Australian Government
Department of Defence

DEFENCE UNEXPLODED ORDNANCE WEBSITE
ORDNANCE INFORMATION SHEET

ALL UXO MAY BE HAZARDOUS IF DISTURBED
DO NOT TOUCH – TAKE A PHOTO – MARK THE LOCATION – CALL THE POLICE

MORTAR – 60 MM

Description

- The 60mm mortar is a smooth bore, muzzle-loading, high-angle-of-fire weapon used for close-in support of ground troops. Designed in the 1930's after the French Brandt mortar, it came into service with the US forces in 1940 (M2). The 60mm was used in WWII, Korea and Vietnam before being replaced by the M224 in 1979 - it remains in use with the US today. Australian forces used the M2 during Korea and Vietnam.
- The main types of projectiles used with the 60mm mortars included the following:
  - **High Explosive** (HE) – filled with high explosive and fitted with a Point Detonated (PD) fuze.
  - **Smoke** (Smk-WP) – M302A1-2, M722-A1 - filled with White/Red Phosphorus, fitted with a Point detonated (PD) fuze and contains an explosive burster charge.
  - **Illuminating** (Illum) – M83 - filled with an illumination incendiary; base ejected, parachute-suspended charge.
  - **Training** (Trg) – M69 - teardrop shaped, contains no explosive elements except ignition charge.
  - **Practice** (Prac, TP) - M50A2-3 - contains black powder as a spotting charge; modern M769 (TP) round has a flash/bang charge.
- Unexploded items of this type are most often found in/near areas used by the Army for infantry live firing practices. UXO are typically being found on or just below the ground surface (to approx 0.5m).

Technical Data

- Projectile length : approx. 196 - 427 mm
- Projectile diameter : approx. 60 mm
- Total weight : Projectile – approx 1430-2010 grams
- Fuse/Burster : Various fuzes used (point detonated, time, etc); Smk has a burster charge.
- Filling : Approx 150-400g of high explosive or 350 grams of White/Red Phosphorus.
- Identification :
  - Projectiles are typically steel with aluminium fins.
  - HE munitions are usually painted olive drab with yellow markings, Smk & Illum painted grey with black markings and Prac painted blue with white markings.
  - Colours are markings vary across nations and may have faded over time. It can be difficult to distinguish between dangerous and safe items - **treat all found munitions as dangerous**.

Images

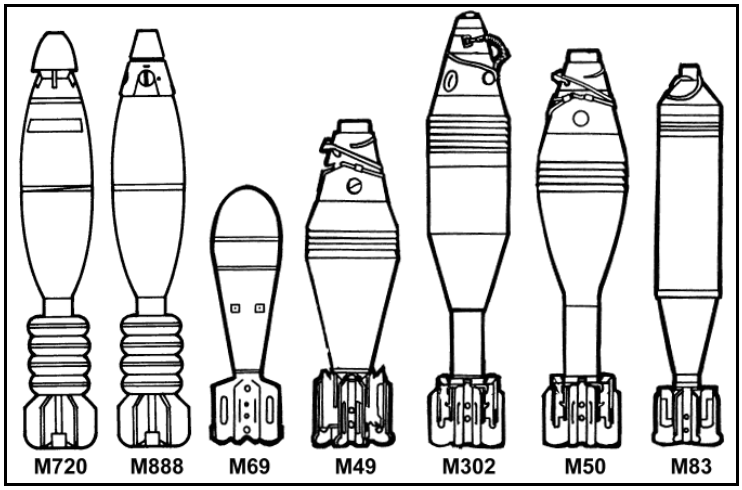

Figure 1 - US 60mm mortar ammunition

Figure 2 - 60mm HE

Figure 3 - US M2 60 mm Mortar Barrel c. 1940 (AWM ID RELAWM15576.001)

Figure 4 – 60mm Illum

Figure 5 – 60mm Prac

Figure 6 - Range practice for the 60 mm mortar men of the 1RAR - Korea, 1955 (Photographer - Meldrum, Donald Albert (Tim); AWM ID MELJ0613 - Image copyright: © Australian War Memorial, licensed under CC BY-NC)

Figure 7 - Unexploded M49A4 HE 60mm (later variant of the M49)

