



SE-ONE

MSX MP3 Player, FM receiver, USB host



Description:

The SE-ONE is an extension cartridge for the MSX home computers. You can play mp3 music files on your MSX 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.

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 decodes multiple formats:
 - MP3 = MPEG 1 & 2 audio layer III (CBR+VBR+ABR)
 - Ogg Vorbis
 - AAC-LC(+PNS), HE-AAC v2 (Level 3) (SBR + PS)
- Mostly compatible with the Sunrise MP3 player
- Player supporting:
 - Symos Symamp
 - GR8NET network streaming of MP3 files
 - GR8NET SD files – playing MP3 files from SD card.
 - Sunrise software PLAYINFO
 - Sunrise software PLAYMP3
- FM stereo radio:
 - European, Japan and US FM bands
 - FM mixer for conversion to IF of the US/Europe (87.5 MHz to 108 MHz) and Japanese (76 MHz to 91 MHz) FM band. RF Automatic Gain Control (AGC) circuit
- Onboard DSP Hi-fi stereo audio processor
 - Source and mode selector for two stereo channels
 - Pseudo stereo, spatial stereo, linear stereo and forced mono switch
 - Volume and balance control
 - Bass, treble and mute control
- Stereo VU LED bar
 - Two bytes parallel
 - Software controlled
- MSX input audio switch
 - Software controlled

- System updatable with a DFU cable and pc software
- Used IO ports are 0x20-0x27
- Busdir is connected.
- The main controller is an ARM® 32-bit Cortex®-M4 CPU with FPU, Adaptive real-time accelerator (ART Accelerator™) allowing 0-wait state execution from Flash memory, frequency up to 168 MHz, memory protection unit, 210 DMIPS/ 1.25 DMIPS/MHz (Dhrystone 2.1), and DSP instructions
- Up to 1 Mbyte of Flash memory
- USB 2.0 full-speed device/host/OTG controller
- Up to 192+4 Kbytes of SRAM including 64- Kbyte of CCM (core coupled memory) data RAM

Applications:

- FM: SymbOs Radio (Edoz)
- FM: Basic Radio(Hans)
- AT CMD: SEone.com (Paul)
- AT CMD: AT.LDR (Hans T)
- MP3: Playinfo(Sunrise)
- MP3: Playmp3.com (Sunrise)

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1.0 Overview

1.1 About us

Two years ago we started again to develop products for the MSX and the C64 home computers, using the name TMTLOGIC.

Special thanks go to the following hobbyists/programmers:

- EdoZ. (SymbOS) <http://members.home.nl/evanzanten/appstore/>
- Paul B.(MSX / C) <https://github.com/PaulBoss/seone/releases>
- Robbert-Jan B. (MSX / TEST),
- Rinus S (webshop), <http://www.msx-shop.nl/winkel/>
- Emil S (MSX hardware),
- Hans O (MSX hardware),
- MVM(MSX computerclub), <http://www.m-v-m.nl/>
- Frits H.(C controllers) <http://nlmsx.generation-msx.nl/>
- Frits K, (C64) Jan D.(C64),
- Erik L (cartridges)
- Leendert N.(C/C#),
- Marco vL.(C# Tmtnet server),
- Gideon Z(FPGA) <http://www.1541ultimate.net>
- Petra (manual),
- Dick T.(manual),
- Libbe R.(PHP/mysql)
- Kebu synthesizer music <http://kebu.fi>

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.

