TS clocks:
CK – 14 MHz
CK1 – 7 MHz
CK2– 3.5 MHz
CK3– 1.75 MHz
CK3D– 1.75 MHz delayed
CK4– 875 KHz

MK1
Mounting_Hole

MK2
Mounting_Hole

VCC
PWR_FLAG
PWR_FLAG

+CD1 +CDbus1 CDbus2
0.1uF 10uF 100nF
GND

CF card IDE
RST
CF_RESET
CF_IORW
CF_IORD
CF_CS0
CF_CS1
A0 CF_A0
A1 CF_A1
A2 CF_A2
D[0..7] D[0..7]
D[8..15] D[8..15]
CF_card_8bit_IDE.sch

Serial IO (SIO 0.1.2)
A[0..7] A[0..7]
SIOCE
INT INT
RST RESET
M1 M1
IORQ IORQ
RD RD
CK2 CK2
CK3 CK3
CK4 CK4
D[0..7] D[0..7]
IEI IEI
IEO IEO
serial_IO.sch

RC bus 1
A[0..15] A[0..15]
D[0..7] D[0..7]   D[8..15] D[8..15]
M1 M1
RST RESET   RESET2 RST2
CK2 CLOCK   CLOCK2 CK3
INT INT   RFSH RFSH
MREQ MREQ   BUSACK BUSACK
WR WR   HALT HALT
RD RD   BUSREQ BUSRQ
IORQ IORQ   WAIT WAIT
IEI IEI   Tx
IEO IEO   Rx
NMI NMI   Tx2
INT1   Rx2   14 MHz CLK   CK
INT2   p78   CK1
SM   p79   7 MHz CLK
JP_SM0 USR4   USR8   JP_CK7
Spctr. Mode
JP_CK14
RCbus.sch

VCC
M1   2 D   Sd Q 5 M1_DEL
CK2   3 Cp
              Cd Q 6
1
74LS74
UF1A

VCC
U-GAL1 GAL22V10
I1/CLK   IO1/Q1 23
A14 I2   IO2/Q2 22
A7   I3   IO3/Q3 21
A6   I4   IO4/Q4 20
A5   I5   IO5/Q5 19
A4   I6   IO6/Q6 18
A3   I7   IO7/Q7 17
A2   I8   IO8/Q8 16
A1   I9   IO9/Q9 15
A0   I10 IO10/Q10 14 A15
IORD 11 I11
IOWR 13 I12
GND

decode_FEh

AY-3-8910 Sound
BDIR
BC1
AY_SWITCH
D[0..7] D[0..7]
CK3 AY_CLOCK
RST RESET
ay-3-8910_sound.sch

BUSRQ
JP_BUSRQ0   BUSACK
P_BUSACK0
JP_RFSH0
RFSH
JP_HALT0
HALT
JP_RST2
RST2
DEV_PWR_Conn_01x02
J2
VCC
GND
100uF
D7 D6 D5 D4 D3 D2 D1 D0
decode_FEh
A15 A14 A13 A12 A11 A10 A9 A8 A7 A6 A5 A4 A3 A2 A1 A0
MREQ D0
IORQ BUSRQ BUSACK
IORD SM RD
IOWR
CK3D WR
RFSH
M1 CK4
WAIT CK3
NMI HALT
CK1 INT
RST2 RST CK CK2

C96ABC_TS_Cobra
J1

SIO 0/1/2 (#84-#87 port decoding)
dual 8 bit IDE (#10-#17 and #20-#27 port decoding)
Turbo Sound option with #A3 switching
AY-3 (MSX compatible #A0-#A2 and Spectrum (#FFFD, #BFFD) decoding)
S.V.Pantazi (svpantazi@gmail.com)
Sheet: /
File: io_decoding_extension_board_v5.sch
Title: Cobra 2 (Turbo Spectrum) IO decoding with GAL22V10
Size: A4   Date: Rev: v5 UPDATE
KiCad E.D.A. kicad 4.0.6   Id: 1/5

Title: Cobra 2 (Turbo Spectrum) IO decoding with GAL22V10

S.V.Pantazi (svpantazi@gmail.com)
Sheet: /AY-3-8910 Sound/
File: ay-3-8910_sound.sch

