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21世纪高职高专电子信息类规划教材
21 Shiji Gaozhi Gaozhuan Dianzi Xinxilei Guihua Jiaocai

通信专业英语

王雨连 孙青华 杨延广 主编
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- 职场英语与专业阅读的有机融合
- 地道英语与最新技术的完美结合
- 轻松学习与有效实践的无缝对接

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内 容 提 要

本书结合通信专业特点，收集常用专业词汇及技术资料，力求实现职场英语及专业阅读的有机融合。本书以通信专业实用英语为背景，从通信技术的发展开始，精心选取了移动通信终端、无线网络优化、物联网等最新英文技术资料，同时，面向客户服务、通信工程师、通信设备安装与维护等工作岗位进行了有针对性的介绍。本书从教学项目设计、辅助教学资料编制、背景资料准备、译文、典型词汇总结，到有针对性的课后练习，较完整地体现了通信专业英语教学理念和方法，有助于学生学习和教师教学。

本书可以作为通信和电子信息类专业英语课程的教材，同时，可以作为相关专业的阅读材料及科普读物。

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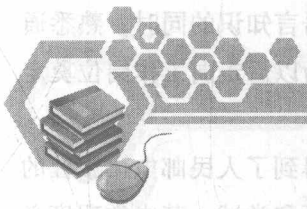

前言

近年来，通信及电子信息类专业的毕业生人数逐年增长，客户服务、通信工程施工维护、无线网络优化等岗位的就业需求逐年增加。然而，目前针对通信职业岗位要求的专业英语教材不多，无法适应通信行业技术和业务的发展，因此急需这方面的专业英语教材和参考资料。为此，我们进行了深入的调研，并结合通信专业特点，收集了大量通信专业常用英语词汇及技术资料，力求编写一部实现职场英语及专业阅读有机融合的通信专业英语教材。

本书以通信专业实用英语为背景，从通信技术的发展开始，精心选取了移动通信终端、无线网络优化、物联网等最新英文技术资料。同时，面向客户服务、通信工程师、通信设备安装与维护等工作岗位进行了有针对性的介绍。本书从教学项目设计、辅助教学资料编制、背景资料准备、译文、典型词汇总结，到有针对性的课后练习，较完整地体现了通信专业英语教学理念和方法，有助于学生学习和教师教学。

本书的内容贴近工作岗位，是一本职场英语教材，其特色体现在以下几个方面。

1．注重实用性。本教材面向就业岗位，选取通信行业实用英文资料，配有通信技术背景资料，对难句、长句进行详细讲解。为方便学生阅读学习，所有文章均有译文，课后设计了配套的练习，有助于学生学习、教师教学。

2．注重时效性。本书内容的选取考虑到通信技术资料的先进性和时效性，例如增加了对4G和物联网的介绍。

3．注重趣味性。本书选用的文章难度适中、形象生动，力求让学生在轻松愉快的氛围中学习知识。

4．本书由英语教师和通信专业教师共同编写完成，实现了专业及英语教学的有机结合。

本书共分 8 个单元，每个单元都包括课文、生词和短语、注释、练习、通信术语和参考译文 6 个板块。

由于各个单元的内容不同，因此每个单元设置的课文从 1～4 篇不等。本书共选用 16 篇文章，涵盖了通信专业学生在职业岗位上所需的常用专业英语知识。

在通信术语板块，以学生动手自己制作通信英语专业术语卡片的形式完成，目的在于充分发挥学生的主观能动性。通过对所学单元中通信术语的回顾和总结，使学生加深对通信术语的理解及认识，提高学生的归纳总结能力。

以上几个板块的设计，力求将知识性和趣味性相结合，既强调英语语言知识的学习和训练，又注重通信专业英语学习及阅读能力的提高。

本书通过对专业英文资料的精选和处理，将英语语言知识和专业知识融为一体，努力实

现英语应用能力与职场工作能力的共同提高，使学习者在掌握英语语言知识的同时，熟悉通信行业在业务、技术、管理和服务等领域的最新发展，拓展视野，为以后走向工作岗位奠定通信专业英语基础。

