

Telemus Inc.

Telemus, an Ottawa-based company specialising in “electronic warfare systems for training, simulation and operational support,”¹ has promoted one of its products by saying that it has been used in the development of targeting systems for “missile defence” weapons. However, few details are publicly available on the helpful role played by Telemus in exporting their so-called “Coho simulator family” of “Radar Target and ECM [Electronic CounterMeasures] simulation” equipment² for use in developing “missile defense” weapons systems.

Telemus is owned by a subsidiary of the world’s fourth largest prime contractor of “missile defense” weapons, namely Northop Grumman.

Telemus has stated that the main buyers of their equipment are “the U.S. Navy and large defense contractors such as Lockheed Martin, Teledyne Technologies and Ericsson.”³

Each of these Telemus clients is engaged in producing “missile defense” weapons systems. First on their list is Lockheed Martin, the world’s largest war industry. It is also one of the so-called “Big Four” “missile defense” prime contractors. (See pp. 22 and 26.)

The Coho Simulator Family

Telemus has disclosed the fact that it was the “Coho simulator family,” of electronic warfare simulation equipment, that

“has been delivered for applications in the development of seekers for ballistic missile defence [BMD].”⁴

(This was stated on a previous version of the Telemus website that has since been updated. The earlier Telemus website is still available online as “cached” by Google.com. See references below for the URLs.)

What do we know about the Coho? Besides being a Telemus product and a species of Pacific salmon, the term Coho is known in the radar world as the verbal contraction for a radar device called a “coherent oscillator.” (To those unfamiliar with the cryptic and shadowy world of radar, a glossary of the technical terms used in this article is provided on pp. 36-37.)

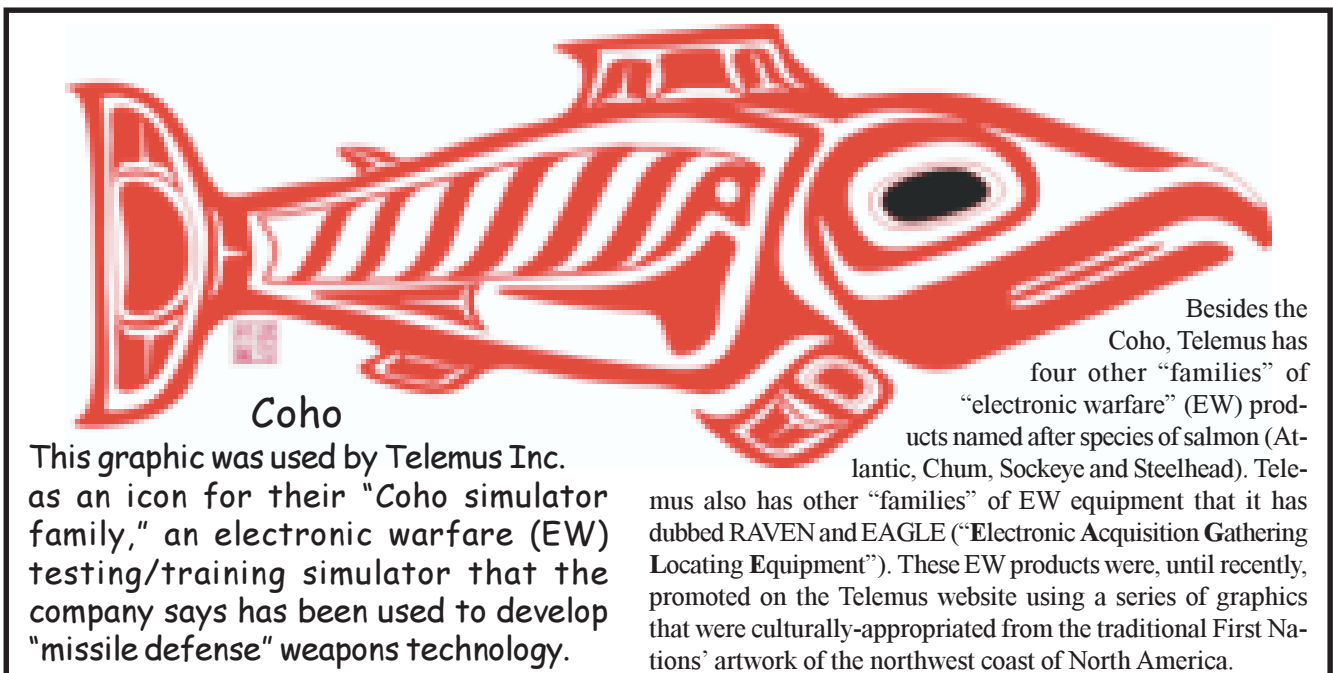
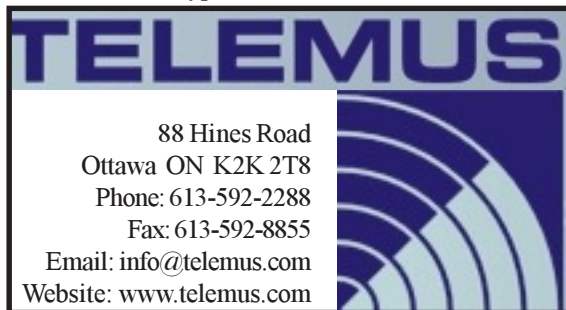
Let’s begin with Telemus’ rather cryptic admission that Coho has been

