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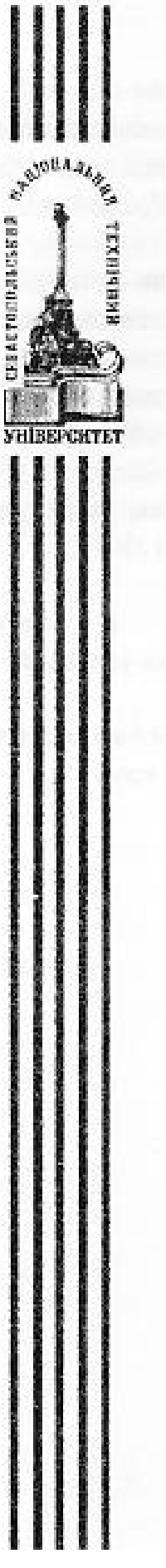
Севастопольский национальный технический университет



СБОРНИК ТЕКСТОВ

к практическим занятиям по дисциплине "Технический перевод" для студентов III-IV курсов специальности 0305 "Филология" и студентов специальности 0701 "Физика" 0908 "Электроника", 0907 "Радиотехника" продвинутого этапа обучения

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Сборник текстов к практическим занятиям по дисциплине "Технический перевод" для студентов III-IV курсов специальности 0305 "Филология" и студентов специальности 0701 "Физика", 0908 "Электроника", 0907 "Радиотехника" продвинутого этапа обучения. Часть II / Сост. Стеценко В.А. – Севастополь: Изд-во СевНТУ, 2006. - 40 с.

Целью сборника является развитие умений и навыков речевой деятельности в процессе изучения лексического материала по специальности, повторение и закрепление пройденного материала.

Сборник текстов утвержден на заседании кафедры Практики романских и германских языков (протокол № 2 от 27.09.2006г.)

Допущено учебно-методическим центром и научно-методическим Советом СевНТУ в качестве методических указаний.

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СОДЕРЖАНИЕ

ВВЕДЕНИЕ

Сборник текстов к практическим занятиям по дисциплине "Технический перевод" для студентов III-IV курсов специальности 0305 "Филология" и студентов специальности 0701 "Физика", 0908 "Электроника", 0907 "Радиотехника" продвинутого этапа обучения для:
- развития умений и навыков речевой деятельности (аудирование, говорение, чтение);
- изучения лексического материала по специальности;
- повторения и закрепления пройденного материала;
- развития коммуникативных навыков и умений.

Сборник текстов состоит из 8 уроков. Каждый урок включает в себя:
- новые слова и выражения из текста;
- текст на английском языке;
- послетекстовые упражнения: тренировочные, контрольные.

1. LESSON 1. Keep the Juice Flowing Smoothly to Your PC

Words and combinations:

juice – (sl.) electricity or electric power
picky – extremely fussy or finicky
to subsist on – to remain alive, as on food
erratic – in an unpredicted fashion, not fixed, wandering
to black out – to extinguish as from a power failure
circuit – the complete path of an electric current
surge – a transient sudden increase of electric current
to course – to run or go speedily
specification – description of work to be done and materials to be used
to be prone to – to have a tendency to
to fend off – to keep or ward off, repel
vulnerable – open to attack, susceptible to wounds
a feature – a specifically prominent characteristic
to trash – to make useless or worthless
pitfall – a drop, any danger for the unwary
to pinch pennies – to be stingy or sparing with
specs = specifications
concurrently – operating at the same time
wattage – amount of electric power in watts
to be rated to – to be classed, to get a relative rank or class
demise = death
to give up the ghost = to peg out
fan – a device (usually electrical) for producing a current of air for cooling smth.

TEXT

KEEP THE JUICE FLOWING SMOOTHLY TO YOUR PC

You wouldn't think to look at them, but PC's are picky eaters. They subsist on a diet of uninterrupted, precisely regulated electricity. Provide too little power, and your system behaves erratically or completely blacks out Provide too much, and its tiny circuits – each 1/400th the width of a human hair, or thinner – are permanently fried. Here's how to ensure that your computer is properly nourished.

Safety first

The biggest threat to your PC's survival is a sudden increase – or spike – in the amount of electric current flowing to it. Normally, your PC's power

supply controls the flow of electricity from the wall socket into the system. But a fallen power line or nearby lightning strike can easily overwhelm the power supply and send a mortal surge of electricity coursing through your motherboard.

Safeguard your computer with a high-quality surge protector. Expect to spend at least $20 to $30, cheaper models probably won't provide the shielding your machine needs. The surge protector should meet the Underwriters Laboratories' UL 1449 specification (most will state this on their packaging).

If your area is prone to electrical storms or other power fluctuations, get a surge protector with an indicator light to confirm that the unit is working properly. Many surge protectors lose their ability to guard against excess current after a single high-voltage surge. Since the unit still provides power to your PC, without an indicator light there's no way to know whether the device has lost its ability to fend off surges. Note that some surge protectors, such as Kensington's $40 Smart-Sockets tabletop unit (find.pcworld.com/32777), have an audible alarm to indicate when a surge has damaged the unit.

Don't forget your phone lines. Your modem and telephone are just as vulnerable to power spikes as your PC is. You can buy a phone-line protector separately or as a feature of your surge protector.

Providing too little voltage to your PC can be as bad as providing too much. A sudden absence of power can trash unsaved data or damage important system files, both of which can be devastating to a business. To avoid these pitfalls, install an uninterruptible power supply.

When the power goes out, a UPS provides sufficient operating current to your PC (usually no more than 10 minutes' worth) for you to save your data and properly shut down the computer. UPSs often come with software that automatically does this for you if you're not around.

Many UPSs cost less than $100 American Power Conversion (www.apc.com) offers a wide selection of affordable power-protection products, including the $40 Back-UPS ES 350VA.

But don't pinch pennies. A UPS must be able to meet your PC's power needs. Before buying, check the UPS's specifications for maximum running time and wattage values, and compare them with your PC's wattage requirements (see below). And be wary: Some UPS vendors state the run time for a "half load," or half the wattage load listed in the specs. Rarely are all the components of a PC running at full speed concurrently so a UPS vendor's claim to keep your PC running for *x* minutes is based on a PC's usual power load, not its rated maximum.

It's watts you need

How many watts does your system use? Some PCs are power-hungry beasts, especially if you've added a second hard drive, a CD-RW drive, more memory, or other extra hardware to your system's original configuration. To calculate your computer's wattage needs, add up the individual wattage requirements for all its components, including the motherboard, expansion cards, optical drives, and hard drives. Your PC's documentation should provide some of these numbers, but FIGURE 1 lists the typical wattage values for common PC components. Once you have a total for your PC, add a 30 percent safety factor – multiply your calculated wattage by 1.3. Make certain the UPS you buy is capable of providing this level of power to your system for a minimum of 6 or 7 minutes.

And while you're calculating wattages, confirm that your PC's power supply is capable of providing sufficient wattage to your PC. With luck, the power supply's wattage rating is indicated on the back of your PC. If it isn't there, open your PC and look on the power supply itself. Note that many power supplies include their maximum wattage in their names, such as the pictured PC Power and Cooling Turbo-Cool 510 ATX-PFC, which is rated to 510 watts.

An overwhelmed power supply may not be able to keep adequate current flowing to your PC's components, and that can mean error messages, strange behavior, or even system shutdowns. But instead of those obvious signs of trouble, an overworked power supply may just pump extra: heat into your PC, speeding up the system's aging process and pushing your PC's components to an early demise.

POWER ACCOUNTING

COMPONENT	Typical wattage range
CPU	
Celeron	15-20
Pentium II, III	20-30
Pentium 4	40-60
AMD Athlon	40-50
Motherboard	20-30
128 Mb of RAM	10-15
IDE hard drive	5-15
SCSI hard drive	20-35
Floppy drive	5
Optical drive	15-25
Zip drive	10
Graphic Card	

2D	5-10
3D with 16Mb RAM	20-30
Sound Card	7
Additional PCI Card	5

FIGURE 1

If you suspect your power supply may be about to give up the ghost, replace it. PC Power and Cooling (www.pcpowerandcooling.com) is a good source for quality power supplies.

