

LAND MINES IDENTIFICATION GUIDE

Edited & Updated By Itamar Levy

INDEX

CONTENTS	SECTION
INTRODUCTION	1
TEAM DEMOLITION KIT	2
MINES	3
COMMON IGNITORS	4
FRAG AND EVAC SAFETY DISTANCES	5
SAFETY FUZE	6
TAMPING – SANDBAG REQUIREMENT	7
UXO PROCEDURE	8
DISPOSAL OPTIONS	9
ELECTRICAL INITIATION	10
ELECTRICAL MISFIRE	11
SAFETY FUZE INITIATION	12
SAFETY FUZE MISFIRE	13
CYRILLIC TABLE	14

SECTION 1 - INTRODUCTION

THIS LAND MINES RECOGNITION POCKET GUIDE HAS BEEN PRODUCED BY THE HALO TRUST FOR ALL HALO SUPERVISORS. IT HAS BEEN WRITTEN TO GIVE HALO PERSONNEL EASY ACCESS TO INFORMATION FOR RECOGNITION, DISPOSAL AND REPORTING PURPOSES. THE INFORMATION IS THE BEST CURRENTLY AVAILABLE AND WILL BE UPDATED AS MORE INFORMATION BECOMES KNOWN.

IN THIS EDITION WE TRIED TO ADD MINES COMMONLY FOUND IN MOST OF THE COUNTRIES WHERE THE HALO TRUST OPERATES AND SOME OF THE MOST COMMON IGNITORS.

THE MINES WITHIN THE SECTIONS ARE ORGANIZED IN GROUPS ACCORDING TO THEIR SHAPES IN ORDER TO MAKE IT EASIER TO USE ON FIELD WHILE TRYING TO IDENTIFY AN UNRECOGNIZED MINE.

I DO HOPE THAT YOU WILL FIND THIS GUIDE HELPFUL.

ITAMAR LEVY
August 2005

SECTION 2 - TEAM DEMOLITION KIT

THE TEAM DEMOLITION KIT MUST CONTAIN THE FOLLOWING ITEMS:

Ser	Item	Max Qty	Min Qty	Remarks
1.	Flash Detonator	10	4	In det box
2.	Electric Detonator	10	4	In det box
3.	Safety Fuze	30m	6m	Main box
4.	Detonating Cord	40m	5m	Main box
5.	Expl Chges	3kg	0.5kg	Main box
6.	Matches	3 box	1 box	Main box
7.	Firing Cable	1 reel	-	
8.	Exploder	1	-	
9.	Safety Ohmmeter	1	-	
10.	3m Tape Measure	1	-	Main box
11.	Crimpers	1	-	Main box
12.	Insulating Tape	5	2	Main box
13.	Sharp Knife	1	-	Main box
14.	Crackerbarrel	4	1	Main box
15.	Sandbags	300	80	

IT IS THE RESPONSIBILITY OF THE TEAM LEADER TO ENSURE THE TEAM DEMOLITION KIT IS REPLENISHED AND THE BOX KEPT TIDY.

SECTION 3 - MINES

HALO POLICY:

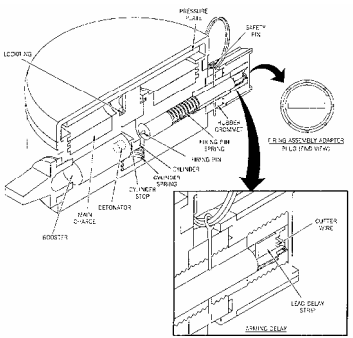
"ALL MINES ARE DESTROYED IN-SITU"

ONLY IN EXTREME CIRCUMSTANCES WILL PERMISSION BE GIVEN TO DISARM OR NEUATRALISE MINES.

REMEMBER THE EXISTANCE OF BOOBY TRAPS AND ANTI HANDLING DEVICES, ALWAYS USE POOLING DRILL WITH HOOK & LINE TO REMOVE MINE FROM ITS ORIGINAL POSITION.

TYPE	PAGES
AP BLAST	
AP BOUNDING FRAGMENTATION	
AP DIRECTIONAL FRAGMENTATION	
AP FRAGMENTATION	
ANTI TANK	

AP BLAST PMN

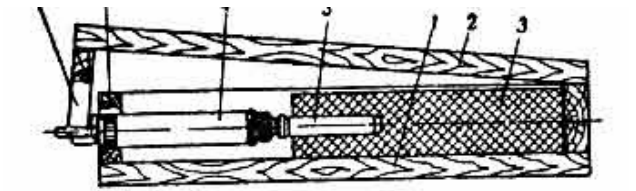


HAS BEEN WIDELY COPIED THEREFORE VARIANTS WILL BE FOUND (Type 58 China)



NEQ	Metal content	Operation	Size (cm)	Origin
240g	High	Pressure	11.2 x 5.6	Russia

AP BLAST PMD 6





WIDELY COPIED THROUGHOUT THE WORLD
USING WOOD AND PLASTIC CONTAINERS.

NEQ	Metal content	Operation	Size (cm)	Origin
200g	High	Pressure	19x6.5x9	Russia

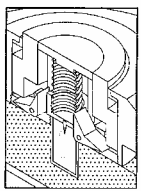
AP BLAST PMN2



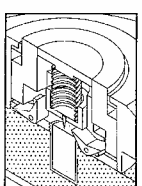
VERY EASILY RECOGNISED BY THE BLACK CROSS ON TOP.

NEQ	Metal content	Operation	Size (cm)	Origin
100g	High	Pressure	12 x 5.3	Russia

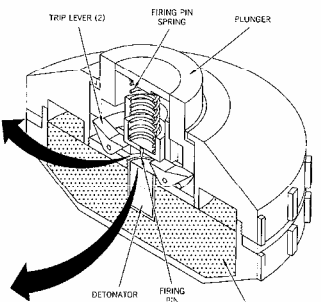
AP BLAST MAI 75



NORMAL FIRING
(BOTH TRIP LEVERS VERTICAL)



UNEVEN PRESSURE APPLIED
(ONE TRIP LEVER VERTICAL)





NEQ	Metal content	Operation	Size (cm)	Origin
120g	Low	Pressure	9.5 x 6.1	Romania

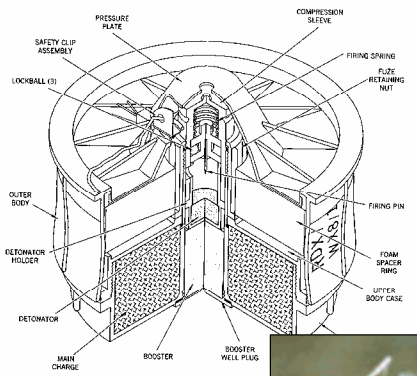
AP BLAST TYPE 72



Identical in appearance to electronic variants Type 72 B & C when armed. Only difference in appearance is the type of ring on the arming pin. The metal content of these makes them easier to detect therefore acts as good indicator to type located.
Never attempt to disarm, move or touch ALWAYS destroy in-situ.

NEQ	Metal content	Operation	Size (cm)	Origin
51g	Low	Pressure	7.8 x 33.8	China

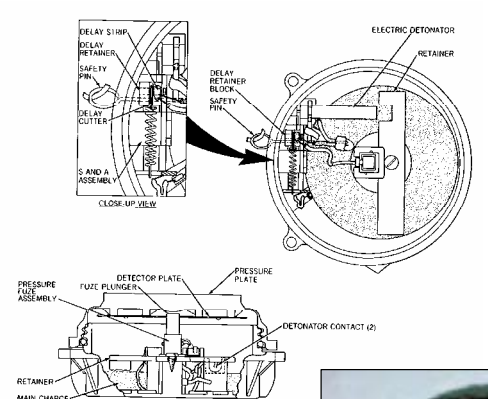
AP BLAST R2M1/2





NEQ	Metal content	Operation	Size (cm)	Origin
58g	Low	Pressure	6.9 x 5.7	RSA

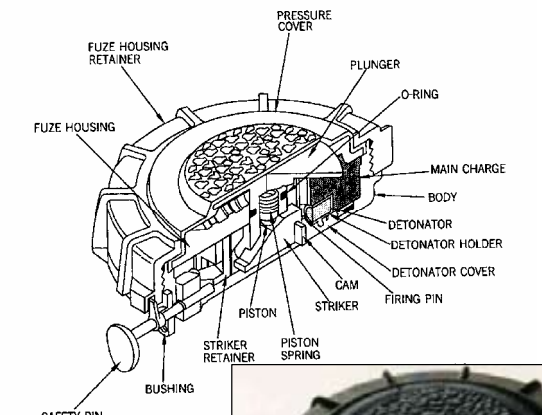
AP BLAST PPM-2





NEQ	Metal content	Operation	Size (cm)	Origin
110g	High	Pressure	13.4 x 6	German

AP BLAST VS – MK2



NEQ	Metal content	Operation	Size (cm)	Origin
33g	Low	Pressure	9 x 3.2	Italy

AP BLAST VS – 50

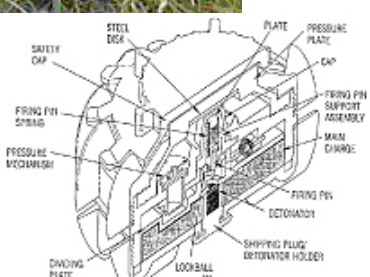


Easily detectable when fitted with the reinforced metal plate.
Egyptian version is T/79
Singapore version is SPM-1

