

BC Info Guide #4.

Путеводитель по портам ZX Spectrum
Guide to the ZX Spectrum ports

Пример системы обозначений:
An example of a symbolic notation codes:

PORT	ADDRESS		DECODING		READ	WRITE		
hex/dec	A15 ... A0		A15 ... A0					
#007E-#FF7E	HGFEDCBA01111110		HGFEDCBA0xxx1110		-	Pal	(X)*0	
^	^		\ /		^	^	^	^
hex	dec	bin	variable	bin decoding	write	symbolic	model	info
address	address	address	address	unknown	only	notation	clones	codes
v	v	v		v		v	v	v
#ECF7/60663	1110110011110111		1110x100xxxx0111?#ECF7(X)			TSL+TVH(X)*0		

Codes of computers

ZX Spectrum line computers (original & clones)

1/+1	ZX Spectrum/Didaktik Gama	8	Pentagon 128(1991)	E	Pentagon-1024SL v2.2
2/+2	ZX Spectrum 128/+2	9	KAY-1024SL/Beta Turbo	-E	Pentagon-1024SL v1.4
3/+3	ZX Spectrum +2a,b/+3	B	Quorum 128	F	ZXM-Phoenix rev0-2
5	Baltik	+B	Quorum 1024	+F	ZXM-Phoenix rev3-5
6	Scorpion ZS256	C	Scorpion ZS256 Turbo+	G	Scorpion GMX
7	Profi+ (v3.x)	D	Profi 3+ (v5.x)	N	Novosibirsk 64k

ZX Spectrum line computers conceptions (clones)

U	- ULA+	X	- XiMera	ZP	- ZX-Poly
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ZX Spectrum compatible computers (no clones)

4/+4	- Timex Computer TC2048/2068	A	- ATM Turbo-2+	S	- SamCoupe
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ZX Spectrum compatible(no clones) computers conceptions

CH	- Chloe 280SE (TC2048/2068 clone)
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SYMBOLIC NOTATION CODE

?	- точная дешифрация порта для клона неизвестна (unknown exact decoding of port for the clone)
A15	- адресная линия процессора (CPU address line)
A15'	- адресная линия менеджера ОЗУ (RAM manager address line)
A15"	- адресная линия менеджера ПЗУ (ROM manager address line)
A15'''	- адресная линия сканера видео ОЗУ (video RAM scanner address line)
alt	- альтернативная (alternative)
Atr	- порт атрибутов (video attributes port)
Brd	- порт бордюра (border port)
CPU0-3	- адресные окна процессора (CPU address windows)
DMMC	- ДММЦ (dynamic modification of machine cycles)
DOS	- режим DOS или CP/M (DOS or CP/M mode)

hi - ВЫСОКИЙ (high)
 Joy - ДЖОЙСТИК (joystick)
 Key - порты клавиатуры (keyboard ports)
 FD - порт НГМД (floppy drive port)
 Fjoy - порт Фуллер джойстика (Fuller joystick port)
 Kjoy - порт Кемпстон джойстика (Kempston joystick port)
 Kmou - порт Кемпстон мыши (Kempston mouse port)
 LPenX - порт светового пера, координата X(light pen port, X coordinate)
 LPenY - порт светового пера, координата Y(light pen port, Y coordinate)
 lo - НИЗКИЙ (low)
 Mag - кнопка "Magic" (button "Magic")
 Mid - MIDI
 Pag - порт страниц памяти (memory paging port)
 Pal - порт палитры (videopalette port)
 PLLFC - порт ОЗУ ФАПЧ (RAM Phase-Locked-Loop Frequency Control port)
 prim - основная (primary)
 Pr - порты принтера (printer ports)
 Reg - порт управления (control port)
 RES - сигнал сброса (reset signal)
 Scrl - порт скроллера (scroller port)
 Scrn - экран (screen)
 Ser - последовательный порт (serial port)
 Shdw - режим открытия теневых портов (open shadow port mode)
 Sjoy - порт Синклер-джойстика (Sinclair joystick port)
 SLA - левый звуковой канал А (Sound Left channel A)
 SLB - левый звуковой канал В (Sound Left channel B)
 SOS - ROM Sinclair Operating System
 SRA - правый звуковой канал А (Sound Right channel A)
 SRB - правый звуковой канал В (Sound Right channel B)
 Sp - порт динамика (speaker port)
 SRV - BIOS сервисмонитора (Service monitor Firm Ware)
 Sys - системный порт (system port)
 Tp - порт магнитофона (tape port)
 Trb - порт турборежима (turbo mode port)
 TSH - TetraSystemHigh - старшая половина системной части тетрапорта
 TSL - TetraSystemLow - младшая половина системной части тетрапорта
 TVH - TetraVideoHigh - старшая половина видеорежимной части тетрапорта
 TVL - TetraVideoLow - младшая половина видеорежимной части тетрапорта
 Vid - порт видеорежима (videomode port)
 VLA - громкость левого канала А (Volume Left channel A)
 VLB - громкость левого канала В (Volume Left channel B)
 VRA - громкость правого канала А (Volume Right channel A)
 VRB - громкость правого канала В (Volume Right channel B)
 ZX - ZX режим (ZX mode)

INFO

* 0 - <http://zx.clan.su/forum/7-57-1>
 * 1 - <http://velesoft.speccy.cz/zxporty-cz.htm>
 * 2 - <http://www.zxspectrum.00freehost.com/zxpc.html>
 * 3 - <http://www.8bc.com/sinclair/index.html>
 * 4 - <http://www.zxbada.bbk.org/zxmmc/index.htm>
 * 5 - <http://www.ppest.org/zx/simpif.htm>
 * 6 - <http://user.tninet.se/~vjz762w/>
 * 7 - <http://pentagon.nedopc.com/info.htm>
 * 8 - <http://www.igormaznitsa.com/zxpoly/zxpoly.html>
 * 9 - http://cygnus.speccy.cz/popis_isorom128.php
 * A - <http://spectrum.alioth.net/doc>
 * B - <http://sites.google.com/site/ulaplus/home>
 * C - <http://www.micklab.narod.ru/ZXMSoundCard.htm>
 * D - <http://cheveron.github.com/sebasic4/>

* E - <http://www.nedopc.com/zxnetusb/zxnetusb.php>
 * F - <https://sites.google.com/site/interfacelbis/>
 *10 - <http://sif.itherm.cz/>
 *11 - http://cygnus.speccy.cz/popis_mhb8255.php
 *12 - <http://velesoft.speccy.cz/profi.htm>
 *13 - <http://nocash.emubase.de/zxdocs.htm>

Часть 1. Дешифрация адресов портов.

Part 1. Decoding address of ports.

PORT hex/dec	ADDRESS A15 ... A0	DECODING A15 ... A0	READ	WRITE
SYSTEM PORTS (real mode)				
#00/0	xxxxxxxx00000000	xxxxxxxx00000000	-	Reg(G)
		xxxxxxxx0xx00xx0	-	Pag(B,+B)
#000F/15	00000000000001111	00xxxxxxx00001111	-	Pag(N)
#5F/95	xxxxxxxx01011111	xxxxxxxx010xxxxx	-	Pag8255RgC0(+1)
#7E/126	xxxxxxxx01111110	xxxxxxxx0xxxxxx0	-	PagVid(5)
#007E-#FF7E	HGFEDCBA01111110	HGFEDCBA0xxxxxx0	-	Pal(D)
#F4/244	xxxxxxxx11110100	xxxxxxxx11110100	Pag(4,+4)	Pag(4,+4)
#F6/246	xxxxxxxx11110110	xxxxxxxxxxxxx0110	-	Brd(A)
#00F8-#0FF8	0000DCBA11111000	xxxxDCBA11111000	-	Pal(S)
#F9/249	xxxxxxxx11111001	xxxxxxxx11111001	INTStatusMid Key(S)	INT(S)
#FA/250	xxxxxxxx11111010	xxxxxxxx11111010	Pag(S)	Pag(S)
#FB/251	xxxxxxxx11111011	xxxxxxxx11111011	PagPal(S)	PagPal(S)
#FC/252	xxxxxxxx11111100	xxxxxxxx11111100	PagVidMid(S)	PagVidMid(S)
#FE/254	xxxxxxxx11111110	xxxxxxxxxxxxxxxxx0	Tp(1-3,7-9,D,-E) Pr(9)	BrdTpSp(1-3,7-9, D,-E)
		xxxxxxxxxxxxxxxxx0	-	BrdSp(E)
		xxxxxxxxxxxxxxxx110	Tp(A,F,+F)	BrdTpSp(A,F,+F)
		xxxxxxxxxxxx1xxx10	TpPrSer(C)	BrdTpSp(C)
		xxxxxxxxxxxx1xx110	TpPrSer(6)	BrdTpSp(6)
		xxxxxxxxxx1xxxxxx0	Tp(5)	BrdTpSp(5)
		xxxxxxxx1xx11xx0	Tp(B,+B)	BrdTpSp(B,+B)
		xxxxxxxx11111110	Tp(4,+4,N,S) SerStatus(S)	BrdTpSp(4,+4, N,S)MidVid(S)
#FF/255	xxxxxxxx11111111	xxxxxxxxxxxxxxxxxxx	Atr(1,+1,2,7,D,S)	-
		xxxxxxxxxxxxxxxx111	Atr(A)	-
		xxxxxxxxxxxx1xxx11	Atr(C)	-
		xxxxxxxxxxxx1xx111	Atr(6)	-
		xxxxxxxx11111111	#FF(4,+4)	Vid(4,+4)
#1FFD/8189	0001111111111101	0001xxxxxxxxxx0x	-	PagPr(3,+3) FD(+3)
		00xxxxxxxxxxxxx01	-	PagPr(9,-E)
		00xxxxxxxxxxxx101	-	PagPr(F,+F)
		00xxxxxxxx1xxx01	Trb-off(C)	PagPrSer(C)
		00x1xxxxxxxx1xx101	-	PagPrSer(6)
		0x0xx111xx1xxx01?	-	Pag(G)
#78FD/30973	0111100011111101	0x1xx000xx1xxx01?	Pag(G)	Pag(G)
#7AFD/31485	0111101011111101	0x1xx010xx1xxx01?	Pag(G)	Scrl(G)
#7CFD/31997	0111110011111101	0x1xx100xx1xxx01?	-	Scrl(G)
#7EFD/32509	0111111011111101	0x1xx110xx1xxx01?	Reg(G)	Pag(G)
#7F7E-#FE7E	HGFEDCBA01111110	HGFEDCBA0xx11xx0	Key(B,+B)	-
#7FFD/32765	0111111111111101	0xxxxxxxxxxxxxx0x	write bug(2)	Pag(2,7,8,D)