used for the: “development of seekers for ballistic missile defence [BMD].” Unravelling the Telemus contribution to “ballistic missile defense,” seems to revolve around the term “seeker.” A “seeker” is a type of electronic sensor that is located within a precision-guided munition. Basically, the seeker does the job of locating the weapon’s target. A “seeker” can, in fact, “survey, acquire, lock-on and track a target.”⁵ One can readily see that such a product is absolutely essential to the functioning of “missile defense” weapons.

The Coho is a Telemus product designed for use in simulating radar signals in both sea-based and land-based applications. First let’s look at the role of the seeker within the sea-based BMD weapons system called AEGIS (See subheading “AEGIS Combat System,” p. 22, and “U.S. using AEGIS to draw Allied Navies into BMD,” pp. 14-15).

AEGIS is a weapons system aboard U.S. and allied warships. It uses a Standard Missile-3 (SM-3). The job of the seeker within the SM-3 missile is described in the following way by the right-wing Claremont Institute on its website, Missile Threat.com:

“Once close enough to the [enemy] ballistic missile, the SM-3 will fire its kill vehicle, the Kinetic Warhead (KW), from its nosecone. The KW will immediately begin to search for its target. It will acquire the ballistic



Coho

This graphic was used by Telemus Inc. as an icon for their “Coho simulator family,” an electronic warfare (EW) testing/training simulator that the company says has been used to develop “missile defense” weapons technology.

Besides the Coho, Telemus has four other “families” of “electronic warfare” (EW) products named after species of salmon (Atlantic, Chum, Sockeye and Steelhead). Telemus also has other “families” of EW equipment that it has dubbed RAVEN and EAGLE (“Electronic Acquisition Gathering Locating Equipment”). These EW products were, until recently, promoted on the Telemus website using a series of graphics that were culturally-appropriated from the traditional First Nations’ artwork of the northwest coast of North America.

missile using a high-resolution seeker, and maintain an accurate trajectory using its internal navigational system.”⁶

In the case of Ground-based Midcourse Defense, a Ground-Based Interceptor (GBI) missile is used. Here is a description from the Claremont Institute’s MissileThreat website:

“At a predetermined point, the GBI [Ground-Based Interceptor] releases its Exoatmospheric Kill Vehicle (EKV). The EKV...has its own infrared seeker, guidance system and motor. As it closes in on its target, the EKV integrates data from the XBR with its on-board sensors and locks on to the enemy missile. The EKV continuously adjusts its flight path until it collides with the target (like a bullet hitting a bullet).”⁷

