A STUDY OF THE PREFERENCES IN BUSINESS MACHINES
IN SACRAMENTO, CALIFORNIA

Eileen Maguire Hawkes
B. S. Boston University 1940

PROJECT

Submitted in partial satisfaction of the requirements of the degree of

MASTER OF ARTS
AT THE
SACRAMENTO STATE COLLEGE

Approved:
Marion M. Lamb, Chair
John R. Cox
Dale P. Wren

Advisory Committee
Date May 25, 1952
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Upon recently being appointed head of the Business Department at El Camino High School, Sacramento, California, the writer was faced with the duty of recommending the purchase of various types of office machines to be used for training purposes. In order to make a better selection of office machines for this high school, it appeared advisable to survey the local business organizations to determine which brands and types of machines were currently being used. For additional information, an attempt was also made to seek the employers' views on trends in the selection of business equipment and modern business practices in an effort to estimate training needs in the immediate future.

I. THE PROBLEM

Statement of the problem. It is the purpose of this study to survey the area of Sacramento, California, (1) to secure information as to the types and brands of business machines most commonly in use; and (2) to become aware of trends in the selection of business machines that will affect future training.
**Importance of the study.** Justification to the taxpayer and the student for the teaching of any business machine rests in the fact that upon securing employment, the student will find the same brands or types of machines currently being used in business practice as he found in the classroom. It is only by constant vigilance to keep up to date on the equipment being operated in the surrounding area that intelligent purchases of new machines for the school can be made. "The American Business Education Yearbook" points out as Principle I, "Equipment needs are determined by making surveys of the equipment used in the area in which the graduates of the Department of Business Education are employed."¹

The purpose of the office machines course at El Camino High School is two-fold in that (1) it serves as a survey course for those students who are interested in later selecting a particular machine on which they wish to specialize, and (2) it presents a working knowledge of all types of machines commonly used in a modern office for those students interested in careers as general office clerks, stenographers, or bookkeepers. We have many students who wish to become

clerical workers, but who are not sure in which field they wish to specialize. In the office machines course, they may find after spending a few weeks on the key-driven calculator that they would like to start their business career in this type of work. Upon graduation, the student may then enroll in the company school which teaches this type of machine. Other students who may enjoy their work on the voice machines and plan a career in this type of work can attain more specialized training at Junior College or Business School. For the students interested in a general knowledge of the machines, the course offered at our high school is adequate.

One of the problems confronting a new department head is the duty of selecting the proper equipment for a well-rounded course in office machines. Several questions beyond library research prompted this survey. Typical of some of these questions are the following:

1. Should new typewriter equipment be electric?
2. Should calculators be of the rotary or the key-driven type? Or both? In what percentage?
3. In which types of duplicating machines should the school invest?
4. Which is more widely used—the 10-key or full-keyboard adding machine?
5. Should we encourage more students into voice machine operation and fewer into stenography?
Such questions place an obligation on those given the responsibility for the wise spending of public funds. To prepare an organized plan for purchasing and a justification for the choices made, it seemed advisable to make a survey of current usage and trends of business machines in the Sacramento area.

In addition to a numerical count of the machines being used, it also seemed advisable to survey the trends for the future in business equipment and practices so as to alert the school to modern business atmosphere. Cognizance was taken of the warning of Walters and Nolan, however, that "Schools should keep up to date with methods and equipment used in business; but keeping up with business is an indication that the school is awake, whereas trying to keep ahead of business is an indication that officials and teachers lack common sense. Business education is intended to prepare young people for office and store work as it exists; it is not intended to reform business or business methods."²

In this survey an attempt was made to cover both private and public employment in order to achieve a cross section of current practices in this area. Sacramento is unlike

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The usual business community in that it is the state capital and the center of much defense activity resulting in a high public employment rate.

II. DEFINITION OF TERMS USED

Public employment. The employment of business personnel by federal, state, county, and city governments defines the term "public employment" as used in this paper.

Private employment. The employment of business personnel by organizations not related to office-machine manufacture or sales and belonging to the National Office Management Association is the limitation of this term in this paper.
CHAPTER II

REVIEW OF THE LITERATURE

Many studies have been made in various local areas to determine the equipment being used in business, with recommendations as to the equipment to be purchased for the high schools. Follow-up studies are necessary because the original studies soon become outdated because of modern technical advancement, varying requirements of business and industry in different areas, and improved sales techniques which tend to make past studies lose their value after four or five years.

When a new course in business machines was to be added in the Edison Vocational and Technical High School in Mt. Vernon, New York, the business instructor, Satina Fradella, made a survey of the business machines used in that area. Eighteen types other than typewriters were widely used in the area. Some of each type were purchased for the classroom. Seven years later another survey was made for the purpose of evaluating their present program and also for the purpose of purchasing new equipment as a result of expanding their business program. Supplementing these surveys, this school also had its business machine teachers make periodic visits to the business offices in the area to determine:
1. The frequency and use of particular machines
2. The machines on which operators are desired
3. The probable long-range demands for such operators.  