		0xxxxxxxxxxxxx01	-	Pag(E)
		0xxxxxxxxxxx11x0x	-	Pag(B,+B)
		0xxxxxx1xxxxxxxx0x	-	Pag(A)
		0x1xx111xx1xxx01?	-	Pag(G)
		01xxxxxxxxxxxxx0x	-	Pag(3,+3)
		01xxxxxxxxxxxxx01	-	Pag(9,-E)
		01xxxxxxxxxxxxx101	-	Pag(F,+F)
		01xxxxxxxx1xxx01	Trb-on(C)	Pag(C)
		01x1xxxxxxxx1xx101	-	Pag(6)
#7FFE-#FEFE	HGFEDCBA11111110	HGFEDCBAxxxxxx0	KeyTp(1-3,7-9,D,-E,E)Pr(9)	-
		HGFEDCBAxxxxx110	KeyTp(A,F,+F)	-
		HGFEDCBAxx1xxx10	KeyTpPrSer(C)	-
		HGFEDCBAxx1xx110	KeyTpPrSer(6)	-
		HGFEDCBA1xxxxxx0	KeyTp(5)	-
		HGFEDCBA1xx11xx0	KeyTp(B,+B)	-
		HGFEDCBA11111110	KeyTp(4,+4,N)	-
		xxxxxxxx11111110	KeyTpSerStatus(S)	-
#80FD/33021	1000000011111101	1x0xxxxxxxxx11x0x	-	CP/MPag(B,+B)
#DFFD/57341	1101111111111101	xx0xxxxxxxxxxxxx0x	-	Pag(7,D)
		1x0xx111xx1xxx01?	-	Pag(G)
#EFF7/61431	1110111111110111	1110xxxxxxxx0xxx	-	PagVidTrbReg(8)
		1110xxxxxxxx0xx1	-	PagVidTrbReg(E)
		1110111111110111	-	IODOS(F,+F)
#FFFE/65534	1111111111111110	1111111111111110	MouseTpSerStatus(S)	-

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PERIPHERALS PORTS (real mode)

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#10-#11	xxxxxxxx0001000A	xxxxxxxx0001000A	8251(N)	8251(N)
#10-#F0	xxxxxxxxCBA10000	xxxxxxxxCBA10000	IDEcs0:#x(F,+F)	IDEcs0:#x(F,+F)
#11/17	xxxxxxxx00010001	xxxxxxxxxxxxxx001	IDEdataHi(F,+F)	IDEdataHi(F,+F)
#18-#1B	xxxxxxxx000110BA	xxxxxxxx000110BA	8255(N)	8255(N)
#1B/27	xxxxxxxx00011x11	xxxxxxxx0xx11xx1	Pr(B,+B)	-
#1F/31	xxxxxxxx00011111	xxxxxxxxxxxxxxxxx1	Kjoy(9)	-
		xxxxxxxxxxxx0xxxxx	Kjoy(4)	-
		xxxxxxxxxxxx0xxxx1	Kjoy(E)	-
		xxxxxxxxxxxx0xxx11	KjoyWD1793(C)	-
		xxxxxxxxxxxx0xx111	KjoyWD1793(6)	-
		xxxxxxxxxxxx0xxxx111	Kjoy(F,+F)	-
		xxxxxxxxxxxx0xx11xx1	KjoyPr(B,+B)	-
		xx0xxxxxxxx0xxxxx1	Kjoy(-E)	-
#1F#3F#5F#7F	xxxxxxxx0BA11111	xxxxxxxx0BAxxxxx	8255(+1)	8255(+1)
		xxxxxxxx0BAxxxxx1	8255(5)	8255(5)
		xxxxxxxx0BAxxxx11	8255(7,D)	8255(7,D)
#57/87	xxxxxxxx01010111	xxxxxxxx01010111	SD SPIdata(+F)	SD SPIdata(+F)
#77/119	xxxxxxxx01110111	xxxxxxxx01110111	SD status(+F)	SD command(+F)
#7B/123	xxxxxxxx01111011	xxxxxxxx0xxxx0xx	LPRINTrom-off(8)	Pr(8,-E,E)
		xxxxxxxxxxxxxx011	-	Pr(A)
		xxxxxxxx0xx110x1	-	Pr(B,+B)
#80#81#82#83	xxxxxxxx100000BA	xxxxxxxx1xx000BA	CP/M WD1793(B,+B)	CP/MWD1793(B,+B)
#85/133	xxxxxxxx10000101	xxxxxxxx1xx00101	CP/MFDctrl(B,+B)	CP/MFDctrl(B,+B)
#C8/#E8	xxxxxxxx11A01000	xxxxxxxxCBA01000	IDEcs1:#6/#7(F,+F)	IDEcs1:#6(F,+F)
#00DF/223	0000000011011111	0000000011011111	VersionZXMC(F,+F)	-
#E0-E7	xxxxxxxx11100CBA	xxxxxxxx11100CBA	FD1 VL1772(S)	FD1 VL1772(S)
#00EF/239	0000000011101111	0000000011101111	VersionZXMC(F,+F)	-
#F0-F7	xxxxxxxx11110CBA	xxxxxxxx11110CBA	FD2 VL1772(S)	FD2 VL1772(S)
#F5/245	xxxxxxxx11110101	xxxxxxxx11110101	-	AYdat(+4)
#F6/246	xxxxxxxx11110110	xxxxxxxx11110110	AYdat(+4)	AYaddr(+4)
#00F6/#00F8	0000000011111AA0	xxxxxxx011111AA0	Pr(S)	Pr(S)
#00F7/247	0000000011110111	0000000011110111	VersionZXMC(F,+F)	-
#00F8/248	0000000011111000	xxxxxxx011111000	MidLPenX(S)	-

#FA/250	xxxxxxxx11111010	xxxxxxxxxxxxxxxx010	IO(A)	IO(A)
#FB/251	xxxxxxxx11111011	xxxxxxxxxxxxxxxx0xx	Pr(8,-E,E)	Pr(8,-E,E)
		xxxxxxxxxxxxxxxx011	Pr(A)	PrDAC(A)
		xxxxxxxx1xx110x1	-	Pr(B,+B)
		00xxxxxxxx1xxxx0xx	LPrintROM-on(8)	-
#FD/253	0000000011111101	xxxxxxxx11111101	MIDIIdat(S)	MIDIIdat(S)
#00FF/255	0000000011111111	xxxxxxx011111111	-	SAA1099dat(S)
#01F6/502	0000000111110110	xxxxxxx111110110	AYdatJoy(+4)	AYaddr(+4)
#01F8/504	0000000111111000	xxxxxxx111111000	LPenY(S)	-
#01FF/511	0000000111111111	xxxxxxx111111111	-	SAA1099addr(S)
#02F6/758	0000001011110110	xxxxxxx1x1110110	AYdatJoy(+4)	AYaddr(+4)
#0FFD/4093	0000111111111101	0000xxxxxxxxxxxx0x	Pr(3,+3)	Pr(3,+3)
#2FFD/12285	0010111111111101	0010xxxxxxxxxxxx0x	8272status(+3)	-
#3FFD/16381	0011111111111101	0011xxxxxxxxxxxx0x	8272data(+3)	8272data(+3)
#7DFD/32253	0111110111111101	0xxxxx0xxxxxxxx0x	ADC(A)	-
#7FFD/32765	0111111111111101	0xxxxxxx111xxx01	-	BDI on/off(7)
		0xxxxx1xxxxxxxx0x	IDE,ADC(A)	-
#80DF-#87DF	10000CBA11011111	10000CBA11011111	PCKey(F,+F)	-
#BFFD/49149	1011111111111101	10xxxxxxxxxxxx0x	AYdat(3,+3)	AYdat(2,3,+3)
		10xxxxxxxxxxxx01	-	AYdat(9,-E)
		10xxxxxxxxxxxx101	-	AYdat(F,+F)
		10xxxx1xxxxxxxx0x	-	AYdat(A)
		1x1xxxxxxxxxxxx0x	-	AYdat(E)
		101xxxxxxxxxxxx0x	-	AYdat(7,8,D)
		101xxxxxxxx1xx0x	-	AYdat(B,+B)
		101xxxxxxxx1xxx01	-	AYdat(C)
		1011xxxxxxxx1xx101	-	AYdat(6)
#E0EF-#E7EF	11100CBA11101111	11100CBA11101111	ZXMCRTC(F,+F)	ZXMCRTC(F,+F)
#E8EF/59631	1110100011101111	1110100011101111	multiplication	multiplication
			operand1(F,+F)	operand1(F,+F)
#E9EF/59887	1110100111101111	1110100111101111	multiplication	multiplication
			operand2(F,+F)	operand2(F,+F)
#EAEF/60143	1110101011101111	1110101011101111	multiplication	wr data(F,+F)
			outcome lo(F,+F)	
#EBEF/60399	1110101111101111	1110101111101111	multiplication	wr data(F,+F)
			outcome hi(F,+F)	
#ECEf-#EFEF	111011BA11101111	111011BA11101111	Reserved(F,+F)	Reserved(F,+F)
#F0EF-#F7EF	11110CBA11101111	11110CBA11101111	Reserved(F,+F)	Reserved(F,+F)
#EFFE/61438	1110111111111110	xxx0xxxxxxxxxxxx0	SJoy1(+2)	-
		xxx0xxx11111110	Sjoy1(S)	-
#F7FE/63486	1111011111111110	xxxx0xxxxxxxxxxxx0	SJoy2(+2)	-
		xxxx0xxx11111110	Sjoy2(S)	-
#F8EF-#FFEF	11111CBA11101111	11111CBA11101111	RS232(F,+F)	RS232(F,+F)
#FADF/64223	1111101011011111	1xx1x0x0xx0xx111	Kmou_B(-E)	-
		1111101011011111	Kmou_B(F,+F)	-
#FBDF/64479	1111101111101111	1xx1x0x1xx0xx111	Kmou_X(-E)	-
		1111101111101111	Kmou_X(F,+F)	-
#FFDD/65501	1111111111101101	xxxxxxxxxx0xxx01	-	Pr(C)
		xxxxxxxxxx0xx101	-	Pr(6)
#FFDF/65503	1111111111101111	1xx1x1x1xx0xx111	Kmou_Y(-E)	-
		1111111111101111	Kmou_Y(F,+F)	-
#FFFD/65533	1111111111111101	1xxxxxxxxxxxx0x	AYdat(2,3,+3)	AYaddr(2,3,+3)
		1xxxxxxxxxxxx01	AYdat(9,-E)	AYaddr(9,-E)
		1xxxxxxxxxxxx101	AYdat(F,+F)	AYaddr(F,+F)
		1xxxxx1xxxxxxxx0x	AYdat(A)	AYaddr(A)
		111xxxxxxxxxxxx0x	AYdat(7,8,D,E)	AYaddr(7,8,D,E)
		111xxxxxxxx1xx0x	AYdat(B,+B)	AYaddr(B,+B)
		111xxxxxxxx1xxx01	AYdat(C)	AYaddr(C)
		1111xxxxxxxx1xx101	AYdat(6)	AYaddr(6)

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SHADOW PORTS (shadow mode)

TR-DOS shadow mode

TR-DOS SHADOW MODE SYSTEM PORTS (* - old address, non recommended)

