21世纪专业英语系列教材
The 21st Century Subject-oriented English

English for Information Technology

信息技术专业英语

（第2版）

[redacted]

主编 董惠 翟俊祥

西安交通大学出版社
XI'AN JIAOTONG UNIVERSITY PRESS

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编者 周军妮 王燕妮 杨润玲

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内容简介

本书内容基本覆盖了信技术的各个领域，可作为信息类各专业本科生的专业英语教材。另外，其它专业的本科生和研究生希望辅修信息专业，或者信息专业的从业人员及广大英语爱好者希望了解信息技术的概貌和发展，都可阅读本书。本书专业内容广泛、通俗，英语流畅、易读。阅读本书，既可丰富专业知识，又可提高英语水平。

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前言

本书是《信息与控制专业英语》的修订本。《信息与控制专业英语》自2000年出版以来受到了广泛的欢迎和好评，被全国各地的许多学校选做教材，连续多次印刷。然而，信息技术的发展极其迅速，新概念、新标准、新技术、新产品层出不穷。为了适应新形势的发展，我们对《信息与控制专业英语》做了较大的修改，删掉了许多旧内容，增加了大量新材料，并更名为《信息技术专业英语》，重新出版。本书包括电子技术和通信、计算机科学与网络，以及控制理论与工程等几个部分，覆盖了当今信息技术的大部分内容。

在《信息与控制专业英语》的使用过程中，我们收到了很多反馈信息和意见。根据广大教师的建议和要求，这次修订中，除教材外，我们还增添了《信息技术专业英语》的教师用书和电子教案。教师用书包括参考译文、背景知识和练习答案几部分。其中背景知识和电子教案中的很多内容，可以帮助读者理解相关的专业知识，或者了解与技术发展有关的人物和历史。电子教案包括了课本和教师用书的电子文挡、大量课堂教学应用的PPT投影片和一些活泼有趣的动画，这样不但方便了教师备课，也会给课堂教学增添生气。

教师在使用本教材时，请特别注意对于练习题的运用。教材中的练习题有三部分内容：选择题、讨论题和摘要写作题。选择题要求学生在理解课文内容的基础上做出正确判断；讨论题和摘要写作题，除了加深学生对课文的理解外，还要求学生练习英文写作和口语表述。对于英文写作的初级要求是选用课文中的句子对讨论题作答、择出课文中的原句写出摘要；对于英文写作的高级要求是在写作中改写课文中的句子，可以改变句子结构、改变语气、改用不同的词汇和短语、增加不同的修饰成分、利用复杂的分词结构和复合句等等。对于这部分写作

练习，老师可以在课堂上提问和讨论，从而练习和提高学生的口语能力。通过这种方法练习写作和口语，其开发的潜力和前景是无限的，在教师用书的练习答案中，只是给了个示范和参考，希望各位老师在教学中不断总结和提高。

通过《信息技术专业英语》的教学活动，使学生熟悉与信息技术专业相关的词汇和术语，掌握科技英语的表达方式，提高专业英语的读写与交际能力。学生可以充分利用教材信息，完成教材和教师的要求，不仅能正确理解课文内容，而且能够迅速提高科技英语的写作和口语能力。

目前，各个学校专业英语的教学情况各不相同，学生的程度和水平参差不齐，专业英语的学时一般也很有限，所以，老师可以根据专业和其它具体情况，选择部分内容进行教学。本书也可作为各专业本科生和研究生对于信息技术的通识教材；由于本书内容涉及到信息技术的各个方面，希望了解信息技术最新发展的工程技术从业人员和广大的英语爱好者，都可以阅读本书，从中获益。

本书由翟俊祥提出编辑纲要、做出编写示范，亲自编写了第 1，2，5 三个单元，最后审查和修改了全部中文译文。董惠作为主编，从教材立项、题材收集和选择，到任务分配、各方协调以及日常各项组织管理，负责全盘工作，并编写了第 6，14，15，20，21，22 单元，同时完成了第 4，11，13，18 单元的初稿翻译。周军妮编写了第 3，7，8，9，16，17，18，24 单元。王燕妮编写了第 4，10，12，19，25 单元。杨润玲编写了第 11，13，23 单元。由于编者专业知识及英语水平有限，缺点和错误在所难免，请广大读者多加指正。

