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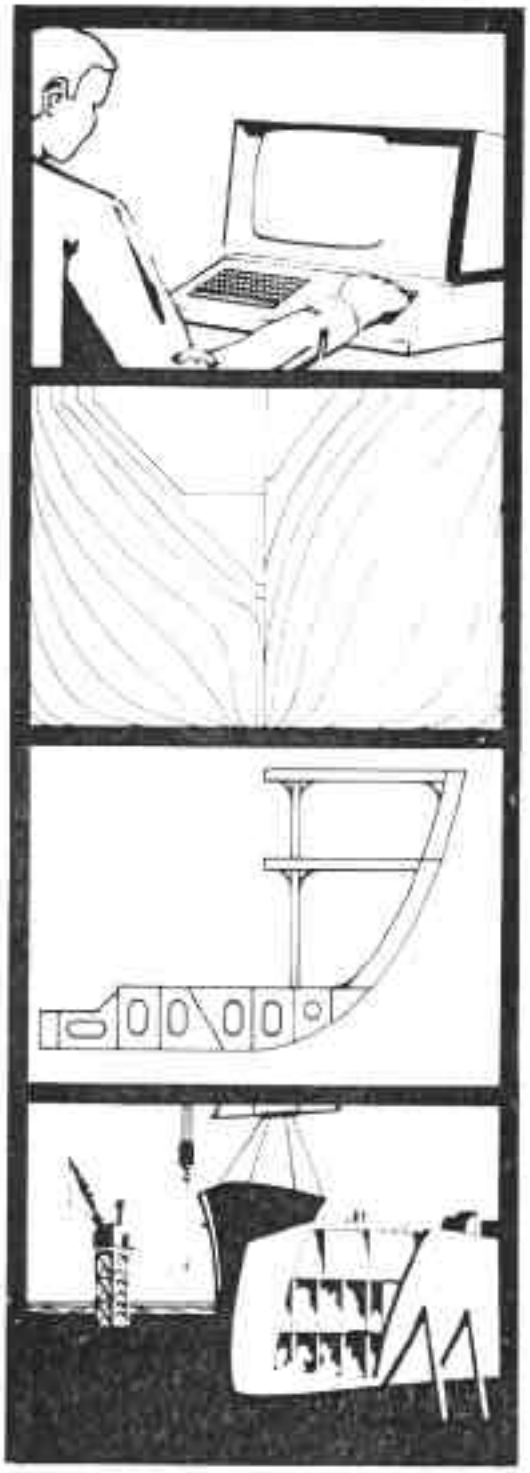

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AUTOKON-76/79 - AN AFFORDABAE IMPLEMENTATION ON PRIME MINICOMPUTERS

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Mr. Gude is presently involved in converting AUTOKON-79 to run on PRIME computers. He has a degree in naval architecture and shipbuilding from the University of Durham in England, and a masters degree in economics from the University of Delaware.

He has previously held the positions of Office Manager at a Norwegian shipping company, and Project Manager at Sun Shipbuilding and Dry Dock Company.

AUTOKON - 76/79, AN AFFORDABLE IMPLEMENTATION ON PRlME MINI COMPUTERS

The version that is about to be implemented on the PRlME mini computer is basically AUTOKON-79 which may be defined as AUTOKON-76 with some improvements as well as several major new features.

The very rapid development of the computer industry with steadily falling prices have changed the outlook with respect to computers and their uses. It is presently feasible to use inhouse computers even for very small operations to run the entire AUTOKON system with its present capabilities as well as the developments that *are* about to be implemented.

The traditional way of processing in a batch made with a waiting time for turnaround have given way to an interactive mode of processing where results come much sooner. Gone are also keypunching, job submission, etc. No longer is it necessary to have large number of pages printed out. Output can be examined by means of an editor, i.e. a system program enabling the user to go through print files as well as other files. Similarly, by means of a graphic scope it is possible to *review* graphic output without drafting.

The most important aspect of these rapid changes is the cost reduction. It is now within reach of all shipbuilders to run AUTOKON on a mini computer such as the PRlME. This computer may well be dedicated to engineering. In fact it may be advantageous to use a dedicated computer.

While computers become more capable and cheaper, the AUTOKON system has been improved and expanded considerably. It has also become more cost effective. Some of these new features utilize the graphic scope such as the TEKTRONIX 4014. But there are other new features.

Apart from the reasons outlined above, the possibility of running interactive graphics was a major consideration in suggesting a dedicated mini computer. It is presently possible to run interactive graphics on an outside computer, but it *is* far better to use an inhouse computer. The major reasons for this are line speed as well as susceptibility to telephone problems which do occur.

