



# RAVEN 145

## Loitering munition



This area denial kamikaze drone is a low-cost and long-range surveillance/assault weapon intended for real-time reconnaissance and strikes at a wide range of targets behind the front lines of a combat zone. It is designed for destruction of tanks and other armored vehicles, command posts, artillery positions, personnel, boats, drones, and other moving or stationary targets.

### General characteristics:

- **Warhead (WH)**
  - **Long-range**
  - **Launching**
  - Max. flying height/ceiling
  - Starting mass
  - Load, payload mass
  - Propulsion
  - Dimensions:
    - Length
    - Wing span
    - Height, with booster
  - Guidance system
  - Approach angle
  - Transport & package
  - Combat use
- penetrability of more than 1000 mm behind ERA**  
**120 km or a 50-minute flight, with one electrical motor**  
**150 km and 3 hours of cruising above the target, with a gasoline motor**  
**120 km at the speed of 160 m/s, with a turbo-jet motor**  
**fast and simple, volley fired from a launcher with 8, 12, 18 or 27 containers with UAVs**
- 2000 m  
 < 50 kg when loaded (35 kg when unloaded)  
 15 kg  
 solid fuel booster motor for the launching phase; electrical or gasoline or turbo-jet motor for the sustained/cruise flight phase
- 2.2 m  
 2.4 m  
 0.4 m
- INS, GPS, GLONASS, with TV/IIR homing in the final phase of flight  
 15° to 75° (Top Attack)  
 Package suitable for transportation to the firing position, with the missile fully armed, batteries charged or tank filled, depending on the type.  
 When taking off from the launching container, the wings unfold, the booster motor is detached, and the sustainer motors are started. Based on the image data received from GSN, the operator selects the target, after which the UAV operates autonomously until the target is destroyed.

## Warheads

Depending on the characteristics of the selected target, one of the 3 types of warheads (WHs) is used:

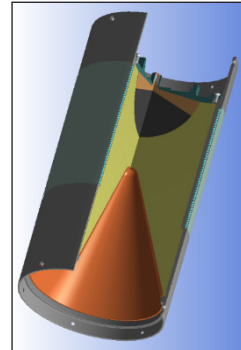
- Combined enhanced blast and fragmentation WH, with 130 mm steel balls, 10.5 kg mass
- Armor piercing tandem charge WH, 145 mm length, 6.4 kg mass
- Combined enhanced blast and fragmentation WH, 165 mm length, 13 kg total mass



Combined enhanced blast and fragmentation WH with steel balls, 130 mm length, 10.5 kg mass  
BFWH



Armor piercing tandem charge WH with steel balls, 130 mm length, 10.5 kg mass, and a spare set of 1 WH and 2 TSCWH fuses



Combined enhanced blast and fragmentation WH, 165 mm length, 13 kg mass, BFSCWH

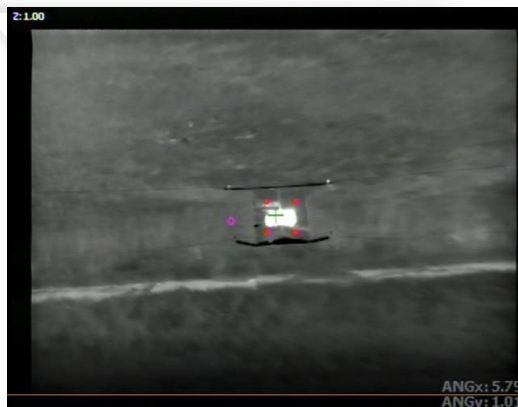
## Homing heads

Depending on the situation and environmental conditions at the target position, one of the 2 types of homing heads (HHs) is used: TV or thermal imaging HH.

Please note that the TV HH is usable only at daylight.