本书在编写过程中，参考和引用了国外作者的相关资料，同时得到了人民邮电出版社的倾力支持，在此向各位表示敬意和感谢。由于本书的编写是一种创新和尝试，其中的瑕疵必定不少，敬请指正。

编　者

2012 年 6 月

目录

UNIT 1

The Development of Communication Technology

Reading 1 Fiber-optic Communication

Fiber-optic communication is a method of transmitting information from one place to another by sending pulses of light through an optical fiber. The light forms an electromagnetic carrier wave that is modulated to carry information. First developed in the 1970s, fiber-optic communication systems have revolutionized the telecommunications industry and have played a major role in the advent of the Information Age. Because of their advantages over electrical transmission, optical fibers have largely replaced copper wire communications in core networks in the developed world.

The process of communicating using fiber-optics involves the following basic steps: creating the optical signal involving the use of a transmitter, relaying the signal along the fiber, ensuring that the signal does not become too distorted or weak, receiving the optical signal, and converting it into an electrical signal.

Applications

Optical fiber is used by many telecommunications companies to transmit telephone signals, Internet communication, and cable television signals. Due to much lower attenuation and interference, optical fiber has large advantages over existing copper wire in long-distance and high-demand applications. However, infrastructure development within cities was relatively difficult and time-consuming, and fiber-optic systems were complex and expensive to install and operate. Due to these difficulties, fiber-optic communication systems have primarily been installed in long-distance applications, where they can be used to their full transmission capacity, offsetting the increased cost. Since 2000, the prices for fiber-optic communications have dropped considerably. The price for rolling out fiber to the home has currently become more cost-effective

than that of rolling out a copper based network. Prices have dropped to $850 per subscriber in the US and lower in countries like the Netherlands, where digging costs are low.

Since 1990, when optical-amplification systems became commercially available, the telecommunications industry has laid a vast network of intercity and transoceanic fiber communication lines. By 2002, an intercontinental network of 250 000 km of submarine communications cable with a capacity of 2.56 Tb/s was completed, and although specific network capacities are privileged information, telecommunications investment reports indicate that network capacity has increased dramatically since 2004.

Technology

Modern fiber-optic communication systems generally include an optical transmitter to convert an electrical signal into an optical signal to send into the optical fiber, a cable containing bundles of multiple optical fibers that is routed through underground conduits and buildings, multiple kinds of amplifiers, and an optical receiver to recover the signal as an electrical signal. The information transmitted is typically digital information generated by computers, telephone systems, and cable television companies.