NEQ	Metal content	Operation	Size (cm)	Origin
43g	Low	Pressure	9 x 4.5	Italy

AP BLAST	TS – 50 / YM I





Note: The mine in the picture is YM-I an Iranian copy of the Italian TS-50

Other versions are produced by Egypt and Singapore

NEQ	Metal content	Operation	Size (cm)	Origin
50g	Low	Pressure	9 x 4.5	Italy

AP BLAST	SB -33



There are Greek version (EM-20), Portuguese (M/412) and Spanish (P-5)

NEQ	Metal content	Operation	Size (cm)	Origin
35g	Low	Pressure	8.5 x 3	Italy

AP BLAST	PRB M409 (NR 409)

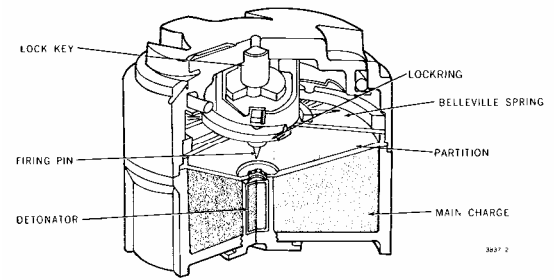




ILLUSTRATION IS PORTUGUESE COPY, M/969 “MAPS”.
Other versions are from Peru & Ecuador (M409) and Columbia (SOPRO)

NEQ	Metal content	Operation	Size (cm)	Origin
80g	Low	Pressure	8.2 x 2.8	Belgium

AP BLAST M14 / MN79

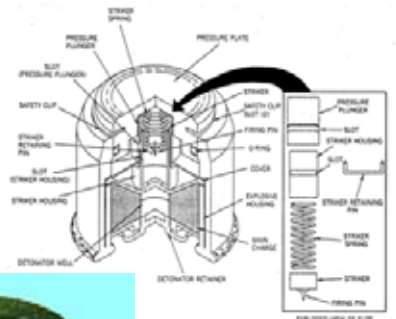


MN79 IS A VIETNAMESE COPY OF THE USA M14 MINE HOUSING BUT CONTAINS MORE METAL



NEQ	Metal content	Operation	Size (cm)	Origin
29g	Low	Pressure	5.6 x 4	USA

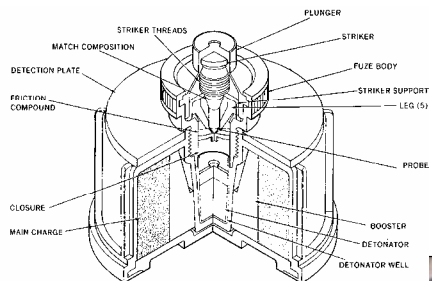
AP BLAST MD-82B





NEQ	Metal content	Operation	Size (cm)	Origin
28g	Low	Pressure	5.5x5.5	Vietnam

AP BLAST MI AP DV 59





With transit cap



NEQ	Metal content	Operation	Size (cm)	Origin
70g	Low	Pressure	6.2 x 5.5	France

AP BLAST PRB M-35



NEQ	Metal content	Operation	Size (cm)	Origin
100g	Low	Pressure	6.5x6	Belgium

AP BLAST APP M-57



NEQ	Metal content	Operation	Size (cm)	Origin
250g	Low	Pressure	20.5x7.2x4	North Korea

AP BLAST No. 4



There are many variants, all developed from the PMD-6

NEQ	Metal content	Operation	Size (cm)	Origin
200g	High	Pressure	13.5x6.5x5.5	Iran/Egypt /Israel

AP BLAST	PN-1



NEQ	Metal content	Operation	Size (cm)	Origin
200g	High	Pressure	14.5x9x5	Cuba

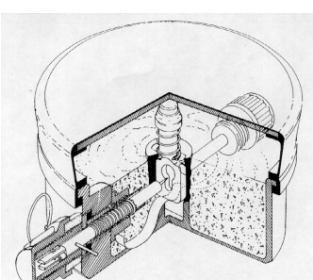
AP BLAST | DM-11 Apers



NEQ	Metal content	Operation	Size (cm)	Origin
114g	Low	Pressure	3.7x8.1	Germany

AP BLAST GYATA 64





Unlike the PMN, the GYATA has a flat base with rubber pressure plate and a different design for the plunger spring.

NEQ	Metal content	Operation	Size (cm)	Origin
300g	High	Pressure	10.6x6.1	Hungary

AP BLAST JONY 95





NEQ	Metal content	Operation	Size (cm)	Origin
50g	High	Pressure	11x6x7	Sri Lanka (LTTE)

AP BLAST JONY 99





This mine is a copy of the P4 Mk1 and is used as a fuse for the Amman & Amman 2000 AT mines.

NEQ	Metal content	Operation	Size (cm)	Origin
100g	High	Pressure	9x5.5	Sri Lanka (LTTE)

AP BLAST P4 Mk 1



P2 Mk2 is very similar to P4 Mk1, with the same NEQ but different size: 7.2x4.5
Both are used as fuse for AT mines. Both uses a white plastic safety cap.

NEQ	Metal content	Operation	Size (cm)	Origin
30g	Low	Pressure	7x3.8	Pakistan

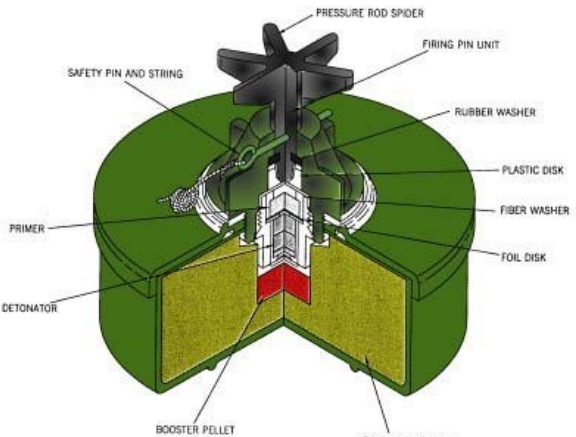
AP BLAST PMA 1 A





NEQ	Metal content	Operation	Size (cm)	Origin
200g	Low	Pressure	14x7x3	Yugoslavia

AP BLAST PMA 2





NEQ	Metal content	Operation	Size (cm)	Origin
100g	Low	Pressure	6.8x6.1	Yugoslavia

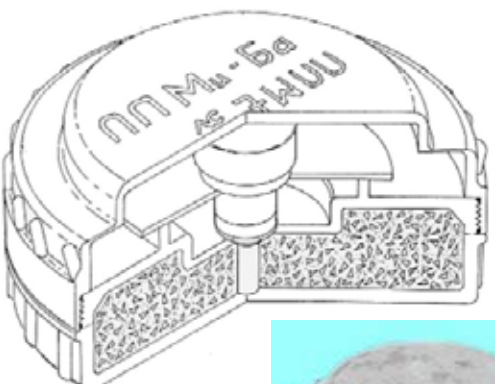
AP BLAST PMA 3





NEQ	Metal content	Operation	Size (cm)	Origin
35g	Low	Pressure	11.1x4	Yugoslavia

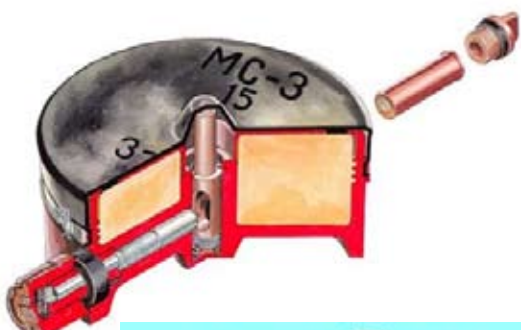
AP BLAST PP Mi Ba





NEQ	Metal content	Operation	Size (cm)	Origin
200g	Low	Pressure	15x64	Czech

AP BLAST	MS 3

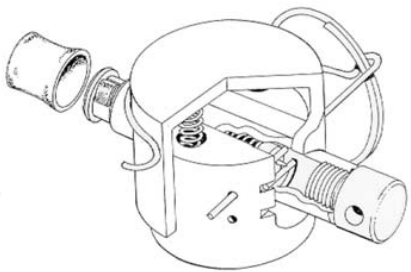




Looks similar to PMN with difference in the pressure plate shape (due to the plunger "cap"). Used for anti-lift booby traps.