A Monograph by Marian J. Collins states that some of the important factors to be considered in selecting equipment were: "A machine should be selected only if it were used in the business area served; not so specialized that employers preferred to train their own operators; so complicated that it is inappropriate for classroom use; so simple to operate that training in its operation is unnecessary."  

We can conclude from this that such machines as postage meters, check signers, date machines, etc. are so simple to operate that it is inadvisable for a school to expend money for their purchase even though they are commonly found in a business office. 

The California State Department of Education made an extensive study of layouts and facilities for business education. In this report the layout and equipment necessary
for business departments ranging from one to eleven classrooms is given. Floor plans, room layouts, and electrical outlets are sketched as well as the listing of the number and types of machines to be included in each room. This report should be of great value to those districts planning the building of new schools or the remodeling of older schools. It is also of value to the classroom teacher in better arranging her laboratory layout.

A study made by Irma Jean Koptzke in 1953 attempted to determine the extent transcribing machines are used in business communication as compared with shorthand and found that 85.8 per cent of business correspondence entailed the use of shorthand. She points out that voice machines are a time-saver for both the dictator and transcriber although many dictators and stenographers object to the impersonality of this method. She concludes as her recommendation that our schools should continue to teach both shorthand and voice machine operation, indicating that more attention should be given to the voice machines than we have given in the past. She also stresses the suggestion that boys enrolled in business education courses should be given training in dictation on voice equipment since they may have to use these machines.4

Sutton summarizes in her study that more emphasis should be placed on the training of adding machine and calculator operators. Her study shows that in the area she surveyed 310 typewriters, 205 calculators, and 130 adding machines were used; yet in the classroom we spend one or two years training students on the typewriter and only a few weeks training students on the use of the calculators and adding machines. It was her recommendation that "instruction in the operation of the adding machine and calculator should be intensified."\(^5\)

In 1950, Dr. Peter J. Agnew of New York University set up a model practice classroom at the National Business Show in New York City. He recommended that the following office machines be used in the average size classroom.

4 Electric typewriters
1 Long carriage typewriter
7 Standard typewriters
2 Key-driven calculators
2 Rotary calculators
1 Full-key adding machine

Limitations of previous studies. The limitations of applying the findings of previous studies of other communities to the Sacramento area are obvious—they reflect the needs of their own business communities which do not have so large a proportion of office employees in public employment as does the Sacramento area. The significance of this statement rests in the fact that under our system of public employment, a free choice of equipment is not always possible, since contracts must be awarded to the lowest bidders. Under such a system an attempt is made to have an impartial selection, thereby having a proportionately larger representation of brands not popular in private industry where free choice of equipment is permissible. Consequently, Sacramento is not a typical or average area, and typical or average equipment for other schools may not be the correct equipment for Sacramento schools.

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6Meshan, op. cit., p. 277.
CHAPTER III
MATERIALS USED AND GROUPS STUDIED

The project. A questionnaire was constructed to include only the types of machines that the average school could afford to purchase and which necessitated a moderate amount of practice for a student to become somewhat proficient in its operation. The second page was constructed to answer questions on current trends in modern business offices. Four out of five of its sections were designed to compare two methods of performing the same type of function and to secure information as to employer's preference and his reasons for such preferences. A copy of this instrument may be found in the Appendix.

Method of procedure. A pilot survey was sent to thirty governmental offices to secure numbers and brands of office machines in current use. Twenty-two usable returns were received.

A second survey was undertaken, which was similar to the first but more detailed in that it contained a second sheet questioning current preferences. The second survey was sent to forty-three selected members of the National Office Management Association. All of the organizations represented in this association were surveyed except those representing public employment or the business machines field. Thirty-nine
usable returns were received. Telephone interviews clarified and supplemented questionable replies where such procedure was deemed necessary.
CHAPTER IV

THE QUESTIONNAIRE RESULTS

PART I

The tabulation of Part I of the questionnaire which dealt with numerical quantities and brand names is summarized in Tables I, II, III, IV, and V.

These tables compile the statistics which represent the usage of business machines in the Sacramento area. The various tables show the brand name, the percentage in use in public employment, the percentage in use in private employment, and the average percentage for this area. The brands are listed in descending frequency of use according to average percentage.

Table I compiles the information on adding machines showing the Burroughs to be the most widely purchased of the eight major brands represented.

Table II is subdivided into two sections which show the use of both the rotary and the key-driven calculator. The Monroe machine proved to be the most used in the rotary type, and the Burroughs proved to be the more popular of the two key-driven brands.

Table III tabulated the data on typewriters, and it also is further classified into two parts--electric and manual.
The Royal proved to be the leader in the manual field and the I. B. M. had the highest percentage in the electrics.

Table IV describes the usage of voice machines for this area. The Dictaphone, closely followed by the Ediphone, proved to be the popularly used ones in this area.

