

Highlights

- **The all new ACES website**

Contact ACES

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The Alberta Clinical Engineering Society Newsletter

October 12th, 2004

Presidents Letter

Doesn't it just frost you when you have so many things you want to do but you fear there's no time to get them all done. That's what ACES feels like right now. A whirlwind of activity and projects on the go, sporting a 2004 Board of Directors that is twelve (12) members strong. With so much participation comes the benefit of a diversity of strengths. Each person brings with them their own unique talents. For example, check out our new Webpage (www.aces.ab.ca). Thao Pham, a recent N.A.I.T. graduate and ACES new Webmaster grasped her opportunity to redesign our webpage and enhance ACES image. Check it out. Thao is updating it regularly.

For those who participated in last years Telehealth Video Presentations, Good News! We are putting together another program of four (4) more sessions. Last year's presentations were quite a challenge since the technology and organizational planning had to bend around presenters previous schedules and commitments along with unexpected surprise's. This year we know what we want to do and how to present it. It's getting the time to do it right that is overwhelming. Some of you asked for copies of the Telehealth presentations on recorded media like DVD or SVCD which could be viewed at a later date. We are working on that and fully expect it will be realized this year.

Orrin Stephen recently moved from Grande Prairie to Calgary. From there, he is putting together an organizational chart and contact information for Biomedical Departments across the prairies...a request which came from Saskatchewan last year. This should really help those biomed in rural areas. Along with that, we will be hosting the Western Regional Biomedical Engineering Conference in the spring of 2005. It's really not that far away and planning for it must begin now. Keep and eye out for dates and location, and make sure your Professional Development budget allows you to rekindle old ties and join your peers at this exciting and informative conference/trade show.

As you can imagine, getting all this done will take a lot of behind the scenes effort. We are up for the challenge of making this one of our best years ever. Remember that you need to send us your wish list of ideas in order to ensure that ACES meets YOUR needs. Yes, we are listening to you and you can make a difference when you get involved...even if all you can muster is a suggestion, it's all welcomed.

Alexander T. Sackiw, B.Sc.
Biomedical Technologist
University of Alberta Hospital (Capital Health)
Edmonton, Alberta

Capital Health Authority Update

Greetings from Edmonton. Take a quick look around the University of Alberta Hospital site's Walter Mackenzie Center (WMC) and you will see five (5) construction cranes towering over the existing buildings including one that travels on it's own railway tracks. Yes, construction is at an all time high. Buildings are going up, staff is being hired, and programs are expanding. Here is a brief overview of the events.

Extensions are being added to both sides of the existing Medical Sciences Building north of the University Hospital. A new 4 level building (the Zeigler Building) is growing out of the surface parking lot north east of the University Hospital to house G.I Outpatient Services. Southeast of the University Hospital, the recently built Emergency Department is having its foundation extended to handle the new Alberta Heart Institute (AHI). This structure will be 16 stories high (8 patient floors and 8 mechanical floors). Blueprints are at the 95% stage and will include numerous Clinical Engineering satellite shops located right on the units. As well, a sizable server room is being located in the basement. Biomedical Techs of current programs which are to be moved into that building were able to define their own work spaces including room size, lighting, communication and electrical wiring as well as millwork and

cabinetry. A very satisfying endeavor indeed.

The University of Alberta NMR Research facility located in the basement of the Emergency Department, houses three new NMR (1.5T, 3.2T & 4.7T) magnets of which the two smaller units are up and running.

The City of Edmonton Light Rail Transit (LRT) extension project (\$110 Million dollars) is in its final stages of construction. This new LRT station just west of the WMC (across the street) will be connected to the hospital with a walkway. This is a bonus for staff and patients coming from the downtown or North East Side of Edmonton.

Inside the University Hospital, renovations are always ongoing. The level 3 OR space is being renovated to accommodate 3 additional new OR suites and an additional 16 suites undergoing extensive renovations. This project is enormous because these suites are all designed around the "Digital O.R. Concept" which enhances the flow of patients and information inside the ORs, between the ORs, ICUs and wards and to external non corporate sites.

