MMI 3G and 3G Plus EEPROM Explained

Version 1.0 – June 2014 (by Keldo Gliana)

Purpose: The purpose of this document is to dump and share my knowledge that I have gained by experimenting and spending countless hours many nights in my Audi trying to reverse engineer my MMI units.

Scope: This document will cover the physical location and specification of the EEPROM, highlighting known sections of the EEPROM content that maintain MMI details such as part and serial number, Component Protection, available languages and some other cool hex data.

Objective: This document is intended to provide the Audi enthusiast a general knowledge in MMI EEPROM, with aim to help in-house projects to be more entertaining and successful.

Cost: This document is provided for free, if you purchased it from someone or website ask for a refund; however, donations some coins to the author as a token of appreciation is not a bad idea.

What is EEPROM?

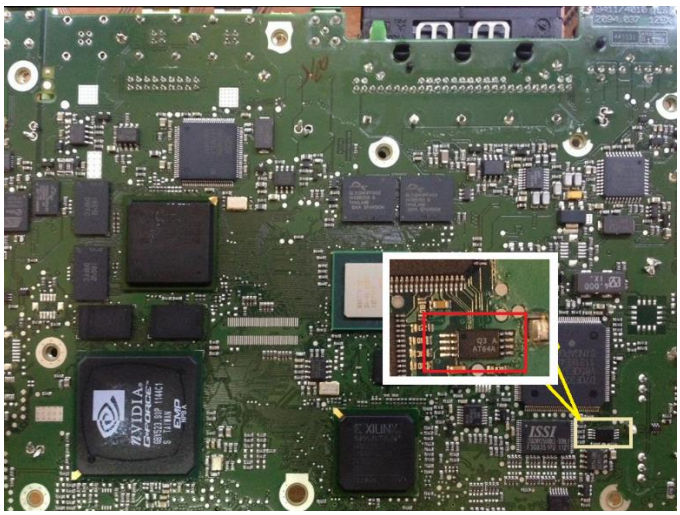
EEPROM (pronounced e-prom) stands for Electrically Erasable Programmable Read-Only Memory and is a type of non-volatile memory used in MMI's motherboard to permanently store details. Normally the content of this memory can only be modified by Audi.

Where is EEPROM on MMI unit?

The chip is manufactured by Atmel specifically for Automotive industry as a 2-Wire EEPROM. It has a capacity of 64Kb.

The full part number is AT24C64A-10TQ-2.7 but it's labelled as Q3, A, AT64A.
You can find more information about the chip here:

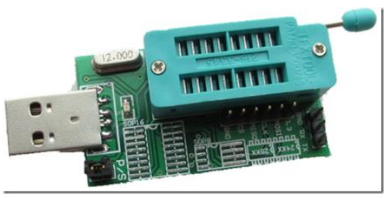
http://www.alldatasheet.com/view.jsp?Searchword=AT64A



How to read and write?

You can read and write to the chip directly using an EEPROM programmer.

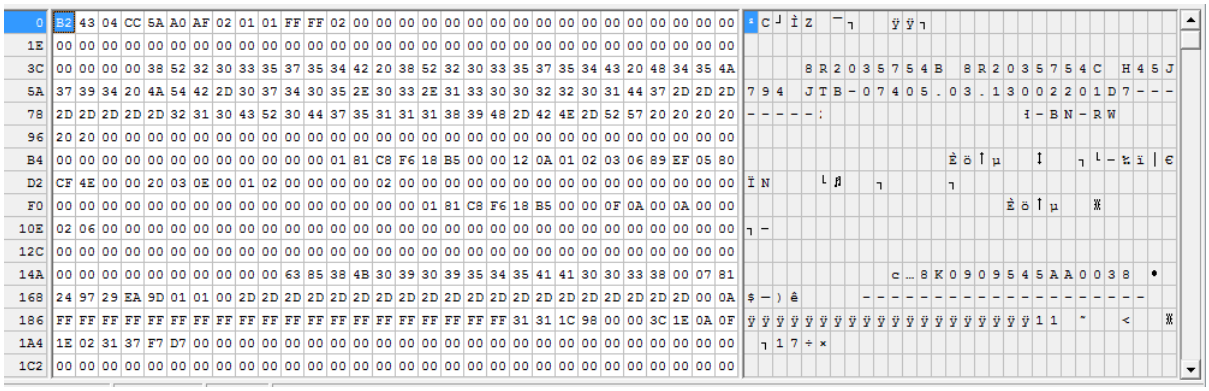
You can find them on eBay for $30 but you have to remove the chip from the board in order to do that.
if you're not very familiar with electronics and removing micro components… this is not an option for you ☺