编者对收录本书的原文作者表示感谢，对关心本书、过去提出过各种意见和建议的各位老师表示感谢，对出版社、特别是责任编辑谭小艺对本书修订工作的热情鼓励和支持以及他们的辛勤劳动和付出表示衷心的感谢。

翟俊祥

2008. 12. 25 于西安

第一版前言

本书用作大学信息与控制类专业的专业英语教材。专业英语是在结束了大学基础英语的学习后开设的，旨在使学生巩固已有的英语知识、进一步提高英语水平，并培养阅读相关专业的文章和资料的能力。

外语是本科教育的重要课程，熟练掌握一门外语是要求学生的一项基本技能，外语能力是衡量学生素质的一个重要方面。英语是目前应用最广、最为普及的一种语言，而信息技术是发展最为迅速、影响最为深远、也是目前最为热门的学科和技术领域。编者希望通过本书，能对提高学生的英语水平和普及信息技术知识作出贡献。

编者根据多年来专业英语教学的经验和目前大多数学生英语水平的现状，力图使本教材具有通俗性和趣味性的特点。基础英语作为必修课，由于学业的要求和考试的压力，学生还比较重视。专业英语是一门考查课，很多学生又通过了英语四级考试，加之后继课程负担加重，大多数人往往放松了英语学习。而这个时候学生的现状是：有了相当的英语基础和读、听能力，但熟练掌握和实际应用英语的能力还很差，处在英语学习的关键时刻。如果放松学习，甚至慢慢遗忘，实在是既可惜、又可悲的事情。如何使“要我学”变为“我要学”，把“应试型”变为“应用型”，关键就是要有一本通俗而有趣的教材，激发学生的兴趣，吸引学生自觉地去学习。如果教材索然无味，学生就不想去看；但如果过于艰深，学生就看不下去。当然，“通俗”不等于“简单”，过于简单的东西是无味的。我们的任务是引导学生在原有的基础上一步一步地提高。当他们增长了知识，看到了自己的进步，就会激发浓厚的兴趣，自觉坚持学习。时间长了，日积月累，英语水平和能力自然而然就提高了。

专业英语是基础英语的继续，学完基础英语、通过四级考试的学生，阅读本书应该没有很大的困难。考虑到三年级学生，刚刚开始接触专业课，所以本书的专业

内容定位在专业教材与科普读物之间 -- 不是用原版英语教材进行专业课教学，而是用英语介绍广泛的专业内容和知识。从专业的角度看，本书可叫做"信息技术概论"或"信息技术博览"，全书包括控制论与电子技术、计算机科学与技术、通信工程与技术三部分。每篇文章，例如计算机、电视或电话机，不但介绍了它的组成部分、各部分的工作原理以及各种体系结构和分类，还介绍了技术进步和发展的历史，目前的技术现状和成果，以及未来的发展方向和前景等。信息技术日新月异，本书力图反映最新的技术成果，例如因特网和全球卫星定位系统等。

本书内容广泛，基本覆盖了信息与控制领域的各个方面，同时专业内容浅显，符合素质教育中拓展学生知识面的指导思想。不仅信息与控制类专业的学生可以用它作为专业英语教材，其它专业的本科生和研究生希望辅修此类专业，信息产业从业人员以及广大的英语爱好者希望了解信息技术的概貌和发展，都可阅读本书，从中获取专业知识，提高英语水平。

本书是由翟俊祥总体策划和选材，由翟俊祥和杨向明共同编写的。翟俊祥编写了全部词汇和句子注释，并编配了部分课文的练习题和答案。第 2，3，4，5，6，11，12，14，15，16，17，18，19，21，27，28，33 课的练习题和答案是由杨向明编配的。另外，赵友安、翟琰也参加了部分编写工作。

出版社聘请专家和教授审阅了书稿，提出了宝贵的修改意见，编者对他们表示衷心的感谢。由于编者水平所限，仍有很多缺点和错误，希望广大读者批评指正。

编 者

2000. 7. 30

Contents

1 Electronics

1 Introduction

Electronics is a field of engineering and applied physics dealing with the design and application of devices, usually electronic circuits, the operation of which depends on the flow of electrons for the generation, transmission, reception, and storage of information.[1] The information can consist of voice or music (audio signals) in a radio receiver, a picture on a television screen, or numbers and other data in a computer.

