発明の巻

C 言語の疑似スレッド最新版(ライセンスフリー) のサポートパック(324,000 円)

スレッドとは、コンピュータープログラミング上の、並列処理の機能です。スレッドをサポートしているプログラミング言語と、スレッドをサポートしていないプログラミング言語があります。高度な機能のスレッドをわざとサポートしない言語があるのは、パソコン以外の環境で実行するために、低レベルマイコン対応のプログラミング言語でいるから(例えば C 言語)です。代わりにマイコンにはインターバルタイマがあります。今回、マイコンのインターバルタイマを使用して、並行処理タイプのスレッド(疑似スレッドと命名)を作成しました。C 言語のスレッドです。低レベル環境に移植可能です。(16bit 以上)サンプルに、エレベーターのプログラムが入っています。「コントローラ」「シミュレータ」の 2 つのプログラムを並行処理技術により連携しながら同時実行するように開発しました。プロセスが 1 個でスレッド(プログラム)が複数で動かせます。LINUX よりも前の世代のマイコンはプロ

セスが 1 個しか入らないでしょうから。C , Assembly , Batch Shell Script 使用。2018 年 4 月 22 日版プログラムです。初期デバッグ対応します。日本語で、日本国内で、初期サポート対応可能です。改造は自己責任でお願いします。324,000 円の中身は初期サポート代です。サンプルコードは開発終了品です。購入後、ご自由に、使用・改造・配布、O.K. です。

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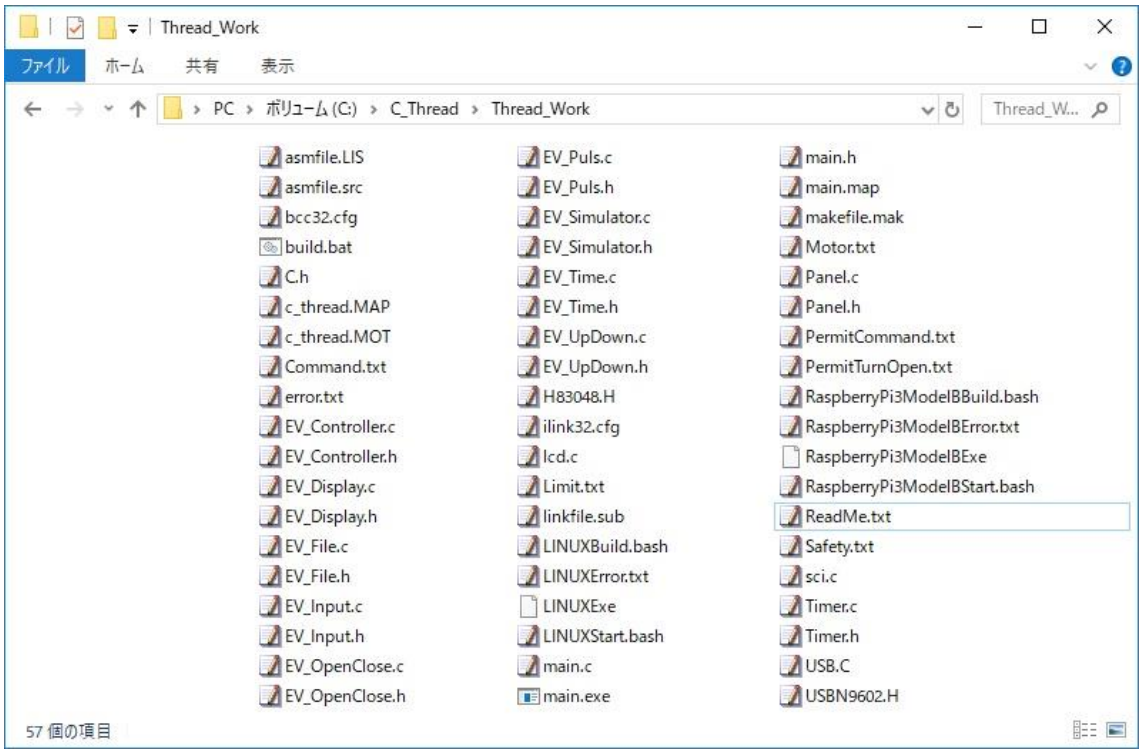

発明アルゴリズムに疑似スレッドと名付けました。本物に偽物と名付けました。特許申請はしないで、無料公開をいたしました。発明という手段で人類としてのノルマを達成し、また、生きた証が発生いたしました。篠宮氏を逆賊に祭り上げようとする人種がいます。篠宮氏は辞退いたします。秋篠宮家様は本物の皇族ですが、篠宮氏は偽物です。

タイトル(title):

C 言語の疑似スレッド

サブタイトル(subtitle):

C 言語の偽物のスレッド

The thread at the imitation of the C language.

似ているが独創的な別物

The resembling but original singleton.

C 言語によるスレッドという概念の模倣

Copying a concept,

the thread, by the C language.

解説

C言語のプロジェクト Thread について、

このプロジェクトは予告なくデバッグ目的で更新されることがあります。

このプロジェクトは、お客様が改造して、よりお客様に使いやすい
プログラムにするために、提供されるサンプルプログラムであり、
お客様の好みに完成させてください。

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このプロジェクトは、3通りの方法で コンパイル 実行 できます。

1つ目の方法：
Windows版 Borland BCC C/C++ のダウンロードとインストール
bcc コンパイラー で検索します
C++Builder のホームページを開きます
C++ Compiler 5.5 / Turbo Debugger (日本語) (コンパイラのみで軽い)
(テキストエディタと組み合わせて使用します)(フリーソフト)
(ユーザー登録が必要)(メールアドレスが必要)をダウンロードして
解凍します
freecommandlinetools2.exeをインストールします
freeturbodebugger.exeをインストールします

2つ目の方法：
Windows版 AKI-H8 3052F USB開発セット の購入
メーカー： ルネサスエレクトロニクスさん
販売者： 秋月電子通商さん
通販コード： K-00182

商品名： AKI-H8 3052F USB開発セット

商品価格： 税込7,000円 (2018年3月6日現在)

AKI-H8 3052F USB開発セット で検索します

AKI-H8 3052F USB開発セット を 秋月電子通商さん の通販サイトで購入するか、それとも ご自宅の最寄りの電子パーツ専門店 で注文購入します

AC/DCコンバータ(ACアダプター) と、 RS-232Cケーブル と、延長USBコード を、ご自宅の最寄りの電子パーツ専門店 で注文購入します

AC/DCコンバータ の 電流電圧 は お店の人 に聞いてください

RS-232C は、パソコンに端子がある必要があり、また、パソコンと AKI-H8基板 の両方の コネクタ の オス端子・メス端子 を確認して購入してください

延長USBコード も オス端子・メス端子 を確認してください

カラー短絡ソケット6mm 青 2228CG-BU で検索します

カラー短絡ソケット6mm 青 2228CG-BU のような 短絡コネクタ を、ご自宅の最寄りの電子パーツ専門店 で 2個 注文購入します

(100円 か 200円 支払うと何個かまとめて購入できます)

USB開発セット のマニュアルに従い、 usbフォルダ の main.c を コンパイルして、 H8WriteTurbo をインストールして、 AKI-H8基板 への書き込み時に、 短絡ソケット(短絡コネクタ) を使用して、マニュアルに従い モード を調節して、 usbフォルダ の usbtest.MOT を AKI-H8基板 へ書き込み、走らせてみます

押しボタンを押すと、sw1 sw2 sw3 sw4 などと 液晶パネル に表示されれば大丈夫です。

C_Threadフォルダ の中の、 Thread_Workフォルダ の中の、 main.c を、コンパイルします(build.bat を、編集で中身を確認後、ダブルクリックします)

C_Threadフォルダ の中の、 Thread_Workフォルダ の中の、 c_thread.MOT を、 モード を調節しながら、 AKI-H8基板 へ書き込み、走らせてみます

液晶パネル ・ 押しボタン ・ LED などが機能していれば、成功です

3つ目の方法：

LINUX Raspbian GCC の利用

私は、 Rasberry Pi 3 Model B (ラズベリーパイ) にしましたが、

linuxBuild.bash linuxStart.bash

が読める方は、お好きな LINUX で挑戦してみてください

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main.c の 関数 Run の ID==31 を見てください。

Thread Ready GO! で開始して競馬のコースが8コースあります。

Thread Ready GO! There are 8 cources on a race.

ゴールまで14歩です。

There are 14 cells to a GOAL.

<1>コースは'r'ボタンが鞭で<2>コースは'l'ボタンが鞭です。

For the <1> cource, You click a 'R' button.

For the <2> cource, You click a 'L' button.