Here are common power-problem warning signs:

A dead PC: You flip the power switch and get nothing – no fan noise, no hard disk noise, and no image. If your PC is plugged in and the wall socket is live, you probably need a new power supply.

No fan noise: If your power supply's fan stops, check for obstructions like dust or paper. If it won't start, replace your power supply immediately.

The smell of smoke: If a burning odor is coming from your system, there's a good chance it's your power supply. Open your PC and sniff around for the source. If the cause isn't obvious, shut the PC down, wait several minutes, and then restart.

Noisy hard disk but no picture: If this happens when your PC isn't in a power-saving mode, electricity may be reaching the hard disk but not the motherboard. Check inside your case to see if the power connector attached to the motherboard is loose. Otherwise, you may need a new power supply – or a new motherboard.

EXERCISES

1. Find in the text the English equivalents:

вести себя непредсказуемым образом; крошечные схемы; питать должным образом; скачок напряжения; электроток; блок питания; электрическая розетка; удар молнии; предохранить; сетевой фильтр; дешевая модель; настольный; блок бесперебойного питания; установить; рабочий ток; сохранить информацию; потребляемая мощность; шум вентилятора; жесткий диск; отключить ПК.

2. True or false?

1) PCs are picky eaters.
2) Spikes are very dangerous for computers.
3) A surge protector is an electric mincer.
4) An uninterruptible power supply provides operating current in case of emergency.
5) Some PCs are power-hungry beasts.

6) To calculate wattage needs you have to add up your age, weight and body temperature.
7) The power supply has no fat at all.
8) An overworked power supply may pump extra heat into a PC.
9) The power connector of the motherboard must be attached.

3. Answer the questions:
1) What's a spike?
2) What controls the flow of electricity to a PC?
3) How much may a surge protector cost?
4) Why is it desirable to have a surge protector with an indicator light?
5) Can a single high-voltage surge knock out a surge protector?
6) Why is it bad to provide too little power to a PC?
7) What's a UPS?
8) What should be kept in mind while buying a UPS?
9) How are the PC wattage needs calculated?
10) What are common power problem warning signs?

4. Translate orally, and make it fast:
разборчивые едоки; существовать (жить) на; erratically; отключиться; точно отрегулированное; tiny circuits; properly nourished; threat; электроток; power supply; стенная розетка; "пробить" блок питания; смертельная волна; safeguard; сетевой фильтр; соответствовать спецификации; световой индикатор; excess current; to fend off surges; настольное устройство; повредить системные файлы; ловушка; UPS; рабочий ток; software; доступные (по цене); рабочее время; мощность; максимальная нагрузка; требования; wattage.

5. Write the summary of the text.

2. LESSON 2. Weathering the Storm

Words and combinations:
geomagnetism – magnetism of the earth
sweep across – to move over with speed and force
expanse – a broad extent
crimp – to cause to become crinkled, wavy, or bent
matriarch – a woman who rules a family, group, etc.
substorm – secondary (minor) storm

to dump – to let fall in a mass, unload
joule – [dʒu:l] – unit of energy or work
earth-bound = land based
space-borne = flying in space
whim – a sudden wish, desire, or change of mind, caprice
random – chance, haphazard
dipole – [dipeul] – type of antenna
to snag – to catch on, to snatch
momentum – the force which a moving body has because of its weight and motion
tadpole – a larval frog or toad with tail and gills
onset – attack, beginning
dissipation – dispersing, scattering, or dissolution
scalable – possible to be sized in proportion to the size of the actual thing
propagate – to cause to spread
to wreak havoc – to destroy or injure
grid – grating, network
to fold – to embrace, to lay one part over another
crucial – vital, essential
NCSA – National Center for Supercomputer Applications
Simulation – created effect or appearance

TEXT

WEATHERING THE STORM

From 60 to 60,000 miles above our heads, the earth's magnetic field is king. In this region, known as the magnetosphere, geomagnetism dominates the physics of the processes that take place. But, as any chess player can tell you, a king often lives and dies at the caprice of other subjects. A queen can sweep across the expanse and really crimp his style. Our solar system is no exception, as our matriarch, the sun, constantly influences the earth's magnetic field.

Magnetospheric substorms, brought on by solar activity, can dump quadrillions of joules of energy into the earth's upper atmosphere in about a half an hour. And these substorms occur two or three times a day.

Using the Alliance's SGI Origin2000 supercomputer at NCSA, a team of physicists is modeling the fine points of this cosmic chess match, building facsimiles of real substorms based on data from earth-bound and space-borne instruments. The team includes Michael Wiltberger and John Lyon of Dartmouth College, Charles Goodrich of the University of Maryland, and

Tuija Pulkkinen of the Finnish Meteorological Institute in Helsinki. Their work is delivering some of the first realistic global views of substorms in progress. It will also prove critical in the ever-progressing field of space weather forecasting.

Whims of the solar wind

A continuous flow of ionized hydrogen and helium — the plasma of solar wind — blows through space at about the speed of sound, carrying the sun's magnetic field with it. This field varies randomly, unlike the earth's field, in which magnetic field lines connect the north and south poles in a simple dipole. If plasma with an opposite flow hits the magnetosphere and is powerful enough, it seriously disrupts the magnetosphere. Some of the earth's field Lines break, causing a substorm.

A magnetospheric substorm has three distinct phases: growth, expansion, and recovery. In the growth phase, the solar wind introduces stress into the system. During this phase, the earth's broken field lines merge with the sun's magnetic field carried by the solar wind. These "open field lines" are, in effect, the snagged ends of magnetic field lines from one of the earth's poles that connect instead to one of the sun's poles. Through them, energy and momentum transfer from the solar wind into the tadpole-shaped magnetosphere.

"As the stress increases, the system has to do something. What you get is an explosive release of energy and a magnetospheric substorm," says Wiltberger, an assistant research professor of physics and astronomy at Dartmouth. This release marks the beginning of the expansion phase, in which the open field lines reconnect to their appropriate poles on the earth. After the release of energy, the system slowly returns to normal during the recovery phase.

"One of the canonical questions in the study of magnetospheric storms is whether reconnection is the cause or the consequence of substorm onset," he says.

Connecting with reconnection

The answer to the chicken-or-the-egg puzzle of when reconnection occurs largely remains a mystery. As in previous studies, this international research team has seen large energy dissipation at substorm onset, as well as smaller, localized dissipation over time throughout the magnetosphere. Yet, because it is difficult to identify unique reconnection sites in computer simulations, no one has been able to tie reconnection events to these dissipations.

"Modeling the reconnection process in 3D is complex. But we do know that it doesn't resemble what is seen in traditional 2D models. Determining detailed boundary conditions for the location and intensity of reconnection sites would require a whole host of additional simulation runs," says Wiltberger. The team has been able to simulate the size, relative strength, and location of active reconnection regions, though, offering 3D simulations to track the density, heat, flow, and magnetic field direction of substorm plasma.

The simulations require about 12 hours to simulate six hours of magnetospheric activity on 16 processors of the Origin2000. The 3D magnetohydrodynamics code used by the team is an adaptation of a vector code with parallel directives written into the software, and it does not scale well beyond 32 processors. Beta testing is underway of a highly scalable version of the code that relies on the common message-passing interface. This new code will allow the team to take advantage of newer systems like the commodity-based Linux terascale clusters at NCSA.

But the code is already helping to settle an ongoing debate in the study of magnetospheric substorms. Currently there are two schools of thought on where, not when, reconnection takes; place. In the near-earth neutral line theory, reconnection starts about 30 earth radii out into the tail of the magnetosphere. In the competing current disruption theory, reconnection starts only about eight earth radii behind the planet and propagates away from the planet. Though there was some instability in the eight earth radii region, the research team saw that reconnection regions in their Origin2000 simulations never came much closer than 20 earth radii into the tail and that the reconnection process propagated away from the earth from there.

