

Infinite Possibilities Research Unleashed



Amplifiers
SynAmps2
NuAmps

Stimulus Generation
STIM 2

Electrode Positioning System
QuikCap

Dipole Source Localization
SOURCE 2
SOURCE 5

Multi-modal Neuroimaging
CURRY 6

Acquisition & Analysis Software
SCAN 4

Simultaneous EEG & MRI
MagLink RT

COMPUMEDICS Neuroscan

Advances from Neuroscan

At no time in Neuroscan's long history of developing cutting edge tools for Neuroscience, has our productivity been greater. With the help of Compumedics wide range of expertise in product design and development, we are seeing better products brought to market more quickly than ever before. This newsletter announces the release of **CURRY 6** and **SCAN 4.4** software. Additionally, across our range of software and hardware products, without exception advances are currently being worked on. Finally, we have hired and continue to look for new staff to better support our growing customer base and streamline our administrative group to serve you better.

NO COMPROMISES, INFINITE POSSIBILITIES has been our mantra for many years, but now those possibilities are often a reality: Today we offer: automated image reconstruction in CURRY 6, real time fMRI artifact removal with the MagLink RT and the use of Neuroscan amplifiers with your custom built software using the Access SDK.

In the near future, we plan to remove the need for independent computers and provide for a comprehensive closed loop system between the stimulus and data acquisition systems. Our development has never been stronger, or faster. The next generation of SCAN is being designed and developed by the CURRY software team, ensuring SCAN's continued position as the world's leading EEG processing software. Enhanced functionality within SCAN and seamless integration with CURRY, as well as its interaction with third party software is paramount in its design.

The INFINITE POSSIBILITIES that Neuroscan has strived to provide is beginning to be fulfilled by our product range, allowing your RESEARCH to be UNLEASHED with more accurate and flexible tools.

INSIDE

CURRY 6 - is now released ②

CURRY on the cover of EPILEPSIA ②

Release of SCAN 4.4 ③

Maglink RT - Recording EEG in the fMRI in Real Time ③
Research Article - Recording EEG in the fMRI in near Real Time

Compumedics Moves Administrative Office Location ④

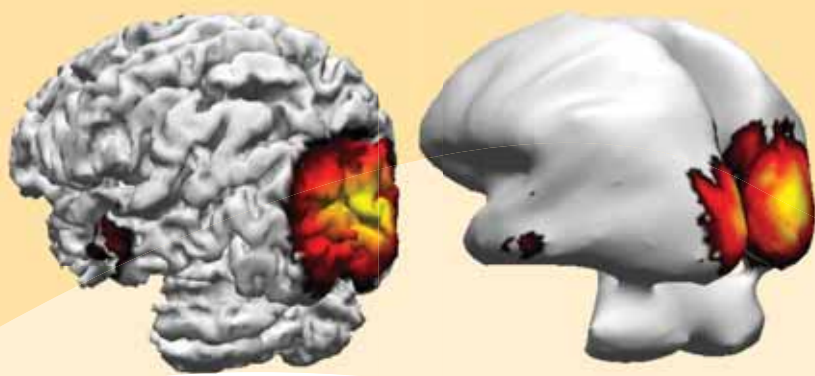
Education & Events ④

News from Technical Support ④

CURRYTM 6 is Now Released

True Multi-Modal Neuroimaging

This latest version of **CURRY** provides significant technical advances to the already much improved user interface of **CURRY 5**. Many of these new features are designed to make it simpler and much more powerful to conduct true multi-modality applications. Additional enhancements to the new interface provide toolbar buttons for the most often used features, allowing for better workflow and less searching within pull down menus. A new montage editor and data processing tools have also been added, such as template based event detection, enhanced averaging abilities. The much requested conversion to the Talairach co-ordinate system has also been included to allow a normalized comparison of data sets. A brief list of the new features follows; please visit our website for complete details.



