# GIDE: IDE drive for Z80

**Most recent revision dated Mar 3 2011. All links verified and updated. In late 2008 this material was moved from my S-100 and CP/M Web pointers page. Links to related projects may be on that Web page. Corrections to this page are appreciated. - Herb Johnson**

A number of people have worked on connecting IDE drives to Z80 processors. Tilmann Reh wrote a series of articles in 1995, about his Z80 plug-in IDE interface, which he called GIDE (Generic IDE). It's a small board of a few chips, which plugs into the Z80 40-pin socket, and which has an IDE interface. A series of GIDE and IDE articles were published by Tilmann from 1993 to 1995, and by others subsequently, in a small-press paper magazine called "The Computer Journal" as published by various private individuals from 1983 to 1998. The link is to an online archive of PDF's of the magazine by the last publisher, Bill Kibler. TCJ articles on GIDE are listed here.

My part in this activity was to encourage Tilmann Reh in developing the GIDE; I was the first to suggest he add a RTC (real time clock) to it. I was the first to import and resell his German-produced GIDE boards into the US; and I distributed all the code he and others developed for it at that time. Other designs followed and others including Tilmann sold them: the details are below.

## Subsequent developments of GIDE

I no longer offer GIDE kits, but I keep up with others who use the design.

### KC Club

In 1996, Helmut Jungkunz wrote in TCJ about adapting GIDE for the German KC-85 Z80 computer. In 2011 the KC85 domain was changed, follow this link to that German site. But as of 2011, there's only a few GIDE ROM images to download, as best I can find as a non-German-speaking American reader.

As of March 2003, a group in Germany called KC Club provided their version of GIDE kits for a modest fee and included US customers. The KC-85 version of GIDE includes a TL7705A reset IC. Pages on the Web site for GIDE are in German and English. On Jan 24 2004, the KC club site reported the last of those kits were available. Another post and offer of kits was on Feb 16 2005; and again on Oct 15 2006. As of Feb 2011 the Web page was updated in Aug 2010 as follows: "All boards and kits from the last run are sold out." But their site has schematics and hardware docs. For software, the GIDE page refers to Gaby's CP/M archive and its GIDE section, as below. I attempted a few times from 2006 to 2010, to ask them for their source code; Frank Dachselt emailed in reply "is still on my ToDo list". A careful search by me in Feb 2011 of their Web site, showed no GIDE source code, only a few ROM images related to GIDE.

### Tilmann Reh

Tilmann Reh, the designer of the GIDE, has a section on his Web site for GIDE code he initially developed. Check this link for those files. As of Oct 2006, they include documentation of the design and use of the GIDE including the Seiko-Epson clock chip, and "test software and samples" of code. This code includes several packages. One is apparently "version 0.9" of Tilmann's GIDE code and includes changes by Shawn Sijnstra from year 2000. Another package has code from 1996 by John Baker to support the "Davidge DSB 4/6 single-board computer", a Z80 board. Also, Pete Cervasio's 1995 MAC version of Tilmann's PASCAL program to identify IDE drives.

In Oct 2006 I looked carefully through my old GIDE distribution archives. I provided all the code I got to all my customers and to Tilmann. Tilmann's archive as above HAS ALMOST ALL of that code. (There was some incomplete code offered by others at the time.)

Gaby's GIDE archive on her "unofficial CP/M archive site" is the same as Tilmann's Web site. Tilmann said both site pages are "mirrored".

Note for 2011: Some years ago, there was a discussion about GIDE applications and problems with hardware resets - I do not recall the details. The original GIDE does not have any elaborate reset circuits. Tilmann Reh said this in response to these comments: "You might clarify this by writing that some host systems had power/reset issues with attached GIDE due to probably lazy reset circuits of the host system, and the reset IC on the KC version fixed them."

## Other implementations

**CPLD version:** On Aug 2009, after a request in Usenet newsgroup comp.os.cpm for "Z80 hard disk code", Armin Diehl posted a link to his Web page on his GIDE design and Z80 software. He programmed a Xilinx CPLD (9572) programmable logic device to implement the GIDE as a ECB design. His code and Web page includes discussion of CP/M partitioning, which was requested in the comp.os.cpm discussion. Page last updated late 2007, available as of Feb 2011.

**SEBHC version:** Also in Aug 2009, Les Bird of SEBHC (Heath H-8 group) created a GIDE support page for his Z80 CPU card for the H-8. Check out his GIDE page, with a KC-85 GIDE card. It includes software for formatting and I think partitioning.

**P112 version:** Another version of GIDE was developed for a Z180 single board called P112. This computer was made by David Brooks of Australia in the 1990's; In 2004 and forwards it was independently produced (in multiple runs) by David Griffith in the USA, with Terry Gulczynski who also provided some kit and GIDE assembly. Look to the P112 Web site for current status. David Griffith explains their GIDE development: "Terry addressed the mechanical problems that prevent the standard GIDE interface from use on the P112. The board he designed simply taps the appropriate lines on the expansion connector and discards the date/time chip. My input on the board was simply to suggest redoing the outline to avoid the coin cell on the main board. As awkward as it looks, that tall holder was the best solution I could find. None of the flat holders I found would have worked."

As of Feb 2011, Terry Gulczynski TG Consulting Web page has links to a (Heath brand) H-89 GIDE and banked RAM board "nearly ready for production" and links about the P112-GIDE (says "ask, still available"). No source code is obviously available for th P112-GIDE;

# Programming the GALs and PAL's for GIDE

PALs and GALs like those used in the GIDE (16V8, 20V8) are still in use and were commonly used in 1980's and 90's digital designs. The devices themselves are bits of logic with fusable links; programming them consists of burning up appropriate fuses. The "GAL" devices are modern equivalents of PALS.

Up to 2010, GALS were easier to find and program than PALS. Major digital parts distributors like Digikey and Jameco stocked GALS. However, Lattice Semiconductor announced in 2010 they have ended production of GALS, and will end GAL distribution by 2014.

For more discussion about PAL and GAL programming, links to programmer you-build-it designs and kits, check my GAL Web page.

## Alternatives to PAL chips

Some people object to using GAL's or PAL's (see the Programming notes above). Ok, look at what the GIDE *does* and build a circuit with TTL-class chips. Of course, others have built such circuits. One example is this IDE interface for a Z80 8-bit interface by "phil" at retroleum.co.uk. Note how it supports 16-bit IDE data, by using a Z80 address line to read a different I/O port for the other 8-bit byte. IDE drives built after a certain date or of a certain size, *don't support 8-bit data transfers*. I was referred to this site by Jim Skinner - thank you!

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# TCJ articles on GIDE

In Feb 2011 I made this partial list of The Computer Journal articles about the GIDE, as below. It's not complete as I and others discussed Tilmann's GIDE in the period of 1993 to 1996. - Herb Johnson.

issue 56 "connecting IDE drives to 8-bit systems" by Reh - ECB bus card
issue 63 "Connecting IDE Drives" part II by Reh
issue 64 "Connecting IDE Drives" part III by Reh
issue 66 "Connecting IDE Drives" by Reh
issue 70 Letter to Editor by John Baker on GIDE
issue 71 "Connecting IDE Drives" part IV by Reh - GIDE card
issue 73 "IDE part 6" by Reh - GIDE in prototype
issue 76 "Dr. S-100" by Johnson - GIDE in production $60 US
issue 77 "Gide news" by editor

issue 78 "The European Beat" GIDE and KC-85 by Jungkunz

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