Table V records the results of the questioning on duplicating machines, showing the Mimeograph and Ditto to be the currently popular types.
### TABLE I

**PREFERENCES IN ADDING MACHINES**

**SACRAMENTO, CALIFORNIA**

**1956**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Percentage in Public Employment</th>
<th>Percentage in Private Employment</th>
<th>Average Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Burroughs</td>
<td>20.00</td>
<td>30.00</td>
<td>25.00</td>
</tr>
<tr>
<td>Sundstrand-Underwood</td>
<td>18.50</td>
<td>20.00</td>
<td>19.25</td>
</tr>
<tr>
<td>Remington</td>
<td>30.00</td>
<td>8.00</td>
<td>19.00</td>
</tr>
<tr>
<td>Victor</td>
<td>7.00</td>
<td>12.00</td>
<td>9.50</td>
</tr>
<tr>
<td>Clary</td>
<td>14.00</td>
<td>2.50</td>
<td>8.25</td>
</tr>
<tr>
<td>Allen-Wales</td>
<td>0.50</td>
<td>11.00</td>
<td>5.75</td>
</tr>
<tr>
<td>Monroe</td>
<td>5.00</td>
<td>6.00</td>
<td>5.50</td>
</tr>
<tr>
<td>National</td>
<td>5.00</td>
<td>6.00</td>
<td>5.50</td>
</tr>
<tr>
<td>Others</td>
<td>4.50</td>
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<tr>
<td>Total</td>
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<td>100.00</td>
<td>100.00</td>
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</tbody>
</table>
TABLE II
PREFERENCES IN CALCULATORS
SACRAMENTO, CALIFORNIA
1956

<table>
<thead>
<tr>
<th>Brand</th>
<th>Percentage in Public Employment</th>
<th>Percentage in Private Employment</th>
<th>Average Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROTARY</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monroe</td>
<td>45</td>
<td>30</td>
<td>37.5</td>
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<tr>
<td>Marchant</td>
<td>33</td>
<td>32</td>
<td>32.5</td>
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<tr>
<td>Friden</td>
<td>22</td>
<td>38</td>
<td>30.0</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>KEY DRIVEN</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burroughs</td>
<td>69</td>
<td>51</td>
<td>60.0</td>
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<tr>
<td>Comptometer</td>
<td>31</td>
<td>49</td>
<td>40.0</td>
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<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100.0</td>
</tr>
<tr>
<td>Brand</td>
<td>Percentage in Public Employment</td>
<td>Percentage in Private Employment</td>
<td>Average Percentage</td>
</tr>
<tr>
<td>---------</td>
<td>---------------------------------</td>
<td>---------------------------------</td>
<td>--------------------</td>
</tr>
<tr>
<td><strong>MANUAL</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Royal</td>
<td>33.00</td>
<td>38.00</td>
<td>35.50</td>
</tr>
<tr>
<td>Remington</td>
<td>22.00</td>
<td>42.00</td>
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<tr>
<td>Underwood</td>
<td>28.00</td>
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<td>Smith-Corona</td>
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<td>10.00</td>
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<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
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<tr>
<td><strong>ELECTRIC</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>I. B. M.</td>
<td>57.00</td>
<td>75.50</td>
<td>66.25</td>
</tr>
<tr>
<td>Underwood</td>
<td>25.00</td>
<td>6.00</td>
<td>15.50</td>
</tr>
<tr>
<td>Remington</td>
<td>12.00</td>
<td>10.00</td>
<td>11.00</td>
</tr>
<tr>
<td>Royal</td>
<td>6.00</td>
<td>8.50</td>
<td>7.25</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
</tr>
</tbody>
</table>
### TABLE IV

PREFERENCES IN VOICE MACHINES
SACRAMENTO, CALIFORNIA
1956

<table>
<thead>
<tr>
<th>Brand</th>
<th>Percentage in Public Employment</th>
<th>Percentage in Private Employment</th>
<th>Average Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dictaphone</td>
<td>34</td>
<td>36</td>
<td>35.0</td>
</tr>
<tr>
<td>Ediphone</td>
<td>27</td>
<td>33</td>
<td>30.0</td>
</tr>
<tr>
<td>Soundscriber</td>
<td>21</td>
<td>22</td>
<td>21.5</td>
</tr>
<tr>
<td>Audograph</td>
<td>12</td>
<td>1</td>
<td>6.5</td>
</tr>
<tr>
<td>Peirce</td>
<td>2</td>
<td>8</td>
<td>5.0</td>
</tr>
<tr>
<td>Others</td>
<td>4</td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Total</td>
<td>100</td>
<td>100</td>
<td>100.0</td>
</tr>
</tbody>
</table>
TABLE V
PREFERENCES IN DUPLICATING MACHINES
SACRAMENTO, CALIFORNIA
1956

