ENGLISH SELECTIONS OF RADIO ENGINEERING

蒋隽人选编

无线电技术英语选读

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内 容 提 要

本书从外文书刊中选编了二十篇英文阅读材料，包括了比较广泛的无线电技术知识。为了便于读者学习，每课后均附有译文和注释，并对重点难句进行了简单的语法分析。本书适合于学过英语基本语法的读者学习。

选编本书的目的是为了帮助读者提高阅读和翻译无线电技术方面英文资料的能力。

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LESSON ONE

CONDUCTORS, INSULATORS AND SEMICONDUCTORS

As is well known, to conduct an electric current means to transmit electrons. All substances have some ability to transmit electrons, but their capacity of conductivity is different. Some substances conduct electricity easily, while others strongly resist the flow of current. The former is called conductor; the latter is known as insulator.

We know metals to be good conductors of electricity. Of all metals, silver is the best conductor, but it is too expensive to be used in power industry. Copper is not so good in its conductivity as silver, bnt it is much cheaper than silver.[1] Therefore copper is widely used in power industry. Some liquids are good conductors, too. Gases are able to conduct electric current under certain pressures and temperatures. However, they are not as good conductors as metals.

The most common insulators are glass, rubber, porcelain, oil, paper, plastics, etc. Insulators are also widely used in power industry.

It is quite wrong to think that conductors are

the only materials to be used for the transmission of power. In fact, we need both conductors and insulators in electrical engineering. We can not do without the copper wire to conduct electricity, nor can we do without an insulator to prevent electric leakage.(2)

Therefore, it is necessary for us to choose the best insulators as well as the best conductors in the transmission of power.(3)

There are some other materials that have properties different from those of conductors and insulators. They are called semiconductors, whose conductivity is poorer than that of conductors, but better than that of insulators. It rapidly increases with heating and falls with cooling. So they have found wide use in electric measurements, radio engineering, telecommunication, automation and other branches of science and technique.

[tek'ni:k]

Notes to the Text

1. Copper is not so good in its conductivity as silver, but it is much cheaper than silver.

铜在导电性能上没有银那样好，但它比银便宜得多。

not so (as) … as … 该词组经常连接原级相比的形容词，副词。

This machine is not so (as) powerful as the other one.

(形容词)

这台机器的功率不如另一台大。

This machine doesn't run so(as)fast as that one. (副词)

这台机器运转得不如那一台快。

powerful 和 fast 是形容词和副词的原级，前边的 so (as) 是副词，后边的 as 是比较状语从句的连接词，后面的从句实质上是一句省略型的从句。

2. We can not do without the copper wire to conduct electricity, nor can we do without an insulator to prevent electric leakage.

没有铜导线不行，没有阻止漏电的绝缘物也不行。

do 作不及物动词用，表示"行"的意思。第二分句是倒装句。

3. Therefore, it is necessary for us to choose the best insulators as well as the best conductors in the transmission of power.

所以在电力传输中，我们必须选用最好的绝缘体和最好的导体。

此句中的 it 是形式主语，真正的主语是不定式短语 for us to choose the best insulators…，因为主语太长，所以用 it 代替，把主语后移。

as well as 是短语连接词，意思是"又"，"和"。

New Words

1. capacity [kə'pæsiti] n. 容量，容积，能力
2. strongly ['strɔŋli] ad. 强烈地，强大地
3. former ['fɔ:mə] a. 以前的，前面的
4. latter ['lætə] a. 后面的，近来的

5. expensive [iks'pensiv] a. 高价的，昂贵的
6. cheap [tʃi:p] a. 便宜的，廉价的
7. liquid ['likwid] n. 液体
8. gas [gæs] n. 气体
9. under ['ʌndə] prep. 在…之下
10. pressure ['preʃə] n. 压力，压强
11. rubber ['rʌbə] n. 橡皮，橡胶
12. porcelain ['pɔ:slin] n. 瓷（器）
13. oil [ɔil] n. 油
14. plastic ['plæstik] a. 可塑的 n. (pl.) 塑料
15. quite [kwait] ad. 完全、非常
16. wrong [rɔŋ] a. 错的
17. electrical [i'lektrikəl] a. 电的，电气的
18. nor [nɔ:] conj. 也不
19. prevent [pri'vent] vt., vi. 防止
20. leakage ['li:kidʒ] n. 漏出、泄漏
21. choose ['tʃu:z] vt. 选择
22. poor [puə] a. 穷、贫乏的
23. fall [fɔ:l] vi. 落下
24. cooling ['ku:liŋ] n., a. 冷却、冷的
25. measurement ['meʒəmənt] n. 测量
26. telecommunication [telikəmju:ni'keiʃən] n. 电信
27. automation [ɔ:tə'meiʃən] n. 自动化