A typical configuration could be as follows:

P550 Base System 512 Kbyte
Disk, 96 Mbyte with controller
Tape Unit, 800 BPI with controller
Line Printer, 300 LPM
Paper Tape Reader/Punch
Two ALPHA Numeric Scopes

Total Purchase Price $141,000

Lease price for 5 year period 2.4% of total price per month.

For above installation	$3,385
Monthly Maintenance, Approx.	1,100
Monthly Cost, Approx.	$4,500

It would be possible to run with a memory of 256 K byte but for practical reasons 512 K bytes seems right and it appears that future extensions to the operating system will require 512 K bytes.

It is also possible *to* operate without a tape drive, but it is really required when backing the system up as well as for putting up new software.

The configuration above includes only two scopes, as many as 14 more, a total of 16 may be put on without putting an extra controller. However, an on-line drafting machine as well as TEKTRONIX graphic scopes each would occupy one of the available terminal lines.

An AUTOKON user would also require a plotter and it is suggested that a CAPCOMP 1038 with a 906 interface be used. This is supported by PRlME and "looks" like a terminal to the computer itself.

Typical prices are presently as follows:

CALCOMP 1038	$9,900
CALCOMP 906	3,324
	$13,224

On a two year lease with maintenance the monthly charge would be approximately $675. However, for shipyards that already has a drafting machine this cost indicated here should be neglected for comparison reasons.

It would have been possible to use other minis besides PRlME. However, the PRlME was chosen for these reasons:

- proven performance of AUTOKON-71 processing by Todd Shipyards.
- one of the lowest priced suitable computers with 32 bit word length.
- 32 M bytes of virtual memory.
- well proven, user oriented operating system and FORTRAN compiler,
- designed for scientific and interactive applications.
- manufacturer is interested in end users, like small shipyards.
- international sales and support organization.
- without changing operating system the user can upgrade his computer from a P 550 to a more powerful P 650 and P 750 configurations.
- several prime CPU's can communicate with each other (large users through established communication procedures,
- ease of communicating with other main frames.

This basic configuration may be expanded depending on the usage and runs of the customer. For AUTONEST and AUTOPART a graphic scope is needed and the price of such a scope with the

TEKTRONIX 4014-1, Enhanced-Graphic Option with Hard Copy Unit	$17,600
Lease for 3 year period including maintenance, approximately	$ 700

For heavier use a customer may want to expand the PRlME systems

96 M byte without controller
Additional ALPHA NUMBERIC screens
600 lpm line printer, over 300 lpm

Total -Purchase Price $36,200

Lease, 5 years with maintenance $ 1,160

A summary of approximate monthly expenses is therefore as follows:

Basic PRlME System	$4,500
Drafting Equipment	675
Graphic Terminal	700
Additions to PRlME Systems'	1,160
Total	$7,035
With 2 Graphic-Terminals	$7,735

The conversion has been performed for nearly all modules short of the BOF module that will replace FAIR, DRAW and OF-TAB. A newer version of ALKON will also be put up- shortly.

Last *year's* paper by Dennis K. Medler and Jack Harper explained the way AUTOKON-71 was converted. The conversion of the AUTOKON 76/79 has followed a similar path.

By having a dedicated computer and only paying the monthly base amounts, computing costs Will not escalate without control. PRlME's standard operating system permits scheduling of jobs by preparing job streams on a file.

Outside computer costs consist of many elements, CPU; I/O, disk file rental, tape storage and connect charges as well as possible phone or connect charges. In addition is often necessary to have an operator to run the terminal.

Equally important is the ready access to the computer facility. Where computers are shared between departments there will frequently be collisions between engineering and data processing. No run has higher priority than a payroll.

Based on what has already been practiced by PRlME users, it is safe to say that the CPU time throughout the night can be utilized while the computer itself is left unattended. This can be done by queing jobs. It is not always the case, but line printers frequently need attention.

It is not necessary to keep a staff of programmers/analysts in order to keep AUTOKON running on a dedicated mini computer. The AUTOKON maintenance is, in our opinion, best left to SRS Inc. One person must be sufficiently trained *to* start the computer, back it up and perform daily maintenance. This could well be the person who now operates the terminal.

All others need not necessarily be trained as anything else than users. As such they will experience a much faster turnaround. Some additional training may be required to take advantage of the interactive features. With a powerful computer available it seems reasonable to expect that existing non AUTOKON programs would be converted to run on the PRlME.

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