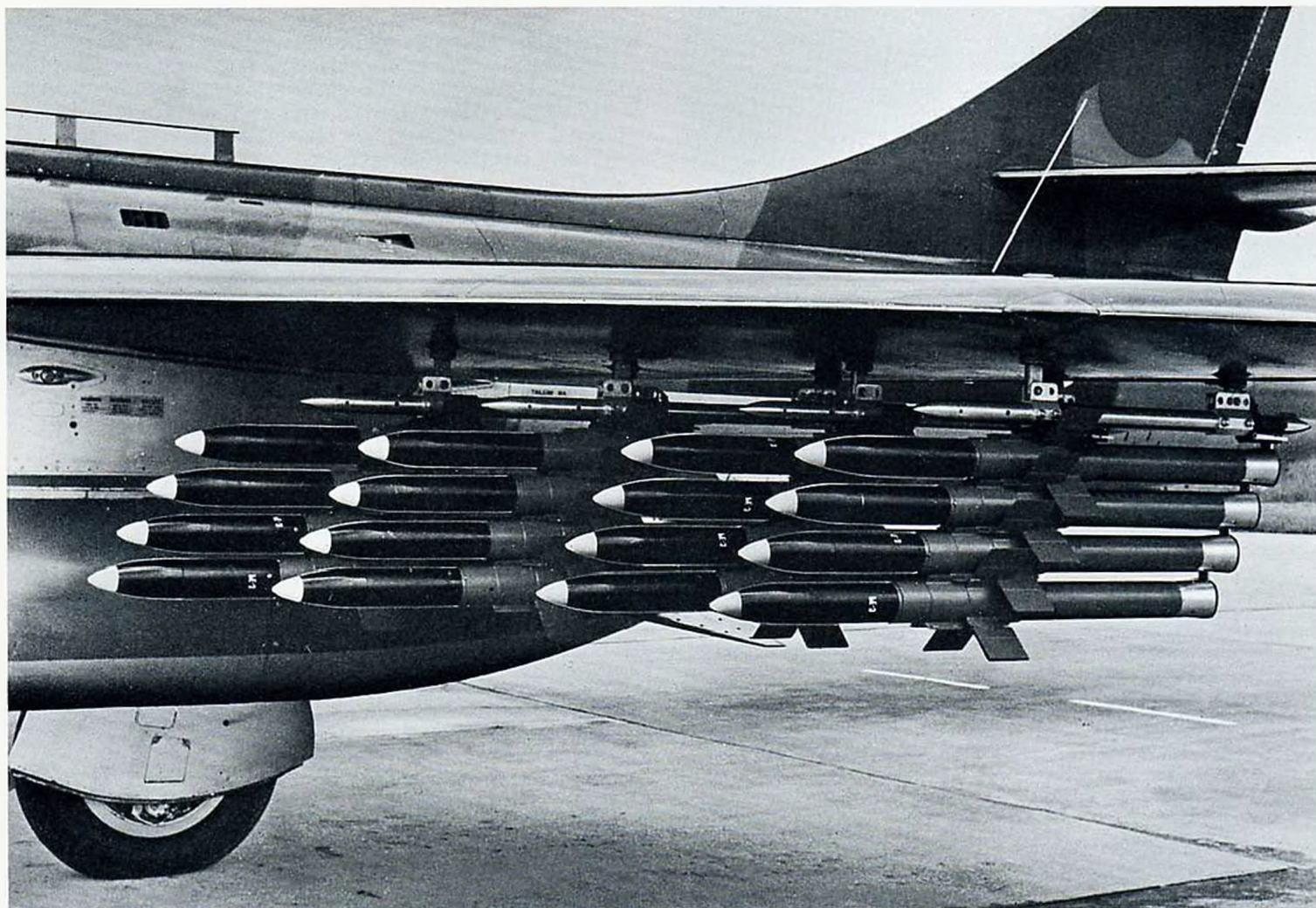


Oerlikon 80 mm Rockets



Aircraft Rocket Type SURA-FL

Oerlikon 80 mm AIRCRAFT ROCKET Type SURA-FL



This modern weapon can be described briefly as follows:

