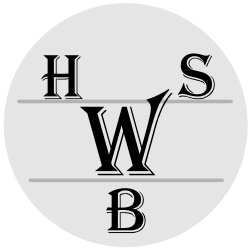
BALS HW & SW, Feldafing



SOFTWARE MANUAL

OAKEMUF

Revision 4.4
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031116	Add HAWK update info	WBA	
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040118	Adapt to HAWK 4.2 / MWOS16	WBA	
0402 15	Add IPV4 / IPV6 stuff	WBA	
050226	Review for multithreaded OS9	WBA	

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Preface and Warnings

Preface

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Scope of delivery

Content:

Description	Order No.	comments
OS-9000 V2.1 Prof. OS-9000 Board support package OAKEMUF	GER-99991-000	Only available with OAKEMUF HW
OS-9000 V2.2 Prof. OS-9000 Board support package OAKEMUF	GER-99992-000	Only available with OAKEMUF HW complete Hawk 2.4/ PPC 1.5

Options:

There are different OAKEMUF Board Versions available. They are reflected in different HW-Manuals and also in different directories in the OS-9000 ports.

Description	Order No.	Comments
OAKEMUF		Standard BSP for 4MB Versions new SMSC LAN-driver
555		Standard BSP for 4MB Version old SMSC LAN driver

Related products:

Description	Order No.	comments
Hardware and freeware OAKEMUF 4MB RAM, 4MB ROM	GER-99993-000	
Manual OAKEMUF	GER-99994-000	

Conventions

If not otherwise specified, addresses are written in hexadecimal notation and identified by a leading 0x .

Signal names preceded by a slash („/“) indicate that this signal is either active low or that this signals becomes active with the trailing edge.

General

Character	Description	Remarks
„b“	Bit	
„B“	Byte	
K	Kilo, means the factor 0x400 = 1024	
M	Mega, means the factor 0x100000 = 1048576	
MHz	1 000 000 Hertz	

Software-specific abbreviations:

Description	Description	Comments
<BS>	Back Space (0x8)	
<CAN>	Control-X (0x19)	
<Ctrl>	Control	
<CR>	Carriage Return (0xd)	
<ESC>	Escape Character (0x2b)	
<LF>	Line Feed (0xa)	
<SP>	Space (0x20)	
NMI	Non maskable interrupt	

How to use this manual

Documentation conventions:

Font	Description	Comments
"Courier New"	C-Sources or defines or assembler files	

Other Conventions

Basic features of OS-9 on MPC555 on OAKEMUF

1. Full implemented .h-structure of processor internals
2. Full implemented .h structure for all internal peripherals like Serial interface, RAM, FLASH, ADC, CAN, TPU, MIOS, SCI, SPI, ...
3. full support of internal serial peripherals for standard OS-9 interface (term)
4. complete OS-9000 modules for irq, vector, timer
5. Interrupt level assignment through “piclib” functions in OS9000
6. using internal decrementer for fast ticker
7. full support of mpc555 internal ram
8. init process initializing all internal features like chip select, bus interface
9. Coreboot-SW for booting without any additional software
10. Board support package fitting to standard PowerPC support package structure (Hawk 2.1 / PPC1.5) on OAKEMUF board from KANIS
11. HW recommendation list to fit to OS-9000 requirements (vectors in RAM, external RAM and ROM, …)
12. Full Multithread support with new OS-9 PPC 4.2 (new kernel and csl library)

The MPC555 is part of the PowerPC – device family with internal Flash. It also contains all automotive peripherals like Serial, CAN, Timer, …
Due to the fixed memory layout and the vector table requirements BALS HW & SW found a special solution for OS-9000.
The coreboot created by BALS HW & SW can boot directly without additional Software.
The SIU IRQ module supports all internal peripherals.
The HW recommendation list contains a description to connect external peripherals (f.e. ethernet controller) to use correct bus access and irq model.

Getting started

This manual contains information about the implementation dependant part of OS-9000-PPC/555 BALS Hardware & Software Systems on KANIS OAKEMUF.

We recommend that you are familiar with the following documentation:

- OAKEMUF HARDWARE Documentation
- OS-9000 User Manual
- OS-9000 PPC specific manual
- OS-9000 Network and Installation manual
- Using standard editor or HAWK for PowerPC
- EBDI-light / EBDS-Software or any other BDM tool
- BDM debug port for Motorola PowerPC on 56x

Preinstalled System

Normally customer orders a complete OAKEMUF system. This system comes up with a preinstalled OS-9000 on Onboard-Flash. You do not need to program the flash before starting.

If you want to use serial line, configure your terminal as follows:
- 9600 baud
- 1 start bit
- 8 data bits
- 1 stop bit
- no parity

After connecting power to the right connector (see HW-Manual) you should see a boot message from the OS-9 Boot loader and after entering a “shell”-prompt from OS-9000 on your terminal.

You can also use Ethernet interface, but watch out the correct IP-Address. (for changing IP-address you should read chapter [IP-Address] “install correct IP-Address” in installing OS-9000.

No Preinstalled System

To install OS-9000 on a new board, not preinstalled by BALS HARDWARE & SOFTWARE you should first bring the software into Onboard-Flash. Therefore you should use EBDI-lite BDM-interface and EBDS-SW (see description on EBDS-disk).

You should do the following steps:
- connect BDM-connector to you OAKEMUF board
- connect EBDI-lite interface with your PC (LPT-connector)
- start EBDS-SW (“ebds.exe”)
- configure EBDS to fit to your application (target 55x, LPT-port, …)
- start Macro OAKEMUF.do to initialize hardware
- use Macro intflash.do to program internal flash
- enter file name of OS-9000 boot image (standard file name is “intflash” from $MWOS\os9000\555\ports\OBK4MBMT\boots\install\portboot-directory
- use Macro extflash.do to program external flash
- enter file name of OS-9000 boot image (standard file name is “rom” from $MWOS\os9000\555\ports\OBK4MBMT\boots\install\portboot-directory) for 555 board version
- disconnect bdm and ebdi lite, restart the system
- connect terminal (OS-9000 should be complete installed now)

Installing OAKEMUF BSP

Preparation

Before you install OAKEMUF BSP you must install a standard HAWK for PowerPC CD from Microware/Radisys.