Alternatively you can use OBD-II port to access module 5F, login as an engineer with appropriate pin number, SendSeed and AccessKey and read and write to the EEPROM. VCDS, VAS and other known cables will not do this job… you need a special cable and software to perform this. Contact me and I may guide you to the right cable…

EEPROM known content:

The EEPROM in MMI only uses 8192 bytes of the chip, when opening the content with HexEditor such as XVI32 it looks like this:



Part Numbers:

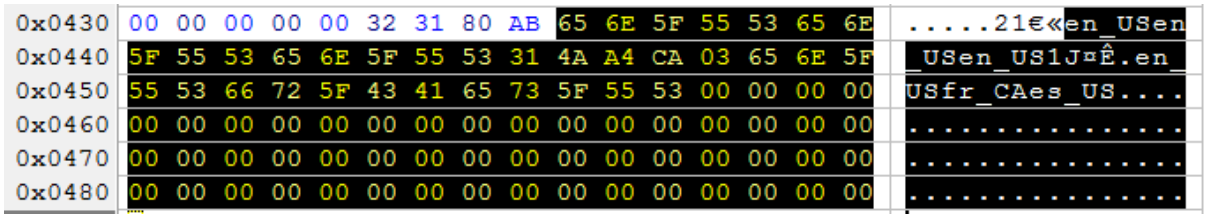
Name	Address	Pos Start	Pos End	Data Type	Example
HW Part Number	0x0040	65	74	ASCII	8R2035754B
SW Part Number	0x0040-50	76	85	ASCII	8R2035754C
HW Version	0x0050	88	89	ASCII	H45
VW Module Num	0x0050	91	94	ASCII	J794
DVD Drive Num	0x0050-60	96	102	ASCII	JTB-074
MMI Manuf Date	0x0060	103	109	ASCII	05.03.13
Compat Screen	0x0070	117	126	ASCII	D7
Serial Number	0x0080-90	130	154	ASCII	DS1E8622290H-BN-RW
Conv. Module	0x0150	344	353	ASCII	8K0909545A
Display Unit	0x19B0-E0	6587	6625	ASCII	DU9466,Front,M,0,0,5

Languages:

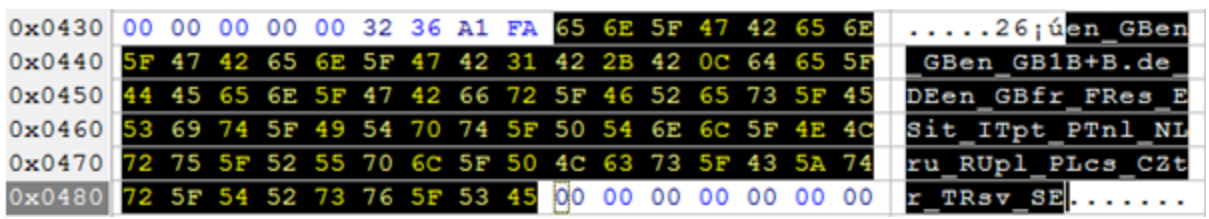
The EEPROM holds a list of languages that can be permitted to be install during firmware update, the NAR (North American Region) units only have English, Spanish and French. Whilst European units have English GB, German, Dutch, French, Spanish, Italian, Portuguese, Russian, Turkish, Swedish etc..