#77/119	xxxxxxx01110111	xxxxxxx0xx10111	-	VidTrbReg(A)
#7FFD/32765	011111111111101	xxxxxxxxxxxxxx0x	Pag(-E)	-
#xx77:	xLxxxxKJ01110111	xLxxxxKJ0xx10111	WRITE_ONLY(A)	L K J
#BD77/#FF77	(#0177-Soft port*)	xLxxxxK10xx10111	L,K=0->Pal,PLLFC,Shdw-on	0 0 1
#BF77/#FF77		xLxxxx110xx10111	L=0 ->Pal,PLLFC -on	0 1 1
#FD77/#FF77	(#4177-Soft port*)	x1xxxxK10xx10111	K=0 ->	Shdw-on 1 0 1
#FE77/#FF77		x1xxxx1J0xx10111	J=0>Pag-off,CP/Mrom>CPU0-3	1 1 0
#3FF7-#FFF7	BA11111111110111	BAxxxx111xx10111	-	RAMPagCPU0-3(A)
#FEE7/#FFE7	1111111A11100111	xxxxxxxAxxx00111	Reserved(A)	Reserved(A)

TR-DOS SHADOW MODE PERIPHERALS PORTS

Beta 128 Disk Interface (KP1818BГ93=WD1793=WD)

#1F#3F#5F#7F	xxxxxxx0BA11111	xxxxxxx0BAxxx11	WD(6-9,C-E,-E)	WD(6-9,C-E,-E)
		xxxxxxx0BAxxx11	WD(F,+F)	WD(F,+F)
		xxxxxxx0BAx11x1	WD(B,+B)	WD(B,+B)
		xxxxxxx0BA11111	WD(A)	WD(A)
#FF/255	xxxxxxx11111111	xxxxxxx1xxxxx11	WD(6-9,C-E,-E)	WD(6-9,C-E,-E)
			Kjoy(6,C)	
		xxxxxxx1xxx11x1	WD(B,+B)	Reg(B,+B)
		xxxxxxx1xx11111	WD(A)	RegPLLFC(A)
		xxxxxxx11111111	WD(F,+F)	Reg(F,+F)

ATM IDE

#2F/47	xxxxxxx00101111	xxxxxxx00101111	IDEerror(A)	IDEparam(A)
#4F/79	xxxxxxx01001111	xxxxxxx01001111	IDEsect(A)	IDEsect(A)
#6F/111	xxxxxxx01101111	xxxxxxx01101111	IDEstartsect(A)	IDEstartsect(A)
#8F/143	xxxxxxx10001111	xxxxxxx10001111	IDEcyl-lo(A)	IDEcyl-lo(A)
#AF/175	xxxxxxx10101111	xxxxxxx10101111	IDEcyl-hi(A)	IDEcyl-hi(A)
#CF/207	xxxxxxx11001111	xxxxxxx11001111	IDEdev/head(A)	IDEdev/head(A)
#EF/239	xxxxxxx11101111	xxxxxxx11101111	IDEstatus(A)	IDEcommand(A)
#000F-#FE0F	GFEDCBA00000111	GFEDCBA00000111	IDEdata-lo(A)	IDEdata-lo(A)
#010F-#FF0F	GFEDCBA10000111	GFEDCBA10000111	IDEdata-hi(A)	IDEdata-hi(A)

SMUC v.1.3 (Scorpion & MOA Universal Controller)

#18E6-#7FFE	0xx11xxx111xx110	0xx11xxx111xx110?IORQGE	IORQGE
#18E6-#7FFE	0ED11CBA111GF110	ISA:xx11hGFEDCBA=io8:#200-3FF	io8:#200-3FF
#5FBA/#7FBA	xxx11xxx101xx010	xxx11xxx101xx010?IORQGE	IORQGE
#DFBA/#FFBA			
#5FBA/24506	0101111110111010	0x011xxx101xx010 Version	-
#5FBE/#7EBE	xxx11xxx101xx110	xxx11xxx101xx110?IORQGE	IORQGE
#D8BE/#F8BE-#FFBE			
#5FBE/24510	0101111110111110	0x011xxx101xx110 Revision	-
#7EBE/32446	0111111010111110	0x111xx0101xx110 8259	8259
#7FBA/32698	0111111110111010	0x111xxx101xx010 VirtualFDD	VirtualFDD
#7FBE/32702	0111111110111110	0x111xx1101xx110 8259	8259
#D8BE/55486	1101100010111110	1x011xxx101xx110 IDEdata-hi	IDEdata-hi
#DFBA/57274	1101111110111010	1x011xxx101xx010 DS1685RTC	DS1685RTC
#F8BE-#FFBE	11111CBA10111110	1x111CBA101xx110 IDEcs0/cs1	IDEcs0/cs1
#FFBA/65466	1111111110111010	1x111xxx101xx010 SYS	SYS

IODOS shadow mode

IODOS SHADOW MODE PERIPHERALS PORTS

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#1F#3F#5F#7F  xxxxxxxx0BA11111  xxxxxxxx0BAxx111  WD1793(F,+F)      WD1793(F,+F)
#FF/255        xxxxxxxx11111111  xxxxxxxx11111111  WD1793(F,+F)      BDI Reg(F,+F)
#BFF7/49143    101111111110111  101111111110111  GlukRTCdat(F,+F)  GlukRTCdat(F,+F)
#DFF7/57335    110111111110111  110111111110111  -                 GlukRTCaddr(F,+F)
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Profi CP/M i/o modify mode (D5=1 #DFFD)

Profi CP/M PERIPHERALS PORTS (D4=0 #7FFD:i/o BDI-modify,i/o ZX & TR-DOS ROM-off)

```

-----
#1F#3F#5F#7F  xxxxxxxx0BA11111  xxxxxxxx0BAxxx11  WD1793(7,D)       WD1793(7,D)
#BF/191        xxxxxxxx10111111  xxxxxxxx101xxx11  WD1793(7,D)       Reg(7,D)
-----

```

Profi CP/M PERIPHERALS PORTS (D4=1 #7FFD:i/o ZX & i/o BDI-modify,TR-DOS ROM-off)

```

-----
#3F/63         xxxxxxxx00111111  xxxxxxxx001xxx11  BDI INTRQ,DRQ(D)  BDI Reg(D)
#83#A3#C3#E3   xxxxxxxx1BA00011  xxxxxxxx1BA00011  WD1793(D)         WD1793(D)
#87#A7#C7#E7   xxxxxxxx1BA00111  xxxxxxxx1BA00111  8255(D)           8255(D)
#8F#AF#CF#EF   xxxxxxxx1BA01111  xxxxxxxx1BA01111  8253(D)           8253(D)
#B3/179        xxxxxxxx10110011  xxxxxxxx10x10011  -                 Reg i/o INT(D)
#D3/#F3        xxxxxxxx11A10011  xxxxxxxx11A10011  8251(D)           8251(D)
#BF/191        xxxxxxxx10111111  xxxxxxxx1x111111  RTCdat(D)         RTCdat(D)
#DF/223        xxxxxxxx11011111  xxxxxxxx1x011111  -                 RTCadr(D)
#F8CB/63691    1111100011001011  xxxxxx00011001011  IDEdata-lo(D)     IDEdata-hi(D)
#F8EB/63723    1111100011101011  xxxxxx00011101011  IDEdata-hi(D)     IDEdata-lo(D)
#F9CB/63947    1111100111001011  xxxxxx00111001011  IDEerror(D)       -
#F9EB/63979    1111100111101011  xxxxxx00111101011  -                 IDEparam(D)
#FACB/64203    1111101011001011  xxxxxx01011001011  IDEsect(D)        -
#FAEB/64235    1111101011101011  xxxxxx01011101011  -                 IDEsect(D)
#FBCB/64459    1111101111001011  xxxxxx01111001011  IDEstartsect(D)   -
#FBEB/64491    1111101111101011  xxxxxx01111101011  -                 IDEstartsect(D)
#FCCB/64715    1111110011001011  xxxxxx10011001011  IDEcyl-lo(D)      -
#FCEB/64747    1111110011101011  xxxxxx10011101011  -                 IDEcyl-lo(D)
#FDCB/64971    1111110111001011  xxxxxx10111001011  IDEcyl-hi(D)      -
#FDEB/65003    1111110111101011  xxxxxx10111101011  -                 IDEcyl-hi(D)
#FE8B/65163    1111111010001011  xxxxxx11010001011  Reserved(D)       -
#FEAB/65195    1111111010101011  xxxxxx11010101011  -                 IDEaltcontrl(D)
#FECB/65227    1111111011001011  xxxxxx11011001011  IDEdev/head(D)    -
#FEEB/65259    1111111011101011  xxxxxx11011101011  -                 IDEdev/head(D)
#FF8B/65419    1111111110001011  xxxxxx11110001011  Reserved(D)       -
#FFCB/65483    1111111111001011  xxxxxx11111001011  IDEstatus(D)      -
#FFEB/65515    1111111111101011  xxxxxx11111101011  -                 IDEcommand(D)
-----

```

=====
ZX Spectrum line & compatible computers conceptions
=====

Chloe 280SE(CH) (Timex Computer TC2048/2068 clone) (*D)

```

-----
#1F/31         xxxxxxxx00011111  xxxxxxxxxxxx0xxxxx  Kjoy              -
#F4/244        xxxxxxxx11110100  xxxxxxxx11110100  Pag              Pag
#F5/245        xxxxxxxx11110101  xxxxxxxx11110101  -                AYdat
#F6/246        xxxxxxxx11110110  xxxxxxxx11110110  AYdat            AYaddr
#FE/254        xxxxxxxx11111110  xxxxxxxx11111110  Tp              BrdTpSp
#FF/255        xxxxxxxx11111111  xxxxxxxx11111111  #FF             Vid
#7FFD/32765    0111111111111101  0xxxxxxxxxxxxx1x0x  -                Pag
#7FFE-#FEFE    HGFEDCBA11111110  HGFEDCBA11111110  KeyTp           -
#BF3B/48955    1011111100111011  1011111100111011  -                Reg
#BFFD/49149    1011111111111101  10xxxxxxxxxxxx1x0x  -                AYdat
#FF3B/65339    1111111100111011  1111111100111011  Data            Data
#FFFD/65533    1111111111111101  11xxxxxxxxxxxx1x0x  AYdat           AYaddr
-----

```

ZX-Poly(ZP) by Igor Maznitsa(16 color per pixel 4xCPU ZX Spectrum 128 clone)(*8)

#1F/31	xxxxxxxx00011111	xxxxxxxx00011111	Kjoy	-
#FE/254	xxxxxxxx11111110	xxxxxxxxxxxxxxxx0	Tp	BrdTpSp
#00FF/255	0000000011111111	0000000011111111	Status	Reg
#01FF/511	0000000111111111	0000000111111111	-	Reg
#02FF/767	0000001011111111	0000001011111111	-	Data/AddrLow
#03FF/1023	0000001111111111	0000001111111111	-	Data/AddrHigh
#3D00/15616	0011110100000000	0011110100000000	Status	Reg
#7FFD/32765	0111111111111101	01xxxxxxxxxxxx0x	-	PagINTlock
#7FFE-#FEFE	HGFEDCBA11111110	HGFEDCBAxxxxxx0	KeyTp	-

