

newsletter

Electrical Engineering Students European association

The EESTEC Newsletter is an official publication of the Electrical Engineering Students' European association, issued bimonthly. It reaches students of technology in 30 member universities across Europe, keeping them informed of the association's activities. The Newsletter has a special focus on cultural and educational practices, as well as career opportunities in various countries. It is publically available for downloading at

<<ftp.eestec.org>>

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Founded in 1986, EESTEC is an organisation that promotes the exchange of ideas, and the development of international contacts, between engineering students and companies throughout Europe. EESTEC now has 30 branches in 19 different countries.

LEADING EDGE

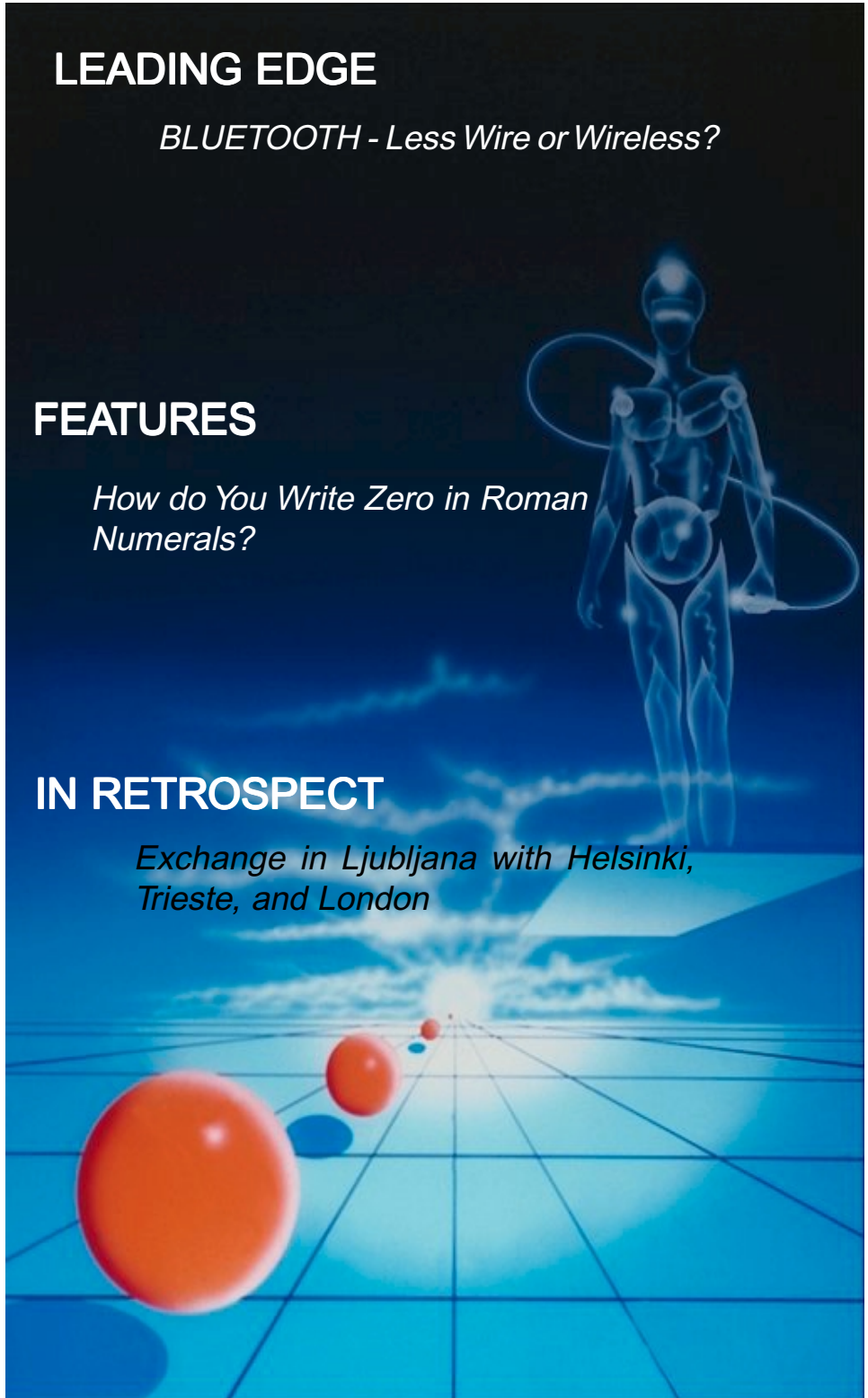
BLUETOOTH - Less Wire or Wireless?