1.2 Discription of the SE-ONE

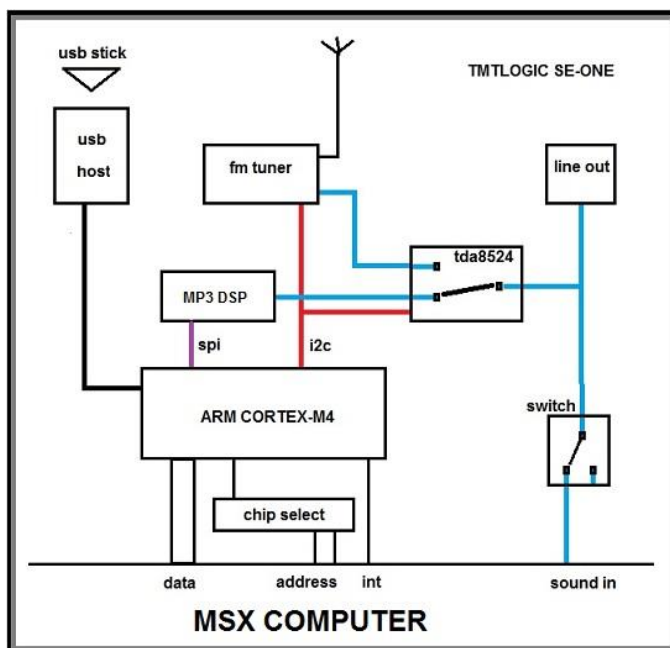
The SE-ONE hardware is simple in its setup. The cartridge responds to IO-addresses &h20-&h27 This is the same IO series as the SUNRISE MP3 player.

The SE-ONE has multiple modes:

- MP3A mode: the IO is 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.
- FM mode: The SE-ONE is an FM Radio

The heart of the SE-ONE is a powerful ARM microcontroller STM32F4. This controller arranges all data streams on the SE-ONE cartridge.

Besides that, it is possible to turn the sound going to the MSX computer on and off.



Basic architecture SE-One

The USB host will soon have more possibilities. A USB stick (Mass storage device) can be developed for playing MP3 files.

You can update the Firmware yourself with the included "DFU-cable" and software for the PC. You can find the software and DFU-files for the SE-ONE on the website of www.tmtlogic.com



Only use the "DFU cable" for updating the SE-ONE. Not for anything else. This can cause serious damage.

1.3 AT commando set

1.3.1 What is an AT-command set?

The protocol of the AT-command set has been used for a long time. AT-commands consists 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 support the MSX CALL. Unfortunately there is no intern ROM present to save these Call commands.

Pros and cons of the AT-commands.

Normally we use registers. For example, if we want to put a character on the screen we express it like: OUT &h98,65. This works fast as it approaches the VDP chip directly. If we use a different VDP-chip of another brand, OUT &h98,65 doesn't work! New software has to be made for this new chip.

With the SE-ONE the hardware can be changed without the need of writing new software. For example, a sound processor (TDA8425) is included in the SE-ONE. This chip is quite old, in due course it will have to be replaced by a modern DSP chip. This new DSP chip contains other registers than the tda8425.

How can you fix that?.., with AT commands.

With sending AT+DSPVOLL=80 to IO port OUT &h20, the volume of the left channel is set.

The ARM microcontroller on the SE-ONE reads the AT string and knows how and which data needs to be send to the TDA8425. ARM also checks whether a different DSP exists.

AT command is clear, OUT &H99,65 cannot be understood well without using this manual.

A possible disadvantage can be that a program can be needed that handles the AT command. Another disadvantage can be that the speed is lower.

When using this device, the next values can be received: OK,ERR,ILL or BUSY

OKe	means that everything is processed well
ERRor	means that there has been made a typo or that you typed a wrong value.
ILLegal error	means that the SE-ONE does not recognize the AT instruction
BUSY	means that the response is taking longer than you are used to. The function needs more time

This is the way the AT command procedure works:

<CR> = CHR\$(13)

<LF> = CHR\$(10)

<NULL>= CHR\$(0)

1. the AT command will be send character by character to OUT &h20
2. send the <CR>

Wait for the SE-ONE to perform the AT-command and responses.

3. read data of INP(&h20)
when <NULL> there is no data, goto point 3
4. When this is not <NULL>, read the response in a buffer until you come across <LF>, this means you reached the end of the response
5. Analyze the buffer now

It is wise to take a timeout for the response string

This procedure works as follows:

1. The AT command will be send character by character to out &h20
2. send the <CR>

Wait for the SE-ONE to perform the AT-command and responses.

