

ATTACHMENT A

Engineering and Operations in the Bell System
R.F. Rey, editor (2nd ed. 1983)

ENGINEERING **O** and **O**PERATIONS in the **B**ELL **S**YSTEM

Second Edition
Reorganized and Rewritten
Telecommunications in the
Bell System in 1982 - 1983

Prepared by Members of the Technical Staff
and the Technical Publication Department
AT&T Bell Laboratories

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This second edition differs significantly from that of 1977. It contains revised and updated information, new entries and illustrations, and a different organization and format.

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About

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Foreword

The first edition of this book, published in 1977, presented a comprehensive view of the Bell System as seen from AT&T Bell Laboratories. Its primary purpose was to provide new members of technical staff of Bell Laboratories with a basic understanding of the Bell System from the standpoint of the services provided, the equipment and systems constituting the nationwide network, the planning and engineering considerations involved in the evolution of the network, and the many activities required for day-to-day operation. However, the book has been used more widely than expected as a general reference and as a primer for others unfamiliar with telecommunications.

This revision was prompted by the significant changes in technology, services, and the environment that have occurred since 1977. Consequently, material from many sections of the first edition has been updated, and the organization and presentation of material have been improved. The level of detail has been reduced in some places and more emphasis placed on explaining important concepts and defining terminology. In addition, an attempt was made to present the material in a manner suitable for a mix of academic backgrounds.

The material for this edition was almost complete when agreement was reached between AT&T and the United States Department of Justice to settle an antitrust suit by divesting the Bell operating companies from AT&T. Recognizing that it would be a long time before the massive change associated with divestiture could be recorded and that most of the information on services and systems would remain valid, revision of the first edition continued as planned. Only the first chapter was revised to indicate the major provisions related to divestiture and to provide an overview of the postdivestiture corporate units. The rest of the book portrays the Bell System as it was near the end of 1982 and early 1983 and reflects changes resulting from the Federal Communications Commission's Computer Inquiry II order that were effective January 1, 1983. Since the existence of the Bell System ends with divestiture, this second edition of *Engineering and Operations in the Bell System* is also the

sharing of functions to reduce overall network costs. The following discussion, which is designed to convey basic concepts, presents a simplified view of the local and toll network structures. The actual structure is far more complex due to the variety of ways in which network functions are integrated to meet diverse needs in particular segments of the network.

Local Network Structure

The structure of the local network begins with customer station equipment connected by loops to local switching systems. All customers connected to a local switching system (central office) in a particular central office building² are said to be located in a *wire center area*, and the location of the building is called the *wire center*. These concepts are illustrated in Figure 4-1. Customers located within a wire center area communicate with each other through the local switching system, or systems, at the wire center. As indicated in Section 3.1, this arrangement reduces network costs by adding some switching costs in return for a large reduction in transmission costs.

Figure 4-2 illustrates the concept of judiciously combining switching and transmission to minimize overall costs in the local network. In the 2-level switching hierarchy shown, which is typical of most metropolitan areas, the switching systems at adjacent or nearby wire centers are connected by trunks, either directly or through one or two tandem switching systems. Thus, customers in adjacent or nearby wire center areas communicate with each other using their dedicated loops and the trunks interconnecting their local and tandem switching systems.

Whether it is more economical to provide direct trunks between two adjacent wire centers, to interconnect them indirectly using tandem trunks and tandem switching systems, or to use a combination of both depends on the traffic volumes, the distances involved, and the opportunities for sharing the facilities among many customers.

In Figure 4-2, there is a strong community of interest (high traffic volume) between offices at wire centers A and B, justifying a direct trunk group (represented by the dashed line). Traffic between wire center C and the other two wire centers does not warrant direct trunk groups and is carried by tandem groups (represented by solid lines) through tandem office T. Using tandem trunk groups and switching systems to provide service in a local area usually involves longer transmission paths and more switching but proves to be more economical when the traffic volumes between pairs of local switching systems are very low.

For intermediate traffic volumes, the most economical solution may be a combination of direct and tandem trunks. The routing technique that

² As noted in Chapter 3, a central office building may contain one or more switching systems.