Figure 8 - Unexploded M83A1 60mm Illum

Australian Government
Department of Defence

DEFENCE UNEXPLODED ORDNANCE WEBSITE
ORDNANCE INFORMATION SHEET

ALL UXO MAY BE HAZARDOUS IF DISTURBED
DO NOT TOUCH – TAKE A PHOTO – MARK THE LOCATION – CALL THE POLICE

MORTAR – 81 MM

Description

- The 81mm mortar has been in service since WW2 and has undergone various developments to modernise both weapon and ammunition. Whilst the Commonwealth forces in WW2 used the British 3" (81.5mm) mortar, the US forces developed the M1 mortar based on the French Brandt mortar, replaced in 1952 with the M29, which was subsequently superseded by the British L16A2 in 1987 (renamed M252 for US use). The L16 81mm mortar was used by Commonwealth forces starting in 1965 and remains in use today; the Australian designation for the L16 is the F2 81mm mortar.
- The 81mm mortar was also mounted on various vehicles and vessels – mounted in APCs during the Vietnam War and installed on Australian Fremantle class ships (1977-2007).
- Numerous types and variations of projectile (both US and Commonwealth) have been used throughout the life of the 81mm mortar including the following:
  - **High Explosive** (HE) – Both '*Light*' (M43A1) and '*Heavy*' variants used as well as the British L15A3 – all filled with high explosive. Various fuzes - Point Detonated (PD), PD Delay, Delay - Variable Time.
  - **Chemical** (Chem) and **Smoke** (Smk) – filled with toxic chemicals or various smoke chemicals (White/Red Phosphorus); normally contains a burster charge and is point detonated.
  - **Illuminating** (Illum) – US & UK variants; base-ejected, parachute-suspended illuminant charge.
  - **Training** (Trg) - (M68) contains no explosive elements except ignition charge.
  - **Practice** (Prac, TP) - (M43A1) Similar to the M43A1 HE shell, contains a black powder spotting charge.
- Unexploded items of this type are most often found in/near areas used by the Army for infantry live firing practices. UXO are typically being found on or just below the ground surface (to approx 0.5m).

Technical Data

- Munition length : approx. 331-571 mm
- Projectile diameter : approx. 81 mm
- Total weight : Projectile – approx 2.2-6.8 kg
- Fuse/Burster : Various fuzes used (point detonated, time, etc); Smk has a burster charge.
- Filling : HE - approx 0.5-1.95 kg of explosive; Smk - 0.7-1.9kg White/Red Phosphorus.
- Identification :
  - US projectiles are usually steel with aluminium fins, British projectiles are all steel.
  - HE munitions are usually painted olive drab/green with yellow markings, Smk & Illum painted grey with black markings and Prac painted blue with white markings.
  - Colours are markings vary across nations and may have faded over time. It can be difficult to distinguish between dangerous and safe items - treat all found munitions as dangerous.

Images

Figure 1 - 81mm HE (Light), M43A1

Figure 2 - 81mm HE (Heavy), M56

Figure 3 - 81mm WP Smk, M57

Figure 4 - 81mm TP, M43A1

Figure 5 - 81mm Training, M68

Figure 6 - UK 81mm HE, L15

Figure 7 - US soldiers in Australia during WWII give a demonstration of mortar firing (AWM ID 012390)

Figure 8 - Australian soldiers from 6 RAR firing the 81mm mortar - Vietnam, 1966 (Photographer - Cunneen, William James. AWM ID CUN/66/0569/VN, Image copyright: © Australian War Memorial licensed under CC BY-NC)

