HUNT ENGINEERING
Chestnut Court, Burton Row,
Brent Knoll, Somerset, TA9 4BP, UK
Tel: (+44) (0)1278 760188,
Fax: (+44) (0)1278 760199,
Email: sales@hunteng.demon.co.uk
URL: http://www.hunteng.co.uk

We are a committed member of the Texas Instruments 3rd party programme

For Sales and Support in North America Please Contact Our Strategic Partner:

Traquair Data Systems Inc, 114 Sheldon Road, Ithaca, NY 14850 USA

Tel 607 266 6000, Fax 607 266 8221

Email Traquair@traquair.com, URL http://www.traquair.com

For Sales and Support in Other Areas Please Contact Your Local Reseller.

HUNT ENGINEERING

HSB API Example

For RTOS-32

Document Rev A
API HSB Example Rev 1.0
J.Thie 20-04-01

COPYRIGHT

WARRANTIES LIABILITY and INDEMNITIES

HUNT ENGINEERING warrants the hardware to be free from defects in the material and workmanship for 12 months from the date of purchase. Product returned under the terms of the warranty must be returned carriage paid to the main offices of HUNT ENGINEERING situated at BRENT KNOLL Somerset UK, the product will be repaired or replaced at the discretion of HUNT ENGINEERING.

Exclusions - If HUNT ENGINEERING decides that there is any evidence of electrical or mechanical abuse to the hardware, then the customer shall have no recourse to HUNT ENGINEERING or its agents. In such circumstances HUNT ENGINEERING may at its discretion offer to repair the hardware and charge for that repair.

Limitations of Liability - HUNT ENGINEERING makes no warranty as to the fitness of the product for any particular purpose. In no event shall HUNT ENGINEERING'S liability related to the product exceed the purchase fee actually paid by you for the product. Neither HUNT ENGINEERING nor its suppliers shall in any event be liable for any indirect, consequential or financial damages caused by the delivery, use or performance of this product.

Because some states do not allow the exclusion or limitation of incidental or consequential damages or limitation on how long an implied warranty lasts, the above limitations may not apply to you.

TECHNICAL SUPPORT

Technical support for HUNT ENGINEERING products should first be obtained from the comprehensive Support section www.hunteng.co.uk/support/index.htm on the HUNT ENGINEERING web site. This includes FAQs, latest product, software and documentation updates etc. Or contact your local supplier - if you are unsure of details please refer to www.hunteng.co.uk for the list of current re-sellers.

HUNT ENGINEERING technical support can be contacted by emailing support@hunteng.demon.co.uk, calling the direct support telephone number +44 (0)1278 760775, or by calling the general number +44 (0)1278 760188 and choosing the technical support option.

The HSB example is an example program that shows how to use the HSB interface of a HERON carrier board. The example assumes you have loaded the DSP program onto the DSP module using Code Composer Studio, and will try to send and receive messages between the Host and the DSP module.

(This example will **not** work with TIM-40 carrier boards such as the HEPC2E, HEPC3, HEPC4 or HECPCI1. It will also **not** work with the HEPC6, a one 'C6x processor board.)

Compiling/Linking the Example

To compile and link the example, please use the 'makefile' that is present in this directory. This makefile is set-up to use a Microsoft 32-bit C/C++ compiler. You can only execute the makefile in a DOS-box prepared by On Time for any of the Microsoft C/C++ command line examples ('Visual C++ (Command Line) Demos'). Or, if you execute from a standard DOS-box, please execute the standard RTOS-32 'varsvc.bat' first.

To execute the 'makefile':

```
nmake  makefile
```

Running the example

To run the example, prepare a floppy disk and insert it into the 'a:' drive. Then type:

```
bootdisk host_hsb a:
```

This example assumes that you have booted the DSP with the 'heron_hsb.out' program. For example, this can be done with Code Composer Studio. Or by using the reads or writes example while slightly changing them to boot the 'heron_hsb.out' program.

After completion, remove the floppy disk and insert it into the target machine's floppy disk. Reboot. Following the instructions you should see messages being sent between the DSP and the Host.

The Makefile

What changes have been made to the original RTOS-32 example makefile? This section will explain what needs to be changed (or added) in a makefile to compile/link successfully the Hunt Engineering API programs

Include file

All Hunt Engineering API programs must include 'heapi.h'. This file is located in the Hunt Engineering API installation directory. The installation program will have created an environment variable 'HEAPI_DIR' that points to the installation directory. To have the makefile understand where 'heapi.h' lives, the following line must be in your makefile:

```
INCLUDE = $(RTTARGET)\include;$(HEAPI_DIR);$(INCLUDE)
```

The bold italic part is the part added by us.