FEATURES

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EDITORIAL

Dear Readers,

The February issue of EESTEC Newsletter features an article by Paolo Cuomo, an EESTEC alumnus, on Bluetooth and its expected penetration into almost every aspect of our everyday life. Zouhair Belkoura, EESTEC Chairman this year, shares with us his experience as a summer intern at McKinsey in Germany.



At the same time, LC London reminds us that the annual EESTEC Congress is nearing. To thank the companies and institutions that help to make the happening possible, the Congress Organising Committee presents the sponsors on page 12. On pages 8 - 9 you can find a profile on the main sponsor of the congress - Philips.

My term as an editor is nearing the end, the March issue of EESTEC newsletter will be the last one I edit. In connection with that, I would like to encourage you to apply for the position at the congress, so if you are interested in the editor's work, please feel free to contact me for information about editor's tasks at editor@eestec.org. I will also present an article featuring the work of an EESTEC Newsletter editor in the next issue.

Enjoy your reading!

Marina Leusko
EESTEC Newsletter Editor

BLUETOOTH - Less Wire than Wireless?

Paolo Cuomo (an alumnus of LCs Aachen and London)

Consider some situations:

- You get back from an EESTEC workshop with all your new friends' telephone numbers in your mobile. Instead of copying them by hand onto your computer or electronic organiser, you just put your mobile next to the other device and they are automatically copied across.

- You drive into a petrol station. The petrol pump automatically recognises which type of petrol it should dispense and the cost is charged to your phone.

- You go to visit your parents and want to call a friend. You use your mobile but the call gets routed automatically via the cheaper fixed telephone line.

You get back from an EESTEC workshop with all your new friends' telephone numbers in your mobile. Instead of copying them by hand onto your computer or electronic organiser, you just put your mobile next to the other device and they are automatically copied across.

ous advantages include the disappearance of cables – for example, the mess of cables coming out of the back of your computer or hi-fi will soon be a thing of the past. More exciting possibilities include automatic updating of information

between personal devices when they come close to each other. However, as well as simply make life quicker and easier, Bluetooth is likely to allow us to do many things that are currently impossible – in fact things that today we can not even imagine we might want to do.

How is this possible?

These are simple examples of what will soon become reality using a new wireless communications technology called Bluetooth. Bluetooth is an international standard supported by over 2000 companies which allows electronic devices to communicate with each other over short distances (10m or 100m). Bluetooth uses the free ISM spectrum band (2.4GHz) so it can be used anywhere by anyone without need to pay or to have a licence. It has a bandwidth of just under 1 Mbps.

Bluetooth is named after 'Harald Bluetooth', a fierce Viking king who ruled Denmark (940-981) and united it with Norway.

Why is Bluetooth important?

Within a few years, Bluetooth chips will be embedded in most new electronic devices. Obvi-

Who thinks Bluetooth is important?

Just about everyone! The Bluetooth Special Interest Group (SIG) was started by Ericsson, Toshiba, IBM, Intel and Nokia and soon joined by Microsoft, Lucent and Motorola. The SIG now includes a vast array of large and small companies who are working closely together to ensure that Bluetooth is a success.

How does Bluetooth work?

Bluetooth sits in the lower layers of the OSI stack and contains 3 main modules:

- *The Bluetooth radio*
This is the actual radio transceiver with range of 10m or 100m depending on the class of the device
- *The link controller*
This is the hardware or software that performs baseband functions such as frequency hopping and baseband encryption
- *The link manager*



This deals with radio channel session management, e.g. link authentication and setup

Any device with a Bluetooth chip can sense other Bluetooth-enabled devices close to it and when relevant, it will set up a network containing it and at least one other device. Such a network is called a piconet and the device which set it up is called a master. A piconet contains one master and up to seven slaves. If a device wants to belong to two piconets it can (providing it is master in only one of them) and a set of overlapping piconets is called a scatternet.

