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release is shielded by the trigger-guard from inadvertent actuation. The USP and USP Compact models can be converted by a H&K certified armourer from one type of trigger firing mode to another, this includes combination DA and single-action SA modes and DA Only modes (DAO). In 2012. both model types were available in ten firing/control mode configurations, including the enhanced DA Law Enforcement Modification (LEM) mode.

The Heckler & Koch USP Compact pistols are generally identical to the full-size USP pistols. To reduce the length of the slide and barrel, the compact version does not have the mechanical recoil-reduction system of the largeframe USPs.. The new system is a specially designed flat compression spring contained in the captive recoil spring assembly by a polymer absorber bushing. The service life is claimed to exceed 20,000 rounds.

As with the full-size USP, the compact versions are chambered for the 9 × 19 mm, .40 S&W and .45 ACP cartridges. The .45 ACP version, with an eight-round magazine, is intended mainly for the US market and is marketed by Heckler & Koch of Columbus, Georgia.

## **Variants**

- Variant 1 Double action/single action with 'safe' position and control lever (manual safety/de-cocking lever) on the left side of the frame.
- Variant 2 Double action/single action with 'safe' position and control lever (manual safety/de-cocking lever) on the right side of the frame.
- Variant 3 Double action/single action without 'safe' position and control lever (manual safety/de-cocking lever) on the left side of the frame.
- Variant 4 Double action/single action without 'safe' position and control lever (manual safety/de-cocking lever) on the right side of the frame.
- Variant 5 Double action only, with 'safe' position and control lever (manual safety) on the left side of the frame.
- Variant 6 Double action only, with 'safe' position and control lever (manual safety) on the right side of the frame.
- Variant 7 Double action only, without control lever (no safety/de-cocking
- Variant 8 Designation not officially assigned, although it was temporarily applied to a Variant 7 tested by a US government agency.
- Variant 9 Double action/single action with 'safe' position and control lever (manual safety/no de-cocking lever) on the left side of the frame.
- Variant 10 Double action/single action with 'safe' position and control lever (manual safety/no de-cocking lever) on the left side of the frame.

All variants are available in 9 × 19 mm, .40 S&W and 0.45 ACP.

The recoil-reduction mechanism is incorporated into the recoil/buffer-spring assembly located below the barrel. Designed primarily to buffer the slide and barrel and to reduce recoil shock to the pistol components, the system also lowers the recoil forces felt by the firer and aids improved accuracy. The system is insensitive to ammunition variations and requires no adjustments or special maintenance.

The forward end of the frame is grooved for fitting a Heckler & Koch Universal Tactical Light (UTL) laser spot projector (weight 150 g). A switch for the light can be secured to the grip. For competition shooting, a Heckler & Koch 'HK Quik-Comp' muzzle brake/compensator is available, as is a scope mount. Other accessories include a transparent magazine and patented H&K 'lockout' safety device that locks the gun and prevents firing until removed.

A 9  $\times$  19 mm variant known as the USP9SD is configured for a Brügger & Thomet Impuls II-A pistol silencer. This version has a barrel 119 mm long, with a screw thread at the muzzle to accept the silencer. The weight of the unloaded pistol with the silencer installed is 1.25 kg. Each silencer is supplied matched to the pistol.

Technical specifications for the military model calibres is given below.

## **Specifications**

## Heckler & Koch USP self-loading pistols

Model:	USP	USP Compact
Cartridge:	9 × 19 mm	9 x 19 mm
Operation:	short-recoil, self-loading	short-recoil, self-loading
Locking:	dropping barrel	dropping barrel
Feed:	detachable double-	detachable double-
	column box magazine	column box magazine
Magazine capacity:	15 rds	13 rds
Weight, unloaded:	770 g	730 g
Length:	194 mm	173 mm
Barrel length:	108 mm	91 mm
Height:	13 mm	127 mm
Width:	38 mm	34 mm
Rifling:	polygonal, 1 turn in	polygonal, 1 turn in
	380 mm	380 mm
Sights:		
fore:	blade	blade
rear:	square notch, adjustable	square notch, adjustable
	for windage and	for windage and
	elevation	elevation
optical:	3-dot (tritium sights	3-dot (tritium sights
	optional)	optional)
Sight radius:	158 mm	135 mm

## Status

In production and in service with German, Greek and Spanish armed forces and police.