スレッドを使用しています。

Thread *th[8]; でオブジェクト宣言しています。

th[i] = new_Thread(i + 1); で初期値設定しています。

この2行は Java で次と同じ意味です。

Thread th[] = new Thread[8];

th[i] = new Thread(i + 1);

void Repaint(void)

```
{
	…
}
void Run(Thread *This)
{
	…
}
void Init(Thread *This)
{
	…
}
void Destroy(Thread *This)
{
	…
}
```

はそれぞれ Java で次と同じ意味です。

```
public void paint(Graphics g)
{
	…
}
public void run()
{
	…
}
public void init()
{
	…
}
public void destroy()
```

{

　　…

}

delete_(th[i]); でオブジェクトを消去しています。

この1行は C++ で次と同じ意味です。

delete th[i];

スレッド20が走り始めたら、

0以外の数字キーを押してみてください。

その数字に20を加えた番号のスレッドが、キーを押す度毎に、

起動・消去を繰り返します。

20を含めて、全部スレッドが消去されると、終了です。

これらのスレッドに関する仕様は Timer.c に記述しました。

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2階建エレベーターEVについて

使用方法

EV_Simulator にエレベーターが表示されます

EV_Controller にエレベーターの動作が表示されます

EV_Input の使用方法

u キーを押すとエレベーターが2階に上昇して扉が開きます

d キーを押すとエレベーターが1階に下降して扉が開きます

o キーを押すと扉が開きます

c キーを押すと扉が閉じます

s キーを押すと籠が非常停止します

r キーを押すと籠が非常停止から復帰します

Y キーを押すとエレベーターが2階に上昇して扉が開きます

H キーを押すと2階で扉が閉じます

y キーを押すとエレベーターが1階に下降して扉が開きます

h キーを押すと1階で扉が閉じます

籠が無い階で H h キーを押しても籠は動作しません

籠が無い階で Y y キーを押したとき籠の扉が開いていると、

籠は動作しません

開いた状態の扉は一定時間後自動で閉じます

EV_Time.h に #define OPENTIMEOUT 10 と書いてあるので 10秒 です

閉まりかけの時に開く動作をするキーを押すと扉が反転して開きます

動作説明

全体の動作説明

モーターの情報は Motor.txt にあります

エレベーター塔内のリミットスイッチの情報は Limit.txt にあります

EV_Simulator はエレベーターの次の位置を出力していて Safety.txt

Motor.txt Limit.txt を採取して Safety.txt Limit.txt に書き込んで

エレベーターの画面表示もしています

EV_Controller はエレベータを制御していて Command.txt Limit.txt
を採取して PermitCommand.txt Motor.txt に書き込んでいます

EV_Controllerの動作説明

エレベーターには現在位置情報(Limit.txt)があります
最簡形の2階建ての場合通常系には5個の位置状態があります
下の階の停止状態
下の階の低速区域
中間の高速区域
上の階の低速区域
上の階の停止状態
5個の区域の境界に合計4個のセンサーがあります
4個のセンサーがエレベーターの現在位置を取得しています
4個のセンサーからの信号はメンバ変数(Positionクラスの
*p_UnderSlow *p_UnderStop *p_UpperSlow *p_UpperStop)
に読み込みます
昇りのメソッド(UpMotorクラスのOnUpMotor)と降りのメソッド
(DownMotorクラスのOnDownMotor)で使って
モーターに出力(Motor.txtに出力)します

全く同じ様にドアも通常系で4個のセンサーがありドアの開閉では
エレベーターの昇降と全く同じクラス構造です

後はインスタンス(Position P UpMotor UPMT DownMotor DNMT
Door DR OpenMotor OPMT CloseMotor CLMT)
を宣言して仕様に合わせてメソッドを呼び出すだけでO.K.です

終了方法

エレベーターが通常停止しているときに q キーを押します

メンテナンス

異常終了した場合、終了後、Thread_Work フォルダの次のファイルを

チェックしてください

Safety.txt

Safety.txt を開いて r にして上書き保存してください

r は通常動作を意味します

s は非常停止を意味します

h は復帰を意味します

Y はスターデルタのスター起動を意味します

Command.txt

Command.txt を開いて q にして上書き保存してください

q は終了を意味します

u は上昇を意味します

d は下降を意味します

o は開を意味します

c は閉を意味します

Y は上階呼びを意味します

y は下階呼びを意味します

H は上階閉を意味します

h は下階閉を意味します

N は信号無しを意味します

PermitCommand.txt

PermitCommand.txt を開いて c にして上書き保存してください

N は命令入力禁止を意味します

c は命令入力許可を意味します

PermitTurnOpen.txt

PermitTurnOpen.txtを開いて N にして上書き保存してください

N は反転開信号入力禁止を意味します

o は反転開信号入力許可を意味します

Motor.txt

Motor.txt を開いて s にして上書き保存してください

s はモーター停止を意味します

j はモーター上昇回転開始を意味します

u はモーター低速上昇回転を意味します

U はモーター高速上昇回転を意味します

k はモーター下降回転開始を意味します

d はモーター低速下降回転を意味します

D はモーター高速下降回転を意味します

h はモーター開回転開始を意味します

o はモーター低速開回転を意味します

O はモーター高速開回転を意味します

t はモーター閉回転開始を意味します

c はモーター低速閉回転を意味します

C はモーター高速閉回転を意味します

Limit.txt

Limit.txt を開いて yynnyynn にして上書き保存してください

yynnyynn は籠が下階停止状態で扉が閉停止状態を意味します

yynnnynn は籠が下階停止状態で扉が閉低速区域を意味します

yynnnnnn は籠が下階停止状態で扉が中間高速区域を意味します

yynnnnyn は籠が下階停止状態で扉が開低速区域を意味します

yynnnnyy は籠が下階停止状態で扉が開停止状態を意味します

nynnyynn は籠が下階低速区域で扉が閉停止状態を意味します

nnnnyynn は籠が中間高速区域で扉が閉停止状態を意味します

nnynyynn は籠が上階低速区域で扉が閉停止状態を意味します

nnyyyynn は籠が上階停止状態で扉が閉停止状態を意味します

nnyynynn は籠が上階停止状態で扉が閉低速区域を意味します

nnyynnnn は籠が上階停止状態で扉が中間高速区域を意味します

nnyynnyn は籠が上階停止状態で扉が開低速区域を意味します

nnyynnyy は籠が上階停止状態で扉が開停止状態を意味します

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ラズベリーパイ の GCC を使用するときは、文字コードを utf8 にして

