DOES TODAY'S GPS AND LORAN ENVIRONMENT OFFER MEANINGFUL INCENTIVE FOR NEW PROPRIETARY PATENTS AND OTHER INTELLECTUAL PROPERTY?

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Abstract

A brief review of the current status of intellectual property in the fields of international satellite and ground-based radio navigation systems that are implemented, regulated and controlled by consortiums of governments. Exploring practical incentives and commercial opportunities for improvement, invention and development in this now mature government-controlled environment.

How new private-sector invention and development of proprietary intellectual property still benefit its varied creators, and by what kind of approaches?

A short historical foray into early solid-state Loran-C operations at Scotland's Loch Ness.

Introduction

A recent search has yielded at least 680 U.S. patents granted to U.S. and foreign inventors in the past decade for inventions relating to GPS --large corporations, independent inventors and smaller companies, universities and government agencies. These have included improvements in enhanced GPS communications and positioning or location systems, antennas, receivers, transmitters, error and anti-jam concepts, applications to vehicle use and to aircraft, projectiles and weaponry, differential positioning, timing and clock use, and integration with

mobile telephones, air traffic and many other systems -- useful both for civilian and government applications. (Figure 1 -- a collage of recent GPS U.S. patents).

It might be interesting to mention a few of these GPS patentees -- Northop Grumman, Ericcson, Sony, Motorola, Garvin, NEC, Hughes Missile Systems, 3M, Nisson, Navsys, Regents of University of California, and a host of small companies and independent inventors.

A very much smaller number of U.S. patents, however, was granted for Loran-C improvements during the past decade--undoubtedly reflecting the never-never-land of at least U.S. government navigation policies. Among these were a few patents on integrated Loran-C and GPS. In light of what is coming to pass today, I am personally proud of the steadfast confidence of at least one company with which I have been associated since its inception, Megapulse--pardon the plug --which steadfastly continued to improve and modernize Loran-C transmitters, receivers and antennas for the day it just knew would have to come when Loran-C would officially complement GPS for the foreseeable future. (Figure 2 -- a collage of Loran-C patents).

A question arises, however, as to the commercial viability to the private sector -- small and even large corporate entities and university researchers -- of patenting new location system concepts in the environment of government control, as distinguished perhaps from gadgetry, where proprietary positions are still obviously useful. Certainly the prospect of suing governments for use of patents is not the most appealing of commercial endeavors. Patent ownership, however, is often persuasive as to who should be awarded government grants or contracts, and the civilian marketplace is still thriving with improved equipment and exciting new cellular-phone and related vehicle applications particularly.

But, within the short confines of this paper, may I concentrate on but one area -- an important one -- where a few words of caution may be appropriate to those with new proprietary ideas who also choose to participate in the deliberations of standards committees setting policies for industry-wide standardization.

In this connection, I call particular attention to the Federal Trade Commission's relatively recent complaint[1] against a Los Altos, California memory chip developer and patentee, Rambus Inc. This company did so participate, but apparently "without ever making it known to the JEDEC (Joint Electron Device Engineering Council) or the members that Rambus was actively working to develop, and did in fact possess, a patent and several pending patent applications that involve specific technologies proposed for, and ultimately adopted in the relevant standards."

While several of our Japanese colleagues acquiesced in Rambus's royalty demands (among them the FTC identifies Samsung, Hitachi, NEC and Toshiba) and to the tune of "royalties in the range of $50 to $100 million per year" for SDRAM manufacturing, other memory chip manufacturers have resisted these royalty demands. The FTC, indeed, filed its complaint in 2002 asserting that such "deception of standard-setting organization(s) violated… federal antitrust laws by deliberately engaging in a pattern of anticompetitive acts and practices that served to deceive an industry-wide standard-setting organization, resulting in adverse effects on competition and consumers."

May I use this conference hosted by our Japanese friends and colleagues as an occasion to urge them to take even more care in submitting to such royalty demands – as by comparing notes perhaps with their U.S. industry counterparts. May I also urge all of us who may desire in the future to participate in such industry Loran-C and GPS standard-setting deliberations, to

follow honestly the prescribed procedures designed to ensure that members disclose any patents or pending patent applications involving the standard-setting activities undertaken by standards organizations. The FTC has pointed out that such bodies maintain "a commitment to avoid, where possible, the incorporation of patented technologies into its published standards, or at a minimum to ensure that such technologies, if incorporated, will be available to be licensed on royalty-free or otherwise reasonable and non-discriminatory terms".

