# The Zebra changes its stripes

A new range of medium-to-heavy weight multi-user computers has been launched on the Australian and New Zealand market, sourced from California. Mark James Picks through one model and its operating system which, although definitely not MS-DOS compatible, is already gaining familiarity.

Amalgamated Wireless Australia, or AWA as most of us know it, has just changed its stripes. Long a distributor of the Microdata range of McDonnell-Douglas computers, AWA Computers has just switched away trom that line as Microdata itself moves into the local market, and instead taken on the General Automation series.
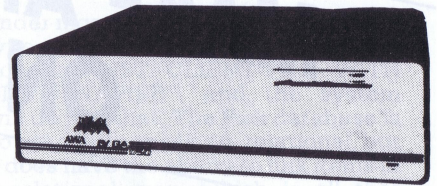
GA's computers are known the world over as Zebras, but the name has been dropped in this region as the arrangement is more complicated than merely that of supplier and distributor, and AWA sells the machines under its own label. The model numbers are the same, however, and as they are beginning to arrive in force in New Zealand, *Bits & Bytes* decided to have a look.

The model that we had for review was the Zebra/AWA 1750. Although it looks at first sight like an ordinary IBM-compatible microcomputer, the 1750 is in fact quite a different animal. A glance at the 12 serial ports on the back panel gives an indication that this machine is built more along the lines of minicomputers than micros. When you power the thing on and the screen asks you "OPTIONS(X,F,B)=", you know you are not dealing with MS-DOS.

In fact the AWAs, like the Microdata range that preceded them, are machines designed specifically for the Pick operating system. As such, the 1750 differs from most other computers of its size in a number of ways, many of which are again reminiscent of larger machines:

- It is built from the ground up to be multi-user.
- It has no memory-mapped console; all terminals on the system are "dumb" screens with, generally, no graphics capabilities.
- Its microprocessor is the Motorola 68010 chip, a competitor to the Intel 80286 used in the IBM PC/AT and compatible machines.
- It runs the Pick multi-user system exclusively; no MS-DOS or other non-Pick programs or systems will run.
- It has an inbuilt network port that can hook up to other AWAs.

