AccessionIndex: TCD-SCSS-T.20190917.002
Accession Date: 17-Sep-2019
Accession By: Pat O'Byrne
Object name: SORD M343SX Multi-user computer
Vintage: c.1984
Synopsis: Japanese microcomputer used with Lear Siegler ADM-3A terminal and acoustic coupler by Roads Design Office, Co.Cork, to interact with design software in TCD.

Description:
This item is a SORD computer that was used with a Lear Siegler ADM-3A terminal and an acoustic coupler modem by the road design engineers in Co.Cork to interact with design software in Trinity College Dublin. These items were the basis of an second iteration of remote usage of computing in TCD, as described below by Pat O'Byrne of the Roads Design Office of Cork County Council. For the first iteration, see the *"Comart Commmunicator Computer"* elsewhere in this catalog.

SORD was a Japanese company. The M343SX was introduced in Nov-1984. It was well engineered with a strong chassis with a backplane for five VME cards. The processor VME card had an Intel i8086 CPU, 512kB of DRAM extensible to 6MB, and an external printer port. A second VME card could control a 40MB internal Winchester hard disk drive and/or up to two internal 1.2MB 5.25" double-sided floppy disk drives, with FDC and DMC ports for external drives; the unit in this collection has a hard disk and one floppy-disk drive. Three serial input/output VME cards, each with two RS232 ports, allowed a modem plus up to five terminals to be used concurrently. At the base of the chassis were proprietary connectors for the system display and for a light-pen. At the rear of the DP148C colour CRT display (supporting 720 x 500 graphics) were proprietary keyboard and mouse connectors.

The M343SX ran either CP/M, MSDOS, UCSD's p-System (Pascal OS), or a proprietary *"Realtime Multi-job Disk Operating System"* (RMDOS) with a text-oriented command-line interpreter (CLI). To view booting the latter see [2].

Trivia: SORD stands for SOftware/haRDware

The Evolution of Engineering Computers in Cork County Council

Pat O'Byrne

In the early 1970s calculations were performed mainly with sliderules, as it had been done for many decades. Then around the middle of the decade we acquired our first "computer". This came in the form of a Texas Instruments Programmable Calculator. Simple programmes could be written on this calculator and stored on magnetic strips for reloading at some future time. This little machine very much simplified repetitive calculations such as reducing the readings from topographic surveys.

Following this, the Roads Design Office acquired the assistance of An Foras Forbartha in Dublin and under the expertise of Mr.David Borland we were able to avail of the processing power of a computer in Trinity College Dublin. The aim was to design road alignments using TCD software and hardware. For our part in Cork we had to write by hand the x, y & z coordinates of thousands of survey points on

numerous sheets of A4 paper. These were then posted to TCD where staff typed them onto punched cards, which were then fed into the computer in order to generate a digital ground model of the site of the proposed new road. This ground model would be printed out and returned to us in Cork by the postal service. We would then superimpose on this a suggested horizontal alignment of the road. The parameters of this alignment would be returned (by post) to Dublin where it would be coded and processed in the computer. We received the results in Cork about a week after preparing them. On inspecting the alignment on paper it invariably needed to be adjusted and fine-tuned. Each alteration would take approximately one week.

We then acquired our own card-punching machine so that we, in Cork, could prepare the cards and post bundles of them to Trinity, where the computer would read them in order to generate the digital ground model. This process was exceedingly slow and labour-consuming.

In order to speed up the process we purchased a Lear Siegler “dumb” Terminal and dot matrix printer. The purpose of this was to enable us to omit the punched card stage and to input the digital ground model directly into the TCD computer in Dublin via the national telephone network. To enable us to connect the terminal and printer remotely to the computer, which was about 160 miles away, we had to interlink them over the normal telephone lines by means of a modem. This modem, more commonly known as an “Acoustic Coupler” was really cutting edge technology at the time. It consisted of a timber box with a hinged soundproof lid and into which one could insert an ordinary telephone handset. In order to make the remote connection one had to dial a given telephone number in Dublin. Then when the number answered with a sound like a FAX machine the telephone handset was inserted into the box and the lid closed in order to keep out extraneous noise interference. With a bit of luck we could then input data directly to the remote computer and also get printed output back. We had now reached the stage where we could input data for digital ground models, horizontal road alignments and vertical alignments. We could also request outputs such as cross sections at any intervals, longitudinal profiles and mass haul diagrams. This was a huge step up because we could now operate a computer without the assistance of a third party. The turn around time was also greatly improved. Instead of having to wait for a week to get feedback we were able to submit an overnight batch job and get results next morning.