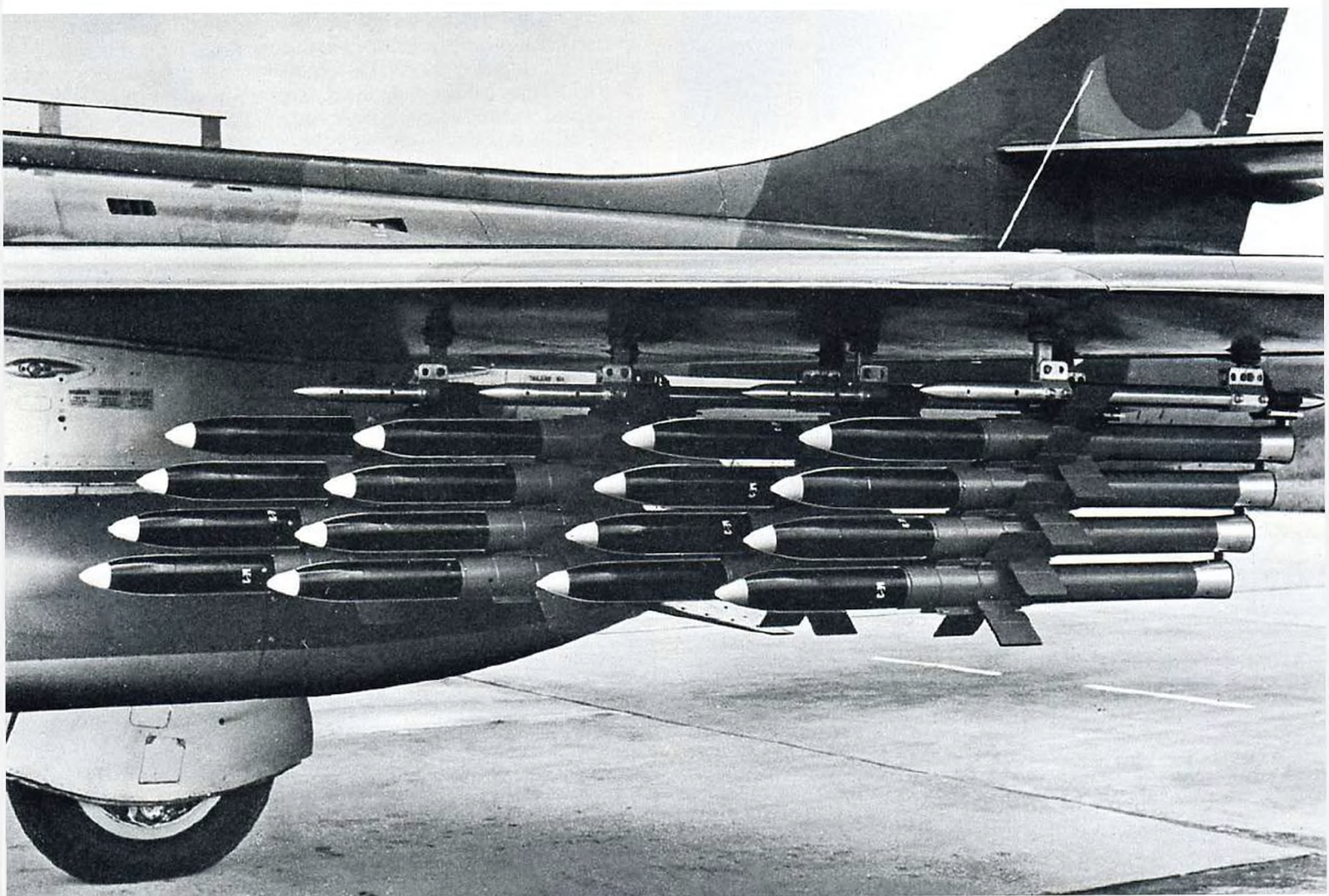
- Effective
- Low launch reaction
- Accurate
- Clean installation
- Simple to handle
- Reliable
- Safe

Main Features

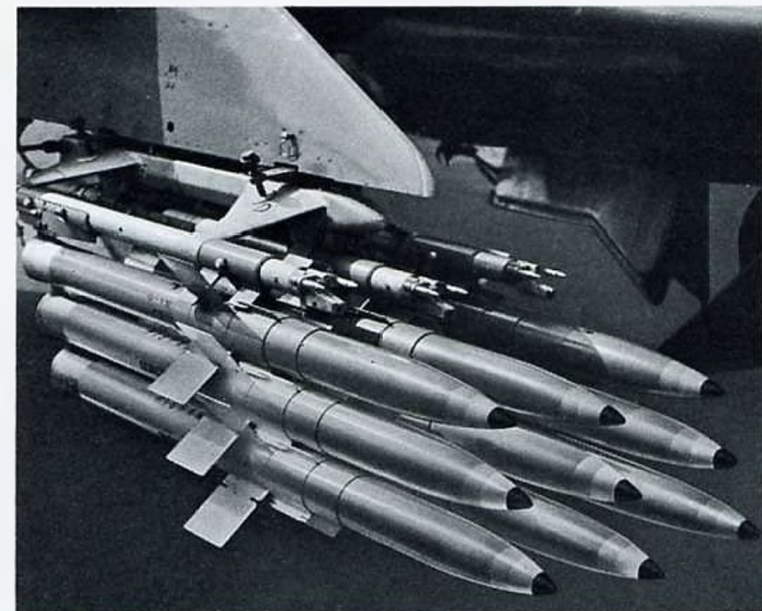
The Oerlikon 80 mm SURA-FL aircraft rocket is an unguided solid fuel rocket with sliding fins. It has been specifically designed for air-to-ground use from fighter aircraft, and has proved effective when fired from helicopters and light reconnaissance aircraft. It can be used to engage point or area targets.