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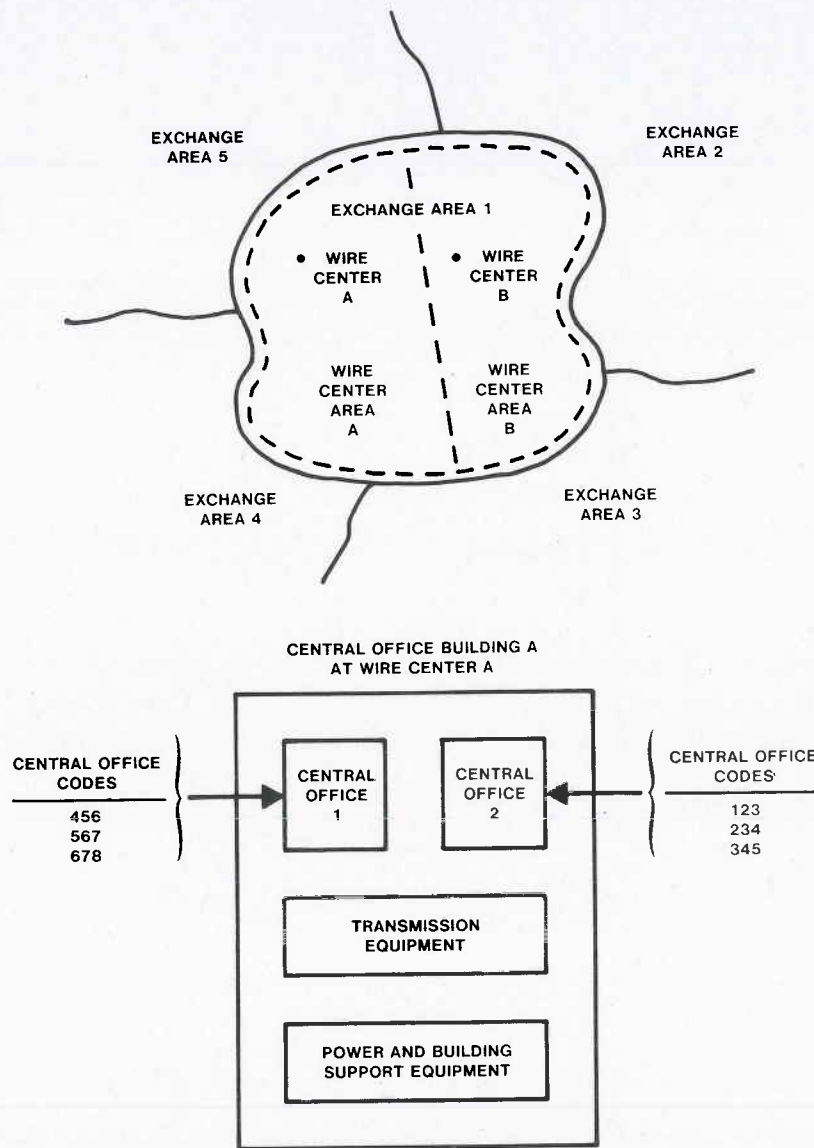


Figure 4-1. Local network topology. Top, wire center areas and exchange areas. Traditionally, a single, uniform set of charges exists for telephone service in an exchange area, and a call between any two points in the area is a local call. (Different meanings will apply after divestiture.) Bottom, central office building terminology.

ATTACHMENT B

Petition for Review of Proposed Wire Center Reclassifications
Vt. PSB Docket No. 7958
Response of DPS Staff to CANNE-DPS-3

STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 7958

Petition of CLEC Association of Northern New England, Inc. and its Affected Members for
Review of Proposed Wire Center Reclassifications

DEPARTMENT OF PUBLIC SERVICE'S RESPONSES TO
CLEC ASSOCIATION OF NORTHERN NEW ENGLAND, INC.'S
FIRST SET OF INFORMATION REQUESTS

June 19, 2013

Docket No. 7958

**Department of Public Service's Responses to
CLEC Association of Northern New England, Inc.
First Set of Information Requests**

CANNE-DPS-3

Please refer to pages 9-10 and 13-14 of Mr. Goldstein's testimony. For collocations that the Department has classified as "fiber-based collocations" using a definition of "premises" other than the "CANNE definition," please state how the Department defined "wire center premises."

ANSWER:

The testimony notes the number of fiber-based collocators that would apply under either of two definitions of "wire center premises", one being the CANNE definition. The other definition is narrower, and does not assume that "wire center boundaries" refers to the boundaries of the "wire center premises" per se, but to a larger geographic area.

The definition of "wire center" in the TRRO begins:

A wire center is the location of an incumbent LEC local switching facility containing one or more central offices, as defined in the Appendix to part 36 of this chapter.

That sentence seems to refer to a specific "location", such as a building. It cites to this definition of "central office" in the chapter of the Rules (47 CFR 36) dealing with jurisdictional separations:

A switching unit, in a telephone system which provides service to the general public, having the necessary equipment and operations arrangements for terminating and interconnecting subscriber lines and trunks or trunks only. There may be more than one central office in a building.

A central office switching unit, then, is at a specific location, the wire center. Thus this more narrow definition of "wire center premises" is the central office building itself, along with associated land, vaults, and related properties that adjoin it. "Wire center boundaries", then, would refer to something other than the wire center premises, though it could include, at other locations, other incumbent LEC premises.

Person Responsible for Response: Fred Goldstein, Consultant

Date: June 19, 2013