***** Honeywell H-112 Emulator Rev 1.7 *****

(c) Spencer 2015

This emulator emulates the following configuration :-

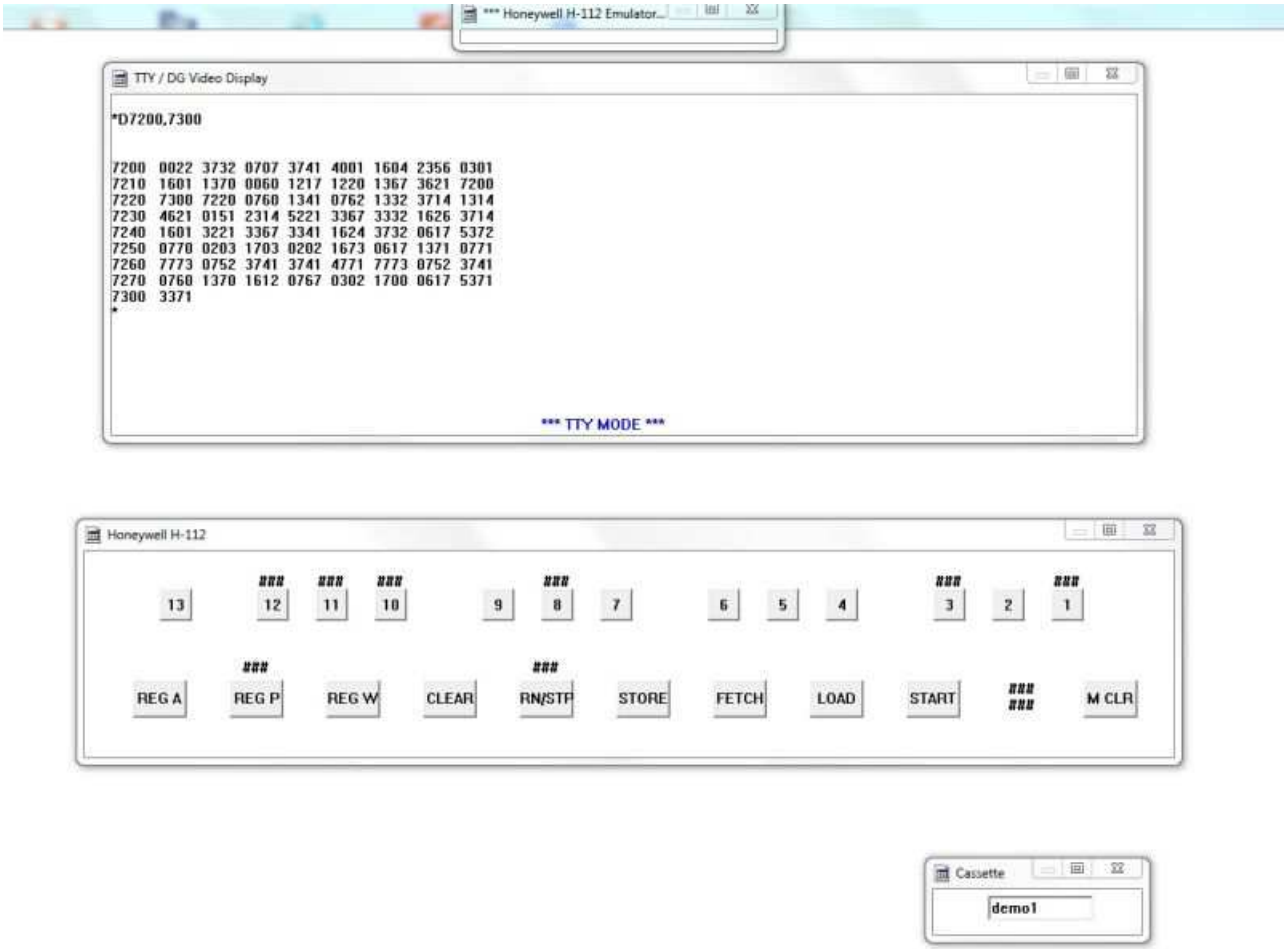
Honeywell H-112 with 8K Memory (on screen control panel)
ASCII Keyboard
DG Display 20 lines x 64 Characters
Teletype ASR33

The 8K memory is automatically saved when the emulation ends and reloaded when the emulation starts from a file called mainmem.112 so memory is not lost and so simulates Ferrite Core memory.

Installation

To Install the Emulator simply unzip all of the files from the **'h112emuv17.zip'** file into a folder of your choice and you can start the emulator by double clicking the **'h112emuv17.exe'** file. Or probably better is to put a 'Shortcut' onto your Desktop.

Emulator running on a PC showing the TTY/DG Video window at the top and below this the H-112 Control Panel. And at the bottom on the right the Emulated Cassette Drive.