The SURA-FL aircraft rocket does not require a special launcher thanks to its suspension system which makes use of the sliding fins. It can be suspended either on NATO type launcher bars or on any other strong point beneath the wings.

The SURA-FL rocket incorporates the safety devices required for storing, transport, handling and firing. Correct operation of the SURA-FL rocket is guaranteed at temperatures from -45°C to $+65^{\circ}\text{C}$.



Suspension



SURA-FL rockets have front and rear suspension points which permit a rocket to be suspended from the one above. The number of rockets which may be carried in a tier is limited only by the ground clearance and payload of the aircraft. The wiring of the ignition system is so arranged that only the bottom rocket of a tier can be fired. Any possibility of simultaneous firing of several rockets from the same tier is excluded. However, bursts at a rate of up to 6 rockets per second can be fired from any tier.

The rear suspension mechanism has a locking catch and automatic electrical contacts. The front suspension system using the fin ensures great rigidity for the whole tier and guides the rocket accurately at the moment of firing.

SURA-FL rockets can be suspended from any subsonic aircraft.



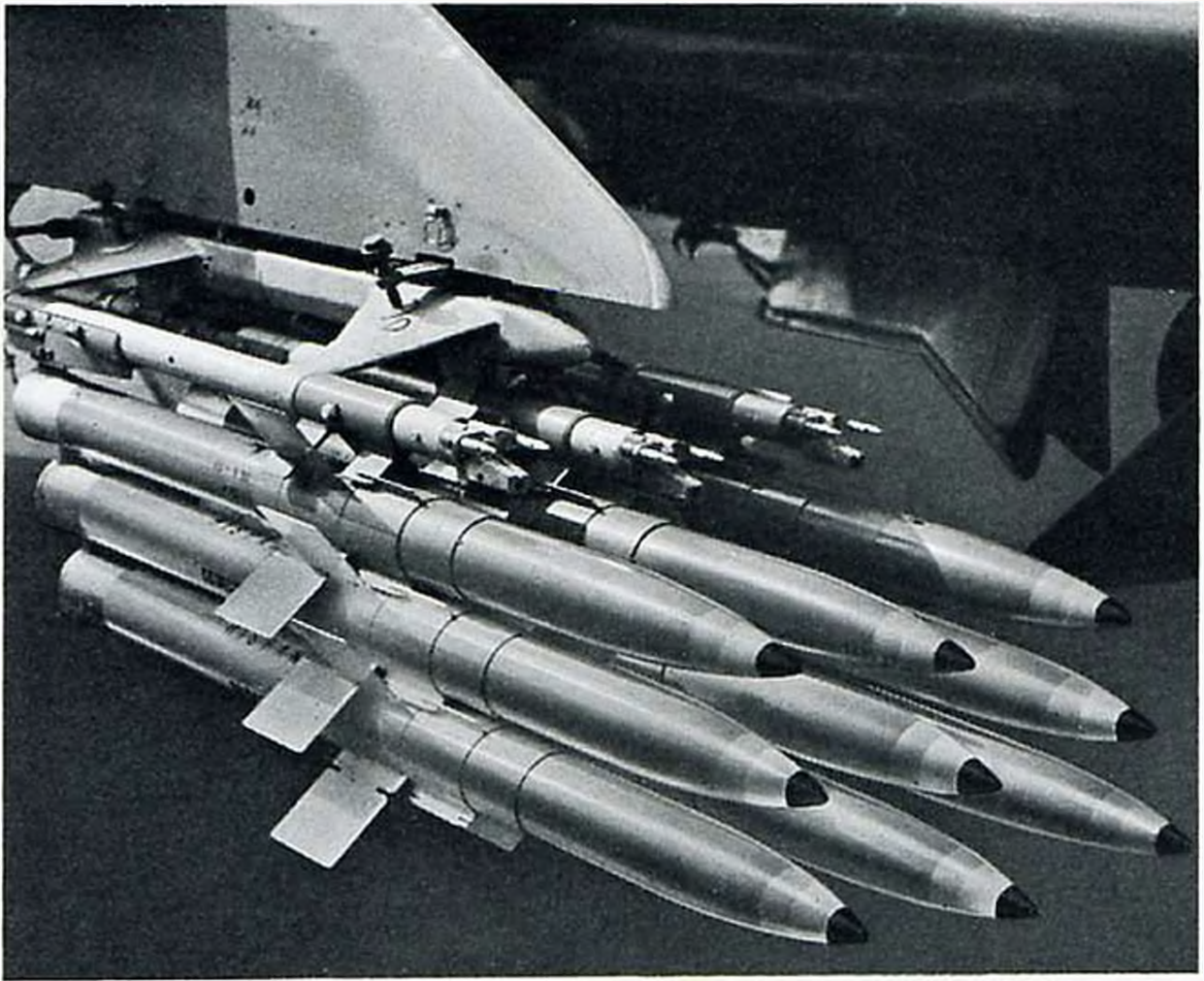
Cessna 182 Loaded with 8 SURA-FL rockets



