

Dr. Kandarpa Kumar Sarma's analysis on Russian EW systems in Ukraine



1L269 Krasukha 2 (Source: MoD Russia)

One clear indication that is emanating from the Ukraine war is the preeminent position that electronic warfare systems (EW) are attaining while other arms of warfare are facing fluctuating fortunes. When the war started, drones, aircraft, artillery, and similar electromagnetic (EM) signal dependent systems, including those requiring global positioning system (GPS) inputs, demonstrated individual prowess and precision to the extent that disruptive technologies and asymmetric warfare tactics appeared to gain the upper hand. But EW systems started to change the scenario and attain pivotal positions.

Electronic warfare is a complementary component of traditional combat arms designed and deployed to deny and degrade the opponent's advantage in the radio frequency (RF) spectrum and disturb all means of communication. EW systems are applied to detect, disrupt, and deceive the RF systems of the opponent and deny the capability to use tactical radios, radar, positioning and navigation signals, weapons systems, and various detectors to coordinate precision operations and find the enemy. These have become vital and play decisive roles in ensuring all round dominance. The EW spectrum is constituted by electronic attack, electronic countermeasures, and

electronic support.

In an electronic attack, the transmitter overwhelms the waveform and signals of an enemy radar or radio, preventing them from functioning properly. This is also known as "jamming" or "signal deception." Deception can spread false messages and traps, while jamming guarantees that crucial signals and messages cannot pass through. Techniques used to safeguard the integrity of signals and keep them from being intercepted or jammed in the first place are referred to as electronic protection and countermeasures. Typically done by passive listening of radio frequency electromagnetic radiations, electronic support is used to comprehend and



R-934B Borisoglebsk-2 (Source: Defence Express)



Krasukha-4 complex (Photo: theaviationist.com)