6.0 ounces) of octol (type 1) explosive and a booster charge of 5 grams of CH-6. The Mk 1 fuzeing system (Mods 0 and 1 bomb) employs an electric detonator with a charge of less than 1 gram of priming mixture, lead azide, and RDX, and an impact detonator with a tetryl booster and an ignition charge of less than 1 gram of lead azide and PETN. The Mk 1 fuzeing system (VECP modified bomb) employs only an impact detonator with a tetryl booster lead and an ignition charge of lead azide and PETN, and an explosive relay of lead azide and RDX, each weighing less than 1 gram.

a. (U) Arming - Cont. Two centrifugally operated detents (figure 3) open and a spring-loaded arming pin moves through the opening between the detents.

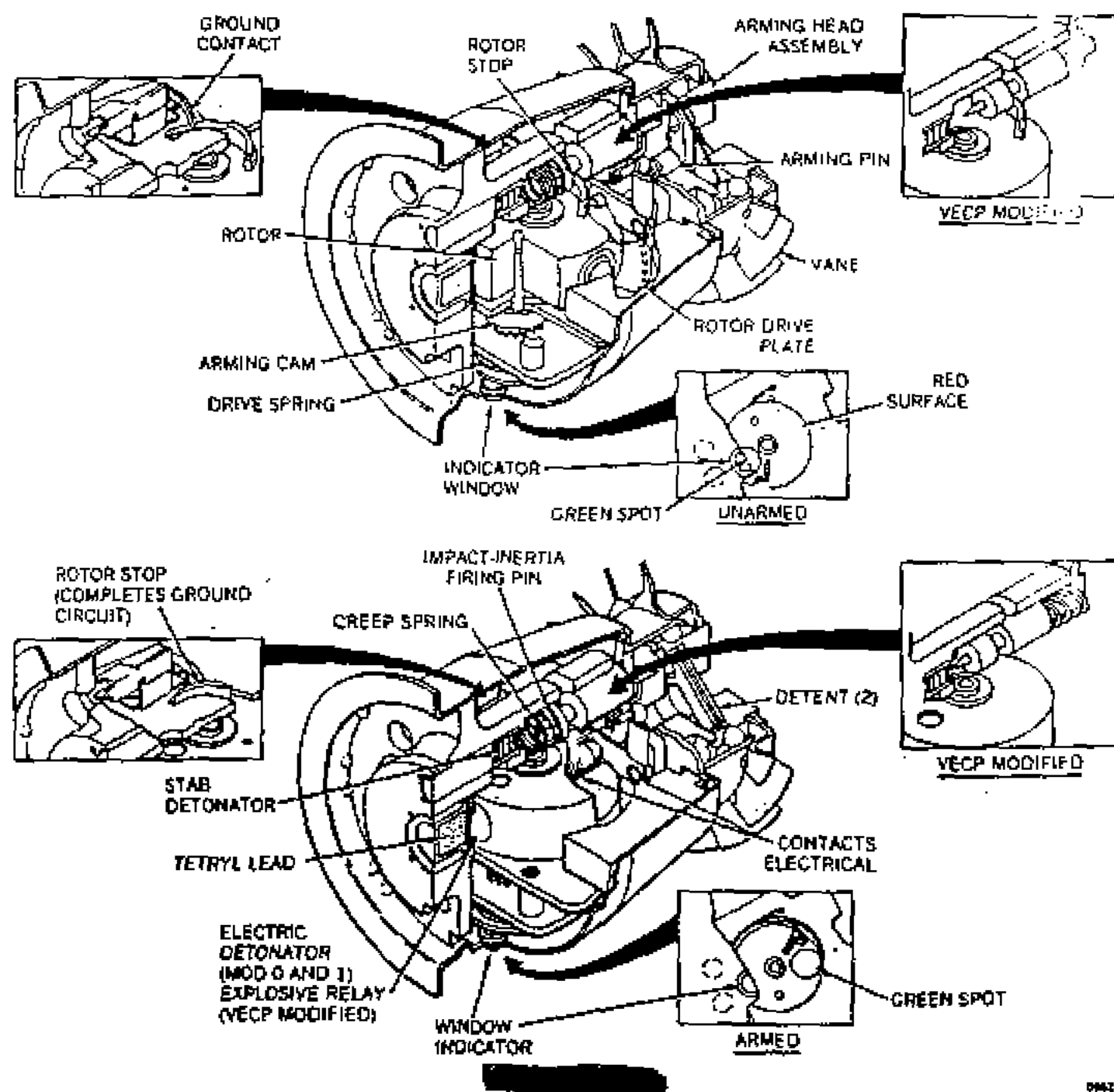
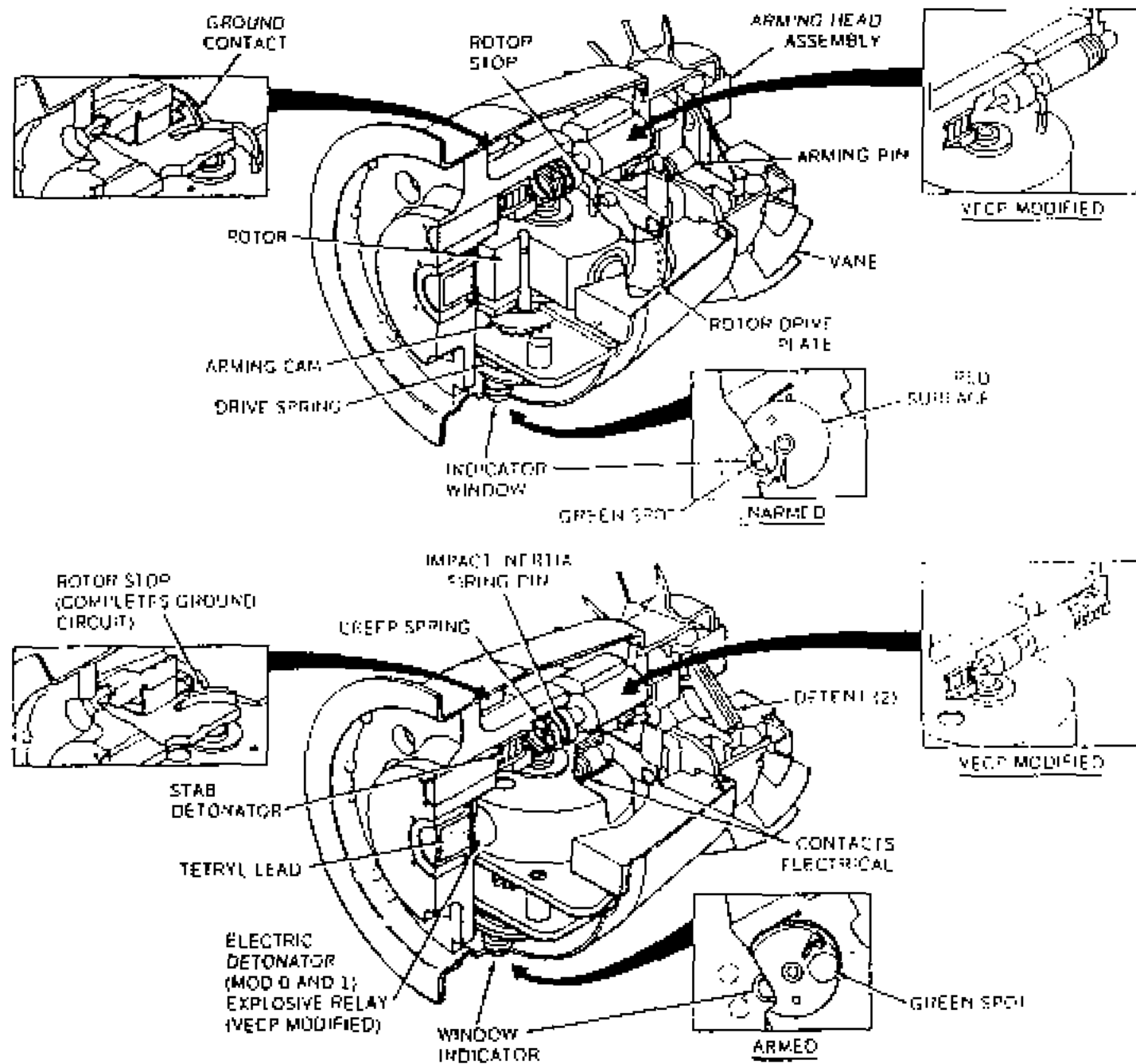
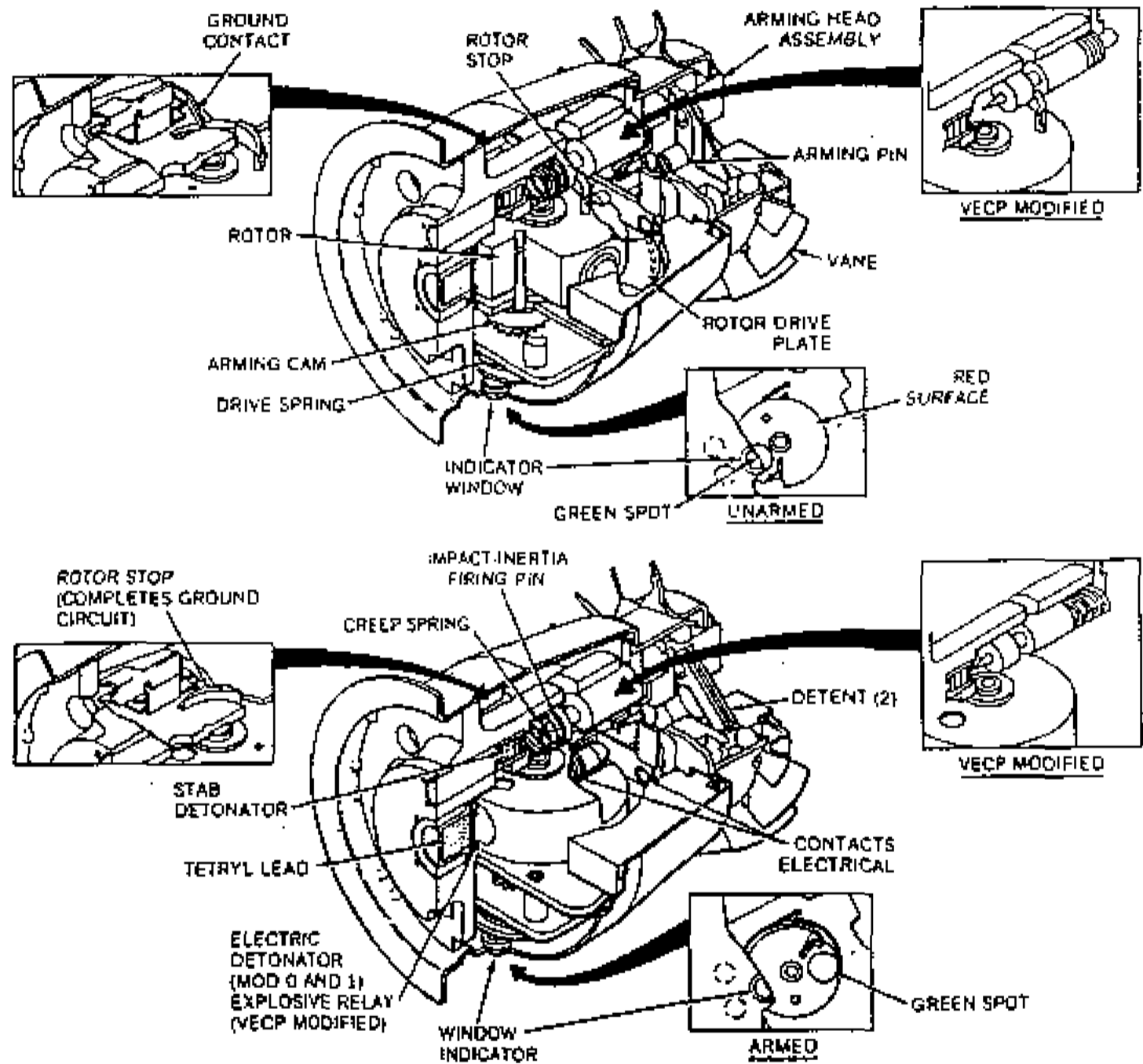


Figure 3. (U) General Arrangement of the Base Fuze Element.

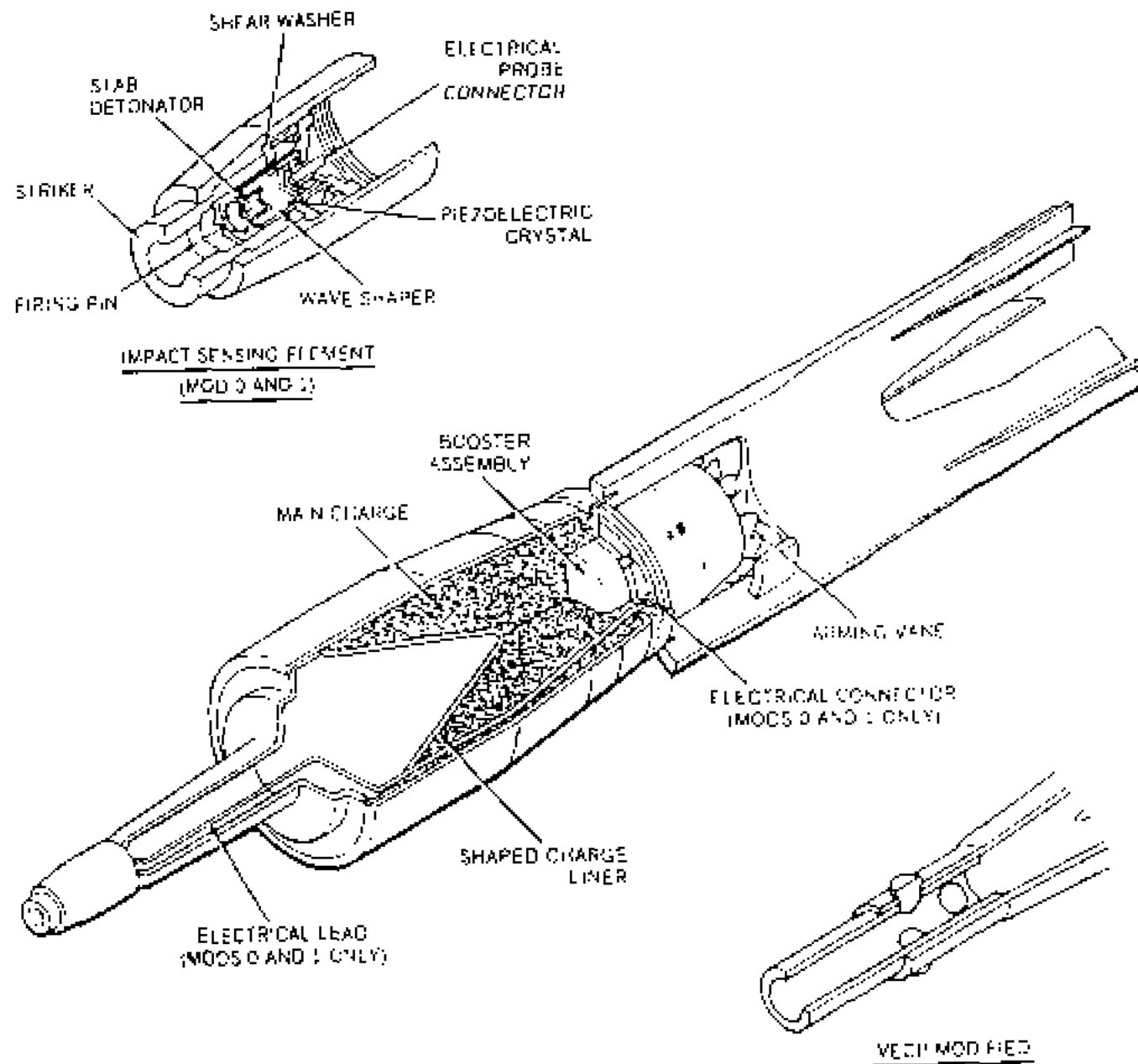
a. (1) *Arming -- Cont.* The rotor (Figure 3) is driven into a partially armed position (approximately 40° from safe) by a cam that is governed by an escapement. This escapement delays the movement of the rotor until 0.9-second has elapsed. At the end of the 0.9-second escapement time, the rotor is engaged by a friction drive, which is driven by rotation of the arming vane, and is rotated the remaining distance (50°) completing the arming cycle. At this time the electric detonator (Mods 0 and 1 bomb only) is in the circuit with the piezoelectric crystal of the impact sensing element. Simultaneously with final rotor alignment, the rotor removes a lock on the inertia-operated firing pin, permits forward movement of the impact inertia firing pin next to the primer of the stab detonator (VECP modified bomb only), removes the short on the electric detonator (Mods 0 and 1 bomb only), and completes the ground circuit between the piezoelectric circuit and electric detonator (Mods 0 and 1 bomb only). The Mk 1 fuzing system is now armed.



(1) (U) Soft target – Cont. Under these conditions, the impact-inertia firing pin (figure 3) in the base fuze element initiates the explosive train.

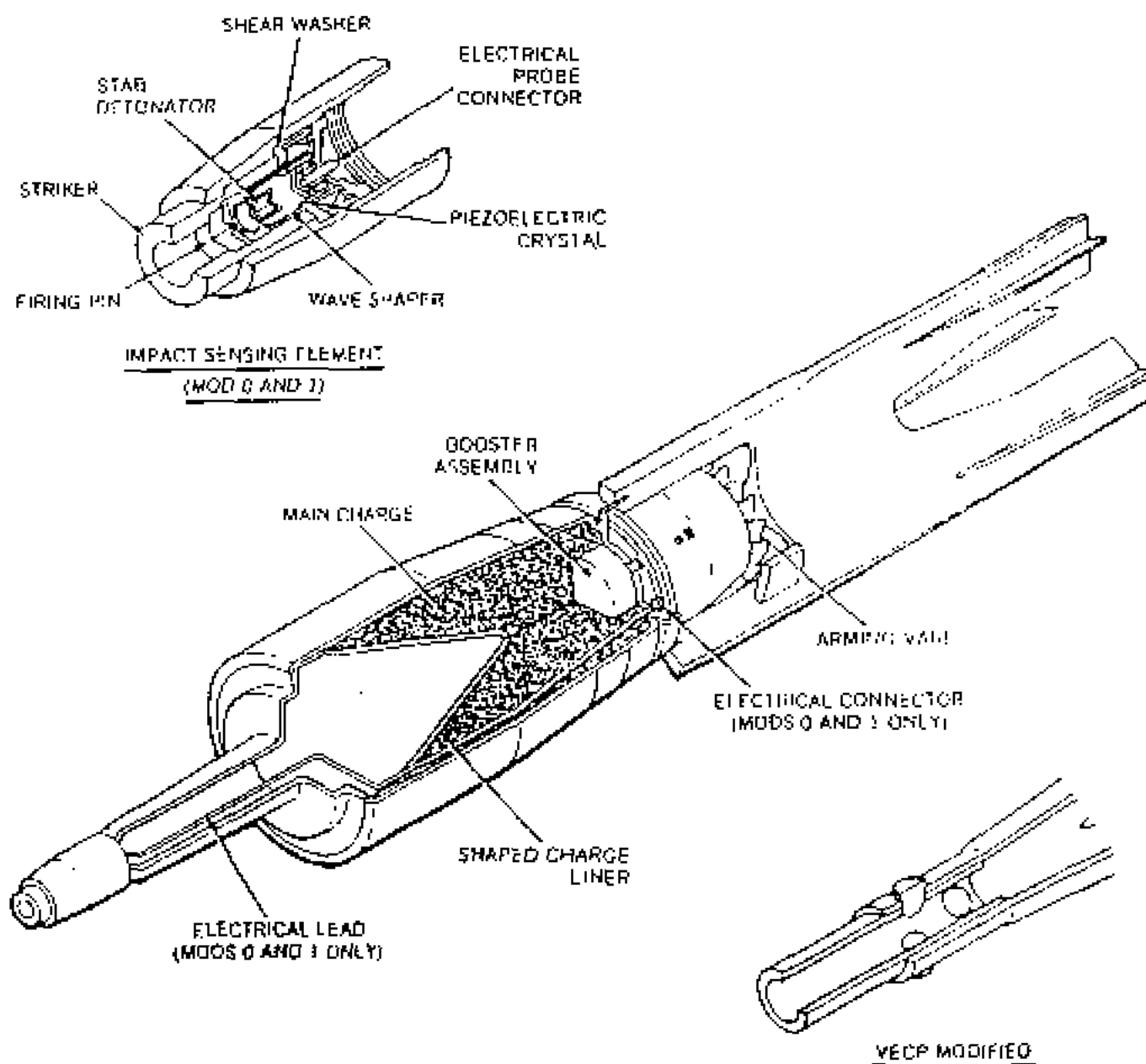


(2) (U) Hard target. If the bomb is a Mod 0 or 1 bomb, and strikes a hard target, such as armor-plate or thick, reinforced concrete, the striker in the impact sensing element (figure 2) is driven inward. The shear washer fails, allowing the firing pin, which is fixed to the striker, to pierce and initiate the detonator. The resulting shock of the explosion drives the wave shaper rearward to stress the piezoelectric crystal, producing an electric current.



WARNING

(U) Exercise extreme caution when moving or handling an armed bomb. The Mk 1 fuzing system in the Mod 0 and 1 bomb contains a piezoelectric impact sensing element (figure 2) which requires striker impact for detonator initiation to stress the piezoelectric crystal, and a base fuze element with an impact firing pin that is restrained only by a creep spring.



5. (U) APPEARANCE.

WARNING

(U) Do not confuse the Mk 118 VECP modified bomb with the bombs contained in the ISCB-1 dispenser. The ISCB-1 bombs and dispenser are manufactured in the U.S. for the United Arab Emirates (UAE). Both bombs are externally identical except for an entrance hole in the forward portion of the UAE bomb. This hole provides access for an electrical cable/fuze module interface to transmit electrical current to remotely set bomb fuze function time (10 seconds to 24 hours) and bomb fuze battery initiation.

COCKED STRIKER BIP VECP
RANDOM DELAY HAS HOLE BODY ISCB

- a. (U) Unarmed Condition. The bomb is unarmed if it is contained within the dispenser.
- b. (U) Armed Condition. Consider the bomb armed if it is out of the dispenser.

NOTE

(U) Exposure to heat or flame may cause the saf/arm indicator window to become opaque.

6. (U) RENDER SAFE PROCEDURES FOR UNARMED CONDITION. Perform procedure for installed dispenser fuze and dispenser as prescribed in applicable 60-series manual.
7. (U) RENDER SAFE PROCEDURES FOR ARMED CONDITION. NO RSP FOR VECP

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TECHNICAL MANUAL

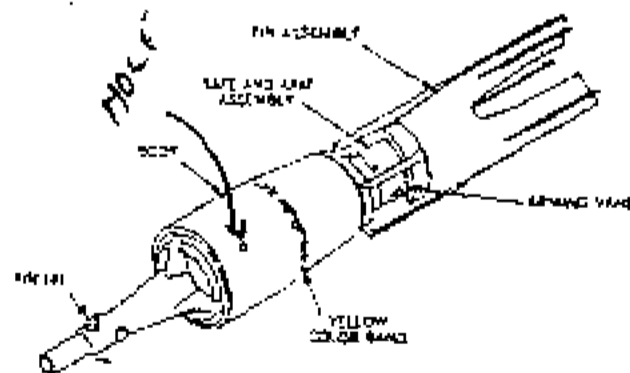
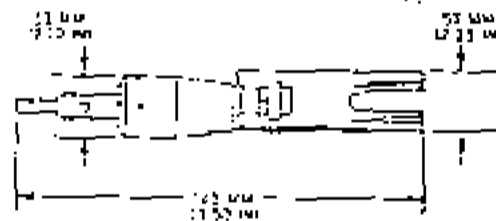
EXPLOSIVE ORDNANCE DISPOSAL PROCEDURES

UNITED ARAB EMIRATES BOMB, FRAGMENTATION, ISCB-1 (D)

1. (U) IDENTIFICATION. Figure 1 shows the appearance and dimensions of the ISCB-1 bomb. The bomb is similar to the Mk 118 (VECP modified) used in the U.S. Rockeye System.

a. (U) Type. This is an aerially dispensed fragmentation fin-stabilized bomb that is used for area denial. The fuze system is mechanically armed and electrically fired after impact. Delays (0 to 24 hours) are electronically programmed prior to aircraft take-off.

b. (U) Painting and Markings. The bomb body and spike are painted light tan. A 3/16-inch yellow color band is painted around the body mid-section. The fin assembly is light tan plastic and the safe/arm device is anodized gold. The words ARMED WHEN READY are stenciled in black on the safe/arm housing just above the safe/arm indicator window. The assembly drawing number and loading data are stenciled in black on the safe/arm housing and a three digit number is stenciled on the forward end of the spike.



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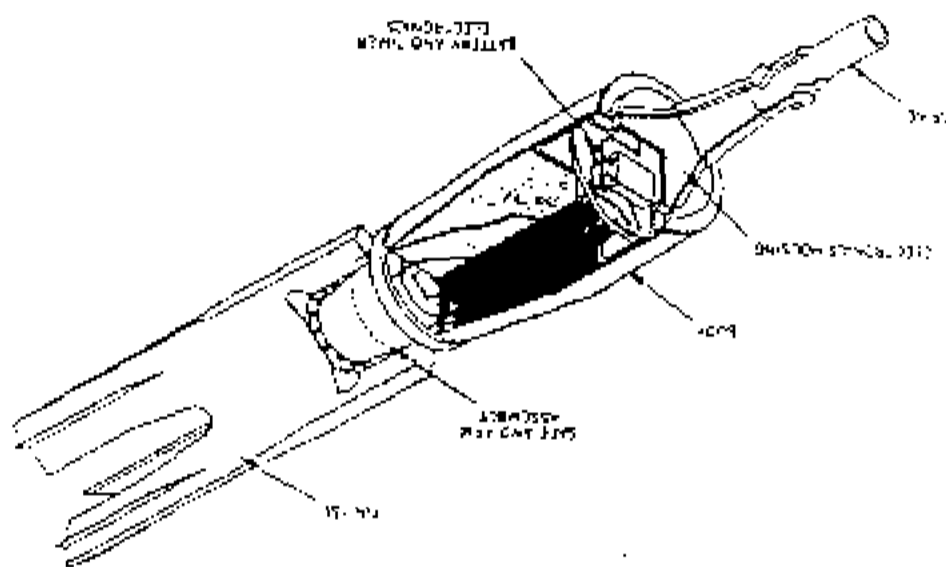
1-100-24

Figure 1. (U) Appearance and Dimensions of the ISCB-1 Bomb.

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Figure 2. (b) General Arrangement of the Bomb.

UNCLASSIFIED



(1) (b) Electroni module: This module is located in the forward end of the bomb body and contains the battery and the electrical timing device (Figure 2). The battery is a dry cell and produces 0.8 volt. The electrical timing device is a custom internal circuit located on the printed wiring board.

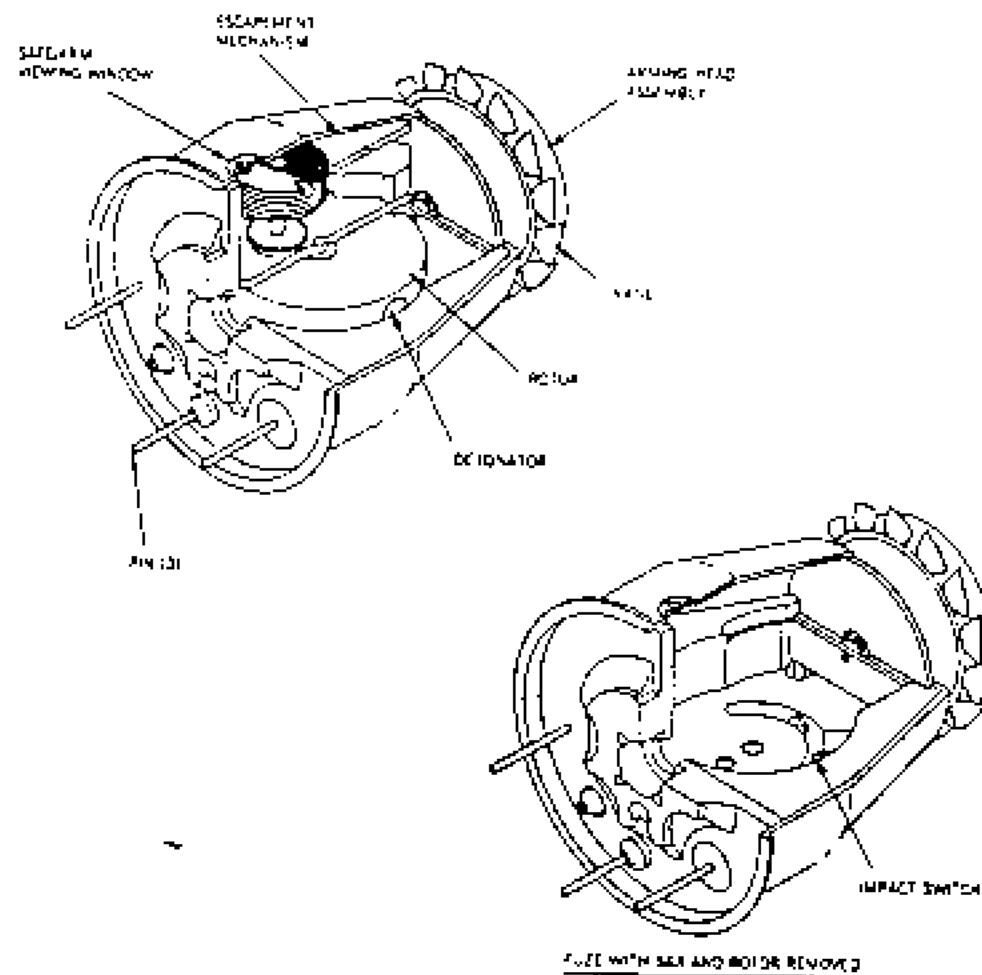
(c) Arrangement

(i) Weight: Each bomb weighs approximately 522 grams (1.2 pounds).

(ii) Material: The bomb body, spike, and safe/arm housing are steel and the fin assembly is plastic.

(iii) Description: The bomb body, spike, and safe/arm housing are steel and the fin assembly is plastic.

(2) (U) Safe/arm device. This device (figure 3) is located on the aft end of the bomb body and is an electromechanical component which is operated by the airstream. It contains the rotor with the electric detonator, the impact switch, the escapement mechanism for delay rotor alignment, and an arming drive assembly. Electrical interface between the safe/arm device and the electronic module is obtained by three electrical wires which pass through the bomb body. Switches in the safe/arm device complete the battery and firing circuits during the arming sequence. An indicator window in the safe/arm housing displays either a green or red flag which provides visual access to determine the safe/armed condition.



UNCLASSIFIED

FORM 34

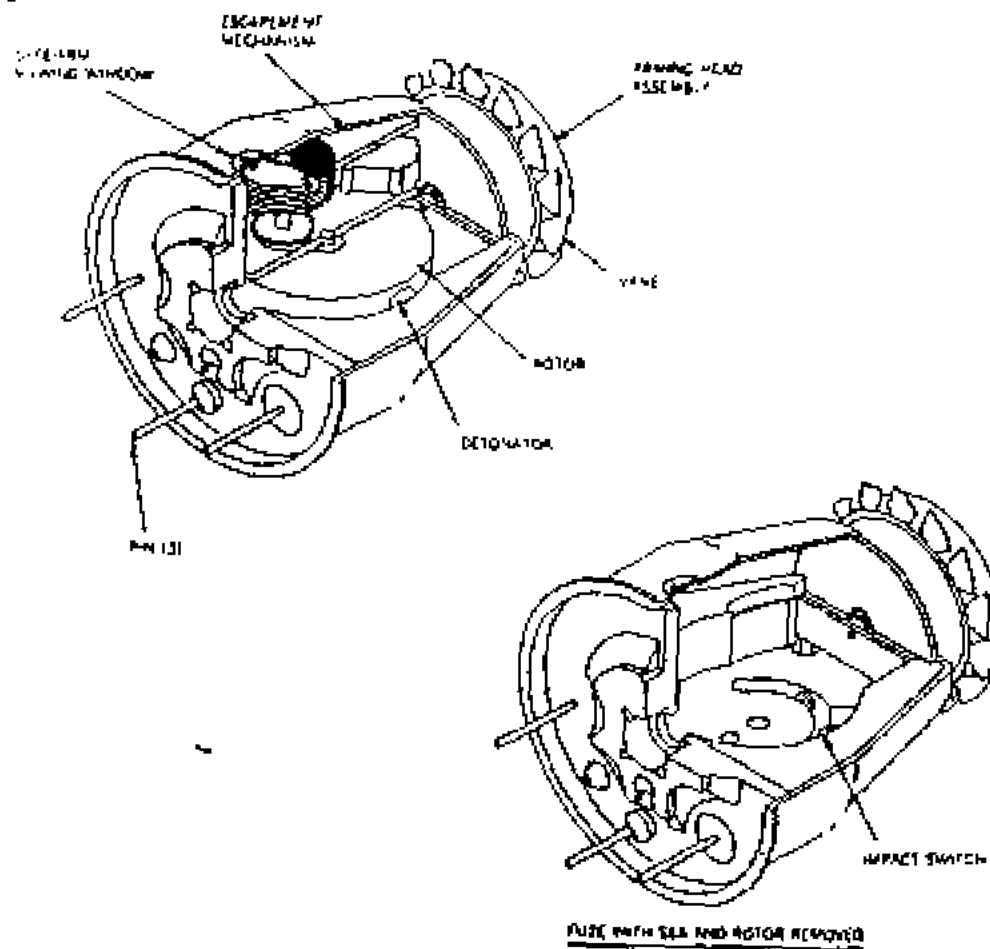
Figure 3. (U) General Arrangement of the Safe/Arm Device.

170

3. (U) **HAZARDOUS COMPONENTS.** The main charge consists of 176 grams (6.2 ounces) of composition B. The safe/arm device contains a detonator with less than 1 gram of lead stypluate, lead azide, and PETN, and a lead containing less than 1 gram of unknown explosive.

4. (U) **FUNCTIONING.**

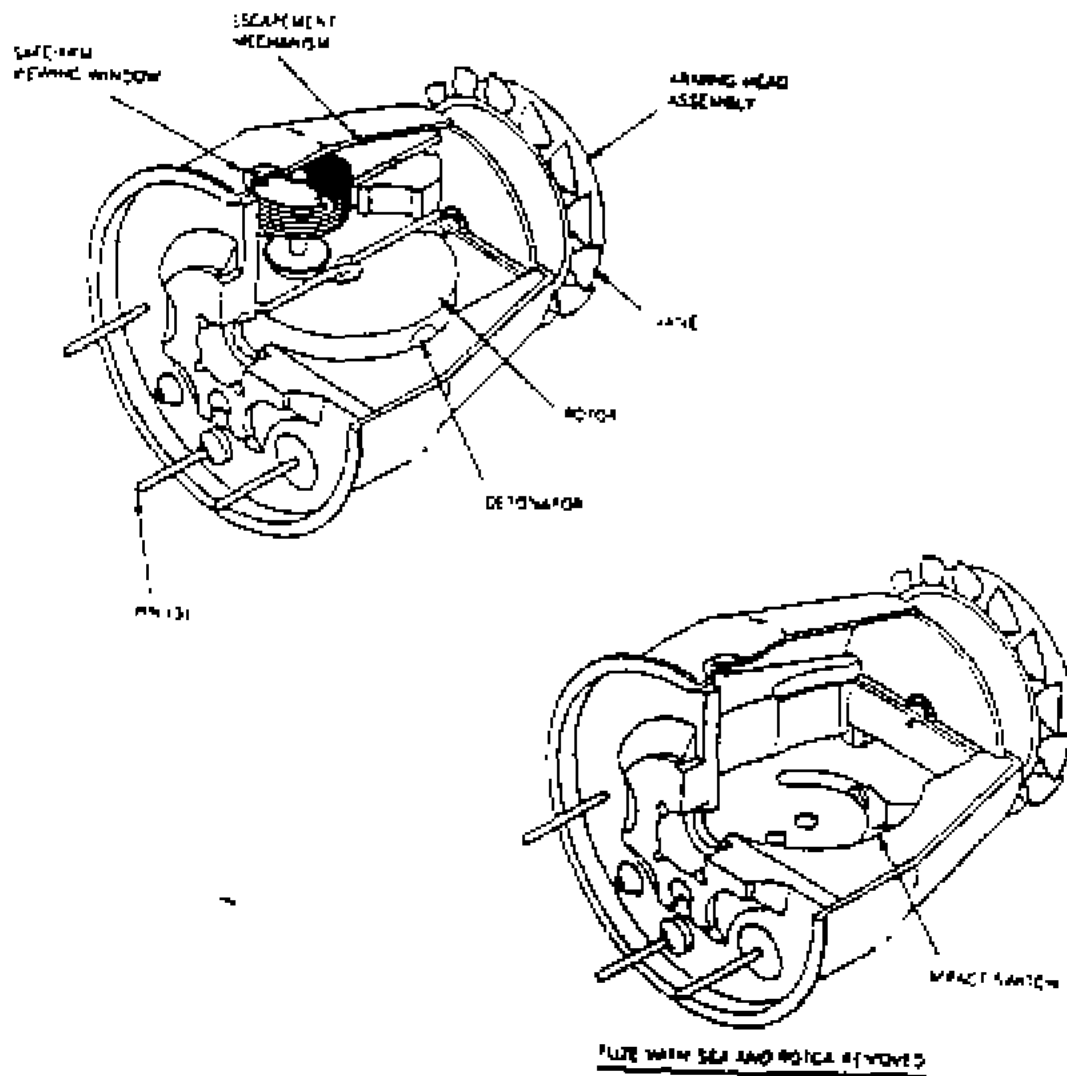
a. (U) **Arming.** When the bomb is released from the dispenser, the programming electrical cable that is routed through the two access holes of each bomb, is severed. The bomb is oriented nose down and the safe/arm device's arming vanes rotate in response to a 225-knot-or-greater airstream. Two centrifugally operated detents, located in the arming head assembly (Figure 3), open and a spring-loaded arming pin moves through the opening between the detents.



UNCLASSIFIED

Figure 3. (U) General Arrangement of the Safe/Arm Device (Repeated).

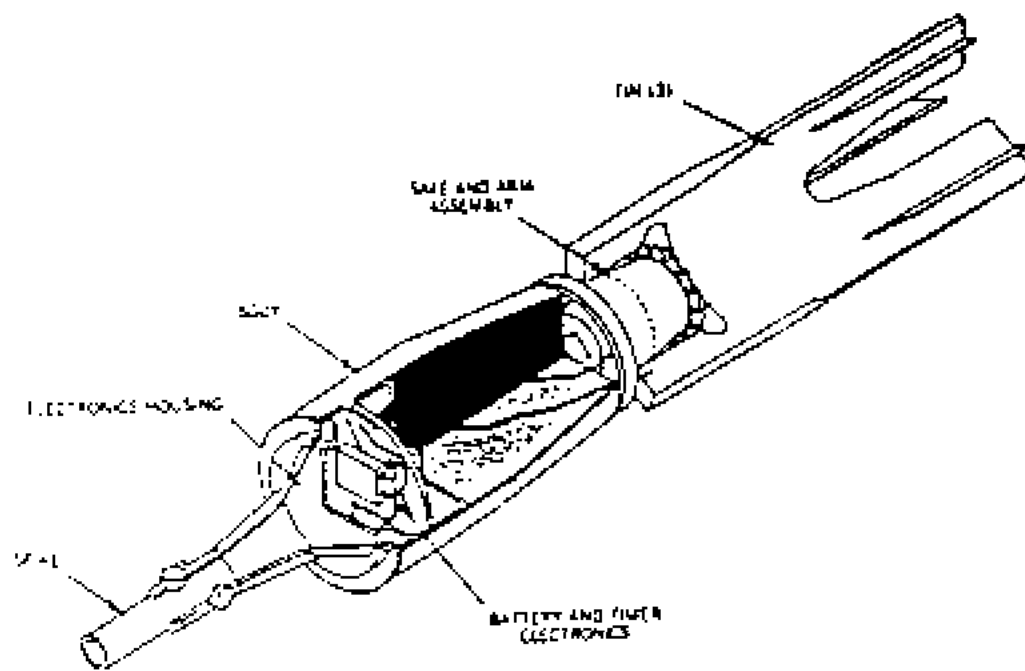
3. (3) Arming - Cont. The forward end of the arming pin clears and unlocks the rotor (Figure 3) containing the electric detonator. The rotor is driven into a partially armed position (approximately 40 degrees from armed) by a cam that is governed by an escapement mechanism. This escapement delays the movement of the rotor until 0.8 second has elapsed. At the end of the 0.8 second escapement time, the rotor is engaged by a friction drive, which is driven by the rotation of the arming vane, and is rotated the remaining distance (50 degrees) completing the arming cycle. Simultaneously with final rotor alignment, the rotor removes a lock on the impact switch, removes the short on the electric detonator, and converts the battery. At bomb impact, forces move the impact switch to the closed position, starting the electronic timer. The bomb is now armed and functioning.



UNCLASSIFIED

1100, 34

h. (U) Firing. The activated electronic timer, powered by its self-contained battery (Figure 2), continues to time the armed and functioning sequence from the time of impact to the programmed delay (0-24 hours) in its memory. When the programmed delay has elapsed, the firing circuit is closed and battery current is routed to the electric detonator to function the explosive train.



UNCLASSIFIED

14-00000

Figure 2. (U) General Arrangement of the Bomb (Repeated).

BIP

(U) Approach with caution when strong winds are blowing. Movement of the ribbon stabilizer by the wind may function the grenade.

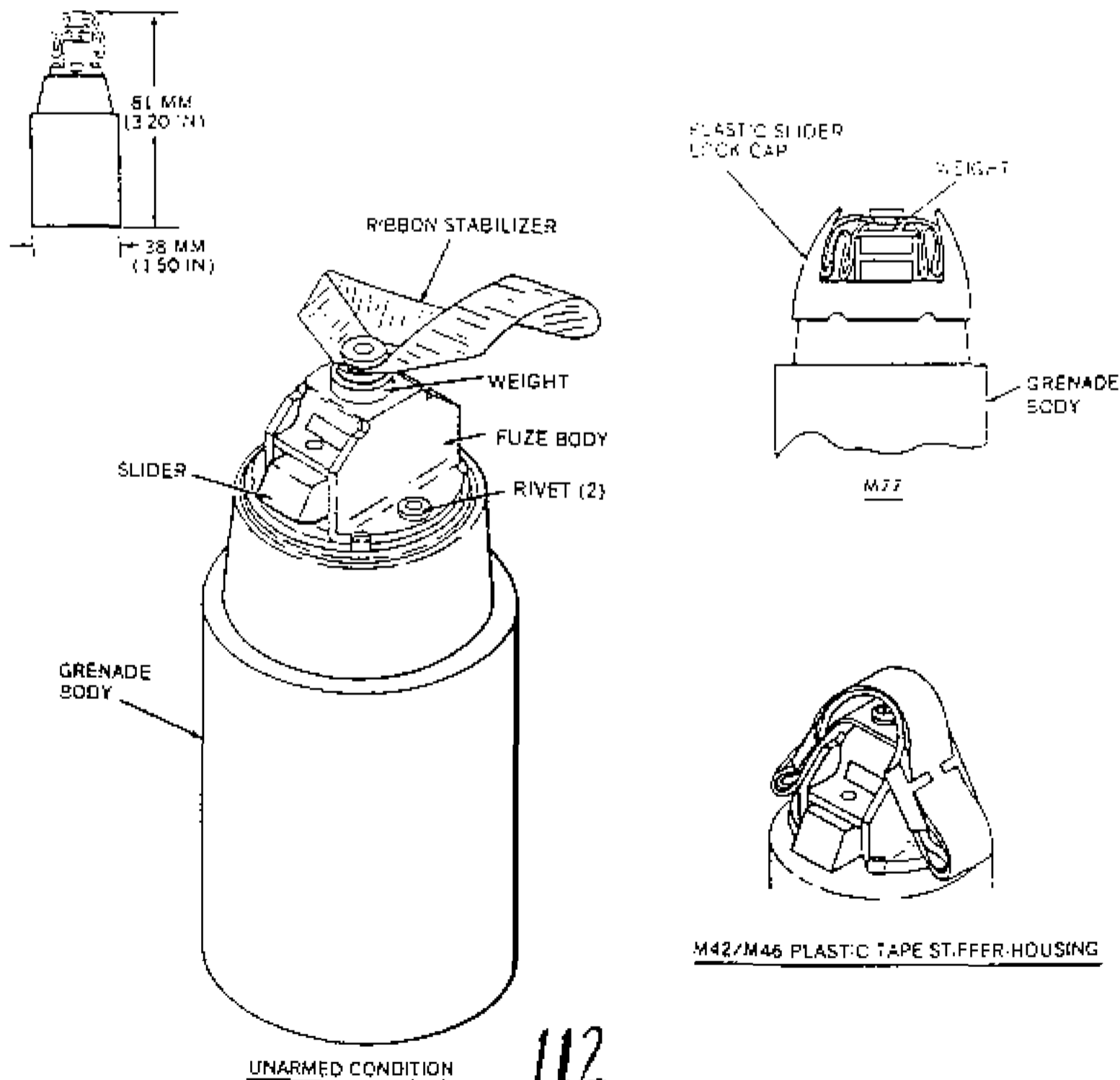
WARNINGS

(U) Do not remove an unarmed grenade from a projectile or rocket warhead. Any attempted removal may arm the grenade. (Frame D2/page 6.)

(U) Do not jar or strike an armed grenade or subject it to any unnecessary movement. The firing pin is held away from the detonator only by friction between the weight and fuze body. (Frame D3/page 7.)

b. (U) Painting and Markings. The M42 and M77 grenades are dull gray. The M46 grenade is silver, reddish brown, or dull gold. There are no markings on these grenades.

c. (U) Features. The M42 and M46 ribbon stabilizer is folded over the fuze body and held by a stiffener (figure 1) before dispersal. When installed in the MLRS warhead, the M77 grenade will have a plastic slider cap (figure 1) over the fuze body before dispersal. The M46 grenade differs from the M42 and M77 in having a heavier, thicker body with a smooth inner wall.

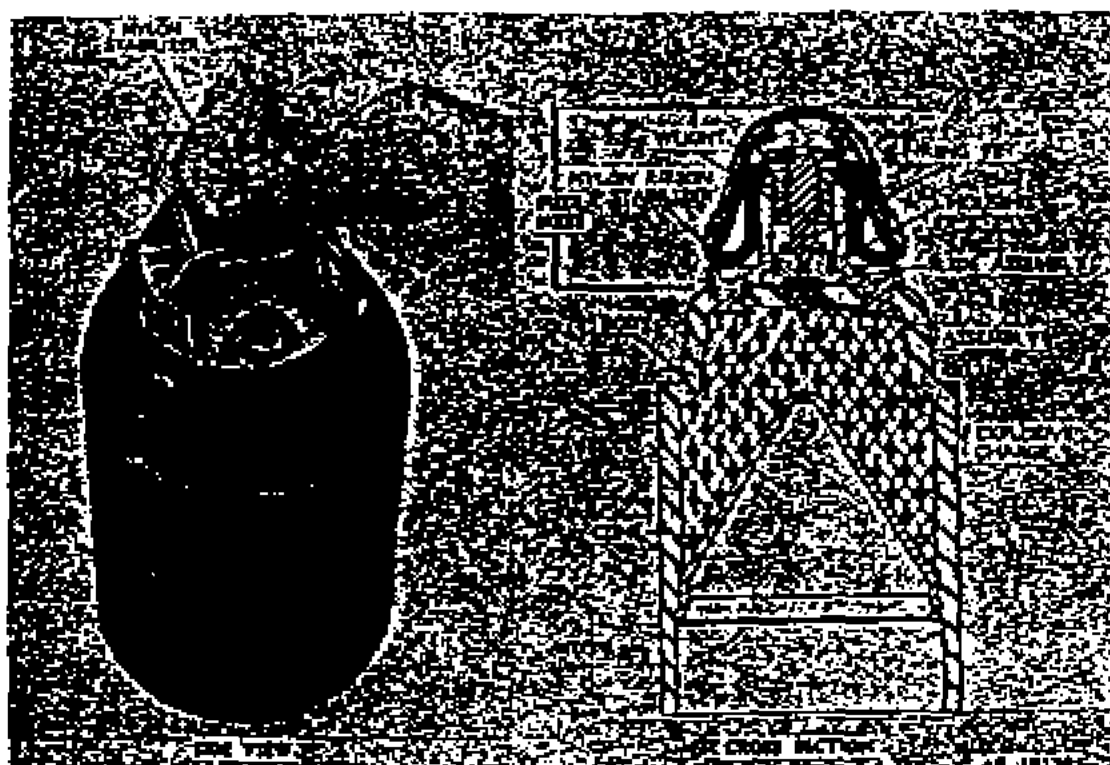


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UNCLASSIFIED

Figure 1. (U) Appearance and Dimensions of the M42, M46, and M77 Grenades (Repeated).

GRENADE GENERAL PURPOSE, M42



USE: To provide anti-materiel and anti-personnel capabilities in a submissile delivered by 155MM M483 and 8 inch M509 projectiles for howitzers.

DESCRIPTION:

(1) The M42 grenade is a ground burst munition consisting essentially of a 1.5 inch diameter cylindrical shell body loaded with approximately 31 grams of Composition A5 in a shaped charge. A nylon ribbon loop stabilizer is provided to orient and arm the grenade.

(2) The inertia type fuze has a slide assembly containing an M55 detonator and a coil spring to force the slide into the armed position.

(3) The M42 grenade has embossed inner side wall for optimum fragment size.

CLASSIFICATION: STANDARD A

TABULATED DATA:

Explosive ----- 30.5 grams Comp A5
Length ----- 3.25 in.
Weight ----- 0.46 lb.

FUNCTIONING:

(1) Upon expulsion from the projectile, the nylon ribbon stabilizer extends and orients the grenade, and due to rotational forces, unthreads the threaded firing pin from the weight (semi-armed), and pulls the firing pin out of the slide assembly. The slide assembly is then free to move, and moves into the armed position by action of the slide spring and centrifugal force. The spring maintains the slide assembly in the fully armed position.

(2) Upon impact, the inertia weight drives the firing pin into the detonator M55, initiating the firing train. A shaped-charge jet is expelled downward while the body bursts into a large number of small fragments. The jet is capable of penetrating approximately 2.75 inches of homogeneous armor plate. Anti-personnel effects are obtained by fragmentation of the grenade body.