Bell UH-1C Helicopter Loaded with 10 SURA-FL rockets



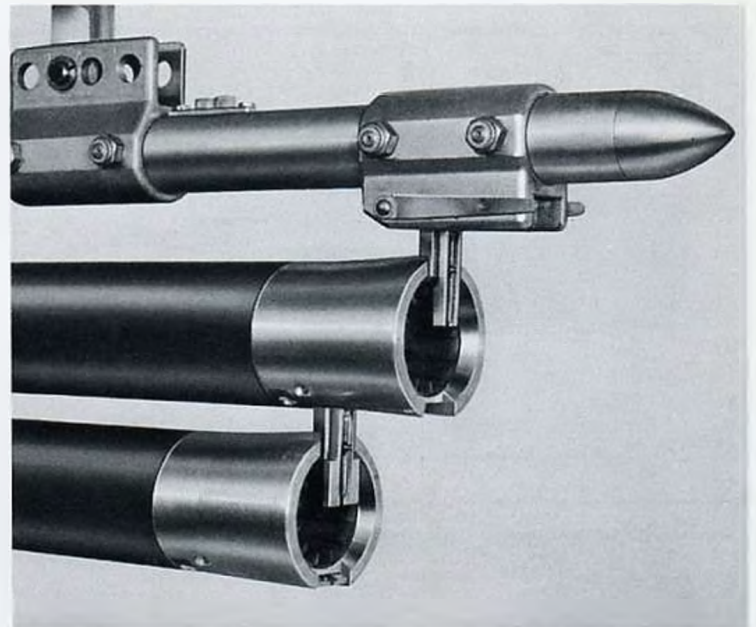
Jet Provost TMK-52 Loaded with 32 SURA-FL rockets



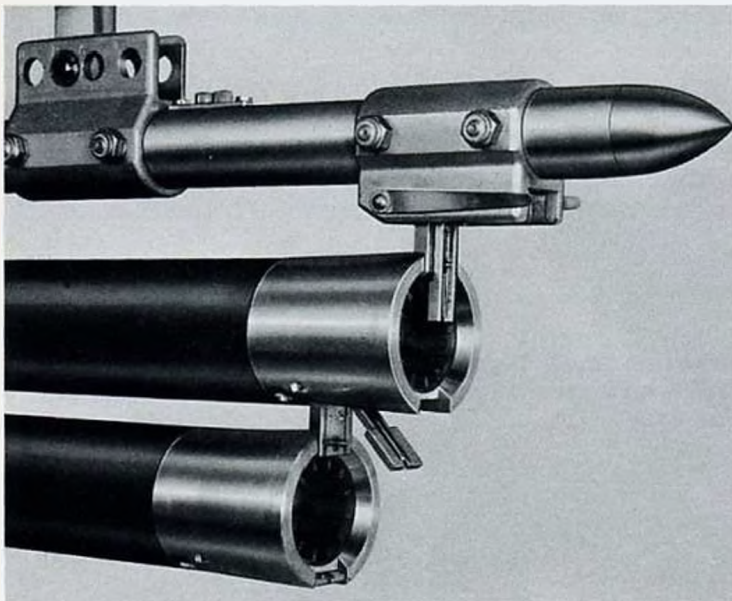
Cessna 182 Loaded with 8 SURA-FL rockets