This section is better illustrated with a screenshot, please see below:

US \ NAR:



European:

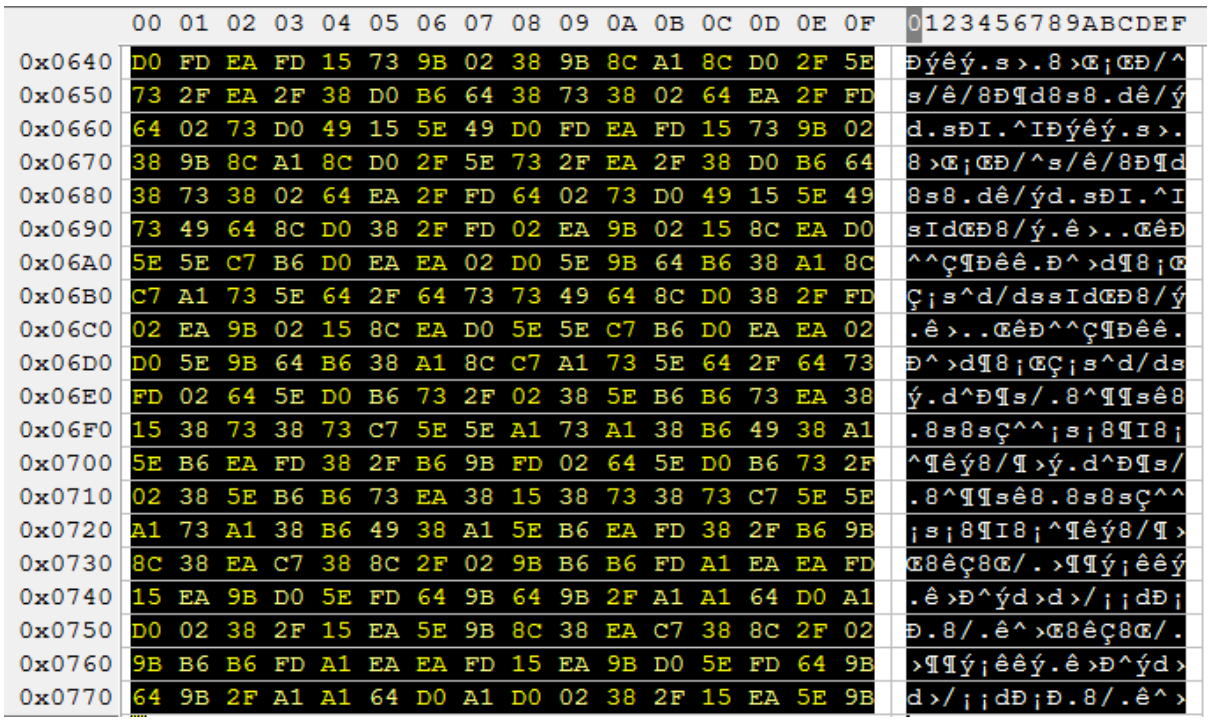


If you need to install languages, you have to modify EEPROM first and then then re-apply the appropriate firmware files. The language setup is introduced by EEPROM, referenced by root-ifs.ifs file on the flash and the actual language files are saved on the hard drive.

Component Protection:

As part of the security and anti-theft strategy, VW has introduced a cool way to protect its clients. They have implemented the so called “component protection”. This is a mechanism dedicated to prevent exchange of modules between different vehicles without central authorization from the VAG online database.

In MMI the component protection is save between 0x0640 and 0x0770, please see below:



