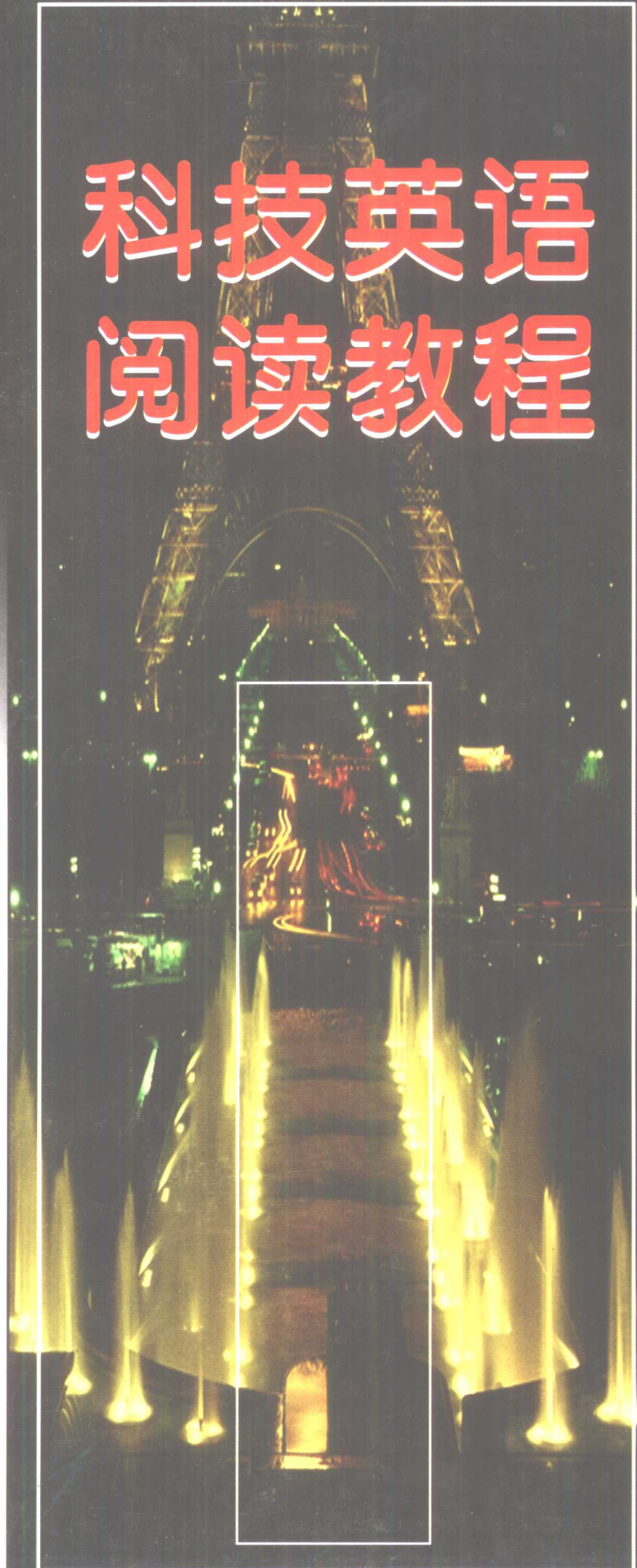


科技英语 阅读教程

主编 朱绍玉 陈淑君

石油大学出版社



Scientific English Reading Course

科技英语阅读教程

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前 言

为了给石油工业培养全面发展的合格人才,满足石油高校函授英语教学需要,提高函授学生阅读英语科技文章的能力,为以后更好地阅读专业英语打下扎实的语言基础,经石油高校函授教育总部批准,石油高函英语学科组在总部的正确指导下,经过周密酝酿,多次严格筛选材料,认真编写,《科技英语阅读教程》今天和广大读者见面了。这本教科书的问世,是石油高函总部亲切关怀和大力支持的结果;是行业联网办学优势的体现;是英语学科组全体成员一年多辛勤劳动的结晶。

这本教科书共分16个单元,48篇文章,其中7个单元,21篇文章(含计算机)属于科普知识;6个单元,18篇文章属于石油主干专业的科普知识;3个单元,9篇文章属于财会和管理专业的科普知识。在每篇文章后面都安排一定数量、形式不一的练习题,用来检查学生理解和掌握的程度。书后还附有词组和总词汇表;科技英语常用构词法表;练习答案及课文的参考译文。

