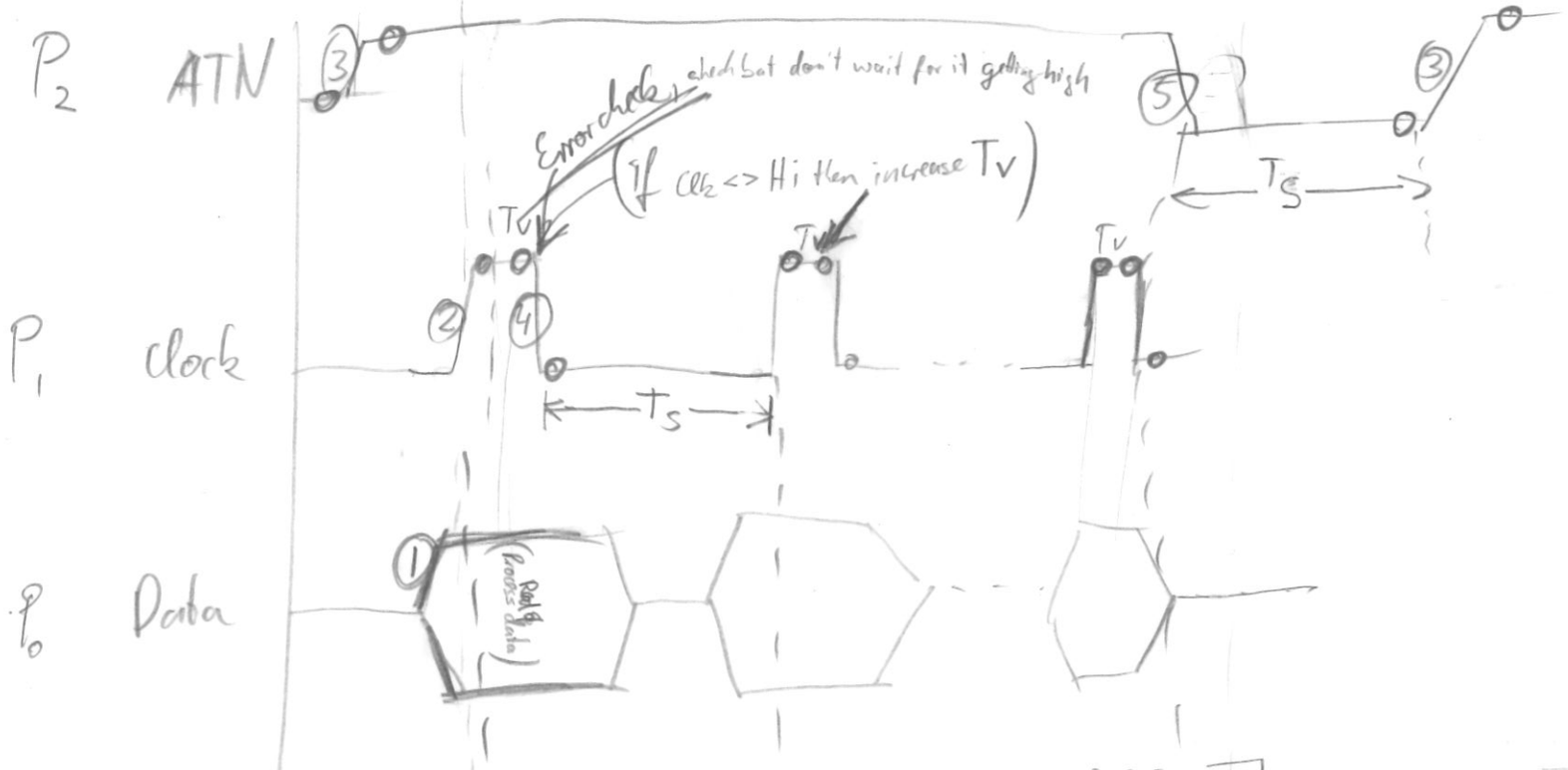
OCT 10th 1989

SERIAL LINK Between C64 Terminal & 6510 Project



TV = Data Valid

TI = Time for intrupt to realise that byte has to be received

TS = Time for synchronisation

○ =check = will wait until potential reached

③ ATN on
- wait TI
① Data (1st)
② Clock on
~~③ ATN on~~
- Wait TV
④ Clock off
- Wait TS

① Data (...)
② Clock on
- Wait TV
④ Clock off
- Wait TS

① Data (8th)
② Clock on
- Wait TV
④ Clock off
⑤ ATN off
- wait TS

repeat process
(JMP start)

- Grenze der Kabelqualität finden, dann aber nur 1/5 Geschwindigkeit gebrauchen

note: Die Leistung dieser Routine ist schwach, dafür braucht sie aber kein RAM.
- Bitte noch mal schreiben wenn Computer auch RAM besitzt!
- Stack Pointer wird zur Datenspeicherung mißbraucht da kein RAM/Stack vorhanden