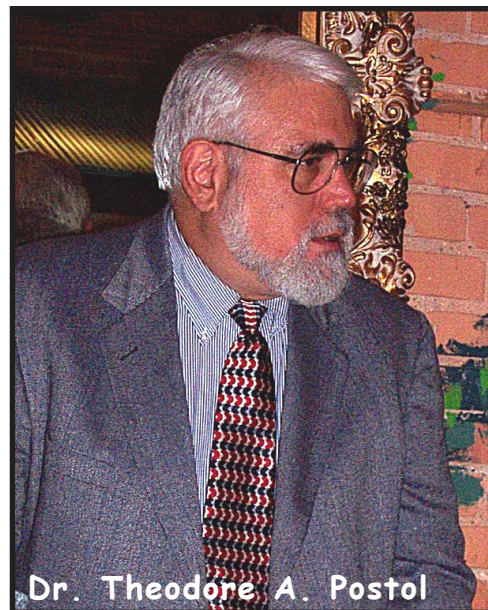
Another ground-based BMD weapons system is called Terminal or Theater High Altitude Area Defense (THAAD). (See p. 19.) THAAD is sup-

posed to shoot down missiles during their final, descent phase. THAAD interceptor missiles contain “an infrared seeker in the [Kill Vehicle] KV’s nose [that] will home in on the target.”⁸

Well, at least that’s what the optimistic, pro-BMD advocates would have us believe. To them, it all sounds doable, at least in theory. However, reality isn’t always so simple, especially when your enemy isn’t helping you to destroy their missiles.

It Just Won't Work, At Least Not as a Shield

Some experts like Dr. Theodore A. Postol, a Massachusetts Institute of Technology professor who teaches courses on science, technology and national security policy, has studied the problem and says “missile defense” just won’t work. He explains that one of the biggest holes in the program is that U.S. missiles can be cheaply and easily foiled, when targeting other mis-



Dr. Theodore A. Postol

siles. Any enemy capable of launching missiles will be able to use inexpensive balloons as decoys to confuse “seekers” and outnumber expensive BMD “kill vehicles.”⁹ (For a critique of this critique, see “The Offensive ‘Missile Defense’ Program is On Target,” p. 30.)

So, if these high-resolution,

A Glossary of Radar Terms

An **active antenna array** includes some electronic circuitry, such as semiconductor devices, to amplify or otherwise aid in the reception or transmission of signals.¹

Active seeker (AS) equipment is, for instance, used by the Patriot Advanced Capability 3 (PAC-3) surface-to-air guided missile that is a major component of the “missile defense” system. The AS, embedded within the PAC-3 “searches for the enemy missile [and once it] acquires the target, its computer uses the locations of both the target and the Patriot missile to calculate the proper trajectory for the interceptor.”²

As a PAC-3 hones in, the AS “recalculates the trajectory and makes adjustments to the interceptor’s speed and direction.”³

A **chamber** is used to create a controlled environment in which the equipment being tested can be subjected to inputs from devices that simulate real-world conditions.

Clutter is the term that is used to describe “radar signals that do not come from actual targets. Rain, snow and the surface of the earth reflect energy, including radar waves. Such echoes can produce signals that the radar system may mistake for targets. Clutter makes it difficult to locate targets, especially when the system is searching for objects that are small and distant.”⁴

Coherent Oscillator (also known as **Coho**) is “an oscillator used in a coherent radar to provide a reference phase by which changes in the phase of the received signal may be recognized.”⁵

Coherent radar: This type of radar extracts “additional information about a target through measurement of the phase of echoes from a sequence of pulses. The phase information may be used to improve the signal-to-noise ratio, to estimate the velocity of the target through the Doppler effect, or in the case of synthetic aperture radar, to resolve the location of the target.”⁶

Digital Radio Frequency Memory is “an approach being adopted by modern electronic attack systems to combat pulse-compression radar. A digital radio frequency memory system receives radar pulses, stores these in a digital delay line, and retransmits them some time later.”⁷

Fire control radar provides data about a target to a computer that can calculate

“how to direct weapons such that they hit the target. Such radars typically emit a narrow, intense beam of radio waves to ensure accurate tracking information and to minimize the chance of losing track of the target.”⁸

The **free-space range** of a radar system is the maximum range determined from the parameters of a radar system (antenna and transmitter/receiver combination).⁹

Considering the context in which Telemus uses the phrase “free space range application,” they are referring to the use of Coho equipment during live-fire missile tests. We know that on March 15, 1999, the Ballistic Missile Defense Organization (BMDO) and the U.S. Army conducted a “Seeker Characterization Flight” to test the Patriot Advanced Capability 3 (PAC-3) missile. The purpose of this test, conducted at New Mexico’s White Sands Missile Range included “collecting data and analyzing the system/missile capability to detect, track and close with its target, gathering data on the PAC-3 missile seeker in a flight environment.”¹⁰