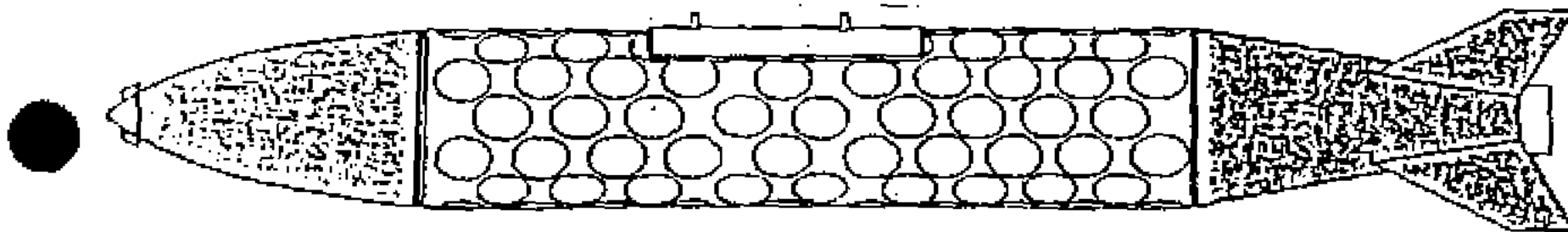
REFERENCES:

TM 9-1320-241-12

Drawing:

Grenade 9215340

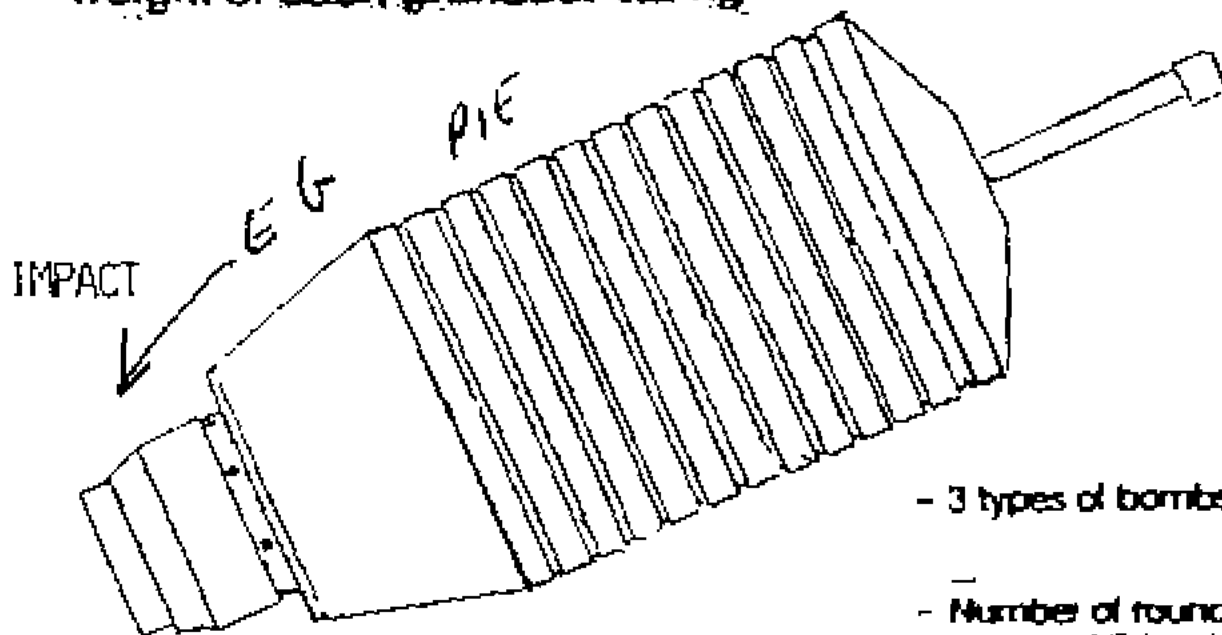
FRENCH CLUSTER BOMBS



characteristics:

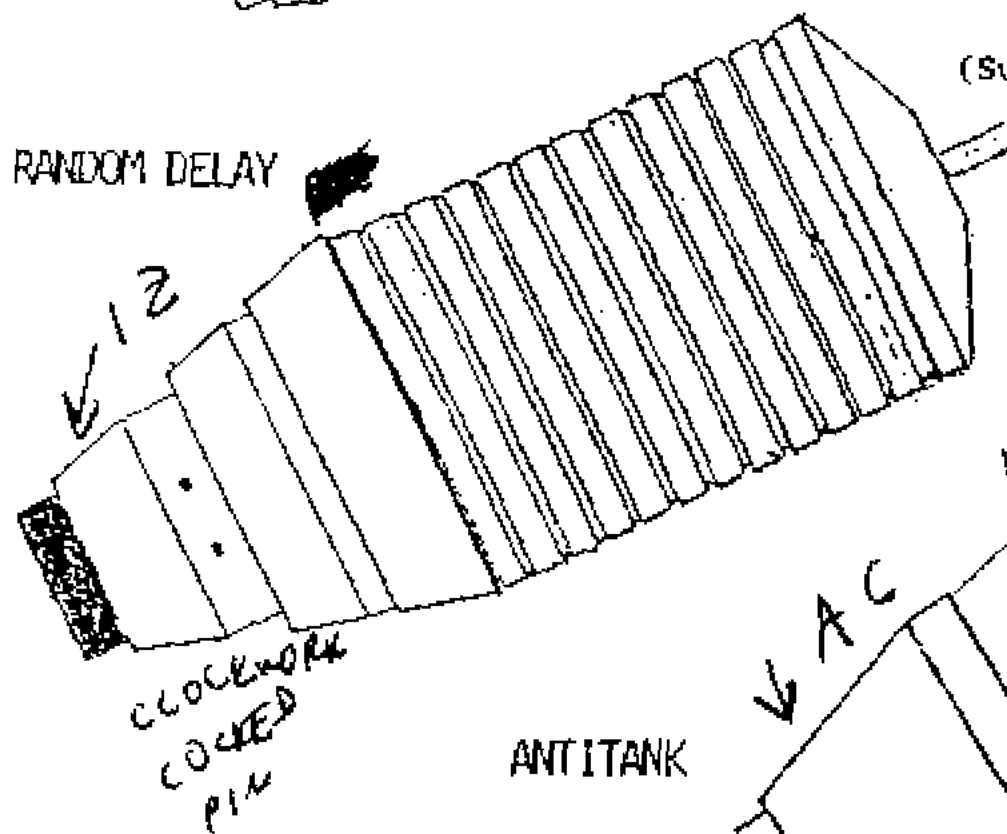
- overall length: 3,330 mm
- diameter: 360 mm
- gross weight loaded: 285 kg
- weight of grenades: 181 kg
- number of grenades: 151
- weight of each grenade: 1.2 kg

MATRA BELUGA BOMBE

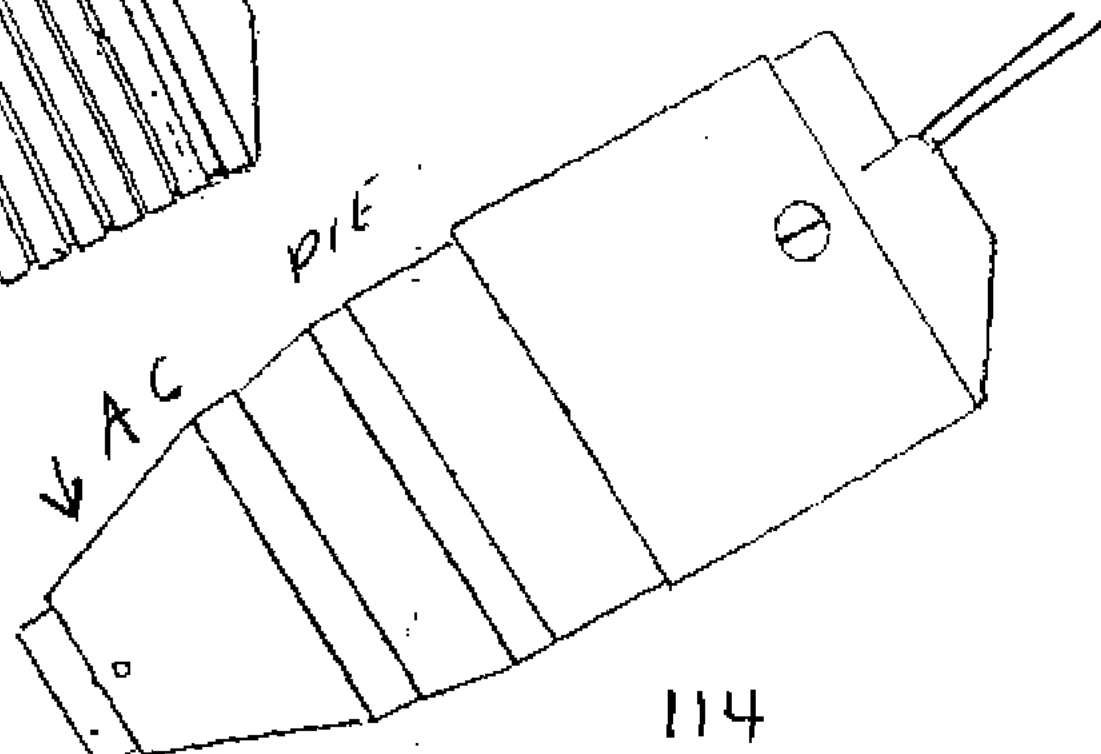


- 3 types of bombs :
 - fragmentation
 - armour piercing (hollow fill)
 - barrage (time-delayed)
- Number of rounds : 151, arranged in 19 crowns
- Weight: 1.3 kg / 2.86 lbs /

(Submunitions are shown without parachutes)



ANTITANK

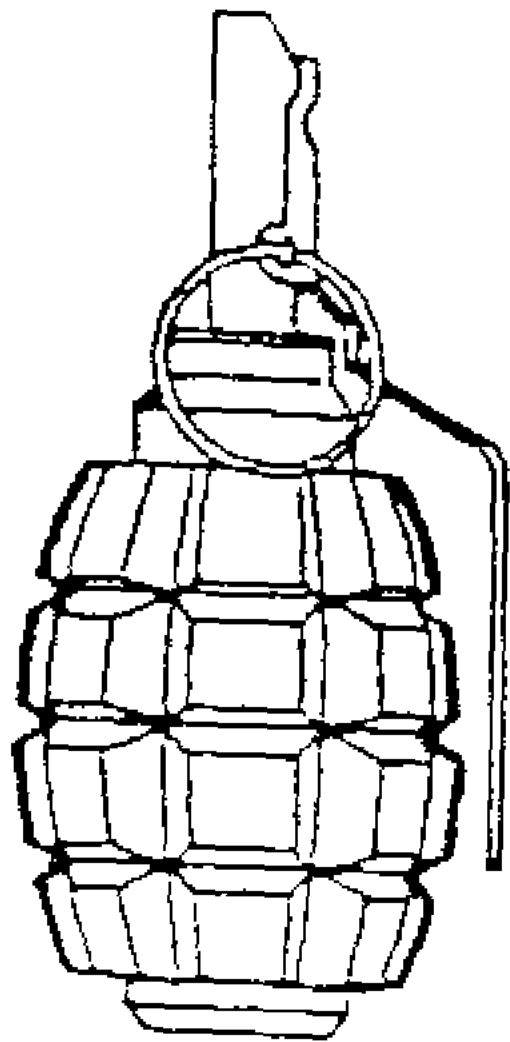


FIELD IDENTIFICATION GUIDE

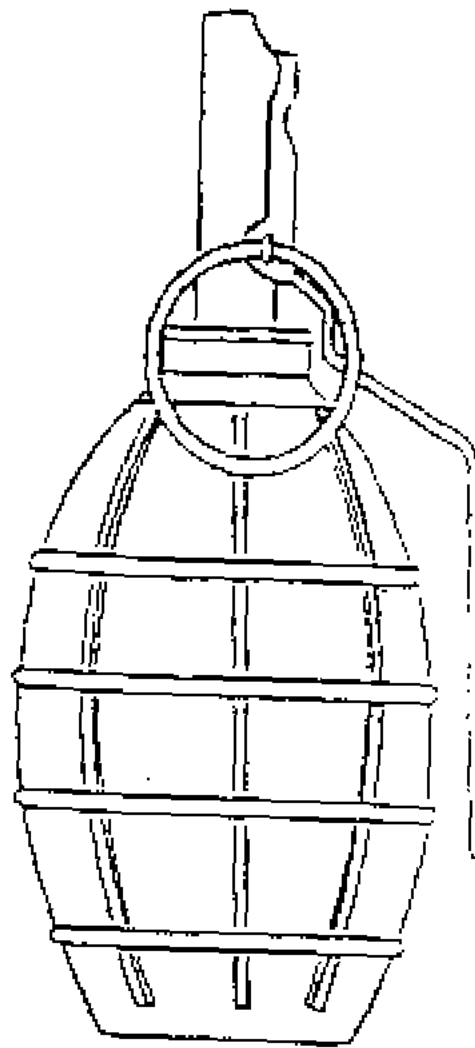
Infantry Weapons (Grenades)
Infantry Weapons (PG-7 Type)
Mortars
Projectiles
Rockets
Fuzes
Anti-Personnel Mines
Anti-Tank Mines
Scatterable Mines
Miscellaneous Mines
Booby Traps
Soviet Markings

INFANTRY WEAPONS

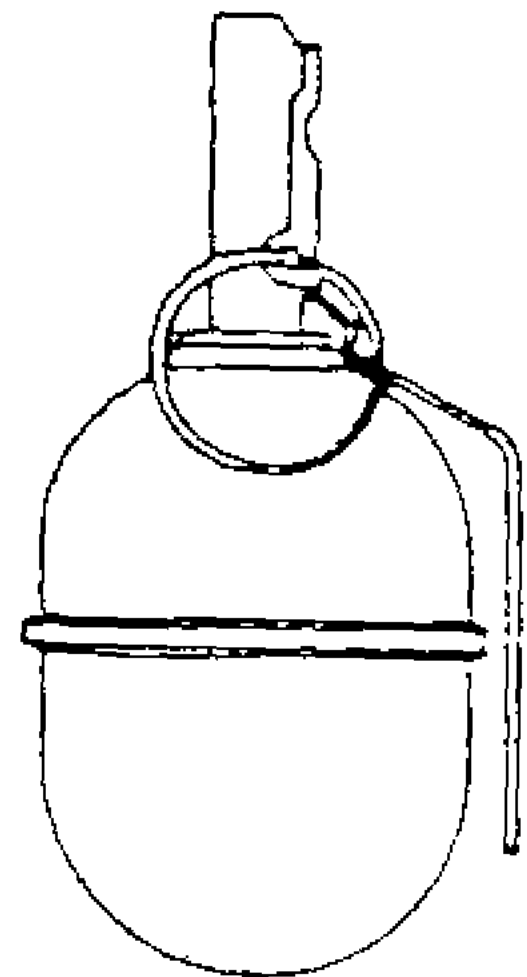
GRENADES



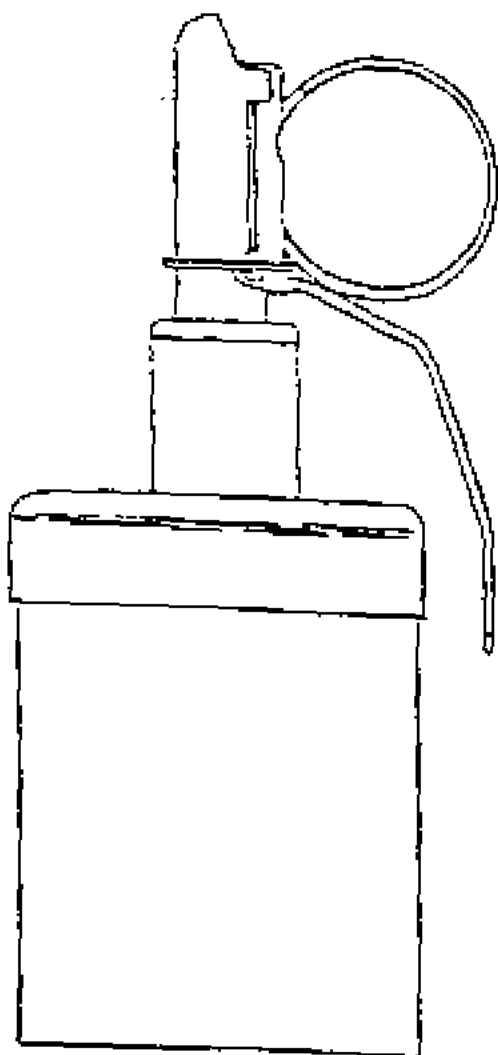
COPY OF SOVIET F-1
FRAGMENTATION GRENADE



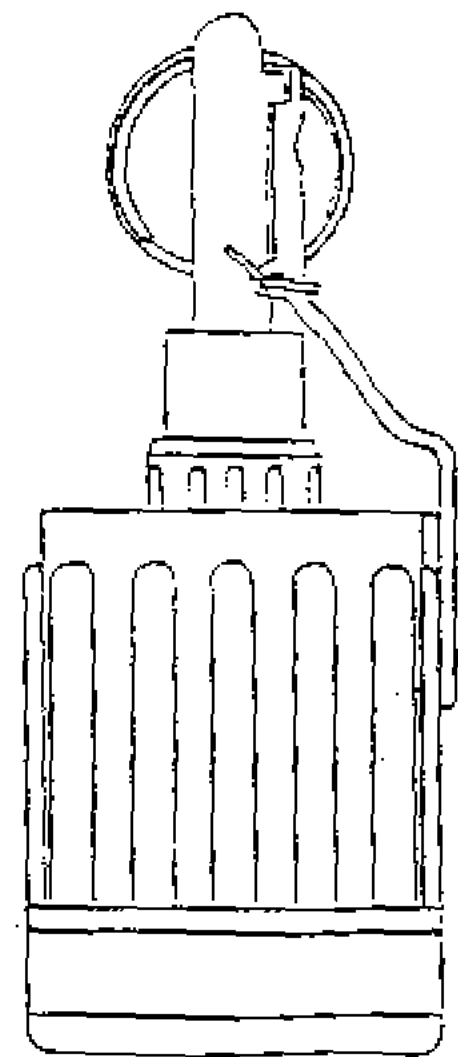
PLASTIC BODY
DEFENSIVE GRENADE



COPY OF SOVIET RGD-5
OFFENSIVE GRENADE



ILLUMINATING GRENADE

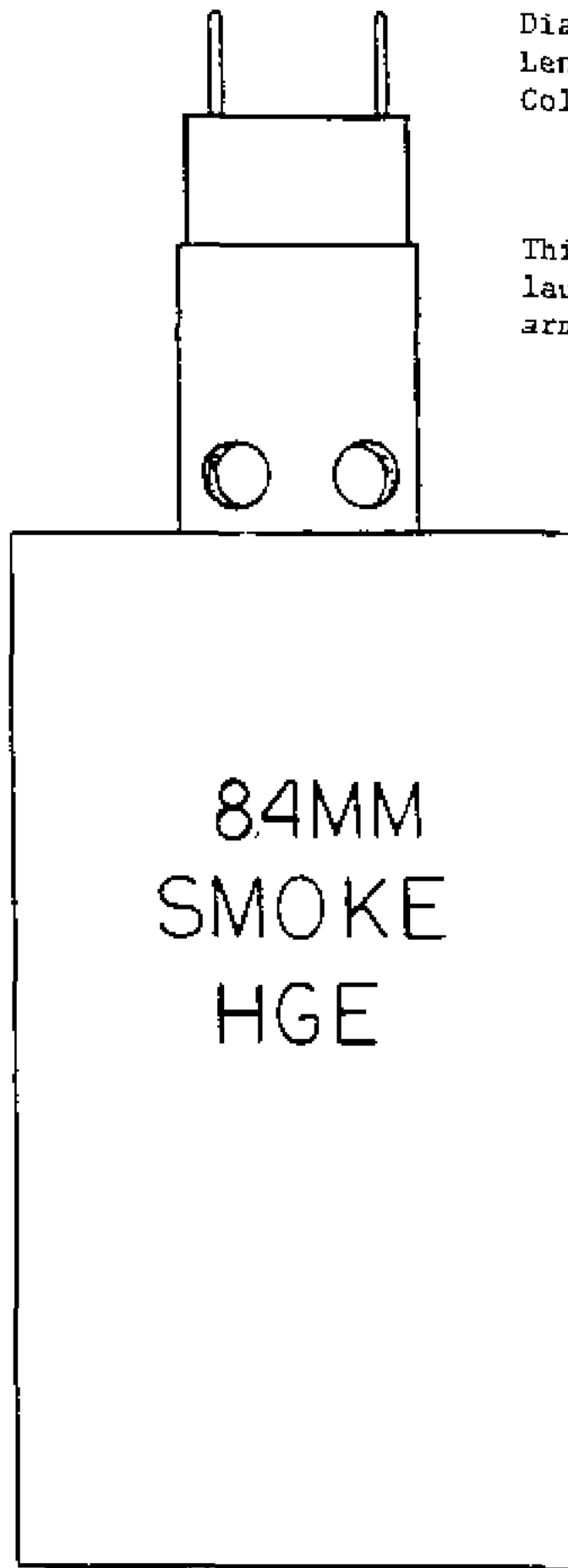


SOVIET CS GRENADE
NOT SEEN IN DISPLAY

(U) Iraqi Grenade, 84-mm,
Smoke, Projected

Diameter: 84 mm
Length: 272 mm (estimated)
Color: Olive Drab with
Black Markings

This grenade is used with grenade
launchers found on tanks and other
armored vehicles.

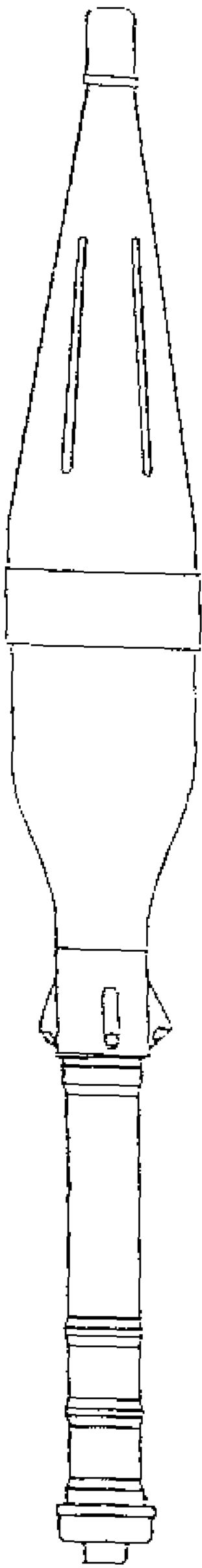


INFANTRY WEAPONS

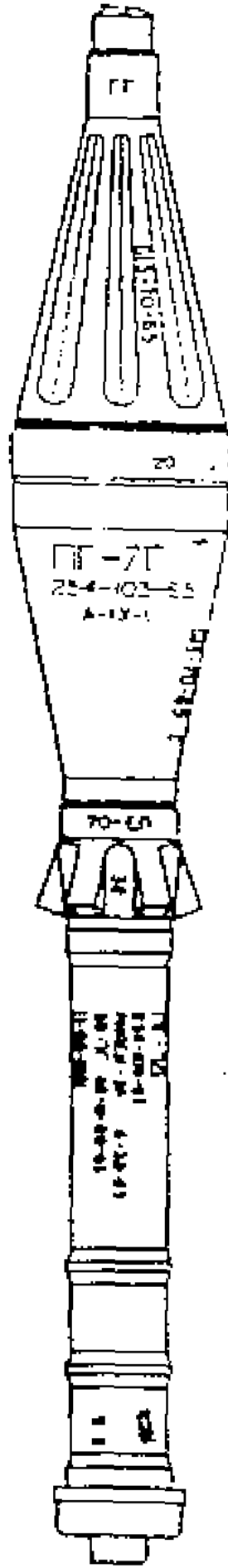
PG-7 TYPE

(U) U.S.S.R. Grenade,
HEAT-T, Rocket Propelled,
Model PG-76

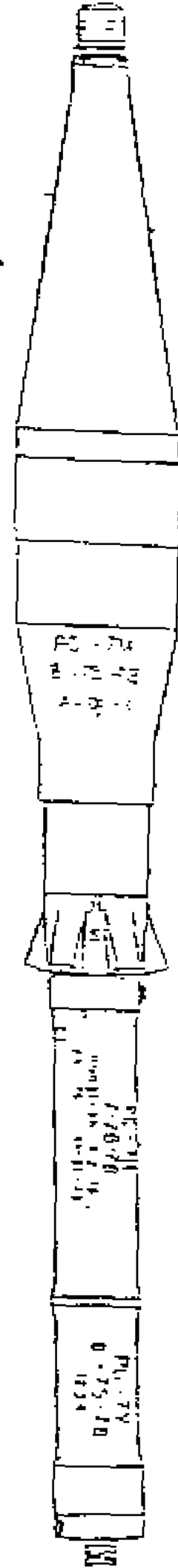
60E-35-2-13



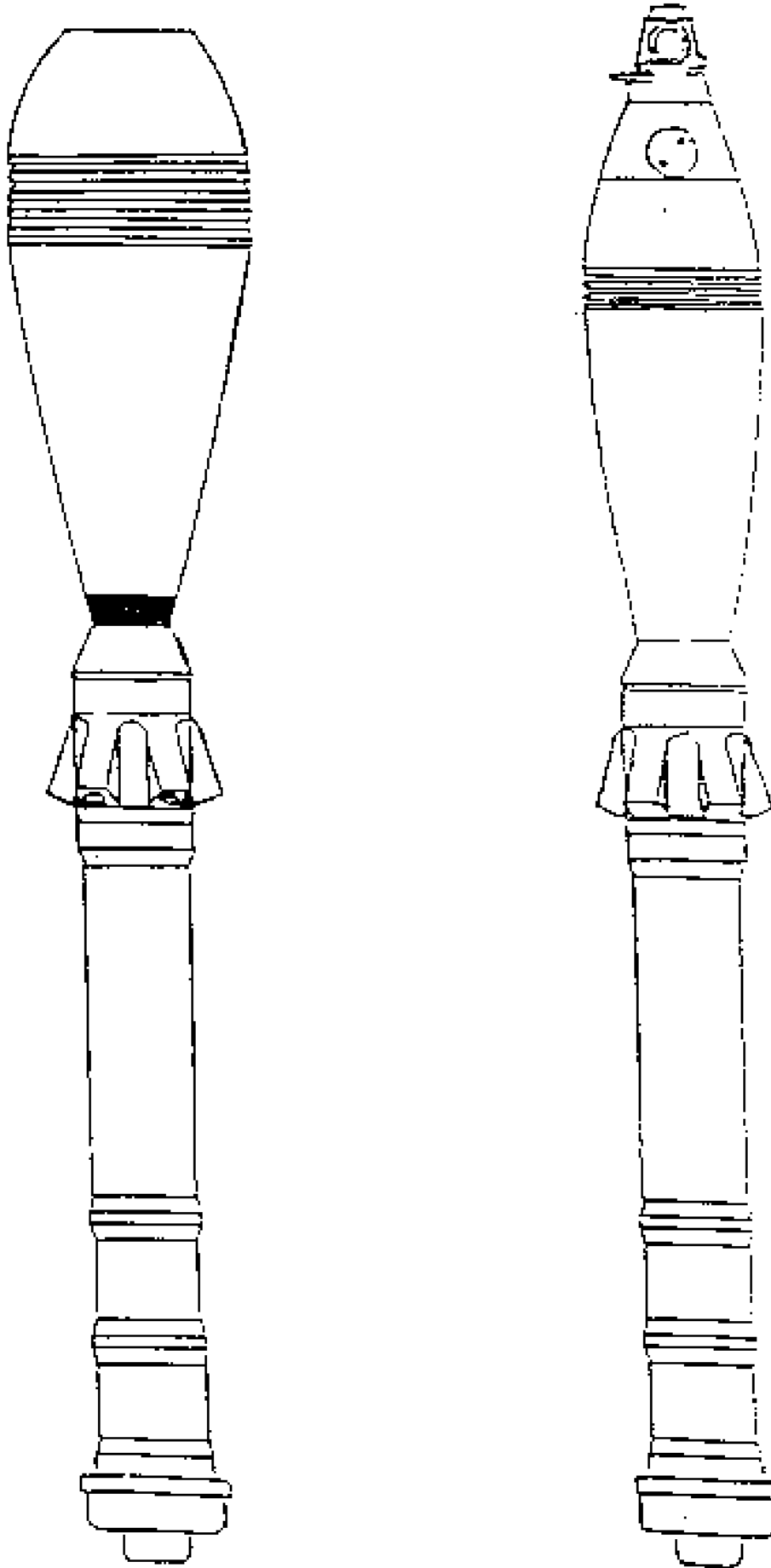
Chinese 92-mm Grenade,
Model Unknown



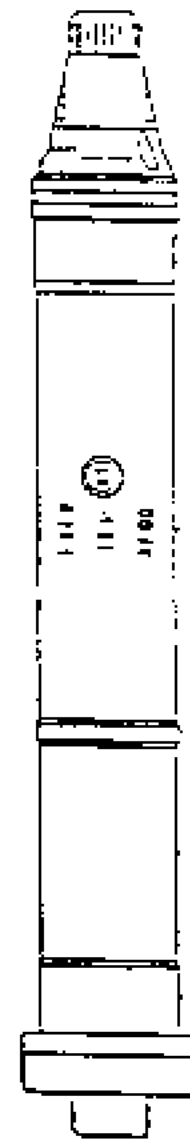
Soviet 70-mm Grenade
Model PG-7M



Iraqi Modified
60-mm Mortar



Iraqi Modified
82-mm Mortar

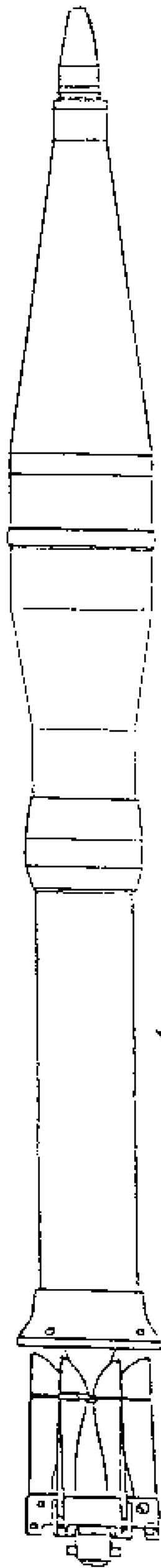


(U) Bulgarian Grenade,
40-MM, HE, Model OC-7V

60E-16-2-1

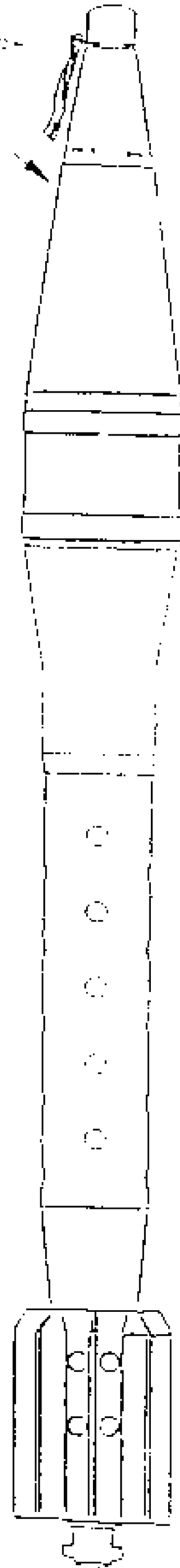
(U) U.S.S.R. Projectile,
73-MM, HE,
Frag, Model FG-9

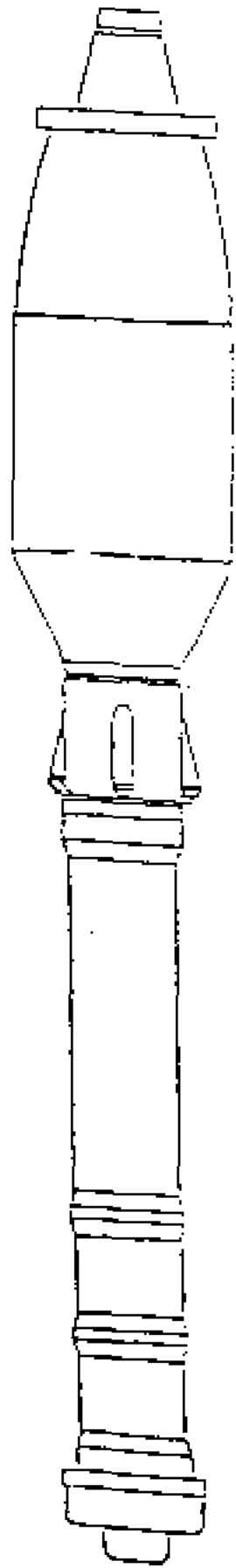
ED Guide



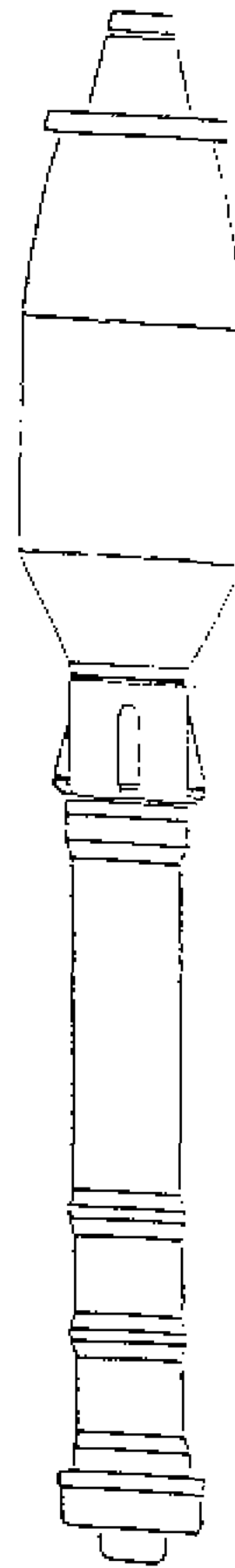
(U) U.S.S.R. Projectiles,
73-MM, HEAT-T,
Model FG-9

60D-35-2-20



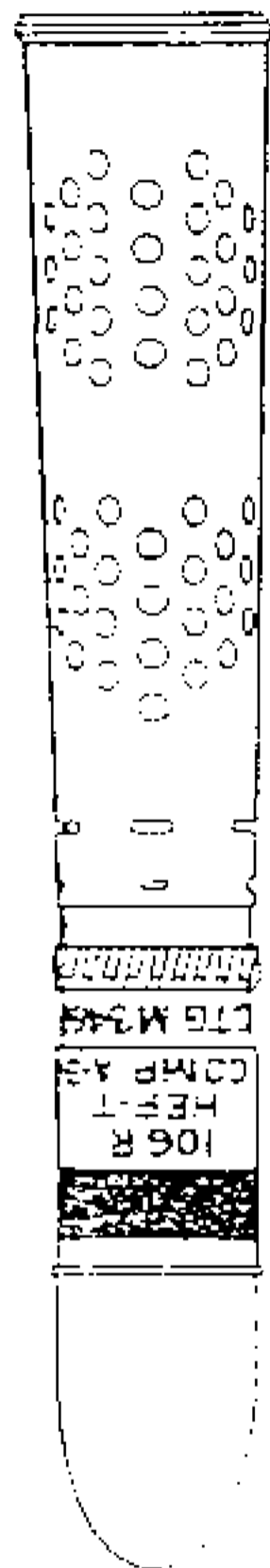
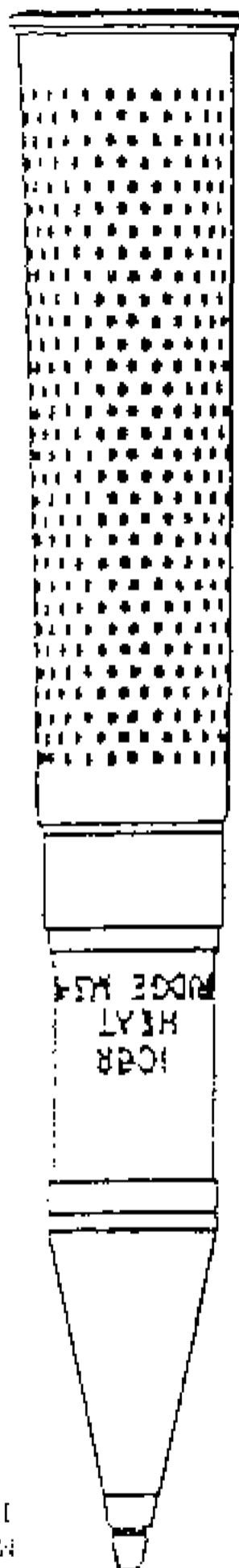
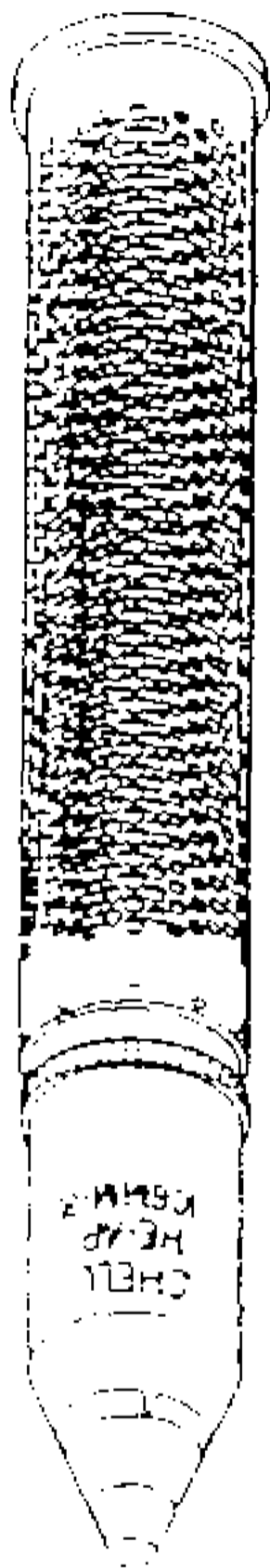


Chinese 75-mm Bounding HE Grenade



Chinese 76-mm Incendiary Grenade

771

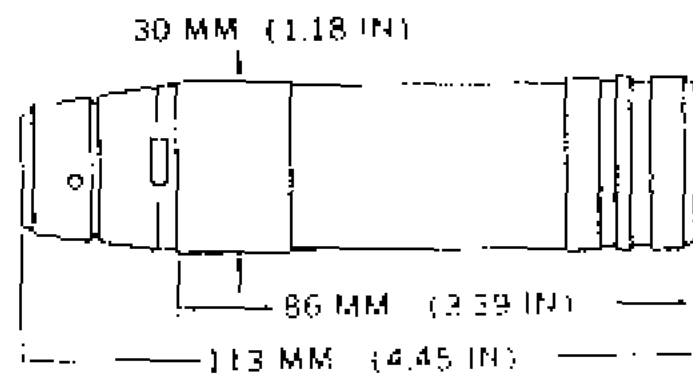


(1) Part, model 106-RM3
Part No. 106-RM3
ID 00140

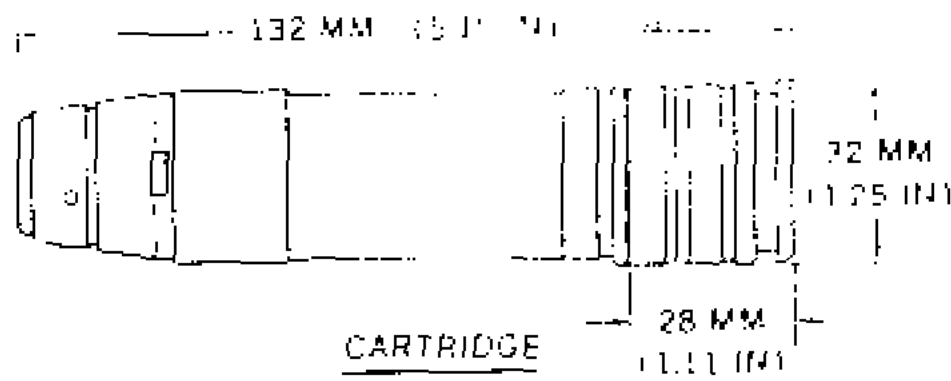
(1) Part, model 106-RM3
Part No. 106-RM3
ID 00140

(1) Part, model 106-RM3
Part No. 106-RM3
ID 00140

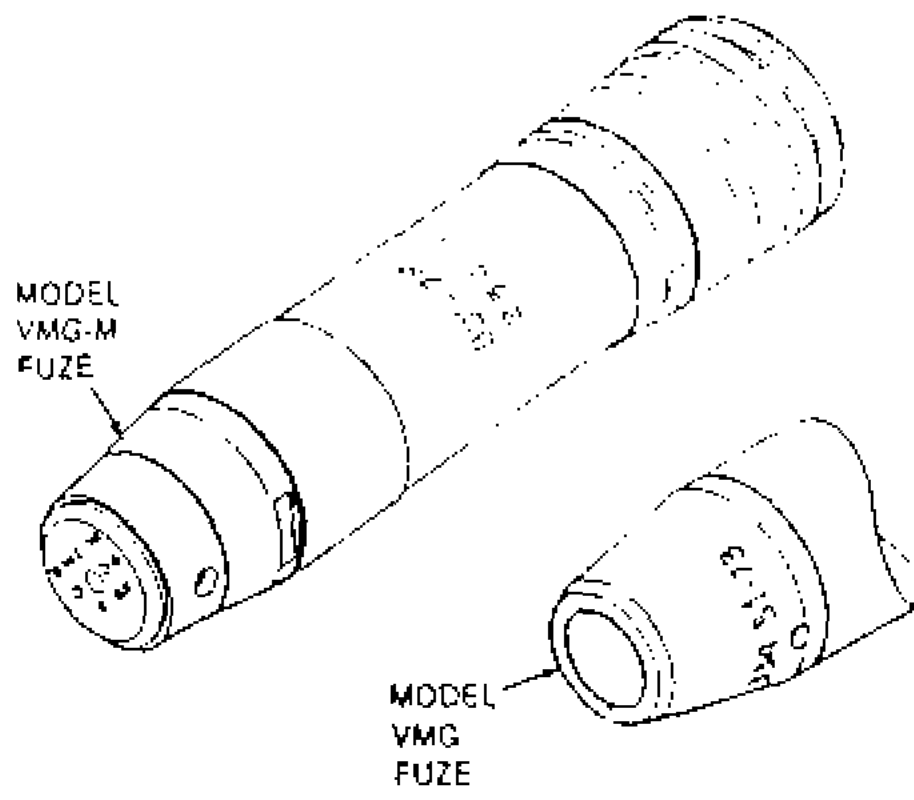
(U) U.S.S.R. Pro- 60D-35-2-43
jectile. 30-MM,
Frag. Model VOG-17M



PROJECTILE



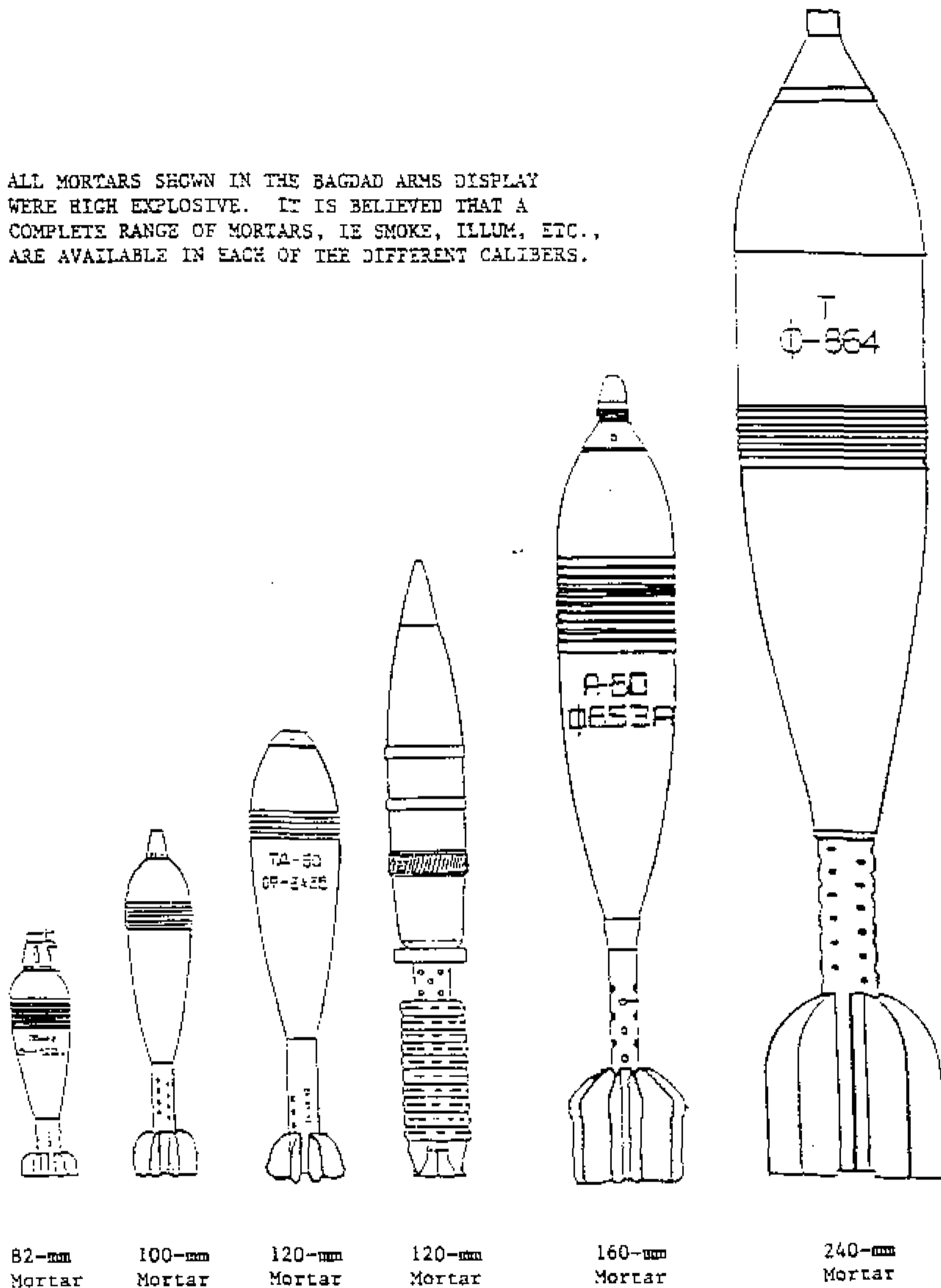
CARTRIDGE



(UNCLASSIFIED)

MORTARS

ALL MORTARS SHOWN IN THE BAGDAD ARMS DISPLAY WERE HIGH EXPLOSIVE. IT IS BELIEVED THAT A COMPLETE RANGE OF MORTARS, IE SMOKE, ILLUM, ETC., ARE AVAILABLE IN EACH OF THE DIFFERENT CALIBERS.