改行コードを <LF>のみ(UNIX) にして名前を付けて保存してください

makefile.mak build.bat asmfile.src linkfile.sub linuxBuild.bash は

複数のファイルを1個のプロジェクトとして

コンパイルするためのファイルです

error.txt linuxError.txt はコンパイルエラーを表示するファイルです

main.exe をダブルクリックすると、BCC実行ソフトが起動します

c_thread.MOT を AKI-H8 3052F USB に書き込みます

linuxStart.bash をダブルクリックすると、

GCC実行ソフト linuxExe が起動します

参照ライブラリ

```
/************************************************************************/
/*      H8/3048F Include File                                           */
/************************************************************************/
struct st_sam {                         /* struct DMAC  */
      void              *MAR;           /* MAR          */
      unsigned int      ETCR;           /* ETCR         */
      unsigned char     IOAR;           /* IOAR         */
      unsigned char     DTCR;           /* DTCR         */
};

struct st_fam {                         /* struct DMAC  */
      void              *MARA;          /* MARA         */
      unsigned int      ETCRA;          /* ETCRA        */
      unsigned char     IOARA;          /* IOAR         */
      unsigned char     DTCRA;          /* DTCRA        */
      void              *MARB;          /* MARB         */
      unsigned int      ETCRB;          /* ETCRB        */
      unsigned char     IOARB;          /* IOAR         */
      unsigned char     DTCRB;          /* DTCRB        */
};

struct st_itu {                         /* struct ITU   */
      unsigned char     TSTR;           /* TSTR         */
      unsigned char     TSNC;           /* TSNC         */
      unsigned char     TMDR;           /* TMDR         */
      unsigned char     TFCR;           /* TFCR         */
      char              wk[44];         /*              */
      unsigned char     TOER;           /* TOER         */
      unsigned char     TOCR;           /* TOCR         */
};

struct st_itu0 {                        /* struct ITU0  */
      unsigned char     TCR;            /* TCR          */
      unsigned char     TIOR;           /* TIOR         */
      unsigned char     TIER;           /* TIER         */
      unsigned char     TSR;            /* TSR          */
      unsigned int      TCNT;           /* TCNT         */
      unsigned int      GRA;            /* GRA          */
      unsigned int      GRB;            /* GRB          */
};

struct st_itu3 {                        /* struct ITU3  */
      unsigned char     TCR;            /* TCR          */
      unsigned char     TIOR;           /* TIOR         */
      unsigned char     TIER;           /* TIER         */
      unsigned char     TSR;            /* TSR          */
      unsigned int      TCNT;           /* TCNT         */
      unsigned int      GRA;            /* GRA          */
      unsigned int      GRB;            /* GRB          */
      unsigned int      BRA;            /* BRA          */
      unsigned int      BRB;            /* BRB          */
      char              wk[2];          /*              */
};

struct st_tpc {                         /* struct TPC   */
      unsigned char     TPMR;           /* TPMR         */
      unsigned char     TPCR;           /* TPCR         */
```

```
    unsigned char   NDERB;      /* NDERB            */
    unsigned char   NDERA;      /* NDERA            */
    unsigned char   NDRB1;      /* NDRB (H'A4)  */
    unsigned char   NDRA1;      /* NDRA (H'A5)  */
    unsigned char   NDRB2;      /* NDRB (H'A6)  */
    unsigned char   NDRA2;      /* NDRA (H'A7)  */
};

struct st_rfshc {                   /* struct RFSHC */
    unsigned char   RFSHCR;     /* RFSHCR           */
    unsigned char   RTMCSR;     /* RTMCSR           */
    unsigned char   RTCNT;      /* RTCNT            */
    unsigned char   RTCOR;      /* RTCOR            */
};

struct st_sci {                     /* struct SCI   */
    unsigned char   SMR;        /* SMR              */
    unsigned char   BRR;        /* BRR              */
    unsigned char   SCR;        /* SCR              */
    unsigned char   TDR;        /* TDR              */
    unsigned char   SSR;        /* SSR              */
    unsigned char   RDR;        /* RDR              */
    char            wk[2];      /*                  */
};

struct st_p1 {                      /* struct P1    */
    unsigned char   DDR;        /* P1DDR            */
    char            wk;         /*                  */
    unsigned char   DR;             /* P1DR         */
};

struct st_p2 {                      /* struct P2    */
    unsigned char   DDR;        /* P2DDR            */
    char            wk1;        /*                  */
    unsigned char   DR;             /* P2DR         */
    char            wk2[20];    /*                  */
    unsigned char   PCR;        /* P2PCR            */
};

struct st_p4 {                      /* struct P4    */
    unsigned char   DDR;        /* P4DDR            */
    char            wk1;        /*                  */
    unsigned char   DR;             /* P4DR         */
    char            wk2[18];    /*                  */
    unsigned char   PCR;        /* P4PCR            */
};

struct st_p5 {                      /* struct P5    */
    unsigned char   DDR;        /* P5DDR            */
    char            wk1;        /*                  */
    unsigned char   DR;             /* P5DR         */
    char            wk2[16];    /*                  */
    unsigned char   PCR;        /* P5PCR            */
};

struct st_p6 {                      /* struct P6    */
    unsigned char   DDR;        /* P6DDR            */
```

```
	char		wk;		/*			*/
	unsigned char	DR;		/* P6DR		*/
};

struct st_p7 {			/* struct P7	*/
	unsigned char	DR;		/* P7DR		*/
};

struct st_p8 {			/* struct P8	*/
	unsigned char	DDR;		/* P8DDR		*/
	char		wk;		/*			*/
	unsigned char	DR;		/* P8DR		*/
};

struct st_p9 {			/* struct P9	*/
	unsigned char	DDR;		/* P9DDR		*/
	char		wk;		/*			*/
	unsigned char	DR;		/* P9DR		*/
};

struct st_da {			/* struct D/A	*/
	unsigned char	STCR;		/* DASTCR		*/
	char		wk[127];	/*			*/
	unsigned char	DR0;		/* DADR0		*/
	unsigned char	DR1;		/* DADR1		*/
	unsigned char	CR;		/* DACR		*/
};

struct st_ad {			/* struct A/D	*/
	unsigned int	DRA;		/* ADDRA		*/
	unsigned int	DRB;		/* ADDRB		*/
	unsigned int	DRC;		/* ADDRC		*/
	unsigned int	DRD;		/* ADDRD		*/
	unsigned char	CSR;		/* ADCSR		*/
	unsigned char	CR;		/* ADCR		*/
};

struct st_bsc {			/* struct BSC	*/
	unsigned char	CSCR;		/* CSCR		*/
	char		wk1[140];	/*			*/
	unsigned char	ABWCR;		/* ABWCR		*/
	unsigned char	ASTCR;		/* ASTCR		*/
	unsigned char	WCR;		/* WCR		*/
	unsigned char	WCER;		/* WCER		*/
	char		wk2[3];		/*			*/
	unsigned char	BRCR;		/* BRCR		*/
};

struct st_intc {		/* struct INTC	*/
	unsigned char	ISCR;		/* ISCR		*/
	unsigned char	IER;		/* IER		*/
	unsigned char	ISR;		/* ISR		*/
	char		wk;		/*			*/
	unsigned char	IPRA;		/* IPRA		*/
	unsigned char	IPRB;		/* IPRB		*/
};
```

```
#define DMAC0A  (*(volatile struct st_sam      *)0xFFFF20) /* DMAC 0A Addr */
#define DMAC0B  (*(volatile struct st_sam      *)0xFFFF28) /* DMAC 0B Addr */
#define DMAC1A  (*(volatile struct st_sam      *)0xFFFF30) /* DMAC 1A Addr */
#define DMAC1B  (*(volatile struct st_sam      *)0xFFFF38) /* DMAC 1B Addr */
#define DMAC0   (*(volatile struct st_fam      *)0xFFFF20) /* DMAC 0  Addr */
#define DMAC1   (*(volatile struct st_fam      *)0xFFFF30) /* DMAC 1  Addr */
#define ITU     (*(volatile struct st_itu      *)0xFFFF60) /* ITU       Address*/
#define ITU0    (*(volatile struct st_itu0     *)0xFFFF64) /* ITU0  Address*/
#define ITU1    (*(volatile struct st_itu0     *)0xFFFF6E) /* ITU1  Address*/
#define ITU2    (*(volatile struct st_itu0     *)0xFFFF78) /* ITU2  Address*/
#define ITU3    (*(volatile struct st_itu3     *)0xFFFF82) /* ITU3  Address*/
#define ITU4    (*(volatile struct st_itu3     *)0xFFFF92) /* ITU4  Address*/
#define TPC     (*(volatile struct st_tpc      *)0xFFFFA0) /* TPC       Address*/
#define RFSHC   (*(volatile struct st_rfshc *)0xFFFFAC) /* RFSHC Address*/
#define SCI0    (*(volatile struct st_sci      *)0xFFFFB0) /* SCI0  Address*/
#define SCI1    (*(volatile struct st_sci      *)0xFFFFB8) /* SCI1  Address*/
#define P1          (*(volatile struct st_p1       *)0xFFFFC0) /* P1        Address*/
#define P2          (*(volatile struct st_p2       *)0xFFFFC1) /* P2        Address*/
#define P3          (*(volatile struct st_p1       *)0xFFFFC4) /* P3        Address*/
#define P4          (*(volatile struct st_p4       *)0xFFFFC5) /* P4        Address*/
#define P5          (*(volatile struct st_p5       *)0xFFFFC8) /* P5        Address*/
#define P6          (*(volatile struct st_p6       *)0xFFFFC9) /* P6        Address*/
#define P7          (*(volatile struct st_p7       *)0xFFFFCE) /* P7        Address*/
#define P8          (*(volatile struct st_p8       *)0xFFFFCD) /* P8        Address*/
#define P9          (*(volatile struct st_p9       *)0xFFFFD0) /* P9        Address*/
