EST BOOK 4

科技英语

第四册

电 专 业

广东科技出版社

初、中级技术人员培训教材

科 技 英 语

第四册（电学部分）

English for Science and Technology

Book 4

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李学平 审校

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内 容 简 介

《科技英语》是为科技人员学习英语而编写的系列教材，分为五册。

本书是《科技英语》第四册(电学部分)。全书以最新的国外电子科技文章为课文和阅读材料，内容涉及激光、电子计算机、电子显微镜、无线电、微波、电报、电话、电视、电冰箱、洗衣机、微波炉、电熨斗等。这些教材反映了现代科技发展的新趋向。每篇课文均有疑难句的语法分析、注释，使读者更好地加深对课文的理解，提高对电类专业英语的阅读和翻译能力；每课后还附有翻译练习。

本书既可作为电类专业中级科技英语培训班的培训教材，也适合于电类大专院校学生和具有中等英语基础的电类专业科技人员和工人自学之用。

前　言

《科技英语》共五册。第一、二册分别为基础部分和提高部分，内容包括了科技人员必须掌握的基本知识；第三、四、五册为专业部分，分为化学类、电类和建筑类英语，供对口专业选用。

本书是《科技英语》第四册（电学部分），是继基础部分和提高部分后编写的。目的是使学完《科技英语》第一、二册或相应教材的电类专业科技人员能在较短时间内掌握本专业英语知识，提高阅读和翻译专业英文书刊、资料的能力。

本书共有课文二十篇，阅读材料二十篇。内容涉及激光、电子计算机、电子显微镜、无线电、微波、电报、电话、电视、电冰箱、洗衣机、微波炉、电熨斗等。全书课文和阅读材料均选自国外书刊和杂志，每篇均附有词汇、词组、难句注释，课后还附有练习。

本书经华南工学院李学平教授悉心审阅，并提出了不少有益的意见。

限于编者的水平，书中谬误和不当之处在所难免，敬请指正。

编　者

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Lesson One

Text

The Growth of Electronics

The first phenomena that we now recognize to be caused by electrons were noticed during the nineteenth century when inventors like Edison were studying electrical effects in evacuated glass bulbs and tubes①. Sometimes certain areas of the almost completely evacuated vessel would become luminous and glow with blue, green or red light. Though these effects were exploited to produce colourful discharges—now well known as the fluorescent neon-tubes used in advertising②—the cause of these phenomena was then unknown.

Then, in 1899, J.J. Thomson discovered the first of the fundamental physical particles—the electron. This particle has a very small mass but carries a negative electric charge. The electron is therefore very responsive indeed to electric and magnetic fields. Soon after it had been discovered, scientists and inventors began to put it to work.

The next invention established the new applied science of electronics. In 1904 J.A. Fleming invented the diode valve which, with later elaborations, became the device which made radio possible③. Marconi's experiments in