本书的文章均选自国内外有影响的、近几年出版的英语报刊、杂志及少量教材的部分章节,内容丰富,范围广泛,语言规范,贴近生活,具有强烈的时代感。我们相信这本教材定会在石油高函英语教学中起到积极的作用。

在编写过程中得到了石油高函总部领导、各石油高校成教学院领导和同志们以及石油大学出版社的同志们的大力支持与帮助,石油高函英语学科组组长胡祖修教授做了大量的指导工作,在此,对他们表示衷心的感谢。对被选用教材的原作者表示深深的谢意。同时对为本书的出版做了大量工作的王芳、刘秀丽、王桂琴等同志表示感谢。

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由于编写时间仓促，加之我们各方面水平有限，书中不足之处在所难免，敬请专家、同行和广大读者赐教。

编 者

1997年12月

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UNIT 1

Part A Intensive Reading

Types of Computers

Digital, analog, and hybrid computers

1 A digital computer is a counting device that operates on discrete data. It operates by directly counting numbers (or digits) that represent numbers, letters, or other special symbols. Just as digital watches directly count off the seconds and minutes in an hour, digital processors also count discrete values to achieve the desired output results.

2 In contrast to digital processors, however, there are also analog computers that do not compute directly with numbers. Rather, they deal with variables that are measured on a continuous scale and are recorded to some predetermined degree of accuracy¹. Analog computing systems are frequently used to control processes such as those found in an oil refinery where flow and temperature measurements are important.

3 Desirable features of analog and digital machines are sometimes combined to create a hybrid computing system. In a hospital intensive-care unit, for example, analog devices may measure a patient's heart function, temperature, and other vital signs².

4 Analog and hybrid processors perform important specialized tasks. But the overwhelming majority of all computers used for business and scientific applications are digital devices.

General purpose and special purpose digital computers

5 Digital computers are made for both special and general uses, as the name suggests, a special-purpose computer is one that's designed to perform only one specific task. The program of instructions is wired into or permanently stored in such a machine. Although it lacks versatility, it does its single task quickly and efficiently. Special-purpose processors designed just to solve complex navi-

gational problems³ are installed aboard U. S. atomic submarines. Not too long ago, however, special purpose computers were too expensive for most applications. Only a few might be needed by one organization, and the specialized model might not do anyone else any good. But today, customized microcomputers are produced in large quantities to perform task such as monitoring household appliance and controlling the fuel, ignition, and instrument systems in automobiles. Furthermore, rapid progress is now being made in developing the automated design tools that engineers can use to economically build small quantities of complex microcomputer chips for specialized purposes.

6 A general-purpose computer is one that can store different programs and can thus be used in countless applications. You've seen that by using different instructions such a machine can process a payroll one minute and a billing application the next⁴. New programs can be written, and old programs can be changed or dropped. The versatility of a general-purpose system is limited only by human imagination. And so, unless otherwise noted⁵, all our future discussion of "computers" will be about general-purpose digital systems.

Micro, mini, mainframe and super computers

7 All computer systems of interest to us are similar in that they contain hardware components for input, central processing, and output. They all perform basic machine operations under the direction of stored programs which can be quickly changed to permit the processing of a stream of different applications. Of course, widely different sorts of applications require different system resources to process them.

8 Modern computers vary in physical size from those that fill rooms to those with CPUs the size of a dime⁶. Generally, the larger the system, the greater is its processing speed, storage capacity, and cost. Also, the larger systems are better equipped to handle a greater number of more powerful input and output devices.

9 Systems on the low end of the size scale are called microcomputers or minicomputers. Microcomputers or personal computers are the smallest general-purpose systems. But they may perform the same operations and use the same program instructions as much larger computers. Minicomputers are also small general-purpose systems. They are typically more powerful and expensive than micros, although the performance of some newer micros may surpass the capabilities of some older minis. In physical size, minis can vary from a desktop model

to a unit the size of a small file cabinet.

10 Continuing up the size scale, mainframe computers are systems that may offer faster processing speeds and greater storage capacity than a typical mini. A whole series of mainframe models ranging in size from small to very large are generally lumped together under family designation by mainframe manufacturers. There's quite a bit of overlap possible in the cost, speed, and storage capacity of larger minis and smaller mainframes.

11 Finally come the supercomputers, designed to process complex scientific applications'. These systems are the largest, fastest.

