

Is GPS Jamming the New Normal?

Over the past several days, North Korea has “reached across its borders” to jam GPS signals in South Korea. This had been a yearly occurrence for a while happening in 2010, 2011, and 2012. Its resurgence this year has been called a retaliation for new sanctions imposed on the regime by the US and its allies. Although reports are still coming in, it appears that the impact of the jamming is widespread, affecting maritime and aviation users, as well as mobile communications. According to the Yonhap News Agency:

“The Ministry of Science, ICT and Future Planning said the GPS disruptions that began Thursday have been repeating at intervals ever since, impacting Seoul's adjacent city of Incheon, and the surrounding Gyeonggi and Gangwon provinces.

The ministry said 746 airplanes and 621 vessels experienced disruptions, but no significant damage has been reported so far. The disruptions can cause mobile phones to malfunction, and affect planes and ships that rely on GPS for navigation.

A separate report indicated that 1,786 mobile telecommunication base stations have also been impacted.”

It is very likely that, in addition to GPS signals, those of other Global Navigation Satellite Systems (GNSS) are also being affected. Europe's Galileo, Russia's GLONASS, China's Beidou, or Japan's QZSS – all operate in the same frequency band as GPS, and all transmit very faint, easy to disrupt signals.

North Korea's GPS jamming is not an event isolated in time or geography. Jamming over wide areas is happening all the time in the Middle-East and Ukraine. GPS jammers are in regular use by organized crime for theft of high value cargo, and by individuals that don't wish to be followed. One sampling showed 25% to 30% of trucks in an industrial area having jammers in operation! This has resulted in disrupted aircraft landing systems, idled container terminals, and innumerable dropped cell phone calls.

What is unique about the North Korean incidents is that South Korea has been paying very close attention and documenting the impacts. Here are the statistics from the South Korean Central Radio Management Office for the events from 2010 to 2012, along with what we have seen reported in the press so far for the most current incidents:

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Dates	Jammer Locations	Affected Areas	Disruptions
2010, Aug 23-26 (4 days)	Kaesong	Gimpo, Paju, etc.	181 cell towers 15 airplanes 1 Battleship
2011, Mar 4 – 14 (11 days)	Kaesong Mtn, Kumgang	Gimpo, Paju, Gangwon etc	145 cell towers 106 airplanes 10 ships
2012, Apr 28 – May 13 (16 days)	Kaesong	Gimpo, Paju, etc.	1,016 airplanes 254 ships
2016, Mar 31 - ongoing	Mt. Geumgang Haeju	Eastern Gagnwon Seoul	962 airplanes 700 ships 1,786 cell towers
2016 information from reports by Yonhap News Agency and KBS News			

Also unique is that North Korea's jamming is high power, sustained and from fixed locations – so it's easy to identify where it's coming from and the impacts. How much more difficult is it when jammers are low power and are in a vehicle that quickly passes by? It took many months, and a concerted effort by several agencies, to locate the signal intermittently jamming an aircraft landing system at the Newark (EWK) airport in the United States.

GPS is the gold standard for PNT. We should do everything possible to keep it that way. We at UrsaNav are strong proponents of fully funding GPS, building better receivers and antennas, for improving the signal structure, and for increasing signal power. We fully support Dr. Brad Parkinson's idea that we should "Protect, Toughen, and Augment" GPS.

We think that augmenting is especially important, and we agree with the US government decisions in 2008 and 2015 and the government of the Republic of Korea that the right augmentation system is eLoran. Yet we have seen little progress in that direction. So not only are the US and south Korea at risk, they are at greater risk than some of our allies and adversaries.

eLoran would provide "proof of time" and "proof of position" for cybersecurity and other uses, it would help deter attacks on GPS satellites and signals by making them less attractive targets, and it would provide a one-way communications capability that could penetrate almost anywhere.

The time to fix the roof is when the sun is shining.

We need to protect GPS with eLoran now, before a really serious attack or other major disruption.