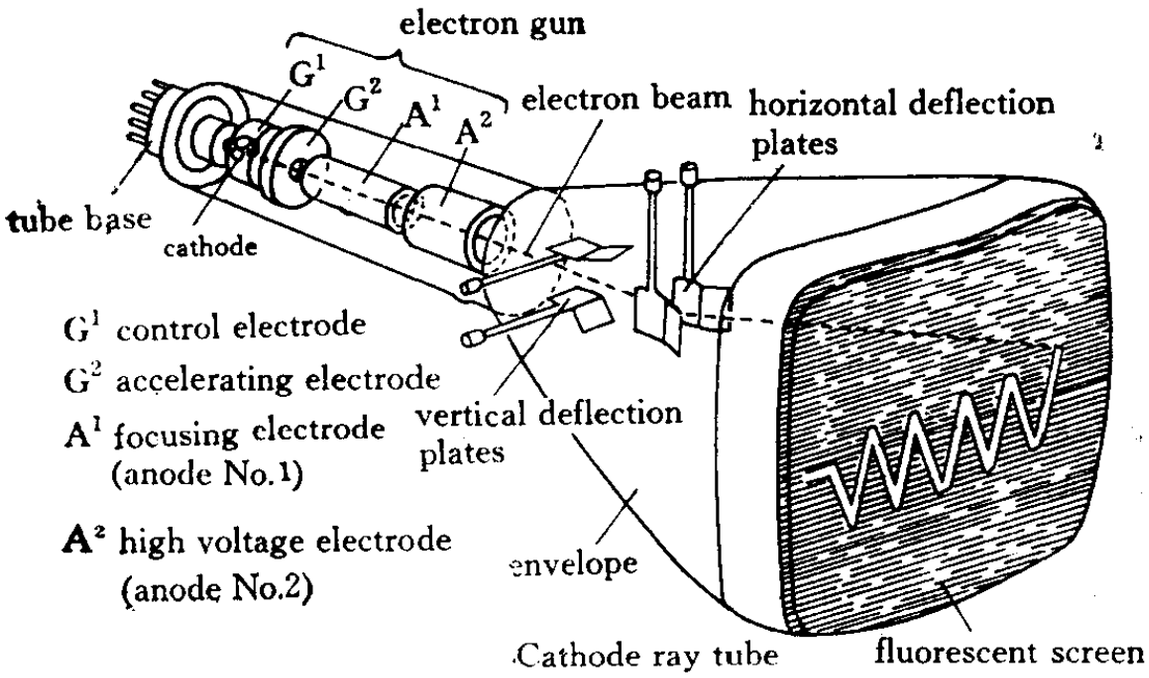
1901, in which he successfully transmitted the first messages by radio across the Atlantic, had demonstrated that radio waves could be used for telecommunications but it took some time to develop the first working radio systems④. The first radio broadcasts were made in Britain in 1927 on short wave.

So electronics is the basis of all telecommunication systems. The radio valves which contained a gas at very low pressure are now being replaced by solid-state semiconductor devices called transistors which are much smaller and have a longer life than gas valves[5]. Since the last war a whole new industry concerned with the manufacture and exploitation of solid-state electronics[6] has been established. One new branch of this field has led to the development of computers which contain enormous numbers of transistors, minute magnetic cores and other new electronic solid-state devices.

The electronics industry now embraces radio, television, computers, automatic control and many other areas. Electronics is a field in which scientific research and technical development is still intensive, and so many more manifestations of the versatility of the electron can be expected[7].

The cathode ray tube (C.R.T.) is one of the most important of the electronic devices because it made television possible. In the C.R.T. a thin beam of electrons moving in an evacuated glass vessel is made to respond to

changes in the electrical and magnetic fields imposed on it[8]. The response of the electronic beam is instantaneous because its inertia is negligible. It is therefore very sensi-



tive to any forces which act on it. When the beam of electrons strikes the front of the cathode ray tube it activates a phosphor—a material which converts electronic energy into the light which shows through the glass.

New words

1. growth [grəuθ] *n.* 发展；成长；增大
2. phenomenon [fi'nɔminən] *n.* 现象
   phenomena [fi'nɔminə] （复）
3. recognize ['rekəgnaiz] *v.* 认识；认出；公认
4. notice ['nəutis] *v.* 注意到
5. inventor [in'ventə] *n.* 发明者；发明家
6. like [laik] *pre.* 象；如
7. Edison ['edisn] *n.* 爱迪生
8. effect [i'fekt] *n.* 效应；作

用；效果

9. evacuate [i'vækjueit] *v.* 抽出；真空
10. area ['ɛəriə] *n.* 面积，区域，领域
11. completely [kəm'pli:tli] *ad.* 完全地
12. vessel ['vesl] *n.* 容器；器皿
13. luminous ['lu:minəs] *a.* 发光的
14. glow [gləu] *v.* 发光；发热
15. exploit [iks'plɔit] *v.* 开发；利用
16. colourful ['kʌləful] *a.* 多色的
17. discharge [dis'tʃɑ:dʒ] *n.* 放电
18. fluorescent [fluə'resnt] *a.* 发萤光的
19. neon-tube ['ni:ɔn 'tjub] *n.* 霓虹灯管
20. advertising ['ædvətaiziŋ] （英）
[ædvə'taiziŋ]（美）
n. 广告
21. Thomson ['tɔmsn] *n.* 汤姆生（人名）
22. fundamental [fʌndə'mentl] *a.* 基本的；基础的
23. physical ['fizikəl] *a.* 物理的
24. particle ['pɑ:tikl] *n.* 粒子；微粒
25. mass [mæs] *n.* 质量；（聚成一体的）团；块
26. negative ['negətiv] *a.* 负的
27. charge [tʃɑ:dʒ] *n.* 电荷
v. 充电；装（满）
28. responsive [ris'pɔnsiv] *a.* 易起反应的；敏感的
responsive to …
对…易起反应的
29. field [fi:ld] *n.* 场；方面，领域
30. establish [is'tæbliʃ] *v.* 建立；创办；确立，证实
31. applied [ə'plaid] *a.* 应用的；实用的
32. Fleming ['flemiŋ] *n.* 弗莱明（人名）
33. diode ['daiəud] *n.* 二极管
34. valve ['vælv] *n.* （英）电子管，阀
tube [tju:b] *n.* （美）电子管；真空管
35. later ['leitə] *a.* 较迟的，稍后的
36. elaboration [ilæbə'reiʃən] *n.* 精心制作；详细阐述
37. Marconi [mɑ:'kəuni] *n.* 马可尼（人名）
38. transmit [trænz'mit] *v.* 传送，输送；发射

