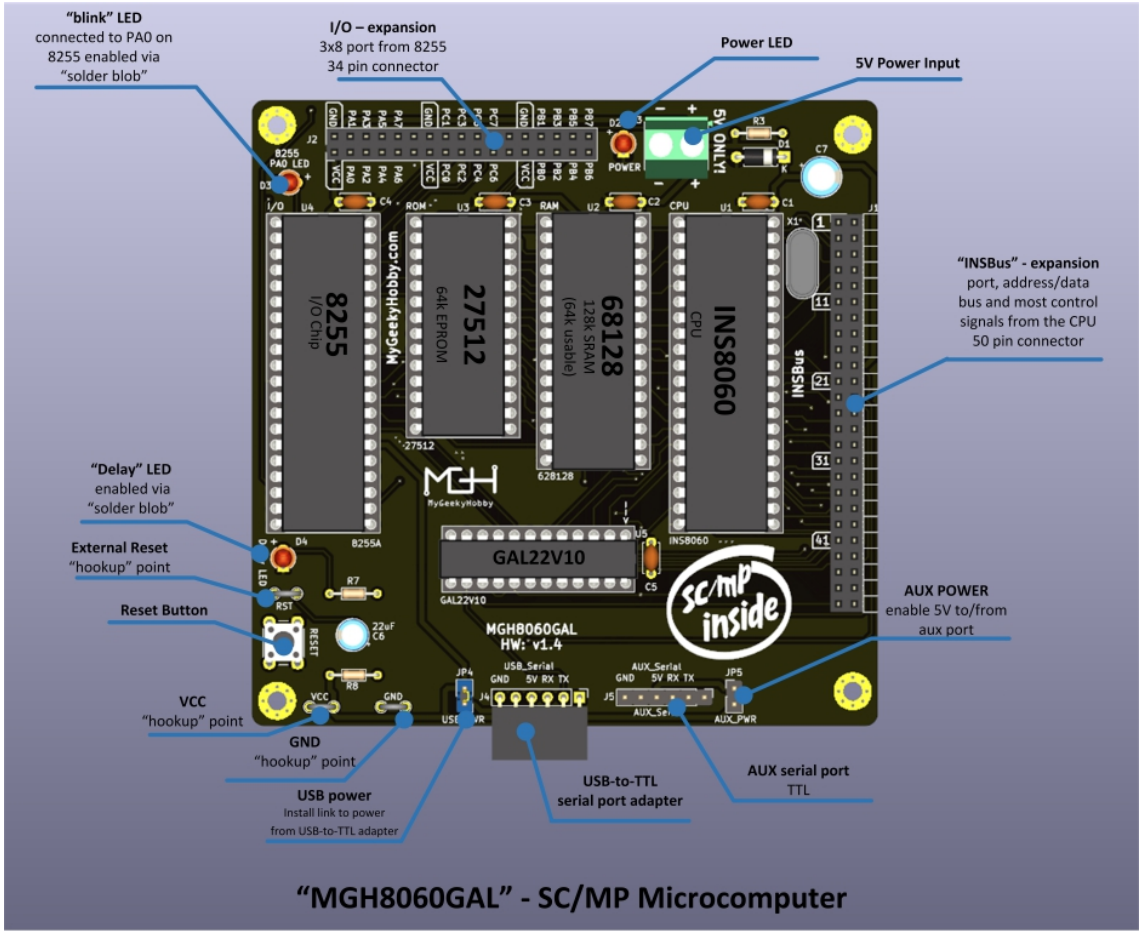
The MGH8060GAL SC/MP Computer



This is a comprehensive design whose overall memory map can be readily configured by interleaving areas from it onboard 64k of RAM and 64k of ROM.
This flexibility is achieved using a GAL22v10 which also provides the SC/MP address latch for A12-15.
The PCB for the project is designed and open-sourced by Kris Sekula:
https://www.pcbway.com/

The software build comprises several modules, all of which have been combined into one hex image-file to be programmed into the EPROM or EEPROM. There are two versions of the image-file, one featuring a Boot-Menu for those who prefer it, and one which boots conventionally into the monitor program 'KitbugPlus':

mgh8060gal_w_menu_1503.hex

mgh8060gal_no_menu_1503.hex

For general use, one or the other of these image-files is all that is required for a full software installation.
The ROM can be a Winbond 27C512 EEPROM, or a 27C512 EPROM, or pin-compatible chip.