New Words and Expressions

1. analog	['ænələg] n.	模拟; 类似物
2. hybrid	['haɪbrɪd] adj. & n.	混合的; 混合词
3. discrete	[dɪs'kri:t] adj.	离散的, 分立的; 无联系的
4. variable	['vɛəriəbl] n. & adj.	变量, 变数, 变元; 可变的, 变量的
5. desirable	[dɪ'zaiərəbl] adj.	称心的, 合意的; 合乎需要的
6. intensive	[ɪn'tensɪv] adj.	密集的; 强烈的; 深入细致的
7. vital	['vaɪtl] adj.	生命的, 生机的; 重要的
8. overwhelming	[ɔuvə'welmiŋ] adj.	巨大的, 压倒性的
9. wire	['waɪə] v. & n.	用金属加固; 打电报; 金属线, 电线
10. versatility	[ɪvɜ:sə'tiliti] n.	通用性; 多功能性
11. navigational	[ɪnəvi'geɪʃənl] adj.	航行的, 导航的
12. customize	['kʌstəmaɪz] vt.	定制, 按规格改制
13. monitor	['mɒnɪtə] vt. & n.	监视, 监控; 监视器; 监听器; 监控程序
14. appliance	[ə'plaiəns] n.	用具, 器具; 应用, 适用
15. ignition	[ɪg'niʃən] n.	点火, 着火
16. chip	[tʃɪp] n.	芯片, 组件
17. payroll	['peɪrəʊl] n.	工资单, 发薪簿
18. micro	['maɪkrəʊ] n.	microcomputer 的缩写
19. surpass	[sə'pɑ:s] vt.	超过, 超越
20. mini	['mɪni] n.	minicomputer 的缩写; 同类中的极小者
21. cabinet	['kæbɪnɪt] n.	箱, 柜, 盒; 密室, 内阁
22. lump	[lʌmp] vt.	把……归并在一起; 集中, 集总
23. designation	[dezi'geɪʃən] n.	命名, 标志; 指明, 指示, 标示
24. overlap	[əʊvə'læp] n. & vt.	重叠; 覆盖面; 与……部分一致

- | | |
|--------------------------|----------------|
| 1. just as | 正如……(一样), 正像 |
| 2. count off | 报数 |
| 3. in contrast to | 与……相反 |
| 4. deal with | 处理, 安排, 做买卖 |
| 5. on a continuous scale | 连续不断地 |
| 6. not too long ago | 不久前 |
| 7. in large quantities | 大批, 大量 |
| 8. a stream of | 一股……流 |
| 9. vary from ... to ... | 与……之间存在差异, 不同于 |
| 10. quite a bit of | 许多 |

Notes

1. ... that are measured ... degree of accuracy. that 引导定语从句, 修饰 variable, 其中 and 连接 are measured ... 和 are recorded... 两个并列谓语。
2. vital signs (指脉搏、呼吸、体温和血压) 维持生命的特征。
3. designed just to solve... problems 是过去分词短语作定语, 修饰 special-purpose processors。
4. ... one minute and... the next. one minute 为名词短语作状语。the next = the next time, 语法作用同前。
5. unless otherwise noted, unless 引导条件状语从句, 句子省略了主语和构成被动语态的助动词。
6. the size of a dime 在 the size 前面省略了 of。这个短语作定语, 修饰 CPUs。
7. Finally, come the... scientific applications. 在这个句子中, 前半部分是倒装句, 后半部分的 designed to ... applications 是分词短语作定语, 相当于一个非限制性定语从句 which are designed to... 。

Exercises

I. Comprehension

Choose the best answer from a), b), c) and d) according to the passage.

1. A _____ computer is a counting device that operates on discrete data.
a) analog b) hybrid c) digital d) personal
2. A hybrid computing system is a combination of the desirable features of _____ computers.
a) digital and analog b) digital and micro c) analog and mini d) micro and mini

3. Analog computers deal with _____ that are measured on a continuous scale and are recorded to the accurate degree which is desired.
 - a) data
 - b) numbers
 - c) letters
 - d) variables
4. Digital computers are designed for _____.
 - a) special uses
 - b) both special and general uses
 - c) general uses
 - d) counting numbers
5. Special-purpose computers were _____ that one company only owned a few in the past.
 - a) too expensive
 - b) so expensive
 - c) too cheap
 - d) so cheap
6. Unlike special-purpose computers, a general-purpose computer can be used in _____ applications.
 - a) limited
 - b) only a few
 - c) meaningful
 - d) endless
7. Small as it is, a personal computer can perform the same program instructions as _____.
 - a) larger computers
 - b) human beings
 - c) typewriters
 - d) printers
8. The largest and fastest computers are _____.
 - a) mainframe computers
 - b) supercomputers
 - c) hybrid computers
 - d) analog computers
9. "The versatility of a general-purpose system is limited only by human imagination." This means _____.
 - a) the versatility of a general-purpose is not limited
 - b) human imagination is limited
 - c) human imagination is unlimited
 - d) a general-purpose computer can do whatever human beings can imagine
10. Hardware components are used for the purpose of _____.
 - a) input
 - b) output
 - c) central processing
 - d) all of the above