NEW FEATURES:

- Additional functional and anatomical formats supported*
- Montage editor*
- Template based event detection*
- PCA-projection for artifact suppression*
- Time-resolved spectra (short time FFT)*
- Vector beamformer scans*
- SWARM algorithm for current density reconstructions*
- Automated 3D-co-registration using mutual volume gray-level matching*
- Talairach co-ordinates (wizard for bounding box definition)*
- Anatomical and functional atlases*
- Orthogonal cuts through segmented surfaces with volume image data display*
- Cortical inflation (smoothing)*
- Full multi-core processor support (multi-threaded algorithms)*
- OpenGL-accelerated 3D-graphics*
- Highly interactive User-interface with toolbars*
- Export of results to EXCEL, MATLAB, SPM*
- Report generator (RTF-format)*

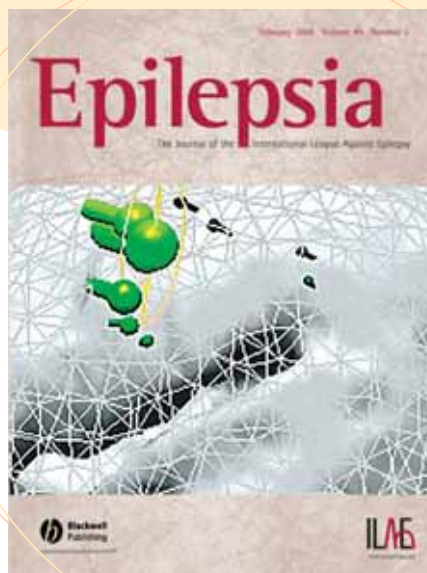
Research Article Highlights: **CURRY on the cover of EPILEPSIA**

Plummer C, Harvey AS, Cook M. (2008)

EEG source localization in focal epilepsy: Where are we now?

Epilepsia. 49:201-18

Clear demonstrations of the validity and utility has kept electroencephalographic source localization (ESL) of epilepsy away from standard clinical use. However, this review of state-of-the-art ESL techniques by Plummer, Harvey and Cook from St. Vincent's Hospital in Fitzroy, Victoria, Australia, illustrates how far such methods have come over the past decade. With a particular emphasis on CURRY, Plummer and colleagues strongly argue that ESL will soon become an accepted, standard tool in the repertoire of the clinical neurologist. CURRY's ability to easily and quickly generate realistically-shaped volume conductor models based on the individual's structural MRI combined with co-registered EEG from that individual brings a level of accuracy to ESL not previously available. Clearly, ESL will not replace current advanced imaging techniques such as (f)MRI. However, the capabilities provided by ESL as a method for localizing epilepsy provides an additional non-invasive source of convergent data to further assist in the neurologist in pre-surgical planning. With its FDA-clearance, CURRY is one ESL application fully prepared for this function.



Examples of Recent EEG/fMRI Publications using NEUROSCAN Systems:

Bernstein LE, Auer ET, Wagner M, Ponton CW. (2008)

**Spatiotemporal dynamics of audiovisual speech processing.
NeuroImage, in press.**
Neuroimage. 39:423-35.

*Basilea LFH, Anghinah R, Ribeiro P, Ramosa RT, Piedaded R,
Ballesterb G, Brunettib EP (2007)*

**Interindividual variability in EEG correlates of attention and limits of
functional mapping.**
International Journal of Psychophysiology. 65:238-251.

Release of Scan 4.4

Compumedics/Neuroscan is pleased to announce the release of the latest version of the Scan software package for EEG acquisition and analysis. **Scan 4.4** was developed largely for users with MagLink RT systems, and it contains the latest methods for removing gradient sequencing and ballistocardiogram artifact.

Additional changes in **Scan 4.4** include several new transforms, as well as modifications to existing ones. Some of the new transforms have been created from parts of the existing EKG Noise Reduction transform. This gives greater control over how they may be used, and permit more general applications aside from ballistocardiogram removal. The **Scan 4.4** Release Notes, included with the 4.4 installation, describe all of the changes since 4.3.1.

