

EIR Science & Technology

West must counter Soviet radio-frequency weapons

Jonathan Tennenbaum reports on the most critical threat which the West must now meet from Soviet Marshal Nikolai Ogarkov's technological war build-up.

Soviet Marshal Nikolai Ogarkov has integrated a new, awesome type of weapon into his plan for all-out war against the United States and its allies: radio-frequency (RF) anti-personnel weapons. While most Western observers have yet to put two plus two together and grasp the dramatic implications of RF technology in the hands of an Ogarkov, Lyndon LaRouche launched an emergency call in late May for an "SDI-like mobilization" in the West, to develop RF weapons and effective countermeasures against such weapons.

Using precisely controlled pulses of electromagnetic energy, RF weapons can knock out the brain, nervous system, and other organs of any person within range of the output beam. Ogarkov plans to use them as a crucial capability for Soviet spetsnaz (special designated forces) units operating in the West. Secretly assembled and hidden in advance of hostilities, in TIR trucks, in civilian aircraft, in residential and commercial buildings adjoining or overlooking military facilities, and in other locations, RF weapons will be deployed by spetsnaz operatives to knock out NATO command centers and key bases, minutes before the launching of an all-out first strike by the Warsaw Pact. The goal of these tightly coordinated spetsnaz attacks, in which RF weapons will be used together with advanced chemical weapons and miniaturized nuclear devices, is to guarantee that no organized resistance can be mounted to the Soviet invasion of Western Europe and other strategic areas. The principle is frighteningly simple: If the brains of a few thousand NATO personnel are

destroyed a few minutes before warning of the Warsaw Pact attack, then Western defense will practically cease to exist.

RF weapons are not limited to spetsnaz applications, however, but are part of a general technological revolution in all fields of warfighting. RF weapons are one part of a strategic concept known as "technological attrition," the crucial concept in Ogarkov's plan to defeat Western civilization.

At present, the Soviet war economy is gearing up to produce entirely new generations of the most awesome weapons man has ever known. These new types of weapons possess such devastating destructive power, that Ogarkov and Gorbachov could demonstratively scrap a large part of their present nuclear missile fleet, and then turn around to launch a successful surprise attack against the West. That is the real significance of the Soviet *perestroika* (transformation) campaign, which stupid Western observers often describe as a "liberalization move"!

How do RF weapons work?

While details of Soviet RF weaponry have never been published in the West, and many of the relevant research areas are classified, the basic scientific principles behind these devices are simple enough.

Until the advent of the SDI, most weapons of war relied on mechanical force and shock (e.g., the impact of a bullet, the explosion of a shell or bomb) for their destructive effects. The main exception to this has been chemical and biological

weapons, which use negligible amounts of energy, and whose effectiveness depends on highly specific physiological effects upon the targeted forces. Exemplary are the powerful nerve gases, extremely minute quantities of which, absorbed by the skin (for example) and lodging in the synapses of the central nervous system, can paralyze and kill a soldier within minutes. For a variety of reasons, however, chemical and biological weapons are difficult to "aim" in such a way that only the chosen targets are knocked out, and no undesirable effects are produced for the forces deploying these weapons.

The laser and particle beam weapons developed by the Soviets and the United States in their respective "SDIs," already make a giant step beyond the "bullets and bombs" of even the atomic age. These are weapons which deliver their energy with the speed of light, but which also rely, in large part, on being able to "tune" that energy in precise ways which ensure penetration and destruction of the target.

Like lasers, RF anti-personnel weapons produce beams of electromagnetic energy traveling with the speed of light. But, unlike the laser weapons of the SDI, their target of preference is the human nervous system, especially the brain. Their effects depend on a little-publicized, but fundamental area of biology: resonant action of electromagnetic pulses on living tissue.

Although living cells are sensitive to nearly all forms of radiation, the particular types of anti-personnel weapon we are discussing here operate in the electromagnetic wavelength range between long-wave radio and radar, and microwaves—that is, from hundreds of meters down to fractions of a millimeter.