## Contractor

Heckler & Koch GmbH.

## Similar models

Greece Contractor

Hellenic Arms Industry (EBO) SA.

Type: 9 mm USP self-loading pistol

Remarks: Standard specifications; some components manufactured within Greece.

## **Heckler & Koch USP Tactical .45 ACP self**loading pistol

## evelopment

Heckler & Koch developed the USP45 Tactical .45 ACP pistol (now known simply as the USP Tactical) to provide a special-operations 'offensive handgun' that was approaching the equal of the Mark 23 United States Special-Operations Command (USSOCOM) pistol, but at a lower cost. H&K approached this market as not everyone in the US special-operations community having adopted the Mk 23. Many organisations continued to use modified M1911A1 pistols that were reaching the end of their service lives. The USP Tactical was therefore a response to US special-operations requirements for a pistol to replace the ageing M1911A1 pistols in the inventory with a newer, more modern and more reliable pistol yet in a smaller package and at lower cost than the Mk 23.

The USP Tactical is no longer actively marketed as a stand-alone model. A further variant, the USP SD in 9 × 19 mm calibre is currently offered.

#### Description

The USP Tactical pistol is essentially a combination of the best features of the Mk 23 USSOCOM pistol and the USP45. It has a polymer frame and a steel slide. US special-operations forces have never been satisfied with the terminal ballistics of the 9 x 19 mm cartridge and continued to specify .45 ACP (Automatic Colt Pistol) rounds for their pistols.

The USP Tactical employs the O-ring barrel design of the Mk 23, albeit shorter and with suppressor threads reversed so that the Mk 23 suppressor cannot be installed. This is because the USP45 Tactical will not function with the Mk 23 suppressor. The USP Tactical suppressor is externally identical to that of the Mk 23 and is also made by Knight's Armament Company. The O-ring achieves consistent 'lock-up' of the barrel and slide, resulting in near-match accuracy without the hand fitting of components. The O-ring has a service life of 20,000 rounds and can be replaced by the user in seconds without tools.



Heckler & Koch USP Tactical .45 ACP self-loading pistol with suppressor (H&K) 1118951



Heckler & Koch USP45 Tactical .45 ACP self-loading pistol

0134892

## **Specifications**

Opcomoditions	
Calibre:	12.7 × 99 mm (.50 Browning) or
	12.7 × 108 mm
Operation:	bolt-action
Feed:	detachable box magazine
Magazine capacity:	5 rds
Weight:	
12.7 × 99 mm:	15 kg
12.7 × 108 mm:	17 kg
Length:	
12.7 × 99 mm:	1,510 mm
12.7 × 108 mm:	1,670 mm
Barrel length:	
12.7 × 99 mm:	840 mm
12.7 × 108 mm:	1,007 mm
Sights:	emergency iron sights
Maximum effective range:	1,600 m
Muzzle velocities:	
12.7 × 99 mm:	888 m/s
12.7 × 108 mm:	825 m/s

## Status

Zastava continues to offer both calibres of the M93 Black Arrow.

#### Contractor

Zastava oružje D.P.

#### Marketing Agency

Yugoimport-SDPR.

## **South Africa**

## **NTW** anti-matériel rifle

## Development

The NTW 20/14.5 anti-matériel rifle was designed by Tony Neophytou and was developed initially under Aerotek auspices. The design then passed to Mkhonto Arms before the total rights were obtained by Mechem, a division of Denel (Pty) Ltd. Denel then transferred the rights to the NTW 20/14.5 to another Denel company, PMP, formerly Pretoria Metal Pressings. Development and production now (2007), rests with Denel Land Systems, part of Denel (Pty) Ltd The rifle was designed to be readily modified by the user to accommodate two primary ammunition calibres; the 20 × 82 (20 mm MG151) cartridge, or the Soviet/Russian 14.5 × 114 cartridge firing either the BS-41 armour-piercing incendiary (API) and BZT armour-piercing incendiary tracer (API-T) based rounds.

