

APPLICATION OF THE PROFESSIONAL 350 IN A UNIVERSITY DEPARTMENT  
A CONSUMER'S REPORT

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ABSTRACT

This paper describes 12 months of experience with one (later: three) DEC PC 350 microcomputers. The hardware proved to be solid and pleasant to work with; a number of components, however, did malfunction upon delivery or later on, and the LQP02 printer plus sheet feeder caused minor annoyances. P/OS 1.7 is user-friendly, and for experienced users there is DCL as well. The standard editor PROSE is limited, but EDT is also available now. The Dutch word processing package DATATEXT is smooth and sophisticated, and was well accepted by secretaries. Poor documentation, plus some bugs, are its main drawbacks. The statistical package SPSS worked well, but it is much more limited than its popular mainframe version. BMDP may prove a useful alternative. The spreadsheet Supercomp-20 is in principle quite powerful, but it does not perform smoothly in the hands of unexperienced users. It is unclear which problems might be encountered upon conversion of programs from RSX to P/OS, and an experienced programmer appears indispensable. Full RSX Fortran 77 is available with the native toolkit. Communication with a DECsystem 10 mainframe works but is not optimal. The quality of service from DEC was initially somewhat uneven but is improving. Supplies are cheaper from outside vendors. The only serious problem with the P350 is the lack of readily available application programs; active intervention of DEC is recommended here.

INTRODUCTION

This paper describes our first 12 months of experience with the DEC Professional 350 microcomputer, including its hardware, peripherals, and operating systems, and some applications in the field of word processing, statistics and computation.

Our department has a staff of about 60 persons. We have access to the DEC-system 10 mainframe computer of the Agricultural University Computing Centre via a number of terminals, and a few small microcomputers are used in our chemical laboratory for data analysis and data reduction.

The following factors led us to acquire the machines described in this paper:

- A need to introduce word processing equipment.
- A need for systems that are more reliable and user-friendly than a large timesharing mainframe.

We chose the P350 because we hoped in future to apply one type of hardware and operating system to all our electronic data processing needs, which include diet calculations, office automation, laboratory automation, and communication with larger systems. We thought that the advantages of a uniform system in terms of training, maintenance and back-up would justify the purchase of the P350 even if it was not optimal in price or performance for each separate application mentioned above.

We ordered our first system in the spring of 1983; it was meant exclusively for word processing, and included an LQP02 printer plus sheet feeder. After an extended period of assembling and testing by one of us (B.A.S.), the system was fully operational by December and was transferred to the secretariate. Two more systems were acquired in the spring of 1984, for statistical data analysis and programming; both included an LA50 matrix printer.

Our evaluation of the system's performance is given point by point below.

#### HARDWARE

The black-and-white monitor and the keyboard are well-designed and the keyboard is especially pleasant to use. The monitor screen does smudge easily when touched.

The system unit, which houses the disk drives, system boards etc., is rather large. However, it fits neatly into a floor stand under a desk. The fan noise is tolerable.

The LQP02 daisy wheel printer is a solid and fairly sophisticated machine. Our impression is that it is not manufactured by DEC but by Qume. Unfortunately, only one or two of the printing wheels offered for the LQP02 corresponded completely with the Dutch keyboard. Combined characters like Æ formed the main problem. It took some time and effort to weed out unsatisfactory printing wheels. We also found nylon ribbons unsatisfactory, and therefore we use only carbon ribbons in spite of their cost.

The sheet feeder also appeared to be a third-party product. Its performance has been somewhat irregular, and is influenced by quality and type of paper used, cleanliness of transport surfaces and other as yet undefined factors. In our hands the printer-plus-sheet-feeder has been the weakest part of the word processing system.

The noise of the printer is damped quite well by the noise reduction cover.

The LA50 printer is small, handy and versatile and gives no reason for complaints.

#### MALFUNCTIONS

Although the P350 is a solid machine we have had a number of failures, as outlined in the table. All were taken care of by DEC as part of the 12-month warranty.

time (months)	malfunction
0	P/OS 1.0 diskettes (replaced)
0	P/OS 1.5 diskettes (replaced)
0	LA50 printer (replaced)
0	10 Mb disk (replaced)
0	diskette drive heads (repaired)
6	LQP02 printer destroys print wheels & ribbons (repaired)
8	system board crash (replaced)
10	keyboard illegible (replaced)

A number of failures were discovered at delivery. With our first P350 it took us a while to realize that there were things wrong with it. The second and third system did not function straight away either, but by that time we were alerted to possible problems. Even if all components are intact the P350 is not a "plug-in-and-go" machine: assembling and installing it takes time and expertise.