## Physical description

The main unit of the 1750 has a 45-by-44cm footprint and stands 13cm high, making it slightly smaller than the IBM PC/AT and its clones. The monitor on the review machine was a Lear-Siegler ADM-11. This has a tilt-and-swivel base and a detachable keyboard with 84 keys, including four function keys and five cursor-control keys which appear to have no function in the Pick operating system. The F and J
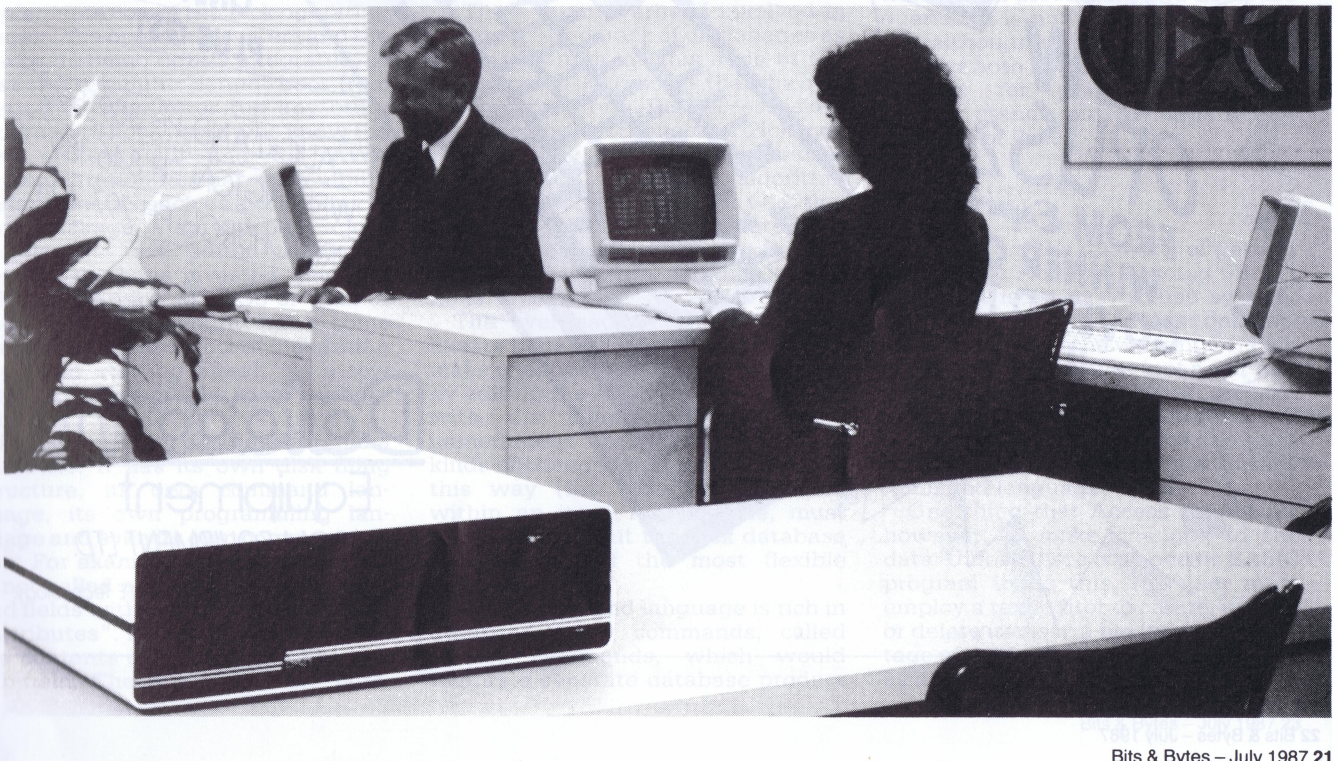
keys are dished for touch typists, and the keyboard has a slightly clackly feel to it.

On the front panel of the main unit is a cassette tape backup unit, which is the only device on the front panel. The AWA range does not support floppy disks. On the back, apart from the power switch and power inputs (including one for an optional uninterruptible power supply — a wise touch), are all of the communications ports. The 1750 comes with six serial ports as standard, and the review machine had six more.

All except one of the serial ports are nine-pin D-connectors. The exception is a full 25-pin connector, suitable for connecting to another computer's serial port. There is also a Centronics-standard parallel printer port, and room for two optional connections for the AWA's own local-area network. The network can connect up to 255 AWAs together, but cannot be used to communicate with non-AWA computers.

Inside the main unit is the 68010 processor, one megabyte of memory (which resides on a card on the bus, and not on the motherboard), the power supply, the tape unit, a 47Mb hard disk, and a controller card for the six extra serial ports. There are three bus expansion slots; only cards supplied by General Automation may be used here. Options include a second one-megabyte memory card, six more serial ports, and the local-area network controller. There is also room for two more disk drives.

## Pick

The AWA computers run an implementation of the Pick operating system, the operating system and the hardware being tightly integrated, so that the computer cannot boot from any other system, or run any other programs. Those users who know the Pick system will find the AWA implementation familiar, with inbuilt enhancements such as a communications package, a spreadsheet and a half-decent text editor. However, people who have invested time and effort in learning MS-DOS or Unix or another system might have some concern at the prospect of unlearning it all and starting afresh, so a few words on Pick would seem appropriate.

Pick is a system designed around a database. It has its own disk filing structure, its own command language, its own programming language and even its own computer jargon. For example, a database record is not called a record but an "item", and fields within the record are called "attributes". A "value" refers not to the contents of an attribute but to a sub-field. These concepts are fairly

elegant once one becomes accustomed to them, but they do require some effort for the new user to master.

Everything to which the ordinary user has access on the Pick database is stored as displayable text. An item (record) on the database may be thought of as a text file, and the attributes (fields) as lines of text within that file. This means that most of the database can be displayed and changed with the text editor program, although this is not a very friendly way to do so. Attribute text is of variable length, so that there is no wasted space for trailing blanks; this is the only form of data compaction that Pick uses.