The CHA region as a whole is under a reclamation project to recover 700+ hospital beds by moving Outpatient Services and non-clinical office space into the newly purchased downtown plaza site. The vacated areas are then converted to in-patient Patient Care Space.

At the Royal Alexandra Hospital site, there is a large Ambulatory Care Project currently under construction that will see 16 new digital OR suites built. The North East Treatment Center, to be located adjacent to the RAH hospital, is a multiple floor complex currently in the design stages. Our RAH Clinical Engineering department will be moved into this building. Our RAH team is working hard to ensure this new space meets their needs.

Regionally, the Renal Department continues to grow at about 14% per year requiring additional staff and equipment. A large in-center dialysis building was constructed beside the RAH. The Renal program continues to

establish satellite units in some of our supported communities.

New initiatives across the region include the selection of a new regional ECG Management System with Brandon Beaudry, Information Technology Co-coordinator for Clinical Engineering, chairing the "Regional ECG Technical/Data Working Group". As well, procurement of a new Critical Care Information System is in the works. Eventually, this system will interconnect and support all ICUs in the region. Although we are looking primarily at the interfacing of medical devices, we have staff in both the technical and clinical committees. Input from all these players should ensure a cost effective and functional system.

On the purchasing side, there is a unique 100 million dollar RFP (3+2 year plan) for all diagnostic imaging, physiological monitoring and a regional ECG management system. The goal is to find a single vendor solution for each of these categories. This process is being driven by executive and managed by Equipment Planning. Two recent hires in Equipment Planning are former Biomedical Technologists from the University site.

Staffing changes at the Capital Health Authority - Clinical Engineering

Reydon moved from Diagnostic Imaging (UAH) into a Biomedical position in Cardiac Sciences (UAH) this past winter.

Taras has moved from the O.R. team (UAH) to the Northern Alberta Renal Program.

Garth has moved from the Royal Alex Hospital (RAH) to take Taras's position in the O.R.

Damen moved from private industry to the I.V. pump position at the Royal Alex Hospital to replace Garth.

Brian Dust left the I.V. pump pool repair at the UAH for private industry.

Darryl returned to the UAH for a few days to do I.V. pump repair (UAH) before moving into the new Equipment Planning position, which he had previously applied for a few months ago.

Thao (ACES webmaster) has taken a casual position at the UAH repairing pumps until Jessica takes over.

Jessica is moving from Diagnostic Imaging (UAH) into the pump position (UAH) at the end of October.

Shawn has a 2-week casual position at the UAH after volunteering all summer at the RAH hospital.

We are currently hiring for the newly created Regional BMET position in Edmonton NE., which will include outlying sites in St. Albert and Fort Saskatchewan.

I hope I've not forgotten anyone, but as you can see, this summer has been very, very busy for us.

Brian VanSkiver, P.Eng.
Clinical Engineering, Capital Health (UAH)

Northern Lights Regional Health Services Update

The arrival of our new Orthopaedic surgeon kicks off the new school year, in his first three week on the job he saw 150 patients and did 50 procedures and that was before any of the new equipment had arrived for him. He got a whole wack of new bits and pieces, along with his equipment came four new Lap/Coly carts of equipment. An operating room is being spruced up and having new surgical lighting installed, another anesthetic machine and operating table as well, bringing us up to six (out of seven) operating rooms available. There is word of another Ortho, another anesthetist and more surgeons. His arrival is much welcomed by the populus but he does put a strain on existing staffing. It's a happenin time in O.R. land.

Meanwhile across the wild expanses of Northern Alberta a brand new hospital in High Level is occupied. The last remaining staff and the patients were moved on September 11th and at 11:00 am services were discontinued at the old facility. Word has it that the transition went smoothly and things are up and running but one can be sure that there will be growing pains. I visited the new building during the week of the 6th thru 9th. and it is a

beautiful new building with some state of the art systems.