Television homing head TV/IIR HH 145 mm



An image from an IIR HH immediately before hitting a moving target size 2x2 m



Thermal imaging homing head IIR HH 145 mm

## Drone versions

|                                       | Reconnaissance drone with gasoline motor (GM)                 | Drone with electric motor (EM)                                                                                                                                                                                                          | Drone with gasoline motor (GM)                                 | Drone with turbo-jet motor (TJ)                                                                 |
|---------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------|
| Model                                 | 1                                                             | 2                                                                                                                                                                                                                                       | 3                                                              | 4                                                                                               |
| Model designation                     | RAVEN 145 GM R                                                | RAVEN 145 EM TSCWH<br>RAVEN 145 EM BFWH<br>RAVEN 145 EM BFSCWH                                                                                                                                                                          | RAVEN 145 GM TSCWH<br>RAVEN 145 GM BFWH<br>RAVEN 145 GM BFSCWH | RAVEN 145 TM TSCWH<br>RAVEN 145 TM BFWH<br>RAVEN 145 TM FSCWH<br>RAVEN 145 with a hunting rifle |
| Range                                 | 300                                                           | 120                                                                                                                                                                                                                                     | 150                                                            | 100                                                                                             |
| Speed (km/h)                          | 150 (40 m/s)                                                  | 160 (45 m/s)                                                                                                                                                                                                                            | 150 (40 m/s)                                                   | 570+ (150 m/s)                                                                                  |
| Time of flight (min)                  | 240                                                           | 50                                                                                                                                                                                                                                      | 240                                                            | 10                                                                                              |
| GSN                                   | TV                                                            | TV/IIRN                                                                                                                                                                                                                                 | TV/IIRN                                                        | TV/IIRN                                                                                         |
| Precursor charge                      | -                                                             | 50 mm                                                                                                                                                                                                                                   | 50 mm                                                          | 50 mm                                                                                           |
| EO set –                              | AP & control unit                                             | AP & control unit                                                                                                                                                                                                                       | AP & control unit                                              | AP & control unit                                                                               |
| Range of radio link with antenna (km) | 150                                                           | 120                                                                                                                                                                                                                                     | 150                                                            | 100                                                                                             |
| Battery                               | +                                                             | +++++                                                                                                                                                                                                                                   | +                                                              | +                                                                                               |
| WH                                    | -                                                             | 165 or 130 or tandem 145/50                                                                                                                                                                                                             | 165 or 130 or tandem 145/50                                    | 165 or 130 or tandem 145/50                                                                     |
| Wings and control surfaces            | Composite                                                     | Composite                                                                                                                                                                                                                               | Composite                                                      | Composite                                                                                       |
| Control section with fins             | 4 fins with 4 electric motors                                 | 4 fins with 4 electric motors                                                                                                                                                                                                           | 4 fins with 4 electric motors                                  | 4 fins with 4 electric motors                                                                   |
| Booster motor                         | Gasoline motor<br>Dual cylinder boxer motor<br>116 ccm, 10 KS | Brushless electric motor, 6 KW                                                                                                                                                                                                          | Gasoline motor<br>Dual cylinder boxer motor<br>116 ccm, 10 KS  | Turbo-jet kerosene motor<br>40 DaN                                                              |
| Mission Abort Capabilities            |                                                               | By selecting another target (hitting any safe spot/object)<br><br>1. Arming the HH while approaching target<br>2. Self-destructing while in the air<br>3. Switching the HH to a safe mode of operation, and landing using the parachute |                                                                |                                                                                                 |
| Parachute                             | +                                                             |                                                                                                                                                                                                                                         |                                                                |                                                                                                 |

## Launcher

Vehicle used for pre-launch preparation and launching of drones.



- Truck, type: Alexandar, MAN, FAP 2028 or any similar one
- Number of containers: 8, 12, 18 or 27
- Angle of launching: 30°

Preparation at the firing position: 3 min. for emplacement and elevation, 30 sec. for single launching from the containers

## Ground control station

Ground control station – GCS is used for launching, entering the flight profile data, guidance/control of the drone and the TV/IIR homing head.



GCS with antenna system

Max. number of simultaneous TV links: 3\*

Max. number of drones in the air: 12

(\*3 video channels are watched simultaneously, as per operator's choice)

GCS comes in 2 versions: cabin and portable.

- Cabin GCS can be mounted on an army vehicle, such as Alexander and Milosh, or on a FAP truck with air-conditioned driver's cabin, or any other materiel with adequate cargo space.
- Portable GCS comes in 2x25 kg suitcases suitable for field conditions, accompanied with an antenna and a battery. The set is intended for use of a 2-men crew.



Two console type GCSs installed in a cabin that can be fit on a trailer or in a vehicle mounted housing.



Portable GCS

### **Environmental conditions:**

1. Operating temperature range from -20°C to +65°C
2. Sand, dust and waterproof
3. Vibration, shock and transport vibration-proof
4. Resistant to fungi, salt fog, fog
5. Resistant to spraying water and rain
6. Resistant to long exposure to sunshine and UV radiation