82-mm
Mortar

100-mm
Mortar

120-mm
Mortar

120-mm
Mortar

160-mm
Mortar

240-mm
Mortar

PROJECTILES

(U) U.S.S.R. Projectile,
23-MM, API-T, Model BZT

ID Guide

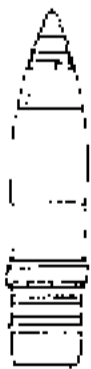


(U) U.S.S.R. Projec-
tile, 23-MM, Frag-
HEIT, Model OFZT

60D-35-2-34



(U) U.S.S.R. Projec- 60D-35-2-38
tile, 23-MM, HEI-
Frag, Model Unknown

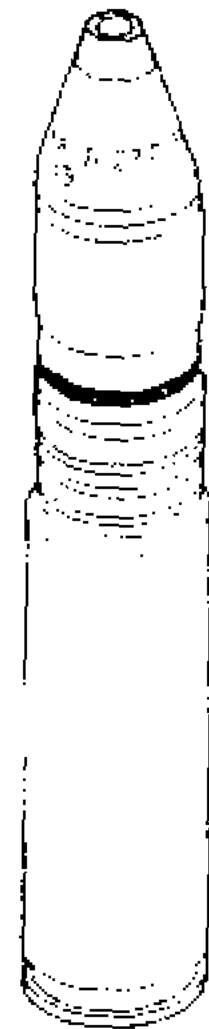
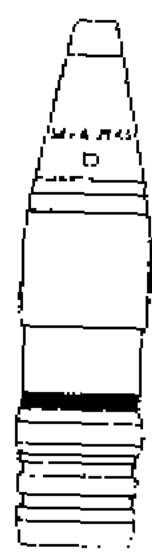


(U) U.S.S.R. Project
ile, 23-MM, Frag-
ile, Model Unknown

60D-35-2-32

(U) U.S.S.R. Project
ile, 23-MM, HEI Frag,
Model OFZ

60D-35-2-33

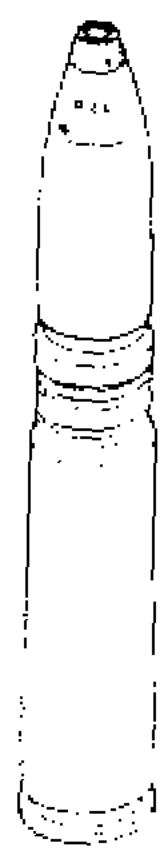


(U) U.S.S.R. Projectile,
23-MM, API, Model BZA-23

ID Guide

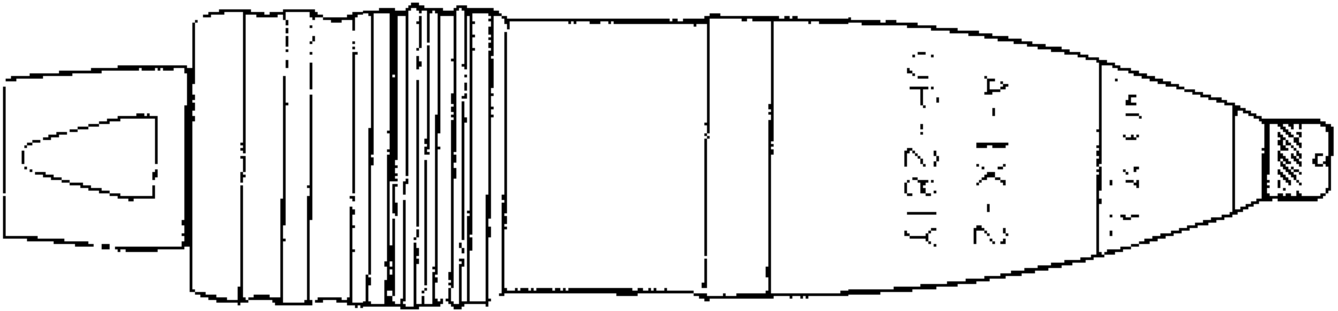
(U) U.S.S.R. Project-
ile, 23-MM, HEIT,
Model OZT

60D-35-2-47



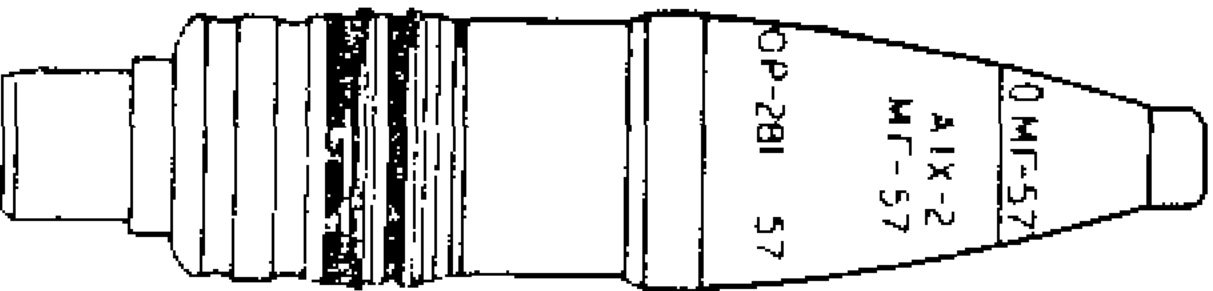
(9) U.S.S.R. Projectile
57-MM, Frag-T, Model
QR-281U

ID Guide



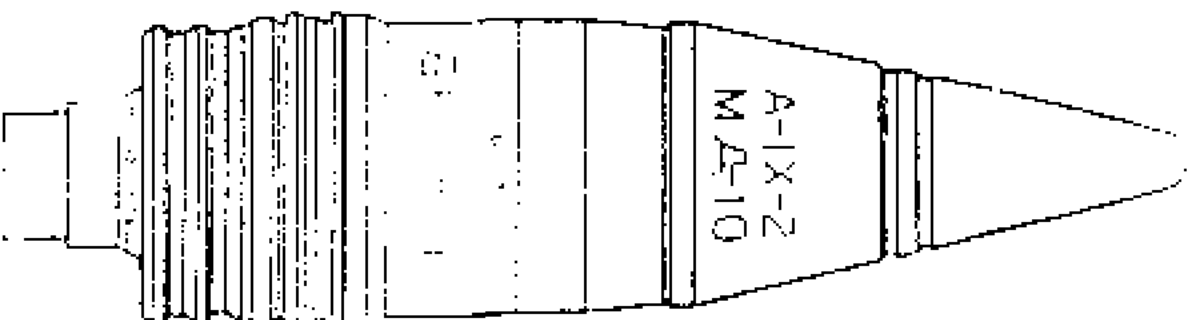
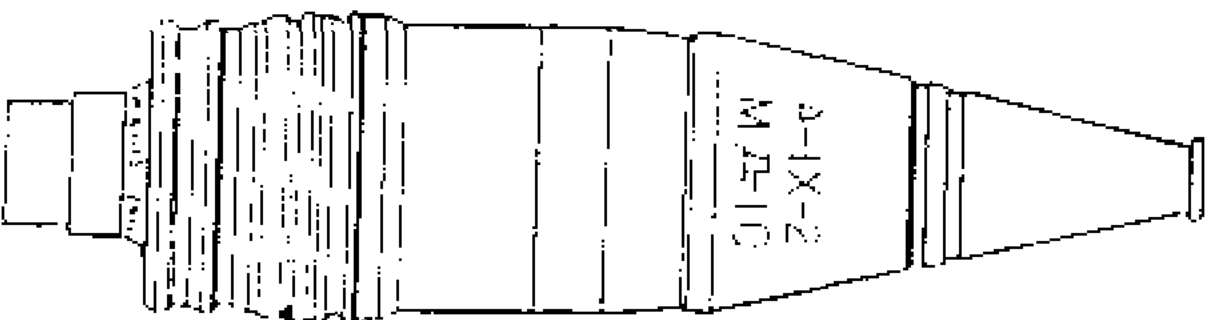
(10) U.S.S.R. Projectile
57-MM, Frag-T, Model
QR-281

ID Guide



(11) U.S.S.R. Projectile
57-MM, APC-T, Model
BR-281U
ID Guide

(11) U.S.S.R. Projectile
57-MM, APC-T, Model
BR-281U
ID Guide



(U) U.S.S.R. Projectile
37-MM, Frag-T, Model
OR-167N

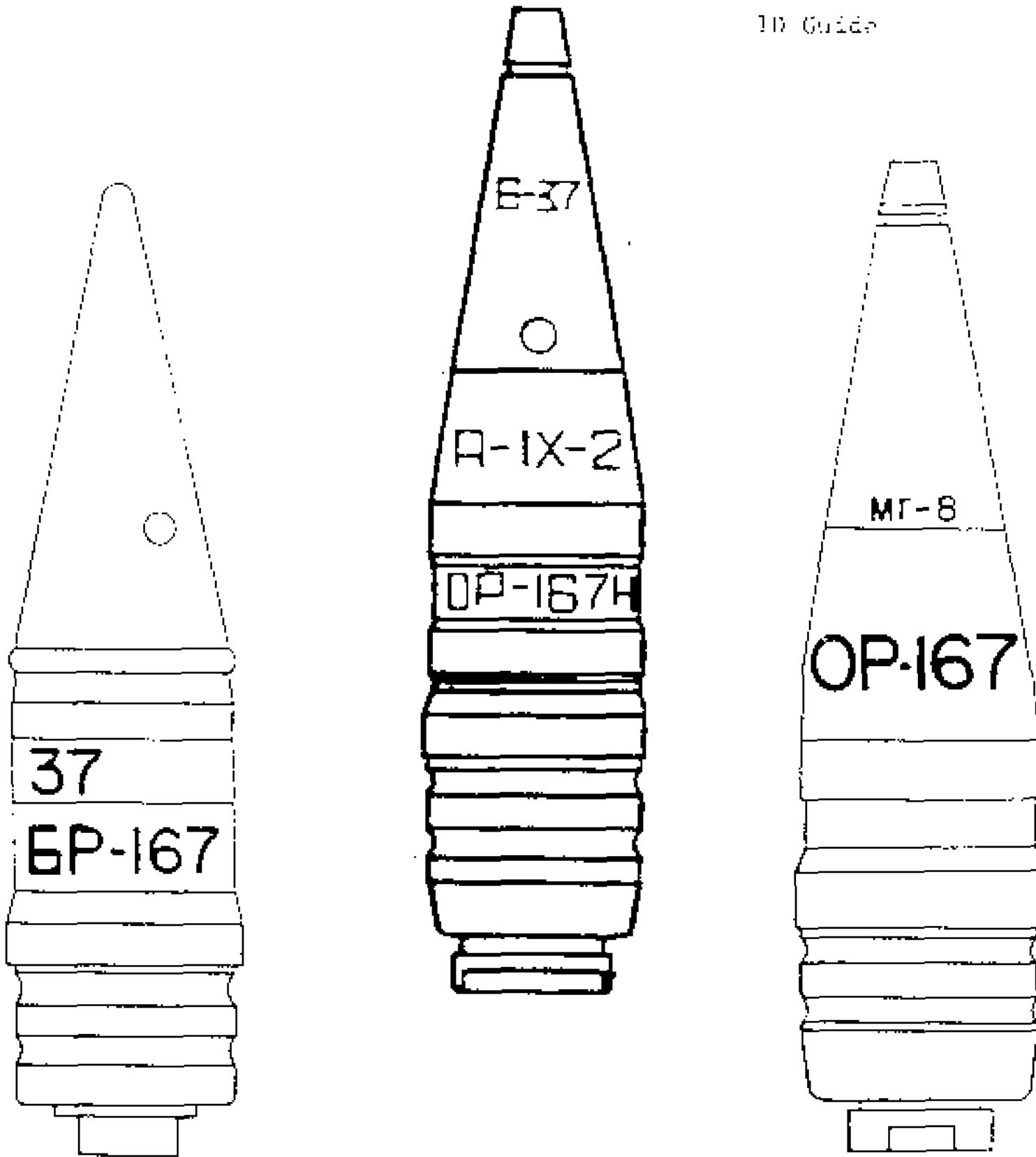
ID Guide

(U) U.S.S.R. Projectile
37-MM, AP-T, Model BR-167

ID Guide

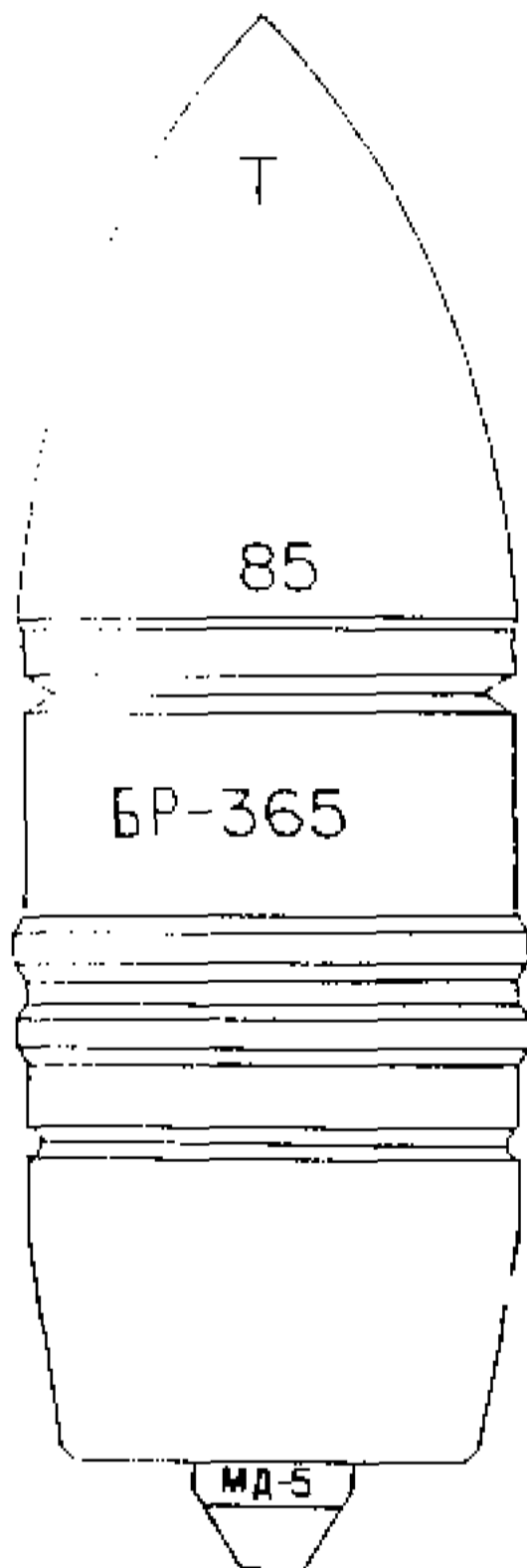
(U) U.S.S.R. Projectile
37-MM, Frag-T, Model
OR-167

ID Guide



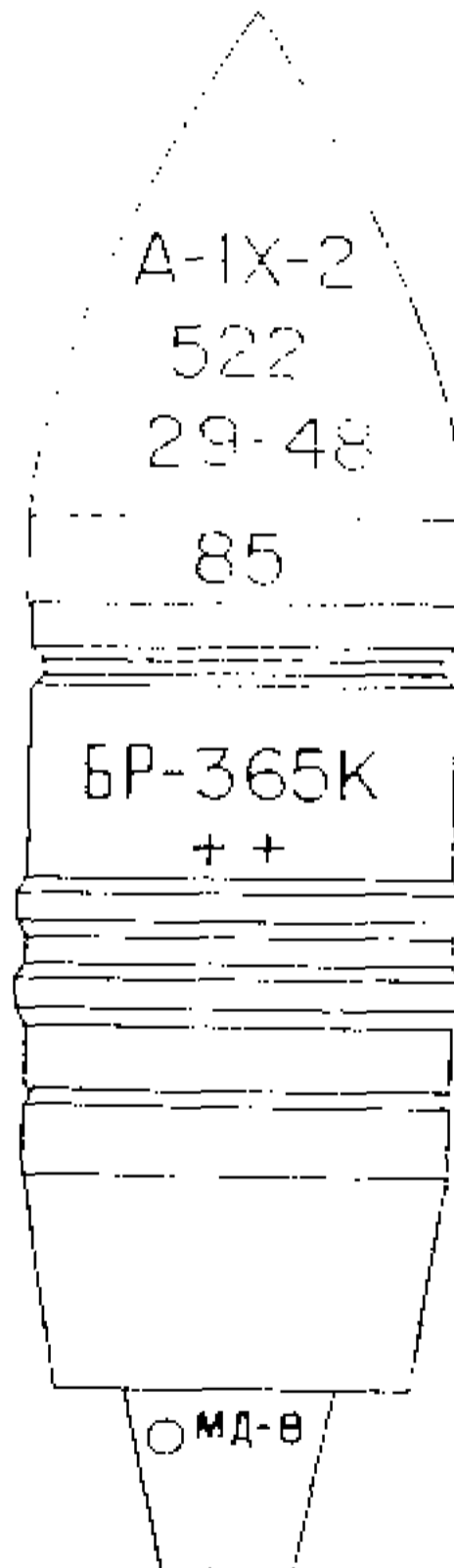
(U) U.S.S.R. Projectile
85-MM, APHE-T, Model
BR-365

ID Guide



(U) U.S.S.R. Projectile
85-MM, APHE-T, Model
BR-365K

ID Guide



(U) U.S.S.R. Projectile
85-MM, Frag, Model O-365

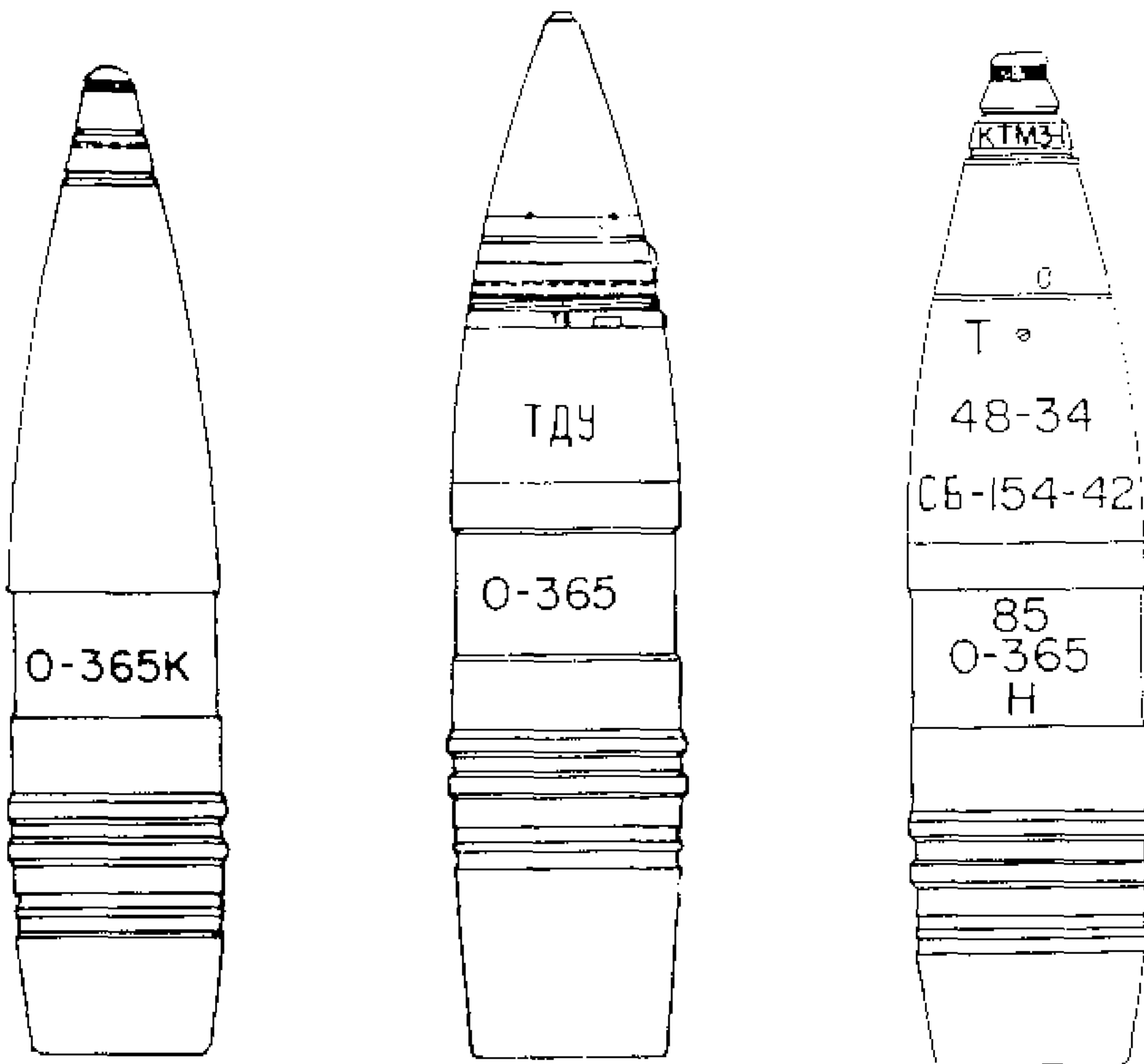
ID Guide

(U) U.S.S.R. Projectile
85-MM, Frag, Model O-365K

ID Guide

(U) U.S.S.R. Projectile
85-MM, Frag, Model O-365

ID Guide



(U) Iraqi Projectile, 100-MM,
HE, Model Unknown (Copy of
Soviet Projectile, Model
OF-412)

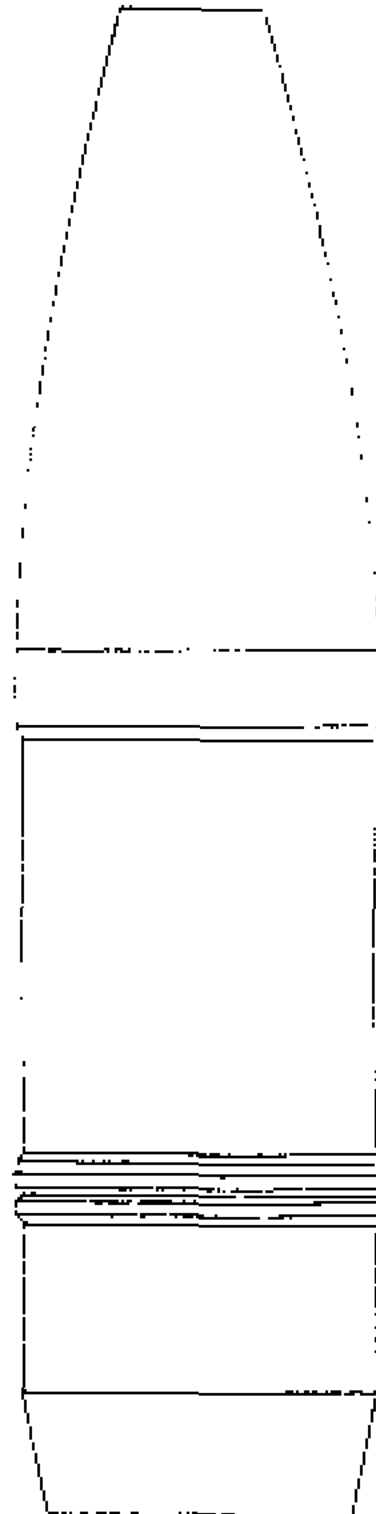
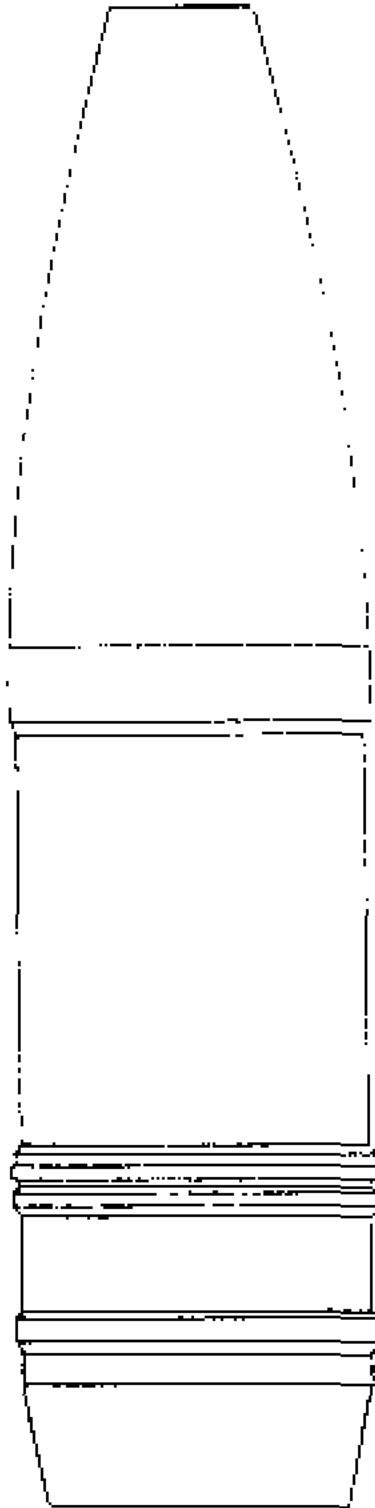
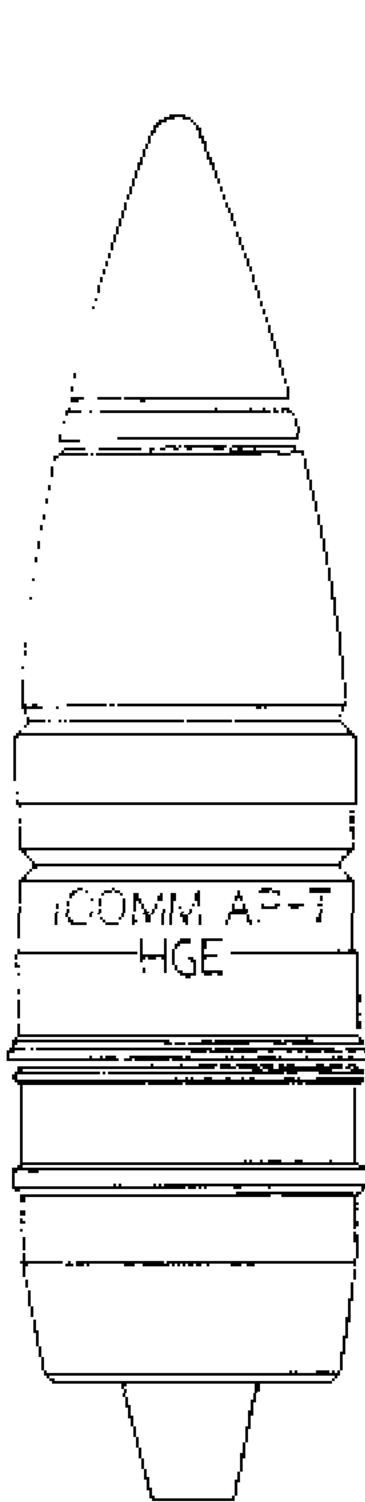
ID Guide

(U) Iraqi Projectile, 100-MM,
APHE-T, Model Unknown (Copy
of Soviet Projectile, Model
BR-412B)

(U) Iraqi Projectile, 100-MM,
HE, Model Unknown (Modified
Copy of Soviet Projectile,
Model OF-412)

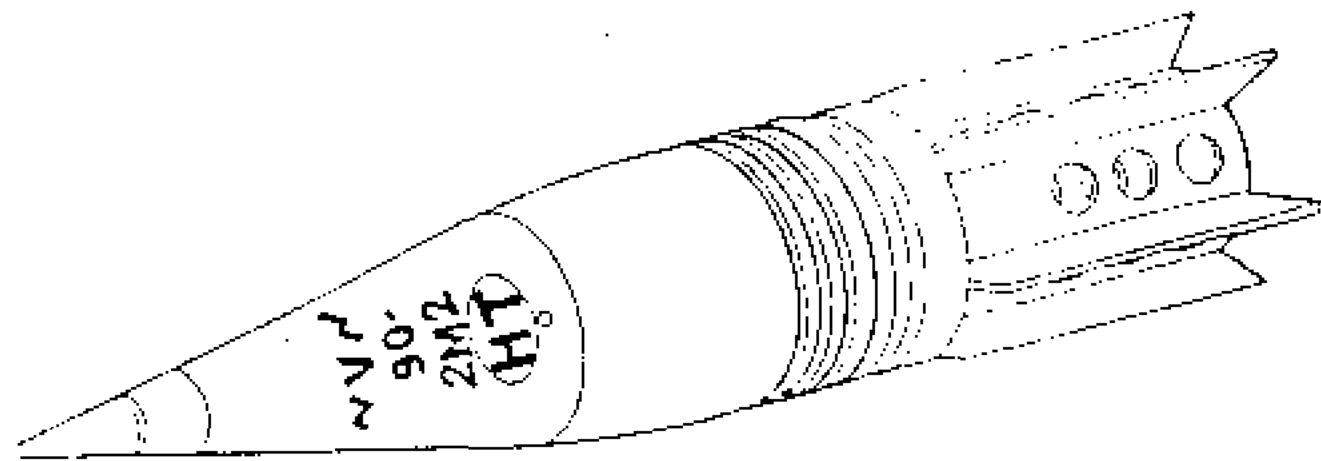
ID Guide

ID Guide

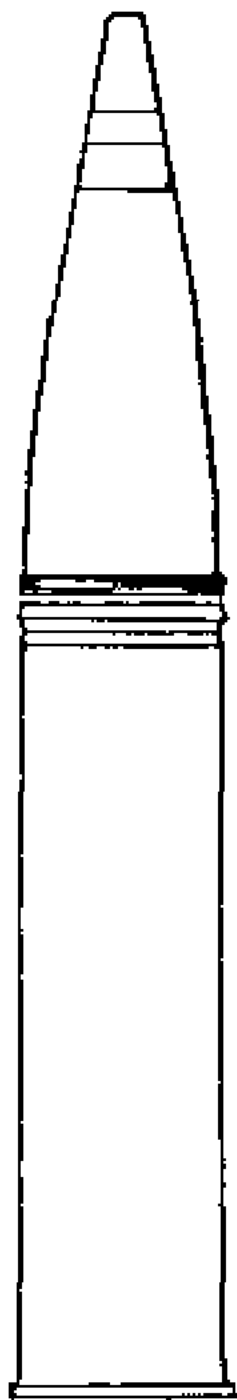


(HGE is an Iraqi factory marking)

(U) French Projectiles, 60D-7.2-3-1
 90-MM, HEAT, Model 62

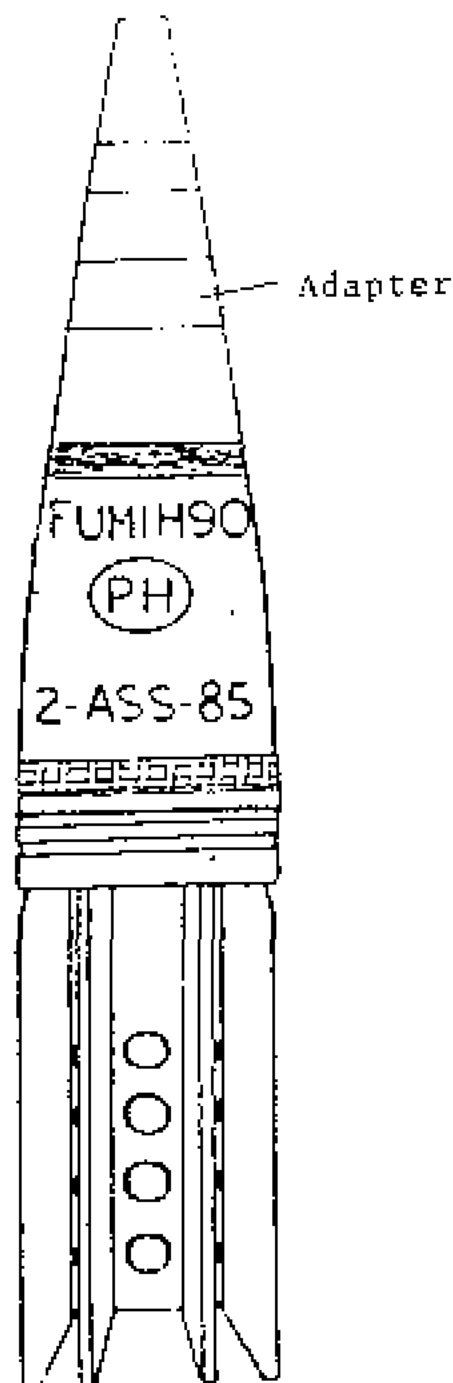


Both the HE and WP rounds use the FU-F2 fuze covered in 60D-7-3-5.

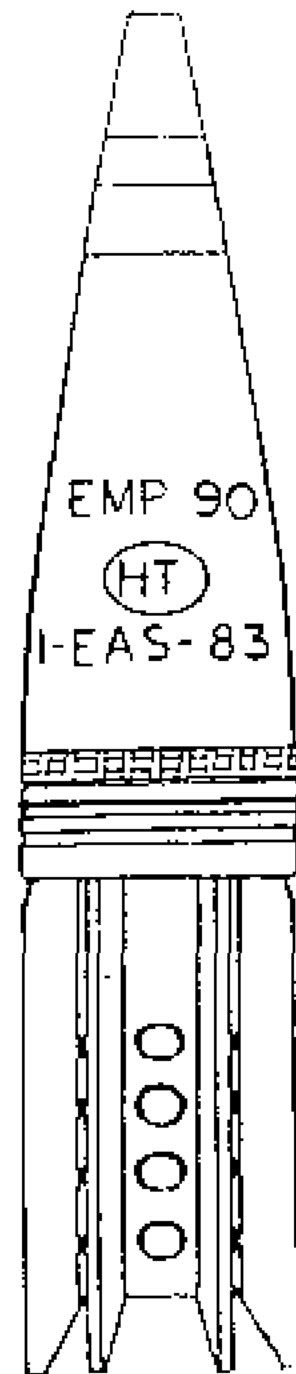


Complete Round

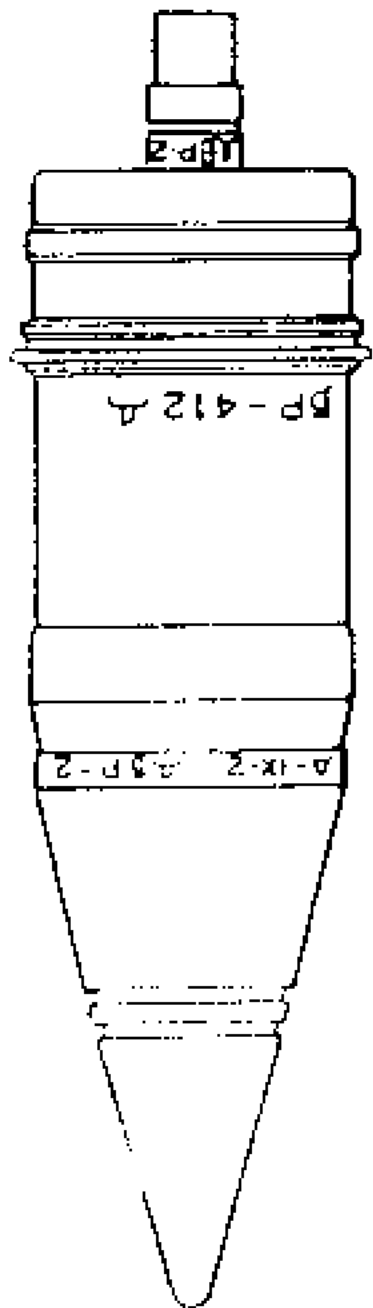
(U) French Projectile, 90-mm, Snake (WP), Model Unknown



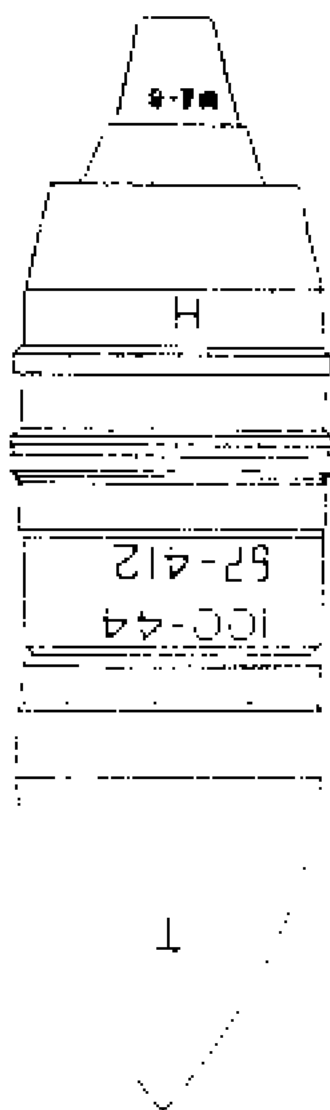
(U) French Projectile, 90-mm, HT, Model Unknown



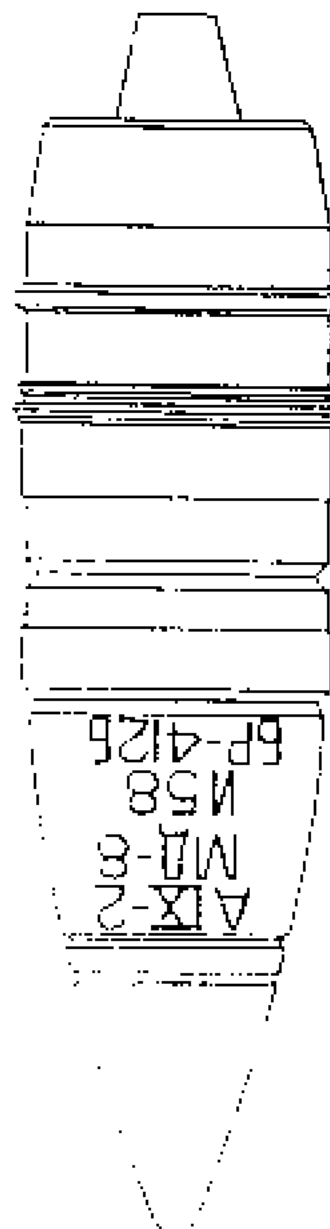
138



(1) U.S.S.R. Projectile
100-MM, APHE-T, Model
BR-412D
ID Guide



(2) U.S.S.R. Projectile
100 MM, APHE-T, Model
BR-412
ID Guide



(3) U.S.S.R. Projectile
100-MM, APHE-T, Model
BR-412B
ID Guide

(U) U.S.S.R. Projectile
100-MM, HE-Frag, Model
OF-412

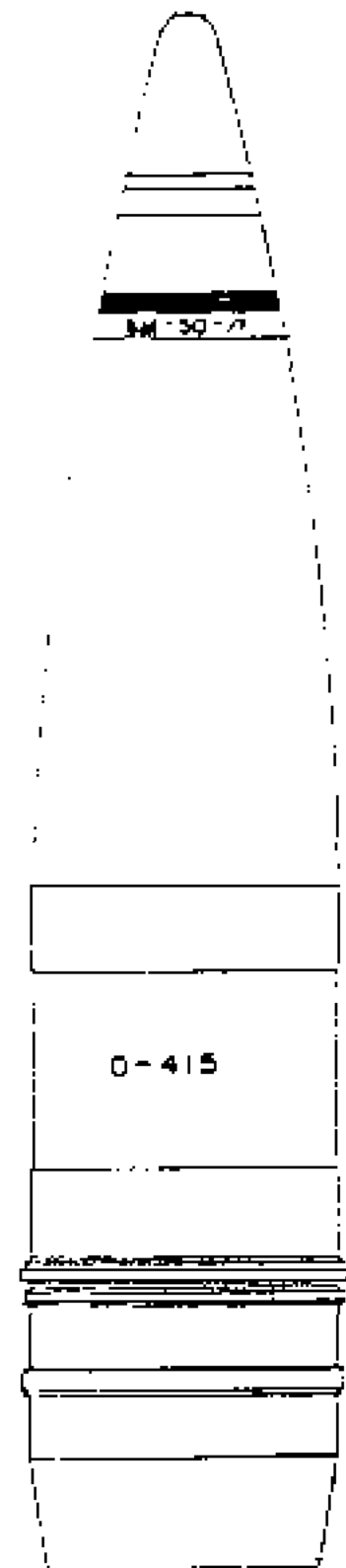
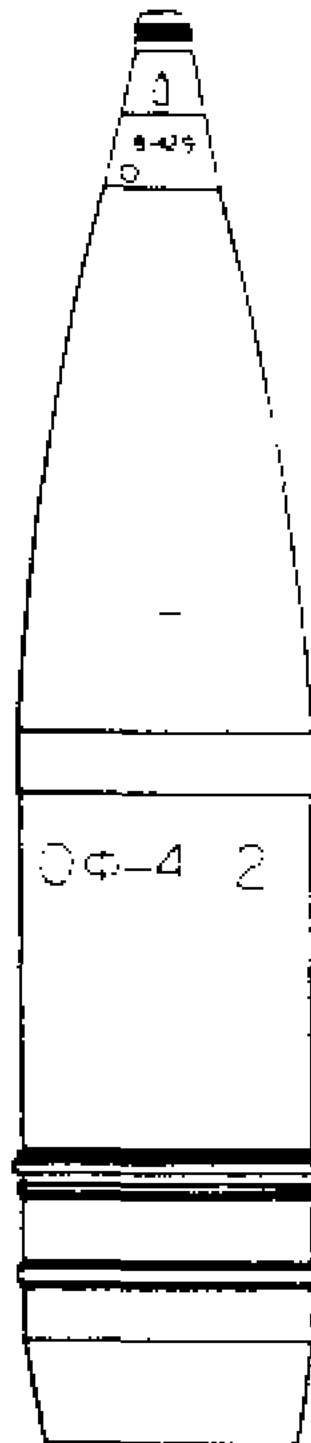
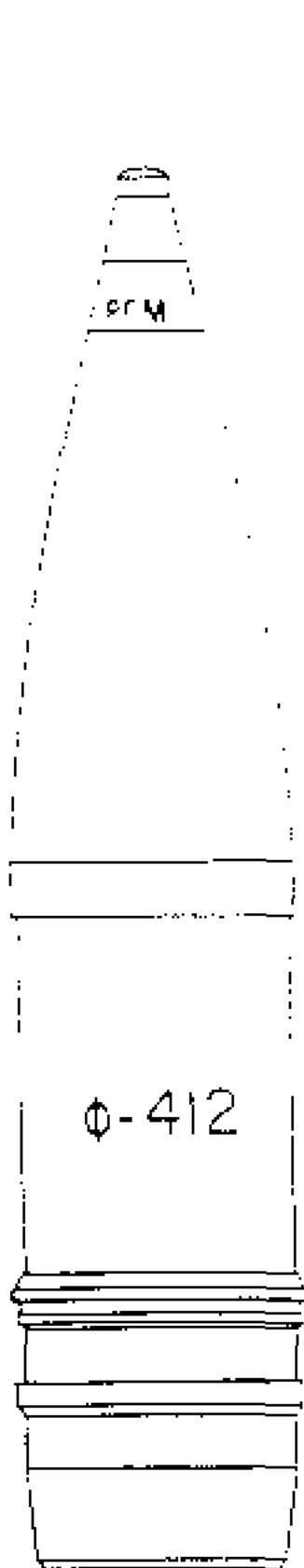
ID Guide

(U) U.S.S.R. Projectile
100-MM, Frag, Model
F-412

ID Guide

(U) U.S.S.R. Projectile
100-MM, Frag, Model
F-415

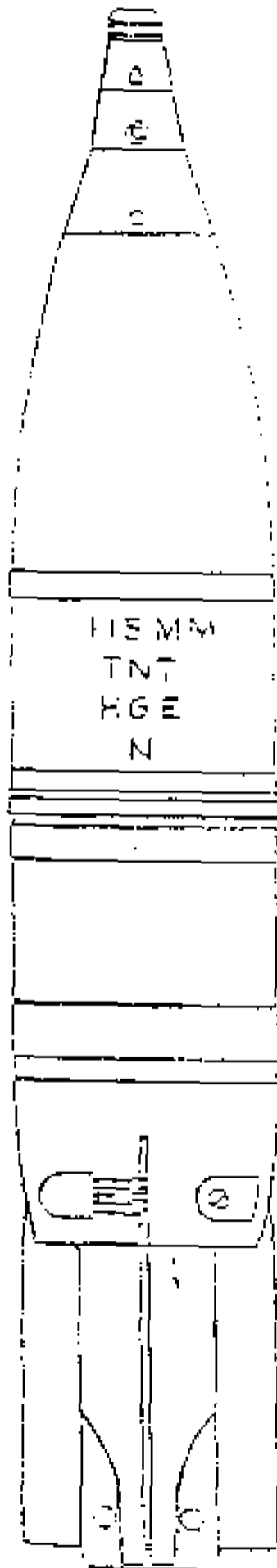
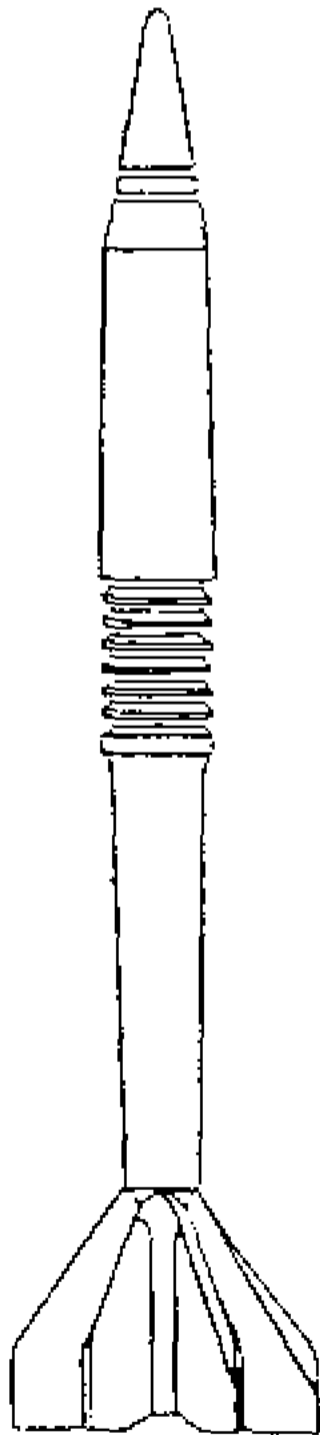
ID Guide



(U) U.S.S.R. Projectile, 115-MM,
HEAT, Model BK-4M
ID Guide

(U) Iraqi Projectile, 115-MM,
HE, Model Unknown (Copy of
Soviet Projectile, Model OF-18)
ID Guide

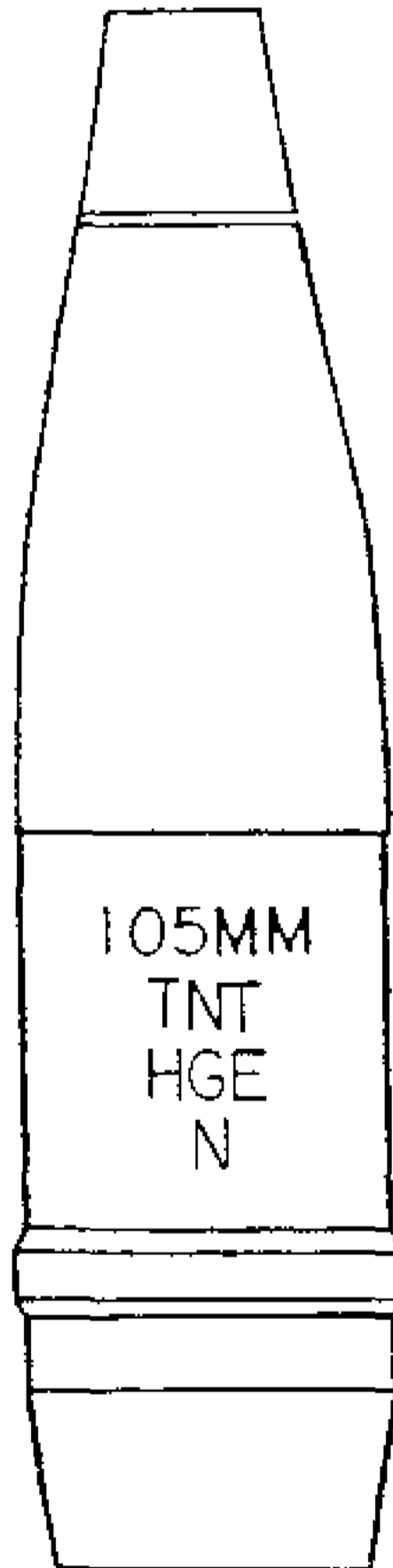
(U) U.S.S.R. Projectile, 115-MM,
AP-T, Model BM6
ID Guide



(U) Iraqi Projectile, 105-MM,
HE, Model Unknown (Modified
Copy of U.S. Projectile, Model
M1.

ID Guide

NOTE: Projectile incorporates a
fuze adapter which allows the
use of Soviet style fuzes.



(HGE is an Iraqi factory marking)

141

(U) Iraqi Projectile, 122-MM,
Smoke (WP), Model Unknown
(Copy of Soviet Projectile,
Model D-4)
NOTE: This round could contain
a Chemical Filler.

ID Guide

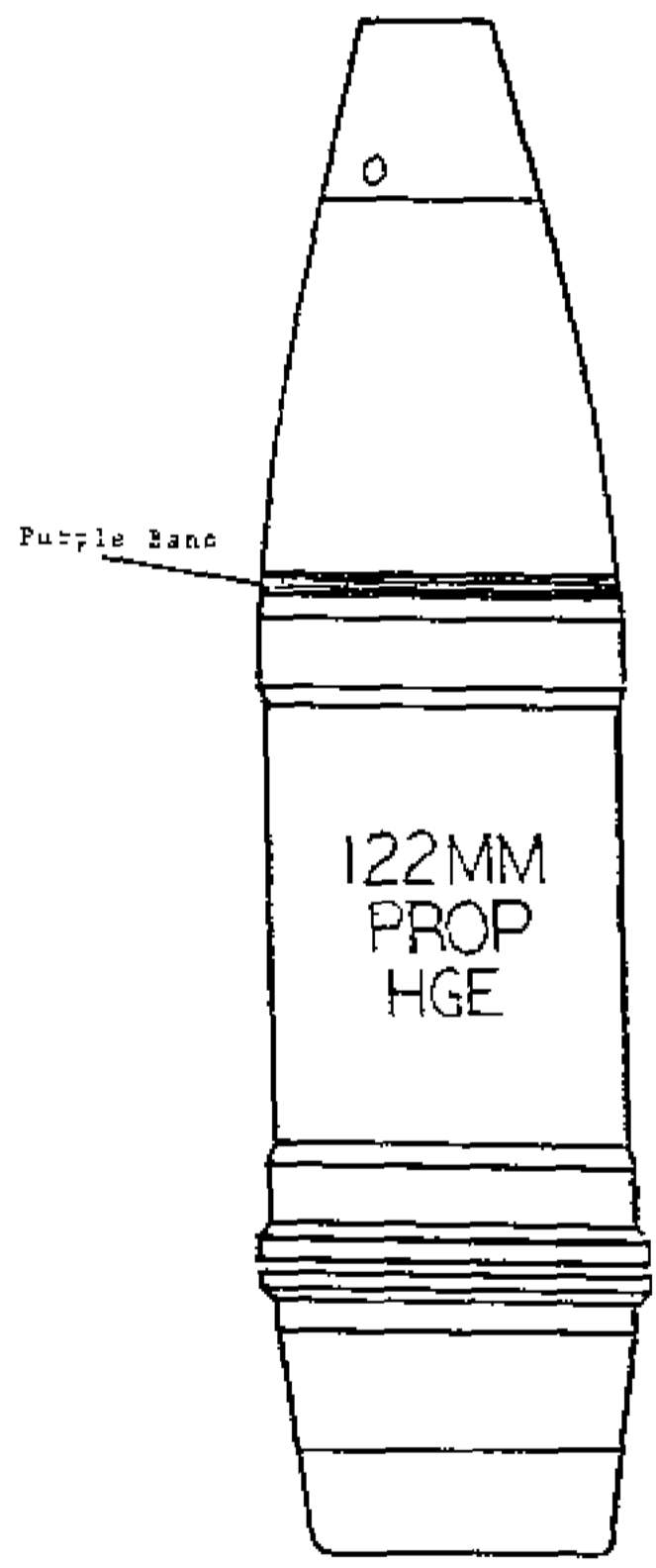
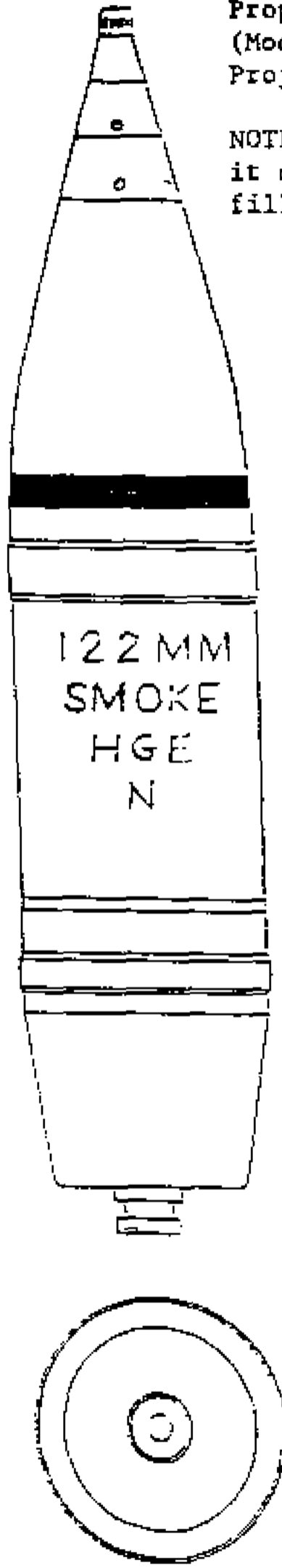
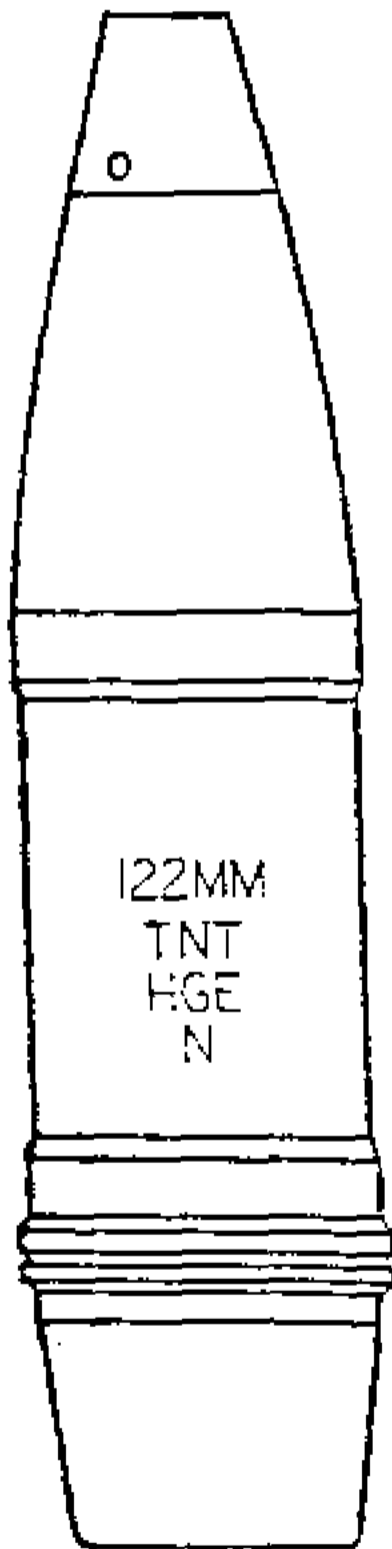
(U) Iraqi Projectile, 122-MM,
Propaganda, Model Unknown
(Modified Copy of a Soviet
Projectile, Model OF-462)

NOTE: This round is field loadable,
it could possibly contain a chemical
filler.