Each Pick file must have a dictionary. A Pick dictionary relates the various lines of text in an item to specific kinds of information, such as name, address, or account balance. In addition, it performs the functions of an ordinary data dictionary, specifying field characteristics and data validation criteria. The interpretation of database records is impossible without the relevant dictionaries.

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There is an overhead involved in having to keep track of dictionaries as well as records, as this adds to the number of disk accesses that the system must perform. Disk accesses are the efficiency bottleneck of Pick systems, as they are for most multi-user systems. Pick has a caching algorithm for disk sectors, which helps with this problem, while the hardware also incorporates intelligent disk controllers optimised for Pick disk operations.

The overhead of the dictionaries has its benefits, however. Users may make changes to data formats simply by editing the appropriate dictionary with the changes taking effect immediately. There are limits to the kinds of changes that can be made in this way (the order of attributes within an item, for example, must remain fixed), but the Pick database remains one of the most flexible around.

Pick's command language is rich in database query commands, called Access commands, which would require a separate database product
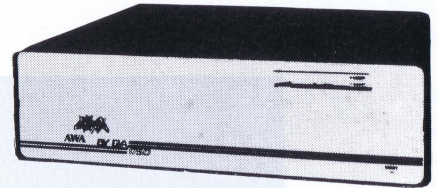
under most other systems. Users may type such self-explanatory instructions as LIST CLIENT-FILE WITH CITY="NAPIER", and the system will do just that. The Pick database is not, properly speaking, relational, but it does have the ability to link items in a relational way, which is all that most people need.

Its filing structure is geared for efficiency in two operations: finding a record whose identity is known exactly; and reading through an entire file. The database does not maintain records in any inherent order, so that the system is weak on such operations as find-next and find-on-partial-key. To perform such functions, the system must first read through the entire file and sort it in an appropriate order; this is very fast for small files, but response times can become quite slow for large ones.

For programmers, Pick suports only one language: Pick BASIC. This is an enhanced, structured BASIC with many instructions specific to the Pick operating system and file structure. Programs written for any other system or in any other language (even other BASICs) must be extensively rewritten to run under Pick.

Pick, then, is a heavily database-oriented system, intended for on-line transaction processing and database queries. It is not fast at calculations, and although the AWA implementation has both a spreadsheet and some support for graphics terminals, neither stands out as a particular strength of Pick.

## Ease of use

Apart from the question of getting used to the Pick way of doing things, the AWA is an easy-to-use system. Every site will need at least one person familiar with the workings of Pick to set up or modify files (not a self-evident procedure). However, day-to-day operations do not require much in the way of expertise, once the user becomes accustomed to the Access command language.

One thing that Access cannot do, however, is make changes to the data. Unless there is a specific BASIC program to do this, the user must employ a text editor to create, update or delete items in a file (taking advantage of the fact that all data are stored as displayable text).
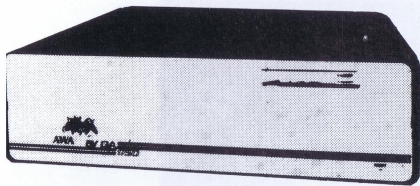
Pick's own Editor program is atrociously user-hostile, and is not recommended for those unaccustomed to such things. Like the EDLIN program of MS-DOS, the Pick Editor works on only one line at a time, as if it were running on an old Teletype printer-terminal. A series of cryptic one- and two-letter commands must be memorised, and changes to the data might not even show on the screen until the text is "filed" (saved to disk).

Fortunately, the AWA range comes with an alternate text editor called Jet, a full-screen editor with visible cursor control, word wrap, reasonable cut-and-paste provisions, and a spelling checker. Its documentation pretentiously calls it a word processor, which it is most certainly not. Text must be entered in upper-case only, and special commands used to convert whatever needs to be in lower-case, which is Jet's worst feature.