A personal piconet for a businessman could be his mobile (the master), his laptop, his personal organiser and his Bluetooth headset (Ericsson is developing a handsfree kit that uses Bluetooth to connect to the mobile handset instead of a wire!). If a second person entered the room, the businessman's laptop could sense the visitor's personal organiser and create another piconet that would allow information exchange between the laptop and the visitor's organiser.

How do devices recognise each other?

As well as a unique identity code, each device has a profile. Profiles must all be agreed with the SIG to ensure compatibility between devices from different manufacturers. The profile identifies the type of devices and holds the protocols that tell other devices how they should interact with it.

The profile concept is a core part of Bluetooth and work on developing them is one of the reasons that Bluetooth is not rolling out quite as quickly as expected.

So where does the spectrum come from? Bluetooth operates in an unlicensed, unregulated

part of the spectrum at 2.4Ghz. This is called the ISM (Industrial, Scientific, Medical) band and is shared with numerous other unlicensed devices such as cordless phones, remote controlled toys, garage door openers and leaky microwave ovens.

Because of the large amount of 'noise' within this part of the spectrum, Bluetooth has to use sophisticated spread-spectrum techniques. Bluetooth splits the band into 79 1Mhz channels and hops between these 1600 times a second.

The hopping sequence of each piconet is determined by the unique identity of the piconet's master so no two sequences are the same.

Frequency hopping aims to overcome

the problem of other devices transmitting in that frequency space by ensuring that another device will only interfere with the Bluetooth signal 1/79th of the time.

Is it secure?

Bluetooth devices use authentication when setting up a link so that a device can not pretend to be another device. However, this authentication does not confirm the user is who he or she say they are, it only confirms the identity of the device – some people regard this as a potential security risk.

When transmitting, Bluetooth encrypts each packet using a 40bit or higher key. It has variable key length because different governments have laws on what can and cannot be used or export in their country.

Although these measures are relatively robust, the security side of things is one of the concerns some people have about the current Bluetooth specifications.

What about all the other wireless technologies?

There are several other wireless technologies currently being developed or sold. These include IEEE 802.11 (wireless LAN), DECT, Infrared, HomeRF and HiperLAN2. Each of these has advantages over Bluetooth: IEEE 802.11 has a higher bandwidth (11Mbps); DECT has a greater range; Infrared is very cheap.

However, Bluetooth's advantage is that it might not be the best for many specific applications, but it is acceptable for almost anything and once the price drops from the current \$20/unit to \$5/unit it will be cheap enough for almost any application. It will coexist with the other technologies e.g. IEEE 802.11 which will be the mainstay of high-speed corporate wireless LANs but as it becomes more pervasive it will become the most important of all the options.

So what are companies doing about Bluetooth?

A visit to any of the SIG member's web pages will unearth some of their plans for Bluetooth. These all seem pretty mundane and straight-forward, due both to the fact that they want to keep their better

ideas secret and that it is going to take a fair amount of persuasion to make senior executives believe some of the true potentials Bluetooth offers.

Companies, such as Ericsson and Motorola, will make large sums of money for production of the chips and premium prices on Bluetooth enabled mobiles, but the truly win will be those companies who identify a way of using Bluetooth to fundamentally change their industry. For example, if Ericsson's suggestion of using Bluetooth to route calls made on mobile at home or in the office onto fixed telephone lines, will all the mobile operators lose huge chunks of their income? It is a scenario worth considering!

What should you remember about Bluetooth?

Remember the name Bluetooth as estimates suggest that in 2005 there will be 2 billion Bluetooth enabled devices in use around the world. Any of you who move into electronics will be coming across it in the next few years. There will be no area of the industry, from telecoms to automotive to banking that will not see its effect. Even more interestingly, Bluetooth will liven up currently 'boring' areas of engineering through the inability to interact wirelessly with anything – e.g. Bluetooth fridges which can tell the day you are having a party from your electronic organiser and remind you to make more ice! Or the device on your dog's collar which rings an alarm in the house if the dog leaves the garden on its own!