(U) Iraqi Projectile, 122-MM,
HE, Model Unknown (Copy of
Soviet Projectile, Model
OF-462)

ID Guide

ID Guide



(U) U.S.S.R. Projectile, 122-MM
HEAT, Model BK-6M

ID Guide

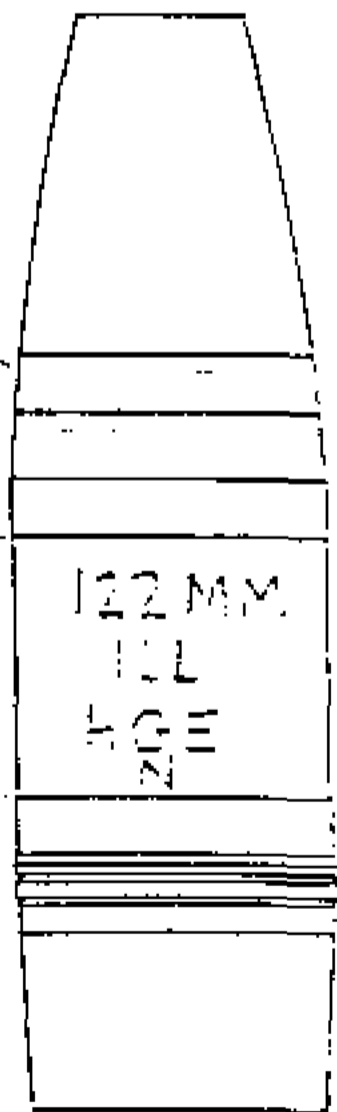
(U) Iraqi Projectile, 122-MM,
Cargo, Model Unknown

NOTE: This projectile contains
an estimated 32 type M42
submunitions.

(U) Iraqi Projectile, 122-MM,
Illum, Model Unknown (Copy of
Soviet Projectile, Model S-462)
ID Guide

White Band

Red Nose
on fuze



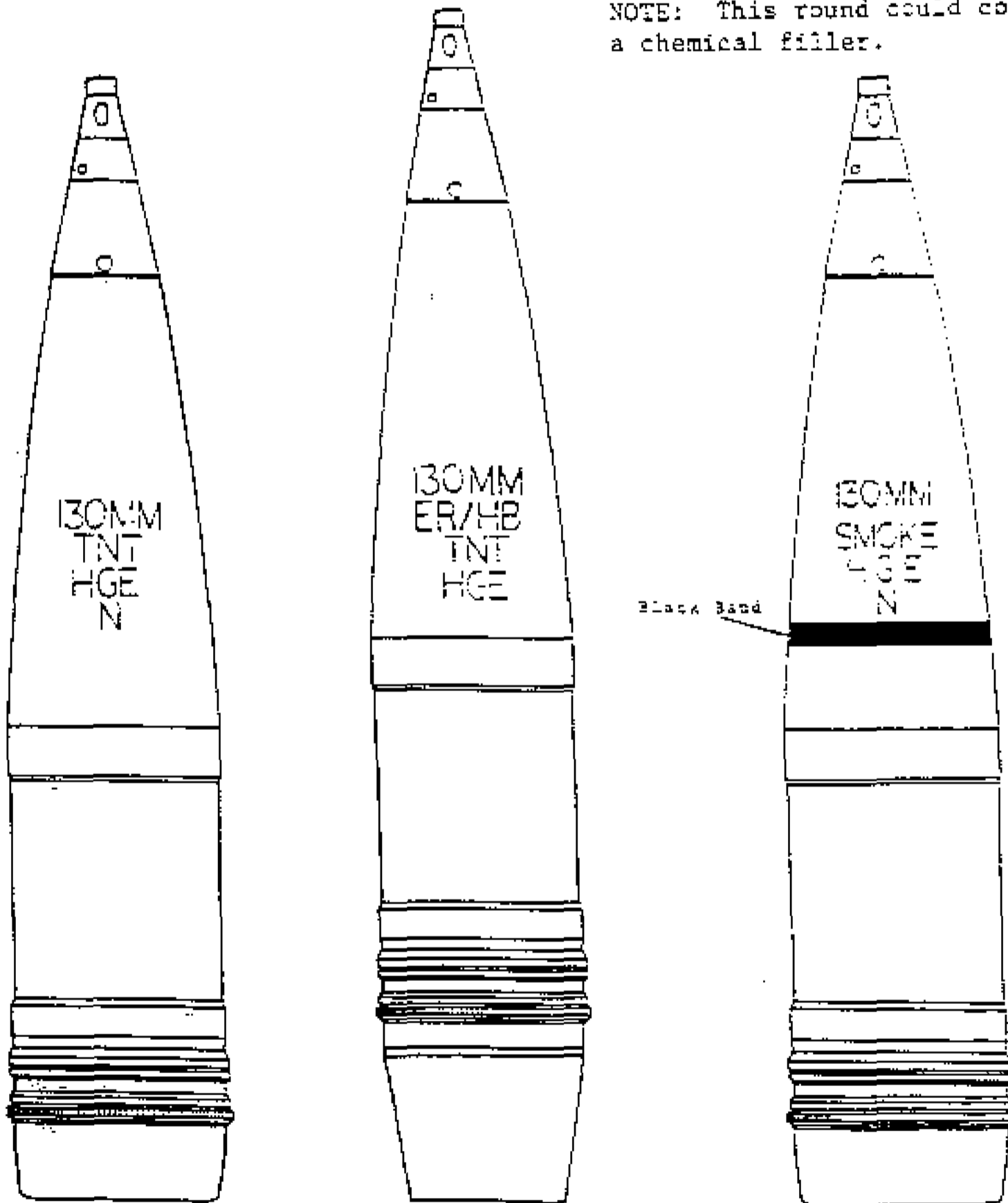
(U) Iraqi Projectile, 130-MM,
HE, ER/HB, Model Unknown (Mod-
ified copy of Soviet Projectile,
Model OF-482M)
ID Guide

NOTE: This projectile incorporates
a threaded-on hollow-base, boat-
tail attachment for extended
range.

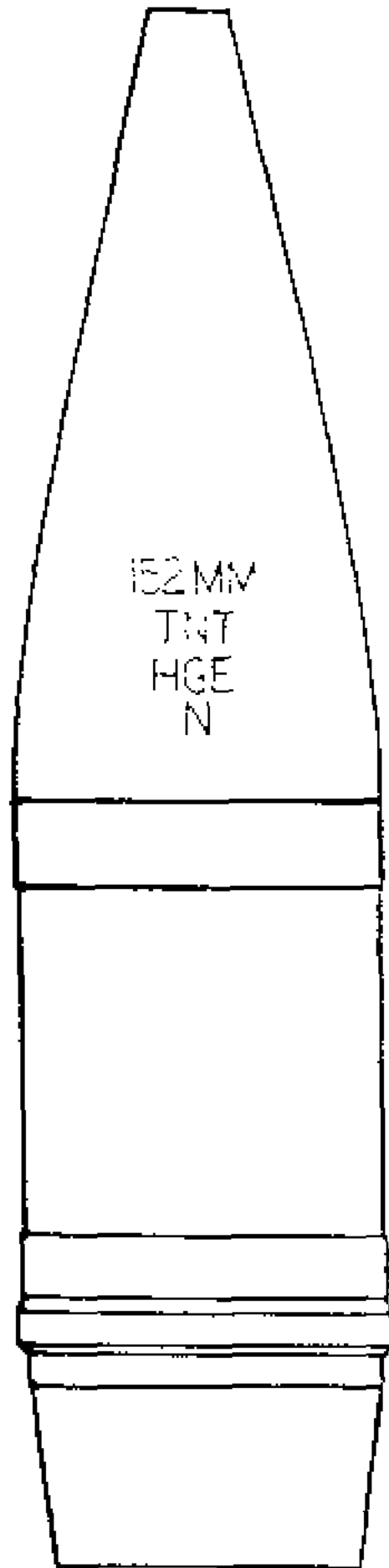
(U) Iraqi Projectile, 130-MM,
HE, Model Unknown (Copy of
Soviet Projectile, Model
OF-482M)
ID Guide

(U) Iraqi Projectile, 130-MM,
Smoke (WP), Model Unknown (Copy
of Soviet Projectile, Model
DTs-1)
ID Guide

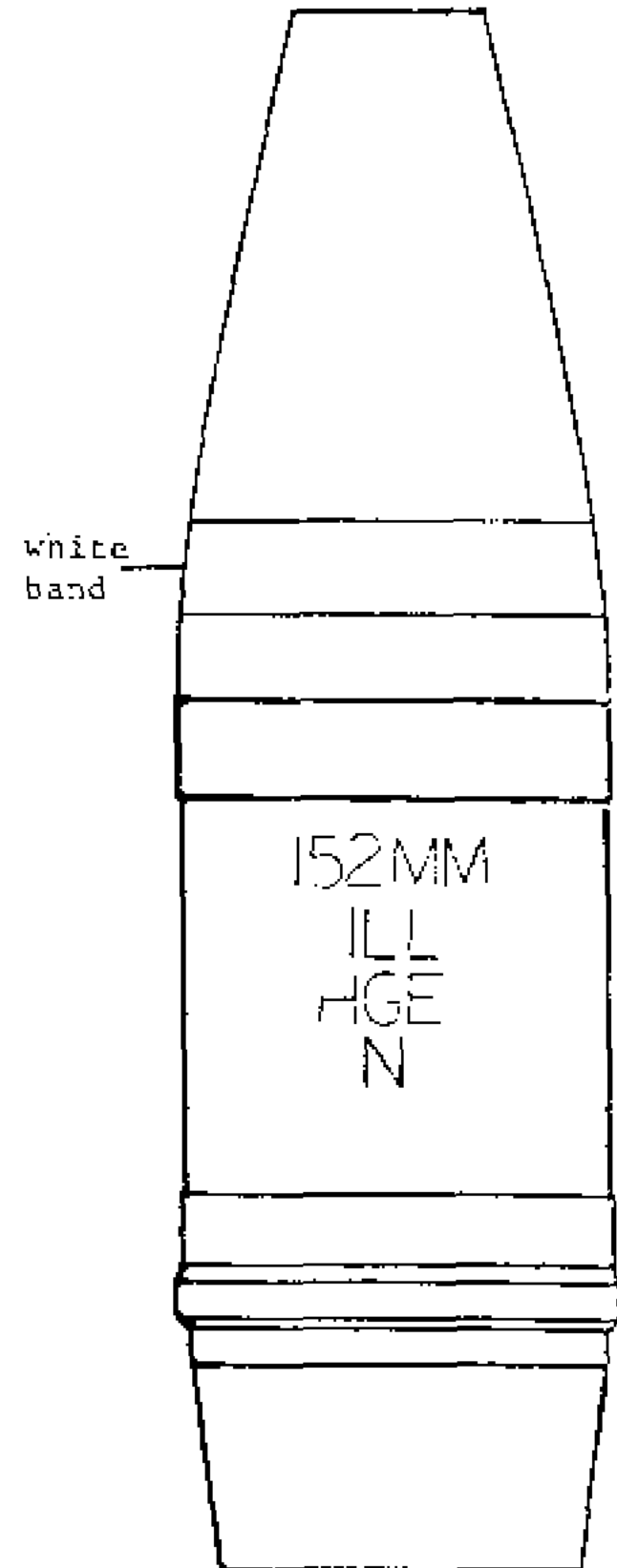
NOTE: This round could contain
a chemical filler.



(U) Iraqi Projectile, 152-MM,
HE, Model Unknown (Copy of Soviet
Projectile, Model OF-540)
ID Guide



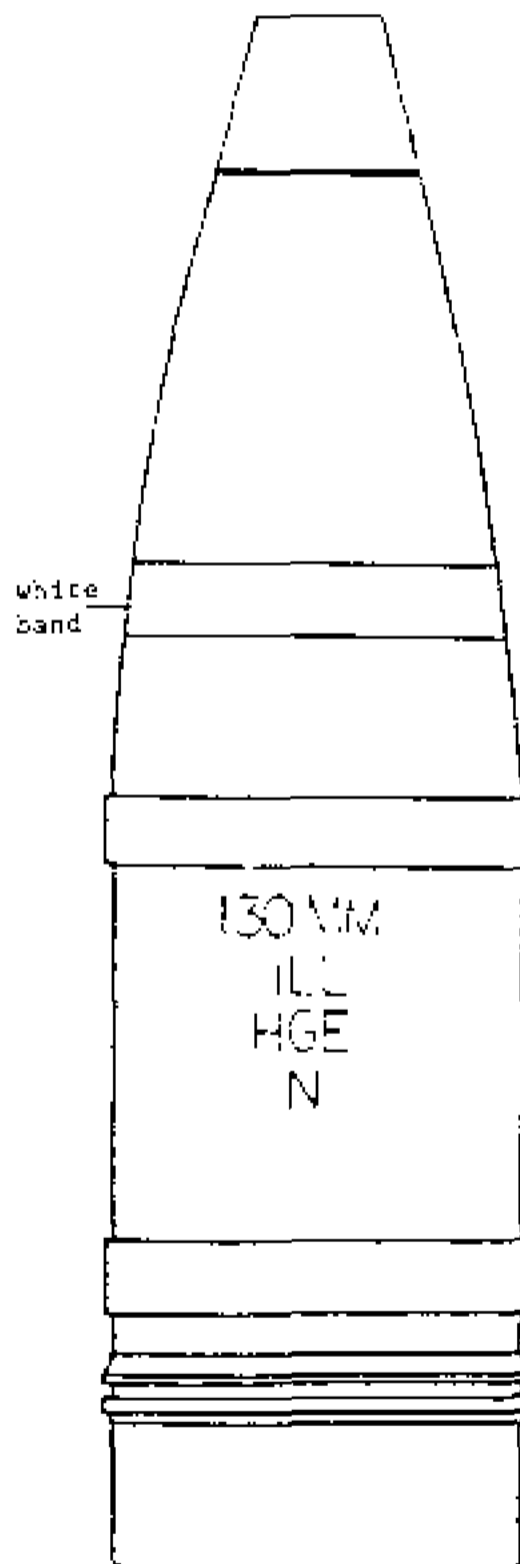
(U) Iraqi Projectile, 152-MM,
Illum, Model Unknown
No Coverage



(U) Iraqi Projectile, 130-MM,
111mm, Model Unknown (Modified
copy of Soviet Projectile,
Model SP-46)

ID Guide

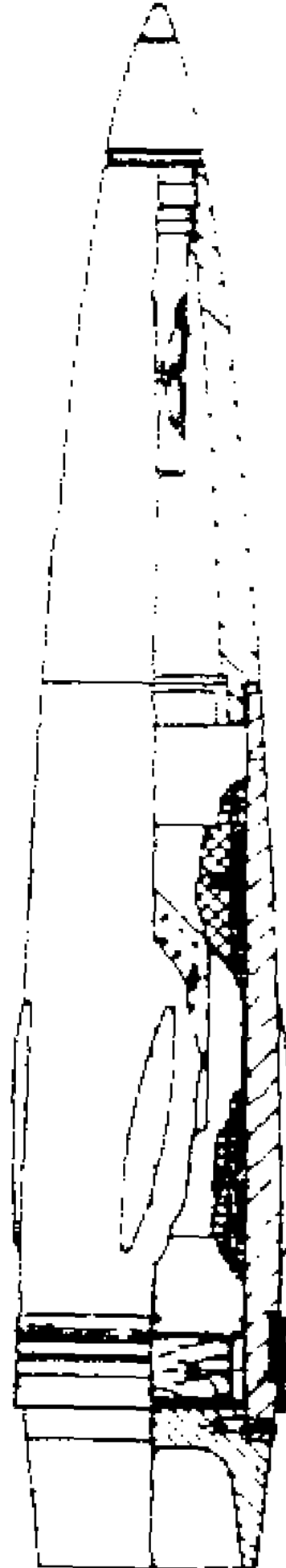
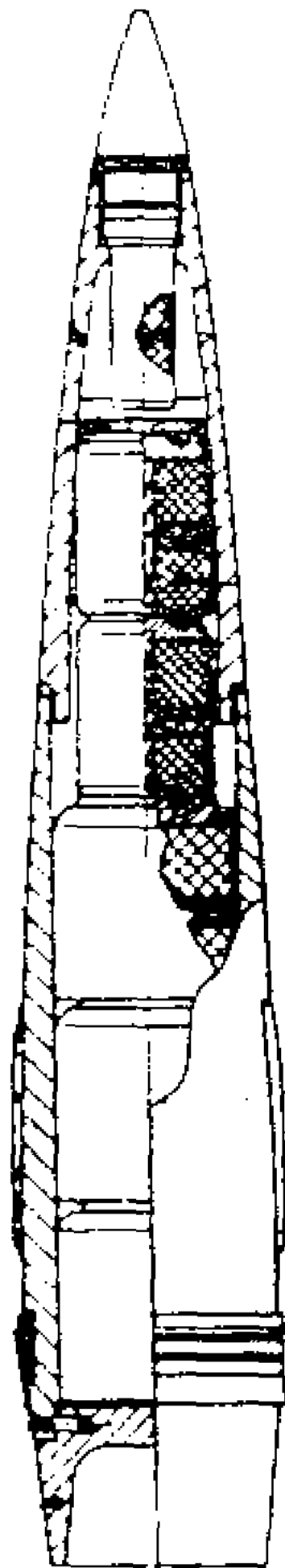
NOTE: This projectile incorporates
a fuzing adapter that allows the
use of small diameter Soviet
style fuzes.



140

(U) Spanish Projectile, 155-MM,
Illum, Model Unknown
No Coverage

(U) Spanish Projectile, 155-MM,
Smoke, Model Unknown
No Coverage

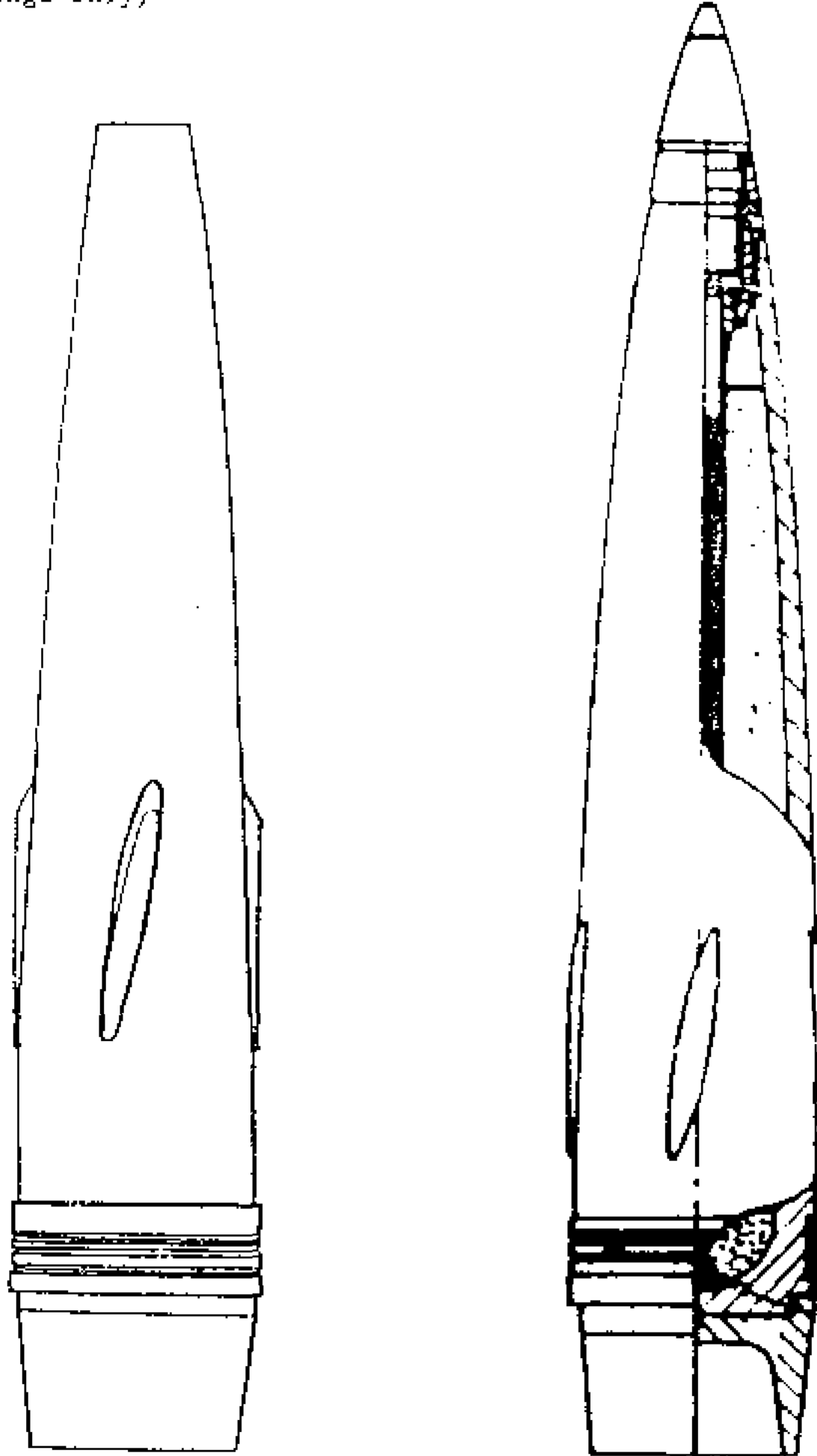


(U) Spanish Projectile, 155-MM,
Smoke (WP), Model Unknown
No Coverage

(U) Iraqi Projectile, 155-MM,
HE, Model Unknown

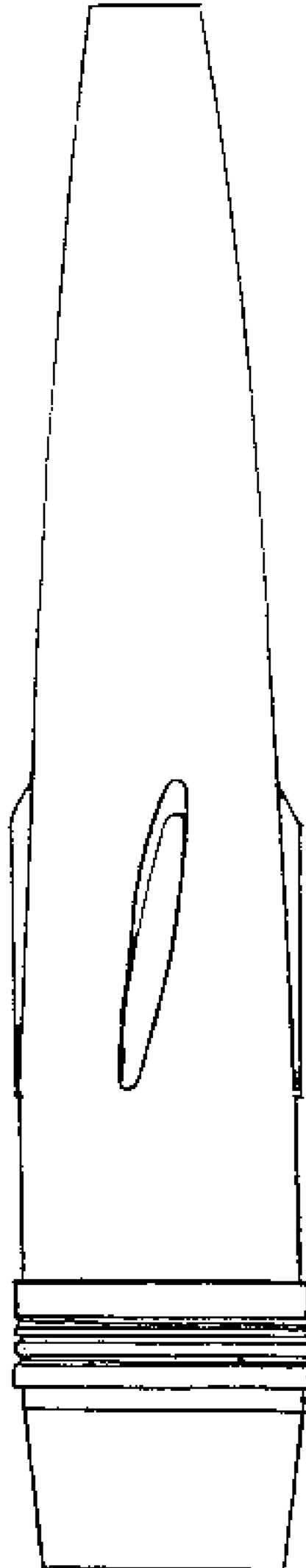
(This projectile appears to be a
copy of a Canadian projectile,
Model MK 10 Mod 2, which as ID
Guide coverage only)

NOTE: This projectile could
possibly be a chemical agent
carrier.



(U) Iraqi Projectile, 210-MM,
HE, Model Unknown
No Coverage

NOTE: This projectile is being
manufactured in Iraq, but most
likely in limited numbers.
The 210-MM family most likely
includes WP and smoke rounds and
is a possible chemical carrier.



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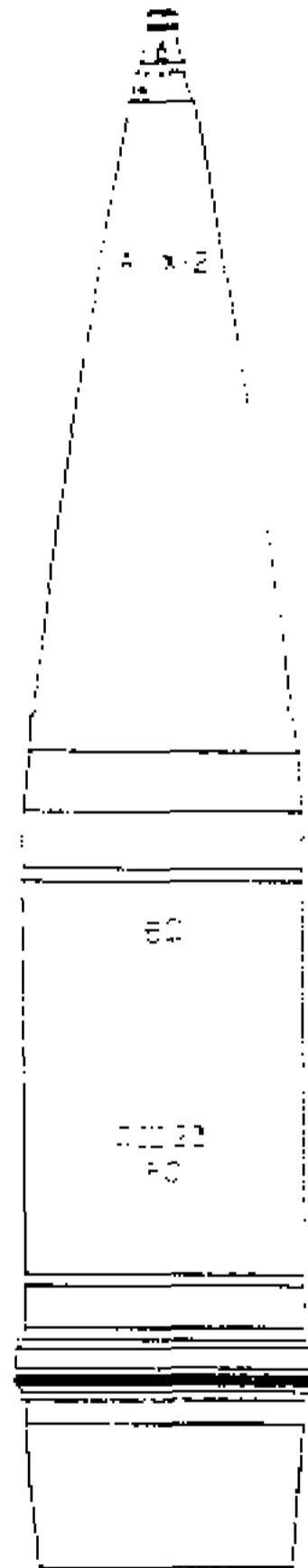
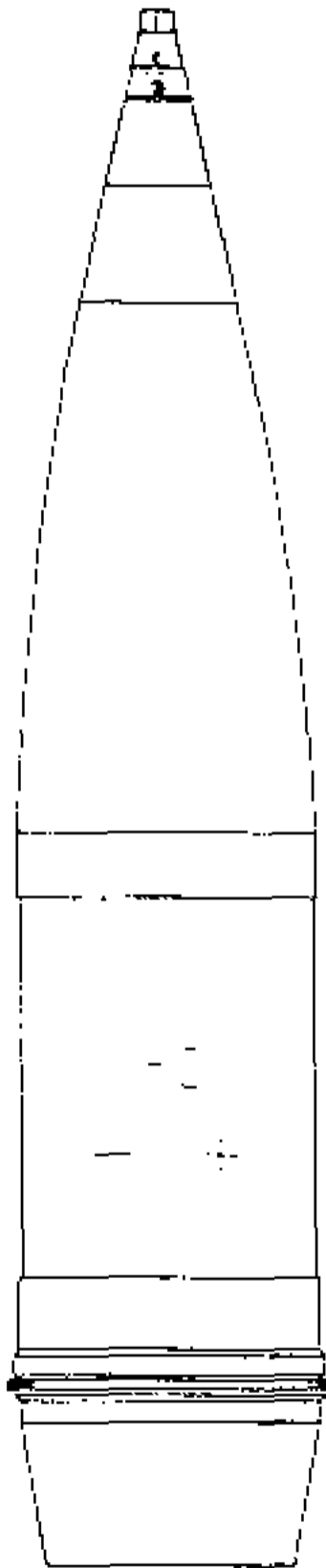
(U) U.S.S.R. Projectile, 180-MM, Frag-HE, Rocket Assisted, Model CF-23

60D-35-2-21

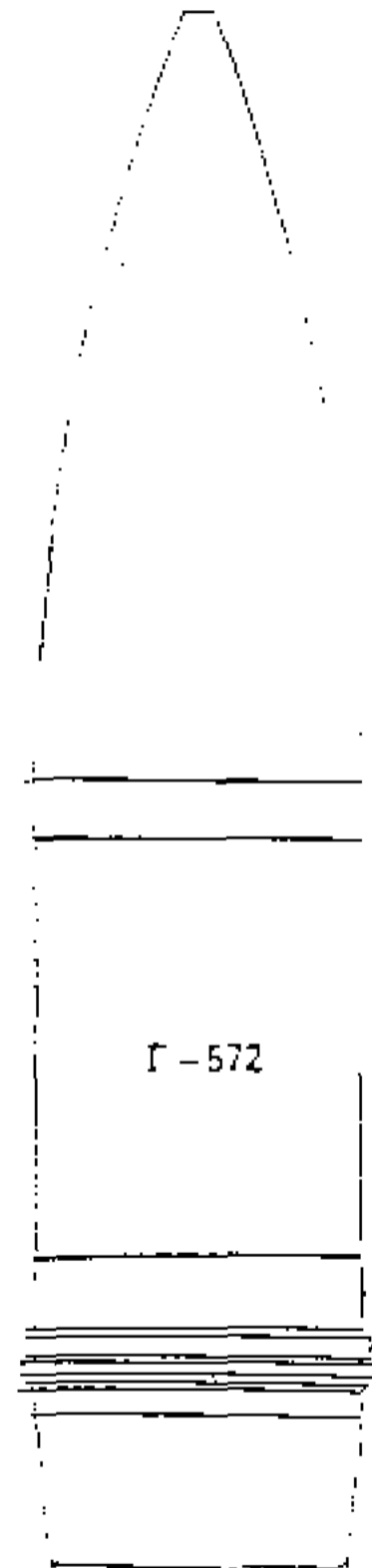
(U) U.S.S.R. Projectile, 180-MM, HE, CF, Model G-572

(U) U.S.S.R. Projectile, 180-MM, HE, Model F-572

ID Guide

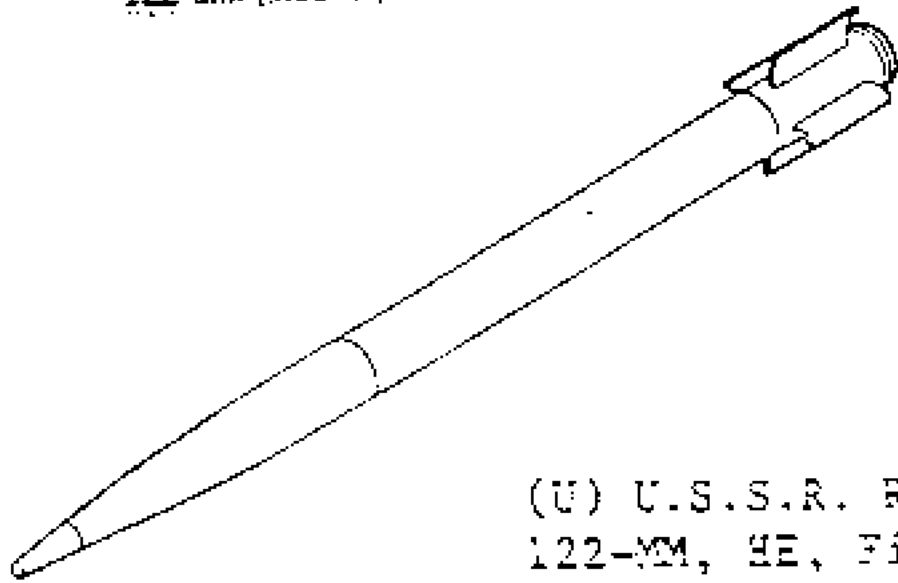
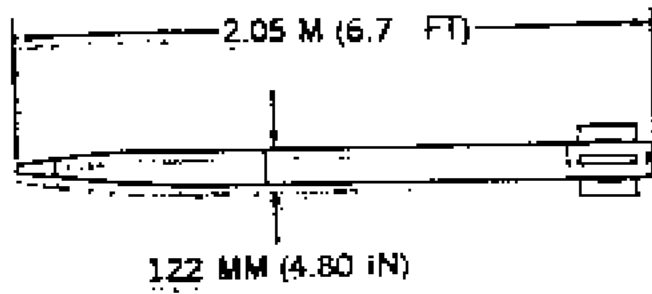


ID Guide

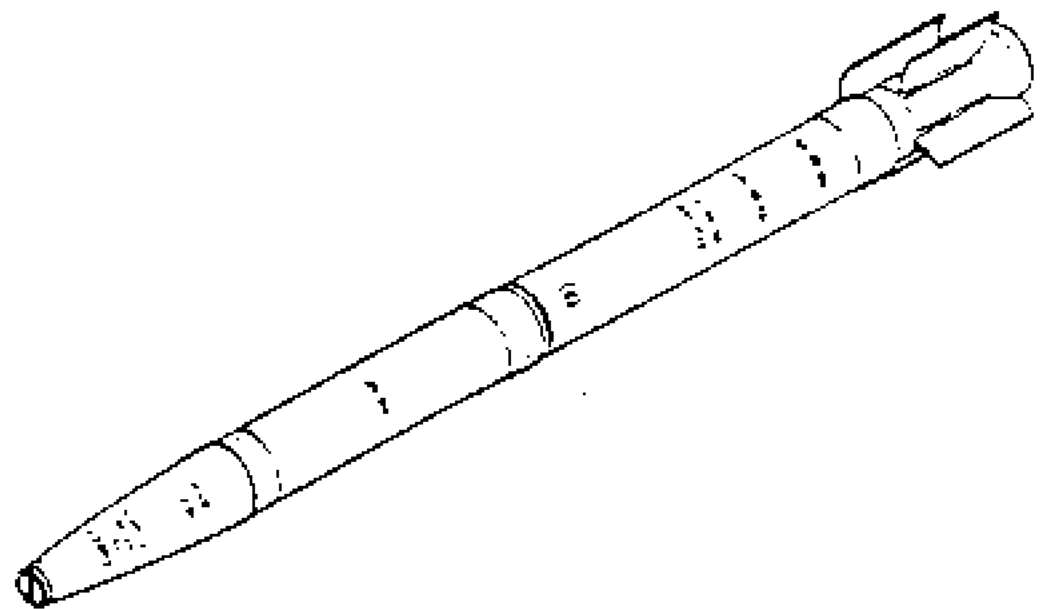
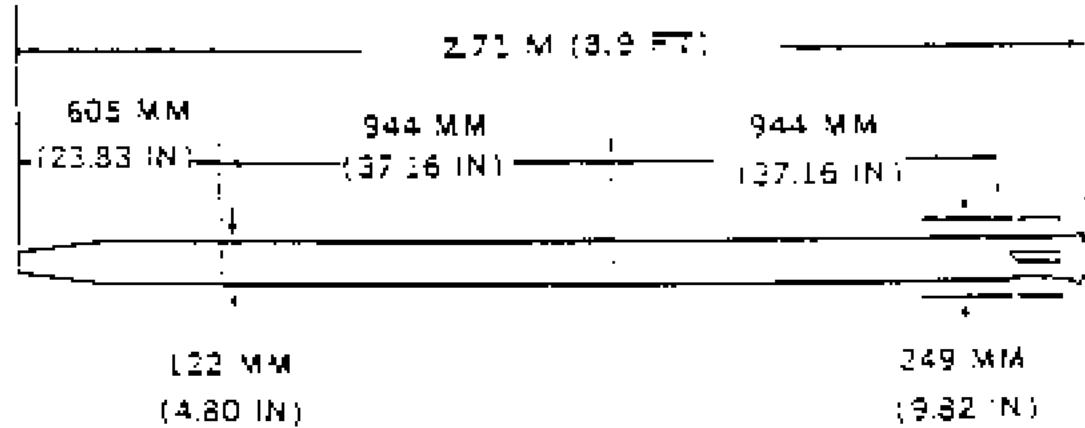


ROCKETS

(U) U.S.S.R. Rocket, ID Guide
122-MM, HE, Model 9M28F



(U) U.S.S.R. Rocket, 60F-35-2-18
122-MM, HE, Fin- &
Spin Stabilized,
Model 9M22U (9-Foot)

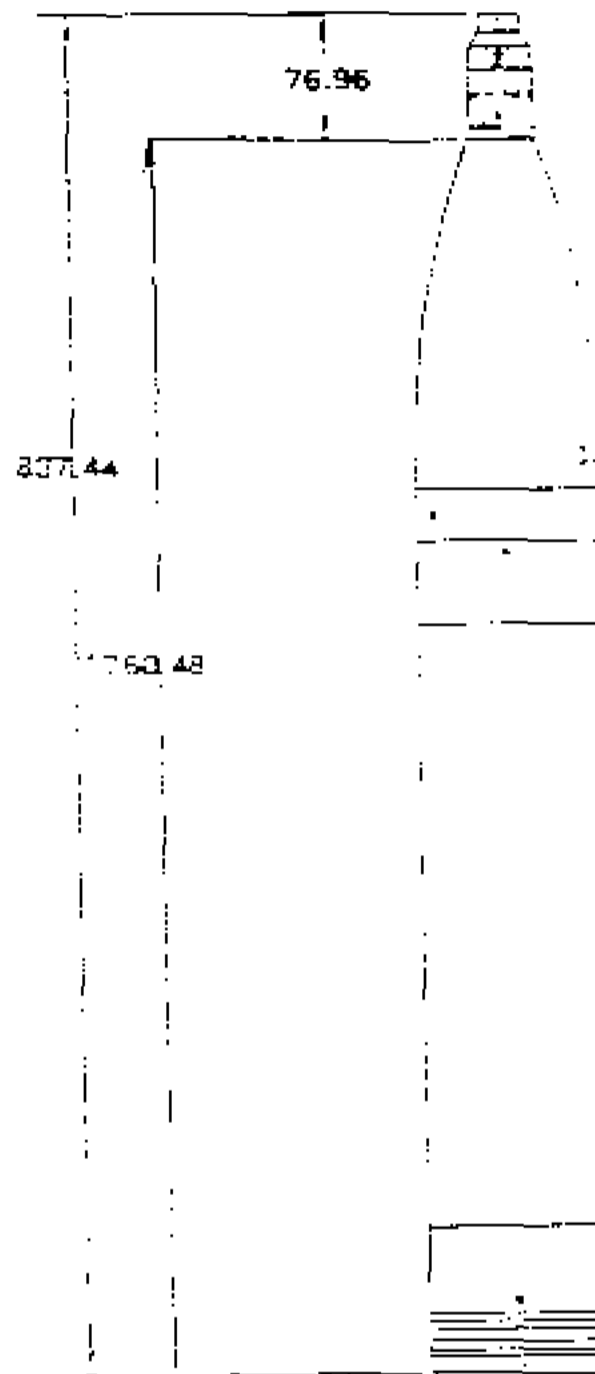
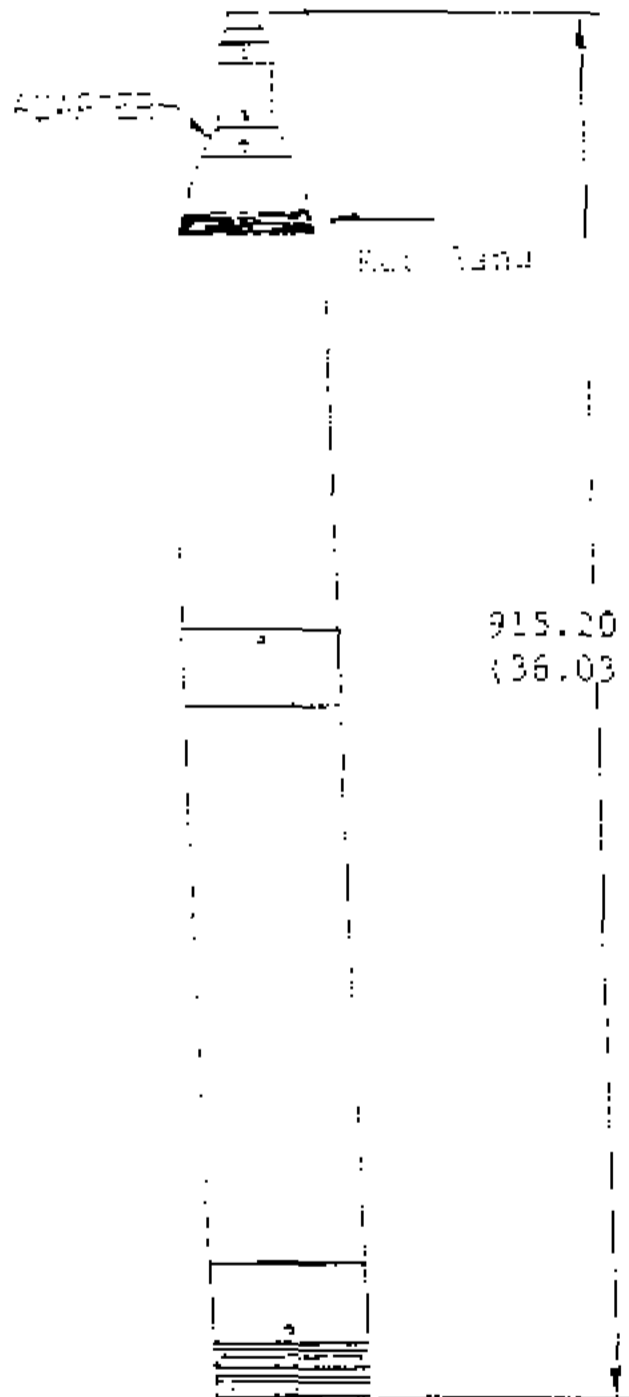


NOTE: It is assumed that Iraq is manufacturing their own version of the Chinese 107mm rocket family. These rounds will almost certainly appear with their own Iraqi nomenclature.



(U) N. Korean, Fuze, FD, Type 76
60F 27-3-01

(U) Chinese (People's Republic) Rocket, 107mm, HE-Frag, Spin-Stabilized, Type 63-2
60F 17-2-8

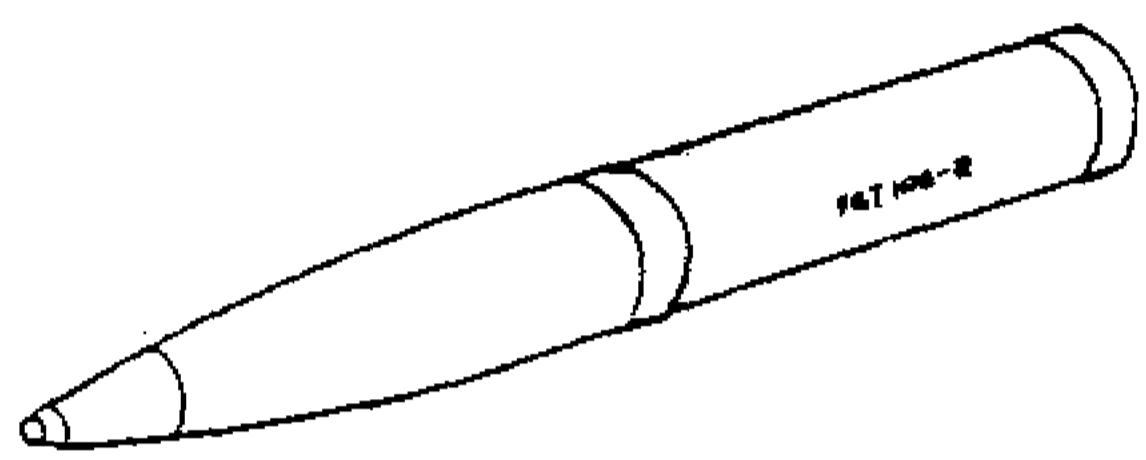


(U) Chinese (People's Republic) Fuze, FD, Type 1
60F 17-3-1

(U) Chinese (People's Republic) Rocket, 107mm Incend. (WP), Spin-Stabilized, Type 63-1
No 60 Series Coverage

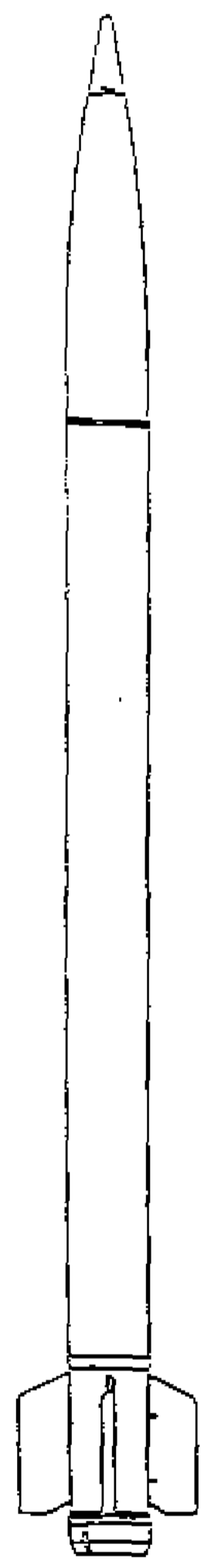
(U) Yugoslav Rocket,
128-MM, HE, Model M77
(Folding Fin)

ID Guide

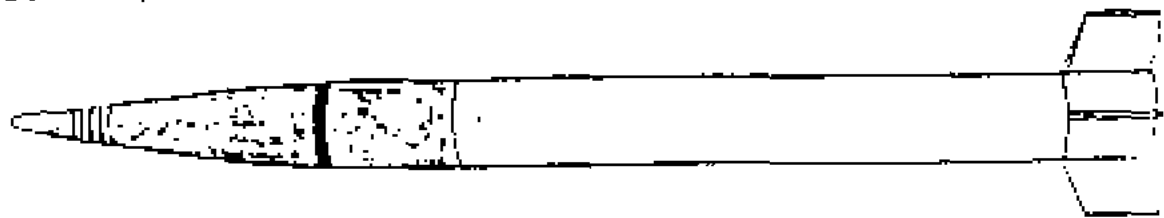


(U) Brazil Rocket, 108-mm,
HE, FGT-108

Length w/o fuze: 920 mm

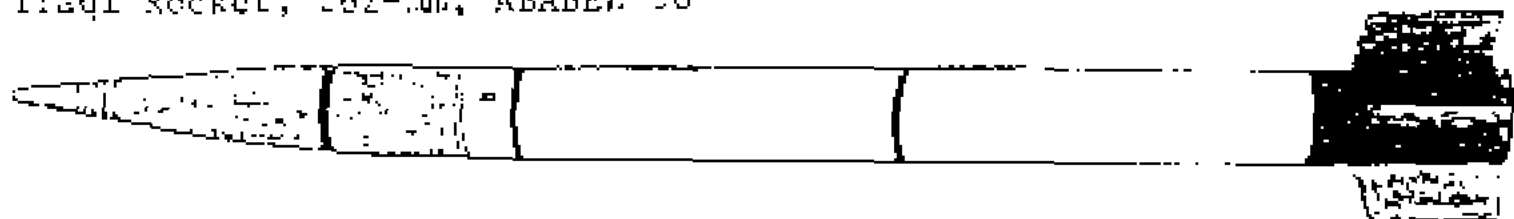


(U) Iraqi Rocket, 262-mm, AL-RASHEED



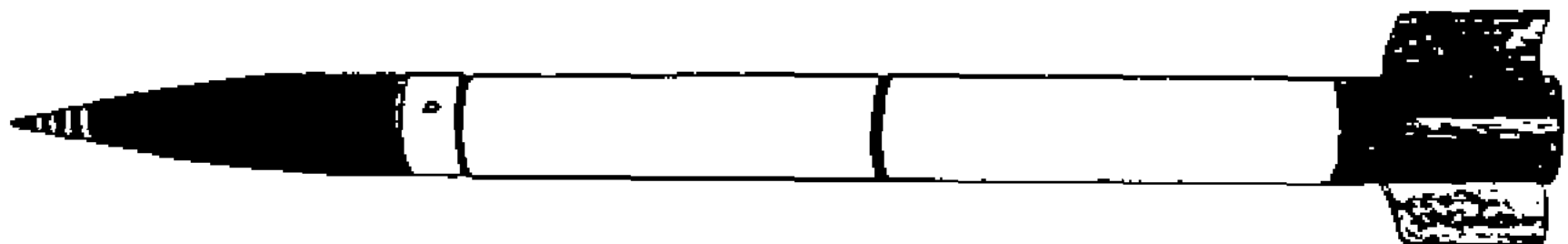
The rocket is believed to be a modified ABABEL 50 rocket. It appears to use the same warhead, but it has a smaller motor and fixed fins. The fixed fins indicate rail launching, which could be from a ground or air weapons system. The length is estimated at 11 feet.

(U) Iraqi Rocket, 262-mm, ABABEL 50



The rocket is a copy of a Yugoslavian system. It uses a submunition warhead with either an M42 ICM-type munition (300 ea) or a scatterable AT mine (25 to 30 ea). It probably uses an electronic time fuze for warhead initiation and has folding (wraparound) fins. The rocket is fired from a 12-tube launcher. The length is estimated at 14 feet.

(U) Iraqi Rocket, 400-mm, ABABEL 100



The rocket looks to be an upscaled version of the ABABEL 50. It is assumed that the payload is probably double that of the smaller rocket. The rocket is fired from a four-tube launcher.

