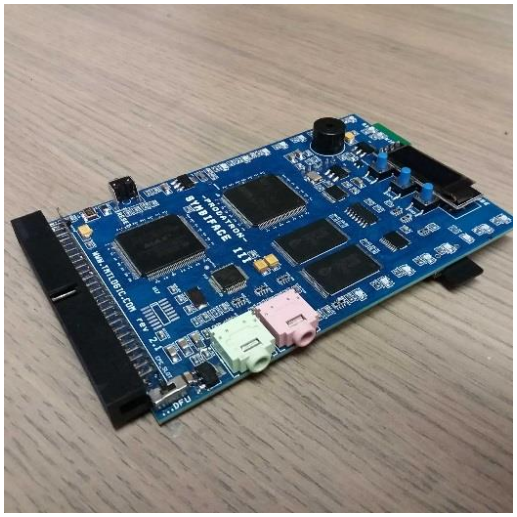
SYMBIFACE III

30 May 2021

SF3 specs 2.x:

Microcontroller:	Cortex -M7 216 MHZ
RAM:	2 MB (SRAM)
"ROM"	2 MB (SRAM)
USB Host	Hid Mouse
USB Host	Fat32 mass storage device
AUDIO	MP3 Player
AUDIO	Recorder / VOIP
WIFI	IOT WIFI module/HTTP(S)/TLS/SSL/MQTT
RTC	+Battery
VU	Stereo level indicator
CPC 464	Extern memory hack
JTAG	Onboard
MEASUREMENTS	Power 5v, ARM temp, RTC batt
SD Card	for internal system storage
OLED	
BUZZER	
TMTNETWORK 2.0	



INHOUD

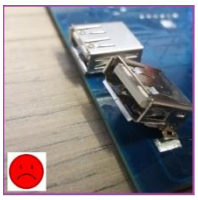
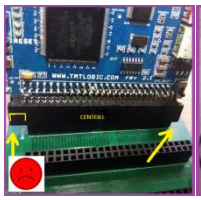
MULTI COMPUTER MANUAL:

The **color** of the selected text indicates for which computer it is intended:

-- CPC ---
-- EP Enterprise --
-- PCW --
-- MSX --

IMPORTANT THINKS, BEFORE START

BE CAREFULL


Charge not your Mobile Phone or another USB power devices, with the USB port. USB is only for a HID mouse or USB mass store device (max 150mA)
Don't use another External RAM or ROM (by default SF3.INI settings) see ENA_RAM / ENA_ROM
Are you sure that the power to the SF3 is not below the 4.6 Volt ! The current of the SF3 is max 600mA

SPECIAL ROM/RAM PLACES:

- (cpc) Regarding ROM[7]: Not every CPC can install ROM 7 externally.

Be aware that if your CPC cannot do this, you should NOT USE ROM[7] = ...
a hardware conflict may occur on the z80's data bus.

- (EP) Regarding ROM[00-04]
- (EP) Regarding ROM[05-07]

MULTI COMPUTER SUPPORT: (CPC,EP, PCW, MSX)

Understand that the SF3 can be used by 4 computer types. But the Main computer is the CPC.
To make the SF3 suitable for the Enterprise or MSX, the CPLD will need to be updated. Because the CPLD controls the hardware connection between the computer and the SF3.

In Google Drive there is a manual that explains how to update the CPLD. Besides a DFU and USB cable, no extra things are needed for this

QUESTIONS:

How do I convert the SF3 from (for example) CPC to Enterprise?

1. Download the SF3_EP .... DFU from Google Drive
2. Upgrade the SF3 with this DFU (see the DFU upgrade manual in Google Drive)
3. Update the CPLD, The SF3 is ready for use. An Adapter PCB is available for each computer, an overview of which is available at (Google Drive)

Q1 Can I return from Enterprise to CPC?

A1 Yes, that's possible. In the same way, namely with the SF3_CPC ... DFU

Q2: Can I use the microphone input to mix the CPC sound?
A2: No. the pink microphone input is only intended for individual microphones and a headset.
The ground pin of this input is not the same as the ground from the SF3

STARTING WITH THE SF3

INI FILE:

THIS TEXT FILE IS PLACED ON THE ROOT OF THE SF3 SD CARD

Note:
This file must be place in the root of the SD card.
Tabs and spaces has no effect.
Uppercase is important.

For CPC **SF3_CPC.INI**
For Enterprise **SF3_EP.INI**
For PCW **SF3_PCW.INI**
For MSX **SF3_MSX.INI**

INI FILE KEYWORDS:

```
*****************************************************************************************************
       *      text line
       @      the SF3 don't remove the spaces and tab's in this line

*****************************************************************************************************
       ROM[]=
              Upload ROM:    upload ROM to SF3 ROM memory
              Note: when file comes from internet. Than First activate WIFI_CONNECT

              ROM[x]  = MSD:FILENAME

              X       = 0 to 126     decimal(127 is lower ROM)
              X       = #00 to #7F   hexadecimal

              MSD     = SD           from SD card
                      = USB          from USB stick
                      = HTTP         from Internet
                      = HTTPS        from Internet

              Example, upload hello.rom from SD to CPC ROM segment 2

              ROM[2] = SD:HELLO.ROM

       ENA_ROM=OFF
              Disable ALL ROMS by hardware

       ENA_ROM7 = ON
              Enable ROM 7 for CPC Note:  risk for some CPC computers !
```

```
*****************************************************************************
*                          CPC
*                          Filename: SF3_CPC.INI
*****************************************************************************
* WIFI settings:
*****************************************************************************

WIFI_PASS    = ..
WIFI_SSID    = ..

* second SSID and password max 5x SSID  Note:  First Password than SSID


*WIFI_PASS    = ..
*WIFI_SSID    = ..

*Connect direct the Wi-Fi with the AP
WIFI_CONNECT

*****************************************************************************
* TMTNET
*****************************************************************************

*   account is available at @tmtlogic

*   tmtnet 1.0        range 3000-3059
*   tmtnet 2.0        range 1000-8000

TMTNET_USERID  = 9999
TMTNET_PASS    = xxxx
```

```
*********************************************************************************
* Select Language
*********************************************************************************
LANGUAGE = HU
*LANGUAGE = ES
*LANGUAGE = RS
*LANGUAGE = UK
*LANGUAGE = DE
*LANGUAGE = NL

*********************************************************************************
* Jump to OLED menu item
*  press middle button JP for jumping
*  see OLED_TREE for details about menu numbers
*********************************************************************************
OLED_JUMPPAGE = 0000

*********************************************************************************
* Define ROMS
*  this ROM are copied to the ROMTABLE BANK 0,
*  if BANK 1 is not present, the ROMs are also copied to BANK 1
*  sources SD: USB: HTTP: HTTPS:
*********************************************************************************

ROM[2]  =SD:/CPC/ROMS/ARKANOID.ROM

*********************************************************************************
* Activate the Audio chip, SYMAMP for symbos audio >> SEONE = MP3A

AUDIO=  SYMAMP
*********************************************************************************
```

```
Only Enterprise:

*Enable Ram blocks

*The SF3 handles always blocks of 16x16kb
* Available blocks:

*       08h .. 0Fh
*       10h .. 1Fh
*       20h .. 2Fh            ! The floppy controller
*       30h .. 3Fh
*       40h .. 4Fh
*       50h .. 5Fh
*       60h .. 6Fh            enabled at power on
*       70h .. 7Fh
*       80h .. 8Fh
*       90h .. 9Fh
*       A0h .. AFh
*       B0h .. BFh
*       C0h .. CFh
*       D0h .. DFh
*       E0h .. EFh
*       F0h .. F7h
*       F8h .. FBh            ! only 64KB machines


*EPRAM [] define segment of 16k as RAM

EPRAM[#08-#1F]
EPRAM[#30-#5F]
EPRAM[#73-#BB]

*ROM [] define segment of 16k as ROM

*ROM[#60]  =SD:/EP/SF3BOOT.ROM
```

```
START (CPC):
```

```
START (EP):
```

Information of the SF3 can be found on Google drive

www.tmtlogic.com >> support >> SF3_EP   or SF3_CPC

CLEAN CONTACTS

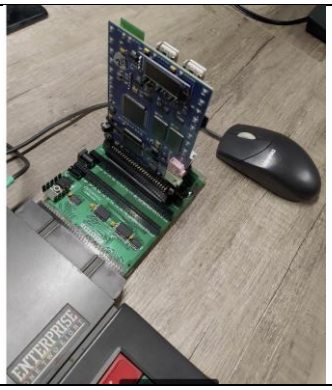
Clean the contacts from the Enterprise with alcohol.
The SF3 is a 3v3 signal hardware, and is sensitive to contamination on the contacts

⚠ Do not use a sandpaper, wire brush or grinder to clean the contacts

CHECK THE WIRE ON THE BACKSIDE

Check if this wire is soldered, between middle of the SF3 and Pin 1 of the Connector

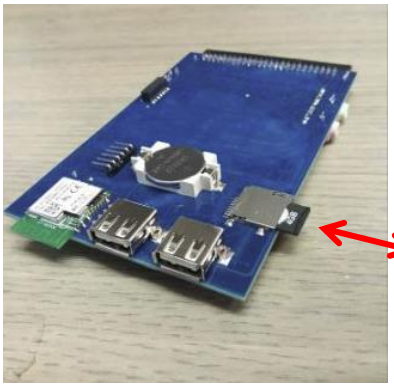
PLACE THE SF3



EXAMPLE INI FILE

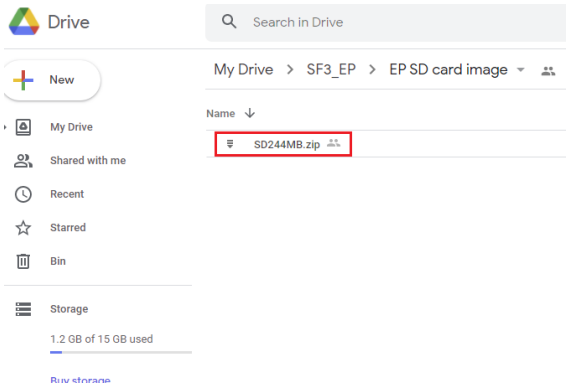
Can you find on tmtlogic drive :

PLACE SF3 SD CARD

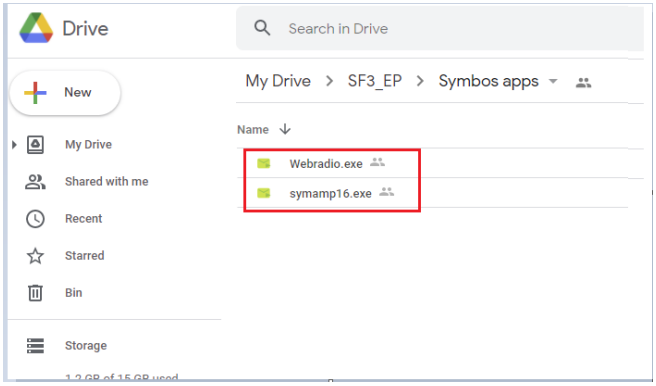


INSTALL THE ENTERPRISE SD CARD

See Google drive or ask Enterprise users for this image



Copy the Symbos Apps in the Symbos directory



ENTERPRISE POWER ON

CPC	EP dec.	EP hex.
&FD40	64	40
&FD41	65	41
&FD42	66	42
&FD43	67	43
&FD44	68	44
&FD45	69	45
&FD46	70	46
&FD47	71	47
&FD48	72	48
&FD49	73	49
&FD4A	74	4a
&FD4B	75	4b
&FD4C	76	4c
&FD4D	77	4d
&FD4E	78	4e
&FD4F	79	4f

START (MSX):

UPDATE THE SF3 (DFU)

Updating is done using DFU.

What is DFU?
DFU stands for Device Firmware Update.
With this file you can update the ARM of the SF3.
This is done via the USB port.

Filename explanation:
SF3_CPC_20190912.DFU

SF3 target product
CPC target computer
2019 year 09 month 12 day

CAUTION !!

Only use the "DFU cable" for updating !!

Not for anything else. This can cause serious damage.

FOR THE SF3 USE ONLY UPDATE FILES THAT STARTED WITH

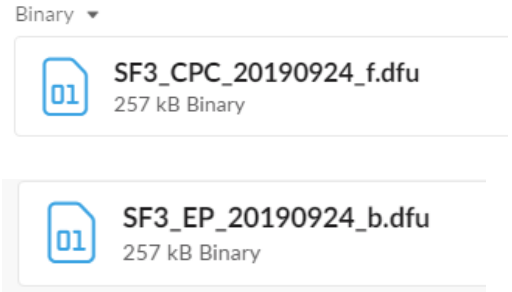
For CPC users:

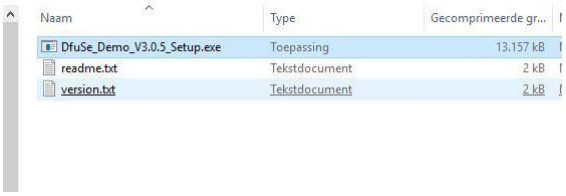
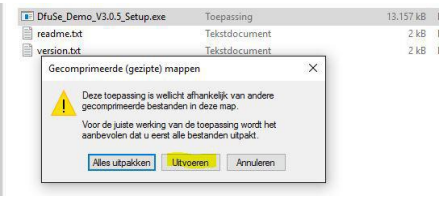
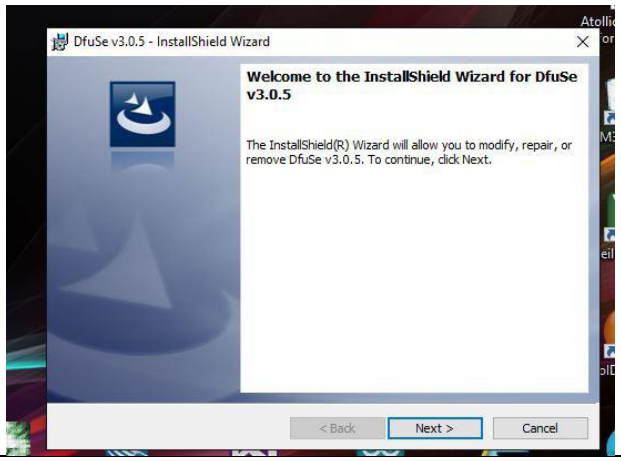
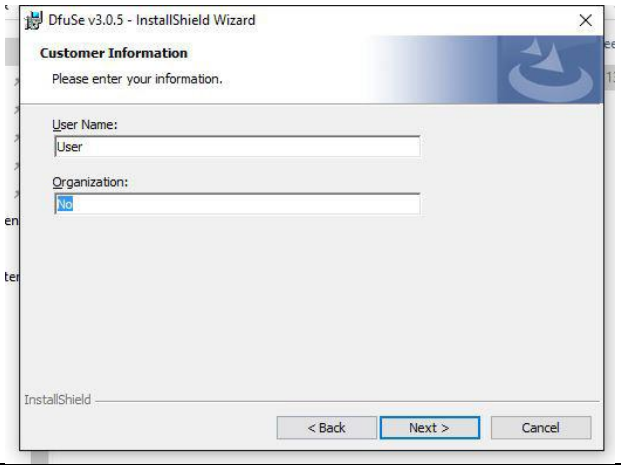
SF3_CPC .....DFU

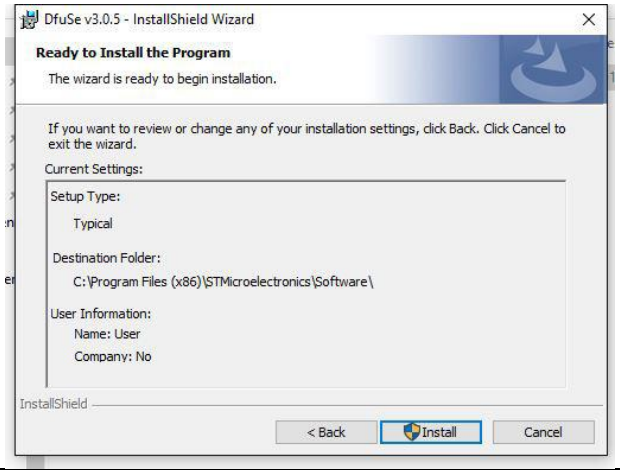
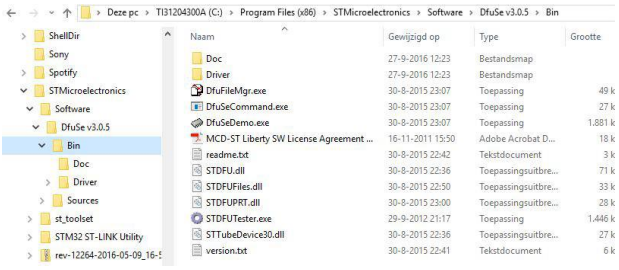
For Enterprise users:

