

信 息 英 语

张筱华 编著

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· 北 京 ·

内 容 简 介

本书共 18 个单元。内容涉及信号分析、数字通信、数字数据传输、光纤通信、电话系统、微波与卫星、移动通信、交换技术、网络基础、联网部件、局域网和因特网等方面,基本覆盖了现代信息技术的所有领域。本书的课文主要选自美国高等院校的教科书,它们既具有较权威的专业背景,又具有语言朴实,文字流畅的特点,因而是一本较理想的专业英语教材。本书可作为信息技术类高职高专院校的专业英语教材,也可供工程技术人员、管理人员和大专院校学生使用。

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前 言

按照教材编委会的要求,我们编写了这本供信息技术类高职高专院校使用的专业英语教材《信息英语》。

本书共 18 个单元。内容涉及信号分析、数字通信、数字数据传输、光纤通信、电话系统、微波与卫星、移动通信、交换技术、网络基础、联网部件、局域网和因特网等方面,基本覆盖了现代信息技术的所有领域。

本书的课文主要选自美国高等院校的教科书,它们既具有较权威的专业背景,又具有语言朴实、文字流畅的特点,因而是一本较理想的专业英语教材。由于文章出自不同的作者,体现了不同的文风和文体,从而对扩展学生的视野和阅读能力极有好处。在课文的编排顺序上,作者充分考虑到学生“先基础,后专业”的特点,无论在语言或专业难度上都由浅入深,循序渐进,因此,相信它会受到学生和教师的欢迎。

本书的每个单元都由五部分组成:课文、生词、注释、练习,以及课文的参考译文。为了便于教师备课和学生自学,对课文的注释较为详尽。考虑到本书主要用于大专层次的教学,所以练习题偏重词组和句子的翻译(英译汉)。当然,如果可能,最好指导学生做练习的第五题,即进行短文的翻译,这对学生英文水平的提高必定有所裨益。

比起公共英语,专业英语的表达方式更为简洁,语法现象也更为规范。作者在本书的开始总结了专业英语中最重要的的一些语法现象,建议教师将它们作为教学内容首先讲透。这样,在讲解后续的课文时,就会事半功倍,取得更佳的效果。

自 1994 年以来,作者编写的《通信英语》、《网络英语》等教材深受广大工程技术人员、管理人员和大专院校学生的厚爱和好评,许多

省、市和院校还将它们指定为工程技术人员和大学生,甚至研究生的必读教材,作者对此表示深切的谢意。

由于时间匆忙,难免有所疏漏,敬请批评指正。

北京邮电大学

张筱华 教授

2004 年 6 月 17 日

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《专业英语》主要语法现象

一、动名词

作用相当于名词,它在句子中可做主语、宾语或介词宾语。例如:

1. Reading is a good habit.

动名词在句子中做主语。

2. I enjoy working with you.

动名词在句子中做宾语。

3. I am interested in reading.

动名词在句子中做介词宾语。

动名词的作用虽然相当于名词,但它仍然具有一些动词的特征。例如,它可以有自己的宾语和状语。例如:

4. I am interested in carefully reading books.

5. He insisted on doing it in his own way.

6. What would you suggest for overcoming the difficulties?

在《专业英语》中,动名词的应用相当普遍,我们来看下面的例子:

7. Digital transmission provides a powerful method for overcoming noisy environments.

8. Consequently there is an inherent advantage for overcoming noisy environments by choosing digital transmission.

9. The telephone contains a transmitter and receiver for converting back and forth between analog voice and analog electrical signals.

二、现在分词

1. 现在分词一般作形容词用,可修饰动作的发出者,有主动的意义。可译成“……的……”,此时多作定语。例如:

(1) The smiling girl is Wangling.

(2) This is an amusing story.

在更多情况下,我们可以用现在分词短语作定语,在意思上和—个定语从句差不多。例如:

- (3) The girl standing by the window talked to her friend.
- (4) There are a lot of boys on the sports ground playing football.
- (5) They built a highway leading into the mountains.

