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Z88 File Transfers

There are two reasons for transfering files between a Z88 and another system. One is to backup Z88 files because permanent file storage on Z88 EPROMs is expensive. The other is to use the transfered data on the other system. These two reasons have been the driving force for the design of over 70 file transfer programs. Closely related are file conversion programs between various file formats. These programs will be added later.

Table of Contents

Protocols

A number of protocols are used for file transfers between Z88s and other computers. The first five in the table below, Imp-Export, PCLink II, EasyLink, RangerLink and SpecLink protocols were invented just for the Z88 and are hardly used elsewhere and none of them does any error check on file contents transfered. Of the following five protocols, Ascii Text, Xmodem, Ymodem, MacBinary and Kermit on the other hand, at least some can be expected to be found on remote dialup computer systems or the average office or home computer. The last two, TFTP and HTTP builds on for the Z88 new Internet TCP/IP technique which is in the test state for SLIP connections only.

- Imp-Export
  > Introduced by Cambridge Computer Ltd in the internal Z88 application Imp-Export. Documented in the Z88 User Guide at least from the second edition. Transfers files individually or batchwise in both directions. Files containing binary data like BASIC programs are slower to transfer then text files like PipeDream documents because of protocol encoding overhead. Can transfer files over 7-bit data links.
- PCLink II
  > Extension to the Imp-Export protocol. Introduced by Cambridge Computer Ltd in the external ROM card Z88 application PCLink. Documented at least in the PC-Link User

Guide second edition. The Z88 application PCLink acts as a server and all commands are entered at the client computer. Transfers device, directory and file names and files in both directions. Files containing binary data like BASIC programs are slower to transfer then text files like PipeDream documents because of protocol encoding overhead. Can transfer files over 7-bit data links. Flow control managed by acknowledging every byte separatly makes transfers very slow taking twice the time needed by the Imp-Export protocol.

- EazyLink

  Extension to the PCLink II protocol. Introduced by InterLogic in the external ROM card Z88 application EazyLink. The Z88 application EazyLink acts as a server and all commands are entered at the client computer. Transfers device, directory and file names, file sizes and files in both directions. Optional newline and configurable character set conversions, also remotely controlled. Gets and sets Z88 file creation and modification date/time. Gets and sets Z88 system date/time. Checks if specified Z88 file exists. Deletes Z88 directories and files. Creates Z88 directories. Renames Z88 files. Gets Z88 RAM estimated free space and device free space.

- RangerLink

  Based on the Christie tape drive protocol. Introduced by Ranger Computers in the external ROM card Z88 application LexLink later named RangerLink. The PC program acts as a server and all commands are entered in the Z88 application. Transfers device, directory and file names, file sizes and attributes and files in both directions. Deletes PC directories and files. Creates PC directories. Renames PC files. Gets PC free space.

- SpecLink

  Proprietary protocol for batch and individual transfer of files with preserved names and lengths to Sinclair Spectrum Microdrive.

- Ascii Text

  All but the most primitive terminal programs have the ability to capture/save received text to file. The reverse ability, that is sending text not typed on the keyboard but sent from a file is also common. Text conversion regarding character set or more often newline convention is often employed. Sometimes flow control or pacing, by character or row, is utilised to prevent overflow and loosing text. Useful for transfering PipeDream documents saved as plain text and BASIC programs in text (CLI) format when no other protocol is available.

- Xmodem.

  File transfer etiquette introduced by Ward Christensen's 1977 MODEM.ASM program. Common extensions are CRC error check instead of checksum, 1KB blocksize instead of 128 bytes and sometimes -G (GoGoGo) for faster streaming mode on reliable links with slow response. Received files are filled out with padding characters to make the file length a multiple of 128 or even 1024 bytes.

- Ymodem.

  Extension to Xmodem introduced by Chuck Forsberg in his CP/M "YAM" program in the early 1980s. Transmission of filename permits batch transfers. CRC error check and 1K blocksize is usually used and sometimes -G mode. True Ymodem preserves file modification date/time and size (no padding).

- MacBinary

  Extension to Xmodem introduced in MacTerminal by Mike Boich and Martin Haeberli in 1985 or earlier. Enables transfer of filenames for batch transfers and preservation of file size, modification date/time and other attributes.

- Kermit

Developed at Columbia University in New York City in 1981. Named after Kermit the Frog, star of the television series, The Muppet Show. Kermit software has been written for [hundreds] of different computers and operating systems.