Correlate Peaks (new; part of EKG Noise Reduction transform)

DC Drift Correction (modification)

Export in EDF Format (modification)

Grid Layout (new)

Import Event File (new)

Insert Multiple Events (new)

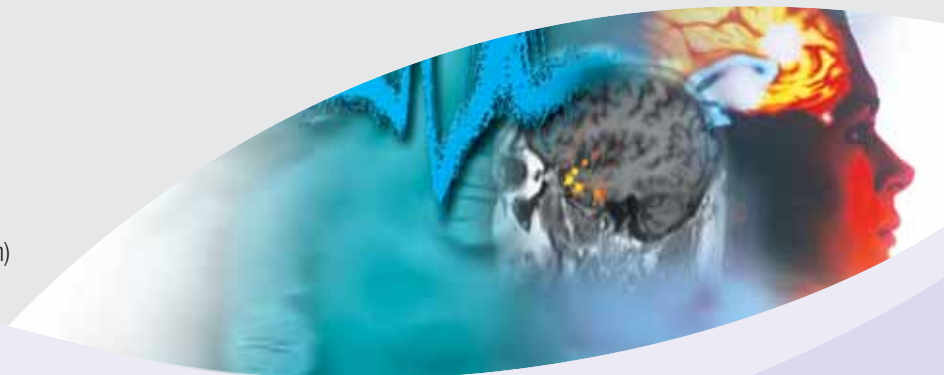
QRS Detection (new; part of EKG Noise Reduction transform)

Subtract Average (new; part of EKG Noise Reduction transform)

Included with the Scan 4.4 release is a complete set of updated user manuals. PDF versions are included with the installation; printed sets may be purchased. Also included are a set of example paradigms for recording a variety of cognitive and sensory EPs. Sample setup files and auditory/visual stimuli for use with **Stim2** are included.

Scan 4.4 is a "patch" that is installed on top of your existing Scan 4.3.1 or newer version (you must have at least 4.3.1). Your 4.3.1 license will run the regular version of Scan 4.4. The MagLink RT version of Scan 4.4 requires a Full ESI 4.3 license as well as a MagLink RT license.

New users will receive Scan 4.4 on a separate CD along with all of the other materials. Existing users may download Scan 4.4 from <ftp://ftp.neuroscan.com> (go to the Public, Released Software, Scan 4.4 folder and read the READ ME FIRST.doc file).



MagLink RT

- Recording EEG in the fMRI in near Real Time

Recording EEG in the MRI has been a major focus of our Research and Development group for many years. The MagLink RT (Real Time) system is the culmination of that effort. While our previous system allows recordings in the MRI with some constraints, the MagLink RT allows the ultimate flexibility in recording right through the pulse sequence and provides the ability to correct both the EPI artifact and Ballistocardiogram (BKG) artifact in (near) REAL TIME.

A combination of advanced hardware and software, the MagLink RT system has been designed to eliminate any RF leakage into the MRI, by

installing a high quality custom designed RF filter. The system also includes an independent pulse oximeter to obtain accurate triggering of the BKG artifact. The MagLink RT software provides an on-line window to the data correction, allowing you to optimize the many different parameters that effect the quality of the artifact removal.

While the number of new installs of the MagLink RT is notable itself, more importantly is the ground breaking research being done with the MagLink systems. An example of which is discussed below.

Research Article Highlights: **MAGLINK in NATURE**

Vincent JL, Patel GH, Fox MD, Snyder AZ, Baker JT, Van Essen DC, Zempel JM, Snyder LH, Corbetta M, Raichle ME. (2007)

Intrinsic functional architecture in the anaesthetized monkey brain.

Nature 447(7140):83-6.

Traditional methods of investigating functional networks in the brain have relied on paradigms in which a specific sensory system is stimulated and the resulting activated network is mapped. However, investigations ongoing at Washington University in St. Louis suggest that coherent patterns of fluctuation in blood-oxygen-level dependent (BOLD) underlying these functional networks may persist in the absence of stimulation. To compare so-called resting networks with driven networks fMRI data were collected with and without sensory stimulation in a group of anesthetized monkeys. In half of the monkeys tested, fMRI data were acquired simultaneously with EEG data using the MagLink system. Results of this study demonstrated that even in anesthetized monkeys, as verified by the MagLink recorded data, coherent activity associated with specific sensory system cortical network persist at arousal levels associated with extreme loss of consciousness. The further challenge the concept of "resting-state" bold activity and strongly suggested that patterned network activation persists within sensory systems in absence of input.

Examples of Recent EEG/fMRI Publications using NEUROSCAN Systems

Espartero AJ, Schmuthorst VJ, Szaflarski JP. (2008)

Chronic isolated hemifacial spasm as a manifestation of epilepsy partialis continua. Epilepsy & Behavior 12:332-6.