Size: A4   Date: Rev: v5 UPDATE
KiCad E.D.A. kicad 4.0.6   Id: 2/5

CF_RESET

D[0..7]

RESET   JIDE40
             1   2
D7   3   4   D8
D6   5   6   D9   D[8..15]
D5   7   8   D10
D4   9   10   D11
D3   11   12   D12
D2   13   14   D13
D1   15   16   D14
D0   17   18   D15
             19   20   PIN20_PWR   IDE_PWR   VCC
DMARQ   21   22   JP_IDE_PWR0
IOW   23   24
IOR   25   26
JORDY   27   28   CSEL
DMACK   29   30
INTRQ   31   32   IOCS16
             33   34   PDIAG
CS0   35   36   A2
             37   38   CS1   VCC
DASP   39   40
        IDE40_Conn_02x20_Odd_Even   RCS1
                                                          10k
                                                 GND

CF_IORW
CF_IORD   RIORD1
             100K
                    CIORD1
        GND   100pF

CF_A1   A1
CF_A0   A0
CF_CS0   CS0

CF_A2

CF_CS1

NOTE:BIG MISTAKE!!
 CS1 is to access the second set of IDE registers (8-15), in the SAME device!!!
 !CS1 it is not for accessing the 0-7 registers of the slave device.

NOTe: for 8 bit True IDE mode and drive select see
/home/spantazi/Work/Projects/HobbyElectronics/RETRO_Computing/IO_storage/IDE/Pera Putnik IDE/8Bit IDE/CF_card in 8 bit mode full capacity

/home/spantazi/Work/Projects/HobbyElectronics/RETRO_Computing/IO_storage/IDE/8bit_iface/SteveSr
adapted from Simple 8-bit HD IF for Spectrum +3 v1.0 by Pera Putnik and Garry Lancaster
S.V.Pantazi (svpantazi@gmail.com)
Sheet: /CF card IDE/
File: CF_card_8bit_IDE.sch
Title: Cobra 2 (Turbo Spectrum) IO decoding with GAL22V10
Size: A4   Date: Rev: v5 UPDATE
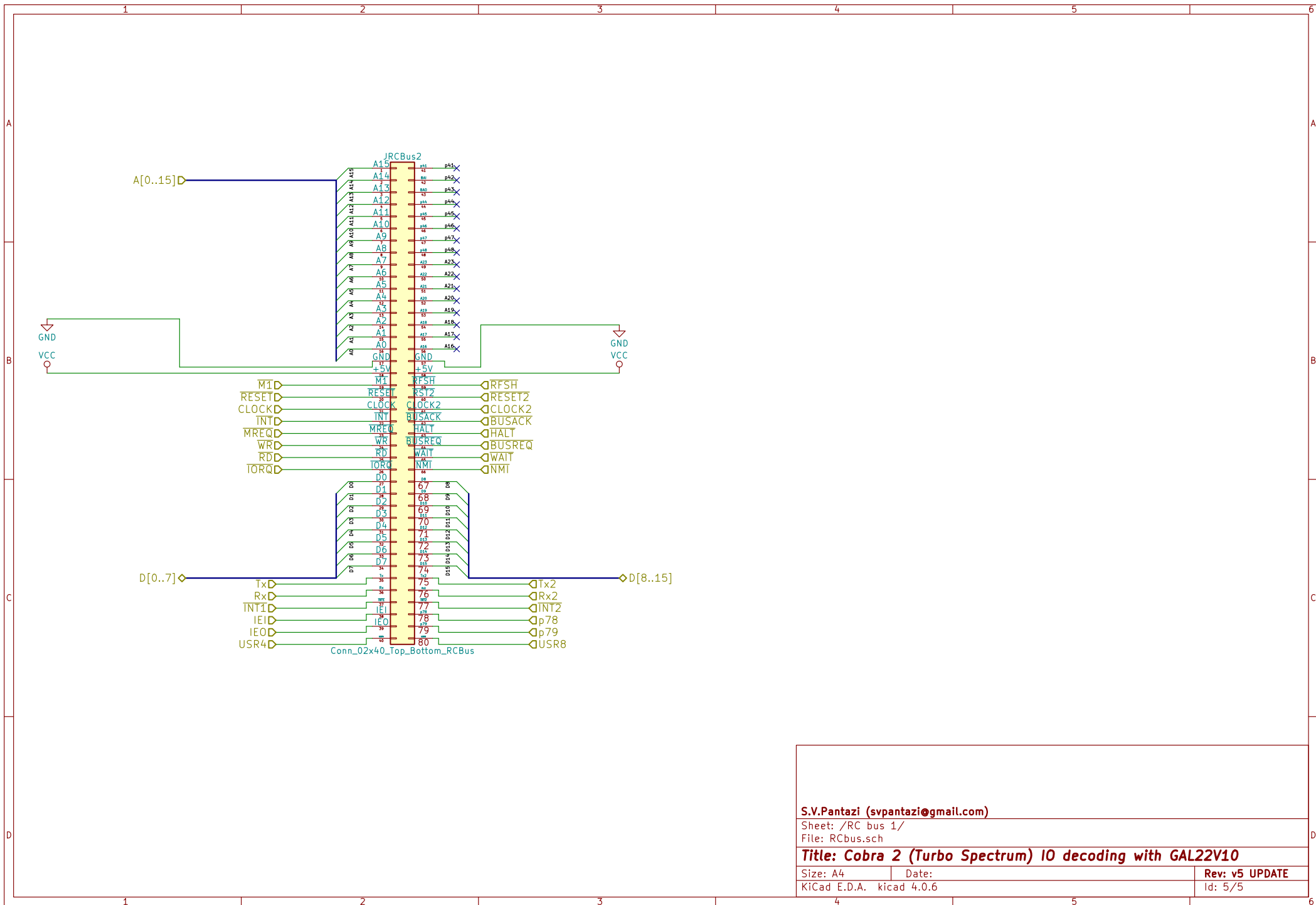KiCad E.D.A. kicad 4.0.6   Id: 3/5

