Aliph™

Improved near-field ARV (GEMS) neck interface

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Version 1.1

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Introduction

The Aliph RadioVibrometer (ARV, formerly known as the GEMS) has the ability to detect very small tissue motions in situ using 2.4 GHz radio waves. These waves must be channeled into the tissue using an antenna, or more generally, an interface. The radiofrequency interfaces supplied with the Revision B and C ARV units consisted of a variety of conventional patch antennae (Figure 1) that, although relatively immune to noise, required fitting and tuning for each individual subject. Even then, the interfaces were difficult to fit and were not sufficiently robust to movement.

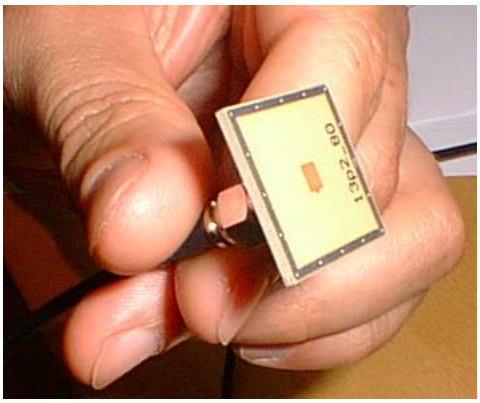

Figure 1. Previous ARV interface.

New near-field neck interface

In response to customer feedback and a government contract for improved ARVs and interfaces, a completely new interface for neck (tracheal) use was developed and tested. This new interface is designed to optimize the location of the near field (0 to 6 cm) of the interface, allowing consistent measurements of tissue motion across individuals while reducing the amount of far-field radiation and noise. In addition, soft, medical-grade silicone rubber is used with an elastic neckband to ensure an even, comfortable fit. Finally, double-shielded cable is used on the ARV itself to further lower any environmental radiofrequency noise.

The new design is shown below in Figures 2 and 3. It uses moldable and medical grade silicone rubber to hold the electrodes in place near the skin. It has proven to be significantly more sensitive and locationally robust than any of the previous interfaces, and does not require fitting or adapting to any individual.

Conclusion

A completely new interface for the Aliph RadioVibrometer (ARV) for use on the neck has been developed. It is significantly more robust and reliable than previous interfaces, and is comfortable to wear. It does not significantly change the amount of radiofrequency emissions for and is compatible with all versions of the ARV (formerly GEMS).

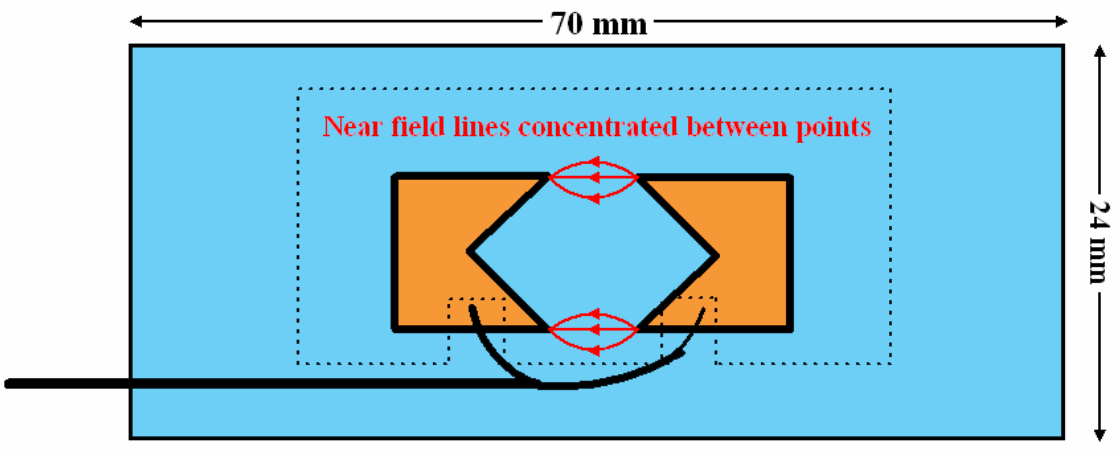

Figure 2. Schematic representation of the new Aliph ARV neck interface.

Figure 3. Photograph of an ARV Rev. B and a advanced near-field neck interface.