PERSONAL COMPUTING:
PAST, PRESENT, AND FUTURE

Robert J. Stek, Ph.D.

Manager, Manpower and Training
Saskatchewan Computer Utility Corporation
2161 Scarth Street
Regina, Saskatchewan
S4P 2H8

ABSTRACT

Personal computing is discussed from its beginnings in the electronic hobbyist market four years ago to the home user and small business user of today. The computer hobbyist is described in terms of income, profession, time spent on hobby, and use of the computer. The possible impact of personal computing on the data processing industry is considered.

L'AMATEUR DES ORDINATEURS
LE PASSE, LE PRESENT ET LE FUTUR

RESUME

Le phénomène des ordinateurs est discuté à partir de son début sur le marché provenant d'amateur en électronique il y a quatre ans jusqu'au rôle quotidien dont jouit l'ordinateur dans nos bureaux d'affaires ainsi qu'avec la population en général. L'amateur en question est analysé en fait de son revenu, sa profession le temps consacré à sa passion et les développements de l'ordinateur. On considère même que ces amateurs ont influencé les développements de l'ordinateur.

Paralleling the growth of the manufacturers has been the growth of the retail computer store. There was one retail computer store in 1976 in California. Now in the U.S. and Canada there are over 350. Recently the Tandy Corporation, owners of Radio Shack, have announced in addition to the Radio Shack stores, which sell microcomputers, they will be opening up fifty additional retail computer stores to handle their own microcomputer products and the products of others. Even DEC and IBM are opening retail computer stores. DEC now has a retail computer store in a shopping centre in Massechusettes where you can literally go pick out a DEC mini from stock. They will help you load it into your station wagon and you can take it home and start computing. IBM also has a retail computer store for their 5110 series in California. Another indicator of growth in this area is the proliferation of computer clubs. While there are clubs in California with memberships in the hundreds, it is interesting to note that even Regina, Saskatchewan in its micro club, the Regina Owners of Microcomputer Systems (ROMS) has over 60 members and has been in existence for a little over a year.

COMPUTER HOBBYISTS - WHO ARE THEY?

(The following figures are from a study of 1500 U.S. computer hobbyists surveyed by Venture Development Corporation.)

The original computer hobbyists tended to be programmers, technicians, or engineers and nearly 3/4 of hobby computer owners use computers on the job as shown in this graph. This market has changed, however, as of late. There actually now seem to be roughly nine markets for microcomputers - three home use segments: hobbyists, home programmers and consumers; and six non-home use segments; very small business, low end business applications, self-employed professionals, scientists, educational institutions, and industrial applications. Of these, the two markets that seem to be growing fastest are educational institutions, and very small business users.

As an indication of the amount of interest in hobby computers, let me show you some graphs. This graph shows the investment of a survey of 1500 hobby computer users. Nearly 2/3 of these hobbyists spent between $1,000 and $5,000 on their hobby. An expensive hobby? Well, one computer club in Texas offered a $50 prize to the member submitting the winning essay titled "How I Justified the Cost of My Computer To My Wife". The prize went unclaimed as no one entered. Another indicator of interest is the time spent on a hobby. Nearly 1/2 of the hobbyists surveyed spent between 10 and 19 hours per week on their hobby. How many other hobbies can claim that amount of time? The computer hobbyist is fairly sophisticated about his hobby. He has some knowledge of hardware and is probably at least an intermediate level programmer in one or several high level languages.

The consumer market or the personal computer market, is just beginning to develop now. These individuals buy a computer just as they would a colour T.V. It's something to plug in, turn on, and have it do something. The lack of software for this market is probably

PERSONAL COMPUTING

The personal computer has arrived - at least in some market segments according to a United States report. Creative Strategies International, a market research firm, stated that unit shipments will jump from 43,000 in 1977 to an estimated 278,000 by the end of 1978, reflecting an increase of 547% in one year. By 1982 annual unit shipments will reach 1,200,000 and the dollar value of retail sales of systems, peripherals and software will reach nearly 3 1/2 billion dollars. The firm which prepared this marketing report predicts the personal computer will be slowly integrated into the lives of a specialized group of consumers ultimately numbering about 20,000,000 in the U.S., about 2,000,000 in Canada. It is becoming apparent that microcomputers, much more expensive than toys, are worthy of the attention of the serious data processing professional. Microcomputers are being used in new applications that don't require the power of the mini. In other areas they are replacing minis, and they are being designed into remote processor stations for users in distributed processing environments.