NEQ	Metal content	Operation	Size (cm)	Origin
310g	High	**Pressure Release**	11x5.9	Russia, Romania

AP BLAST TOE POPPER

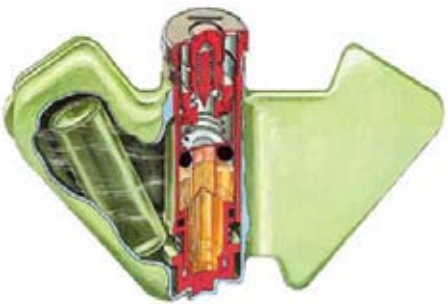




Can be used as firing device for Booby Traps.

NEQ	Metal content	Operation	Size (cm)	Origin
Only Det	Low	Pressure	4.2x3.5x6.5	SA

AP BLAST BLU 43/B

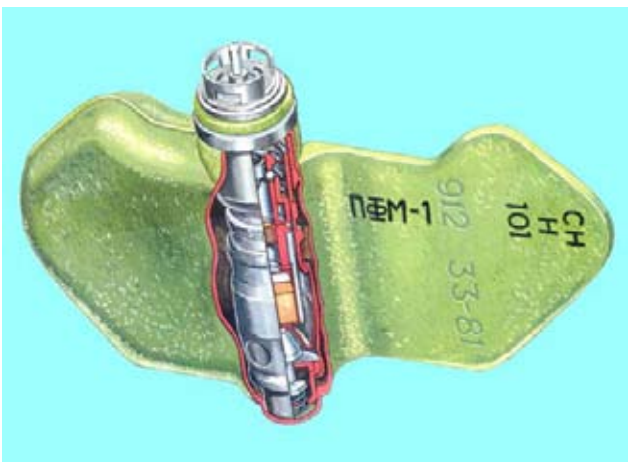




Known also as: "Dragon's Tooth".

NEQ	Metal content	Operation	Size (cm)	Origin
9g	Low	Pressure	7.5x4.5x1.4	USA

AP BLAST PFM-1



PFM-1S has a self destruct mechanism for about 24 hours, but might be more types of delay.
Known also as: "Green Parrot" &" Butterfly Mine".

NEQ	Metal content	Operation	Size (cm)	Origin
37g	Low	Pressure	12x6.1x2	Russia

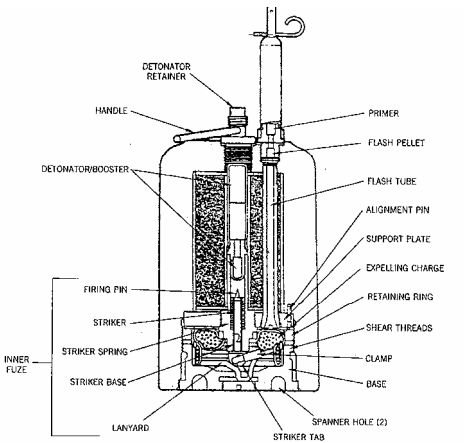
INTENTIONALLY LEFT BLANK

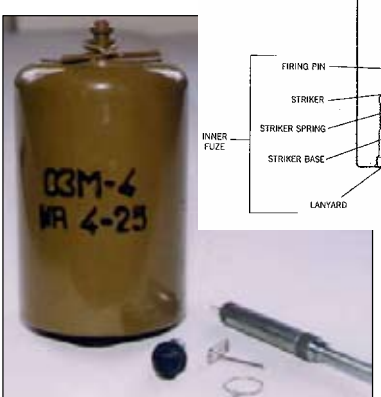
AP BOUNDING FRAG OZM-3



NEQ	Lethal Radius	Operation	Size (cm)	Origin
75g	15-20 m	Trip/Pres/Elec	7.5 x 12	Russia

AP BOUNDING FRAG OZM-4





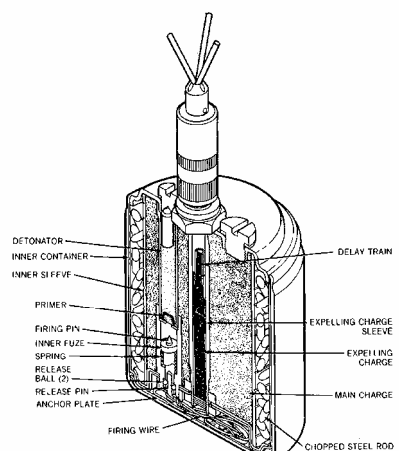
NEQ	Lethal Radius	Operation	Size (cm)	Origin
170g	15m+	Trip/Pres/Elec	9.1 x 14	Russia

AP BOUNDING FRAG OZM-72



NEQ	Lethal Radius	Operation	Size (cm)	Origin
500g	25-30m	Trip/Pres/Elec	10.6 x 17.2	Russia

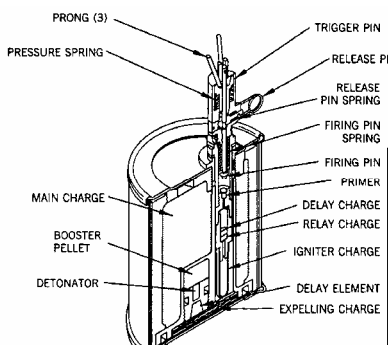
AP BOUNDING FRAG PP Mi-Sr





NEQ	Lethal Radius	Operation	Size (cm)	Origin
360g	20m+	Trip/Elec	10.2 x 15.2	Czech

AP BOUNDING FRAG M16





NEQ	Lethal Radius	Operation	Size (cm)	Origin
575g	10m+	Trip/Pres	10.3 x 20.3	USA

AP BOUNDING FRAG M2 A4

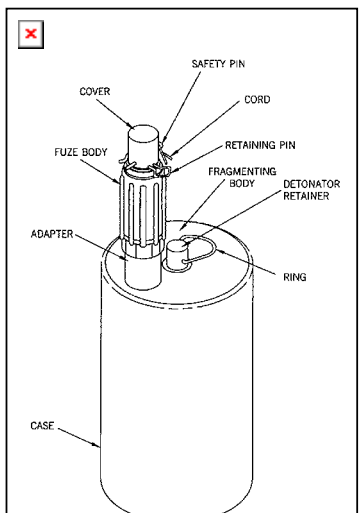


Produced also in Taiwan under the same designation.
Portuguese M/966 is a copy of this mine as well.

NEQ	Lethal Radius	Operation	Size (cm)	Origin
154g	10m+	Trip/Pres	24.4 x 10.4	USA

AP BOUNDING FRAG TYPE 69





NEQ	Lethal Radius	Operation	Size (cm)	Origin
105g	11m	Trip/Pres	6.1 x 16.8	China

AP BOUNDING FRAG M/966



NEQ	Metal content	Operation	Size (cm)	Origin
154g	High	Trip/Press	10x24.4	Portugal

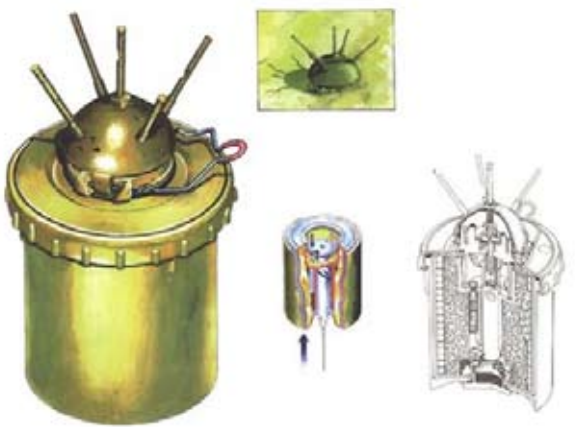
AP BOUNDING FRAG	VALMARA 59



South African copy designated as No. 69 Mk 1

NEQ	Lethal Radius	Operation	Size (cm)	Origin
550g	27m	Trip/Pres	19.6x10.2	Italy

AP BOUNDING FRAG VALMARA 69



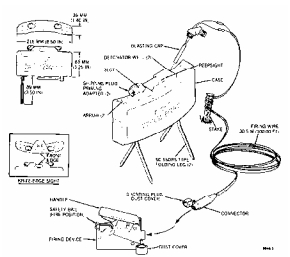
Valmara 69 has plastic body, while Valmara 59 made of metal.
South African copy designated as J69

NEQ	Lethal Radius	Operation	Size (cm)	Origin
400g	27m	Trip/Pres	20.5x13	Italy

INTENTIONALLY LEFT BLANK

AP DIRECTIONAL FRAG CLAYMORE

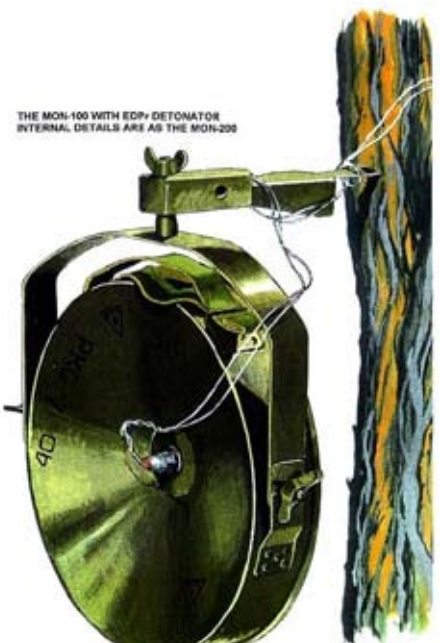
THE AMERICAN M18, COMMONLY KNOWN AS THE CLAYMORE, IS ONE OF THE MOST COPIED DESIGNS IN THE WORLD. THE TABLE BELOW INDICATES THE VARIATIONS ENCOUNTERED.