Verifying those results, however, will require more simulation runs. "Models of just a few events do not a theory make," as Wiltberger says.

Should we talk about weather?

Though the simulation results are tools in themselves for understanding the nature of the magnetosphere and its substorms, they are also part of the larger National Space Weather Project of the National Oceanic and Atmospheric Administration (NOAA), the Department of Defense, NASA, and the National Science Foundation. One of the space weather project's primary goals is to predict magnetospheric storms.

These bigger, less frequent disruptions to the magnetosphere can wreak havoc on communications systems and can black out power grids. A half-century ago, for example, current from a particularly nasty magnetospheric storm not only entered and interfered with telegraph systems but even melted telegraph keys at the ends of some lines, according to the Space Environment

Center operated by NOAA and the U.S. Air Force. More recently — in 1989 — a storm-induced blackout left about eight million Canadians without power. Today the outage of a single commercial satellite costs about $1,000 per minute in lost revenue.

To forecast magnetospheric storms and other space weather in the vicinity of the earth, researchers need to model the behavior of other systems that cause and are influenced by magnetospheric storms. Magnetospheric substorms, which occur independently as well as during magnetospheric storms, are just one piece of this puzzle. Space weather prediction also requires good models of things like the solar wind and the earth's upper atmosphere. Without an all-inclusive model in which subsystems work together seamlessly, no one will be able to forecast when a storm might start, how it might progress, and what impact it might have.

So right now, the goals of the team using NCSA's 0rigin2000 are twofold: perfect the substorm model itself and begin folding it into a larger, comprehensive sun-magnetosphere-ionosphere model.

"We need to fully understand the fundamental magnetospheric response during storms and substorms," Wiltberger says. "But even when that is perfected, the larger, coupled space weather system will be crucial. Without an overall modeling system, we would have a leadtime of about 45 minutes. It would be like seeing the dark cloud overhead and predicting rain."

This research is supported by the National Science Foundation and NASA.

EXERCISES

1. Find the English equivalents in the text:

подданные; магнитное поле; солнечная активность; сбрасывать; верхние слои атмосферы; наземные приборы; прогноз погоды; космического базирования; прихоть; меняться произвольно; простой диполь; вызывать возмущения магнитосферы; расширение; восстановление; сливаться (смешиваться); в форме головастика; взрывное освобождение энергии; начало; рассеивание; трехмерное моделирование.

2. True or false?

1) The sun doesn’t influence the earth’s magnetic field.
2) Energy is measured in square liters.
3) Substorms can be simulated.
4) The solar wind blows only in the summertime.
5) A magnetospheric substorm has 3 phases.
6) 3D models are very different from 2D ones.

7) Processors are used to simulate magnetospheric activity.
8) The simulation results are used in a number of programs.
9) Communications systems are very vulnerable to magnetospheric disruptions.
10) An all-inclusive model can be very helpful.

3. Answer the questions:
1) What's the magnetosphere?
2) What triggers magnetospheric storms?
3) Where do physicists get data from to model cosmic phenomena?
4) What's the plasma made of? Is it an organic matter?
5) Can you unravel the chicken-or-the-egg puzzle?
6) Why do they use so many processors to simulate magnetospheric activity?
7) How many models are required to make a theory?
8) Why is it necessary to predict magnetospheric storms?
9) What does "seamlessly" mean?
10) What are the current goals of the team using NCSA's Origin 2000?

4. Translate orally and look smart:
реакция магнитосферы; общая система моделирования; crucial; упреждение; crimp; solar activity; to dump; создавать факсимиле (копии); space weather for casting; whim; со скоростью звука; поток; отчетливые фазы; energy and momentum transfer; фаза расширения; соответствующие полюса; фаза восстановления; energy dissipation; boundary conditions; software; масштабная версия; теория нейтральной линии; распространяться; simulation; неустойчивость; подтверждение результатов; tools; instruments; отключить; to wreak havoc.

5. Make up the summary of the text and retell it.

3. LESSON 3. Supercomputing to the Rescue

Words and combinations:
to perch – to rest or set on
viable – capable of living or growing
to fit in – to be of the right size or shape for
NCSA – National Center for Supercomputing Applications
to simulate – to assume the appearance of
rescue – freeing or saving from danger, captivity, etc.

mandatory – obligatory, a must
site – the location of a place
dropped call – disconnected / disrupted call
exemplar – a model or pattern to be imitated
legacy – anything handed down from the past
to hand off – to relay, to pass along
flux – continuous change
susceptible – especially liable to some influence or agency
to overwhelm – to get better of, to suppress
to anticipate – to foresee and act in advance of
to initiate – to begin or set going
to execute – to fulfill, to carry out
drive – a vigorous effort toward a goal
downtime – saved time
to plague – to annoy unremittingly (bother, trouble)
crucial – involving a final and supreme decision
to draw upon – to get or receive, as from a source

TEXT

SUPERCOMPUTING TO THE RESCUE

Motorola began testing its first mobile phone, called the DynaTAC, in the early 1970s. It was a monster, weighing in at two and a half pounds. The battery life was quite a burden, too – 10 hours of charge time earned you only 35 minutes of talk time. The test phone used a single cell site perched atop a Manhattan skyscraper. Although DynaTAC was still 10 years from being commercially viable and other companies were building mobile phones, Motorola did win a critical race within the industry. In 1976 the company was granted a patent for the first practical cellular telephone system.

Today, cellular communication is a $40 billion industry. There are more than 110 million cellular subscribers in the U.S. alone. And the phones fit in your pocket.

In May the NCSA Private Sector Program presented its 2001 Industrial Grand Challenge Award to Motorola's Jeff Bonta as he continues this tradition of innovation. The annual Industrial Grand Challenge Award honors breakthrough research enabled by a private sector partner's relationship with NCSA — research that will help ensure America's continued leadership in global business.

Bonta used thousands of hours on the Alliance's SGI Origin2000 supercomputer at NCSA to simulate real-world cellular systems. This work

resulted in a new method of saving calls at risk of being disconnected. Known as rescue channels, this method will be part of the next-generation industry standard that will govern digital cellular systems in the United States and parts of South America and Asia. Rescue channels will be mandatory in all handsets, and – in an unprecedented move by the standard – setting body-they will also be mandatory in site equipment.

"If we were to actually go out and drive around the cities trying to capture enough data to be able to properly analyze the root causes of dropped calls, I'd be old and retired before we could get enough of that information," says Bonta, a senior member of the technical staff at Motorola. "By modeling cities on a supercomputer, I can run the simulation for 20 minutes of real time on 32 processors, and I can get the answers I need from a fairly busy system within 12 hours. If I had to run the same thing on a single processor system, it would be well over a week."

Legacy of collaboration

Motorola has been a member of NCSA's Private Sector Program since the late 1980s. Six years ago, another group of Motorola researchers received the Industrial Grand Challenge Award. In 1995 Gerry Labedz and his team developed massive computer models of early digital cellular networks using NCSA supercomputing resources and visualization software. The full-motion simulator, known as CMS, models cities configured with digital cellular infrastructure and mobile devices. It allows researchers to look at the radio connections between hundreds of cell sites and mobile units. Using the data produced, the researchers can evaluate system performance and call quality.

Bonta used CMS in the development of rescue channels.

"As we developed CMS, we realized that we were understanding the physical reality but that we needed to improve it. Improvements meant solving problems, getting rid of errors in the system," says Labedz, a principal member of the technical staff and Dan Noble Fellow at Motorola. "And that's where the rescue channels work comes in. Jeff was able to build a model from an idea that showed that his idea was really going to work without having to introduce it into a real, complicated cellular system."

"Motorola is an exemplar of what a company can do as a part of the Private Sector Program," says Dan Reed, NCSA's director. "For more than 10 years in the program, using a whole succession of computer technologies at NCSA to develop generations of new products, Motorola has gained advantage in the marketplace. Rescue channels are only the most recent fruit of this long legacy of collaboration."