在《专业英语》中,现在分词的应用相当普遍,我们来看下面的例子:

- (6) Furthermore, we shall prove that a minimum theoretical sampling frequency of order 6.8 kilohertz is required to convey a voice channel occupying the range 300 Hz to 3.4 kHz.
- (7) Thus the output to the codec may be seen as a sequence of 8 pulses relating to channel 1, then channel 2, and so on.
- (8) Fig. 3-1 illustrates a typical full-duplex data transmission system including the originating data processing equipment and the interface assembly which consists of buffer and control units.
- (9) In addition to defining standards covering the NNI, CCITT also embarked on a series of standards governing the operation of synchronous multiplexers and SDH Network Management.
- (10) The unquestionable success of the first generation of paging systems using wired networks with signaling devices was followed in the early 1950s by technological progress in the miniaturization of electronic circuitry.

2. 现在分词(分词短语)还可以作状语,用来表示方式、目的、条件、结果和背景等等;有时表示主语在作一个动作的同时还进行的另一动作,此时称为伴随状态。例如:

- (1) Every evening they sit in sofa watching TV.

现在分词起伴随作用。

- (2) I read the English book, using my dictionary.

现在分词表示条件或背景。

还可列出更多的例子:

- (3) I ran out of the house shouting.
- (4) I got home, feeling very tired.
- (5) Not knowing her address, we couldn't get in touch with her.
- (6) She got to know them while attending a conference in Beijing.
- (7) By comparison, most other forms of transmission systems convey the message information using the shape, or level of the transmitted signal; parameters that are most easily affected by the noise and attenuation introduced by the transmission path.

- (8) At the receiving end of an asynchronous serial data link, the receiver continually monitors the line looking for a start bit.
- (9) Generally, this link has lower capacity than the total number of PBX subscribers, reflecting the fact that, at any given time, only a fraction of the subscribers will be engaged in external calls.
- (10) Today, certain models of pagers are even equipped with a display capability of providing optical messages consisting of 10 to 80 characters, and thus substantially increasing the efficiency of the system.

三、过去分词

1. 过去分词(短语)一般作形容词用,可修饰动作的对象,有被动的意义。可译成“被……的……”或“由……的……”,此时多作定语。例如:

- (1) The trees planted by me have grown up.
- (2) We've already met the target set in the program.
- (3) What's the language spoken in this area?
- (4) Suddenly there appeared a young woman dressed in green.
- (5) For example, the signal received from a satellite, located in far outer space, is very weak and is at a level only slightly above that of the noise.
- (6) Once the start bit has been detected, the receiver waits until the end of the start bit and then samples the next N bits at their centers, using a clock generated locally by the receiver.
- (7) Paging solutions to the above communication situations were introduced in the first half of this century by means of simple optical and acoustical signaling devices installed on the premises of enterprises, hospitals, offices, etc.
- (8) The ideal mobile telephone system would operate within a limited assigned frequency band and would serve an almost unlimited number of users in unlimited areas.
- (9) This is actually a collection of national networks interconnected to form an international service.
- (10) In addition to the five classes of switching centers listed above, the network is augmented with additional switching nodes called tandem switches.

2. 过去分词还可以作状语,例如:

- (1) Although originally designed and implemented to service analog telephone subscribers, it handles substantial data traffic via modem, and is gradually being converted to a digital network.
- (2) Compared with you, we still have a long way to go.
- (3) Moved by their speech, we were momentarily at a loss what to say.
- (4) He returned us the papers uncorrected.

四、动词不定式

在《专业英语》中,动词不定式大量地用来做状语或作定语。

1. 动词不定式在句首或句尾常常用来表示目的,可译成“为了……”,“以便……”,可见这时候起状语作用。例如:

- (1) To do a good job, we use good tools.
- (2) We use good tools to do a good job.
- (3) We must do everything we can to help them.

由于英语中常用被动语态,所以上面的例(2)可表示为:

- (4) Good tools are used to do a good job.

注意,上例中的下划线部分,这类句型在“专业英语”中大量出现。例如:

- (5) A circuit of the demultiplexer is arranged to detect the synchronization word, and thereby it knows that the next group of 8-digits corresponds to channel 1.
- (6) Furthermore, we shall prove that a minimum theoretical sampling frequency of order 6.8 kilohertz is required to convey a voice channel occupying the range 300 Hz to 3.4 kHz.
- (7) As each incoming bit is sampled, it is used to construct a new character.
- (8) Timing signals from the interface assembly at the transmitter are applied to the data modem to synchronize the computer and the data set.
- (9) The switching centers are linked together by trunks. These trunks are designed to carry multiple voice-frequency circuits using either FDM or synchronous TDM.
- (10) The 10 regional centers are meshed together to provide full connectivity.