NEW WORDS AND PHRASES

fiber-optic/'faibə'ɔptik/ *adj.* 纤维光学的，属于纤维光学的；有特殊光学性质镀膜的玻璃或塑料纤维的

communication/kəˌmju:ni'keiʃən/ *n.* 交流，交际，通信；信息，消息，通信工具，交通联系；书信，口信

transmit/'trænsmit/ *vt. & vi.* 传播，传染，传导

pulse/pʌls/ *n.* 脉搏，脉冲 *vi.* （心脏）跳动，脉动

electromagnetic/iˌlektrəumæg'netik/ *adj.* 电磁的，（与）电磁（有关）的

modulate/'mɔdjuleit/ *vt.* 调整，调节，使缓和；（对波幅、频率的）调制，<音>转调

revolutionize/revə'lu:ʃəˌnaiz/ *vt.* 使彻底变革，使发生革命性巨变

telecommunication/'telikəˌmjuni'keiʃən/ *n.* 电信，远距离通信，长途通信；（正式）电信信息

advent/'ædvənt/ *n.* （重要人物、事物、事件的）出现、到来，耶稣降临（节）

copper/'kɔpə/ *n.* 铜，铜币 *vt.* 用铜皮包，镀铜

network/'netwə:k/ *n.* 网状物，（电视与计算机）网络；网状系统，广播网，电视网

distort/dis'tɔ:t/ *vt.* 歪曲，曲解，扭曲；使变形，误报

convert/kən'və:t/ *vt. & vi.* （使）转变，（使）转化，皈依，改变（信仰）

application/ˌæpli'keiʃən/ *n.* 申请；应用；应用程序

cable/'keibl/ *n.* （船只、桥梁等上的）缆绳、钢索，电缆 *vt.* 给（某人）发电报，打电报告诉（某人）

attenuate/ə'tenju:ˌeit/ *vt. & vi.* （使）变细，（使）变薄，（使）变小；减弱，贬值 *adj.* 稀薄的，细小的；减弱的，减少的

interference/ˌintə'fiərəns/ *n.* 干涉，介入，阻碍；扰乱，干扰

infrastructure/'infrə,strʌktʃə/ *n.* 基础设施，基础结构；基底层结构，下部结构；公共建设

install/in'stɔ:l/ *vt.* 安装，安顿，安置；（使）正式就职

capacity/kə'pæsiti/ *n.* 容量，容积；才能，能力；身份，职位

offset/'ɔfset/ *vt.* 抵消，补偿 *n.* 弥补，抵消；偏离量，偏离距离；（山的）支脉

subscriber/səb'skraibə/ *n.* （报刊的）订阅人，订购者，订户，消费者，用户

available/ə'veiləbl/ *adj* 可用的或可得到的，可利用的

citation/sai'teiʃən/ *n.* 引用，引证，引文；表扬，嘉奖

optical/'ɔptikəl/ *adj.* 视觉的，视力的；光学的，光的；（电子）（装置）光电的

amplification/,æmpləfi'keiʃən/ *n.* 扩大，发挥，详述；<物>振幅，放大率

intercity/,intə'siti/ *adj.* 城市间的，来往于城市间的

transoceanic/,trænzəuʃi'ænik/ *adj.* 在海洋彼岸的，横越海洋的，海外的；跨洋的，越洋的；来自海洋那边的，在海洋那边的

intercontinental/,intə,kɔntə'nentl/ *adj.* 跨洲的，洲际的，来往于洲际间的

submarine/'sʌbməri:n/ *n.* 潜艇，潜水器，深潜器 *adj.* 水下的，水下发生的，海中的，海底的

trillion/'triljən/ *n.* 万亿，百万兆；大量，巨额 *adj.* 万亿的，百万兆的

privilege/'privilidʒ/ *n.* 特权，特别待遇，（因财富和社会地位而仅有部分人享有的）权益；特殊荣幸

investment/in'vestmənt/ *n.* 投资，投入，付出

indicate/'indikeit/ *vt.* 标示，指示，指出，象征，表明或暗示……的可能性

dramatic/drə'mætik/ *adj.* 戏剧的，有关戏剧的，戏剧学的；引人注目的，给人深刻印象的；突然的，显著的，惊人的

bundle/'bʌndl/ *n.* 捆，包，束 *vt. & vi.* 收集，归拢，把……塞入

route/ru:t/ *n.* 路线；航线；通道 *vt.* 按某路线发送

conduit/'kɔndit/ *n.* [电] 导管；沟渠；导水管

NOTES

● Explanation of Difficult Sentences

1. (para.2) The process of communicating using fiber-optics involves the following basic steps: creating the optical signal involving the use of a transmitter, relaying the signal along the fiber, ensuring that the signal does not become too distorted or weak, receiving the optical signal, and converting it into an electrical signal.

