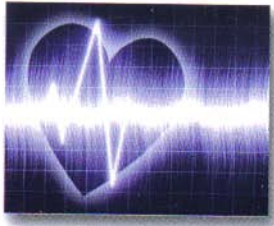




Medical Advances Award



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Wittenstein: FitBone cuts healing time and infection rates after leg bone breaks / cancer

Severe bone breakages and tumours can often lead to bone length inequalities. If occurring in the leg, and untreated, this causes lifelong walking difficulties. Femur/tibia length inequalities are traditionally treated using the Ilizarov technique, an external cage connected to the bone via pins entering the body through the leg. 40mm growth takes 9-18 months and pin-tract infections are common, occurring in 50% of cases.

FITBONE is an implantable device that fits inside the bone. It is a telescopically extendable rod, microcontroller and wireless receiver and controlled using a special high integrity embedded software application.

It is the result of a joint project between German Wittenstein AG (mechanics) and British Wittenstein HIS (real-time software).

To cut infection risk, the device is controlled via a wireless remote. Power is also passed wirelessly removing the need for a battery.

Compared with Ilizarov techniques, trials show:

- Increased load bearing – patients can leave hospital 20% earlier.
- 50% improved recovery time - regeneration of bone mass takes 5-10 months.
- Improvements in patient pain, infection rates, cosmetic appearance and patient confidence were also recorded.

Analog Devices: ADAS1128 – enabling faster clearer CT scans

The ADAS1128 is a 128-channel, 24-bit current-to-digital converter that enables high slice count CT scanners for faster, clearer images.

With the ADAS1128, diagnostic system designers can develop CT scanners that produce clearer images while reducing overall scan time compared with older machines. The dramatic system-level cost, size, and power savings resulting from the ADAS1128 means that world-class CT scan diagnostics will become more affordable and practical in medical environments throughout the world.

PRODUCT BENEFITS:

- Increased resolution, tissue type discrimination, flexibility
- Increased spatial volume of tissue and organs imaged
- Speed to capture 4D moving images of dynamic events
- Replace multiple exams with a single study
- Replace invasive exams with non-invasive study
- Lower patient X-ray dose
- Less patient prep time
- Faster patient throughput.

Ramtron: F-RAM capacity gives key design advantage for digital hearing aids

Today's hearing aids are vast improvements over the simple amplifiers of early analogue models, and now typically full of digital technology enabling advanced features such as matching amplification to patient's particular characteristics of hearing loss, removing background noise, echo cancellation and smaller sized devices, with some sitting completely in the ear canal (CIC). For those CIC hearing aids it is crucial that the reduction in physical size of components does not compromise capability of the hearing device.

Ramtron's technological achievement has seen F-RAM memory capacity quadruple to 8 megabits (Mb) moving F-RAM into a range of new markets that require a high endurance, low-power memory in a very constrained space. Physically smaller than EEPROM for a similar density, F-RAM technology allows more memory to be fitted in the same space or to use less space for the same amount of memory. Ramtron's development of its VFamily of F-RAM memory devices, built on an advanced manufacturing process, is an ideal replacement for serial Flash in sophisticated electronic systems and one of the many areas where the VFamily devices are applied in digital hearing aid design.

Intersil Corporation: ISL22317 - low-voltage, precision, digitally controlled potentiometer

Pulse oximetry is the greatest advance in patient monitoring in recent years. Many medical sensor applications, such as O2 sensors, need highly accurate calibration. Introduced by Intersil in June, 2009, Intersil's ISL22317 is a true low-voltage, precision, digitally controlled potentiometer (DCP) with typical $\pm 1\%$ tolerance. Previously DCPs have $\pm 20\%$ of Rtotal accuracy, and the technological leap to $\pm 1\%$ represents a major breakthrough. The ultra-low tolerance allows the ISL22317 to be used as a true variable resistor, enabling users to set standard and non-standard resistor values for open-loop applications.

Designed around a new, patent-pending architecture, the ISL22317 allows for modularity and consistency of measurements. Once the ideal start up value is determined for one O2 distribution system that also has a sensor feedback mechanism, this value can be programmed across other modules.

For example, a child's dose will most likely be less than an adult's, you can determine settings for both adult and child and program each unit to the initial value in the production line. At start-up, each unit will now be within 1% of the ideal value, and can then be further tuned by the end user.

Texas Instruments: Advancing the future of medical imaging with TI's TX7xx medical solutions

Technology that is coming from Texas Instruments is changing how and where medical technicians perform medical imaging and improving the experience for patients. Our customers are challenged with making ultrasound systems more portable, more affordable and with higher quality imaging.

Texas Instruments solves this design challenge by integrating and optimising key system components with our new TX7xx family of high-voltage pulsers and switches. It's an integrated signal chain for ultrasound systems, helping ultrasound designers design more compact systems with clearer images. The TX734 reduces board space by 50 percent compared to discrete solutions, and its active damping feature improves pulse symmetry and second order distortion to achieve clearer images. It is designed for portable to mid-range medical ultrasound systems.

With the TX7xx product family, our customers are able to make ultrasound portable, bringing high-quality medical imaging to previously hard to reach places such as disaster sites, accident scenes and even into war-torn areas.

JAOtech: Sheffield Children's Hospital patient terminals

The Children's Hospital, Sheffield has implemented an innovative system that delivers electronic patient records to the bedside. Delivered by ANS Group in partnership with Provision Network, a division of Quest Software, on JAOtech Smart Terminals, the system is to be rolled out across all 140 bedside terminals at the hospital, as well as other computers used by clinical staff at nursing stations and in offices.

JAOtech's terminals were originally installed to provide patients with free entertainment, education and communication. ANS Group installed an authentication module and some specialist client software on each terminal, to provide clinicians with access to a clinical desktop when inserting their Connecting for Health smart card into the JAOtech reader provided and entering their pass-code. Removing the card instantly closes the desktop, and returns the terminal to the application last used by the patient. The system is secure, and no data is held on the terminal itself.

"The solution allows medical and nursing staff to increase the time they spend on patient care, giving more individual attention by providing quick and convenient access to the records they need," explains Russell Banks, Head of IT, Sheffield Children's NHS Foundation Trust.