The image includes the KitbugPlus machine-code monitor, NIBL-E integer BASIC, a version of Karen Orton's PAGE2 development system, the NIBL-E toolkit, the Boot-Menu and Erich Kuester's floating-point version of NIBL.

Documentation for KitbugPlus, PAGE3.SYS, and the Boot Menu is available via:
https://www.mccrash-racing.co.uk/philg/scmp/scmp.htm

NIBL is a typical 'Tiny BASIC' with some useful additions, and is well documented on the web.

The MGH8060GAL is influenced by Ronald Dekker's concept with several modifications.
Ronalds design has no RAM in page zero, which prevents the use of National Semiconductors original Kitbug, or its successor KitbugPlus.

As a consequence, Ronalds build image-file comprises just NIBL-E and NIBL-FP, nothing more.
Further, these two packages have different async-serial configurations which need a change of setup in Teraterm. As such, Ronalds image file is not a good option.

The most significant change in the MGH8060GAL memory-map is to split page zero into half ROM, half RAM which allows either monitor to run at its native address of 0000 hex.
The new image-files listed above need no async-serial configuration changes, everything runs seamlessly at 2400N81 throughout.

The software zip file contains the source and listings for all the modules which contribute to the overall ROM build image. The individual files, memory-map addresses and descriptions are as follows:

Filename	**Load address**	**Description**
mgh8060gal_no_menu_1503.hex	0000-FFFF	Full build image file without Boot Menu
mgh8060gal_w_menu_1503.hex	0000-FFFF	Full build image file with Boot Menu
KitbugPlus2400menu.asm kitbugplus2400menu.hex kitbugplus2400menu.prn	0000-07FF	KitbugPlus modified for Boot Menu
KitbugPlus2400.asm kitbugplus2400.hex kitbugplus2400.prn	0000-07FF	KitbugPlus machine-code monitor, this is the standard source without the jump to the boot menu.
nible24g.asm nible24g.hex NIBLE24g.lst	1000-1FFF	NIBL-E configured for 2400N81
PAGE3.asm PAGE3.hex PAGE3.lst	3000-3FFF	Karen Orton's PAGE2.SYS reconfigured to page 3, this auto-runs on entering NIBL-E
menu_c000gal.asm menu_c000gal.hex menu_c000gal.prn	C000-C1FF	The Boot Menu
nible_toolkit.asm nible_toolkit.hex NIBLE_toolkit.pdf nible_toolkit.prn	8200-8FFF	Extensions to NIBL-E called using LINK, including cursor control, colour, sound, delays, printing etc.
NIBLFP2400.asm NIBLFP2400.hex NIBLFP2400.lst	D000-FFFF	Floating Point NIBL by Erich Kuester
MGH2210p.EQN		The equation file used for the GAL22v10
MGH2210P.JED		Pre-assembled JED file for programming the GAL
MGH2210P.LOG		GALASM log file

Whilst complete and fully functional, some of this software remains a work-in-progress and may develop further, for example more functions may be added to the NIBL-E Toolkit.

Combining the modules into a build image-file

This has already been done, producing the two image files referred to on page 1, however, for interest...

Using a hex editor such as HxD or Xgecu set to 64k, load each individual hexfile at its own embedded address. Turn off any function to clear the buffer on loading as we have several modules to load. When all six modules have been loaded, save the entire image from 0000-FFFF to an Intel Hex file, which can be read by your programmer. I recommend the TL 866 Pro.

Credits:

Kris Sekula	Hardware design, testing & development, PCB design
NS & Elektor	NIBL-E relocation of NS NIBL
Erich Kuester	NIBL-FP
Karen Orton	PAGE2.SYS
Phil Green	KitbugPlus, Boot Menu, PAGE3 edit, NIBL-E Toolkit, GAL mapping, async fixes

Resources:

https://www.pcbway.com/project/shareproject/MGH8060GAL_SC_MP_Microcomputer_with_GAL22V10_23baed0e.html

https://github.com/Kris-Sekula/MGH8060GAL

https://www.dos4ever.com/SCMP/SCMP.html

https://philg.uk

https://www.vintage-radio.net/forum/showthread.php?p=1278090#post1278090

Phil_G, March 2024