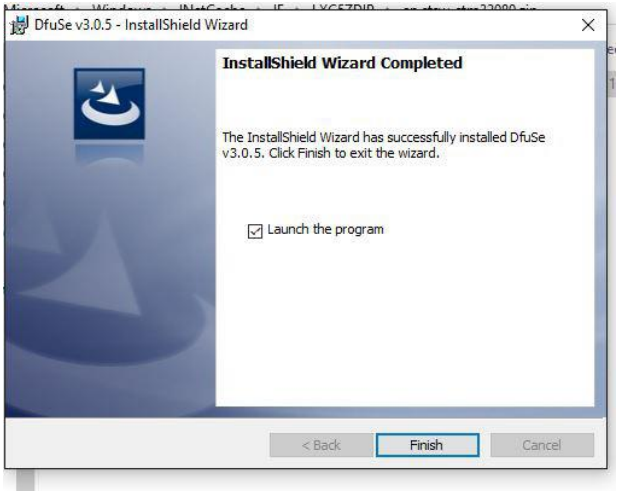
SF3_EP .....DFU

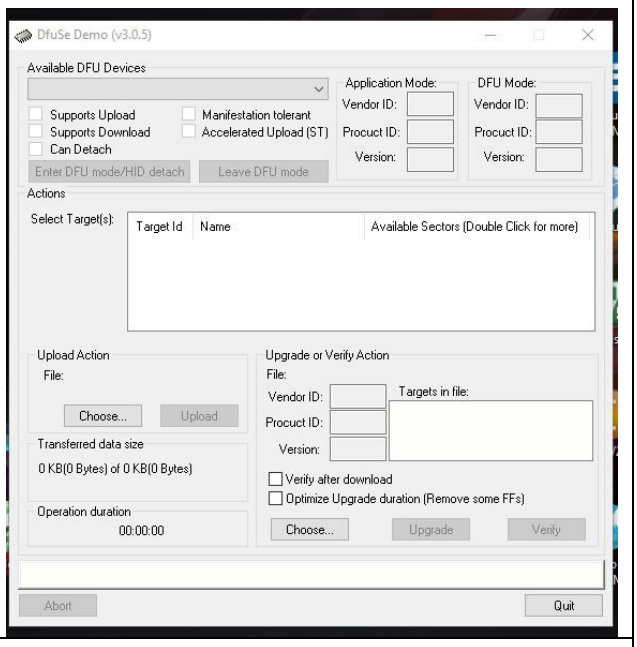
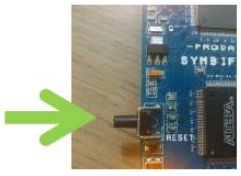
Example:

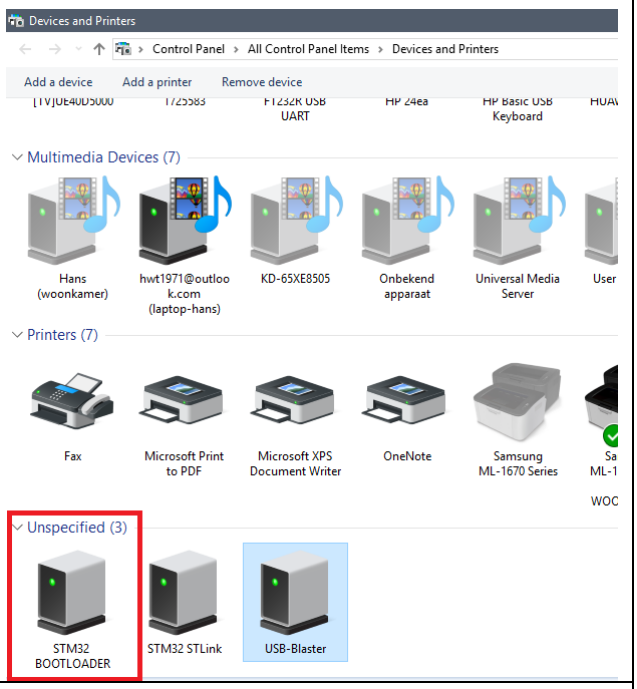
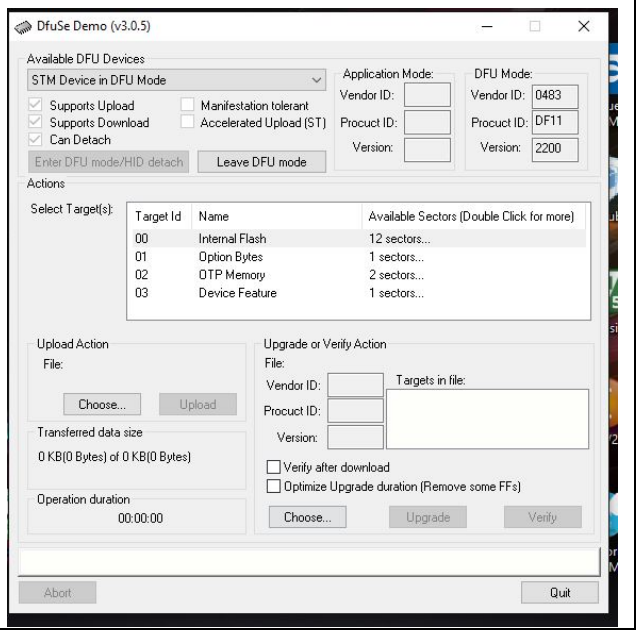


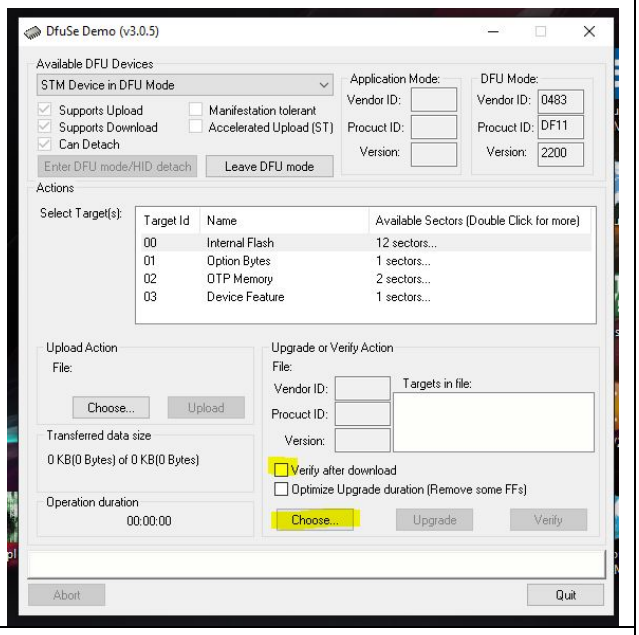
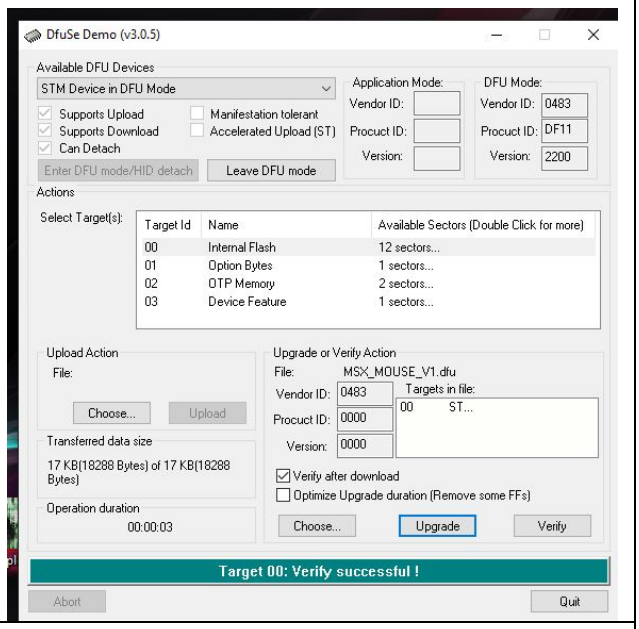
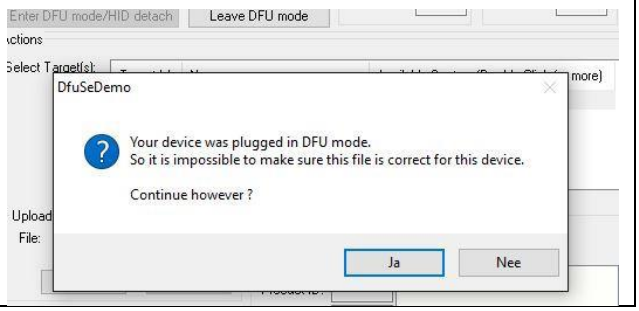
PC update Software: If you have already install this software, goto Running Program DfuSe Demo:	Download and install windows program from stmicroelectronics (**en.stsw-stm32080.zip**): From website STmicroelectronics: http://www.st.com/content/st_com/en/products/development-tools/software-developmenttools/stm32-software-development-tools/stm32-programmers/stsw-stm32080.html?s_searchtype=keyword or From website TMTLOGIC http://www.tmtlogic.com/software/en.stsw-stm32080.zip
Start DfuSe_Demo_V3.0.5_Setup..exe	
Press Execute	
Next	
Option change your name Next	

Install	
The software is installed here:	

Select Finish	

Running Program DfuSe Demo:		
Press the DFU switch above, in DFU mode		
Connect the USB male USB male connector on the PC and SF3 (FAT32 port)		
Example: SF3 and SE-ONE(msx)		
Reset the SF3 / SE-ONE		

STM32 BOOTLOADER is added in the Devices and Printers	
If windows cannot found this driver, you can do it manual. You can find the drivers in the map "Driver".	C:\Program Files (x86)\STMicroelectronics\Software\DfuSe v3.0.5\Bin\Driver
The select target(s) is show	

Select **Verify** after download and click **Choose**	
Open DFU file	SF3_CPC….DFU
Press Upgrade	
Are your sure it’s a dfu for the right product ? Click yes	

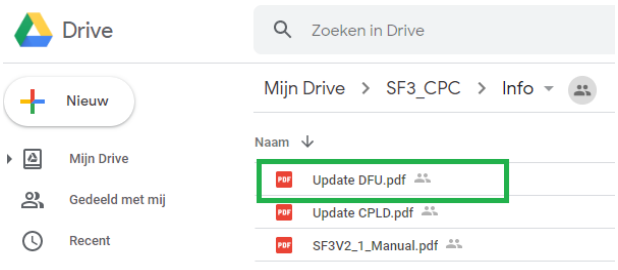
Update is ready	
Remove the SF3 / SE-ONE from the PC	
CAUTION !! Only use the "DFU cable" for updating !! Not for anything else. This can cause serious damage.	
If it still doesn't work after that. do not use the SF3, and contact TMTLOGIC. **tmtlogic@gmail.com**	

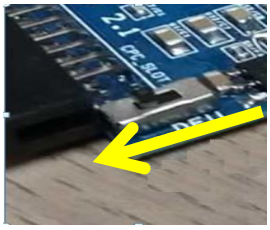
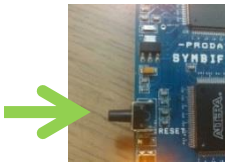
UPDATE THE CPLD

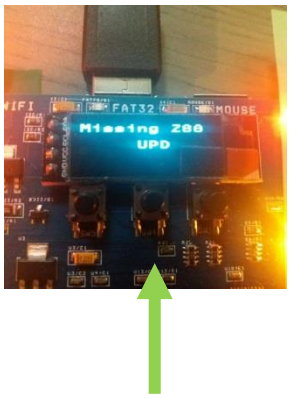
What is JTAG and what is the difference in update between ARM and a CPLD:

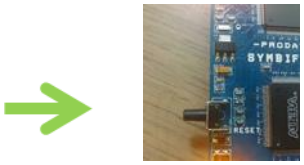
On the board of the SF3 there are 2 large ICs, one of which is an ARM microprocessor, the other is a CPLD logic chip.

Normally with a DFU you reprogram the ARM, the ARM controls all processes of the SF3.
A CPLD makes a hardware connection between the Z80 and the ARM and MEMORY.
The SF3 has an onboard JTAG interface.
The ARM programs the CPLD via this JTAG interface
The code for the CPLD has been added in the DFU

First normal DFU update: *Manual see Google Drive*	
CPLD UPDATE:	

CPLD update: Leave the SF3 connected to your computer. press the DFU switch down (normal position)		
Reset the SF3		
OLed shows: Missing Z80 this is displayed when the CPC is NOT connected		

Press the middle button (UPD)	
the display shows: UPDATE the CPLD is now being updated	
when the update is complete, *the display shows: READY*	

The SF3 is ready to use	
When it's go wrong:	
Reset the SF3:	
Try again	

If it still doesn't work after that. do not use the SF3, and contact TMTLOGIC.

tmtlogic@gmail.com

SF3

SF3 ADDRESS RANGE INP/OUT(&FD40 - &FD4F):

```
        &FD40           reserve for AT command set
        &FD41           Command functions / response
        &FD42           port 0, Data read/write buffers             (Serveral)
        &FD43           port 1,         Data read/write buffers     (Fatfs read)
        &FD44           port 2, Data read/write buffers             (Fatfs write)

        &FD45           port 3, Data read buffers                   (Wifi socket channel 0)
        &FD46           port 4, Data read buffers                   (Wifi socket channel 1)
        &FD47           port 5, Data read buffers                   (Wifi socket channel 2)
        &FD48           port 6, Data read buffers                   (WIFI socket channel 3)

        &FD49           port 7, Data read/write buffers             (WIFI AT command's, non-socket)


        &FD4A           port 8,         Data read/write buffers     (2th Fatfs read)
        &FD4B           port 9, Data read/write buffers             (2th Fatfs write)

        &FD4C           reserve for TMTNET

        &FD4D           reserve for TMTNET

        &FD4E           WIFI process status byte
        &FD4F           system databus echo
```

SF3 KEYWORDS:

```
        SF3_CPC.INI     this file initializes the SF3, and must be place in the root of the SD card.
                        - for CPC users use SF3_CPC.INI
                        - for Enterprise users use SF3_EP.INI
```

ARM	Arm is the stand-alone microcontroller on the SF3. the most functions on the SF3 are controlled by the ARM
DFU	Device firmware upgrade, to upgrade the firmware of the ARM. there is a manual for updating see above (Upgrade Firmware SF3 though DFU)
WIFI module	WIFI is controlled by an external module on the backside of the SF3, this module handles all WIFI protocols.

WIFI PROCCES STATUS NUMBER INP(&FD4E):

Read:

0 Idle
1 Busy
2 Error
3 Offline
4 Socket not available

SYSTEM DATABUS ECHO INP/OUT(&FD4F)

Echo test:

```
Out &FD4F,234
Print(inp(&hFD4f))

234
```

ERROR TABLE:

```
"Succeeded                          "//..0
"Disk IO errror                     "//..1
"Assertion failed                   "//..2
"The physical drive cannot work     "//..3
"Could not find the file            "//..4
"File not found                     "//..5
"Invalid path name                  "//..6
"Access denied directory full       "//..7
"Access denied                      "//..8
"Invalid  file/directory            "//..9
"Write protected                    "//..10
"Invalid logical drive              "//..11
"The volume has no work area        "//..12
"No valid FAT volume                "//..13
"The f_mkfs() aborted               "//..14
"Time out                           "//..15
"Rejected according  sharing policy"//..16
"LFN could not be allocated         "//..17
"Number of open files               "//..18
"Invalid parameter                  "//..19
"Unknow at commando                 "//..20
"Syntax error                       "//..21
"Usb busy                           "//..22
"Invalid at command                 "//..23
"Usb already installed              "//..24
"Parameter error                    "//..25
"AT not in uppercase                "//..26
"ARM flash error                    "//..27
"Invalid input                      "//..28
"Wrong SE mode                      "//..29
"Out of range                       "//..30
"Wifi offline                       "//..31
"Wifi_resonse_error                 "//..32
"Wifi stream error                  "//..33
"Wifi socket error                  "//..34
"Wifi socket is already open        "//..35
"Wifi RxBuffer overflow             "//..36
"Datastream CRC error               "//..37
"Wifi socket closed                 "//..38
"Tmtnet invalid userID              "//..39
"Wifi no ssid found                 "//..40
""
```

LEDS:

Green Led	RX	Burn when one of the 4 receive sockets is not empty
Blue led	WIFI	Burn when Wifi is ONLINE

```
Blue led       FAT32  Burn when USB stick is installed and ready to use
Green led      MOUSE  Burn when mouse in ready to use

Yellow LED left under, process led z80 bus

Red LED right above, burn alone when ARM stay in DFU mode
```

SWITCHES:

```
DFU…   when turn up, the ARM stay in DFU mode (Device upgrade mode)
```

EXTRA FUNCTIONS:

```
Menu functions comes later
```

TOTAL SF3 MEMORY ARRAY MAP:

SF3_CPC:

```
Rom 0 – 127    &0000.0000 - &001F.FFFF      = 2 MB        128 x 16KB

Ram            &0020.0000 - &003F.FFFF      = 2 MB
```

CALL ARM CHECK READY:

Check of the ARM is busy, to make sure that the SF3_ARM ready to use.

```
REM call ARM ready

1000 I = INP(&FD41)
1010 IF I = 1 THEN RETURN
1020 IF I = 2 THEN PRINT”ARM Error”                Get Error,  see F72,4 / F72,5
1030 REM your program
..
```

CALL WIFI CHECK READY:

Check of the Wifi module is busy, to make sure that the wifi module ready to use.

```
REM call WIFI ready

1000 I = INP(&FD4E)
1010 IF I = 1 THEN RETURN                          arm is not ready
1020 IF I > 1 THEN PRINT”WIFI Error”               Get Error,  see F72,4 / F72,5
1030 REM your program
..
```

CALL ARM RESPONSE:

```
REM call ARM response

1000 I = INP(&FD41)
1010 IF I = 1 THEN GOTO 1000                       wait processing 0 = oke 1 = busy 2 = error
1020 IF I = 2 THEN PRINT”ARM Error”                Get Error,  see F72,4 / F72,5
1030 RETURN
```

CALL WIFI RESPONSE:

```
REM call WIFI resonse

1000 I =       INP(&FD4E)
1010 IF I = 1 THEN GOTO 1000
1020 IF I = 0 THEN RETURN
1030 IF I = 2 THEN PRINT”WIFI Error”               Get Error,  see F72,4 / F72,5 or F91 for extra
1040 IF I = 3 THEN PRINT”WIFI Offline"

1050 IF I = 4 THEN PRINT”WIFI Socket not available"
1060 RETURN
```

MOUSE:

Tested mouse:

Works well:

