AccessionIndex: TCD-SCSS-T.20190917.003
Accession Date: 17-Sep-2019
Accession By: Pat O'Byrne
Object name: Tulip AT 386/25 PC with powerline printer/plotter sharing system
Vintage: c.1985
Synopsis: Desktop i386-based PC used with powerline printer/plotter sharing adapters and multi-port printer/plotter switches by Roads Design Office, Co.Cork.

Description:
This item is a Tulip AT386 desktop PC and powerline printer/plotter sharing system used by the road design engineers in Cork County Council. These items were the basis of the third iteration of road design computing, as described below by Pat O'Byrne of the Roads Design Office of Cork County Council. This iteration finally enabled road design software to be run locally in Co.Cork, rather than remotely at TCD. For the first and second iterations, see *"Comart Commmunicator Computer and peripherals"* and *"SORD M343SX-2 Multi-user computer"* elsewhere in this catalog.

The Tulip computers were made by an Amercian company, Compudata (later Tulip Computers), as IBM PC-compatible computers. In fact their first products were exact copies, which led to lengthy litigation by IBM. The AT 386/25 desktop PC was introduced c.1985. It had a 25MHz i386 CPU, with 4MB DRAM. It was available with a 100/200/330/660MB internal hard disk, plus both a 5.25" and 3.5" floppy disk drives, and a 14" monitor plus keyboard. It ran Microsoft MSDOS and Windows software such as Word, Excel, and the engineering design package Autocad.

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, a system of powerline print/plotter sharing adapters plus multi-port printer/plotter switches was adopted as also described by Pat O'Byrne below. This consisted of frontend adapters between the PCs and powerline, and a backend adapter plus a multiport switch between the powerline and the printers and plotters.

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 these items, and for permission to preserve the description above and to publish it online, and also to Pat and his wife for transporting these items 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.20190917.003.001	Tulip AT 386/25 PC base chassis. Base chassis of 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. Serial No.: S02 88280018, Model No.: ATC – 90.03.36.03
TCD-SCSS-T.20190917.003.002	Tulip AT 386/25 keyboard. Keyboard of 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. Mitsumi, Model: KPQ-E99ZC-13
TCD-SCSS-T.20190917.003.003	Black Box multi-port backend printer/plotter switch. Backend printer/plotter switch used with Tulip AT 386/25 PC and powerline printer/plotter sharing adapters by Roads Design Office, Co.Cork. c.1985. Black Box Corporation, Serial No.: 518121466, Model No.: SW270L-FFFF
TCD-SCSS-T.20190917.003.004	Black Box EasyPrint backend powerline printer/plotter sharing adapter. Backend powerline printer/plotter sharing adapter used with Tulip AT 386/25 PC, frontend powerline printer/plotter sharing adapters and multi-port backend printer/plotter switch by Roads Design Office, Co.Cork. c.1985. Black Box Corporation, Serial No. 92104006, Model No. SW124AE, Serial 4
TCD-SCSS-T.20190917.003.005	Verran frontend powerline printer/plotter sharing adapter. Frontend powerline printer/plotter sharing adapter used with Tulip AT 386/25 PC, backend powerline printer/plotter sharing adapters and multi-port backend printer/plotter switch by Roads Design Office, Co.Cork. c.1985. Verran Electronics, S/N: AAA 8911104039
TCD-SCSS-T.20190917.003.006	Verran frontend powerline printer/plotter sharing adapter. Frontend powerline printer/plotter sharing adapter used with Tulip AT 386/25 PC, backend powerline printer/plotter sharing adapters and multi-port backend printer/plotter switch by Roads Design Office, Co.Cork. c.1985. Verran Electronics, S/N: CAB 9003100257
TCD-SCSS-T.20190917.003.007	Verran frontend powerline printer/plotter sharing adapter. Frontend powerline printer/plotter sharing adapter used with Tulip AT 386/25 PC, backend powerline printer/plotter sharing adapters and multi-port backend printer/plotter switch by Roads Design Office, Co.Cork. c.1985. Verran Electronics, S/N: AAA 8912100049
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.20190917.002	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.20190917.004	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, *Tulip Computers*, see:
   https://en.wikipedia.org/wiki/Tulip_Computers
   Last browsed to on 1-Nov-2019.

2. CC - Computerarchiv, *Tulip Computers*, see:
   http://www.cc-seller.de/CC-Archiv/bc-aktuell/gb-tulip/gb-tulip-12_91.html
   Last browsed to on 1-Nov-2019.