The most serious failure encountered during operation was an irreparable crash of the main system board after 8 months. In addition we had minor but annoying troubles with the LQP02, and the keyboard had to be replaced because the text had worn off the most frequently uses keys. After 4 months the replacement keyboard is now showing similar problems.

#### OPERATING SYSTEMS

P/OS release 1.0 was unsatisfactory, but it was quickly replaced by P/OS 1.5. When we realized that the Dutch version of P/OS 1.7 would become available later than expected we applied for the American P/OS 1.7, and that is what we are still using at the time of writing. P/OS 1.7 is a user-friendly system. To quote from an informal conversation over lunch: "It is divine. I have no fear whatever to work with it" (Said by a technician who had previously used the timesharing). P/OS 1.7 is safe, it has plenty of on-line help, and it is fast enough. A negative feature is that it takes up 256 kbyte of the random-access memory. Digital Command Language (DCL) is available under P/OS, and functions as a separate operating system for experienced users. DCL is also used on VAX and PDP 11, which should be a great advantage if you use different machines in one institution. We found DCL clear, versatile, and fairly fault-tolerant. On the negative side, unlike several application programs DCL does not recognize the <DO> key, which is a bit confusing. There is no PRINT or SORT command, and the LA50 printer width is not adjustable with either P/OS or DCL commands. Both are minor problems that can be solved with a small Fortran application program.

FORTRAN AND TOOL KIT. The full RSX Fortran 77 V 5.0 compiler is available with the tool kit. Bench marks tests were satisfactory: filling an array with 20 000 elements took 0.70 seconds of central processor unit time (as opposed to 0.10 on the DEC system 10 mainframe), and creation on hard disk of 1000 records of 128 characters each took 56 seconds (3 seconds CPU on DEC system 10).

COMMUNICATIONS. The P350 can emulate a VT125 terminal, and it functioned well as a terminal for the DEC system 10. File transfer was problematic, until we managed to obtain the KERMIT program which allows controlled data exchange. However, KERMIT does not yet run in background. When the mainframe is slow, transfer of a few hundred blocks may occupy the P350 for several hours.

EDITORS. The standard editor for the P350 is PROSE. It has the virtue of being simple, but experienced computer users find it clumsy, and limited in its possibilities. Fortunately, EDT is now also available although not yet under a menu. Like DCL, EDT is a DEC standard which is used on VAX and PDP 11. EDT is clear, versatile and forgiving, it provides on-line help, and it makes extensive use of function keys. Unfortunately, it does not use the function keys of the P350, but instead redefines the keys of the numeric key pad; even the P350 HELP key is not supported. EDT key pad overlays are not available; time will probably take care of that.

## APPLICATIONS

DATATEXT (WORD PROCESSING). DATATEXT is a Dutch word processing package originally developed for VAX and PDP 11. It is a smooth and sophisticated text processor, with a small built-in data base management system, calculator facilities and many other features. Indeed, the sheer number of options proved somewhat overwhelming at first. However, after a few weeks our secretaries became quite enthusiastic about it. Part of the strength of DATATEXT is its extensive use of function keys: printed paper strips are used to indicate 40 special functions, 20 of which are available with a single keystroke and another 20 as <GOLD><KEY>.

DATATEXT also has a few negative features. First of all, even release 4.2 still has bugs. Also, the manual is difficult to read for non-technical persons, and in several places it is unclear; providing more examples of each application would do much to improve the manual. Secondly, DATATEXT is difficult to use for filling in preprinted forms, e.g. research proposal forms, because it has no horizontal tabs and no overtyping mode. Last but not least, it is not a fast program.

SPSS (STATISTICS). Statistical Package for the Social Sciences is one of the most widely used applications on the central computer of many universities including ours. The P350 version (SPSS/PRO) is user-friendly and reasonably fast. However, it is severely trimmed down from the mainframe version. We even discovered recently that it will not handle the 250 real variables, as advertised in SPSS publications and specified in the manual, but only 123. (Indeed, in our hands it will not accept more than 98 variables.) An update that would meet specifications has been promised to us by SPSS.