For more information checkout:

www.bluetooth.com

www.bluetooth.net

www.red-m.com

www.ericsson.com



HOW DO YOU WRITE ZERO IN ROMAN NUMERALS?

Internship at McKinsey & Co. Inc. in Germany

Zouhair Belkoura

Well, how do you? I stole this question from a McKinsey advert I saw in my College. I admit, it is rather philosophical compared to the questions one faces while working for them. However, from my experience, it is the type of question I would expect all of McKinsey's Consultants to find interesting and that does in a way represent their perspective. They're broad and open minded people and tend to ask questions few have asked or even thought about. But more on that later.

For those of you who don't know what McKinsey is, and as engineers chances are that you don't: It is a global management consulting firm with 78 offices in 42 countries and about 5-6000 consultants. Please don't take this last number as a guarantee, because I don't remember exactly. To take a closer look at the professional life of a consultant, I worked 8 weeks for them during this Summer and would like to share my views on the firm and on the job with you.

The nature of the work

The projects one can face, working for a firm like this, are very diverse and are a combination of different industries and different economical foci. They can range from strategy to purchasing to marketing and whilst one project is in the automotive industry the next could be in e-business or with a Bank.

Two things, however, can characterise most of the tasks: people and numbers. Other than engineering work, where you go to your customer, fix a product and then go away, the change you try to achieve is less tangible. In order for success it is

necessary to work with people, i.e. with the client and with your team. It is necessary to motivate people, obtain information from them, get them to cooperate, hold efficient meetings and so on, all of which require your interpersonal skills.

However, there is also the analytical part. Whatever the proposed solution might be, it is necessary that it is based on sound analysis and logical reasoning. Numerical skill, and more importantly, logical and analytical thinking is required to achieve this. And the ability to think laterally, i.e. spot things no one has seen, look at the problem from a different viewpoint, is a valuable skill.



Another difference between engineering and consulting is the longer feedback time. You will not immediately see the results of your work and the success of your proposals. However during the project I was working in, I did have the feeling that we were laying the foundation for the client's future success and that we were making a difference.

Apart from having to attend meetings and stick to deadlines, there is a great degree of freedom. The style of work is very output oriented, so in essence one could get away with working 4 hours a day, if the job was done. Sadly, however this was never the case which brings me right to the next aspect.

Downsides

Well, there is a downside to everything and in this job it definitely is the long working hours. They are not a result of peer pressure or anything like that, the workload can simply be so high. Most of my day is spent with client meetings, interviews etc. and only after they'd gone home, the team would start on its work. Another factor is the travelling that adds to the time spent for the firm.

Most of the time is spent at the client's site, which, in most cases, is not where you live. Hence, the weekday evenings, if they happen to be free, cannot be spent with friends or family, but either with your team or in the solitude of the hotel room. I might sound really sensitive saying this, but after a long day, I really would rather go to sleep in my own bed.

So how bad the negative aspects really are, depends on how willing (or reluctant) you are to work long hours away from home.

A lot more positive aspects

Having said all this, I also have to tell you that I would rather do 12 or 14 or 16 hours a day work-

ing in an intellectually stimulating and challenging environment than to work in a company where everyone waits for the clock to strike 5 to go home. McKinsey provides the former situation. With their strive for excellence, they have become one of the top consulting firms in the world. Therefore they expect the best output from everyone and nothing less which posed a challenge in everything I did. After proving my logical and analytical abilities I felt respected by everyone despite my young age and little experience, since in this firm arguments and facts are more important than status and age.

Which is the reason why it is completely acceptable to call anyone in the company and take 5 minutes (or more if necessary) of their time to share some of their expertise with you, no matter if he is a partner and you are just doing an internship. I expect not many firms to work like that.

Leaving salary aside, the greatest benefit of working for McKinsey is the learning process. During the 8 weeks I always found myself in completely new situations, having to quickly learn how to handle them, while I could of course always rely on advice from more experienced consultants. The number of different experiences I made and skills I picked up in this short time is amazing.

This broadly describes the consultants. Everyone I met at McKinsey is open minded enough to always be interested in discovering something new, never stop learning and never tired on hearing a new viewpoint to a topic they already know about.