#define PA          (*(volatile struct st_p1       *)0xFFFFD1) /* PA        Address*/
#define PB          (*(volatile struct st_p1       *)0xFFFFD4) /* PB        Address*/
#define DA          (*(volatile struct st_da       *)0xFFFF5C) /* D/A       Address*/
#define AD          (*(volatile struct st_ad       *)0xFFFFE0) /* A/D       Address*/
#define BSC     (*(volatile struct st_bsc      *)0xFFFF5F) /* BSC       Address*/
#define FLMCR   (*(volatile unsigned char  *)0xFFFF40) /* FLMCR Address*/
#define EBR1    (*(volatile unsigned char      *)0xFFFF42) /* EBR1  Address*/
#define EBR2    (*(volatile unsigned char      *)0xFFFF43) /* EBR2  Address*/
#define RAMCR   (*(volatile unsigned char  *)0xFFFF48) /* RAMCR Address*/
#define DIVCR   (*(volatile unsigned char  *)0xFFFF5D) /* DIVCR Address*/
#define MSTCR   (*(volatile unsigned char  *)0xFFFF5E) /* MSTCR Address*/
#define MDCR    (*(volatile unsigned char      *)0xFFFFF1) /* MDCR  Address*/
#define SYSCR   (*(volatile unsigned char *)0xFFFFF2) /* SYSCR Address*/
#define INTC    (*(volatile struct st_intc     *)0xFFFFF4) /* INTC  Address*/
#define st_itu1 st_itu0                                 /* Change Struct ITU1   */
#define st_itu2 st_itu0                                 /* Change Struct ITU2   */
#define st_itu4 st_itu3                                 /* Change Struct ITU4   */
#define st_p3   st_p1                                   /* Change Struct P3->P1 */
#define st_pa   st_p1                                   /* Change Struct PA->P1 */
#define st_pb   st_p1                                   /* Change Struct PB->P1 */
```

```
/*===============================================================
                        N9604 Address
===============================================================*/
#define     USB9602R        (*(volatile unsigned char *)0x400003)
#define     USB9602D        (*(volatile unsigned char *)0x400001)

/*===============================================================
                        N9604 Define
===============================================================*/
#define     USB_CLKDIV      0x04    /* CLKOUT = 48MHz/4 = 12MHz */


/* USB1.0リクエスト */
#define     USB_GET_STATUS          0
#define     USB_CLEAR_FEATURE       1
#define     USB_SET_FEATURE         3
#define     USB_SET_ADDRESS         5
#define     USB_GET_DESCRIPTOR      6
#define     USB_SET_DESCRIPTOR      7
#define     USB_GET_CONFIGURATION   8
#define     USB_SET_CONFIGURATION   9
#define     USB_GET_INTERFACE       10
#define     USB_SET_INTERFACE       11
#define     USB_SYNCH_FRAME         12

/* ディスクリプタ名 */
#define     USB_DEVICE              1
#define     USB_CONFIGURATION       2
```

```
#define     USB_XSTRING                 3
#define     USB_INTERFACE               4
#define     USB_ENDPOINT                5
#define     USB_HID                     0x21
#define     USB_HIDREPORT               0x22
#define     USB_HIDPHYSICAL             0x23

/* HIDリクエスト */
#define     USB_GET_REPORT              0x01
#define     USB_GET_IDLE                0x02
#define     USB_GET_PROTOCOL            0x03
#define     USB_SET_REPORT              0x09
#define     USB_SET_IDLE                0x0A
#define     USB_SET_PROTOCOL            0x0B


/*============================================================
                        N9604 Register
============================================================*/
#define     USB_MCNTRL              0x00    /*Main control register   */
#define     USB_CCONF               0x01    /*Clk. config. register   */
#define     USB_TCR                 0x02    /*Xcvr config. register   */
#define     USB_RID                 0x03    /*Rev. ID     register   */
#define     USB_FAR                 0x04    /*Func address register   */
#define     USB_NFSR                0x05    /*Node func st register   */
#define     USB_MAEV                0x06    /*Main event   register   */
#define     USB_MAMSK               0x07    /*Main mask    register   */
#define     USB_ALTEV               0x08    /*Alt. event   register   */
#define     USB_ALTMSK              0x09    /*ALT  mask    register   */
```

```
#define     USB_TXEV            0x0A   /*TX  event  register  */
#define     USB_TXMSK           0x0B   /*TX  mask   register  */
#define     USB_RXEV            0x0C   /*RX  event  register  */
#define     USB_RXMSK           0x0D   /*RX  mask   register  */
#define     USB_NAKEV           0x0E   /*NAK event  register  */
#define     USB_NAKMSK          0x0F   /*NAK mask   register  */
#define     USB_FWEV            0x10   /*FIFO warning register  */
#define     USB_FWMSK           0x11   /*FIFO warning mask     */
#define     USB_FNH             0x12   /*Frame nbr hi register  */
#define     USB_FNL             0x13   /*Frame nbr lo register  */
#define     USB_DMACNTRL        0x14   /*DMA  control register  */

#define     USB_EPC0            0x20   /*Endpoint0   register  */
#define     USB_TXD0            0x21   /*TX  data   register 0 */
#define     USB_TXS0            0x22   /*TX  status  register 0 */
#define     USB_TXC0            0x23   /*TX  command register 0 */

#define     USB_RXD0            0x25   /*RX  data   register 0 */
#define     USB_RXS0            0x26   /*RX  status  register 0 */
#define     USB_RXC0            0x27   /*RX  command register 0 */

#define     USB_EPC1            0x28   /*Endpoint1   register  */
#define     USB_TXD1            0x29   /*TX  data   register 1 */
#define     USB_TXS1            0x2A   /*TX  status  register 1 */
#define     USB_TXC1            0x2B   /*TX  command register 1 */

#define     USB_EPC2            0x2C   /*Endpoint2   register  */
#define     USB_RXD1            0x2D   /*RX  data   register 1 */
#define     USB_RXS1            0x2E   /*RX  status  register 1 */
```

```
#define     USB_RXC1                0x2F    /*RX   command register 1 */

#define     USB_EPC3                0x30    /*Endpoint3    register   */
#define     USB_TXD2                0x31    /*TX   data    register 2 */
#define     USB_TXS2                0x32    /*TX   status  register 2 */
#define     USB_TXC2                0x33    /*TX   command register 2 */

#define     USB_EPC4                0x34    /*Endpoint4    register   */
#define     USB_RXD2                0x35    /*RX   data    register 2 */
#define     USB_RXS2                0x36    /*RX   status  register 2 */
#define     USB_RXC2                0x37    /*RX   command register 2 */

#define     USB_EPC5                0x38    /*Endpoint5    register   */
#define     USB_TXD3                0x39    /*TX   data    register 3 */
#define     USB_TXS3                0x3A    /*TX   status  register 3 */
#define     USB_TXC3                0x3B    /*TX   command register 3 */

#define     USB_EPC6                0x3C    /*Endpoint6    register   */
#define     USB_RXD3                0x3D    /*RX   data    register 3 */
#define     USB_RXS3                0x3E    /*RX   status  register 3 */
#define     USB_RXC3                0x3F    /*RX   command register 3 */

/*---------- MCNTRL bits -------------*/
#define     USB_SRST                0x01    /*software reset        */
#define     USB_DBG                 0x02    /*debug mode            */
#define     USB_VGE                 0x04    /*voltage regulator enable*/
#define     USB_NAT                 0x08    /*node attached         */
#define     USB_INT_DIS             0x00    /*interrupts disabled    */
#define     USB_INT_L_O             0x40    /*act lo ints, open drain */
```

```
#define       USB_INT_H_P              0x80    /*act hi ints, push pull  */
#define       USB_INT_L_P              0xC0    /*act lo ints, push pull  */

/*------------ FAR bits --------------*/
#define       USB_AD_EN                0x80    /*address enable        */

/*------------ NFSR bits -------------*/
#define       USB_RST_ST               0x00    /*reset      state      */
#define       USB_RSM_ST               0x01    /*resume     state      */
#define       USB_OPR_ST               0x02    /*operational state      */
#define       USB_SUS_ST               0x03    /*suspend    state      */

/*-------- MAEV, MAMSK bits ---------*/
#define       USB_WARN                 0x01    /*warning bit has been set*/
#define       USB_ALT                  0x02    /*alternate event        */
#define       USB_TX_EV                0x04    /*transmit event         */
#define       USB_FRAME                0x08    /*SOF packet received    */
#define       USB_NAK                  0x10    /*NAK event              */
#define       USB_ULD                  0x20    /*unlock locked detected  */
#define       USB_RX_EV                0x40    /*receive event          */
#define       USB_INTR_E               0x80    /*master interrupt enable */

/*-------- ALTEV, ALTMSK bits --------*/
#define       USB_EOP                  0x08    /*end of packet          */