Electronic circuits provide different functions to process this information, including amplification of weak signals to a usable level; generation of radio waves; extraction of information, such as the recovery of an audio signal from a radio wave (demodulation); control, such as the superimposition of an audio signal onto radio waves (modulation); and logic operations, such as the electronic processes taking place in computers.[2]

2 Historical Background

The introduction of vacuum tubes at the beginning of the 20th century was the starting point of the rapid growth of modern electronics. With vacuum tubes the manipulation of signals became possible, which could not be done with the early telegraph and telephone circuit or with the early transmitters using high-voltage sparks to create radio waves. For example, with vacuum tubes weak radio and audio signals could be amplified, and audio signals, such as music or voice, could be superimposed on radio waves. The development of a large variety of tubes designed for specialized functions made possible the swift progress of radio communication technology before World War II and the development of early computers during and shortly after the war.[3]

The transistor, invented in 1948, has now almost completely replaced the vacuum tube in most of its applications. Incorporating an arrangement of semiconductor materials and electrical contacts, the transistor provides the same functions as the vacuum tube but at reduced cost, weight, and power consumption and with higher reliability.[4] Subsequent advances in semiconductor technology, in part attributable to the intensity of research associated with the space-exploration effort, led to the development of the integrated circuit.[5] Integrated circuits may contain hundreds of thousands of transistors on a small piece of material and allow the construction of complex electronic circuits, such as those in microcomputers, audio and video equipment, and communications satellites.

3 Electronic Components

Electronic circuits consist of interconnections of electronic components. Components are classified into two categories—active or passive. Passive elements never supply more energy than they absorb; active elements can supply more energy than they absorb. Passive components include resistors, capacitors, and inductors. Components considered active include batteries, generators, vacuum tubes, and transistors.

3.1 Vacuum Tubes

A vacuum tube consists of an air-evacuated glass envelope that contains several metal electrodes. A simple, two-element tube (diode) consists of a cathode and an anode that is connected to the positive terminal of a power supply. The cathode—a small metal tube heated by a filament—frees electrons , which migrate to the anode—a metal cylinder around the cathode (also called the plate).[6] If an alternating voltage is applied to the anode, electrons will only flow to the anode during the positive half-cycle; during the negative cycle of the alternating voltage, the anode repels the electrons, and no current passes through the tube. Diodes connected in such a way that only the positive half-cycles of an alternating current (AC) are permitted to pass are called rectifier tubes; these are used in the conversion of alternating current to direct current (DC). By inserting a grid, consisting of a spiral of metal wire, between the cathode and the anode and applying a negative voltage to the grid, the flow of electrons can be controlled. When the grid is negative, it repels electrons, and only a fraction of the electrons emitted by the cathode can reach the anode. Such a tube, called a triode, can be used as an amplifier. Small variations in voltage at the grid, such as can be produced by a radio or audio signal, will cause large variations in the flow of electrons from the cathode to the anode and, hence, in the circuitry connected to the anode.

3.2 Transistors

Transistors are made from semiconductors. These are materials, such as silicon or germanium, that are "doped" (have minute amounts of foreign elements added) so that either an abundance or a lack of free electrons exists.[7] In the former case, the semiconductor is called n-type, and in the latter case, p-type. By combining n-type and p-type materials, a diode can be produced. When this diode is connected to a battery so that the p-type material is positive and the n-type negative, electrons are repelled from the negative battery terminal and pass unimpededly to the p-region, which lacks electrons.[8] With battery reversed, the electrons arriving in the p-material can pass only with difficulty to the n-material, which is already filled with free electrons, and the current is almost zero.