Type	NEQ	Lethal Range	Size (cm)	Origin
MS-803	460g	15m	22x7x3.5	RSA
No2	680g	50m	21.6x8.1x3.6	RSA
M18	682g	50m	21.6x8.1x3.6	USA
Type 66	680g	50m	21.6x8.3x3.5	China
MON 50	700g	50m	21.6x14.6x6.4	Russia
Claymore	700g	50m	22x12x3	Egypt
LI 12	700g	50m	10x17	Sweden
MON 90	6.45kg	90m	33.7x16.4x13	Russia
P 5	720g	50m	21x8x3.5	Pakistan
MRUD	900g	50m	23 x 8.9 x 4.6	Yugo.

AP DIRECTIONAL FRAG MON-100



NEQ	Lethal Dist	No of Fragments	Size (cm)	Origin
2kg	100m	400	23.6 x 8.3	Russia

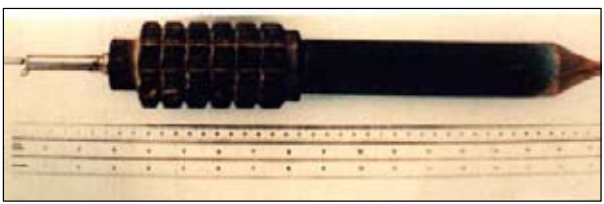
AP DIRECTIONAL FRAG MON-200



NEQ	Lethal Dist	No of Fragments	Size (cm)	Origin
12kg	200m	900	43.4x13	Russia

INTENTIONALLY LEFT BLANK

AP FRAGMENTATION



POMZ-2



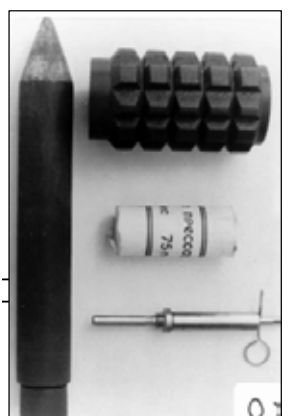
POMZ-2M



TYPE 59



PMFH 1



ALL MINES CONTAIN SIMILAR KIT AND ARE USUALLY FOUND LYING ON THE GROUND AS THE STAKE QUICKLY ROTS AWAY

Type	NEQ	Lethal Dist	Size (cm)	Origin
POMZ-2	75g	25m+	6 x 13	Russia
POMZ-2M	75g	25m+	6 x 10.7	Russia
Type 59	75g	25m+	6 x 10.7	China
PMFH-1	75g	25m+	6 x 13	Cuba

AP FRAGMENTATION Yugoslavian



PMR 1 | PMR 2A | PMR 3 | PROM 1

Type	NEQ	Lethal Distance	Size (cm)	Origin
PMR-1	75g	10m+	8X12	Former Yugoslavia
PMR-2A	100g	10m+	6.6x14	-“-
PMR-3	410g	15m+	7.8x13.4	-“-
PROM 1	425g	20m+	7.5x26	-“-

AP FRAGMENTATION AUPS





Without the metal jacket it is a low metal blast mine (10.2x3.6 cm).

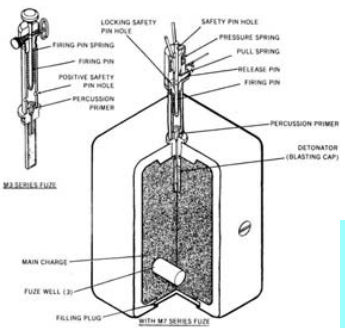
NEQ	Metal content	Operation	Size (cm)	Origin
115g	High	Pressure/ Tripwire	12X8	Italy

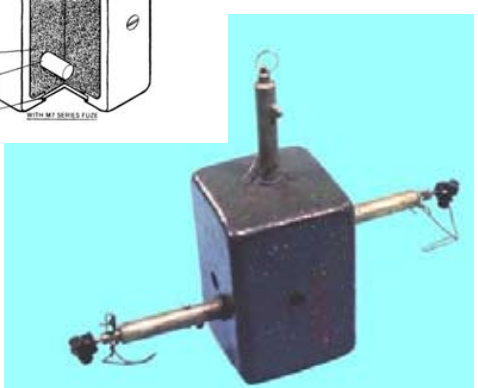
AP FRAGMENTATION M/966-B



NEQ	Metal content	Operation	Size (cm)	Origin
300g	High	Tripwire	9x5x7	Portugal

AP FRAGMENTATION M3





NEQ	Metal content	Operation	Size (cm)	Origin
480g	High	Pressure / Pull	8.9 x 8.9 x13.7	USA

AP FRAGMENTATION POM 2S



POM-2S has a self destruct mechanism for 23 hours, but might be more types of delay.

NEQ	Metal content	Operation	Size (cm)	Origin
120g	High	2x “Y” shape Tripwire	18x6.3	Russia

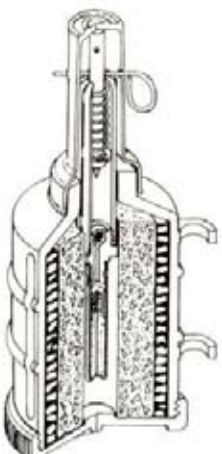
AP FRAGMENTATION B40



This mines made of US sub-munition BLU -24

NEQ	Metal content	Operation	Size (cm)	Origin
120g	High	Tripwire	14x6.9	Vietnam

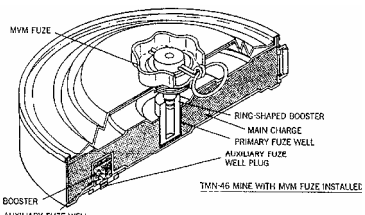
AP FRAGMENTATION MBV 78 A2



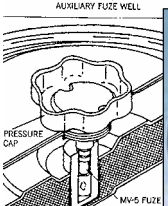


NEQ	Metal content	Operation	Size (cm)	Origin
65g	High	Tripwire	8x5.3	Vietnam

INTENTIONALLY LEFT BLANK



TMN-46 MINE WITH MVM FUZE INSTALLED

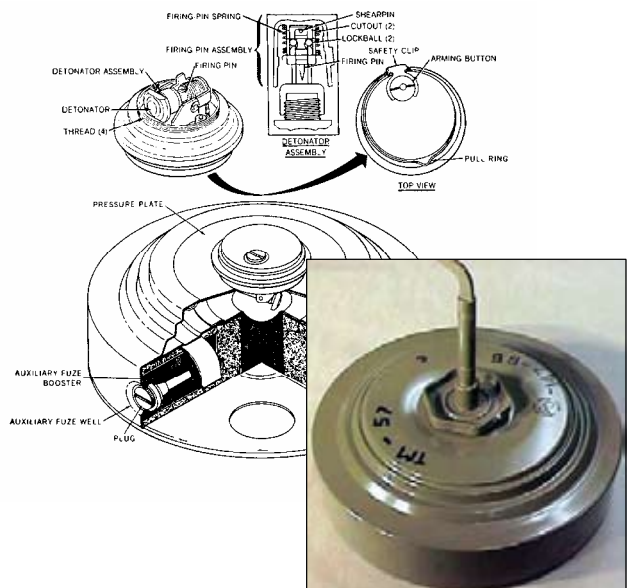


TMN-46 MINE WITH PRESSURE CAP AND MV-5 FUZE INSTALLED



THERE IS AN EGYPTIAN COPY: M/71

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press/Tilt	5.7kg	Yes – TMN46	30.5x10.8	Russia



Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press/Tilt	6.3kg	Yes	31.6 x 10.2	Russia



TM-62M METAL CASE



TM-62T CAST BODY
(with waterproof cover)



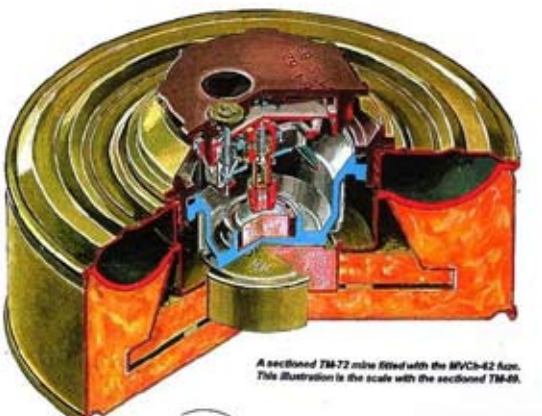
TM-62P2 BAKELITE CASE



TM-62P3 PLASTIC CASE

THERE ARE A NUMBER OF VARIENTS AVAILABLE, MOST ARE DEPLOYED USING THE MVCh-62 FUZE

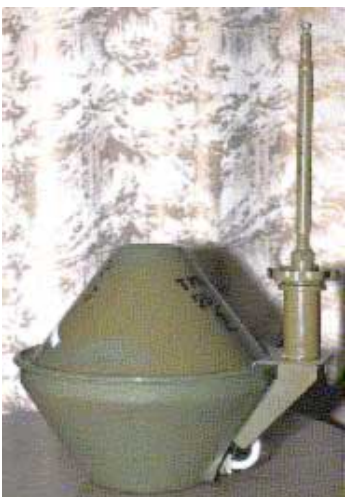
Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press/Tilt/ Magnetic	7.2kg	No	32 x 11.2	Russia



Can be found with MVN-72 Magnetic influence fuse.