<table>
<thead>
<tr>
<th>Brand</th>
<th>Preference in Public Employment</th>
<th>Preference in Private Employment</th>
<th>Average Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mimeograph</td>
<td>35.00</td>
<td>33.00</td>
<td>34.00</td>
</tr>
<tr>
<td>Ditto</td>
<td>33.00</td>
<td>33.00</td>
<td>33.00</td>
</tr>
<tr>
<td>Multilith</td>
<td>15.00</td>
<td>8.00</td>
<td>11.50</td>
</tr>
<tr>
<td>Copy-Rite</td>
<td>2.00</td>
<td>14.50</td>
<td>8.25</td>
</tr>
<tr>
<td>Speed-O-Print</td>
<td>8.00</td>
<td></td>
<td>4.00</td>
</tr>
<tr>
<td>Heyer</td>
<td>4.00</td>
<td>3.50</td>
<td>3.75</td>
</tr>
<tr>
<td>Multigraph</td>
<td>2.50</td>
<td>2.00</td>
<td>2.25</td>
</tr>
<tr>
<td>Standard</td>
<td>0.50</td>
<td>2.00</td>
<td>1.25</td>
</tr>
<tr>
<td>Gestetner</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td>Others</td>
<td>2.00</td>
<td>2.00</td>
<td>1.00</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
<td><strong>100.00</strong></td>
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</tbody>
</table>
THE QUESTIONNAIRE RESULTS

PART II

Part II of the questionnaire dealt with current trends and preferences of business methods found in the private business organizations surveyed in the Sacramento area. Part II of the questionnaire was not sent to the governmental agencies surveyed as their policies and preferences are not a result of the supervisor's choice but rather the result of a policy based on (1) equality in purchasing of all machines in the field or (2) the lowest bidder obtaining the contract for large amounts of machines.

A state purchasing department executive explained their present policy to be one where purchases of over $1000 must be put out for bid, but that purchases of under $1000 need not be bid on. He further stated that departments were discouraged from putting in numerous requests for equipment amounting to less than $1000 to avoid the necessity of bids. He did explain that where schools requested twenty typewriters, for example, that they would receive five of each of the four major brands. Because such a system of impartial selection does not exist in private business, it was only the National Office Management Association group that was surveyed as to personal choices.
The tabulation of Part II revealed the following information:

**QUESTION:** Which style of adding machine do you prefer?
**RESPONSE:** 75% preferred the 10-key adding machine; 25% preferred the full-keyboard adding machine.

**QUESTION:** On which machine is your repair costs higher?
**RESPONSE:** 37% stated repair costs were higher on the full-keyboard; 13% stated repairs were higher on the 10-key adding machine; 50% stated repair costs were the same for both styles of machine.

**QUESTION:** Which machine do you consider to be faster for your work?
**RESPONSE:** 85% responded that they felt the 10-key machine was faster; 15% felt that the full-keyboard was faster.

**QUESTION:** Which style do you plan to buy in the future?
**RESPONSE:** 72% planned on buying 10-key adding machines; 28% planned on buying full-keyboard style.

**QUESTION:** Is the purchasing price an influencing factor?
**RESPONSE:** 85% stated that price was not a factor; 15% stated that price was an influencing factor.

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1 For the actual number of machines represented, see Appendix pp. 43-50.
QUESTION: Which style of calculator do you prefer?
RESPONSE: 83% preferred the rotary type calculator; 17% preferred the key-driven type.

QUESTION: Which type of operation is faster for your work?
RESPONSE: 74% responded that the rotary calculator was faster for their type of work; 26% responded that the key-driven style was faster.

QUESTION: Which type do you plan to purchase in the future?
RESPONSE: 83% indicated that they planned to purchase rotary calculators in the future; 17% indicated that they planned to purchase key-driven calculators.

QUESTION: Which type of operator is higher paid?
RESPONSE: 50% indicated that the key-driven machine operator was the higher paid; 40% indicated that both types of operators were paid the same; 10% indicated that the rotary machine operator was paid higher.

QUESTION: Are trained operators difficult to find?
RESPONSE: 55% indicated that trained operators were difficult to find; 45% indicated that trained operators were not difficult to find.

QUESTION: Do you train operators on the job?
RESPONSE: 80% did train operators on the job; 20% did not.
QUESTION: Do you prefer a voice machine operator to a stenographer?
RESPONSE: 60% preferred voice machine operators; 40% preferred stenographers.

QUESTION: Do your executives object to using voice machines?
RESPONSE: 65% did not object to using voice machines; 35% did object to using voice machines.

QUESTION: Do your stenographers object to using voice machines?
RESPONSE: 75% of the stenographers did not object to using voice machines; 25% did object.

QUESTION: Which type of employee is higher paid?
RESPONSE: 78% indicated that the stenographer was higher paid; 22% indicated that both were paid the same; 0% indicated that voice machine operators were higher paid.

QUESTION: Which is the more economical method of dictation for you?
RESPONSE: 72% revealed that voice machine operators were the more economical method of dictation; 28% stated that stenographers were the more economical.