The serious user has also been troubled by questions of reliability. Have the home computers been designed and built to provide the level of reliability that commercial users expect, or are there only a handful of desk-top machines from companies like IBM, Hewlett-Packard, and Tektronics that are reliable enough?

HISTORY - HOW DID THE PERSONAL COMPUTING INDUSTRY BEGIN

While there have been individuals over the years who have put together their own computing systems, the history of personal computing can be fairly easily marked as beginning in January, 1975. That was the month that the magazine "Popular Electronics" presented a construction project called the Altair 8800. This was a $600 kit that was offered by a small electronics firm that originally had sold desk calculator kits. The Altair 8800 was a very primitive machine which used paper tape input, had plenty of blinking lights and switches on its front panel and usually started off with about 4K of memory. Much time was spent in toggling in a bootstrap loader just to load a paper tape operating system or a tiny version of BASIC. Input was usually through a home built terminal or T.V. typewriter. What was astonishing, however, was the fact that this firm which had expected to sell perhaps 200 units was flooded with orders. Within a month of the appearance of the article this company had orders for over a thousand. An industry began to form on the basis that this one company could not provide enough equipment fast enough to satisfy the consumer demand for that product. For example, one of the better companies right now, Processor Technology, began when two computer hobbyists at a club meeting in California decided that they could build a better memory board than was offered by MITS, the company that manufactured the Altair. Processor Technology grew from this initial cottage industry housed in a garage in California to one of the leading manufacturers of microcomputers today. Currently there are over 100 manufacturers of peripherals, mainframes and memory boards for microcomputers. That's not a bad beginning for an industry just four years old.

delaying its growth somewhat. However, more and more software is being made available at very reasonable prices so that the personal computer hobbyist can now buy preprogrammed packages for financial planning, including cheque book balancing and stock analysis - and one computer company, Apple Computers, has available a service which allows Apple owners to connect directly to the Dow Jones reporting service - game packages such as chess, othello, checkers and bridge and many other applications.

SMALL BUSINESS COMPUTERS

The small business market is still growing. Many small businesses who would not even think of spending $50,000 to $100,000 for a minicomputer are taking a serious look at spending $5,000 to $10,000 for a microcomputer system. These systems will be used for the same purposes as in-house minis - inventory, general ledger, accounts payable, accounts receivable, etc. - but at only 10 - 20% of the cost of the mini. A typical small business configuration might include the computer itself with 32 kilobytes of RAM, a video terminal, dual sided double density 8 inch floppies capable of storing 4 megabytes on-line, and a hundred line per minute printer. Such a set-up might cost between $8,000 to $10,000. Smaller businesses could get by with even less. The software is available; however, its quality is extremely variable as are prices. For example, an inventory package can be bought for $20, $100, $200, $500 or $1,000. Of course, unless you see the system in operation, you can never be sure exactly what you are buying and if it will meet your needs.

MICROS AND THE DP INDUSTRY

The microcomputer market is still growing. Its effect on the data processing professional is just beginning to be felt. The theme of this conference is "Resource Sharing - Cost Sharing". But the advent of the microcomputer may put a new perspective on that theme. Many user departments complain about the priesthood which surrounds the DP department and "protects" the user from direct contact with the computer. How often is the user told that what he wants done cannot be integrated into the current system, and that implementation of "something like it" will take many months. How many organizations state that all computer-related requisitions must be handled by the DP department? And how many departments have the authority to spend $100,000.00 on their own mini? But many departments do have $5,000 to purchase a micro. And this has led to the "secret computer". Many retail computer store owners will tell stories of selling bits and pieces of a system with invoices labelled "electronic components" of "calculating machinery" so as to avoid detection by the DP department. The point is, if everyone has a micro computer, what becomes of sharing a mainframe? Obviously, micros cannot replace mainframes. But with the current lack of standards on the microcomputer scene, when it does become obvious to the micro-users that they still have to share information, perhaps as input to the mainframes, they may have second thoughts about their systems. The current lack of both hardware and

software standards in the microcomputer industry may prove a hinderance to sharing resources. Whether a single standard will emerge, or whether the DP industry will have to offer a variety of "standards" is anyone's guess right now.