I wouldn't be surprised if someone there already has come up with a sensible way of writing zero in roman numerals.

If you are interested in knowing more about my experiences, feel free to email me.



PHILIPS

Let's make things better.

Comments from our Employees

Cindy Wong - Software Engineer

"At Philips Semiconductors, hardware and software design engineers work together, developing products which will be in people's homes, cars and offices in the near future. Rather than just producing chips, today we make complete "systems-on-silicon" that require complicated software, tightly integrated with the hardware in ever more innovative products. Working closely together on specific hardware components is a fascinating process, and it's very satisfying to be able to say "my code is part of a real product, not an emulation or part of a large anonymous system".

Even now it gives me a buzz to see my software running in the application it was specifically designed for. One of the things I like best about working for Philips Semiconductors is the variety of work and high level of personal responsibility. I'm currently working as project leader on one project and contributing to another. My manager has always encouraged me to get involved in the projects I find interesting and do what I want to do. Also, being a truly international company, it's possible to work on projects all around the world, meeting people from different countries and cultures, exchanging new ideas and ways of working. It's a highly dynamic environment - one of my colleagues has moved to a new project in a new country almost every two years! At the same time,

because Philips is such a large and stable company, it provides a secure working environment with a wide range of career opportunities."

Hans Peeters - IC Design Methodology Engineer, Design Technology Centre

"Having worked as a design engineer on the architecture of complex ICs for leading edge consumer products, I quickly realised that the CAD tools I used were often a limiting factor in my designs. The old saying may be that "a bad workman blames his tools", but often in IC design, advanced ideas are difficult to translate to silicon due to limitations in tool design and capability. Sophisticated, flexible tools result in faster design times, enabling us to provide extra functionality, giving Philips Semiconductors an edge over its competitors. Philips Semiconductors' Design Technology Centre is dedicated to taking IC CAD technology forward faster, so when a vacancy appeared I jumped at it.

As a Flow and Methodology Engineer, I now work at the cutting-edge of tool and flow development. I liaise with our suppliers, shaping their tools and libraries to meet the requirements of Philips Semiconductors' design teams, so we can be first to market with leading edge, high quality, cost-ef-

fective solutions. My knowledge of IC design is vital - I know the challenges my colleagues face and I now have the ability to apply my experience to solve these problems. My role is very varied: as well as working with customers, suppliers and other flow groups around the world to define and prove complete design flow solutions, I also train colleagues on the new tools and support them in the design process.”

Stephanie Marlow - Test Engineer

“One of the things I like best about test and product engineering (TPE) is that you can grow with a product. You don’t just do the coding once and then move on; you usually stay with a chip throughout its whole life-cycle. For example, I started work on a new high-end TV chip three years ago as the TPE representative in a cross-site development team. Once it was ready to go into production, I wrote the program to test the devices; after

that went to Nijmegen to test the wafers coming out of the fab; and then spent a few weeks in Taiwan, testing the final product at our dedicated facility. It was extremely satisfying following the whole project from start to finish, ramping up production from nothing to a million devices a month in just six months.

Over the past few years the chip has gone through several generations and test platforms, and I’ve helped lift yield from 85 % to 95 % - no small achievement! At the same time, other TPE engineers have started working with the next generation devices and I now work as a team leader, supervising five other engineers working on my family of chips. Philips is a leading player in the TV market, so you know you’re working on cutting edge devices and, as Philips is a global company, there is a vast range of job opportunities - and Southampton is just a great place to live.”

What employees say about working at Philips Semiconductors Southampton

According to the results of a recent survey on employee satisfaction and motivation, there is a

very positive working atmosphere at the Southampton site. The survey was organized by an independent, specialized international research company, which has a large bank of data to allow comparison with other companies in the UK in terms of the following “norms”:

The survey, which was anonymous, achieved a very high response rate of 85 %, adding real credibility to the results - and in virtually all categories, our ratings were above the measured norms. In particular, Philips Semiconductors Southampton scored twice the UK norm in the category “Management support” and 50 % higher than the norm in the category “Performance reviews”; it was also significantly above the norm in “Support from immediate bosses” and “Reward and recognition” categories - in fact, in most areas Philips Semiconductors was a minimum of 10 - 15 percentage points above the norm.