2. 动词不定式在名词之后常用来表示定语,译成“……的……”。例如:

- (1) She usually has a lot of meetings to attend in the evenings.

- (2) I want to get something to read during the vacation.
- (3) She was the first person to think of the idea.
- (4) This will be a good opportunity to exchange experience.
- (5) The operator of a local telephone switchboard had an option to transmit an optical or acoustical signal for the searched person over a wired network.
- (6) Why 800 MHz? The FCC's decision to choose 800 MHz was made because of severe spectrum limitations at lower frequency bands.
- (7) Any communication systems which can provide customers with means to communicate from any place, at any time and at any distance gives social and economic advantages.

五、一个重要的语法现象——被动语态

被动语态在“专业英语”中被大量使用,这里给出几个例子:

1. If we consider binary transmission, the complete information about a particular message will always be obtained by simply detecting the presence or absence of the pulse.
2. Noise can be introduced into transmission path in many different ways; perhaps via a nearby lightning strike, the sparking of a car ignition system, or the thermal low-level noise within the communication equipment itself.
3. An asynchronous serial data link is said to be character oriented, as information is transmitted in the form of groups of bits called characters.
4. When the received character has been assembled, its parity is calculated and compared with the received parity bit following the character.
5. The first low-loss silica fiber was described in a publication which appeared in October of 1970. The date of this publication is sometimes cited as the beginning of the era of fiber communication.

当然,在“专业英语”中还有许多其他重要的一些语法现象,请读者参阅作者建议的相关书籍,这里不在一一赘述。

UNIT 1

PASSAGEA Brief History of Communications¹

The field of communications is certainly not new: People have been communicating since early humans grunted and scratched pictures on cave walls. For thousands of years people communicated using little more than words², parchments, stone tablets, and smoke signals. The primary forms of sending information³ were based on the auditory and visual senses. You either heard someone speaking or saw the letters and symbols that defined a message.

Communications changed drastically in 1837, when Samuel Morse invented the telegraph. This invention made it possible to send information using electrical impulses over a copper wire. The characters in a message were first translated into a sequence of long or short electrical impulses (or in less technical terms, dots and dashes), and then, the message was transmitted. This association of characters with electrical impulses was called the Morse code. The ability to send information with no obvious verbal or visual medium⁴ began a sequence of events that forever changed the way people communicate⁵.

In 1876 Alexander Graham Bell took the telegraph one step further. Rather than⁶ converting a message into a sequence of dots and dashes, he showed that a voice could be converted directly to electrical energy and transmitted over a wire using continuously varying voltages⁷. At the wire's other end the electrical signals were converted back to sound. The result was that a person's voice could be transmitted electronically between two points as long as a physical connection existed between them. To most people whose lives were based on only what they could see and hear, this invention was absolutely incredible and seemed magical.

The earliest telephones required a different pair of wires for each phone to which you wished to connect⁸. To place a call, a person had to

first connect the telephone to the correct wires and then hope the person on the other end was there, listening⁹. There were no bells or signaling devices to interrupt his or her dinner. That changed with the invention of the switchboard, shown in Fig. 1-1, a switching device that connected lines between two telephones. Callers simply picked up the phone and recited the number of the person they wished to call. Establishing connections was voice-activated¹⁰. That is, an operator heard the number and then used a switchboard to connect one person's phone lines with another person's lines.

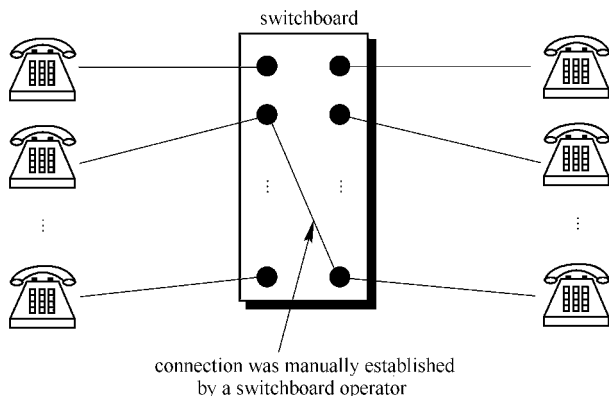


Fig. 1-1

During the next 70 years the telephone system grew to the point where the telephone became a common device in a home. Most of us do not even think about how the telephone system works. We know we can dial a number and be connected to just about anywhere in the world.