Distributed processing has arrived. In February, a school superintende in Moosomin, Saskatchewan began transferring data files back and forth between his micro and a Xerox Sigma 9 in Regina. He prepares and enters his data files and does some initial pre-processing on his microcomputer. He dials up the Sigma 9, his micro logs onto the system, loads the appropriate program, and then sends the data. When processing is complete, he receives his new data back from the mainframe, stores it on disk, and prints out his reports on his printer when convenient.

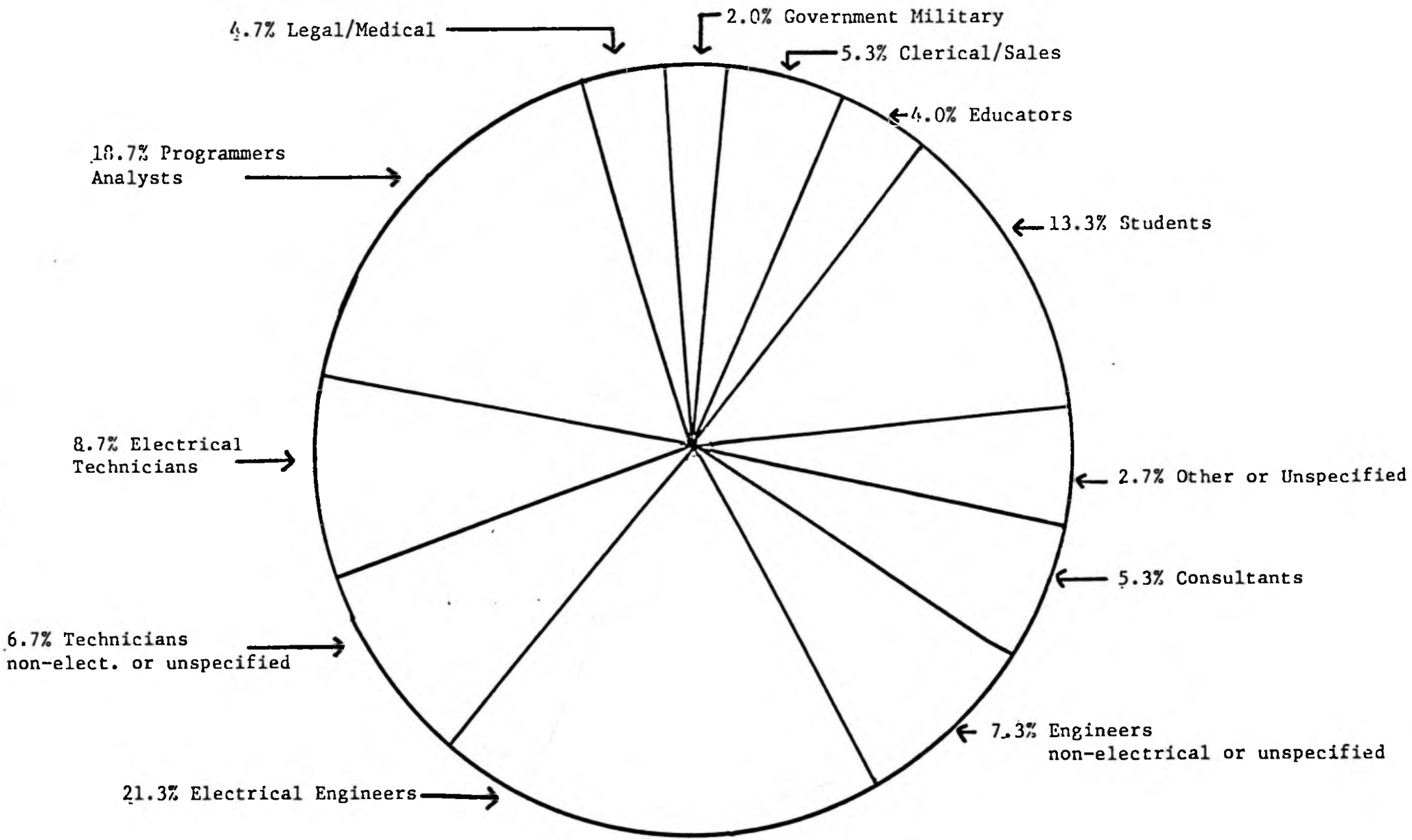
Distributed processing has been discussed to death in the trade journals. Here is a real life example born out of necessity: a school superintendent had a need to process large amounts of data in a town with no local computing facilities. Tying up a long distance phone line for data entry was economically impractical. Sending records away to be entered in Regina was too slow. But entering data and pre-processing on a home microcomputer which could then quickly transmit the data to mainframe over the phone was a practical solution.