While the above shows that we were making good progress in computerising Roads Design we could work only when we were on a telephone line to Dublin. This had many obvious disadvantages, not the least of which was that the telephone bill in the County Hall must have gone through the roof – but we received no complaints.

Our next advance was to make the dumb terminal into an intelligent terminal with the addition of a Comart Communicator Computer. This was a computer with a 10MB hard disk and a 5.25” 720kB floppy disk drive. It had a CP/M operating system, 64kB of RAM and ran MSDOS software. It had basic graphics capabilities also.

This combination of terminal and computer enabled us to prepare data when not online, store it on disk and transmit it quickly to the remote computer, thus greatly enhancing our efficiency. The computer could also be used to run other programs that had been written in-house.

Our next major step forward was the acquisition of Sord Computers. These were much more powerful than the Comart Communicator Computer and two terminals could be connected to each computer so that two operators could (in theory) use the same processor. They also had very basic graphics software, called “Dragon”. There was no mouse, instead the cursor was moved using the four arrow keys, so in practice it had practically no use in the engineering graphics field, but was very useful for text documents. The Sord computers had two 1MB floppy double-sided disk drives, and were suitable for running the DOER Roads Design program written by Mr.John Devlin of the Department of Local Government.

The Sord Computers had a relatively short lifespan, when along came desktop PCs in the form of the Tulip i286-based computers. These were a huge improvement over the Sord machines. They ran Microsoft software such as Word and Excel, and their great advantage was that they could run “Autocad”, a graphics-orients engineering design program which was just becoming prominent. The i286-based model was quickly followed by the more powerful i386-based model, then the i486-based model, and progressively faster processors.

As desktop PCs dropped in price they became more widely used in every office. Networking had not yet become common-place. To enable many computers to have access to central printers and plotters we used a system whereby the computers were connected to the printers/plotters over the mains AC electrical wiring in the office. To achieve this, each computer was connected to a “black box” which, in turn, was connected to a mains socket. A similar box then interfaced each printer or plotter to the mains AC and connected the computers to the printer/plotter on a “first-come-first-served” basis. The actual printer/plotter to be used was chosen by selecting it manually on a multi-port switch. Later, an Ethernet network was installed in the office, which made the above system obsolete.

In order to change the font on the daisy wheel printer it was necessary to physically change the daisy wheel in the printer.

Many thanks to Pat O’Byrne for donating this item, and for permission to preserve the description above and to publish it online, and also to Pat and his wife for transporting this item from Cork to this collection.

The homepage for this catalog is at: https://www.scss.tcd.ie/SCSSTreasuresCatalog/
Click *'Accession Index'* (1st column listed) for related folder, or *'About'* for further guidance.
Some of the items below are more properly part of the other categories of this catalog, but are listed here for convenience.

Accession Index	Object with Identification
TCD-SCSS-T.20190917.002	SORD M343SX Multi-user Computer. Computer used with Lear Siegler ADM-3A terminal and acoustic coupler to interact with design software in TCD. c.1984.
TCD-SCSS-T.20190917.001	Comart Communicator Computer. Computer used with Lear Siegler ADM-3A terminal and acoustic coupler to interact with design software in TCD. c.1979.
TCD-SCSS-T.20190917.003	Tulip AT 386/25 PC with powerline printer/plotter sharing system. Desktop i386-based PC used with powerline printer/plotter sharing adapters and multi-port printer/plotter switches by Roads Design Office, Co.Cork. c.1985.
TCD-SCSS-T.20190917.004	Lear Siegler LSI-310 printer. Tractor-feed dot-matrix printer used by Roads Design Office, Co.Cork. c.1980.
TCD-SCSS-T.20190917.005	Brother HR-15 Lear Siegler LSI-310 printer. Daisy-wheel printer used by Roads Design Office, Co.Cork. c.198x.
TCD-SCSS-X.20121208.005	History of the Computer Laboratory, Trinity College Dublin. The evolution of Trinity College Dublin computing services as reflected in the long line of machines used by the Computer Lab since its inception. c.1968.
TCD-SCSS-T.20160323.001	Networking and the Internet. Networking hardware and the arrival of the Internet in Ireland. 1991.