Install

OAKEMUF-BSP contains all board related files and tools and also all enhancements to use 555-specific Software on your HAWK system.
If you are ready with HAWK-installation, just copy the complete OAKEMUF-BSP-CD from your CD-ROM-drive to your hard disk. Watch out base directory!

Attention: All files copied from a CD-ROM are read only! So we recommend to copy the files first to a temporary location and to setup the files to read/write.

Help files

On the OAKEMUF-BSP-CD are also help files, which includes full Radisys documentation for HAWK and C-Compiler use. These files can be found in the $MWOS\DOS\BIN directory.

Installing EBDS / BDM-SW

To program onboard-flash and to debug your hardware/software you can also order a BDM-interface and the related software EBDS from MOT-CONSULTING.
You should install this software to your harddisk. We recommend, using this software in a DOS-box of Windows95/98. Under W2000/XP-Workstation EBDS, a special NT-Version is required.
Read the help file for Ebds before use and watch out of hardware-connections with the ebdi-lite interface.

Installing OS-9000 V4.2/MWOS_V1_6

This chapter contains installation instruction for new OS-9000 on OAKEMUF. OS-9000 always contains two parts of software, the coreboot-part and the OS-9000-part.

The coreboot-part is located in:
§MWOS\OS9000\555\Ports\OBK4MBMT\BOOTS\INSTALL\PORTBOOT directory.
The name of the file is “coreboot”

The OS-9000 part is splitted in two parts and located in:
§MWOS\OS9000\555\Ports\OBK4MBMT\BOOTS\INSTALL\PORTBOOT directory.
The name of the system file is rom, the name of the second part is intflash

The final name depends on the processor-derive used on the OAKEMUF.

Generating new ROM bootfile

See Microware/Radisys Wizzard description on page 14.

Prepare Hardware for OS-9

To run OS-9 you have to use the correct “Reset-Status-Word”.

The complete value is: 0x40000008
The bits in this register are

Installing OS-9000 by BDM / EBDS

The installation process is done by EBDS-SW using BDM-interface of 555-processors. The board-support-package is supplied with EBDS-SW and EBDI-lite BDM-interface.

To run EBDS compliant to OAKEMUF, you need 3 support files. All of these files are text-files and simply contain commands for EBDS command line interpreter. The three files are:

File name	Content	Comment
555_ini.DO	Initialisation	Init OAKEMUF to run ; after OAKEMUF.do you only need to enter “go”
555ext.do	Program external FLASHROM	Bootrom… ; calls flash555.d5x
555int.do	Program internal flash of MPC555	Option to put high speed applications and OS-9 parts into internal flash
xxxxxx.do	Program reset status word	

To install a complete new board you should do the following steps:
- connect BDM-connector to you OAKEMUF board
- connect EBDI-lite interface with your PC (LPT-connector)
- start EBDS-SW (“ebds.exe”)
- configure EBDS to fit to your application (target 55x, LPT-port, …)
- start Macro OAKEMUF.do to initialize hardware
- use Macro intflash.do to program internal flash
- enter file name of OS-9000 boot image (standard file name is “intflash” from $MWOS\os9000\555\ports\OBK4MBMT\boots\install\portboot-directory
- use Macro extflash.do to program external flash
- enter file name of OS-9000 boot image (standard file name is “rom” from $MWOS\os9000\555\ports\OBK4MBMT\boots\install\portboot-directory) for 555 board version
- disconnect bdm and ebdi lite, restart the system
- connect terminal (OS-9000 should be complete installed now)

Attention:
With EBDS there is no way to program only part of the external flash.
With the current EBDS macros the rom-image must be less than 1 Mbyte.
To install additional Modules in the external flash use the macro for 2ndmeg

Floating point support:

OS-9000 support floating point in all tasks.
Be careful with floating point in IRQ-service-routines; OS-9000 on OAKEMUF do not support floating-point in IRQ-service-routines in this version.

Microware/Radisys HAWK

HAWK

We recommend using the updated HAKW environment supported with this BSP in the directory $MWOS\DOS\BIN.
There are two versions:

- HAWK 2.4-20; this is a simple update for the HAWK running with OAKEMUF without other changes in the target

Microware/Radisys WIZZARD

Wizzard configuration file

The Microware/Radisys Wizzard is controlled by many configuration file.
On the SOURCE-CD there are two important locations with files:

Filename	Directory	Remark
Os9p.ini	$MWOS\DOS\BIN	Controlls basic features of OS-9000 wizzard, contains entries for last opened files; In this example, the file shows OAKEMUF directory
555emuf.ini	$MWOS\OS9000\555\PORTS\ OAKEMUF\BOOST\INSTALL\OBK4MBMT	Basic features for this board are fixed in this file

IPV4 / IPV6 differences

HAWK 4.2 support now PIV6. The current installation uses IPv4. Please read HAWK technical manual to modify the merge-lists and you can generate easily a new group of files with IPV6-features.

Generating new ROM bootfiles

To generate the complete ROM you must start Microware/Radisys mwWizzard:

- in the wizzard you will see OAKEMUF entries (do not forget to copy os9p.ini-file from BSP-CD to your $MWOS\DOS\BIN-directory
- to generate the second part call simple batch job in the PORTBOOT directory 2ndmeg.bat
- to generate the third part (MPC555 internal Flash) call simple batch job flash555.bat

Bootlists

The Bootlist, which contains all selected modules is located in $MWOS\OS9000\555\PORTS\OBK4MBMT\BOOTS directory and is managed by Microware/Radisys Wizzard.

The standard Bootlists contains all files for OS-9 in external flash.
On MPC555 there is also an internal flash, which can be used for high speed applications. User can also put some OS-9 modules in it.
The Bootlists contains all modules related to this part of merging files; Bootlists uses file-extension .ml.