Back at the fort, Diagnostic Imaging has begun its renovations, Computing services finalizes plans for its expansion (more room for servers). Keyano nursing students have returned, lots of new faces on staff, new equipment to replace antiquated stuff continues to come in dribs and drabs. The Medtech projects rolls on. Biomedical Services gets some new test equipment.

Summer was a bust, no snow yet but I have seen 3 large "vees" of geese headed south and it only just September not a good sign. Due to the short time frame, those are the highlight of the region.

Your colleague

Graham Bruce, C.E.T.

NAIT Update

We are into week 3 of the new school year here at NAIT. So far things are going very well. Our first year class consists of 24 students, 5 of them are women. Our second year class currently has 20 students including 6 women. This year we have a new anatomy and physiology instructor, Dr. John Ulici Petrut is new to NAIT Biological Sciences this year and we are very pleased to have him work with our program. Otherwise it is business as usual.

Best Regards,

Roy Sharplin

Program Coordinator

Biomedical Engineering Technology,
NAIT

Attention Students:

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Biomed Forum

Dear Biomed:

My name is Chau H. Nguyen. I graduated from BCIT BMET program in 1991. I am currently working at the Richmond Hospital.

For many years, I have not seen a communication medium for Biomed in BC as well as around the world to communicate effectively. To provide a communication medium where Biomed from all parts of the world can come and share ideas, thoughts, experience, etc, I have created a forum at

<http://www.dynav.com/biomed/>.

This forum is 100% free of sponsorship. Everyone is welcome.

I am also looking for helps from individuals to:

- advise on the content, structure and operation of the forum (Advisor role)
- administrate the forum (Administrator) and
- moderate designated forum (Moderator).

Please visit the forum for more information.

Please come, participate and make this forum the most valuable resources for biomed. Bookmark and visit the forum often.

Regards,
Chau H. Nguyen

Letter from the Editor

When I was on my way to Red Deer to attend the annual general meeting, the thought of becoming a newsletter editor never came to mind. But during the meeting I came to the realization that now that school was over and we were all entering the real world as the next generation of biomed, I wanted to remain involved with the people I've met so far and get to know more BMETs and CETs. For me this is challenging because I don't work in the hospitals or clinics of Alberta, and feel rather isolated from other BMETs. The calling from Chau Nguyen for more effective communication and Orrin Stephen's organizational chart project should help bring the community closer together. As some might recall Alex's message on the importance of networking, I can't agree more that, more often than not, it's not what you know, it's who you know. For the NAIT students it's never too early to start to make contacts with the people in the industry and get involved with ACES through the spring conference (hint, hint).

We've received quite a few articles for this issue but I'd like to ask anybody reading this newsletter to contribute any interesting articles or ideas for the next newsletter. Please send them to tdelaive@imagingdynamics.com.

Regards,

A. Timo de Laive, B.Sc.



ACES on the Bench

Infra Red troubleshooting Cheats...the hard way.

Now this article would be considered common sense for some, but a revelation for others, so bear with me while I attempt to bring everyone up to speed!

Infra Red (I.R.) emitters can be almost impossible to troubleshoot without expensive test equipment unless, you have been following the development of digital camera's. We've seen the price of digital camera's drop to under \$100.00. I'd recommend a good digital camera for every biomedical department and here's why.

Digital camera's use light sensitive "CCD's" (Charge Coupled Device's) instead of photographic film to record images...light images, only what you see, is not what you get. You can get a lot more. Our eyes cannot see infra red but those "chips" can! We use this technology in a huge assortment of devices starting with TV/VCR remote controls. Those and many other devices use infra red transmitters and receivers for communicating and sending commands.

