

AUG Signals Ltd.

The “main focus” of Airborne Underwater Geophysical Signals, known as AUG Signals, is the creation of “advanced and innovative Signal Image and Data Processing algorithms” for military use. Its products have a range of applications including:

- ◆ Early Missile Warning, Detection, Recognition and Tracking
- ◆ Anti-ballistic Missile Defence.¹

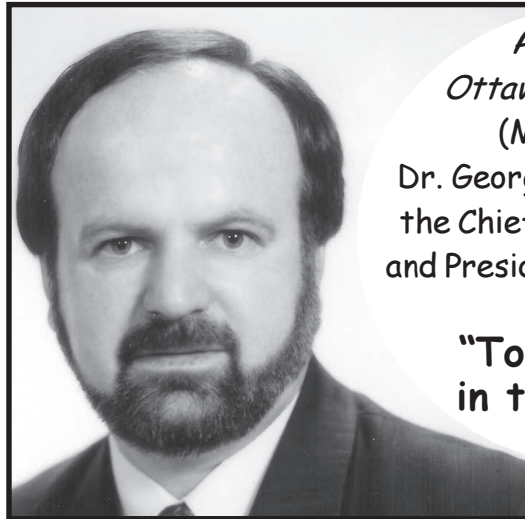
The AUG Signals product used for such “missile defense” applications is the “Detection and Recognition Intelligent System” (DRIS). AUG says that besides being used for “military airborne targeting,” DRIS is also used for “anti-missile defense” purposes. DRIS is said to screen out the “background clutter” associated with “Synthetic Aperture Radar and Electro-Optical” detection systems.

AUG Signals says that “the major advantage” of its DRIS “detection system,” is that “it detects weak target signatures” thus reducing the usual “false alarm rate” to “lower or equal to the desired level.” This maximizes the probability of detecting the target amidst the confusing muddle of background signals. AUG Signal’s website concludes its puff by saying that: “DRIS is one of the latest successes of the company and we proudly present it to you.”²

AUG Signals’ expertise in enhancing target recognition and tracking functions of weapons systems is an important area of research and development coveted by the Missile Defense Agency (MDA). In the MDA’s “Proposal Submission Instructions” for “Small Business Technology Transfer,” there are numerous categories of R&D in this area of expertise exhibited by AUG Signals. Companies are eligible for MDA grants of up to \$150,000 within each “topic area.” These “topic areas” are described as having

“originated from the MDA Programs and are directly linked to their core research and development requirements.”

All of the following MDA solicitations deal with problems related to the reduction or mitigation of background clutter to increase target recognition and



According to
Ottawa Life Magazine
(March 2005),
Dr. George A. Lampropoulos,
the Chief Executive Officer
and President of AUG Signals,
is one the
**“Top 50 people
in the Capital.”**

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tracking:

- MDA04-098 “Radar Data Fusion for Single Integrated Air Picture for Ground-based Midcourse Defense”
- MDA04-T014 “Target Scene Resolution and Calibration”
- MDA04-154 “Simulation of Stressing Optical Clutter for Scene Generation”
- MDA04-137 “S-band Radar Micro-Doppler Signatures for BMD Discrimination”
- MDA04-012 “Generalized Multivariate Decision Theory: Hyperspectral Target Detection in Remote Sensing Operations”
- MDA05-T003 “Airborne Detection Sensor Improvements”³

Further evidence that AUG Signals products are being applied to “missile defense” efforts is also found in the company’s promotional blurbs. For instance, the July 2002 issue of *Micronet News*, included the following description of the company’s work:

“AUG Signals builds dedicated on-board processors for satellite surveillance systems and Space Qualified Digital Signal Processors for on-board processing. Their multi-sensor signal image and data fusion methods are used for early missile warning, detection, recognition and tracking, *anti-ballistic missile defense* and mine detection.”⁴ (Emphasis added.)

Micronet News is an online

publication of Micronet R&D, which is “a Canada-wide network of researchers from institutions (universities), industry and government research organizations working cooperatively towards the development of the next generation of microelectronic systems.”

It is one of 22 such “Centres of Excellence” funded by the Canadian government.⁵

Canadian Space Agency

AUG Signals, like many other Canadian, military-related corporations, has not only benefited from the networking and promotional efforts of a government-funded “Centre of Excellence,” its work is also endorsed and encouraged by other government institutions such as the Canadian Space Agency (CSA). This government body funds and otherwise supports Canadian corporations, like AUG Signals, that produce technology for use in military and civilian space applications.

Besides promoting AUG Signals through its “Space Directory,”⁶ the CSA gave AUG Signals \$97,375 for a contract to

“develop optimal polarimetric Constant False Alarm Rate (CFAR) detectors using simulated Radarsat-2 data. The team intends to combine recent advances in ship detection from the Canadian Centre for Remote Sensing and Defence Research and Development Canada-Ottawa [DREO] using polarimetric data with A.U.G. Signals’ innovations in the areas of CFAR detection, statistical target and clutter description and fusion of CFAR detection technologies.”⁷



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The CSA also gave the corporation a contract worth \$227,716.33 for undisclosed work as a “scientific consultant” for the period 2004-11-15 to 2005-12-31.⁸

Defence R&D Canada

AUG Signals has also received considerable financial and technical support from other Canadian government agencies, such as Defence R&D Canada (DRDC). In fiscal year 1998-1999, DRDC gave \$60,306 to AUG Signal for a Defense Industrial Research (DIR) project called: “Signal Image and Data Processing Algorithms” (SIDPA).⁹