Operation

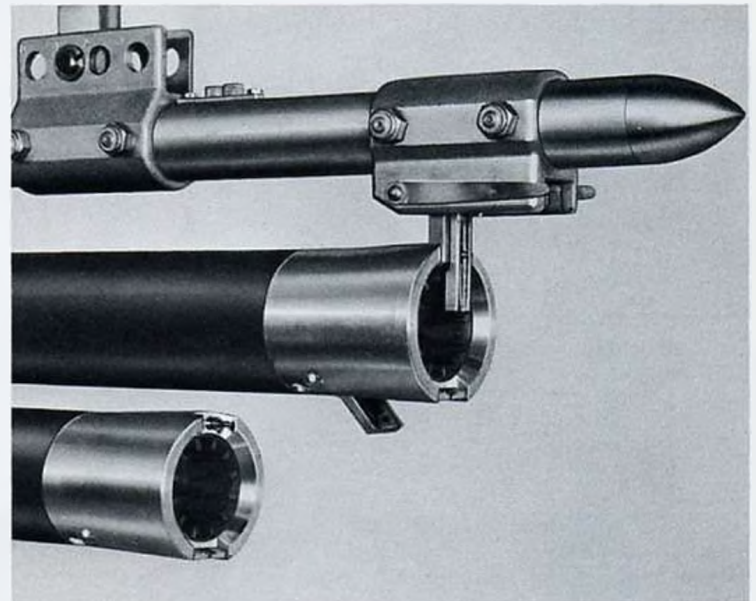
On firing, the propellant gases from the rocket nozzle raise the locking flap and then the suspension lever of the rocket above (fig. 2 and 3). From that moment the motor is producing its full thrust and the rocket is driven forward in the guiding tube of the fin assembly for a distance of about 50 cm (fig. 4). The rear cone of the rocket then drives itself into this guiding tube, the fin assembly disengages from that of the rocket above and the whole rocket is then in entirely free flight. The closing of the suspension lever of the rocket above closes its ignition circuit ready for firing.



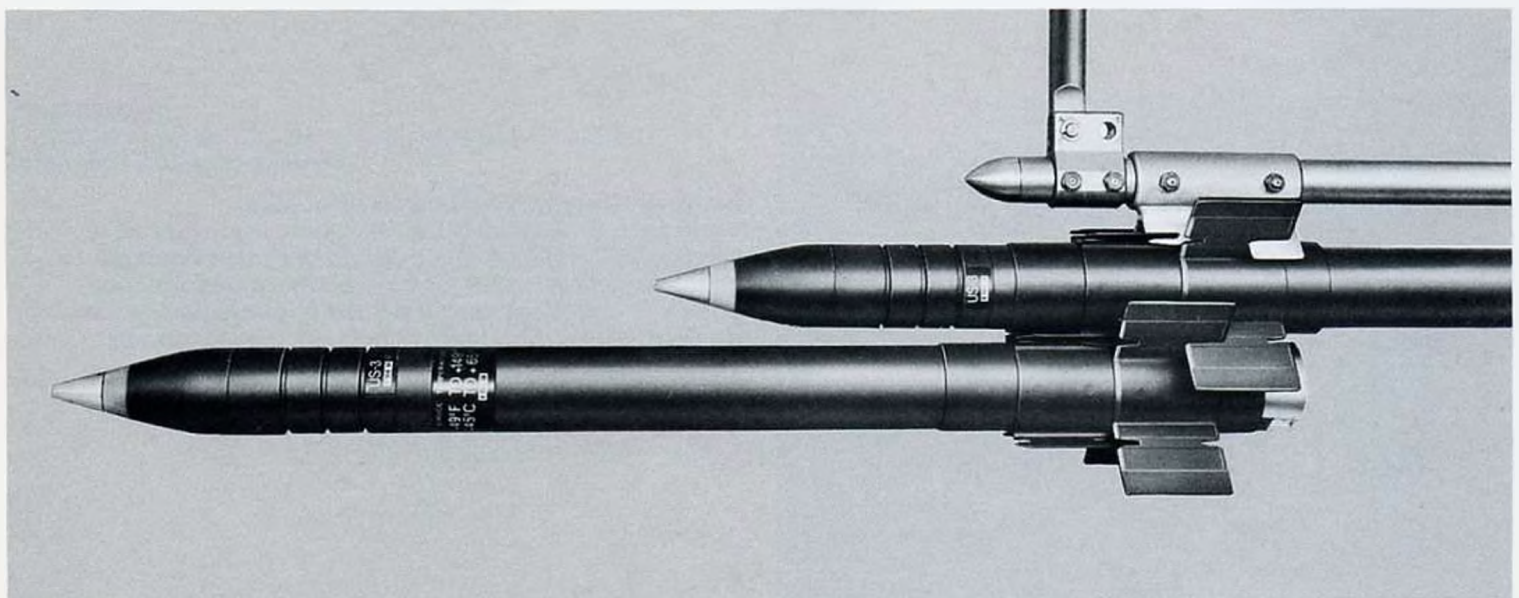
1. Position before firing



2. Disengagement of the locking flap



3. Release of the suspension lever



4. Rocket with fin assembly in flight position shortly before release from front suspension of rocket above

Warheads



Explosive Fragmentation Shell Type US-3

The US-3 warhead has a thick-walled, grooved casing. It is filled with approx. 0.87 kp explosive and is initiated by a mechanical impact fuze. The density and high penetration power of the fragments together with the blast effect render the US-3 shell particularly suitable for use against troop concentrations and infantry support weapons.



