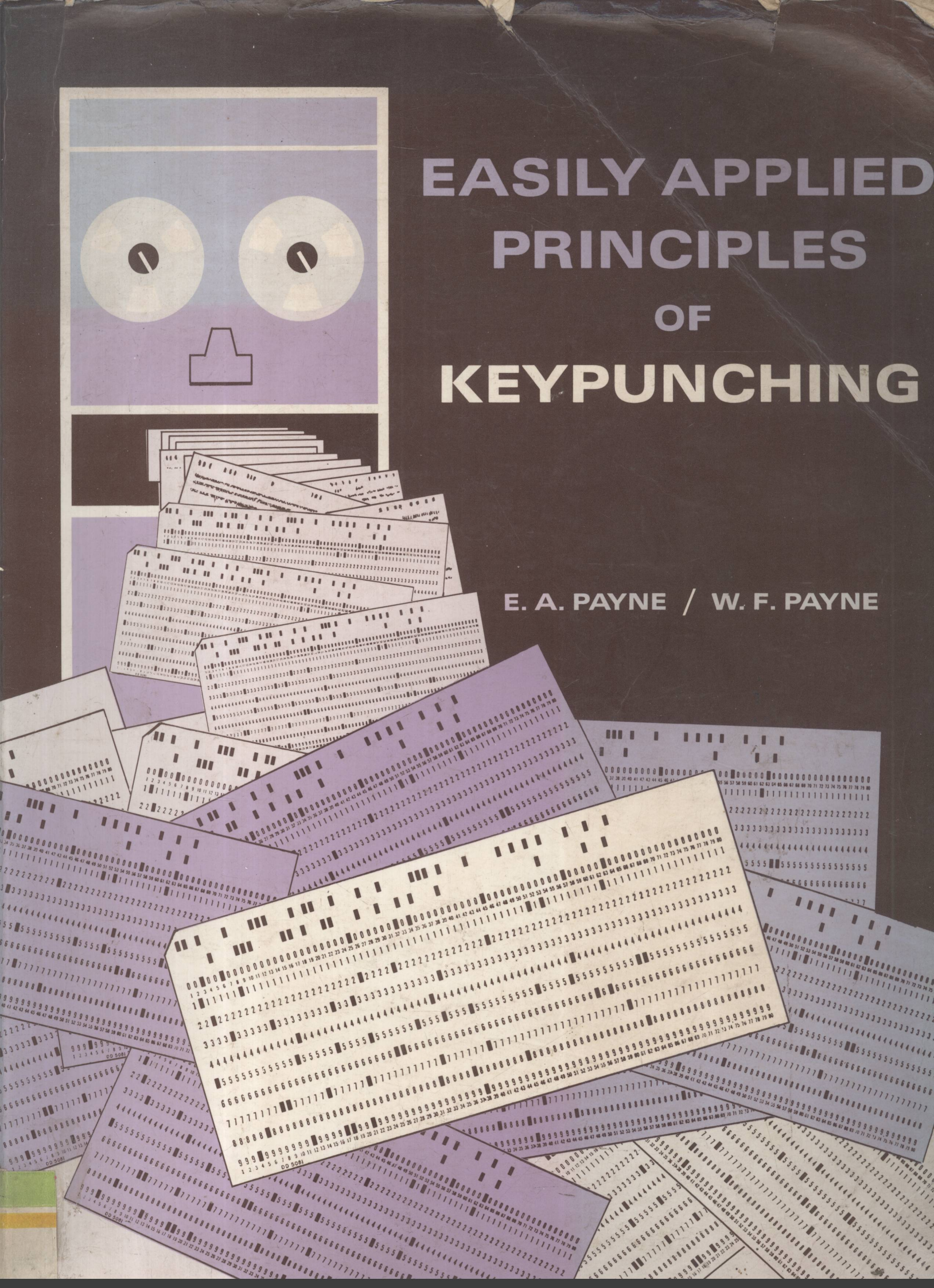
EASILY APPLIED PRINCIPLES OF KEYPUNCHING

E. A. PAYNE / W. F. PAYNE



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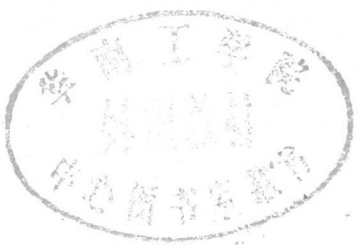

Prentice-Hall, Inc., Englewood Cliffs, New Jersey

Printed in the United States of America.

