FCC Lets Radar Company See Through Walls

Posted on December 2, 2009 by Mitchell Lazarus

Novel technology approved after almost two years

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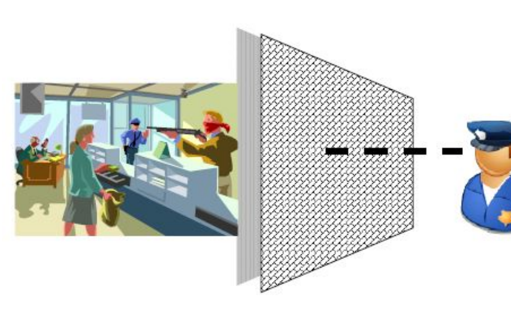

Regulars here know about the problems faced by innovators whose ideas do not conform to the FCC's technical rules.

A recent case in point is L-3 CyTerra, a division of L-3 Communications Corporation. Its new radar device, intended for police, fire, and homeland security personnel, can look through walls to detect people on the other side – even immobile hostages or unconscious fire victims.

Most civilian radars use the same principles worked out during World War II. They emit a short pulse of radio waves at some frequency and analyze the echo to deduce the direction, the distance, and possibly the speed of the target. The FCC routinely approves this kind of product.

But that approach would not do the job for L-3 CyTerra. It is easy enough to send a radar pulse through a wall and into a room on the other side. Coming back, though, would be dozens of echoes bouncing off multiple walls, furniture, and people, with no way to sort them out.

Instead, the L-3 CyTerra device sends pulses on 200 different frequencies, one at a time, ranging in sequence from 3101 to 3499 MHz at 2 MHz intervals. The whole cycle repeats 54 times per second. Each of the pulses still reflects from multiple surfaces. But the circuitry combines the echoes at different frequencies in such a way that the echoes from stationary objects fade into the background while those from moving objects stand out. The system is sensitive enough to detect the chest motions of a person who is unconscious but breathing, or the slight swaying of a person trying to stand perfectly still.

A radar that uses 200 different frequencies is not consistent with the FCC's technical rules. No rule expressly forbids such a device, but neither is there a rule under which the FCC can authorize it. L-3 CyTerra accordingly requested a waiver, which the FCC granted. Read the waiver order here.

The waiver grant is the good news. The bad news is the 21 months the FCC needed to process the request, despite of a total lack of opposition. (That in itself is unusual; here in Washington, somebody opposes almost everything.) It may be that the FCC staff took time at the front end to consider whether some other procedure, less time-consuming than a waiver, might have accomplished the same purpose. Another possible source of delay is the same one we see every four or eight years: a new Administration installs a new FCC Chairman, who in turn re-staffs the top FCC posts with new people, who then need time to familiarize themselves with a very long list of pending matters.

But let us not dwell on the negatives. We can applaud the fact that, thanks to technology and the FCC's approval, our first responders have a new tool to help them help us, particularly in emergency situations. Next, maybe somebody will develop a type of radar capable of detecting and rescuing immobile administrative proceedings from the file drawers of our federal agencies . . .

TAGS: EMMDAR, Electromagnetic motion detection and ranging sensor, L-3 CyTerra, Unlicensed Operations and Emerging Technologies

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Warped With Jolly Delusions - December 3, 2009 8:34 AM

So, the next CCTV government protection program has arrived. America does it better!

LennyP - December 3, 2009 9:12 AM

But will a search warrant be required before this technology will be used and will the powers that be care? This is, yet again, a new implementation of technology which brings us a giant step closer to completing our "big brother" society. Yes, this has the potential of both saving and improving our lives but it has the even greater potential for misuse by those that seek to control us such as the NSA, our police, our military...?

Proder - December 3, 2009 9:17 AM

"our first responders have a new tool to help them help us"

And when that tool is inevitably abused, you'll claim that's a completely separate issue. But if you KNOW that a technology WILL be abused, isn't ANY movement to deploy a bad thing? And if you say I can't know it will be abused, please submit the list of spy technology that has NOT been abused. Because that's a 0 item list.

Mitchell Lazarus - December 3, 2009 9:32 AM

This is radar, people, not TV. It does not provide an image -- just a dot to show something is moving. And the range is only a few meters. Personally I share your concerns about technology invading privacy. But in the real world, this particular device is not a threat.

Cellar - December 3, 2009 9:45 AM

Since when is the DHS a "first responder"? Will they rush out together with police- or firemen? Personally I'm waiting for the end of automatically adding " (anti-)terrorist" or "homeland security!!!1!" to just about anything whether it has anything to do with it or not. Especially because they're all suitably vague.