INFO WORLD

Perspectives looks at a new breed of temp workers who have sophisticated PC skills **43**

Seiko Instruments' CM-1430 is one of nine VGA monitors in this Product Comparison **55**

The Mac IIcx fits almost everything found in the Mac IIx into its smaller chassis **73**

AT DEADLINE *Continued From Page 1*

The proposed agreement calls for Intel to market the ECL processor that Prime has the right to use in its own systems.

The ECL modules will be bit-compatible with the Intel i486 microprocessor, according to Prime.

— Ron Copeland

EISA 33-MHz 386 System Proposed

Tulip Computers UK PLC announced its intention to bring a 33-MHz 386-based computer with an EISA bus to the market by the fourth quarter.

The British company said that for the full potential of the 33-MHz processor to be realized, the current ISA bus is not sufficient. Direct Memory Access (DMA) using an AT-compatible bus is only 2 megabytes per second, but the company said speeds of 32 megabytes per second could be achieved with the EISA architecture.

Specifications were not released, but the machine will have advanced cache memory, high capacity, fast access to hard disks, and expansion capabilities on the motherboard and within the CPU.

— Yvonne Lee

Seiko to Sell Low-Cost Color Printer

Seiko Instruments U.S.A. Inc. is scheduled to unveil this week at the National Computer Graphic Association (NCGA) Exposition a Postscript-compatible color printer that will sell for less than $5,000.

The product, called the CH5303-PS Color Thermal Printer, matches Seiko's 240-dot-per-inch thermal print engine with the Freedom of Press Postscript language interpreter from Custom Applications Inc.

Freedom of Press runs on AT-class PCs and PS/2s and works with Bitstream fonts.

The printer is rated to print at one page per minute and comes in two models with different page buffer sizes for $4,995 and $5,995.

— Bob Ponting

Tops Ships Appletalk Chip Samples

In a move designed to promote the manufacturing of PC compatibles with network capability built-in, the Tops division of Sun Microsystems Inc. is now shipping samples of a $5.65 single-chip Appletalk controller, according to sources close to the company.

The Flash Chip, which will ship in August, will allow manufacturers of personal computers and printers to inexpensively build compliance with Appletalk-compatible networking schemes directly into their hardware, according to sources.

The chip will allow PCs to communicate at up to 770 kilobits per second and will support software including Appleshare, Novell's Netware, Tops' own Flashtalk, and any other Appletalk-Filing-Protocol-compatible software, including upcoming versions of 3Com's 3+ and 3+Open LAN Manager.

— Mark Stephens

Microsoft Offers Free DOS 4.01 Fix

Microsoft Corp. is offering a free fix for an obscure bug in some releases of MS-DOS 4.01 that can, if invoked, destroy data.

The bug apparently occurs only if the user allocates buffers with secondary cache, uses partitions greater than 32 megabytes, and performs a certain sequence of operations, according to Microsoft. When a user calls a file that is partly stored past the 32-megabyte range and immediately follows with an operation that prompts the system to read a FAT (File Allocation Table) section, the bug causes data to be lost, according to Microsoft.

The fix — already implemented in copies of DOS shipped after April 7 — is also posted for downloading as DSPATCH.ARC in Data Library 1 of Microsoft's Compuserve forum.

— Peggy Watt

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Figure 1: Tulip AT 386 announcement, InfoWorld, Vol.11, Issue 16, page 3, 17-Apr-1989

Figure 2: Tulip AT 386/25 desktop PC with keyboard and display
Only the base chassis is preserved in this collection
Photograph courtesy Pat O'Byrne

Figure 3: Tulip AT 386/25 desktop PC base chassis, front view
Photograph courtesy Pat O'Byrne

Figure 4: Tulip AT 386/25 desktop PC base chassis, front view

Figure 5: Tulip AT 386/25 desktop PC base chassis, rear view

Figure 6: Tulip AT 386/25 desktop PC base chassis, rear view closeup

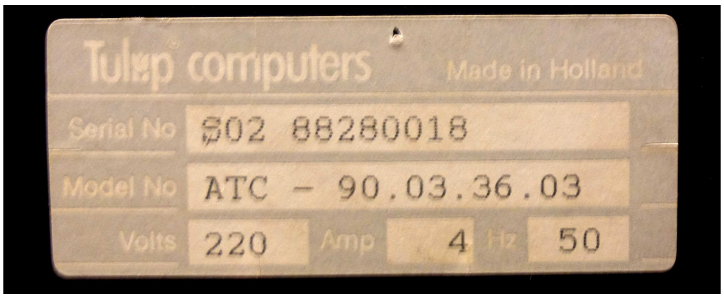

Figure 7: Tulip AT 386/25 manufacturing label
"Serial No. S02 88280018
Model No. ATC – 90.03.36.03
Volts 220 Amps 4 Hz 50"