Another such test was conducted on October 2, 1999, by the BMDO and the U.S. Army Space and Missile Defense Command to test “a prototype NMD interceptor” that was “equipped with two infrared sensors, a visible sensor and a small propulsion system. The interceptor’s seeker system located and tracked the target and then guided the kill vehicle to a body-to-body impact with the target”¹¹

The target in this case was a modified Minuteman intercontinental ballistic missile target vehicle.¹²

Prof. Postol critiqued a crucial June 1997 “missile defense” test by TRW Inc., (now owned by Northrop Grumman) conducted to see if sensors could distinguish between warheads and balloon decoys. After the lawsuit of a TRW engineer turned whistleblower, federal agents went to MIT researchers with evidence that TRW faked test results to hide failures of their system.

Although TRW didn’t get the contract, the winning Raytheon system uses a similar sensor. Postol says TRW’s POET (Phase One Engineering Team) report fudged the data and the “missile defense” system could not stop a real attack.

Source: From Harry Goldstein, “MIT Professor Alleges Missile Defense Coverup,” *IEEE Spectrum Online*, January 14, 2005.

seeker devices, embedded within the kill vehicles of “missile defense” weapons, are ever going to work (at least for the publicly-stated purpose of “missile defense”), and that is highly debatable, then rigorous training and testing programs are clearly required. This is where the Coho simulator, designed and pro-

duced by Canada’s Telemus Inc., comes in handy. It generates electronic signals used to test sensors and train military personnel in how to use them. As the updated Telemus website says:

“The Coho RTS 1200 series is a family of advanced computer controlled radar target and ECM simulators. They can be used to simulate radar target echoes, clutter returns, interference and ECM for the purposes of radar system and missile seeker test and evaluation. The Coho can also be used to train radar operators in a realistic jamming environment.”¹⁰

And, just to make things a bit more complicated, according to the earlier version of the Telemus website, Coho simulator systems:

“include an active antenna array and DRFM [Digital Radio Frequency Memory] technology for high quality target, clutter, ECM and JEM [Jet Engine Modulation] simulation.”¹¹

Telemus has also confided that

their Coho radar target and ECM simulator is being used around the world to test advanced electronic scanning, active seeker and fire control radars.¹²

What’s more, the Coho can be configured for a variety of different types of testing operations. For instance, it “can be used in hardware-in-the-loop, chamber and free space range applications.”¹³

Big Fish Eats Little Fish

In an effort to understand how Canada’s Telemus Inc. fits into the brave new world of “missile defense” contractors, it is worth noting that its parent company is owned by Northrop Grumman (NG) and that NG is one of “The Big Four” prime contractors for America’s “missile defense” weapons program.

Here’s the chronology of how this little Canadian military company called Telemus got swallowed up by a bigger war industry that was then gobbled up by an even bigger weapons

Hardware-in-the-loop simulator (HILS): This “powerful tool” tests software systems in missiles. It “fools the embedded system into thinking that it’s operating with real-world inputs and outputs, in real-time.”¹³

Electronic Counter Measures (ECM), (aka Electronic Attack, is the aspect of electronic warfare “involving actions taken to prevent or reduce an enemy’s effective use of the electromagnetic spectrum.”¹⁴

Electronic Support aims to gain sufficient information about radar sensors to allow an understanding of the radar’s characteristics including its role, its method of operation, and its strengths and weaknesses.¹⁵

Electronic warfare (EW) describes techniques that exploit an adversary’s use of the electromagnetic spectrum or defend friendly use of the electromagnetic spectrum. There are three subdivisions of EW: Electronic Support, Electronic Attack and Electronic Protection.¹⁶

Jet Engine Modulation (JEM) refers to radar signatures of jets. JEM is useful for target identification.¹⁷

An **oscillator** is “an electrical device that generates alternating currents or voltages”¹⁸

Phase: For any type of periodic motion (such as an oscillation), a phase is a point in the period to which the motion has advanced with respect to a given initial point.¹⁹

Range is “the radial distance measured outward from the ...radar transmitter; ordinarily the distance to a target.”²⁰