The emulator is designed for a 1920 x 1080 screen but if the emulator windows are not positioned correctly for your screen you can go to the top of the screen and click on **‘Screen Size’** then click on 1280 x 720 which is normally correct for 17″ screens. Or you can click on the top of a window and holding the mouse button depressed drag the window to the position you want it on the screen

You can also change the speed at which the emulator runs from ‘very slow’ to ‘very fast’ or simply leave it at the ‘standard’ speed.

The EMULATOR

The Keyboard has the address '20 or address '01

The keyboard is read with INA '20 or INA '01 commands.
INA '20 for the Keyboard used with the DG display and INA '01 for the standard TTY Read.
The '#' character is used as carriage return and is converted to '215 (Ascii C/R).
the keyboard delivers Upper case Ascii for TTY and Upper and lower case for the DG Display and the INA skips only if a character has been input to 'Register A'.

The TTY output is with OTA '02.
'*** TTY Mode ***' is displayed at the bottom of the display and the display has a larger number of characters/line than the DG Display but only in Upper Case as for the real ASR33 or CREED 7 Series of terminals and scrolls when a C/R character is received on the bottom line of the display. To more accurately simulate a teletype device the output is slower than when in ‘DG Video Display’ mode. The TTY terminal is always ready to receive a character and so the OTA always skips.

The DG Display has the address '2X :-

OCP 20	Clears the screen and resets the cursor to the start of the screen
OCP 21	Moves the cursor position to the start of the screen
OCP 22	Skips to next cursor position
OTA 20	Outputs an Ascii character to the screen and the DG display is always Ready and so always skips after outputting.

The display has 20 Lines of 64 Characters both Upper and lower case can be displayed but the display does not scroll as for the TTY display instead by using the OCP's the display can be positioned to any character position on the screen. Outputting a C/R causes a move to a new line.

The Cassette can be used by the Hardware 'Load button' function which has been extended to include a hardware save function.

You can insert a cassette by typing it's name into the Cassette window. A name which does not already exist will be treated as a blank cassette.

If 'Register P' is zero then clicking 'Load' and then 'Start' will load into the default locations specified in the PLOD12 (H112 Load format) file contained on the cassette.
If 'Register P' is not zero then the file will be loaded starting at the location specified in 'Register P'.
If the cassette file does not exist the cassette name will be erased and 'Load Mode' will be ended.

To 'Save' You can put an Address in 'Register P' and a range in 'Register A', when you click 'Store' and then 'Load' this puts the machine into Save mode and clicking 'Start' will save to the cassette.
The range is 1 to 4096 whereby 0 is 4096 words.
Clicking 'Master Clear' and then 'Store' then 'Load' will save the whole bottom 4K in PLOD12 format.

If there is no name in the cassette window when saving or loading then the file 'cassette.112' will be used.

The file format is Bank/Load address/Range/Start Address/Then the locations to be saved.
When using the Save/Load function from the control panel the Start Address is always the same as the Load Address.

The Hardware Save function can write the cassette even if ‘write enable’ is not set.

The cassette can be used from a program and has the address '1X :-

```
  OCP '10  Start Cassette in Record mode (Open file for write)
  OCP '11  Start cassette in play mode (Open file for read)
  OCP '12  Stop Cassette (Close file)
  SKS ’10  Skip if write enabled
  SKS ’11  Skip if cassette exists
  OTA '10  Write to Cassette (Skip if character output correctly)
  INA '10  Read from cassette (Skip if character input correctly
```

To allow writing to a cassette ‘Write Enable’ should be set by adding a ‘.’ To the beginning of the cassette name. For example :-

.mycass allows reading and writing
mycass allow only reading

This should be tested with an SKS ’10. If you do not test with an SKS then the cassette can be overwritten by your program

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The Emulator has an added Hardware debugging feature.
Normally the bit 13 button has no effect on the H-112 when the 'W Register' is selected. But in the emulator it puts a 'Break' window on the screen.
Entering an Octal address into the 'Break Window' will cause the machine to stop running when the 'Break' address is seen in the 'P Register'. Clicking Bit 13 again while Register W is selected will turn off the 'Break' debug facility.
Addresses in the 'Break Window' can be deleted using the 'Backspace' key.

All cassette file names have the format 'xxxxx.112' the '.112' is added automatically and should not be specified in the file name entered into the cassette drive.

H-112 Mini Assembler

This program allows the entry of symbolic instructions for the 112 on a PC and the creation of ‘.112’ file which can be loaded by the hardware loader of the H-112 into the computer.

Enter the 'name' of the tape/file, then the 'start address' in octal.
Then enter numeric values or symbolic code such as :-

```
24
3650
lda 6
lda*200
```

All numeric values are in octal '*' means indirect.
When the input is complete enter just '#' on the line to terminate input and write the file.
Typing '<' steps back one location in case an error has been made.

H-112 TBX Lister

This program allows any TBX file to be listed to a text file, so for example TBXMM.112 as the TBX file would produce TBXMM.txt as a listing of the TBX program. As always you do not type the .112 as part of the file name this is added automatically. The listing can then be printed on the PC in the normal way using any PC editor program (Edit, Word etc.).