Figure 9 - Unexploded 81mm HE mortar bomb found at Cashmere in SE QLD

Figure 10 - Unexploded 81mm M370 Smk-WP

Australian Government
Department of Defence

DEFENCE UNEXPLODED ORDNANCE WEBSITE
ORDNANCE INFORMATION SHEET

ALL UXO MAY BE HAZARDOUS IF DISTURBED
DO NOT TOUCH – TAKE A PHOTO – MARK THE LOCATION – CALL THE POLICE

MORTAR - 2 INCH

Description

- The original British 2-inch Mortar (Mk I) was introduced during WWI but was quickly declared obsolete. The 2-inch mortar was re-introduced into Commonwealth service in 1938 as the Smooth-Bore Muzzle Loading 2-inch Mortar, Mark II (SBML 2" Mk II) and was used in Australia throughout most of WWII and into the Korean War.
- Several types of 2-inch mortar bomb were produced including:
  - **High Explosive** (HE) - several variations ('Marks'/Mk) of HE rounds were manufactured; all contain a fuze and High Explosive (HE).
  - **Smoke** (Smk) – contained a fuze, burster or expelling charge and potentially hazardous chemicals - typically White Phosphorus (Smk WP) or Titanium Tetrachloride (Smk FM).
  - **Illumination** (Illum) - contains a burster charge and incendiary-like chemical (often magnesium) attached to a parachute to illuminate specific areas.
  - **Signal** – either single or multi-star; contains a burster/expelling charge and a coloured incendiary-like chemical.
  - **Practice** (Prac) - several types were manufactured (some may contain a small burster charge).
- The 2 inch mortar was predominantly used by Australian infantry units (Regular and Reserve) and was fired at many live firing ranges throughout Australia. UXO of this type are usually found on the surface or shallow buried (<0.5m).

Technical Data

- Bomb length : approx. 225-250mm
- Bomb diameter : approx. 50-51mm (~ 2 inch)
- Bomb weight : approx 0.45-1.02 kg
- Fuse/Burster : May contain a sensitive fuse which can be easily detonated
- Filling : HE - approx 300 g high explosive (Amatol, TNT, etc)
  Smk –White Phosphorus (WP) or Titanium Tetrachloride (FM)
- Identification :
  - The body may have one or more bands of colour. Red, yellow or green bands/stripes were most often used to denote hazardous munitions however other colours may have been used or colours may have faded over time.
  - It can be difficult to distinguish between dangerous and safe items - **treat all found munitions as dangerous**.

Images

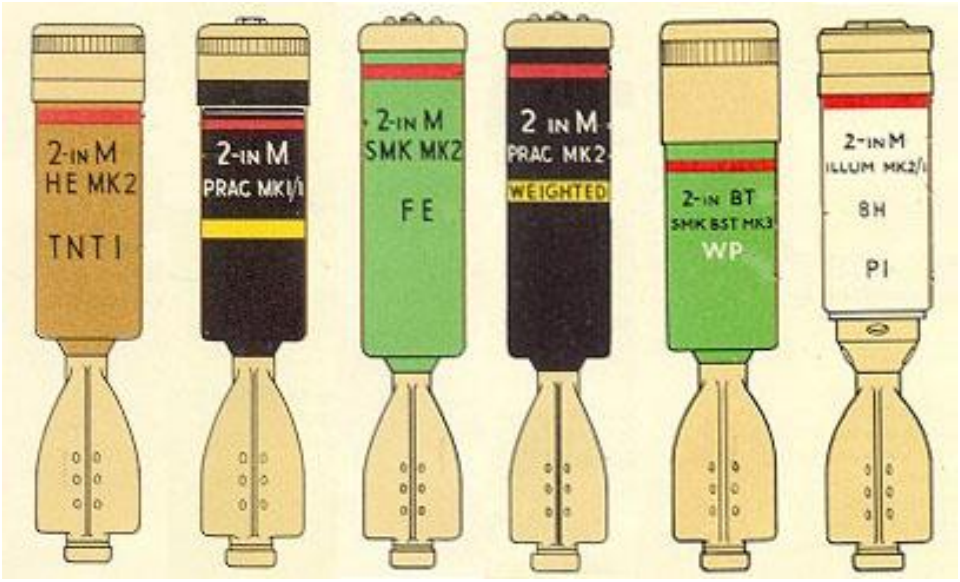

Figure 1 - Example 2" mortar markings (L to R): HE, Prac HE, Smk, Prac Smk, Smk WP, Illum
(colours and markings may vary)