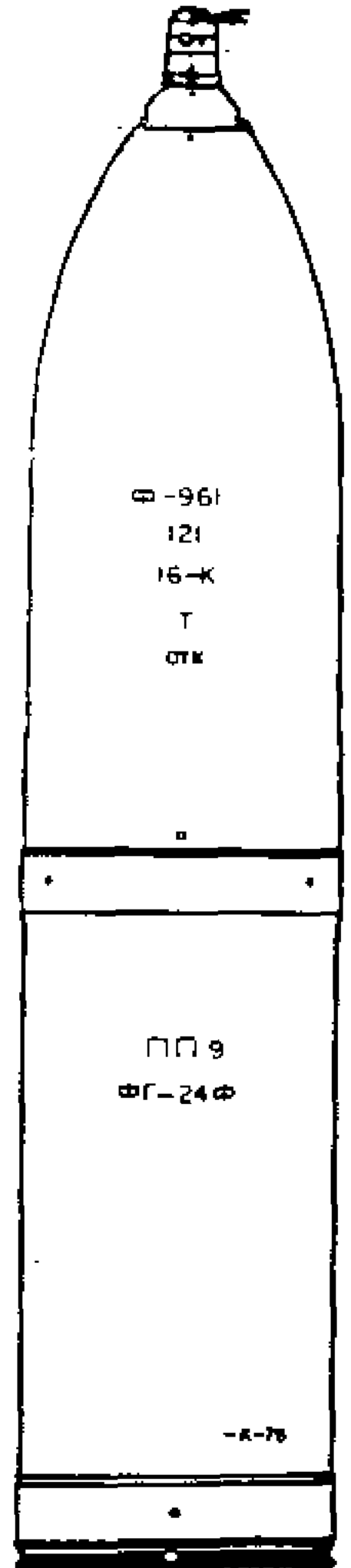
(U) U.S.S.R. Rockets, 60F35-2-7
240-MM, HE Spin-Stabilized,
F-961 & F-961U

(U) Czechoslovak Rocket,
130-MM, HE, RP-2

60F-20-2-1

(U) Yugoslav Rocket,
128-MM, HE, Spin-
stabilized, M63

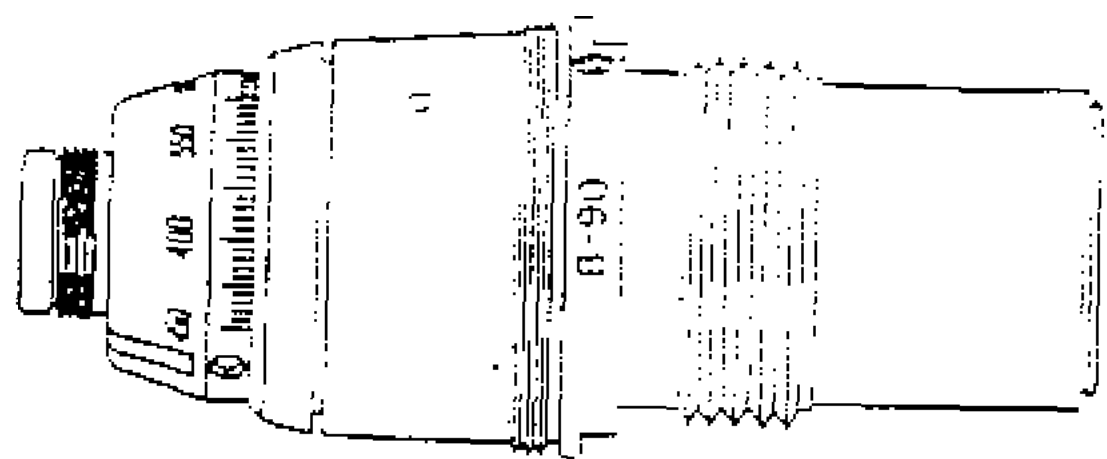
ID Guide



FUZES

(U) U.S.S.R.
Projectile
Fuze, MTSC,
Model 7-90

60D-35-3-45

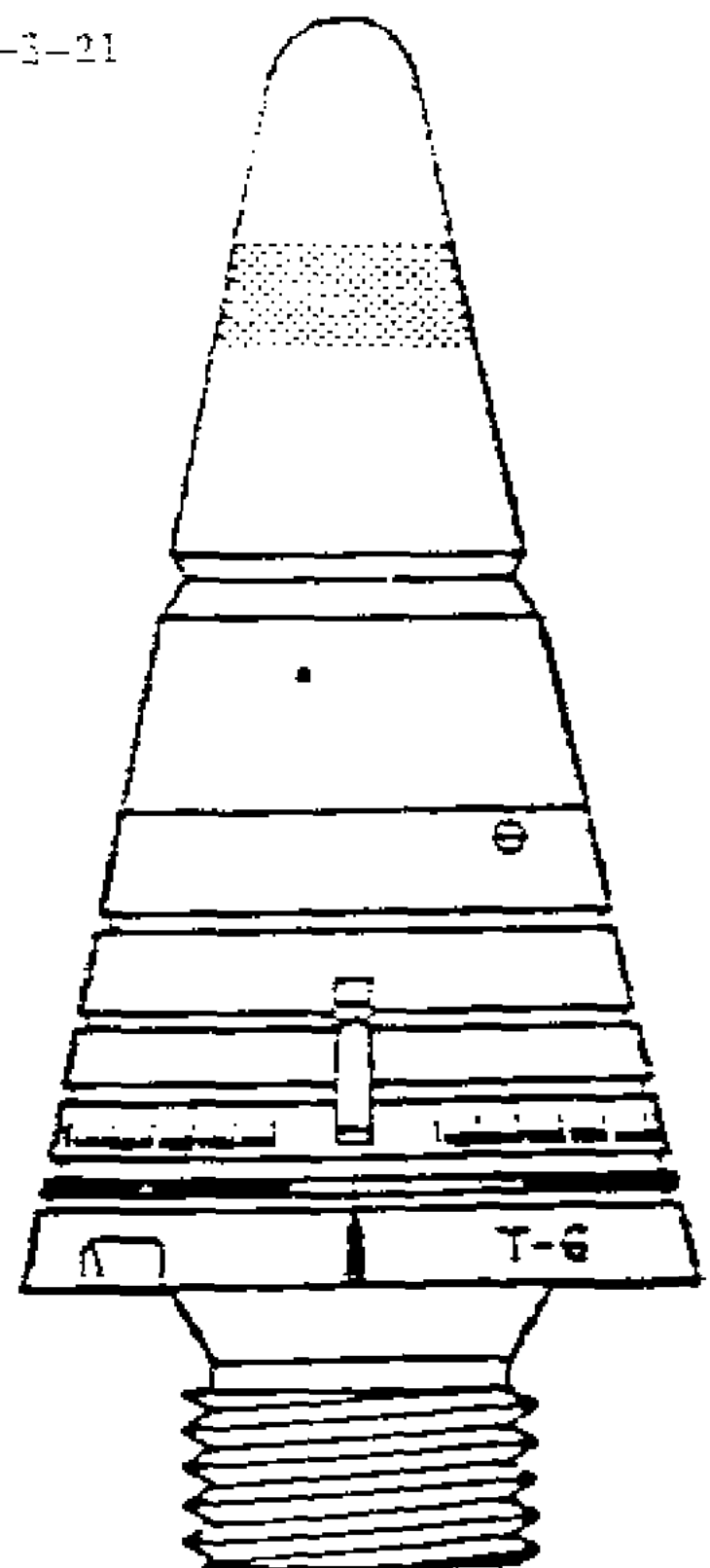
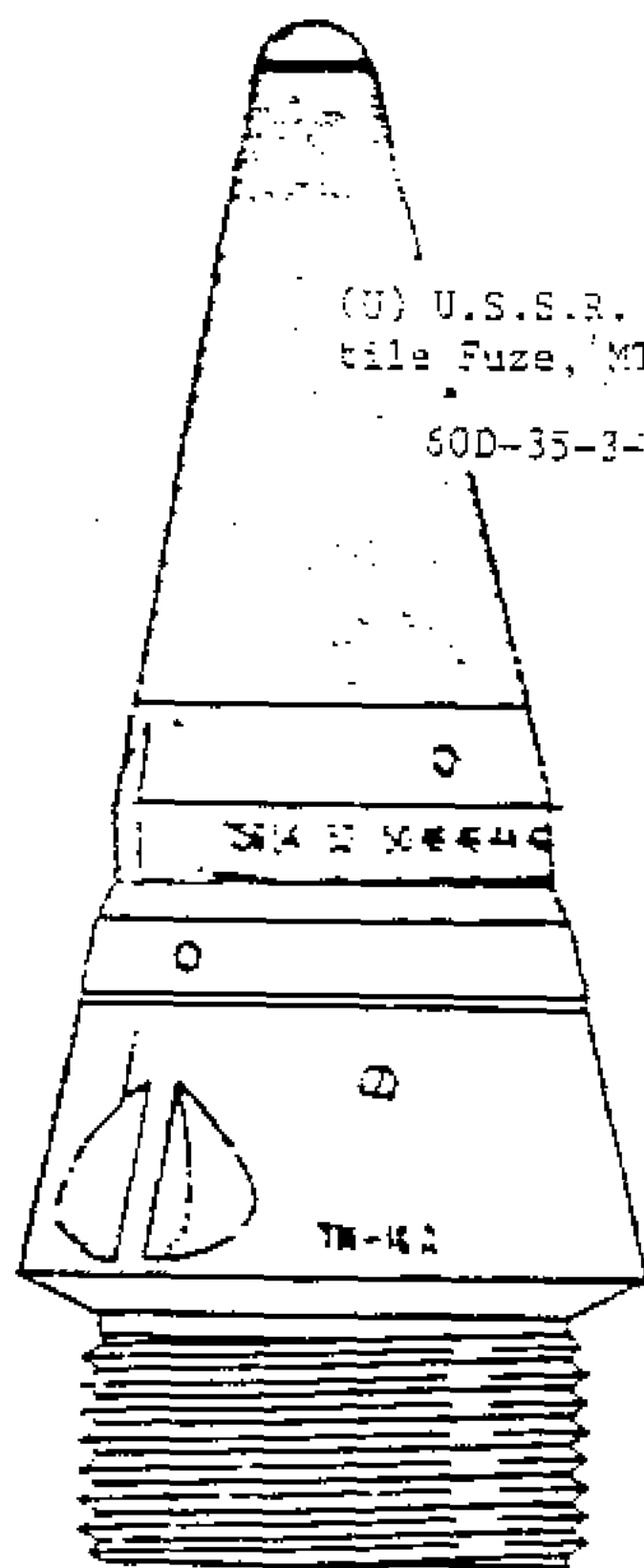


(U) U.S.S.R. Projec-
tile Fuzes, TSQ,
T-6; & T or TSQ, T-7

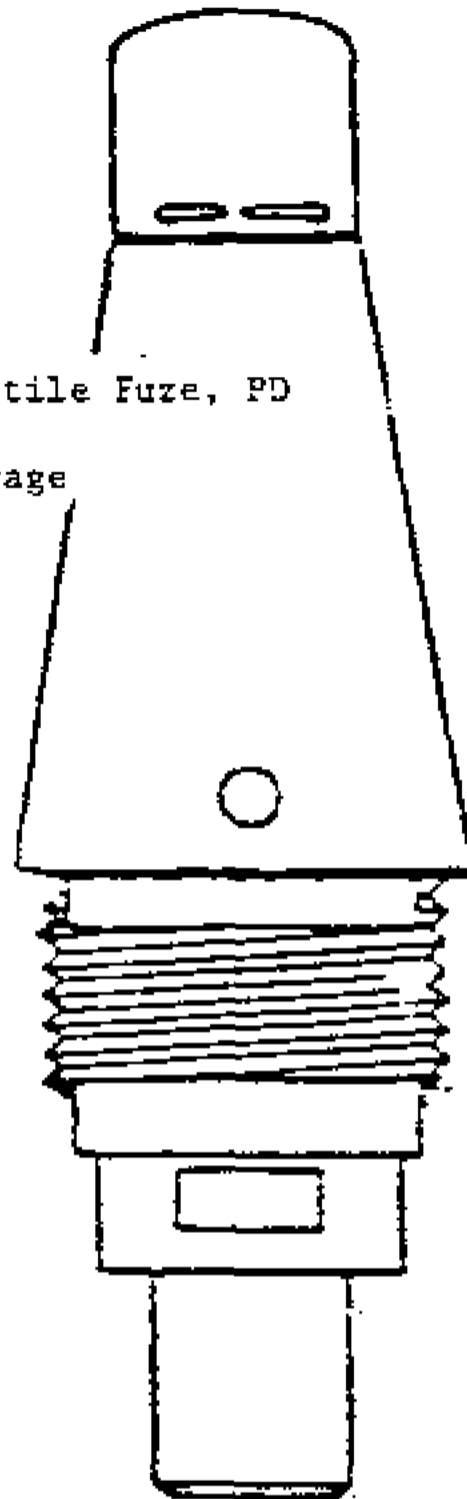
60D-35-3-21

(U) U.S.S.R. Projec-
tile Fuze, MT, TM-16L

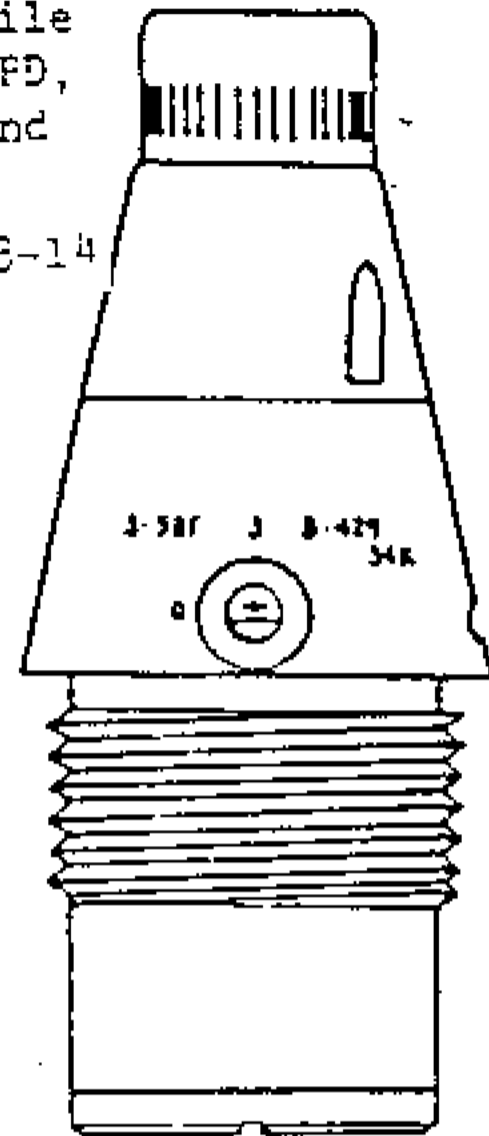
60D-35-3-40



(U) USSR Projectile Fuze, PD
Model GO-2
ID Guide Coverage

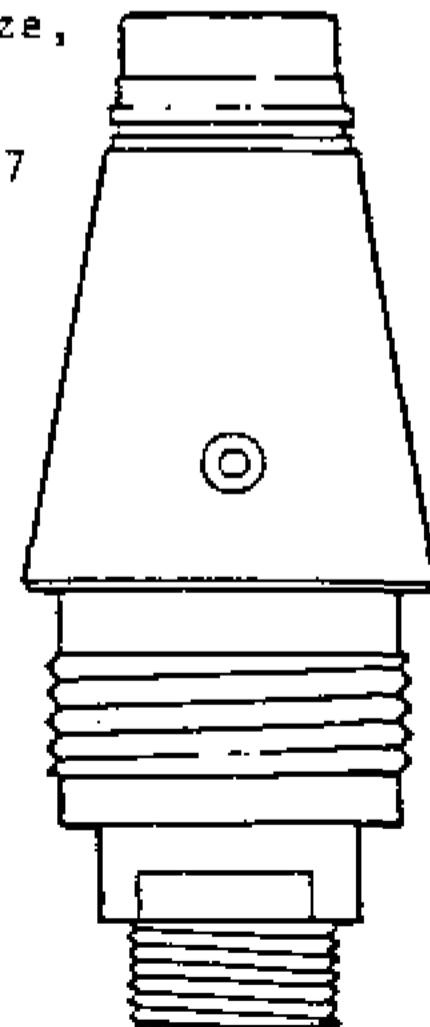


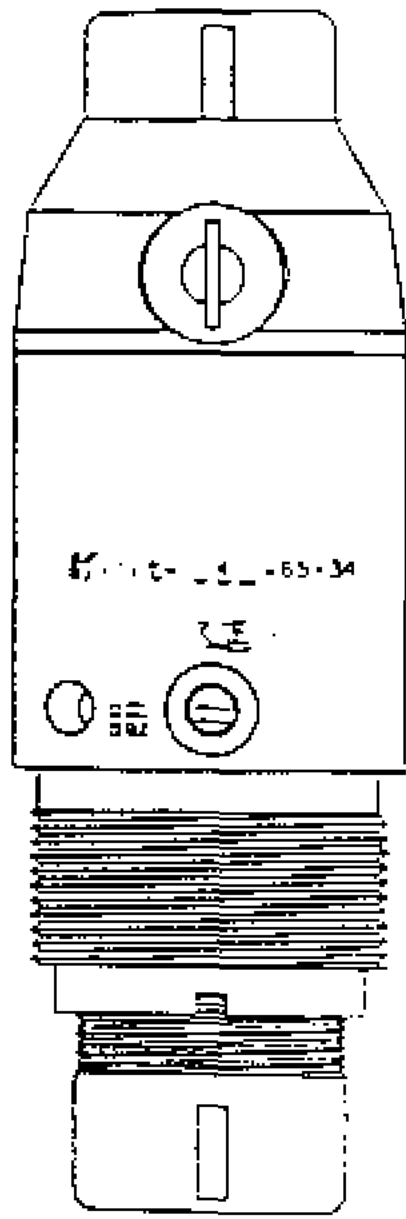
(U) U.S.S.R.
Projectile
Fuzes, PD,
V-429 and
V-429E
60D-35-3-14



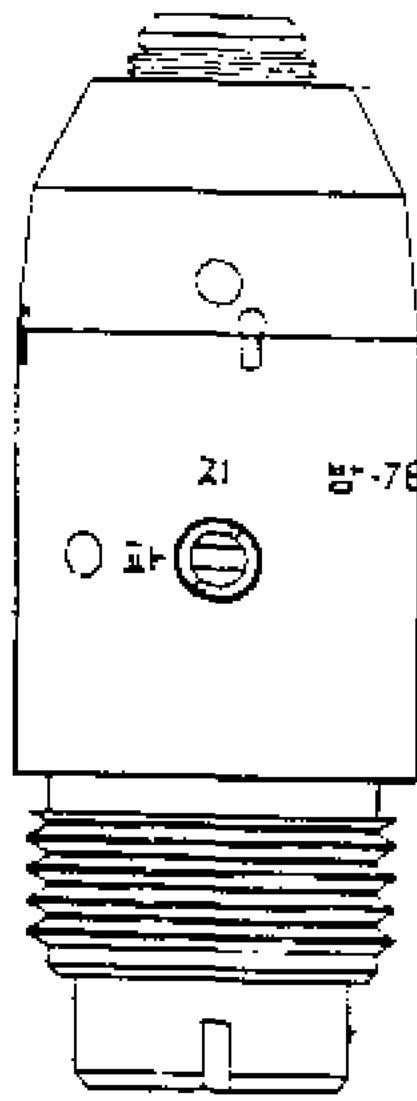
(U) USSR, Projectile,
Fuze, PDSD, Model A-670M
60D-35-2-54

(U) U.S.S.R.
Projectile Fuze,
PIBD, GPV-2
60D-35-3-27

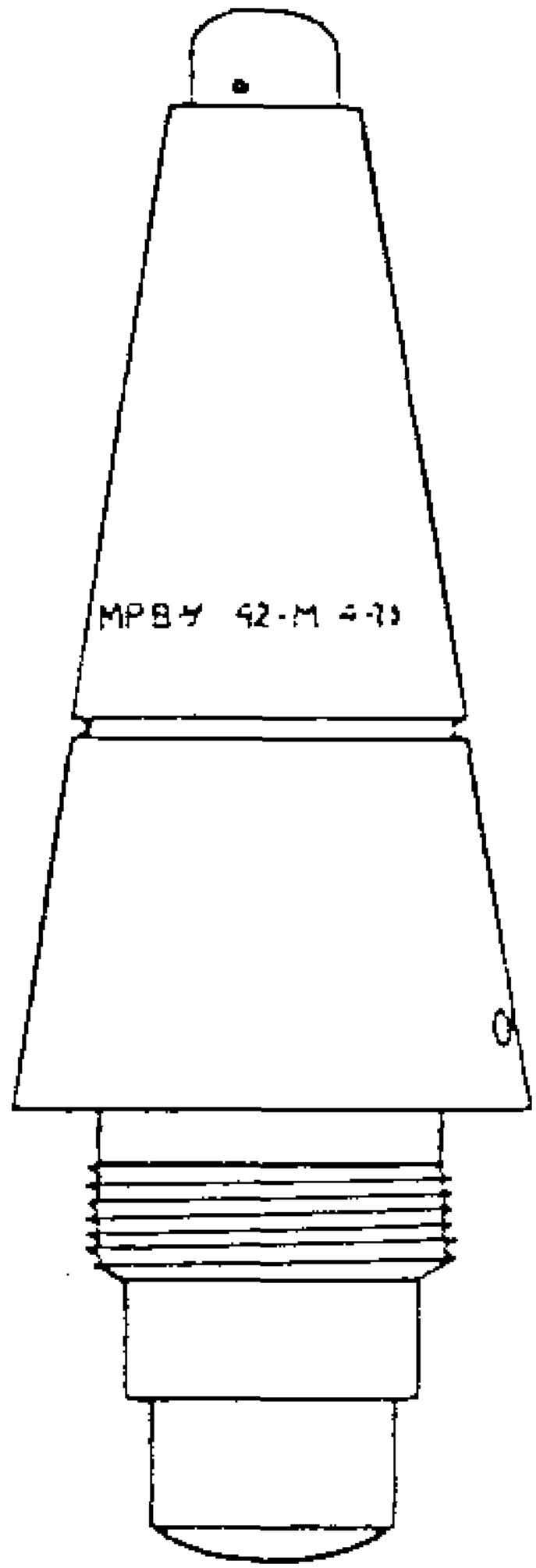




(U) PRC Rocket Fuze,
PD, Model Type 1
60F 17-3-1



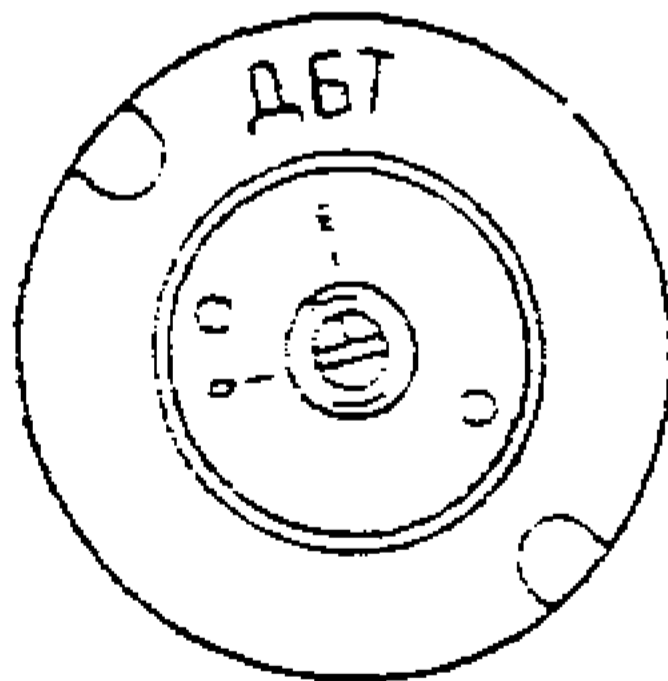
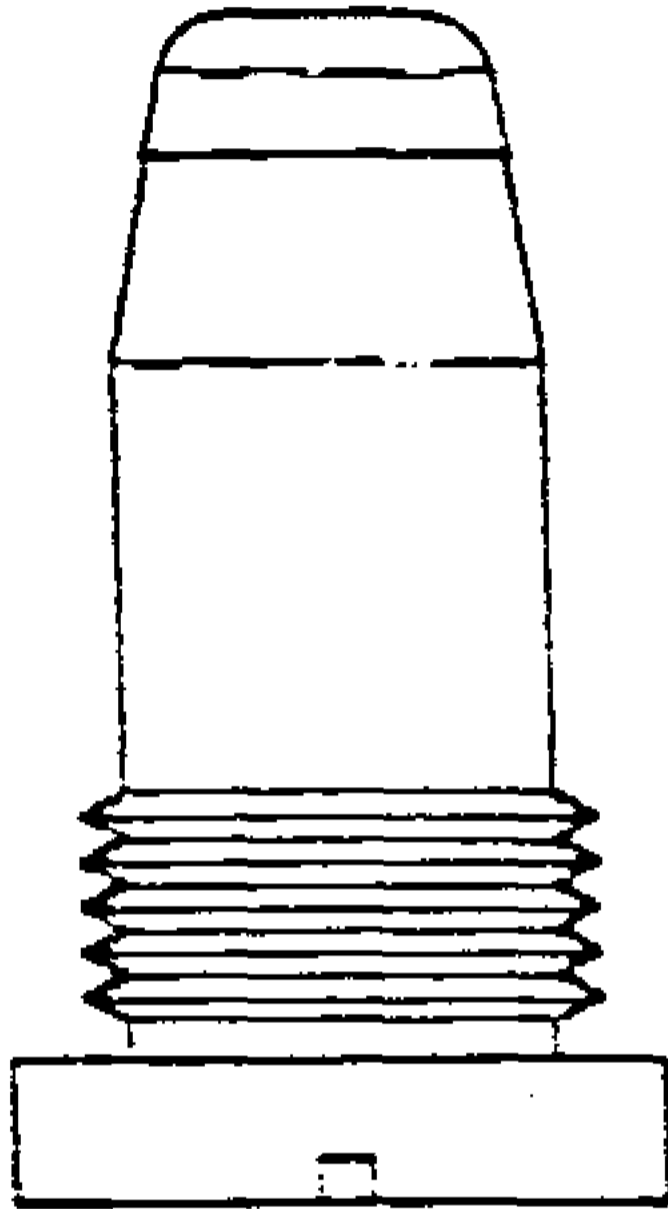
(U) NORTH KOREAN
ROCKET FUZE, PD
TYPE 76



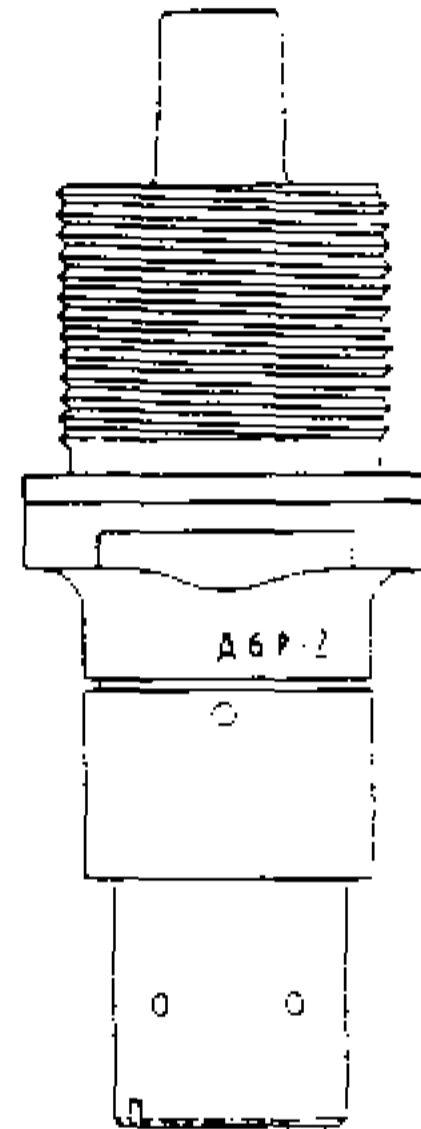
(U) U.S.S.R. Rocket 60F-35-3-10
Fuze, PD, MRV-U

160

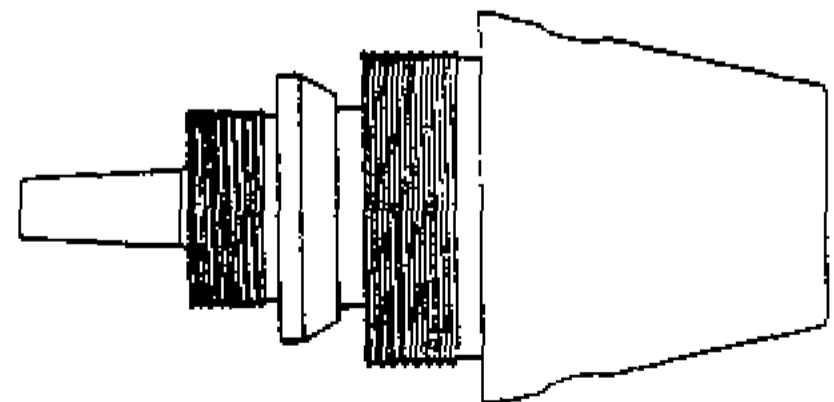
(U) U.S.S.R. 60D-35-3-44
Projectile (DS)
Fuze, BD,
Model DBT



(U) U.S.S.R. Pro-
jectile Fuzes,
BD, Models DBR &
DBR-2 60D-35-3-32

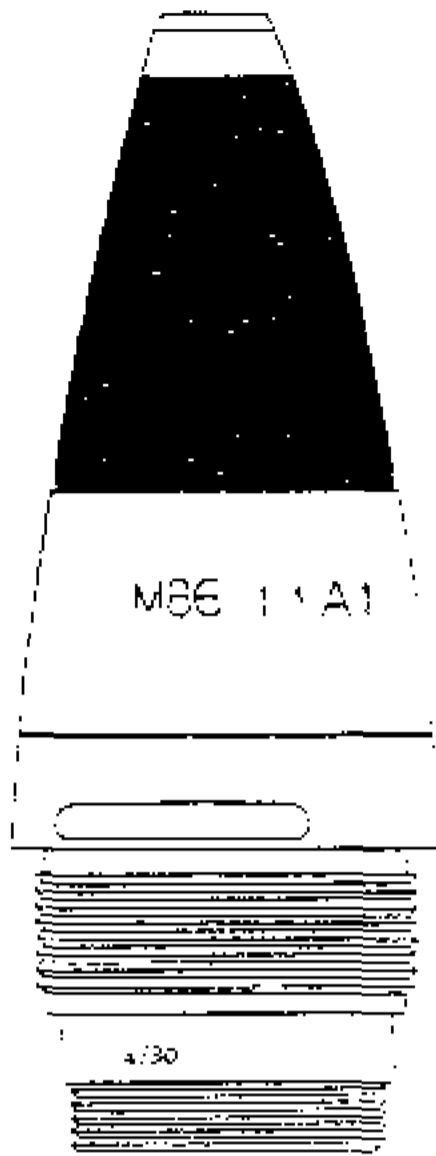


Fuze, BD, MO-8

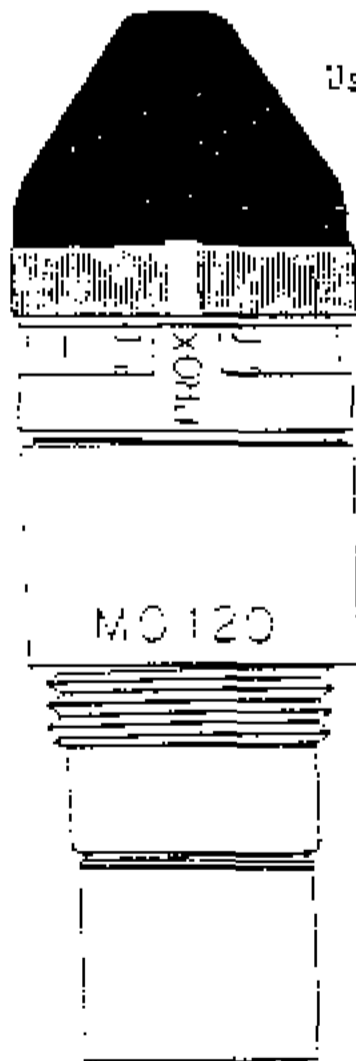


161

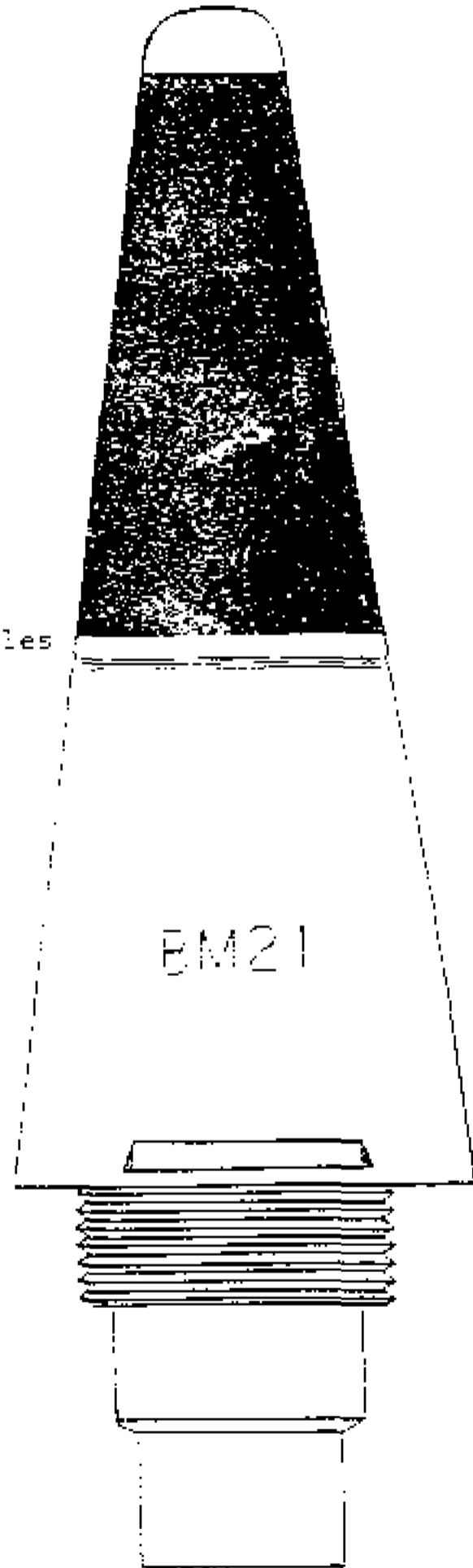
SOUTH AFRICAN FUZES



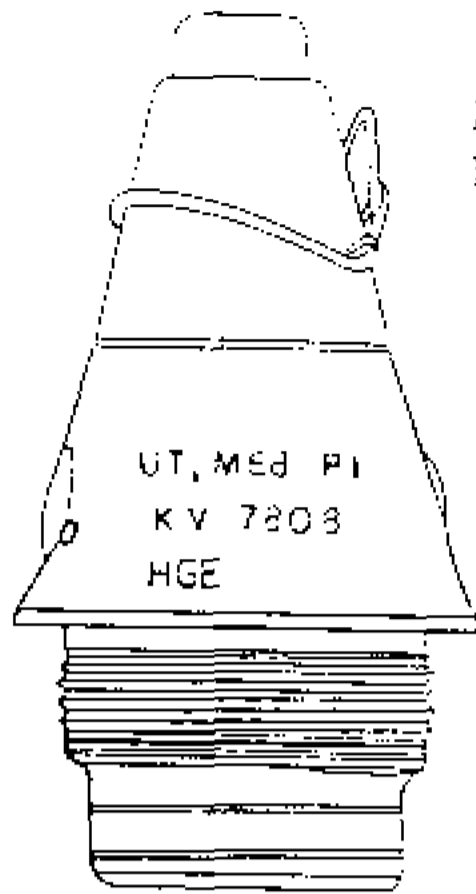
Used with 105- to 203-mm projectiles



Used with 120-mm mortars
(Free World and Warsaw Pact)

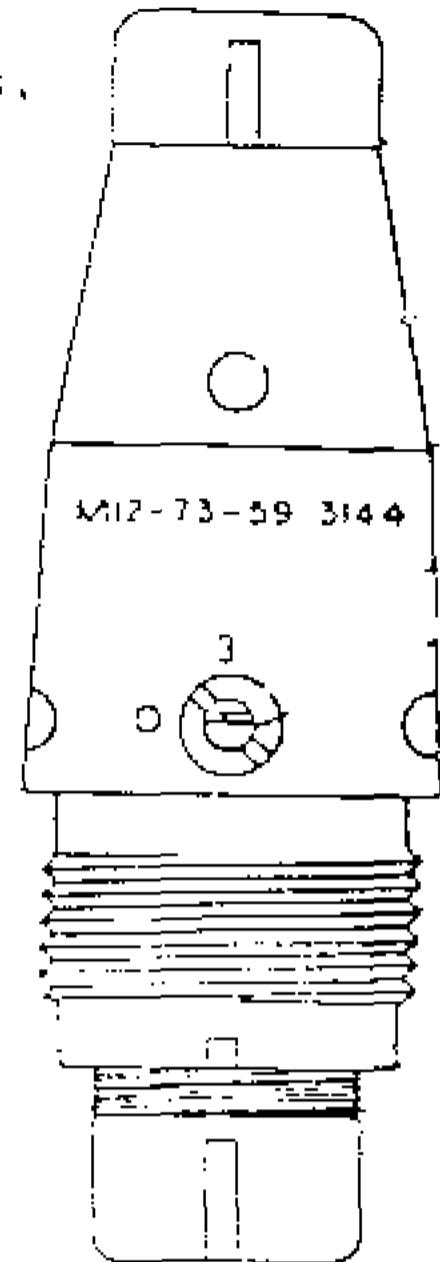


Used with 122-mm rockets

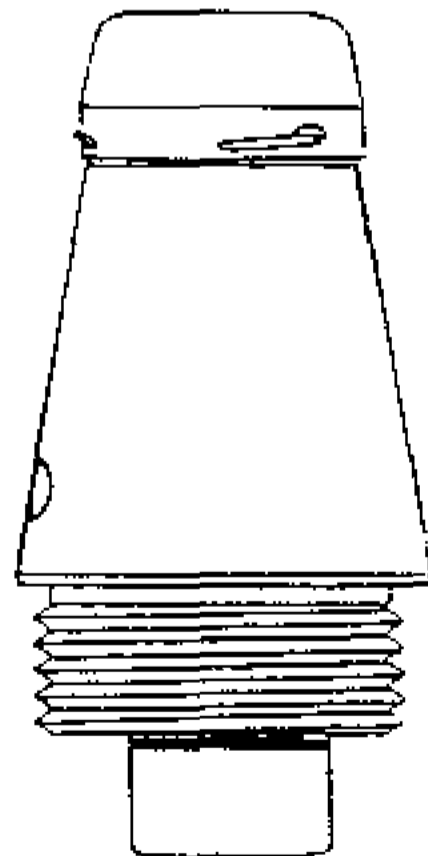


(U) U.S.S.R.
Projectile Fuzes,
PD, M12 & V-23

60D-35-3-12

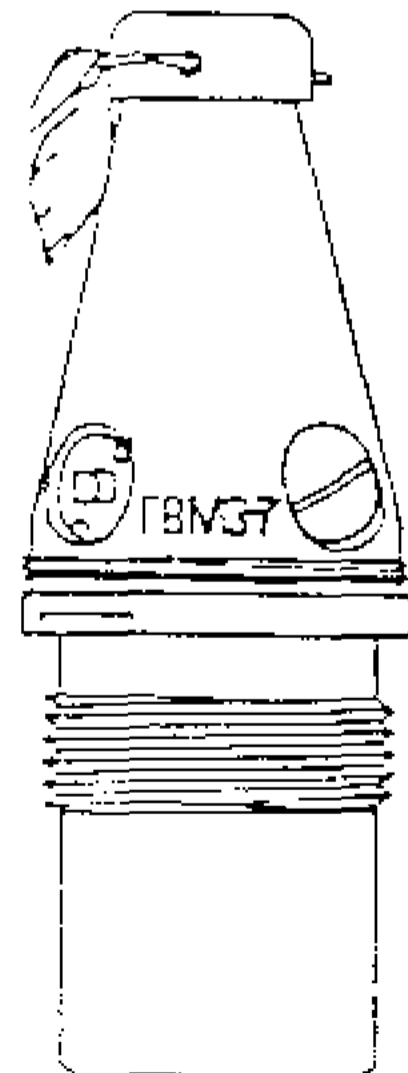


(U) Yugo, Mortar, Fuze.
PD, Model JT M68 P1
ID Guide Coverage Only



(U) U.S.S.R.
Projectile
Fuze, PD,
GVMZ-7

60D-35-3-7

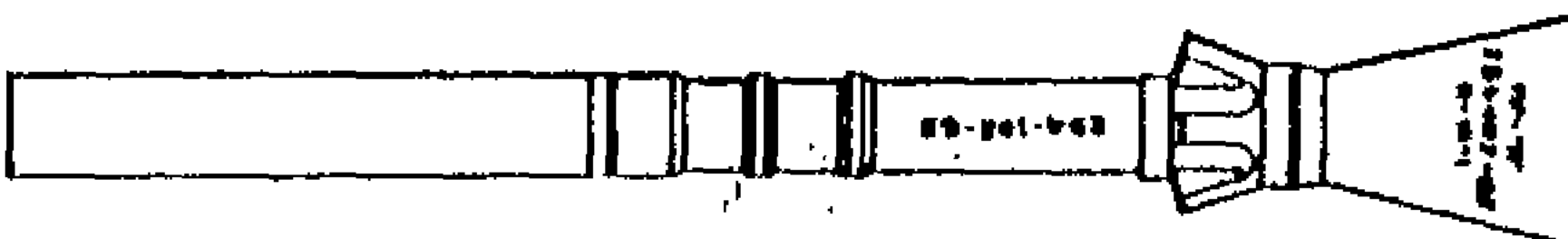


IRAQI, FUZE, PD
MODEL UNKNOWN

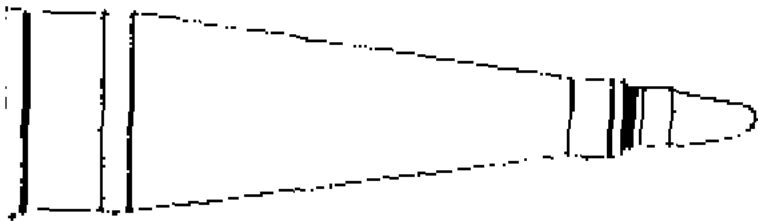
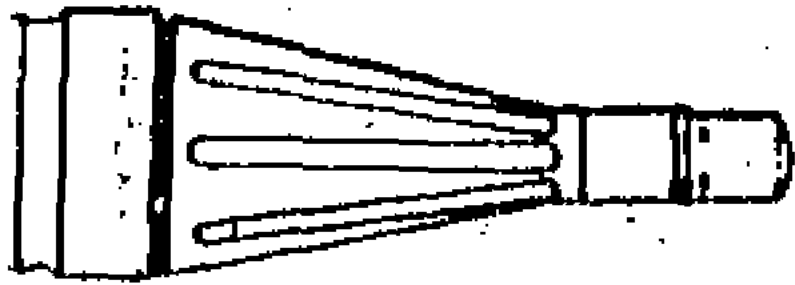
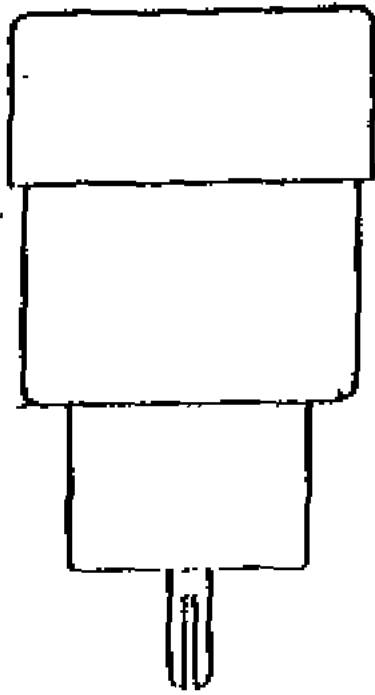
163

(U) USSR, Fuze, BD, VP 7, 9,

60D 35-2-20

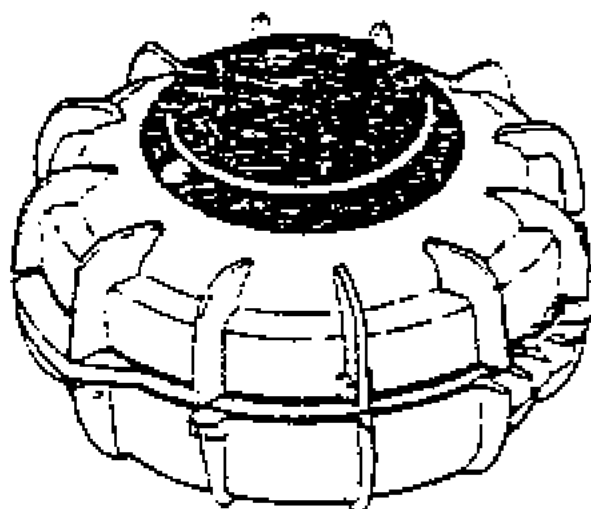


164

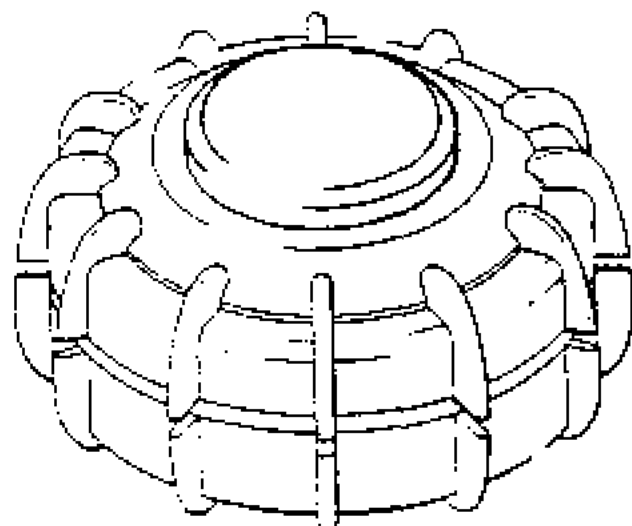


ANTI-PERSONNEL MINES

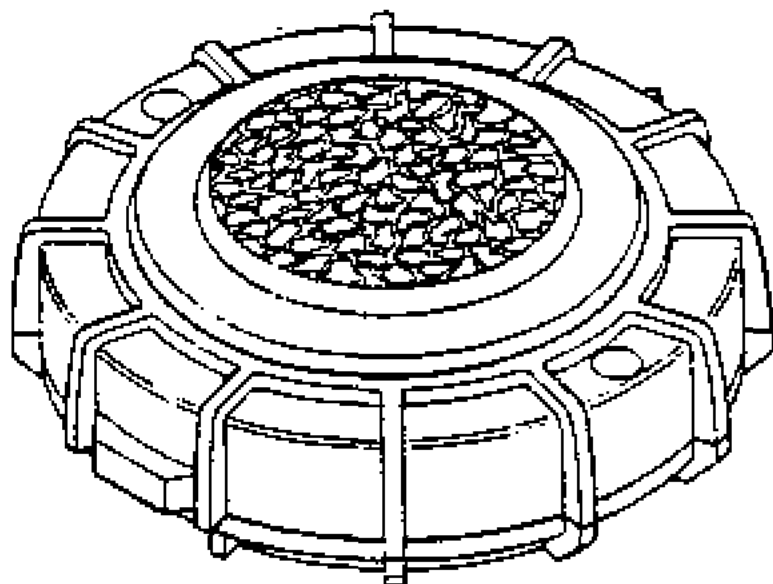
(U) Italian Landmines, 60H-9-2-11
Apers, VS 50 & VS 50AR



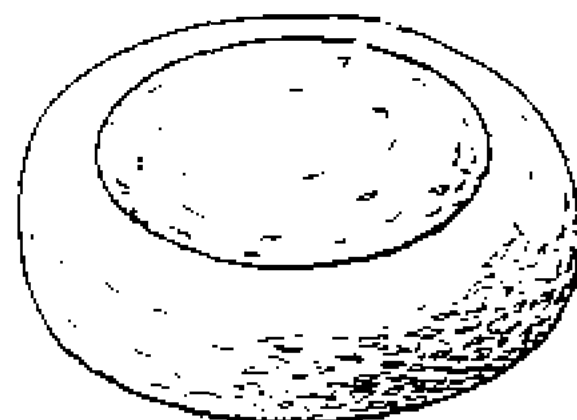
(U) Italian Landmine,
Apers, (Scatterable),
Model TS-50



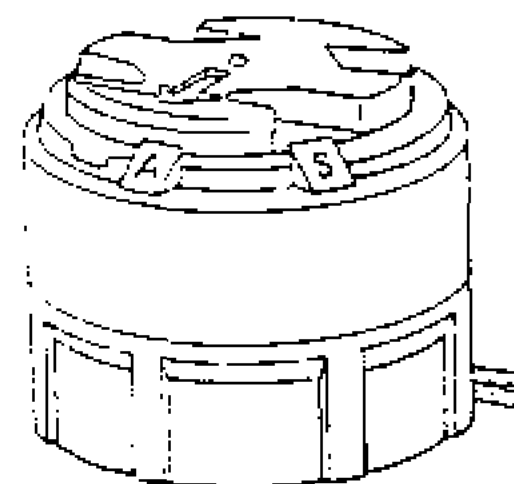
(U) Italian Landmine, 60H-9-2-6
Apers, Models VS-MK 2
& VS-MK 2 AR-AN



(U) Italian Landmines,
Apers, (Scatterable),
Models SB-33 and SB-
33/AR-AN

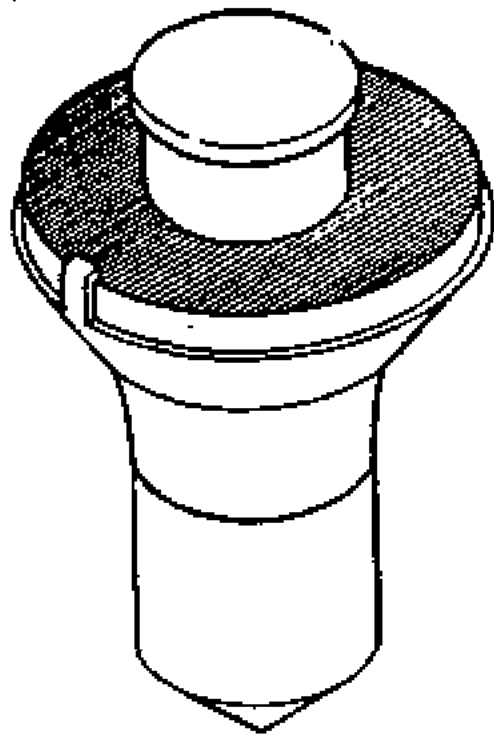


(U) U.S. Landmines, 60H-2-2-27
Apers, HE, M14 & M14E1;



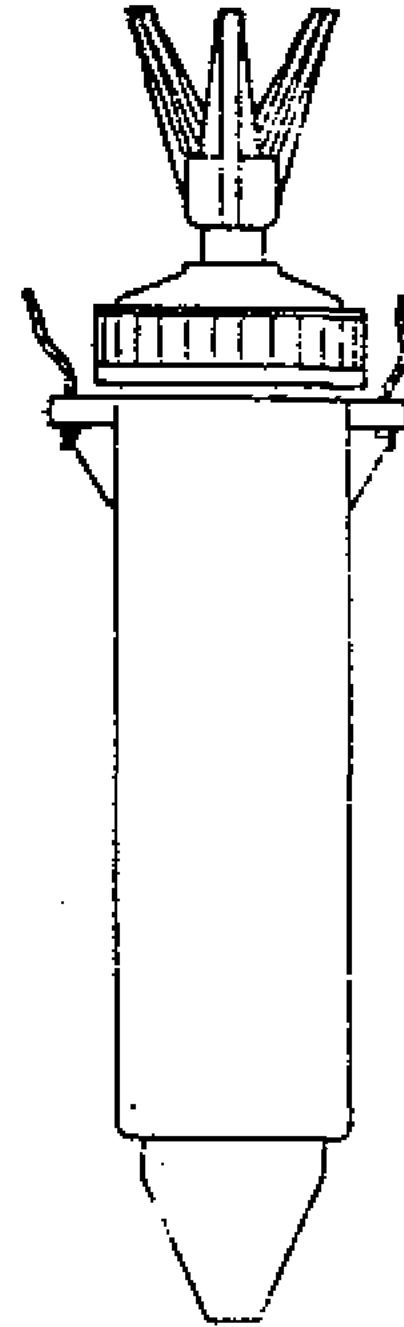
(U) Canadian Landmine, Apers, C-3

60H-5-2-1



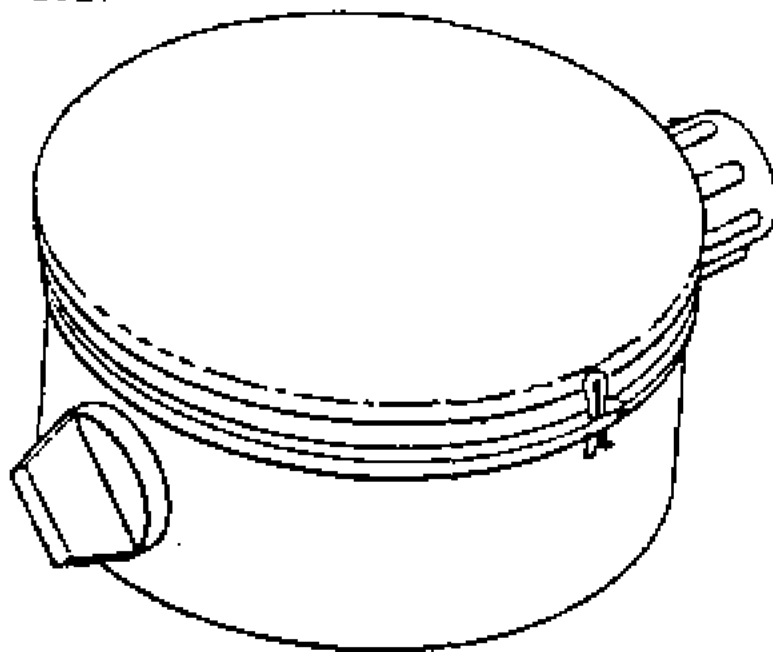
(U) U.K. Landmines, Apers; No. 6 Mk 1;

60H-3-2-8

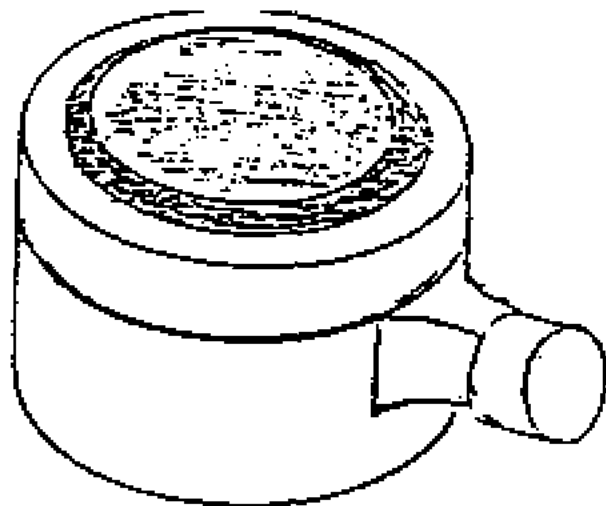


(U) U.S.S.R. Landmine, Apers, PMN

60H-35-2-7

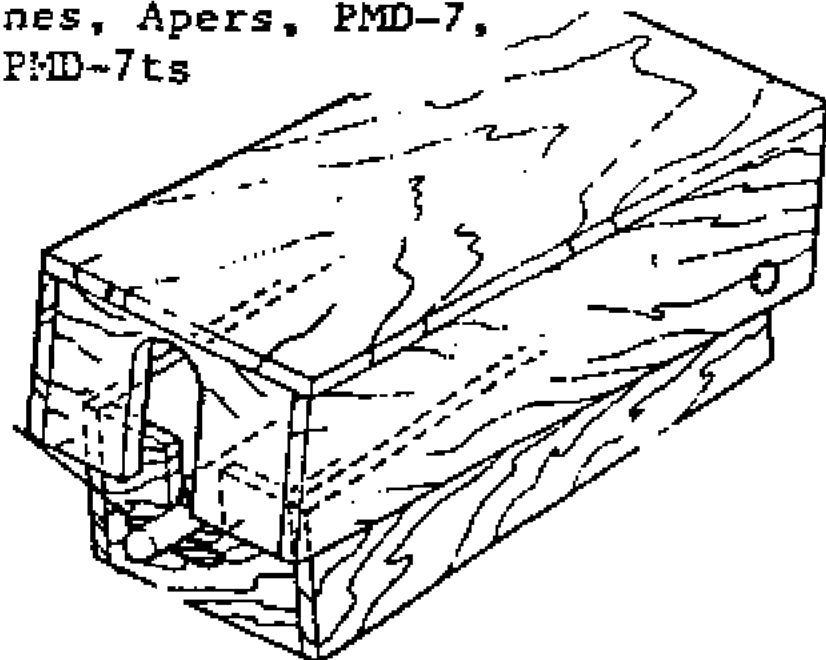


(U) Chinese, landmine (scatterable), APER, Model Unk.