3. set the timeout counter on value
4. read the data of INP(&h20) and lower the timeout counter
When the timeout counter is null goto the Error handler.
read the response in a buffer until you come across <LF>, this means you reached the end of the response, goto point 5
if not <LF> go back to point 4
5. Analyze the buffer now

Send (AT+SEMODE?)

A	T	+	S	E	M	O	D	E	?	<CR>
---	---	---	---	---	---	---	---	---	---	------

65	84	43	83	69	77	79	68	69	63	13
----	----	----	----	----	----	----	----	----	----	----

Response:

When the processor is busy it displays many zero bytes chr\$(0)

0	0	0	0	0	...
---	---	---	---	---	-----

A	T	+	S	E	M	O	D	E	=	F	M	<CR>	O	K	<CR>	<LF>
---	---	---	---	---	---	---	---	---	---	---	---	------	---	---	------	------

No more information is available after response when &h20 data is CHR\$(0) (zero)

Send (AT+FMSCANUP)

A	T	+	F	M	S	C	A	N	U	P	<CR>
---	---	---	---	---	---	---	---	---	---	---	------

Response:

If the processor is busy it displays many zero bytes <NULL>

0	0	0	0	0	...
---	---	---	---	---	-----

O	K	<CR>	<LF>
---	---	------	------

1.3.2 AT quick reference help option:

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

1.4 Under construction

The spectrum analyzer of the mp3 chip must be processed in the software.
This plug in will be automatically loaded during the startup of the MP3Amode.

An expansion of the USB host port is under construction, including a possibility to connect a USB stick which can be used to play music files.

1.5 Safety

1.5.1 Safety points:

1.5.1.1 *Plugging in/out MSX computer:*

Only insert the SE-ONE in the MSX while this is turned off and is voltage-free! !
This also applies to when you unplug the SE-ONE from the MSX.

1.5.1.2 *Antenna:*

Carefully move the antenna and keep a firm hold on the cartridge.

1.5.1.3 *ESD:*



ESD means:

electrostatic-sensitive device

An electrostatic-sensitive device (often abbreviated ESD) is any component (primarily electrical) which can be damaged by common static charges which build up on people, tools, and other non-conductors or semiconductors. ESD commonly also stands for electrostatic discharge. Be careful with the ESD. Don't touch the SE-ONE print or the contacts of the USB connection. This can cause damage. (Wikipedia)

Caution with ESD !! do not touch the SE-ONE circuit board contacts or the contacts of the USB connector. Without good earth. This can cause damage !!

USB:

Never use the USB portal to charge your phone or other power using devices !!

The maximum current is 300mA. The print entry points will burn if you do use too much current of the SE-ONE !!.

The power supply of your MSX computer will be heavily charged. The power supply of the MSX can possibly be damaged !!

The USB portal is also used to update Firmware.

This DFU update can only take place if the SE-ONE is unplugged from the MSX !!

The manual for these updates is on the website tmtlogic.com > support > SE-ONE

1.5.1.4 *USB Stick:*

After plugging the USB stick in or out, the SE-ONE must be reset first. This is a familiar bug. We will solve this problem as soon as possible.

1.6 Warranty and Liability

1.6.1 Warranty

The warranty of the SE-ONE is 6 months, provided that it is used properly as written in this manual

Covered by the warranty is:

- Damage during transportation
- hardware faults that have appeared during production
- defective Dfu cable

Not covered by warranty:

- Breakdown of the antenna
- Defective aux out plug
- Defective USB connector
- Changes or attempted repairs to the device, or unauthorised modification of the circuitry
- Any other damage, including by improper use (e.g. placing or removing the SE-One while the MSX computer is turned on and power on the cartridge is locked)

1.6.2 Liability

Tmtlogic / Hans Tillema and all other people who have cooperated on this project do not accept any liability for the damage that may have appeared during the use of the SE-ONE.