In 1998, this rifle was selected by the South African National Defence Force (SANDF), which procured all available development models for trials and familiarisation prior to the availability of newly manufactured rifles. The NTW 20/14.5 was subsequently procured in substantial numbers by an unspecified South Asian nation and in smaller quantities by other nations.



NTW 20 × 110 anti-material rifle (Denel)

1132766



NTW 20 × 82 anti-matériel rifle in firing position

0536172

Development of the NTW rifle has continued; recent innovations include a magazine constructed using plastic mouldings and a new multibaffle muzzle brake. Another innovation is a mechanism to cock the trigger during the recoil phase and so alleviate some of the load from the trigger mechanism. Reloading remains manual. The trigger facility is applicable only to the 20  $\times$  82 (NTW 20) model. A further modification of the NTW rifle involves the provision of suitable barrels and other components to allow the rifle to fire either 12.7  $\times$  99 (.50 Browning) or  $12.7 \times 107$  ammunition. In mid-2006 it was announced that the NTW 20 was now available in the larger 20  $\times$  110 (20 mm Hispano Suiza [HS]) calibre, known as the NTW 20 (HS).

The NTW 20 (HS) rifle is single-shot only and has been reconfigured to accept the longer case length of this round. For use in a vehicle-mounted role, a buffered mount is also available. The vehicle-mounting has been specially developed for use in urban operations to provide precision fire against snipers in the upper stories of high-rise buildings. Effective range has been extended to 1.500 m.

## Description

The 20 NTW is an anti-matériel weapon with many applications, including explosive ordnance disposal (EOD).

Changing from one calibre to another with the NTW 20/14.5 series takes less than 30 seconds with the barrel, bolt, magazine and sighting equipment being interchanged between calibres as required.

The NTW 20/14.5 Combination is a manual bolt-action rifle with the bolt employing six locking lugs. Barrel bedding is of free-floating design for maximum accuracy. Recoil is mitigated by a large double-baffle muzzle brake and a combined hydraulic/pneumatic damping and buffer system. Two hydraulic dampers are available, one for use in warm climates and one for use in cold climates. Warm climates are defined as +10 to +60°C; cold climates are defined as -25 to +35°C.

Rounds are fed into the rifle from a three-round box magazine fitted to the left side of the receiver and integral fuze protection for the HE rounds is built into the magazine body. Spent cases eject to the right as the bolt is withdrawn.

Recoiling parts slide within a chassis frame which includes the butt assembly, so the firer can assume a conventional firing position with the butt held into the shoulder by a handgrip located under the lower buttstock, the handgrip under the butt can also be lowered to act as a monopod (folding monopod only on the NTW 20 (HS) model). The index finger operated safety catch is located on the front of the trigger guard. Trigger pull is an adjustable, double stage. By design, right-handed and left-handed firing positions are possible. The recoiling parts and the barrel can be removed from the chassis frame for maintenance and also for carrying.

## NTW anti-matériel rifles

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Model	NTW 14.5	NTW 20	NTW 20 (HS)
Cartridge:	14.5 × 114	20 × 82 (20 mm MG 151)	20 x 110 (20 mm Hispano Suiza)
Operation:	manual bolt-action	manual, bolt-action	manual, single-shot
Locking:	6 lugs	6 lugs	6 lugs
Feed:	detachable box magazine	detachable box magazine	manual
Magazine capacity:	3 rds	3 rds	n/appl
Weight:	33.8 kg	30.5 kg	31.5 kg
Length:			
overall:	2,015 mm	1,795 mm	1,795 mm
barrel:	1,220 mm	1,000 mm	1,000 mm
Rifling:	1 turn in 406 mm	1 turn in 560 mm	n/avail
Sights:	telescopic, 8 × 56 with 250 mm long eye	telescopic, 8 × 56 with 250 mm long eye	telescopic, 8 × 56 with 250 mm long eye
	relief	relief	relief
Muzzle velocity:	1,000 m/s	720 m/s	820 m/s
Muzzle energy:	circa 31,500 J	circa 28,500 J	circa 43,500 J
Max effective range:	1.750 m	1.300 m	1,500 m

downward, out of engagement with the bolt. The bolt is thus unlocked, separates from the barrel/barrel extension and travels to the rear. The barrel and barrel extension are completely halted by the barrel buffer body.