Then, during the following fiscal year, 1999-2000, AUG received \$247,200 from the DRDC as a follow-up to the DIR grant.¹⁰

These two grants, totalling over \$300,000, appear to be related to AUG’s work with the DRDC on its previously mentioned missile-defense related “Detection and Recognition Intelligent System” (DRIS). In the context of DRIS, the AUG Signals’ website refers to its collaborative work with DRDC on “Intelligent Constant False Alarm Rate Target Detection and Recognition.” This product, which characterizes “background clutter of Synthetic Aperture Radar (SAR) and Electro-Optical (EO) clutter,” detects and recognizes

“very weak targets that are not detectable [sic] (recognizable), with available systems. It is fully adaptive and keeps the false alarm (probability [sic] of misclassification) below user desired levels.”¹¹

According to the DRDC’s annual report for 1999-2000, AUG Signal “has worked with DREO and DREV [Defence Research Establishment Valcartier] to produce combined electro-optical [E-O] and SAR space-based algorithms for surveillance applications, and is developing detection and recognition products from space-based radar algorithms.”¹²

DREO and DREV are two DRDC-related research establishments. They are among the government’s network of military R&D centres that help corporations devise new and improved weapons, and related systems.

Two AUG Signals’ employees, Dr. George A. Lampropoulos and Arezki Halet, along with their collaborators from DREO (M. Rey) and DREV

(J.F.Boulter) delivered a paper on their joint research called “E-O and SAR image analysis for registration applications” during a session on “Fusion System Applications” at the 1997 symposium of the International Society for Optical Engineering (SPIE).¹³

Their session was chaired by S.R.F.Sims of the U.S. Army Aviation and Missile Command (USAAMC). USAAMC operates the “U.S.Army’s premier Ballistic Missile Defense Test Site.” Located in the Pacific’s Marshall Islands, it has been involved in testing ballistic missiles for 40 years. Now known as the “Reagan Test Site” this USAAMC facility currently supports “the developmental and operational testing of Theater Missile Defense and National Missile Defense.”¹⁴

Several of the other sessions on “fusion systems” at this SPIE symposium focused on “missile defense” applications. The list of speaker’s and chairs included several “missile defense”-contractors and the Ballistic Missile Defense Organization.¹⁵

This was not the first conference at which representatives of AUG Signals and DRDC scientists have presented joint papers on a topic of relevance to “missile defense.” AUG Signals’ G.A.Lampropoulos and DREV’s J.F.Boulter delivered a paper on “Multiframe detection of direction of moving targets,” during a session on “Weak Target Detection” at another SPIE conference in 1997, on “Signal and Data Processing of Small Targets.”¹⁶

DND/NSERC

In fiscal year 1999-2000, AUG Signals pulled in yet another \$247,000 contract (over three years) through a different Canadian military R&D program. This time it was the DND/NSERC Research “Partnership Program” that handed them the cash. This program combines the generous largesse of Canada’s Department of National Defence (DND) with that of Natural Sciences and Engineering Research Council (NSERC) to provide “a vehicle for DRDC-industry-university collaboration.” DND’s share of this AUG Signals’ project on “Non-linear signal processing for sensor surveillance” was \$90,000. DND’s academic partner for this project was the University of Calgary.¹⁷

References

1. “Detection and Recognition with AUG Signals,” *Micronet News*, October 2002. www.micronetrd.ca/Newsletters/Micronet_news/2002_news/Oct2002.pdf
2. “DRIS: Detection and Recognition Intelligent System,” AUG Signals website. www.augsignals.com/product_DRIS.htm
3. Proposal Submission Instructions, Missile Defense Agency, Small Business Innovation Research Program (2004, 2005) www.dodsbir.net
4. *Micronet News*, July 2002 www.micronetrd.ca/Newsletters/Micronet_news/2002_news/Jul2002.html
5. Micronet: Mission Statement and Objectives www.micronetrd.ca/Management/index.html#mission
6. *Space Directory*, Canadian Space Agency www.space.gc.ca/asc/app/csd/search.asp?Item=Affichage&Id=AUG
7. Media Release, “Details of the 18 Contracts Awarded Through the Canadian Space Agency’s Earth Observation Application Development Program,” March 29, 2004. www.newswire.ca/en/releases/archive/March2004/29/c5287.html
8. Proactive Disclosure of Contracts Over \$10,000, 2004-2005 - 3rd quarter www.space.gc.ca/asc/eng/resources/publications/contracts-2004-d.asp?trimestre=3&id=387
9. DRDC Annual Report 1998-1999, Table 6: Defence Industrial Research Projects in 1998/1999. dsp-psd.pwgsc.gc.ca/Collection/D1-14-1999E.pdf
10. DRDC Annual Report 1999-2000, Table 8: Defence Industrial Research Projects in 1999/2000. dsp-psd.pwgsc.gc.ca/Collection/D1-14-2000E.pdf
11. AUG Signals website, ICFAR-ATDR www.augsignals.com/ship_det.htm
12. DRDC (1999-2000), op. cit.
13. Conference 3067, April 24-25, 1997, SPIE Proceedings www.spie.org/web/meetings/programs/or97/conferences/or97_3067.html
14. Reagan Test Site / Kwajalein Missile Range www.globalsecurity.org/space/facility/kwaj.htm
15. Conference 3067, op. cit.
16. Conference 3163, July 29-31, 1997, Proceedings. www.spie.org/web/meetings/programs/sd97/conferences/sd97_3163.html
17. DRDC (1999-2000), op. cit. www.micronetrd.ca/Newsletters/Micronet_news/2002_news/Jul2002.html