ULA+(U) (64 color palette ZX Spectrum clone) (*B)

#FE/254	xxxxxxxx11111110	xxxxxxxxxxxxxxxx0	Tp	BrdTpSp
#FF/255	xxxxxxxx11111111	xxxxxxxxxxxxxxxx	Atr	-
#7FFE-#FEFE	HGFEDCBA11111110	HGFEDCBAxxxxxx0	KeyTp	-
#BF3B/48955	1011111100111011	1011111100111011	-	Reg
#FF3B/65339	1111111100111011	1111111100111011	Data	Data

ZX Spectrum PERIPHERALS DEVICES PORTS

#0B/#6B	xxxxxxxx0AA01011	xxxxxxxx0Ax01011	Z80DMA	Z80DMA	*1
#0E/14	xxxxxxxx00001110	xxxxxxxx0000xxxx	PC<->ZXDrBeep	PC<->ZXDrBeep	*2
#1F/31	xxxxxxxx00011111	xxxxxxxx000xxxxx	KempstonIF	-	*13
		xxxxxxxx0xxxxxx1	Kempston-M	-	*1
		xxxxxxxx00011111	AMIGA-MOUSE	-	*1
#3F/63	xxxxxxxx00111111	xxxxxxxx0xxxxxx	LIGHT PEN	-	*1
#007F/#017F	0000000A01111111	xxxxxxxxA0111x1xx	I2cIF PCF8584	I2cIF PCF8584	*6
#B7/183	xxxxxxxx10110111	xxxxxxxx10110111	XTR modem	XTR modem	
#EF/239	xxxxxxxx11101111	xxxxxxxx1xx01xxx	C-DOS modem	C-DOS modem	
#EF/239	xxxxxxxx11101111	xxxxxxxx1110xxxx	-	ISO ROM 128	*9
#F7/247	xxxxxxxx11110111	xxxxxxxxxxxx0xxx	-	DIGITIZER(VMG)	

SIF (Serial InterFace True RS232 & ETHERNET & WiFi)(cba - jumpers selected)(*10)

#0003-#001F	00000000cbaCBA11	00000000000CBA11	16C650SerialPort	16C650SerialPort
#0023-#003F	00000000cbaCBA11	00000000001CBA11	16C650SerialPort	16C650SerialPort
#0043-#005F	00000000cbaCBA11	00000000010CBA11	16C650SerialPort	16C650SerialPort
#0063-#007F	00000000cbaCBA11	00000000011CBA11	16C650SerialPort	16C650SerialPort
#0083-#009F	00000000cbaCBA11	00000000100CBA11	16C650SerialPort	16C650SerialPort
#00A3-#00BF	00000000cbaCBA11	00000000101CBA11	16C650SerialPort	16C650SerialPort
#00C3-#00DF	00000000cbaCBA11	00000000110CBA11	16C650SerialPort	16C650SerialPort
#00E3-#00FF	00000000cbaCBA11	00000000111CBA11	16C650SerialPort	16C650SerialPort

MB-02+(*3)

#0003-#0F03	0000DCBA00000011	xxxxDCBA0xx00011	RTC-72421	RTC-72421
#07/11	xxxxxxxx00000111	xxxxxxxx0xx00111	IDEcontrol	IDEcontrol
#0B/11	xxxxxxxx00001011	xxxxxxxx0xx01011	Z80DMA	Z80DMA
#0F#2F#4F#6F	xxxxxxxx0BA01111	xxxxxxxx0BA01111	WD2797	WD2797
#13/19	xxxxxxxx00010011	xxxxxxxx0xx10011	FDcontrol	-
		xxxxxxxx00010011	-	FDcontrol
#17/23	xxxxxxxx00010111	xxxxxxxx0xx10111	memsel	memsel
#1B#3B#5B#7B	xxxxxxxx0BA11011	xxxxxxxx0BA11011	8255-2	8255-2
#1F#3F#5F#7F	xxxxxxxx0BA11111	xxxxxxxx0BA11111	8255-1	8255-1
#A3-#BF	xxxxxxxx101CBA11	xxxxxxxx101CBA11	IDEcs0:#x	IDEcs0:#x

RTC MODULE v.03 for DIVIDE 57b/c/d/d2/d3(*1)(decoding:J3,J4-sel RTC, B8-sel Joy)

#0003-#0F03	0000DCBA00000011	xxxxDCBA00000011	RTC-72421	RTC-72421
#1F/31	xxxxxxxx00011111	xxxxxxxx0x011111	Kjoy	-
#1F/31	xxxxxxxx00011111	xxxxxxxx00011111	Kjoy	-
#703B-#7F3B	0111DCBA00111011	0111DCBA00111011	RTC-72421	RTC-72421
#C0EF-#CFEF	1100DCBA11101111	1100DCBA11101111	RTC-72421	RTC-72421

Cheetah Sweet Talker(*13)

#0007/07	00000000000000111	0000000000000111?	-	SP0256-AL2
----------	-------------------	-------------------	---	------------

SOUNDRIVE v1.02

#0F/#1F	xxxxxxxx00001111	xxxxxxxx00A1111	-	SLA/SLB
#2F/#3F	xxxxxxxx001A1111	xxxxxxxx01A1111	-	L Rg C/L Rg8255
#4F/#5F	xxxxxxxx01001111	xxxxxxxx10A1111	-	SRA/SRB
#6F/#7F	xxxxxxxx011A1111	xxxxxxxx11A1111	-	R Rg C/R Rg8255

SOUNDRIVE v1.05 (SOUNDRIVE(*), COVOX(+))

#0F#1F#4F#5F*xxxxxxxx0B0A1111	xxxxxxxxB0Axxx1	-	SLA,SLB,SRA,SRB
#B3/179	+xxxxxxxx10110011	xxxxxxxxxxxx0011	SLB (GS)
#DD/221	*xxxxxxxx11011101	xxxxxxxx101xxx1	SRB (Scorpion)
#FB/251	+xxxxxxxx11111011	xxxxxxxxxxxx1011	SRB

SOUNDRIVE v1.51 (SOUNDRIVE(*), COVOX(+))

#0F#1F#4F#5F*xxxxxxxx0B0A1111	xxxxxxxxB0Ax1x1	-	SLA,SLB,SRA,SRB
#B3/179	+xxxxxxxx10110011	xxxxxxxxxxxx0011	SLB (GS)
#DD/221	*xxxxxxxx11011101	xxxxxxxx101x1x1	SRB (Scorpion)
#FB/251	+xxxxxxxx11111011	xxxxxxxxxxxx1011	SRB

SOUNDRIVE v1.52 (SOUNDRIVE(*), COVOX(+))

#0F#1F#4F#5F*xxxxxxxx0B0A1111	xxxxxxxxB0Ax111	-	SLA,SLB,SRA,SRB
#3F/63	*xxxxxxxx00111111	xxxxxxxx011x111	SLB (Profi)
#B3/179	+xxxxxxxx10110011	xxxxxxxxxxxx0011	SLB (GS)
#FB/251	+xxxxxxxx11111011	xxxxxxxxxxxx1011	SRB

SOUNDRIVE v1.53 (SOUNDRIVE(*), COVOX(+))

#0F#1F#4F#5F*xxxxxxxx0B0A1111	xxxxxxxxB0A1111	-	SLA,SLB,SRA,SRB
#3F/63	*xxxxxxxx00111111	xxxxxxxx0111111	SLB (Profi)
#B3/179	+xxxxxxxx10110011	xxxxxxxx1xxx0011	SLB (GS)
#FB/251	+xxxxxxxx11111011	xxxxxxxx1xxx1011	SRB

SOUNDRIVE v1.54 (SOUNDRIVE(*), COVOX(+))

#0F/#1F	*xxxxxxxx000A1111	xxxxxxxx00A1111	L Rg A/L Rg B	SLA/SLB
#2F/#3F	*xxxxxxxx001A1111	xxxxxxxx01A1111	L Rg C/ -	L Rg C/L Rg8255
#4F/#5F	*xxxxxxxx010A1111	xxxxxxxx10A1111	R Rg A/R Rg B	SRA/SRB
#6F/#7F	*xxxxxxxx011A1111	xxxxxxxx11A1111	R Rg C/ -	R Rg C/R Rg8255
#B3/179	+xxxxxxxx10110011	xxxxxxxx1xxx0011	L Rg B	SLB (GS)
#FB/251	+xxxxxxxx11111011	xxxxxxxx1xxx1011	R Rg B	SRB

SOUNDRIVE v1.6 (SOUNDRIVE(*)/COVOX(+))

#0F#1F#4F#5F*xxxxxxxx0B0A1111	xxxxxxxxB0Ax1x1	-	SLA,SLB,SRA,SRB
#79#7B#F9#F+BxxxxxxxxB11110A1	xxxxxxxxBx1xx0A1	-	SLA,SLB,SRA,SRB
#B3/179	+xxxxxxxx10110011	xxxxxxxx1x1xx011	SRB (GS)
#DD/221	*xxxxxxxx11011101	xxxxxxxx101x1x1	SRB (Scorpion)

Ultra SOUNDRIIVE v1.666 (Ultra: sound(S)/volume(V), SOUNDRIIVE(*), COVOX(+))

#0F#1F#4F#5F*	xxxxxxxx0B0A1111	xxxxxxxxBxA1111	-	SLA,SLB,SRA,SRB
#3F/63	*xxxxxxxx00111111	xxxxxxxx0x11111	-	SLB (Profi)
#45/#55/#59/ /#5D/#DD	xxxxxxxx10xxx01	xxxxxxxx10xxx01	IORQGE	IORQGE
#45/#55	Vxxxxxxxx010A0101	xxxxxxxx10A0101	-	VRA,VRB
#4F/#5F	Sxxxxxxxx010A1111	xxxxxxxx1xA1111	-	SRA,SRB
#59/#5B	Vxxxxxxxx010110A1	xxxxxxxx010xx0A1	-	VLA,VLB
#79/#F9	xxxxxxxxB1111001	xxxxxxxx1xx001	IORQGE	IORQGE
#79/#7B	Sxxxxxxxx011110A1	xxxxxxxx0x1xx0A1	-	SLA,SLB
#79#7B#F9#FB+	xxxxxxxxB11110A1	xxxxxxxxBx1xx0A1	-	SLA,SLB,SRA,SRB
#B3/179	xxxxxxxx10110011	xxxxxxxx1x0011	IORQGE	IORQGE
#B3/179	+xxxxxxxx10110011	xxxxxxxx1x1xx011	-	SRB (GS)
#DD/221	*xxxxxxxx11011101	xxxxxxxx1011101	-	SRB (Scorpion)
#xx5D	HGFEDCBA01011101	xxxxxxxx10x1x01	XiMera expander	XiMera expander

ZXM-SoundCard Middle (*C)

