程控交换专业英语

ENGLISH FOR SPC SWITCHING TECHNOLOGY

滕绵震 主编

北京邮电学院出版社

ENGLISH FOR SPC SWITCHING TECHNOLOGY

程控交换专业英语

滕绵震
温 玫 编
冯春燕

北京邮电学院出版社

(京)新登字 162 号

内容提要

本书用英语介绍了程控数字交换技术及典型的程控数字交换机。内容包括电子交换的发展、基本交换及话务量概念、存储程序控制及部件、交换网络控制、时分和空分交换、用户交换机、数据通信、公共信道信令、综合业务数字网和 Fetex-150、S1240 数字交换机等。书中还有全部课文的参考译文、注释、词汇表、词组表及练习。

本书可作为通信交换专业继续教育教学用书，也可作为电信工程技术人员及大学本科生的自学参考书。

程控交换专业英语

滕绵震　温　玫　冯春燕　编

周　明　　责任编辑

*

北京邮电学院出版社出版

新华书店北京发行所发行　各地新华书店经售

昌平马池口印刷厂印刷

*

850×1168 毫米　1/32　印张 13.875　字数 371 千字

1993 年 3 月第一版　1993 年 3 月第一次印刷

印数：1-8500 册

ISBN 7-5635-0113-4/TN・36　定价：11.00 元

编者的话

80年代以来，我国根据通信事业迅速发展的需要，从国外引进了不少数量和种类的程控数字交换机。为了尽快地消化吸收当今最新技术，正确地操作、维护和管理这些电信设备，需要技术人员具有相当水平的程控交换专业英语阅读能力。应广大学员的要求，我们编写了教材，通过多次教学实践，不断改进和完善，现在出版了本书。

本书力图概括科技英语中经常遇到的句型、语法及程控交换专业单词，使读者通过阅读本书提高专业英语阅读能力和翻译水平。全书共分十二个单元，每个单元包括课文、阅读材料和泛读材料三部分。其中课文为精读部分。为帮助读者深入领会，该部分给出单词、短语；对课文中的长句和难句进行剖析并结合课文对翻译技巧进行了介绍；每一单元末均附有课文的参考译文，以便英汉对照阅读。阅读材料部分不仅给出单词和短语，而且给出练习和答案，便于读者阅读理解。泛读材料部分供读者自学用。书后附有程控交换专业常用词汇和词组。

本书由滕绵震副教授主编，其中第一、二、三、九单元由冯春燕讲师完成，第四、五、六、十单元由温玫讲师完成，第七、八、十一、十二单元由滕绵震副教授完成。全书由北京邮电学院计算机工程系赵辰教授审阅。

由于我们水平有限，时间仓促，书中会有不足之处，敬请读者批评指正。

编者

1992年11月

CONTENTS

UNIT 1

UNIT 2

UNIT 3

UNIT 4

UNIT 5

UNIT 6

UNIT 7

UNIT 8

UNIT 9

UNIT 10

UNIT 11

UNIT 12

UNIT 1

PART A

TEXT

The Slow Push for Progress

During the 10 years between 1970 and 1980 the number of telephones in the world has doubled. The number of countries with more than a million telephones has risen to 36. During this same period, the number of countries with over 200 annual conversations per person has reached an all-time high. Through cables, land lines, and satellite relays, the U. S. resident has access to more than 98 percent of the world's nearly 400 million telephones. Nineteen of the world's major cities had more than a million telephones each by 1972. In Table 1-1 the top 15 countries in numbers of telephones are listed and in Table 1-2, 20 of the cities and urban areas with more than 1,000,000 telephones each are listed in the order of their number of phones. In addition to the transmission of voice, the telephone system was called upon increasingly to send and receive data from computers, facsimile equipment, video devices and other data sources.

TELECOMMUNICATIONS SWITCHING

Because relatively few telephones can provide contact without switching from a multitude of local lines to a much smaller number of trunks between exchanges, the demands for service have not only in-

creased the amount of switching required but have emphasized the need

Table1-1. Top Telephone Countries

Country	Number of Telephones
United States	162,076,146
Japan	50,625,589
United Kingdom	23,182,239
West Germany	22,931,683
Russia	19,600,000
France	17,518,813
Italy	16,118,928
Canada	14,505,728
Spain	9,527,781
Sweden	5,930,276
Netherlands	5,845,894
Australia	5,835,330
Brazil	4,708,000
Switzerland	4,145,169
Mexico	3,712,407

for greater dependability, faster connections, and new conveniences[1]. The importance of switching to telecommunications can be measured to a degree by comparing its costs to that of the other elements of the overall systems. In that regard it represents nearly half the cost of an average telephone call and more than half the cost of a long-distance call. However, with the present-day mix of switching systems—which are predominantly electromechanical—about one-fourth the cost of an average call pays for switching equipment and approximately one-fifth goes for operators' salaries. However, the huge capital investment in electromechanical exchanges precludes their replacement for many years especially on a worldwide basis.