Logitech	RX250
MAXXTER	ACT-MUS-U-01
Microsoft	BASIC Optical Mouse 2.0 USB/PS2 compatible
DELL	MS111-T
APPLE	A1152
CIRKUIT DISNEY	DSY MO-180
MICROSOFT	WHEEL MOUSE OPTICAL 1(USB-PS/2)
MICROSOFT	INTELLIMOUSE 1(USB-PS/2)
LOGITECH	G1
LOGITECH	M90
UNIDENTIFIED	CHINESE
KONIG	CMP-MOUSE60

Do not work:

Logitech	M100
Logitech	M220
HP	M-UV69a CODE IS READ BUT NOT INITIALISED

F20 USB mouse data read
F21 USB mouse host info

F20 USB mouse data read

```
110 out &FD41,20                    (no ARM response needed)

120 print inp(&FD42);               X as (relative) -100 + 100
130 print inp(&FD42);               Y as (relative) -100 + 100
140 print inp(&FD42);               byte (LSB is button 0)
150 print inp(&FD42)                Wheel steps   -100 + 100
```

F21 USB mouse host info

```
110 out &FD41,21
120 call ARM response

Device information

Max 1000 characters

text    <13>
text    <13>
        <13>

Hid report information

05,09           <13>
75,01           <13>
..
CC CC           <13>                cc,cc is the end
                <10>

1000 C = INP(&FD42)
1010 IF C = 10 THEN PRINT:END
1020 IF C = 13 THEN PRINT:GOTO 1000
1020 PRINT CHR$(C);
1030 GOTO 1000
```

AUDIO:

F40 Select Audio application mode

App:

```
  0 = Disable SE-ONE by hardware &FF20-&FF27 (mp3 player)
  1 = Seone_MP3A
  2 = Seone_MP3B
  3 = Seone_FM
  4 = Seone_REG
  5 = AudioStream
```

```
  6 = Midi
  7 = Synth
  8 = Voice


110 out &FD41,0                          reset write buffer pointer 0
120 out &FD42, App                       Application
130 out &FD41, 40                        function set date
140 call ARM response

Error response:
Nr. 28  Invalid input;
```

F41 Seone audio settings

F41,0: Set volume L+R the same time

```
        110 out &FD41,0                  reset write buffer pointer 0
        120 out &FD42, Volume            (0-100)
        130 out &FD41, 41                function set date
        140 call ARM response

        Error response:
        none
```

F41,1: Set volume L R

```
        10 out &FD41,0
        120 out &FD42, Volume left       (0-100)
        125 out &FD42, Volume right      (0-100)
        130 out &FD41, 41                function set date
        140 call ARM response

        Error response:
        none
```

TODO set bass,treable

MSD DEVICE FILE LEVEL:

F47 Mass storage device file level functions (beta)
F48 Mass storage device file level read data
F49 Mass storage device file level write data

Device is:

```
 0: SD
 1: USB
```

F47,0: Status

```
        120 out &FD41,0                          reset pointers 0
        130 out &FD42,0
        140 call ARM response
        150 print inp(&FD42);            status Read    0 = Idle
                                                        1 = Active
        160 print inp(&FD42);            status Write   0 = Idle
                                                        1 = Active
```

F47,10: Start Loading file

Procedure:

```
        ' 1a  start load      (F47,10)
        ' 1b  read file size
        ' 2   read data       (F48)
        ' 2b  read number of data to read
        ' 3   if data to read > 0 then read again(2)
        ' 4   when data to read is null the file is closed



        bh = 8                           '8 x 256 =2048
        bl = 0                           '0
```

```
OUT io41,0
OUT io42,10

OUT io42,DV                          'select Device

OUT io42,bh                          'Number of bytes read High
OUT io42,bl                          '1..2048              Low


F$="TEST.TXT"
FOR FP = 1 TO LEN(F$)                'set FileName
   OUT io42,ASC(MID$(F$,FP,1))
NEXT

OUT io41,47
gosub armResponse

'Get file size

B1 = INP(io42)                                 '<< 24 ignore this
B2 = INP(io42)                                 '<< 16
B3 = INP(io42)                                 '<<  8
B4 = INP(io42)                                 '<<  0

‘B1 and B2 not calculated for this test
FS = (B3 * 256) + B4

PRINT"File size: ";FS

PRINT"Attrib 1: ";INP(io42)
PRINT"Attrib 2: ";INP(io42)

Error response:
Nr. 4  _Could not find the file
```

F47,11: Start save file

```
Procedure:

'1     Start save            (F47,11)
'2     write data            (F49)
'3     end save              (F48,12)

F$="TEST.TXT"
OUT io41,0
OUT io42,11
OUT io42,DV                          'select Device

OUT io42,0                           'reserve
OUT io42,0                           'reserve

FOR FP = 1 TO LEN(F$)
  OUT io42,ASC(MID$(F$,FP,1))
NEXT

OUT io41,47
gosub armResponse
```

F47,12: End Write / Save (close file)

```
OUT io41,0
OUT io42,12
OUT io41,47

gosub armResponse
```

F48 Mass storage device file level read data

```
OUT io41,48
gosub armResponse

bh = inp (io4A)                              'Number of bytes to read     High
bl = inp (io4A)                              '                            Low

br = (bh *256) + bl                          'Calculate to 16 bit

PRINT"Bytes read: "+STR$(br)
```

```
FOR x = 1 TO br                              'max 2048
          PRINT HEX$(INP(io4A))+" ";
NEXT
```

F49 Mass storage device file level write data

```
F$="Hello this is an test"
PRINT "length of text is:";LEN(F$)

OUT io41,9

FOR FP = 1 TO LEN(F$)
  OUT io4B,ASC(MID$(F$,FP,1))
NEXT

OUT io41,49
gosub armResponse

bh = inp (io4B)                              'Read number of written bytes High
bl = inp (io4B)                              '                             Low

bw = (bh *256) + bl

PRINT"Bytes write :"+STR$(bw)
```

FAT32 (USB MSD) SECTOR LEVEL:

F51 Read sector from USB MSD
F52 Write protection FAT32 (software setting)
F53 Write sector to USB Stick
F54 USB fatfs host info
F55 Check if USB stick available

info:

When USB stick is installed, the blue led with the text FATFS will burn.

while exchanging the USB stick you must make sure that the FAT32 software on the CPC supports it.

Changing the USB stick takes about 10s, change not to fast

F50 (removed)

F51 Read sector from USB MSD

```
110 call ARM ready
120 out &FD41,1                          reset pointers 1
130 out &FD43, byte3              MSB    32bit
140 out &FD43, byte2
150 out &FD43, byte1
160 out &FD43, byte0              LSB    32bit

170 out &FD43, Sectors            Sector write (max 8)
180 out &FD41,51                         active function
190 call ARM response

1000 S = sectors * 512
1010 FOR T = 1 TO S
1020 PRINT INP(&FD43);
1030 NEXT T
1040 I = INP(&FD43)
1050 IF I <> &1A THEN PRINT "End of file check error"
```

F52 Write protection FAT32 (software setting)

write protection lock off:

```
110 out &FD41,2                          reset buffer pointer 2 fatfs write
```

```
        120 out &FD44, &AA                          lock of code
        130 out &FD41,52                            active function
        140 call ARM response                       16kbyte 16ms / 512bytes 900us

        write protection lock on:

        110 out &FD41,2                             reset buffer pointer 2 fatfs write
        120 out &FD44, <> &AA                       lock of code (all but &AA)
        130 out &FD41,52                            active function
        140 call ARM response                       16kbyte 16ms / 512bytes 900us



F53     Write sector to USB Stick

        110 out &FD41,2                             reset buffer pointer 2 fatfs write
        120 out &FD44, byte3                MSB     32bit
        130 out &FD44, byte2
        140 out &FD44, byte1
        150 out &FD44, byte0                LSB     32bit

        160 out &FD44, Sectors                      Sectors write (max 8)

        1000 S = sectors * 512
        1010 A [0…S] = DATA, DATA.
        1020 FOR T = 1 TO S
        1030 OUT &FD44, A[T]
        1040 NEXT T
        1050 OUT &FD44, &1A

        2000 out &FD41,53                           active function
        2010 call ARM response

F54     USB fatfs host info                 // TODO

        110 out &FD41,54
        120 call ARM response

        Device information

        Max 1000 characters

        text    <13>
        text    <13>
                <13>
                <10>

        1000 C = INP(&FD42)
        1010 IF C = 10 THEN PRINT: END
        1020 IF C = 13 THEN PRINT: GOTO 1000
        1020 PRINT CHR$(C);
        1030 GOTO 1000

F55     Check if USB stick available

        110 out &FD41,55
        120 call ARM response

        130 print inp(&FD42);                       1 = USB stick is available and installed
                                                    0 = USB stick is NOT available
        140 print inp(&FD42);                       hot-plug counter
                                                    every hot-plug the counter are increment +1 (8bit)
```

USB CPC DSK FILE SUPPORT:

```
F56,0:  open *,DSK file
F56,1:  DSK read sector
F56,2   (todo) DSK Write sector
F56,3   DSK Close
F56,10  (todo) DSK info

F56     DSK image functions:


        Please make a DUMMY.DSK in the root of the device

        F56,0:  Start/open  DSK

                Device is:
```

```
        0: SD
        1: USB

        100 out &FD41, 0
        110 out &FD42, 0                            sub function 0
        120 out &FD42, device number                device number
        130 out &FD43, byte3                MSB     LBA 32bit
        140 out &FD43, byte2
        150 out &FD43, byte1
        160 out &FD43, byte0                LSB     LBA
        170 out &FD41, 56                           Function 56
        180 call ARM response

        Error Response:
        Nr.--  FAT error table

F56,1:  DSK read sector

        120 out &FD41,0
        130 out &FD42,1
        140 out &FD42, track
        150 out &FD42, Sector
        160 out &FD42, Side
        170 out &FD41, 56
        180 call ARM response

        1000 FOR T = 1 TO ??
        1020 PRINT INP(&FD42);
        1030 NEXT T


        Error Response:
        ?? Nr.19       Invalid parameter
        Nr.1   Disk error


F56,2   (todo) DSK Write sector

        110 out &FD41, 0
        130 out &FD42, 2
        140 out &FD42, track
        150 out &FD42, Sector
        160 out &FD42, Side

        1010 A [0…S] = DATA, DATA.
        1020 FOR T = 1 TO S
        1030 OUT &FD42, A[T]
        1040 NEXT T
        2000 out &FD41,56
        2010 call ARM response



F56,3   DSK Close

        110 out &FD41, 0
        120 out &FD42, 3
        130 out &FD41,56
        140 call ARM response


F56,10  DSK info

        110 out &FD41, 0
        120 out &FD42, 10
        130 out &FD41, 56
        140 call ARM response
        150 print inp(&FD42)  0 =  not active     1 = dsk active
        151 print inp(&FD42)  '.' reserve
        152 print inp(&FD42)  '.' reserve
        153 print inp(&FD42)  '.' reserve
        160 print chr$(inp(&fd42))    f
        170 print chr$(inp(&fd42))    i
        180 print chr$(inp(&fd42))    l
        190 print chr$(inp(&fd42))    e
        200 print chr$(inp(&fd42))    n
        210 print chr$(inp(&fd42))    a
        220 print chr$(inp(&fd42))    m
        230 print chr$(inp(&fd42))    e
        240 print chr$(inp(&fd42))    .
        250 print chr$(inp(&fd42))    d
        260 print chr$(inp(&fd42))    s
```

```
        270 print chr$(inp(&fd42))    k

F56,100 FAT32 (2th) Select Volume (default 0=SD)

        Volume:
         0: SD msd card
         1: USB msd stick

        110 out &FD41,0
        120 out &FD42,100
        130 out &FD42,Volume 0..1
        140 out &FD41,56                            active function
        150 call ARM response


F56,101 FAT32 (2th) Write protection (z80 software setting)

        write protection lock off:

        110 out &FD41,0
        120 out &FD42,101
        130 out &FD42,&AA                           lock of code
        140 out &FD41,56                            active function
        150 call ARM response

        write protection lock on:

        110 out &FD41,0
        120 out &FD42,101
        130 out &FD42, <> &AA               lock of code (all but &AA)
        140 out &FD41,56                            active function
        150 call ARM response

F56,102         FAT32 (2th) host info
        (todo)
```

FAT32 (SD) SECTOR LEVEL:

```
F57     FAT32 (2th) Check if SD card is available
F58     FAT32 (2th) Read sector from MSD
F59     FAT32 (2th) Write sector to MSD

F57     FAT32 (SD) Check if volume is available

        140 out &FD41,57
        150 call ARM response

        160 print inp(&FD42);               1 = Volume is available and installed
                                            0 = Volume is NOT available
        170 print inp(&FD42);               3 (TODO)
                                            hot-plug counter
                                            every hot-plug the counter are increment +1 (8bit)

F58     FAT32 (2th) Read sector from MSD

        110 call ARM ready
        120 out &FD41,8                             reset pointers 8(A)
        130 out &FD4A, byte3                MSB     32bit
        140 out &FD4A, byte2
        150 out &FD4A, byte1
        160 out &FD4A, byte0                LSB     32bit

        170 out &FD4A, Sectors              Sector write (max 4)
        180 out &FD41,58
        190 call ARM response

        1000 S = sectors * 512
        1010 FOR T = 1 TO S
        1020 PRINT INP(&FD4A);
        1030 NEXT T
        1040 I = INP(&FD4A)
        1050 IF I <> &1A THEN PRINT "End of file check error"


F59     FAT32 (2th) Write sector to MSD

        110 out &FD41,9                             reset buffer pointer 9 (B) fatfs write
        120 out &FD4B, byte3                MSB     32bit
        130 out &FD4B, byte2
```

```
140 out &FD4B, byte1
150 out &FD4B, byte0                LSB     32bit

160 out &FD4B, Sectors                      Sectors write (max 4)

1000 S = sectors * 512
1010 A [0…S] = DATA, DATA.
1020 FOR T = 1 TO S
1030 OUT &FD4B, A[T]
1040 NEXT T
1050 OUT &FD4B, &1A

2000 out &FD41,59
2010 call ARM response
```

ROM:

```
F62,11: Set Enable/Disable All ROMs 0-126
F62,3:  Set Disable/Enable ROM[n] by Hardware
F62,0:  Get Hardware ROM[n] enable / disable


F62,1:  Get list of Hardware Enables ROMs (127 is lower ROM)
F62,2:  Get all first byte of the ROM's (127 is lower ROM)

F62,4:  Write first byte of the ROM with 255
F62,6:  Read data form ROM address nn
F62,7:  Write data to ROM address nn

F62,8:  Clear Array
F62,5:  Fill Array and ROM[] with number n


F62,10: CPC/Z80 >>> Array
F65     WEB     >>> Array
F62,14  MSD     >>> Array

F62,9:  Array   >>> Z80
F66     Array   >>> ROM[]
F62,13  Array   >>> External RAM
F62,12: Array   >>> MSD
```

ROM TABLE SD CARD:

```
F62,20  copy Array   >>>   ROM[nn]    sd:..ROMTABLE

F62,21  Delete Rom[nn]                sd:..ROMTABLE
F62,36  Delete complete Rom Bank [n]

F62,22  Get File size from ROM[nn]    sd:..ROMTABLE

F62,25  Save Free text for ROM[nn]    sd:..ROMTABLE
F62,26  Load Free text from ROM[nn]   sd:..ROMTABLE



F63     CPC/Z80 >>> CPC ROM   (direct)
F64     MSD     >>> CPC ROM   (direct)




F62     Rom Sub functions:

        F62,0:  Get Hardware Rom enable / disable

                110 out &FD41, 0                    reset write buffer pointer 0
                120 out &FD42, 0                    active sub function
                130 out &FD42, Rom number
                140 out &FD41, 62                   active function
                150 call ARM response
                160 print inp(&FD42)

                Error Response:
                Nr.19   Invalid parameter

        F62,1:  Get list of Hardware Enables ROMs (0-15 127 is lower ROM)
```

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 1                    active sub function
130 out &FD41, 62                   active function
140 call ARM response

150 T = 0
160 I = INP(&hfd42)                 Example Rom Numbers Enables:  2 3 4 13 255
170 IF I = 255 THEN PRINT "TOTAL ROM ENABLE:";T: END
180 T = T + 1
190 PRINT I;
200 GOTO 160
…
Last byte is 255                    Rom 255 don't use

Error Response:
Nr.30  Out of range
```

F62,2: Get all first byte of the ROMs (127 is lower ROM)

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 2                    active sub function
130 out &FD41, 62                   active function
140 call ARM response

150 FOR T = 0 TO 127
160 PRINT "ROM:";T;" FIRST BYTE:";INP(&FD42)
170 NEXT T
```

F62,3: Set Disable/Enable ROM by Hardware

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 3                    active sub function
130 out &FD42, Rom number           0-15  127
140 out &FD42, 0 or 1         1 = Enable
150 out &FD41, 62                   active function
160 call ARM response

Error Response:
Nr.19  Invalid parameter
```

F62,4: Clear first byte of ROM with 255

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 4                    active sub function
130 out &FD42, Rom number
140 out &FD41, 62                   active function
150 call ARM response


Error Response:
Nr.19  Invalid parameter
```

F62,5: Fill Rom with number n

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 5                    active sub function
130 out &FD42, Rom number
140 out &FD42, fill number
150 out &FD41, 062                  active function
160 call ARM response

Error Response:
Nr. 15 Timeout              Background upload to Rom more than 5 sec.
                            please contact me !!   tmtlogic
```

F62,6: Read one data form Rom address nn

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 6                    active sub function
130 out &FD42, Rom number
140 out &FD42, High byte address    address max &4000
150 out &FD42, Low byte address
160 out &FD41, 062                  active function
170 call ARM response
```

```
        180 print inp(&hfd42)        data

        Error Response:
        Nr.30  Out of range
        Nr. 19  Invalid parameter            Rom select > 127
```