For detailed information please look in Appendix.

Size restriction

Attention: With standard OAKEMUF, the complete system “rom” must not be greater than 1015808 bytes = 0xf8000. The size is fixed in the oak2mb.ini file, so mwWizzard will not accept generating larger bootrom file!

The size of the 2ndmeg.rom is currently also restricted to 1 Megabyte.

Memory Layout on OAKEMUF

OAKEMUF is available with different RAM and ROM sizes. User can define these areas by config.des and romcnfg.h files. Normally no changes are required.

Additional memory accesses are driven by additional CS-pins of MPC555. On OAKEMUF CS are connected to the ACTEL FPGA, which is used for accessing SMC Ethernet controller and additional external devices. All these devices can only be accessed by 16bit transfer! For correct use, 128MB space must be available for every sub-CS on this interface.

All MPC555-CS-features are programmed in sysinit.c file in the ROMCORE directory. These features are activated during Rom boot phase of OS9000. User should be careful when changing CS-features in a system level task while OS9000 is running.

Memory configuration with MemList:

The RAM-memory size is set to 4MB per default in the systype.des-file located in $MWOS\OS9000\555\Ports\OBK4MBMT directory. Changing memory size will need a new init-module after changing entries in systype.des:

The entry memlist[0] contains definition of an additional memory space for download / reboot use.

The entry memlist[1] contains definition of part of internal SRAM of MPC555; the other part can be used outside of OS-9000.

The entry memlist[2] contains the start and end address of external memory. The user can generate a new init-module by calling the appropriate makefile in the $MWOS\OS9000\555\Ports\OBK4MBMT\init directory. For further details of INIT module refer to the OS-9000-technical manual.

Example of default.des entries

```
/* external ram for os use */
init memlist[0] {                   /*  Initialize memory list element          */
       type = MEM_SYS;                     /*  memory type code                    */
       prior = 200;                 /*  memory allocation priority              */
       access = B_USERRAM;          /*  access permissions                      */
       blksiz = 0x400;                     /*  search block size                   */
       lolim = 0x0;                 /*  beginning absolute address              */
       hilim = 0x001e0000;          /*  ending absolute address + 1 2MB Version */
       hilim = 0x002e0000;          /*  ending absolute address + 1 4MB Version */[1]
};

/* problem: cannnot use IMMRBASE here !!! */
/* IMMRBASE = 0x100 0000 */

/* internal ram */
init memlist[1] {                   /*  Initialize memory list element          */
       type = MEM_SYS;              /*  memory type code                        */
       prior = 220;                 /*  memory allocation priority              */
       access = B_USERRAM;          /*  access permissions                      */
       blksiz = 0x400;              /*  search block size                       */
       lolim = 0x13fc000;           /*  beginning absolute address          */
       hilim = 0x1400000;           /*  ending absolute address + 1         */
};

/* internal flash */
init memlist[2] {                   /*  Initialize memory list element          */
       type = MEM_SYS;              /*  memory type code                        */
       prior = 0x0;                 /*  memory allocation priority              */
       access = B_ROM;              /*  access permissions                      */
       blksiz = 0x800;              /*  search block size                       */
       lolim = 0x01000000;          /*  beginning absolute address without rombug */
       hilim = 0x01070000;          /*  ending absolute address + 1   */
};

/* external ram for download use */
init memlist[3] {                   /*  Initialize memory list element          */
       type = MEM_SYS;              /*  memory type code                        */
       prior = 0x0;                 /*  memory allocation priority              */
       access = B_ROM;              /*  access permissions                      */
       blksiz = 0x800;              /*  search block size                       */
       lolim = 0x01e0000;           /*  beginning absolute address              */
       lolim = 0x01e0000;           /*  beginning absolute address 4MB Version  */
       hilim = 0x01fff00;           /*  ending absolute address + 1             */
       hilim = 0x01fff00;           /*  ending absolute address + 1 4MB Version */
};

/* external rom */
init memlist[4] {                   /*  Initialize memory list element          */
       type = MEM_SYS;              /*  memory type code                        */
       prior = 0x0;                 /*  memory allocation priority              */
       access = B_ROM;              /*  access permissions                      */
       blksiz = 0x800;              /*  search block size                       */
       lolim = 0xffe00000;          /*  beginning absolute address              */
       hilim = 0xfffff000;          /*  ending absolute address + 1             */
};
/* end of list */
init memlist[5] {                   /*  Initialize memory list element          */
       type = 0;                    /*  memory type code                        */
       prior = 0x0;                 /*  memory allocation priority              */
       access = 0;                  /*  access permissions                      */
       blksiz = 0x0;                /*  search block size                       */
       lolim = 0x0;                 /*  beginning absolute address              */
       hilim = 0x0;                 /*  ending absolute address + 1             */
};
```

[1] Blue lines are for 4MB version

Piclib function

The piclib functions allows simple use of interrupts by generating OS-9 descriptors.

The MPC555 piclib supports 8 internal (software) interrupts, generated by SIU and 8 external (hardware) interrupts, generated by external lines on MPC555 and also transferred by SIU to MPC555 core.

The vector numbers supported by MPC555 piclib are in the range of 0x40 up to 0x58.
Vector numbers from 0x40 to 0x48 are software level interrupts and vector numbers from 0x50 to 0x58 are hardware level interrupts.

Piclib functions will enable and disable mask bits in SIU of MPC555.

Drivers and Descriptors

This chapter describes the available drivers and descriptors for clock, SCF and ISP-devices. All these modules are in the $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS-directory.

Clock-Module

OS-9 ticker

For time slicing, OS-9000 needs a real-time clock that periodically interrupts the CPU and an appropriate driver module to handle the interrupt. For the 555-port the standard decrement timer is used. The related files are:

- tk555
  OS-9000 clock driver module
  directory: $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS
- tk555.c
  Source
  directory: $MWOS\OS9000\sysmods\ticker
- makefile
  directory: $MWOS\OS9000\555\Ports\OBK4MBMT\CLOCK
  makefile to produce new ticker

We recommend, to rename ticker source to for example. tk5555v1.c and to produce your own ticker for your purpose.