The bipolar transistor was invented in 1948 as a replacement for the triode vacuum tube. It consists of three layers of doped material, forming two p-n (bipolar) junctions with configurations of p-n-p or n-p-n. One junction is connected to a battery so as to allow current flow (forward bias), and the other junction has a battery connected in the opposite direction (reverse bias). If the current in the forward-biased junction is varied by the addition of a signal, the current in the reverse-biased junction of the transistor will vary accordingly.[9] The principle can be used to construct amplifiers in which a small signal applied to the forward-biased junction causes a large change in current in the reverse-biased junction.

Another type of transistor is the field-effect transistor (FET). Such a transistor operates on the principle of repulsion or attraction of charges due to a superimposed electric field. Amplification of current is accomplished in a manner similar to the grid control of a vacuum tube.[10] Field-effect transistors operate more efficiently than bipolar types, because a large signal can be controlled by a very small amount of energy.

3.3 *Integrated Circuits*

Most integrated circuits are small pieces, or "chips", of silicon, perhaps 2 to 4 sq mm (0.08 to 0.15 sq in) long, in which transistors are fabricated. Photolithography enables the designer to create tens of thousands of transistors on a single chip by proper placement of the many n-type and p-type regions. These are interconnected with very small conducting paths during fabrication to produce complex special-purpose circuits. Such integrated circuits are called monolithic because they are fabricated on a single crystal of silicon. Chips require much less space and power and are cheaper to manufacture than an equivalent circuit built by employing individual transistors.

3.4 *Resistors*

If a battery is connected across a conducting material, a certain amount of current will flow through the material. This current is dependent on the voltage of the battery, on the dimensions of the sample, and on the conductivity of the material itself. Resistors with known resistance are used for current control in electronic circuits. The resistors are made from carbon mixtures, metal films, or resistance wire and have two connecting wires attached. Variable resistors, with an adjustable sliding contact arm, are often used to control volume on radios and television sets.

3.5 Capacitors

Capacitors consist of two metal plates that are separated by an insulating material. If a battery is connected to both plates, an electric charge will flow for a short time and accumulate on each plate. If the battery is disconnected, the capacitor retains the charge and the voltage associated with it. Rapidly changing voltages, such as caused by an audio or radio signal, produce larger current flows to and from the plates; the capacitor then functions as a conductor for the changing current. This effect can be used, for example, to separate an audio or radio signal from a direct current in order to connect the output of one amplifier stage to the input of the next amplifier stage.

3.6 Inductors

Inductors consist of a conducting wire wound into the form of a coil. When a current passes through the coil, a magnetic field is set up around it that tends to oppose rapid changes in current intensity. As a capacitor, an inductor can be used to distinguish between rapidly and slowly changing signals. When an inductor is used in conjunction with a capacitor, the voltage in the inductor reaches a maximal value for a specific frequency. This principle is used in a radio receiver, where a specific frequency is selected by a variable capacitor.

3.7 Sensing Devices and Transducers

Measurements of mechanical, thermal, electrical, and chemical quantities are made by devices called sensors and transducers. The sensor is responsive to changes in the quantity to be measured, for example, temperature, position, or chemical concentration. The transducer converts such measurements into electrical signals, which, usually amplified, can be fed to instruments for the readout, recording, or control of the measured quantities. Sensors and transducers can operate at locations remote from the observer and in environments unsuitable or impractical for humans.

Some devices act as both sensor and transducer. A thermocouple has two junctions of wires of different metals; these generate a small electric voltage that depends on the temperature difference between the two junctions. A thermistor is a special resistor, the resistance of which varies with temperature. A variable resistor can convert mechanical movement into an electrical signal. Specially designed capacitors are used to measure distance, and photocells are used to detect light. Other devices are used to measure velocity, acceleration, or fluid flow. In most instances, the electric signal is weak and must be amplified by an electronic circuit.