Radar, is a contraction coined from the phrase Radio Detection and Ranging. It is a “remote detection system used to locate and identify objects. Radar signals bounce off objects in their path, and the radar system detects the echoes of signals that return. Radar can determine a number of properties of a distant object, such as its distance, speed, direction of motion, and shape. Radar can detect objects out of the range of sight and works in all weather conditions.”²¹

A **seeker** is “a device that orients a munition’s sensor to survey, acquire, lock-on and track a target.”²²

References

1. “Active array antenna with flexible membrane elements and tensioning arrangement,” Patents Issued Feb. 4, 2003.
2. Patriot Advanced Capability 3, Missile Defense Systems www.missilethreat.com/systems/pac3.html
3. Ibid.
4. Radar, *Encarta Encyclopedia* encarta.msn.com/encyclopedia_761569568_3/Radar.html
5. *Glossary of Meteorology* amsglossary.allenpress.com
6. Ibid.
7. *Radar Glossary*, Argos Press. www.argospress.com/Resources/radar
8. *Wikipedia* en.wikipedia.org/wiki/Fire-control_system and en.wikipedia.org/wiki/Fire-control_radar
9. BLANKET - Radar Free-space Calculation www.mar-it.de/Radar/Blanket/blanket.htm
10. Chronology of Missile Defense www.missilethreat.com/overview/chronology.html
11. Ibid.
12. Ibid.
13. Martin Gomez, “Hardware-in-the-Loop Simulation,” Embedded.com, November 30, 2001. www.ewh.ieee.org/r3/huntsville/cmte/tutorials.htm
14. Space & Electronic Warfare Lexicon www.sew-lexicon.com/gloss_e.htm
15. Ibid.
16. Ibid.
17. Communications and Signal Processing, Annual Research Summary, July 1, 1994 - June 30, 1995. https://engineering.purdue.edu/ECE/Research/ARS/ARS95/Sec4/4_46.html
18. *Glossary of Meteorology*, op. cit.
19. Ibid.
20. Ibid.
21. Radar, *Encarta Encyclopedia*, op. cit.
22. Space & Electronic Warfare, op.cit

corporation that was then devoured by the colossal, multi-national Northrop Grumman mega-corporation, a top "missile defense" prime contractor.

Telemus was spawned in 1984 as a subsidiary of Omega Technologies. Then in October 1997, Omega Telemus, as it was then known, was purchased for an undisclosed sum from Omega by Amherst Systems Inc.¹⁴ Amherst was a slightly larger manufacturer, based in Buffalo, New York, that built

"simulation and measurement products for use in testing/evaluating electronic warfare (EW) systems and training system operators."¹⁵

Less than a year later, in April 1997, Amherst Systems was absorbed by a much larger, Buffalo-based company called Comptek Research Inc. It was described as a

"manufacturer of computer controlled simulation/stimulation equipment and systems that are used to test military equipment including radar warning receivers, radar counter-measures equipment, and infrared sensor systems."¹⁶

Then another year or so later, in June 2000, Northrop Grumman (NG) announced that it had signed an agreement to acquire Comptek Research "in

a stock-for-stock transaction."¹⁷ Comptek was thus added to NG's "Electronic Sensors and Systems Sector."¹⁸

Over the decades since Northrop's creation in 1939, it has successively swallowed up a series of large military-related corporations. Its acquisitions over the past decade or so include the following: Grumman (1994), Westinghouse (1996), Logicon (1997), Teledyne Ryan Aeronautical (1999), Litton Industries (2001), Newport News Shipbuilding (2001) and TRW (2002).¹⁹

When NG purchased TRW in 2002, the latter was already one of "The Big Four" overall contractors for "mis-

Telemus, the Seer who Warned an Enemy of Civilization

Telemus Inc. gets its name from a fortune-telling cyclops with a bit part in Homer's classic, *The Odyssey*. Students of Greek mythology will recall this epic tale of a great warrior who spent years trying to get home after a bloody war against the city of Troy. In one adventure, our hero, Odysseus, who boastfully called himself "the waster of cities," encountered a Cyclops named Polyphemus.¹

Few however may remember another Cyclops named Telemus, the seer who kindly warned Polyphemus that Odysseus would one day blind him. In Polyphemus' words: "There lived here a soothsayer, a noble man and a mighty, Telemus, son of Eurymus, who surpassed all men in soothsaying..... He told me that all these things should come to pass in the aftertime, even that I should lose my eyesight at the hand of Odysseus."²