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press/ Magnetic	2.5kg	No	25 x 9.7	Russia

ANTI-TANK TMK-2



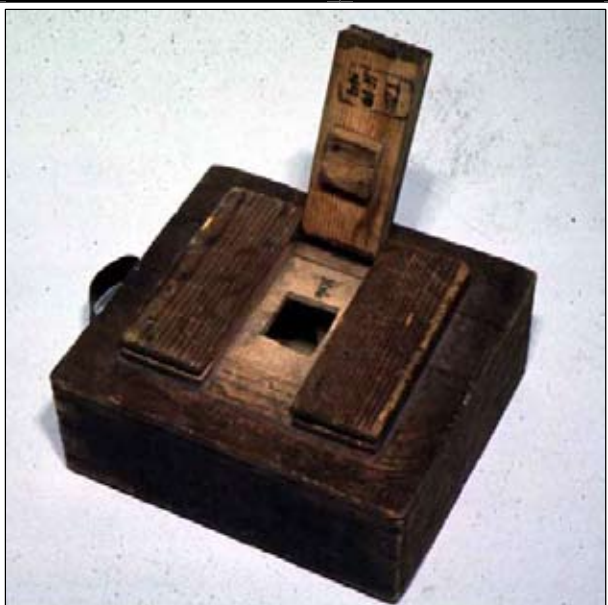
Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Tilt	6.5kg	No	35x30	Russia

ANTI-TANK TMD-44



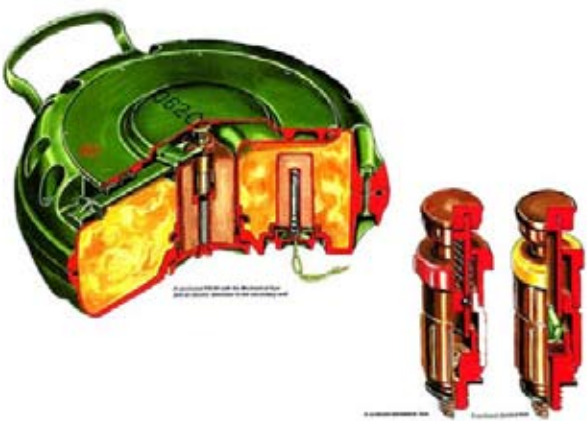
Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5-7kg	None	32x16x29	Russia

ANTI-TANK TMD-B



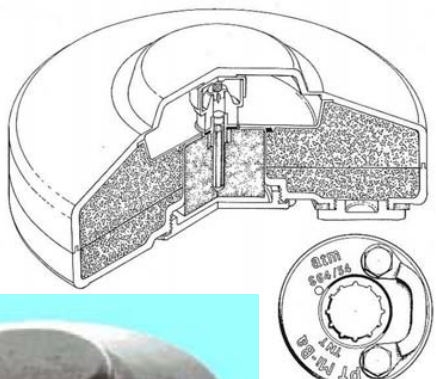
Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5-7kg	None	32x16x29	Russia

ANTI-TANK PM-60



Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	8kg	Yes	32x11.7	East Germany

ANTI-TANK PT Mi Ba





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	6.2kg	No	32.4 x 11.5	Czech



A sectioned PT Mi-Ba-II showing one of the plungers resting on an RO-7-II fuze in the booster.

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	6kg	No	39.5X23X13.5	Czech

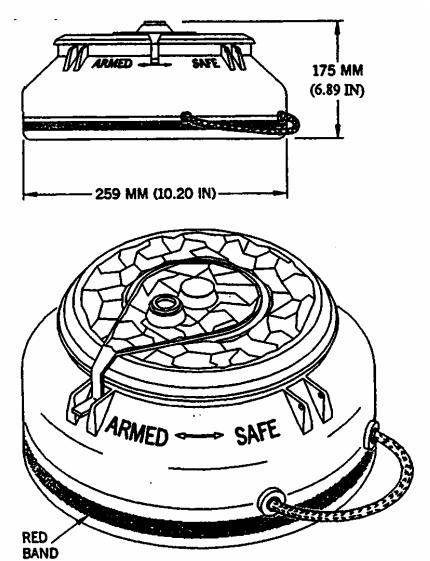
ANTI-TANK PT Mi Ba-III





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	7.2kg	Possible	33 x 10.1	Czech

ANTI-TANK No 8



Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	7kg	Possible	25.9 x 17.5	RSA

ANTI-TANK Mk 7



Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	8.89kg	None	32.5x 13	UK

ANTI-TANK M15



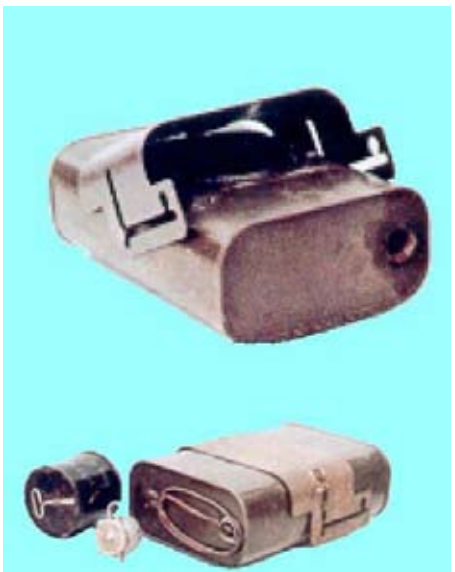
Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	10.3kg	Yes	33.3x 15	USA

ANTI-TANK M19



Fuse	NEQ	Anti-handling	Size (cm)	Origin
Press	9.53 kg	Yes	33.2 x 9.4	USA

ANTI-TANK M7A2



Fuse	NEQ	Anti-handling	Size (cm)	Origin
Press	1.6 kg	Yes	17.8x12.7x6.4	USA

ANTI-TANK PRB M3



Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	6kg	M3A1 has anti-lift	23 x 13	Belgium

ANTI-TANK TMA 1A





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5.4kg	Yes	31.5x10	Yugoslavia

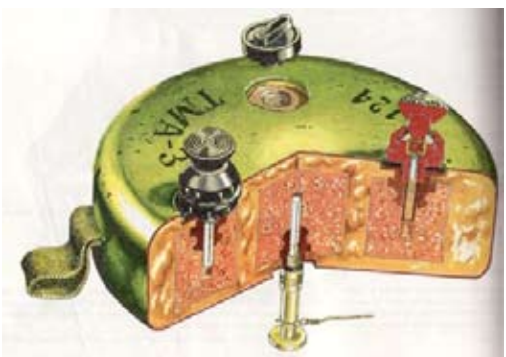
ANTI-TANK TMA 2





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	6.5kg	Yes	26x20x14	Yugoslavia

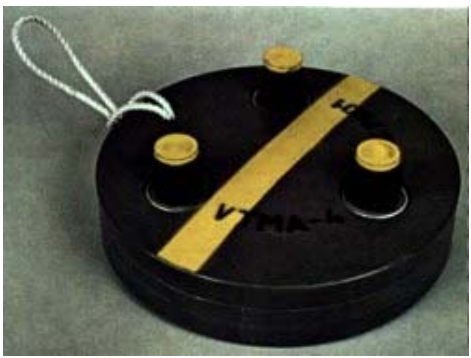
ANTI-TANK TMA 3





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	6.5kg	Yes	26.5x11	Yugoslavia

ANTI-TANK TMA 4





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5.5kg	No	28.4x11	Yugoslavia

ANTI-TANK TMA 5





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5.5 kg	Yes	30X27.5X11	Yugoslavia

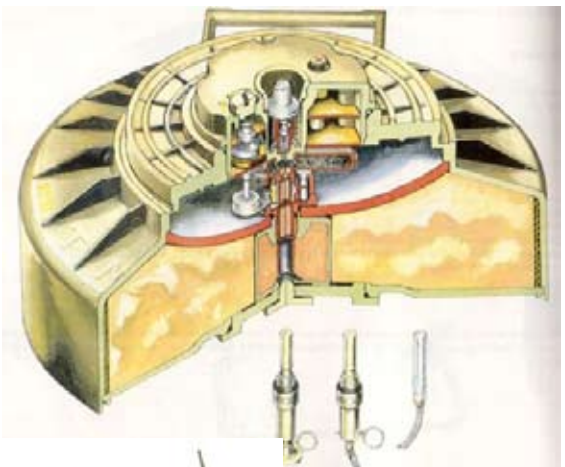
ANTI-TANK TMM 1





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure	5.6kg	Yes	30X9	Yugoslavia

ANTI-TANK TMRP 6





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Pressure/ tilt-rod	5.1kg	Yes	29X13.5	Yugoslavia

ANTI-TANK SB-81 / YM II

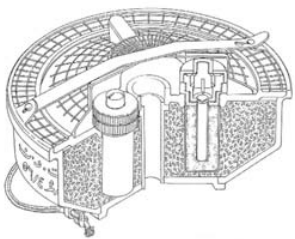


The illustration is of YM II made in Iran.