#define       USB_SD3                  0x10    /*3 ms suspend           */
#define       USB_SD5                  0x20    /*5 ms suspend           */
#define       USB_RESET_A              0x40    /*reset  detected        */
#define       USB_RESUME_A             0x80    /*resume detected        */
```

```
/*--------- TXEV, TXMSK bits ---------*/
#define     USB_TXFIFO0             0x01    /*TX_DONE, FIFO 0      */
#define     USB_TXFIFO1             0x02    /*TX_DONE, FIFO 1      */
#define     USB_TXFIFO2             0x04    /*TX_DONE, FIFO 2      */
#define     USB_TXFIFO3             0x08    /*TX_DONE, FIFO 3      */
#define     USB_TXUDRN0             0x10    /*TX_URUN, FIFO 0      */
#define     USB_TXUDRN1             0x20    /*TX_URUN, FIFO 1      */
#define     USB_TXUDRN2             0x40    /*TX_URUN, FIFO 2      */
#define     USB_TXUDRN3             0x80    /*TX_URUN, FIFO 3      */

/*--------- RXEV, RXMSK bits ---------*/
#define     USB_RXFIFO0             0x01    /*RX_DONE, FIFO 0      */
#define     USB_RXFIFO1             0x02    /*RX_DONE, FIFO 1      */
#define     USB_RXFIFO2             0x04    /*RX_DONE, FIFO 2      */
#define     USB_RXFIFO3             0x08    /*RX_DONE, FIFO 3      */
#define     USB_RXOVRN0             0x10    /*RX_OVRN, FIFO 0      */
#define     USB_RXOVRN1             0x20    /*RX_OVRN, FIFO 1      */
#define     USB_RXOVRN2             0x40    /*RX_OVRN, FIFO 2      */
#define     USB_RXOVRN3             0x80    /*RX_OVRN, FIFO 3      */

/*------- NAKEV, NAKMSK bits ---------*/
#define     USB_NAK_I0              0x01    /*IN  NAK, FIFO 0      */
#define     USB_NAK_I1              0x02    /*IN  NAK, FIFO 1      */
#define     USB_NAK_I2              0x04    /*IN  NAK, FIFO 2      */
#define     USB_NAK_I3              0x08    /*IN  NAK, FIFO 3      */
#define     USB_NAK_O0              0x10    /*OUT NAK, FIFO 0      */
#define     USB_NAK_O1              0x20    /*OUT NAK, FIFO 1      */
```

```
#define       USB_NAK_O2              0x40    /*OUT NAK, FIFO 2       */
#define       USB_NAK_O3              0x80    /*OUT NAK, FIFO 3       */

/*--------- EPCX bits ----------------*/
#define       USB_EP_EN               0x10    /*enables endpt.  (1-6)   */
#define       USB_ISO                 0x20    /*set for isochr. (1-6)   */
#define       USB_DEF                 0x40    /*force def. adr (0 only) */
#define       USB_STALL               0x80    /*force stall handshakes  */

/*---------- TXCx bits ---------------*/
#define       USB_TX_EN               0x01    /*transmit enable       */
#define       USB_TX_LAST             0x02    /*last data in FIFO     */
#define       USB_TX_TOGL             0x04    /*specifies PID used    */
#define       USB_FLUSH               0x08    /*flushes all FIFO data   */
#define       USB_IGNIOS              0x80    /*      */

/*----------- TXSx bits --------------*/
#define       USB_TX_DONE             0x20    /*transmit done         */
#define       USB_ACK_STAT            0x40    /*ack status of xmission  */

/*------------ RXCx bits -------------*/
#define       USB_RX_EN               0x01    /*receive  enable       */
#define       USB_IGN_OUT             0x02    /*ignore out tokens     */
#define       USB_IGN_SETUP           0x04    /*ignore setup tokens    */

/*------------- RXS0 bits ------------*/
#define       USB_RX_LAST             0x10    /*indicates RCOUNT valid  */
#define       USB_RX_TOGL             0x20    /*last pkt was DATA1 PID  */
#define       USB_SETUP_RX            0x40    /*setup packet received   */
```

```
#define	USB_RX_ERR		0x80	/*last packet had an error*/
```

```
/*

      USB N9604 コントロール

                                                    (C)2002 C.I.M

*/

#include      <stdio.h>
#include      <string.h>
#include      "usbn9602.h"
#include      "h83048.h"

extern  void PrintSCI(const char *fmt, ...);          /* sci.c */

static void RegisterSet();
static void ResetUSB();
static void WakeupUSB();

static void rx0();
static void rx1();
static void tx0();
static void tx1();
static void nako0();
static void nako1();
static void naki0();
static void naki1();

static void clrfeature();
```

```
static void setfeature();
static void getdescriptor();
static void send_desc_sub(void *ptr,int size);
static void send_desc();
static void getstatus();
static void setconfiguration();

static void SetStallUSB(int adr);
static void ClearStallUSB(int adr);
static void FlushRXC(int no);
static void FlushTXC(int no);
static void TxTogle(int no);

static void WriteUSB(int adr,int data);
static unsigned char ReadUSB(int adr);
static int ReadUSBBurst(int adr,int adr2,char *buff,int cnt);
static int WriteUSBBurst(int adr,int adr2,char *buff,int cnt);

/*---------------------------------*/
static int SendTX1();

/*---------------------------------*/
int get_inbufflen(void);
void init_usbbuff(void);
int write_inbuff(char *p,int size);
int get_outbufflen(void);
int write_buff(char *p,int size);
int read_outbuff(char *p,int size);
/*---------------------------------*/
```

```
static  unsigned char   usbevent;           /* USB割り込みイベント        */
static  unsigned char   SETADDR;            /* アドレスセット             */
static  unsigned char   configno;           /* コンフィグレーションNO */
static  unsigned char   usbbuff[64];    /* 読み込みバッファ               */
static  unsigned char   rx1buff[64];
static  unsigned char   rx2buff[64];
static  unsigned char   STALLD;             /* ECPの状態                  */
static  unsigned char   DATA0_1;            /* USB_TXTGLのフラグ          */
static  char            senddesc;           /* 1 = ディスクリプタ送信中   */
static  int             desc_size;          /* ディスクリプタ送信サイズ */
static  char            *desc_ptr;          /* ディスクリプタポインタ  */


static  const unsigned char     epctbl[8] =
{USB_EPC0,USB_EPC1,USB_EPC2,USB_EPC3,USB_EPC4,USB_EPC5,USB_EPC6,USB_EPC0};
static int      txcreg[4] = {USB_TXC0,USB_TXC1,USB_TXC2,USB_TXC3};
static int rxcreg[4] = {USB_RXC0,USB_RXC1,USB_RXC2,USB_RXC3};

/*-----------------------------------------------------------*/
/*-----------------------------------------------------------*/
static const unsigned char dev_desc[] = {
    0x12,               /* length of this desc.                   */
    0x01,               /* デバイス・ディスクリプタ 1             */
    0x00,0x01,              /* USB Version 1.0                        */
    0x00,               /* device class クラス無し                */
    0x00,               /* device subclass                        */
    0x00,               /* device protocol                        */
    0x08,               /* EP0の最大パケットサイズ                */
```

```
    0xfe,0xff,              /* vendor ID    サンプルなのでとりあえず        */
    0x10,0x00,              /* product ID                                   */
    0x01,0x00,              /* revision ID                                  */
    0x01,                   /* index of manuf. string                       */
    0x01,                   /* index of prod.  string                       */
    0x02,                   /* index of ser. # string                       */
    0x01                    /* bNumConfigurations                           */
};


/* コンフィグレーションディスクリプタ */
static const unsigned char cfg_desc[] = {
    0x09,                   /* length of this desc.                         */
    0x02,                   /* コンフィグレーション・ディスクリプタ         */
    9+9+7*3,                /* インターフェース／エンドポイントディスクリプタ等の合計長 CFG + IF +
EP*3 */
    0x00,                   /*                                              */
    0x01,                   /* インターフェース数 1                         */
    0x01,                   /* コンフィグレーションは 1                     */
    0x00,                   /* index of config. string                      */
    0xc0,                   /* attr.: self powered  D6=自己電源             */
    100,                    /*     ;max power (100 mA)                      */
/*},*/
/*static const unsigned char if_desc[] = {*/
    0x09,                   /* length of this desc.                         */
    0x04,                   /* INTERFACE descriptor                         */
    0x00,                   /* interface number                             */
    0x00,                   /* alternate setting                            */
    0x03,                   /* # of (non 0) endpoints                       */
    0x00,                   /* interface class                              */
```

```
    0x00,               /* interface subclass                   */
    0x00,               /* interface protocol                   */
    0x03,               /* index of intf. string                */
/*};*/
/*static const unsigned char endp_desc[] = {*/
    /* pipe 0 */
    7,                  /* length of this desc.                 */
    5,                  /* ENDPOINT descriptor                  */