On another note, there's a school of thought that has it that it's not the thing nor the technology that does the harm, but the people using it, or the way it is used. There is truth in that, but the corrolary is that this leaves the users responsible for their using, and the deployers responsible for the deploying, and all consequences. So if there are privacy implications, and here there are, who is going to make sure those responsible are held responsible, or put another way, who will watch over the watchers? You can't really do that with vague concepts, which is a core problem with deploying all sorts of things in the name of or against some vague concept, by a vague agency with a vague mission and but the vaguest accountability.

So how would one watch over such a vague, but nonetheless, or exactly because of that vagueness, very real long term threat to our privacy? Discuss.

Joe - December 3, 2009 10:26 AM

And what does this company (L-3) say about the interference its products will generate to all the current uses of those frequencies?

Seems L-3 wants to trump others' legal use of those frequencies just because. If it wanted to be a legal user of those frequencies, it should ask the FCC which frequencies it *could* use, AND THEN develop its technology to work on those frequencies.

Darren - December 3, 2009 10:52 AM

Yes, there is a huge potential for abuse. The first time a police agency (and I include the various branches of DHS) uses one of these to "search" rather than in a case of clear-and-present danger or as part of a duly-authorized raid, there will be a very interesting round of court decisions, I'm sure.

That doesn't make the technology bad - the vast majority of tech is neutral, and has as many good uses as bad ones. This particular tech has a lot of good uses for helping firefighters find trapped people, keeping officers and innocents safe on legal raids or in hostage situations, etc.. It also has a lot of bad uses.

You know, like any other tool. Kitchen knives save me a great deal of time in preparing food, but they can also be used to kill people - in fact, it's certain that someone *will* use a kitchen knife to kill. Shall we ban knives? No? How is this different?

Bryan - December 3, 2009 11:04 AM

@Mitchel Lazarus

I don't know the capabilities of this technology, but let's say it can construct an image or 3D model of anything moving in the room? 3D scanners that use a laser range finder have existed for a while, that also just measures one "dot" at a time and may be restricted to "only a few meters", but uses that information to build a very accurate model. What if this technology can do the same with radar measurements?

Even with a model or photo, there are privacy concerns with just being able to tell when you are home, which room you are in, how many people are in your house, etc.

This technology may also be useful to a criminal planning to invade your home for theft or to cause harm.

Patriot - December 3, 2009 12:08 PM

This would be a great addition to a sniper rifle scope, or for military use. I wonder why the DoD never though of this, despite billions in research on the subject.

FlyingAfrican - December 3, 2009 12:39 PM

to Mitchell Lazarus - December 3, 2009 9:32 AM ...
it does not provide an image... NOW

what happens after they develop this technology further and we entrench the 'right' of the authorities to use it without a warrant.

Infringement of your civil liberties don't happen overnight, they erode it slowly to prevent opposition.

Mitchell Lazarus - December 3, 2009 1:09 PM

L-3 CyTerra's 3100-3500 MHz band has long been allocated for radar. The FCC did not have to give special permission for use of these frequencies. When the FCC made the waiver request public, there was no opposition from other users of the band (or anyone else).

q - December 3, 2009 1:21 PM

Can't they just use infrared cameras to see through walls? And also, what about the microwave based see-through-wall devices that the military and the fbi are using? (impsar, radarvision) And yes, these technologies I mentioned have very high resolution, THEY ARE TV

Mitchell Lazarus - December 3, 2009 1:23 PM

The fanciful illustration above seems to have misled some readers into thinking the device has capabilities far beyond the reality. All the device does is provide the rough location of a moving object at very short range. This information is enormously valuable to a firefighter searching for victims or or to a police officer dealing with a hostage situation. But it would not allow even a malevolent user to violate anyone's privacy in any meaningful way.

Mitchell Lazarus - December 3, 2009 4:49 PM

Some commenters have come up with creative illegal uses for a radar device capable of doing things that this one is not. The waiver order restricts sales to state and local police and firefighters. Commenters seem to think that other users also will have access to devices. But a renegade company that wants to build units for illegal sale will do so with or without an FCC waiver. The waiver helps legal manufacturers and users; it does nothing to help or hinder the (hypothetical) law-breakers.

Jack D. Ripper - December 3, 2009 6:52 PM

This isn't millimeter wavelength radar. The resolution without resorting to SAR is going to be around 100mm or four inches. Now, if it were millimeter wavelength radar you would have resolution of under 1mm.

Steve Crowley - December 4, 2009 7:11 AM

Thank you Mr. Lazarus. I wonder to what extent an Experimental License would be helpful in such a case, not only in terms of technical development but also moving things along business-wise with market tests and demonstrations? Make the best use of those 21 months!

Nick Linn - January 5, 2010 1:28 PM

"L-3 CyTerra's 3100-3500 MHz band has long been allocated for radar."

Yes and no. Yes it's been allocated for radar use however there are restrictions on what kind of radar it's used for. 3300-3500 is reserved for radio surveying, which this is not equipment for. This is why the device would need an exemption.

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FHH Memo to Clients Archive (monthly issues, June, 2002 to date)
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