Some specific figures make the position clear:

Departments and people cooperate well together Relationships are likely to be harmonious right up to management level, with 92 % of employees feeling that they can trust people in their department.

Survey results indicate that 95 % believe that teamwork is encouraged and 70 % that it is given recognition. Relationships between management and employees also positive. A full 80 % responded that they could trust PSS management, compared to the UK norm of 43 %, and only 8 % felt they could not. Around 79 % felt that PSS management usually makes fair decisions, with 71 % believing that management communicates its long term strategic direction adequately.

Concerning their immediate bosses, people expressed the same positive feeling, with 80 % reporting that they could trust their immediate superior and 87 % feeling that he or she is receptive to suggestions for change. About 67 % felt their boss is good at developing people’s abilities.

October Exchange in Ljubljana with Helsinki, Trieste, and London

LC Ljubljana

Monday

Our meeting point on Monday morning was the parking-lot in front of our Faculty where we met at 9.45. At 10.00 we had a pleasant meeting with dr. Tadej Bajd, the dean of the Faculty of Electrical Engineering. Later on we saw some of the most interesting laboratories at both faculties, Electrical Engineering and Computer Science.

After all the visits and lunch that we also had on the faculty, we went to International Office where participants were given some instructions and maps of the centre of Ljubljana. They were divided in three groups and sent on a City Rally.

All three groups did well even though they had to count all the stairs at the city fortress' tower and all the front windows of our parliament building.

We had our dinner in a palace called Tunnel where they mostly serve pizzas...

Night life started with a few drinks in Krigl pub and continued in a pub called Fleks...

Tuesday

The day began at 01.00, as we were leaving the Krigl pub. We were heading for the Fleks bar and as we came there we were almost alone inside there.

The real party started at around 2.00, LC London started drinking tequilas with Pero and Gašper, but also LC Helsinki had got things to show and we can say that Johanna is the bravest of them all. The party continued as it was supposed to and later turned into a more romantic form of party.

We left Fleks at 4.30 after quite some drinks. We woke up at 8.30, but couldn't manage to get out of bed until 9.00. We visited Infos and the boys

liked it very much because of the hostesses. Next we visited ELES, where they took us to the control room and showed us everything. At the end of the visit at ELES two new members from Italy joined us. Then we went to eat something at the faculty and the rest of the day was free. We get together again at 19.00, for the dinner. The party continued at 21.00 at Kra Kra, where we partied again until we dropped.

Wednesday

Wednesday morning began as every other morning on this exchange did. The waking up part was almost too hard to handle, and some of us were forced to abandon the plans of having breakfast. The breakfast, that we bought just hours before in a 24 hours shop after a night of partying.

The gathering point was at the "Gospodarsko razstavišče", and after the parking part we continued our way towards the NIL company. At the company they prepared a presentation where we learned that NIL is one of the biggest Slovenian companies providing network based solutions and training services.

Among other things they are also a CISCO partner with a CISCO Golden Partner certificate. We were also interested in seeing some CISCO communication equipment located at their premises in Ljubljana, that was just about to be used over the Internet by a group of students in San Diego in the USA.

After the educational part of the day we continued our way out of Ljubljana. On our way we picked up Kevin and Blas, who managed to miss the morning gathering and stayed in their beds for a little longer, and we stopped for a pizza or two. Our way led us to the Iški Vintgar, just about

20km out of the city. It's a picturesque river valley cutting through the wild Karst region. It was great fun for all of us, especially the overhanging paths, well secured, but still something to wake you up. We also found out, that for the guys from LC London no path was overhanging enough to keep them from taking some pictures of their adventurous hiking trip. But nevertheless we all survived and returned to Ljubljana in the late afternoon.

All beat up we were waiting for the dinner to begin, just the LC London people had to buy some emergency alcohol reserves and a wooden witch as a souvenir. Only for this they had to be driven to the BTC shopping area.