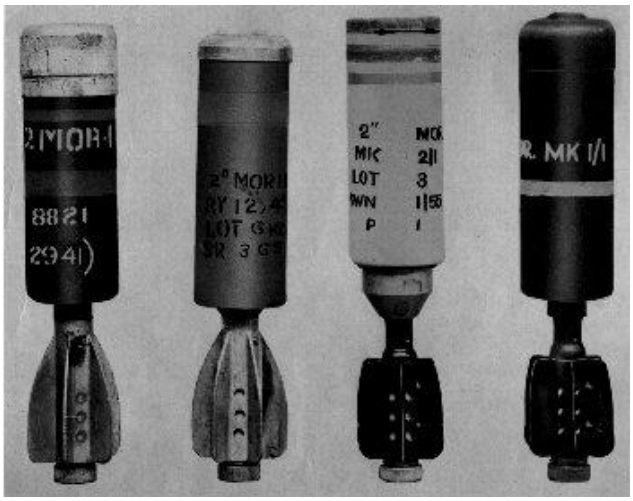

Figure 2 - Various 2 inch mortar bombs

Figure 3 – Unexploded 2 inch mortar found on a property near Warwick, Qld, 2014

Figure 4 - Australian infantrymen firing 2” mortar – New Guinea, 1945 (AWM ID number 094355)

Figure 5 - Unexploded 2 inch mortars found on the Atherton Tablelands, Nth Qld

Australian Government
Department of Defence

DEFENCE UNEXPLODED ORDNANCE WEBSITE
ORDNANCE INFORMATION SHEET

ALL UXO MAY BE HAZARDOUS IF DISTURBED
DO NOT TOUCH – TAKE A PHOTO – MARK THE LOCATION – CALL THE POLICE

MORTAR - 3 INCH

Description

- The British 3-inch Stokes Mortar was invented during WWI and the bomb originally had no tail vanes (10-11lb/4.5-5.0 kg). A subsequent variation of the bomb was constructed with 3 tail vanes (approx 7lb/3.2 kg). Both variants were widely used by Commonwealth forces until superseded by the ML 3-inch Mortar bomb Mk II with 6 tail vanes in the early 1930s (approx 10lb/4.5 kg).
- The Mk II bomb was subsequently further modified to the Mk II Long Range (LR) and was extensively used by Australian units throughout WWII. The Mk II remained in service with the ADF up until the late 1960s, although some types of ammunition were still in use for training up until the mid 1980s.
- Several types of 3-inch bomb were produced or used including:
  - **High Explosive** (HE) – all variations ('Marks'/Mk) of HE bombs contain a fuze and High Explosive (HE).
  - **Smoke** (Smk) - Bursting, Screening, Coloured and Observing Smoke; weights and types of fill varied with the nature of the round.
  - **Chemical** (Chem) – contains a fuse and hazardous chemicals; limited stocks were used in Australia at few locations – all were reported to have been dumped at sea after WWII.
  - **Illumination** (Star) - the standard illumination round was known as a Star round and contained a white Star unit attached to a parachute to illuminate specific areas.
  - **Flare** - Similar in design to a smoke bomb but contained a candle producing a coloured flare for marking areas.
  - **Practice** (Prac) - several types were manufactured including powder-filled and sand-filled.
- The 3" mortar bomb was produced in large quantities at various factories around Australia. All Australian infantry units (Regular, Reserve and Militia) and numerous other military personnel fired the 3" mortar at many live firing ranges throughout Australia and many were dumped at sea. UXO of this type are one of the most common found by the civilian population and have caused a number of fatalities over the years. Usually found on the surface or shallow buried (<0.5m).

Technical Data

- Bomb length : approx. 370-500mm
- Bomb diameter : approx. 81-82mm
- Total weight : approx 3.2-5.0 kg
- Fuse/Burster : May contain a sensitive fuse and explosive which can be easily detonated
- Filling : HE - approx 500 g high explosive (Amatol, TNT, etc)

  Smoke – White Phosphorus (WP), Titanium Tetrachloride (FM) or Chlorosulphonic Acid/Sulphur Trioxide mixture (CSAM)
- Identification : The main body is cast iron and may have one or more bands of colour. Red, yellow or green bands were most often used to denote hazardous munitions however other colours may have been used or colours may have faded over time.