This individual worked out the protocols mostly by himself over a period of several months. Perhaps the DP industry would be wise to investigate how it can help the microcomputer user link up to main frames. Many people may start off by doing nothing more complicated than playing Startrek, but eventually the end result will be a more computer-literate public.

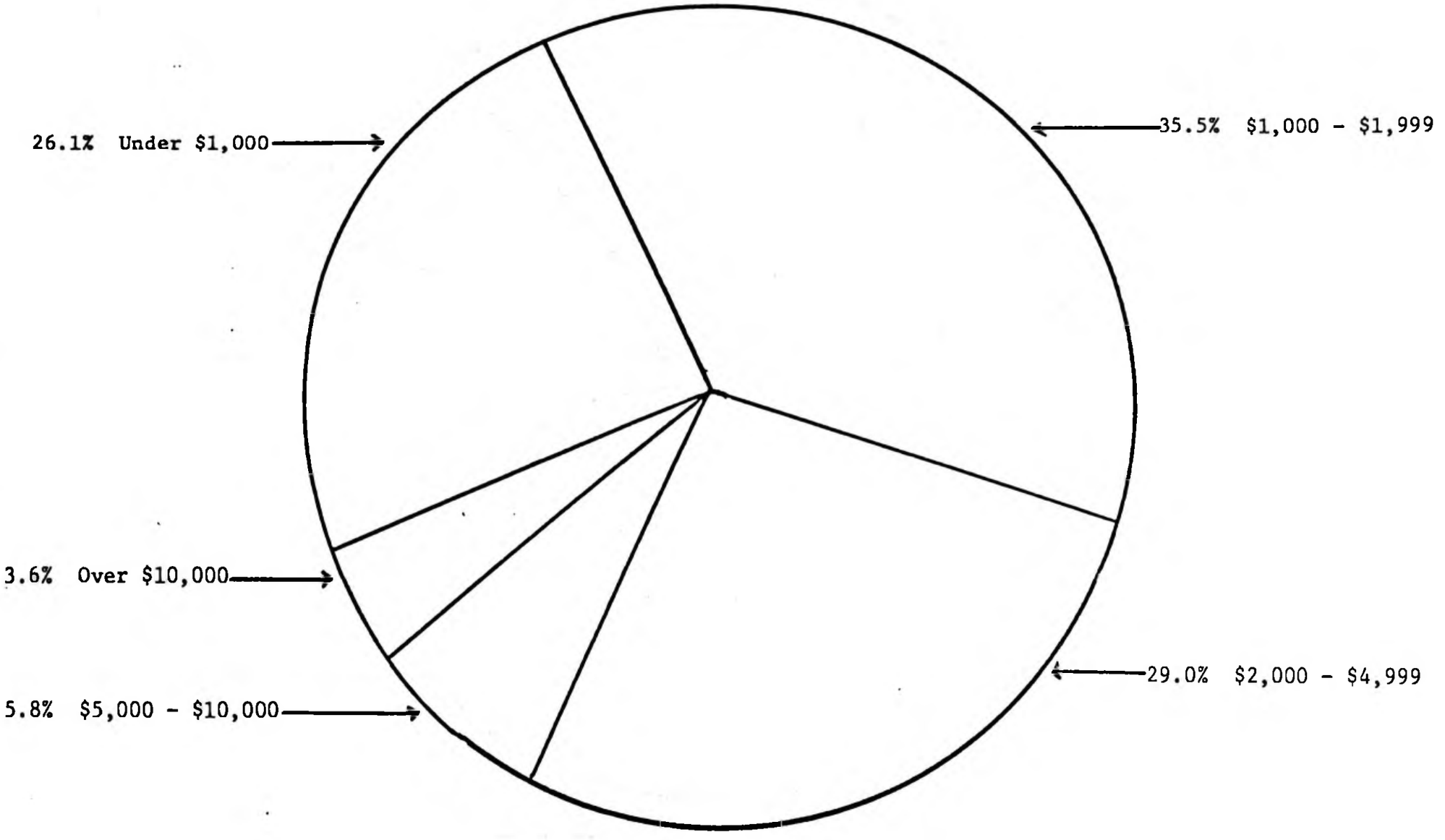
CONCLUSION

The rapid growth of microcomputers will continue for the next five years at least. For five years after that we can expect micros to "grow up". Even now, 16-bit micros are being announced, and 32-bit micros are on the drawing boards. A simple trend line analysis will not predict the future of microcomputer systems. A crystal ball may help - but only if it is microprocessor controlled.