Figure 8: Tulip AT 386/25

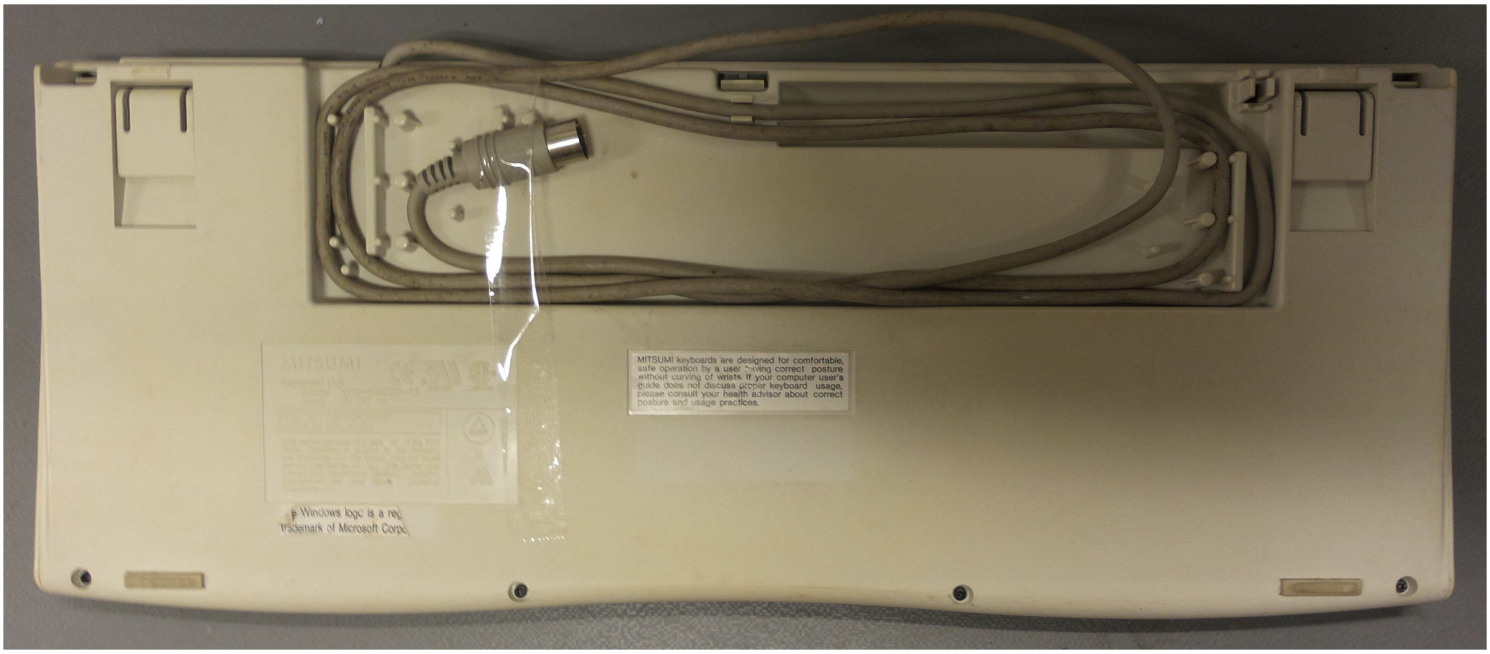

Figure 9: Tulip AT 386/25

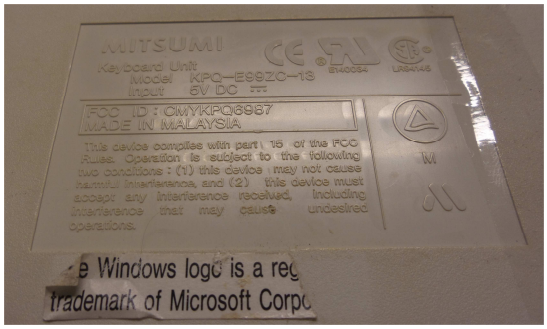

Figure 10: Tulip AT 386/25
"Mitsumi, Model: KPQ-E99ZC-13, Input: 5V DC"

