Frame Buffer -Device driver

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Device.h (\include)

```
typedef struct dentry
{
      ushort   num;                          /**< device number          */
      char    *name;                         /**< device name            */
      devcall (*init)   (struct dentry *, ...); /**< init function       */
      devcall (*open)   (struct dentry *, ...); /**< open function          */
      devcall (*close)  (struct dentry *, ...); /**< close function         */
      devcall (*read)   (struct dentry *, ...); /**< read function          */
      devcall (*write)  (struct dentry *, ...); /**< write function         */
      devcall (*seek)   (struct dentry *, ...); /**< seek function          */
      devcall (*getc)   (struct dentry *, ...); /**< getc function          */
      devcall (*putc)   (struct dentry *, ...); /**< putc function          */
      devcall (*control)(struct dentry *, ...); /**< control function       */
      void    *csr;                         /**< ctrl & status reg addr   */
      uchar   inmask;                        /**< input vector           */
      uchar   outmask;                       /**< output vector          */
      void    (*inintr)(void);               /**< input interrupt handler  */
      void    (*outintr)(void);              /**< output interrupt handler */
      void    *controlblk;                   /**< control block          */
      ushort  minor;                         /**< minor device number     */
} device;
```

Devtable.c (\system)

```
{       4,
        "FRAMBUF",
        (void *)fbInit,
        (void *)ionull,
        (void *)fbClose,
        (void *)ionull,
        (void *)fbWrite,
        (void *)ionull,
        (void *)ionull,
        (void *)fbPutChar,
        (void *)fbControl,
        0000000,
        0000,
        0000,
        (void *)ioerr,
        (void *)ioerr,
        NULL,
        0
}
```

Makefile (1)

```
# TTY Driver
TTY = ttyAlloc.c ttyControl.c ttyOpen.c ttyRead.c ttyClose.c
    ttyGetChar.c ttyInit.c ttyPutChar.c ttyWrite.c

# Frame buffer driver
FB = console-font.c fbControl.c fbGetChar.c fbInit.c fbPutChar.c
    fbWrite.c fbClose.c

# Shell
SHL = shell.c lexan.c xsh_exit.c xsh_gpiostat.c xsh_help.c
    xsh_kill.c xsh_led.c xsh_memstat.c xsh_ps.c xsh_reset.c
    xsh_sleep.c xsh_uartstat.c xsh_test.c xsh_testsuite.c
```

Makefile (2)

```
SRC =${LDR:%.c=../loader/%.c}\
        ${SYS:%.c=../system/%.c}\
        ${UART:%.c=../uart/%.c}\
        ${TTY:%.c=../tty/%.c}\
        ${FB:%.c=../fb/%.c}\
        ${SHL:%.c=../shell/%.c}\
        ${TST:%.c=../test/%.c}
```

Functions

void fbInit(char *fb, int pixwidth, int pixheight);

int fbClose(char *fb);

devcall fbControl(int dev, int func, void *arg1,
void *arg2);

void fbWrite(int dev, char *buf, int len);

devcall **fbPutChar**(int dev, int c);

Draw characters

Draw characters in fbPutChar()

0x00, 0x00, 0x3e, 0x08, 0x08, 0x08, 0x08, 0x08, 0x3e,
0x00, 0x00, 0x00, /*'I'*/

0x00, 0x00, 0x22, 0x36, 0x2a, 0x2a, 0x22, 0x22, 0x22,
0x00, 0x00, 0x00, /*'M'*/