F62,7: Write one data to Rom address nn

```
        110 out &FD41, 0                     reset write buffer pointer 0
        120 out &FD42, 7                     active sub function
        130 out &FD42, Rom number
        140 out &FD42, High byte address     address max &4000
        150 out &FD42, Low  byte address
        160 OUT &FD42, data
        170 out &FD41, 062                   active function
        180 call ARM response


        Error Response:
        Nr.30  Out of range
        Nr. 19  Invalid parameter            Rom select > 31
```

F62,8: Clear Array

```
        110 out &FD41, 0                     reset write buffer pointer 0
        120 out &FD42, 8                     active sub function
        130 out &FD41, 062                   active function
        140 call ARM response
```

F62,9: Array >>> CPC/Z80 data, begin adr nn
Note: Address is autoincrement

Maximal address is &4000

```
        110 out &FD41, 0                     reset write buffer pointer 0
        120 out &FD42, 9                     active sub function
        130 out &FD42, High byte address     address
        140 out &FD42, Low byte address
        150 out &FD41, 062                   active function
        160 call ARM response

        170 print inp(&hfd42)        data
        180 print inp(&hfd42)        data
        190 print inp(&hfd42)        data
        ..

        Error response:
        Nr.30  Out of range
```

F62,10: CPC/Z80 >>> Array data begin adr nn

Note: Address is auto increment

```
        110 out &FD41, 0                     reset write buffer pointer 0
        120 out &FD42, 10                    active sub function
        130 out &FD42, High byte address     Start address max &4000
        140 out &FD42, Low byte address

        150 out &FD42, data
        160 out &FD42, data
        170 out &FD42, data
        ..

        200 out &FD41, 062                   active function
        210 call ARM response


        Error response:
        Nr.30  Out of range
```

F62,11: Set Enable/Disable All ROMs 0-126 (by hardware)

```
        110 out &FD41, 0                     reset write buffer pointer 0
        120 out &FD42, 11                    active sub functions
        130 out &FD42, 0-1                   0 = Disable >=1 Enable(default)
        140 out &FD41, 062                   active function
        150 call ARM response
```

F62,12: Array >>> MSD (sd / usb)   16kb

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 12
        130 out &FD42, 0                    0= SD 1=USB
        140 out &FD42, ASC("T")             maximal 8+4 charcters 12345678.123
        150 out &FD42, ASC("E")
        160 out &FD42, ASC("S")
        170 out &FD42, ASC("T")
        180 out &FD42, ASC("F")
        190 out &FD42, ASC("I")
        200 out &FD42, ASC("L")
        210 out &FD42, ASC("E")
        220 out &FD42, ASC(".")
        230 out &FD42, ASC("R")
        240 out &FD42, ASC("O")
        250 out &FD42, ASC("M")
        260 out &FD41, 062                  active function
        270 call ARM response

F62,13  Array >>> External RAM[]

               Array size is &4000

        110 out &FD41, 0                            reset write buffer pointers0
        120 out &FD42, 13
               120 out &FD42, RAM number                    RAM number 0-127
        120 out &FD42, MEM block                    MEM block 0-255
        140 out &FD41, 62                           reset write buffer pointers0
        150 call ARM response

        Error response:
        Nr.13   Invalid parameter
        Nr.15   Timeout

F62,14  MSD >>> Array

        File size is maximal &4000
        File size is maximal &FFFF

        Example path:    map1/map2/map3/test.rom


        110 out &FD41, 0
        120 out &FD42, 14                           reset write buffer pointer 0
        120 out &FD42, device number                0=SD 1=USB
        130 out &FD42, path                         example:  test/hello.rom
        140 out &FD42, path
        150 out &FD42, path
        ..
        300 out &FD41, 62                           active function
        310 call ARM response

        Error response:
        Nr.6.   Invalid path name
        Nr.19.  Invalid parameter
        Nr.30.  Out of memory

F62,15  res
F62,16  res
F62,17  res
F62,18  res

        ROMTABLE is a directory on then SD card
        For every computer system his own PATH, example CPC: SD:/CPC/ROMTABLE/BANKnnn
        When function F62,20 or F62,25 is used this directory is automatically created.
        If the SF3 can find this directory, all ROMs will be loaded automatically
        This is done before executing the INI file

        BANKnnn means,  a group of ROMS (default is BANK000)
        ROM001.BIN means , the content of this file loaded in ROM place 1, or segment 1


F62,20  copy Array   >>>   ROM[nn]    sd:..ROMTABLE

        This function create this file: ROMnnn.BIN    nnn = rom number

        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 20                   active sub function
        130 out &FD42, Bank
        140 out &FD42, Rom number
        141 out &FD42, Size High            (only EP)
        142 out &FD42, Size Low
```

```
150 out &FD41, 062                  active function
160 call ARM response

Error Response:
Nr.30  Out of range
Nr. 19  Invalid parameter           Rom select > 31
```

F62,21 Delete Rom[nn] sd:..ROMTABLE

This function delete the files ROMnnn.BIN and ROMnnn.TXT

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 21                   active sub function
130 out &FD42, Bank
140 out &FD42, Rom number
150 out &FD41, 62                   active function
160 call ARM response
```

F62,22 Get list of availeble ROM sd:..ROMTABLE

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 22                   active sub function
130 out &FD42, Bank
140 out &FD41, 62                   active function
180 call ARM response
190 Print"Roms availeble:"
200 i = inp(&hfd42)
210 if i <> 255 then PRINT i;",";:GOTO 200
```

F62,23 Get File size from ROM[nn] sd:..ROMTABLE

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 23                   active sub function
130 out &FD42, Bank
140 out &FD42, Rom number
150 out &FD41, 62                   active function
160 call ARM response
270 print chr$(inp(&FD42)           1
280 print chr$(inp(&FD42)           6
290 print chr$(inp(&FD42)           3
300 print chr$(inp(&FD42)           8
310 print chr$(inp(&FD42)           4
```

When inp(&FD42) = 0 , last character

F62,25 Save Rom name

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 25
130 out &FD42, Bank
140 out &FD42, Rom number
150 out &FD42, asc("T")
160 out &FD42, asc("e")
170 out &FD42, asc("s")
180 out &FD42, asc("t")
190 out &FD41, 62
200 call ARM response
```

F62,26 Load Rom name

```
110 out &FD41, 0                    reset write buffer pointer 0
120 out &FD42, 26
130 out &FD42, Bank
140 out &FD42, Rom number
150 out &FD41, 62
160 call ARM response
270 print chr$(inp(&FD42)           t
280 print chr$(inp(&FD42)           e
290 print chr$(inp(&FD42)           s
300 print chr$(inp(&FD42)           t
```

When inp(&FD42) = 0 , last character

F62,30 Set Startup Bank

When SF3 startup ,this bank start

```
110 out &FD41, 0                    reset write buffer pointer 0
```

```
        120 out &FD42, 30
        130 out &FD42, Bank
        130 out &FD41, 62                   active function
        180 call ARM response
```

F62,31 Get startup ROMTABLE bank

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 31
        130 out &FD41, 62                   active function
        180 call ARM response
        230 i =inp(&FD42)                   i  (0..255) is bank
```

F62,32 remove 20200426 Set select edit ROMTABLE bank

F62,33 Load Bank name

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 33
        130 out &FD42, Bank
        180 out &FD41, 62
        190 call ARM response
        240 print chr$(inp(&FD42)           N
        250 print chr$(inp(&FD42)           a
        260 print chr$(inp(&FD42)           m
        270 print chr$(inp(&FD42)           e
        280 print chr$(inp(&FD42)           ..
```

When inp(&FD42) = 0 , last character (max 255)

F62,34 Save Bank name

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 34
        130 out &FD42, Bank
        140 out &FD42, asc("B")
        150 out &FD42, asc("a")
        160 out &FD42, asc("n")
        170 out &FD42, asc("k")             max(255 characters)
        180 out &FD41, 62
        190 call ARM response
```

F62,35 Get list of availeble Bank's

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 35                   active sub function
        140 out &FD41, 62                   active function
        180 call ARM response
        190 Print"Bank's availeble:"
        200 i = inp(&hfd42)
        210 if i <> 255 then PRINT i;",";:GOTO 200
```

F62,36 Delete complete Rom Bank [n]

This function delete the complete ROMBANK

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, 36                   active sub function
        130 out &FD42, Bank
        150 out &FD41, 62                   active function
        160 call ARM response
```

F63 Transfer CPC To ROM

Note:
CRC header is automatic detected

```
        110 out &FD41, 0                    reset write buffer pointer 0
        120 out &FD42, Rom number           ROM number 0-127 127 is Lower ROM
        120 out &FD42, Rom number           Mem block number 0-255
        130 out &FD42, 0                    0 = normal.  (todo) 1 = under CPC reset)

        140 out &FD42, data                 Max data size is &4000+80
        150 out &FD42, data
```

```
        160 out &FD42, data
        ..

        300 out &FD41, 063                          active function
        310 call ARM response

        Error response:
        Nr. 15  Timeout                         Background upload to Rom more than 5 sec.
                                                please contact me !!  TMTLOGIC
        Nr. 19  Invalid parameter                       Rom select > 127
        Nr. 30  Out if range                    Rom > 0x4080
        Nr. 30  Out if range                    Mem > 0xFFFF


F64     Transfer MSD To ROM

        Write ROM data from SD USB to ROM

        Example path:    map1/map2/map3/test.rom


        ..TODO LOWER ROM upload under CPC RESET

        110 out &FD41, 0                            reset write buffer pointer 0
        120 out &FD42, device number                0=SD 1=USB
        130 out &FD42, Rom number                   Rom nummer 0-126 127 is Lower ROM
        130 out &FD42, Mem number                   Mem nummer 0-255

        140 out &FD42, path                         example:  test/hello.rom
        150 out &FD42, path
        160 out &FD42, path
        ..
        300 out &FD41, 064                          active function
        310 call ARM response

        Error response:
        Nr.6.   Invalid path name
        Nr.19.  Invalid parameter



F65     Transfer Internet To Array

        Note:
        After download, the CPC CRC Header is automatic removed

        Target:

        0 = HTTP
        1 = HTTPS

        (todo)
          2 = MQTT
          3 = TMTNET
          4 = FTP
          5 = SMB


         ..TODO LOWER ROM upload under CPC RESET

        .
        120 call WIFI ready

        130 out &FD41, 0                                reset write buffer pointer 0
        140 out &FD42, target                   0=HTTP 1=HTTPS
        150 out &FD42, ASC("w")                         example:  www.tmtlogic.com/hello.rom
        160 out &FD42, ASC("w")
        170 out &FD42, ASC("w")
        180 out &FD42, ASC(".")
        190 out &FD42, ASC("t")
        ...
        300 out &FD41, 065                          active function
        310 call ARM response

         Error response:
         Nr.6.  Invalid path name
         Nr.31  offline
         Nr.33  steam error                     if http response not good

        320 call WIFI response
```

```
F66     Transfer Array to ROM[]

        .
        110 out &FD41, 0                        reset write buffer pointers0
        120 out &FD42, Rom number               Rom number 0-127 127 is Lower ROM
        130 out &FD42, 0                        reserve default =0, later function load under Reset

        131 out &FD42, High                     size High byte
        132 out &FD42, LOW                      size low byte

        140 out &FD41, 66                       reset write buffer pointers0
        150 call ARM response

        Error response:
        Nr.15   Time out
```

RAM:

```
F67,0:  Set Enable/Disable external RAM (by hardware)

F72,14: Read data from Total Ram array SF3 (4MB)
F72,15: Write data to Total Ram array SF3 (4MB)


F67     Ram Sub functions:

        F67,0:  Set Enable/Disable All external RAM

                .
                110 out &FD41, 0                reset write buffer pointer 0
                120 out &FD42, 0                active sub functions
                130 out &FD42, 0-1              0 = Disable >=1 Enable(default)
                140 out &FD41, 67               active function
                150 call ARM response

        F67,1:  reserved for cubeMDos write memory  256 bytes
                (if you modify this 256 bytes, contact SOS)


                120 out &FD41,0                         reset pointers 0
                130 out &FD42,1
                140 out &FD42,start address             0..255
                150 out &FD42,data
                150 out &FD42,..

                150 out &FD41,67


                320 call ARM response           < 500ns
                Error response:
                Nr.30   out of range



        F67,2:  reserved for cubeMDos read memory  256 bytes
                (if you modify this 256 bytes, contact SOS)


                120 out &FD41,0                         reset pointers 0
                130 out &FD42,2
                140 out &FD42,start address             0..255

                150 out &FD41,67
                320 call ARM response           < 500ns
                399 print inp(&hfd42)           data
                399 print inp(&hfd42)           data
                399 print inp(&hfd42)           data
                …
        F67,3:  reserved for cubeMDos memory  256 bytes
                (if you modify this 256 bytes, contact SOS)

                Read real buffer 255x and send to FTDI and read buffer

                120 out &FD41,0                         reset pointers 0
                130 out &FD42,3
                1430 out &FD41,67
                150 call ARM response
                160 For x = 0 to 255
```

```
170  Print x,inp(&hfd42)                    data
180 Next x
```

SYSTEM:

```
F70     Get DFU filename
F72,20  Get firmware date

F72,0:  Reset CPC
F79:    Get 3 buttons

F72,11: Get logbook
F71     Get System info
F72     System sub Functions:


F72,1:  Memory test
F72,2:  SD card test
F72,3:  Hello.rom test
F72,10: Echo test Microphone and Ear
F72,6:  Led test

F72,4:  Get Error number
F72,5:  Get Error Text
F72,16: Get (n) Error Text
F250,7: Make Error


F72,7:  Set VU LED
F72,12: Set bit for activate  this ini File command  #...
F72,13: Get bit for activate this ini File command  #...
F72,14: Read data from Total Ram array SF3
F72,15: Write data to Total Ram array SF3

F72,16: Reinit ROM RAM settings user.CFG file

F70     Get DFU filename

        .
        110 out &FD41,70                          Function Get DFU filename
        120 call ARM response
        130 C = inp(&FD42)
        140 IF C = 10 THEN PRINT: END
        150 IF C = 13 THEN PRINT: GOTO 130
        160 PRINT CHR$(C);
        170 GOTO 130

F71     Get System info

        Note:
        Check if the Symbiface is connected, you can read the first 3 characters “Sys”, this is always the
same text

        .
        110 out &FD41,71                    Function Get System info
        120 call ARM response

                System: SYMBIFACE 3v2.1             <13>
                                                <13>
                SF3V2D1                         <13>
                                                <13>
                MPU:    CORTEX M7 216Mhz            <13>
                RAM:    2MB                         <13>
                ROM:    2MB                         <13>
                WIFI:   RAK473                  <13>
                AUDIO:  VS1053                  <13>
                OLED:   SS1306 128x32           <13>
                CPLD:   ALTERA 172560dd             <13>
                                                <10>
        130 C = inp(&FD42)
        140 IF C = 10 THEN PRINT: END
        150 IF C = 13 THEN PRINT: GOTO 130
        160 PRINT CHR$(C);
        170 GOTO 130

F72     System sub functions:
```

F72,0: Reset CPC

Note:
Activate bus Reset pin of the CPC

One byte for safety access !
if the access number <> 123 then Oled prints “No access”

```
.
110 out &FD41,0                     reset write buffer pointers0
120 out &FD42, 0                    active sub function
130 out &FD42, 123                  access number (123)

140 out &FD41, 72                   active function
150 call ARM response
```

F72,1: Memory test

Note:
time around 10 sec,
don’t use another ROMs
Information is reading on the Oled display

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 1                    active sub function
130 out &FD41, 72                   active function
140 call ARM response
```

F72,2: SD card test

Note:
Symbiface3 create a file on the SD card (SDTEST.TXT)

```
.
110 out &FD41, 0                    write buffer pointers0
120 out &FD42, 2                    active sub function
130 out &FD41, 72                   active function
140 call ARM response
```

F72,3: Hello.rom test (made by SOS)

Note:
Running Hello.rom (is internal stored in arm) ROM2
After CPC reset is this rom activate
Print to CPC screen: Hello
Or activate with |H

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 3                    active sub function
130 out &FD41, 72                   active function
140 call ARM response
```

F72,4: Get Error number

Note:
remove the error text on the oled
reset WIFI error

```
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 4                    active sub function
130 out &FD41, 72                   active function
140 call ARM response

150 print(inp(&FD42))         Error number

(option)

160 print chr$((inp(&FD42)))          E
170 print chr$((inp(&FD42)))          R
180 print chr$((inp(&FD42)))          R
190 print inp(&FD42)          32x..
..
300 print inp(&FD42)          <10>
310 print inp(&FD42)          <13>
```

F72,5: Get Error Text

Note: remove the error text on the oled

Note the Error string is 34 bytes long and 2 bytes (LF CR)

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 5                    active sub function
130 out &FD41, 72                   active function
140 call ARM response

160 print chr$((inp(&FD42)))        E
170 print chr$((inp(&FD42)))        R
180 print chr$((inp(&FD42)))        R
190 print inp(&FD42)          32x..
..
300 print inp(&FD42)          <10>
310 print inp(&FD42)          <13>
```

F72,6: Led test

Note: test all leds on board

```
if (&FD41 = 1) return         check ARM busy?
out &FD41, 0                  reset write buffer pointers0
out &FD42, 6                  active subfuntion
out &FD41, 72                 active function
call ARM response
```

F72,7: Set VU LED

Note: first byte is left, second is right
LSB is green,MSB is red
This function set the MP3 app off (F40 = 0)

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 7                    active sub function
130 out &FD42, byte           left VU
140 out &FD42, byte           right VU
150 out &FD41, 72                   active function
160 call ARM response
```

F72,10: Echo test Microphone and Ear

Note: Connect the Headset on the SF3
Green connector is Ear
Pink connector is microphone

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 10                   active sub function
130 out &FD41, 72                   active function
140 call ARM response
```

F72,11: Get logbook

The logging can be deactivated by the SF3.INI file DEBUG=OFF

```
.
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 11                   active sub function
130 out &FD41, 72                   active function
140 call ARM response

150 print chr$((inp(&FD42)))  L     max &h2000 bytes
160 print chr$((inp(&FD42)))  O
170 print chr$((inp(&FD42)))  G
..
..
500 print chr$((inp(&FD42)))  '0'   last byte is &h00
```

F72,12: Set bit for activate this INI File command #...

Note,
When this bit is disable, the INI file skipped the line with #<>

```
        .
        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 12                   active subfuntion
        130 out &FD42, 0 or 1        =0 then skip the command line
        140 out &FD41, 72                   active function
        150 call ARM response
```

F72,13: Get bit for activate this INI File command #...