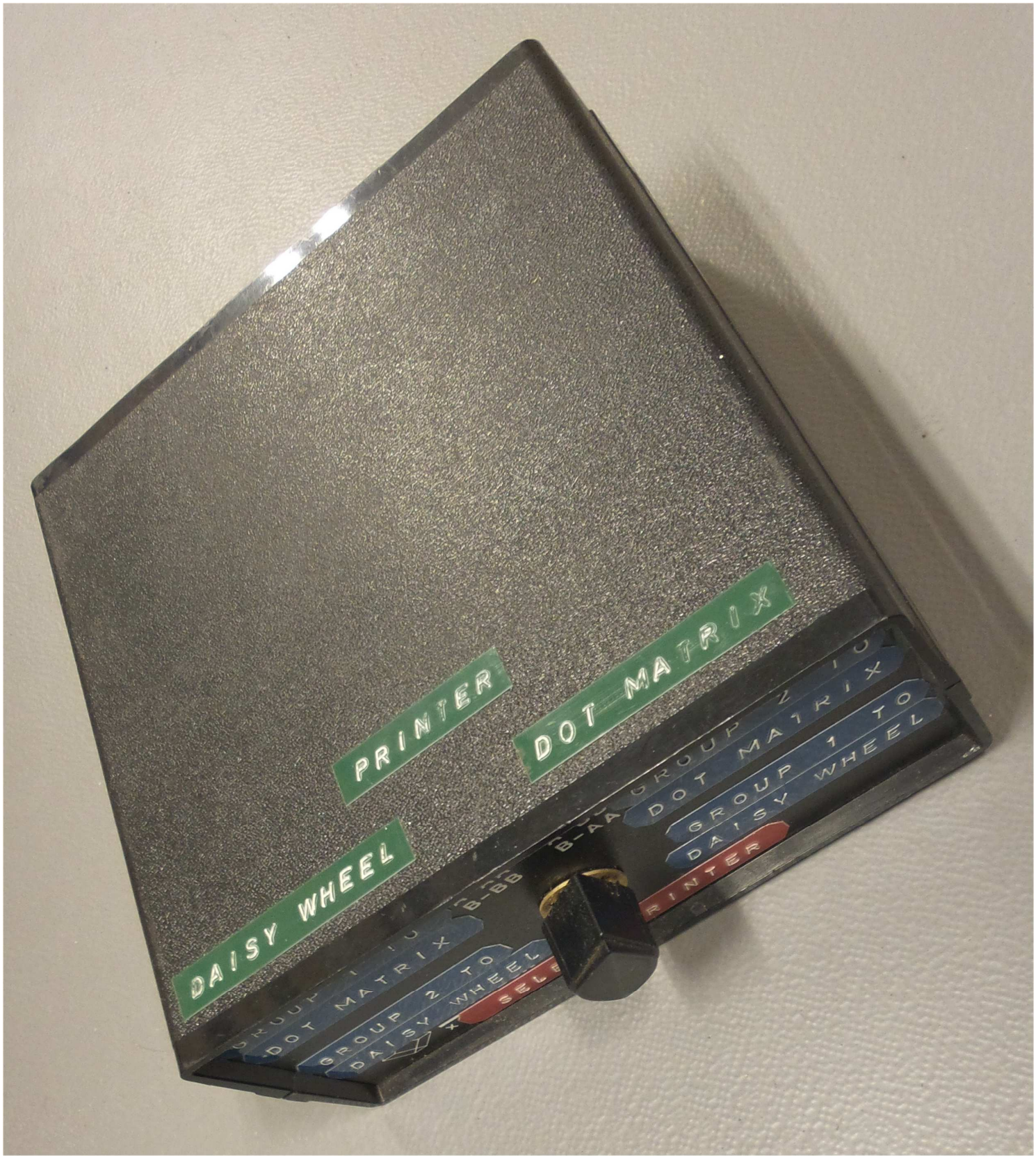

Figure 11: Multi-port backend printer/plotter switch, three-quarter view