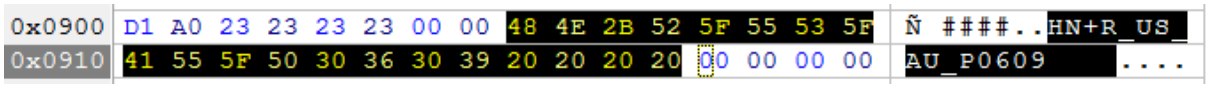
	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F	0123456789ABCDEF
0x0640	D0	FD	EA	FD	15	73	9B	02	38	9B	8C	A1	8C	D0	2F	5E	Ðýêý.s›.8›Œ¡ŒÐ/^
0x0650	73	2F	EA	2F	38	D0	B6	64	38	73	38	02	64	EA	2F	FD	s/ê/8Ð¶d8s8.dê/ý
0x0660	64	02	73	D0	49	15	5E	49	D0	FD	EA	FD	15	73	9B	02	d.sÐI.^IÐýêý.s›.
0x0670	38	9B	8C	A1	8C	D0	2F	5E	73	2F	EA	2F	38	D0	B6	64	8›Œ¡ŒÐ/^s/ê/8Ð¶d
0x0680	38	73	38	02	64	EA	2F	FD	64	02	73	D0	49	15	5E	49	8s8.dê/ýd.sÐI.^I
0x0690	73	49	64	8C	D0	38	2F	FD	02	EA	9B	02	15	8C	EA	D0	sIdŒÐ8/ý.ê›..ŒêÐ
0x06A0	5E	5E	C7	B6	D0	EA	EA	02	D0	5E	9B	64	B6	38	A1	8C	^^Ç¶Ðêê.Ð^›d¶8¡Œ
0x06B0	C7	A1	73	5E	64	2F	64	73	73	49	64	8C	D0	38	2F	FD	Ç¡s^d/dssIdŒÐ8/ý
0x06C0	02	EA	9B	02	15	8C	EA	D0	5E	5E	C7	B6	D0	EA	EA	02	.ê›..ŒêÐ^^Ç¶Ðêê.
0x06D0	D0	5E	9B	64	B6	38	A1	8C	C7	A1	73	5E	64	2F	64	73	Ð^›d¶8¡ŒÇ¡s^d/ds
0x06E0	FD	02	64	5E	D0	B6	73	2F	02	38	5E	B6	B6	73	EA	38	ý.d^Ð¶s/.8^¶¶sê8
0x06F0	15	38	73	38	73	C7	5E	5E	A1	73	A1	38	B6	49	38	A1	.8s8sÇ^^¡s¡8¶I8¡
0x0700	5E	B6	EA	FD	38	2F	B6	9B	FD	02	64	5E	D0	B6	73	2F	^¶êý8/¶›ý.d^Ð¶s/
0x0710	02	38	5E	B6	B6	73	EA	38	15	38	73	38	73	C7	5E	5E	.8^¶¶sê8.8s8sÇ^^
0x0720	A1	73	A1	38	B6	49	38	A1	5E	B6	EA	FD	38	2F	B6	9B	¡s¡8¶I8¡^¶êý8/¶›
0x0730	8C	38	EA	C7	38	8C	2F	02	9B	B6	B6	FD	A1	EA	EA	FD	Œ8êÇ8Œ/.›¶¶ý¡êêý
0x0740	15	EA	9B	D0	5E	FD	64	9B	64	9B	2F	A1	A1	64	D0	A1	.ê›Ð^ýd›d›/¡¡dÐ¡
0x0750	D0	02	38	2F	15	EA	5E	9B	8C	38	EA	C7	38	8C	2F	02	Ð.8/.ê^›Œ8êÇ8Œ/.
0x0760	9B	B6	B6	FD	A1	EA	EA	FD	15	EA	9B	D0	5E	FD	64	9B	›¶¶ý¡êêý.ê›Ð^ýd›
0x0770	64	9B	2F	A1	A1	64	D0	A1	D0	02	38	2F	15	EA	5E	9B	d›/¡¡dÐ¡Ð.8/.ê^›

You can transfer\duplicate\remove this section between all different MMI 3G and MMI 3G Plus units. When you upgrade MMI 3G to 3G plus this is the section that you will need to transfer.

As of this minute (when typing this documents) there isn’t an easy way to translate or generate the above code. It’s not based on VIN only, it’s also based on several other variables that get pulled from CAN gateway.

Firmware Version:

Firmware details are located on 0x910 between pos 2314 and 2332.



0x0900	D1	A0	23	23	23	23	00	00	48	4E	2B	52	5F	55	53	5F	Ñ ####..HN+R_US_
0x0910	41	55	5F	50	30	36	30	39	20	20	20	20	00	00	00	00	AU_P0609 ....

MMI Configuration:

A lot of other configurations are encoded in none human readable format unfortunately are saved on address 0x0B00 between 2823 and 6540.

I hope this helps!

-- End of Document --