

I. The Strategic Crisis

Drones Against the Kremlin

by Lt. Col. (ret.) Ralph Bosshard

This analysis by Lt. Col. (ret.) Ralph Bosshard of Switzerland was translated from the German by EIR. Lt. Col. Bosshard, during the years 2014 to 2017, served in the Organization for Security and Cooperation in Europe (OSCE) peacekeeping mission in Ukraine, where in 2014 he served as Senior Planning Officer in the Special Monitoring Mission to Ukraine, which brought him to Kiev, Mariupol, and Dnepropetrovsk. Until 2017 he served as the Special Military Adviser to the Permanent Representative of Switzerland to the OSCE and to the Swiss Ambassador to Kiev. From 2017 to 2020 he served as Operations Officer in the OSCE High-Level Planning Group, planning for a military peacekeeping operation in the South Caucasus.

The author's extensive footnotes, referring to sources in German, Russian and English, are omitted here.

May 4—The pictures of the drone attack on the Kremlin in the heart of Moscow on May 2 have gone through social networks. And already the question is going around, whether it was at best a “false flag” operation by the Russians. Since then, the world may be one step closer to the nuclear abyss.

In the context of other current events, this latest occurrence takes on a somewhat different meaning than it might seem at first glance. On April 26, Russian drones near Kherson hit carrier vehicles of a Ukrainian air defense battalion equipped with S-300 guided weapons, damaging or destroying four of them. The battalion was apparently to be deployed near the front to protect from Russian air strikes the passage of Ukrainian

troops across the Dnipro (Russian Dnepr) River and an advance to the Black Sea.

A high-value target such as an S-300 anti-aircraft missile must be protected while moving and deployed close-in, either by mobile systems such as the Gepard anti-aircraft tank, or by static ones such as anti-aircraft guns set up along the line of march. On that April 26 occasion, close protection apparently failed. Subsequently, videos circulated of an attack by a drone on



Explosions over the dome of the Kremlin in Moscow, a result of a drone attack by Ukraine, May 4, 2023.

a Gepard anti-aircraft tank that should not have occurred. In defending against drones, the radars rather than the weapons may be the critical point, because today's anti-aircraft guns, such as the German Mantis, are capable of intercepting even approaching artillery and mortar shells.

Experience in Small-Scale Warfare

The experience of the conflict so far in eastern Ukraine shows that it is difficult to detect and locate small drones, even commercially available ones,



USAF/Alejandro Peña

An RQ-11B Raven remote-controlled drone. Joint Base Elmendorf-Richardson, Alaska, Aug. 27, 2019.

with today's radars. As a caveat, drones that are small enough to go undetected are also likely too small to do much damage. The kinetic energy of the aircraft that targeted the Kremlin [May 2—ed.] was apparently low, so even the falling debris could not do any damage.

From 2014-2022, the Special Monitoring Mission to Ukraine of the Organization for Security and Cooperation in Europe (OSCE) deployed numerous drones to monitor ceasefire observance along the so-called line of contact in eastern Ukraine. In particular, the Schiebel Camcopter S-100 drones were comparatively large, but the radiation of heat from their engines was too weak for heat-seeking missiles such as the Iгла or similar man-portable anti-aircraft missiles to shoot them down. The OSCE lost the most drones to radio jamming. Very rarely, OSCE drones were shot down, and only after icing had made them so heavy that they could not maintain their altitude and airspeed. Special antennas were mounted on OSCE drones after the first incidents, supposedly to allow reception of data from navigation satellites despite radio interference, but re-sounding success never occurred.

The Russian army has certainly learned its lessons from eight years of war in the Donbass and has created zones around important objects where the reception of GPS satellite data and of control signals from ground control stations is disrupted. In addition, a lot of research has been done in the field of drone defense in recent years: Special stations for radio jamming of drones are now available on the market. The Mayor of Moscow has already stated that the city authorities have

banned the use of drones in the city, but Moscow is so large that the ban probably cannot be enforced completely. On the other hand, it is likely that effective electronic warfare systems are in use around the Kremlin, so it would take some skill in this area to have a drone flying around over the center of Moscow. The drone attack was not the act of a few pro-Ukrainian amateurs, but of experts.

Peculiarities of the Moscow Location

The problem of air defense in the Kremlin is that people in the center of Moscow want to use their cell phones, navigation devices and other systems, with radio control as undisturbed as possible. This is still possible on Red Square and in other areas surrounding the Kremlin. In the center of the

city, on the other hand, it is not possible to fire anti-aircraft guns and missiles, because even if they hit an approaching aircraft, they endanger the surrounding area.

Therefore, defensive weapons are probably installed in and around the Kremlin, which only go into action when an aircraft directly enters the airspace above this small city within the city. The weapons and the sensors themselves do not necessarily have to be installed on the buildings of the Kremlin. It is also conceivable that such systems are installed on neighboring buildings such as the GUM department store or the Historical Museum.