QUESTION: Which style of typewriter do you prefer?
RESPONSE: 80% preferred the electric typewriter; 20% preferred the manual typewriter.
QUESTION: Which style of typewriter do you plan to purchase in the future?
RESPONSE: 72% indicated that they planned to purchase electric machines; 28% planned on purchasing manual typewriters.

QUESTION: Do your operators object to changing over to electric machines?
RESPONSE: 96% of the operators did not object to changing over to electric typewriters; 4% did object.

QUESTION: Does an electric typewriter produce more work?
RESPONSE: 100% indicated that the electric typewriter would produce more work.

QUESTION: Is the quality of work noticeably better on an electric?
RESPONSE: 81% replied that the work was noticeably better on an electric; 19% felt that the work on a manual typewriter was equally as good.

QUESTION: Which type of duplicating process do you prefer?
RESPONSE: 37% preferred the stencil process of duplication; 8% preferred hectograph work; 8% preferred offset printing; 13% preferred a photo process; 34% did not respond.

QUESTION: Do you train your own operators?
RESPONSE: 96% stated that they trained their own operators; 4% did not train operators.
QUESTION: Does the salary vary with the type of duplicating process?

RESPONSE: 95% did not pay any particular type of machine operator higher; 5% indicated that all types were not paid the same, but did not indicate which type was paid the higher.

QUESTION: Do your operators express a preference for any particular method of duplication?

RESPONSE: 88% of the operators did not have a preference; 12% did prefer one process over another. 4% preferred the Multilith; 4% preferred the Mimeograph.

QUESTION: Is cost or personal preference the basis on which your duplicating method is selected?

RESPONSE: 52% indicated that preference for the method was the basis for selection; 48% indicated that cost was the controlling factor.
CHAPTER V

SUMMARY AND CONCLUSIONS

Summary. The findings for the adding machine category indicated that the Burroughs adding machine was more generally used throughout the Sacramento area because of the fact that private employment usage of this machine is greater than that of any other machine. However, the Remington was more popularly used in public employment. There seemed to be an overwhelming preference for the 10-key style of adding machine with the banks preferring the full-keyboard style for their use. Both operators and employers preferred the 10-key type as it allowed them to use a touch system of operation rather than one which requires the shifting of the eyes from the copy to the machine. The banks preferred the full-keyboard because their work entails the use of many zeros. As zeros need not be depressed on the full-keyboard, this style of machine is faster for their work. Most operators felt that the 10-key machine was the faster type.

Very few responses (25%) were given to indicate whether the machine repairs were higher for one style over the other. The few that did respond indicated that the repair costs were greater on the full-keyboard machine.
The future trend in purchasing of adding machines seems to be very much in favor of the 10-key style, and this decision was based on preference and not on price.

In the calculator section the distribution of popularity was nearly equally divided among the Monroe, Marchant, and Friden for the rotary type, with the Monroe slightly leading over the other two brands. The choice of employers in both public and private employment was the Burroughs key-driven calculator over the Comptometer, but the Comptometer does have a large following as 40% of the machines being used in this area are of this brand. Of the calculators in use in this area, 69% are rotaries and 31% are key driven.

Most employers and employees preferred the rotary type calculator to the key-driven type. A very large percentage (74%) felt that this style was faster for their type of work and could be learned in a short period of time on a job not necessitating the employing of skilled operators. It is most popular with those persons who do not use the machine for the major portion of their work day. A little over 50% indicated that skilled operators were difficult to employ and 80% of the employers trained their employees on the job. It was indicated that the operators of the key-driven style were higher paid in 50% of the cases, whereas 40% indicated that both types were paid the same.
The voice machines in highest demand are the Dictaphone and the Ediphone with Soundscriber holding third place. Employers indicated a preference for voice machine operators over stenographers in a ratio of 3 to 2. Stenographers are paid more or equal to voice-machine operators in all responses. Most employers agreed that dictation to the machine was the more economical method of dictation for them; but 28% did feel that the stenographer was the more economical method. Three-fourths of the stenographers have no objection to using the voice machine.

The tabulation of the typewriter section of the questionnaire revealed that the Royal and Remington typewriters were the manual machines most in demand. Public employment preferred the Royal, and private employment preferred the Remington. The Underwood held a strong third place and was preferred in public employment over the Remington. In the electric typewriter field, the I. B. M. led the others by a vast majority. Underwood held a poor second place but seemed to be getting a foothold in public employment. The preference for electric typewriters over manually operated ones was in a ratio of 4 to 1. Nearly three-fourths of all future purchases of typewriters are planned in the electric field. Of course, this statement by employers may represent optimistic planning rather than purchasing potential. The changeover to electrics meets with very little objection from the operators. All felt that the electric typewriters could produce
more work with quality equal to or better than that done on a manual typewriter. Of the typewriters in use in private employment in the Sacramento area at the present time, 23% are electrics. The percentage for governmental usage is less. One organization stated that when an employee spent more than one-half her work day at a typewriter, the additional cost for an electric machine was justified.