39. message ['mesidʒ] *n.* 信息；消息，电报
40. across [ə'krɔs] *pre.* 横过；穿过
41. The Atlantic [ði ət'læntik] 大西洋
42. demonstrate ['demənstreit] *v.* 表明；示范；论证
43. telecommunication ['telikəmju:ni'keiʃən] *n.* 长途通讯；电信（复）
44. working ['wə:kiŋ] *a.* 工作的；实用的；可资用的
45. broadcast ['brɔ:dkɑ:st] *n.* 广播；播音
46. Britain ['britən] *n.* 不列颠（英格兰、威尔士和苏格兰的总称）
47. basis ['beisis] *n.* 基础；根据
bases ['beisi:z] （复）
48. replace [ri'pleis] *v.* 代替；把…放回（原处）
49. solid-state ['sɔlid-steit] *a.* 固体的；固态的
50. semiconductor ['semikən'dʌktə] *n.* 半导体
51. device [di'vais] *n.* 装置；器件；设备；元件
52. transistor [træn'sistə] *n.* 晶体管
53. manufacture [mænju:'fæktʃə] *n.* 制造 *v.* 制造(大量)
54. exploitation [ikspləi'teiʃən] *n.* 利用；开发
55. branch [brɑ:ntʃ] *n.* 分支；部门
56. contain [kən'tein] *v.* 包含；容纳
57. enormous [i'nɔ:məs] *a.* 巨大的；庞大的
58. minute [mai'nju:t] *a.* 微小的；精密的
59. embrace [im'breis] *v.* 包括；包含；包围
60. automatic [ɔ:tə'mætik] *a.* 自动的
61. research [ri'sə:tʃ] *n.* 研究
62. intensive [in'tensiv] *a.* 紧张的；精耕细作的
63. manifestation [mænifes'teiʃən] *n.* 表现形式
64. versatility [və:sə'tiliti] *n.* 多方面适用性
65. expect [iks'pekt] *v.* 期待；预料；盼望
66. thin [θin] *a.* 细的；薄的
67. beam [bi:m] *n.* （光、波、电子等的）束
68. respond [ris'pɔnd] *v.* 对…有反应；对…作答
69. impose [im'pəuz] *v.* 施影

响；强加于…

70. instantaneous [instən'teinjəs] *a.* 瞬时的；瞬态的
71. inertia [i'nə:ʃiə] *n.* 惯性；惯量；惰性
72. negligible ['neglidʒəbl] *a.* 可忽略不计的；微不足道的
73. sensitive ['sensitiv] *a.* 敏感的；灵敏的
74. act [ækt] *v.* 作用；干；行动
75. strike [straik] *v.* 打；击；触发；闪击
76. activate ['æktiveit] *v.* 激活、激发；作用
77. phosphor ['fɔsfə] *n.* 磷光体；磷光粉
78. convert [kən'və:t] *v.* 转变；变换