OPTIONAL TO DO: inversion of pin order of JST HX connectors for SIO A and SIO B
(currently order is backwards from the one inherited from Simple80 — which is my prefered pinout now) (:(but this requires re-routing the board) —
workaround so far is to install the JST HX connectors backwards to maintain the pin compatiblity with my other SIO boards)

what to do with unused SIO pins that can be used for general IO

Channel B SIO 0/1/2 jumpers

SIO	0	1	2
JP-T1	——	1-2	2-3
JP-T2	2-3	1-2	2-3
JP-T3	1-2	1-2	2-3

T1, 2, 3 configure SIO port B
T1 — Rx and Tx clock source
T2 — Tx pin assignment
T3 — Rx pin assignment

SIO0:
 — RxTx clock on pin 27
 — TxDB on pin 26
 — RxDB on pin 28

SIO1:
 — Tx clock on pin 26
 — Rx clock on pin 27
 — TxDB on pin 25
 — RxDB on pin 28

SIO2:
 — Tx clock on pin 27
 — Rx clock on pin 28
 — TxDB on pin 26
 — RxDB on pin 29

JRCBus2

A[0..15]

GND
VCC

GND
VCC

A15
A14
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
GND
+5V

p41
p42
p43
p44
p45
p46
p47
p48
A23
A22
A21
A20
A19
A18
A17
A16
GND
+5V

M1
RESET
CLOCK
INT
MREQ
WR
RD
IORQ

M1
RESET
CLOCK
INT
MREQ
WR
RD
IORQ

RFSH
RST2
CLOCK2
BUSACK
HALT
BUSREQ
WAIT
NMI

RFSH
RESET2
CLOCK2
BUSACK
HALT
BUSREQ
WAIT
NMI

D0
D1
D2
D3
D4
D5
D6
D7

D0
D1
D2
D3
D4
D5
D6
D7

67
68
69
70
71
72
73
74

D8
D9
D10
D11
D12
D13
D14
D15

D[0..7]

D[8..15]

Tx
Rx
INT1
IEI
IEO
USR4

Tx
Rx
INT1
IEI
IEO

75
76
77
78
79
80

Tx2
Rx2
INT2
p78
p79
USR8

Conn_02x40_Top_Bottom_RCBus

S.V.Pantazi (svpantazi@gmail.com)

Sheet: /RC bus 1/
File: RCbus.sch

Title: Cobra 2 (Turbo Spectrum) IO decoding with GAL22V10

Size: A4   Date: Rev: v5 UPDATE
KiCad E.D.A. kicad 4.0.6   Id: 5/5