Analysis：该句的主干是“The process involves the following basic steps”，“involve”表示“包含，涉及”。句中主语“The process（过程）”后面的“of communicating using fiber-optics”是后置定语，修饰主语，而现在分词短语“using fiber-optics”则修饰它前面的“communicating”，说明通信的方式是“光纤通信”。句中冒号后面的“creating..., relaying..., ensuring..., receiving..., and converting...”是“steps”（步骤）的同位语，说明“光纤通信包括的几个基本步骤”。其中“creating the optical signal involving the use of a transmitter”的意思是：“使用发射机产生光信号”，其中的现

在分词短语“involving the use of a transmitter”作状语，补充说明“creating”；“ensuring that the signal does not become too distorted or weak”的意思是：“保证信号在光纤中正常传输，控制其失真及衰减”，其中的“that”从句作“ensuring”的宾语；“converting...into”表示“把……转换成……”。

2. (para.3) Due to these difficulties, fiber-optic communication systems have primarily been installed in long-distance applications, where they can be used to their full transmission capacity, offsetting the increased cost.

Analysis：本句的主干是“fiber-optic communication systems have primarily been installed in long-distance applications”，“Due to”意为“由于，因为”，在句中引导原因状语，“where they can be used to their full transmission capacity”为非限制性定语从句，修饰句中的地点状语“in long-distance applications”，现在分词短语“offsetting the increased cost”在句中作状语，起补充说明的作用。“transmission capacity”意为“传输容量”，一般等同于信道容量。

3. (para.4) By 2002, an intercontinental network of 250 000 km of submarine communications cable with a capacity of 2.56 Tb/s was completed, and although specific network capacities are privileged information, telecommunications investment reports indicate that network capacity has increased dramatically since 2004.

Analysis：本段包含两个并列句，由 and 连接。前一句的主干是“an intercontinental network was completed”；后一句是一个主从复合句，其中“although”引导让步状语从句。在主句中，有一个“that”引导的宾语从句，作“indicate”的宾语。

Reading 2 Wireless Network Transmission Technology

Wireless (also often called air based or mobile) communication systems can be used for a wide range of applications and are widely used in the telecommunication, data communication as well as the broadcast world. Therefore, air-based communication is often categorised in applications concerning voice, data communication or integrated voice/data applications. However, this categorisation is hard to maintain consequently. E.g. a technology like GSM can be used for both voice and data. Therefore, we choose a separate classification in technology.

Semaphony Technology

Semaphony technology is rather old. Originally, semaphony is used as a beeper (e.g. in hospitals). The main disadvantages of semaphony are that it is only text-based and that two-way transmission is not possible.

Mobilophony Technology

Mobilophony systems are designed for business use. One can distinguish between public mobilophony like Traxys and closed private networks like Private Mobile Radio(PMR). For joint usage of the frequency spectrum trunking is an important technique. TETRA is the European standard for trunking. With TETRA highly secure voice and data transmission is possible. Mobilophony and notably TETRA is the most important communication standard for organisations in the area of public security (police, firearms etc).

Cordless Technology

Digital Enhanced Cordless Telephony(DECT) networks are primarily intended for voice communication indoor. Ericsson invented DECT. Momentarily DECT is mostly used in offices as wireless PBX. With DECT also data communication at low speeds is possible comparable to GSM.

Wireless LAN technology

A Wireless LAN functions like any other data communication LAN, but requires no cabling. Many different Wireless LAN technologies are currently available or under development. Examples are:

IEEE 802.11 is the oldest standard for wireless LANs. It is developed by the IEEE, Institute of Electrical and Electronics Engineers and accepted in 1997.

HiperLAN2 (High Performance Radio Local Area Network Type 2) is a new high-performance radio networking technology, specifically suited for operating in LAN environments.

HomeRF. The Home Radio Frequency Working Group has developed a single specification (Shared Wireless Access Protocol_SWAP) for a broad range of interoperable consumer devices.

Wireless ATM is a form of ATM that can be used in future wireless LAN's. It will provide up to 155Mbps transfer rates in wireless environments. The standard is not yet mature.

Bluetooth is an open (global) specification for wireless communication of data and voice. It is based on a low-cost short-range radio link, built into a microchip, facilitating protected ad hoc connections for stationary and mobile communication environments. The Bluetooth Consortium, founded by IBM, Toshiba, Ericsson and Nokia in 1998, is supported by about 1000 organizations in the Bluetooth Special Interest group (SIG). First products will come to the market in mid-2000.