Library of Congress Catalog Card Number: 72-11835

Current printing (last digit):
10 9 8

PRENTICE-HALL INTERNATIONAL, INC., London
PRENTICE-HALL OF AUSTRALIA, PTY. LTD., Sydney
PRENTICE-HALL OF CANADA, LTD., Toronto
PRENTICE-HALL OF INDIA PRIVATE LIMITED, New Delhi
PRENTICE-HALL OF JAPAN, INC., Tokyo

CREDITS

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Illustrations on pages 36 and 40 are reprinted by permission from "Punched Card Data Processing Principles, 24-26 Card Punch, 56 Verifier Operations, Illustrations, PI Course" (©1964) by International Business Machines Corporation.

We are indebted to our friends, Wilma and Walter Parks, for their assistance with the chapter, "Punching Computer Programs."

PREFACE

This is the Computer Age.

Demand has caused more and more high schools and universities to establish courses in keypunch and data processing operations. The contents of this book are focused on practical business application; the lessons deal with problems and forms widely used in the fast-moving world of business.

With the particular problems of the keypunch operator in mind, this reference book concentrates on the 029 keypunch, the newest card-punch machine. The need for information and instructions, and for material that is presented in a concise and easily understood manner, appears to be great.

The novice keypunch operator (student) might assume that lessons are arranged in easy-reading style; on the contrary, the material reflects actual business practices. Card-punch data, for example, may be typewritten, handwritten (frequently illegible), printed, or often a combination of all three. Thus the lessons have been carefully planned to guide the student and assist him toward a positive think attitude, which is imperative if he is to grasp the basic functions and become an accurate operator.

The amount of time spent on each lesson should be at the instructor's discretion, depending, of course, on the student's objectives. The material can be covered in a school semester.

The authors have based this material on years of practical experience and current information, keeping in mind that a blend of theory and practical application best assists the beginner.

E. A. P.
W. P.

INTRODUCTION

In today's highly technical world, data processing is being used in all types of business, government, and science. The result is a demand for highly trained, accurate keypunch operators. Punched cards still constitute the most common method by which data are fed into computers. Many data processing managers are aware that reports compiled from the punched cards are only as good as the operators who have punched them. Consequently, the need for properly trained operators has multiplied and will continue to do so in the future.

This book has been written for those who want to meet the challenge of the Computer Age. We believe that it will qualify them to meet this challenge and will prepare them for the world of business or for further advancement in the data processing area. For these reasons, business application has been stressed in all lessons.

The material may be used in classroom lectures or as a course of individual study. The style is simple in order not to confuse those who are unfamiliar with data processing terminology or keypunch machines. Once the function of the machine is understood, the technique of keypunching should develop easily. ACCURACY plus SPEED make a good keypunch operator.

You will find that people in data processing are a different breed of people. They even talk a different language. You will learn to spead the computer's language, too—that is, you will speak in terms of zones, columns, fields, programs, drum, to name only a few.

In order to learn all functions of the machine, special emphasis will be placed on programming and practical business application. Special lessons will be used to acquaint the student with proper procedures and application. Since it is necessary for students to know *how an improperly punched card can affect the printed computer report,* there are illustrations showing the correctly and incorrectly punched cards and how they affect the completed reports compiled by the computer.

Think positively. Give your undivided attention to the study of this book and your efforts will be abundantly rewarded.