Another event important to communications occurred in 1945 with the invention of the first electronic computer, ENIAC (Electronic Numerical Integrator and Calculator). Designed for computing ballistics tables¹¹ for World War II, it was the first device that could actually process information electronically. Although ENIAC played no direct role in data or computer communications, it did show¹² that calculations and decision-making could be done electronically, an important ability in today's communications systems.

The relation between computers and communications began to emerge after the invention of the transistor in 1947 allowed smaller and cheaper

computers to be built. The new generation of computers that emerged during the 1960s made new applications such as processing and routing telephone calls economically feasible. In addition, more businesses were buying computers and developing applications, and the need to transfer information between them began to grow.

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The first communication system between computers was simple. Basically, it involved writing information from one computer onto a magnetic tape, throwing the tape into the back of the car, and then transporting the tape to another computer. Once there, the other computer could read the information on the tape. This was a very reliable form of communication, assuming the person driving the car¹³ didn't get into an accident (People today still do the same thing although the tape has been replaced by disks and CD-ROMs).

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Another milestone in electronic communications occurred with the development of the personal computer (PC). The ability to have computing power on a desk generated an entirely new way of storing and retrieving information. The 1980s saw the infusion of millions of PCs into virtually every business, company, school, and organization and into many homes as well. The fact that so many people had computers generated the need to make information even more easily accessible.

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Satellite communication system began in 1962. Today, many communications satellites transmit television signals, and Fig. 1-2 shows a com-

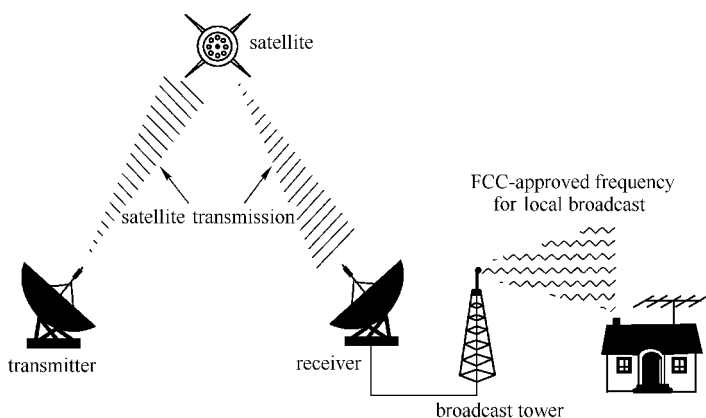


Fig. 1-2

mon system. A transmitter in one part of the world sends a signal to an

orbiting satellite, which relays the signal to receivers on other parts. Signals from the receiver are sent to broadcasting towers and are transmitted locally using a frequency approved by the Federal Communications Commission (FCC). An antenna receives the signals and relays them to the television set in your home.

Television antennas are not the only way to receive signals. Many homes subscribe to a cable television service that brings signals into the home using optical fibers and coaxial cable. In addition, many people purchase their own receiving dishes and receive satellite signals directly.

Another important communications applications, appeared in 1990s, are local area networks (LANs) and wide area networks (WANs), systems that allow multiple computers to communicate over short or long distances. Once connected to them, users can send or receive data files, log in to remote computers, send mail, or talk to the World Wide Web.

With email, it is possible to send a message to remote locations from the privacy of your own home, Fig. 1-3 shows how. A person with a PC and

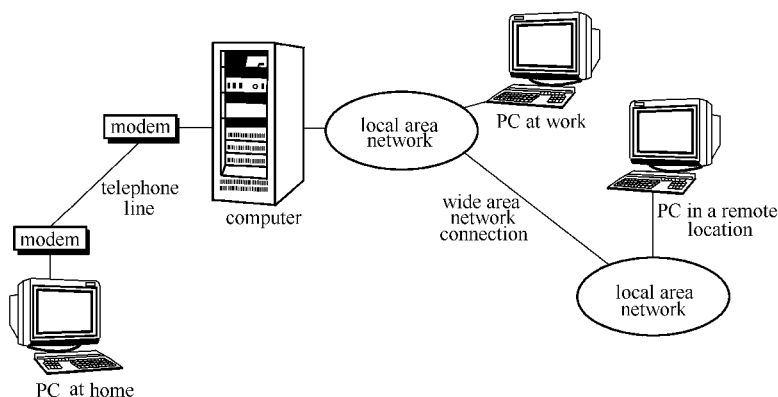


Fig. 1-3

modem at home¹⁴ can access his or her company's or Internet Service Provider's computer. This computer is connected to local area network that allows a message to be sent to any person connected to it. The local area network also connects to a wide area network that allows a message to be sent across the country or to other countries. Local area networks at the other end can route a transmitted message to any connected PC. An individual on that end with a PC and modem can receive the message at home.