2.0 AT command reference

2.1 CARTRIDGE

2.1.1 AT+CARTRIDGE

SEONE/M only MP3
SEONE/R only 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>

2.1.2 AT+LIST

Get the SE-ONE AT command's list

send: AT+LIST<13>
response: AT+LIST=
 AT+CARTRIDGE<13>
 AT+SEMODE<13>
 AT+SELOGBOOK <13>

 OK<13><10> options: OK,ERR

2.2 SE

2.2.1 AT+SEMODE

FM = FM tuner
MP3A = Sunrise MP3

Change mode from SE-ONE

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

Get SE-ONE mode

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

2.2.2 AT+SELOGBOOK

Get SE-ONE system logbook

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

2.2.3 AT+SEVERSION

versions 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>
OK<13><10>

options: 1,2,3
options: OK,ERR,ILL

2.2.4 AT+SEFIRMWARE

Get firmware firmware dfu file.

send: AT+SEFIRMWARE?<13>
response: AT+SEFIRMWARE= SEONEddmmjjjj.DFU<13>
OK<13><10>

options: SEONE[date].DFU
options: OK,ERR,ILL

2.2.5 AT+SETUNE

Set startup tune

Set or Reset (ON/OFF) factory start-tune, this will be store in the ARM flash memory when Set the SE-ONE play the factory start-tune directly when system startup.

send: AT+SETUNE=ON<13>
response: OK<13><10>

options: ON,OFF
options: OK,ERR,ILL

2.2.6 AT+SEPLAYTUNE

Plays then intro tune from TMTLOGIC

send: AT+SEPLAYTUNE<13>
response: OK<13><10>

options: OK,ERR

2.3 FM Radio

2.3.1 AT+FMTYPE

Get Radio chip type

send: AT+FMTYPE?
response: AT+FMTYPE=TEA5767<13>
OK<13><10>

options:TEA5767
options: OK,ERR,ILL

2.3.2 AT+FMFREQ

Set FM radio frequention

send: AT+FMFREQ=88.7<13>
response: OK<13><10><0>

options: (76 to 108)*
options: OK,ERR,ILL

Get FM Radio frequention

send: AT+FMFREQ?<13>
response: AT+FMFREQ=88.3<13>

options: (76 to 108)*

OK<13><10><0>

options: OK,ERR,ILL

* one decimal

2.3.3 AT+FMSCANUP

Scan up to next radio channel

send: AT+FMSCANUP<13>
response: OK<13><10>

options: OK,ERR,ILL

2.3.4 AT+FMSCANDOWN

Scan down to next radio channel

send: AT+FMSCANDOWN<13>
response: OK<13><10>

options: OK,ERR,ILL

2.3.5 AT+FMSM

Change search mode on or off , its look alike the AFC function

send: AT+FMSM=ON<13>
response: OK<13><10>

options: ON,OFF
options: OK,ERR,ILL

Get the search mode

send: AT+FMSM><13>
response: AT+FMSM=ON<13>
OK<13><10>

options: ON,OFF
options: OK,ERR,ILL

bit 6 from byte 1 SM Search mode, if SM = 1= ON then in search mode; if SM = 0 = OFF then not in search mode

2.3.6 AT+FMMUTE

Set FM radio mute

send: AT+FMMUTE=ON<13>
response: OK<13><10>

options: ON,OFF
options: OK,ERR,ILL

Get FM radio mute state

send: AT+FMMUTE?<13>
response: AT+FMSM=ON<13>
OK<13><10>

options: ON,OFF
options: OK,ERR,ILL

bit 7 from byte 1 MUTE, if MUTE = 1 = ON then L and R audio are muted; if MUTE = 0 = OFF then L and R audio are not muted

2.3.7 AT+FMPLL

Set FM PLL value

send: AT+FMPLL=1<13>

options: (0-8191) 13 bits

response: OK<13><10> options: OK,ERR,ILL

Get FM PLL value

send: AT+FMPLL?<13>
response: AT+FMPLL=1<13> options: (0-8191) 13 bits
OK<13><10> options: OK,ERR,ILL