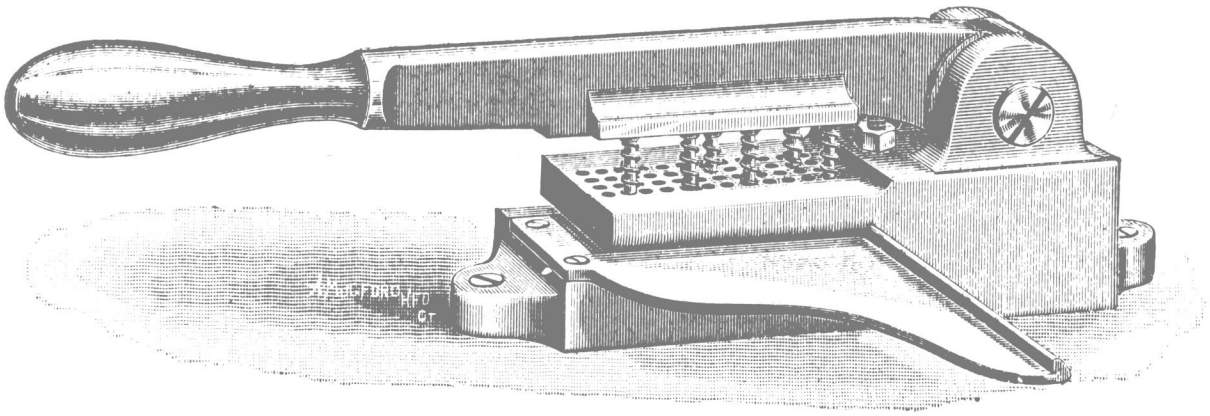

Figure 1

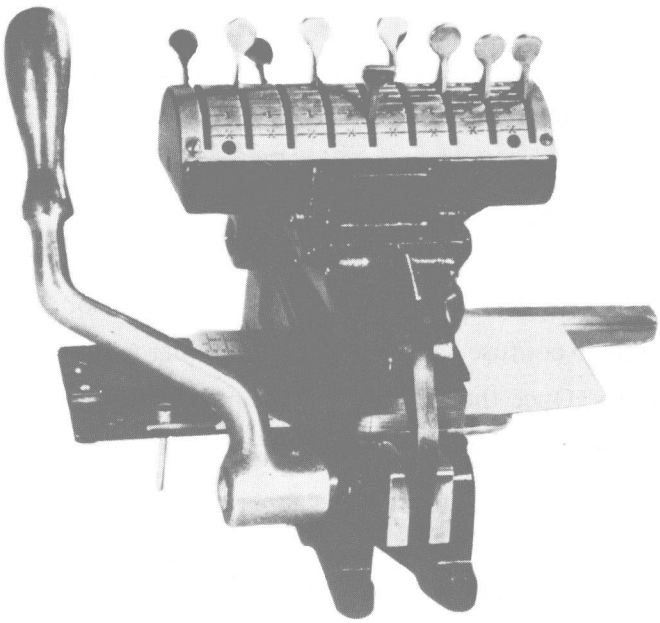

Figure 2

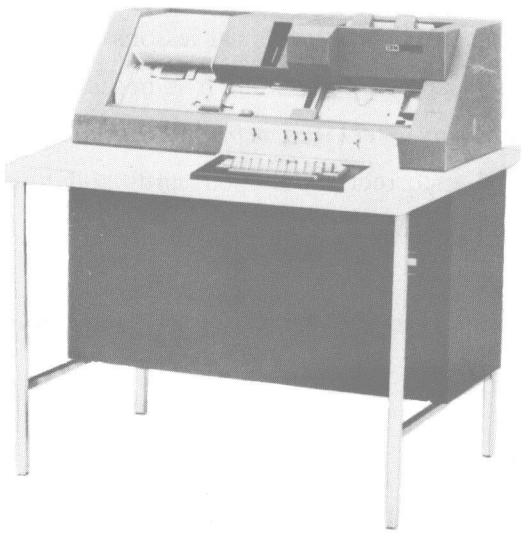

Figure 3

CONTENTS

WHY A CARD-PUNCH MACHINE?

Seven years were needed to complete the U.S. census for 1880 because the methods used were inadequate. Noting this need for faster processing of data, an employee in the census office, Dr. Herman Hollerith, invented the first card-punch machine. Figure 1 shows one of the early card-punch machines.

The 1880 census consisted of 12 million fewer people than the 1890 census; however, the 1890 census was taken in one-third less time by using card-punch machines.

It was from this first card-punch machine that other such machines were developed. (See Figure 2 for the 1914 lever-set gang punch.) Dr. Hollerith's principle of punched holes in cards remains the same; the alphabetic code is sometimes referred to as "Hollerith's code."

The 029 keypunch, which you are going to study, is the latest card-punch machine. (See Figure 3.) The card punch is the most common form of input to the present sophisticated computer. Once you have mastered the keypunch skill and think attitude, you will understand the importance of the punched card.

BASIC PARTS OF THE MACHINE

All IBM keypunch machines are identified by a number as well as by name. There are several types of keypunch machines and the number identifies the model of the machine. For example, there are the 024, 026, and 029 keypunch machines. The model that concerns us is the 029 (pronounced "oh twenty-nine") and the latest card punch.

1. This is the _____ keypunch.

The various functions of the 029 keypunch will be explained in detail and practical applications will be given. You will be taught *what it is—how to do it*—and then *do it.*

MAINLINE SWITCH

The 029 keypunch is transistorized and is ready for use the instant the mainline switch is turned on. The switch is located under the desk, near the right leg.

Locate the switch. Turn it on and off.

When the mainline switch is turned off, it locks the keyboard, making the other switches inoperative.

1. Where is the switch located?
2. What happens when the switch is turned off?

Figure 4

DESK

It has been explained that you will punch the information from source documents. These documents will be placed on the desk on the left side of the keyboard. As each source document is punched, it is turned face down to the left of the stack from which you are punching. This is done so that you will know which source documents have been punched and so that they will be kept in proper order. The desk is used as a place for aligning the cards to be punched.