4 Power-Supply Circuits

Most electronic equipment requires DC voltages for its operation. These can be provided by batteries or by internal power supplies that convert alternating current as available at the home electric outlet, into regulated DC voltages.[11] The first element in an internal DC power supply is a transformer, which steps up or steps down the input voltage to a level suitable for the operation of the equipment. A secondary function of the transformer is to provide electrical ground insulation of the device from the power line to reduce potential shock hazards.[12] The transformer is then followed by a rectifier, normally a diode. In the past, vacuum diodes and a wide variety of different materials such as germanium crystals or cadmium sulfide were employed in the low-power rectifiers used in electronic equipment. Today silicon rectifiers are used almost exclusively because of their low cost and their high reliability.

Fluctuations and ripples superimposed on the rectified DC voltage (noticeable as a hum in a malfunctioning audio amplifier) can be filtered out by a capacitor; the larger the capacitor, the smaller is the amount of ripple in the voltage. More precise control over voltage levels and ripples can be achieved by a voltage regulator, which also makes the internal voltages independent of fluctuations that may be encountered at an outlet.[13] A simple, often-used voltage regulator is the zener diode. It consists of a solid-state p-n-junction diode, which acts as an insulator up to a predetermined voltage; above that voltage it becomes a conductor that bypasses excess voltages.[14] More sophisticated voltage regulators are usually constructed as integrated circuits.

5 Amplifier Circuits

Electronic amplifiers are used mainly to increase the voltage, current, or power of a signal. A linear amplifier provides signal amplification with little or no distortion, so that the output is proportional to the input.[15] A nonlinear amplifier may produce a considerable change in the waveform of the signal. Linear amplifiers are used for audio and video signals, whereas nonlinear amplifiers find use in oscillators, power electronics, modulators, mixers, logic circuits, and other applications where an amplitude cutoff is desired.[16] Although vacuum tubes played a major role in amplifiers in the past, today either discrete transistor circuits or integrated circuits are mostly used.

5.1 Audio Amplifiers

Audio amplifiers, such as are found in radios, television sets, citizens band (CB) radios, and cassette recorders, are generally operated at frequencies below 20 kilohertz (1 kHz = 1000 cycles/sec). They amplify the electrical signal, which then is converted to sound in a loudspeaker. Operational amplifiers (op-amps), built with integrated circuits and consisting of DC-coupled, multistage, linear amplifiers, are popular for audio amplifiers.

5.2 Video Amplifiers

Video amplifiers are used mainly for signals with a frequency spectrum range up to 6 megahertz (1 MHz = 1 million cycles/sec). The signal handled by the amplifier becomes the visual information presented on the television screen, with the signal amplitude regulating the brightness of the spot forming the image on the screen.[17] To achieve its function, a video amplifier must operate over a wide band and amplify all frequencies equally and with low distortion.

5.3 Radio Frequency Amplifiers

These amplifiers boost the signal level of radio or television communication systems. Their frequencies generally range from 100 kHz to 1 GHz (1 billion cycles/sec = 1 gigahertz) and can extend well into the microwave frequency range.

6 Oscillators

Oscillators generally consist of an amplifier and some type of feedback: The output signal is fed back to the input of the amplifier. The frequency-determining elements may be a tuned inductance-capacitance circuit or a vibrating crystal. Crystal-controlled oscillators offer the highest precision and stability. Oscillators are used to produce audio and radio signals for a wide variety of purposes. For example, simple audio-frequency oscillators are used in modern push-button telephones to transmit data to the central telephone station for dialing.[18] Audio tones generated by oscillators are also found in alarm clocks, radios, electronic organs, computers, and warning systems. High-frequency oscillators are used in communications equipment to provide tuning and signal-detection functions. Radio and television stations use precise high-frequency oscillators to produce transmitting frequencies.

7 Switching and Timing Circuits

Switching and timing circuits, or logic circuits, form the heart of any device where signals must be selected or combined in a controlled manner. Applications of these circuits include telephone switching, satellite transmissions, and digital computer operations.