- **CET**
  Council for Educational Technology. For telesoftware downloading from viewdata (Videotex) services like Prestel.
- **TFTP**
  Trivial File Transfer Protocol
- **HTTP/0.9**
  Hypertext Transfer Protocol 0.9 defined in 1991.
- **FTP**
  File Transfer Protocol

Platforms

Acorn BBC

Protocol	Name	Version	Date	Author
Imp-Export	BBC Link		1987	Cambridge Computer
Imp-Export	BEEBLINK	1.0	1988	Jeff Moon
Imp-Export	BBC/Z88 File Transfer		1988	John Allen
PCLink II	BBC-Link II for Z88		1988	John Allen
BBC BASIC	BBC/Z88 Basic program transfer		1988	John Allen
Mini Office, Wordwise	Pipedream to Mini Office / Wordwise Conversion		1988	John Allen

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Acorn Archimedes

Protocol	Name	Version	Date	Author
Imp-Export	ZAP-Z88, a153.txt	1.02	1992	K.S & S.S Pardesi
Imp-Export	Archimedes Link		1995	Lindis International
Imp-Export	Z88-Arc		1989	Henri Derksen
Imp-Export	!Z88Link	1.0	1989	Lingenuity
Imp-Export, ArcBasic	Z88 Utility	3.71	1997	David Holden
PCLink II	PipeDream		1988	Colton Software
?	Z88 Link		1991	S&S Computer Advice
BASIC V	BConvArc			Matthew Astley

| Interword, First Word Plus | PipIn | | 0.94 | 1992 David Holden |

Acorn RISC OS

Protocol	Name	Version	Date	Author
Imp-Export	Z88Link	1.02	1996	John Allen
Imp-Export	Z88Link	2.00		John Allen
Imp-Export?	Z-Link II			20-20 Software/Tony Howat
PCLink II	ZLink			John Allen

Amiga

Protocol	Name	Version	Date	Author
Imp-Export	LinkUP, readme	1.0	1998	Mathew Key
Imp-Export	FileZ88, readme		1998	Owen Birnie
Imp-Export	AZ		1997	Sector Software
Imp-Export	AtoZ, readme	2.0	2000	Joe Mackay
Imp-Export	Z88-Amiga Link		1989	The Music Suite
?	Z88-LINK II		1991	The Music Suite
PCLink II	LinkZ88, readme	1.0.0	1995	Andy Dean
EazyLink	Link	0.97	1998	Gunther Strube, Garry Lancaster, Dominic Morris
Digita Organiser	DiaryConv		1998	Owen Birnie

Amstrad PCW

Protocol	Name	Version	Date	Author
Imp-Export	IMPEXP80		1988	C Port (Martyn Wilkinson)

Apple MacIntosh

Protocol	Name	Version	Date	Author
Imp-Export MacWrite, Lotus, 6502 BBC BASIC	Z88 Import-Export	1.0i	1989	C Port
Imp-Export	ZX		1990	Richard Haw
PCLink II MacWrite, WKS, BBC BASIC	Z88-to-Mac	1.1	1988	Cambridge Computer (Human-Computer Interface)
?	Z88 Link			S&S Computer Advice

Atari ST

Protocol	Name	Version	Date	Author
Imp-Export	Z88 Utility	1.2	1988	J. Hollis
Imp-Export	Z88-ST Link	3	1989	The Music Suite
?	Z88-LINK II		1991	The Music Suite
Imp-Export?	ST-Z88 LINK (Z099)		1990	Martin Dolphin
PCLink II	Z88LINK	1.3	1990	Ian Johnston
PCLink II	ZLink	1.2	1989	Andy R. Barrow

Nimbus

Protocol	Name	Version	Date	Author
?	Nimbus Link		?	Lindis International

PC DOS

Protocol	Name	Version	Date	Author	Bytes / Second
Imp-Export, Wordstar, Lotus 123	PC-LINK	1.0	1987	Cambridge Computer	Up to 355
Imp-Export, WordPerfect	Z88 WordPerfect Link	1.08	1991	Tinus van de Wouw	