References:

1. Wikipedia, *Sord Computer Corporation*, see:
   https://en.wikipedia.org/wiki/Sord_Computer_Corporation
   Last browsed to on 1-Nov-2019.

2. Youtube, *Booting a Sord M343SX Computer*, see:
   https://en.wikipedia.org/wiki/Sord_Computer_Corporation
   Last browsed to on 1-Nov-2019.

3. Wikipedia, *ADM-3A*, see:
   https://en.wikipedia.org/wiki/ADM-3A
   Last browsed to on 1-Nov-2019.

4. Wikipedia, *Acoustic Coupler*, see:
   https://en.wikipedia.org/wiki/Acoustic_coupler
   Last browsed to on 1-Nov-2019.

Figure 1: SORD M343SX Multi-user Computer
Photograph courtesy Pat O'Byrne

Figure 2: SORD M343SX front view, door closed

Figure 3: SORD M343SX front view, door open

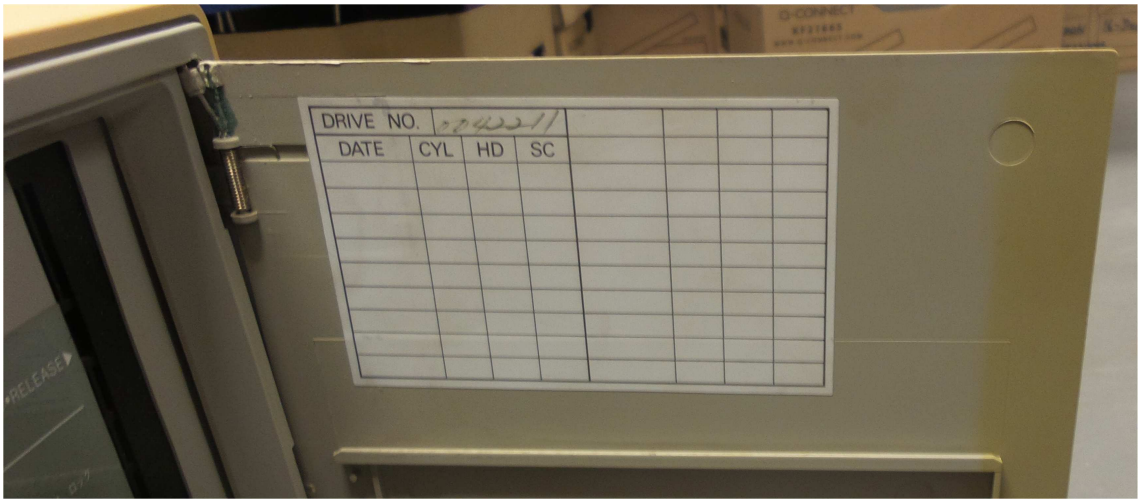

Figure 4: SORD M343SX inside door
"DRIVE NO. 0042211"