Despite this grave warning from Telemus, Polyphemus still met his sad fate. After taking Odysseus and the crew of his ship captive, Polyphemus foolishly drank the Greeks' wine and fell into a peaceful, after-dinner sleep. He soon awoke screaming when our great hero's men, in a terribly civilised manner, began ramming a large, pointed and smouldering pole deep into the Cyclops' only eye.³

Odysseus and his men greatly underestimated Polyphemus. They saw all cyclops as brutish cannibals devoid of culture. Perhaps by seeing foreigners in such xenophobic terms, the marauding military men of ancient times—those largely responsible for spreading democracy and western civilisation abroad—felt better about blinding and killing people, sacking their cities, raping their women and plundering their riches. Thankfully such dehumanisation and exploitation of others no longer plagues the world.

In reality, Cyclops were quite civilised, even in militaristic Greek terms. The Cyclops had forged magical weapons for the gods of Mount Olympus, including a thunderbolt for Zeus (ruler

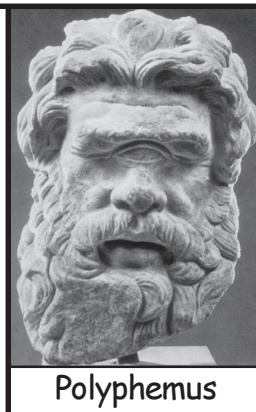


Polyphemus hurled boulders and a curse at Odysseus, the "Sacker of Cities" and purveyor of western civilisation.

of the Olympian gods), a powerful helmet for Hades (god of the underworld) and a trident for Poseidon (god of the sea).⁴ Thanks to these potent weapons, the Olympian team of gods had beaten the Titans. They were a different brand of deities that had fought to become the leading group of gods.⁵

After Odysseus and his men blinded Polyphemus, they fled. Then, in a "fatal swagger,"⁶ Odysseus mocked Polyphemus and so the Cyclops hurled huge rocks at their retreating ship. Despite this, in a fit of bravado, Odysseus continued to tease the blinded giant. Polyphemus then recalled Telemus' prophecy and called out to his father, the god of the sea:

"Hear me, Poseidon... grant that Odysseus, who styles himself Sacker of Cities... may never reach his home.... But if he is destined to reach his native land, to come once more to his own house..., let him come late, in evil plight, with all his comrades dead, in someone else's ship, and



Polyphemus

sile defense” weapons. And so, by acquiring this company, NG then took on this mantle. Nowadays, NG is responsible for numerous major aspects of the “missile defense” weapons development program, including:

- ◆ The megawatt-class Airborne Laser weapon
- ◆ Satellites used for NORAD’s Tactical Warning & Attack Assessment system since 1970
- ◆ Ground-based Midcourse Defense Fire Control/Communications System to integrate and guide interceptors until on-board sensors acquire their targets
- ◆ *Modeling and simulation, war-gaming capability, test and analytic tools*
- ◆ Kinetic Energy Interceptors
- ◆ Mobile Tactical High Energy Laser
- ◆ Using deactivated Intercontinental Ballistic Missiles as launch vehicles for BMD targets, R&D missions
- ◆ The Space Tracking and Surveillance System (low-orbit satellites with sensors

to detect and track ballistic missiles).²⁰ (Emphasis added) (Canada’s Telemus contributes to NG’s role in “missile defense” through the “modeling and simulation” category.)

Telemus’ Government Origins

Telemus proudly tells visitors to its website that it is now one of:

“Canada’s most successful EW (Electronic Warfare) and C⁴ISR (Command, Control, Communications, Computer, Intelligence, Surveillance and Reconnaissance) companies.”²¹