#0F#1F#4F#5F	xxxxxxxx0B0A1111	xxxxxxxx0B0A1111	-	SLA,SLB,SRA,SRB
#3F/63	xxxxxxxx00111111	xxxxxxxx00111111	-	SLB (Profi)
#B3/179	xxxxxxxx10110011	xxxxxxxx10110011	-	SRB (GS)
#FB/251	xxxxxxxx11111011	xxxxxxxx11111011	-	SRB (Covox)
#04FF/1279	0000010011111111	00xx010011111111	-	SAA1099 Data
#05FF/1535	0000010111111111	00xx010111111111	-	SAA1099 Address
#FFFD/65533	1111111111111101	11xxxxx11111101	-	Control

ZXM-SoundCard Extreme rev.01 (*C)(JP3:off/on-(*))/(+))

#0F#1F#4F#5F	xxxxxxxx0B0A1111	xxxxxxxx0B0A1111	-	SLA,SLB,SRA,SRB
#3F/63	xxxxxxxx00111111	xxxxxxxx00111111	-	SLB (Profi)
#FB/251	xxxxxxxx11111011	xxxxxxxx11111011	-	SRB (Covox)
#04FF/1279	0000010011111111	00xxxxx01111111*	-	SAA1099 Data
		00xx010011111111+	-	SAA1099 Data
#05FF/1535	0000010111111111	00xxxxx11111111*	-	SAA1099 Address
		00xx010111111111+	-	SAA1099 Address
#BFFD/49149	1011111111111101	10xxxxx11111101	-	AY Data
#FFFC/65532	1011111111111100	1011xxxx11111100	-	Control
#FFFD/65533	1111111111111101	11xxxxx11111101	IORQGE incorrect	-
#FFFD/65533	1111111111111101	11xxxxx11111101	AY Data	AY Address

NemoIDE

#10-#F0	xxxxxxxxxxxxx00x	xxxxxxxxxxxxx00x	IORQGE	IORQGE
#10-#F0	xxxxxxxxCBA10000	xxxxxxxxCBA10000	IDEcs0:#x	IDEcs0:#x
#11/17	xxxxxxxx00010001	xxxxxxxxxxxxx001	IDEdata-hi	IDEdata-hi
#C8/#E8	xxxxxxxx11A01000	xxxxxxxxCBA01000	IDEcs1:#6/#7	IDEcs1:#6

Z-CONTROLLER by Alexey Zhabin (*7)

#10-#F0	xxxxxxxxxxxxx00x	xxxxxxxxxxxxx00x?	IORQGE	IORQGE
#10-#F0	xxxxxxxxCBA10000	xxxxxxxxCBA10000?	IDEcs0:#x	IDEcs0:#x
#11/17	xxxxxxxx00011001	xxxxxxxxxxxxx001?	IDEdata-hi	IDEdata-hi
#57/#77	xxxxxxxx01x10111	xxxxxxxx01x10111?	IORQGE	IORQGE
#57/87	xxxxxxxx01010111	xxxxxxxx01010111?	SD SPIdata	SD SPIdata
#77/119	xxxxxxxx01110111	xxxxxxxx01110111?	SD status	SD command
#C8/#E8	xxxxxxxx11A01000	xxxxxxxxCBA01000?	IDEcs1:#6/#7	IDEcs1:#6
#DF/223	xxxxxxxx11011111	xxxxxxxx11011111?	IORQGE	-
#EF/239	xxxxxxxx11101111	xxxxxxxx11101111?	IORQGE	-
#F7/247	xxxxxxxx11110111	xxxxxxxx11110111?	IORQGE	-
#FE/254	xxxxxxxx11111110	xxxxxxxx11111110?	IORQGE	-

#FE/254	xxxxxxxx11111110	xxxxxxxxxxxxxxxx0?Key	-
#FADF/64223	1111101011011111	1111101011011111?K mou_B	-
#FBDF/64479	1111101111011111	1111101111011111?K mou_X	-
#FFDF/65503	1111111110111111	1111111110111111?K mou_Y	-

NemoIDE-A8

#0010-#FF10	xxxxxxxxxxxx000	xxxxxxxxxxxx000	IORQGE	IORQGE
#0010-#FE10	GFEDCBA000010000	GFEDCBA000010000	IDEdata-lo	IDEdata-lo
#0110-#FF10	GFEDCBA100010000	GFEDCBA1xxxxx000	IDEdata-hi	IDEdata-hi
#7FFD/32765	011111111111101	0xxxxxxxxxxxxx0x	D6-INTRQ	-
#FE30-#FEF0	11111110CBA10000	xxxxxxx0CBA10000	IDEcs0:#x	IDEcs0:#x
#FEC8/#FEE8	1111111011A01000	xxxxxxx0CBA01000	IDEcs1:#6/#7	IDEcs1:#6

PROFI INTERFACE by VELESOFT(*12)

#17/23	xxxxxxxx00010111	xxxxxxxx00010111	-	MB02/divIDEmode
#E3/227	xxxxxxxx11100011	xxxxxxxx11100011	-	divIDEcontrol
#00EF/239	0000000011101111	0000000011101111	-	ZX mode
#01EF/495	0000000111101111	0000000111101111	-	Interface mode
#02EF/751	0000001011101111	0000001011101111	-	ROMPag
#03EF/1007	0000001111101111	0000001111101111	-	FAST,ROMEMUL
#04EF/1263	0000010011101111	0000010011101111	-	Clear RESET
#1FFD/8189	0001111111111101	0001111111111101	-	CPU3 Pag(6)
#7FFD/32765	0111111111111101	0xxxxxxxxxxxxx0x	ZX128 write bug	CPU3 Pag(2)
		0xxxxxxxxxxxxx0x	-	CPU3 Pag(7)
		01xxxxxxxxxxxxx0x	-	CPU3 Pag(E)
		01xxxxxx11111101	-	CPU3 Pag(6)
#80FD/33021	1000000011111101	1000000011111101	ZX mode	-
#81FD/33277	1000000111111101	1000000111111101	Interface mode	-
#82FD/33533	1000001011111101	1000001011111101	ROMPag	-
#83FD/33789	1000001111111101	1000001111111101	FAST,ROMEMUL	-
#84FD/34045	1000010011111101	1000010011111101	divIDEcontrol	-
#85FD/34301	1000010111111101	1000010111111101	CPU3Pag,D3,D4#7FFD	-
#86FD/34557	1000011011111101	1000011011111101	Status	-
#87FD/34813	1000011111111101	1000011111111101	Version=#81	-
#DFFD/57341	1101111111111101	1101111111111101	-	CPU3 Pag(7)
#BFFD/49149	1011111111111101	10xxxxxxxxxxxxx0x	-	AYdat(2,E)
		101xxxxxxxxxxxxx0x	-	AYdat(7)
		10xxxxxx11111101	-	AYdat(6)
#EFF7/61431	1110111111110111	1110111111110111	-	RAM1024/128k(E)
#FFFD/65533	1111111111111101	11xxxxxxxxxxxxx0x	AYdat(2,E)	AYaddr(2,E)
		111xxxxxxxxxxxxx0x	AYdat(7)	AYaddr(7)
		11xxxxxx11111101	AYdat(6)	AYaddr(6)

DISciPLE

#1B#5B#9B#DB	xxxxxxxxBA011011	xxxxxxxxBA0x1011	WD1772	WD1772
#1F/31	xxxxxxxx00011111	xxxxxxxx000x1111	Kjoy,Busy,Net	Control,Net
#3B/59	xxxxxxxx00111011	xxxxxxxx001x1011	-	NetWAIT
#7B/123	xxxxxxxx01111011	xxxxxxxx011x1011	boot-on	boot-off
#BB/187	xxxxxxxx10111011	xxxxxxxx101x1011	patch-on	patch-off
#FB/251	xxxxxxxx11111011	xxxxxxxx111x1011	-	LPTdata
#EFFE/61438	1110111111111110	xxx0xxx111x1110	Right SJoy	-
#F7FE/63486	1111011111111110	xxx0xxx111x1110	Left SJoy	-

UR-4 (*11)

#1F#3F#5F#7F	xxxxxxxx0BA11111	xxxxxxxx0BAxxxxx	8255	8255
--------------	------------------	------------------	------	------

ZXMMC+ (*4)

#1F/31	xxxxxxxx00011111	xxxxxxxx00011111	Kjoy	CScard
#3F/63	xxxxxxxx00111111	xxxxxxxx00111111	SPIRegRX	SPIRegTX
#5F/95	xxxxxxxx01011111	xxxxxxxx01011111	RS232status	-
#7F/127	xxxxxxxx01111111	xxxxxxxx01111111	RS232RegRX	RS232RegTX

Interface lbis v.4b by Dan Antohi(*F)

#1F/31	xxxxxxxx00011111	xxxxxxxx00011111	Kjoy	-
#3F/63	xxxxxxxx00111111	xxxxxxxx00111111	Pag-on,B28bus=Z	RAM=SOS,WR-off
#5F/95	xxxxxxxx01011111	xxxxxxxx01011111	Status	-
#7F/127	xxxxxxxx01111111	xxxxxxxx01111111	-	SOSROM>CPU0
#9F/159	xxxxxxxx10011111	xxxxxxxx10011111	SD SPIdata	SD SPIdata
#BF/191	xxxxxxxx10111111	xxxxxxxx10111111	Pag-off,B28bus=0	RAM=IFlbOS,WR-on
#FF/255	xxxxxxxx11111111	xxxxxxxx11111111	-	IFlbisRAM>CPU0
#FADF/64223	1111101011011111	1111101011011111	Kmou_B	-
#FBDF/64479	1111101111011111	1111101111011111	Kmou_X	-
#FFDF/65503	1111111111011111	1111111111011111	Kmou_Y	-

Multiface 1

#1F/31	xxxxxxxx00011111	xxxxxxxx001xx1x	ROM/RAM-off,Kjoy	NMI-reset
#9F/159	xxxxxxxx10011111	xxxxxxxx1001xx1x	ROM/RAM-on	-

Jessa i/o (RS232 & Kempston Joystick v.1.0) by Sami Vehmaa (*6)

#1F/31	xxxxxxxx00011111	xxxxxxxx0001x1xx	Kjoy	-
#00AF-#08AF	00000CBA10101111	xxxxxCBA1010x1xx	82450SerialPort	82450SerialPort

MIO-SC (MIO-Scorpion)

#1F/#DF	xxxxxxxx00011111	xxxxxxxxxxx0xx111?	IORQGE	-
#1F/31	xxxxxxxx00011111	xxxxxxxx0x0xx111?	Kjoy	-
#FE/254	xxxxxxxx11111110	xxxxxxxx1x1xx110?	IORQGE	-
#FE/254	xxxxxxxx11111110	xxxxxxxx1x1xx110?	Key	-
#FADF/64223	1111101011011111	xxxxx0x01x0xx111?	Kmou_B	-
#FBDF/64479	1111101111011111	xxxxx0x11x0xx111?	Kmou_X	-
#FFDF/65503	1111111111011111	xxxxx1x11x0xx111?	Kmou_Y	-

