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Witness Statement for

**Joint Hearing on Small Business Technologies**

House Armed Services Committee's Subcommittees on Tactical Air and Land  
Forces and Projection Forces

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**Statement:**

Good afternoon, Mr. Chairman, and members of the committee. I'm Acie Vickers, President of Digital Receiver Technology, Inc. (DRT). Thank you for allowing me to speak with you today.

DRT is located in Germantown, Maryland, about an hour's drive from the capitol. Our business is the design, manufacture, and sale of communications intercept equipment for the US Signal Intelligence (SIGINT) community. Our company is not quite eight years old, and has grown from 4 employees and \$680K of annual sales in 1997, to over 250 employees and \$66M in annual sales in 2004. Most of our growth, on a percentage basis, occurred prior to 9/11. We are a small business, and entirely employee-owned.

DRT's specialty is tactical signal intercept. Most of our equipment is used in close proximity to the target. Size, weight, and power (SWAP) are very important to our customers. More than 2000 DRT systems have been sold, at an average price of about \$80K apiece, and very few are collecting dust on a warehouse shelf. DRT equipment is state-of-the-art, and dominates the market niche it serves. As evidenced by our customer list, DRT systems are used by virtually all elements of the US SIGINT Community. As many of our customers have pointed out, DRT equipment is "in the fight."

Unlike many of our competitors, virtually all of our contracts with the Government are firm, fixed price. Less than a third of DRT's R&D costs are paid through customer developmental funds. Most of DRT's R&D costs are paid with profits from product sales. We are structured more like a commercial product company than a defense contractor – our customer base just happens to be the Government. Like a commercial product company, we only prosper when we succeed in developing a superior product – we suffer terribly when we fail.

DRT's product designs are based on a "Software Radio" architecture, similar to that used in the well-known JTRS program. DRT boxes can be re-programmed and reconfigured to process a wide variety of communications signals ranging from basic "walkie-talkies" to far more complex types. Unlike many of our competitors, we actually have a lot of software for our software radio. At last count, DRT software provided processing capability against more than 30 different signal types. Much of this software was written in rapid response to the changing environments our warfighters face.

As I said, DRT equipment dominates the niche market it serves. Most of our effort now involves writing additional software for our platform and developing even better hardware. However, customers are basically happy with the capability DRT provides, and there are only so many DRT boxes they need. So, if we are to continue to grow, we have to find new product areas. Two areas of interest to DRT are threat warning and avoidance, and military communications.

Although DRT equipment is used heavily for threat warning, it is not optimized for that mission. The goal is to build a portable or handheld, low-cost system that can scan the entire signal environment and alert the user when a signal is detected that indicates a potentially dangerous situation. Furthermore, the system should provide meaningful information about the nature of the threat. This is a far more difficult problem than just detecting radio activity. There are always lots of radio signals present in any situation, and the trick is to look for the unique characteristics that differentiate harmless radio traffic from a potential threat. Given the wide variety of threats, the potential for the threat environment to change rapidly, and the complexity of the different threat signatures, it is a perfect application for a software radio.

In addition to SIGINT and threat warning, software radios are also ideal for military communications. DRT possesses many of the key technologies required to build military, multiband radios, and intends to compete in this marketplace.

One specific product we are developing is the DRT4403 handheld transceiver. This software radio will be optimized to provide effective threat warning and avoidance, as well as multimode communications. It will also provide limited SIGINT capabilities. One of the communications modes it will support is data networking – this will support the movement toward network-centric warfare and allow multiple units to operate cooperatively.

To illustrate my discussion, I have brought several items. The DRT4101B is a heavily modified version of our SIGINT technology that we plan to sell to commercial telecom companies as a piece of test equipment. This system illustrates the size of some



of our current equipment. The DRT4301 is another example of a DRT product intended for commercial telecom applications. Both the DRT4101B and DRT4301 are real products that are currently manufactured and sold.



Finally, I have a mockup of the DRT4403 handheld transceiver. Work has started on this project, and we estimate it will take 2 years to rollout the first systems. We are estimating that it will cost \$10-15M to develop this product. Approximately half of the development cost will go towards developing the miniaturized circuitry required, and the remainder will go towards algorithm and software development. Although we are hoping for Government support for the project, we plan on bearing at least half of the development cost ourselves.



This concludes my opening remarks. I've submitted a detailed statement for the record. I'd be happy to answer any questions you might have.