Realtime clock

The realtime clock on OAKEMUF is driven by OS-9 task.
We recommend to start this task in sysgo-module at startup and to read time/date in this task to setup OS-9 time base.

SCF Drivers and Descriptors

For standard serial I/O the serial interface MPC555 QSM_A module is used. The related files are:

- sc555
  OS-9000 scf driver for serial interface related to motorola QSM interface
- directory: $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS
- term
  OS-9000 scf descriptor, avalable as term and t1 descriptor
  directory: $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS\DESC\SC555

Baudrate is configured by descriptior.

QSM Channel B is also available for standard use in OS-9.
The related files are:

- sc555b
  OS-9000 scf driver for serial interface related to motorola QSM interface
- directory: $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS
- term
  OS-9000 scf descriptor, avalable as term and t1 descriptor
  directory: $MWOS\OS9000\555\PORTS\OBK4MBMT\CMDS\BOOTOBJS\DESC\SC555B

User can define OS-9 standard terminal interface by selecting the desired interface in Wizzard.

SPF Drivers and Descriptors

For all drivers and descriptor around isp there is a central makefile in the directory directory:
$MWOS\OS9000\555\PORTS\xxxxxx\SPF

Descriptor

- spsmc0
  descriptor for twisted pair / utp interface

Driver

- smc91c111

The SMC-driver is delivered as a complete OS-9-modul. All changes needed by customer are made by descriptor.

IP-Address

The IP-Address can be changed by Micoware mwWizzard tool.
The MAC-Address can also be changed by using Micorware mwWizzard tool. On the OAKEMUF it is normally fixed and must be changed by recompiling SPF descriptor/inet data modules. Future releases will support changing IP-Address and MAC-Address by using EBDS debug tool..

For all other information's look in OS-9000 manual "installation and networking".

IP-Config

From shell, user can change ip-address by using "ifconfig"-tool.

Example:
`"ifconfig enet0 192.168.2.1"`
will assign new ip-address 192.168.2.1 to the OAKEMUF.

Features and Enhancements

Tools:

Enhanced software packages are available for EBDS to program internal flash of mpc555.

BALS HARDWARE and SOFTWARE also offers source code for OS-9 to program internal flash, TOUCAN module, TPU, QUADC or QSPI.

Installation

The installation of the OAKEMUF is very easy. The power supply must meet the specification described in the chapter „General description, power supply“.

The serial RS232 interface can be used to connect a serial terminal or a standard serial interface from PC. The standard SW on board configures this interface with:
- 9600 baud
- no parity check
- eight data bits
- one stop bit

These specifications can only be changed by software.

For the pin-assignment of the RS232 connector see chapter „connectors, serial“ .

If the board is supplied with OS-9®, then the twisted-pair interface can also be connected and used for communication. Communication parameters on tcp/ip can only be changed by software.

Appendix

General source file list

All Source files are fully tested on MPC555 Version G up to Version L
Not all of these source files are included in standard Board support package (BSP). For all source files, portpack license is required.

Include files

All include files are tested and support access of internal registers and bits of these registers.

File name	Directory	Specification	Comment
Siu555.h	$MWOS\OS9000\555\DEFS	Includes for MPC555 internal SIU	
Reg555.h	$MWOS\OS9000\555\DEFS	MPC555 internal register definitions	Like reg505.h
Uimb.h	$MWOS\OS9000\555\DEFS	Includes for MPC555 internal U2IMB interface	Required for irqs and speed control
Sram555.h	$MWOS\OS9000\555\DEFS	Includes for MPC555 internal SRAM	Required for access control and internal definitions
QSMCM.h	$MWOS\OS9000\555\DEFS	Includes for MPC555 internal serial interface	

C-source files

§MWOS\SRC\DPIO

File name	Directory	Specification	Comment
Chip.c	$MWOS\SRC\ DPIO\SPF\DRVR\ SP91C94	SMC91C94 driver	Adapted from Microware source to MPC555 special bus access
Smc91c94.h	$MWOS\OS9000\SSRC\ DPIO\SPF\DRVR\ SP91C94	SMC91C94 driver	Adapted from Microware source to MPC555 special bus access

§MWOS\SRC\IO

File name	Directory	Specification	Comment
Mpc55pic.c	$MWOS\SRC\ IO\PICLIB	Enable / disable SIU interrupts	New piclib functions for MPC555

§MWOS\SRC\ROM

File name	Directory	Specification	Comment
Iosci55a.c	$MWOS\SRC\ ROM\SERIAL\SCI555	Low level driver for serial interface in MPC555 internal QSM module	
Iosci55a.h	$MWOS\OS9000\SRC\ ROM\SERIAL\SCI555	Include file for low level driver for serial interface in MPC555 internal QSM module	

§MWOS\OS9000\SRC\SYSMODS

File name	Directory	Specification	Comment
Tk555.c	$MWOS\OS9000\SRC\ SYSMODS\TICKER	MPC555 decrementer ticker routine	Adapted to new base adresses and SIU interface from 50x
SIU5IRQ.c	$MWOS\OS9000\SRC\ SYSMODS\IRQS	MPC555 SIU interrupt decoder	

§MWOS\OS9000\PPC\SRC\IO\SCF\DRVR

File name	Directory	Specification	Comment
STATUS.C TERM.C UTIL.C WRITE.C CONFIG.C DEFSFILE DRVMAIN.C INIT.C IRQ.C READ.C SC555.DES SC555.H	$MWOS\OS9000\PPC\SRC\ IO\SCF\DRVR\SC555	MPC555 serial interface driver for internal QSM module channel A	
STATUS.C TERM.C UTIL.C WRITE.C CONFIG.C DEFSFILE DRVMAIN.C INIT.C IRQ.C READ.C SC555.DES SC555.H SC555B.H	$MWOS\OS9000\PPC\SRC\ IO\SCF\DRVR\SC555B	MPC555 serial interface driver for internal QSM module channel B	

Ports file list

All the ports source files are fully tested on OAKEMUF from KANIS with HAWK 2.0 / PPC1.4
The subdirectory structure is fully compliant with other BSP directories. Files not mentioned here are not modified in compare to other ports-directories.

