

Non-Invasive Field Triage Device (NFTD)

• WHAT IS NFTD?

The NFTD is a *man-portable* diagnostic tool used to detect and locate intracerebral hemorrhage and hemorrhagic stroke, diagnose and monitor closed head injuries *in situ* in far-forward combat areas and disaster sites, and provide near real-time, limited, functional cranial imaging in far-forward areas. It is important because central nervous system trauma is a leading cause of combat fatalities.



• FEATURES

S*R's NFTD technology is a low cost sensor that provides first responders a lightweight portable device:

- A system to diagnose and monitor closed head injury, *a capability that currently does not exist!*
- Effective triage by reducing the time between diagnosis and casualty evacuation
- A capability for limited cranial imaging in far-forward areas, *a capability that currently does not exist!*
- The potential to detect and alert medics, doctors and nurses about life-threatening hidden bleeding sites in soldiers wounded in combat.

• OPERATION

The NFTD uses non-ionizing electromagnetic radiation to interrogate the designated trauma region. This technique takes advantage of the different response of materials to electromagnetic radiation, thus detecting such differences.

Operational NFTD units consist of:

- Antenna/Applicator;
- Battery pack;
- Electromagnetic radiation source;
- Signal processing unit; and
- Display unit.

• SPONSORSHIP

This research was sponsored by the U.S. Army Medical Research and Material Command, Ft. Detrick, MD. S*R would like to acknowledge the guidance of Colonel William Wiesmann, MD and Major Stephen Bruttig, Ph.D. during the initial stages of this project. The program has continued, moving into animal testing under the sponsorship of the Henry M. Jackson Foundation. The animal testing was accomplished at the Uniformed Services University of the Health Sciences (USUHS) under the direction of Lt. Col. Geoffrey Ling, MD, Ph.D. Additional efforts to study the applicability of this technology in cases of pneumothorax (collapsed lung) and compartment syndrome have been accomplished under the sponsorship of the National Institutes of Health and US Army, with testing accomplished by Rhode Island Hospital under the direction of Ludivikas Jagminas, MD.

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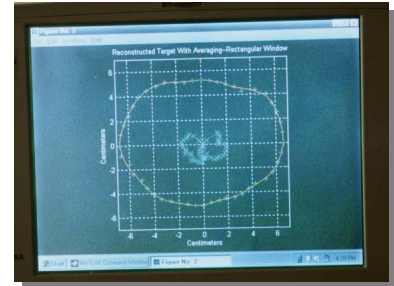
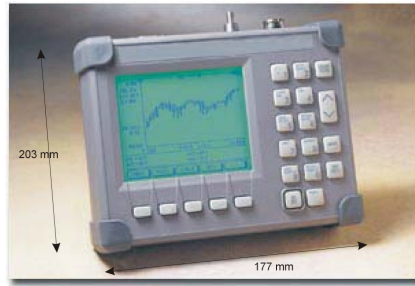
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- **COMMERCIAL APPLICATIONS**

The NFTD technology can be used in many commercial applications where there is a requirement for a non-invasive interrogation of a region. Several medical applications are under study, including, using the NFTD as an aid to first responders (combat medics) on the battlefield, and as an aid to first responders at an accident scene (EMTs). The NFTDS technology can be used in a more traditional setting, such as the Emergency Room of a Trauma Center to provide a means of monitoring patients with head injury or possible stroke victims.

The technology can be used outside the medical arena in such areas as non-destructive evaluation, location of buried objects, and mine detection. S*R has demonstrated the effectiveness of this method in several areas and is currently investigating the extension of the NFTD technology to imaging objects for such applications as bridge inspection, and tumor detection.



- **S*R EXPERTISE**

S*R began research into the application of DOD developed technology at the inception of the company. S*R personnel have extensive experience in the areas of electromagnetics, antennas, RF and Microwave circuit design, and modern signal processing and spectral estimation methods. Experience in applying these technologies to non-defense problems has been a hallmark of S*R research efforts.

The NFTD development began as a Phase I STTR sponsored by the USAF Wright Labs with the goal of using electromagnetic energy in the microwave region of the spectrum to locate tumors and possibly small, calcified regions in the breast. The research direction changed from cancer detection to combat casualty care at the end of Phase I under an Army BAA for the application of the technology to hemorrhage detection. This research has continued until the present with the establishment of a unique relationship with the Critical Care Medicine Division of the US Army at Walter Reed Army Medical Center and the personnel at USUHS. A Phase II STTR award with the U.S. Army is continuing the development of this technology.

- **PATENT**

Electromagnetic Detection of an Embedded Dielectric Region within an Ambient Dielectric Region
United States Patent Number 6,064,903

- **PARTNERING OPPORTUNITIES**

Spectra Research, Inc. is actively seeking partnerships with companies, government agencies, universities, and individuals with interest in producing the NFTD technology. Leveraging the related efforts of the newly formed exclusive licensee, DelMEDIX, S*R anticipates rapid inclusion of this innovative technology into the medical marketplace. For further information, please visit our web site at www.spectra-research.com or contact:

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