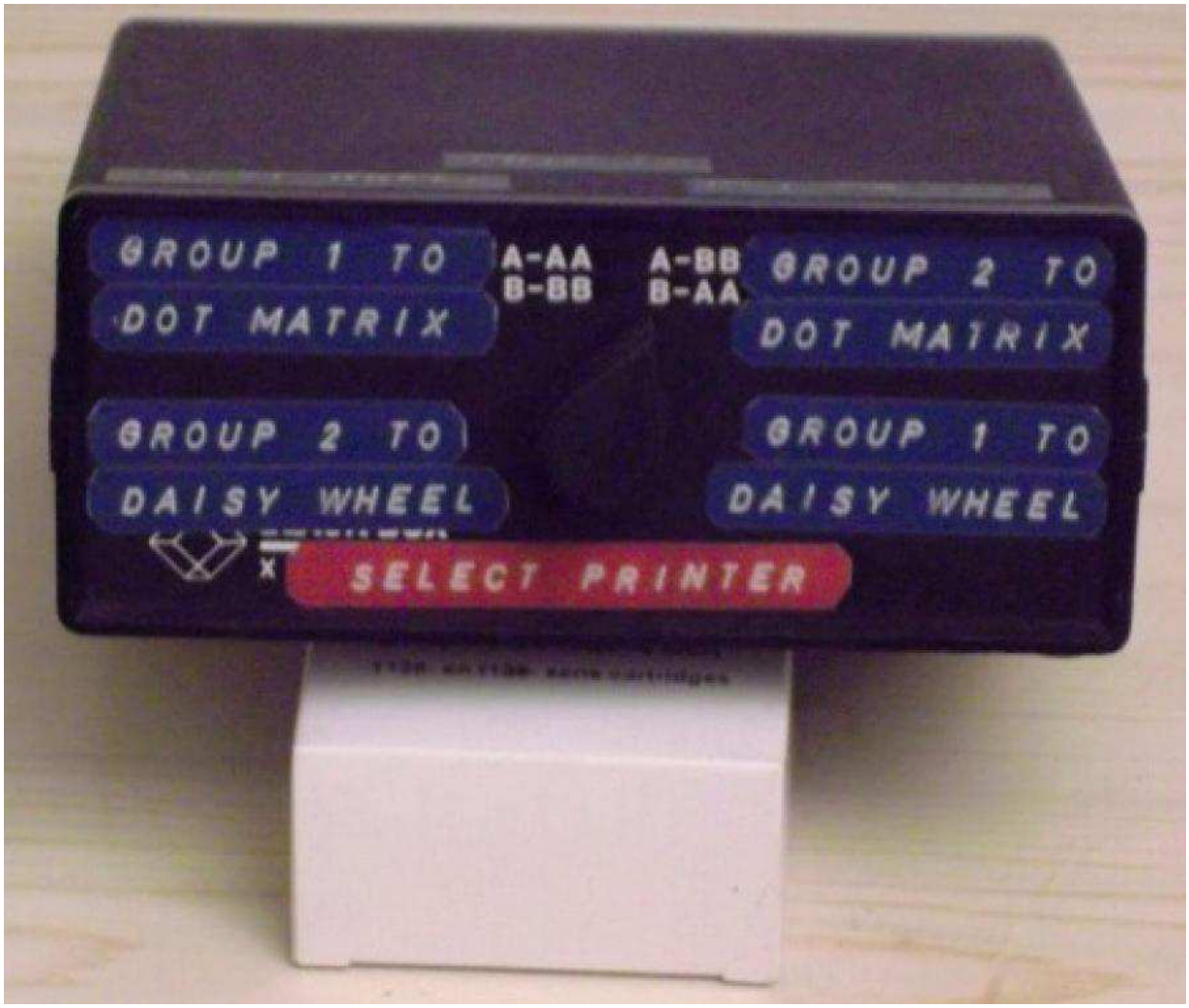

Figure 12: Multi-port backend printer/plotter switch, front view
Photograph courtesy Pat O'Byrne