5 to 0 PLL[13:8] + 7 to 0 PLL[7:0] from byte 1 and 2 setting of synthesizer programmable counter for search or preset

2.3.8 AT+FMSUD

Set search up or down direction bit

send: AT+FMSUD=UP<13> options: UP,DOWN
response: OK<13><10> options: OK,ERR,ILL

Get search direction

send: AT+FMSUD?<13>
response: AT+FMFMSUD=DOWN<13> options: UP,DOWN
OK<13><10> options: OK,ERR,ILL

bit 7 from byte 3 SUD **Search Up/Down**, if SUD = 1 = ON then search up; if SUD = 0 = OFF then search down

2.3.9 AT+FMSSL

Set the search stop level

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

Get the search stop level value

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

bit 6 and 5 from byte 3 SSL[1:0] **Search Stop Level:**
SSL1 SSL0 Search stop level

- 0) 0 0 not allowed in search mode
- 1) 0 1 low; level ADC output = 5
- 2) 1 0 mid; level ADC output = 7
- 3) 1 1 high; level ADC output = 10

2.3.10 AT+FMHLSI

Set the High Low Signal Injection bit

send: AT+FMHISI=HLGH<13> options: HIGH,LOW
response: OK<13><10> options: OK,ERR,ILL

Get the High Low Signal Injection bit

send: AT+FMHLSI?<13>
response: AT+FMFMHLSI=LOW<13> options: HIGH,LOW
OK<13><10> options: OK,ERR,ILL

bit 4 from byte 3 HLSI **High/Low Side Injection**: if HLSI = 1 = HIGH then high side LO injection; if HLSI = 0 = LOW then low side LO injection

2.3.11 AT+FMMS

Change force stereo or mono

send: AT+FMMS=STEREO<13> options: STEREO,MONO
response: OK<13><10> options: OK,ERR,ILL

Get the force value

send: AT+FMMS?<13>
response: AT+FMMS=MONO<13> options: STEREO,MONO
OK<13><10> options: OK,ERR,ILL

bit 3 from byte 3 MS **Mono to Stereo**: if MS = 1 = MONO then forced mono; if MS = 0 = STEREO then stereo ON

2.3.12 AT+FMBAND

Set the FM band range Europa and Japan/VS

send: AT+FMBAND=EUR<13> options: EUR,JAP
response: OK<13><10> options: OK,ERR,ILL

Get the FM band range Europa and Japan/VS

send: AT+FMBAND?<13>
response: AT+FMBAND=EUR<13> options: EUR,JAP
OK<13><10> options: OK,ERR,ILL

bit 5 from 4e byte BL **Band Limits**: if BL = 1 JAP then Japanese FM band; if BL = 0= EUR then US/Europe FM band

2.3.13 AT+FMHCC

Set the High cut control bit

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

Get the High cut control bit

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

bit 2 from 4e byte HCC **High Cut Control**: if HCC = 1 = ON then high cut control is ON; if HCC = 0 = OFF then high cut control is OFF

2.3.14 AT+FMSNC

Set the stereo noise canceling on/off

send: AT+FMSNC=ON<13> options ON/OFF

response: OK<13><10> options: OK,ERR,ILL

Get the stereo noise cancellation setting

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

bit 1 from byte 4 SNC **Stereo Noise Cancelling**: if SNC = 1 = ON then stereo noise cancellation is ON; if SNC = 0 = OFF then stereo noise cancellation is OFF

2.3.15 AT+FMREADY

Get the ready flag

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

bit 7 from 1e byte RF **Ready Flag**: if RF = 1 =ON then a station has been found or the band limit has been reached; if RF = 0 = OFF then no station has been found

2.3.16 AT+FMBLF

Get the band limit flag

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

bit 6 from 1e byte BLF **Band Limit Flag**: if BLF = 1 = ON then the band limit has been reached; if BLF = 0 =OFF then the band limit has not been reached

2.3.17 AT+FMSTEREO

Get the stereo status from the FM channel

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

bit 7 byte 2 STEREO **Stereo indication**: if STEREO = 1 = ON then stereo reception; if STEREO = 0 = OFF then mono reception