    0x81,               /* address (IN)                         */
    0x02,               /* attributes  (BULK)                   */
    0x40,0x00,          /* max packet size (64)                 */
    255,                /* interval (ms)                        */
    /* pipe 1 */
    7,                  /* length of this desc.                 */
    5,                  /* ENDPOINT descriptor                  */
    0x02,               /* address (OUT)                        */
    0x02,               /* attributes  (BULK)                   */
    0x40,0x00,          /* max packet size (64)                 */
    255,                /* interval (ms)                        */

    /* pipe 2 (not use) */
    7,                  /* length of this desc.                 */
    5,                  /* ENDPOINT descriptor                  */
    0x83,               /* address (IN)                         */
    0x02,               /* attributes  (BULK)                   */
    0x40,0x00,          /* max packet size (64)                 */
    255,                /* interval (ms)                        */
};
```

```
static const char lang_data[] = {
        4,3,9,4             /* LANGID (English)                                    */
};

static const char mfg_str[] = {
        18,3,
        'U',0,'S',0,'B',0,' ',0,'T',0,'E',0,'S',0,'T',0,
};



static const char nbr_str[] = {
    8,3,
    '1',0,'.',0,'0',0,
};

static const char int_str[] = {
    34,3,
    'U',0,'S',0,'B',0,' ',0,
    'T',0,'E',0,'S',0,'T',0,' ',0,'P',0,'R',0,'O',0,'G',0,'R',0,'A',0,'M',0,
};

static void wait(int c)
{
    int         i,j;
    for(j=0;j<c;j++)
    {
        for(i=0;i<0x682;i++)
```

```
            {
            }
        }
    }

    /*-----------------------------------------------------------*/
    /* USB初期化 */
    void InitUSB()
    {
        init_usbbuff();
        ResetUSB();
        RegisterSet();
        WakeupUSB();
    /*     PrintSCI(" REV = %d¥n",ReadUSB(USB_RID)); */
    /*     PrintSCI(" CLOCK = %02X¥n",ReadUSB(USB_CCONF)); */

    }

    static void RegisterSet()
    {
        STALLD = 0;
        senddesc = 0;
        DATA0_1 = 0;
        SETADDR = 0;

        WriteUSB(USB_FAR,USB_AD_EN+0);                  /* アドレス初期化     */
        WriteUSB(USB_EPC0,USB_EP_EN);                   /* EP0をｲﾈｰﾌﾞﾙ         */
        WriteUSB(USB_NAKMSK,USB_NAK_O0);                /* NAK MASKをｾｯﾄ */
        WriteUSB(USB_TXMSK,USB_TXFIFO0+USB_TXFIFO1+USB_TXFIFO2+USB_TXFIFO3);    /* TX MASK
```

```
をｾｯﾄ */
    WriteUSB(USB_RXMSK,USB_RXFIFO0+USB_RXFIFO1+USB_RXFIFO2+USB_RXFIFO3);  /* RX MASK
をｾｯﾄ */
    WriteUSB(USB_ALTMSK,USB_SD3+USB_RESET_A);          /* ALT MASKをｾｯﾄ */
    WriteUSB(USB_MAMSK,USB_INTR_E+USB_RX_EV+USB_NAK+USB_TX_EV+USB_ALT);          /*
MAIN MASKをｾｯﾄ */
    FlushTXC(0);
    FlushRXC(1);
    FlushTXC(1);
    WriteUSB(USB_TXC1,0);
    WriteUSB(USB_RXC1,0);
    WriteUSB(USB_RXC0,USB_RX_EN);                  /* RX0をｲﾈｰﾌﾞﾙ        */
}

static void ResetUSB()
{
    WriteUSB(USB_MCNTRL,USB_SRST+USB_VGE);                /* USBリセット 3.3V供給 */
    wait(100);                                          /* 100msec */
    WriteUSB(USB_MCNTRL,USB_INT_L_P+USB_VGE);             /* 割込みはactive low push pull */
    WriteUSB(USB_CCONF,USB_CLKDIV-1);                     /* 48MHz/4 = 12MHz */
}

static void WakeupUSB()
{
    WriteUSB(USB_NFSR,USB_OPR_ST);                        /* 動作可にする */
    WriteUSB(USB_MCNTRL,USB_INT_L_P+USB_NAT+USB_VGE);     /* USBのﾉｰﾄﾞを動作可にする */
}

/* USBポートデータ表示 */
```

```
/* ※リードすると、ステータスが変わるレジスタもあるので注意 */
void DispUSBPort()
{
        int         i,j;
        PrintSCI("00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F¥n");
        for(j=0;j<4;j++)
        {
            for(i=0;i<16;i++)
                PrintSCI("%02X ",ReadUSB(i+j*16));
            PrintSCI("¥n");
        }
}

/*-----------------------------------------------------------*/
/* USB割り込み */
#ifdef  __GNUC__
void usb_int()  __attribute__ ((interrupt_handler));
#endif
void usb_int()
{
    unsigned char   nakevent,rxevent,txevent,altevent;
    char    reg;


    usbevent = ReadUSB(USB_MAEV);

    if( usbevent & USB_NAK )
    {
```

```
        nakevent = ReadUSB(USB_NAKEV);
        if( nakevent & USB_NAK_O0 )
        {
            nako0();
        }
        if( nakevent & USB_NAK_O1 )
        {
            nako1();
        }
        else if( nakevent & USB_NAK_I0 )
        {
            naki0();
        }
        else if( nakevent & USB_NAK_I1 )
        {
            naki1();
        }
    }
    else if( usbevent & USB_RX_EV )
    {
        rxevent = ReadUSB(USB_RXEV);
        if( rxevent & USB_RXFIFO0 )
        {
            rx0();
        }
        else if( rxevent & USB_RXFIFO1 )
        {
            rx1();
        }
```

```
}
else if( usbevent & USB_TX_EV )
{
    txevent = ReadUSB(USB_TXEV);
    if( txevent & USB_TXFIFO0 )
    {
        tx0();
    }
    else if( txevent & USB_TXFIFO1 )
    {
        tx1();
    }
}
else if( usbevent & USB_ALT )
{
    altevent = ReadUSB(USB_ALTEV);
    if( altevent & USB_RESET_A )
    {
        /* リセット */
        RegisterSet();
        WakeupUSB();
    }
    else if( altevent & USB_SD3 )
    {
        /* サスペンド */
        /* ALTMSKをｾｯﾄ          */
        WriteUSB(USB_ALTMSK,USB_RESUME_A+USB_RESET_A);
        /* ﾉｰﾄﾞをｻｽﾍﾟﾝﾄﾞ */
        WriteUSB(USB_NFSR,USB_SUS_ST);
```

```
        }
        else if( altevent & USB_RESUME_A )
        {
            /* リジューム */
            /* ALTMSKをｾｯﾄ                */
            WriteUSB(USB_ALTMSK,USB_SD3+USB_RESET_A);
            /* ﾉｰﾄﾞを動作可能にする */
            WriteUSB(USB_NFSR,USB_OPR_ST);
        }
    }
}

/*================================================================
                        RXイベントの処理
================================================================*/
/* RX0(system) */
/*
 リクエストコードの取得
        0 byte
            D7 ... データ方向 0=ホスト->デバイス , 1=デバイス->ホスト
            D6-D5 ... タイプ
                    0:標準 , 1:クラス , 2:ベンダ , 3:予約
            D4-D0 ... 受信側
                    0:デバイス , 1:インターフェイス , 2:エンドポイント , 3:その他
        1 byte
            特定のリクエスト
        2 byte
            value
```

```
        2 byte
            index
        2 byte
            length
*/
static void rx0()
{
    unsigned char   rxstat;
    rxstat = ReadUSB(USB_RXS0);
    if( rxstat & USB_SETUP_RX )
    {
        ReadUSBBurst(USB_RXD0,USB_RXS0,(char*)usbbuff,8);
        FlushRXC(0);
        FlushTXC(0);
        ClearStallUSB(USB_EPC0);
        if( (usbbuff[0] & 0x60) == 0 )
        {
            /* 標準リクエスト */
            switch( usbbuff[1] )
            {
                case    USB_CLEAR_FEATURE :
                    clrfeature();
                    break;
                case    USB_GET_CONFIGURATION :
                    WriteUSB(USB_TXD0,configno);
                    break;
                case    USB_GET_DESCRIPTOR :
                    getdescriptor();
```

```
                break;
            case    USB_GET_STATUS :
                getstatus();
                break;
            case    USB_GET_INTERFACE :
                WriteUSB(USB_TXD0,0);
                break;
            case    USB_SET_ADDRESS :
                WriteUSB(USB_EPC0,USB_DEF);
                SETADDR = usbbuff[2]¦USB_AD_EN;
                WriteUSB(USB_FAR,SETADDR);
                break;
            case    USB_SET_CONFIGURATION :
                setconfiguration();
                break;
            case    USB_SET_FEATURE :
                setfeature();
                break;
            case    USB_SET_INTERFACE :
                if( usbbuff[2] != 0 )
                    SetStallUSB(USB_EPC0);
                break;
            default :
                /* 未定義 */
                SetStallUSB(USB_EPC0);
                break;
        }
    }
    else if( (usbbuff[0] &0x60 ) ==  0x20 )
```

```
        {
            /* クラスリクエスト */
            SetStallUSB(USB_EPC0);
        }
        else if( (usbbuff[0] &0x60 ) ==  0x40 )
        {
            /* ベンダリクエスト */
            SetStallUSB(USB_EPC0);
        }
        else
        {
            /* 未定義 */
            SetStallUSB(USB_EPC0);
        }
        /* SETUPなのﾃﾞｰﾀの有無に関係無くDATA1として送信 */
        DATA0_1 ¦= 1;
        TxTogle(0);
    }
    else
    {
        if( senddesc )
        {
            senddesc = 0;
        }
        FlushTXC(0);
        WriteUSB(USB_RXC0,USB_RX_EN);
    }
}
```

```
/*-----------------------------------------------------------*/
/* RX1 受信 */
static void rx1()
{
    int             cnt;
    unsigned char   rxstat;
    rxstat = ReadUSB(USB_RXS1);             /* RX1ステータス取得 */
    /* SETUP,ERRORパケットでない */
    if( !(rxstat & (USB_SETUP_RX¦USB_RX_ERR)) )
    {
        /* ホストからデータの受信 */
        /* FIFOからデータ取得 */
        cnt = ReadUSBBurst(USB_RXD1,USB_RXS1,(char*)rx1buff,64);
        /* リングバッファに書き込み */
        write_inbuff((char*)rx1buff,cnt);
    }