```
        .
        110 out &FD41, 0                    reset write buffer pointers0

        120 out &FD42, 13                   active sub function
        130 out &FD41, 72                   active function
        140 call ARM response
        150 Print inp(&FD42)         = 0 then skip command
```

F72,14: Read data from Total Ram array SF3 (4MB)
&0000.0000 - &003F.FFFF

```
        .
        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 14                   active sub funCtion
        130 out &FD42, High                 32 bits address High byte
        140 out &FD42,
        150 out &FD42,
        160 out &FD42, LOW                  32 bits address
        170 out &FD41, 72                   active function
        180 call ARM response
        190 Print inp(&FD42)         data

        Error response
        Nr.30   Out of range
```

F72,15: Write data to Total Ram array SF3
&0000.0000 - &003F.FFFF

```
        .
        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 15                   active sub function
        130 out &FD42, High                 32 bits address High byte
        140 out &FD42,
        150 out &FD42,
        160 out &FD42, LOW                  32 bits address
        170 out &FD42, data
        180 out &FD41, 72                   active function
        190 call ARM response

        Error respone
        Nr.30   Out of range
```

F72,16: Get (n) Error Text

```
        Note: remove the error text on the oled

        Note the Error string is 34 bytes long and 2 bytes (LF CR)

        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 16                   active sub function
        130 out &FD42, N                    error number 0-37
        140 out &FD41, 72                   active function
        150 call ARM response

        160 print chr$((inp(&FD42)))        E
        170 print chr$((inp(&FD42)))        R
        180 print chr$((inp(&FD42)))        R
        190 print inp(&FD42)         32x..
        ..
        500 print inp(&FD42)         <10>
        510 print inp(&FD42)         <13>
```

F72,18: Activate the NMI from the z80
Make an puls from 100ms

```
        110 out &FD41, 0
        120 out &FD42, 18
        140 out &FD41, 72                   active function
```

```
150 call ARM response
```

F72,19: Activate WIFI WEB update

```
110 out &FD41, 0
120 out &FD42, 19
130 out &FD42, 53                   access code
140 out &FD42, 88                   access code
150 out &FD41, 72                   active function
160 call ARM response

Error response:

19.    Invalid parameter
32.    Wifi response error

See WIFI update manual
```

F72,20 Get firmware date

```
110 out &FD41, 0                    reset write buffer pointers0
120 out &FD42, 20
140 out &FD41, 72                   active function
150 call ARM response

160 print chr$((inp(&FD42)))        2      date 2020 11 22 = 22 nov 2020
170 print chr$((inp(&FD42)))        0
180 print chr$((inp(&FD42)))        2
190 print chr$((inp(&FD42)))        0
200 print chr$((inp(&FD42)))        1
210 print chr$((inp(&FD42)))        1
220 print chr$((inp(&FD42)))        2
230 print chr$((inp(&FD42)))        2
```

F79 Get 3 buttons

```
Note: bits:  x x x x x  right mid left    (sorry)

110 out &FD41, 79                       active function
120 call ARM response
130 print inp(&FD42)                0-7 (3 bits)
```

BUZZER:

F80 Set buzzer

```
Note:  Tone    00 buzzer off
               01 low
               02 middles
               03 high

       rhythm  00 continue
               01 slow
               02 middles
               03 fast


110 out &FD41,0                         reset buffer pointers 0
120 out &FD42, tone                     2 bits
130 out &FD42, rhythm               2 bits
140 REM out &FD42, res
150 REM Out &FD42, res
160 out &FD41,80d                       active function
170 call ARM response
```

WIFI:

F65 Transfer Internet To Array

F90,0: Wifi modele ResetPin on/off

F90,1: Set wifi password
F90,2: Set wifi ssid network name
F90,3: wifi connect with access point

F90,4: wifi At-Command Get DNS
F90,11: wifi At-Command IP config
F90,10: wifi At-Command Close socket
F90,5: wifi At-Command Open TCP socket client
F90,6: WIFI Static ip

F90,13: wifi Get free socket number
F90,8: wifi Send socket data
F90,18: WIFI Check and Read socket data

F90,21: WIFI Check and Read and send to audiostream

F91: WIFI Get WIFI module state (pointer 0 !)

inp(&FD4E)status number

F90 WIFI Sub functions

F90,0: WIFI module Reset Pin on/off

```
110 out &FD41, 7                    resets write buffer pointers 7
120 out &FD49, 0                    active sub function
130 out &FD49, reset 0 or 1         0 = RESET WIFI module
                                1 = WIFI active
140 out &FD41, 90                   active function
150 call ARM response
```

F90,1: Set WIFI password

```
110 out &FD41, 7                    reset write buffer pointer 7
120 out &FD49, 1                    active sub function
130 out &FD49, 'h'                  data
140 out &FD49, 'e'                  data
150 out &FD49, 'y'                  data
160 out &FD41, 90                   active function
170 call ARM response
```

F90,2: Set WIFI SSID network name

```
110 out &FD41, 7                    reset write buffer pointer 7
120 out &FD49, 2                    active sub function
130 out &FD49, 'N'                  data
140 out &FD49, 'e'                  data
150 out &FD49, 't'                  data
160 out &FD41, 90                   active function
170 call ARM response
```

F90,3: WIFI connect with access point

Note: this function can take a few seconds, The SF3 ARM is busy with the WIFI module

```
110 out &FD41, 7                    reset write buffer pointer 7
120 out &FD49, 3                    active sub function
125 out &FD49, DHCP                 0 = client 1 = server
130 out &FD41, 90                   active function
140 call ARM response
```

Error response:
Nr. 31 WIFI offline

F90,4: WIFI At-Command Get DNS

```
110 out &FD41, 7                    reset write buffer pointer 7
120 out &FD49, 4                    active sub function
130 out &FD49, 'w'                  data   www.google.com
140 out &FD49, 'w'                  data
150 out &FD49, 'w'                  data
160 out &FD49, '.'                  data
170 out &FD49, 'g'                  data
..
300 out &FD41, 90                   active function
310 call ARM response
320 call WIFI response
```

```
500 print inp(&hfd49) 172
510 print inp(&hfd49) 217
520 print inp(&hfd49) 17
530 print inp(&hfd49) 35
```

Error response:

offline
Nr. 32 Wifi_resonse_error
Nr. 33 Wifi stream error

F90,5: WIFI At-Command Open TCP socket client

```
120 out &FD41, 7                    reset write buffer pointer 7
130 out &FD42, 5                    active sub functions
140 out &FD49,192                   IP address 1th
150 out &FD49,168                   IP address 2th
160 out &FD49,2                     IP address 3th
170 out &FD49,151                   IP address 4th
180 out &FD49,0D                    Port address High (example 3333)
190 out &FD49,05                    Port address Low
200 out &FD49,01                    Socket Channel 0-3

210 out &FD41, 90                   active function
220 call ARM response
230 call WIFI response
```

Error response:
Nr. 35 "Wifi socket is already open "
Nr. 31 "Wifi offline "
Nr. 25 "Parameter error "

F90,6: WIFI Static ip

```
120 out &FD41, 7                    reset write buffer pointer 7
130 out &FD42, 6                    active sub functions

140 out &FD49, 192                  IP address 1th
150 out &FD49, 168                  address 2th
160 out &FD49, 2                    address 3th
170 out &FD49, 151                  address 4th

180 out &FD49, 255                  NETMASK address 1th
190 out &FD49, 255                  address 2th
200 out &FD49, 255                  address 3th
210 out &FD49, 0                    address 4th

220 out &FD49,192                   GATEWAY address 1th
230 out &FD49,168                   address 2th
240 out &FD49,2                     address 3th
250 out &FD49,254                   address 4th

260 out &FD49,192                   DNS1 address 1th
270 out &FD49,168                   address 2th
280 out &FD49,2                     address 3th
290 out &FD49,254                   address 4th

300 out &FD49,0                     DNS2 address 1th
310 out &FD49,0                     address 2th
320 out &FD49,0                     address 3th
330 out &FD49,0                     address 4th

340 out &FD41, 90                   active function
350 call ARM response
360 call WIFI response
```

Error response:

Nr. 25 "Parameter error "

*F90,7: Deleted !!

F90,8: WIFI Send socket data

note: send buffer is maximal 1004 bytes

.

```
        120 out &FD41, 7
        130 out &FD49, 8
        140 out &FD49, socket channel

        150 out &FD49, data
        160 out &FD49, data
        170 out &FD49, data
        180 out &FD49, data
        190 out &FD49, data
        ..
        400 out &FD41, 90
        410 call ARM response
          Error response:
          Nr. 19       "Invalid parameter"
        420 call WIFI response



*F90,9 Deleted !!

F90,10: WIFI At-Command Close socket

        .
        120 out &FD41, 7                    reset write buffer pointers0
        130 out &FD49, 10                   active sub function
        140 out &FD49, n                    socket channel number 0-3
        150 out &FD41, 90                   active function
        160 call ARM response
          Error Response:
          Nr.19 Invalid parameter
          Nr.34 Wifi socket error

        170 call WIFI response
          Error response:
          Nr.34 Wifi socket error


F90,11: WIFI At-Command IP config

        120 out &FD41, 7                    reset write buffer pointers7
        130 out &FD49, 11                   active sub function
        140 out &FD41, 90                   active function
        150 call ARM response
        160 call WIFI response

        6x print inp(&hfd49);         mac:    &hx &hx &hx &hx &hx &hx
        4x print inp(&hfd49);         IP:     192 168  2 19
        4x print inp(&hfd49);         Mask:   255 255 255 0
        4x print inp(&hfd49);         Gateway:       192 168 2 192
        4x print inp(&hfd49);         dns1:   168 2 254 0
        4x print inp(&hfd49);         dns2:   0 0 0 0

*F90,12:       Deleted !! wifi Get socket state


F90,13: WIFI Get free socket number

        Note: Gives a free socket number


        .
        110 out &FD41, 7                    reset write buffer pointers 7
        120 out &FD49, 13                   active sub function
        130 out &FD41, 90                   active function
        140 call ARM response
        150 print inp(&hfd49);        free socket number 0-3   255 is no free socket or offline


F90,16         check type connection
                                    0 none
                                    1 TCP client
                                    2 TCP server
                                    3 UDP client
                                    4 UDP server



        userSocket(0-3) > intern Flag number 0-7 8-12
        Out:
        Socket type,
        number of connections (server),  max 7
        2 byte port, 6 byte ip
```

```
        2 byte port, 6 byte ip
        2 byte port, 6 byte ip
        2 byte port, 6 byte ip
        2 byte port, 6 byte ip
        2 byte port, 6 byte ip
        2 byte port, 6 byte ip
```

F90,17 check socket connection

```
        120 out &FD41, 7                    reset write buffer pointers 7
        130 out &FD49, 17                   active sub function
        140 out &FD49, Socket        (0-3)
        150 out &FD41, 90                   active function
        160 call ARM response
        170 print inp(&hfd49);       0 = socket channel open
                                     1 = socket channel close
                                     2 = WIFI offline

        180 print inp(&hfd49);       0 none
                                     1 TCP client
                                     2 TCP server
                                     3 UDP client
                                     4 UDP server
```

F90,18 WIFI Check and Read socket data to rx buffer

```
        120 out &FD41, 7
        130 out &FD49, 18
        140 out &FD49, Socket        (0-3)
        150 out &FD41, 90
        160 call ARM response
        170 call WIFI response
        180 print inp (&FD49)               content of received bytes    High byte
        190 print inp (&FD49)               content of received bytes    Low byte
        200 print inp (&FD49)               content of received bytes    Low byte
```

Read the data (the content of received bytes decrement automatic -1) every read

```
        1000 print inp (&fd45 + Socket)     data
        1010 print inp (&fd45 + Socket)     data
        ..
        ..
```

F90,21 WIFI Check if there is data and send it to the audiostream (webradio)

```
        120 out &FD41, 7
        130 out &FD49, 21
        140 out &FD49, Socket        (0-3)
        150 out &FD41, 90
        160 call ARM response
        170 call WIFI response
```

F91 WIFI Get WIFI module stat

States are :

This is changed …

0 = WifiRak_idle

```
.
110 out &FD41, 91                           active function
120 call ARM response
130 print inp(&hfd42)                WIFI module state  number
140 print inp(&hfd42)                High byte 16bit Len RX At-Command data buffer
150 print inp(&hfd42)                Low  byte 16bit
```

RTC:

```
F105   RTC sub functions
F105,0: RTC Save Backup register
F105,1: RTC Load Backup register
F105,2: RTC Set date in BCD
F105,3: RTC Set time in BCD
F105,4: RTC Set username

F105,
F100   Set time       hour minute sec
F101   Get time       hour minute sec
F102   Reset RTC
F103   Get time BCD hour minute sec
F104   Get date BCD day month year
F110   Set date       day month year
F111   Get date       day month year


F100   Set time       hour minute sec

       .
       110 out &FD41,0                          reset buffer pointers 0
       120 out &FD42, hours                hours 0 - 23
       130 out &FD42, minutes              minutes 0 - 59
       140 out &FD42, seconds              seconds 0 - 59
       150 out &FD41,100                        function set time
       160 call ARM response



F101   Get time       hour minute sec


       110 out &FD41,101                        active function
       120 call ARM response

       130 print inp(&FD42)                hours  0-23
       140 print inp(&FD42)                minutes       0-59
       150 print inp(&FD42)                seconds 0-59


F102   Reset RTC
       Note: Only needed when are problem with the time and date, all value are 0 !

       110 out &FD41,102                        active function
       120 call ARM response

F103   Get time BCD hour minute sec

       110 out &FD41,103                        active function
       120 call ARM response

       130 print hex$(inp(&FD42))               hours  0-23
       140 print hex$(inp(&FD42))               minutes       0-59
       150 print hex$(inp(&FD42))               seconds 0-59


F104   Get date BCD day month year

       110 out &FD41,104                        active function
       120 call ARM response

       130 print hex$(inp(&FD42))               day    1-31
       140 print hex$(inp(&FD42))               month  1-12
       150 print hex$(inp(&FD42))               year   0-99 (real is + 2000)
       160 print hex$(inp(&FD42))               Weekday 0-31


F105   RTC sub functions

       F105,0: RTC Set Backup register(s)

              110 out &FD41, 0
              120 out &FD42, 0
              120 out &FD42, (start)Register (0-250)
              130 out &FD42, Data
              130 out &FD42, Data
              131 out &FD42, Data
              132 out &FD42, Data
              ..
              140 out &FD41, 105
              150 call ARM response
```

```
        Error response:
           (25) parameter error
```

F105,1: RTC Get Backup register

```
        110 out &FD41, 0
        120 out &FD42, 1
        120 out &FD42, Backup Register (0-250)
        140 out &FD41, 105
        150 call ARM response
        170 print inp(&FD42)

        Error response:
           (25) parameter error
           Todo ..   batt low
```

F105,2: RTC Set date in BCD

```
        110 out &FD41,0                          reset buffer pointers 0
        120 out &FD42,2                          day    1 -31
        130 out &FD42, day                       day    1 -31
        140 out &FD42, month               month  1 -12
        150 out &FD42, year                      year   0-99 (real is + 2000)
        160 out &FD41,105                        active function
        170 call ARM response

        Error response:
           (25) parameter error
```

F105,3: RTC Set time in BCD

```
        110 out &FD41,0
        120 out &FD42,3
        130 out &FD42, hours               hours 0 - 23
        140 out &FD42, minutes             minutes 0 - 59
        150 out &FD42, seconds             seconds 0 - 59
        160 out &FD41,105                        function set time
        170 call ARM response

        Error response:
           (25) parameter error
```

F105,4: RTC Set username

```
        Default username is :DEFAULT

        SD:/cpc/SYSTEM/RTC/ username /RTC-MEM.BIN

        110 out &hfd41,0
        120 out &hfd42,4
        150 out &hfd42,'u'                       name max 8 characes
        160 out &hfd42,'s'
        170 out &hfd42,'e'
        180 out &hfd42,'r'
        180 out &hfd41,105
        190 call ARM response
```

```
F110    Set date        day month year

        110 out &FD41,0                          reset buffer pointers 0
        120 out &FD42, day                       day    1 -31
        130 out &FD42, month               month  1 -12
        140 out &FD42, year                      year   0-99 (real is + 2000)
        150 out &FD41,110                        active function
        160 call ARM response

F111    Get date        day month year

        110 out &FD41,111                        active function
        120 call ARM response
        130 print inp(&FD42)               day    1-31
        140 print inp(&FD42)               month  1-12
        150 print inp(&FD42)               year   0-99 (real is + 2000)
        160 print inp(&FD42)               Weekday 0-31
```

MEASUREMENTS:

```
F125   Get Power Supply 5v , RTC batt voltage , ARM temperature

       110 out &FD41,125                          active function
       120 call ARM response

       130 print chr$(inp(&FD42))          4      power Supply 4565mV
       140 print chr$(inp(&FD42))          5
       150 print chr$(inp(&FD42))          6
       160 print chr$(inp(&FD42))          5
       170 print inp(&FD42)          <13>