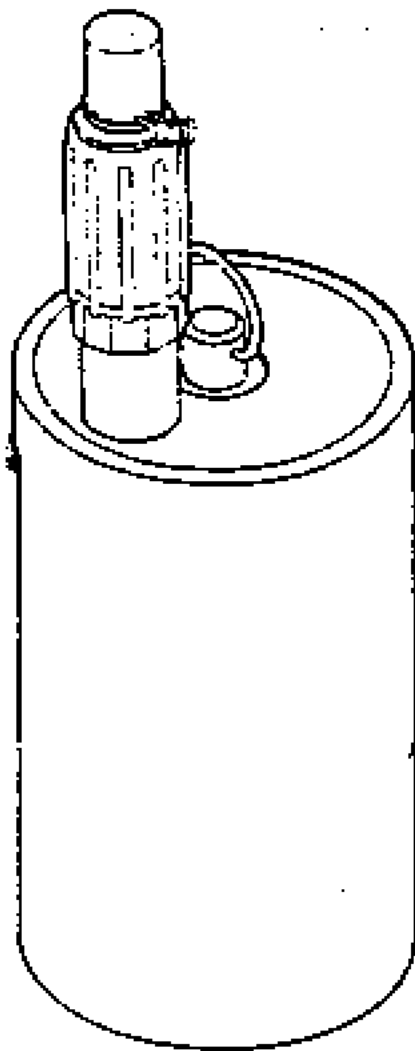


(U) U.S.S.R. Landmines, Apers, PMD-7, & PMD-7ts

60H-35-2-19

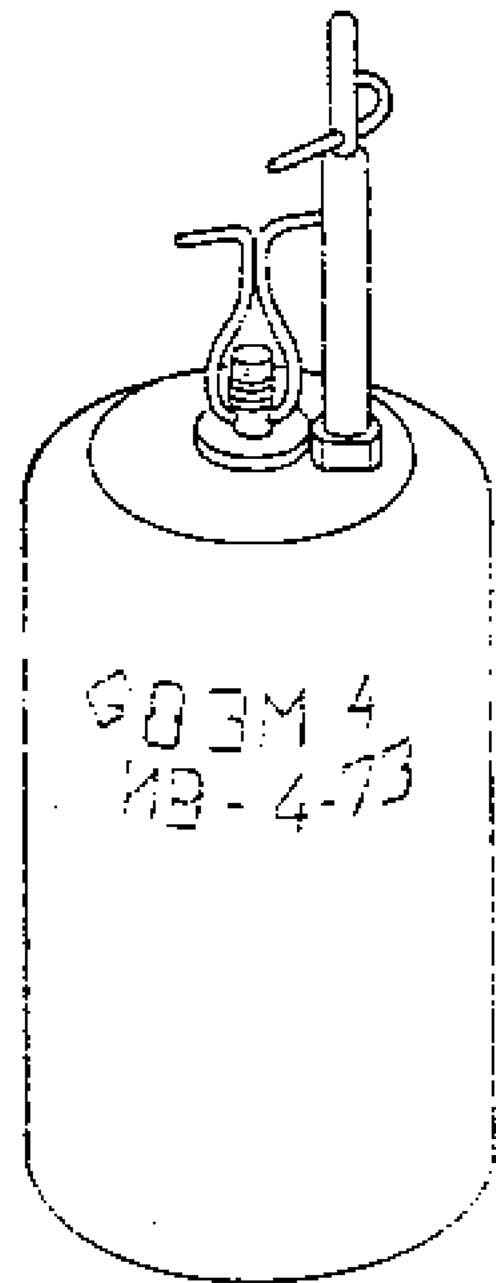
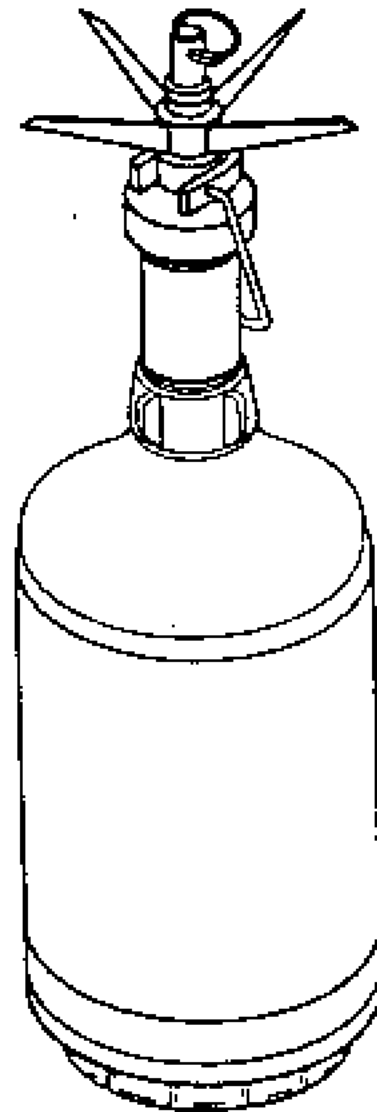


(U) Chinese Landmine,
Apers, (Bounding),
Type 69
60H-17-2-3



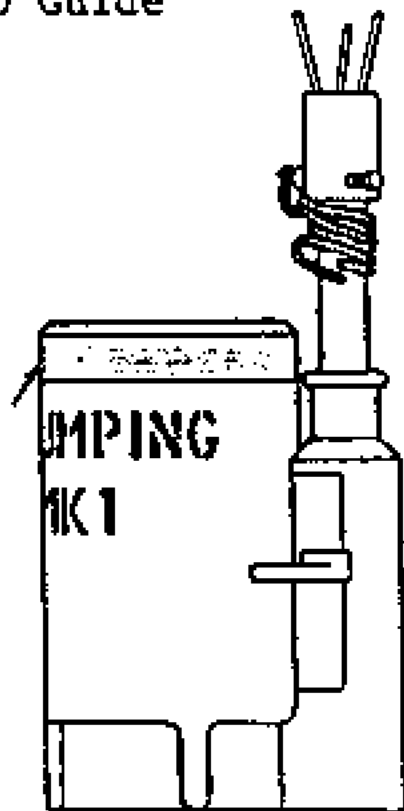
(U) U.S.S.R. Landmine,
Apers, Bounding, OZM-4
60H-35-2-14

(U) Yugoslav Landmine,
Apers, Bounding (Frag),
PROM-1
60H-37-2-1

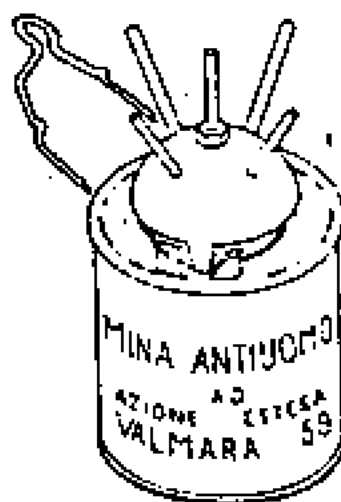


(U) Pakistani Landmine,
AP, Jumping, Model
P7 MK1

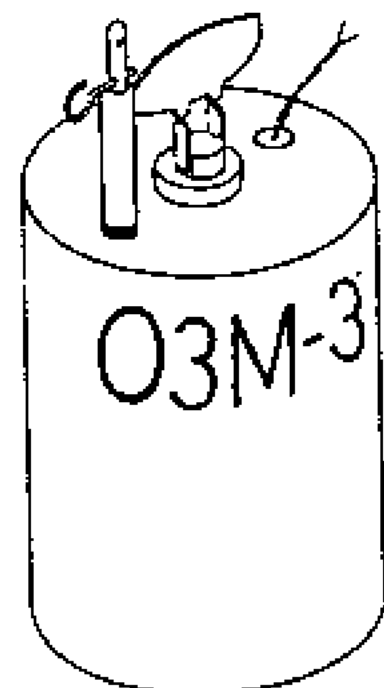
ID Guide



(U) Italian Landmines,
Apers, Valmara &
Valmara 59
60H-9-2-15

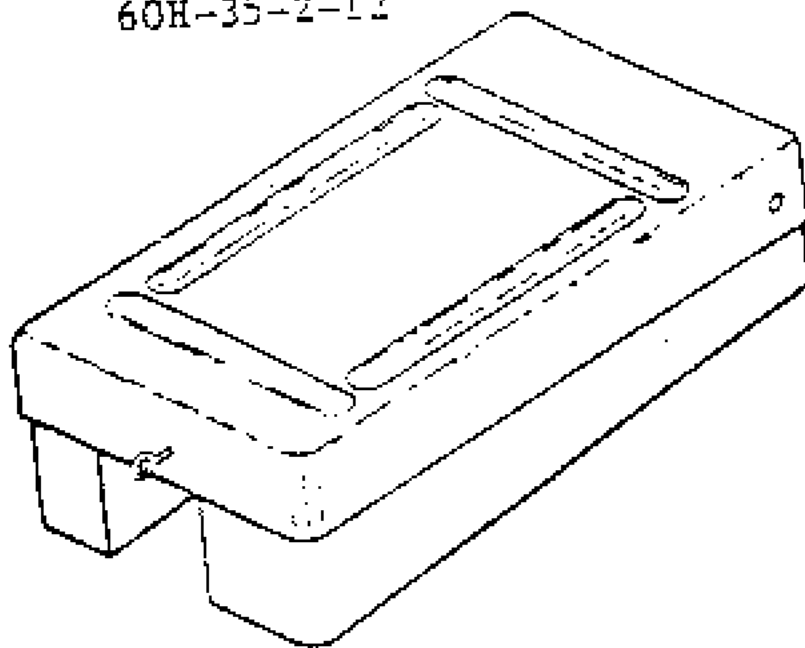


(U) U.S.S.R. Landmine,
Apers, OZM-3
60H-35-2-6



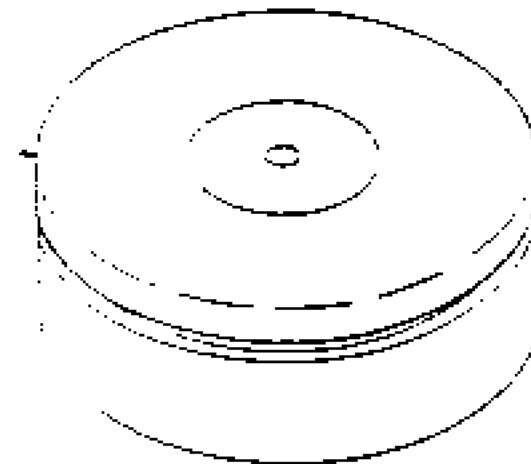
(U) Yugoslav Landmine,
Apers, PMA-1, PMA-1A.

60H-35-2-12



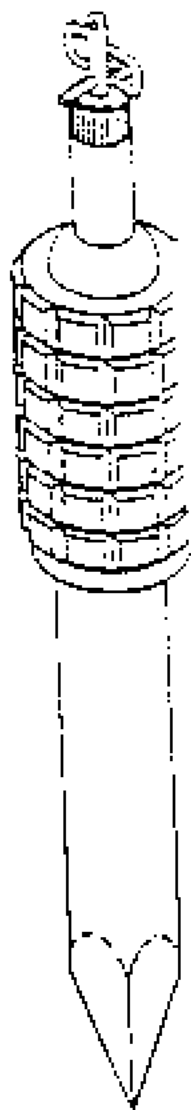
(U) Yugoslav Landmine,
Apers, Model PMA-3

60H-37-2-3



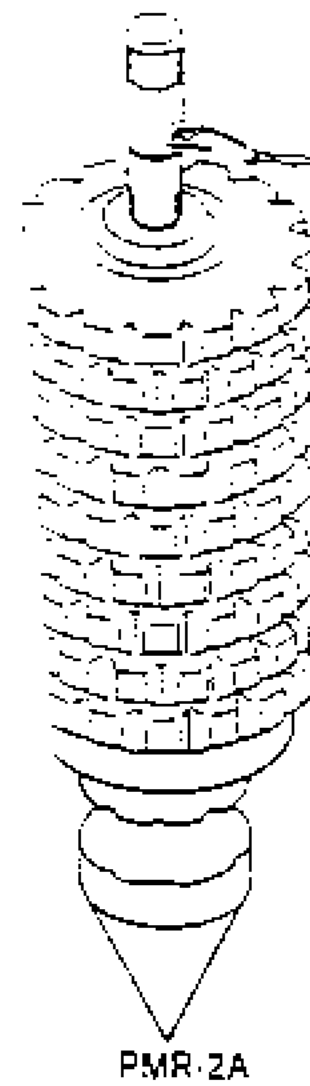
(U) Czechoslovak
Landmine, Apers, PP-
Mi-Sk

60H-39-2-21

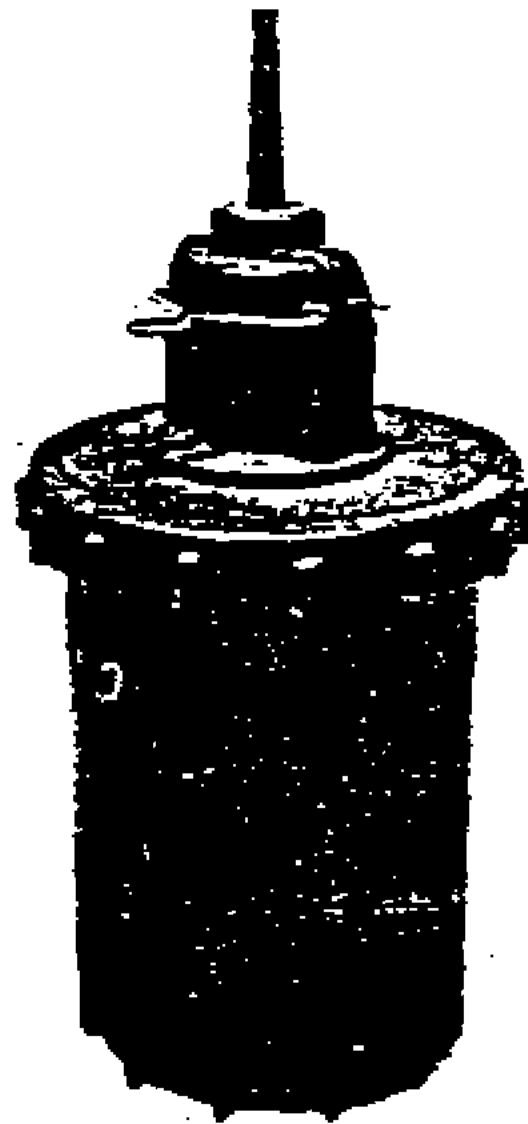


(U) Yugoslav Landmine
Apers, PMR-2A

60H-37-2-13

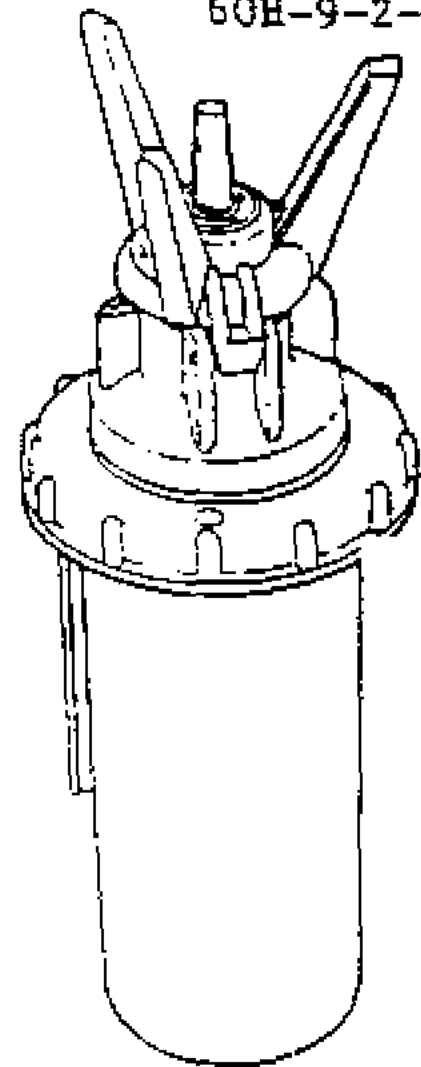


(U) U.S.S.R. Land-
mines, Apers, POMZ-2
& POMZ-2M 60H-35-2-1-2



P-40 anti-personnel mine

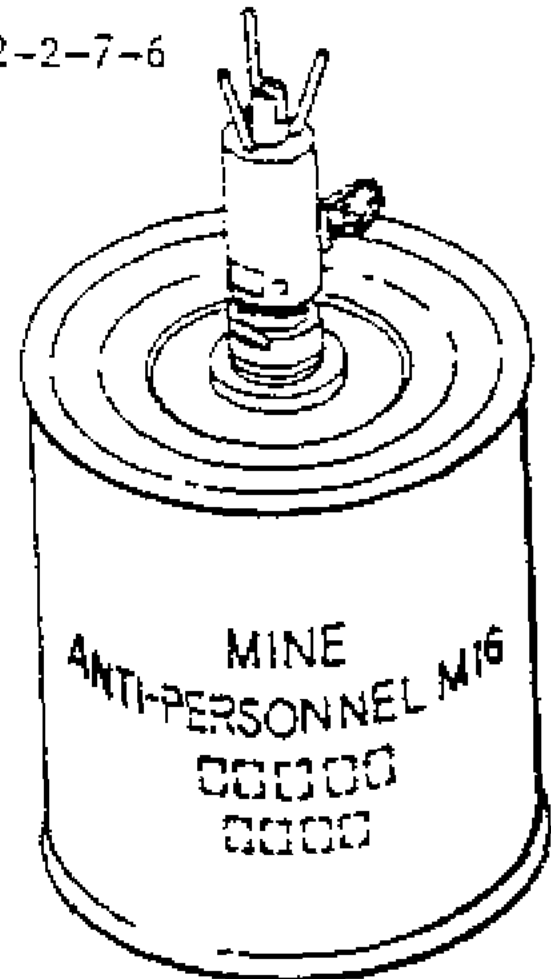
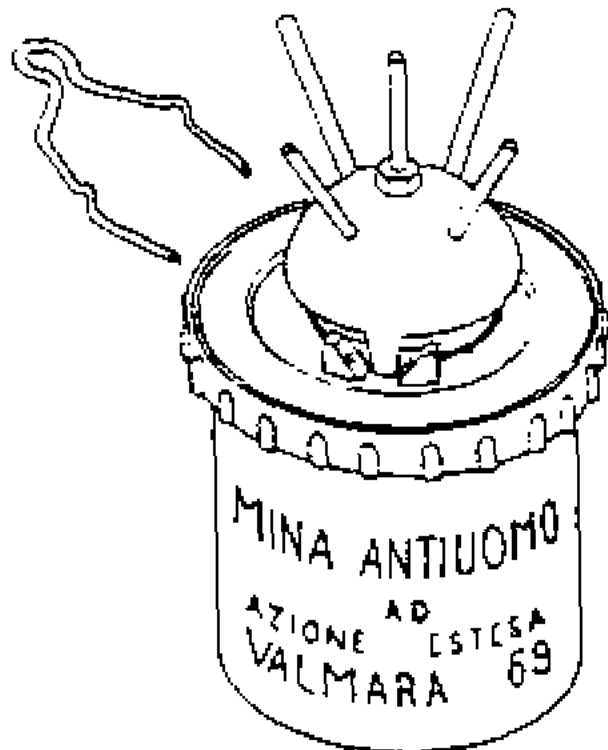
(U) Italian Landmine,
Apers, Model P-25
60H-9-2-10



(U) U.S. Landmines,
Apers, HE, M16

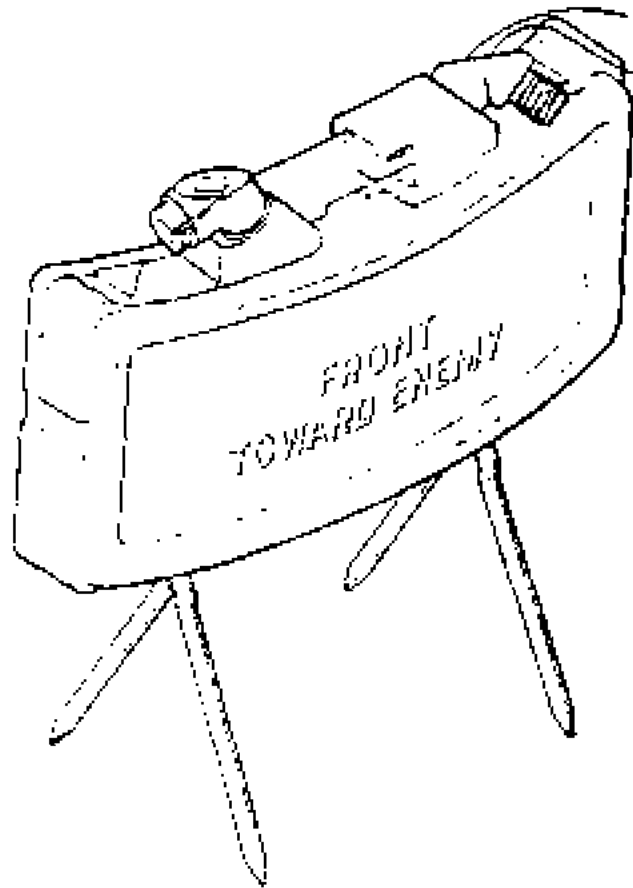
60H-2-2-7-6

(U) Italian Landmines, 60H-9-2-15
Apers, Valmara 69 &



(U) U.S. Landmine,
Apers, HE, M18A1; &

60N-2-2-3i

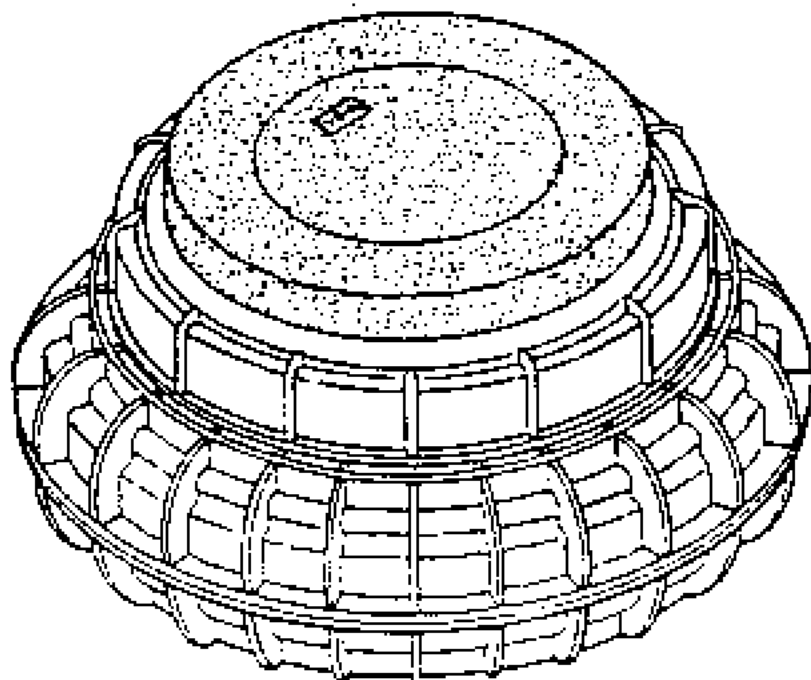


Other claymore-type mines include:

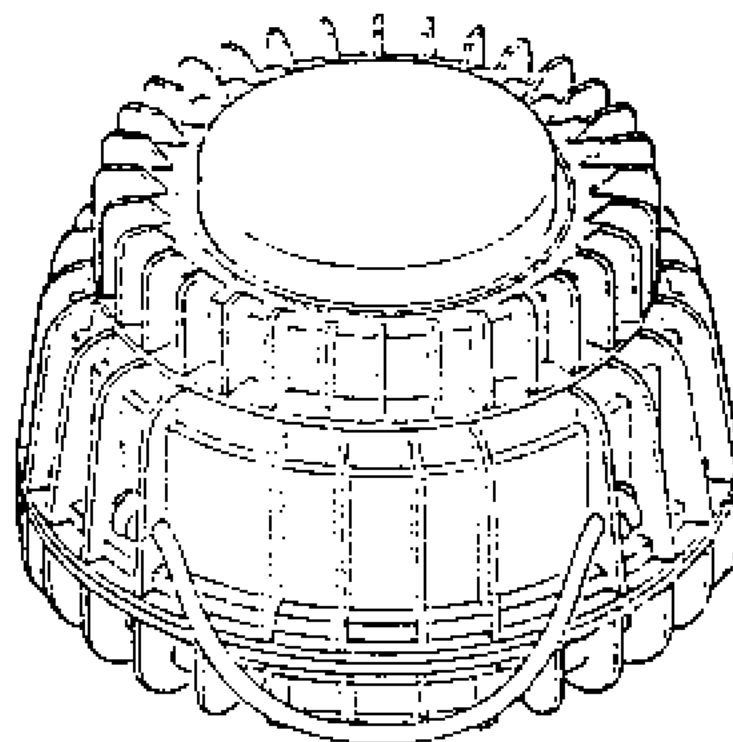
Soviet MON 50 APERS mine
Soviet MON 100 APERS mine
Soviet MON 200 APERS mine
Yugoslavian MRVD APERS mine

ANTI-TANK MINES

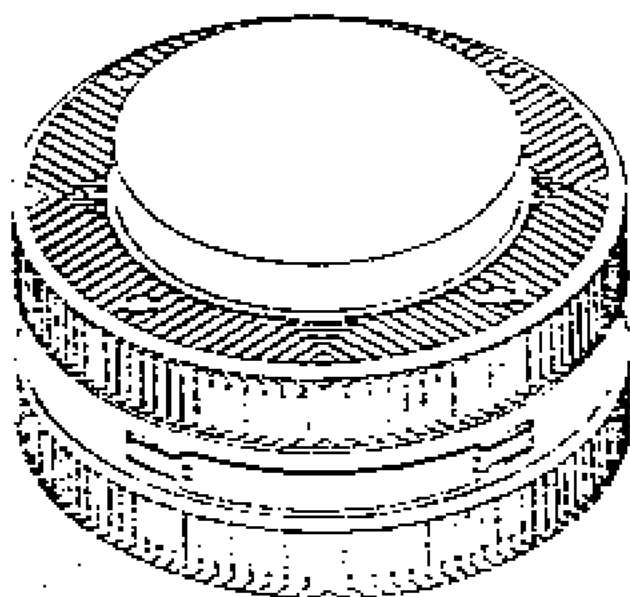
(U) Italian Landmine, 60H-9-2-17
AT, Model VS-2.2



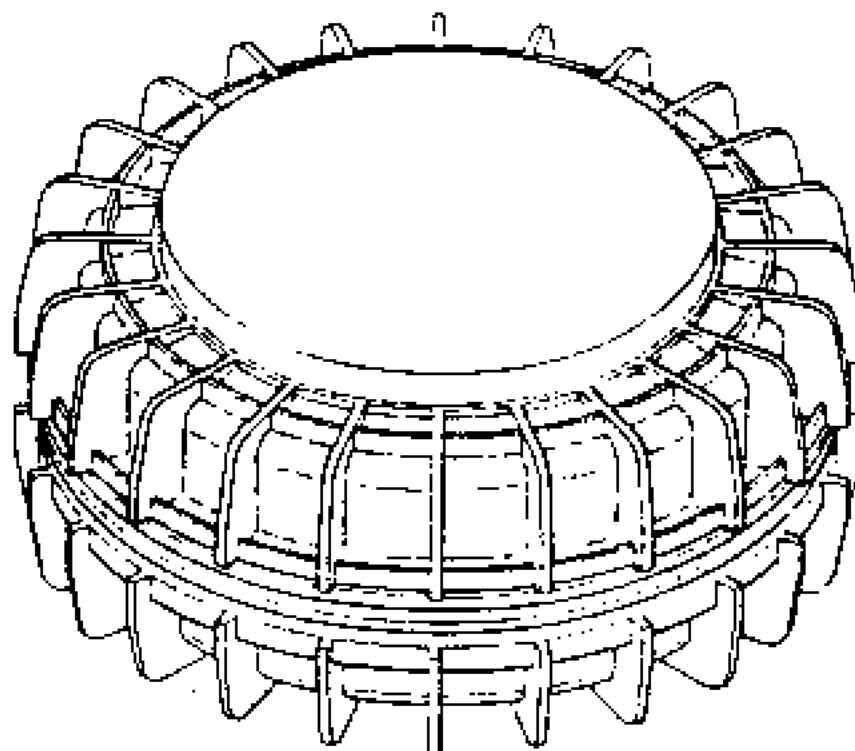
(U) Italian Landmine, 60H-9-2-7
AT, Model TC-6



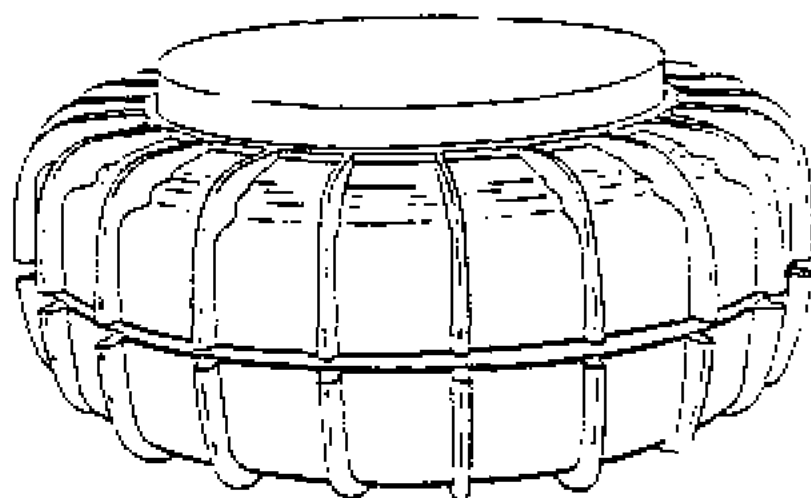
(U) Italian Landmine, 60H-9-2-8
AT, TC/2.4



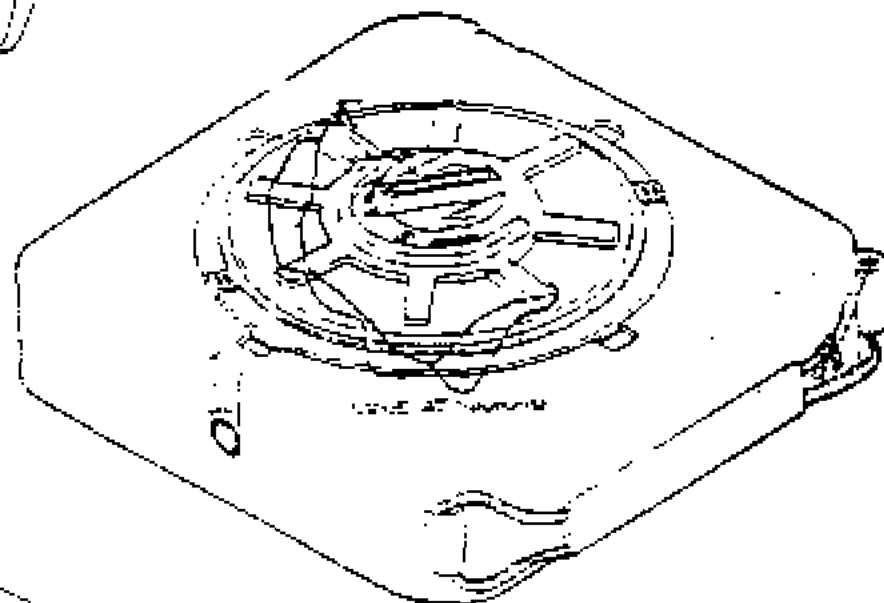
(U) Italian Landmine, 60H-9-2-14
AT, Model VS 1.6



(U) Italian Landmines,
AT, (Scatterable),
Models SB-81 and
SB-81/AR-AN

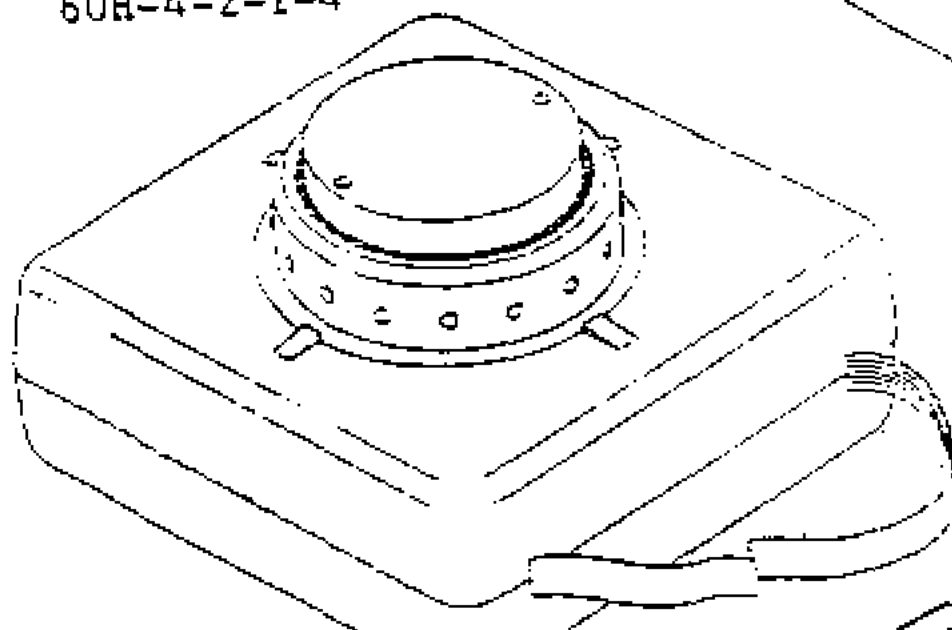


(U) U.S. Landmine, AT,
Heavy, HE, M19
60H-2-2-13-3

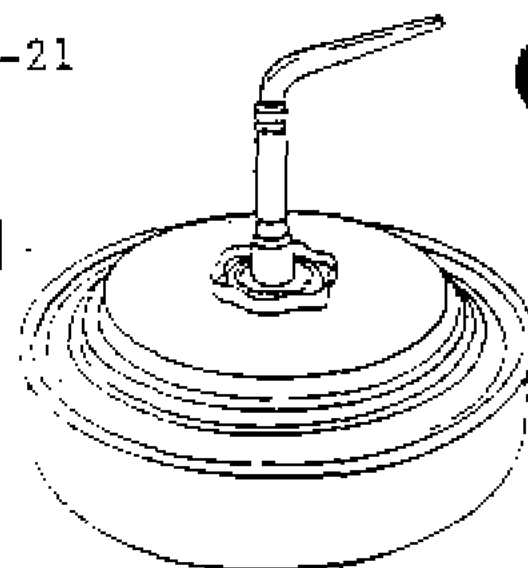


(U) Belgian Landmine,
AT, PRB-ATK-M3

60H-4-2-1-4

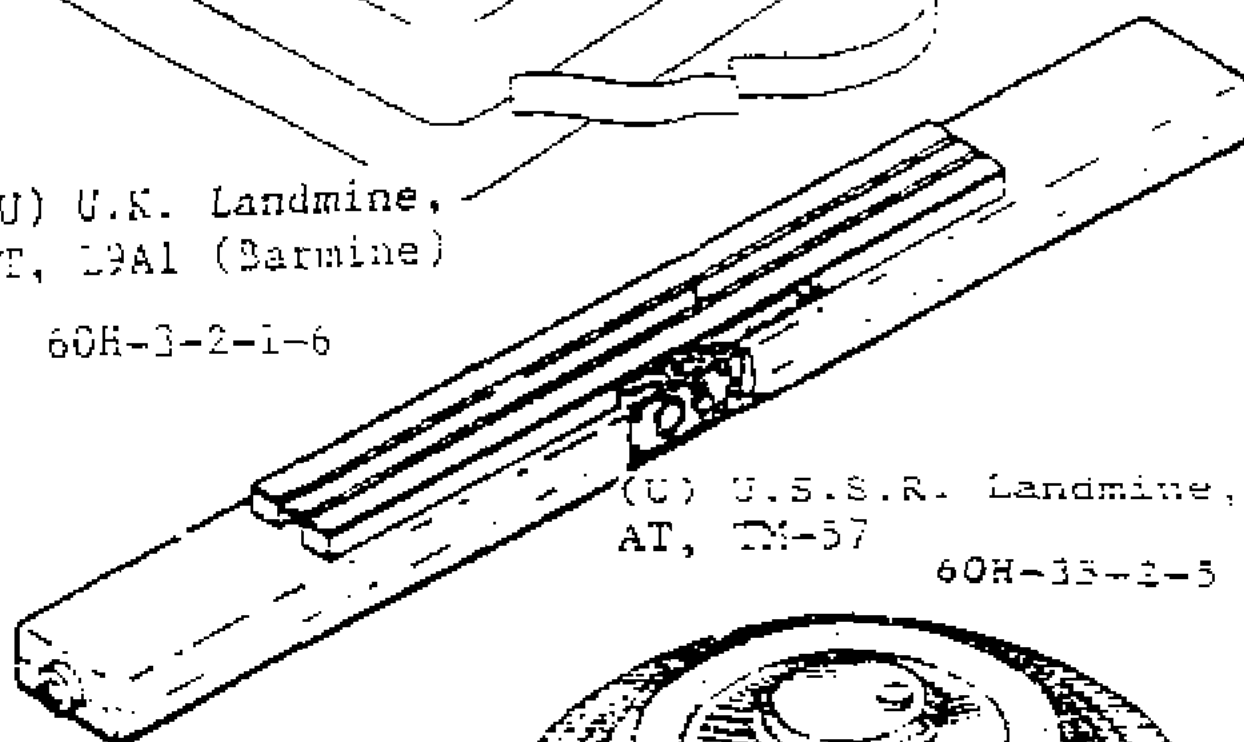


(U) U.S.S.R. Landmines,
AT, TM-46 and TMN-46,
60H-35-2-21

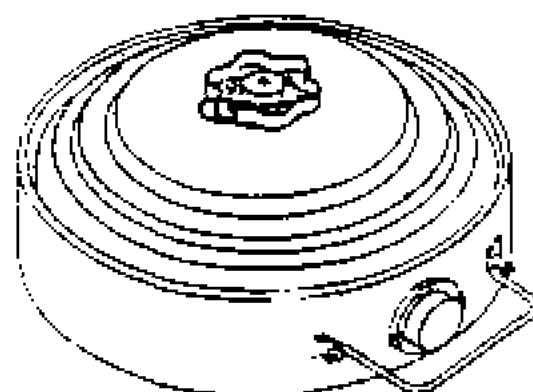
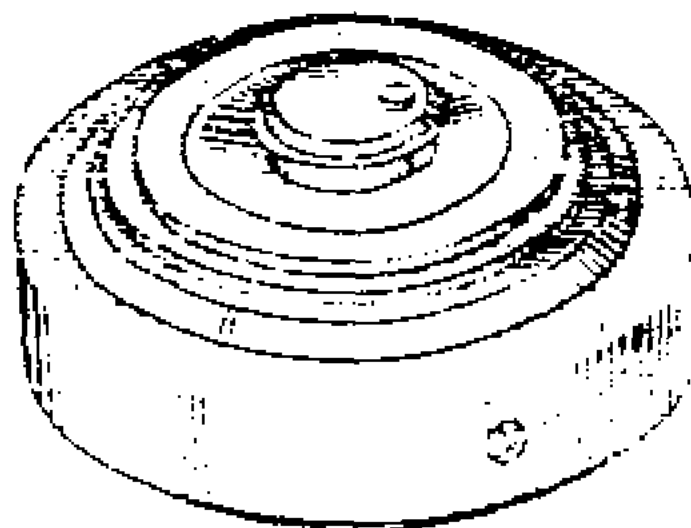


(U) U.K. Landmine,
AT, L9A1 (Sarmine)

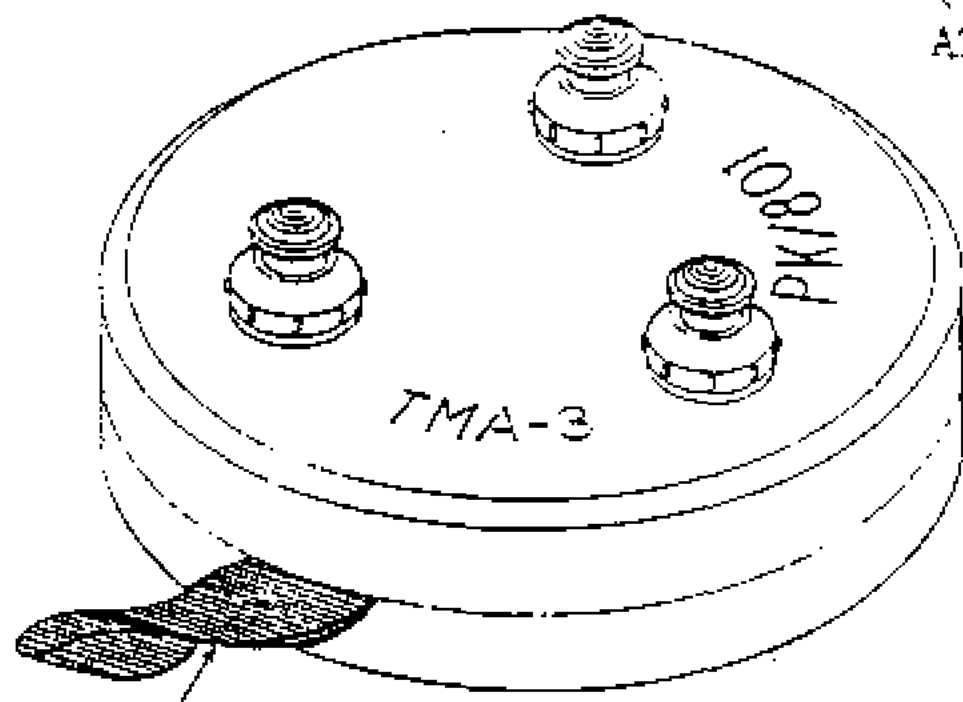
60H-3-2-1-6



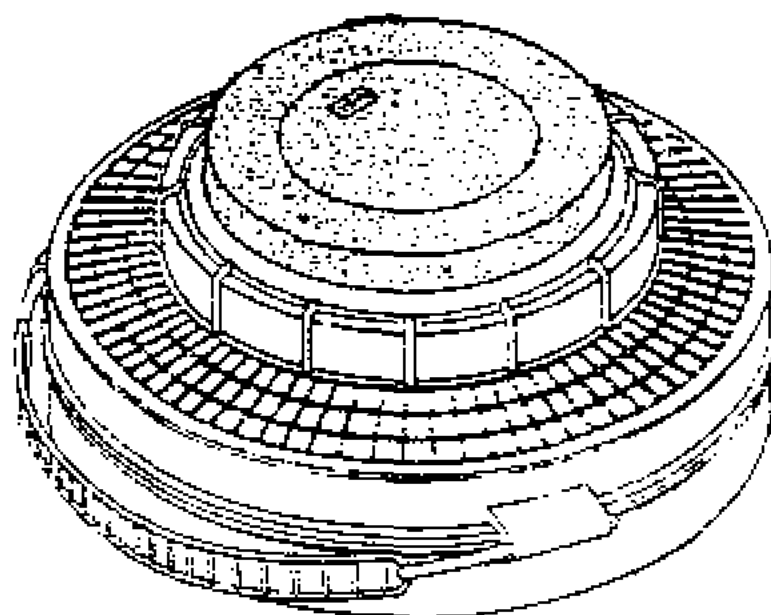
(U) U.S.S.R. Landmine,
AT, TM-57
60H-35-2-5