Satellite Technology

Satellite transmission. Satellite networks like IRIDIUM, GLOBALSTAR and ICO offer global transmission for both telephony and data communication. Satellite systems are extremely expensive, but they allow for truly global transmission. Satellite networks momentarily have commercial problems to find enough customers to cover the large amount of investments.

2nd Generation Cellular Technology

Current 2nd generation cellular technology is based on two competing approaches: Time Division Multiple Access (TDMA) and Code Division Multiple Access (CDMA). TDMA is the basis for mobile communications in Europe (GSM) and Japan (PDC). In the US, CDMA is mostly used. The main difference between the two standards is in the way they make use of the frequency spectrum. CDMA is here the more flexible approach.

Global System for Mobile communications (GSM) is a wireless digital circuit switched (cellular) communication standard based on TDMA. GSM users can send and receive data, at rates up to 9.6 kbps, to users on PSTN, ISDN, Packet Switched Public Data Networks, and Circuit Switched Public Data Networks using a variety of access methods and protocols, such as X.25. Since GSM is a digital network, a modem is not required between the user and the GSM network, although an audio modem is required inside the GSM network to interwork with POTS. A GSM network consists of a number of mobile stations and a base station. Part of the base station is the Mobile services Switching Center (MSC). The MSC provides the connection to the fixed networks (such as the PSTN or ISDN).

High-Speed Circuit Switched Data (HSCSD) is the high-speed extension of GSM. It offers up to 57.6 kbps transfer rates by joining circuit switched GSM channels.

General Packet Radio Service (GPRS) is a packet-based technology that will allow transmission rates up to 115 kbps. GPRS will serve in the near future as an IP based GSM backbone transmission network. GPRS is TDMA based.

CDMAOne is a brand name of the US vendor consortium for implementation of the CDMA standard in the US. Transmission rates are comparable to GSM.

3rd Generation Cellular Technology

Nowadays much effort is undertaken to develop 3rd generation wideband cellular technology. Three different standards seem to emerge.

Wideband Code Division Multiple Access (W-CDMA) is a next generation cellular transmission technology based on the current narrowband CDMA. W-CDMA offers more possibilities for multimedia applications. W-CDMA is strongly pushed by Nokia and Ericsson.

CDMA2000 is the next generation technology strongly pushed by US companies led by Qualcomm. CDMA2000 is the intended broadband successor of CDMAOne.

EDGE is an advanced evolution of GSM and GPRS as proposed by Ericsson. EDGE allows existing GSM radio bands to transmit multimedia IP-based services at speeds up to 384 kbps. EDGE will be TDMA-based. EDGE is planned to be commercially available in 2001. An important advantage of EDGE is its backward compatibility with the widely used GSM standard.

It is expected that, alike the current situation, no one standard will achieve world dominance. Instead, each standard will take its piece of the market.

Worldwide, the ITU has tried to define the world standard IMT2000 (International Mobile Telecommunications). IMT2000 aim is to provide a global broad-band solution based on multiple technologies offering high-speed multimedia services. IMT2000 will ensure interoperability and interworking of mobile systems. After many discussions (especially between European and U.S. groups) IMT2000 now consists of five sub-standards:

- IMT DS, widely known as UTRA (UMTS terrestrial radio access) based on W-CDMA
- IMT MC, widely known as CDMA2000
- IMT TC also called TD-SCDMA
- IMT SC also called UWC-136 (EDGE)
- IMT FT (DECT)

IMT2000 specifies three distinct transmission standards 144 kbit/s for full mobility, 384 kbit/s for 'pedestrian' mobility and 2 Mbit/s for stationary, in-building use.

Universal Mobile Telecommunication System

Universal Mobile Telecommunication System (UMTS) is the ETSI (European Telecommunication Standards Institute) approach to provide a framework for next-generation mobile communications including non-cellular systems. It is a leading member of the IMT2000 umbrella. Important goal of UMTS is to integrate mobile telecommunication (data and voice) into the fixed infrastructure offering high bandwidth services.