2.3.18 AT+FMIF

Get the intermediate frequency

send: AT+FMIF?<13>
response: AT+FMIF=123<13> options: 0-127 7 bits
OK<13><10> options: OK,ERR,ILL

IF[7:0] IF counter result

2.3.19 AT+FMADC

Get the Analog signal level

send: AT+FMADC?<13>

response: AT+FMADC=5<13>
OK<13><10>

options: 0-15 4 bit
options: OK,ERR,ILL

bit 7 to 4 from 4e byte level ADC output

2.3.20 AT+FMSTARTFREQ

Flashed the FM radio frequency in the ARM memory.
When the radio turns on, the radio starts with this frequency

the Set FM radio frequention

send: AT+FMSTARTFREQ=88.7<13>
response: OK<13><10>

options: (76 to 108)*
options: OK,ERR,ILL

Get FM Radio frequention

send: AT+FMSTARTFREQ?<13>
response: AT+FMFREQ=88.7<13>
OK<13><10>

options: (76 tot 108)*
options: OK,ERR,ILL

* one decimal

2.4 DSP Digital Sound Processor / Audio Processor

2.4.1 AT+DSPTYPE

Get the DSP chip type

send: AT+DSPTYPE?<13>
response: AT+DSPTYPE=TDA8425<13>
OK<13><10>

options: TDA8425
options: OK,ERR,ILL

2.4.2 AT+DSPVOLL

Set the left volume level

send: AT+DSPVOLL=80<13>
response: OK<13><10>

options: 0-100
options: OK,ERR,ILL

Get the left volume level

send: AT+DSPVOLL?<13>
response: AT+DSPVOLL=66<13>
OK<13><10>

options: 0-100
options: OK,ERR,ILL

2.4.3 AT+DSPVOLR

Set the right volume level

send: AT+DSPVOLR=80<13>
response: OK<13><10>

options: 0-100
options: OK,ERR,ILL

Get the left volume level

send: AT+DSPVOLR?<13>
response: AT+DSPVOLR=66<13>
OK<13><10>

options: 0-100
options: OK,ERR,ILL

2.4.4 AT+DSPBASS

Set the bass level

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

Get the bass level

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

2.4.5 AT+DSPTREBLE

Set the treble volume level

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

Get the left volume level

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

2.4.6 AT+DSPVOLUP

Increase the volume by 10 steps

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

2.4.7 AT+DSPVOLDOWN

Decrease the volume by 10 steps

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

2.4.8 AT+DSPMUTE

Set DSP mute

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

Get DSP mute state

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

2.5 MP3 DSP chip

2.5.1 AT+MP3TYPE

Get the mp3 chip type

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

2.6 VU meter

2.6.1 reserve at+vutype

2.6.2 AT+VULEFT

Set the left VU byte

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

Get the left VU byte

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

2.6.3 AT+VURIGHT

Get the left VU byte

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

Get the left VU byte

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

2.6.4 AT+VULN

Get the left VU number

send: AT+VULN?<13>
response: AT+VULN=7<13>
OK<13><10> options: 0-255*
options: OK,ERR,ILL

Get IO base: PRINT INP(&H26)

*default 0-8

2.6.5 AT+VURN

Get the right VU number

send: AT+VURN?<13>
response: AT+VURN=7<13>
OK<13><10> options: 0-255*
options: OK,ERR,ILL

Get IO base: PRINT INP(&H27)

*default 0-8

2.6.6 AT+VULEDS

Set the number of leds, default is 8

send: AT+VULEDS=8<13> options: 1-255
response: OK<13><10>

Get the number of leds

send: AT+VULEDS?<13>
response: AT+VULEDS=8<13> options: 1-255
OK<13><10> options: OK,ERR,ILL

2.7 MSX

2.7.1 AT+MSXAUDIO

Set MSX aux in switch

Signal is the left output channel

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

Get MSX aux line status

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

2.7.2 AT+MSXSTARTAUDIO

Flashed the this settings in the ARM memory. When the SE-ONE turns on, this setting will be used

Set MSX aux in switch

Signal is the left output channel

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

Get MSX aux line status

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

3.0 AT examples

3.1 Set mode to MP3

send:
AT+SEMODE=MP3A

Run a MP3 player program.