General files

File name	Directory	Specification	Comment
Systype.h	$MWOS\OS9000\555\ PORTS\OBK4MBMT	OAKEMUF definitions	
Config.h	$MWOS\OS9000\555\ PORTS\OBK4MBMT	OAKEMUF definitions	
Systype.des	$MWOS\OS9000\555\ PORTS\OBK4MBMT	OAKEMUF definitions	

Wizzard files

File name	Directory	Specification	Comment
Boot.ml	$MWOS\OS9000\555\ PORTS\OBK4MBMT\ boots\install\portboot	OAKEMUF wizzard mergelist file	Modified for special 2 flash regions
Core.ml	$MWOS\OS9000\555\ PORTS\OBK4MBMT\ boots\install\portboot	OAKEMUF wizzard mergelist file	Modified for special 2 flash regions
2ndmeg.ml 2ndmeg.bat	$MWOS\OS9000\555\ PORTS\OBK4MBMT\ boots\install\portboot	OAKEMUF mergelist file	Spezial batch file and merge list for 2nd flash region
Os9p.ini	$MWOS\DOS\BIN	Wizzard ini file	New for OAKEMUF
OAKEMUF.ini	$MWOS\OS9000\555\ PORTS\OBK4MBMT\ boots\install\OBK4MBMT	Wizzard ini file	
Spf*	$MWOS\OS9000\555\ PORTS\OBK4MBMT\ boots\install\spf	Wizzard spf files	

Sysmods

File name	Directory	Specification	Comment
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SYSMODS\ticker	Makefile for MPC555 ticker	
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SYSMODS\irqs	Makefile for MPC555 siu5irq	See siu5irq.c

SCF

File name	Directory	Specification	Comment
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SCF	Makefile for MPC555 serial drivers and descriptors	
Default.des	$MWOS\OS9000\555\PORTS\OBK4MBMT\SCF	Descriptor for MPC555 serial drivers and descriptors	
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SCF\SC555	Makefile for MPC555 serial high level driver and descriptors	QSM channel A
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SCF\SC555B	Makefile for MPC555 serial high level driver and descriptors	QSM channel B
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\SCF\SCLLIO	Makefile for MPC555 serial low level driver and descriptors	

ROM\ROMCORE

File name	Directory	Specification	Comment
Makefile sysinit.c	$MWOS\OS9000\555\PORTS\OBK4MBMT\ROM\ROMCORE	Makefile and sources for romcore part	Special solution for booting directly with MPC555; activating chipselects etc..
Rom_cnfg.h	$MWOS\OS9000\555\PORTS\OBK4MBMT\ROM\ROMCORE	Include file with address definitions	Set up for all memory areas due to kernel problem with different memory area definitions

PICLIB

File name	Directory	Specification	Comment
Makefile	$MWOS\OS9000\555\PORTS\OBK4MBMT\PICLIB	Makefile for MPC555 piclib files	See mpc55pic.c
Config.h	$MWOS\OS9000\555\PORTS\OBK4MBMT\PICLIB	Include file for MPC555 piclib files	See mpc55pic.c

INIT

File name	Directory	Specification	Comment
Default.des	$MWOS\OS9000\555\PORTS\OBK4MBMT\INIT	Descriptor file for init modules	Special solution due to kernel problem with different memory area definitions

Mergefiles for Microware/Radisys wizzard

Mergefiles for OS-9 in external flash only

2ndmeg.ml

```
../../../../../../PPC/CMDS/mbdump
*
* [PKMAN]
*
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pkman
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pkdvr
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pk
*
../../../../../../PPC/CMDS/arp
*
../../../../../../PPC/CMDS/bootptest
*
../../../../../../PPC/CMDS/dhcp
*
../../../../../../PPC/CMDS/ftp
../../../../../../PPC/CMDS/ftpd
../../../../../../PPC/CMDS/ftpdc
*
../../../../../../PPC/CMDS/hostname
*
../../../../../../PPC/CMDS/idbdump
*
../../../../../../PPC/CMDS/idbgen
*
../../../../../../PPC/CMDS/inetd
*
../../../../../../PPC/CMDS/ndbmod
*
../../../../../../PPC/CMDS/route
*
../../../../../../PPC/CMDS/routed
*
../../../../../../PPC/CMDS/telnet
../../../../../../PPC/CMDS/telnetd
../../../../../../PPC/CMDS/telnetdc
*
../../../../../../PPC/CMDS/ping
../../../../../../PPC/CMDS/login
*
../../../../../../PPC/CMDS/spfndpd
../../../../../../PPC/CMDS/spfndpdc
../../../../../../PPC/CMDS/ndpio
```

