

RADIOBARRIER

Autonomous Perimeter Security System

Market standing at a glance

White Paper

Idea 1

PREVENTION IS BETTER THAN CURE

Key factors in the game are
Efficiency & Cost

It is better to stop something bad from happening than to deal with it after it has already happened – that is the goal of all modern security systems. Some of the world's best minds work on making our world safer. Key factors in the game are, as in any other industry, efficiency and cost. Users need to know about the incoming threat early enough to mitigate all possible risks. Also, they want a system that would be easy to install, operate and maintain.

Idea 2

ISOLATED AREAS THAT MATTER

Meeting these requirements is even a greater challenge when it comes to systems that should operate in complex terrain, isolated areas, and territories with no power and communication. These challenges demand unique technologies, knowledge and skills that would still keep security solutions efficient and cost-effective.

Idea 3

INNOVATIVE APPROACH TO UGS

Easy to install, operate & maintain

The perimeter protection and area surveillance market offers a large variety of electronic, mechanical and optical systems. While many of them are well suited for small areas, only a few are applicable for protection of large perimeters and assets in remote areas and territories with neither reliable power supply nor communication infrastructure.

When the first unattended ground sensors (UGS) got to the market, no one could imagine they would later become a tool for large scale perimeter and surveillance projects.

A revolutionary approach to seismic signal processing, easily scalable and flexible architecture turned UGS systems into highly efficient tools, applicable not only to defense, but also to homeland, industrial and private security operations.

Today there is a list of companies that form the entire UGS perimeter security systems' market. The pioneers in the segment are major US companies, which implemented UGS for force protection and special military campaigns in the middle of 1960s. Later, Israeli and European companies joined this market, offering their family of UGS products. The architecture of those UGS systems is more or less similar.

US systems generally consist of detection devices (sensors) with different physical principals of operation, gateway nodes, repeaters, information processing hubs, exploitation and dissemination stations and receivers. All components communicate either via radio-frequency or via satellite channel.

Any activity detected by the sensors is transmitted to the processing stations through gateways and repeaters, where it is compared to stored data libraries to identify the intrusion and classify the target. Most of the systems use a one-way channel that only

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allows it to receive data – there is no remote adjustment of parameters and settings on the units.

Among the main US developers and manufactures, we should mention L-3 *Communication Systems* (current systems are BAIS ISR, BAIS and BAIS-i), *HARRIS Corporation* (Falcon Watch™), *Textron Systems* (MicroObserver), *Northrop Grumman* (Scorpion II), *Trident Systems Inc.* (UGS Noce V2), *Applied Research Associates Inc.* (E-UGS), *Lockheed Martin* (Self-Powered Ad-hoc Network (SPAN)) *Quantum Technology Sciences, Inc.* (QM-100) and some others.

The terms of autonomous operation of UGS systems are from 14 to 700 days with 6 months on average.

Table Main technical characteristics overview 1

	BAIS-i L-3 Communications	E-UGS ARA	RDC UGS Digital Barriers	MicroObserver® TEXTRON
Sensor Type	Seismic + Acoustic	Seismic	Seismic	Seismic (MO-2730 NODE)
Autonomy, days	130	180	180	730
Detection, m	70-100 (human) 400 (vehicle)	10	30 (human) 100 (vehicle)	100 (human) 300 (vehicle)
Frequency	138 – 153 MHz	UHF	863-870, 902-908 MHz	2,4GHz or ISM
IP rating	IP68	IP68	IP67	IP67
Temperature, °C	-40...+70	- 32...+7 1	-15...+70	-30...+70
Weight, gr	680	320	400	2000

Source: Official information published by the manufactures

Israeli system manufactured by *Elbit Systems Ltd.* referred to as SAND was developed for short-term missions in sandy areas. Currently, the company offers the TREASURE system combining different in-house and contract manufactured sensors and products (SAND has become a part of the entire system). The TREASURE system also includes gateways and communication units. There are some other Israeli companies that offer UGS systems as a part of the complex solution based on radars where UGS is used solely for blind--spot monitoring.

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There are European companies that produce UGS systems different from the one mentioned above. They are *Digital Barriers plc.* (UK) and *Exensor* (Sweden – UK).

Digital Barriers plc manufactures the RDC UGS system that includes seismic sensors and a master node (a gateway) that are directly connected to the PC-based control unit or integrated into cellular systems, SATCOMS and other networks via encoder. The system is adapted to EU and US frequency requirements and complies with ESTI and FCC standards. Sensors operate up to 6 months without battery replacement and charging.

Exensor – a manufacturer from Sweden – has been known as one of the leaders in the UGS niche since 1987. This company offers several versions of UGS that vary depending mainly on the communication range in Line-of-Sight (LoS) conditions and autonomous operation time parameters. UMRA 1 (first generation of UGS) provides communication up to 15 km LoS while UMRA MINI MK2 has a 1 km range and a 1-year mission life (when powered by an external battery).

All aforementioned products have almost the same approach to UGS systems and quite limited fields of application – either to control radar blind spots, or to protect personnel (during military operations and special missions) on duty or to quickly create a secure protection for a short run. But none of them can be used as a self-contained perimeter security solution for long-term operations and large scale projects. They all require regular maintenance to replace batteries and make the system continuously functional as well as demand technical support due to complex and bulky system architecture and an alarms processing model.