For a real life example, I'm going to use an old Spacelabs transport monitor called the Scout (Model Number). This particular unit uses a pseudo touchscreen technology that doesn't rely on actual physical touch, but the breaking of I.R. beams across the display from left to right and top to bottom just in front of the screen itself. Upon start up, the diagnostic software detected an abnormal condition of the I.R. transmitter/receivers. It failed with an error message and ended up in the shop. Once there, the problem proved to be intermittent. "*Hmmm, could be dust*", you say, so you take it apart and clean it out. Yes, there was dust inside. Then you re-test...It works consistently! *GREAT!* Back it goes into service, only to show up on your door step next week with the same intermittent fault. OK, you take it apart again...this time you're not going to let this one get away. You get out your trusty digital camera, line it up with the

receivers on your circuit board, turn on both units and voila! Those I.R. emitters light up like white lights on a christmas tree when seen on a TV monitor which is fed a signal from your digital camera. (Oh, make sure the camera you buy has an A/V output! Most do these days). Alrighty, now some of those emitters are nice and bright but some are dim, so you physically tweak all those I.R. LED's until they shine brightly at their respective receivers. You now know they are all working and are aligned. Reassemble and test again! It doesn't fail now! OK, back to the wards; a job well done! "*You sure are smart...using a digital camera to troubleshoot, eh!?*"

What's this! Two weeks later it's back....same note "Failed Touchscreen Diagnostic Test". "*Dang*", so you turn it on. Yup, fails almost every time. It's got to be a fault on the board. You know all the I.R. transmitters are working, you saw that with your own eyes. "*It's got to be the I.R. receivers! That's the only explanation! It just took time for them to degrade to this point*". Testing all those receivers will take a lot of time and the building of a test jig. Your co-workers say, "*Just swap the board*," so you order another board (an \$800.00 mistake!) and install it. Retest; "*STILL FAILS!!! What the ...?*"

Here is where I'd like you to think about what you would do....but remember, it took someone with better eyes than mine to find this one! Give up! Read on.

Intermittents are very hard to find so grabbing a new board could have been a cost effective test only if you had a spare board (which we now have!!!) however there is one more problem, although those I.R. transmitters really do emit I.R., their receivers respond to all wavelengths of light, not just I.R. Remember that bezel? Check it out. It's RED in colour. It's RED for a reason. Red plastic allows only RED light to pass through. Infra "RED" light that is, so testing the circuit board laying on the bench would have you believing all the receivers were constantly "ON" or shorted due to ambient white light in the room. What else could you try? Maybe another thorough physical inspection because

the problem here was not the circuit board. A closer inspection by a young eagle eyed tech found the plastic faceplate was cracked. It had broken away from the rest of the bezel. A different tech came up with the idea to test this condition by shining a regular penlight flashlight along the surface to see just what the crack would do to the Infra red beam. It was just light after all and must obey the laws of physics. It was a good idea. When the flashlight was shone through the bezel, a red spot appeared on the inside of the front cover through the RED plastic bezel. When the flashlight was moved to the region of the cracked plastic, that red spot dimmed and was outshone by two white lines about the apparent position of the I.R. receivers. The red light was drowned out by the leaking white light which would have triggered multiple receiver(s), especially when ambient ceiling lights shone directly into the crack. Now if we go back in time, that crack was small to start with, so every time we "fixed" the transport monitor, we actually did do some good. Cleaning the dust and improving the alignment all helped increase the signal to noise ratio, or apparent strength of the I.R. beam, but that crack kept growing and growing until the I.R. receivers were overwhelmed by leaking white ambient room light and the unit failed entirely.

What did we learn by this?

1. I.R. light can be seen and verified by an inexpensive digital camera (with A/V out and a T.V. monitor), OR a DV camcorder OR your computer camera.
2. Visible light can be used to verify the path of I.R. light to ensure the pathway is not blocked or flooded with ambient light.
3. Infra Red receivers are sensitive to many wavelengths of light, not just I.R.
4. There's no replacement for a good old physical inspection (and good eyes).

Now we didn't save any money this time, but hopefully someone will try these techniques and get their equipment up and running the next day with only a dab of glue!

