THE ACORN IEEE INTERFACE FOR THE BBC MICROCOMPUTER

IEEE INTERFACE

The Acorn IEEE Interface enables a British Broadcasting Corporation Microcomputer to control any scientific and technical equipment which conforms to the IEEE488 standard.

Together, the IEEE Interface and BBC Microcomputer provide computer control of IEEE488-compatible devices at a lower price than other systems – but without sacrificing any aspect of the IEEE488 standard. And, as an added bonus, Interface users have available to them the full power and versatility of the BBC Microcomputer.

OPERATION

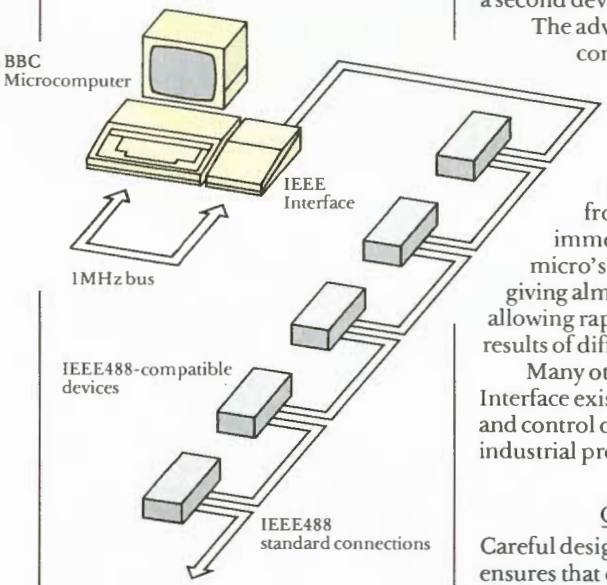
The IEEE Interface is provided in its own case, designed to match the BBC Microcomputer. It can be linked to a network of up to 14 separate IEEE488-compatible devices: oscilloscopes, voltmeters, logic analysers, spectrum analysers, function generators, frequency meters, and any of the many other devices that are available.

When initialised, the Interface automatically establishes the micro as the controlling device on the network. In addition, the micro can operate as a controller-talker or controller-listener and it can pass control to and from any other suitable device on the network. When not controlling the network the micro can operate as a talker or listener.

Typical applications of the Interface are in experimental work in academic and industrial laboratories. For example, the micro might be programmed to instruct one device to generate input signals at a range of frequencies, and to accept measurements of the corresponding output signals from a second device.

The advantages of computer-controlled operation over manual operation are speed, accuracy and repeatability. In addition, the data from the experiment are immediately available to the micro's analysis programs, giving almost instant results and allowing rapid comparison of the results of different tests.

Many other applications of the Interface exist in the monitoring and control of scientific and industrial processes.



STRUCTURE OF AN IEEE NETWORK CONTROLLED BY A BBC MICROCOMPUTER

CONTROL

Careful design of the Interface ensures that efficient hardware is matched by easy-to-use software.

A Read Only Memory plugging into one of the BBC Microcomputer's spare ROM slots provides the IEEE Interface Filing System (IEEEFS). This is a set of plain English

commands which the programmer uses to pass instructions from the micro to the devices on the network. The micro regards the IEEEFS as another filing system like disc or tape, so that the format of the program statements which address the IEEEFS will already be familiar to those with …perience …he BBC Microcomputer. In addition, the straightforward nature of the commands enables full control of an IEEE488 network to be achieved without a detailed understanding of the operation of the Interface.

The IEEEFS commands can be incorporated in programs written in any of the high-level languages available on the BBC Microcomputer: BBC BASIC, 6502 Assembler and so on.

Commands are available for all the functions included in the IEEE488 standard, including both serial and parallel polling, timeouts, and enabling and disabling of local control for all or individual devices.

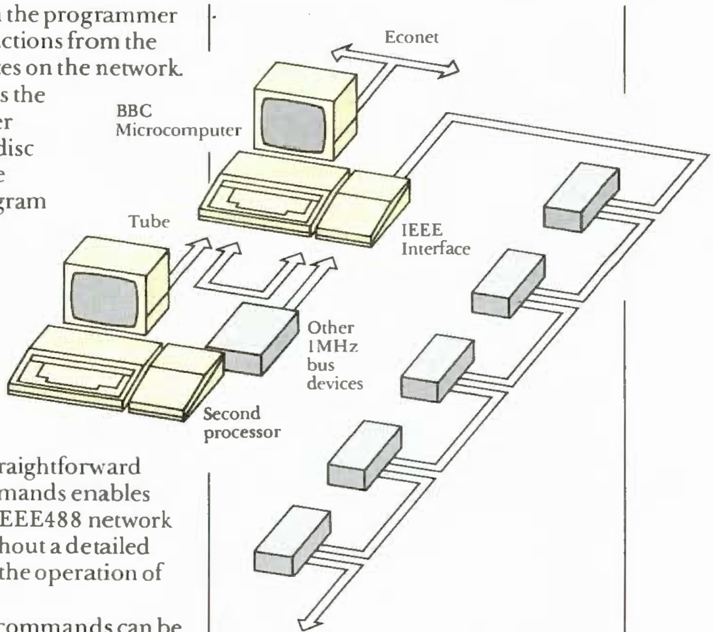
Full explanations of the IEEEFS commands, and examples of their … are included in the User Guide …pplied with the Interface.