Digital logic is a rational process for making simple "true" or "false" decisions based on the rules of Boolean algebra. "True" can be represented by a 1 and "false" by a 0, and in logic circuits the numerals appear as signals of two different voltages. Logic circuits are used to make specific true-false decisions based on the presence of multiple true-false signals at the inputs.[19] The signals may be generated by mechanical switches or by solid-state transducers. Once the input signal has been accepted and conditioned (to remove unwanted electrical signals, or "noise"), it is processed by the digital logic circuits. The various families of digital logic devices, usually integrated circuits, perform a variety of logic functions through logic gates, including "OR", "AND", and "NOT", and combinations of these (such as "NOR", which includes both OR and NOT).[20] One widely used logic family is the transistor-transistor logic (TTL). Another family is the complementary metal oxide semiconductor logic (CMOS), which performs similar functions at very low power levels but at slightly lower operating speeds. Several other, less popular families of logic circuits exist, including the currently obsolete resistor-transistor logic (RTL) and the emitter coupled logic (ECL), the latter used for very-high-speed systems.

The elemental blocks in a logic device are called digital logic gates. An AND gate has two or more inputs and a single output. The output of an AND gate is true only if all the inputs are true. An OR gate has two or more inputs and a single output. The output of an OR gate is true if any one of the inputs is true and is false if all of the inputs are false. An INVERTER has a single input and a single output terminal and can change a true signal to a false signal, thus performing the NOT function. More complicated logic circuits are built up from elementary gates. They include flip-flops (binary switches), counters, comparators, adders, and more complex combinations.

To perform a desired overall function, large numbers of logic elements may be connected in complex circuits. In some cases microprocessors are utilized to perform many of the switching and timing functions of the individual logic elements. The processors are specifically programmed with individual instructions to perform a given task or tasks. An advantage of microprocessors is that they make possible the performance of different logic functions, depending on the program instructions that are stored.[21] A disadvantage of microprocessors is that normally they operate in a sequential mode, which may be too slow for some applications. In these cases specifically designed logic circuits are used.

8 Recent Developments

The development of integrated circuits has revolutionized the fields of communications, information handling, and computing. Integrated circuits reduce the size of devices and lower manufacturing and system costs, while at the same time providing high speed and increased reliability.[22] Digital watches, hand-held computers, and electronic games are systems based on microprocessors. Other developments include the digitalization of audio signals, where the frequency and amplitude of an audio signal are coded digitally by appropriate sampling techniques, that is, techniques for measuring the amplitude of the signal at very short intervals.[23] Digitally recorded music shows a fidelity that is not possible using direct-recording methods. Digital playback devices of this nature have already entered the home market. Digital storage could also form the basis of home video systems and may significantly alter library storage systems, because much more information can be stored on a disk for replay on a television screen than can be contained in a book.[24]

Medical electronics has progressed from computerized axial tomography, or the use of CAT or CT scanners, to systems that can discriminate more and more of the organs of the human body.[25] Devices that can view blood vessels and the respiratory system have been developed as well. Ultrahigh definition television also promises to substitute for many photographic processes, because it eliminates the need for silver.

Today's research to increase the speed and capacity of computers concentrates mainly on the improvement of integrated circuit technology and the development of even faster switching components. Very-large-scale integrated (VLSI) circuits that contain several hundred thousand components on a single chip have been developed. Very-high-speed computers are being developed in which semiconductors may be replaced by superconducting circuits using Josephson junctions and operating at temperatures near absolute zero.[26]