The World Wide Web, also appeared in 1990s, makes information from around the world easily accessible to one's desk. With the click of a mouse button, computer users can access files, programs, video clips, and sound bites. Online services such as America Online and CompuServe provide a wealth of services to their users, such as chat rooms, bulletin boards, airline reservation systems, and more. Computers and communications have progressed to the point¹⁵ where most businesses or schools can no longer function without them. Our almost total dependence on them demands that we understand them and their abilities and limitations.

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NEW WORDS AND PHRASES

brief	<i>a.</i> 简短的, 简洁的 <i>n.</i> 概要, 摘要, 短文
grunt	<i>v.</i> 咕哝着说, 含糊不清地说
scratch	<i>v.</i> 抓, 挠, 刮, 擦
cave	<i>n.</i> 山洞
parchment	<i>n.</i> 羊皮纸
tablet	<i>n.</i> 刻写板, 碑, 匾; 药片
signal	<i>n.</i> 信号
auditory	<i>a.</i> 听的, 听觉的
visual	<i>a.</i> 视的, 视觉的
sense	<i>n.</i> 感官, 官能; 感觉, 观念, 意识; 知觉, 理智, 理性
symbol	<i>n.</i> 符号, 记号; 象征
message	<i>n.</i> 消息; 流言; 报文
drastically	<i>ad.</i> 激烈地, 猛烈地; 极端地, 严厉地
invent	<i>v.</i> 发明, 创造
telegraph	<i>n.</i> 电报
impulse	<i>n.</i> 脉冲
character	<i>n.</i> 字符; 特征, 特性, 特色; 人物, 角色
sequence	<i>n.</i> 序列, 次序; 连续, 一连串
transmit	<i>v.</i> 发送; 传输
association	<i>n.</i> 联合, 结合, 关联; 协会, 联盟, 社团
code	<i>n.</i> 码 <i>v.</i> 把……编码
obvious	<i>a.</i> 明显的

medium	<i>n.</i> 媒体,媒介,传媒
convert	<i>v.</i> 转换,转变,使转化
dot	<i>n.</i> 点,小圆点,小数点
dash	<i>n.</i> 划,长划线
vary	<i>v.</i> 变化,改变,使多样化
voltage	<i>n.</i> 电压
connection	<i>n.</i> 连接;联系,连贯
incredible	<i>a.</i> 不可相信的,难以置信的;了不起的,惊人的
magical	<i>a.</i> 魔法的;神秘的
interrupt	<i>v.</i> 中断,打断
switchboard	<i>n.</i> 交换台,交换板
recite	<i>v.</i> 背诵,朗诵
evolve	<i>v.</i> 发展,进化,衍变
activate	<i>v.</i> 使活动起来,使起作用,激活
device	<i>n.</i> 器件,部件,设备
dial	<i>v.</i> 拨号,打电话
integrator	<i>n.</i> 综合者;积分器
calculator	<i>n.</i> 计算器
ballistics	<i>n.</i> 弹道学
process	<i>n.</i> 过程,进程;步骤,程序,手续 <i>v.</i> 对……加工;对……进行处理
ability	<i>n.</i> 能力
emerge	<i>v.</i> 出现,浮现
transistor	<i>n.</i> 晶体管
route	<i>n.</i> 道路,路线,路由,渠道 <i>v.</i> 给……定路线,按规定路线发送
feasible	<i>a.</i> 可行的,行得通的
transfer	<i>v.</i> 转移,转换,传送
reliable	<i>a.</i> 可信赖的,可靠的
magnetic	<i>a.</i> 磁的
transport	<i>v.</i> 运输,传输
store	<i>v.</i> 存储,存放
retrieve	<i>v.</i> 重新得到,挽回,恢复;追溯,回忆
infusion	<i>n.</i> 注入,灌输,浸入
accessible	<i>a.</i> 可接入的,能进入的
transmitter	<i>n.</i> 发射机,发送器
orbit	<i>n.</i> 轨道,活动范围