During rearward travel, the barrel and extension assembly comes into contact with the accelerator, which then pivots on the accelerator pin. The contact point between the barrel extension and the accelerator moves downwards progressively, while the barrel extension slides backwards. This downward movement changes the ratio of leverage exerted by the tip of the accelerator against the bolt, so that the bolt is thrown backwards at an increased speed relative to the other recoiling parts. In addition, the gradual transfer of energy from the barrel extension to the bolt, via the accelerator, also dampens the shock given by the barrel extension against the barrel buffer. A further advantage accruing from the accelerator is that the increase in bolt speed assists in extracting the spent case from the chamber in a progressive manner.

The rearward travel of the bolt compresses the return spring and is finally halted when the bolt strikes the buffer plate. The buffer plate discs absorb the shock and, rebounding, start the bolt forward once more. This movement is continued by the energy stored in the return spring. The lower edge of the bolt strikes the tip of the accelerator, turns it forward and unlocks the barrel and barrel extension assembly from the barrel buffer, whereupon the barrel buffer spring drives the barrel and barrel extension assembly forward. This forward motion is augmented by that of the bolt and its driving spring as the bolt reaches its foremost position in the barrel extension.

At the end of the forward movement, the breech-lock lug, driven by the barrel extension, rides up the inclined plane of the breech-lock cam and enters the recess in the bottom of the bolt, thereby locking the bolt to the barrel/barrel extension assembly.

During the recoil of the bolt, the spent case in the breech is withdrawn by the T-slot in the face of the bolt. At the same time, a fresh cartridge is pulled from the belt by the extractor-ejector. The extractor is gradually forced down by the cover extractor cam until the fresh cartridge is located on the barrel axis. This downward movement also forces out the spent case, which is then ejected downwards. As the bolt returns, the fresh cartridge is inserted into the chamber.

During the recoil movement of the bolt, the belt-feed lever engages in a diagonal groove in the top of the bolt and is pivoted as a result of the bolt's movement. This forces the belt feed slide to move to the left in the slot in the feed cover. The belt-feed pawl engages behind the next cartridge. As the bolt moves forward, the belt-feed lever is pivoted in the reverse direction, and the belt-feed slide moves to the right, ready to begin the next feed.

The cartridge headspace is critical on the standard M2 HB. Ideally, it should be adjusted by means of 'go'/'no-go' gauges as described in the various field manuals relating to the M2 HB. In default of the correct gauges, an approximation may be achieved by screwing the barrel in fully, then unscrewing it two clicks. Should the gun fire sluggishly, the barrel should be unscrewed by one further click.

There are also many special mountings and additional devices for the M2 HB. Typical of the latter was a trigger safety modification produced by w+f of Bern, Switzerland, while Manroy Engineering, General Dynamics Armament and Technical Products and FN Herstal produce quick-change barrel kits, firing solenoids and special mountings.

The safety adopted by the US Army is a sliding bar that mounts to the backplate underneath the trigger. Sliding it to one side places it directly beneath the trigger, keeping the trigger from moving forward; sliding it to the other side moves it out of the way allowing the trigger to be depressed and the weapon to be fired. The mount for the trigger block is attached via screw holes in the backplate originally intended for the optional attachment of a firing solenoid

## **Specifications**

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Cartridge:	.50 Browning (12.7 × 99 mm)
Operation:	short recoil
Locking:	projecting lug
Feed:	disintegrating link belt
Weight:	38 kg
Length:	
overall:	1,651 mm
barrel:	1,143 mm
Rifling:	Eight grooves, rh, one turn in 381 mm
Sights:	
fore:	blade
rear:	leaf aperture
Muzzle velocity:	930 m/s
Rate of fire, cyclic:	450-600 rds/min
Range:	
maximum:	± 6,800 m
effective:	± 1,500 m

## Status

Available and in service with US forces and at least 30 other countries. Future production by GD-ATP for the US military will be the M2A1 QCB version.