An Historical Loran-C Foray At Loch Ness, Scotland

And now to a lighter side of this paper -- still in keeping, however, with the general subject of independent inventor or small company Loran-C patents.

Come with me on a little historical trip to Scotland thirty years ago--to its famous Loch Ness with, of course, its legendary "monster" "Nessie"– a tale which I may be the only participant still alive to recount.

A small New England company, International Navigation Corporation (Internav), founded by John Currie and later merged with Megapulse, was a true pioneer in creating early solid-state low cost Loran-C receivers, then marketed with Simrad. (The frontspiece of John's basic solid-state Loran-C U.S. patent is presented in Figure 3.)

The Academy of Applied Science sonar and underwater elapsed-time camera expedition to Loch Ness in the summer of 1975[2] was fortunate to be loaned Internav's very first commercial Loran-C receiver unit -- number 101 – to help in navigation along this 25-mile long, 1-to-1 1/2 mile wide fjord-like lake. And we were also fortunate in those early days of map charts with Loran-C hyperbolic navigation lines drawn on them, that one of the Loran-C lines ran right up

the center line of Loch Ness, making the navigation of that era rather easy. Figure 4 is a map of the Loran-C Sylt chain coverage (GRI 7499) pin-pointing Loch Ness.

Figure 5 is a picture of one of our Academy's Raytheon 723 sonar profilers equipped with the Academy's own target alarm detection computer[3] for gating large targets within underwater photographic range, and which was sometimes carried aboard the research boat Hunter of veteran Loch Ness explorer--the late Tim Dinsdale--on which we made many forays with the aid of my late brother-in-law Bob Needleman, who was also Internav's general attorney.

One late afternoon and into the early evening--to be specific, on June 30, 1975 -- we were some miles south of Urquhart Bay and its Temple Pier, mid-way along the loch, taking sonar measurements and checking Loran-C map locations with visual shore-based sites. Suddenly and without warning a dense fog totally engulfed us to the extent that we were unable even to see the bow of the Hunter, let alone any part of the loch or shore. This seemed to heighten as dark was upon us and so we headed northward by compass to get back to the bay. Tim and Bob were at the helm and I was in the cabin with the Internav 101 and my Loran-C chart lines as shown in Figure 6.

Since the helmsmen couldn't see anything, I was their sole navigator, following Loran readings in the cabin and shouting "slightly left -- straight ahead, etc.". The path we took can be seen drawn diagonally downward in the upper left of the sonar chart of Figure 6, proceeding along the "56-320-0560" line and into the mouth of Urquhart Bay. The dot just above the scribbled legend "Temple Pier" on the left side of the chart represents the mooring from which we had taken the Hunter earlier in the day--and to which, *believe it or not,* we finally returned in total blackout --actually bumping the mooring and its lines *in the dark*!

Apart from this near miracle, which might not have been repeatable, what was always somewhat uncomfortably in the back of our minds during this "blind" adventure was the

possibility of an unpleasant encounter with what at least *we* then knew inhabited the loch. Figure 7 presents one of the underwater elapsed time pictures that our Academy had been lucky to obtain of the then inhabitant "Nessie"--enhanced by Jet Propulsion Labs and announced and published in unenhanced form by Technology Review[2] and Nature magazine [4].

Our most recent returns to Loch Ness, with my younger son Justice and wife Joanne, however, have disappointedly not yielded us any large-target sonar hits. So we're again using Loran-C and GPS and underwater beaconry as we to try to locate possible bottom remains. Figure 8 is a recent video frame of such interesting remains discovered by our underwater ROV[5]. Unfortunately, we simply have not as yet had the skill to find our way back to it, despite our initial shipboard coordinates information.

We welcome ideas from the navigation community as to how more precisely and repeatably to position and relocate such ROV bottom finds.

References

1. FTC Issues Complaint Against Rambus, Inc. (June 19, 2002) http://www.ftc.gov/opa/2002/06/rambus.htm

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