Phrases and Expressions

1. as is well known 众所周知
2. to be different from 不同于

3. too … to … 太…而不…

4. to find wide use 得到广泛的应用

5. in fact 事实上

第一课 导体、绝缘体和半导体

大家都知道，传导电流即意味传送电子。一切物质都有一定传送电子的能力，但它们的导电率不同。有些物质容易导电，而另一些则强烈地阻止电流流动。前者称作导体，后者称作绝缘体。

我们知道金属是电的良导体。在一切金属中银是最好的导体，但它太贵而不能用在电力工业上。铜的导电率虽不如银那样好，但要比银便宜得多，所以铜被广泛地用于电力工业中。有些液体也是良导体。气体在一定的压力和温度之下，能够传导电流，然而它们不是象金属那样的良导体。

最常见的绝缘体为玻璃、橡皮、瓷、油、纸张、塑料等。在电力工业中也广泛使用绝缘体。

认为导体是电力传输上唯一使用的材料，是非常错误的。事实上，我们在电气工程上，既需要导体，也需要绝缘体。没有导电的铜线不行，没有阻止漏电的绝缘体也不行。

所以在电力传输中我们必须选用最好的绝缘体和最好的导体。

还有另外一些材料，它们的性质与导体和绝缘体的不同，称作半导体，它们的导电率比导体的差，但比绝缘体的好。它随着温度上升而迅速增大，随温度下降而迅速减小。所以它们在电气测量、无线电工程、电信、自动化以及其他科技分支中已得到广泛应用。

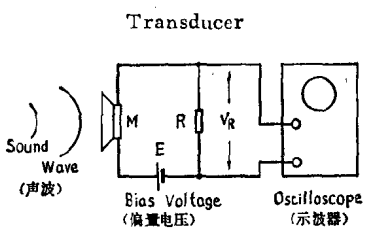
LESSON TWO

THE OSCILLOSCOPE

The cathode-ray oscilloscope is one of the most useful test and measurement instruments devised. Not only does it allow one to measure the magnitude of a test signal, but also it allows one to see how it varies with time.(1) Oscilloscopes can easily measure time spans from 1 second to 1×10^{-9} sec.(2) An oscilloscope is essentially a voltage-measuring device. It shows how voltage varies with time. But such parameters as current, light intensity, temperature, and sound pressure can easily be converted to voltages and measured by an oscilloscope.(3) All one needs is a transducer that converts each of these parameters into a corresponding change in current in an electric circuit.(4) One of the components of the electric circuit should be a resistor. Then the change in current produces a proportional voltage change across the resistor. This changing voltage is amplified and displayed by the oscilloscope.

The situation is shown in simplified form in the figure.In this case, it is desired to display a sound wave on the oscilloscope. A transducer M is used to

convert alternating pressure waves into a varying dc current. The circuit is a simple series circuit consisting of the transducer M, the bias voltage E, and the load resistor R.(The bias voltage is not always necessary. Some transducers are generators and produce their own emf.) The battery E produces a dc current in the simple series circuit and the transducer M modulates the current by varying its resistance in accordance with the impinging sound wave. The oscilloscope's measuring leads are placed across the load resistor R to detect the resultant voltage variation V_R. This voltage variation is then amplified to a useful level so that it can be displayed on the oscilloscope screen.[5]



Notes to the Text

1. Not only does it allow one to measure the magnitude of a test signal, but also it allows one to see how it varies with time.

它不仅使人们可以测量测试信号的大小，而且使人们可以

看到信号是怎样随着时间变化的。

凡用 not only … but also … 连接的句子，如果否定词 not only 出现在句首，该句的语序就应该倒装。其他否定词在句首时，也应倒装。如果行为动词之前原来无助动词，要另加助动词 do, does 或 did.

这种否定词还包括： never, seldom, hardly, scarcely, no sooner … than 等。例：

1) Never has he seen such a good radio.

他从来也没有见到这样好的无线电收音机。

2) Seldom have I met him recently.

最近我很少碰到他。

3) Hardly had I got on the bus when it started to move.