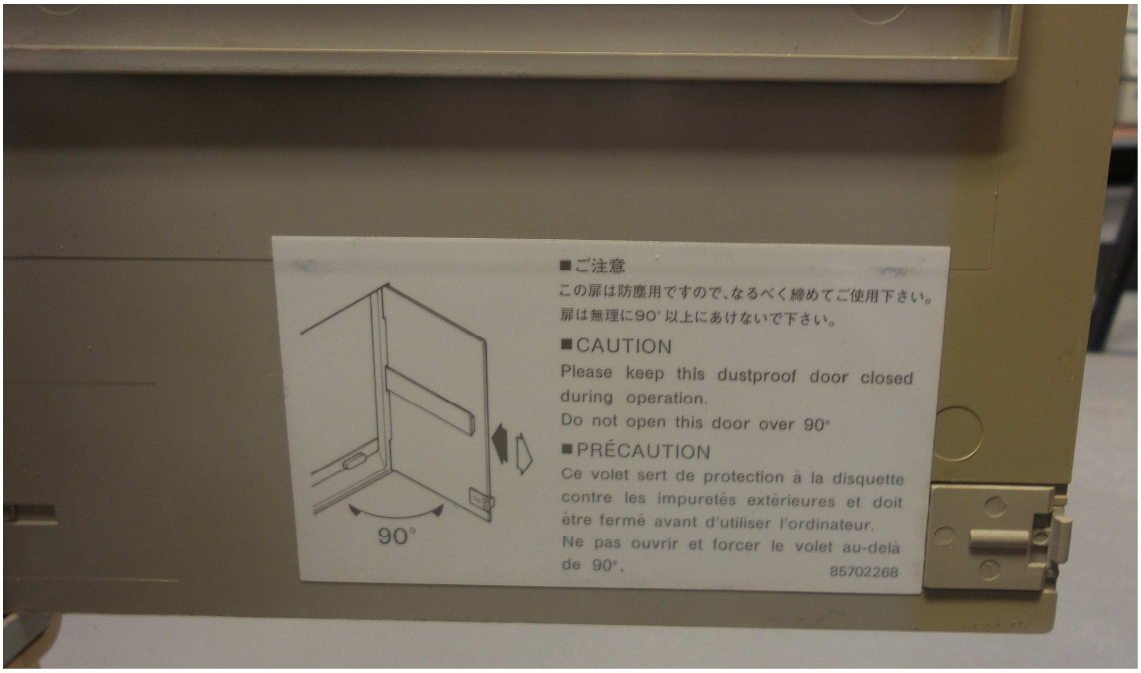

Figure 5: SORD M343SX inside door lower closeup

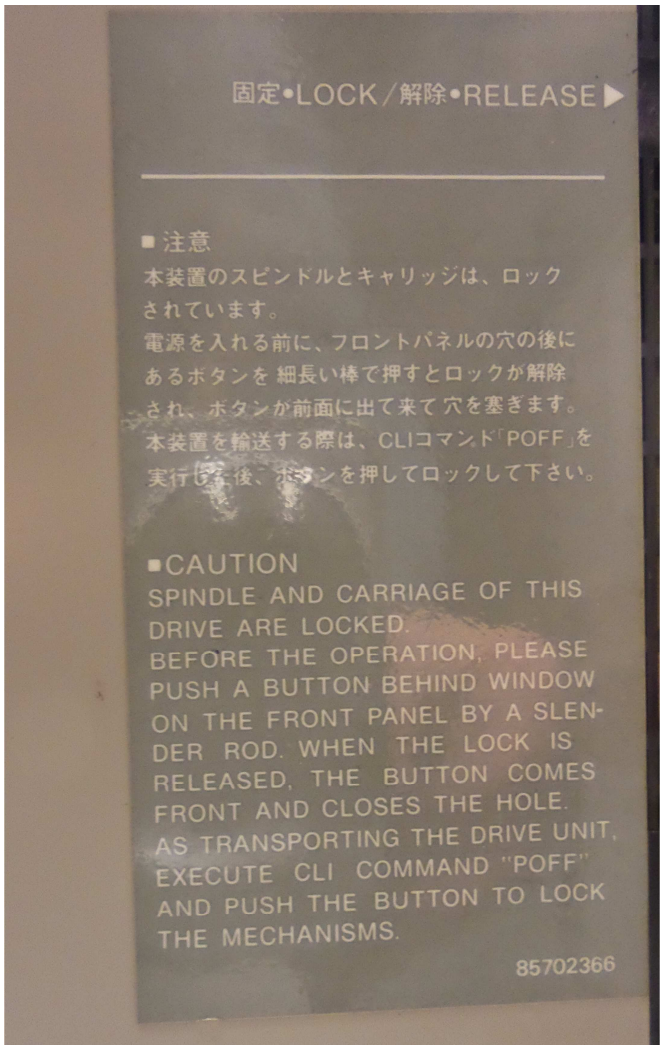

Figure 6: SORD M343SX closeup of text on front panel inside door

Figure 7: SORD M343SX rear three-quarter view

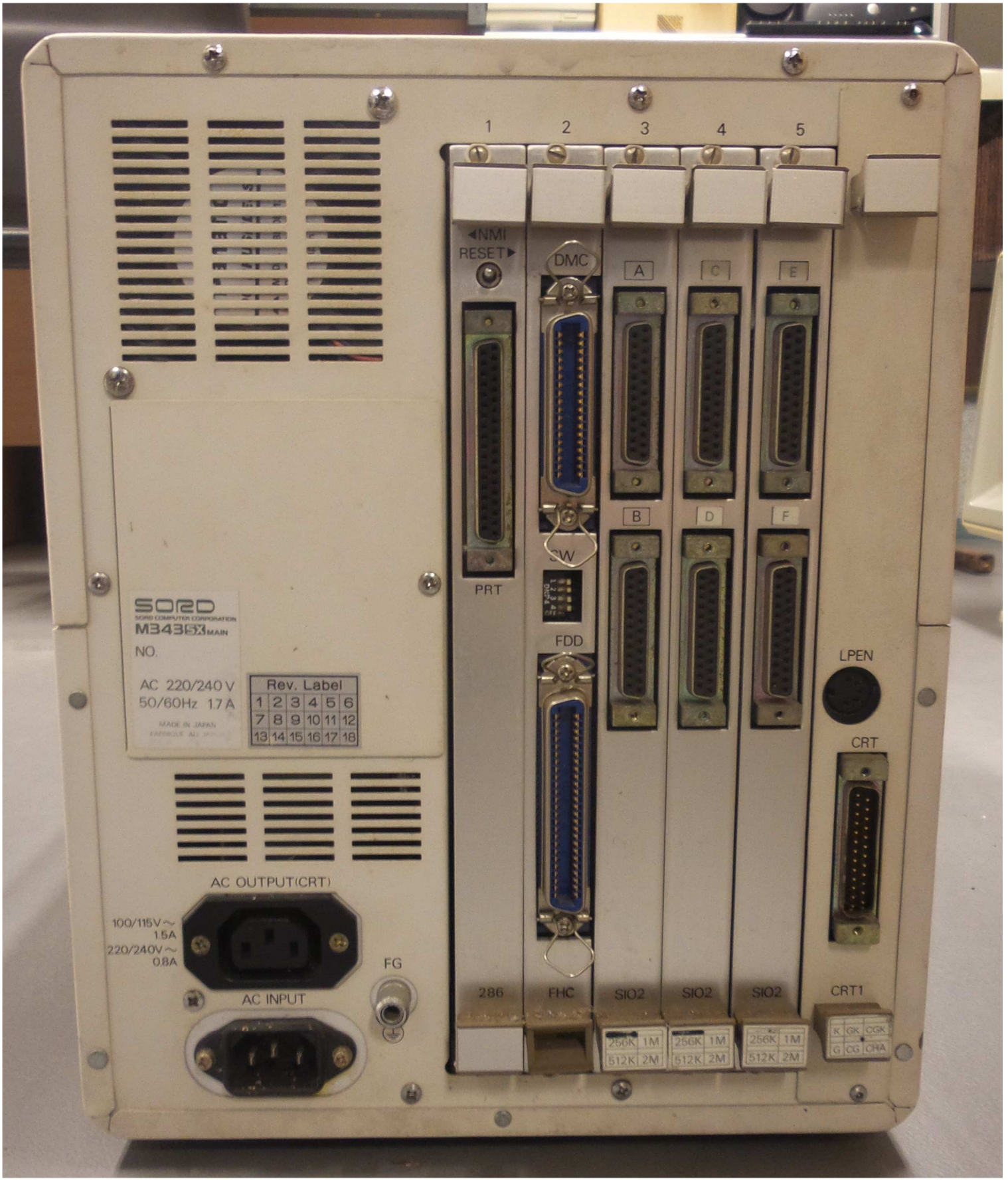

Figure 8: SORD M343SX rear view

Figure 9: SORD M343SX input/output panel closeup

Figure 10: SORD M343SX manufacturing labels and mains AC input and output

“M343SX
No.
AC 220/240V
50/60Hz 17A
Made in Japan
Fabrique au Japon”

Figure 11: SORD M343SX DP148C colour display front view

Figure 12: SORD M343SX DP148C colour display rear view
"DP148C color display
RATING 220V 100W
50/60Hz
Made in Japan
Fabrique au Japon
Serial No. 740 0756"

L'Electron : une très bonne résolution graphique. ▲
Sord M 343 SX, un OI puissant ►
Le Squale avec ses 92 Ko, un vorace ! ▼

Brisera-t-il l'Atom ?