Technology for producing radiation in this range has been standard since the breakthroughs in radio and radar during the Second World War. However, the type of signal most suitable for biological effects differs substantially from what is commonly used in communication, navigation, radar and so forth. The typical RF anti-personnel weapon produces "shaped" pulses involving several different frequencies at the same time. The reason for this lies in the peculiarities of biological systems, which are "tuned" in a fundamentally different way than radio receivers and television sets.

Although informed military scientists have long been aware of the possibilities of tuned RF pulses, very little discussion of them has appeared, until recently, in the public domain. However, the 1987 issue of the U.S. Defense Department's *Soviet Military Power* warned of a massive Soviet research and development effort in RF weaponry. Under the title, "The Zap Gap," the March issue of the popular U.S. magazine *Atlantic Monthly* quoted a number of leading military experts describing Soviet RF work. Most recently, the German newspaper *Die Welt* broke the story on its front page, warning that RF weapons capable of neutralizing thousands of troops on a battlefield while leaving their equipment functional, are "closer to realization than the SDI."

Tuning into living cells

When most people hear about radio-frequency weapons, they tend automatically to think of victims being "cooked" in the fashion of a microwave oven. Although some recent technologies (gyrotrons and similar devices) actually make it possible to generate powerful enough bursts of microwaves to produce these gross kinds of effects on a battlefield, the most dangerous kinds of RF weapons produce no heating at all. The typical power densities required to induce biological effects are on the order of hundredths of a watt or less per square centimeter of tissue area. This is a power density comparable to an ordinary household light bulb at the distance of half a meter.

The effects of RF weapons are based on the circumstance, that a living cell differs from a mere dead mass of molecules by a very special type of coherent *organization*, which is mediated by what appear to be weak electromagnetic effects. If this electromagnetic organization is systematically disturbed, the cell will malfunction or die. We might think of the effect as an instantaneous "electromagnetic poison."

While most people are aware that the activity of the nervous system involves tiny electrical pulses, many are unaware that *all* processes in living tissue are electromagnetic in character, from the chemical reactions to the systems of electromagnetic oscillations which "organize" processes in various parts of the cell into a coherent whole. In fact, living tissue possesses a frequency spectrum, analogous to the spectra of individual atoms and molecules, but much more complicated. RF weapons depend on detailed knowledge of the spectra of various types of tissue under various conditions.

Induced transparency

Primitive organisms like bacteria are so exceedingly sensitive to electromagnetic radiation in their environment, that it is nearly impossible to conduct a biophysical experiment which does not introduce large "artifacts" produced by the impact of the laboratory electronics on the experimental subject. Higher organisms have evolved their own electromagnetic "screening," to shield their tissues from changes in the outside radiation environment.

The best shielded of all organs in all living organisms known to biologists, is the human brain. This defines a crucial problem for RF weapons: how to get their signal "in" to the brain and other targeted tissues.

Here, a phenomenon known as "self-induced transparency" becomes decisive: Contrary to everyday concepts of the hardness and opacity of materials, it is possible to design electromagnetic pulses able to easily pass through any given material medium. The properly shaped pulse propagates by organizing the medium to reproduce the pulse within itself; in other words, the material is momentarily made to become transparent for the specific form of action applied.

Thus, a series of short, carefully shaped pulses can not

only penetrate the natural organic shielding of the body, but can get through heavy walls and even metal shielding as well, unless such shielding is specially "tuned" to block the precise frequencies used. With the proper choice of the frequency combination and the right "phase relationships" between the various frequencies, the energy absorbed into the body can be "steered" to focus in a specific region inside the body. While a large variety of physiological alterations can thereby be obtained, the central nervous system presents itself as a most favorable target for anti-personnel applications—because of its exceptional sensitivity and because of the instant debilitating effects produced.

What do RF weapons look like?

