

Airborne Reconnaissance in Afghanistan – KZO Target Locating Remote Controlled Unmanned Aerial Vehicle

Ronny Herok

Military reconnaissance has a long history: The first airship company was established in France in June 1794. The first missions of a captive balloon employed for enemy reconnaissance took place in the revolutionary wars. It was on 2 June 1794 when the physician and Captain Jean Marie Joseph Coutelle and General Radet went up with the French gas balloon “Entreprenant” during the siege of Maubeuge for a first long-range reconnaissance flight to observe the besieged Austrian troops. They knew that the heavy toll of lives their comrades have to pay in the battle depends also on the quality of their reconnaissance results. More than 210 years later this principle is still valid in a completely different context. The quality of reconnaissance results has a direct influence on the quality of the command and control process as well as on the “reconnaissance – decision – effect” process. The age and topicality of the information has become an operational factor.

In Afghanistan the reconnaissance results are the outcome of a comprehensive analytical reconnaissance process, which is based on the combined results of different reconnaissance means. In particular these are also the imaging air reconnaissance means aside from intelligence collected from human sources in talks (HUMINT) and electronic intelligence (ELINT). The airborne reconnaissance capacities of ISAF are specified in the force requirements catalog “Combined Joint Statement of Requirements” (CJSOR). Unmanned aerial vehicles (UAVs) are provided by Germany, Italy, Canada and the United States in the regional commands North, West, South and East for conducting regional, time and area-limited airborne reconnaissance. They contribute to a picture compilation with a high degree of topicality and thus increase the protection of the international ISAF troops.

The artillery corps has been providing the “KZO” system (target locating remote controlled unmanned aerial vehicle) for the ISAF mission since late July 2009. A first result reads: The drone has meanwhile become an essential and permanent element of the conduct of operation. It contributes considerably to the fact that the operations of the Bundeswehr, ISAF, and



Launch of KZO Drone from Kunduz PRT.
Photo: Marcel Schillo

the Afghan security forces have become more secure.

Five Megabit per Second in Real Time

The tactical KZO UAV is launched with a weight of 168 kg. It has a wing span of 3.42 m and length of 2.26 m and it is equipped with a stabilized high-resolution infrared camera. The launch is carried out by means of a solid propellant rocket engine from a vehicle after a preparatory time of just 45 minutes. The drone flies propeller-driven with a speed between 120 and 210 km/h at altitudes between 800 and

3,000 m over ground, depending on the task. Time of flight is more than 4 hours. The drone’s course of flight is pre-programmed. It can fly fully automatically, but the flight course is also possible to be changed by the ground control station by radio during the flight. The camera is controlled from the ground station. The landing is carried out

by means of a parachute; airbags cushion the impact when landing on the ground. After a few hours, the aerial vehicle is again ready to be used for another employment. A system consists of a ground control station, an antenna vehicle, a launcher vehicle, a recovery vehicle, five drones, and a supply component. The operation of the system is performed by a reinforced KZO platoon. This element consists of nearly 30 soldiers who are responsible for the service, maintenance, and supply and for ensuring the operation.

The tactical advantage of the KZO drone is given by the reconnaissance depth, its speed of information processing, and by the reconnaissance capability that is independent of weath-

er and time of the day. The aerial vehicle transmits the video data of the sensor in encrypted form to the ground control station in near real-time. Data are received and transmitted every 40 milliseconds. In addition to the control data for the flight a useable data stream of approximately five megabit per second develops at a reconnaissance depth of up to 100 km. The KZO drone is equipped with a powerful sensor head, which, with a traversing range of 360 degrees, is also capable of covering the infrared spectrum. This allows a precise target location even at night and in almost all weather conditions.

The Artillery School in Idar-Oberstein and the Army Land Systems Maintenance School and Army School of Engineering in Aachen are responsible for the training on the system. It comprises the course-based training of the operators, the technicians and of the control personnel as well as the specific preparation for the mission. Manufacturer of the KZO drone is the "Rheinmetall Defence Electronics" Company in Bremen.

By now the Bundeswehr has acquired six total systems. After 131st Target Acquisition and Armored Artillery Battalion, stationed at Muehlhausen/Thuringia, had successfully carried out the required troop test flights at Baumholder training area in August 2008, the

introduction of the system into the Bundeswehr was completed in the 2nd quarter of 2009. The 131st Target Acquisition and Armored Artillery Battalion (TAAABn) and 345th Artillery Regiment were equipped with two KZO platoon systems each. The 295th Artillery Battalion as well as the five reconnaissance battalions of the Army reconnaissance corps were equipped with one platoon system each.

The KZO Drone in the Provincial Reconstruction Team (PRT) at Kunduz

There were concrete deliberations during the introduction phase already to close the capability gaps existing in the composite reconnaissance pool of the Kunduz PRT by use of the KZO system. These considerations were translated into reality in early 2009. In the first quarter of 2009, a final exploratory visit in the country of deployment was made under the direc-



Landing of KZO Drone near Kunduz PRT.

Photo: Marcel Schillo

tion of the Army Forces Command. Here, representatives of the Artillery School and of 131st TAAABn were also involved. 131st Battalion was designated in the lead-up phase already to be the prime unit for the initial employment of the KZO drone. Directly after the exploration the mission-related training was started for the 3rd Battery. At the same time, the planning process on the deployment of the extensive system equipment was initiated on all command levels.