Pseudocode for SER.SENDER.SRC

OKT 1014 1989

preparations: - Load accu with Databyte
- X will be stored in SP temporarly and returned into X after transmition

Hole nächstes Zeichen

- TXS
- set port to Output $P_0 - P_2$
- LDX #04
- ATN on (STX Direction)

LDY #08

TAX

TXA

Y=8 to 1 - ROL (clear carry)

if carry = 1 then

LDX #05 (CLK=1)
STX PORT
NOP
NOP
LDX #07
STX PORT
JMP cont

LDX #06 (CLK=1)
STX PORT

0 6 cont - Wait NOP1
LDX #04
STX Port
- Wait NOP2
key
LDX #00
STX PORT
- TSX

löscht CLK zwangsweise im Port

TAX
TYA
BNE

NOP1 2 ms / 2 NOP = 2 ms
JMP NOP1 Cont

NOP2 2 ms / 2 NOP = 2 ms
JMP NOP2 Cont

NOP3 2k NOP 2ms
JMP NOP3 cont

- Input when not sending!

```
DD03 DIRECTION  DD01 PORT    6000 START   6008 TEXT    602F READDATA  6048 LOOP1

604C SENDLOW  6064 SENDHIGH  6079 CONT    608D WAITTV  6092 LOOPTV  6099 WAITTI
609E LOOPTI  60A5 WAITTS  60AA LOOPTS  01

6000                    ;NAME:     SER.SENDERV2.SRC
                        ;DATE:     OCTOBER 15TH 1989
                        ;AUTHOR:   OLIVER KALTSTEIN

                        ;VERSION:      V2 (NEEDS RAM)

                        ;PREPARATION: LOAD ACCU WITH CHARACTER,
                        ;              POSITION-COUNTER X WILL BE SAVED.

6000                    ORG$6000

DD03            DIRECTION =  56579
DD01            PORT      =    56577


6000 78         START   SEI
6001 18                 CLC
6002 D8                 CLD
6003 A200               LDX #00
6005 4C2F60             JMP READDATA
6008 48414C     TEXT    B   "HALLO THOMAS, HALLO OLIVER. ICH LEBE!  "
602F BC0860     READDATA LDY TEXT,X
6032 E8                 INX
6033 8A                 TXA
6034 48                 PHA
6035 98                 TYA
6036 A207               LDX #07
6038 8E03DD             STX DIRECTION           P0 TO P2 ARE OUTPUTS
603B 20A560             JSR WAITTS              DELAY ALLOWS RECEIVER TO SYNCRONIZE I
F BYTE LOST
603E A204               LDX #04
6040 8E01DD             STX PORT                SET ATN
6043 209960             JSR WAITTI
6046 A008               LDY #08
6048 18         LOOP1   CLC
6049 2A                 ROL
604A B018               BCS SENDHIGH            IF MSB IS ONE IT WILL BE SEND AS HIGH
604C A204       SENDLOW LDX #04                 SET DATA LOW
604E 8E01DD             STX PORT
6051 EA                 NOP
6052 EA                 NOP
6053 EA                 NOP
6054 A206               LDX #06                 SET CLOCK HIGH
6056 8E01DD             STX PORT
6059 208D60             JSR WAITTV
605C A204               LDX #04
605E 8E01DD             STX PORT
6061 4C7960             JMP CONT

6064 A205       SENDHIGH LDX #05
6066 8E01DD             STX PORT                SET DATA HIGH BUT CLOCK LOW
6069 EA                 NOP
606A EA                 NOP
606B EA                 NOP
606C A207               LDX #07
606E 8E01DD             STX PORT                PUT CLOCK HIGH
6071 208D60             JSR WAITTV
6074 A205               LDX #05
6076 8E01DD             STX PORT
6079 20A560     CONT    JSR WAITTS
607C 88                 DEY
```

```
607D D0C9           BNE LOOP1
607F A200           LDX #00                 END OFF BYTE, ALL LINES LOW
6081 8E01DD         STX PORT
6084 68             PLA
6085 AA             TAX



02

6086 E027           CPX #39
6088 D0A5           BNE READDATA
608A 4C0060         JMP START

608D 48      WAITTV PHA
608E 8A             TXA
608F 48             PHA
6090 A2A0           LDX #$A0
6092 CA      LOOPTV DEX
6093 D0FD           BNE LOOPTV
6095 68             PLA
6096 AA             TAX
6097 68             PLA
6098 60             RTS
6099 48      WAITTI PHA
609A 8A             TXA
609B 48             PHA
609C A240           LDX #$40
609E CA      LOOPTI DEX
609F D0FD           BNE LOOPTI
60A1 68             PLA
60A2 AA             TAX
60A3 68             PLA
60A4 60             RTS
60A5 48      WAITTS PHA
60A6 8A             TXA
60A7 48             PHA
60A8 A2FF           LDX #$FF
60AA CA      LOOPTS DEX
60AB D0FD           BNE LOOPTS
60AD 68             PLA
60AE AA             TAX
60AF 68             PLA
60B0 60             RTS
```