Telephone switching is the means by which a communication channel, capable of carrying analog or digital information between two or

more subscribers, is established and maintained[2]. Only in the case of pri-

Table1-2. Top Telephone Cities

City	Number of Telephones
New York City	5,936,829
Los Angeles	5,861,543
Tokyo	5,673,845
London	4,691,468
Chicago	2,610,000
Paris	2,502,414
Moscow	2,480,000
Osaka	1,936,280
Madrid	1,720,789
Toronto	1,689,359
Philadelphia	1,683,341
Mexico City	1,671,950
Sidney	1,614,598
Minneapolis-St. Paul	1,580,900
Rome	1,514,246
Milan	1,483,946
Houston	1,359,494
Baltimore	1,353,051
Buenos Aires	1,341,484
Melbourne	1,327,644

vate lines is it not required[3]. Any modern telecommunications switching system consists of a great many intricate equipment and components combined into a overall system operating along certain well defined principles. A typical electromechanical automatic switching system contains several master control circuits, each of which consists of some 1500 relays. Such circuits are able to select particular paths and establish a desired connection in less than one second. In doing this , some 700 relays operate and about 10,000 electrical contacts are closed and opened. As an example, a single telephone call from Ann Arbor, Michi-

gan, to downtown Detroit through an electromechanical exchange requires 37,000 relay contacts to make connection. To link any U. S. telephone with any other, the Bell System switching network provides a staggering 2. 5 million billion possible connections. The installation of electronic exchanges will reduce the number of relay contact operations considerably—especially in the control portion of the system. But there are still 15 reed relay crosspoints for each subscriber's line in the No. 1 ESS offices. Even when a majority of the subscribers have such electronic switching service, it can be seen that the number of connections to be made for many calls will not be minor.

Present-day telephone-circuit switching equipments are based on either electromechanical techniques (employing crossbar, Strowger, or rotary switches) or electronic techniques (employing either electromechanical or solid-state speech switches and some form of electronic common control). The development of most of these systems has required years of time due largely to the extreme requirements for dependability and reliability. Even a "negligible" amount of downtime of a network cannot be tolerated by the telephone operating companies. There would be a much higher percentage of program-controlled electronic exchanges in use today if the demands for service in the late 1950s had not forced the installation of many crossbar exchanges while the full development of practical electronic exchanges was awaited. Also, at the present time stored-program electronic exchanges[4] are economical only in medium to large central offices and for large private branch exchanges (PABXs). For these reasons, Western Electric produced more electromechanical crossbar switches annually 20 years after the invention of the transistor than ever before; and Japan (a major source of telephone switching systems in the international market) exported only exchanges with crossbar and step-by-step switches during the past decade. Even more surprising-

ly, Western Electric manufactured more stepping equipment in 1969 and 1970 than ever before and installed the ancient panel system equipment in the world's largest telephone city to cope with the service crisis in the city of New York.

SUBSCRIBER SERVICES

It has been said that the ultimate goal of telephone switching systems is that every telephone subscriber in the world be able to call any other subscriber without the intervention of a telephone operator[5]. The world's first international direct-dial route was placed in operation in September 1955, between Germany and Switzerland. Although this goal has not yet been realized between many countries, the public has been exposed to many new services beyond the establishment of basic connections between subscribers during the past few years.

Starting with centralized extension service in private branch exchanges in the early 1960s, unique features were offered business subscribers who could afford them in the so-called *Centrex* service packages of the Bell System. Such PABXs provide for direct inward dialing of calls to their extensions and for message accounting of outgoing toll calls for billing purposes, either automatically or by an operator. The latter feature is referred to as identification of outward toll dialing. By furnishing these services, Centrex systems provided the significant advantage of increasing the speed with which incoming calls could be completed to the dialed station extension without operator assistance. The operator workload was reduced, fewer operators were required, and an accounting record of each outgoing call was available for the benefit of the business customer in analyzing the telephone expenses of his various departments.

The introduction of pushbutton telephones has facilitated the ex-

pansion of other new subscriber services to include variable abbreviated dialing, call waiting, visible and audible charge information service, add-on, holding, temporary transfer, call transfer on busy, message service and telephone calculating, as well as international direct dialing and various other Centrex functions. Although it is possible to supply most of these services through an electromechanical crossbar switching system, its expansion to include many of these services inevitably leads to complications in circuit and equipment arrangements and excessive increase in the physical size of the installation. The introduction of electronic circuitry and memory into the control section of the exchange offers the best means to introduce the new subscriber services. These can be accommodated more flexibly if stored-program control can be afforded. In that case services can be changed readily by altering software. Even if stored-program control cannot be afforded due to the size of the exchange, electronic componentry is most effective in the translation and memory functions of the exchange.

In addition to providing new subscriber services on a more economical basis, electronic control makes possible highly concentrated maintenance by providing for the replacement of faulty packages rather than requiring the repairing of hardware. Also, only about one-third of the floor space is required for the equipment when compared with the conventional electromechanical crossbar systems due to the use of integrated circuitry and other miniature and subminature components. Because of computer capabilities, electronic switching systems are capable of performing store and forward switching—a technique applicable to data handling. Thus, an electronic switching system can serve as a data-switching center by concentrating and distributing various data at different speeds; that is , it can concentrate traffic from terminating devices at low speed and transmit it to a data-processing center at high speed.