The Army Forces Command gave the order for the deployment of KZO drones to Kunduz to the 131st TAAABn on 26 June 2009. The extensive system equipment was concurrently prepared for air transport by 3rd Battery/131st Battalion and delivered to the air transshipment point to Waren/Mueritz as from 6 July 2009.

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The advance party of the unit had already deployed to Kunduz on 7 July 2009 to prepare the reception of the main forces and of the major item of equipment. Here, it was possible for the advance party to resort to an exemplary preparation made by the reconnaissance company stationed there. The required infrastructure and logistical measures were implemented by the PRT within a very short period of time, so that the first operational flight could be conducted under field-type conditions on 29 July 2009 already. Full operational readiness of the reconnaissance system could be reported even before the ordered date 1 August 2009. In parallel to that, the homeland supply base was established at Kusel/Germany under the lead management of 345th Artillery Regiment.

The J2 intelligence division performs the coordination of all reconnaissance systems of the Kunduz PRT. The KZO platoon is subordinate to the Kunduz reconnaissance company whose commander serves the J2 division as advisor in all matters of the employment of his forces and means. For the first two KZO mission contingents a KZO advisor position was created additionally to the KZO platoon leader. This position as an advisor was assumed by Commander 3rd Battery/131st TAAABn. Due to the different airborne reconnaissance systems, which the PRT has directly at its disposal, there are a large number of aerial photos that need to be categorized and archived. Moreover, the necessary aviation safety and air traffic control work requires additional resources. A representative of the airborne reconnaissance systems is therefore employed with the Kunduz PRT in the Airspace Control/Airspace Coordination Cell.

Capability Gap Closed

For the Kunduz PRT which is employed in the center of the Regional Command North (RCN), the KZO drone represents a valuable addition to the LUNA unmanned airborne close-in reconnaissance system which has been in service for quite some time already. It was succeeded in closing substantial capability gaps in the reconnaissance pool of the PRT, which made it possible to bring about a qualitative improvement of the reconnaissance results directly available in the PRT. This has a decisive influence on operation planning and the conduct of operations within the Kunduz PRT's area of responsibility. Thanks to the longer range, the higher independence of weather effects, the higher jam resistance, and the better target locating accuracy of the KZO reconnaissance system it is now possible at Kunduz to reconnoiter areas which were previously not possible to be reached by airborne reconnaissance means and to monitor own operations. Reconnaissance tasks were thus successfully supported outside ranges of approximately 40 km so far reachable with the LUNA reconnaissance system. Such ranges were possible to be reached even in adverse weather conditions so



Successfully Employed: KZO.

Photo: Rheinmetall

that it is now possible to also support operations of the neighboring Po-i- Khomri and Mazar-i-Sharif PRTs right from the Kunduz-located PRT. In addition, the Kunduz PRT is now capable of supporting the Taloqan branch, situated approximately 60 km east of the PRT, in operations conducted in its respective area. In particularly security-relevant incidents such as for instance suicide bomber attacks or attacks against own or friendly soldiers in this area it is now possible to quickly provide support with airborne reconnaissance and, in consequence, to considerably improve the own picture of the situation.

The flight time of the KZO reconnaissance system in Afghanistan is approximately 4.5 hours with a range of up to 100 km which can be reached at any time within the first hour of flying. The possibility that several KZO aerial systems can be controlled at the same time allows to considerably extending the time of flight. In the initial employment of the system it was already possible to reach a time on task of more than 15 hours over the reconnaissance area. In this process, an operation of the Quick Reaction Force (QRF) was permanently supported by KZO surveillance from the very beginning.

Basically the reconnaissance spectrum of aerial reconnaissance systems of the Kunduz PRT (LUNA and KZO drones) can be subdivided into two categories. On the one hand, aerial photos are made for the assessment of the situation and planning of the operation and, on the other hand, for the immediate support of ongoing operations of ground forces by direct reconnaissance and surveillance, respectively. This requires precise coordination and an efficient liaison organization with the operating forces on site. The two airborne reconnaissance systems of the Kunduz PRT have thus additional communication means such as the tactical

FAUST and IRIDIUM command and control equipment.

KZO Drone – An Essential Means of Support in Missions

The employment of the KZO was assessed downright positive by the leadership of the Kunduz PRT, since KZO drones were possible to be quickly and profitably integrated into the composite reconnaissance system existing there. Right from the first flight the system not only proved to be technically extremely reliable in the difficult climatic conditions of the Afghan summer with peak temperatures of more than 50° Celsius and an enormous dust-laden atmosphere, but it also provided impressively proof of its initial operational capability. The employment of the KZO drone in addition to the LUNA system made it possible to close substantial capability gaps in the field of reconnaissance in the own area of responsibility. The system also allows the PRT to react quickly to developments and changes in the situation even over and beyond the range of the LUNA system. The co-acting of these two tactical reconnaissance systems has proved to be extremely target-oriented and effective and has developed into an indispensable component of the reconnaissance pool of the PRT. The superior command levels also share this assessment. The initially temporary employment of the KZO drones in Afghanistan was thus extended to an indefinite period of time. ■

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