       180 print chr$(inp(&FD42))          3      RTC batt power 3101mV (todo)
       190 print chr$(inp(&FD42))          1
       200 print chr$(inp(&FD42))          0
       210 print chr$(inp(&FD42))          1
       220 print inp(&FD42)          <13>

       230 print chr$(inp(&FD42))          1      ARM internal Temperature 18.6 Celsius (todo)
       240 print chr$(inp(&FD42))          8
       250 print chr$(inp(&FD42))          6
       260 print chr$(inp(&FD42))          0
       270 print inp(&FD42)          <13>
       280 print inp(&FD42)          <10>
```

OLED DISPLAY:

```
F200   Oled clear display (black)
F201   Oled Write data to SSD1306
F202   Oled print text in Upper row
F203   Oled print text in Lower row
F210   Oled print text on display   x, y, font, text


F200   Oled clear display (black)

       110 out &FD41,200                          active function
       120 call ARM response


F201   Oled Write data to SSD1306

       Manual : https://cdn-shop.adafruit.com/datasheets/SSD1306.pdf

       110 out &FD41,0                                   reset intern write buffer pointers


       example scroll to right

       120 out &FD42, 0x2E                        De-Activated scroll
       130 out &FD42, 0xA3                        Direction
       140 out &FD42, 0x00                        Dummy
       150 out &FD42, 0x00                        Start page
       160 out &FD42, 0x02                        Interval
       170 out &FD42, 0x02                        End page
       180 out &FD42, 0x0B                        vertical scrolling offset
       190 out &FD42, 0x2F                        Activated scroll
       ..
       ..
       ..
       300 out &FD41,201                          active function
       310 call ARM response

F202   Oled print text in Upper row

       Note: maximum is 12 characters

       110 out &FD41,0                            reset intern writes buffer pointers
       120 out &FD42, char
       130 out &FD42, char
       140 out &FD42, char
       ..
       ..
       300 out &FD41,202                          active function
```

```
        310 call ARM response

F203    Oled print text in lower row
F204,0  default screen
F204,1  show page nr  32bit


        See F202

F210    Oled print text on display   x, y, font, text

        Note: this function is change, now with auto erase

        110 out &FD41,0                             reset write pointer 0
        120 out &FD42, x                            x as 0-127     (left to right)
        130 out &FD42, y                            y as 0-31              (up to down)
        140 out &FD42, font                         Font types :10,18,26
        150 out &FD42, char                 to print character
        160 out &FD42, char                 to print character
        170 out &FD42, char                 to print character
        ..
        ..
        300 out &FD41,210                           active function
        310 call ARM response
```

TEST:

Development test functions:

F250   test sub Functions:

F250,0: Force auto update are active after SF3 reset

```
        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 0                    active sub function
        140 out &FD41, 250                  active function
        150 call ARM response
```

F250,7: Make Error

```
        Note:
        For testing error number en text routine

        110 out &FD41, 0                    reset write buffer pointers0
        120 out &FD42, 7                    active sub function
        130 out &FD42, 34                   Error number
        140 out &FD41, 250                  active function
        150 call ARM response
```

TMTNETWORK 1.0

FUNCTIONS

F130 tmtnet subfunctions

F130,0 connection login with tmtnet broker
091219

```
        10 out &hfd41,0
        20 out &hfd42,0
        30 out &hfd42,High     0x0b          userID 3000 + your userID decimal (1-60)
        40 out &hfd42,Low      0xbc
        50 out &hfd42,'h'
        60 out &hfd42,'a'
        70 out &hfd42,'s'
        80 out &hfd41,130
        90 call ARM response
```

F130,1 get status
091219

```
        10 out &hfd41,0
        30 out &hfd42,1
```

```
40 out &hfd41,130
50 call ARM response
70 print inp(&hfd42)

0 = tmtnet  Offline
1 = tcp connection with the server,  but user is not accepted
2 = waiting for server feedback
3 = user is connected

When:  Tmtnet is not connected with server  status 0
       User login success                   status 3
       User login fault                     status 1
       Wait for server login response       status 2
```

F130,2 query online status to all users

```
10 out &hfd41,0
30 out &hfd42,2
40 out &hfd41,130
50 call ARM response
```

F130,3 query online status to all users

```
note:
 wait 2 seconds after F130,2
 UserID 0 = server

10 out &hfd41,0
30 out &hfd42,3
40 out &hfd41,130
50 call ARM response

70 for w = 1 to 2000:next w

70 for t = 0 to 20
80 print "UserID: ";t;" online: ";inp(&hfd42)
90 next t
```

F130,4 start measure response time

```
10 out &hfd41,0
30 out &hfd42,4
40 out &hfd41,130
```

F130,5 get response time

```
Note:
 wait 1 seconds after F130,4

10 out &hfd41,0
30 out &hfd42,5
40 out &hfd41,130
50 call ARM response

70 c = inp(&hfd42)
80 if c = 10 then print :end
80 print chr$(c);
90 goto 70

....ms
0065ms
```

F130,6 UserID logoff Disconnect from tmtnet broker

```
10 out &hfd41,0
30 out &hfd42,6
40 out &hfd41,130
50 call ARM response
```

F130,7 Get UserID info

```
10 out &hfd41,0
20 out &hfd42,7
30 out &FD42, 0x0B           high   userID #3003 = &BBB
```

```
40 out &FD42, 0xBB           low
50 out &hfd41,130
60 call ARM response
70 c = inp(&FD42)
80 if c = 0 then end
90 print chr$(c);
100 goto 70

username is maximal 12 Characters

#3003,Hans,NL,CPC,


(see SD:/TMTNET/USERID.TXT)
```

F130,8 Get userID and Password

```
100 out &hfd41,0
110 out &hfd42,8
120 out &hfd41,130
130 call ARM response

140 print inp(&hfd42) high    userID #3003 = &B
150 print inp(&hfd42) low     userID #3003 = &BB
160 c = inp(&fd42)
170 if c = 32 then print :end
180 print chr$(c);
190 goto 160


Note: when not define , FFFF**
```

TMTNETWORK 2.0 FUNCTIONS

SEONE

Note:

The SEONE part of the SF3 are only accessible with you have define in the INI file:
AUDIO=SYMAMP

HISTORY

DESCRIPTION:

The SE-ONE is an extension cartridge for the MSX and CPC home computers. You can play mp3 music files on your home computer.
The SE-ONE has a lot of modes. This mode and another option can be set and read with a user-friendly AT command set or Register commands.
Mode MP3A is the Sunrise compatible mode, there is IO compatibility with the Sunrise mp3 cartridge.
The FM mode turns the SE-ONE into a FM radio. European and a US Japan bands are available.

FEATURES:

- Fully user-friendly AT command set
- MP3 chip VS1053 decodes multiple formats:
- Mosty compatible with the Sunrise MP3 player
- FM stereo radio
- FM US/Europe (87.5 MHz to 108 MHz) and Japanese (76 MHz to 91 MHz) FM band.
- Onboard DSP Hi-fi stereo audio processor
- Stereo VU LED bar
- MSX input audio switch
- System updatable with a DFU cable and pc software
- Used IO ports for MSX : &h20 - &h0x27
- User IO ports for CPC: &FF20 - &FF27
- Connected pins : +5V, +12V, Busdir, Wait, Int.
- USB 2.0 host controller

THANKS TO

EdoZ. (SymbOS),RJB (MSX / TEST),Totaly (webshop),Emil S (MSX hardware),Hans O (MSX hardware),MVM(MSX computerclub),Frits H.(C controllers),Kebu synthesizer music,Prodatron(SymbOS /CPC) ,GFlorez(Enterprise)

Also a word of thank to the Sunrise Foundation for the clear manual / documentation of the MP3 cartridge. This has contributed to the creation of the SE ONE, as it is now.

ABOUT MODES:

The SE-ONE has multiple modes:

MP3A: this mode is I/O identical to the SUNRISE MP3 player,
there are differences in the software because the SE-ONE has another chipset and all of the functions convert to this chipset.
MP3B: mode: this mode you can play music files from USB stick
FM: The SE-ONE is an FM Radio
REG: Register functions , fasther than AT commands
TEST: Test mode

ABOUT AT COMMANDOS:

The protocol of the AT-command set has been used for a long time. AT-commands exist of a short string of text with added settings or parameters. You can also request data from the hardware with the AT-commands. You need a small program to use AT-commands that sends the string of text to the SE-ONE and processes the response of the SE-ONE. They are working on a machine language program that will

For quick reference help with AT commands, you can also use the /H after a command.
For example: AT+SEMODE/H

IO SETTINGS MODES:

	MP3A	MP3B	REG	FM	MIDI	SYNTH
Rd 0x20	At command	At command	At command	At command	At command	At command
Wr	At command	At command	At command	At command	At command	At command
Rd 0x21	Reset MP3A	--	-	--	Midi status	Midi status
Wr	Reset MP3A	--	--	--	--	--
Rd 0x22	Data	--	--	--	Midi data	Midi data
Wr	Data	audioStream	audioStream	--	Midi data	Midi data
Rd 0x23	Status	Status byte *1	Status byte *1	--	Status byte *1	--
Wr	Mode	--	--	--	--	--
Rd 0x24	i2c status	--	--	--	--	--
Wr	I2c status	--	--	--	--	--
Rd 0x25	Data	Usb directory data	Usb directory data	--	Usb directory data	--
Wr	Data	--	--	--	--	--
Rd 0x26	I2c address	Vu left	Cmd respose	Vu left	Cmd respose	Cmd respose
Wr	I2c address	--	Cmd Function	--	Cmd Function	Cmd Function
Rd 0x27	I2x control	Vu Right	Cmd Command	Vu Right	Cmd Command	Cmd Command
Wr	I2c control	--	Cmd Data	--	Cmd Data	Cmd Data

	TEST					
Rd 0x20	At command					
Wr	At command					
Rd 0x21	0x21					
Wr	= Value					
Rd 0x22	0x22					
Wr	= Value					
Rd 0x23	0x23					
Wr	= Value					
Rd 0x24	0x24					
Wr	= Value					
Rd 0x25	0x25					
Wr	= Value					
Rd 0x26	0x26					
Wr	= Value					
Rd 0x27	Value					
Wr						

*1 status byte

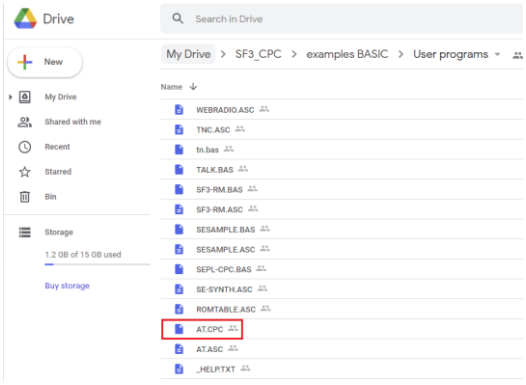
```
bit     3       End of MUSIC playing
bit     4       USB Error
bit     5       USB busy
bit     6       Fifo buffer Full
bit     7       Fifo buffer emty
```

AT BASIC PROGRAM

Use this progam to used AT commands

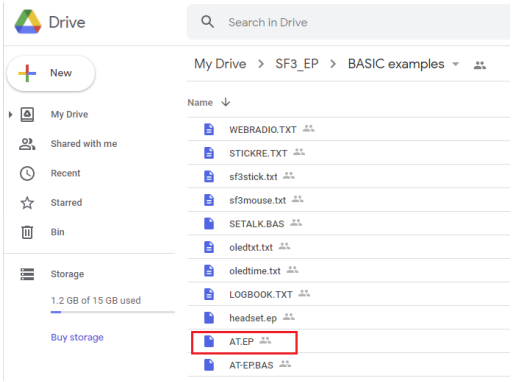
CPC

RUN”AT.CPC”



EP

RUN”AT.EP”



AT COMMAND REFERENCE:

CARTRIDGE

AT+CARTRIDGE

```
        SEONE/Monly MP3
        SEONE/Ronly Radio
        SEONE/MR        MP3 and Radio
```

Get cartridge type

```
send:           AT+CARTRIDGE?<13>
response:       AT+CARTRIDGE=SEONE/MR<13><10>                   options: SEONE/M,SEONE/R,SEONE/MR
OK<13><10>
```

AT+SEMODE

```
        MP3A    = Sunrise MSXMP3
        MP3B    = TMTLOGIC  MP3
        REG     = Register mode
```

```
       TEST    = Test mode

Change mode from SE-ONE

send:          AT+SEMODE=FM<13>                              options: FM,MP3A,MP3B,REG,TEST
response:      OK<13><10>                              options: OK,ERR,ILL

Get SE-ONE mode

send:          AT+SEMODE?<13>
response:              AT+SEMODE=FM<13>                                  options: FM,MP3A,MP3B,REG,TEST
OK<13><10>                             options: OK,ERR,ILL

AT+SELOGBOOK

Get SE-ONE system logbook

send:          AT+SELOGBOOK?<13>
response:      AT+SELOGBOOK=TEXT<13>
               OK<13><10>                              options: OK,ERR,ILL

AT+SEVERSION

1 = Radio
2 = MP3
3 = Radio and MP3

Get SE-ONE system SE-ONE version number

send:          AT+SEVERSION?<13>
response:      AT+SEVERSION=1<13>                                    options: 1,2,3
OK<13><10>                             options: OK,ERR,ILL

AT+SEFIRMWARE

Get firmware dfu file name

send:          AT+SEFIRMWARE?<13>
response:      AT+SEFIRMWARE= SEONEddmmyyyy.DFU<13>        options: SEONE[date].DFU
OK<13><10>                             options: OK,ERR,ILL


AT+SETUNE

Set startup tune

Set or Reset (ON/OFF) factory start-tune, this will be store in the ARM flash memory
When set OFF, the SE-ONE play the factory start-tune not when system startup.

send:          AT+SETUNE=ON<13>                              options: ON,OFF
response:      OK<13><10>                              options: OK,ERR,ILL


AT+SEPLAYTUNE

Plays then intro tune from TMTLOGIC

send:          AT+SEPLAYTUNE<13>
response:      OK<13><10>                              options: OK,ERR



AT+SEFIRMWARECHK

Check if the firmware must be updated.

When firmware check is false, you must updating your SE-ONE !

send:          AT+SEFIRMWARECHK=DDMMYYYY<13>
response:      AT+SEFIRMWARECHK=TRUE <13>                    options: true, false
OK<13><10>                             options: OK,ERR,ILL

AT+SEFAULTNR

Get the actual error number.

send:          AT+SEFAULTNR ?<13>
response:      AT+ SEFAULTNR=12 <13><10>                     options: 0-29


       0       "Succeeded                                    "
       1       "Disk IO errror                               "
```

```
        2       "Assertion failed                           "
        3       "The physical drive cannt work              "
        4       "Could not find the file                    "
        5       "Could not find the path                    "
        6       "Invalid path name                          "
        7       "Access denied directory full               "
        8       "Access denied                              "
        9       "Invalid  file/directory                    "
        10      "Write protected                            "
        11      "Invalid logical drive                      "
        12      "The volume has no work area                "
        13      "No valid FAT volume                        "
        14      "The f_mkfs() aborted                       "
        15      "Could not to access volume                 "
        16      "Rejected according  sharing policy         "
        17      "LFN could not be allocated                 "
        18      "Number of open files                       "
        19      "Invalid parameter                          "
        20      "Unknow at commando                         "
        21      "Syntax error                               "
        22      "Usb busy                                   "
        23      "Invalid at command                         "
        24      "Usb already installed                      "
        25      "AT parameter error                         "
        26      "AT not in uppercase                        "
        27      "ARM flash error                            "
        28      "Invalid input                              "
        29      "Wrong SE mode                              "
```

AT+SEFAULTTXT

Get the actual error text.