    FlushRXC(1);                            /* バッファをフラッシュ */
    WriteUSB(USB_RXC1,USB_RX_EN);       /* 受信可に設定                 */
}

/*-----------------------------------------------------------*/
/* RX2 受信(not use) */
static void rx2()
{
    unsigned char   rxstat;
    rxstat = ReadUSB(USB_RXS2);
}

/*===========================================================
```

```
                                TXイベントの処理
==========================================================================*/
/* TX0 送信終了 */
static void tx0()
{
    unsigned char   txstat;
    txstat = ReadUSB(USB_TXS0);
    if( (txstat & USB_ACK_STAT) && (txstat & USB_TX_DONE) )
    {
        /* ok */
        FlushTXC(0);
        if( senddesc )
        {
            send_desc();
            TxTogle(0);                         /* TX0送信可 */
        }
        else
        {
            WriteUSB(USB_RXC0,USB_RX_EN);   /* RX0受信可 */
        }
    }
    else
    {
        /* error ? */
    }
}

/*--------------------------------------------------------*/
```

```
/* TX1送信終了 */
static void tx1()
{
    unsigned char   txstat;
    txstat = ReadUSB(USB_TXS1);
    if( (txstat & USB_ACK_STAT) && (txstat & USB_TX_DONE) )
    {
        /*
            送信終了後に次の送信データを送信するようにする
            送信データが無い場合、HOSTには0バイトで送る
        */
        SendTX1();
    }
    else
    {
        /*
            送ったサイズより小さい読み込みが行われた場合、こちらにくる場合がある
        */
    }
}

/*==========================================================================
                                NAKイベントの処理
==========================================================================*/
/*
    NAKイベントは、エラーが発生した場合など再送信する場合処理する
    NAK0しかENABLEにしていないので、それ以外は処理無し
*/
static void nako0()
```

```
{
}
static void nako1()
{
}
static void naki0()
{
}

static void naki1()
{
}



/*=============================================================
                        標準リクエストの処理
=============================================================*/
/* 選択機器 */
static void clrfeature()
{
    if( (usbbuff[0] & 3) == 2 )
    {
        /* エンドポイントデータ */
        if((usbbuff[3]&7) != 0 )
            ClearStallUSB(epctbl[usbbuff[3]&7]);
        STALLD &= -1 ^ (1<<(usbbuff[3]&7));
    }
}
static void setfeature()
```

```
{
    if( (usbbuff[0]&3) == 2 )           /* ENDPOINT */
    {
        /* エンドポイントデータ */
        if((usbbuff[3]&7) != 0 )
            SetStallUSB(epctbl[usbbuff[3]&7]);
        STALLD |= (1<<(usbbuff[3]&7));
    }
}

/*-------------------------------------------------------------*/
/* ディスクリプタを返す */
static void getdescriptor()
{
    DATA0_1 &= 0xfe;
    switch( usbbuff[3] )
    {
        case   USB_DEVICE :
            send_desc_sub((void*)dev_desc,dev_desc[0]);
            break;
        case   USB_CONFIGURATION :
        {
            send_desc_sub((void *)cfg_desc,cfg_desc[2]);
            break;
        }
        case   USB_XSTRING :
        {
            switch( usbbuff[2] )
            {
```

```
                case  0 :
                    send_desc_sub((void *)lang_data,lang_data[0]);
                    break;
                case  1 :
                    send_desc_sub((void *)mfg_str,mfg_str[0]);
                    break;
                case  2 :
                    send_desc_sub((void *)nbr_str,nbr_str[0]);
                    break;
                case  3 :
                    send_desc_sub((void *)int_str,int_str[0]);
                    break;
            }
            break;
        }
        default :
        {
        }
    }
}

static void send_desc_sub(void *ptr,int size)
{
    desc_size = (usbbuff[7] << 8) + usbbuff[6];
    /* 受信要求バッファ以上はデータを送らない */
    if( desc_size > size )  desc_size = size;
    desc_ptr = ptr;
    senddesc = 1;   /* ディスクリプタ送信中フラグを立てる */
```

```
    send_desc();
}

static void send_desc()
{
    int         sz;
    sz = 8;
    if( desc_size == 0 )    return;
    if( desc_size <= 8 )    sz = desc_size;
    sz = WriteUSBBurst(USB_TXD0,USB_TXS0,desc_ptr,sz);
    desc_size -= sz;
    desc_ptr += sz;
    if( desc_size == 0 )    senddesc = 0;
}
/*-------------------------------------------------------------*/
/* ステータス */
static void getstatus()
{
    int         data,ep;
    data = usbbuff[0]&3;
    if( (data == 0) || (data == 1) )       /* DEVICE,INTERFACE */
    {
        WriteUSB(USB_TXD0,0);
        WriteUSB(USB_TXD0,0);
    }
    else if( data== 2)                          /* エンドポイント */
    {
        ep = usbbuff[3]&7;
        /* epのSTALL状態を送信 */
```

```
        if( STALLD & (1<<ep) )  WriteUSB(USB_TXD0,1);
        else                    WriteUSB(USB_TXD0,0);
    }
    else
    {
        WriteUSB(USB_TXD0,0);
    }
}

/*-------------------------------------------------------*/
static void setconfiguration()
{
    configno = usbbuff[2];
    if( configno == 0 )
    {
        WriteUSB(USB_EPC1,0);           /* EPC1を使用不可 */
        WriteUSB(USB_EPC2,0);           /* EPC2を使用不可 */
        WriteUSB(USB_EPC3,0);           /* EPC3を使用不可 */
        WriteUSB(USB_EPC4,0);           /* EPC4を使用不可 */
        WriteUSB(USB_EPC5,0);           /* EPC5を使用不可 */
        WriteUSB(USB_EPC6,0);           /* EPC6を使用不可 */
    }
    else
    {
        STALLD = 0;
        FlushTXC(1);
        /* EPC1をｱﾄﾞﾚｽ1としてｲﾈｰﾌﾞﾙ */
        WriteUSB(USB_EPC1,USB_EP_EN+01);
        /* TX1送信可 */
```

```
        WriteUSB(USB_TXC1,USB_TX_EN¦USB_TX_LAST);


        FlushRXC(1);
        /* EPC2をｱﾄﾞﾚｽ2としてｲﾈｰﾌﾞﾙ */
        WriteUSB(USB_EPC2,USB_EP_EN+02);
        /* RX1受信可 */
        WriteUSB(USB_RXC1,USB_RX_EN);
        /*
            USB_TX_LASTを立てると、READ時ストールしなくなる。
            ただし、データを送る前の最初のREADは0byteになります。
            host側は複数のリクエストを同時発行できないので、
            リクエストがストールするのはまずいの回避。
        */
    }
}

/*============================================================
                        汎用ルーチン
============================================================*/
/* STALLのセットとクリア */
static void SetStallUSB(int adr)
{
    WriteUSB(adr,ReadUSB(adr) ¦ 0x80);
}

static void ClearStallUSB(int adr)
{
    WriteUSB(adr,ReadUSB(adr)&0x7f);
}
```

```
/* FIFOのフラッシュ */
static void FlushRXC(int no)
{
	WriteUSB(rxcreg[no],USB_FLUSH);
}

static void FlushTXC(int no)
{
	int		d;
	d = ReadUSB(txcreg[no]);
	d ¦= USB_FLUSH;
	WriteUSB(txcreg[no],d);
}

/* 送信終了フラグセット */
/* reg = USB_TXC0～6	*/
static void TxTogle(int no)
{
	unsigned char	d;
	d = USB_TX_EN;
	if( DATA0_1 & (1<<no) ) d ¦= USB_TX_TOGL;
	else			d &= ˜USB_TX_TOGL;
	d ¦= USB_TX_LAST;
	WriteUSB(txcreg[no],d);
	DATA0_1 ^= (1<<no);
}
```

```
/*-----------------------------------------------------------*/
/* USBのアドレスから読み込み */
static unsigned char ReadUSB(int adr)
{
	USB9602R = (unsigned char)adr;
	return( USB9602D );
}
/* USBのアドレスへ書き込み */
static void WriteUSB(int adr,int data)
{
	USB9602R = (unsigned char)adr;
	USB9602D = (unsigned char)data;
}


/* バーストト転送 */
static int ReadUSBBurst(int adr,int adr2,char *buff,int cnt)
{
	int		i;
	int		rcnt;
	USB9602R = (unsigned char)adr;
	for(rcnt=0,i=0;i<cnt;i++)
	{
		if( (ReadUSB(adr2) & 0xf) == 0 )	break;

		USB9602R = (unsigned char)adr;
		*buff = USB9602D;
		buff++;
		rcnt++;
```

```
	}
	return(rcnt);
}

static int WriteUSBBurst(int adr,int adr2,char *buff,int cnt)
{
	int		i,scnt;
	for(scnt=0,i=0;i<cnt;i++)
	{
		if( (ReadUSB(adr2) & 0x1f) == 0 )	break;

		USB9602R = (unsigned char)adr;
		USB9602D = *buff;
		buff++;
		scnt++;
	}
	return(scnt);
}

/*==========================================================================
				サンプルプログラム
==========================================================================*/
/* TX1送信ルーチン */
/*
	USBから一方的に送信できないため、今回は、
	TX1送信終了時にバッファ(outbuff)にあるデータを送信します。
	よって、HOSTからは定期的にREADを行う。
	それ以外のタイミングではEPC1のFIFOバッファのサイズに注意する。
*/
```

```
static int SendTX1()
{
	int		c,cnt,sz,i;

	cnt = 0;
	/* FIFOは最大64byte */
	sz = read_outbuff((char*)rx2buff,64);
	FlushTXC(1);	/* 送信バッファをフラッシュ */
	if( sz != 0 )
	{
		/* バースト転送 */
		cnt = WriteUSBBurst(USB_TXD1,USB_TXS1,(char*)rx2buff,sz);
	}
	TxTogle(1);		/* 送信終了処理 */
	return( cnt );	/* 送信データ数を返す sz==cntのはず */
}

/*-------------------------------------------------------------*/
/*
 送受信バッファ
	inbuffがHOSTから送られてきたデータのバッファ
	outbuffがHOSTへ送るデータ用
	このサンプルではリングバッファを超えた分は捨てられます。
	今回は、256バイト確保しています。バッファがあふれないように
	メイン側で処理してください。
*/
#define	USBBUFFLEN	256		/* バッファのサイズ */
static int	inpos,inlen;		/* 入力バッファ位置、サイズ */
static int	outpos,outlen;		/* 出力バッファ位置、サイズ */
```

```
static char    inbuff[USBBUFFLEN];          /* 入力リングバッファ */
static char    outbuff[USBBUFFLEN];   /* 出力リングバッファ */

/*-------------------------------------------------------------*/
/*                              バッファの初期化                                */
/*-------------------------------------------------------------*/
void init_usbbuff()
{
      inpos = inlen = 0;
      outpos = outlen = 0;
}

/*-------------------------------------------------------------*/
/*                    HOSTからの受信バッファへ書き込み                    */
/*     char        *p          バッファポインタ                              */