Idea 4

PREVENTING BLIND SPOTS IN COST ESTIMATES

When you need to secure a facility located in a remote area with complex terrain, the main issue is how to make the system run 24/7 hours a day, 365 days a year without any infrastructure and with minimum maintenance.

On the one hand, you face technical challenges, such as building the system and implementing it on site along with undergoing many environmental and resource limitations. On the other hand, you need to support the hardware to make it functional in any environmental conditions.

The first issue is normally resolved at the budgeting stage when you plan all the costs and expenses and you need to supply the solution to the end user and to implement it on site. But it becomes much more complicated when it comes to a service stage. It's very difficult to evaluate and calculate all possible overruns you might face to maintain the hardware in remote locations.

While surfing the web for a perimeter security system, you would definitely find many options other than UGS based solutions that generally can be divided into three major groups: fiber optic solutions, fenced solutions and wired systems (this category includes CCTV, sensing cables, sensors and others).

The key players include *Anixter International*, *Axis Communications*, *Fiber Sensys*, *FLIR Systems*, *Honeywell International*, *RBtec Perimeter Security Systems*, *Senstar*, *Southwest Microwave*, *Tyco*, *United Technologies Corporation*, *LRAD*, *ELFAR*, and *Xtralis* among others.

Those giants in the security business do offer complex solutions with various integrated technologies into the entire security system. They normally supply a combination of different wired products to meet the security goal. This combination may include both in-house and contract manufactured units.

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Commonly, the cost of the hardware is very inexpensive and competitive. One can easily find a solution that meets quality-price ratio. But those solutions work well until it comes to a remote facility or a place with no power supply and plenty of ground work required. In this scenario, the budget for building the infrastructure can exceed two to three times the cost of the hardware. That also increases further maintenance and service works cost. Altogether, solutions become not as cost-effective as previously planned.

Idea 5

NO GOTCHA: ALL-INCLUSIVE!

Since RADIOBARRIER Autonomous Security System broke into the market in 2006, the traditional mindset has been changed. For the very first time, the system based on UGS was offered as a main tool in problem-solving scenarios for large scale projects like border surveillance, extended terrain monitoring, solutions for oil and gas industry, and protection of large perimeters.

The only seismic sensor based system
used as the main tool for border surveillance

Practical experience and unique knowledge, acquired through years of close cooperation and ongoing dialogue with end users, enabled us to create a universal product suitable for various outdoor applications. Unlike other UGS systems present on the market today, the RADIOBARRIER system combines technologies, skills, knowledge, efficiency and effectiveness into one solution that can do the whole job on its own.

Idea 6

WHAT MAKES THE RADIOBARRIER SYSTEM UNIQUE?

The answer is simple. The RADIOBARRIER system is an optimal mix of augmented advantages of other UGS systems and elimination of their weaknesses and gaps.

Solutions based on RADIOBARRIER products are fully independent due to an inbuilt power supply and communication line. These solutions run 5 years in remote locations in complex terrain and require minimum maintenance work. Clear and easy-to-use architecture of these solutions, achieved by means of the devices' flexibility, (ability to operate selectively or simultaneously in different modes) provides minimum effort during system planning and project implementation stages.

The system itself informs the operator about type and timing of maintenance, if it is required. Outstanding performance characteristics reduce investments on the project thanks to reduced hardware quantity and minimum installation charges.

Once the solution is deployed, it starts surveying the area of interest to detect any unauthorized intrusion. All alarm and self-tested messages are transmitted in real time to a control unit located anywhere in the world with guaranteed delivery of information. Remote control of the entire system as well as selective and bulk adjustment of parameters and network configuration from a control room makes any solution based on RADIOBARRIER products user-friendly. Unique features minimize the probability of false and nuisance alarms.

- **In-house** power supply and communication capability
- **5 years** of autonomous operation
- Unique **signal processing** algorithms
- **Full remote** system control and adjustment
- Proprietary secure **mesh network**

Idea 7

STAND ALONE TURN-KEY SOLUTION OR FIRST LAYER OF DEFENSE?

When implementing a perimeter protection project, one needs to understand that it is quite hard to make even the best technologies and products work together as one system, if they were not developed as part of the whole.

It is much easier to use a system that already has a range of various sensor technologies seamlessly working together as one system. RADIOBARRIER already includes seismic, passive infrared, microwave, opto-electronic, magnetic, trip-wire and other detection devices, so it can be easily tailored to virtually any requirements, without any additional hardware.

Yet, the flexibility and wireless architecture of the system make it a perfect pick for the first layer of defense in multi-layered complex perimeter solutions.

Idea 8

PROVEN TECHNOLOGY AND SIGNIFICANT TRACK RECORD

The RADIOBARRIER System is now in operation in over 25 countries on 5 continents across the globe. Military, law enforcement and industry users rely on RADIOBARRIER products for security of personnel and highly critical facilities .

The RADIOBARRIER is the most mass produced UGS in the world. Just the number of seismic sensors manufactured annually is over 15 000 units.

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The company uses best manufacturing practices and equipment. Quality control procedures are regularly verified by experts from key players on the defence and security market that supply our product as part of their solutions.

Sales of RADIOBARRIER system have been growing steadily for the last few years, and in 2016 the sales volume doubled as compared to 2015.

- **3 500 km** of state borders
- **1 500 km** of pipelines & infrastructure
- **25** countries