1. What are the two functions of the desk?

KEYBOARD

The combination keyboard, which has both numeric and alphabetic keys, is called the alphameric keyboard. The keyboard can be equipped with the special character keys that are graphic punches and that are used for programming the fourth generation computers. The graphic punches will be discussed later.

1. Name the keyboard.

The alphabetic keys are arranged exactly as on the standard typewriter. You will use the same finger positions as on a typewriter. The "home keys" for the alphabetic punching are also the same as the typewriter's.

1. How are the alphabetic keys arranged?
2. Where are the "home keys"?

The number keys located across the top of the standard typewriter have been eliminated. Combination keys are located to the right side of the keyboard and are used for both numeric and alphabetic punching.

Remove Figure 4 so that you can see the combination keys. (The figure shows a standard keyboard and thus does not have the special character keys.)

When these combination keys are used for numeric punching, the 4, 5, and 6 will be the "home keys." You will use the index, middle, and ring fingers on the right hand to punch the numeric keys.

1. The combination keys are used for punching _____ and _____ .
2. What three fingers on the right hand are used for punching the numeric keys?
3. What punches are the "home keys"?

There are three zone punches. They are called the 11-, 12-, and zero punches. Other names are frequently used in identifying the zone punches. Thus it is well to learn them and to identify all the names of each punch.

The 11 zone punch is also referred to as the x-punch or the dash punch. It is the *dash* punch on the machine. Locate it.

The 12-punch is also sometimes referred to as the high-punch or the & punch. It is the & punch on the machine. Locate it.

The zero punch is the top key to the right side. It has the slash beneath it. Do not confuse the zero key with the alphabetic "O" key, which is the numeric 3 key. Locate the *zero* key.

1. Name the three zone punches.
2. What are the other names for each key?

The numeric punches are zero, 1, 2, 3, 4, 5, 6, 7, 8, 9. The zero is the same key as the zero zone.

There are *ten* numeric keys. Locate them on the keyboard.

You will use the index finger to punch the 1, 4, and 7 keys.

The middle finger will punch the dash, 2, 5, and 8.

The ring finger will punch the zero, 3, 6, 9, and &.

1. What keys do you punch with the ring finger?
2. The index finger?
3. The middle finger?

With the machine turned off, punch the zone punches–zero, dash, and &.

Punch these keys six times until you can feel the "reach" from key to key.

Now punch the dash, zero, and &. Do this six times.

Punch the &, dash, and zero. Do this six times.

With the machine turned off, punch the numeric keys–zero, 1, 2, 3, 4, 5, 6, 7, 8, and 9. Do this six times, feeling the different reach from key to key.

Practice this "warm up" exercise until you become familiar with the zone keys and the numeric keys.