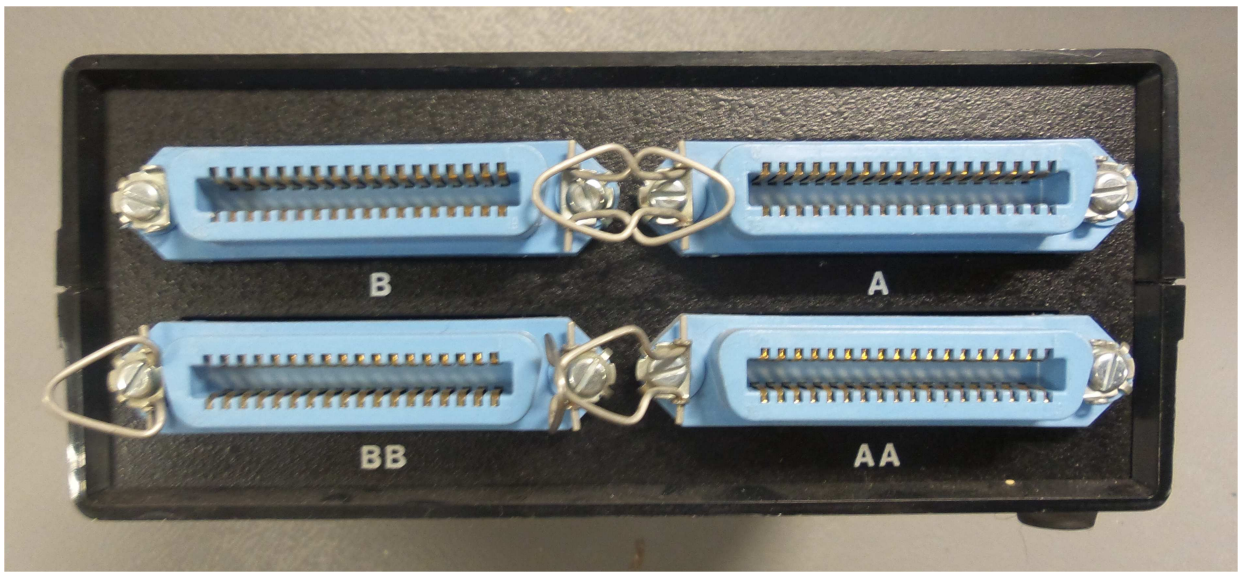

Figure 13: Multi-port backend printer/plotter switch, rear view

Figure 14: Multi-port backend printer/plotter switch, bottom view

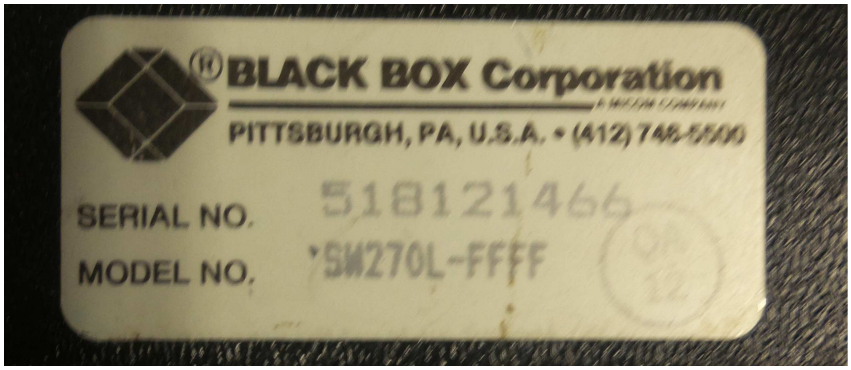

Figure 15: Multi-port backend printer/plotter switch manufacturing label "Black Box Corporation, Serial No. 518121466, Model No. SW270L-FFFF"

Figure 16: BlackBox EasyPrint backend powerline printer/plotter sharing adapter

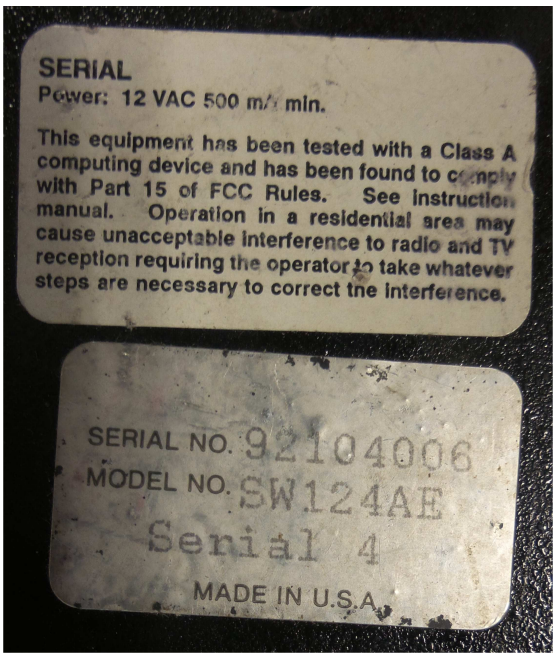

Figure 17: BlackBox EasyPrint backend powerline printer/plotter sharing adapter manufacturing label "Serial No. 92104006, Model No. SW124AE, Serial 4"