A big dinner for some and time to rest for others followed. The evening gathering point was Prešernov trg in the centre of Ljubljana. While waiting, Terence learned how to count and some other interesting words in Slovenian. He turned out to be an expert on Slovenian language. The party went on in the AS pub until the early morning hours, when we somehow managed to walk our way home and fall asleep.

Thursday

On Thursday we planned a trip to the Karst region. Our first serious stop was at Šepulje at the facilities of Kras, where they produce dried ham and other sorts of meat.

We had to dress in special clothes in order to take a look at the production of meat. It was a new and modern production facility. After that they had let us to taste some of their dried ham and although we were many, we couldn't eat all that.

Later on we went to the Škocjan caves, which proved themselves again to be really beautiful.

We stopped at an inn, where we had a typical Slovenian farmer's dinner.

The next stop was Pero's weekend cottage, where it was meant mostly to sleep, as party followed the next day.

Friday

The day woke up in a beautiful morning and we left the cottage at the hills and went to the valley to buy some food.

We headed towards North to the Soča valley, where we stopped to take a look at the beautiful Soča river, the mountains and the 1st World War museum.

Further we stopped at an Alpine high-altitude road pass, where we stopped to have lunch: we ate the "jota", a typical Slovenian dish.

Because it was getting dark, we continued our journey to Pokljuka, where some of our EESTEC people were already expecting us. After some preparations Andrej cooked dinner, which was exquisite. We organised a farewell party later on and received some gifts.

Saturday

The majority of the participants left Slovenia already on Saturday. So we planned the farewell party for Friday evening. Almost all EESTEC-ers left Pokljuka early on Saturday morning, after a sleepless night.

Drivers Andrej and Pero met other Slovenians and foreign students in Bled. They have eaten a pizza and had a cop off coffee, which they needed.

During the sight seeing they enjoyed sunny weather. Gasper and I stayed on Pokljuka breathing fresh air and preparing for the last evening. After the vans with students arrived back, we were having a dinner in "balcan way" with pleskavica, steak, ajvar,... Happy that we managed to run the exchange to the end, we spend the last night more or less sleepless again.

In the morning we only have to clean the cottage and after all, relax enjoying quiet Sunday afternoon. We got some organizing skills again and I hope we will manage to organize some more events like the Slovenian Exchange 2000.

CONGRESS - News from LC London

Dear EESTECers,

The Congress registration form is now ready. Please register on-line (<http://www.ee.ic.ac.uk/eestec>) as soon as possible. When you write telephone numbers, please include the country and area codes.

Unfortunately, we can only afford 2 people / LC + VIPs. If we get more sponsorship, we will increase it to 3 people / LC, but this is quite unlikely.

Another issue is that the congress is set to start on Sunday 25th March, however, for practical reasons, we are thinking of bringing it forward to Tuesday 20th March.

We will let u know as soon as we know if it's OK with the accomodation, companies etc...

We would like to thank our sponsors for providing us with financial support to hold Congress London 2001:

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We would also like to thank the following organisations for supporting the event:

City&Guilds College Association
Old Centralians Trust



Institution of Electrical Engineers



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*<http://www.eestec.org/
mailguide.html>*

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EESTEC is represented in its member cities through Local Committees. The association's head office is located in Zurich, Switzerland. Please contact your LC regarding all matters at a regional level. Please contact the board for all international matters.

LETTERS TO THE EDITOR

Dear EESTECers,

I would like to encourage you to apply for the position of EESTEC Newsletter Editor at the congress in London. To do the job you do not really need to have any special publishing skills, although familiarity with professional publishing software might prove helpful in your work. The job is not only a great way to learn to use the software (if you've never come across it before), but also a fantastic opportunity to become pen pals with many great EESTECers all over Europe, who write for the magazine.

To take this job also means to take the responsibility of making each issue appear as planned (despite late at times...) and test your organising skills in the most extreme conditions. Although a challenge at times, being an editor is a great experience that pays off real big in the end!

*If you are interested in the job, please feel free to write to me for detailed information at *editor@eestec.org*.*

I am looking forward to hearing from you!

Best wishes,

*Marina Leusko
EESTEC Newsletter Editor*

CALENDAR

March 25 - April 1

**LC London
Congress**

April 29 - May 5

**LC Paris
Exchange**



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