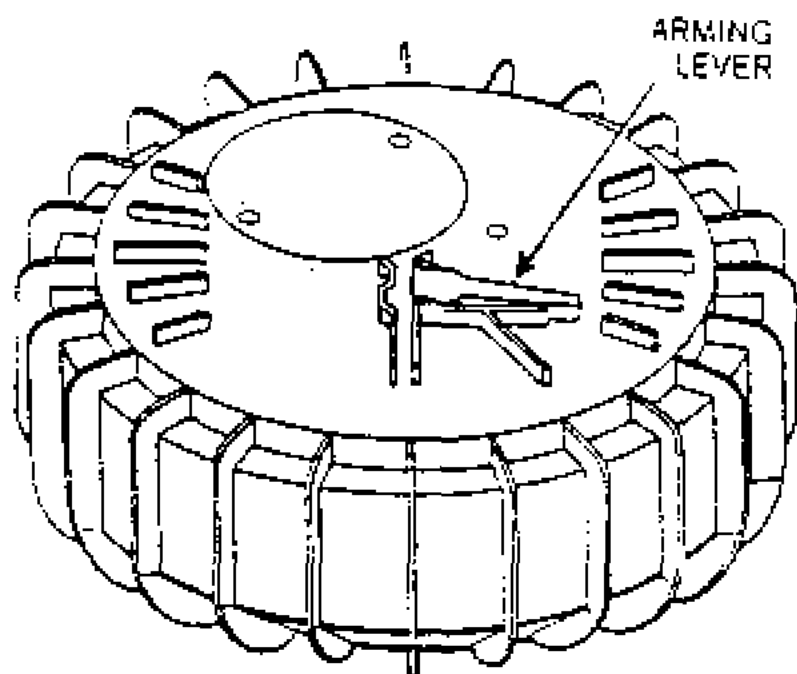
(U) Yugoslav Land- 60H-37-2-14
mines (Nonmetallic),
AT, Models TMA-3



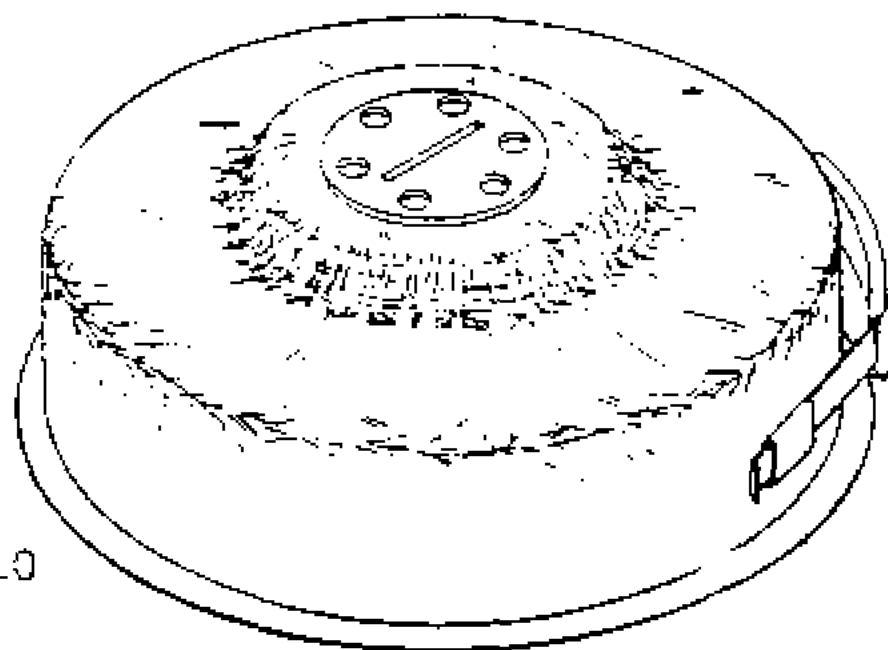
(U) Italian Landmines, 60H-9-2-13
AT, SH55 & FD



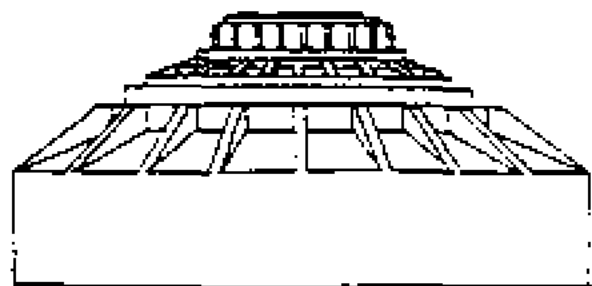
(U) Italian Landmine, 60H-9-2-5
AT, SB-MV and SB-MV/AR (DS)



(U) U.K. Landmine, AT, 60H-3-2-1-5
Mk 7, Mk 7/1, Mk 7/4

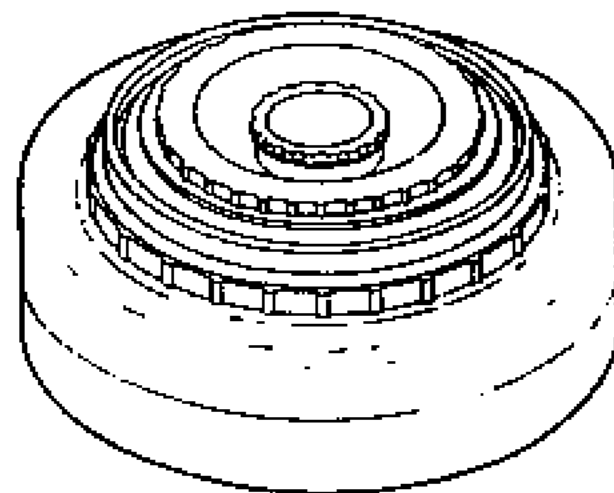
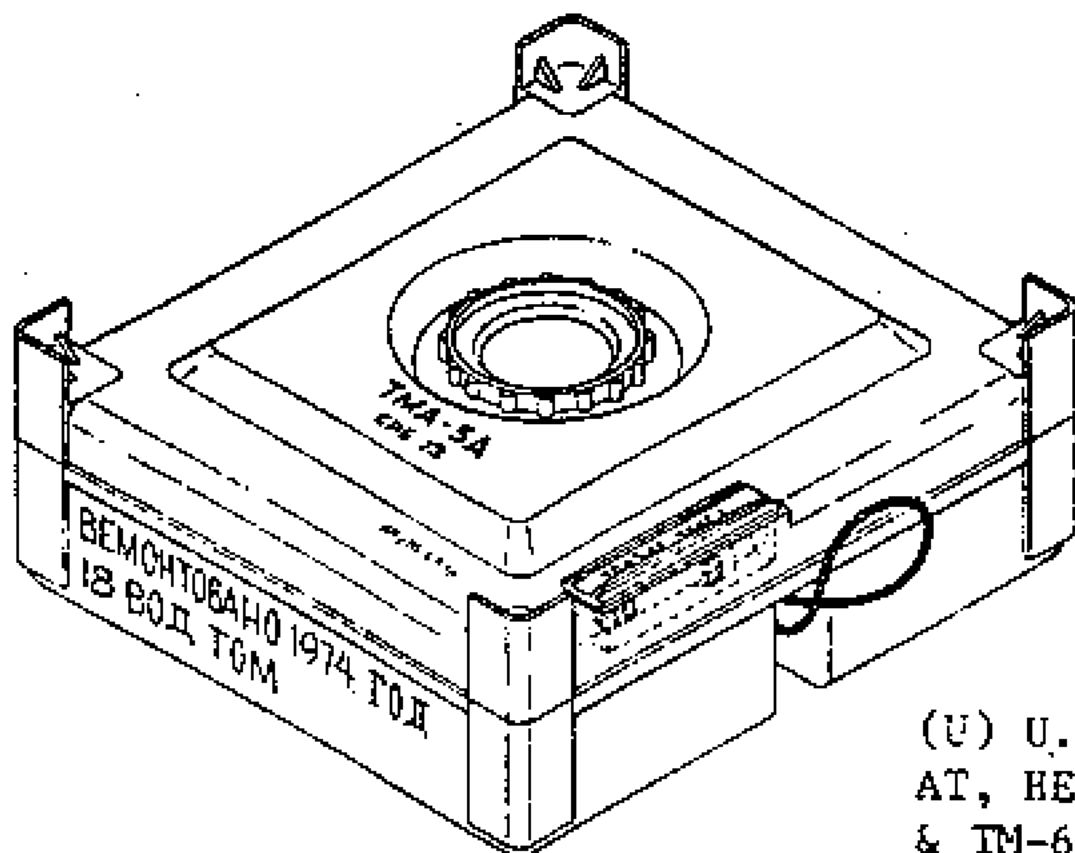


(U) Yugoslav Landmine, 60H-37-2-10
AT, TMRP-6 (DS)



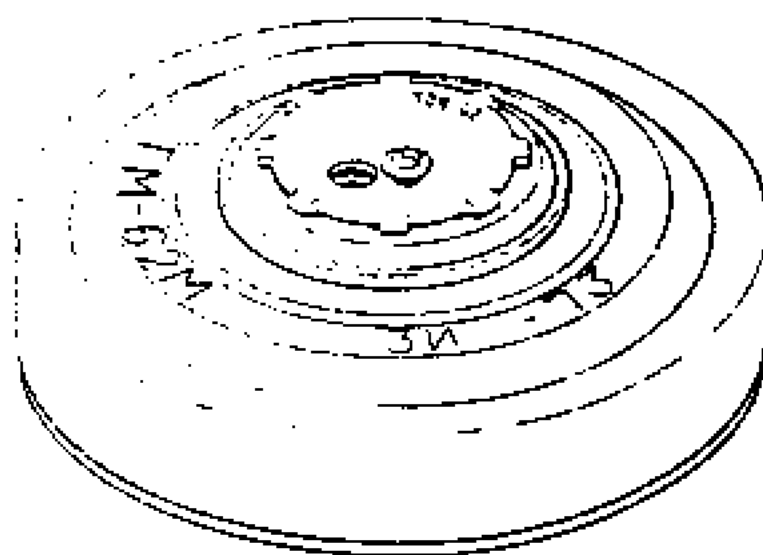
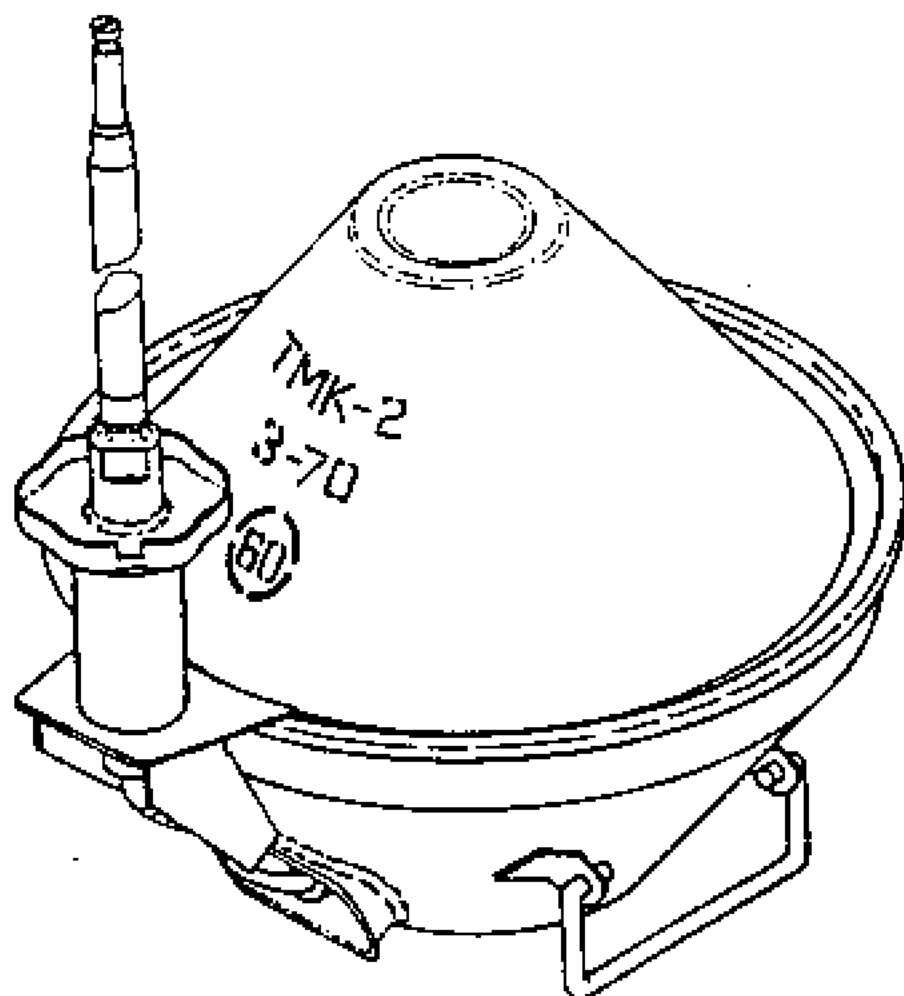
(U) Czechoslovak Landmine, AT, PT-Mi-BAIII;
& Landmine, Practice,
BT-Mi-BAIII 60H-20-2-12-5

(U) Yugoslav Landmine, 60H-37-2-2
AT, Nonmetallic, Model
TMA-5A



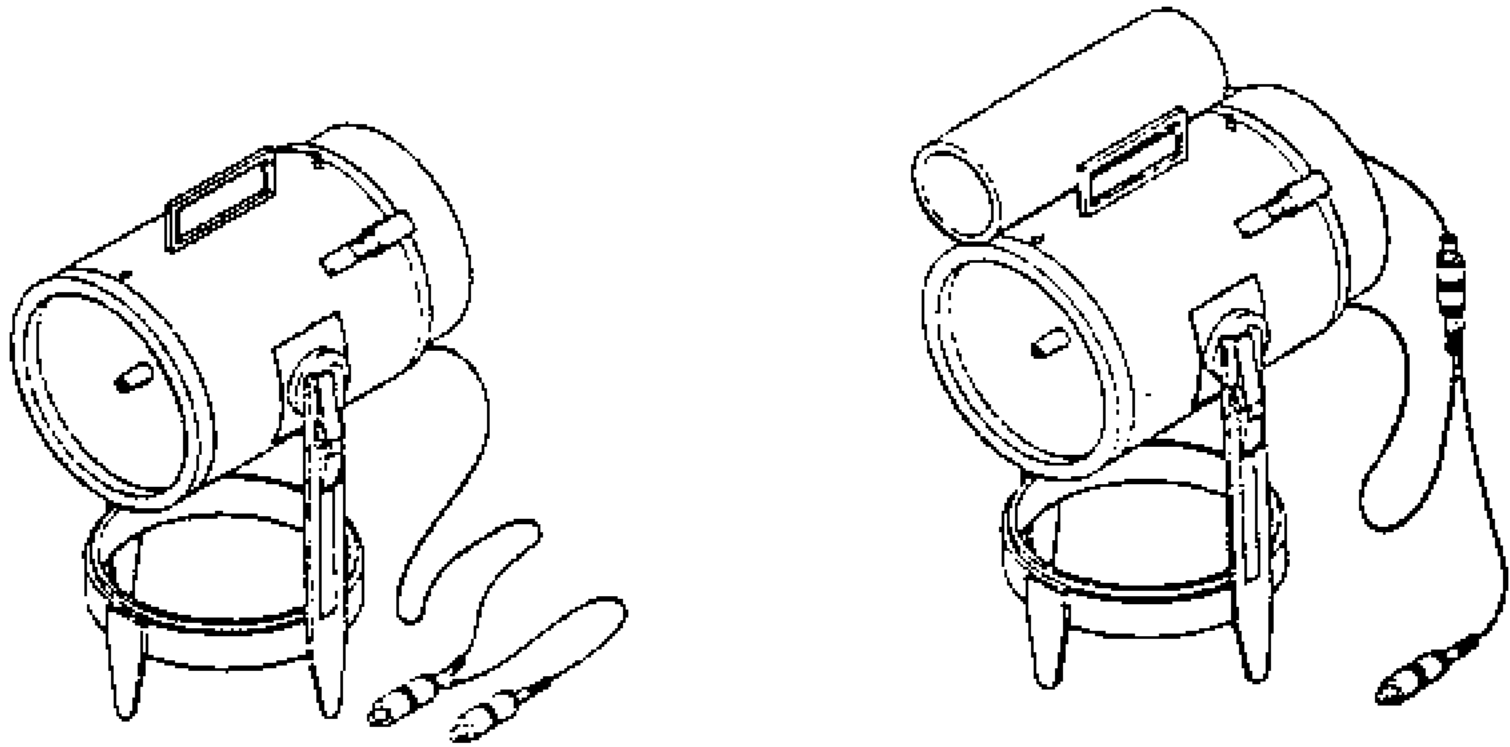
(U) U.S.S.R. Landmine, 60H-35-2-12
AT, HE, TM-62M, TM-62P,
& TM-62B

(U) U.S.S.R. Landmine, 60H-35-2-1-10
AT, TMK-2



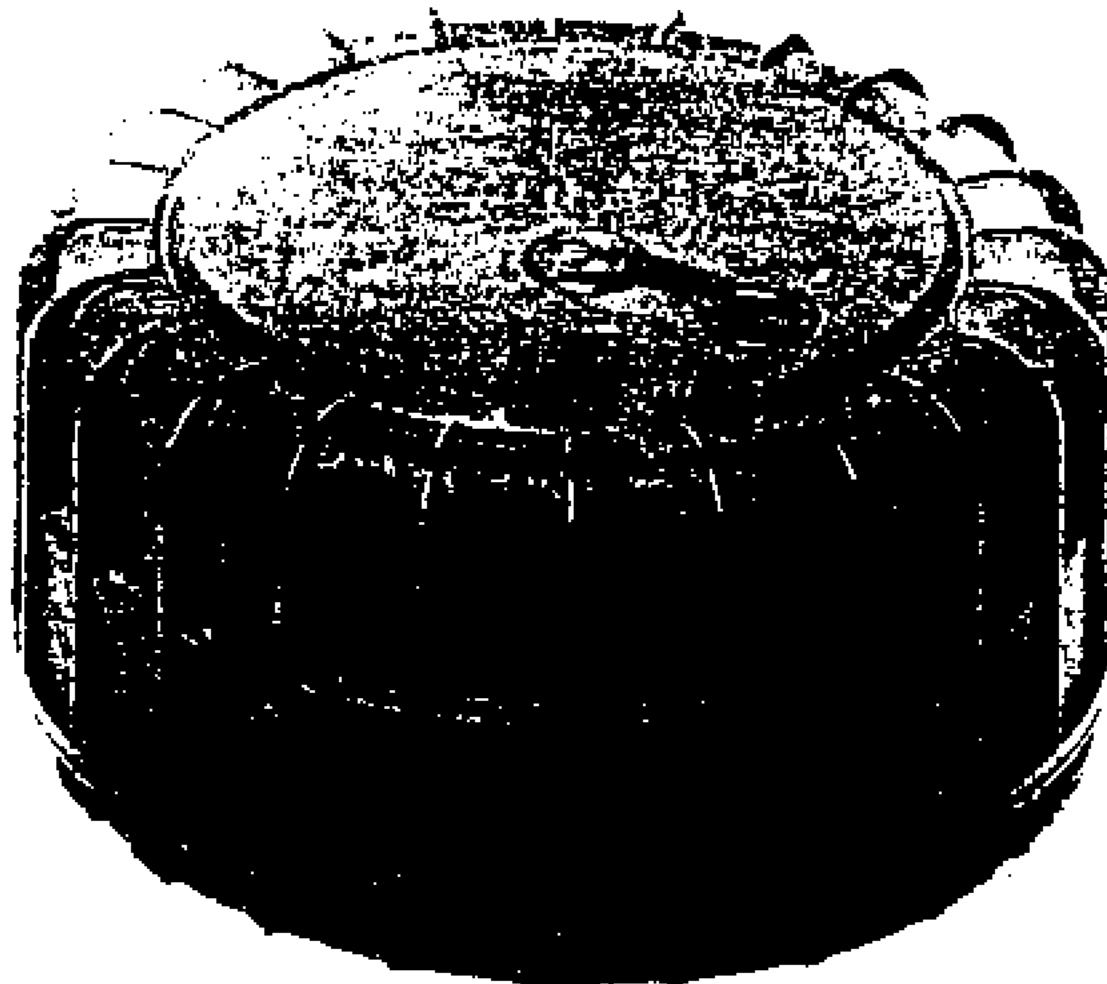
(U) French Landmines,
AT, MIACAH, Type F1,
IRMAH Type F1

60H-7-2-2
(DS)



VS-HCT

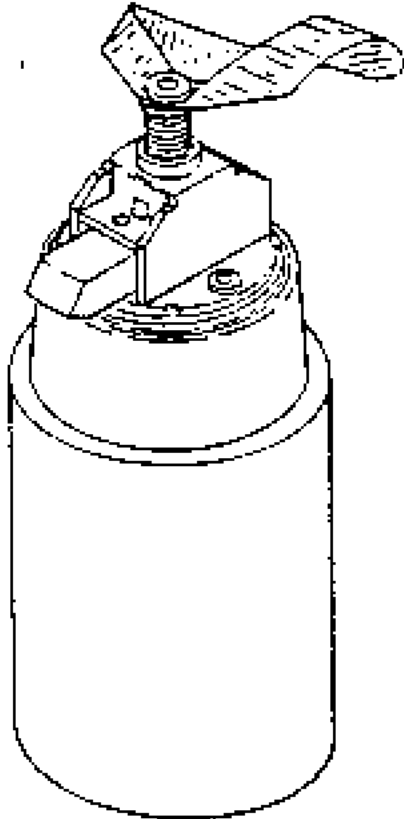
**Full-width Influence
Anti-tank Mine**



SCATTERABLE MINES

ROCKET AND/OR ARTILLERY SUBMUNITIONS THAT MAY BE ENCOUNTERED DURING DESERT SHIELD

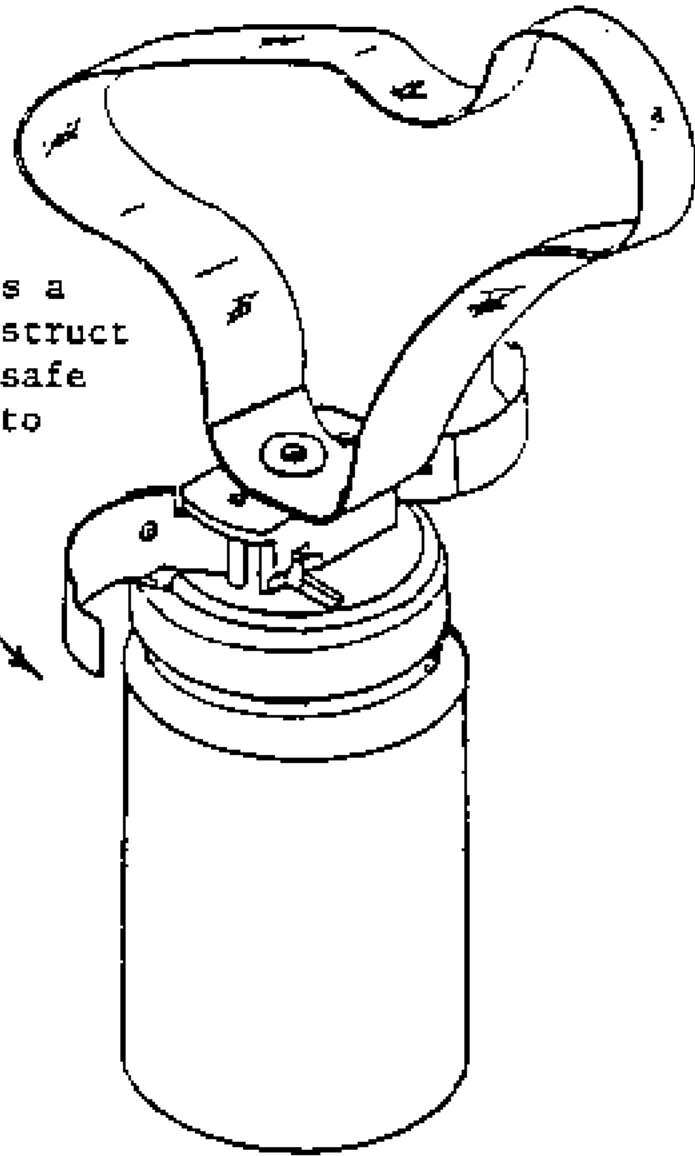
(U) U.S. Grenades, 60E-2-2-23
DP, HE, M42, M46,
and M77



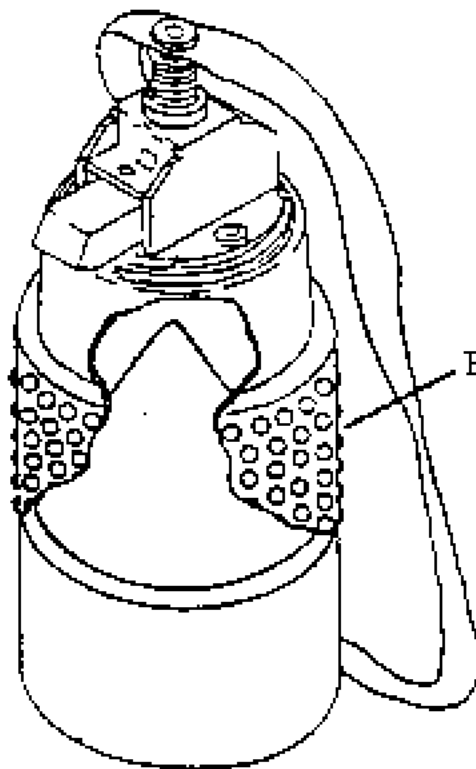
(U) German Grenade, DP, HE,
RH II

Length: 83.5 mm
Diameter: 42.25 mm

The grenade contains a
pyrotechnic self-destruct
and is reported to safe
itself if it fails to
function.

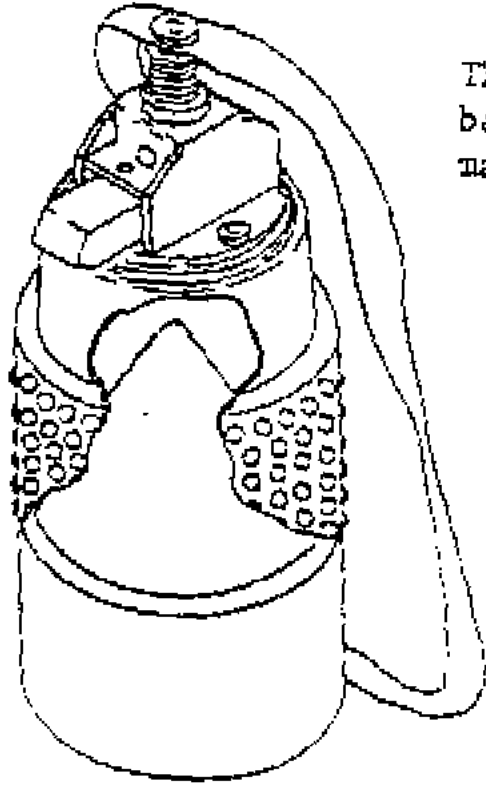


(U) Iraqi/Yugoslavian Grenade,
DP, HE, Model Unknown



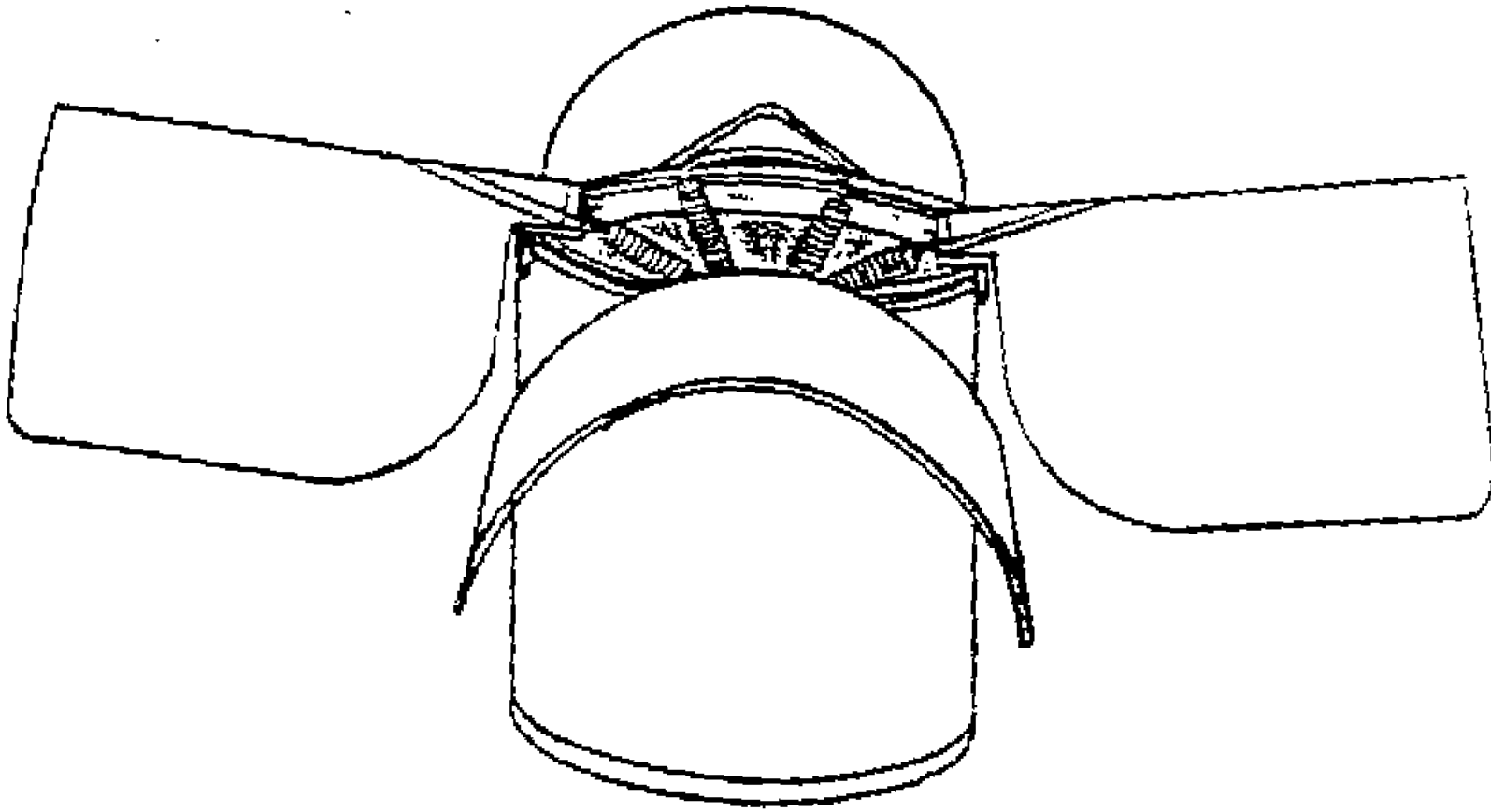
Frag Sleeve

The grenade has a plastic frag
sleeve and a fuze that resembles
the one used with the US M77.



This munition has a frag sleeve with ball bearings embedded in a plastic matrix.

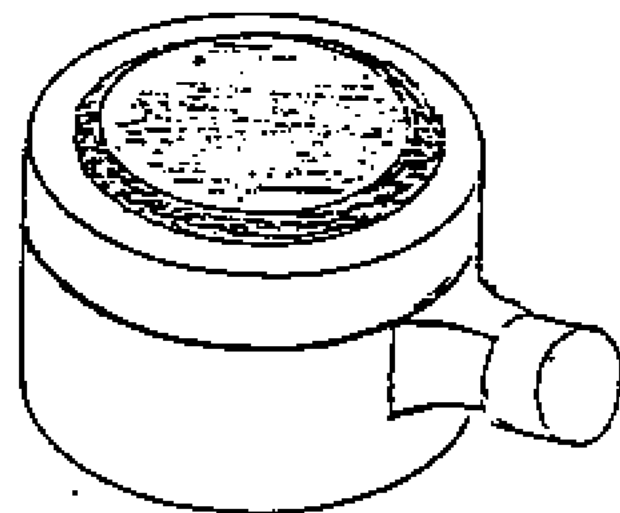
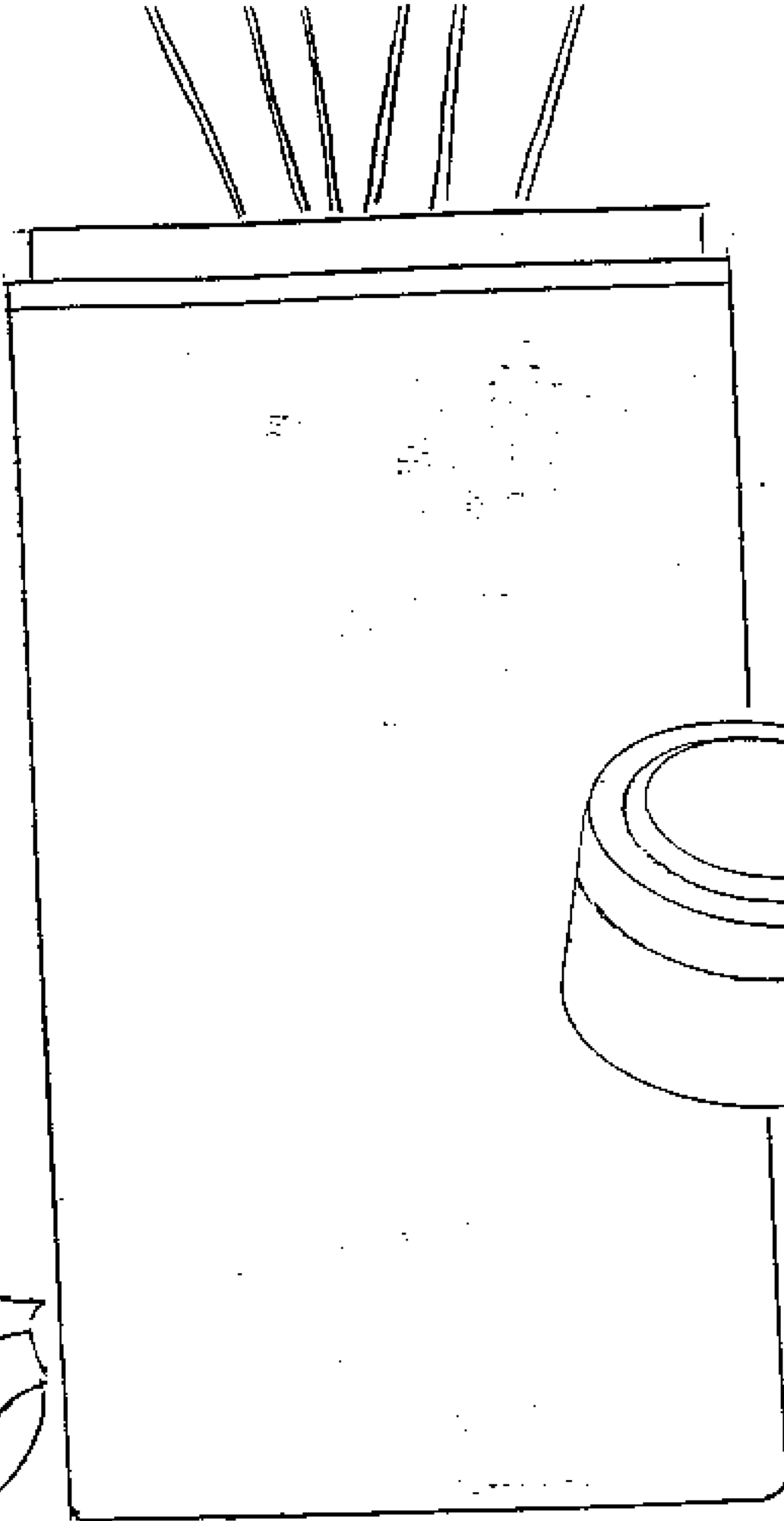
Dual-purpose ICM and AT mine used with the Iraqi 162-mm rocket system.



CHINESE MINE DISPENSER
FOR 122 MM ROCKET WITH
MINE.

APPROX. SCALE

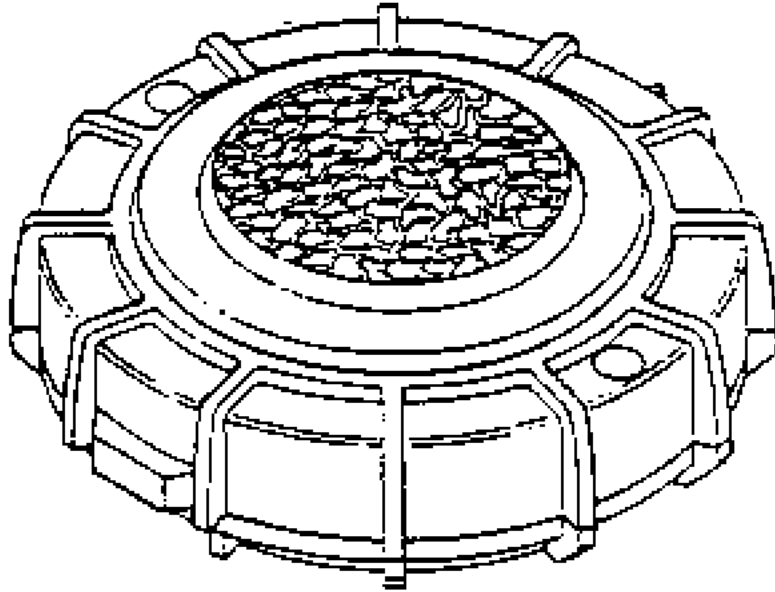
95 TO 128 MINES PER
ROCKET



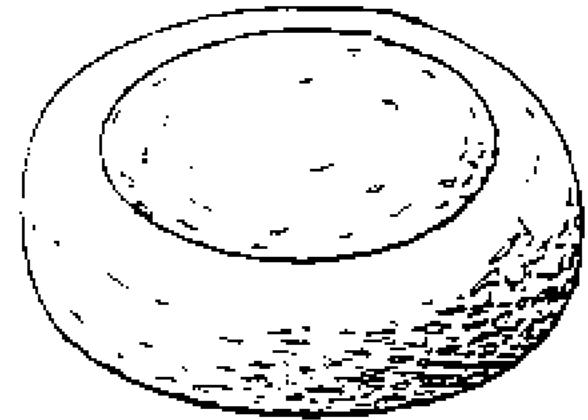
(U) Chinese, landmine
(scatterable), APER, Model Unk,

182

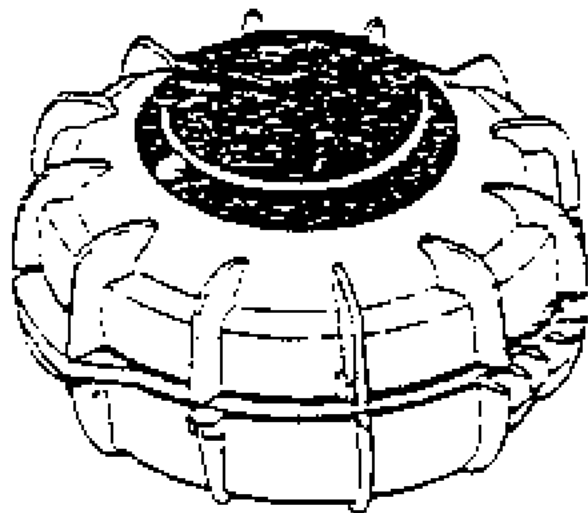
(U) Italian Landmine, 60H-9-2-6
Apers, Models VS-MK 2
& VS-MK 2 AR-AN



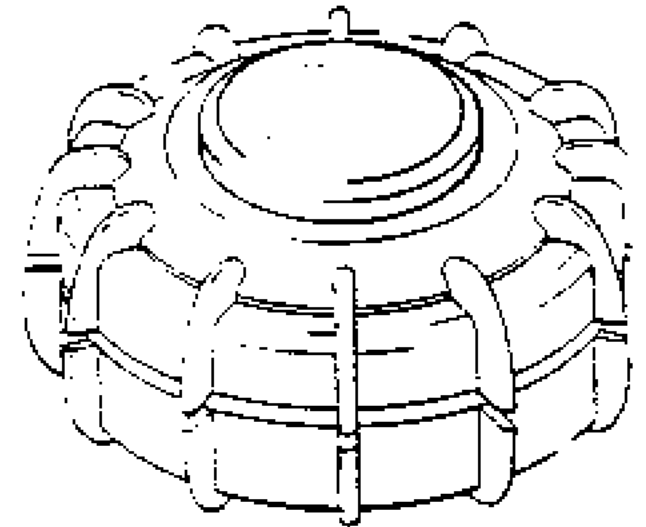
(U) Italian Landmines,
Apers, (Scatterable),
Models SE-33 and SE-
33/AR-AN



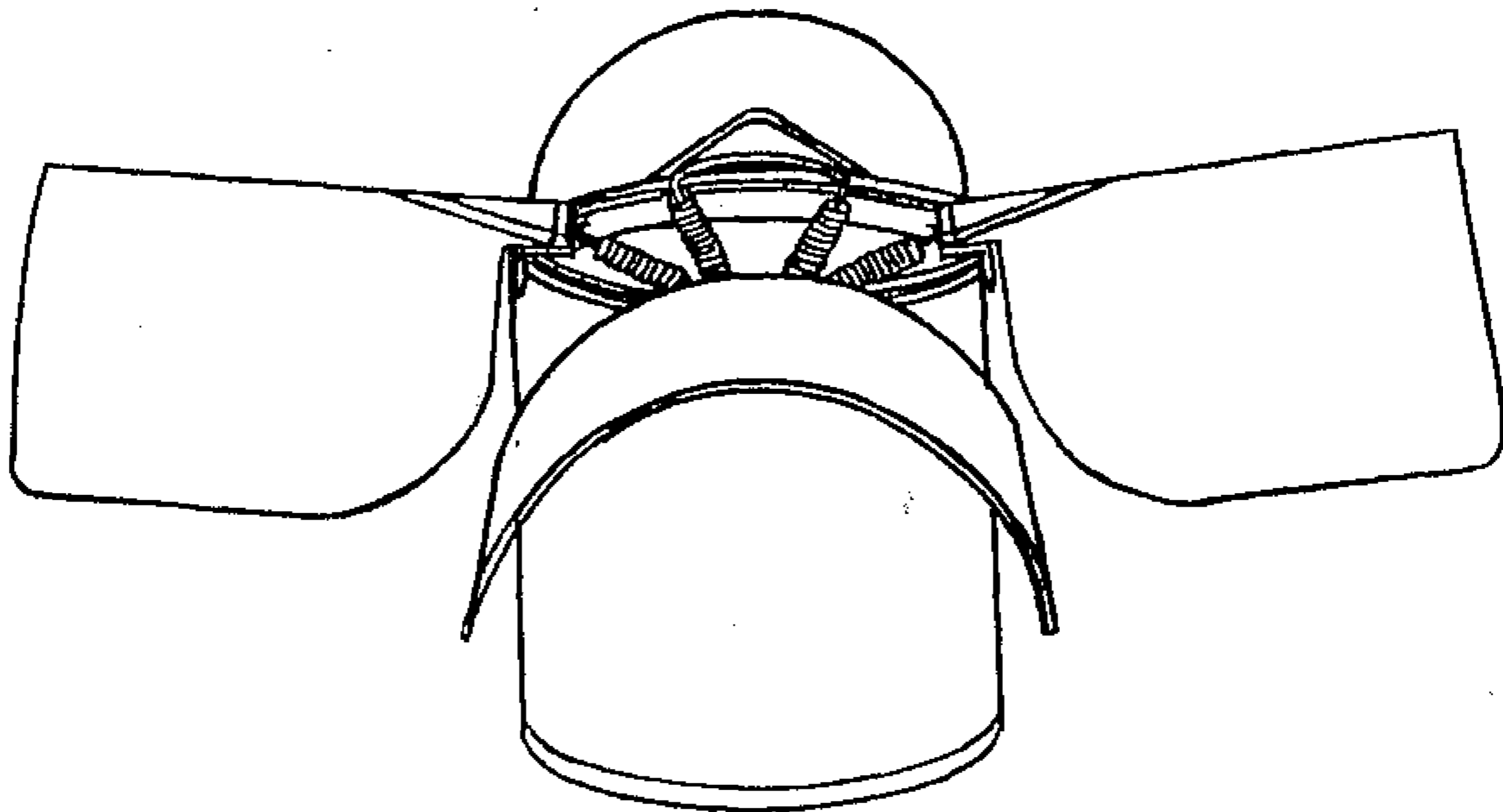
(U) Italian Landmines, 60H-9-2-11
Apers, VS 50 & VS 50AR



(U) Italian Landmine,
Apers, (Scatterable),
Model TS-50

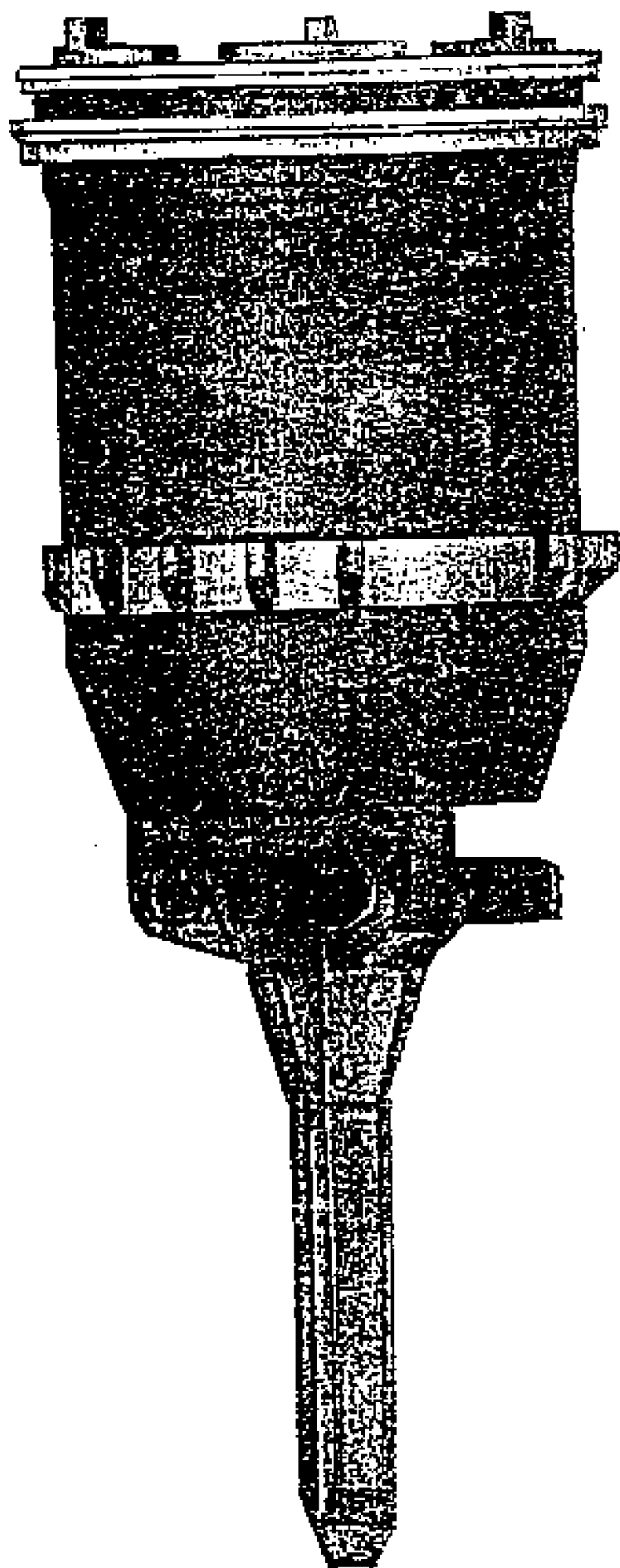


184

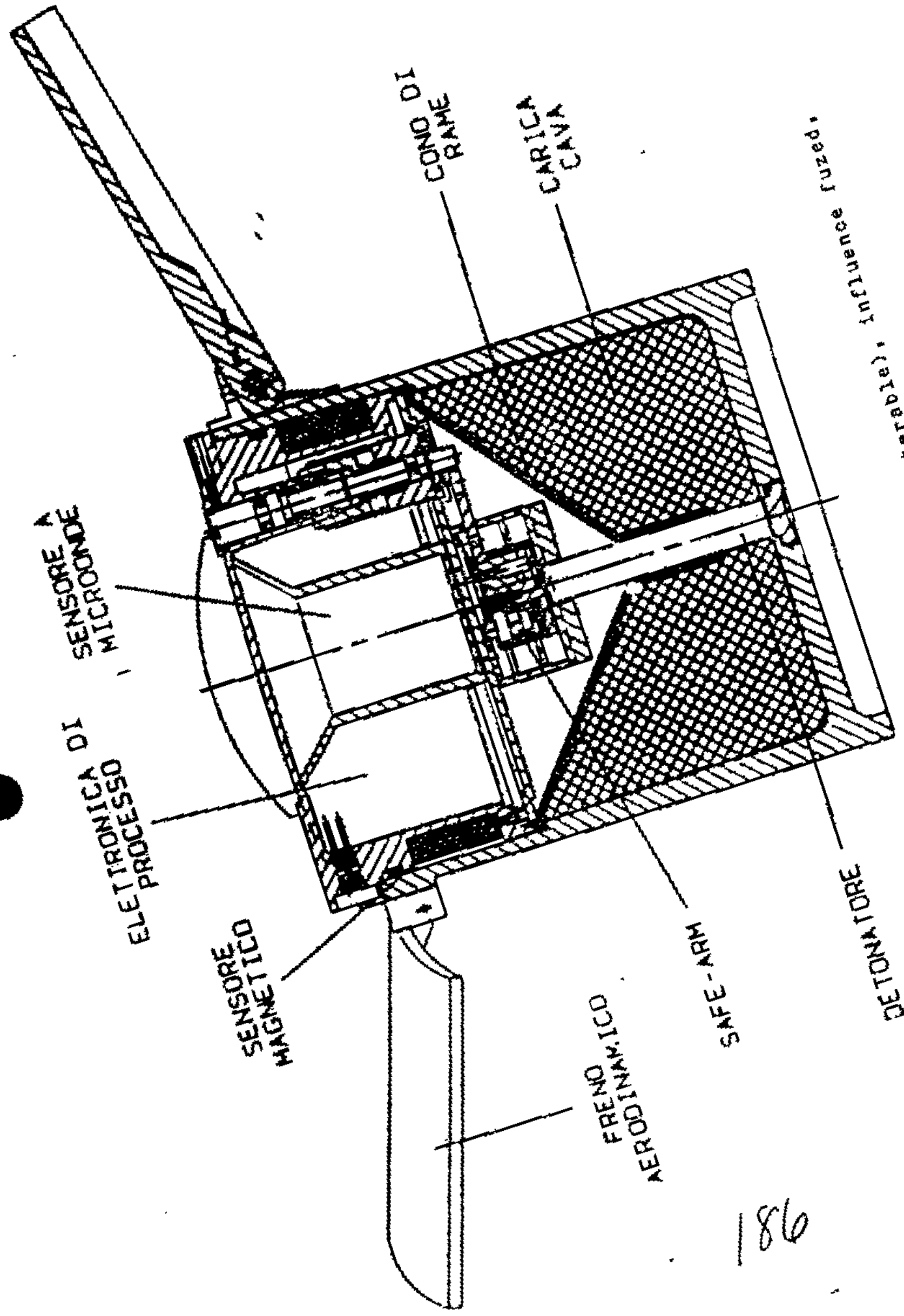


(U) Yugoslav landmine (scatterable), influence fuzed,
Model Unk, 262 mm, Rocket

(U) Chinese, Landmine, AT (scatterable), influence
fuzed, Model Unk, 122 mm, Rocket