II. Replace the following underlined parts with the words or expressions that best keep the original meanings.

1. A digital computer operates by directly counting numbers that represent numbers, letters, or other special symbols.
 - a) signs
 - b) idols
 - c) signals
 - d) codes
2. Generally, the larger the system, the greater is its processing speed, storage capacity and cost.
 - a) charge
 - b) fee
 - c) price
 - d) value
3. The overwhelming majority of all computers used for business and scientific applications are digital devices.
 - a) overmuch
 - b) overlooking
 - c) crushing
 - d) surprising
4. A special-purpose computer is one that's designed to perform only one specific task.
 - a) devised
 - b) imagined
 - c) signed
 - d) assigned
5. Special-purpose processors designed just to solve complex navigational problems are in-

stalled aboard U. S. atomic submarines.

- a) put b) placed c) fitted d) arranged
6. Microcomputers are produced to perform tasks such as controlling the fuel, ignition and instrument systems in automobiles.
- a) autos b) transportations c) vessels d) vehicles
7. A general-purpose computer is one that can store different programs and can thus be used in countless applications.
- a) however b) nevertheless c) thereafter d) therefore
8. New programs can be written, and old programs can be changed or dropped.
- a) omitted b) fallen c) stopped d) lost
9. Widely different sorts of applications require different system resources to process them.
- a) request b) ask c) need d) inquire
10. We have now developed automated design tools that the engineers can use to economically build small quantities of complex microcomputer chips.
- a) produced b) manufactured c) studied d) prepared

III. Translate the following sentences into Chinese.

1. A computer is a fast and accurate symbol manipulating system that is organized to accept, store, and process data and produce output results under the direction of a stored program of instructions.
2. Computer system may be discussed in two parts: software and hardware. Software refers to programs, the intangible (无形的, 不能触接的) components, as opposed to hardware which refers to the physical components of the computer.
3. The rapid growth of microcomputer systems since the late 1970s has now resulted in BASIC being very likely the most widely used computer language in the world.
4. It is well known that a data base is a collection of logically related data elements that may be structured in various ways to meet the multiple processing and retrieval needs of organizations and individuals.
5. Output devices are instruments of interpretation and communication between humans and computer systems. These devices take output results from the CPU in machine-coded form and convert them into a form that can be used by people.

IV. Put the following sentences into English.

1. 几乎所有人都相信, 不久的将来, 进入信息高速公路将成为人们日常生活中极平常的事。
2. 文字处理是指利用计算机软件和硬件完成文件的写作、编辑、排版、存储、打印工作的过程。用于文字处理的计算机程序称之为文字处理程序。
3. 数字计算机是通用的数字系统。一台通用数字计算机可执行各种微机操作, 并且还可以规定它必须执行哪些特定的操作序列。
4. 40年以前电子数字计算机尚不存在; 而今天小得像婴儿指甲一样的微型集成电路块却正在更快捷更方便地承担着各种各样的任务。
5. 一些计算机的实验带来了人们对未来的幻想。例如科学家们正在制作能用电子来实现的视听功能的装置, 这能使聋哑人生活得更容易些。

Part B Extensive Reading

I. Computer Generations

The first generation of computers (1946 through 1959)

1 The first generation of computers was characterized by the most prominent feature of the ENIAC—vacuum tubes. Through 1950, several other notable computers were built, each contributing significant advancements¹, such as binary arithmetic, random access, and the concept of stored programs. These computer concepts are still common in today's computers.

The second generation of computers (1959 through 1964)

2 To most people, the invention of the transistor meant small portable radios. To those in the data processing business, it signaled the start of the second generation of computers. The transistor meant more powerful, more reliable, and less expensive computers that would occupy less space and give off less heat than did vacuum-tube-powered computers.

3 The expense item should be emphasized. The cost of a computer during the first, second, and part of the third generations represented a significant portion of a company's budget. Computers were expensive. Cost per instruction executed can be used to measure the cost of computers over the last three decades². Significant innovations spurred by intense competition have resulted in enormous increases in computer performance and substantial reductions in price. This trend, established with the introduction of second-generation computers, continues today.