bootfile.ml

```
********************************************************************************
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*  reproduce this copyright notice exactly as provided herein on any copies    *
*  of the software that Licensee is authorized to distribute.                  *
*                                                                              *
********************************************************************************
*                                                                              *
* Edition History:                                                             *
* #   Date     Comments                                                  By    *
* --- -------- --------------------------------------------------------- ----- *
*  01 98/07/14 Added edition history.                                    gdb   *
*  02 98/07/15 Corrected rb1003 descriptors.                             gdb   *
*  03 98/08/14 Added MVME2300/2600/3600/MTX support.                           *
*              Added SC8042k mouse keyboard support.                     GbG   *
*  04 98/08/17 Removed rb1003.stb.                                       GbG   *
*  05 98/08/17 Changed sc8042m options. Added tape utilities.            GbG   *
*             ---- OS-9000 MOTRAVEN Sub-component v1.0 Released ----            *
*  06 98/12/02 Added Profiler daemons to SPFNDPD section.                ajk   *
*            $$                      <RELEASE_INFO>                      $$    *
********************************************************************************
** Bootlist for the OAKEMUF Board
**
** Pathlists are relative to the:
** MWOS/OS9000/555/PORTS/OBK4MBMT/BOOTS/INSTALL/PORTBOOT directory
*
* OS-9000 [KERNEL]
*
../../../../../../PPC/CMDS/BOOTOBJS/kernel.fph
*
* [INIT] Modules
*
*       configurer - created by configurer program
*nodisk - no default device ( optional )
*dd - default device is /dd ( optional )
*        vcons - no default device, vcons is the system console ( optional )
*
*
../../../CMDS/BOOTOBJS/INITS/configurer
*
* [INIT_NODISK]
*
*../../../CMDS/BOOTOBJS/INITS/nodisk
*
* [INIT_DD]
*
*../../../CMDS/BOOTOBJS/INITS/dd
*
* [INIT_VCONS]
*
*../../../CMDS/BOOTOBJS/INITS/vcons
*
* [EXCEPTION] Vector Module for PPC50x/PPC55x
*
../../../../../../PPC/CMDS/BOOTOBJS/vect505
*
* [PIC] Handling module for 555 based boards
*
../../../CMDS/BOOTOBJS/picsub
*
* System clock module:
*
```

```
* tk555 or 555 - Ticker                    driver
*
* [TICKER && OPTION11]
*
../../../CMDS/BOOTOBJS/tk555
*
* Real Time Clock
*
* [CLOCK]
*
*../../../CMDS/BOOTOBJS/rtc48t18
*
* Pre I/O modules
*
* abort - Abort switch handler
* ravenirq - PIC handler for the Raven MPIC
* universeirq - PIC handler for the Tundra Universe
* picirq - PIC handler for the 8259
* hlproto - Protoman interface trap module for user-state connections
*
* [OPTION8]
*
../../../CMDS/BOOTOBJS/abort
*
* [PRE-IO]
*
../../../CMDS/BOOTOBJS/siu5irq
*
* [HLPROTO]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/hlproto
*
* [IOMAN]
*
../../../../../../PPC/CMDS/BOOTOBJS/ioman
*
* System [CUSTOMIZATION] modules:
*
* cache750 - MVME2700/MCP750 cache control module (instruction and data cache)
* ssm604 -  MVME2700/MCP750/MVME2304/MVME2604/MVME3604/MTX604 system security
module
*
* [OPTION10]
* no cache on mpc555
*./../../../../../PPC/CMDS/BOOTOBJS/cache555
*
* [PIPE] Descriptor
*
* pipeman - file manager
* pipe - pipe descriptor
*
../../../../../../PPC/CMDS/BOOTOBJS/pipeman
../../../CMDS/BOOTOBJS/DESC/pipe
*
* [SCF] Subsystem Modules:
*
* scf - file manager
* null - device driver
* nil - device descriptor
*
../../../../../../PPC/CMDS/BOOTOBJS/scf
../../../../../../PPC/CMDS/BOOTOBJS/null
../../../../../../PPC/CMDS/BOOTOBJS/nil
*
* [SERIAL] Ports
*
* sc555 - sc555 driver
* t1 - term device descriptor for com1
*
* [OPTION1 || TERM1]
*
../../../CMDS/BOOTOBJS/sc555
* [OPTION1]
../../../CMDS/BOOTOBJS/DESC/SC555/t1
*
* [TERM1]
*
```

../../../CMDS/BOOTOBJS/DESC/SC555/term_t1

```
*
*
* [RBF] Subsystem Modules:
*
* rbf - file manager
*
../../../../../../PPC/CMDS/BOOTOBJS/rbf
*
* ram - RAM disk driver
* r0 - device descriptor for default RAM disk
* r0.dd - default RAM disk descriptor as default device (/dd)
*
* [RAM]
*
../../../../../../PPC/CMDS/BOOTOBJS/ram
*
* [R0]
*
../../../CMDS/BOOTOBJS/DESC/RAM/r0
*
* [R0.DD]
*
../../../CMDS/BOOTOBJS/DESC/RAM/r0.dd
*
* [SHELL]
*
../../../../../../PPC/CMDS/shell
*
*
* [MSHELL]
*
../../../../../../PPC/CMDS/mshell
*
* C Shard Library (CSL) Module
*
* [CSL]
*
../../../../../../PPC/CMDS/csl
*
* System-state debugging modules
*
* [SNDP]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/sndp
*
* [ROMBUG]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/RomBug
*
* User-state remote debugging modules
*
* [UNDPD]
*
* low-level
*
../../../../../../PPC/CMDS/undpd
../../../../../../PPC/CMDS/undpdc
*
* User-state remote debugging modules for use with SPF
*
* Start it with spfndpd<>>>/nil&
*
* [SPFNDPD]
*
../../../../../../PPC/CMDS/spfndpd
../../../../../../PPC/CMDS/spfndpdc
../../../../../../PPC/CMDS/ndpio
* The profiler daemons (start with spfnppd<>>>/nil&)
* [OPTION15]
../../../../../../PPC/CMDS/spfnppd
../../../../../../PPC/CMDS/spfnppdc
* The hawkeye daemons (start with p2init slm; router<>>>/nil &)
* [OPTION16]
../../../../../../PPC/CMDS/slmPPC
../../../../../../PPC/CMDS/cmdd
../../../../../../PPC/CMDS/loggerd
```

```
../../../../../../PPC/CMDS/router
*
* Utilities we must include
* NFS mount and disk support will not
* function without alias.
*
* [MUST_HAVE]
*
../../../../../../PPC/CMDS/alias
../../../../../../PPC/CMDS/iniz
../../../../../../PPC/CMDS/pd
../../../../../../PPC/CMDS/sleep
../../../../../../PPC/CMDS/echo
*
* Special Disk Utility Set
*
* [DISK_UTILITY]
*
*../../../../../../PPC/CMDS/attr
*../../../../../../PPC/CMDS/del
*../../../../../../PPC/CMDS/deldir
*../../../../../../PPC/CMDS/fdisk
*../../../../../../PPC/CMDS/format
../../../../../../PPC/CMDS/dir
*../../../../../../PPC/CMDS/dsave
*../../../../../../PPC/CMDS/save
../../../../../../PPC/CMDS/list
../../../../../../PPC/CMDS/makdir
../../../../../../PPC/CMDS/pd
../../../../../../PPC/CMDS/free
../../../../../../PPC/CMDS/load
../../../../../../PPC/CMDS/copy
*../../../../../../PPC/CMDS/build
*../../../../../../PPC/CMDS/bootgen
*
*
* [OPTION6]
*
*../../../CMDS/pciv
*../../../CMDS/setpci
*../../../CMDS/dmppci
*
* [OPTION13]
*
*../../../CMDS/testpci
*../../../CMDS/mouse
*
*
* End of bootlist
*
```