K-MOUSE Turbo 2008(Kempston mouse by VELESOFT A=0/1, B=1/0 -> SLAVE/MASTER)(*1)

#1F/#7F	xxxxxxxx0BB11111	xxxxxxxx0BB11111	Fjoy/A-MOUSE	-
#0ADF/#FADF	AAAA101011011111	Axxxx0x011011111	KmouTrb_B	-
#0BDF/#FBDF	AAAA101111011111	Axxxx0x111011111	KmouTrb_X	-
#0EDF/#FEDF	AAAA111011011111	Axxxx1x011011111	#7FFD	-
#0FDF/#FFDF	AAAA111111011111	Axxxx1x111011111	KmouTrb_Y	-
#3EDF/16095	0011111011011111	0xxxx1x011011111	-	K-MOUSE:off/on
#7FFD/32765	0111111111111101	0xxxxxxxxxxxxxx0x	ZX128 write bug	Pag

K-MOUSE Turbo 2011(Kempston mouse by VELESOFT A=0/1, B=1/0 -> SLAVE/MASTER)(*1)

#1F/#7F	xxxxxxxx0BB11111	xxxxxxxx0BB11111	Fjoy/ /Kjoy or A-MOUSE	-
#0ADF/#FADF	AAAA101011011111	xxxAx0x011011111	KmouTrb_B	-
#0BDF/#FBDF	AAAA101111011111	xxxAx0x111011111	KmouTrb_X	-
#0EDF/#FEDF	AAAA111011011111	xxxAx1x011011111	Version=#80	-
#0FDF/#FFDF	AAAA111111011111	xxxAx1x111011111	KmouTrb_Y	-
#3EDF/16095	0011111011011111	xxxxxxxx11011111	-	K-MOUSE:off/on
#EFDE/#FBFE	111B11A111111101	xxx0xxxxxxxxxxx0	/Sjoy1/ /xxxxx0xxxxxxxxxx0	-
			/QWERT Joystick	
#FEFE/65247	1111111101111110	xxxxxxxx0xxxxxxxxx0	C,V/Z,X=Fire2,3	-

8 bit IDE by Pera Putnik (*5)

```

-----
#2B-#EF      xxxxxxxxCB101A11 xxxxxxxxCBx0xAxx IDEcs0:#x      IDEcs0:#x
-----

NeoGS (NEO GENERAL SOUND)
-----
#33/51      xxxxxxxx00110011 xxxxxxxx00110011 IORQGE incorrect IORQGE incorrect
#33/51      xxxxxxxx00110011 xxxxxxxx00110011      -      Reset,NMI,LED
#B3/#BB      xxxxxxxx1011x011 xxxxxxxx1011x011 IORQGE incorrect IORQGE incorrect
#B3/179      xxxxxxxx10110011 xxxxxxxx10110011 Data      Data
#BB/187      xxxxxxxx10111011 xxxxxxxx10111011 Status      Comnd
-----

ZXM-GeneralSound (*C)
-----
#33/51      xxxxxxxx00110011 xxxxxxxx00110011      -      Disable GS
#B3/#BB      xxxxxxxx1011x011 xxxxxxxx1011x011 IORQGE incorrect      -
#B3/179      xxxxxxxx10110011 xxxxxxxx10110011 Data      Data
#BB/187      xxxxxxxx10111011 xxxxxxxx10111011 Status      Comnd
-----

Multiface 128 v.36
-----
#3F/63      xxxxxxxx00111111 xxxxxxxx0011x1xx ROM/RAM-off      NMI-reset
#BF/191      xxxxxxxx10111111 xxxxxxxx1011x1xx ROM/RAM-on,      NMI-reset
                                         D3#7FFD,A15blk
#7FFD/32765  0111111111111101 0xxxxxxxxxxxxxx0x      -      D3#7FFD
-----

Multiface 3 (*13)
-----
#3F/63      xxxxxxxx00111111 xxxxxxxx0011x1xx?ROM/RAM-on,A15blkNMI-reset
#BF/191      xxxxxxxx10111111 xxxxxxxx1011x1xx?ROM/RAM-off      NMI-reset
#1F3F/7999   0001111100111111 0001xxxx0011x1xx?#1FFD      -
#1FFD/8189   0001111111111101 0001xxxxxxxxxx0x?      -      #1FFD
#7F3F/32575  0111111100111111 01xxxxxx0011x1xx?#7FFD      -
#7FFD/32765  0111111111111101 01xxxxxxxxxxxxxx0x?      -      #7FFD
-----

ZXMEM (Memory extender 256kb-32Mb v.1.0) by Sami Vehmaa (*6)
-----
#005F/95     xxxxxxxx001011111 xxxxxxxx00101x1xx      -      SRAM Pag 16kb
#015F/351    xxxxxxxx101011111 xxxxxxxx10101x1xx      -      SRAM Pag 256kb
-----

ZXM-LanCard (*C)
-----
#67/103      xxxxxxxx01100111 xxxxxxxx01100111 IORQGE      IORQGE
#67/103      xxxxxxxx01100111 xxxxxxxx01100111 Control      Status
-----

ZX LPRINT-III PIO & SIO Interfase
-----
#7B/123      xxxxxxxx01111011 xxxxxxxx0xxxx0xx ROMCS-off      STROBE
#FB/251      xxxxxxxx11111011 xxxxxxxx1xxxx0xx      -      DATA(TxD)
                                         00xxxxxx1xxxx0xx ROMCS-on,BUSY,DSR      -
-----

MoonSound (MSX OPL4)
-----
#7C-#7F      xxxxxxxx011111BA xxxxxxxx011111BA PCM      PCM
#C4-#C7      xxxxxxxx110001BA xxxxxxxx011111BA FM      FM
-----

DK'Tronics Speech Synthesiser(*13)
-----
#7F/127      xxxxxxxx01111111 xxxxxxxx01111111?Speech status      SP0256-AL2
-----

MOREX PIO & SIO Interfase
-----
#7F/127      xxxxxxxx01111111 xxxxxxxx0xxxx1xx      -      STROBE,TxD,RTS

```

#FB/251 xxxxxxxx11111011 xxxxxxxx1xxxx0xx BUSY,DSR,RxD DATA

CDOS Interface (KP1818BГ93=WD1793=WD)

#007F/127 0000000011111111 xxxxxxx00011xxxx ROMdiskData -
#017F-#027F 000000BA01111111 xxxxxxxBA011xxxx - ROMdiskControl
#037F/895 000000BA01111111 xxxxxxxBA011xxxx - 8255 control
#00E3-#00EF 000000001110BA11 xxxxxxxxxxx0BAxx WD WD
#00F3/243 0000000011110011 xxxxxxxxxxx100xx - FDCReg
#00F7/247 0000000011110111 xxxxxxxxxxx101xx LPT LPT
#FEBF/65215 1111111010111111 1111111010111111 DS1685Data DS1685Data
#FFBF/65471 1111111101111111 1111111101111111 - DS1685Address

D40/80 (Didaktik 40/80)

#81#83#85#87 xxxxxxx10000BA1 xxxxxxx10000BA1 WD2797 WD2797
#89#8B#8D#8F xxxxxxx10001xx1 xxxxxxx10001xx1 - FDSys
#91/145 xxxxxxx10010001 xxxxxxx10010xx1 - 8255 off & reset
#99/153 xxxxxxx10011001 xxxxxxx10011xx1 - 8255 on
#1F#3F#5F#7F xxxxxxx0BA11111 xxxxxxx0BAxxxxx 8255 8255

MIDI-SC (MIDI-Scorpion)

#83-#9B xxxxxxx100xx011 xxxxxxx100xx011? IORQGE IORQGE
#83-#9B xxxxxxx100BA011 xxxxxxx100BA011? 8253 8253
#A3/#AB xxxxxxx1010x011 xxxxxxx1010x011? IORQGE IORQGE
#A3/#AB xxxxxxx1010A011 xxxxxxx101xA011? 8251 8251

Fuller Orator / Fuller Box Master Unit(*13)

#9F/159 xxxxxxx10011111 xxxxxxx10011111? - SP0256-AL2
#BF/191 xxxxxxx10111111 xxxxxxx10111111? Speech status -

divIDE (*1)

#A3-#BF xxxxxxx101CBA11 xxxxxxx101CBA11 IDEcs0:#x IDEcs0:#x
#E3/227 xxxxxxx11100011 xxxxxxx11100011 - divIDEcontrol

ZXNET & USB (*E)

#AB/171 xxxxxxx10101011 xxxxxxx10101011 IORQGE incorrect IORQGE incorrect
#00AB-#7FAB 0xxxxxxx10101011 0xxxxxxx10101011 sl811Data/W5300 sl811Data/W5300
#80AB/32939 1000000010101011 1x0xxx0010101011 sl811Address sl811Address
#81AB-#83AB 100000BA10101011 1x0xxxBA10101011 sl811Control sl811Control

GENERAL SOUND

#B3/#BB xxxxxxx1011x011 xxxxxxx1011x011 IORQGE incorrect -
#B3/179 xxxxxxx10110011 xxxxxxx10110011 Data Data
#BB/187 xxxxxxx10111011 xxxxxxx10111011 Status Command

ZXCF INTERFACE v1.41 by Sami Vehmaa (*6)

#00BF-#0FBF 0000DCBA10111111 xxx0DCBA101111xx 8bit CF IF 8bit CF IF
#10BF/4287 0001000010111111 xxx1xxxx101111xx - SRAM Pag

+D (Issue 4)

#E3#EB#F3#FB xxxxxxx111BA011 xxxxxxx11BA01x WD1772 WD1772
#E7/231 xxxxxxx11100111 xxxxxxx1110011x patch-on patch-off
#EF/239 xxxxxxx11101111 xxxxxxx1110111x - FDSys,LPTstrobe
#F7/247 xxxxxxx11110111 xxxxxxx1110111x LPTbusy LPTdata

ZX Interface 1

#0001-#FFFF	xxxxxxxxxxxxxxxx1	xxxxxxxxxxxxxxxx1	IORQGE	IORQGE
#E7/231	xxxxxxxx11100111	xxxxxxxxxxxx00xx1	Microdrive Data	Microdrive Data
#EF/239	xxxxxxxx11101111	xxxxxxxxxxxx01xx1	Status,DSR	Comnd,RTS
#F7/247	xxxxxxxx11110111	xxxxxxxxxxxx10xx1	RxD,Net Data	TxD,Net Data
#FB/251	xxxxxxxx11111011	xxxxxxxxxxxx11xx1	BUSY	PrSer,SPEED,ON

ZXMC-1 (ZX Multi Card-1 by Kamil' Karimov v1.2)