BMDP (STATISTICS). A widely used alternative to SPSS is BMDP (Bio-Medical Data Package), which is more powerful but also more complicated than SPSS. It is not available under P/OS, but the RSX version of several BMDP programs performed satisfactorily on the P350; e.g. a BMDP4F log-linear model computation that required 40 seconds of central processor unit (CPU) time on the DEC system 10 took 9.5 min on the P350. This is quite acceptable because on the P350 CPU time equals total waiting time (connect time). We will shortly attempt conversion of the entire BMDP package to P/OS.

SUPERCOMP 20 (SPREADSHEET). SUPERCOMP 20, kindly made available to us by DEC-Utrecht, is a classical spreadsheet program. Its great advantage over e.g. SPSS is that the data themselves are visible all the time. However, Supercomp has not yet become very popular in our department. Creating models proved to be quite time consuming, and one tends to make frequent errors. The program uses few special-function keys but instead uses one- or two-character commands. On-line help is available but a bit slow. Other problems are that disk directories are invisible during Supercomp 20 sessions, and that compatibility with DATATEXT and SPSS is somewhat limited. Last but not least, of the 1 000 000 advertised cells, only 3000 can be used simultaneously.

## CONVERSION OF RSX PROGRAMS TO P/OS

The large number of RSX application programs available forms an argument in favor of the P350. In practise, things are not that simple. In order to convert a PDP 11 RSX program to the P350 one needs first of all to have the program, and we have heard conflicting opinions as to whether this has to be the original source (which for commercial programs is often not for sale) or whether a compiled version will do. Secondly, one needs transfer facilities, e.g. a P350 plus communications software coupled to a PDP 11 or VAX. And last but not least, one needs an experienced programmer. Although the necessary adjustments (building of overlay structures, linking) are not complicated, they cannot be done by end users. Programmers and computer time are expensive, and our limited experience suggests that conversion of a program from RSX to P/OS may cost more than the program itself.

## SERVICE AND SUPPLIES

DELIVERIES. Deliveries were disappointing. First of all, they were usually late. This may have been due to teething troubles of the P350, but the experience has made us wary. When shipments were finally delivered they sometimes contained wrong items (such as a real-time-interface instead of a CP/M-card), or a part did not work.

SUPPLIES AND ACCESSORIES. Authentic DEC supplies are convenient, but expensive. A rather extreme example is the cleaning fluid necessary to remove smudges from the monitor, which costs Hfl 48,- (about \$ 14,-) + 19% tax. Daisy printing wheels, ribbons, diskettes and other supplies are available cheaper from outside vendors.

BACKUP AND HOTLINE. We have had much help from people at Digital; more, probably, than other firms would spend on such a small customer as we were. Staff members of the Utrecht office have been especially helpful. However, certain problems need to be mentioned.

First of all, DEC is a large organization, and it was not always easy to identify and reach the person who would be most able to answer a certain question. Responsibilities for various aspects of selling, delivering and servicing personal computers were spread over different offices, which did not help either. Still, quite a number of faulty parts were replaced under the warranty when needed. It has also become easier to reach the right people over the last year. The same holds for the "hot line" service. Still, the number of problems that were solved by a "hot line" call was limited. Most of our queries tended to require more specialized expertise, or dealt with problems for which there simply was no solution.

## CONCLUSION AND RECOMMENDATIONS

The virtues of the P350 are evident: solid, professional hardware, sophisticated operating systems and utilities, and compatibility with VAX. This paper has mentioned quite a few weak points as well. The most serious deficit of the P350 has, however, not yet been mentioned, and that is the scarcity of application software. The number of applications offered by DEC, at least in The Netherlands, is quite limited, and there is no organized system to bring third-party programs to the customer. Giving out the addresses of magazines in the United States that carry reviews and advertisements of programs for the P350 simply is no substitute for making the software available in the customer's own country. The lack of readily available software probably also explains why so few of our scientific

colleagues around the world are aware of the P350, let alone own or use one. Friends or colleagues who have the same microcomputer are worth more than all the "hot lines" in the world, and for the P350 such people are quite rare. As DEC appears to rely heavily on outside vendors to create applications there is a risk of a vicious circle: no users -> no software, no software -> no users. It is to be hoped that DEC will take an active role to break this circle.

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