The Mimeograph and the Ditto seem to be the most commonly used duplicating machines. In that category, more than any of the others, the wide variety of brand names was most astonishing. Most of the duplicating processes are used by the government with relatively few being used in private industry. In addition, many of the respondents stated that they were using one of the new photo processes. Most businesses trained their own operators and did not pay the operator of one type of machine any higher than the operator of another type. Most operators did not have any preference for the type of process used. Of those that did have a preference, their choice was equally divided as to whether they based this choice of duplication process on preference or cost.

Conclusions. Future purchasing of adding machines should be concentrated on the purchasing of the 10-key style. As this machine lends itself to a touch system of operation, it requires more practice than does the operation of the
full-keyboard which requires relatively little skill for its operation. For classroom instruction, I would recommend the purchasing of one or two full-keyboard machines. Remaining purchases should be 10-key machines selected from the Burroughs, Sundstrand-Underwood, or Remington brands.

Future purchases of calculators should be divided equally between rotaries and key-driven machines. Although more rotaries than key-driven machines are used and preferred, the learning process is longer on the key-driven machine, and this longer training period should justify the equal expenditure for these machines. The proportion of brands for the rotary style calculator should, in my opinion, be divided among the three machines in the field; the Monroe, the Marchant, and the Friden. I suggest that one of each brand be purchased; and if a fourth is needed, I would then select a Monroe. I would recommend the purchase of key-driven calculators in the ratio of two Burroughs to one Comptometer.

Future purchasing of voice machines should include Dictaphones, Ediphones, and Soundscribers. Probably more than the usual two or three machines per classroom should be purchased. It is therefore recommended that a full classroom be equipped with this type of machine and taught as a one-year course which should include all the principles of transcription. Under the present set-up in most schools,
these machines are frequently taught to those students having no stenographic background. This places the student at a disadvantage and produces a poorly trained student who will represent the business department. As voice machine operators are in demand in the Sacramento area, it might be wise for the high schools in this area to develop a terminal course in this area of study.

Also recommended is increased purchasing of electric typewriters in the high schools. In no other section of this questionnaire was so unanimous an opinion expressed as was the high acclaim for electric typewriters. The I. B. M. leads the field for popularity and should be represented in the major portion of typewriter purchases. Although the present per cent of usage is not high, it is a figure which will probably rise steadily. Some companies responding to this questionnaire are using electric typewriters exclusively. The purchases of manual typewriters should be divided among the three leading brands; Royal, Remington, and Underwood.

The duplicating processes recommended for a course in office machines are the stencil and hectograph types of operation. The brands most popular for these processes are the Mimeograph and the Ditto. Both processes require some skill and would be recommended for those intending to go into government work where much of the duplicating type of work is done.
The photo process of duplication is becoming popular in industry and government, but the simplicity of the machine does not warrant the expenditure of its purchase price for classroom use.

**Recommendation for further study.** A repetition of this study would be helpful after a five year lapse to find out what changes in preferences have been made or if new machines have been developed on the market. With automation now being introduced into the field of business machines, a revolution in the office machine field could well take place in a relatively short period.
BIBLIOGRAPHY

A. BOOKS

An analysis of the objectives of high school business education and the general methods of teaching business subjects.

B. BOOKS: PARTS OF SERIES

A careful analysis of the furniture and office equipment for a modern classroom.

A handbook designed to provide teachers of office practice with information and suggestions useful to him in his efforts to solve his problems.

A short treatise on the purposes and methods of making community surveys for the improvement of business education.

C. PUBLICATIONS OF LEARNED SOCIETIES, GOVERNMENT, AND ORGANIZATIONS

A survey of the secondary schools in California with suggested layouts and equipment for business departments from one to eleven classrooms.

A report on the need for equipment in a course in office machines and the equipment recommended by the author.


A consideration of the methods of determining equipment needs and suggested plans for obtaining adequate facilities and equipment.


Standards of competence for operation of various machines is described along with time limits for these goals.

D. PERIODICALS


A survey of voice machines in use in the Madison and Milwaukee areas with advantages and disadvantages of voice machines over stenographers for dictation purposes.


Suggested methods of securing office machines and a list of present equipment at St. Xavier's Academy, Providence, Rhode Island.
A survey of the business machines of 184 colleges.

E. UNPUBLISHED MATERIALS

A survey of the business machines used in the San Jose area and a recommended layout and equipment plan for an office machines class of 20 students.

A survey of the office machine equipment of 75 secondary schools in Pennsylvania with a list of recommended equipment for a class or 25 students.

Survey of the manufacturing industries in Muncie to determine the extent that various office machines were used with recommendations for improvement of classroom techniques.
March 25, 1956

As Head of the Business Department at El Camino High School, I am surveying the business organizations in the Sacramento area as to the quantity, types, and brands of business machines being used. The results of this survey will be used to correlate the purchase of these machines in El Camino High School with business practice in the Sacramento area.