#DF/223	xxxxxxxx11011111	xxxxxxxx11011111	IORQGE	-
#00DF/223	0000000011011111	0000000011011111	Version	-
#EF/239	xxxxxxxx11101111	xxxxxxxx11101111	IORQGE	-
#00EF/239	0000000011101111	0000000011101111	Version	-
#FE/254	xxxxxxxx11111110	xxxxxxxx11111110	IORQGE	-
#FE/254	xxxxxxxx11111110	xxxxxxxx11111110	Key	-
#80DF-#87DF	10000CBA11011111	10000CBA11011111	PCKey	-
#E0EF-#E7EF	11100CBA11101111	11100CBA11101111	ZXMC RTC	ZXMC RTC
#F8EF-#FEFF	11111CBA11101111	11111CBA11101111	RS232	RS232
#FADF/64223	1111101011011111	1111101011011111	Kmou_B	-
#FBDF/64479	1111101111011111	1111101111011111	Kmou_X	-
#FFDF/65503	1111111111011111	1111111111011111	Kmou_Y	-

ZXMC-2 (ZX Multi Card-2 by Kamil' Karimov)

#DF/223	xxxxxxxx11011111	xxxxxxxx11011111	IORQGE	-
#00DF/223	0000000011011111	0000000011011111	Version	-
#EF/239	xxxxxxxx11101111	xxxxxxxx11101111	IORQGE	-
#00EF/239	0000000011101111	0000000011101111	Version	-
#F7/247	xxxxxxxx11110111	xxxxxxxx11110111	IORQGE	-
#00F7/247	0000000011110111	0000000011110111	Version	-
#FE/254	xxxxxxxx11111110	xxxxxxxx11111110	IORQGE	-
#FE/254	xxxxxxxx11111110	xxxxxxxx11111110	Key	-
#80DF-#87DF	10000CBA11011111	10000CBA11011111	PCKey	-
#BFF7/49143	1011111111110111	1011111111110111	Gluk RTC Data	Gluk RTC Data
#DFF7/57335	1101111111110111	1101111111110111	-	Gluk RTC Address
#E0EF-#E7EF	11100CBA11101111	11100CBA11101111	ZXMC RTC	ZXMC RTC
#E8EF/59631	1110100011101111	1110100011101111	multiplicatData1	multiplicatData1
#E9EF/59887	1110100111101111	1110100111101111	multiplicatData2	multiplicatData2
#EAEF/60143	1110101011101111	1110101011101111	multiplication	wr data
			outcome lo	
#EBEF/60399	1110101111101111	1110101111101111	multiplication	wr data
			outcome hi	
#ECEf-#EEEF	111011BA11101111	111011BA11101111	Reserved	Reserved
#EFF7/61431	1110111111110111	1110111111110111	-	Gluk RTC=on/off
#F0EF-#F7EF	11110CBA11101111	11110CBA11101111	Reserved	Reserved
#F8EF-#FEFF	11111CBA11101111	11111CBA11101111	RS232	RS232
#FADF/64223	1111101011011111	1111101011011111	Kmou_B	-
#FBDF/64479	1111101111011111	1111101111011111	Kmou_X	-
#FFDF/65503	1111111111011111	1111111111011111	Kmou_Y	-

divMMC

#E7/231	xxxxxxxx11100111	xxxxxxxx11100111	-	SD control
#E3/227	xxxxxxxx11100011	xxxxxxxx11100011	-	divIDEcontrol
#EB/235	xxxxxxxx11101011	xxxxxxxx11101011	SD SPIdata	SD SPIdata

Keyboard Proface (*1)

#FA/250	xxxxxxxx11111010	xxxxxxxxxxxxxx0x0	-	Pro/Keyface
#FE/254	xxxxxxxx11111110	xxxxxxxxxxxxxx0	Pro/Keyface	-

ZX Printer (Timex TS2040*)

#FB/251	xxxxxxxx11111011	xxxxxxxxxxxx0xx	Pr	Pr
*		xxxxxxxx1xxxx0xx	Pr	Pr

Spectranet by Winston (*A)

#FE/254	xxxxxxxx1111110	xxxxxxxxxxxx0	-	Brd
#003B/59	0000000000111011	0000000000111011	-	Page:#1000-#1FFF
#013B/315	0000000100111011	0000000100111011	-	Page:#2000-#2FFF
#023B/571	0000001000111011	0000001000111011	-	Addr trap Reg
#033B/827	0000001100111011	0000001100111011	Control Reg	Control Reg
#7FFD/32765	011111111111101	01xxxxxxxxxxxx0x	-	Page

ZXM-SoundCard Lite (*C)

#04FF/1279	0000010011111111	00xx010011111111	-	SAA1099 Data
#05FF/1535	0000010111111111	00xx010111111111	-	SAA1099 Address
#FFFD/65533	111111111111101	11xxxxxx1111101	-	Control

ZXM-SoundCard rev.03(*C)

#04FF/#05FF	0000010x11111111	00xxxxxx11111111	-	IORQGE incorrect
#04FF/1279	0000010011111111	00xxxxxx01111111	-	SAA1099 Data
#05FF/1535	0000010111111111	00xxxxxx11111111	-	SAA1099 Address
#BFFD/#FFFD	1x11111111111101	1xxxxxxx1111101	IORQGE incorrect	IORQGE incorrect
#BFFD/49149	101111111111101	10xxxxxx1111101	-	AY Data
#FFFD/65533	111111111111101	11xxxxxx1111101	AY Data	AY Address

DMA USC (DMA Ultra Sound Controller)

#0777-#3777	00BA011101110111	00BA0x1101110xxx	-	AddrChannel:0-3
#0C77-#FC77	DCBA110001110111	DCBAxx0001110xxx	8237	8237
#3D77-#FD77	BA11110101110111	BAxxxx0101110xxx	8253-1	8253-1
#3E77-#FE77	BA11111001110111	BAxxxx1001110xxx	8253-2	8253-2
#3F77-#FF77	BA11111101110111	BAxx1x1101110xxx	-	Volume
#F777/63351	1111011101110111	11xx0x1101110xxx	-	INTMask

SMUC-2 (Scorpion & MOA Universal Controller clone)

#58BA-#FFBE	x1x11xxx10111x10	xxx11xxx101xxx10	IORQGE incorrect	IORQGE incorrect
#5FBA/24506	0101111110111010	0x011xxx101xx010	Version	-
#5FBE/24510	0101111110111110	0x011xxx101xx110	Revision	-
#7FBA/32698	0111111110111010	0x111xxx101xx010	VirtualFDD	VirtualFDD
#D8BE/55486	1101100010111110	1x011xxx101xx110	IDEdata-hi	IDEdata-hi
#DFBA/57274	1101111110111010	1x011xxx101xx010	DS1685RTC	DS1685RTC
#F8BE-#FFBE	11111CBA10111110	1x111CBA101xx110	IDEcs0/cs1	IDEcs0/cs1
#FFBA/65466	1111111110111010	1x111xxx101xx010	SYS	SYS

COM ports by VIC

#80F7-#83F7	100000BA11110111	1000xxBAxxxx0xxx	-	8253
#90F7/#91F7	1001000A11110111	1001xxxAxxxx0xxx	8251-1	8251-1
#A0F7/#A1F7	1010000A11110111	1010xxxAxxxx0xxx	8251-2	8251-2
#B0F7/#B1F7	1011000A11110111	1011xxxAxxxx0xxx	8251-3	8251-3

GLUK CMOS RTC

#BFF7/49143	1011111111110111	1011xxxxxxxx0xxx	DS1685Data	DS1685Data
#DF7/57335	1101111111110111	1101xxxxxxxx0xxx	-	DS1685Address
#EFF7/61431	1110111111110111	1110xxxxxxxx0xxx	-	on/off

KEMPSTON PIO Interfase

#E0BF/57535	1110000010111111	xxxxxx00x0xxx1xx?	-	DATA
#E2FB/58107	1110001011111011	xxxxxx10x1xxx0xx?BUSY	-	
#E3FB/58303	1110001111111011	xxxxxx11x1xxx0xx?	-	STROBE

Profi external RS232 port & Soft XT keyboard

#E0FB/57595	1110000011111011	1110000x1xx1x011	-	XTKey
#E8FB/59643	1110100011111011	1110100x1xx1x011 Reg		Reg
#EAFB/#EBFB	1110101A11111011	1110101A1xx1x011 8251		8251
#ECFB-#EFFB	111011BA11111011	111011BA1xx1x011 8253		8253

ZX Interface 2

#EFFE/61438	1110111111111110	xxx01xxxxxxxxxxx0 Right SJoy	-
#F7FE/63486	1110111111111110	xxx10xxxxxxxxxxx0 Left SJoy	-

ISA RS232/Modem(8250/*82450) by Kondrat'yev (A=0 IRQ4-on, A=1 IRQ4-off)

#F0EF/#F8EF	1111A00011101111	xxxxA000xxx0xxxx RBR/DivLchLSB	THR/DivLchLSB
#F1EF/#F9EF	1111A00111101111	xxxxA001xxx0xxxx IER/DivLchMSB	IER/DivLchMSB
#F2EF/#FAEF	1111A01011101111	xxxxA010xxx0xxxx IIR	FIFO CR
#F3EF/#FBEF	1111A01111101111	xxxxA011xxx0xxxx LCR	LCR
#F4EF/#FCEF	1111A10011101111	xxxxA100xxx0xxxx MCR	MCR
#F5EF/#FDEF	1111A10111101111	xxxxA101xxx0xxxx LSR	-
#F6EF/#FEFF	1111A11011101111	xxxxA110xxx0xxxx MSR	-
#F7EF/#FFEF	1111A11111101111	xxxxA111xxx0xxxx ScratchReg*	ScratchReg*

KEMPSTON mouse (*1)

#FADF/64223	1111101011011111	xxxxxx10xx0xxxxx Kmou_B	-
#FBDF/64479	1111101111011111	xxxxxx011xx0xxxxx Kmou_X	-
#FFDF/65503	1111111111011111	xxxxxx111xx0xxxxx Kmou_Y	-

USSR KEMPSTON mouse

#FADF/64223	1111101011011111	xxxxxx0x01x0xxxx1 Kmou_B	-
#FBDF/64479	1111101111011111	xxxxxx0x11x0xxxx1 Kmou_X	-
#FFDF/65503	1111111111011111	xxxxxx1x11x0xxxx1 Kmou_Y	-

Часть 2. Назначение разрядов портов

Part 2. BIT MAP OF PORTS

PORT hex/dec	READ	WRITE
--------------	------	-------

BIT MAP OF SYSTEM PORTS (real mode)

#00/0 Quorum 128(B)/1024(+B) MEMORY MANAGETMENT PORT(RES or NMI=#00)

D0 -	D0 CPU0:0-ROM,1-RAM0(B,+B) or RAM8(+B)
D1 -	D1 -
D2 -	D2 -

D3 -	D3 CPU0:0-RAM0,1-RAM8(+B)
D4 -	D4 -
D5 -	D5 ROMsel & wrCPU0:
	0-SRVROM(B) & wrCPU0-on(+B)
D6 -	1-ZXROM(B) & wrCPU0-off(+B)
	D6 wrCPU0:0-on,1-off(B)
	wr#7FFD:0-on,1-off(+B)
D7 -	D7 rdTRDOSROM:0-RAM,1-ROM(B,+B)