## Contractors

General Dynamics Armament and Technical Products. US Ordnance Inc.

## Similar models

Belgium

Contractor

FN Herstal SA. **Type:** .50 M2 HB and M2 HB/QCB

Remarks: produced in standard and Quick-Change Barrel forms.

#### China

Chinese state arsenals.

Type:CQO .50M2HB

Remarks: it appears to be a direct copy of the original M2 HB model. Also referred to (in English) in Chinese literature as the CS/LM6 0.50.

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## **United Kingdom**

Contractor

Manroy Engineering Ltd.

Type: .50 M2 HB and M2 HB-QCB

Remarks: produced in standard and Quick-Change Barrel forms

## M2A1 HB .50 QCB machine gun system

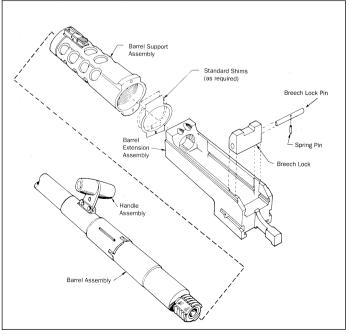
#### Development

The requirement to adjust headspace and timing on the M2 machine gun has long been recognised as its main shortcoming. FN Herstal of Belgium began manufacturing a version with a Quick-Change Barrel and fixed headspace in the early 1980s and by 2008 had built around 40,000 weapons. In fact, during that time they had received only one order for the conventional M2, and that customer came back several years later to buy conversion kits.

In 1978, Saco Defense (now General Dynamics Armament and Technical Products - GD-ATP) introduced a modification to the .50 M2 HB machine gun to provide fixed headspace and a Quick-Change Barrel (QCB). All the other features of the weapon have been retained and ammunition could be fed to the gun from either side with a simple adjustment. It is not clear if any were sold for export, but the US did not buy them.

The US Army has been aware of the limitations of the M2, particularly the need to set headspace and timing, but there was little pressure to divert funding from other projects to modify a weapon that had worked well for about 80 years. An improvement programme to incorporate a Quick-Change Barrel with fixed headspace was finally launched in 2004, with certification funding provided in Fiscal Year 2005 (FY05). The programme would include a Quick-Change Barrel, barrel handle, flash suppressor, trigger block safety (to allow movement of the weapon with round chambered) and rail. Procurement funding showed up in FY06 for 480 kits for USD3.1 million, but no contract actually resulted. A further USD16 million was provided in FY08 for 2,665 kits, but no contracts were awarded that fiscal year either. Instead, comparative trials were held of several models, including versions from GD-ATP, FN Herstal and Sabre Defense. An award was expected near the end of 2008 or early 2009. As a result of the delays, the trigger-block safety effort proceeded independently as a modification to standard M2s. In May 2009 the US Army stated that Quick-Change Barrel kits would be incorporated into production buys starting in FY10. The Army has also been procuring the flash suppressors as separate items, from Knight's Armament Company at USD380 each.

In the GD kit almost all the standard M2 HB components are unchanged. The only new parts are the barrel, barrel extension assembly and barrel support. To make matters easier for customers the barrel can be a converted standard



Drawing showing the components of the GD-ATP QCB conversion kit 0508100

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design is entirely conventional, with the number of shock-absorbing cylinders between the mounting and the barrel being increased to 2. The circular baseplate, which is larger than that for the special-forces mortar, is ribbed to reduce weight while retaining stability.

It is stated that the maximum rate of fire is 30 rds/min. Drop firing is used, as there is no provision for a firing lever.