UMTS offers a migration path of the existing mobile cellular and cordless systems to a global broadband system. UMTS will be based on WCDMA technology and some key features of TD/CDMA technology. WCDMA provides wide area, cellular-type services and TD/CDMA provides low mobility, indoor-type applications.

NEW WORDS AND PHRASES

wireless/'waiəlis/ *adj.* 不用电线的，用无线电波传送的 *n.* 无线电，收音机，无线电接收机或发射机

categorise/'kætigəˌraiz/ *vt.* 分类，归类

maintain/mein'tein/ *vt.* 保持，继续；保养，维护；坚持，主张；供给，赡养

consequent/'kɔnsikwənt/ *adj.* 作为结果的，随之发生的，由……而起的

classification/ˌklæsifi'keiʃən/ *n.* 分类，分级，类别，种类，门类，密级

beeper/'bi:pə/ *n.* 能发出哔哔声音的仪器，呼叫装置，呼叫器，蜂鸣器

semaphony/'seməˌfəni/ *n.* 信号告警，告警发生器，蜂鸣器

distinguish/dis'tiŋgwiʃ/ *vt. & vi.*辨别，区别 *vt.* 显扬自己，使自己扬名

firearm/'faiərˌɑ:m/ *n.* 枪，武器，（步枪、手枪等）便携枪

cordless/'kɔ:dlis/ *adj.*（电话或电动工具）不用电线与电源相连的，无电线的

mobilophony/məubil'ɔˌfəni/ *n.*（可）移动性，（可）流动性

traxys/'treiksis/ *n.* 荷兰的一种公共中继网名称

spectrum/'spektrəm/ *n.* 光谱，频谱，电磁波谱

trunking/trʌŋking/ *n.* 中继，电缆管道，通风管，干线行车，干线的运行，干线配置

enhance/in'hɑ:ns/ *vt.* 提高，增加，加强

telephony/ti'lefəni/ *n.* 电话学，电话，电话制造，电话（指通信方式），电话操作

momentarily/'məuməntərəli/ *adv.* 顷刻之间，马上，立刻

overview/'əuvəˌvju:/ *n.* 综览，概观，概述，综述 *vt.* 概述，总结

association/əˌsəuʃi'eiʃən/ *n.* 协会，社团，联合，结合，交往

homepage/'həumpeidʒ/ *n.*（互联网的）首页，主页

specification/ˌspesifi'keiʃən/ *n.* 说明书，工程设计书；载明，详述，说明；规格，规范

interoperable/ˌintər'ɔpərəbl/ *adj.* 能共同操作的，能共同使用的；（电脑系统或软件）可互换并利用信息的

ATM *abbr.* Asynchronous Transfer Mode 异步传输方[模]式

microchip/'maikrəˌtʃip/ *n.* 微芯片（微型集成电路片），微片

facilitate/fə'siliteit/ *vt.* 使便利，减轻……的困难，使更容易，推动，促进，便于

ad hoc/æd'hɔk/ 一种特殊的无线网络应用模式，一群计算机接上无线网络卡即可相互连接，无需透过 Access Point（接入点）

stationary/'steiʃənəri/ *adj.* 不动的，静止的，稳定的，不可移动的

consortium/kən'sɔ:ti:əm/ *n.*（数家公司或银行联合组成的）财团，联营企业，协会，联合，联盟（尤指联营企业、财团）

iridium/i'ridi:əm/ *n.* 铱（77 号元素，符号 Ir）

cellular/'seljulə/ *adj.* 细胞的；多孔的；由细胞组成的 *n.* 移动电话；单元

PDC *abbr.* Personal Digital Cellular 个人数字蜂窝系统

flexible/'fleksəbl/ *adj.* 易弯曲的，柔韧的，灵活的，可变通的，（人）适应力强的

approach/ə'prəutʃ/ *vt. & vi.* 接近，走近，靠近 *vt.* 接洽，交涉，着手处理 *n.* 靠近，接近；通路；途径，方法

PSTN *n. abbr.* Public Switched Telephone Network 公共交换电话网络

ISDN *n. abbr.* Integrated Services Digital Network 综合服务数字网

protocol/'prəutəˌkɔ:l/ *n.* 礼仪，外交礼仪，（外交条约的）草案，（尤指）议定的条款，议定书，（计算机）协议，约定，规程

POTS *abbr.* Plain Old Telephone Service 简易老式电话业务