#000F/15 Novosibirsk 64k CPU0 CONFIGURATION PORT(RES=#03)

D0 -	D0 ROMsel:0-DOS,1-ZX(N)
D1 -	D1 CPU0:0-RAM,1-ROM(N)
D2 -	D2 -
D3 -	D3 -
D4 -	D4 -
D5 -	D5 -
D6 -	D6 -
D7 -	D7 -

#7E/126 Quorum EXTENDED KEYBOARD PORT(B,+B) & Baltik SYSTEM PORT(5)(RES=#00)

D0 Keyboard(B,+B)	D1D0 Screen Address(5)
	0 0 #4000-ZX Screen
D1 Keyboard(B,+B)	0 1 #4000-Multicolor Screen
	1 0 #0000-Multicolor Screen
D2 Keyboard(B,+B)	1 1 #2000-Monitor Screen
D3 Keyboard(B,+B)	D2 -
	D3 -
D4 Keyboard(B,+B)	D4 -
D5 Keyboard(B,+B)	D5 -
D6 -	D6 -
D7 -	D7 CPU0:0-ROM,1-RAM(5)

#F4/244 Timex Horizontal Select Register: (RES=#00)
0-INTERNAL RAM, 1-EXTERNAL/DOCK ROM

D0 #F4(4)	D0 CPU0 #0000-#1FFF(4)
D1 #F4(4)	D1 CPU1 #2000-#3FFF(4)
D2 #F4(4)	D2 CPU2 #4000-#5FFF(4)
D3 #F4(4)	D3 CPU3 #6000-#7FFF(4)
D4 #F4(4)	D4 CPU4 #8000-#9FFF(4)
D5 #F4(4)	D5 CPU5 #A000-#BFFF(4)
D6 #F4(4)	D6 CPU6 #C000-#DFFF(4)
D7 #F4(4)	D7 CPU7 #E000-#FFFF(4)

#FE/254 SYSTEM PORT

D0 Keyboard(All)	D0 B Border(All)
D1 Keyboard(All)	D1 R Border(All)
D2 Keyboard(All)	D2 G Border(All)
D3 Keyboard(All)	D3 Tp(All)SpDAC D0(1,+1,F,N)
D4 Keyboard(All)	D4 Tape-InSelect(1,+1)SpDAC D1(All)
D5 Ser(DSR)(6,C)	D5 SpDAC D2(N)
D6 Tape(All)	D6 SpDAC D3(N)
D7 Pr(Busy)(6,9,C)	D7 -

#FF/255 rd:ATTRIBUTES PORT,r/w:Timex(4)Display Enhancement Control PORT(RES=#00)

D0 AtrD0(1,+1,6,C)#FF(4)	D2D1D0 Enhanced video mode:(4)
	0 0 0 Base Screen Address:#4000

```

D1 AtrD1(1,+1,6,C)#FF(4)      0 0 1 Base Screen Address:#6000
                                0 1 0 Video mode:Multicolor
                                0 1 1 -
                                1 0 0 -
D2 AtrD2(1,+1,6,C)#FF(4)      1 0 1 -
                                1 1 0 Video mode:512x192
                                1 1 1 -
D3 AtrD3(1,+1,6,C)#FF(4)      D5D4D3 512x192 colour:(4)
                                0 0 0 Black on White
                                0 0 1 Blue on Yellow
                                0 1 0 Red on Cyan
                                0 1 1 Magenta on Green
D5 AtrD5(1,+1,6,C)#FF(4)      1 0 0 Green on Magenta
                                1 0 1 Cyan on Red
                                1 1 0 Yellow on Blue
D6 AtrD6(1,+1,6,C)#FF(4)      1 1 1 White on Black

                                D6 internal 50Hz INT:0-on,1-off(4)
D7 AtrD7(1,+1,6,C)#FF(4)      D7 EXT ROM:0-DOCK,1-EXPANSION(4)
-----
#1FFD/8189 EXPANSION PORT rd>Turbo-off(6,C)(RES=#00)
-----
D0 -                            D0 SYS:0-ZX,1-DOS(3,+3)
                                CPU0:0-ROM,1-RAM(6,9,C,-E,F,+F)
                                D1 SRVROM>CPU0:0-off,1-on(6,C,F,+F)
                                wr D7#7FFD&#1FFD:0-on,1-off(-E)
                                Pr(/Q8)(9)
D1 -                            D2D1 DOSRAMPag:(3,+3)
                                CPU0 CPU1 CPU2 CPU3
                                0 0 RAM0,RAM1,RAM2,RAM3
                                0 1 RAM4,RAM5,RAM6,RAM7
                                1 0 RAM4,RAM5,RAM6,RAM3
D2 -                            1 1 RAM4,RAM7,RAM6,RAM3

                                D2 Pr(/Q2),Trb:0-turbo,1-normal(9)
                                D2 DOSROMPag:(3,+3)
                                D2|D4#7FFD
D3 -                            0| 0 ROM0: +3 Editor
                                0| 1 ROM1: +3 Syntax
                                1| 0 ROM2: +3 DOS
                                1| 1 ROM3: +3 SOS48

D4 -                            D3 FDC(MOTOR):0-off,1-on(+3)
                                Ser(TxD)(6,C)
                                SRVROM>CPU0:0-off,1-on(-E)
                                CPU0 A15" Change ROM Address:(9,F,+F)
D5 -                            0-SOS128+SOS48
                                1-SRVROM+TRDOSROM
                                D4 Pr(STROBE)(3,+3)
                                CPU3 A17'(6,9,C,-E,F,+F)
D6 -                            D5 Pr(STROBE)(6,9,C)
                                blk D7#7FFD&#1FFD:0-off,1-on(-E)
                                D6 Pr(/Q6)(9)
                                CPU3 A20'(F,+F)
D7 -                            D7 CPU3 A19'(9,-E,F,+F)
-----
#7FFD/32765 CONFIGURATION PORT(RES=#00)rd> Turbo-on(6,C)write bug(2,2+)
-----
D0 -                            D0 CPU3 A14'
                                D1 CPU3 A15'
                                D2 CPU3 A16'

```

```

D1 - D3 A15'" ScanVideoRAMAddress:
      0-ScanRAM5
      1-ScanRAM7
D2 - D4 CPU0 A14" ROM Address:
      0-SOS128 or SRVROM
      1-SOS48 or TRDROM
D3 - D5 48kb mode & blk#7FFD:0-off,1-on
D4 - D5 CPU3 A19'(+B)
      D5 #7FFD: | D2 #EFF7(E)
      CPU3 A19' | 0-over 128k mode
D5 -      blk#7FFD | 1-128k mode

D6 - D6 CPU3 A17'(+B,E)
      Pr(INIT)(9)
D7 - D7 CPU3 A18'(9,+B,-E,E,F)
-----
#80FD/33021 Quorum 128/1024 CP/M PORT(RES=#00>first wr-on, CP/M mode:wr-on)
-----
D0 - D2D1D0 CP/M Screen Address(B,+B)
      0 0 0 #4000
D1 -      0 0 1 #6000
      0 1 0 #8000
D2 -      0 1 1 #A000
      1 0 0 #C000
D3 -      1 0 1 #E000
      1 1 0 #0000
D4 -      1 1 1 #2000

D5 - D3 -
D6 - D4 -
D7 - D5 -
      D6 -
      D7 CPU0:0-rdROM,1-rdROM/wrRAM(B,+B)
-----
#DFFD/57341 Profi EXPANDED MEMORY PORT(RES=#00)
-----
D0 - D0 CPU3/1 A17'(7,D)
      D1 CPU3/1 A18'(7,D)
      D2 CPU3/1 A19'(7,D)
D1 - D3 WinPagSel:(7,D)
      0-paging>CPU3, RAM5>CPU1
      1-paging>CPU1, RAM7>CPU3
D2 - D4 1-blk D5#7FFD, RAM0>CPU0(7,D)
      D5 i/o modify mode:0-ZX,1-CP/M(7,D)
      D5 | D4#7FFD
D3 -      0 | x i/oBDI & TRDOSROM or i/oZX-on
      1 | 0 i/oBDI-modify,i/oZX & TRDOSROM-off
      1 | 1 i/oZX & i/oBDI-modify,TRDOSROM-off
D4 -
      D6 Scan mode:0-ZX,1-CP/M(7,D)
      D6 | D3#7FFD
      0 | 0 ScanRAM5, RAM5>CPU1, RAM2>CPU2
D5 -      0 | 1 ScanRAM7, RAM5>CPU1, RAM2>CPU2
      1 | 0 ScanRAM4(AtrRAM56), RAM6>CPU2
      1 | 1 ScanRAM6(AtrRAM58), RAM6>CPU2

D6 - D7 Video mode:0-ZX,1-CP/M
      D7 | D5#7FFD
      0 | x 256x192 ZX(7,D)
      1 | 0 512x240 CP/M(7,D)
D7 -      1 | 1 512x240 CP/M(7,D)wrShadowPal(D)
-----

```

```
#EFF7/61431 HARDWARE EXTENSIONS PORT#0 (RES=#00)
```

```
D0 - D0 Video mode:16color(E)
D1 - D1 Video mode:512x192(E)
D2 - D2 0-blkD5#7FFD,1-blk over 128k(E)
D3 - D3 CPU0:0-ROM,1-RAM(E)
D4 - D4 Turbo mode:0-on,1-off(E)
D5 - D5 -
D6 - D6 -
      D7 GlukRTC:0-off,1-on(E)
D7 -     GlukRTC, i/oBDI:0-off,1-on(F,+F)
```

BIT MAP OF SHADOW PORTS (shadow mode)

TR-DOS shadow mode

BIT MAP OF TR-DOS SHADOW MODE SYSTEM PORTS

```
#1FFD/8189 EXPANSION PORT(RES=#00) (the function D1 #1FFD is blocked)
```

D0 -	D0 CPU0:0-ROM,1-RAM(-E)
D1 -	D1 wr D7#7FFDFFD:0-on,1-off(-E)
D2 -	D2 -
D3 -	D3 SRVROM>CPU0:0-off,1-on(-E)
D4 -	D4 CPU3 A17'(-E)
D5 -	D5 blk D7#7FFDFFD:0-off,1-on(-E)
D6 -	D6 -
D7 -	D7 CPU3 A19'(-E)

```
#7FFD/32765 CONFIGURATION PORT(RES=#00)
```

D0	#7FFD(-E)	D0	CPU3 A14'
		D1	CPU3 A15'
D1	#7FFD(-E)	D2	CPU3 A16'
		D3	A15'" ScanVideoRAMAddress:
D2	#7FFD(-E)		0-ScanRAM5
			1-ScanRAM7
D3	#7FFD(-E)	D4	CPU0 A14" ROM Address:
			0-SOS128 or SRVROM
D4	#7FFD(-E)		1-SOS48 or TRDROM
D5	#7FFD(-E)	D5	48kb mode & blk#7FFD:0-off,1-on
D6	#7FFD(-E)	D6	-
D7	#7FFD(-E)	D7	CPU3 A18'(-E)