Rescue channels explained

To understand rescue channels, you first have to understand how calls are handed off from one tower to another in a traditional cellular system; When a cellular call is established, the subscriber's mobile is connected to a cell station or tower over a radio channel. As the mobile unit moves through an area, the quality of its connection with this station is in flux. The mobile constantly monitors signals from other stations, looking for a new station that might provide a better signal.

If the mobile finds a neighboring station that provides a better signal, it requests a "hand off." In a hand off, the mobile sends a message to its original station saying that it has found a neighboring station that it would like to switch to. The original base station sets up a radio channel on the new station and gives the mobile permission to switch to that channel. The mobile then has a new, better connection to a new station, and the subscriber's call continues.

However, this system of handing calls off is susceptible to failure.

As the signal to the original station becomes weaker, interference can interrupt communication between the mobile and the station. If the mobile's request for a hand off does not reach the station or if the new channel information does not reach the mobile, interference can overwhelm the signal. The call can be dropped.

"Rescue channels allow the system to prepare for what might be inevitable. In any cellular system, there is going to be some level of interference. What we try to do is get the system to anticipate what might happen and make plans for getting around that particular problem," says Bonta.

With rescue channels as a part of the system, the base station and the mobile agree ahead of time on what to do if something goes wrong. Rather than waiting until the signal is weakened, the mobile and the station establish rescue candidates at the beginning of the call and any time there is a hand off during the call. Channels on neighboring stations are reserved for the mobile before a hand off is necessary. And – in a further improvement over the current system – the mobile is empowered to select the station to which it will hand off. It can even initiate that hand off on its own.

That way, even if interference overcomes the original signal, the mobile can make the switch to the new station on its own – the channel has already been reserved, permission has already been granted, and a substantial number of calls are saved.

This elegant solution takes less than a second to execute, requires no changes to physical infrastructure, and is totally transparent to the customer.

No more 'Are you there?'

Bonta's rescue channel concept is part of the larger 5NINES initiative underway at Motorola. 5NINES – as in 99.999 percent end-to-end service availability – is a companywide drive to make cellular service more reliable than your home phone. This goal will translate into about five minutes of downtime per year for a customer and will effectively eliminate the most common question plaguing cellular communication. No more "Are you there?" shouted into your mobile as you drive along.

5NINES is crucial to the company's future competitiveness, and it will require continued support from NCSA and the Alliance.

"Some time ago, Motorola learned that it couldn't do it all," says Dennis Roberson, Motorola's Chief Technology Officer. "There are expertise areas that should be drawn upon instead of developed within the company. The simulation and modeling capabilities of NCSA in both their human manifestation as well as their manifestation in computational power and infrastructure really do provide Motorola with a great partnering opportunity.

EXERCISES

1. Find in the text:

испытывать; весить; время зарядки; жизнеспособный; связь; абонент; моделировать; обязательный; прерванный вызов; разработать; программное обеспечение; оценивать; работа системы; решать задачу; внедрять; сложный; образец; постоянно меняться; обеспечить; помехи; усовершенствование; донимать; конкурентоспособность.

2. Fill in the blanks:

1) Bonta used thousands of hours on the supercomputer to ____ real-world ____ systems.
2) In 1976 the company was ____ a patent for first practical ____ telephone system.
3) ____ channels will be mandatory in all handsets.
4) I can ____ the simulation for 20 mins. of red time.
5) In 1995 Gerry Labedz and his team ____ massive computer models of early digital cellular ____ using NCSA supercomputing resources and visualization ____ .
6) When a cellular call is ____ , the subscriber's mobile is connected to a ____ or tower over a radio channel.
7) The call can be ____ .
8) In any cellular system, there is going to be some level of ____ .

9) Channels on ____ stations are reserved for the mobile before a ____ is necessary.
10) This elegant solution ____ less than a second to ____ .

3. Answer the questions:
1) What's the charge time of a modern phone?
2) Why are rescue channels that important?
3) Why did they use a supercomputer to model cities?
4) What's the full-motion simulator?
5) Could you explain what "to hand of calls" means?
6) Why can a call be dropped?
7) Does handing-off take much time?
8) Is your cell phone (if any) more reliable than the home one?
9) What does "to plague" mean?

4. Translate orally and look lively:
спасение; весить; battery life; время зарядки; talk time; жизнеспособный; помещаться в кармане; прорыв; абонент; to result; to save calls; mandatory; dropped call; разработать; сеть; передвижные устройства; оценить; to improve; решение задач; to get rid of; радио канал; to monitor signals; постоянно меняться; permission; прервать связь; помеха; to overwhelm; переключить; to anticipate; досаждать.

5. Write a summary of the text. Retell it.

4. LESSON 4. Your New PC: Be Very Afraid

Words and Combinations

specs = specifications – a detailed description of materials, measurements etc.
out-of-box – appearing unexpectedly
Pandora – (Class. Myth.) the first woman on Earth, opened a box holding troubles
to stumble – to trip or stagger, to make a slip or blunder
to pop up – to come or go suddenly
to ship – to transport
HP = Hewlett Packard
to freeze (froze) – to become hand or rigid (because of cold), immobilized
camcorder – video camera
to flounder – to struggle clumsily or helplessly

to fiddle – to make fussing movements, to trifle or waste time
slick – smooth and slippery (in manners, speech etc., but shallow)
teeth – gritting-torturing, annoying
to rush-out – made up hastily
to urge – to try to persuade, to impel or move to some action
sapping – weakening or destroying insidiously
to fend for – to shift or provide
predation – a relation between animals in which one organism feeds on others
miscreant – behaving villainously
explicit – clearly stated and defined
to expire – to lapse or terminate, as a contract
galling – bitter or severe
billboard – advertisement board, usually outdoors
to hawk – to peddle, to offer for sale by calling aloud in public
to figure out – a) to understand, b) to solve
niggling – fussy or fastidious

TEXT

YOUR NEW PC: BE VERY AFRAID

You see computer prices dropping. You see specs improving. You start thinking it's time to buy a new machine. But lost in the numbers and the endless lists of features is what hardly anybody can bear to discuss for fear of apoplexy: the worst "out-of-box" experience since Pandora's.

At least her box had Hope at the bottom; with PCs, you have to bring your own. Lately I stumbled into the greatest run of bad computer luck I can recall: Four desktop computers in a row revealed problems less than an hour out of the box. One Dell machine sounded interesting – until I discovered that the onboard surround-sound system wouldn't work and that Windows was positive that no sound capabilities actually existed on the machine.

Next, the Case of the Dead Mouse. When another Dell machine booted up, it displayed a video mode so inappropriate that Windows popped up a message recommending it be changed. Windows should have been able to do that on its own, but it didn't. And I couldn't, because the mouse wouldn't move the cursor, not even to the Start button to – yes – shut the machine down.

Eventually Dell diagnosed the two problem PCs. Restoring the sound involved correcting a misconfigured setting from a panel you can access only at startup – if you know the secret key to press. Restoring the mouse was a matter of replacing it with an old-style PS/2 model; for unexplained reasons

the USB mouse that shipped with the computer wouldn't work with the old-style PS/2 keyboard that came in the same box.

The first time an HP Media Center model booted, it refused to recognize the cabled Internet connection. A reboot solved that problem, but the unit turned into the Machine That Would Not Turn Off. Twice the Media Center software froze so hard I had to hold down the power button to restart the computer.

My Apple experience was better but not trouble-free. I tested a new iMac G5 by editing video from Sony's new high-definition camcorder with iMovie. It worked, but when I tried to use the Help system, its screens came up blank. After some floundering and fiddling, I eventually got them to deliver the information I'd been looking for, instead of windows of white.

But at least Apple provides OS X users a slick feature called Setup Assistant, which lets you move everything from an old machine to a new one quickly and painlessly. Switching from one Windows machine to another is a time-wasting, teeth-gritting task. You can transfer your files and some settings relatively easily, but thanks to unintelligent design, you generally have to reinstall your software, which can create any number of headaches – even if you can find the original disks you need to do the job.