Words

1. attributable 可归因的，可归属的
2. communications satellite 通讯卫星
3. integrated circuit 集成电路
4. microcomputer 微型电脑，微型计算机
5. semiconductor 半导体
6. transistor 晶体管
7. vacuum tube 真空管，电子管
8. active element 有源元件
9. alternating current (AC) 交流电
10. amplifier 放大器，扩大器
11. anode 阳极
12. air-evacuated 抽成真空的，排空空气的
13. battery 电池
14. bias 偏压，偏置
15. capacitor 电容器
16. cathode 阴极
17. current intensity 电流强度
18. diode 二极管
19. direct current (DC) 直流电
20. dope (半导体中)掺杂
21. electrode 电极
22. field-effect transistor (FET) 场效应管
23. filament 细丝，细线，灯丝
24. generator 发电机，电源
25. germanium 锗元素(半导体材料)
26. grid 格子，栅极
27. inductor 电感器
28. magnetic field 磁场
29. migrate 移动，移往
30. monolithic 独块巨石的，整体的，单片的
31. passive component 无源元件
32. photocell 光电管，光电池
33. photolithography 照相平版印刷术，光刻法
34. rectifier 整流器
35. resistor 电阻器
36. sensor 传感器，敏感元件
37. silicon 硅元素(半导体材料)
38. thermistor 热敏电阻
39. thermocouple 热电偶
40. transducer 变换器，换能器，传感器

41. triode 三极管，真空三极管
42. unimpededly 无阻地，不受阻地
43. cadmium sulfide 硫化镉
44. filter 过滤，滤波；过滤器，滤波器
45. fluctuation 变动，波动
46. hum 嗡嗡声，哼声，杂声
47. malfunction 故障，失灵；发生故障，不起作用
48. regulator 调节器，稳压器
49. ripple 涟波，波纹
50. zener diode 齐纳二极管，稳压二极管
51. audio amplifier 音频放大器
52. cassette recorder 盒式录音机
53. citizens band 民用无线电频带
54. DC-coupled 直流耦合的，直接耦合的
55. discrete 离散的，分离的
56. distortion 失真，变形
57. mixer 混合器，混频器
58. modulator 调制器
59. operational amplifier (op-amp) 运算放大器
60. oscillator 振荡器
61. radio frequency amplifier 射频放大器
62. video amplifier 视频放大器
63. alarm clock 闹钟
64. dial 拨打电话；拨号盘
65. electronic organ 电子琴
66. feedback 反馈，回授
67. push-button 按钮，按键
68. tune 为……调谐，对准频率
69. warning system 报警系统
70. adder 加法器
71. AND gate "与"门
72. Boolean algebra 布尔代数
73. complementary metal oxide semiconductor (CMOS) logic 互补型金属-氧化物-半导体(CMOS)逻辑(电路)
74. comparator 比较器
75. counter 计数器
76. emitter coupled logic (ECL) 发射极耦合逻辑(电路)
77. flip-flop 触发器
78. INVERTER 反相器
79. logic circuit 逻辑电路
80. obsolete 荒废的，陈旧的，失去时效的
81. OR gate "或"门
82. resistor-transistor logic (RTL) 电阻-晶体管逻辑(电路)
83. timing circuit 定时电路
84. transistor-transistor logic (TTL) 晶体管-晶体管逻辑(电路)
85. blood vessel 血管
86. CT(Computer Tomography) 计算机断层造影术，CT 检查
87. definition 清晰度，分辨率
88. discriminate 区别，区分，差别待遇
89. fidelity 保真度
90. playback 播放，回放，重现
91. respiratory 呼吸的
92. superconducting 超导电的
93. very-large-scale integrated (VLSI) circuit 超大规模集成电路

Notes

[1] Electronics is a field of engineering and applied physics dealing with the design and application of devices, usually electronic circuits, the operation of which depends on the flow of electrons for the generation, transmission, reception, and storage of information.
电子学属于工程和应用物理学的范畴，研究通常由电子线路构成的设备的设计和应用，电子线路依靠电子的流动进行信息的产生、传输、接收和储存。

[2] Electronic circuits provide different functions to process this information, including amplification of weak signals to a usable level; generation of radio waves; extraction of information, such as the recovery of an audio signal from a radio wave (demodulation); control, such as the superimposition of an audio signal onto radio waves (modulation); and logic operations, such as the electronic processes taking place in computers.
电子线路具有各种不同的功能来处理这一信息，包括把微弱信号放大到可用的大小、无线电波的产生、信