transfer/træns'fə:/ *vt. & vi.* 转移，迁移 *vt.* 转让 *n.* 转移，转让，转录，中转，改变路线

backbone/'bækˌbəun/ *n.* 脊骨，脊柱，骨干，支柱，主力，中坚，（船的）龙骨

vendor/'vendə/ *n.* 摊贩，小贩，（房屋等的）卖主，卖方，自动售货机

implementation/ˌimplimən'teiʃən/ *n.* [计] 实现；履行；安装启用

Qualcomm/'kwəulkɔm/ *n.* 美国高通公司

successor/sək'sesə/ *n.* 接替的人或事物，继任者，继承人

EDGE *abbr.* Enhanced Data rates for GSM Evolution 全球演进式数据速率增强技术

evolution/ˌi:və'lu:ʃən/ *n.* 演变，进化，发展

compatibility/kəmˌpætə'biləti/ *n.* 适合，一致，互换性，通用性，兼容性

dominance/'dɔmənəns/ *n.* 优势，支配地位，控制力，支配权，影响力

interwork/ˌintə'wə:k/ *n.* 互相配合，互相作用，（硬件或软件部件）互工作

terrestrial/tə'restri:əl/ *adj.* 地球的，陆地的，陆栖的，陆生的，人间的，尘世的

pedestrian/pi'destriən/ *n.* 步行者，行人 *adj.* 缺乏想象力的，平淡无奇的，乏味的

integrate/'intigreit/ *vt.* 使……成整体；使结合 *vi.* 成为一体；结合在一起；合并

bandwidth/'bændwidθ/ *n.* 带宽，（系统或仪器正常运作所需的）频带，（电脑网络或其他电讯系统的）传输容量

multimedia/ˌmʌlti:'mi:di:ə/ *adj.* 多种手段的，多种方式的 *n.* 多媒体

migration/mai'greiʃən/ *n.* 迁移，移居

NOTES

● Explanation of Difficult Sentences

1.（para.10）It is based on a low-cost short-range radio link, built into a microchip, facilitating protected ad hoc connections for stationary and mobile communication environments.

Analysis：本句中的主语“It”指代 bluetooth，句中的分词短语“based on a low-cost short-range radio link”、“built into a microchip”和“facilitating protected ad hoc connections for stationary and mobile communication environments”都作系动词 is 的表语。“ad hoc”是一种特殊的无线网络应用

模式，一群计算机接上无线网络卡即可相互连接，无需透过 Access Point（接入点）。过去分词“protected”用作形容词，修饰“ad hoc”。

2.(para.13)GSM users can send and receive data, at rates up to 9.6 kbps, to users on PSTN, ISDN, Packet Switched Public Data Networks, and Circuit Switched Public Data Networks using a variety of access methods and protocols, such as X.25.

Analysis：本句的主干是“GSM users can send and receive data to users”，句中的介词短语“at rates up to 9.6 kbps”和“on PSTN, ISDN, Packet Switched Public Data Networks, and Circuit Switched Public Data Networks”都是用来说明“send and receive”的状语，“using a variety of access methods and protocols, such as X.25”是现在分词短语作后置定语，修饰它前面的“Circuit Switched Public Data Networks”。

3. (para.24) Universal Mobile Telecommunication System (UMTS) is the ETSI (European Telecommunication Standards Institute) approach to provide a framework for next-generation mobile communications including non-cellular systems.