Computer makers are so accustomed to delivering unfinished products that you never know what's going to be missing from the box. Nowadays the manuals you get are little more than internationalized posters that leave you puzzled over which hole gets the plug from your speakers. And it's up to you to download all the software patches and fixes developed since the machine left the factory — an annoying experience over broadband, an infuriating one over dial-up.

A friend who bought a Mac mini not long ago was handed a disk with the then-new Tiger version of OS X and instructed to install it himself. Despite Apple's pride in the tight integration between its hardware and software, the company wasn't about to upgrade all the old machines on the shelves when a supply of free labor — customers — was readily available. After that, of course, came the inevitable online upgrade of bits that didn't make it onto the rushed-out CD — a long download followed by a reboot, and sometimes an additional download and reboot or two to get stuff enabled in the previous cycle.

At least new Macs urge you to use their Software Update program right away. Windows machines have so many update options that you can't be sure when, how, or even if updating will happen — though you can be sure you need it when you start your new machine and at least once a month thereafter, and you can expect a productivity-sapping reboot will be involved. But

"automatic" does not mean "instant"; if you let the machine fend for itself, the new bits may not arrive for a day or more. That's a long time to wait to protect yourself from the predations miscreants have developed since your machine left the factory.

So when you need Windows updates immediately, as when you first start a new machine, you must go directly to update.microsoft.com (use Internet Explorer; other browsers won't work) and explicitly demand the new stuff. Whatever you do, don't go hunting for any updates unless you're sure you have a software firewall running.

No matter when you buy your PC, you'll doubtless spend time updating the antivirus and antispyware software that comes on your machine. You'll also get offers to subscribe to those programs, which typically expire in a month or two, but they may or may not be the specific software you really want. Computer makers have become even more galling in how they exploit your moment of greatest vulnerability: when you're trying to get your machine up and running. More than ever, PC makers consider your desktop their billboard.

Apple hawks its Mac service even before you get to do a single useful task with your new Macintosh. With many HP machines, when you first reach the desktop, the company tries to sign you up for an Internet service you probably don't need and for "Updates from HP," a popup window that delivers commercials one to three times a month unless you bother to disable it. This "service" is so annoying that some programs label it as spyware.

Users increasingly accept all this as routine, part of the price of computing. But as we trade horror stories, those of us who write about these matters for a living repeatedly ask each other: If we can't figure this stuff out, how can people who don't want to become techheads hope to get it right? Now we're beginning to extend the question to increasingly computerlike consumer electronics such as cell phones. Last year I had to download software to fix some niggling problems with my Treo. This morning I had to reboot it.

EXERCISES

1. Find in the text:

падать (о цене); технические характеристики; дно; подряд; встроенная; мышь; отключить; установка; клавиши; клавиатура; загружать; программное обеспечение; "зависать"; пустой; безболезненно; инструкция для пользователя; разъем; широкополосный; работающий; подписываться.

2. True or false?
1) Computer prices are rising.
2) Specs means spectacles.
3) Surround-sound system is an audio system.
4) The keyboard contains a number of keys.
5) The USB is designed for connection.
6) You can't upgrade a PC online.
7) To reboot a PC is very easy.
8) Setup assistant is a shop assistant.
9) A firewall is a special protection software.
10) To sign up for an Internet program is very easy.

3. Answer the questions:
1) What's a desktop computer?
2) Why is the mouse essential for a PC?
3) How is the startup activated?
4) Is the USB really necessary? Why?
5) What does "OS" stand for?
6) Why are the speakers necessary?
7) What's an update?
8) Is antivirus software really efficient?
9) How does the firewall operate?
10) Why do PC makers consider our desktops their billboards?

4. Translate orally and put some snap into it!
пользователи; версия; to reboot; dial-up; video mode; редактировать; features; настольный ПК; мышь; message; to pop up; клавиша; модернизация; программное обеспечение; разъем; hardware; productivity; online; to freeze; выбор; мгновенный; защитить; to have a software firewall running; несомненно; подписаться на; истекать; vulnerability; to hawk; сообразить; to disable.

5. Give a short summary of the text and retell the former.

5. LESSON 5. Three Serious Scanners

Words and combinations

to overtake – to catch up with
a must – smth. obligatory
versatile – having many aptitudes
crisp – sharp and clear
to yield – to give as fitting, owed or required; produce supply
feeder – a device to supply, provide smth., usually automatically
to rip – to cut or tear open
gusto – relish, zest
hefty – impressively large
dpi = dots per inch
pixel – a tiny dot making up a picture
roughly – approximately
flaw – crack, fault, defect
gouge – a hole or groove
ADF – automatic document feeder
to gear – to intend for, to aim at
USB – universal serial bus
to ship – to have transported by a carrier
OCR – optical character recognition

TEXT

THREE SERIOUS SCANNERS

Scanners may no longer top most home office PC users' wish lists – digital cameras and multifunction devices have overtaken them – but they're still a must for people who want top-quality digitized photos and paper documents. If that describes you, one of three new scanners from Epson, HP, and Microtek will likely meet your needs.

Buyers seeking a versatile scanner that yields crisp, colorful images with excellent details will find that the new Epson **Perfection 3200 Photo** and Microtek **ScanMaker 6800** are impressive choices. For people who are more interested in using a scanner to perform optical character recognition — turning print into editable text – HP's new Scanjet 5550c has an automatic document feeder that rips through stacks of documents with gusto and efficiency.

The Epson and Microtek models are designed to suit photographers, graphic artists, and other users who will not mind paying a premium for the

ability to perform high-quality photo scans. Each of these two $399 scanners justifies its hefty price tag by providing outstanding features that you won't find included with less-expensive devices.

Graphics first

With an optical resolution of 3200 dpi, the Epson Perfection 3200 Photo can produce much more detailed scans and bigger enlargements than the previous, 2400-dpi generation of scanners. At 3200 dpi, for example, a scan of a 35mm slide (or negative) has enough pixels to blow up to 11 by 14 inches at a printer resolution of 300 dpi. That's roughly equivalent to enlarging a postage stamp sufficiently to fill the front of a sweatshirt, with no loss of image quality.

The 2400-dpi Microtek Scan-Maker 6800 is the first flatbed scanner to offer Applied Science Fiction's hardware-based Digital ICE for Photo Prints technology, which removes surface defects such as dust and scratches from photo prints. Until now, Digital ICE was available only in dedicated slide scanners that cost upward of twice the Microtek's price. The technology did a terrific job of cleaning up my flawed test prints, removing deep gouges as well as lesser imperfections. However, the Microtek takes about twice as long to complete a scan using ICE as it does without ICE. Another drawback: The scanner can apply the ICE technology only to prints, not to film positives or negatives.

Document friendly

HP's $299, 2400-dpi Scanjet 5550c is intended for small businesses that need to turn documents into editable text quickly. The ADF can feed the scanner up to 35 pages at a time. In my tests the unit took 3 minutes, 35 seconds to complete the scan of a 15-page text document. Though geared toward documents, the 5550c also handled several test photos well, producing accurate color and good detail.

I tested all three scanners using high-speed USB 2.0; the Epson and Microtek also support FireWire (IEEE 1394), but only Microtek sweetens the deal by adding a FireWire card and cable, as well as a USB cable, to the shipping package.

All three units have excellent drivers that support the TWAIN standard for inputting scanned images. The Epson and Microtek models both include Adobe Photoshop Elements; the HP device comes with Scansoft Paperport document management software, in addition to HP's own imaging and printing suite.

The Microtek's Digital ICE feature and bundled Fire Wire kit make it a superb value, but users who require big-time enlargements should consider the Epson. For OCR work, meanwhile, the HP unit is definitely the best choice.

EXERCISES

1. Find the English equivalents in the text:
список желаний; занимать первые места; догонять; высшего качества; оцифрованный; разносторонний; четкий; устройство автоматической подачи; стопка документов; спроектированный; характеристики; разрешающая способность; увеличение; приблизительно; потеря; планшетный сканер; изъян; недостаток; точный; высокоскоростная; программа.