Incendiary Blast Shell Type UIS-3

The incendiary blast shell type UIS-3 has a thin-walled body and is filled with approx. 1.5 kp explosive which produces a considerable incendiary and blast effect. The UIS-3 shell is intended principally for use against unarmoured targets such as troop concentrations, vehicles, buildings, fuel-dumps and parked aircraft.



Practice Shell Type USE-3

This is an inert shell made entirely of metal for practice purposes.



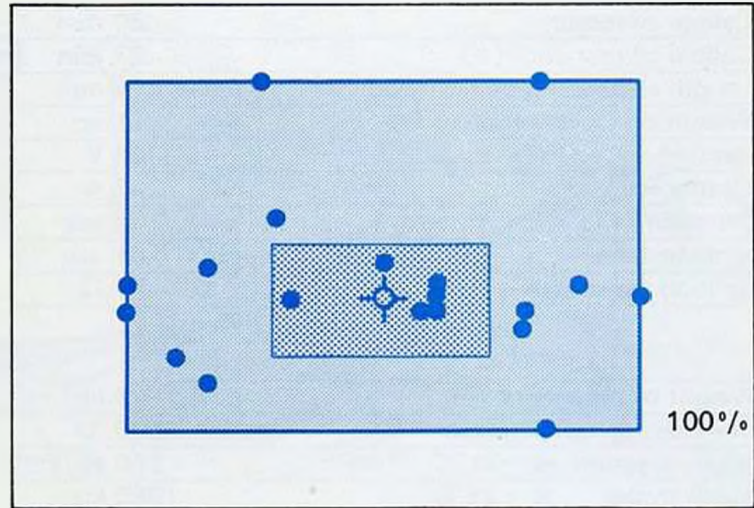
Hollow Charge Warhead Type PI-3

Head type PI-3 contains a hollow charge and has a mechanical impact fuze considerable fragmentation effect supplements its high penetration performance. The PI-3 hollow charge warhead is particularly suited for use against armoured targets such as armoured vehicles, naval units, strong-point buildings, etc.

Effectiveness

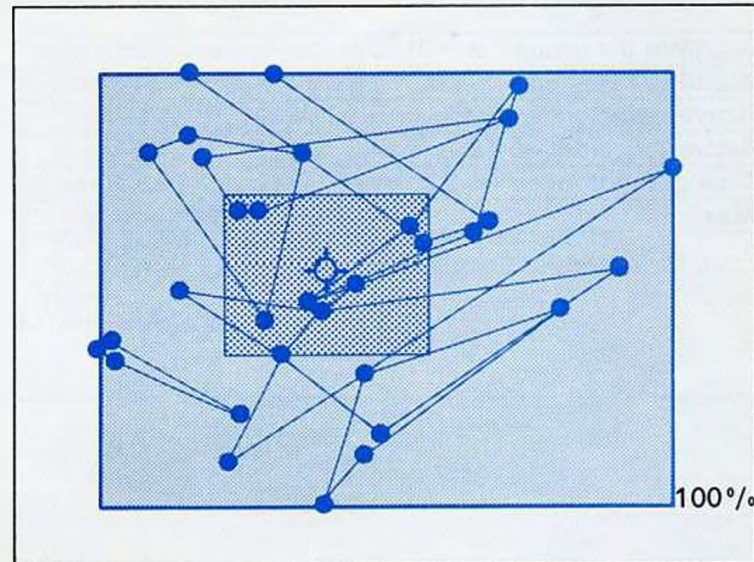
Dispersion

Aircraft:	Jet Provost AC MK2
Warheads:	Hollow charge type PI-3 Fragmentation explosive shell type US-3 Practice shell type USE-3
Range:	750 m
Task:	5 attacks with 2 rockets 1 attack with 4 rockets 1 attack with 6 rockets
Dive angle:	15°
Aircraft speed:	530 km/h