At Sacramento State College, I have learned that the National Office Management Association is interested in encouraging and participating in research; consequently, I am sending the enclosed questionnaire to NOMA members. It looks time consuming, but I believe that it will take no more than twenty minutes to complete. We shall certainly appreciate your co-operation.

It is through your help and co-operation that our high school can better train students to be better employees for you.

Very truly yours,

(Mrs.) Eileen R. Hawkes
Business Department Chairman
QUESTIONNAIRE ON BUSINESS MACHINES FOR EL CAMINO HIGH SCHOOL, SACRAMENTO 21, CALIFORNIA

DIRECTIONS: In the space provided at the right, please indicate the number of each type of machine in your organization.

<table>
<thead>
<tr>
<th>ADDING MACHINES</th>
<th>Full</th>
<th>Type</th>
<th>10-Key</th>
<th>Keyboard</th>
<th>Type</th>
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<tbody>
<tr>
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<td></td>
<td></td>
</tr>
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<td>I. B. M.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
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<td>Remington</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Victor</td>
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<table>
<thead>
<tr>
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<th>TYPE</th>
<th>KEY-DRIVEN CALCULATORS</th>
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<tbody>
<tr>
<td>Friden</td>
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<td>Comptometer (Felt &amp; Tarrant)</td>
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<td>Marchant</td>
<td></td>
<td>Burroughs Duplex</td>
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<tr>
<td>Monroe</td>
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<td>Burroughs Simplex</td>
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</table>

<table>
<thead>
<tr>
<th>VOICE MACHINES</th>
<th>TYPE</th>
<th>DUPLICATING MACHINES</th>
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</thead>
<tbody>
<tr>
<td>Audograph</td>
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<td>Copy-Rite</td>
</tr>
<tr>
<td>Dictaphone</td>
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<td>Ediphone</td>
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</tr>
<tr>
<td>Felt &amp; Tarrant</td>
<td></td>
<td>Heyer</td>
</tr>
<tr>
<td>Peirce</td>
<td></td>
<td>Mimeograph (A. B. Dick)</td>
</tr>
<tr>
<td>Soundscriber</td>
<td></td>
<td>Multilith</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Multigraph</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Speed-O-Print</td>
</tr>
</tbody>
</table>
DIRECTIONS: Indicate your response by placing a check mark in the space provided at the right. On questions requiring a statement of your opinion, please be as brief as possible.

ADDING MACHINES
1. Which style of adding machine do you prefer?  
   10-Key Full
2. Why?  
3. On which machine is your repairs higher?  
4. Which machine do you consider to be faster for your work?  
5. Which style do you plan to purchase in the future?  
6. Is the purchasing price an influencing factor?

CALCULATORS
1. Which style of calculator do you prefer?  
   Key-driven Rotary
2. Why?  
3. Which type of operation is faster for your work?  
4. Which type do you plan to purchase in the future?  
5. Which type of operator is higher paid?  
6. Are trained operators difficult to find?  
7. Do you train operators on the job?

VOICE MACHINES
1. Do you prefer a voice machine operator to a stenographer?  
2. Why?  
3. Do your executives object to using voice machines?  
4. Do your stenographers object to using voice machines?  
5. Which type of employee is higher paid?  
6. Which is the most economical method of dictation for you?

TYPEWRITERS
1. Which style of typewriter do you prefer?  
   Electric Manual
2. Why?  
3. Which style do you plan to purchase in the future?  
4. Do your operators object to changing over to electrics?  
5. Does an electric typewriter produce more work?  
6. Is the quality of work noticeably better on an electric?

DUPLICATING MACHINES
1. Which type of duplicating process do you prefer?  
2. Are trained duplicating machine operators difficult to employ?  
3. Do you train your own operators?  
4. Does the salary vary with the type of duplicating process?  
5. If so, which process pays the highest?  
6. Do your operators express a preference for any particular method of duplication?  
7. If so, which process?  
8. Is cost or personal preference the basis on which your duplicating method is selected?

NAME
ADDRESS
TYPE OF BUSINESS
GOVERNMENTAL OFFICES SURVEYED

Agriculture, Department of
Alcoholic Beverage Control
Controller
Corrections, Department of
Education, Department of
Equalization Board
Employees Association
Employment, Department of
Finance, Department of
Fish & Game, Department of
Franchise Tax Board
Geological Survey
Highway Patrol
Interior, Department of
Justice, Department of
Legislature, Department of
McClellan Air Force Base
Motor Vehicles, Department of
Mather Air Force Base
Mental Hygiene, Department of
Natural Resources, Department of
Personnel Board
Professional & Vocational Standards, Department of
Public Works, Department of
Reclamation, Bureau of
Sacramento, City of
Sacramento, County of
Sacramento Signal Depot
Social Welfare, Department of
Veterans Affairs
NOMA MEMBERS SURVEYED

Paul Alston, Jr.
Spreckels Sugar Co.