2. Fill in the blanks:
1) Top-quality ____ photos are handled with scanners.
2) A ____ scanner yields crisp, colorful images.
3) Optical ____ recognition means turning print into editable text.
4) Scanjet has an automatic document ____.
5) The optical ____ of 3200 dpi is pretty good.
6) Scanmaker 6800 is the first ____ .
7) Scanjet 5500 is ____ for small business.
8) The ____ can feed the Scanner up to 35 pages.
9) The 5500c is ____ toward documents.
10) The Epson and Microtek also ____ FireWire.
11) The HP device comes with Scansoft Paperport document ____ ____ .

3. Answer the questions:
1) Why are scanners no longer most desirable for home office PC users?
2) What's a "multifunctional device"?
3) Does "yield" mean "eat"?
4) What device is used for OCR? What does it mean?
5) Why is it necessary to have a scanner equipped with the ADF?
6) What's the difference between "hardware" and "software" (if any)?
7) What are the slide scanners geared for?
8) You can use Scanjet 5550c to fax a document, right?
9) Could you explain what a USB is?
10) What does "document management" mean?

4. Translate orally – make it snappy!
пользователь; digital camera; multifunctional device; to overtake; высшее качество; a must; разносторонний (универсальный); character; превращать; to rip; с удовольствием (усердием); художник-график; ценник (ярлык); характеристики; resolution; dpi; поколение; приблизительно; sweatshirt; планшетный; hardware based; специализированные сканеры для слайдов; пробные отпечатки с дефектами; завершить сканирование; занимать 3 минуты; to gear toward; accurate; to sweeten a deal; поддерживать; to bundle; набор (комплект).

5. Retell the text.

6. LESSON 6. Astronomical

Words and combinations

icon – anything devotedly admired
bowl – a concave vessel used to hold liquids
to feature – to outline or mark the shape or appearance
replica – a close reproduction, copy, duplicate
consortium – [kən'sɔ:*f*əm] – an international business or banking agreement
array – a regular arrangement
scribbling – smth. written hastily or carelessly
CSIRO – International Scientific Center for Oceanic Research (Centre Scientific International des Recherches Oceaniques)
ripple – a slight ruffle on the surface
compelling – driving or urging with force
to probe – to investigate thoroughly
to gather clues – to collect information, data
to lurk – to move furtively, to sneak
halo – the aura of glory surrounding an idealized person or thing
pulsar – a celestial source of pulsating radio waves
tell-tale – smth. that serves to disclose, indicative
to toss about – to move restlessly, to fling to and fro, up and down
elusive – escaping the notice of, evasive
host – army, multitude
a seed program = preliminary program
bid – an offer (as at an auction)
to boost – to increase, raise, promote
20/20 vision – 100% eyesight
multiple – numerous, not in a bunch

to cluster – to group in a bunch
retina – the sensory membrane lining the inside rear wall of the eyeball
front runner – a pioneer
to be in for the long haul – to be ready to participate for a long period of time
operational – capable to function, ready

TEXT
ASTRONOMICAL

Mention the words 'radio telescope' and many of us think of the Parkes Telescope in New South Wales, an icon of Australian science, and star performer in the movie *The Dish.* Others might picture the giant bowl at Arecibo in Puerto Rico, as featured in the James Bond adventure *Golden Eye.*

Imagine now a radio telescope 100 times larger and more powerful than ever before, equivalent to 300 replicas of the Parkes dish as big as die suburb or town you live m An international consortium of astronomers is planning to build such a telescope – the Square Kilometre Array, or SKA – and Australia is high on the list of candidate locations.

This 'next generation' telescope will cover one square kilometre, but unlike the Parkes dish, it won't be a single surface, or even confined to one locality Instead, many small antennas will collect the radio waves, their signals combined electronically into one big picture

The array's central mission will be to explore the childhood scribblings of the Universe weak, distant signals emitted less than a million years after the Big Bang. These will shed light on how the first stars and galaxies came into being

'The SKA will reveal the emergence of structure in the early Universe, help us distinguish between competing cosmological theories, and perhaps predict the evolution and eventual fate of the Universe,' Dr Peter Hall, SKA program leader at CSIRO's Australia Telescope National Facility says

'It will tell us how ripples in the cosmic background have been transformed into the structures we know in the present Universe, such as stars and galaxies.'

The SKA will also provide more detailed pictures of known astronomical objects, and help solve some puzzles uncovered by astronomers in recent years

One such mystery is 'dark matter'.

We see stars and galaxies because they shine, but there is compelling evidence that most of the matter in the Universe may be hidden from view. The array will probe the structure of galaxies to gather clues about whether dark matter exists, and whether it lurks in giant halos surrounding each galaxy.

Gravity waves – ripples in die fabric of space-time generated by black holes and other massive objects – are another great mystery. These were first predicted by Albert Einstein in his 1915 theory of general relativity, but have yet to be directly detected.

The array will study a large sample of pulsars and closely monitor the timing of the radio pulses they emit. Variations in the regularity of the pulses could be the tell-tale sign that a pulsar has been tossed about by passing gravity waves.

How common the planets elsewhere in our galaxy? A number of giant Jupiter-sized objects have already been detected orbiting nearby stars, but it may take the sensitivity of the array to detect the first small earth-like planets The array will also join the search for extra-terrestrial intelligence The planetary systems of many stars will be monitored simultaneously in the hope of finding the first elusive signal that tells us we are not alone.

Closer to home, neighboring planets will be studied in greater detail, and changes monitored in our local space weather The array will also be able to track a host of satellites and deep-space probes simultaneously, proving its value not just to astronomy

A global pursuit

The Square Kilometre Array project is too large to be handled by one country This will be the first radio telescope to be 'born global', growing out of discussions at the International Union of Radio Science and the International Astronomical Union, umbrella organizations that oversee the development of radio astronomy.

An international consortium will develop and evaluate the various design concepts So far, the consortium consists of institutions in 11 countries Britain, Canada, China, Germany, India, Italy, the Netherlands, Poland, Sweden, the United States, and Australia. The cost of the project is expected to be more than $1 billion.

Australia has supported the project from the start, and there is now a national consortium coordinating research and development for the array. Its members include CSIRO, the University of Sydney, the Australian National University and Swinburne University of Technology.

In 1999, CSIRO set up a seed program for SKA research and development, the beginning of a larger commitment that will build to 2005, the year the international consortium will choose between the various design concepts. The Australia Telescope National Facility and the Division of Telecommunications and Industrial Physics are the main CSIRO divisions involved.

In August this year, Australia's bid was further boosted by the announcement of a large government grant under the Major National Research Facilities Program.

Revolutionary design

More design concepts are under investigation than the number of countries involved, but this is deliberate. The consortium wants to investigate a wide range of ideas as a means of arriving at a revolutionary array that:

- has a high angular resolution to obtain sharp images of radio sources (with its high sensitivity, high-fidelity imaging, and excellent angular resolution, the SKA will have 20/20 vision compared with existing radio telescopes);
- operates over a much wider bandwidth than the narrow radio spectrum now allocated to radio astronomy;
- is located in a radio-quiet zone and can counteract interference from sources such as satellites and communications transmitters;
- has multiple fields of view so that up to 100 different observing programs occur simultaneously (conventional radio telescopes 'look' m one direction), and
- is flexible enough to take advantage of future breakthroughs the rapidly-developing areas of computer and signal processing.

The design favoured by Australian astronomers consists of a close-packed group of relatively small antennas covering an area of 100-200 metres in diameter. Such a group is called an 'array-station'. The complete array will combine a large number of these array-stations, possibly as many as 100.

About half the array-stations would be clustered together in a central site of about 50 square kilometers. The others would span larger distances, as far as 2000 km from the central site. This array would produce the angular resolution required to create sharp images of radio sources.

Russian eyeballs

Australia has been investigating a type of antenna known as the Luneburg lens. In collaboration with Russian astronomers, CSIRO has obtained a small prototype lens from a Moscow-based company.