Figure 18: Verran frontend powerline printer/plotter sharing adapters
Photograph courtesy Pat O'Byrne

Figure 19: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8911104039, top view

Figure 20: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8911104039, top closeup

Figure 21: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8911104039, bottom closeup

Figure 22: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8911104039, manufacturing label

Figure 23: Verran frontend powerline printer/plotter sharing adapter S/N CAB 9003100257, top view

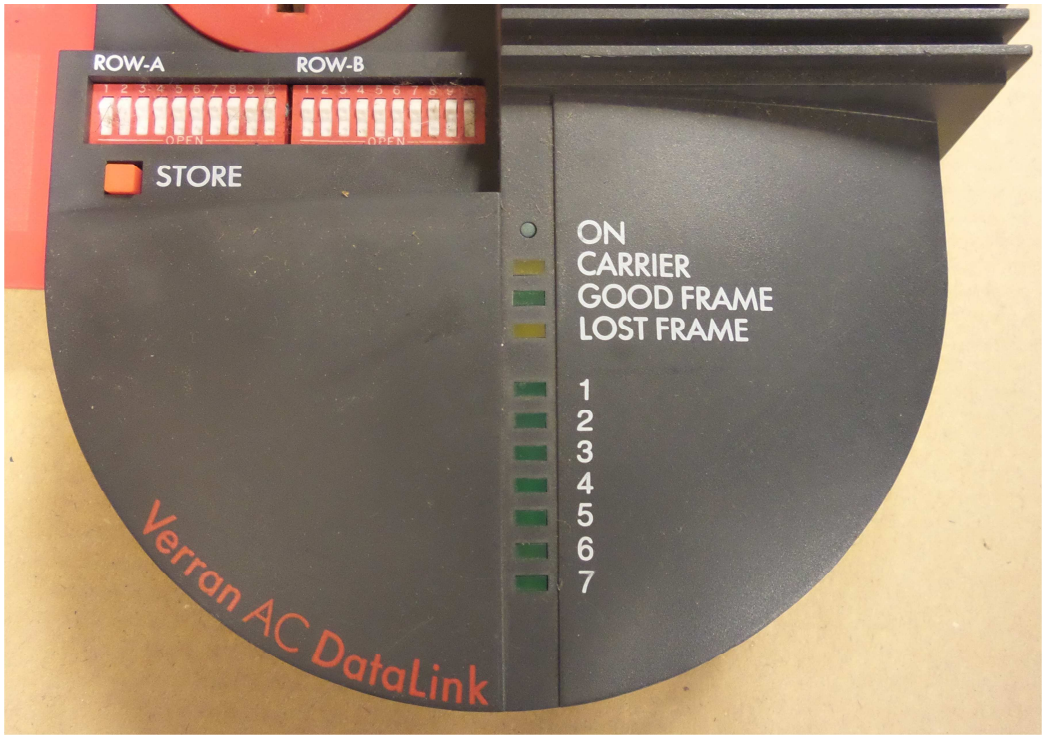

Figure 24: Verran frontend powerline printer/plotter sharing adapter S/N CAB 9003100257, top closeup

Figure 25: Verran frontend powerline printer/plotter sharing adapter S/N CAB 9003100257, bottom closeup

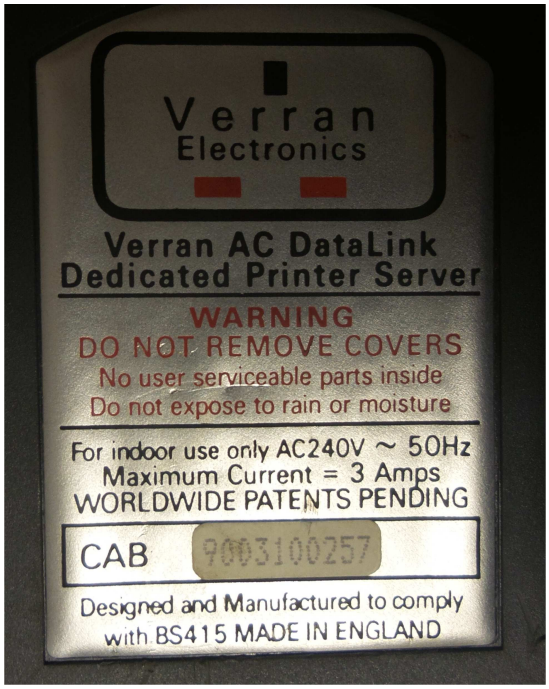

Figure 26: Verran frontend powerline printer/plotter sharing adapter S/N CAB 9003100257, manufacturing label