Vincent JL, Larson-Prior LJ, Zempel JM, Snyder AZ. (2007)

Moving GLM ballistocardiogram artifact reduction for EEG acquired simultaneously with fMRI Clinical Neurophysiology 118: 981-998.

Sabri M, Liebenthal E, Waldron EJ, Medler DA, Binder JR. (2006)

Attentional modulation in the detection of irrelevant deviance: a simultaneous ERP/fMRI study.

Journal of Cognitive Neuroscience 18:689-700.

Compumedics Moves Administrative Office Location –

We're pleased to report that the transition and move of operations from El Paso to Charlotte last fall was a success. All US Administration, Customer Order Entry, Accounting, HR, Service, Shipping and Receiving and Marketing functions are now in Charlotte, NC. We are excited about the new facilities and surroundings. More importantly we are excited about this new opportunity to better support our customers.

Neuroscan still maintains a research facility in El Paso and has expanded the research operations in both Australia and Germany. Working together, these three sites have vastly improved our ability to develop and bring products to market. Each group now has the ability to focus on its specific area of expertise, while benefiting from the expertise of the other groups. The benefit of this approach is clear in the number of new products and the capabilities they offer. We look forward to utilizing this new structure to ensure the best development and support of our growing customer base

... **Infinite Possibilities, Research Unleashed**



Education & Events 2008

Please check our **WEB** page for more information or to pre-register.

USA - 2008 Schedule

- **Intermediate SCAN School**
Seattle, WA - August 26-28, 2008
- **Advanced SCAN and Full CURRY**
Charlotte, NC - September 8-12, 2008

Europe - 2008 Schedule

- **Advanced SCAN and Full CURRY**
IOP, London, UK - September 2008

CHINA 6th Compumedics Neuroscan China School

- **CURRY & SCAN,
Kunming China - August 2008**

CURRY (Aug 13-14) & SCAN (Aug 15-18)
e-mail: zengyu@fistar.com.cn

AUGUST - 08	DATE	PLACE
Intermediate SCAN school	26 - 28 Aug	Seattle, WA
6th Compumedics Neuroscan China School	11 - 15 Aug	Kunming, China
SEPTEMBER - 08	DATE	PLACE
Advanced SCAN and Full CURRY	8 - 12 Sept	Charlotte, NC
OCTOBER - 08	DATE	PLACE
SPR- Society for Psychophysiological Research	1 - 5 Oct	Austin, TX
NOVEMBER - 08	DATE	PLACE
SfN - Society for Neuroscience	15 - 19 Oct	Washington, DC
DECEMBER - 08	DATE	PLACE
AES - American Epilepsy Society	5 - 8 Dec	Seattle, WA

NEWS FROM TECHNICAL SUPPORT!

Neuroscan has recently added to our support staff personnel, in order to provide greater opportunities for consultation and troubleshooting to an expanding customer base.

We are pleased to announce the addition of **Dr. Ronnie Abi-Raad** to the Neuroscan family! Ronnie is an experienced user of Neuroscan products in his past employment at Kennedy Krieger Institute in Baltimore, MD, where he enabled the completion of multiple research projects, including high-resolution recordings. Ronnie is at this moment sitting by his phone, in front of a laptop, waiting to hear from you!

If you have any questions about our extensive line of products including (but not limited to): electrode caps, Scan, Stim, Curry, Nuamp and Synamp2, please contact us via phone at **1-800-474-7875**, or **email: techsup@neuroscan.com**. In addition to telephone and email support, we are also in the process of adding new tools that will provide immediate and direct assistance when you are experiencing difficulties.

These include:

1. The addition of a **FAQ** to our website, including answers to questions revolving around amplifier installation, subject preparation, and basic software issues.
2. Direct, remote connection to your Scan or Stim desktop/laptop computer, enabling a direct demonstration of software transformations.

We also provide opportunities for support personnel to visit your laboratory in order to provide direct assistance and training! If you are interested in hosting a visit from a Compumedics Neuroscan representative, please contact us at **1-800-474-7875**. We may also be reached via email at **techsup@neuroscan.com**. We are committed to assisting your exploration of the unlimited possibilities and potential of your Neuroscan system.

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