Analysis：该句的主干是“Universal Mobile Telecommunication System (UMTS) is the ETSI (European Telecommunication Standards Institute) approach”，后面的动词不定式短语“to provide a framework for next-generation mobile communications including non-cellular systems”是后置定语，用来修饰“approach”。不定式短语中，介词短语“including non-cellular systems”修饰它前面的“communications”。“including”，介词，表示“包含，包括”。本句的意思是：“通用移动通信系统（UMTS）是 ETSI 组织（欧洲电信标准协会）提供的一种面向下一代移动通信（包括非蜂窝式系统）的解决方案。”

Reading 3 The 4th Generation Mobile Communication System

The users of the Third-Generation (3G) International Mobile Telecommunications 2000 (IMT2000) mobile communication services, which was launched in October 2001, has already reached about 34 million subscribers in Japan. The system provides a variety of advanced multimedia services such as video communications and high speed internet access.

It is expected that this will lead to the mobile communication more important to our daily lives and will expand the role as a lifestyle basis in the next ten years. It is also expected that such an era requires a more advanced wireless communications system, such as the Fourth-Generation (4G) mobile communication system, which far surpasses the capability of the existing IMT2000. The development process of the new mobile systems consists of developing the requirements, providing solutions satisfies the requirements, showing evidences for each technology to satisfy the requirements, as well as building international consensus through the standardization activities.

A. Applications for 4G systems

The improvements in media communication quality have been one of the most perceptible advancements and only the perceptible advancements noted by the customers. For example, the size and

resolution of LCD (Liquid Crystal Display) screens, the number of pixels in built-in camera, and the wide variety of ringer tones have been key to the popularity of mobile handsets. However, current mobile terminals still have much room in terms of improving communication reality. The ultimate objective of enhanced-reality media communications is to provide a transparent environment that is indistinguishable from face-to-face communications.

The applications require more advanced wireless capabilities. Three main directions for enhancing media communication reality are 3D audio communications, 3D visual communications and biological information communications. It is expected that the future customers will be able to full use of 1 Mbit/s to 100 Mbit/s under the end-to-end latency of 5 msec to 50 msec. This seems a reasonable motivation for discussing the necessity of the new mobile systems.

B. Requirements for 4G system

1) Broadband Wireless Access

The traffic carried by mobile communication systems until today was mainly for voice communications. The Second-Generation (2G) system, the Personal Digital Cellular (PDC) system, introduced the i-mode services, which enabled the Internet access, electronic commerce and e-mail from mobile terminals, and mainly used for the text-based data communications. The IMT2000 system offers high bit rate transmission service from 64 kbit/s to 384 kbit/s, and it is expected that the proportion of the amount of data traffic to the voice traffic would continue to increase. Moreover, the rising popularity of broadband services such as Asymmetric Digital Subscriber Line (ADSL) and optical fiber access systems and office or home LANs is likely to lead to a demand for comparable services in the mobile communication environment.

2) Low Cost

To make broadband services available to the user to exchange various kinds of information, it is necessary to lower charges dramatically in order to keep the cost at or below the cost of existing service. The IMT2000 system aimed at lower bit cost and economical charge rates, however for the 4G system, a broadband channel and an even lower bit cost are both required.

3) Wide Area Coverage

One feature of mobile communications is that it is available for use anytime and anywhere. That advantage is important for future mobile communication as well. In particular, it is important to maintain the service area in which the terminals of the new system can be used during the transition from the existing system to a new system. It can be assumed that terminals that have relatively large display screens, such as Personal Digital Assistants (PDAs) or personal computers are used indoors rather than outdoors. Accordingly, better coverage of indoor service areas is needed.

4) Capable for Wide Variety of Services

Mobile communication is for various types of users. In the future, we expect to make the advanced system performance and functionality to introduce a variety of services not only the ordinary telephone service but to transfer information about the five sensual modes. Those services must be made easier for anyone to use.