Mergefiles for OS-9 in inernal and external flash

This is an example, to merge the required files into external and internal flash files
There are 3 mergelists:

- flash555.ml for internal flash in MPC555
- 2ndmeg.ml for 1st Megabyte of external flash
- bootfile.ml for last Megabyte of external flash

Flash555.ml

The files are removed from the standard mergelists bootfile.ml and spf.ml.

```
*** flash555.ml for OAKEMUF with 4MB RAM and 2 MB flash
*** W.Bals, 00 1110
*** ------------------------------------------------
* from bootfile.ml
../../../../../../PPC/CMDS/BOOTOBJS/kernel.fph
*
../../../../../../PPC/CMDS/BOOTOBJS/vect505
*
../../../CMDS/BOOTOBJS/picsub
*
../../../CMDS/BOOTOBJS/tk555
*
../../../CMDS/BOOTOBJS/siu5irq
*
../../../../../../PPC/CMDS/csl
*
* from spf.ml
../../../../../../PPC/CMDS/BOOTOBJS/SPF/spf
../../../../../../PPC/CMDS/BOOTOBJS/SPF/sptcp
../../../../../../PPC/CMDS/BOOTOBJS/SPF/spudp
../../../../../../PPC/CMDS/BOOTOBJS/SPF/spenet
../../../../../../PPC/CMDS/BOOTOBJS/SPF/spip
* [ETHERNET_CONTROLLER_0]
../../../CMDS/BOOTOBJS/SPF/sp91c94
../../../CMDS/BOOTOBJS/SPF/spsmc0
* following files previously in 2nd flash mergelist
../../../../../../PPC/CMDS/mbdump
*
* [PKMAN]
*
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pkman
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pkdvr
../../../../../../PPC/CMDS/BOOTOBJS/SPF/pk
*
../../../../../../PPC/CMDS/arp
*
../../../../../../PPC/CMDS/bootptest
*
../../../../../../PPC/CMDS/dhcp
*
../../../../../../PPC/CMDS/ftp
../../../../../../PPC/CMDS/ftpd
../../../../../../PPC/CMDS/ftpdc
*
../../../../../../PPC/CMDS/hostname
*
../../../../../../PPC/CMDS/idbdump
```

```
*
                                        ../../../../../../PPC/CMDS/idbgen
*
../../../../../../PPC/CMDS/inetd
*
../../../../../../PPC/CMDS/ndbmod
*
../../../../../../PPC/CMDS/route
*
../../../../../../PPC/CMDS/routed
*
../../../../../../PPC/CMDS/telnet
../../../../../../PPC/CMDS/telnetd
../../../../../../PPC/CMDS/telnetdc
*
../../../../../../PPC/CMDS/ping
../../../../../../PPC/CMDS/login
*
../../../../../../PPC/CMDS/spfndpd
../../../../../../PPC/CMDS/spfndpdc
../../../../../../PPC/CMDS/ndpio
```