```
send:          AT+SEFAULTTXT? <13>
response:      AT+ SEFAULTTXT= Invalid input <13><10>
```

DSP DIGITAL SOUND PROCESSOR / AUDIO PROCESSOR

```
AT+DSPTYPE            Get the DSP chip type
AT+DSPVOLL            Set the left volume level
AT+DSPVOLR            Set the right volume level
AT+DSPBASS            Set the bass level
AT+DSPTREBLE          Set the treble volume level
AT+DSPVOLUP           Increase the volume by 10 steps
AT+DSPVOLDOWN         Decrease the volume by 10 steps
AT+DSPMUTE            Set DSP   mute
```

AT+DSPTYPE

Get the DSP chip type

```
send:          AT+DSPTYPE?<13>
response:              AT+DSPTYPE=TDA8425<13>              options: TDA8425
OK<13><10>                          options: OK,ERR,ILL
```

AT+DSPVOLL

Set the left volume level

```
send:          AT+DSPVOLL=80<13>                           options: 0-100
response:      OK<13><10>                                  options: OK,ERR,ILL
```

Get the left volume level

```
send:          AT+DSPVOLL?<13>
response:              AT+DSPVOLL=66<13>                           options: 0-100
OK<13><10>                          options: OK,ERR,ILL
```

AT+DSPVOLR

Set the right volume level

```
send:          AT+DSPVOLR=80<13>                           options: 0-100
response:              OK<13><10>                                  options: OK,ERR,ILL
```

Get the left volume level

```
send:          AT+DSPVOLR?<13>
response:              AT+DSPVOLR=66<13>                              options: 0-100
OK<13><10>                                    options: OK,ERR,ILL

AT+DSPBASS

Set the bass level

send:          AT+DSPBASS=80<13>                              options: 0-100
response:              OK<13><10>                             options: OK,ERR,ILL

Get the bass level

send:          AT+DSPBASS?<13>
response:              AT+DSPBASS=66<13>                              options: 0-100
OK<13><10>                             options: OK,ERR,ILL



AT+DSPTREBLE

Set the treble volume level

send:          AT+DSPTREBLE=80<13>                            options: 0-100
response:              OK<13><10>                             options: OK,ERR,ILL

Get the left volume level

send:          AT+DSPTREBLE?<13>
response:              AT+DSPTREBLE=66<13>                            options: 0-100
OK<13><10>                             options: OK,ERR,ILL

AT+DSPVOLUP

Increase the volume by 10 stepsl

send:          AT+DSPVOLUP<13>
response:              OK<13><10>                             options: OK,ERR

AT+DSPVOLDOWN

Decrease the volume by 10 steps

send:          AT+DSPVOLDOWN<13>
response:              OK<13><10>                             options: OK,ERR

AT+DSPMUTE

Set DSP   mute

send:          AT+DSPMUTE=ON<13>                              options: ON,OFF
response:              OK<13><10>                             options: OK,ERR,ILL

Get DSP  mute state

send:          AT+DSPMUTE?<13>
response:              AT+DSPMUTE=ON<13>                              options: ON,OFF
               OK<13><10>                           options: OK,ERR,ILL
```

MP3 DSP CHIP

```
AT+MP3TYPE             Get the mp3 chip type
AT+MP3LOWLEVEL Set the low-level bit from status register inp(&hFF23) bit 7
AT+MP3HIGHLEVEL        Set the high-level bit from status register inp(&hFF23) bit 6

AT+MP3TYPE

Get the mp3 chip type

send:          AT+MP3TYPE?<13>
response:              AT+ MP3TYPE=VS1053<13>                 options: VS1053
OK<13><10>


AT+MP3LOWLEVEL

Set the low-level bit from status register inp(&hff23) bit 7

Note: this works only in MP3B mode !
```

Bit 7 will be set when the content of the audio-stream FiFo lower is than this value

send: AT+MP3LOWLEVEL= 32<13> options: 0-65535
response: OK<13><10> options: OK,ERR,ILL

AT+MP3HIGHLEVEL

Set the high-level bit from status register inp(&hff23) bit 6

Note: this works only in MP3B mode !

Bit 6 will be set when the content of the audio-stream FiFo higher is than this value.

send: AT+MP3HIGHLEVEL= 12232<13> options: 0-65535
response: OK<13><10> options: OK,ERR,ILL

VU METER

AT+VULEFT Set the left VU byte
AT+VURIGHT Get the left VU byte
AT+VULN Get the left VU number
AT+VURN Get the right VU number

rserve at+vutype

AT+VULEFT

Set the left VU byte

send: AT+VULEFT=80<13> options: 0-255
response: OK<13><10> options: OK,ERR,ILL

Get the left VU byte

send: AT+VULEFT?<13>
response: AT+VULEFT=66<13> options: 0-255
OK<13><10> options: OK,ERR,ILL

AT+VURIGHT

Get the left VU byte
send: AT+VURIGHT=80<13> options: 0-255
response: OK<13><10> options: OK,ERR,ILL

Get the left VU byte

send: AT+VURIGHT?<13>
response: AT+VURIGHT=66<13> options: 0-255
OK<13><10 options: OK,ERR,ILL

AT+VULN

Get the left VU number

send: AT+VULN?<13>
response: AT+VULN=7<13> options: 0-8
OK<13><10> options: OK,ERR,ILL

Get IO base: PRINT INP(&Hff26)

AT+VURN

Get the right VU number

send: AT+VURN?<13>
response: AT+VURN=7<13> options: 0-8
OK<13><10> options: OK,ERR,ILL

Get IO base: PRINT INP(&Hff27)

USB UNIVERSAL SERIAL BUS

```
AT+USBINIT            Install usb port
AT+USBDEVICE          Get which USB device is connected
```

AT+USBINIT

Note: only in MP3B mode
Install usb port

When USB is good installed, the blue led is burn on the SE-ONE

```
send:          AT+USBINIT<13>
response:              OK<13><10>                          options: OK,ERR,ILL
```

AT+USBDEVICE

Note: only in MP3B mode

NONE: no device
MSD: Mass storge device (usb stick)

Get which USB device is connected

```
send:          AT+USBDEVICE?<13>
response:              AT+USBDEVICE =MSD<13>               options:       NONE,MSD
OK<13><10>                          options: OK,ERR,ILL
```

MSD MASS STORAGE DEVICE (ONLY MP3B & REG MODE)

```
AT+MSDPATH            Set the directory from the  Mass Storage Device (usb stick)
AT+MSDFILES?          Get the available files and directories in the current directory.
AT+MSDPLAY            Play an music file from Mass Storage Device (usb stick)
AT+MSDPAUSE           Pause playing
AT+MSDSTART           Continue music playing
AT+MSDSTOP            Stop playing
AT+MSDTALK            Play a speech sample from usb /setalk
```

AT+MSDPATH

Note: only in MP3B mode

Set the directory from the Mass Storage Device (usb stick)

```
send:          AT+MSDPATH=/MAP/MAP<13>
response:              OK<13><10>                          options: OK,ERR,ILL
```

Get the directory from the Mass Storage Device (usb stick)

```
send:          AT+MSDPATH?<13>
response:              AT+MSDPATH=/MAP/MAP<13>
               OK<13><10>                        options: OK,ERR,ILL
```

AT+MSDPATHUP

Set the directory above from the Mass Storage Device (usb stick) (dos syntax "\..”

```
send:          AT+MSDPATHUP<13>
response:              OK<13><10>
```

AT+MSDFILES?

Note: only in MP3B mode

Get the available files and directories in the current directory.

```
send:          AT+MSDFILES?<13>
response:              OK<13><10>                          options: OK,ERR,ILL
```

for read the files run this program:

```
1000 D = INP(&HFF25)
1010 PRINT CHR$(D);
1020 IF D = 10 THEN END
1030 GOTO 1000
```

AT+MSDPLAY

Note: only in MP3B mode
       This function works stand-alone in the SE_ONE

Play an music file from Mass Storage Device (usb stick)

send: AT+MSDPLAY=MUSIC.MP3<13>
response: OK<13><10>   options: OK,ERR,ILL

AT+MSDPAUSE

Note: only in MP3B mode

Pause playing

send: AT+MSDPAUSE<13>
response: OK<13><10>   options: OK,ERR,ILL

AT+MSDSTART
Note: only in MP3B mode

Continue music playing

send: AT+MSDSTART<13>
response: OK<13><10>   options: OK,ERR,ILL

AT+MSDSTOP
Note: only in MP3B mode
Stop playing

send: AT+MSDSTOP<13>
response: OK<13><10>   options: OK,ERR,ILL

AT+MSDTALK

Note: only in MP3B and REG mode
       Play app switch to streaming mode.
       Speech samples can be download from www.tmtlogic.com > support > sf3 > sd system files
       Place the samples in \SETALK directory or the SD card

Play a speech sample from sd /setalk

send: AT+MSDTALK=44<13>   0-57 *
response: OK<13><10>   options: OK,ERR,ILL

wait for usb   140 if (inp(&hFF23) AND 32) = 32) then goto 140   bit 5 USB_busy

see data sheet of the SP0256

http://www.futurebots.com/spo256.pdf

hex	??oct	word	time
00	000 PA1	PAUSE	1OMS
01	001 PA2	PAUSE	30MS
02	002 PA3	PAUSE	50MS
03	003 PA4	PAUSE	1OOMS
04	004 PA5	PAUSE	200MS
05	005 /OY/	BOY	420MS
06	006 /AY/	Sky	260MS
07	007 /EH/	End	70MS
08	010 /KK3/	Comb	120MS
09	011 /PP/	Pow	21OMS
0A	012 /JH/	Dodge	140MS
0B	013 /NN1/	Thin	140MS
0C	014 /IH/	Sit	70MS
0D	015 /TT2/	To	140MS
0E	016 /RR1/	Rural	170MS
0F	017 /AX/	Succeed	70MS
10	020 /MM/	Milk	180MS
11	021 /TT1/	Part	1OOMS
12	022 /DH1/	They	290MS
13	023 /IY/	See	250MS
14	024 /EY/	Beige	280MS
15	025 /DD1/	Could	70MS
16	026 /UW1/	To	1OOMS
17	027 /AO/	Aught	1OOMS

```
18 030  /AA/    Hot            1OOMS
19 031  /YY2/   Yes            180MS
1A 032  /AE/    Hat            120MS
1B 033  /HH1/   He             130MS
1C 034  /BB1/   Business        80MS
1D 035  /TH/    Thin           180MS
1E 036  /UH/    Book           100MS
1F 037  /UW2/   Food           260MS
20 040  /AW/    Out            370MS
21 041  /DD2/   Do             160MS
22 042  /GG3/   Wig            140MS
23 043  /VV/    Vest           19OMS
24 044  /GG1/   Got             80MS
25 045  /SH/    Ship           160MS
26 046  /ZH/    Azure          190MS
27 047  /RR2/   Brain          12OMS
28 050  /FF/    Food           150MS
29 051  /KK2/   Sky            190MS
2A 052  /KK1/   Can't          160MS
2B 053  /ZZ/    Zoo            21OMS
2C 054  /NG/    Anchor         220MS
2D 055  /LL/    Lake           110MS
2E 056  /WW/    Wool           180MS
2F 057  /XR/    Repair         360MS
30 060  /WH/    Whig           200MS
31 061  /YY1/   Yes            130MS
32 062  /CH/    Church         190MS
33 063  /ER1/   Fir            160MS
34 064  /ER2/   Fir            300MS
35 065  /OW/    Beau           240MS
36 066  /DH2/   They           240MS
37 067  /SS/    Vest            90MS
38 070  /NN2/   No             190MS
39 071  /HH2/   Hoe            180MS
3A 072  /OR/    Store          330MS
3B 073  /AR/    Alarm          290MS
3C 074  /YR/    Clear          350MS
3D 075  /GG2/   Guest           40MS
3E 076  /EL/    Saddle         190MS
3F 077  /BB2/   Business        50MS
```

AT+MSDSETSAMPLE

Note: only in MP3B and REG mode
Store sample filename in memory 0-9.
Place the samples in \SAMPLE directory

Play a speech sample from usb /setalk

send: AT+MSDSETSAMPLE=1@TOETER.MP3<13>
response: OK<13><10> options: OK,ERR,ILL

AT+MSDSAMPLE

Note: only in MP3B and REG mode
Play app switch to streaming mode.
Play sample from USB/SAMPLE
Place the samples in \SAMPLE directory

Play a speech sample from usb /setalk

send: AT+MSDSAMPLE=1<13> 0-9
response: OK<13><10> options: OK,ERR,ILL

REG REGISTER MODE (BETA)

Before test this mode run this command :AT+SEMODE=REG

(AT commands are active in REG mode)

I/O port setting see begin of this manual

CALL ARM response

```
1000 I = INP(&hFF26)
1010 IF  I = 1 THEN GOTO 1010
1020 IF  I = 2 THEN PRINT "Error" : end
1030 RETURN
```

Audio DSP

```
F48     cmdDspVolUp                                     17 sept 2018
F49     cmdDspVolDown                                17 sept 2018
F50     cmdSetVolLeftRight                              17 sept 2018
F51     cmdGetVolLeftRightStereo                        18 sept 2018
F52     cmdSetBassTreableStereo                         18 sept 2018
F53     cmdGetBassTreableStereoMute                     18 sept 2018
```

F48 cmdDspVolUp 17 sept 2018

```
        100 out &hFF26,48                               activate function
130 gosub ARM response
```

F49 cmdDspVolDown 17 sept 2018

```
        100 out &hFF26,49                               activate function
130 gosub ARM response

F50     cmdSetVolLeftRight                              17 sept 2018

        value 0-100d

        100 out &hFF26,0
        110 out &hFF27,45     volume left
        120 out &hFF27,55     volume Right
        130 out &hFF26,50
140 gosub ARM response

F51     cmdGetVolLeftRightStereo                        18 sept 2018

        100 out &hFF26,51
110 gosub ARM response

        120  print inp(&hFF27)
        130  print inp(&hFF27)

F52     cmdSetBassTreableStereo                         18 sept 2018

        bass,treable   value 0-100d
        stereo type    value 0-3

        0  =    Fored mono
        1  =    linear Stereo
        2  =    pseudo Stereo
        3  =    spatial Stereo

        mute           value 0-1

        100 out &hFF26,0
        110 out &hFF27,45                               bass
        120 out &hFF27,55                               treable
        130 out &hFF27,2                                       Stereo type
        140 out &hFF27,1      Mute
        150 out &hFF26,52
160 gosub ARM response

F53     cmdGetBassTreableStereoMute                  18 sept 2018

        100 out &hFF26,53
110 gosub ARM response
        120 print inp(&hFF27)
        130 print inp(&hFF27)
        140 print inp(&hFF27)
        150 print inp(&hFF27)
```

VU

```
F64     cmdSetVuEnable                                  18 sept 2018
F66     cmdSetVuLeftRight                               18 sept 2018
F67     cmdGetVuLeftRight                               18 sept 2018
```

```
F68     cmdSetVuMaxLeds                                 18 sept 2018
F69     cmdGetVuLeftRightNumber                         18 sept 2018
F70     cmdGetEqualizer  (todo)                         19 sept 2018


F64     cmdSetVuEnable                          18 sept 2018

        0 = OFF
        1 = ON

        100 out &hFF26,0
        110 out &hFF27,1                                        = ON
        120 out &hFF26,64

        130 gosub ARM response

F66     cmdSetVuLeftRight                               18 sept 2018

        100 out &hFF26,0
        110 out &hFF27,1        left byte
        120 out &hFF27,1        right byte
        130 out &hFF26,66
140 gosub ARM response

F67     cmdGetVuLeftRight                               18 sept 2018

        100 out &hFF26,67
110 gosub ARM response
        120 print inp(&hFF27)                           Vu left   byte leds
        130 print inp(&hFF27)                           Vu right byte leds

F68     cmdSetVuMaxLeds                                 18 sept 2018

        value is 1-32

        100 out &hFF26,0
        110 out &hFF27,8        Default 8
        120 out &hFF26,68
130 gosub ARM response

F69     cmdGetVuLeftRightNumber                         18 sept 2018

        is the same as in MP3B inp(&hFF26) & inp(&hFF27)

        value is: 0 - 8

        100 out &hFF26,69
110 gosub ARM response
        120  print inp(&hFF27)                          Vu left   n leds
        130  print inp(&hFF27)                          Vu right n leds


F70     cmdGetEqualizer  (todo)                         19 sept 2018

        Not for FM radio sound

        100 out &hFF26,&hFF46                   function cmdGetEqualizer
110 gosub ARM response

todo    16x print inp(&hFF27)
        print inp(&hFF27)               Vu right n leds
```

SYSTEM:

```
60h     cmdGetFirmwareVersion                   18 sept 2018

        Atention! another structure then AT+SEFIRMWARE !

        YEAR
        YEAR
        YEAR
        YEAR
        MOUNT
        MOUNT
        DAY
        DAY

        out &hFF26,&hFF60                       function cmdGetFirmwareVersion
```

```
inp(&hFF26)                          0=idle, 1= busy, 2=Error
wait for ilde..
while(inp(&hFF26) == 1);

print chr$(inp(&hFF27))      2
print chr$(inp(&hFF27))      0
print chr$(inp(&hFF27))      1
print chr$(inp(&hFF27))      8
print chr$(inp(&hFF27))      0
print chr$(inp(&hFF27))      9
print chr$(inp(&hFF27))      1
print chr$(inp(&hFF27))      8
print inp(&hFF27)            <0>
```

BASIC example Firmware check

```
10 OUT &hFF26,&hFF60
20 IF INP(&hFF26) = 1 THEN GOTO 20
21 IF INP(&hFF26) = 2 THEN PRINT"ERROR":END
30 F$ = ""
40 I = INP(&hFF27)
50 IF I = 0 THEN GOTO 80
60 F$=F$+CHR$(I)
70 GOTO 40
80 C = 20170909      :rem  Year Mount Day
90 F = VAL(F$)
99 IF F <  C THEN PRINT"Update your SE-ONE" :END
```

USB MSD:

70h cmdUsbMsdInit 18 sept 2018

```
out &hFF26,&h70                      function      cmdUsbMsdInit

inp(&hFF26)                          0=idle, 1= busy, 2=Error
wait for ilde..
while(inp(&hFF26) == 1);
```

72h cmdUsbMsdAvailable

74h cmdSetMSDPLAY 19 sept 2018

```
out &hFF26,0
out &hFF27,asc("F")
out &hFF27,asc("I")
out &hFF27,asc("L")
out &hFF27,asc("E")
out &hFF27,asc("N")
out &hFF27,asc("A")
out &hFF27,asc("M")
out &hFF27,asc("E")
out &hFF27,asc(".")
out &hFF27,asc("B")
out &hFF27,asc("A")
out &hFF27,asc("S")

out &hFF26,&h72                      Function cmdSetMSDPLAY

inp(&hFF26)                          0=idle, 1= busy, 2=Error
wait for ilde..
while(inp(&hFF26) == 1);
```

75h cmdGetMSDPLAY 19 sept 2018

```
out &hFF26,&h75                      function cmdGetMSDPLAY

inp(&hFF26)                          0=idle, 1= busy, 2=Error
wait for ilde..
while(inp(&hFF26) == 1);

print chr$(inp(&hFF27))      F
print chr$(inp(&hFF27))      I
print chr$(inp(&hFF27))      L
print chr$(inp(&hFF27))      E
print chr$(inp(&hFF27))      N
```

```
        print chr$(inp(&hFF27))       A
        print chr$(inp(&hFF27))       M
        print chr$(inp(&hFF27))       .
        print chr$(inp(&hFF27))       B
        print chr$(inp(&hFF27))       A
        print chr$(inp(&hFF27))       S
        print inp(&hFF27)             <0>

76h     cmdSetMSDPATH                         19 sept 2018

        out &hFF26,0
        out &hFF27,asc("\")
        out &hFF27,asc("M")
        out &hFF27,asc("A")
        out &hFF27,asc("P")
        out &hFF26,&h76                               Function cmdSetMSDPATH