Images

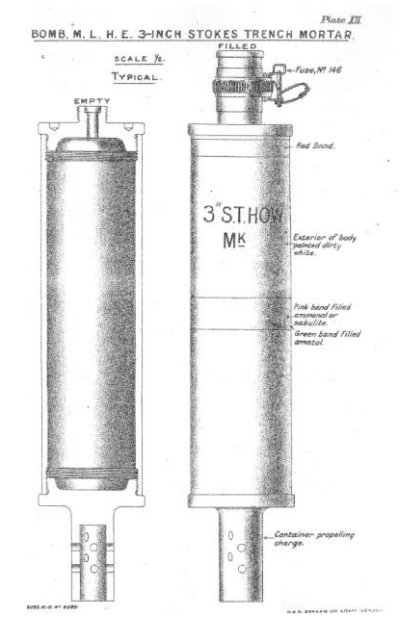

Figure 1 – Example original 3” Stokes HE Mortar (c. 1914)

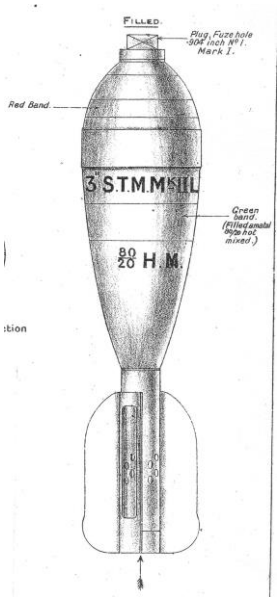

Figure 2 - 3" Stokes Mortar Mk II (3 vanes; WWI era)

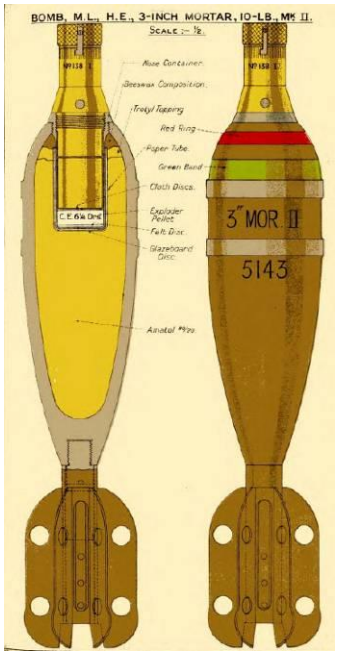

Figure 3 - ML 3" Mortar Mk II (6 vanes; WWII era)

Figure 4 - 3" Mortars - HE, HE (6 vane), Illumination (6 vane), Smoke WP (possibly earlier 3 vane)

Figure 5 - Duntroon cadets firing the 3" mortar - Canberra, 1941 (AWM ID number 008006)

Figure 6 - Unexploded 3" HE Mortar - found on the Atherton Tablelands, Nth Qld

Figure 7 - Unexploded 3" Mortar found at Canberra, ACT

Australian Government
Department of Defence

DEFENCE UNEXPLODED ORDNANCE WEBSITE
ORDNANCE INFORMATION SHEET

ALL UXO MAY BE HAZARDOUS IF DISTURBED
DO NOT TOUCH – TAKE A PHOTO – MARK THE LOCATION – CALL THE POLICE

MORTAR – 4.2 INCH

Description

- The Smooth-Bore Muzzle-Loading (SBML) 4.2-inch mortar was a British-designed mortar introduced into Australian service in late 1942/early 1943. The Mark 3 became the standard model. Initially the ammunition was made of heavy cast iron, with a subsequent short range. Improved variants with increased range became available in 1944.
- The US M2 4.2 inch mortar (replaced in the 1950s with the M30 107mm/4.2 inch mortar) was also used in Australia during WWII by US forces undergoing training however the US version was rifled while the British version was smooth bore. Australian and US forces primarily used High Explosive and Smoke mortar bombs against pillboxes and defences in the WWII Pacific battles.
- The 4.2 inch mortar saw service with Australian forces during WWII, Malaya and Korea until eventually withdrawn from service in 1985 with the introduction of the 105mm L5 Pack howitzer. Their use in later years was primarily for training mortar locating radar operators.
- Several types of 4.2 inch bomb were produced including (not all may have been used in Australia):
  - **High Explosive** (HE) – contains a nose fuze and approx. 3.6-4.25 kg of high explosive.
  - **Smoke** (Smk) – contains a fuze, bursting charge and White Phosphorus (Smk WP) or Titanium Tetrachloride (Smk FM). Bursting and Base Ejection (BE) variants of the bomb were produced.
  - **Illumination** (Illum) - contains a burster charge and incendiary-like chemical to illuminate specific areas.
  - **Chemical** (Chem) – contained a nose fuze, bursting charge and various chemicals.
  - **Practice, Bursting** (Prac) – contains Calcium Chloride and Phosphorus.
- The 4.2 inch was used by a few Australian anti-tank and artillery units and was fired at limited live firing ranges in Australia. UXO of this type may be found on the surface or shallow buried (<0.5m).