The lens acts just like an eyeball focusing radio waves to a point in the same way that the lens in an eye focuses light to a point on the retina. Similar to the eye, the lens can ‘see’ many radio sources in the sky at the same time, one of the key design requirements.

The array would need tens of thousands of these Luneburg lenses, each about five metres in diameter, so ways will have to be found to mass-produce them easily and cheaply.

The Russian lens is made of high-density polystyrene foam, but CSIRO is developing lighter and cheaper materials that absorb less of the faint radio signals.

'The Luneburg lens is one of the front runners', Peter Hall says 'The lens is the least understood of the candidate antennas, but stands a good chance if the problems associated with the foam loss and cost can be overcome '.

If small-scale prototyping studies are successful, the CSIRO group plans to build a small array of the lenses at Narrabri in New South Wales, the site of the array of large dishes that form the Australia Telescope. The Luneburg array will be integrated into the Australia Tekscope so that a range of ideas and theories can be tested.

Australia and the rest of the international consortium are in for the long haul. After the final decisions on the design concept and the location of the telescope are made in 2005, work will begin on an advanced prototype. Construction of the mega-telescope itself is expected to start in 2010 and for the array to be operational in 2015. The telescope for the new millennium is on its way.

Abstract: Astronomers are planning to build a gigantic new radio telescope known as the SKA or Square Kilometre Array. The SKA will be 100 times larger than the current generation of radio telescopes. Australia is part of an international consortium planning the telescope. Researchers at CSIRO and several Australian universities are investigating a number of design concepts. The SKA will be used to study a wide range of problems in astronomy, in particular how stars and galaxies formed in the early Universe. Australia may be chosen as the country to host the SKA.

EXERCISES

1. Find in the text:

объектив; показательный; сеть (решетка); проект; угловое разрешение; высокая чувствительность; четкое изображение; копия; каракули; "Большой Взрыв"; внеземной разум; одновременно; зондировать; подстегнуть; прослеживать; поддерживать проект; разработка; преднамеренный; помехи; пена; поглощать.

2. Fill in the blanks:

1) The 'next ____ ' telescope will cover 1 sq. km.
2) An international consortium will develop and evaluate different ____ .

3) The array will ____ the structure of galaxies.
4) The SKA will ____ the emergence of structure in the early Universe.
5) The array will study a ____ of pulsars.
6) The SKA project is too large to be ____ by one country.
7) … operates over a much wider ____ than the narrow ____ now allocated to radio astronomy.
8) Such group is called ____ .
9) About half the array-stations would be ____ together in a central ____ of about 50 sq. km.
10) The Russian lens is made of ____ polystyrene ____ .

3. Answer the questions:
1) What does a conventional Radio telescope look like?
2) What is the array's basic missions going to be?
3) Where can "dark matter" be found?
4) What generates gravity waves?
5) How can the array participate in the search for extra-terrestrial intelligence?
6) What are the deep-space probes used for?
7) Why are so many design concepts investigated?
8) What's :high-fidelity" imaging?
9) What is considered to be "a radio-quiet zone"?
10) How does the Luneburg lens act?

4. Translate orally and make it sizzle:
параболическая антенна ("тарелка"); копия; location; поколение; surface; Big Bang; to shed; появление; конкурирующие теории; рябь; решить загадку; compelling evidence; matter; регулярность импульсов; вращаться на орбите; sensitivity; присоединиться; simultaneously; чувствительность; neighboring; a host; зонд; поддерживать проект; разработка; research; facility; широкий диапазон; angular resolution; радиоспектр; высокая плотность; lens.

5. Write a summary of the text.

7. LESSON 7. Chillin' Chips

Words and combinations

vicious – malicious, harmful
filament – a fine thread or thread like object
mittens – gloves with only the thumb separate
utility bills – home electricity bills
guts – innards
silicon – semiconductor (devices)
to flourish – to thrive, prosper
wafer – a thin (round) piece
to dub – to name, nickname
gain – profit, advantage
foundry – works where metal is cast
living room battle – battle for household consumer market
dissipation – loosing (heat) irrecoverably
high-end = sophisticated and expensive
to be cool on – to be calmly audacious
cutting edge – most sophisticated
stock – sum of money invested in a large business
to triple – to make or become 3 times as great
to cleave – to split or divide by or as by a cutting blow
to soar – to fly upward
hype – intensified publicity campaign
to get on board – to be revitalized
to churn – to produce in mechanical manner
fault – fractured with a resulting displacement of one side relative to the other

TEXT
CHILLIN' CHIPS

The newest INTEL PENTIUM chip has such densely packed circuits that it consumes the same power as a 100-watt lightbulb with a filament burning as hot as 4,500 degrees Fahrenheit – one you'd have to wear mittens to unscrew. Such high temperatures run up utility bills and force chip designers to sacrifice performance for coolness. Intel has warned that if the heat wave continues, the guts of a PC will one day generate the same heat – 10,800 degrees – as the surface of the sun.

Challenges create opportunities in the chip industry, which is why the French silicon maker Soitec is flourishing. Its wafers, dubbed silicon-on-

insulator, or SOI, can go into standard chipmaking equipment but are engineered to reduce power consumption, and thus heat, by up to 50%. The wafers use an insulation layer that acts as a radiator under the circuits. Lab tests claim a 30% gain in performance for microprocessors.

Advanced Micro Devices uses Soitec wafers for its Opteron computer server chips and Athlon 64 PC chips. A server using two AMD Opteron chips consumes 190 watts of power versus 262 watts for one using two Intel Xeon chips, says analyst Nathan Brookwood at Insight64. IBM and Freescale began using SOI for PowerPC chips, which run IBM servers and Microsoft's new Xbox 360. The new PlayStation 3 also will be cooled with silicon-on-insulator. Chartered and TSMC, two huge Asian contract foundries, are becoming SOI-ready. David Greenlaw, AMD's director of process integration, calls Soitec's technology one of the most valuable patents of the 1990s.

"For the living room battle, speed, power consumption and heat dissipation are important," says Soitec Chief Executive André-Jacques Auberton-Hervé.

But silicon-on-insulator, first used in costly satellite and military applications, is practical for only high-end chips. The largest SOI wafers sell for $1,000 each, compared with $300 for a standard silicon wafer. Only 3% of wafers are currently SOI, and the world's biggest chipmaker, Intel, is cool on this cooling technique.

"We believe we can meet our goals without the complexity or cost of SOI," says Intel Chief Paul Otellini. Intel is going with older tricks for cooling, including a technology called strained silicon.

But Soitec founders Auberton-Hervé and Jean-Michel Lamure expect to continue growing rapidly despite Intel's chilly attitude. Annual sales are up 55% over the year-ago level to $194 million. In its most recent fiscal year, ended in March, it showed $13 million in losses. It has $295 million in debt, much of it borrowed to build a cutting-edge wafer factory in France in 2002. Profits should appear when its next results are released in November.

The Paris-listed stock has tripled in a year to pass the $15 mark, though it may still be cheap. Its only competitor is Ibis, of Danvers, Mass., which has developed its own version of SOI. It currently makes $7 million machines that implant oxygen into wafers, and has sold three so far.

Soitec uses a method known as hydrogen-cleaving technology. Auberton-Hervé and Lamure left their jobs in a French government microelectronics lab in 1992 to start Soitec. They came up with an approach they believed could be used for mass production. The company went public at $3.44 in 1999, and its stock soared to $39 amid hype that SOI would be adopted immediately. It fell back to the single digits in 2002 when that fast uptake didn't happen.

Chipmakers are getting on board now that wafer-circuitry has narrowed below 90 nanometers, or one one-thousandth the width of a human hair.