Other copies made by Portugal (M-453) and Spain (Expal SB-81)

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	2.2kg	No	23 x 9	Italy

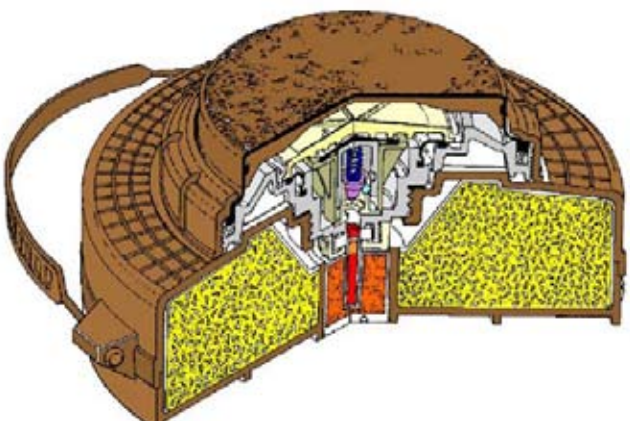
ANTI-TANK SAC I 54/7



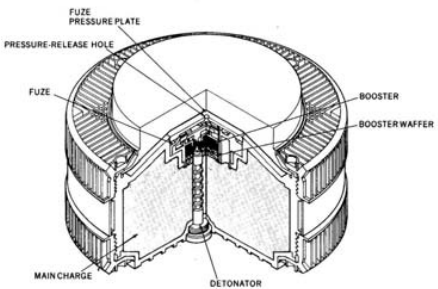


Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	7kg	No	28x20.5	Italy

ANTI-TANK SH 55

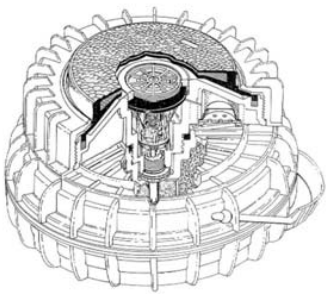


Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	5.5kg	Yes	28x12.2	Italy



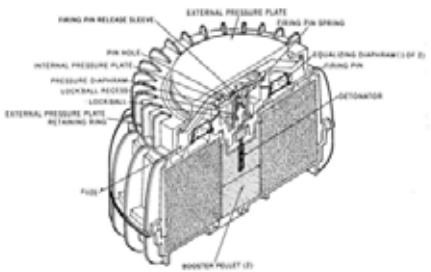


Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	2.4kg	Yes	20.4x10.8	Italy





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	3.6kg	No	27x14.5	Italy





Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	6kg	Yes	27x18.5	Italy

ANTI-TANK TYPE 72 / YM III



This is a LOW METAL AT Mine.
Iranian copy called YM III

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	5.4kg	No	27 x 10	China

ANTI-TANK P2 Mk 2



This mine use a P2 Mk2 AP mine as a fuse.

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	6.5kg	Yes	27 x27x 13	Pakistan

ANTI-TANK P3 Mk 2





P3 Mk1 is bigger and contains 6.5 kg TNT. (30.6x11.7 cm)

These mines use the P4 Mk1 as a fuse.

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	5 kg	Yes	27 x 13	Pakistan



This mine uses the Jony 99 AP mine as a fuse.
Danger: Operating pressure is the same as AP mine.

Fuze Options	NEQ	Anti-handling	Size (cm)	Origin
Press	3.5 kg	No		Sri Lanka (LTTE)



This mine uses the Jony 99 AP mine as a fuse.
Danger: Operating pressure is the same as AP mine.

Fuse	NEQ	Anti-handling	Size (cm)	Origin
Press	11.3 kg	No	30x10	Sri Lanka (LTTE)



Indian copy designated as AT3

Fuse	NEQ	Anti-handling	Size (cm)	Origin
Press	7.2 kg	No	120x10.8x8.1	UK

INTENTIONALLY LEFT BLANK

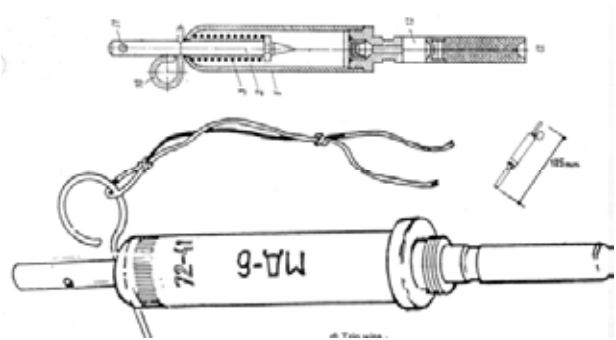
SECTION 4 – IGNITORS

HALO POLICY:

“UNDER ANY CIRCUMSTANCES DON”T TRY TO NEUTRALIZE OR DISARM AN ARMED IGNITOR FROM A MINE OR IED”

MOST OF THE IGNITORS ARE USED FOR BOOBY TRAPS. BE CAREFUL DURING DISPOSAL OF SUCH ITEM.
USE PULLING DRILL TO REMOVE MINES & UXO FROM THEIR ORIGINAL POSITION BECAUSE OF THAT THREAT.

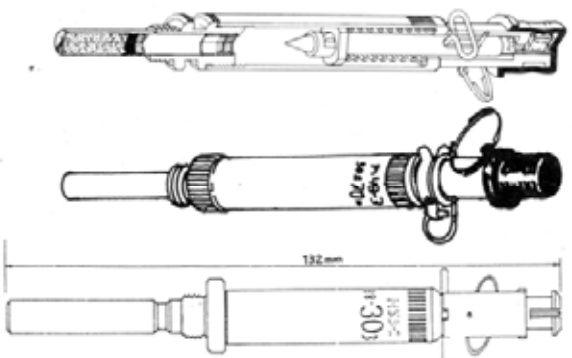
MUV IGNITOR USSR



Widely copied.
Used for booby traps and anti-handling/anti-lift AT mines

Material	Arming delay	Operation	Size (cm)	Use
Metal /plastic	No	Pull/ Pressure/ Tension release	12.5	POMZ-2 PMD-6

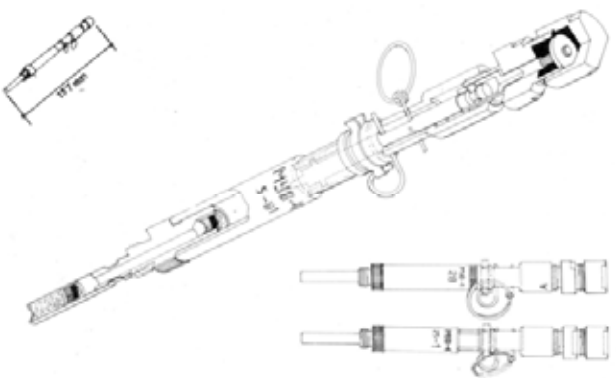
MUV 2/3 IGNITOR USSR



Modification of MUV with arming delay. MUV 3 has a metal clip to increase the amount of pull required from 0.5-1kg (in MUV 2) to 1.5-6 kg.

Material	Arming delay	Operation	Size (cm)	Use
Metal	25-30 min ***cut lead***	Pull/ Pressure/ Tension release	13.2	POMZ-2 PMD-6

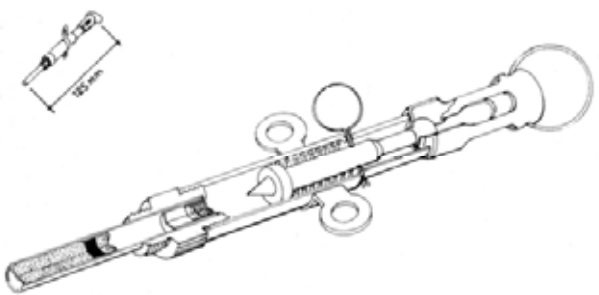
MUV 4 IGNITOR USSR



Arming delay with pressured piston in silicon gel.