Libraries

The Hunt Engineering API is delivered as a static library ('rtosdrv.lib'). It must be linked with RTTARGET-32, RTFILES-32 and RTKERNEL-32. In the lines following your '.exe' declaration 'rtosdrv.lib' must be linked in first, before all of the RTOS-32 libraries:

```
host_hsb.exe: ..\host_hsb.c Init.c
   cl /MT /Fm /Zi -D_RTOS32=1 –ohost_hsb.exe \
      ..\host_hsb.c \
      init.c \
      $(HEAPI_DIR)\rtosdrv.lib \
      rtk32.lib \
      drvrt32.lib \
      rtfiles.lib \
      rtfsrtt.lib \
      rtt32.lib \
      rttheap.lib \
      $(LNKOPT)
```

The bold italic part is the part added by us.

The necessary RTFILES-32 libraries are 'rtfiles.lib' and 'rtfsk32.lib'. Note that the latter is the RTKERNEL-32 version of the RTFILES-32 library.

The necessary RTKERNEL-32 libraries are 'rtk32.lib' (debug version) and 'drvrt32.lib', as the Hunt Engineering API uses multi-threading. (The HeRead and HeWrite will spawn separate threads to do the actual reading and writing. HeTestIo and HeWaitForIo 'test' the thread to see whether it has completed a transfer.)

The RTTARGET-32 library is 'rtt32.lib'. Library 'rttheap.lib' is optional. Please refer to the RTOS-32 manual (for example, ch.7 page 106 and 107).

Compile Parameters

The Hunt Engineering API supports several different types of Operating Systems. To select RTOS-32 support, you need to #define a variable '_RTOS32'. The easiest way to do this is in the makefile. Also, as the Hunt Engineering API is multi-threaded, you need to use the '/MT' option of the Microsoft C/C++ compiler.

```
host_hsb.exe: ..\host_hsb.c Init.c
   cl /MT /Fm /Zi -D_RTOS32=1 –ohost_hsb.exe \
      ..\host_hsb.c \
      init.c \
      $(HEAPI_DIR)\rtosdrv.lib \
      rtk32.lib \
      drvrt32.lib \
      rtfiles.lib \
      rtfsrtt.lib \
      rtt32.lib \
      rttheap.lib \
      $(LNKOPT)
```

Initialisation

A file 'init.c' is included in the project. This is a 'standard' file from On Time, which they use for projects that use RTFILES-32. I have simply copied it into the Hunt Engineering API examples the reads example uses file support. On Time's comment in 'init.c':

```
/* Some standard initializations for RTFiles-32 programs.

  This file is linked with most RTFiles-32 demo programs. It provides a
  convenient place to configure RTTarget-32 and RTFiles-32.
*/
```

The host_hsb.cfg configuration file

What changes have been made to the original RTOS-32 example configuration file? This section will explain what needs to be changed (or added) in a configuration file to compile and link successfully the Hunt Engineering API programs

Host_hsb.cfg: commandline

RTOS-32 programs have the possibility to carry a command line. This is done by specifying a command line in one of the configuration files (we just chose 'host_hsb.cfg'). As the 'host_hsb' example doesn't use command line parameters (it assumes the DSP program is loaded on the DSP), it doesn't really need a command line. A commandline definition is added anyway, easy to be used/extended later as necessary:

```
CommandLine "a:\host_hsb.exe"
```

The directory ('a:\') is significant. The 'host_hsb' program may search the command line, and will assume that argv[0] is the path that also contains any *.out.

Host_hsb.cfg: floppy access

To access files on a floppy disk, not only do you need to link with RTFILES-32 libraries, you also need to allocate a DMA buffer for the floppy driver in your configuration file. We added the following line to the 'host_hsb.cfg' configuration file:

```
Locate Nothing FloppyDMA HighMem 18k 32k ReadWrite
```

Please refer to the RTOS-32 manual (Part III, ch. 7, page 300) for more information.

1. Technical support for HUNT ENGINEERING products should first be obtained from the comprehensive Support section www.hunteng.co.uk/support/index.htm on the HUNT ENGINEERING web site. This includes FAQs, latest product, software and documentation updates etc. Or contact your local supplier - if you are unsure of details please refer to www.hunteng.co.uk for the list of current re-sellers.
2. HUNT ENGINEERING technical support can be contacted by emailing support@hunteng.demon.co.uk, calling the direct support telephone number +44 (0)1278 760775, or by calling the general number +44 (0)1278 760188 and choosing the technical support option.