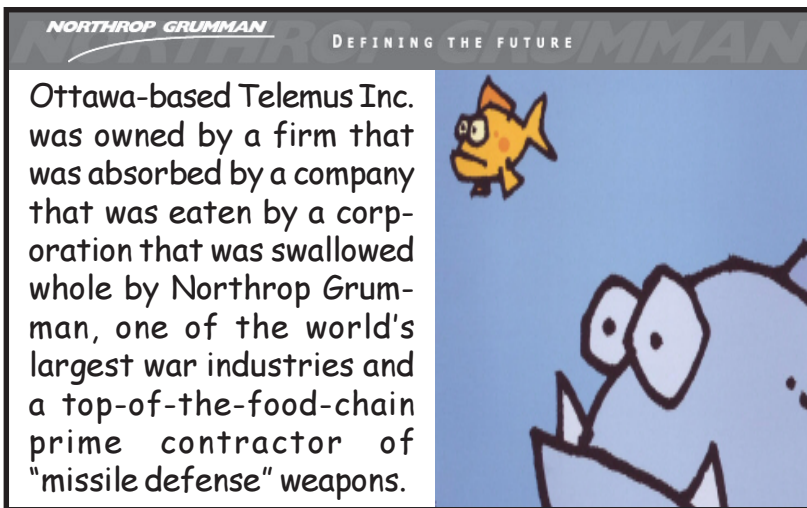
As we’ve seen, Telemus has been owned by a succession of larger and larger U.S. war industries. But how did Telemus get its start? The “His-

tory” page on the Telemus website reveals that the Canadian government was instrumental in the initial launching of the company:

“From its *origins of developing and building EW systems for the Defence Research and Development Canada (DRDC)*, Telemus has evolved into a supplier of mission critical technology for its international customer base.”²² (Emphasis added.)

So, as revealed in this statement, Telemus owes its “origins” to “electronic warfare” work done for DRDC. DRDC is the Canadian government’s \$250 million-a-year war-technology research institution that employs 1400 people.²³

DRDC scientists, lab technicians and researchers are dedicated to such noble goals as serving the needs of Canada’s arms industries and helping them to compete and prosper. Another major DRDC goal is to ensure that Canada’s armed forces have all the necessary war technologies so that they can be efficiently in-



Ottawa-based Telemus Inc. was owned by a firm that was absorbed by a company that was eaten by a corporation that was swallowed whole by Northrop Grumman, one of the world's largest war industries and a top-of-the-food-chain prime contractor of "missile defense" weapons.

find troubles in his household.”⁷

This “Curse of the Cyclops,” gave Polyphemus the last laugh because Poseidon created many trials for Odysseus on the rest of his odyssey.⁸

It is appropriate that the name Telemus is used by a war industry that makes radar and other sensor devices. But, it also seems odd because this seer, after all, used his prophetic powers to forewarn a fellow cyclops, Polyphemus. Isn’t it considered treasonous to warn the enemy, especially the mortal enemy of one of western civilization’s greatest, mythic war heroes, Odysseus?



Former Boeing Worker converts to become Telemus the Wizard

As an Aside to the Aside

Besides Telemus Inc., the ancient seer has another modern namesake, a wannabe mystic, Telemus the wizard. A former Boeing Co. employee (a.k.a. John LeBlanc) switched careers and now stages elaborate magic shows. Boeing, which ranks first on Telemus’ list of “Satisfied Customers”⁹ is also the world’s number-one, prime contractor for “missile defense” weapons systems. When Boeing held a “Family Day” extravaganza in 2004, Telemus was the “featured performer.” A Boeing media release says thousands “stood in awe” at this family fun fair as Telemus (and his scantily-clad female assistants) performed a “Vegas-style magic show.”¹⁰

References

1. Homer, *The Odyssey, The Harvard Classics*. 1909-1914 (trans. Andrew Lang and S.H. Butcher). www.bartleby.com/22/9.html
2. Ibid.
3. Greek Mythology Link - Polyphemus 2 homepage. mac.com/cparada/GML/Polyphemus2.html
4. Ibid.
5. Wikipedia - Titan (mythology) en.wikipedia.org/wiki/Titans
6. Contents of the Odyssey pegasos.fhw.gr/chronos/03/en/culture/literature/350odysseycontents.html
7. Greek Mythology Link, op. cit.
8. Wikipedia - Polyphemus en.wikipedia.org/wiki/Polyphemus
9. Kathleen Spicer, “Master of illusion combines Boeing process with life’s passion,” *Boeing News Now*. www.wizardslaire.com/page3press.html
10. Media Release, “Telemus Performed for Thousands of Guests at Boeing’s Family Day,” September 24, 2004. www.emediawire.com/releases/2004/9/prweb160081.htm