Phrases and Expressions

1. evacuated glass bulb 真空（抽掉空气的）玻璃圆球
2. evacuated tube 真空（抽掉空气的）管子
3. evacuated vessel 真空（抽掉空气的）器皿
4. fluorescent neon-tube 荧光霓虹管
5. fundamental physical particle 基本物理粒子
6. negative electric charge 负电荷，阴电荷
7. magnetic field 磁场
8. put … to work 使…工作
9. diode valve 二极管
10. radio valve 电子管
11. longer life 较长寿命
12. gas valve 充气管；离子管
13. concerned with … 与…有关的
14. lead to … 导致…
15. magnetic core 磁心
16. cathode ray tube (C.R.T.) 阴极射线管
17. a beam of electrons 一束电子

18. respond to ... 对…反对；对…作答
19. impose on (upon) ... 施于…
20. sensitive to ... 对…敏感的；对…灵敏的

Notes

1. The first phenomena that we now recognize to be caused by electrons were noticed during the nineteenth century when inventors like Edison were studying electrical effects in evacuated glass bulbs and tubes.

全句是一个主从复合句。The first phenomena ... were noticed…为主句。that we now recognize to be caused by electrons 是修饰 phenomena 的定语从句，其中 to be caused by electrons 是不定式短语（被动形式）作宾语 that 的补足语。when inventors ... bulbs and tubes 是修饰 century 的定语从句。全句可译为："我们现在认为由电子引起的一些现象，是在十九世纪象爱迪生等一批发明家在研究抽掉空气的玻璃圆球和管子的电效应的过程中首先注意到的。"

2. ... —now well known as the fluorescent neon-tubes used in advertising ... "now well known as ..." 是过去分词短语，意义相当于 which are now well known as ...", "used in advertising" 是过去分词短语作定语修饰 neon-tubes。

3. In 1904 J. A. Fleming invented the diode valve which, with later elaborations, became the device which made radio possible.

这一句是带有两个定语从句的复合句。第一个定语从句"which, with later elaborations, became the device" 修饰 diode valve, 其中 "with later elaborations" 是介词短语作状语。第二个定语从句 "which made radio possible 修饰device. 全句可译为："1904年J.A.弗莱明发明了二极管，加上后来的精心改良，使无线电收音机的出现成为可能。"

4. Marconi's experiments in 1901, in which he successfully transmitted the first messages by radio across the Atlantic, had demonstrated that radio waves could be used for telecommunications but it took some time to develop the first working radio systems.

全句是一个并列主从复合句。Marconi's experiments in 1901, … had demonstrated … 是主句。"in which he successfully transmitted the first messages by radio across the Atlantic," 是修饰 experiments 的定语从句。"that radio waves … radio systems." 是 had demonstrated 的宾语从句。but 开始是另一个分句，其中 it 是形式主语，真正的主语是 "to develop the first working radio systems." 此句可译为："马可尼在1901年所做的试验，成功地用无线电首次把信息传过大西洋，这已经说明无线电波能用于长途通讯，但第一批可用的无线电通讯系统的发展成功是花了一些时日的。"

5. The radio valves which contained a gas at very low pressure are now being replaced by solid-state semiconductor devices called transistors which are much smaller and have a longer life than gas valves.

"are now being replaced" 是谓语动词，现在进行时态，被动语态。"called transistors" 是过去分词短语作 devices 的后置定语。"which are much … gas valves." 是修饰 transistors 的定语从句。全句可译为："含有某种压力很低的气体的电子管，正在被一种固态半导体元件所代替，这元件称为晶体管，比充气管小得多，而使用寿命较长。"

6. Since the last war "第二次世界大战以来"。"concerned with … solid-state electronics" 过去分词短语作定语修饰名词 industry.

7. Electronics is a field … can be expected.

此句可译为："电子学是一门学科，其相关的科学研究和技术发展仍在不断进行，因此可以预料电子还将显示出愈来愈多的用途。"

8. In the C.R.T. a thin beam of electrons moving in an evacuated glass vessel is made to respond to changes in the electrical and magnetic fields imposed on it.

这是一个简单句。主语是 a thin beam of electrons, 分词短语 moving in an evacuated glass vessel 是它的定语。is made 是谓语，to respond to changes in …是动词不定式短语，在句中作主语补足语。imposed on it 是过去分词短语作名词 fields 的后置定语，it 指 a thin beam of electrons。全句可译为："在阴极射线管内，有一小束电子在抽空的玻璃管体内运动，使得此电子束对所施加的电磁场的变化作出反应。"