Dispersion	100%	50%
Elevation	8.6°/∞	1.8°/∞
Azimuth	12.4°/∞	5.2°/∞

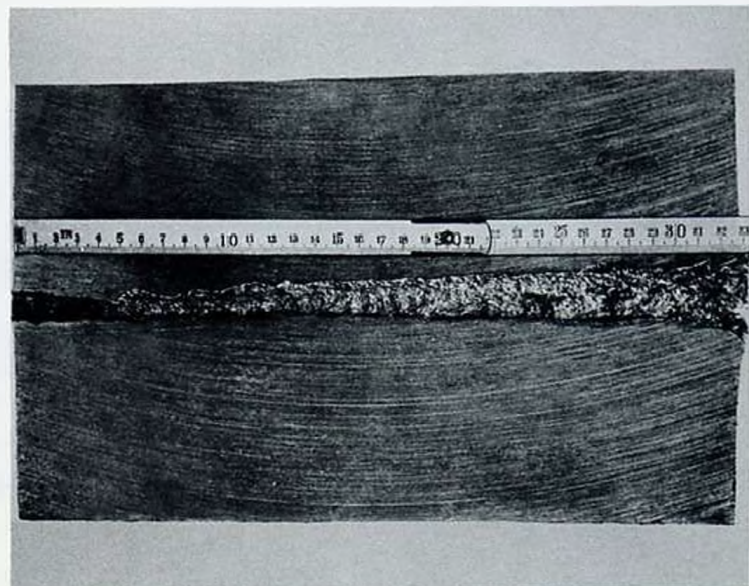
Aircraft:	Hunter
Warhead:	Hollow charge type PI-3
Range:	1000 m
Task:	8 attacks with 4 rockets
Dive angle:	20°
Aircraft speed:	920 km/h



Dispersion	100%	50%
Elevation	10.5°/∞	3.8°/∞
Azimuth	13.7°/∞	4.8°/∞

Penetration

Penetration of an 80 mm hollow charge warhead through a 33 cm test block.