Although this mortar can fire all NATO-standard 60 mm bombs, a locally-produced high-explosive fragmentation (HE frag) bomb weighing 1.925 kg has been manufactured. Provided with an M-6 impact fuze, this bomb produces a 10 m lethal radius on impact.

## **Specifications**

Calibre:	60.75 mm
Barrel length:	800 mm
Weight:	35 kg
Range:	
max:	4500 m
min:	400 m

#### **Status**

Current production and usage uncertain.

#### Contractor

Delta State Military Scientific and Technical Centre.

## Delta 60 mm silent mortar

## **Development**

The Delta 60 mm silent mortar was one of several infantry mortars developed by the Delta State Military Scientific and Technical Centre of Georgia after the dissolution of the former Soviet Union. Possibly other variants of this silent mortar have entered Georgian army service. One version of the 'Mkudro' has the same calibre of 60 mm, but appears dissimilar in construction, one version having a tangent aiming sight, another reportedly in 40 mm calibre being visually aimed by a vertical white line along the length of the barrel. Ammunition also differs in construction. It is probably that both this mortar and the 'Mkudro' are ad-hoc designs, produced only in small numbers.

#### Description

The Delta 60 mm silent mortar is intended for use by special forces. System of operation is based on a 'captive-piston' design. On discharge, all propellent gases are contained within a sealed unit, reducing the sound of discharge to around 65 dB.

Bombs are inserted into the muzzle with the impact fuze protruding, so that double loading is not possible. When the striker hits the base of the bomb, an internal cartridge charge is ignited. The force of the detonation causes a piston within the bomb's telescopic tail assembly to attempt to move backwards. This rapid movement forces the bomb from the mortar barrel and on to a maximum range of 600 m. All the noise and flash of the firing signature are retained within the bomb tail assembly.



Delta 60 mm silent mortar, with bombs. The bomb at the left rear has its tail assembly telescoped ready for firing 0132888

The mortar has an aluminium barrel hinged on to a rectangular baseplate at the breech end. If required, the baseplate may be detached to be carried separately. Two types of firing mechanism have been observed: a shorterbarrel version with a bolt assembly and a longer-barrel version with no manual bolt. Early models used a relatively short barrel with a bolt assembly at the base. The bolt handle was manually pulled back and then was released to strike the base of the bomb within the barrel. What appears to be the main production model has a longer barrel assembly and does away with the manual bolt. The firing mechanism now has a rotary collar at the base. Turning the collar with one hand tenses and releases a long, internal firing rod with a firing pin at the top, the other hand being used to hold the barrel in the required elevation position. The barrel and firing-collar surfaces are both milled to provide a secure grip. Maximum fire rates of between 20 and 25 rds/min have been claimed. There are no sights, all aiming being accomplished by eye.

Few details are available relating to the bombs fired, other than that their weight is given as ranging from 800 g to 1.2 kg. Presumably, the bombs are of the High-Explosive Fragmentation (HE frag) type, as a nose-mounted impact fuze is fitted.

## **Specifications**

Calibre:	60 mm
Length, overall:	300 mm
Weights:	
total:	<5 kg
bomb:	800-1200 g
Elevation:	+20 to 90°
Muzzle velocity:	90 to 130 m/s
Max range:	600 m
Sound level:	<60 to 65 dB

#### Status

Current production and usage uncertain.

#### Contractor

Delta State Military Scientific and Technical Centre.

## Delta 60 mm special-forces light mortar

## Development

The Delta 60 mm special-forces light mortar was one of several infantry mortars developed by the Delta State Military Scientific and Technical Centre of Georgia after the dissolution of the former Soviet Union. This 60 mm light mortar is intended for use by special forces and is designed to be as light as possible while being capable of delivering prolonged and accurate firing using 60 mm NATO-standard bombs.

Current production status and service use of this mortar are uncertain. Recent foreign imports of other 60 mm mortars suggest it is no longer in front-line service, although numbers may still be held in reserve stockpiles, given that it is claimed to be able to fire 'NATO' standard 60 mm ammunition.



Delta 60 mm special-forces light mortar, in firing position and with 60 mm HE frag bomb 0132883