

FOREWORD

In spite of the large number of computing systems which have been designed and are in use today there is no clear-cut optimum approach to a general purpose computing system. Rather, it would seem, we are just beginning to explore the really basic variations from the one address sequential machines that launched the digital computing industry.

Early in digital computer history circuit technology advanced so rapidly that giant strides were made in equipment performance with little variation in design structure. The very presence of this rapid technological advance discouraged exploration of system structure. Electrical circuits tend to interact with system organization, and a good system design could become obsolete in a short period of time because the associated electrical circuits had been passed by.

In the early 1960's electrical circuit performance began to stabilize with the advent of integrated circuit technology. Circuit speed improvement continued but at a somewhat lower rate. In addition the integrated circuit offered the alternative of using larger quantities of mass produced configurations for the same cost as might be obtained by brute force efforts at speed in serial processors.

System design then began to diverge into parallel structures. This book describes one of the early machines attempting to explore parallelism in electrical structure without abandoning the serial structure of the computer programs. Yet to be explored are parallel machines with wholly new programming philosophies in which serial execution of a single program is abandoned.

A book describing the characteristics of a modern large-scale digital computer is a challenging undertaking. There is more detail information to be presented than is possible in a single volume. An overview of the system without being specific is generally too vague to convey the important characteristics that are of real interest. The author in this book selects special areas for detail treatment where those areas are unique to the machine described. These are interconnected with a general description of the system as a whole.

The reader can rest assured that the material presented is accurate and from the best authority as Mr. Thornton was personally responsible for most of the detailed design of the Control Data model 6600 system.

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