OUTLINE OF PLANS FOR DEVELOPMENT OF ELECTRONIC COMPUTORS

The first objective of the proposed company will be to design and develop a multi-purpose rapid computing machine of moderate cost.

Two or three years will be required for this development. This estimate, and the estimate of engineering staff and operating funds needed for this period, are based on the experience gained (by those who will form this company) during the development and construction of the ENIAC, the first electronic multi-purpose computing machine ever to be built.

It is hoped that, during the developmental period, contracts may be secured which will help to defray the development costs. Since at the present time such contracts have not yet been assured, and since some of the development contracts which are in view might require larger or somewhat different types of machines, it appears that a conservative procedure is to secure enough capital in advance so that the entire development program can be carried out even though no such assisting contracts can be made.

In the event that additional funds can be secured through such development contracts, the scale of costs - both as to the number of engineers employed and other costs - can be increased by about 50% per year (estimate B). In this case, the overall time of development might be shortened, since this increase in the size of the organization remains compatible with efficient engineering and research supervision and management.

The machines to be developed, whether for business and accounting purposes, or scientific and engineering work, will represent a great advance over the present ENIAC, being more easily and automatically controlled, and involving considerably less equipment. An essential improvement lies in increasing the speed of the associated mechanical equipment by replacing present punched card equipment by radically different devices. Not only will such new machines be much smaller and more easily operated, but the reliability of their operation can be substantially improved.

As a consequence of these improvements, both the initial cost and the maintenance of such machines will be made much lower.

The market for high-speed multi-purpose computing machines of moderate cost can be indicated by the following brief list of possible users:

1. Scientific laboratories, universities and research foundations.
2. Industrial research and engineering laboratories.
3. The U. S. Census Bureau.
4. The U. S. Weather Bureau.
5. Other government agencies such as the U. S. Bureau of Standards.
6. Astronomical observatories.

7, Accounting and bookkeeping departments of large business firms.

8. Inventory, stock control and planning of departments of large business firms.

9. Agencies having voluminous files and records, libraries, social security offices, etc.

10. Insurance companies, both for records and actuarial work.

It is believed that the equipment to be developed will constitute a sufficiently great improvement over existing business machines, and will be cheap enough, so that its use will be extended to many places which now cannot even consider the introduction of automatic machine methods. The electronic devices will not only have superior speed and flexibility, but will carry out a longer and more complicated routine without human supervision during the course of the work. Thus business firms will find that the same work, such as large payroll or inventory jobs, can be carried out with a smaller operating personnel than with any equipment now in use for such work.

Agencies now using punched cards frequently find the storage of these cards a difficult problem. This storage problem will all but vanish with the new equipment which it is proposed to develop. The same information which now requires 50,000 punched cards (occupying an entire filing cabinet) can be stored on a spool of magnetic tape or wire which can easily be carried in one's pocket (which is less than 1/1000 the size by volume). It is obvious that this compactness of storage is important in another way, since it means that when an operator has placed such a spool in the electronic apparatus, she has in that simple act performed the equivalent of carrying 50,000 punched cards from the storage file to one of the present day business machines. To carry that many cards, and see that they are properly fed into the card machine, is a laborious and time-consuming job in itself.

Taking into account the more automatic way in which large quantities of information can be fed into the eleetronic equipment, it is estimated that when the operation to be carried out is one of sorting or arranging the data, the electronic device will function at a rate perhaps ten times that of present card machines. For operations which require computations, the advantage will be even more marked. As an example, a card machine may require several seconds to perform a single multiplication. The electronic computor will perform about 1000 multiplications in one second.

The physical size or bulk of such an electronic device might be slightly larger than one of the present card machines. It should be borne in mind, however, that this single machine will do everything that is required, while from four to six different card machines may be required to perform the various operations needed for ordinary business and accounting work. (In addition to the electronic computor itself, there will be a small auxiliary device, like a typewriter, for the preparation of magnetic tape and the printing of results. This corresponds to the key punch devices for cards, and the card tabulators).

The cost of such electronic computor, of course, can only be estimated very roughly at this time, but present judgment is that the development work will make it possible to market such a machine for less than $30,000. and possibly as low as $5,000. That such a cost is not unreasonable is indicated by the fact that many business firms spend more than $30,000. per year for the rental of card machines which are not able to do what this equipment is expected to do. Furthermore, such firms spend about an equal amount per year for personnel to operate these card machines. As already stated, it is believed that a smaller staff will be able to operate the electronic machine in those cases where the operations are recurrent routine business and accounting jobs.

It should be pointed out that the development here proposed is based on prior development work done for Army Ordnance, using government funds. Some of the devices which are to be used are at present still under security classification. No patents are as yet issued, but the work of filing patents is now in progress. The inventors, who will head the proposed company, are required to give the government a royalty-free license (non-exclusive) and have agreed to license educational institutions to build and use such devices for non commercial purposes. The inventors now hold the commercial rights under all patents which will issue.

NAME OF THE COMPANY:

The company to be formed will be engaged in the development of, and possibly the manufacture and sale of, electronic calculating devices and a large variety of other devices which may be associated with such devices or utilized components of such devices. An important category of such devices lies in the field of control of industrial processes. With this in mind, the following names are suggested. They are listed in order of preference:

Electronic Calculator Company.

Electronic Control Company.

Electronic Manufacturing Company.

Automatic Electronic Control Co.

Automatic Electronic Company.

STATEMENT OF PURPOSE of the Proposed Company:

a. To conduct, or to have conducted for it, research on electronic devices and associated equipment (examples itemized later).

b. To perform services for others in connection with design, development, installation and use of such items.

c. To manufacture, or to have manufactured for it, all such items.

d. To sell such items, manufactured by it or for it.

e. To engage in consulting work (possibly covered by b.).

f. To publish books, manuels, technical catalogs, etc.

g. To acquire patent rights from others, either by licensing or assignment, and to license or assign patents which it controls to others.

h. To rent or lease equipment which it owns or controls to others for specific uses.

i. To conduct experimental or development work for others either on its own premises or on the premises of others.

Perhaps the purposes set forth in the corporation charters of companies like IBM and RCA should be examined for further suggestions.

Some indication of the extent of the interpretation to be given to "electronic devices and associated equipment" can be given by listing some of the items now foreseen as coming within the range of possible development. For this list, see the following:

The following list is intended to indicate the extent and variety of devices and equipment which are now foreseen as subjects of possible development or improvement by the engineering and research work of the proposed company. Even at the present time,