Burton O. Baump
Mutual of New York

Anthony Blas
Precision Engineering Co.

Lee W. Blass
Heleck-Moran Company

Goerge R. Boardman
Heald College

Richard W. Braire, Jr.
A. Teichert & Sons, Inc.

Clarence W. Brown
American Trust Company

Mrs. Marcella Brown
Lyon-Darwin Hardware Co.

Robert W. Brown
Pacific Gas & Electric Co.

Harold H. Buckman
California-Western States Life Insurance Company

Mrs. E. Coquet
Yancey Company

Ted Dangerfield
Sierra Mill & Lumber Co.

Lloyd W. Eager
Campbell Soup Company

Elmer G. Gray
Borden's Capitol Dairy

Roger J. Gunther
United Pacific Insurance Co.

Harry Harvey
American River Junior College

Miss Nellie E. Hull
Western Hyway Oil Company

John F. Kelley
Kraft Foods Company

Mrs. Bessie C. Lebar
Sacramento Valley Insurance Agency

George H. Letellier
Standard Oil Co. of New York

Robert H. Lewis
McKesson & Robbins, Inc.

Tillman Lungren
Sutter Hospital

Walton E. Mann
Pillsbury Mills, Inc.

M. W. McCahan
Crystal Ice & Cold Storage Co.

John A. McGee
General Electric Supply Co.

Gene T. Moore
Newton A. Cope Co.

Robert L. Moore, Jr.
Orchard Supply Co.

William Morgan
NEWSCO Accounting Systems
Mrs. Katherine E. Morrison
Fremders Agency

John Pelton
Sacramento Valley Associated
Industries

Raymond H. Richards
Shell Oil Company

Miss E. H. Riggs
Wm. A. Sutton Co.

William H. Robertson
Arden-Carmichael Union
School District

Frank Russell
UARCO Incorporated

Leonard B. Sequeira
Bank of America

Levaughn Shipley
Ward Harris, Inc.

C. Clark Smith
Artz and Cook Realty Co.

Loren Smith
Industrial Indemnity Co.

Jack H. Stansfield
A. Dewied Casing Co.

Ian M. Stoddart
Stop-N-Shop Markets

Richard E. Thomas
Aerojet General Corp.

Melvin E. Woodhouse
Bekin Van & Storage Co.

Robert G. Thorp
Zellerback Paper Co.
### Preferences in Adding Machines

**Sacramento, California**

**1956**

<table>
<thead>
<tr>
<th>Brand</th>
<th>Number in Public Employment</th>
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<tr>
<td>Burroughs</td>
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<td>-------------</td>
<td>-----------------------------</td>
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<td><strong>ROTARY</strong></td>
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<td>140</td>
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PREFERENCES IN TYPEWRITERS  
SACRAMENTO, CALIFORNIA  
1956

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## Preferences in Voice Machines

**Sacramento, California**

1956

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<td>Ediphone</td>
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NUMERICAL TABULATION OF RESPONSES TO
PART II OF QUESTIONNAIRE

ADDING MACHINES
1. Which style of adding machine do you prefer? 10-Key_24_ Full_8
2. On which style of machine is your repair costs higher? 10-Key_1_ Full_3
3. Which machine do you consider to be faster for your work? 10-Key_24_ Full_4
4. Which style do you plan to purchase in the future? 10-Key_21_ Full_8
5. Is the purchasing price an influencing factor? Yes_3_ No_27

CALCULATORS
1. Which style of calculator do you prefer? Key-Driven_4_ Rotary_20
2. Which type of operation is faster for your work? Key-Driven_6_ Rotary_17
3. Which type do you plan to purchase in the future? Key-Driven_3_ Rotary_15
4. Which type of operator is higher paid? Key-Driven_5_ Rotary_1
5. Are trained operators difficult to find? Yes_10_ No_8
6. Do you train operators on the job? Yes_16_ No_4
VOICE MACHINES

1. Do you prefer a voice machine operator to a stenographer?  Yes 17  No 10
2. Do your executives object to using voice machines?  Yes 9  No 17
3. Do your stenographers object to using voice machines?  Yes 6  No 18
4. Which type of employee is higher paid?  Machine 0  Steno. 14
5. Which is the most economical method of dictation for you?  Machine 17  Steno. 7

TYPEWRITERS

3. Do your operators object to changing over to electrics?  Yes 1  No 24
4. Does an electric typewriter produce more work?  Yes 23  No 0
5. Is the quality of work noticeably better on an electric?  Yes 22  No 5

DUPLICATING MACHINES

1. Are trained duplicating machine operators difficult to employ?  Yes 5  No 15
2. Do you train your own operators?  Yes 22  No 1
3. Does the salary vary with the type of duplicating process?  Yes 1  No 15
4. Do your operators express a preference for any particular method of duplication?  
   Yes 2  No 15

5. Is cost or personal preference the basis on which your duplicating method is selected?  
   Cost 9  Pref. 10