Imp-Export	Z88ToPC	1.1	1990	Anton Bialecki	
Imp-Export	Z88 File Transfer	1.0	1988	Andrew Pepper	
Imp-Export	Z88TRAN		1989	Richard Haw	
Imp-Export	Z88UP/Z88DOWN	1.03	1991	Roberto Piola	
Imp-Export	Z88TOPC		1991	Paul Doherty	
?	Z88-LINK II		1991	The Music Suite	
PCLink II, Wordstar, Lotus 123	PC-LINK	2.1	1988	Cambridge Computer	Up to 200
PCLink II	PipeDream	2.20	1988	Colton Software	
PCLink II	Z88link	1.5	1990	Steve Marsh	
PCLink II	zBack	1.05	1990	Simon Phipps	
PCLink II	Zback			Ranger Computers	
EazyLink	Link	0.97	1998	Gunther Strube	
RangerLink	RangerLink	4.00	1990	Ranger Computers	

PC Windows 3.1

Protocol	Name	Version	Date	Author	Bytes / Second
Imp-Export	WinSrv88		1999	Paul Robson	
Imp-Export	Z88-Xport	0.10	1998	Dennis Gröning	Up to 340
PCLink II	Z88Link		1997	Kevin Millican	
RTF, HTML, Excel	PipeView	0.18	1999	Dennis Gröning	

PC Windows 95

Protocol	Name	Version	Date	Author	Bytes / Second
Imp-Export	Z88serve	1.3	1999	Richard Eby	
Imp-Export	Z88-Xport	0.11	1998	Dennis Gröning	Up to 340
EazyLink	EazyLink	1.6.1	1998	Gunther Strube	
RangerLink	RangerLink	4.05	2001	Ranger Computers, Dennis Gröning	

PC Linux

Protocol	Name	Version	Date	Author
EazyLink	Link	0.97	1998	Gunther Strube, Garry Lancaster

Sinclair QL

Protocol	Name	Version	Date	Author
Imp-Export	QZ		1987	Sector Software
Imp-Export	QL ImpExp	2.1	1990	Phil A. Borman
Imp-Export	QLtoZ88		1993	Timothy Swenson
Imp-Export	Z88 Transfer	1.0		Mike Edwards
Imp-Export	Impex95	2.01a	1995	Phil A. Borman, Ivan Hall
EazyLink	Link	0.97	1998	Gunther Strube
QL Archive	PipeDream/QL Archive File Conversion		1994	Dilwyn Jones

Sinclair Spectrum

Protocol	Name	Version	Date	Author	Bytes / Second
Imp-Export	BackupZ		1988	Patman	
Imp-Export	Z88-ImpExp (Z110)	10	1990	Dennis Gröning	Up to 185
Imp-Export	ZX-Tasword to PipeDream, z80		1991	Austin L. Fox	
SpecLink	Z88-Link	2	1991	Dennis Gröning	Up to 205

Unix

Protocol	Name	Version	Date	Author
Imp-Export	z88link (Z144)	1.11	1991	Richard Hesketh

Z88

Protocol	Name	Version	Date	Author	Bytes / Second
Imp-Export, Ascii Text	Imp-Export		1987	Cambridge Computer	Up to 355
PCLink II	PCLink	2	1987	Cambridge Computer (S. Kelly)	Up to 200
EazyLink, PCLink II	EazyLink	5.0.3	1998	Gunther Strube (InterLogic)	Up to 530
RangerLink	RangerLink	5.02	1991	Ranger Computers	Up to 605
SpecLink	Spectrum-Link	1.1	1991	Dennis Gröning	Up to 205
?	TX		1987	Wordmongers	
Xmodem	COMM88	2	1988	Wordmongers	
Xmodem, CET	Z-Term	2.5	1989	Wordmongers	Up to 220
Xmodem	Z88COM	2.3	1989	Phil Wheeler	Up to 460
Xmodem	SSX (Z185)		1992	Phil Wheeler, Tom Hawkins	
Xmodem	XMODEM (Z202)		1992	Phil Wheeler, Christian Pearson	
Xmodem	Remote Z88 Link	1.0	1990	Phil Wheeler, DR Armstrong	
Xmodem, MacBinary	ZCP	1.02	1990	Richard Haw	Up to 515
Xmodem, Ymodem	XY-Modem	1.1	1999	Dennis Gröning	Up to 3300
Kermit	Kermit-88, more docs	1.04	1990	Wally Wright	Up to 310
Kermit ?	Vision-100		1990	Ranger Computers (Dave Hampson)	
TFTP, HTTP, FTP	Zsock	2.31	2002	Dominic Morris	

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