The process is reversed in the distribution of data. These are some of the reasons why the use of electronic switching in telecommunication systems is bound to grow and why more significant percentages of the total number of local lines will be switched by such equipment in the future.

VOCABULARY

telephone [ˈtelifoun] *n.* 电话
cable [ˈkeibl] *n.* 电缆，多芯导线
line [lain] *n.* 线路，传输线
satellite [ˈsætəlait] *n.* 卫星；*a.* 卫星的，附属的，辅助的
relay [ˈri:lei] *n.* 中继，继电器
transmission [trænzˈmiʃən] *n.* 传送，传输，传递，发送
voice [vɔis] *n.* 话音，声音
computer [kəmˈpju:tə] *n.* （电子）计算机，计算器
facsimile [fækˈsimili] *n.* 传真，传真通信
video [ˈvidiou] *n.*，*a.* 视频（的）
device [diˈvais] *n.* 装置，设备
telecommunication [ˈtelikəmju(:)niˈkeiʃən] *n.* （常用 pl）电信
switching [ˈswitʃiŋ] *n.* 交换
local [ˈləukəl] *a.* 本地的，局部的
trunk [trʌŋk] *n.* 中继，中继线
electromechanical [iˈlektroumiˈkænikəl] *a.* 机电的
exchange [iksˈtʃeindʒ] *n.* 交换机，电话（交换）局
communication [kəmju:niˈkeiʃən] *n.* 通信
channel [ˈtʃænl] *n.* 信道，通道
carry [ˈkæri] *v.* 携带，传送，运载
analogue [ˈænəlɔg] *n.* 模拟
analog＝analogue
digital [ˈdidʒitl] *a.* 数字的
subscriber [səbˈskraibə] *n.* 用户
operate [ˈɔpəreit] *v.* 运转，操作

control [kən'troul] *n.*, *v.* 控制,操纵

contact ['kɔntækt] *n.* 触点,接点

network ['netwə:k] *n.* 网络

installation [instə:'leiʃən] *n.* 安装,设置,装配

crossbar ['krɔsbɑ:] *n.* 纵横,交叉

reliability [rilaiə'biliti] *n.* 可靠性

program ['prougræm] *n.* 程序

service ['sə:vis] *n.* 服务,业务

private ['praivit] *a.* 私有的,个人的,专用的

private branch exchange (PABX) 用户小交换机

switch [switʃ] *n.* 接线器,开关

manufacture [mænju'fæktʃə] *vt.* 制造,生产,加工

extension [iks'tenʃən] *n.* (电话)分机,扩展

feature ['fi:tʃə] *n.* 特性,性能,特征; *vt.* 使成为…的特征

Centrex *n.* 集中用户交换机,集中式用户交换功能

message ['mesidʒ] *n.* 消息,信息

billing ['biliŋ] *n.* 记帐,编制帐单

pushbutton ['puʃbʌtn] *n.* 按钮; *a.* 按钮(式)的

facilitate [fə'siliteit] *vt.* 便于,简化

abbreviate [ə'bri:vieit] *vt.* 缩写,将…缩短

abbreviated dialing 缩位拨号

information [infə'meiʃən] *n.* 信息,消息

arrangement [ə'reindʒmənt] *n.* 配置,布局,结构,设备,装置

memory ['meməri] *n.* 存储器,存储文件

software ['sɔftwɛə] *n.* 软件

maintenance ['meitinəns] *n.* 维护,操作

replacement [ri'pleismənt] *n.* 替换,更换,代替

hardware ['hɑ:dwɛə] *n.* 硬件

circuitry ['sə:kitri] *n.* 电路,线路

component [kəm'pounənt] *n.* 元件,组成部分,成分

equipment [i'kwipmənt] *n.* 设备,装置

PHRASES & EXPRESSIONS

all-time high　最高记录，记录上所列最高数字
have access to　可能接触，可以出入
in the order of　按照…排列，依照…的次序
in addition to　除…以外
a multitude of　大批的，大量的
not only…but　不仅…而且，不但…而且
in that regard　在这点上，关心此事
be referred to as　叫作，称为，被认为(看作)是
for the benefit of　为了…(的利益)
be bound to(do)　必然会，一定会

NOTES

1. • Because relatively few telephones can provide contact without switching from a multitude of local lines to a much smaller number of trunks between exchanges, the demands for service have not only increased the amount of switching required but have emphasized the need for greater dependability, faster connections, and new conveniences. 本局用户线路是大量的，而交换局之间的中继线路是少量的，没有交换只能接通相对少量的电话。所以为了满足业务要求，不仅要增加所需要的交换量，而且强调需要较高的可靠性、更快速的接续以及新的设施。

   • "Because relatively…between exchanges"为原因状语从句。

   "without switching"为介词短语作状语。

   "from a multitude of … between exchanges"为介词短语作状语。

   "not only…but…"为并列结构，译为"不仅…而且…"。

   "for service"和"for greater…new conveniences"均为介词短语