Technical Data

- Bomb length : approx. 500-525mm
- Bomb diameter : approx. 105-107mm (~4.2 inch)
- Bomb weight : approx 9-13 kg (depending whether UK or US)
- Fuse/Burster : Sensitive fuse and HE bursting charge which can be easily detonated
- Filling : HE - approx 3.6 kg (US) to 4.25 kg (UK) high explosive
  Smk –approx 3-4 kg White Phosphorus (WP) or Titanium Tetrachloride (FM)
- Identification :
  - The body is usually made of cast iron/steel and may have one or more bands of colour.
  - Red, yellow, green or grey colours and bands were most often used to denote hazardous munitions however other colours may have been used or colours may have faded over time. It can be difficult to distinguish between dangerous and safe items - **treat all found munitions as dangerous**.

Images

Figure 1 - Example 4.2 inch mortars (L to R): HE, Smk (WP), Chem, Smk BE (sizes, colours & shapes may vary)

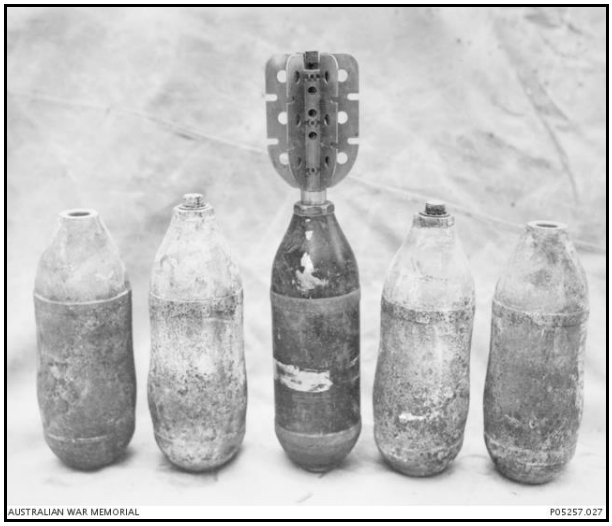

Figure 2 - Various unexploded 4.2 inch mortar bombs used on Hinchinbrook Island, Nth Qld (AWM ID P05257.027)

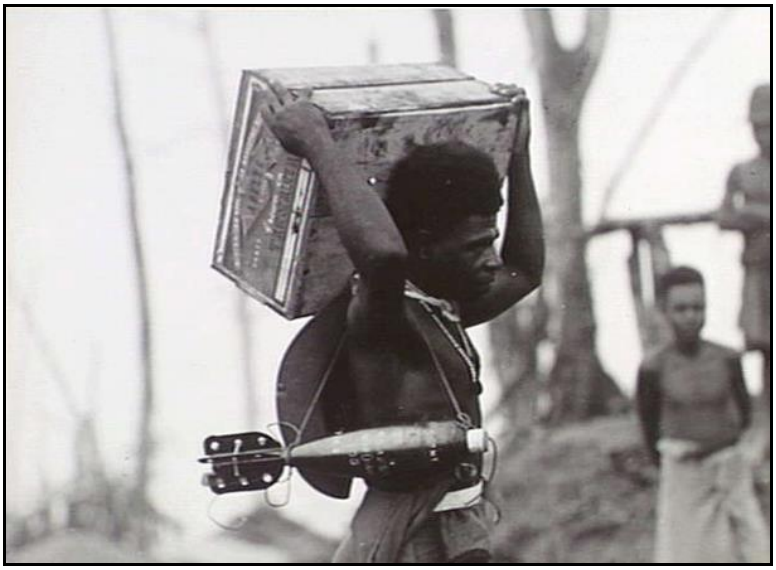

Figure 3 - Carrying supplies and a 4.2" inch mortar bomb – Bougainville, 1945 (AWM ID number 093399)

Figure 4 - Australian soldiers firing 4.2" mortar – possibly Innisfail, Nth Qld, c. 1945 (AWM ID number P05257.025)