The third generation of computers (1964 through 1971)

4 The System 360 ushered in the third generation of computers. Integrated circuits did for the third generation what transistors did for the second generation³. The System 360s and the third-generation computers made all previously installed computers obsolete.

5 The compatibility problems of second-generation computers were almost eliminated in third-generation computers. However, third-generation computers differed radically from second-generation computers. The change was revolu-

tionary, not evolutionary, and caused conversion nightmares for thousands of computer users. In time, the conversion of information systems from second-generation to third-generation hardware was written off.

6 Third-generation computers work so quickly that they provide the capability to run more than one program concurrently (multiprogramming).

The fourth generation of computers

7 The first three generations were characterized by significant technological breakthroughs in electronics — the use of vacuum tubes, then transistors, and then integrated circuits. Some people prefer to pinpoint the start of the fourth generation as 1971, with the introduction of large-scale integration (more circuits per unit space) of electronic circuitry. However, other computer designers argue that if we accept this premise, then there would probably have been a fifth⁴, a sixth, and maybe a seventh generation since 1971.

8 The base technology of today's computers is still the integrated circuit. This is not to say that two decades have passed without any significant innovations. In truth, the computer industry has experienced a mind-boggling succession of advances in the further miniaturization of circuitry, data communications, the design of computer hardware and software, and input/output devices.

9 One of the most significant contributions to the emergence of the fourth generation of computers is the microprocessor. The microprocessor, which can be contained on a single silicon chip, is a product of the microminiaturization of electronic circuitry. The first fully operational microprocessor, sometimes called a "computer on a chip", was invented in 1971. Today, there are more microprocessors on Earth than there are people. This device costs less than a soft drink and can be found in everything from elevators to satellites.

Generationless computers

10 We may have defined our last generation of computers and begun the era of generationless computers. Even though computer manufacturers talk of "fifth"-and "sixth"-generation computers, this talk is more a marketing play than a reflection of reality. Advocates of the concept of generationless computers say that even though technological innovations are coming in rapid succession, no single innovation is, or will be, significant enough to characterize another generation of computers.

New Words and Expressions

1. prominent	['prɒmɪnənt] adj.	突出的;显著的;杰出的;重要的
2. binary	['baɪnəri] adj.	二进制的;二值的
3. arithmetic	[ə'riθmətik] n. & adj.	算术学,算术;算术的,运算的
4. random	['rændəm] adj.	随机的,杂乱的,无规则的;任意的,随便的
5. access	['ækses] n.	进入,通道;使用,接近;突发,发作
6. portable	['pɔ:təbl] adj.	便携式的,简便的;可移动的
7. budget	['bʌdʒɪt] n. & vt.	预算;安排开支
8. spur	[spɜ:] vt.	刺激,鼓舞
9. substantial	[sʌbs'tænʃəl] adj.	大量的,大的;物质的,实质的
10. usher	['ʌʃə] vt. & n.	带来,引进;领座员,招待员,引导员
11. obsolete	['ɒbsəli:t] adj.	老式的,已废弃的;过时的
12. compatibility	[kəm,pætə'biliti] n.	兼容性,相容性;一致性;互换性
13. eliminate	[i'limineɪt] vt.	排除,除去,淘汰
14. radically	['rædɪkli] adv.	完全地,彻底地;基本地;偏激地,激进地
15. conversion	[kən'veɪʃn] n.	变换,转化;转化法
16. nightmare	['naitmɛə] n.	恶梦
17. concurrently	[kə:n' kʌrəntli] adv.	并行地;一致地,同时存在地
18. pinpoint	['pɪnpɔɪnt] vt. & n.	指出正确位置;找出或描述准确的性质或原因;正确定位
19. circuitry	['sə:kɪtri] n.	电路
20. premise	['premɪs] n.	前提
21. boggle	['bɒgl] v.	(使)吃惊;搞坏(事情等)
22. succession	[sək'seʃən] n.	连续,继任
23. miniaturization	[minɪətʃəraɪ'zeɪʃən] n.	小型化
24. silicon	['sɪlɪkən] n.	硅
25. advocate	['ædvəki:t] n.	鼓吹者,提倡者;辩论者

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1. give off	发散,发出
2. result in	造成,导致
3. usher in	带来
4. write off	容易地写成(文章等),一口气写成;注销
5. in truth	实际上,事实上