bootfile.ml

```
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*  reproduce this copyright notice exactly as provided herein on any copies    *
*  of the software that Licensee is authorized to distribute.                  *
*                                                                              *
********************************************************************************
*                                                                              *
* Edition History:                                                             *
* #   Date     Comments                                                  By    *
* --- -------- --------------------------------------------------------- ----- *
*  01 98/07/14 Added edition history.                                    gdb   *
*  02 98/07/15 Corrected rb1003 descriptors.                             gdb   *
*  03 98/08/14 Added MVME2300/2600/3600/MTX support.                           *
*              Added SC8042k mouse keyboard support.                     GbG   *
*  04 98/08/17 Removed rb1003.stb.                                       GbG   *
*  05 98/08/17 Changed sc8042m options. Added tape utilities.            GbG   *
*             ---- OS-9000 MOTRAVEN Sub-component v1.0 Released ----            *
*  06 98/12/02 Added Profiler daemons to SPFNDPD section.                ajk   *
*            $$                    <RELEASE_INFO>                        $$    *
*  07 00/11/10 remove some files fro flash555.ml                         WB    *
********************************************************************************
** Bootlist for the OAKEMUF Board
**
** Pathlists are relative to the:
** MWOS/OS9000/555/PORTS/OBK4MBMT/BOOTS/INSTALL/PORTBOOT directory
*
* OS-9000 [KERNEL]
*
* removed, now in 555flash.ml
*../../../../../../PPC/CMDS/BOOTOBJS/kernel.fph
*
* [INIT] Modules
*
*       configurer - created by configurer program
* nodisk - no default device ( optional )
* dd - default device is /dd ( optional )
*        vcons - no default device, vcons is the system console ( optional )
*
*
../../../CMDS/BOOTOBJS/INITS/configurer
*
* [INIT_NODISK]
*
*../../../CMDS/BOOTOBJS/INITS/nodisk
*
* [INIT_DD]
*
*../../../CMDS/BOOTOBJS/INITS/dd
*
* [INIT_VCONS]
*
*../../../CMDS/BOOTOBJS/INITS/vcons
*
* [EXCEPTION] Vector Module for PPC50x/PPC55x
*
* removed, now in 555flash.ml
*../../../../../../PPC/CMDS/BOOTOBJS/vect505
*
* [PIC] Handling module for 555 based boards
*
* removed, now in 555flash.ml
*../../../CMDS/BOOTOBJS/picsub
```

```
*
* System clock module:
*
* tk555 or 555 - Ticker driver
*
* [TICKER && OPTION11]
*
* removed, now in 555flash.ml
*../../../CMDS/BOOTOBJS/tk555
*
* Real Time Clock
*
* [CLOCK]
*
*../../../CMDS/BOOTOBJS/rtc48t18
*
* Pre I/O modules
*
* abort - Abort switch handler
* ravenirq - PIC handler for the Raven MPIC
* universeirq - PIC handler for the Tundra Universe
* picirq - PIC handler for the 8259
* hlproto - Protoman interface trap module for user-state connections
*
* [OPTION8]
*
../../../CMDS/BOOTOBJS/abort
*
* [PRE-IO]
*
* removed, now in 555flash.ml
*../../../CMDS/BOOTOBJS/siu5irq
*
* [HLPROTO]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/hlproto
*
* [IOMAN]
*
../../../../../../PPC/CMDS/BOOTOBJS/ioman
*
* System [CUSTOMIZATION] modules:
*
* cache750 - MVME2700/MCP750 cache control module (instruction and data cache)
* ssm604 -  MVME2700/MCP750/MVME2304/MVME2604/MVME3604/MTX604 system security
module
*
* [OPTION10]
* no cache on mpc555
*./../../../../../PPC/CMDS/BOOTOBJS/cache555
*
* [PIPE] Descriptor
*
* pipeman - file manager
* pipe - pipe descriptor
*
../../../../../../PPC/CMDS/BOOTOBJS/pipeman
../../../CMDS/BOOTOBJS/DESC/pipe
*
* [SCF] Subsystem Modules:
*
* scf - file manager
* null - device driver
* nil - device descriptor
*
../../../../../../PPC/CMDS/BOOTOBJS/scf
../../../../../../PPC/CMDS/BOOTOBJS/null
../../../../../../PPC/CMDS/BOOTOBJS/nil
*
* [SERIAL] Ports
*
* sc555 - sc555 driver
* t1 - term device descriptor for com1
*
* [OPTION1 || TERM1]
*
../../../CMDS/BOOTOBJS/sc555
```

```
* [OPTION1]
                                        ../../../CMDS/BOOTOBJS/DESC/SC555/t1
*
* [TERM1]
*
../../../CMDS/BOOTOBJS/DESC/SC555/term_t1
*
*
* [RBF] Subsystem Modules:
*
* rbf - file manager
*
../../../../../../PPC/CMDS/BOOTOBJS/rbf
*
* ram - RAM disk driver
* r0 - device descriptor for default RAM disk
* r0.dd - default RAM disk descriptor as default device (/dd)
*
* [RAM]
*
../../../../../../PPC/CMDS/BOOTOBJS/ram
*
* [R0]
*
../../../CMDS/BOOTOBJS/DESC/RAM/r0
*
* [R0.DD]
*
../../../CMDS/BOOTOBJS/DESC/RAM/r0.dd
*
* [SHELL]
*
../../../../../../PPC/CMDS/shell
*
*
* [MSHELL]
*
../../../../../../PPC/CMDS/mshell
*
* C Shard Library (CSL) Module
*
* [CSL]
*
* removed, now in 555flash.ml
*../../../../../../PPC/CMDS/csl
*
* System-state debugging modules
*
* [SNDP]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/sndp
*
* [ROMBUG]
*
../../../../../../PPC/CMDS/BOOTOBJS/ROM/RomBug
*
* User-state remote debugging modules
*
* [UNDPD]
*
* low-level
*
../../../../../../PPC/CMDS/undpd
../../../../../../PPC/CMDS/undpdc
*
* User-state remote debugging modules for use with SPF
*
* Start it with spfndpd<>>>/nil&
*
* [SPFNDPD]
*
../../../../../../PPC/CMDS/spfndpd
../../../../../../PPC/CMDS/spfndpdc
../../../../../../PPC/CMDS/ndpio
* The profiler daemons (start with spfnppd<>>>/nil&)
* [OPTION15]
../../../../../../PPC/CMDS/spfnppd
```

```
* The hawkeye daemons
* [OPTION16]
../../../../../../PPC/CMDS/slmPPC
../../../../../../PPC/CMDS/cmdd
../../../../../../PPC/CMDS/loggerd
../../../../../../PPC/CMDS/router
*
* Utilities we must include
* NFS mount and disk support will not
* function without alias.
*
* [MUST_HAVE]
*
../../../../../../PPC/CMDS/alias
../../../../../../PPC/CMDS/iniz
../../../../../../PPC/CMDS/pd
../../../../../../PPC/CMDS/sleep
../../../../../../PPC/CMDS/echo
*
* Special Disk Utility Set
*
* [DISK_UTILITY]
*
*../../../../../../PPC/CMDS/attr
*../../../../../../PPC/CMDS/del
*../../../../../../PPC/CMDS/deldir
*../../../../../../PPC/CMDS/fdisk
*../../../../../../PPC/CMDS/format
../../../../../../PPC/CMDS/dir
*../../../../../../PPC/CMDS/dsave
*../../../../../../PPC/CMDS/save
../../../../../../PPC/CMDS/list
../../../../../../PPC/CMDS/makdir
../../../../../../PPC/CMDS/pd
../../../../../../PPC/CMDS/free
../../../../../../PPC/CMDS/load
../../../../../../PPC/CMDS/copy
*../../../../../../PPC/CMDS/build
*../../../../../../PPC/CMDS/bootgen
*
*
* [OPTION6]
*
*../../../CMDS/pciv
*../../../CMDS/setpci
*../../../CMDS/dmppci
*
* [OPTION13]
*
*../../../CMDS/testpci
*../../../CMDS/mouse
*
*
* End of bootlist
*
../../../../../../PPC/CMDS/spfnppdc
(start with p2init slm; router<>>>/nil &)
```

Related files