A.T. Sackiw, Biomed Tech.

Beam us up, Scottie

For all you closet and not so closeted "Star Trek" fans, I found an interesting article in the Quarterly Technology Review section of *The Economist* magazine (September 18th to 24th, 2004). The article is titled "Science fiction? Not any more". The article is written so well, that I am just going to quote huge chunks of it verbatim.

"Science fiction has often been the source of inspiration for new technologies. ... Now it seems that "Star Trek" has done it again. This month, American soldiers in Iraq will begin trials of a device inspired by the 'comm badge' featured in 'Star Trek: The Next Generation'. Like crew members of the starship *Enterprise*, soldiers will be able to talk to other members of their unit just by tapping and then speaking into a small badge worn on their chest. What sets the comm badge apart from a mere walkie-talkie, and appeals to 'Star Trek' fans, is the system's apparent intelligence. It works out who you are calling from spoken commands, and connects you instantly.

The system, developed by Vocera Communications of Cupertino, California, uses a combination of Wi-Fi wireless networking and voice-over-internet protocol (VOIP) technologies to link up the badges via a central server, akin to a switchboard. The badges are already being used in 80 large institutions, most of them hospitals, to replace overhead paging systems, says Brent Lang, Vocera's vice-president.

Like its science fiction counterpart, the badge is designed so that all functions can be carried out by pressing a single button. On pressing it, the caller gives a command and specifies the name of a person or group of people, such as 'call Dr. Smith'. or locate nearest anaesthesiologist'. Voice-recognition software interprets the commands and locates the appropriate person or group, based on which ever Wi-Fi base-station they are closest to. The person receiving the call then hears an audible alert stating the name of the caller and, if he or she wishes to take

the call, responds by tapping the badge and starting to speak.

That highlights a key difference between the 'Star Trek' comm badge and the real-life version: Vocera's implementation allows people to reject incoming calls, rather than having the voice of the caller patched through automatically. ... Allowing badge users to reject incoming calls if they are busy, rather than being connected instantly, was a feature added at the request of the customers, says Mr. Lang.

Vocera's system is particularly well suited to hospitals, says Christine Tarver, a clinical manager at El Camino Hospital in Mountain View, California. It allows clinical staff to reach each other far more quickly than with beepers and overhead pagers. A recent study carried out at St. Agnes Healthcare in Baltimore, Maryland, assessed the amount of time spent by clinical staff trying to get a hold of each other, both before and after the installation of the Vocera system. It concluded that the badges would save the staff a total of 3,400 hours each year.

Nursing staff often end up playing phone tag with doctors, which wastes valuable time, says Ms. Taver. And although people using the badges sometimes look as though they are talking to themselves, she says, many doctors prefer it because it enables them to deal with queries more efficiently. The system can also forward calls to mobile phones; it can be individually trained to ensure that it understands users with strong accents; and it can even be configured with personal ring tones."

Hmm, maybe it's not just a fantasy dreamed up by people with no life, no relations with the opposite sex, and no prospect of having any. It sounds interesting, and apart from everything else, just think of the pranks and jokes that could come out of it!

Orrin Stephen

JOIN ACES !!

To enjoy the benefits of ACES, and ensure that you continue to receive the ACES newsletter and meeting notices, Become a member! Complete the following Information form, and return with payment in the amount \$10.00 (free for Students) to:

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Member Feedback & Recognition

ACES is an organization dedicated to our members and the field of Clinical and Biomedical Engineering. As a member of ACES you are entitled to provide your input into the activities of the committee. Please forward all ideas and comments directly to a member of the ACES Executive. For a list of your executive visit the **ACES Web Page** @ <http://www.aces.ab.ca>

Special Recognition

If someone you know has made an outstanding contribution to the field of Biomedical or Clinical Engineering please nominate that person by sending an email message outlining that contribution to Alex Sackiw. He can be contacted through the ACES website or at president@aces.ab.ca
