Appendum

for

HM2007 datasheet

Version 1.0
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1. Revisions

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<tr>
<td>27-06-2006</td>
<td>All</td>
<td>First version</td>
<td>KJ</td>
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<tr>
<td>04-07-2006</td>
<td>5</td>
<td>Section 3.1 WLEN = low else the HM2007 will lock in some cases</td>
<td>KJ</td>
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<tr>
<td>04-07-2006</td>
<td>7,8,9</td>
<td>Flow chart updated, in better quality</td>
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2. Scope
This document is JKA-Electronic's property. It must not be copied nor re-generated without JKA-Electronic's allowing this in writing.

2.1 Purpose
The purpose of this document is to describe and clarify the correct use of HM2007 speech recognition chip in CPU-Mode.

2.2 Introduktion
This document is based on using the Speech recognition kit SR-07 from Images SI Inc in CPU-mode with an ATMega 128 as host controller. Troubles were identified when using the SR-07 in CPU-mode. Also the HM-2007 booklet (DS-HM2007) has missing/incorrect description of using the HM2007 in CPU-mode.

This appendum is giving our experience in solving the problems when operating the HM2007 in CPU-Mode.

A generic implementation of a HM2007 driver is appended as reference.
3. Hardware

3.1 Startup
Following conditions must be performed before/when power-up of the HM2007:

- Pin CPUM must be logical high (PDIP pin 14, PLCC pin 15), this means select CPU-Mode.
- Pin WLEN must be logical low (PDIP pin 13, PLCC pin 14), this means select 0.92 sec word length. This is very important; else the HM2007 will lock, or give wrong command answer when result data is read.
4. Software

4.1 HM2007 Commands in general

It seems that it is important to have a delay every time the state of the S-bus is changed. In the JKA-Electronic implementation, a 1 msec delay is used.
4.2 HM2007 Recognize Command flow

![Flowchart diagram showing command flow for HM2007 in CPU-mode VER. 1.00]

- **S = 010**
  - **Y**: ST = 10
    - **N**: ST = ST1 ST0 = K4 K3
  - **N**: ST = 01
    - Send another command

- **S = 000**
- **S = 100**
- **SEND RECOG (0001)**
- **S = 010**: Y

Send 0001 means put data on the K-bus

Fig 1. Control flow of the CPU mode for recognition

Above picture shows an updated flow description, of the one from the original HM2007 datasheet.
4.3 **HM2007 Train Command flow**

Above picture shows an updated flow description, of the one from the original HM2007 datasheet.
4.4 **HM2007 Result Command flow**

Updated flow chart

![Flow chart diagram]

Fig 2. Control flow of the CPU mode for resulting

Send another command
Above picture shows an updated flow description, of the one from the original HM2007 datasheet. It should be mentioned that when right column of the above shown flow chart is run through the first time, you will get position data, and the next time you run this part through you will get the score data. This information has not been described correctly anywhere in the original datasheet. If above is not followed exactly as described, the HM2007 will lock in the Result state.

4.5 **HM2007 Upload Command**
The flow for the Upload command is exactly as described in the datasheet, but care must be taken. Do not try to use the Upload command when no data is stored on a specific memory position in the HM2007, then it will lock, and the only way to get in contact with it again, is to recycle the power supply for the circuit.

4.6 **HM2007 Download Command**
The flow for the Download command is exactly as described in the datasheet.

4.7 **HM2007 Reset Command**
The flow for the Reset command is exactly as described in the datasheet.