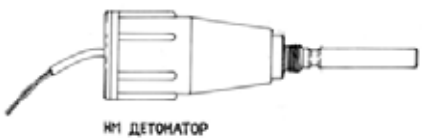
Material	Arming delay	Operation	Size (cm)	Use
Metal/ plasic	25-30 min ***Piston***	Pull/ Pressure/ Tension release	13.2	POMZ-2 PMD-6

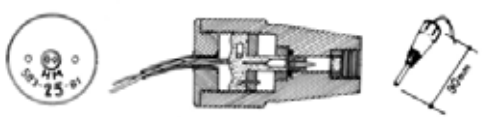
VPF IGNITOR USSR



Material	Arming delay	Operation	Size (cm)	Use
Metal	No	Pull	12.5	Mines & IED's

NM IGNITOR USSR

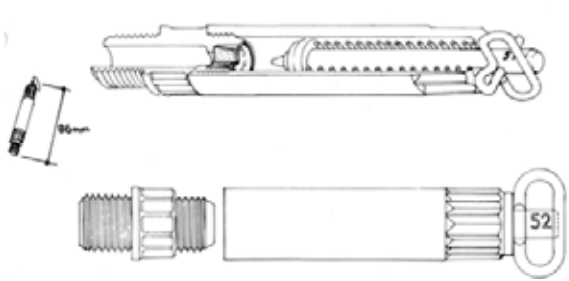




Electro-Mechanical firing switch.
Uses electrical initiation to drive a firing pin into percussion cap.
Used for remote command explosive charges such as MONs and IEDs.

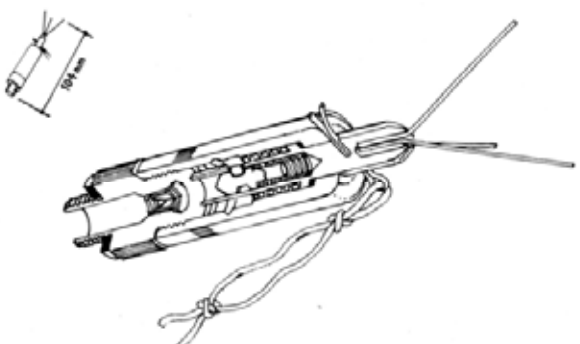
Made of plastic with 46cm long electrical leads.

RO-1 IGNITOR CZECH



Material	Arming delay	Operation	Size (cm)	Use
Metal/ Plastic	No	Pull/ Pressure	8.6	PP-Mi-Sr-II PP-Mi-D

RO-8 IGNITOR CZECH



Material	Arming delay	Operation	Size (cm)	Use
Metal	No	Pressure	10.4	PP-Mi-Sr

SECTION 5 - FRAGMENTATION AND EVACUATION (SAFETY DISTANCES)

Total NEQ (kg)	Safety Distance (m)
0.45	100
0.90	126
1.35	144
1.80	159
2.25	171
2.70	181
3.15	191
3.60	200
4.05	208

Total NEQ (kg)	Safety Distance (m)
4.50	215
4.95	222
5.40	228
5.95	235
6.40	241
6.85	246
7.30	251
7.75	257
8.20	262

Total NEQ (kg)	Safety Distance (m)
8.65	266
9.10	271
9.55	275
10.00	280
10.45	284
10.90	288
11.35	292
11.80	296
12.25	300

NEQ includes the UXO explosive content plus the disposal charge.
1kg = 1000g > 100g = 0.10kg
Formula for calculating safety distances greater than above is:
Cubed root(NEQ of UXO + Donor Charge x 2.2) x 100 = required distance in metres

Safety Distances for mines:
AP Blast **100m**
AP Frag **250m**
A/Tk **300m**

SECTION 6 - SAFETY FUZE CALCULATION

Lengths are in centimetres. Where the time you require is not listed in the table use the next greater time, NEVER REDUCE THE REQUIRED TIME ALWAYS GO UP IN TIME.

MINIMUM LENGTH TO BE USED IS 60CM.

Formula:

Travel time in seconds (pit to safe area) x 2 divided by safety fuze burning time x 30 = length required in cms.

Note:

If the safety fuze is burning outside its normal time (this is usually between 30 –55 seconds), then time three lengths of 30cm lengths to check consistency.

If all three lengths burn at the same time the fuze is consistent therefore can be used. If burning times vary DO NOT USE.

Table 1 BURNING TIME

Length	35s	36s	37s	38s
60	1:10	1:12	1:14	1:16
70	1:22	1:24	1:26	1:29
80	1:34	1:36	1:38	1:42
90	1:45	1:48	1:51	1:54
100	1:57	2:00	2:03	2:07
110	2:09	2:12	2:15	2:20
120	2:20	2:24	2:28	2:32
130	2:32	2:36	2:40	2:45
140	2:44	2:48	2:52	2:58
150	2:55	3:00	3:05	3:10
160	3:07	3:12	3:17	3:23
170	3:19	3:24	3:29	3:39
180	3:30	3:36	3:42	3:48
190	3:42	3:48	3:54	4:01
200	3:54	4:00	4:06	4:14
210	4:05	4:12	4:19	4:26
220	4:17	4:24	4:31	4:39
230	4:29	4:36	4:43	4:52
240	4:40	4:48	4:56	5:04
250	4:52	5:00	5:08	5:17
260	5:04	5:12	5:20	5:30
270	5:15	5:24	5:32	5:42
280	5:26	5:36	5:45	5:54
290	5:38	5:48	5:57	6:07
300	5:50	6:00	6:10	6:20

Table 2 BURNING TIME

Length	39s	40s	41s	42s
60	1:18	1:20	1:22	1:24
70	1:31	1:33	1:35	1:38
80	1:44	1:46	1:49	1:52
90	1:57	2:00	2:03	2:06
100	2:10	2:13	2:16	2:20
110	2:23	2:26	2:30	2:34
120	2:36	2:40	2:44	2:48
130	2:49	2:53	2:57	3:02
140	3:02	3:06	3:11	3:16
150	3:15	3:20	3:25	3:30
160	3:28	3:33	3:38	3:44
170	3:41	3:46	3:52	3:58
180	3:54	4:00	4:06	4:12
190	4:07	4:13	4:19	4:26
200	4:20	4:26	4:33	4:40
210	4:33	4:40	4:47	4:54
220	4:46	4:53	5:00	5:08
230	4:59	5:06	5:14	5:22
240	5:12	5:20	5:28	5:36
250	5:25	5:33	5:41	5:50
260	5:38	5:46	5:55	6:04
270	5:51	6:00	6:09	6:18
280	6:04	6:13	6:22	6:32
290	6:17	6:26	6:36	6:46
300	6:30	6:40	6:50	7:00

Table 3 BURNING TIME

Length	43s	44s	45s	46s
60	1:26	1:28	1:30	1:32
70	1:40	1:42	1:45	1:47
80	1:54	1:57	2:00	2:03
90	2:09	2:12	2:15	2:18
100	2:23	2:26	2:30	2:33
110	2:37	2:41	2:45	2:48
120	2:52	2:56	3:00	3:04
130	3:06	3:10	3:15	3:19
140	3:20	3:25	3:30	3:34
150	3:35	3:40	3:45	3:50
160	3:49	3:54	4:00	4:05
170	4:03	4:09	4:15	4:20
180	4:18	4:24	4:30	4:36
190	4:32	4:38	4:45	4:51
200	4:46	4:53	5:00	5:06
210	5:01	5:08	5:15	5:22
220	5:15	5:22	5:30	5:37
230	5:29	5:37	5:45	5:52
240	5:44	5:52	6:00	6:08
250	5:58	6:06	6:15	6:23
260	6:12	6:21	6:30	6:38
270	6:27	6:36	6:45	6:54
280	6:41	6:50	7:00	7:09
290	6:55	7:05	7:15	7:24
300	7:10	7:20	7:30	7:40

SECTION 7 - TAMPING – SANDBAG REQUIREMENT

SURFACE UXO

40 SANDBAGS FOR EVERY 1kg
(1 SANDBAG FOR 25g)

100g	4
200g	8
300g	12

400g	16
500g	20
600g	24

700g	28
800g	32
900g	36

BURIED UXO

WHEN THE UXO IS BURIED GREATER THAN 75cm THE REQUIREMENT CAN BE REDUCED TO:

20 SANDBAGS FOR EVERY 1kg
(1 SANDBAG FOR 50g)

100g	2
200g	4
300g	6

400g	8
500g	10
600g	12

700g	14
800g	16
900g	18

Note:
IT IS IMPORTANT TO USE ALL THE SANDBAGS CALCULATED TO ENSURE MAXIMUM PROTECTION. THE SANDBAGS MUST BE PLACED EVENLY AROUND THE UXO AND AS CLOSE AS POSSIBLE WITHOUT TOUCHING.