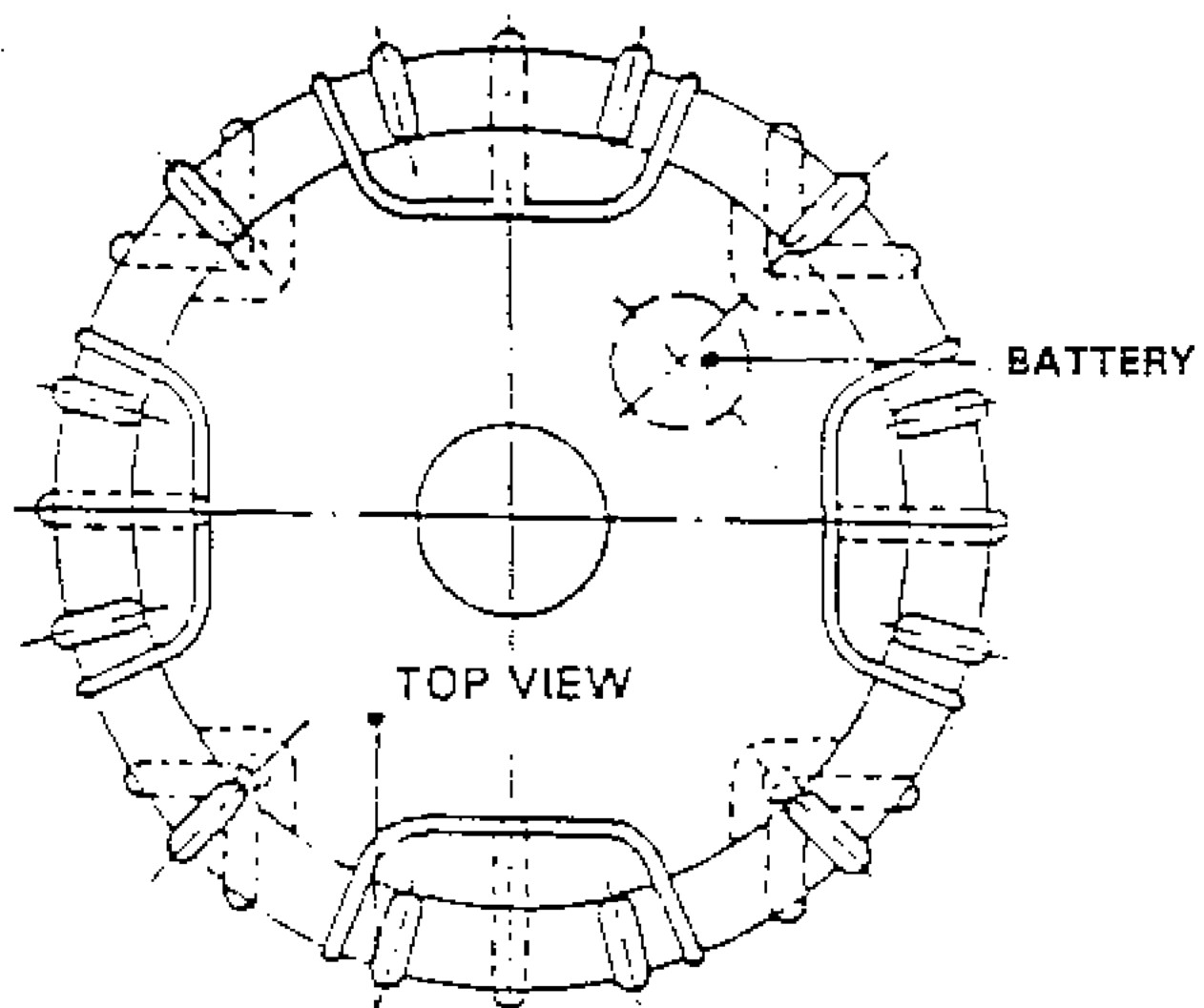
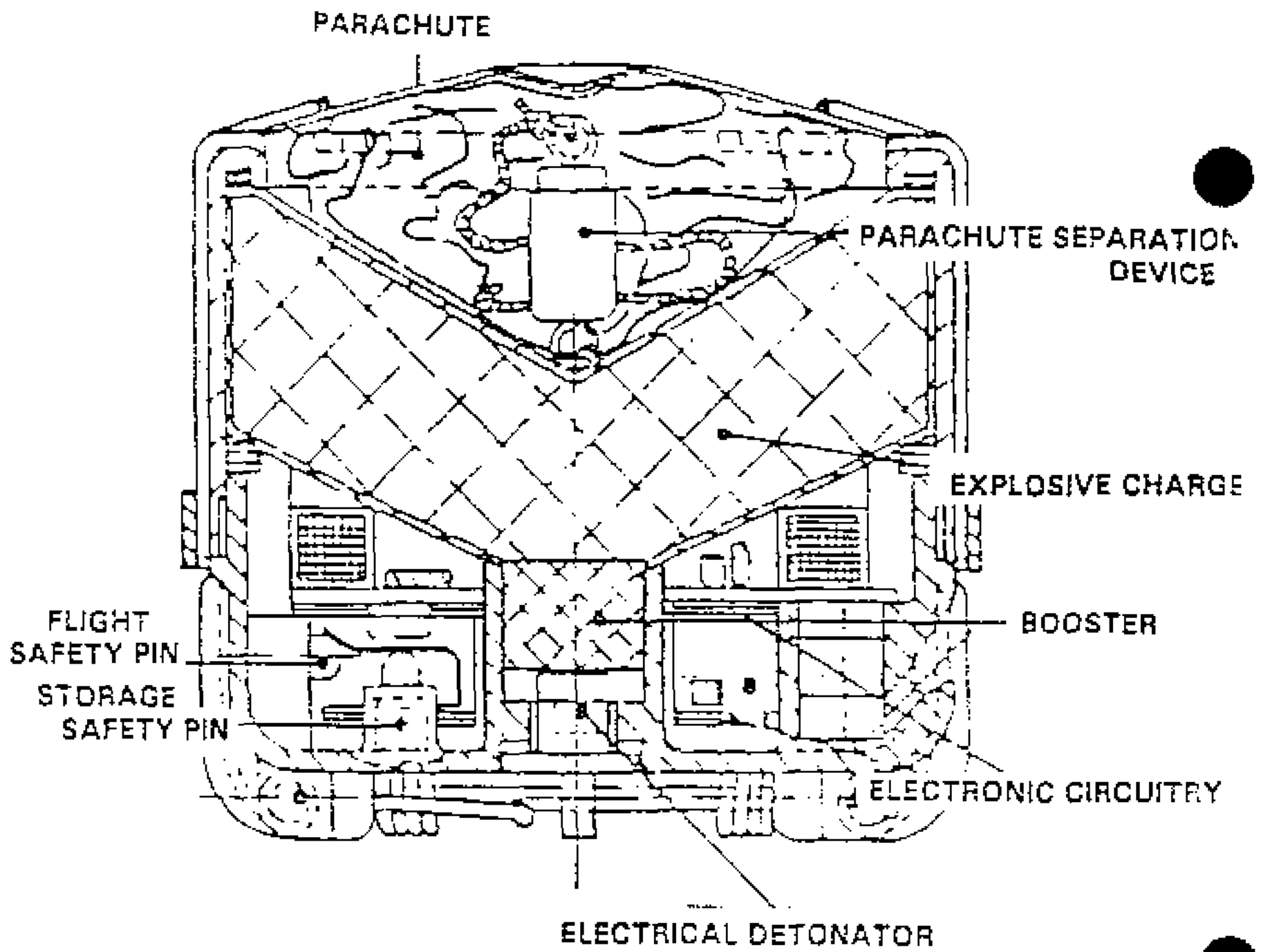


185



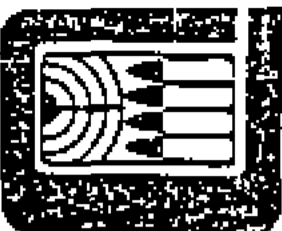
Italy, IRL, 122 mm, Rocket
 (U) Model, (scattered), Influence

186



(U) Italy, landmine (scatterable), influence fuzed, Model Unk, 122 mm, Rocket

MISCELLANEOUS MINES



"UDAR" - FAE*

General data

"UDAR" acts on the principle of aerosol explosion. Primarily intended for annihilation of live force and light armoured vehicles.

Initiation may be by means of various systems with remote control. Activated singly or in groups. If a group of more than 500 "UDAR" units is activated the destructive effect of nuclear blast is obtained, equivalent to the amount of 1 kt TNT.

Technical data

Blast wave pressure	direct 20 bars reflected 40 bars
Diameter of effect on live force to	40 m
Charge mass	approx. 20 kg
Total mass	approx. 40 kg

*Fuel air explosion

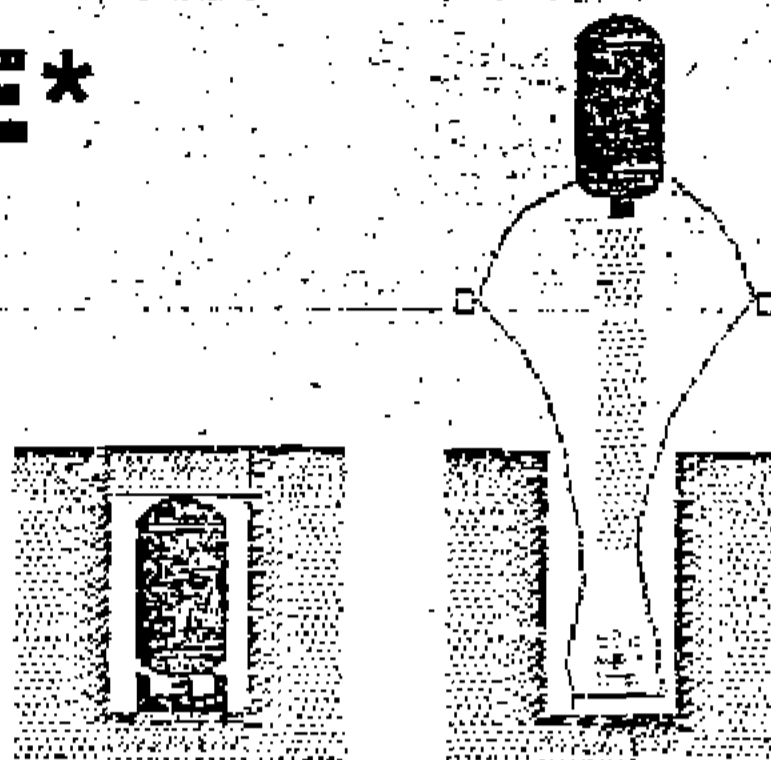


fig. 1

fig. 2

Unit laid on the ground

After remote activation

The other version of this unit is of a total weight of 20 kg, charge about 10 kg, with the blast wave of the same characteristics, only the diameter of effect on live force being up to 25 m.

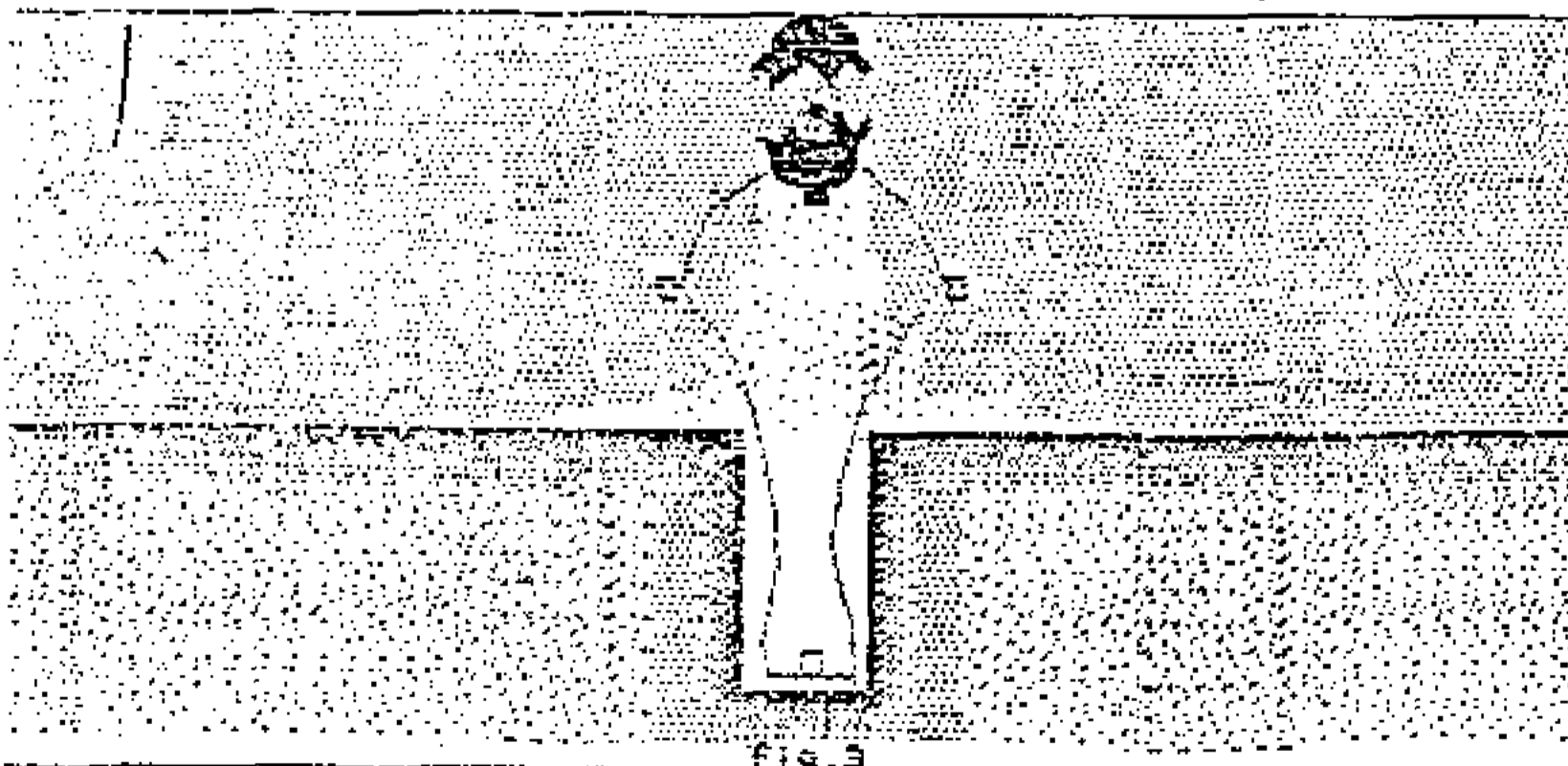


fig. 3

Development of aerosol cloud



FEDERAL DIRECTORATE
OF SUPPLY AND PROCUREMENT

BOOBY TRAPS

VS-AR 4 ANTILIFE DEVICE

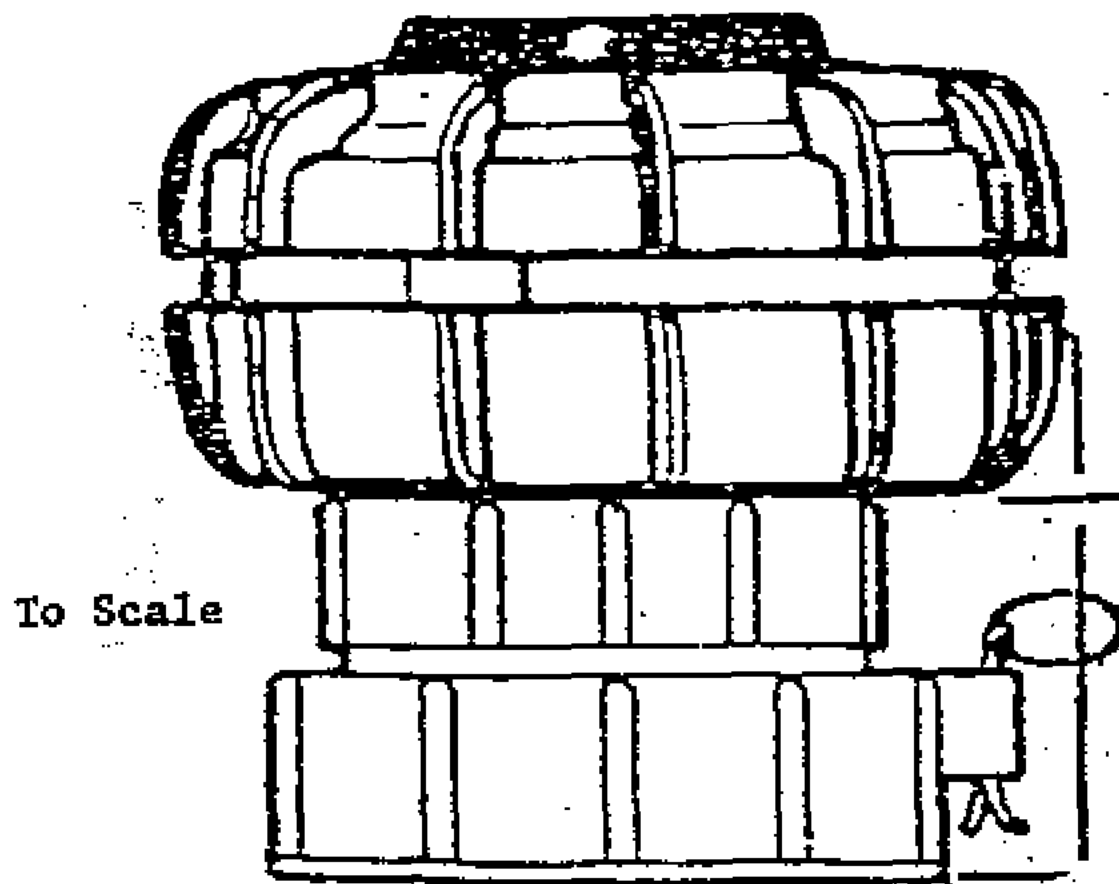
Functioning Mode: Tilt

Used with: VALMARA 69 APERS Mine
VS-50 APERS Mine
VS-1.6 AT Mine
VS-1.2 AT Mine

Arming Delay: 10 to 40 minute mechanical delay
30 minute electronic delay after mechanical delay

Power Source: Two 1.5v batteries

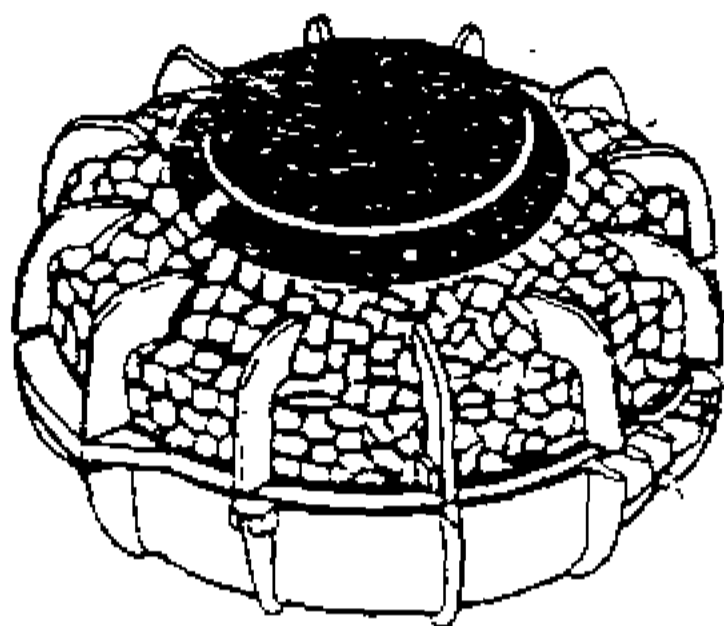
Operational Life: Longer than 1 year



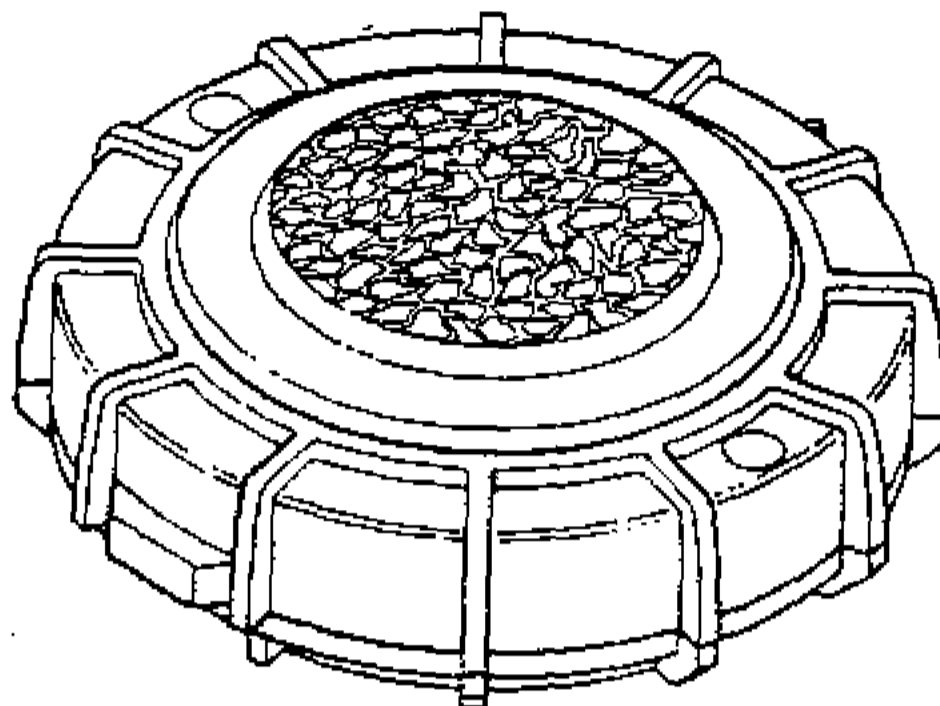
VS-50 with ANTILIFT Device

(Repeat from page 62)

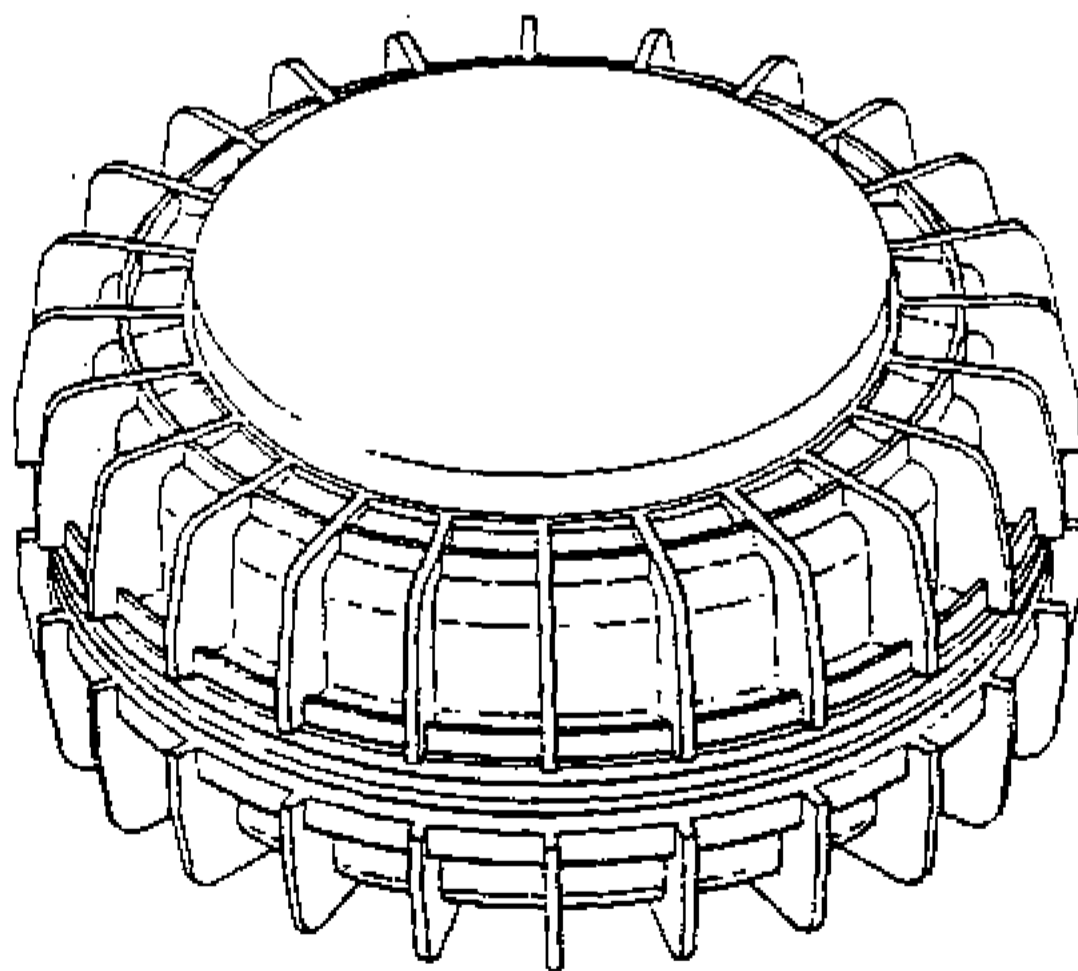
These items can be used as boobytraps by themselves or as fuzes to function larger explosive charges. All contain electric antidisturbance devices.



VS 50AR

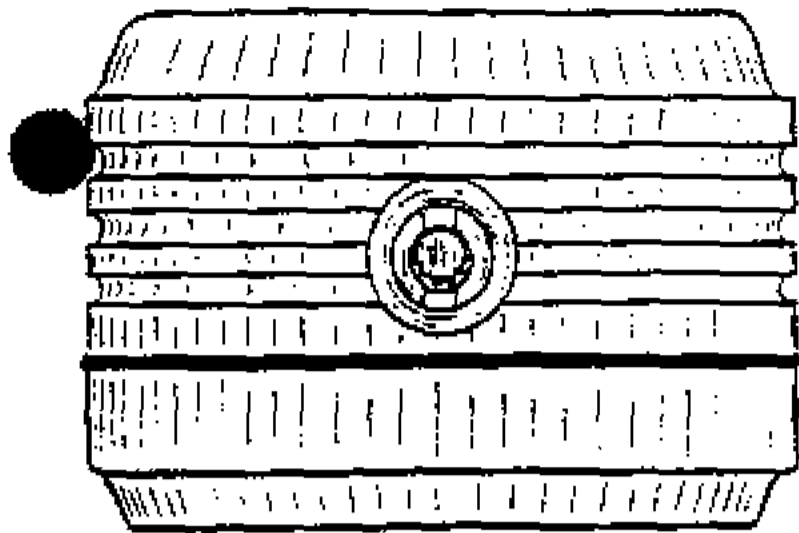


VS-MK 2 AR-AN



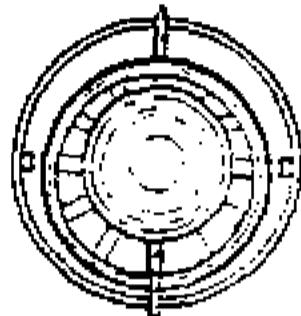
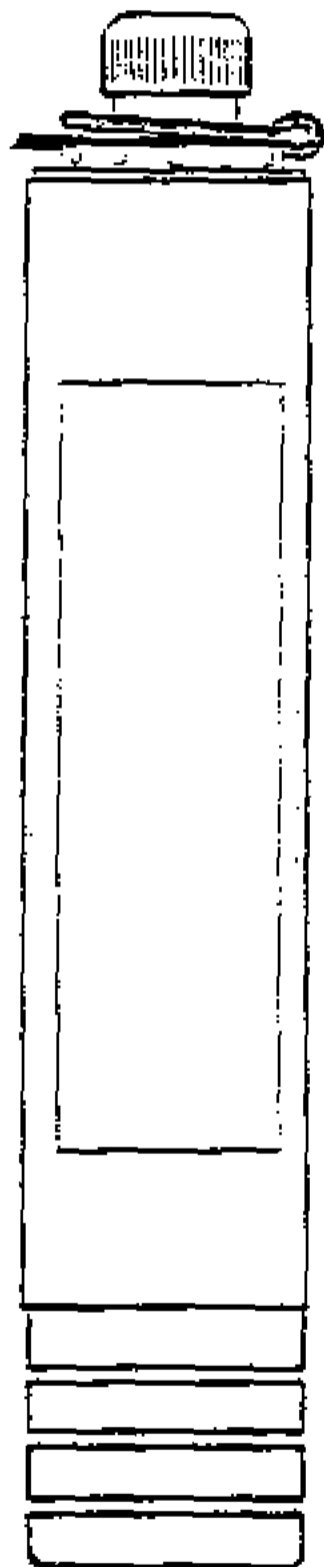
VS 1.6 AR-AN

CHINESE ELECTRONIC MINES AND DEVICES THAT MAY BE USED AS BOOBYTRAPS

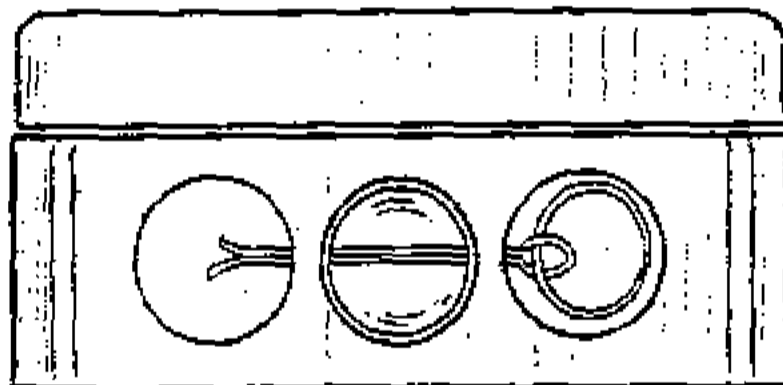


SCATTERABLE ELECTRONIC APERS MINE WITH SETTABLE SELF-DESTRUCT TIME AND POSSIBLE ANTI-REMOVAL DEVICE
SELF-DESTRUCT TIMES ARE AS FOLLOWS

- 1-3 DAYS
- 4-6 DAYS
- 7-9 DAYS
- 10-12 DAYS
- 13-15 DAYS

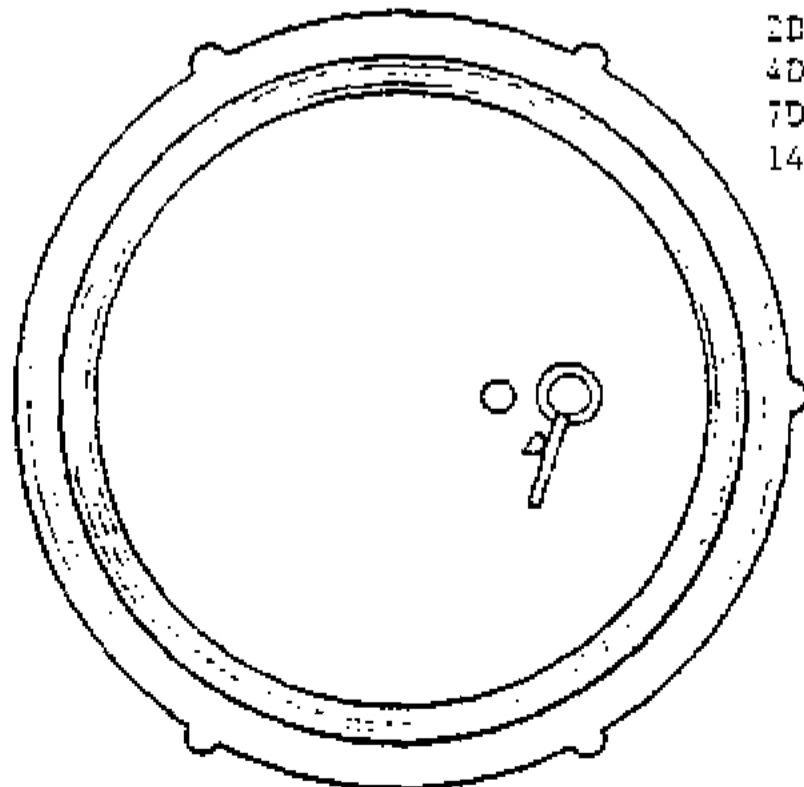


TUBE TYPE ELECTRONIC APERS MINE USED TO IMPEAD MINE CLEARANCE OPERATIONS. HAS AN ANTI-REMOVAL FEATURE AND POSSIBLE SELF-DESTRUCT SETTINGS

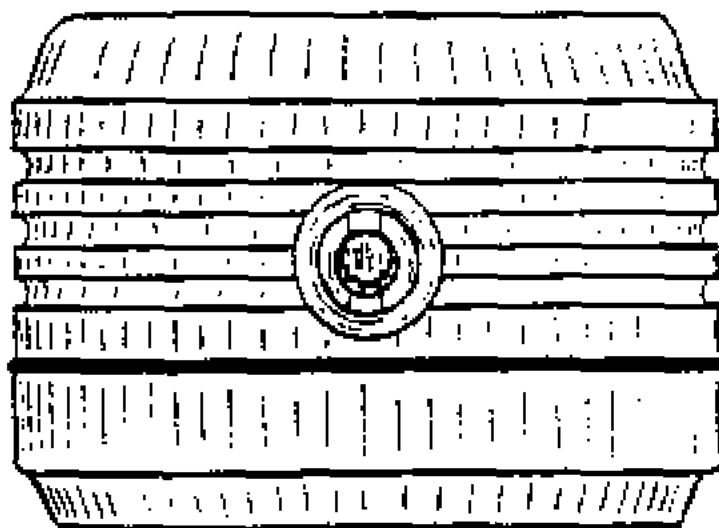


SCATTERABLE ELECTRONIC APERS MINE WITH AN ANTI-REMOVAL FEATURE AND A SETTABLE SELF-DESTRUCT TIME
THE SELF-DESTRUCT TIMES ARE AS FOLLOWS

- 2DAYS, 18HRS-2DAYS, 21HRS
- 4DAYS, 14HRS-4DAYS, 19HRS
- 7DAYS, 5HRS-7DAYS, 16HRS
- 14DAYS, 17HRS-15DAYS 7HRS

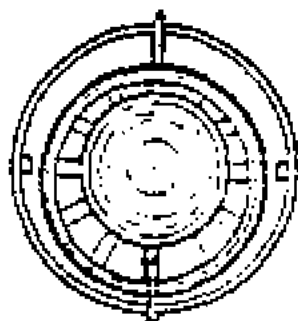
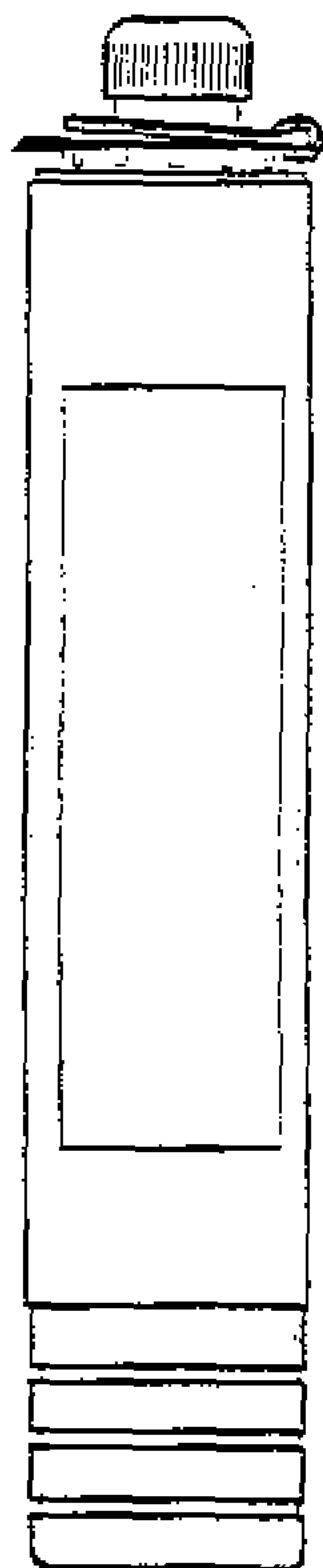


CHINESE ELECTRONIC MINES AND DEVICES THAT MAY BE USED AS BOOBYTRAPS

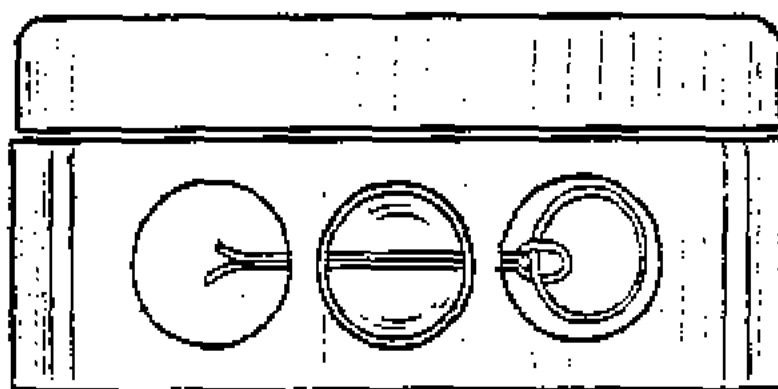


SCATTERABLE ELECTRONIC APERS MINE WITH SETTABLE SELF-DESTRUCT TIME AND POSSIBLE ANTI-REMOVAL DEVICE

- SELF-DESTRUCT TIMES ARE AS FOLLOWS
- 1-3 DAYS
 - 4-6 DAYS
 - 7-9 DAYS
 - 10-12 DAYS
 - 13-15 DAYS

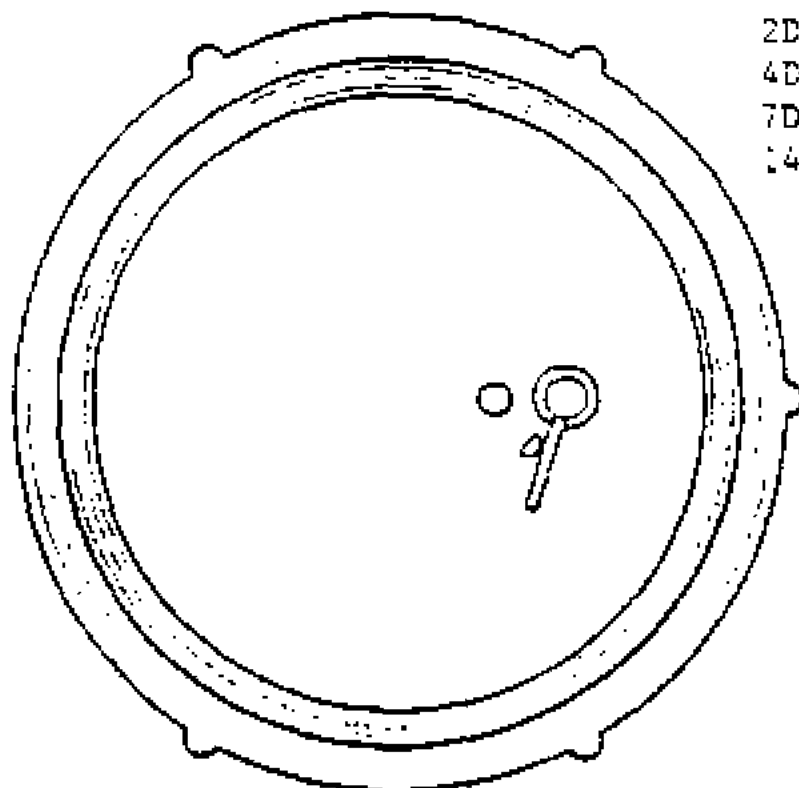


TUBE TYPE ELECTRONIC APERS MINE USED TO IMPEAD MINE CLEARANCE OPERATIONS. HAS AN ANTI-REMOVAL FEATURE AND POSSIBLE SELF-DESTRUCT SETTINGS



SCATTERABLE ELECTRONIC APERS MINE WITH AN ANTI-REMOVAL FEATURE AND A SETTABLE SELF-DESTRUCT TIME THE SELF-DESTRUCT TIMES ARE AS FOLLOWS

- 2DAYS, 16HRS-2DAYS, 21HRS
- 4DAYS, 14HRS-4DAYS, 19HRS
- 7DAYS, 8HRS-7DAYS, 16HRS
- 14DAYS, 17HRS-15DAYS 7HRS



~~194~~ 195

SOVIET MARKINGS

The symbol of the explosive filler is also stenciled in black on the projectile. The following is a list of Cyrillic letters and numbers that identify Soviet explosive fillers.

<u>Russian</u>	<u>English</u>	<u>Explosive or Chemical</u>
A	A	Amatol (100% ammonium nitrate)
A-40	A-40	Amatol (40% ammonium nitrate, 60% TNT)
AT-40	AT-40	Amatol (40% ammonium nitrate, 60% TNT pressed)
A-80	A-80	Amatol (80% ammonium nitrate, 20% TNT)
AT-90	AT-90	Amatol (90% ammonium nitrate, 10% TNT pressed)
ATФ-40	ATF-40	TNT (40% ammonium nitrate, 60% TNT pressed)
A-IX-1	A-9-1	RDX 94% and wax 6%
A-IX-2	A-9-2	RDX 73%, aluminum 23%, wax 4%
A-IX-20	A-9-20	RDX 78%, aluminum 19%, wax 3%
A-IX-П	A-9-P	RDX with unknown suffix "P"
ДБ	DB	Dinitrobenzol
ДБТ	DBT	Dinitrobenzene and TNT
Г	G	Hexogen (cyclonite, RDX)
З	Z	Incendiary
Н	H	Picric acid
K-1	K-1	TNT 70%, dinitrobenzene 30%
K-2	K-2	TNT 80%, dinitrobenzene 20%
ОКТОГЕН	Octogen	HMX
ОКФОЛ	OKFOL	HMX 95%, wax 5% (normal composition)
ОКТОЛ	OKTOL	HMX and TNT
ОЛ	OL	HMX 95%, wax 5% (normal composition)
Т	T	Trotyl (TNT)
T-80	T-80	TNT 80%, RDX 20%
ТГ	TG	TNT and RDX
ТГ-30	TG-30	TNT 30%, hexogen (RDX) 70%
ТГ-50	TG-50	TNT 50%, hexogen (RDX) 50%
ТГАФ-5	TGAF-5	TNT 40%, RDX 40%, aluminum 20%
ТГАГ-5	TGAG-5	TNT 60%, RDX 20%, aluminum 15%, wax 5%
ТД-42	TD-42	TNT 42%, dinitronaphthalene 58%
ТД-50	TD-50	TNT 50%, dinitronaphthalene 50%
ТДУ	TDU	TNT with spotting charge
ТС	TS	TNT sulfite
Ш	Sh	Schneiderite (ammonium nitrate 88%, dinitronaphthalene 12%)

The following is a list of Cyrillic letters that appear in the second component of Soviet complete-round model numbers. The meanings given are valid only when the letters appear in the second component of the model number.

<u>Russian</u>	<u>English</u>	<u>Meaning</u>
А	A	Propaganda or fragmentation
Б	B	Armor-piercing
БР	BR	Armor-piercing tracer
БЗА	BZA	Armor-piercing incendiary (improved)
БРЗ	BZR	Armor-piercing incendiary tracer
БМ	BM	Armor-piercing discarding sabot (fin or spin stabilized)
БП	BP	High-explosive antitank (spin stabilized)
БК	BK	High-explosive antitank (fin stabilized)
БЗ	BZ	Armor-piercing incendiary
Д	D	Smoke
ДУ	DTs	Target marker smoke
Ф	F	High explosive
Г	G	Concrete piercing
О	O	Fragmentation
ОФ	OF	Fragmentation high explosive
ОГ	OG	Fragmentation (pertaining to launched grenades)
ОФР	OFR	Fragmentation high-explosive tracer
ОФЗТ	OFZT	High-explosive incendiary tracer (improved)
ОР	OR	Fragmentation tracer
ОЗ	OZ	Fragmentation incendiary
ОХ	OKh	Fragmentation gas
ПБР	PBR	Armor-piercing target practice
ПГ	PG	High-explosive antitank (pertaining to launched grenades)
ПУ	PU	Target practice
Р	R	Tracer
РНО	RPO	Infantry rocket flamethrower
С	S	Illuminating
СП	SP	Solid shot armor piercing

The symbol of the explosive filler is also stenciled in black on the projectile. The following is a list of Cyrillic letters and numbers that identify Soviet explosive fillers.

<u>Russian</u>	<u>English</u>	<u>Explosive or Chemical</u>
AT-40	AT-40	Anatol (40% ammonium nitrate, 60% TNT pressed)
A-80	A-80	Anatol (80% ammonium nitrate, 20% TNT)
AT-90	AT-90	Anatol (90% ammonium nitrate, 10% TNT pressed)
ATΦ-40	ATF-40	TNT (40% ammonium nitrate, 60% TNT pressed)
A-IX-1	A-9-1	RDX 94% and wax 6%
A-IX-2	A-9-2	RDX 73%, aluminum 23%, wax 4%
A-IX-20	A-9-20	RDX 78%, aluminum 19%, wax 3%
A-IX-П	A-9-P	RDX with unknown suffix "P"
ДБ	DB	Dinitrobenzol
ДБТ	DBT	Dinitrobenzene and TNT
Г	G	Hexogen (cyclonite, RDX)
ГАИ-30	GAI-30	RDX 30%
З	Z	Incendiary
М	M	Picric acid
МС	MS	TNT/AL/RDX
К-1	K-1	TNT 70%, dinitrobenzene 30%
К-2	K-2	TNT 80%, dinitrobenzene 20%
ОКТОГЕН	Octogen	HMX
ОКФЛ	OKPOL	HMX 95%, wax 5% (normal composition)
ОКТОЛ	OKTOL	HMX and TNT
ОЛ	OL	HMX 95%, wax 5% (normal composition)
ПВВ-5А	PVV-5A	RDX 85%, mineral oil 10%, poly-isobutylene 5% (plastic explosive)
Т	T	Trotyl (TNT)
Т-80	T-80	TNT 80%, RDX 20%
ТГ	TG	TNT and RDX
ТГ-30	TG-30	TNT 30%, hexogen (RDX) 70%
ТГ-50	TG-50	TNT 50%, hexogen (RDX) 50%
ТГАФ-5	TGAF-5	TNT 40%, RDX 40%, aluminum 20%
ТГАГ-5	TGAG-5	TNT 60%, RDX 20%, aluminum 15%, wax 5%
ТД-42	TD-42	TNT 42%, dinitronaphthalene 58%
ТД-50	TD-50	TNT 50%, dinitronaphthalene 50%
ТДУ	TDU	TNT with spotting charge
ТС	TS	TNT sulfite
Ш	Sh	Schneiderite (ammonium nitrate 88%, dinitronaphthalene 12%)

<u>Russian</u>	<u>English</u>	<u>Meaning</u>
Ш	Sh	Shrapnel
К	Shch	Canister
Х	Kh	Gas
З	Z	Incendiary
ИНЕРТ	INERT	Inert (contains no explosive, pyrotechnic, or chemical)
МАКЕТ	MAKET	Model (used for training)
ОСКОЛ	OSKOL	Fragmentation
ПРАКТ	PRACT	Practice

Suffixes

<u>Russian</u>	<u>English</u>	<u>Meaning</u>
А	A	Cast iron
Б	B	Improved projectile - mostly AP types
Д	D	Improved projectile - mostly AP types
ДУ	DU	Improved projectile - mostly Frag types
Х	Zh	Sintered iron rotating band
К	K	Improved projectile - mostly AP types
М	M	Usually HEAT projectile - copper liner
Н	N	Improved projectile - mostly Frag
П	P	Usually improved HVAP projectile
ПК	PK	Usually improved HVAP projectile
С	S	Improved HEAT projectile
СП	SP	Improved AP projectile
У	U	Usually improved AP projectile
УМ	UM	Improved HEAT projectile

<u>Russian</u>	<u>English</u>	<u>Explosive or Chemical</u>
ШТ	ShT	Schneiderite and TNT
P-4	R-4	White and yellow phosphorus
P-5	R-5	Mustard gas
PC	RS	Lewisite gas
PD	RYu	Phosgene gas
P-15	R-15	Adamsite gas
P-2	R-2	Hydrocyanic (AC) Gas
P-35	R-35	Sarin (GB) Gas
P-43	R-43	Lewisite Gas
P-55	R-55	Soman (GD) Gas
P-74	R-74	Mustard Gas
PK-7	RK-7	Mustard/Lewisite Mixture

10/18/27
mark filters

IMPORTANT INFORMATION

DEPLETED URANIUM (DU) AMMUNITION

BACKGROUND

1 During the gulf war DU penetrators were used by the US and UK forces in tank and aircraft ammunition. The A-10 and SEA HARRIER can both carry DU ammunition and some have been found near our SAC areas.

SAFETY

2 DU is mildly radioactive and in the form of dust is toxic. It emits gamma rays (at a low level) and alpha particles which if they get into the skin or lungs may cause long term problems.



RECOGNITION

3 The DU penetrator forms the core of the projectile. When damaged the core may be exposed. A red ballistic cap, DU or DEPLETED URANIUM markings and a blunt (Tungsten penetrators are pointed) nose to the penetrator may indicate DU ammunition.

PROCEDURE TO BE USED

- 4 DU ammunition MAY have been used to attack AFV's
Therefore :
- a. Do not enter AFV's except to clear them of ammunition. If you do, always wear a face mask (Dust Mask) and wear gloves. Try not to disturb any dust.
 - b. Use gloves and masks if you must handle the contents of AFV's and keep up wind of any dust.
 - c. If you suspect DU has been used or found, collect the ammunition carefully, wearing gloves. Double wrap the items in polytene bags. One item per bag.
 - d. Store recovered items in the open, mark the location and report it to the operations room.

REPORTING

- 5 If you suspect DU is involved in any of your tasks and you need further advice Contact :

ZONE MGR / CMS OPS CENTER

Although a hazard which we need to be aware of and take safety precautions against, the hazard should be kept in perspective.

SAFETY FIRST

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