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

77h     cmdGetMSDPATH                         19 sept 2018


        out &hFF26,&h77                               function cmdGetMSDPATH

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

        print chr$(inp(&hFF27))       \
        print chr$(inp(&hFF27))       M
        print chr$(inp(&hFF27))       A
        print chr$(inp(&hFF27))       P
        print inp(&hFF27)             <0>


78h     cmdMsdStart                           19 sept 2018

        out &hFF26,&h78                               Function cmdMsdStart

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

79h     cmdMsdStop                            19 sept 2018

        out &hFF26,&h79                               Function cmdMsdStop

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

7Ah     cmdMSDPAUSE                           19 sept 2018

        out &hFF26,&h79                               Function cmdMsdPause

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

7Bh     cmdMSDFILES                           19 sept 2018

        8 characters + ' . ' + 3 characters + <TAB>
        out &hFF26,&h7B                               Function cmdMsdFiles

        inp(&hFF26)                           0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

        10 i = inp(&hFF25)                            note: 25h !
        20 if i = 0 then end
        30 print chr#(i);
        40 goto 10

        f i l e  , m  p 3 <32> <32> <32> <32> <9> f i l  e n

7Ch     cmdGetMSDSIZE                         19 sept 2018

        Gives the size of the file after play commando

        32 bits binair value
```

```
        out &hFF26,&h77                             function cmdGetMSDPATH

        inp(&hFF26)                         0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

        print çhr$(inp(&hFF27))       \
        print çhr$(inp(&hFF27))       M
        print çhr$(inp(&hFF27))       A
        print çhr$(inp(&hFF27))       P
        print inp(&hFF27)             <0>

7Dh     cmdGetMSDCNT                        19 sept 2018

        value 0 - 100 %

        out &hFF26,&h7D                             function cmdGetMSDCNT

        inp(&hFF26)                         0=idle, 1= busy, 2=Error
        wait for ilde..
        while(inp(&hFF26) == 1);

        print inp(&hFF27)


F126    cmdSetMSDTALK

        note:  Emulation of the SP0256 speech chip
               place in the directory USB:/SETALK/SP...H.MP3 files
               this can be download from http://www.tmtlogic.com/SE_ONE/SETALK.ZIP

               more information see AT+MSDTALK

        value 0 - 58

        100 out &hFF26,0
        110 out &hFF27,value
        120 out &hFF26,126                                  function cmdGetMSDCNT
        130 if inp(&hFF26) = 1 then goto 130                0=idle, 1= busy, 2=Error
        140 if (inp(&hFF23) AND 32) = 32 ) then goto 140           bit 5 USB_busy


F127    cmdSetMSDSETSAMPLE

        note:  place in the directory USB:/SAMPLE

        value 0 - 9
        filename max 12 characters  ( filename.mp3 = 12 characters )

        100 out &hFF26,0
        110 out &hFF27,value
        120  out  &hFF27,asc("B")
130  out  &hFF27,asc("E")
140  out  &hFF27,asc("L")
150  out  &hFF27,asc("L")
160  out  &hFF27,asc(".")
170  out  &hFF27,asc("M")
180  out  &hFF27,asc("P")

190  out  &hFF27,asc("3")
200 out  &hFF26,127
210 gosub ARM response

F128    cmdSetMSDSAMPLE

        note:  Play samples
               place in the directory USB:/SAMPLE

        value 0 - 9

        100 out &hFF26,0
        110 out &hFF27,value
        120 out &hFF26,128
130 gosub ARM response
```

PROBLEMS

Q1 SF3 does nothing and the red led right above burn:
A1 the SF3 is in DFU mode, the switch right under must be pull down!

Test of the SF3 responds:

```
10 out &FD4F,170: REM 10101010
20 print(&FD4f)
30 out &FD4F,85: REM 01010101
40 print(&FD4f)

170
85
```

CPC prints 170 and 85 that's oke, if not there is another problem.

CPC464 extern memory does not work

In the INI file must be set: CPC464=TOTO (set no another CPC464= commands)
the MERQ signal is pull-up some Z80 processors are too strong for this function.

The power supply to the SF3 is too low. Minimum power limit is 4.7 volt
Check power with F125

No sound

for testing audio , use an headphone. Connect normal the green to an extern audio amplifier

No sound Symbos

In the INI file must be set: AUDIO=SYMAMP (set no another AUDIO= commands)
the green connector is the audio output

When symamp is started the OLED shows "SYMAMP", if not, you use the MSX version not the CPC

Wifi password of SSID error

Maybe you have use a space in the password or SSID
Default removed the SF3 all spaces and tabs in the INI file
Change the INI row with this:

Old
WIFI_SSID=ab cd

New
@WIFI_SSID=ab cd

Wifi no connection with AP

Reset the router
Maybe the channels are too close to each other.
Try your hotspot from the smartphone

APP EXAMPLES

AT COMMAND'S

MIDI

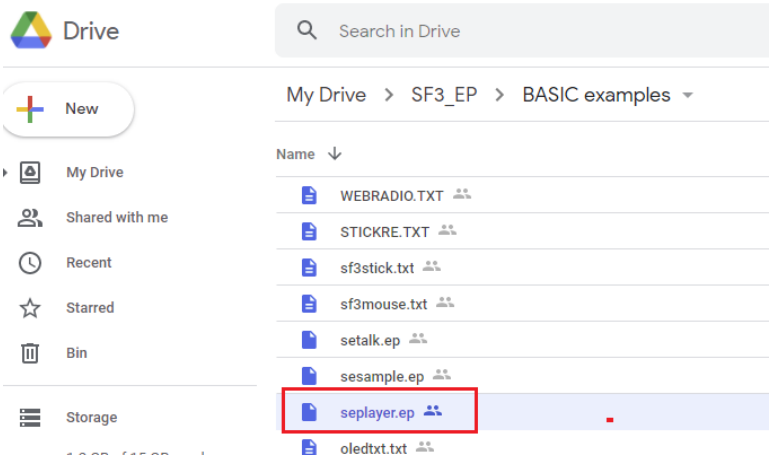
SYNTH

MP3(A) SYMBOS

SEPLAYER MUSIC FILE PLAYER

EP

Place in the FAT32 USB connector , your MUSIC USB STICK (mass storage device)



Download this file to de EP sd card

Connect the audio output of the SF3 to an amplifier or your input of the EP

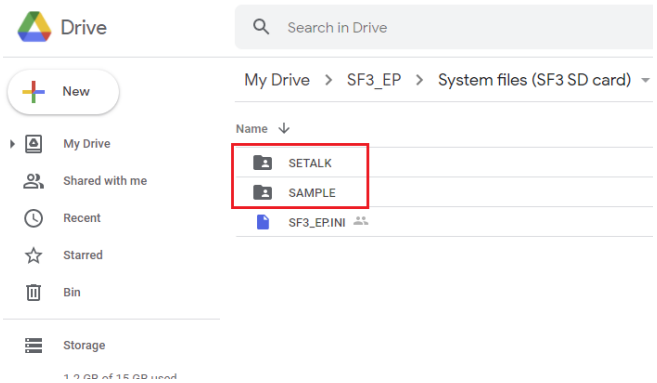
Type:
RUN”seplayer.ep”

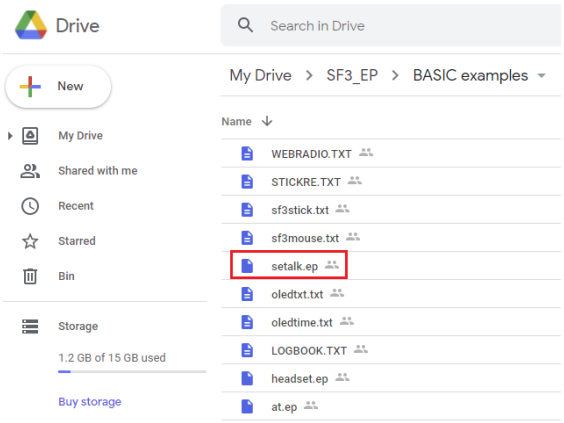
Select the Music file and press ENTER

SPEECH SYNTHESIZER

EP

Place on the root of the SF3 SD card, the follow directory’s





Download this file to de EP sd card

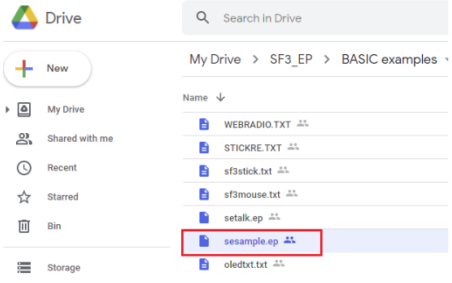
Connect the audio output of the SF3 to an amplifier or your input of the EP

Type:
RUN"setalk.ep"

SAMPLE BOX

EP

Place on the root of the SF3 SD card, the directory's (see speech synthesizer)



Download this file to de EP sd card

Connect the audio output of the SF3 to an amplifier or your input of the EP

Type:
RUN"sesample.ep"

Press number 0 …6 for play the sample

INTERNET RADIO (SYMBOS)

INTERNET RADIO (BASIC)

VOIP

HEADSET

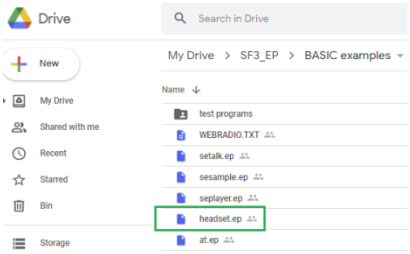
Tested Headsets:
Use only headset with 2 separate connectors EAR and MIC !

Genius HS-02B
Nedis CHST100BU

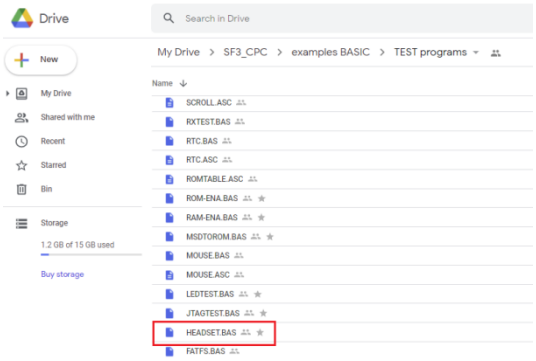
⚠ do not use this:
Because the ground of the MIC connector is shorted with the ground on the EAR connector

For testing the Headset , there is an program available

EP



CPC



VOIP PROGRAM:

Login with your TMTNET userID:
Example 3055:

USERID: 3055
PASS: xxx

Call user:

1. Press ’g’ for call user (see left side)
2. Type userID
3. Wait for connecting

Accept calling

Press ‘g’

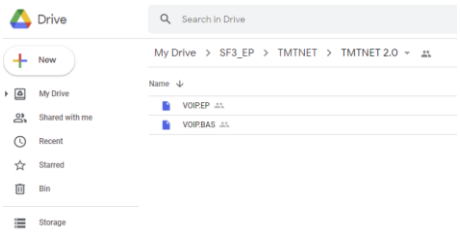
Break or stop calling

Press 'r'

Quit TMTNET

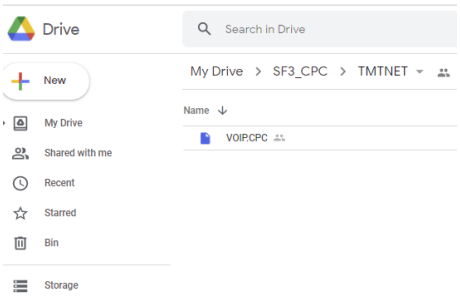
Press 'q'

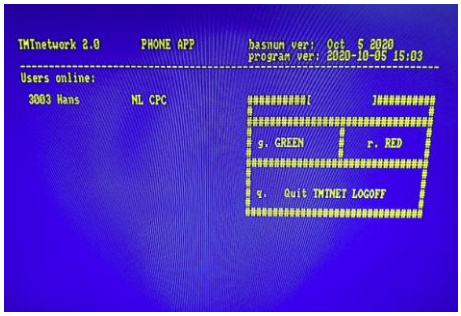
EP



RUN"VOIP.BAS"

CPC





APPENDIX:

Symbiface III convertion table:

CPC/BASE SF3

SF3 &FD40 – FD4F
SEONE &FF20 – &FF27

PinName	PinNumber	CPC >> SF3
Z80_A0	18	O
Z80_A1	17	O
Z80_A2	16	O
Z80_A3	15	O
Z80_A4	14	O
Z80_A5	13	O
Z80_A6	12	O
Z80_A7	11	O
Z80_A8	10	O
Z80_A9	9	O
Z80_A10	8	O
Z80_A11	7	O
Z80_A12	6	O
Z80_A13	5	O
Z80_A14	4	O
Z80_A15	3	O
Z80_D0	26	BI
Z80_D1	25	BI
Z80_D2	24	BI
Z80_D3	23	BI
Z80_D4	22	BI
Z80_D5	21	BI
Z80_D6	20	BI
Z80_D7	19	BI
Z80_nM1	29	O
Z80_nIORQ	31	O
Z80_nMREQ	28	O
Z80_nRFSH	30	O
Z80_nWR	33	O
Z80_nRD	32	O
Z80_nINT	35	I
Z80_nNMI	36	I
Z80_nREADY	39	I
Z80_nRESET	41	O
Z80_CLK	50	O
CPC_ROMDIS	43	O
CPC_RAMDIS	45	O
CPC_nRAMRD	44	O
CPC_EXP	48	I
CPC_ROMEN	42	O
CPC_nBUSRESE	40	I
5V0	27	O
GND	2	O
GND	49	O
TP3		O

ENTERPRISE

&40 – &4F
&20 – &27

PinName	PinNumber	ENT >> SF3
Z80_A0	a10	O
Z80_A1	b10	O
Z80_A2	a11	O
Z80_A3	b11	O
Z80_A4	a12	O
Z80_A5	b12	O
Z80_A6	a13	O
Z80_A7	b13	O
Z80_A8	a6	O
Z80_A9	b6	O
Z80_A10	a7	O
Z80_A11	b7	O
Z80_A12	a8	O
Z80_A13	b8	O
Z80_A14	a9	O
Z80_A15	b9	O
Z80_D0	a14	BI
Z80_D1	b14	BI
Z80_D2	a15	BI
Z80_D3	b15	BI
Z80_D4	a16	BI
Z80_D5	b16	BI
Z80_D6	a17	BI
Z80_D7	b17	BI
Z80_nM1	a20	O
Z80_nIORQ	b3	O
Z80_nMREQ	a5	O
Z80_nRFSH	a2	O
Z80_nWR	b2	O
Z80_nRD	a3	O
Z80_nINT	b18	I
Z80_nNMI	b5	I
Z80_nWAIT	a19	I
Z80_nRESET	a18	O
ENT_A21	a29	O
ENT_A17	a27	O
ENT_A19	a28	O
ENT_A18	b27	O
ENT_A20	b28	O
ENT_A16	b26	O
5V0	a4,b4(direct:+9v a33,b33	O
GND	b19,b20,b21,b22,b23	O
GND		O
BUSDIR	2.1:TP3 2.11->:internally	O

PCW

&40B0 – &4FB0
&20B0 – &27B0

PinName	PinNumber	PCW >> SF3
Z80_A0	23	O
Z80_A1	24	O
Z80_A2	21	O
Z80_A3	22	O
Z80_A4	19	O
Z80_A5	20	O
Z80_A6	17	O
Z80_A7	18	O
Z80_A8	15	O
Z80_A9	16	O
Z80_A10	13	O
Z80_A11	14	O
Z80_A12	11	O
Z80_A13	12	O
Z80_A14	9	O
Z80_A15	10	O
Z80_D0	31	BI
Z80_D1	32	BI
Z80_D2	29	BI
Z80_D3	30	BI
Z80_D4	27	BI
Z80_D5	28	BI
Z80_D6	25	BI
Z80_D7	26	BI
Z80_nM1	34	O
Z80_nIORQ	42	O
Z80_nMREQ	40	O
Z80_nRFSH		O
Z80_nWR	39	O
Z80_nRD	41	O
Z80_nINT	36	I
Z80_nNMI		I
Z80_nWAIT	38	I
Z80_nRESET	33	O
		O
nBUSRQ	35	I
nBUSAK	37	O
nMDIS	45	I
32Mhz	47	O
4Mhz	48	
5V0	5,6	O
GND	3,4,49,50	O
		O
		O

MSX

&40 – &4F
&20 – &27

PinName	PinNumber	PCW >>MSX
Z80_A0	28	O
Z80_A1	27	O
Z80_A2	30	O
Z80_A3	29	O
Z80_A4	32	O
Z80_A5	31	O
Z80_A6	22	O
Z80_A7	21	O
Z80_A8	24	O
Z80_A9	17	O
Z80_A10	20	O
Z80_A11	19	O
Z80_A12	23	O
Z80_A13	26	O
Z80_A14	25	O
Z80_A15	18	O
Z80_D0	34	BI
Z80_D1	33	BI
Z80_D2	36	BI
Z80_D3	35	BI
Z80_D4	38	BI
Z80_D5	37	BI
Z80_D6	40	BI
Z80_D7	39	BI
Z80_nM1	9	O
Z80_nIORQ	11	O
Z80_nMREQ	12	O
Z80_nRFSH	6	O
Z80_nWR	13	O
Z80_nRD	14	O
Z80_nINT	8	I
Z80_nWAIT	7	I
Z80_nRESET	15	O
MSX_CLK	42	O
MSX_nSLTSL	4	O
MSX_BUSDIR	10	O
MSX_nCS1	1	O
MSX_nCS2	2	O
MSX_nCS12	3	O
5V0	45 47	O
GND	41,43	O
		O
		O
MSX_SW1		TO SW2
MSX_SW2		TO SW1