



# RAVEN 145

## Loitering munition



This area denial kamikaze drone is a 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.

When taking off from the launching container, the wings unfold, the booster motor is detached, and the sustainer motor is started. Raven 145 is flying at extremely low altitude till it reaches target region using GPS or INS without any radio link with ground control station (GCS). Close to target region it gains altitude in order to provide radio link with GCS. Based on the image data received from homing head, the operator selects the target, after which the UAV operates autonomously until the target is destroyed. If the radio link is not established or the operator could not track the target, Raven will fly to the target using INS or GPS data.

### General characteristics:

- |  |   |
|--|---|
| <ul style="list-style-type: none"> <li>• <b>Warhead (WH)</b></li> <li>• <b>Long-range</b></li> </ul>   | <p><b>Penetrability of more than 1000 mm behind ERA</b><br/> <b>120 km or a 50-minute flight, with one electrical motor</b><br/> <b>150 km and 3 hours of cruising above the target, with a gasoline motor</b><br/> <b>120 km at the speed of 160 m/s, with a turbo-jet motor</b></p> |
| <ul style="list-style-type: none"> <li>• <b>Launching</b></li> </ul>   | <p><b>Fast and simple, volley fired from a launcher with 8, 12, 18 or 27 containers with UAVs</b></p>   |
| <ul style="list-style-type: none"> <li>• Max. flying height/ceiling</li> <li>• Starting mass</li> <li>• Load, payload mass</li> <li>• Propulsion</li> </ul>                                  | <p>2000 m<br/>         &lt; 50 kg when loaded (35 kg when unloaded)<br/>         15 kg<br/>         Solid fuel booster motor for the launching phase; electrical or gasoline or turbo-jet motor for the sustained/cruise flight phase</p>   |
| <ul style="list-style-type: none"> <li>• Dimensions:             <ul style="list-style-type: none"> <li>- Length</li> <li>- Wing span</li> <li>- Height, with booster</li> </ul> </li> </ul> | <p>2.2 m<br/>         2.4 m<br/>         0.4 m</p>  |
| <ul style="list-style-type: none"> <li>• Guidance system</li> <li>• Approach angle</li> <li>• Transport &amp; package</li> </ul>   | <p>INS, GPS, GLONASS, with TV/IIR homing in the final phase of flight<br/>         15° to 75° (Top Attack)<br/>         Package suitable for transportation to the firing position, with the missile fully armed, batteries charged or tank filled, depending on the type.</p>        |

**Field testing :**



Raven immediately before hitting the target



Combined enhanced blast and fragmentation WH



Armor piercing tandem charge WH (1000mm armor)

**Type of warheads :**

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

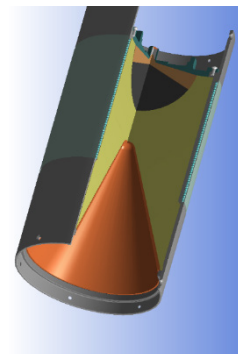
- Combined enhanced blast and fragmentation WH 175 mm with steel rods, 10.5 kg max for soft and surface targets (**BFWH**),
- Armor piercing tandem charge WH, 145 mm, 6.4 kg max for tanks and other armored vehicles (**TSCWH**),
- Combined enhanced blast and fragmentation WH, 165 mm, 13 kg total mass (**BFSCWH**) for all types of targets.



Combined enhanced blast and fragmentation WH with steel rods, 175 mm, 10.5 kg mass BFWH



Armor piercing tandem charge WH, 145 mm, 6.4 kg mass, and a spare set of 1 WH TSCWH and 2 fuses



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

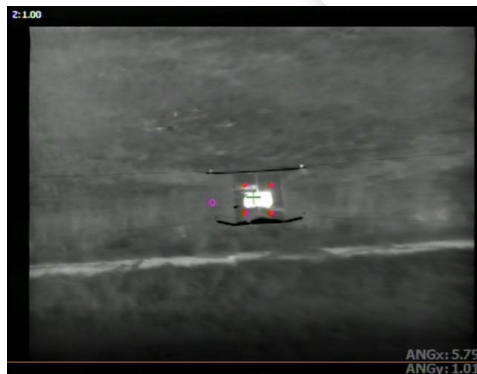
**Type of homing heads :**

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/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 RAVEN 145 EM BFWH RAVEN 145 EM BFSCWH	RAVEN 145 GM TSCWH RAVEN 145 GM BFWH RAVEN 145 GM BFSCWH	RAVEN 145 TM TSCWH RAVEN 145 TM BFWH RAVEN 145 TM FSCWH 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	11
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 Dual cylinder boxer motor 116 ccm, 10 KS	Brushless electric motor, 6 KW	Gasoline motor Dual cylinder boxer motor 116 ccm, 10 KS	Turbo-jet kerosene motor 40 DaN
Mission Abort Capabilities		By selecting another target (hitting any safe spot/object) 1. Arming the HH while approaching target 2. Self-destructing while in the air		
Parachute	+			

**Model 5:** Drone with gasoline motor without homing head and radio link. Range is 600 km. Guidance INS and GPS. Intended for destruction of area targets as aircraft stands, parked combat and logistic vehicles, soft targets etc. Area of 540x180m is covered with 100% efficiency by 27 UAVs.

## Launcher :

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



- Truck, type: Aleksandar, MAN, 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 entering the flight profile data, guidance/control of the drone and the TV/IIR homing head.

GCS comes in 3 versions: shelter, cabin and portable



Shelter with GCS and antenna system



Two-console type GCSs installed in a shelter that can fit on a trailer or in a vehicle mounted housing



Antenna system on ALEKSANDAR



Cabin GCS can be mounted on an army vehicle, such as Alexander and Milosh

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. GCS has two displays, joystick and push buttons. First display shows targets and UAVs on map, velocities and angles of flight, and selected data giving the status of the UAV. Second display shows the picture from the homing head. Max. number of drones in the air: 12. Max. number of simultaneous TV links 3 (3 video channels are watched simultaneously, as per operator's choice)



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



Should you have any further enquires, please do not hesitate to contact us at [office@yugoimport.com](mailto:office@yugoimport.com)

All the data given in the brochure are for information purposes only. The final configuration and/or technical specification are defined for each contract individually.