An RF weapon must contain a power source, a generator of the basic signal, amplifiers, calibration equipment, an antenna system, and a small computer. For "close-in" applications such as spetsnaz, where the device would be located within a few thousand meters at most from the target area, the entire unit could be fit into a single TIR truck. This also provides a good camouflage, since hundreds of thousands of such trucks travel around Europe and the U.S. every day. A truck carrying an RF weapon would look like any other truck, from the outside. Although such a device is easy to detect once in operation (too late!), use of camouflage and delaying final assembly until shortly before use, would make these weapons difficult—though not impossible—to locate prior to attack. Another potential spetsnaz deployment mode would be in a medium-sized commercial aircraft flying within line-of-sight of the target area.

RF weapons are obviously not restricted to spetsnaz-type deployments. They revolutionize many domains of battlefield warfare in the same way as the SDI transforms strategic warfighting. The most powerful sorts of RF weapons involve the focusing of entire arrays of antennae, deployed in different locations, to "sweep out" a huge target area. Given the opportunity to deploy large structures in space (which the Soviets now possess, thanks to their new heavy launch vehicle and their space station), it becomes possible to target areas on the Earth from space.

"Close-in" anti-personnel RF weapons can be built with essentially "off-the-shelf" technology. However, an entirely new dimension of RF weaponry becomes possible on the basis of the new high-temperature superconducting materials, MHD pulsed power systems and ultra-high-power microwave sources (gyrotrons and beam-plasma devices)—all areas of intense research and development in the U.S.S.R. On the basis of such technologies, electromagnetic weapons become possible which make an ICBM missile look like a minor threat: We are talking about weapons which could wipe out the populations of towns and cities anywhere on the Earth, instantaneously, from thousands of miles out in space.

Moreover, the use of advanced electromagnetic beam

technology will not be limited to anti-personnel applications. With the vast increase in available power and precision in tuning, made possible by breakthroughs in superconductivity and other areas, it will shortly become feasible to construct pulsed electromagnetic weapons capable of destroying aircraft, tanks, bridges, and other heavy structures.

What means of defense are available against RF weapons?

Properly shaped electromagnetic pulses can penetrate into buildings and even into a tank. The theoretical possibility of protection exists, using a screening arrangement known as a "Faraday cage," a dense net of conducting material surrounding the area to be defended. However, to be effective, the Faraday cage would have to be designed and tuned with prior knowledge of the frequencies and pulse shapes employed in the attack. Recent development of high-temperature superconducting materials may permit more effective types of screens to be constructed.

Since the "close-in" spetsnaz type of RF weapon operates mostly in "line-of-sight," massive physical barriers such as a few meters of moist earth, can be an effective screen against these weapons. However, a well-planned surprise attack could utilize pre-calculated reflection and diffraction of the signal, as well as obvious secondary "antennas" and waveguides provided by electrical wiring, piping, ventilation, etc. to reach even into underground bunkers.

Better screening would be provided by specially designed electromagnetic fields, "controlled environments" around key areas, which would constitute a kind of immunization against the biological effects of RF weapons. Such screens would depend on extensive scientific research, and are not now available in the West. The best defense we now possess is to locate and destroy the RF devices before they can be used.

A new SDI

Understood in their full strategic and tactical implications, RF weapons constitute fully as dramatic a revolution in warfare as the antimissile beam weapons of the SDI. Also like the SDI, their development involves crucial areas of science, particularly biology and electromagnetic theory, and promises to bring remarkable "spin-offs" in many civilian areas. The ability to focus tuned electromagnetic energy anywhere in the body, and to trigger specific biological processes with such tuned pulses, opens up a new era in the treatment of disease. Crucial experiments have already proven that RF pulse technology can cure cancers, accelerate tissue growth and the healing of wounds, and stimulate the immune system to eliminate otherwise fatal infections.

Lyndon LaRouche's call for an "SDI-like" mobilization in the West, to develop RF weapons and countermeasures against them, might also be part of the solution to AIDS. That is just one more urgent reason for launching a Western crash program in this area—right now!