L'Electron

La firme anglaise Acorn Computer n'en est pas à son premier coup. Déjà responsable du BBC – bon succès en Grande-Bretagne – et de l'Atom, qui n'a jamais connu une grande diffusion, elle récidive avec l'Electron que nous avions annoncé il y a quelques mois.

Cet appareil remplacera plus ou moins l'Atom avec quelques solides caractéristiques. Sur 32 Ko de mémoire vive, 29,5 sont destinés à la programmation et à la mémoire d'écran. Celle-ci permet une très bonne résolution graphique (de 640 ×256 points en deux couleurs à 160 × 256 points en seize couleurs) ainsi qu'un affichage de texte sur 40 ou 80 colonnes. Quant au Basic, il s'agit de celui du BBC, très réputé. Ajoutons que l'Electron dispose de sortie UHF-Pal, Péritel (câble en option) et d'un magnétophone à cassettes. Extension mémoire et disquette 8 cm sont prévues. Le prix de la version de base est de 3 000 FF ttc.

Fiche technique
- Processeur : 6502.
- Mémoire : 32 Ko de mémoire vive, 32 Ko de mémoire morte.
- Ecran : 32 lignes de 40 ou 80 caractères, résolution graphique de 640 × 256 points en 2 couleurs, 16 couleurs maximum.
- 3 000 FF ttc.

Service lecteurs p. 66, référence 19.

Un gros

Sord M 343 SX

Le Sord M 343 SX est un OI haut de gamme. Il accepte d'emblée crayon optique et souris, et sa mémoire vive de 512 Ko est extensible jusqu'à 6 Mo. Construit autour d'un bus VME, il peut gérer quatre disques durs Winchester de 40 Mo chacun.

Fiche technique
- Processeur : Intel 8086, 16 bits.
- Mémoire : 512 Ko extensible à 6 Mo.
- Ecran : 30 cm monochrome, haute résolution.
- Clavier : Azerty ou Qwerty (programmable), pavé numérique, 2 × 20 touches de fonction.
- Mémoire de masse : double unité de disquettes 13 cm (2 × 1,2 Mo).

Service lecteurs p. 66, référence 20.

Familial
avec écran

L'Amstrad CPC 464

Surnommé outre-Manche « Arnold », le CPC 464 de la société britannique Amstrad, plus connue dans le domaine de la hi-fi, prépare son arrivée en France.

Il fait l'objet d'un essai dans ce numéro (voir la rubrique « Actualité »).

Fiche technique
- Processeur : Z 80.
- Mémoire : 64 Ko de MEV, 16 Ko de MEM.
- Ecran : monochrome vert, 24 lignes de 80 colonnes.
- Clavier : Qwerty, pavé numérique.
- Mémoire de masse : lecteur de cassettes intégré.
- Prix : 3 000 FF ttc (4 400 FF ttc avec écran couleurs).

Service lecteurs p.66, référence 21.

Français

Squale

Le Squale, fabriqué par la société Apollo 7 (française comme son nom ne l'indique pas), est équipé d'un processeur 6809, d'une mémoire vive de 92 Ko dont 32 sont réservés à l'affichage graphique (256 × 256 points), d'un générateur de sons et d'un affichage de 25 lignes de 40 caractères, 16 couleurs...

Lecteurs de cassettes et de disquettes sont en option, l'utilisateur dispose seulement d'un connecteur pour insérer des cartouches de mémoire morte. L'interface fournie en standard est aux normes Centronics. Les autres connecteurs permettent une sortie aux normes Minitel, des poignées de jeu et un magnétophone à cassettes.

Un boîtier d'extensions, optionnel, agrandira le cercle des périphériques, entre autres avec une interface série RS 232C. La connexion à l'écran est du type Péritel et l'ordinateur tourne sous le système d'exploitation Flex, équipant les Goupil.

Fiche technique
- Processeur : 6809, 8 bits, 1 MHz.
- Mémoire : 92 Ko de MEV, 4 Ko de MEM.
- Clavier : Azerty 55 touches.
- Prix : 3 450 FF ttc.

Service lecteurs p. 66, référence 22.

Figure 13: SORD M343SX Multi-user Computer advertisement
L'Ordinateur Individual, Issue 63, Oct-1964, p.91