我一上公共汽车，它就开动了。

4) Scarcely did he speak about the difficulties in his work.

他很少提到自己工作中的困难。

5) No sooner had I reached home than it began to rain.

我刚一到家，天就下雨了。

2. 1×10^{-9} 应该读作 one times ten to the minus ninth power.

3. But such parameters as current, light intensity, temperature, and sound pressure can easily be converted to voltages and measured by an oscilloscope.

而象电流、光强度、温度和声压等参数可以容易地转换成电压，而由示波器来测量。

such … as 中的 such 是形容词，修饰 parameters, as 是

关系代词，引导一个定语从句，实际上该从句省略了谓语动词。

4. All one needs is a transducer that converts each of these parameters into a corresponding change in current in an electric circuit.

人们所需要的主要是个转换器，把这些参数中的每一种，在电路里转换成为对应的电流变化。

one needs 是定语从句修饰 all 省略了作 needs 的宾语的关系代词 that, 而句子中的 that 又引导了一个定语从句，that 本身又作从句的主语，该从句修饰 a transducer.

5. This voltage variation is then amplified to a useful level so that it can be displayed on the oscilloscope screen.

然后把这个电压变化放大到合用的电平，使它能在示波器的屏幕上显示出来。

so that 引导一个结果状语从句，so that 有时可以引导一个目的状语从句，其区别在于后者的从句谓语动词要用 may, might, should 等情态动词或助动词，例如：

I am telling you this so that you should not make a mistake.

我把这个告诉你，目的在于使你不至弄错。

New Words

1. oscilloscope [ɔ'siləskoup] n. 示波器
2. cathode-ray ['kæθoud-rei] n. 阴极射线
3. devise [di'vaiz] vt. 设计
4. span [spæn] n. 跨距，间隔
5. essentially [i'senʃəli] ad. 本质上

6. parameter [pə'ræmitə] n. 参数，参量
7. intensity [in'tensiti] n. 强度
8. sound [saund] n. 声音，声学
9. transducer [træns'dju:sə] n. 转换器，换能器
10. correspond [kɔris'pɔnd] vi. 符合
11. display [dis'plei] vt. 显示
12. situation [sitju'eiʃən] n. 情况
13. simplify ['simplifai] vt. 简化
14. convert [kən'və:t] vt. 转换
15. alternating ['ɔ:ltə:neitiŋ] a. 交变的
16. bias ['baiəs] n. 偏置
17. own [oun] a. 自己的
18. e. m. f. (electromotive force) 电动势
19. modulate ['mɔdjuleit] vt. 调制
20. accordance [ə'kɔ:dəns] n. 一致，调和
21. impinge [im'pindʒ] vi. 冲击
22. lead [li:d] n. 接线，引线
23. resultant [ri'zʌltənt] a. 合成的
24. variation [vɛəri'eiʃən] n. 变化
25. level ['levl] n. 电平，能级、水平线

Phrases and Expressions

1. to vary with 随着…而变化
2. to convert … into … 把 … 变成 …
3. not only … but also … 不仅 … 而且 …
4. in accordance with 根据…，按照 …

第二课　示　波　器

阴极射线示波器是已制成的最有用的测试和测量仪器之一。它不仅使人们可以测量测试信号的大小，而且使人们可以看到信号是怎样随着时间变化的。示波器能够容易地在1秒至10^{-9}秒的时间间隔内进行测量。示波器实际上是一个电压测量仪器。它显示出电压如何随时间变化。而象电流、光强度、温度和声压等参数能容易地转换成电压，由示波器测量。人们所需要的主要是个转换器，把这些参数中的每一种转换成电路中对应的电流变化。电阻器是电路的元件之一，那么电流的变化在电阻器的两端产生一个成比例的电压变化，将这个变化的电压放大并用示波器显示出来。

图中以简化的形式表示这种情况。该例子中是要在示波器上显示声波。用转换器M将交变的声压波转换成变化的直流电流。电路是由转换器M、偏置电压E和负载电阻器R组成的简单串联电路（偏置电压并非经常必需，有些转换器就是发生器并产生电动势）。电池E在简单串联电路里产生直流电流，而转换器M随声波冲击而改变其电阻，调制电流。示波器的测量引线接在负载电阻R的两端，检测合成电压变化V_R。然后把这个电压变化放大到一个合用的电平，使它能在示波器的屏幕上显示出来。