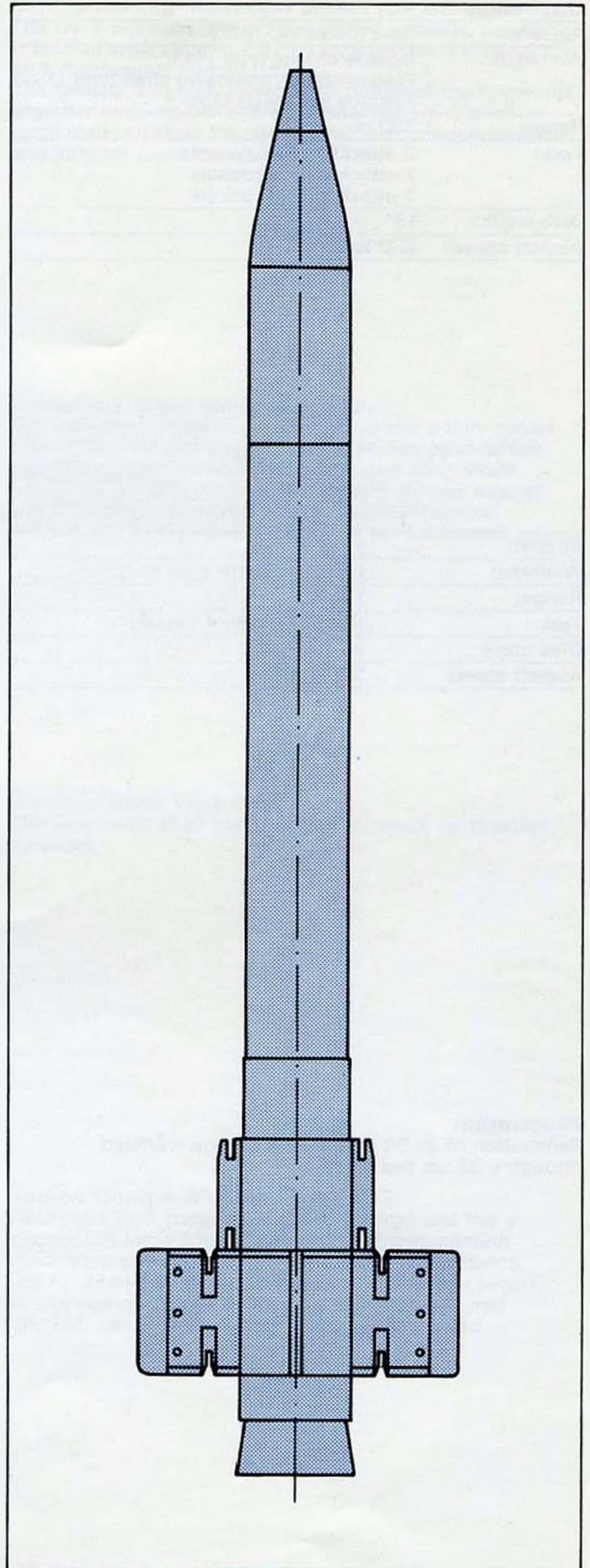


Technical Data

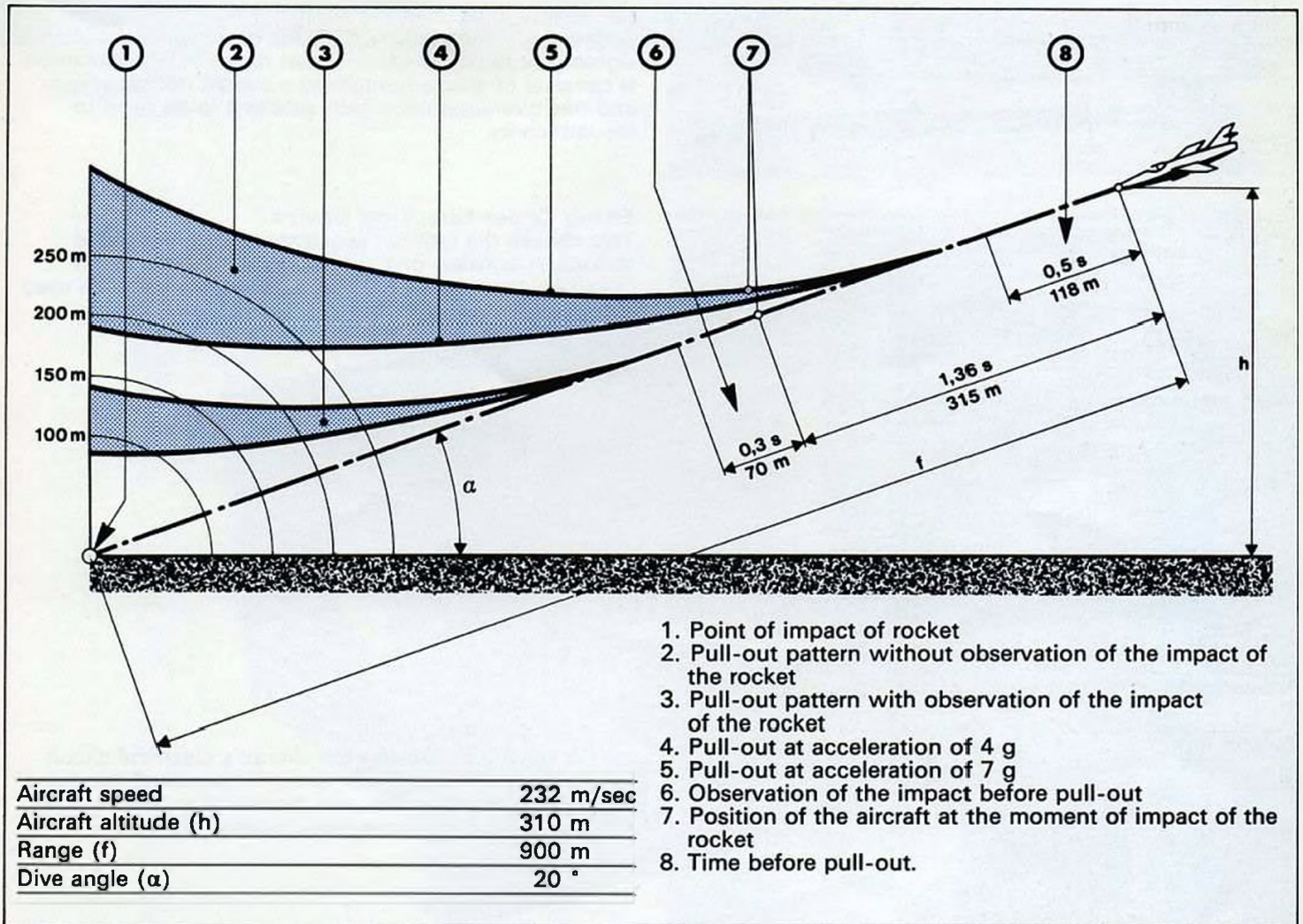
Calibre of motor	80 mm
Calibre of rear cone	87 mm
Length depending on warhead	1064–1212 mm
Weight of rocket ready to fire	11 kp
Ignition voltage (DC)	24–28 V
Ignition current	2–7 A
Duration of ignition impulse	min. 0.02 sec
Ignition time	approx. 0.01 sec
Ignition resistance	0.4–0.7 Ω

Weight of propellant	3 kp
Combustion temperature	approx. 2800 °C
Mean pressure at +21 °C	150 kp/cm ²
Mean thrust at +21 °C	885 kp
Total impulse at +21 °C	620 kp/sec
Burning time at -40 °C	1.2 sec
at +21 °C	0.7 sec
at +60 °C	0.5 sec

v_{\max} from the ground at +21 °C	620 m/sec
v_{\max} at $v_{\text{aircraft}} = 230$ m/sec	840 m/sec
Active trajectory from the ground at +21 °C	200 m
Active trajectory at $v_{\text{aircraft}} = 230$ m/sec	370 m
Time of flight for range 930 m at +21 °C	1.38 sec
Max.	1000 rpm



Air-to-Ground Firing Pattern



Fuze Safety Distance