SECTION 8 - UXO PROCEDURE

1. Initial inspection alone.
2. Excavate to see fuze without moving UXO.
3. Identify by GROUP then SUB (SUB) GROUP.
4. Assess arming and propelling state.
5. Assess disposal options: Destroy-In-Situ, Pull and move, Make safe, Mark and leave.
6. Check or estimate explosive content.
7. Calculate safety distance and sandbag requirement.
8. Set up cordon – use assistant to control cordon.
9. Select firing point.
10. Prepare charge in safe area.
11. Place charge.
12. Build sandbag protection.
13. Ensure cordon in place and secure.
14. Det up.
15. Final confirmation.
16. After blow wait for smoke and debris to clear then check area to ensure UXO has been destroyed.
17. Proceed to conduct an area clearance of the vicinity to ensure no further UXOs. A minimum area of 150m x 150m should be

checked with the position of the UXO in the centre of the area.

18. Complete task report and include BAC figure.
19. Where the area is being cultivated or lived in then request permission to conduct search or ask if any other items have been seen.

SECTION 9 – DISPOSAL OPTIONS

Ser	Method	Advantages	Disadvantages
1.	Destroy in-situ	Positive action Ideal for blinds No casualties	Damage to surrounding area
2.	Make Safe	Removes means of initiation making UXO safe – not good for base fuze Reduces damage	Care and time needed to set up task
3.	Pull & remove	Removes danger to general public when dealing with safe munitions without causing any damage	Still requires to be stored and destroyed
4.	Mark & leave	Only done where operator knows he will return sooner rather than later	Danger still remains for local people

The decision on what action to be taken is entirely the operator' – no one can second-guess. REMEMBER we are here to assist locals not make it worse for them.

SECTION 10 - ELECTRICAL INITIATION

1. Test cable for continuity. Lay cable from UXO / mine to safe area. Earth cable at both ends.
2. Place sandbag at UXO / mine. Position dem charge.
3. Ensure cordon is secure.
4. ONE MAN RISK. Go forward with elec det in a suitable container, tape and tools. ENSURE CODAN IN VEHICLE IS SWITCHED OFF.
5. Prepare tape, SWITCH OFF RADIO.
6. EARTH YOURSELF. Remove det and place under sandbag.
7. Earth det leads to same potential as firing cable.
8. CONNECT DET TO FIRING CABLE ENSURING BARE LEADS ARE TAPED WHEN TWISTED TOGETHER.
9. CONNECT DET TO DEM CHARGE.
10. Check area for tools and equipment then return to firing point.
11. Connect firing cable to safety ohmmeter and check continuity. Connect firing cable to exploder.
12. Check cordon secure, do final visual check.
13. Fire exploder. Disconnect and earth wires. Wait for smoke and debris to clear then check

for full demolition alone before declaring area clear.

Note: 10 minute waiting period to be observed in the event of a misfire.

SECTION 11 – ELECTRICAL MISFIRE

First failure:

1. Ensure all personnel remain under cover and quiet.
2. Remove key, break and remake connections to EDC.
3. Re-fire circuit.

Second failure:

4. Remove key, break connection and earth leads.
5. Ensure all personnel remain undercover.
6. Inform cordon and start 10-minute misfire period.
7. Prepare new detonator and equipment.
8. Brief nominated person to control cordon and assist with reverse cable test.
9. After 10-minutes go forward **ALONE** with:
   EDC Key
   New Detonator
   Tools and Tape
   Stopwatch
10. Check cable on route and mark any damage. DO NOT REPAIR CABLE.
11. REMOVE DETONATOR FROM EXPLOSIVES and place under sandbag.
12. SWITCH OFF RADIO AND OBSERVE STATIC PRECAUTIONS.

13. Remove tape from first connection, check and break connection, remove tape from second connection, check and break connection.
14. Earth detonator leads and firing cable leads.
15. Repair firing cable if required.
16. Conduct reverse cable test.
17. Confirm cordon still secure.
18. Repeat detting up procedure:
    a. Put on original detonator if cable was at fault.
    b. Put on new detonator if cable not at fault.
19. Return to firing point and conduct circuit test.
20. Check cordon and repeat firing procedure.

SECTION 12 - SAFETY FUZE INITIATION

1. First demolition of the day: cut and discard first 30cm fo safety fuze (SF). Cut and time second 30cm. Note time.
2. For subsequent demolitions on the same day using same SF miss step 1 above unless it is raining.
3. Time the walk FROM the UXO / mine to the safe area.
4. DOUBLE THE TIME FOR SAFETY. Go to SF tables in guide and find appropriate column for the SF burning time. Go down column until the required time is reached and go across to see the required length of SF.
5. Cut SF, one end straight and one end scarved.
6. Wearing body armour and visor, remove flash det from box, close box and inspect det.
7. Insert SF, straight end, into det. Holding det at arms length crimp det onto SF using supplied crimpers.
8. Place prepared initiator into det box
9. Ensure cordon is in place. Place dem charge and attach prepared initiator. FINAL CHECK.
10. Light SF, note time, retain match and collect all equipment. Return to safe area.
11. Countdown.

Note: 30 minute waiting period to be observed in the event of a misfire.

SECTION 13 - SAFETY FUZE MISFIRE

1. Ensure all pesonnel remain under cover
2. Inform sentries and ensure area remains secure
3. **Start 30 mins waiting period from time you expected dem to function or from last signs of smoke**
4. During waiting period prepare new initiator using same length of safety fuze
5. Nominate asssistant to control cordon and keep everyone under cover
6. **After 30 mins go forward alone,** taking with you:
   New initiator
   Watch
   Tool box and tape
   Matches
7. **Observe for signs of smoke as you move forward, if seen return immediately to safe area and wait further 30 mins**
8. **<u>Do not touch old detonator.</u> Leave old detonator in place and tape new detonator to det cord below and away from old detonator**
9. Check with assistant that the cordon is still secure and everyone under cover
10. Repeat firing procedure

SECTION 14 – CYRILLIC TABLE

KNOWN MINE MARKINGS WITH MEANINGS

CYRILLIC	NATO STANAG	MEANING
ТМН	TMN	ANTI-TANK MINE WITH ANTI-HANDLING FUZE
ТМК	TMK	SHAPED CHARGE ANTI-TANK MINE
ПМН	PMN	ANTI-PERSONNEL MINE TREAD OPERATED
ПМД-6М	PMD-6M	ANTI-PERSONNEL MINE TYPE 6 MODERNISED
ПОМЗ	POMZ	FRAGMENTATION ANTI-PERSONNEL MINE - OBSTACLE
ОЗМ	OZM	FRAGMENTATION OBSTACLE MINE
ТМД-Б	TMD-B	ANTI-TANK MINE - WOODEN - LARGE
ТМ	TM	ANTI-TANK MINE
УНТМ	UITM	TRAINING ANTI-TANK MINE
МПМ	MPM	PISTOL ROUND MINE MODERNISED
МОН	MON	DIRECTIONAL FRAGMENTATION MINE
УВ	UV	PULL FUZE
МУВ	MUV	MINE FUZE - PULL
ВПФ	VPF	ALL WAYS PULL FUZE
МВ	MV	MINE FUZE (PERCUSSION)
МВМ	MVM	MV - MODERNISED
ВЗ	VZ	FUZE/BOOSTER
ЧВЗ	ChVZ	CLOCKWORK FUZE/BOOSTER
ЭХЗ	E Kh Z	ELECTRO CHEMICAL FUZE
ЧЗ	ChZ	CLOCKWORK FUZE
ЧМВ	ChMV	CLOCKWORK MINE FUZE
МВШ	MVSh	TILT ROD FUZE
ЗТ	ZT	SAFETY FUZE LIGHTER
ЯМ	YaM	OLD DES. BOX (WOODEN) MINE ANTI-TANK
ТМБ	TMB	PAPER (Tar) ANTI-TANK MINE

KNOWN MARKINGS AND MEANINGS

CYRILLIC	NATO STANAG	MEANING
Б	B	LARGE OR PAPER
В	V	FUZE (EXPLODER)
Д	D	WOODEN
Э	E	ELECTRICAL (AS IN EKh - ELECTRO-CHEMICAL)
З	Z	OBSTACLE OR ELECTRIC CIRCUIT CLOSER/ CHARGE
К	K	SHAPED (CHARGE) OR CONTAINER/CARRIER
М	M	MINE, METAL OR MODERNISED
Н	N	ANTI-HANDLING,DIRECTIONAL OR TREAD OPERATED
О	O	FRAGMENTATION
П	P	ANTI-PERSONNEL OR PLASTIC
С	S	SELF DESTRUCT, SUPRISE ATTACK (BOOBY TRAP) OR CONCENTRATED
Т	T	ANTI-TANK OR TNT (FILLER)
У	U	TRAINING
Ф	F	FOUGASSE, AIR DROPPED OR EXPLOSIVE
Х	Kh	CHEMICAL
Ч	Ch	CLOCKWORK
Ш	Sh	TILT ROD
Я	Ya	BOX OR ANCHORED
Р	R	RIVER DEMOLITION, ANTI-HANDLING (RA)

SUPERVISORS' NOTES

Please make use of these pages to note details of items photographed including:
Colour, shape, marking, size (approx), diameter, fuse details etc which will help us identify the item.