**Alan Pierce**
pierceaj@techtoday.us

## Walabot DIY Can See Into Walls

At a recent technology press event I found a new product that lets you see through walls. Representatives from the company had a small demonstration wall and I spent a few minutes using the Walabot DIY and their smartphone to see the plumbing and wiring that was partially hidden inside.

Walabot DIY was the scanning hardware and a Samsung Note 5, running the free Walabot app, was converting what the scanner saw into smartphone real-time video (Photo 1). I was intrigued enough to request a loaner to run my own tests.

When this issue went to press, they didn't have an app that would work with an Apple iPhone; I was

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*Alan Pierce, Ed.D., CSIT, is a technology education consultant. Visit www.technologytoday.us for past columns and teacher resources.*

also informed that Walabot only works with certain Android smartphones. To guarantee that my testing



**Photo 1—Walabot sits directly beneath your phone as it scans your wall. Its smartphone app converts what it sees into live video on your phone's screen.**

would be successful, they loaned me a Samsung Note 5 and a Walabot DIY wall scanner. During testing I found that it did work with my Samsung Note 3, because I updated my phone to the latest Android software and my phone does have an OTG/USB port. See Photos 2 and 3.

Wallabot emits radio waves into your concrete or dry wall. It has multiple antennas to receive the information that bounces back from the objects that it finds in your wall. To recognize the areas that are free of plumbing, electrical wires, rebar, studs, and other objects, you start each scan by calibrating the unit by moving it back and forth on your wall. This process allows the software to determine a baseline for your scan. To understand how it works, its strengths, and its weaknesses, I created a YouTube video: https://youtu.be/zxqfQU5qh_w.

It is the technology behind Walabot that is most fascinating. Walabot uses ultra-wideband (UWB) microwave radio waves in the 3-10 GHz frequency range to see into walls. The Vayyar sensor chip, which is the heart of Walabot, has a very low power output of non-ionizing UWB radio waves that are safe for human exposure. Vayyar, the parent company of Walabot, is currently performing clinical trials with their new UWB mammography scanner that is used for screening for cancer, like current medical machines, at a fraction of the cost. When an ultra-wideband radar medical scanning machine is used for breast cancer screening, the patient doesn't have to experience the physical discomfort currently necessary for an accurate scan using current technology.

The big question in my mind from the moment I found out that Walabot uses ultra-wideband radar was: Is it
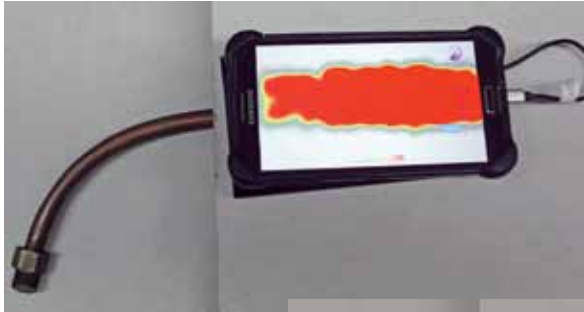
**Photo 2 (left)—In the dummy wall that I created, my phone is sitting directly over the plumbing pipe. This shows the raw data mode.**



**Photo 3 (right)—This is how Walabot saw the same pipe when I set the app to pipes mode.**

safe? I felt that answer should come from a source other than Walabot.

In a 2005 U.S. government report, researchers at Lawrence Livermore National Laboratory made the following statement about the use of ultra-wideband radar in future medical applications: "Ultra-wideband radar holds great promise for a variety of medical applications. We have demonstrated the feasibility of using ultra-wideband sensors for detection of internal injuries, monitoring of respiratory and cardiac functions, and continuous non-contact imaging of the human body. Sensors are low-power, portable, and do not require physical contact with the patient."

(https://e-reports-ext.llnl.gov/pdf/325992.pdf)

From a U.S. military website report I learned that ultra-wideband radar is being used by our military to find roadside bombs and by homeland security at airports and other locations to find weapons and explosives.

If you feel that Walabot is a tool you would want to add to your tool box, I recommend that you watch my video and also make certain that your smartphone is on their approved list.

## Taking it a Step Further

**Classroom Debate:** My video demonstration shows the strengths and weakness of the first generation Walabot DIY and its software. Do the strengths outweigh the weaknesses?

**Tech Challenge:** Many less sophisticated ways exist to determine what lies inside a wall. Given a specific amount of time to search the Internet, which class team can find the largest number and also the most outrageous methods? ⓣⓖ