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There is an obtrusive command mode that gets in the way of the editing, although this is not as bad as in the Pick Editor, and there is no proper character-insert mode, right-margin justification or page indicators. Although a vast improvement over the Pick Editor, Jet is not very impressive itself. Text editing must still be considered one of the weak points in the AWA's ease of use.

The machine comes with three fat binders with a dozen manuals inside, including two introductory guides to the Pick system and separate volumes for the Access language, Pick BASIC, general Pick operations, and Procs (a "Proc" is Pick jargon for a command file). Although the quality of the presentation is sometimes lacking, the documentation itself is uniformly well-written. All manuals are indexed. There is also a small Quick Guide, which presents a summary of commands and their syntax, and proved to be extremely useful during the review.

All in all, with the exception of text editing, the AWA is an efficient, easy-to-use system. Since the problem of text editing affects everything in a text-oriented database, AWA is wisely concentrating its sales energies on fully-developed package systems, in which changes to the database are done through pre-written BASIC programs rather than a text editor.

Those using other Pick systems (including former AWA machines) will find a fairly standard implementation of Pick on the (ex-) Zebra. However, not all versions of Pick are the same. Although the differences from one "flavour" to another are less annoying than those which afflict the various incarnations of Unix, the AWA support people still estimate that it could take up to a week to convert large systems from another Pick system over to the new machine.

## Conclusions

AWA's decision to market General Automation's Zebra computers stems, according to managing director Martyn Coe, from disappointment in the inability of their previous supplier, McDonnell-Douglas, to come up with cost-effective products and first-rate support. However, it has been no secret that McDonnell-Douglas has been itching to set up in Australasia, and that it was only a matter of time before friction arose with its Australasian distributor, AWA. In fact, McDonnell-Douglas is reported to have already sold Micro data computers quietly to Australian hospitals, in competition with AWA.

The new AWA range includes, in addition to the 1750, a bottom-of-the-line 1350 as well as larger systems (really minicomputers) based on Motorola's 32-bit 68020 chip, which is in direct competition with Intel's 80386. Later this year, General Automation is scheduled to introduce the 8820, possibly the first computer to use Motorola's new 68030 microprocessor, which AWA claims will support up to 256 users. It is clear, then, that General Automation intends to stay up with the state of the art.

With its new distributorship and a concentration on packaged solutions rather than just the "raw" Pick system, AWA is approaching the market from a new angle. The quality of the packaged software and the suitability of the Pick system for a given situation, of course, must be the deciding factor as to whether a company should consider purchasing an AWA computer.

However, the computer itself is a well-designed machine with a multi-user orientation and thorough documentation, and the support of an established local organisation.

*Review machine supplied by AWA Computers, Auckland.*

| Microcomputer Summary | |
|---|---|
| Name | AWA 1750 |
| Manufacturer | General Automation Inc., Anaheim, California |
| Microprocessor | Motorola 68010 |
| Clock speed | 12.5 MHz |
| RAM, | 1 Mb (expandable to 2 Mb) |
| Input/output | 6 serial ports (expandable to 18) |
| | 1 Centronics parallel port |
| | ¼-inch cassette tape drive |
| | optional local-area network (to other AWA computers only) |
| Graphics | None |
| Monitor | Lear-Siegler ADM-11 ASCII terminal |
| Keyboard | 84 full-travel keys, including 4 shiftable function keys, |
| | 8 cursor-control keys, numeric keypad and BREAK key |
| Disk | 47 Mb Rodime hard disk |
| Operating system | Pick |
| Language | Pick BASIC |
| Bundled software | Jet editor, Compusheet spreadsheet, COM.SYS inter-Pick communications, Accuplot graphics |
| Base price | $28,500 |
| Options | second 1Mb memory $5,500 |
| | 6 more serial lines $2,800 |
| | network controller board $3,100 |
| | uninterruptable power supply $2,500 |
| | Extra 47, 67 or 140-megabyte disk drives |
| Ratings (5 highest) | Documentation 4; support 5; ease of use 4; expansion capability 4; connectivity 3. |