OTHER FACILITIES

The BBC Microcomputer/IEEE Interface combination provides more than just control of an IEEE network. When not being used with a network, or whilst two other devices on the network are communicating with each other, the usual range of facilities of the versatile BBC Microcomputer are available to the user.

Its renowned colour graphics capabilities provide the ideal way of presenting experimental results in an instantly understandable form. A second processor can be connected for even faster processing and greater memory capacity. Or the micro can be linked into Acorn's Econet local area network, making control of and data from the IEEE488 system available to all the other micros on the network.

The Interface itself has an additional 1MHz bus connection, enabling it to be linked to any of the other interfaces which operate from this bus, such as Acorn's Teletext acquisition unit. Use of the IEEE Interface places no restrictions on the other applications of the BBC Microcomputer.



OTHER FACILITIES AVAILABLE WITH THE BBC MICROCOMPUTER/ IEEE INTERFACE CONTROLLER

TECHNICAL DETAILS

Specification The Acorn IEEE Interface enables full implementation of the IEEE Standard 488-1978. IEEE488 is also known as, and is equivalent to: IEC625-I (in Europe) and GPIB or HP-IB (Hewlett Packard General Purpose Interface Bus).

Configuration The Interface is a high-quality, double-sided, plated-through-hole printed circuit board, produced to BS9000. It is supplied in a robust case designed to match the BBC Microcomputer.

Connections A cable and plug to IEEE488-1978 specification for connection to one IEEE488-compatible device. A ribbon cable for connection to the BBC Microcomputer 1MHz expansion bus. A socket enabling connection of other 1MHz bus devices. A two-metre mains cable with fitted 13A square pin plug.

Network configuration The Interface can support a network of up to 14 other IEEE488-compatible devices. Devices can be interconnected in a star or linear fashion. IEEE488 permits individual cable lengths of up to four metres, and a total cable length in a network of two metres per device with a maximum of 20 metres.

Software provision The IEEE Interface Filing System (IEEEFS) is provided in a ROM which fits into one of the BBC Microcomputer's paged ROM slots.

Software facilities Access to the IEEEFS commands is provided by the command * IEEE. The commands available (with standard IEEE488 mnemonics in brackets are:

BBC DEVICE NO	(MTA & MLA)	READ BINARY	
CLEAR	(IFC)	REMOTE DISABLE	
DEVICE CLEAR	(DCL)	REMOTE ENABLE	(REN)
END OF STRING		REQUEST CONTROL	
EXECUTE		SELECTED DEVICE CLEAR	(SDC)
GO TO LOCAL	(GTL)	SERIAL POLL (SPE RQS STB & SPD)	
LISTEN	(LAG)	STATUS	
LOCAL LOCKOUT	(LLO)	TAKE CONTROL	(TCT)
PARALLEL POLL		TALK	(TAG)
DISABLE	(PPD)	TIMEOUT OFF	
PARALLEL POLL		TIMEOUT ON	
ENABLE	(PPE)	TRANSFER	
PARALLEL POLL		TRIGGER	(GET)
REQUEST	(PPR)	UNLISTEN	(UNL)
PARALLEL POLL		UNTALK	(UNT)
UNCONFIGURE	(PPU)	WRITE BINARY	

Data transmission Data can be sent and received by the Interface in strings of up to 255 ASCII characters. The delimiting character defaults to line feed (ASCII code 10), but any other delimiting character or characters can be specified if required by a particular device. Longer strings of data can be transmitted in binary coded form. The Interface can instruct two devices to transfer data from one to the other without storing it in the BBC Microcomputer's memory, so freeing the computer for other tasks.

Error checking Comprehensive error checking facilities are provided. Bus errors and the state of the Interface are available to the user via a 32-bit status word.

Power supply 220/240V AC, 50/60Hz.

Documentation A 70-page User Guide containing full details of the IEEEFS commands and their use is supplied with the Interface.

Dimensions (approx) Height×width×depth: 75×205×350mm.

Temperature range 10° to 30°C.

Requirements The IEEE Interface requires a BBC Microcomputer Model B with a series 1 MOS (Machine Operating System). The operating system is provided free if required.

In this leaflet, the initials BBC stand for the British Broadcasting Corporation.

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