Note :

When the SE-ONE startup , the default mode is MP3A

3.2 Set mode to FM radio

send:

AT+SEMODE=FM

Send:

AT+FMFREQ=88.0

To search UP

Send:

AT+FMSCANUP

To search Down

Send:

AT+FMSCANDOWN

4.0 Applications

Radio apps

Radio app (SymbOS) written by Edoz
Basic Radio Radio.asc saved in ASCII format

MP3 apps

Playinfo.bas (sunrise)
Playmp3.com (sunrise)
(symbOS)

UTILITY apps:

SEONE.COM a MSXDOS AT handler (Paul B)
AT.LDR a basic AT handler (Hans t)
AT_RESP.BAS a basic AT handler with response (Hans t)

5.0 Basic examples

5.1 AT.BAS

```
100 WIDTH 80
110 '
120 'Example: AT COMMAND: ? AT+SEMODE?
130 '
140 'set caps lock
150 DEFUSR1=&HF36:A=USR1(0)
160 '
170 '
180 AT$=""
190 INPUT"AT COMMAND: ";AT$
200 L = LEN(AT$)
210 IF L = 0 THEN GOTO 180
220 FOR T = 1 TO L
230 S = ASC(RIGHT$(LEFT$(AT$,T),1))
240 OUT &H20,S
250 NEXT T
260 OUT &H20,13
270 '
280 'read response
290 IF INKEY$<>"" THEN GOTO 180
300 '
310 I = INP(&H20)
320 IF I = 0 THEN GOTO 280
330 IF I > 31 THEN PRINT CHR$(I);
340 IF I = 13 THEN PRINT
350 IF I = 10 THEN GOTO 180
360 GOTO 280
```

(Hans t)

6.0 Z80 examples

7.0 Electrical descriptions

8.0 Troubleshooting

8.1 No Sound

Send: AT+MSXAUDIO=ON

9.0 Revision history

9.1 AT command list SEONE27072017.DFU

AT+CARTRIDGE
AT+SEMODE
AT+SELOGBOOK
AT+SEVERSION
AT+SEFIRMWARE
AT+SETUNE
AT+SEPLAYTUNE
AT+FMTYPE
AT+FMFREQ
AT+FMSCANUP
AT+FMSCANDOWN
AT+FMSM
AT+FMMUTE
AT+FMPLL
AT+FMSUD
AT+FMSSL
AT+FMHLSI
AT+FMMS
AT+FMBAND
AT+FMHCC
AT+FMSNC
AT+FMREADY
AT+FMBLF
AT+FMSTEREO
AT+FMIF
AT+FMADC
AT+FMSTARTFREQ
AT+DSPTYPE
AT+DSPVOLL
AT+DSPVOLR
AT+DSPBASS
AT+DSPTREBLE
AT+MP3TYPE
AT+VULEFT
AT+VURIGHT
AT+VULN
AT+VURN
AT+MSXAUDIO
AT+MSXSTARTAUDIO

DFU: SEONDE22072017.DFU
- this file is fashing in the first batch.
DFU: SEONE27072017.DFU
- fix start frequention AT+FMSCANUP ,
- fix volume schaal AT+DSPVOLL/R 0-100
- Vu meter heeft nu automatische schalering

9.2 AT command list 28072017.DFU

DFU: SEONE28072017.DFU

AT+DSPMUTE
AT+DSPVOLUP

AT+DSPVOLDOWN
AT+VULEDS
AT+LIST

- Each help command has added a help
This is to activate with /H
Example:
AT+SEMODE/H
- The value AT+VULN can also read with a IO base commando INP(&h26)
The value AT+VULR can also read with a IO base commando INP(&h27)