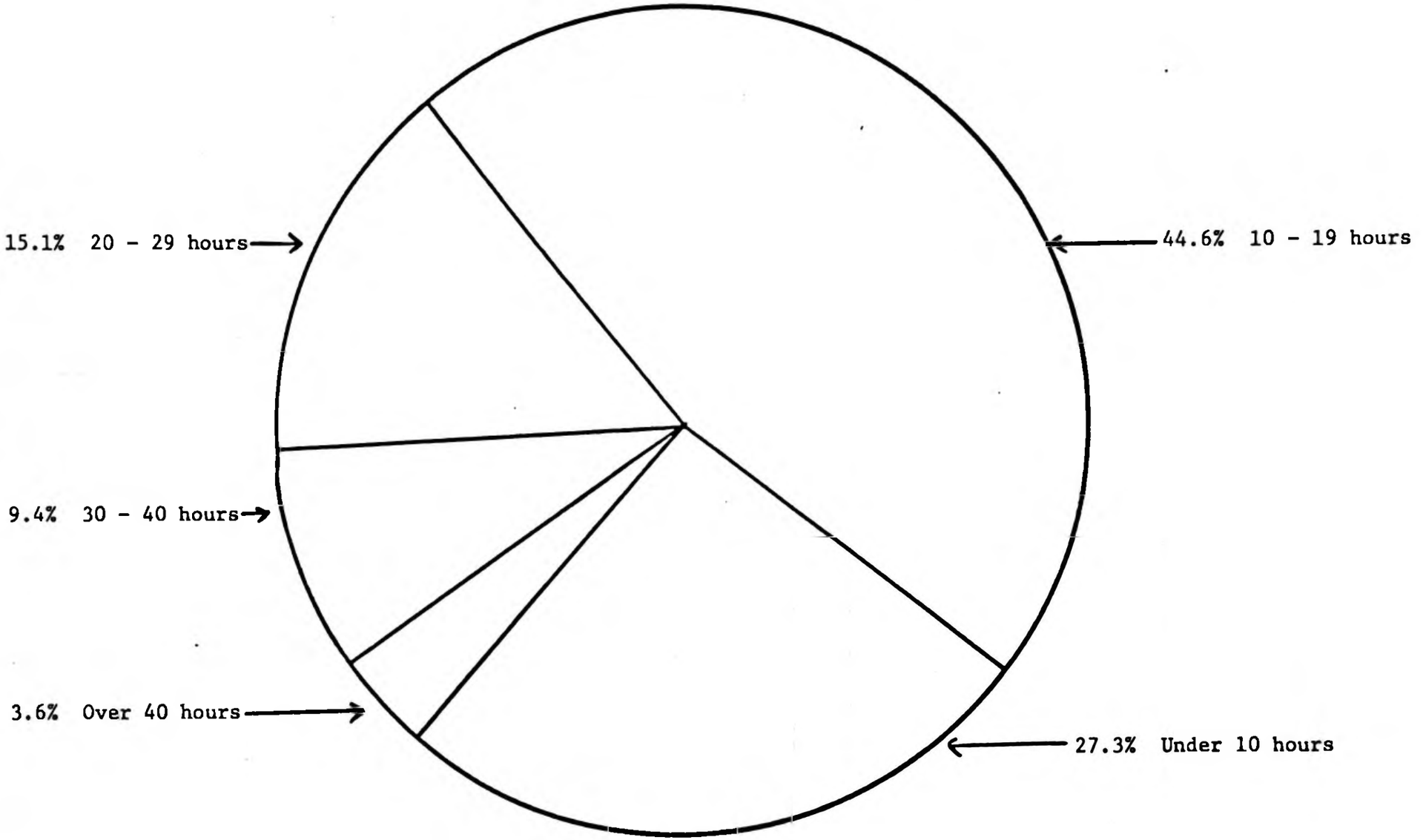
COMPUTER HOBBYISTS BY OCCUPATION



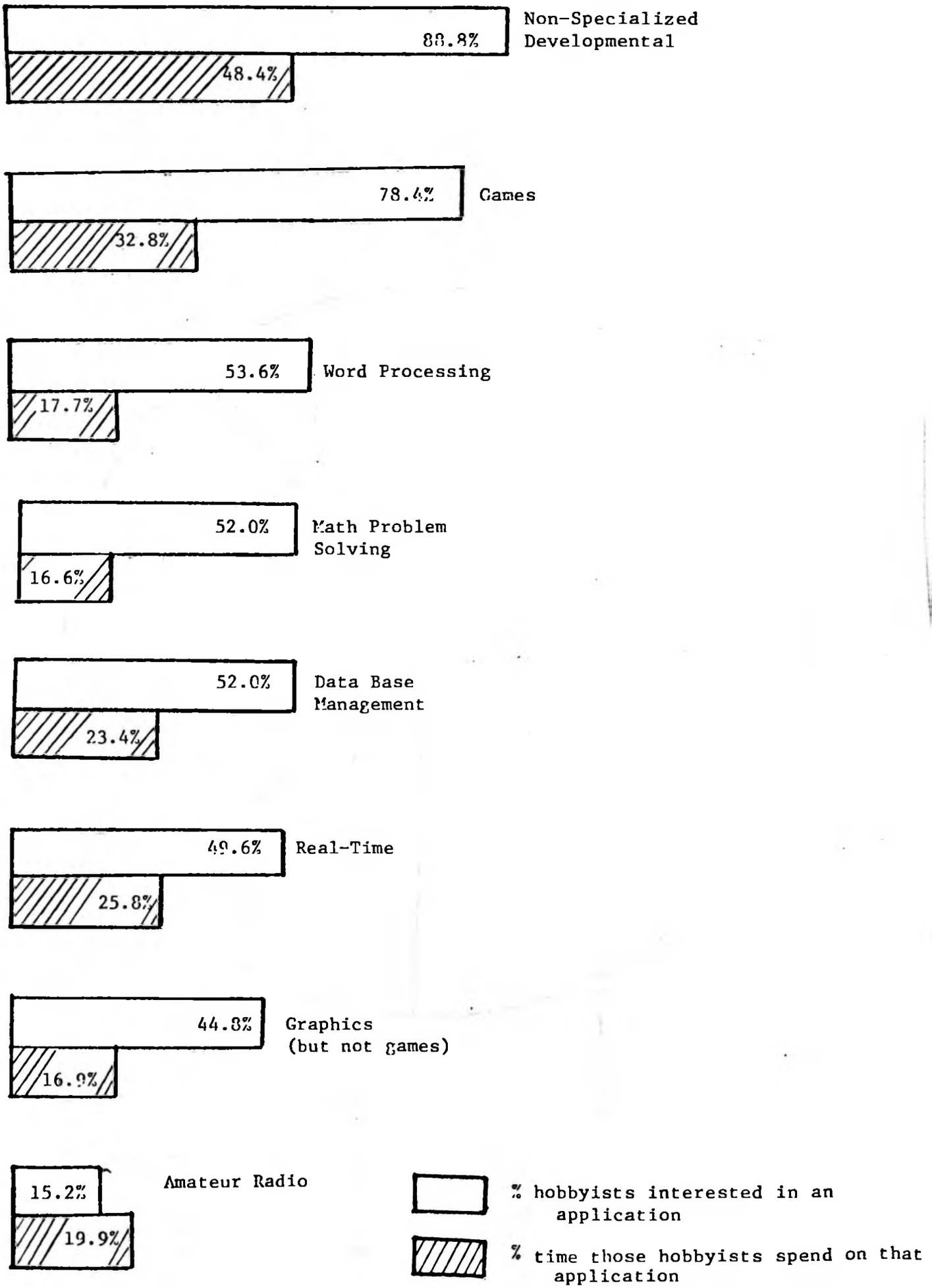
PRESENT INVESTMENT



TIME SPENT WEEKLY ON HOBBY



HOW ARE HOBBYIST COMPUTERS USED?



COMPLILER/INTERPRETER EXPERTISE