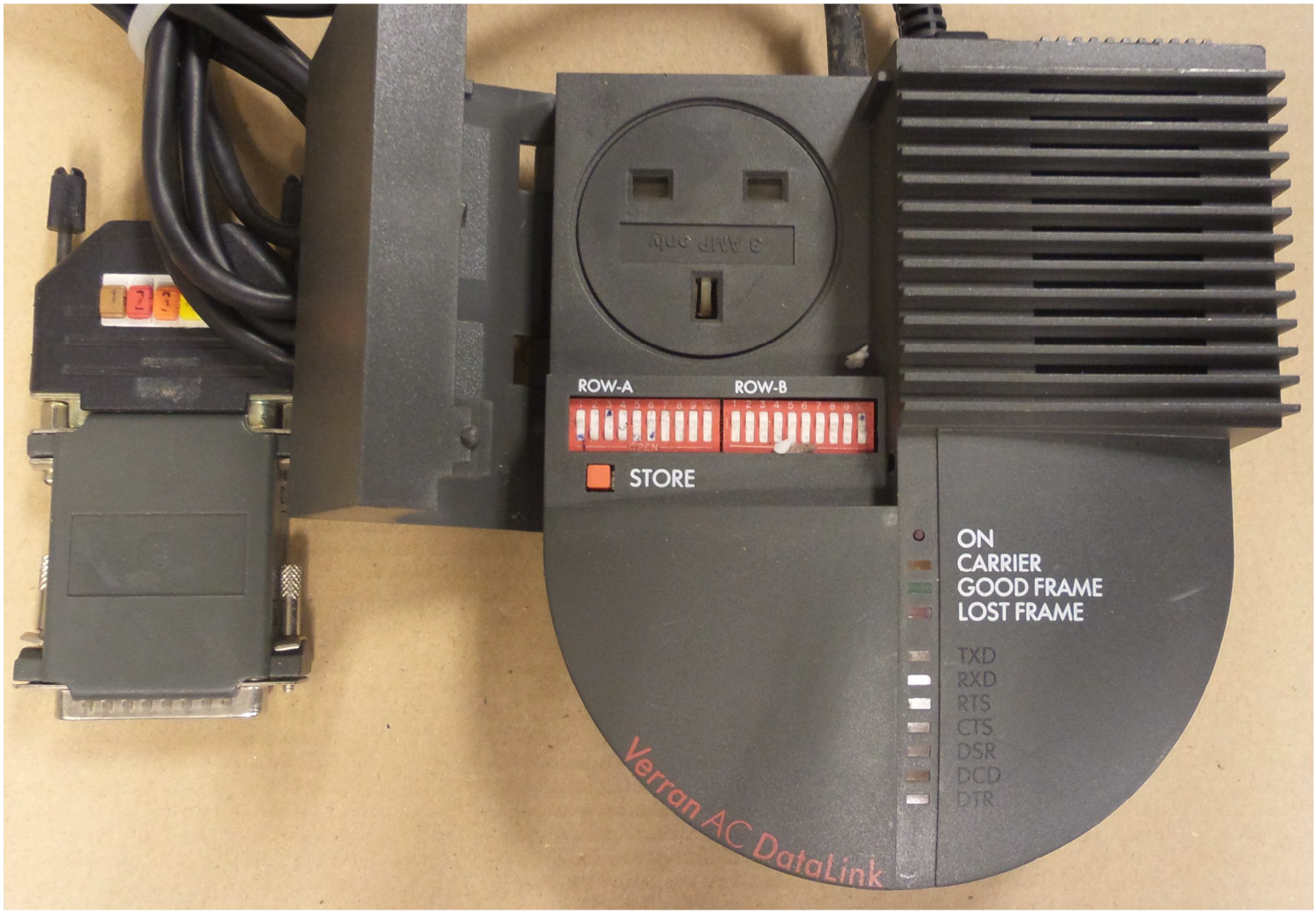

Figure 27: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8912100049, top view

Figure 28: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8912100049, top closeup

Figure 29: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8912100049, bottom closeup

Figure 30: Verran frontend powerline printer/plotter sharing adapter S/N AAA 8912100049, manufacturing label