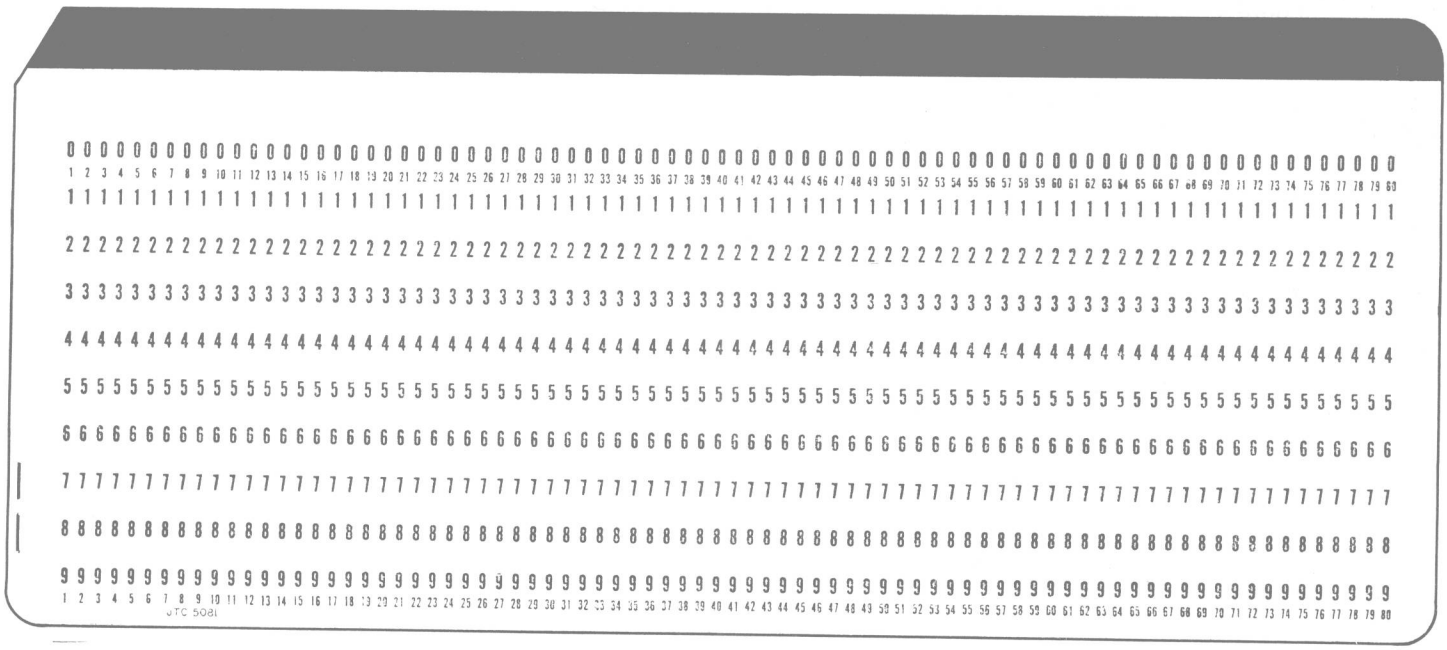

Figure 5

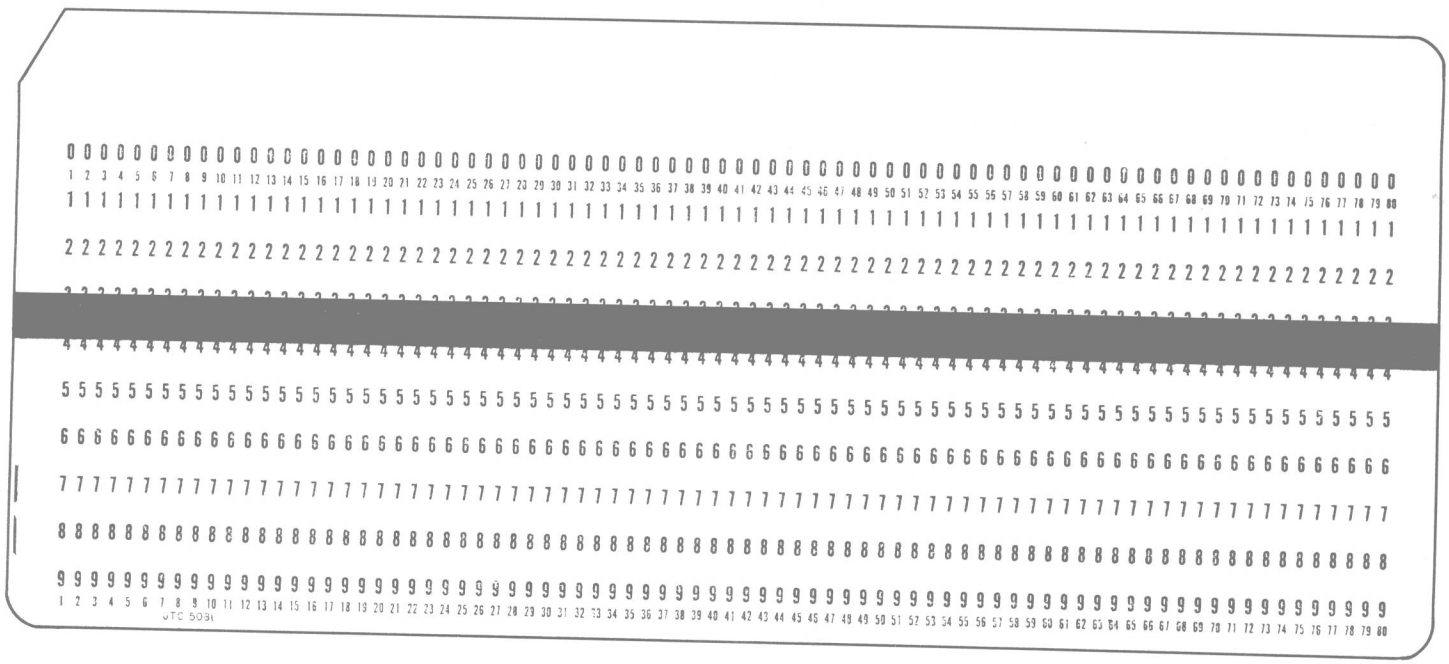

Figure 6