Soitec chums out 800,000 wafers a year at two factories in France, using its elegant sandwichmaking technique. Starting with two silicon wafers, Soitec machines coat the surface of one with silicon dioxide insulator and embed inside it a thin fault line of hydrogen atoms anywhere from 100 to 20,000 nanometers below the surface, depending on customers' desired wafer thickness. The coated wafer is laid on top of a raw wafer, with a little water in between, and then the sandwich is baked at 1,750 degrees Fahrenheit The heat fuses the two and excites the fault line enough to crack off any wafer sitting above it What's left is machine-ready silicon atop a layer of insulator. The donor wafer can be reused ten times before it gets too thin.

EXERCISES

1. Find in the text:

полупроводниковый; схема; нить накаливания; градус; микросхема; внутренности; процветать; называть; подложка; потребление; изоляция; выигрыш; против; литейный завод; рассеивание; применение; высококачественный; в настоящее время; метод(ика); самый передовой; разработать; расщепление.

2. True or false?

1) The newest chips have very densely packed circuits.
2) Mittens are used to protect feet.
3) SOI wafers are engineered to reduce power consumption.
4) Radiators are used to dissipate heat.
5) Soitec's technology was developed in 1890s.
6) SOI is practical only for high-end chips.
7) "A cutting-edge factory" means cattery factory.
8) Currently the water-circuity is very small.
9) Silicon dioxide is used as insulator.
10) The donor wafer can be used only once.

3. Answer the questions:

1) Why do the newest chips consume much power?
2) What's the burning temperature of the bulb filament?
3) What does SOI stand for?
4) Is power consumption related to heat generation?
5) What are radiators used for?
6) What does "SOI-ready" mean?

7) Is the SOI technology cheap?
8) Why is Intel skeptical about SOI?
9) Why do they coat wafers with silicon dioxide?
10) Why is a very high temperature (1,750ºF) used to bake "the sandwich"?
4. Translate orally – as fast as you can:
кремний; to take off; chip; плотный; схема; filament; unscrew; проектировщик; пожертвовать; generate; возможности; to dub; уменьшать; потребление; слой; микросхема; foundry; ценный; дорогостоящий; wafer; technique; complexity; финансовый; потери; утроиться; competitor; to implant; кислород; расщепление; подход; технология "бутерброда"; to reuse.

5. Present an oral account of the text.

8. LESSON 8. How PDAs Work

Words and combinations

PDA = Personal Digital Assistant, microcomputer
desktop – stationary home/office PC
laptop – portable PC
to power – to activate, make operating
counterpart – a person or thing very closely like or corresponding to another
benefit – advantage
intact – untouched, not damaged
to draw – to bring or pull out
add-on = additional
handy – conveniently near, easily used
volatile – readily becoming lost
to deplete – to exhaust, esp. of strength or resources
to drain – to make or become gradually dry or empty
by virtue of – due to, thanks to
feature – individual characteristic
juice – electricity, power
output device – device only displaying (presenting) information
to input information – to introduce into a device
pixel – the tiniest dot constituting an image
resolution – sharpness of an image

TEXT

HOW PDAs WORK

PDA Parts

Microprocessors and Memory

Like standard desktop and laptop computes, PDAs are powered by microprocessors. The microprocessor is the brain of the PDA, and it coordinates all of the PDA's functions according to programmed instructions. Unlike desktop and laptop PCs, PDAs use smaller, cheaper microprocessors. Although these microprocessors tend to be slower than their PC counterparts they are adequate for the tasks that PDAs perform. The benefits of small size and price outweigh the cost of slow speeds.

A PDA doesn't have a hard drive. It stores basic programs (address book, calendar, memo pad and operating system) in a read-only memory (ROM) chip, which remains intact even when the machine shuts down. Your data and any programs you add later are stored in the device's random-access memory (RAM). Information in RAM is only available when the device is on. Due to their design, PDAs keep data in RAM safe because they continue to draw a small amount of power from the batteries even when you turn the device off.

Less powerful PDAs have lower amounts of RAM. However, many application programs take up significant memory space, so most models have more memory. Also, Pocket PC devices generally require more resources ^rid have even more RAM. To provide additional memory, many PDAs accept removable flash media add-on cards. These are handy for storing large files or multimedia content, such as digital photos.

Some newer PDAs, such as the Palm Tungsten E2, use flash memory instead of RAM. Flash memory is nonvolatile, which means it preserves the data and applications it stores — even when all battery power is depleted.

Operating Systems

The operating system contains the pre-programmed instructions that tell the microprocessor what to do. The operating systems used by PDAs are not as complex as those used by PCs. They have fewer instructions, which require less memory.

PDAs and smart phones typically have one of two types of operating systems: Palm OS or Windows Mobile. However, RIM makes a specific OS for its Blackberry devices, and the Symbian OS operates some smart phones.

More Parts. Batteries

PDAs are powered by batteries. Some models use alkaline (AAA) batteries, while others use rechargeable batteries (lithium, nickel-cadmium or

nickel-metal hydride). The battery life depends on what kind of PDA you have and how you use it. Here are some of the things that can drain batteries:

- Operating system (PocketPC requires more power by virtue of its increased memory requirements)
- More memory
- Wireless connections, such as Wi-Fi and Bluetooth
- Backlighting on the display

Battery life can vary from hours to months, depending upon the PDA model and its features. Most PDAs have power management systems in place to extend the battery life. Even if the batteries are so low that you can no longer turn the machine on (it will give you plenty of warning before this happens), there's usually enough power to keep the RAM refreshed.

If the batteries do run completely out of juice or if you remove them, most devices have an internal backup battery that provides short-term power (typically 30 minutes or less) until you install a replacement. If all power sources are depleted, PDAs lose all of the data in RAM. This makes backing up or synchronizing your PDA extremely important.

In addition to battery power, many PDAs come with AC adapters to run off household electric current. A car adapter is also generally available as an accessory.

LCD Display

PDAs use an LCD (liquid-crystal display) screen. Unlike the LCD screens for desktop or laptop computers, which are used solely as output devices, PDAs use their screens for output and input. The LCD screens of PDAs are smaller than laptop screens, but vary in size. Almost all PDAs now offer color displays.

PDA displays have the following features:

- Transflective TFT (thin-film transistor) LCD for indoor and outdoor use
- Different pixel resolutions with higher resolutions for better quality
- Color screen
- Backlighting for reading in low light

EXERCISES

1. Find in the text:

ноутбук (компьютер); приводить в движение (в рабочее состояние); мозг; команды; в отличие от; дешевый; иметь тенденцию; выгода; перевесить; жесткий диск; хранить; оперативная память; микросхема; отключение; съемный; удобный; щелочные батареи; аккумулятор; требования; беспроводной; подсветка; домашний.

2. True or false?
1) The microprocessor is a common feature for PDAs and PCs.
2) A PDA can easily do without the microprocessor.
3) A PDA has no hard disc drive.
4) Shut down does not damage stored data.
5) Removable flash cards provide additional electric power.
6) PDAs do not have color displays.
7) The operating system is very important for a PDA.
8) PDAs are powered by wind.
9) Display backlighting can drain batteries significantly.
10) An internal backup battery provides a short term power supply.
11) AC adapters are used to connect devices to electrical mains.

3. Answer the questions.
1) What does the microprocessor do in a PDA?
2) Why are PDA microprocessors slow?
3) What's stored in the RAM?
4) Why are removable media cards said to be handy?
5) Are there any advantages of flash memory over RAM?
6) Can a PDA operate without the operating system? Why?
7) What does "rechargeable battery" mean?
8) What is the wireless connection for?
9) What does "LCD" stand for?
10) Is an AC adapter a very complicated device? What's inside?
11) Why do they call it "a backup battery"?

4. Translate orally – and look lively!
настольный ПК; запрограммированные команды; tend to be; computer parts; memo pad; RAM; проект; to draw; выключить устройство; мощный; приложение; объем памяти; требовать; обеспечить; съемный; add-on; handy; мультимедийное содержание; цифровой; non-volatile; depleted; сложный; аккумулятор; to drain batteries; благодаря; требования; система управления энергопотреблением; краткосрочный; источник питания; backup battery; жидкий; экран; ввод.

5. Write down an outline of the text and retell it.

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