It is noticeable that the drone exploded in the immediate vicinity of the Kremlin dome. Either a munition with explosive effect was used, or the drone's payload exploded.

At such short range, different systems can have an effect against drones. It is conceivable that a system was in use that shoots small projectiles, similar to a shotgun. The small bullets quickly lose kinetic energy and after a short flight time are no longer dangerous to people in the vicinity. The Russian army uses such systems to protect the silos of its intercontinental ballistic missiles (ICBMs). One of them is the Mozyr active defense system. The system, which consists of fixed guns, fires a "cloud" of metal bullets and arrows that destroy attacking warheads directly above the silo. Development began in the 1980s, but then stalled because sufficiently powerful radars and computers for target acquisition and trajectory calculation were not yet available.



USAF Research Lab

Artist's depiction of a high-power microwave weapon system disabling small unmanned aerial vehicles.

A few years ago, the program was resumed. In the case of a drone traveling at a few hundred km/h, target acquisition and tracking are obviously easier than for a warhead flying in at several times the speed of sound. It is possible that Russia has developed a similar system for protecting important objects such as the Kremlin.

Laser Weapons

Another option is laser weapons, which at best destroy key components of a drone, causing it to crash. A technology-inherent problem with laser weapons is “thermal blooming,” which occurs when air is heated by the laser beam and absorbs some of the beam’s energy. Fog, smoke, dust, rain and snow also reduce the effectiveness of laser beams. The same effect can be achieved by artificial fog that can be created around an object. These problems occur to a lesser extent, or not at all, when laser weapons are used at high altitudes, where the air is correspondingly thinner, or in space.

In a city like Moscow, where dust from numerous polluters permanently affects the transparency of the atmosphere, laser weapons are likely to be effective only at short range. Various systems for combating drones using laser beams

are already available on the defense market, such as the ATHENA laser system from U.S. manufacturer Lockheed Martin. Research programs have also been underway for years in Türkiye, Germany and Israel. In Russia, the “Peresvet” (Russian “Пересвет”) laser system has already been in service since 2019, according to official data.

A third option is high-energy microwave weapons. They generate a very short and intense pulse of energy that creates a momentary surge of thousands of volts in electrically conductive components of all kinds of devices, destroying them. Such weapons can disable electronic devices that are not specially shielded. The required energy is often generated by the explosion of a small explosive charge. The resulting electromagnetic pulse is effective at best for a few hundred meters. Such weapons are also already on offer from the arms industry.

Demining devices, which use radiation to detonate the fuses of mines and booby traps, operate on a similar principle. Such a device, the Listva demining vehicle, has been in service with the Russian Army’s Strategic Missile Forces for years. It uses powerful radiation to detonate mines up to a distance of 100 m. It is possible



Air Force Research Lab, Directed Energy Directorate

A THOR pulsed high-power directed microwave weapon, designed to knock down drone swarms by frying their electronics. Kirtland Air Force Base, New Mexico.

that an analogously built device in the Kremlin detonated the drone's payload prematurely. This is probably the most plausible explanation for the destruction of [the] drone over the Moscow Kremlin.

Conclusion

In any case, the shooting down of the drone in such a complex environment as the center of Moscow testifies to an effective and highly complex system of object protection. It is possible that the Russians already have systems in service today in the area of air defense that are only being introduced in the West.

At a time when the complete conquest of the city of Bakhmut/Artemovsk seems imminent, the Zelensky government must be trying to distract from it by a few spectacular actions. Apparently, drone attacks are the accompaniment to Zelensky's current round of visits to Europe. In addition to attacks on factories and depots far from the front, which are less well protected than facilities close to the front, an attack in the heart of Moscow is a promising option for action that is getting a lot of attention. Such attacks will continue until the

PMC Wagner has captured the last neighborhoods of Bakhmut. This may take a few more days.

Playing with Fire Again

The attack on the Kremlin was playing a game with fire. The attacks on [Russia's—ed.] air bases at Engels and Lipetsk challenged Russia's ability to repel a surprise attack and provide strategic deterrence; and the attack on the Kremlin now does so again.

The Russian side will interpret the attack on the country's decision-making center as an attempt at a decapitation strike by conventional means, or rather as a reconnaissance attack in the sense of probing. Such decapitation strikes—albeit with nuclear weapons—were already talked about during the Cold War. The Russian side will also suspect that Western countries such as the United States or the UK used the Ukrainians here, to test the chances of success of a first strike in a nuclear war.

The attack on the Kremlin shows that Ukraine is ready to drag the world into a nuclear war for the sake of the Donbass and Crimea. We are one step closer to a global thermonuclear war.

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