/*     int              size   書き込みサイズ                                */
/*     戻り値                   書き込んだサイズ                              */
/*-------------------------------------------------------------*/
int write_inbuff(char *p,int size)
{
      int          i;
      INTC.IER &= (-1^0x20);                  /* IRQ5 Disable */
      for(i=0;i<size;i++)
      {
      if( inlen >= USBBUFFLEN )      break;
      inbuff[inpos] = *p;
      inpos = (inpos + 1)%USBBUFFLEN;
      inlen++;
```

```
        p++;
    }
        INTC.IER |= 0x20;                       /* IRQ5 Enable */
        return(i);
}
/*-------------------------------------------------------------*/
/*                      送信バッファへ書き込み                 */
/*    char      *p        バッファポインタ                     */
/*    int           size   書き込みサイズ                      */
/*    戻り値              書き込んだサイズ                     */
/*-------------------------------------------------------------*/
int write_buff(char *p,int size)
{
        int         i;
        INTC.IER &= (-1^0x20);                  /* IRQ5 Disable */
        for(i=0;i<size;i++)
        {
        if( outlen >= USBBUFFLEN )    break;
        outbuff[outpos%USBBUFFLEN] = *p;
        outpos = (outpos + 1)%USBBUFFLEN;
        outlen++;
        p++;
    }
        INTC.IER |= 0x20;                       /* IRQ5 Enable */
        return(i);
}

/*-------------------------------------------------------------*/
/*                      送信バッファから読み込み               */
```

```
/*     char        *p          バッファポインタ                          */
/*     int             size    バッファ最大サイズ                        */
/*     戻り値                  読み込んだサイズ                          */
/*--------------------------------------------------------------*/
int read_outbuff(char *p,int size)
{
    int    i;
    INTC.IER &= (-1^0x20);                  /* IRQ5 Disable */
    for(i=0;outlen>0;i++)
    {
        if( i >= size ) break;
        p[i] = outbuff[ (USBBUFFLEN+outpos-outlen)%USBBUFFLEN ];
        outlen--;
    }
    INTC.IER |= 0x20;                       /* IRQ5 Enable */
    return(i);
}
/*--------------------------------------------------------------*/
/*                      受信バッファから読み込み                */
/*     char        *p          バッファポインタ                          */
/*     int             size    バッファ最大サイズ                        */
/*     戻り値                  読み込んだサイズ                          */
/*--------------------------------------------------------------*/
int read_buff(char *p,int size)
{
    int    i;
    INTC.IER &= (-1^0x20);                  /* IRQ5 Disable */
    for(i=0;inlen>0;i++)
    {
```

```
        if( i >= size ) break;
        p[i] = inbuff[ (USBBUFFLEN+inpos-inlen)%USBBUFFLEN ];
        inlen--;
    }
    INTC.IER |= 0x20;                   /* IRQ5 Enable */
    return(i);
}
/*-------------------------------------------------------------*/
/*                      受信バッファのサイズ取得                    */
/*-------------------------------------------------------------*/
int get_inbufflen()
{
    return( inlen%USBBUFFLEN );
}

/*-------------------------------------------------------------*/
/*                      送信バッファのサイズ取得                    */
/*-------------------------------------------------------------*/
int get_outbufflen()
{
    return( outlen%USBBUFFLEN );
}
```

```
/*

                    SCI処理

                                                    (C)2002 C.I.M

*/

#include    <stdio.h>
#include    <stdarg.h>
#include    "h83048.h"


static  char buff[80]; /* 文字列展開用バッファ(必要なら増やす) */


/*=================================================================
                                SCI初期化
-----------------------------------------------------------------
    9600bps ﾊﾟﾘﾃｨ無し STOP1
=================================================================*/
void InitSCI()
{
    int         i;
    SCI1.SCR = 0;
    SCI1.SMR = 0;                   /* ﾊﾟﾘﾃｨ無し STOP1                  */
    SCI1.BRR = 80;                  /* 9600bps     3052                */
    for(i=0;i<280;i++)    {}        /* wait                            */
    SCI1.SCR = 0x30;                /* TE = 1 , RE = 1                 */
    i = SCI1.SSR;
    SCI1.SSR = 0x80;                /* Clear Error Flag (TDRE=1)    */
```

```
}

/*================================================================
                        SCI出力
----------------------------------------------------------------
================================================================*/
void PutSCI(char c)
{
    unsigned char   i;
    while( 1 )
    {
        i = SCI1.SSR;
        if( i & 0x80 )      break;
    }
    SCI1.TDR = c;
    SCI1.SSR = i&0x7f;
}

/*================================================================
                        SCI入力
----------------------------------------------------------------
    データを受信するまで待ちつづけます。
================================================================*/
char GetSCI()
{
    unsigned char   i;
    char            c;
    while( 1 )
    {
```

```
        i = SCI1.SSR;
        if( i & 0x40 )      break;
    }
    c = SCI1.RDR;
    SCI1.SSR = i&0xbf;
    return(c);
}

/*=============================================================
                        SCI入力データチェック
-------------------------------------------------------------
    SCIにデータがあるかチェックします。
    戻り値          1 = データあり、0 = データなし
=============================================================*/
int ScanSCI()
{
    if( SCI1.SSR & 0x40 )   return(1);
    return(0);
}

/*=============================================================
                        SCI文字列出力
-------------------------------------------------------------
書式はprintf()と同じです。バッファは80文字分しか取っていないので、
必要ならば、増やしてください。
=============================================================*/
void PrintSCI(char *fmt, ...)
{
    int         i;
```

```
    va_list arg;
    va_start(arg, fmt);
    *buff = '¥0';
    vsprintf(buff,fmt,arg);
    va_end(arg);

    for(i=0;;i++)
    {
        if( buff[i] == 0 )      break;
        /* 改行コードは2バイトにして送信 */
        if( buff[i] == '¥n' )   PutSCI('¥r');
        PutSCI(buff[i]);
    }
}
```

```
/*

        LCD処理

                                                (C)2002 C.I.M
*/



#include      <stdio.h>
#include      <stdarg.h>
#include      "h83048.h"

void ClearLCD();

/* PortB (write) b0..3 = LCD(LED) out , bit4 = LCD RS , bit7 = LCD E */
#define       LCD_RS              0x10
#define       LCD_E               0x80
#define       LCDMASK             0x60

static void wait(int c)
{
    int         i,j;
    for(j=0;j<c;j++)
    {
        for(i=0;i<0x682;i++)    {}
    }
}
```

```
/*====================================================================
                                LCD BYTE 出力
====================================================================*/
/*
    今回の基板は4bit接続なので、下位4bitのみ出力
*/
static void LCDOut8(short rs,short code)
{
    int         stat;
    int         pb;

    pb = PB.DR;                         /* 現在のPBDを退避 */

    if( rs )    stat = (pb & LCDMASK) ¦ LCD_RS;
    else        stat = (pb & LCDMASK);
    PB.DR = code ¦ stat ¦ LCD_E;
    PB.DR = code ¦ stat;
    PB.DR = pb;                         /* 元のPBDに復帰 */
    wait(4);
}

/*====================================================================
                                LCD BYTE 出力(4bit)
====================================================================*/
void LCDOut4(int rs,int code)
{
    int         stat;
    int         pb;
    char    lb,hb;
```

```
    pb = PB.DR;                         /* 現在のPBDを退避 */

    if( rs )        stat = (pb & LCDMASK) ¦ LCD_RS;
    else            stat = (pb & LCDMASK);

    hb = ((code>>4)&0xf) ¦ stat;
    lb = (code&0xf) ¦ stat;

    PB.DR = hb ¦ LCD_E;
    PB.DR = hb;

    PB.DR = lb ¦ LCD_E;
    PB.DR = lb;

    PB.DR = pb;                         /* 元のPBDに復帰 */
    wait(4);
}

/*================================================================
                        LCD コントロール
----------------------------------------------------------------
    LCD初期化、表示、クリア
================================================================*/

void InitLCD()
{
    int         i;
    wait(15);
```

```
    for(i=0;i<3;i++)
    {
        LCDOut8(0,0x3);
    }
    LCDOut8(0,0x2);


    LCDOut4(0,0x28); /* bit4=8/4bit , bit3=1/2line , bit2=large/small */
    LCDOut4(0,0x10); /* bit3=Display/Cursor , bit2=Right/Left */
    LCDOut4(0,0x0e); /* bit2=display , bit1=coursor , bit0=blink */
    LCDOut4(0,0x06);

    LCDOut4(0,0x01); /* クリア */
    LCDOut4(0,0x02); /* カーソルホーム */

}


/*================================================================
                                LCD クリア
----------------------------------------------------------------
    LCD初期化、表示、クリア
================================================================*/
void ClearLCD()
{
    LCDOut4(0,0x01);      /* クリア */
    LCDOut4(0,0x02);      /* カーソルホーム */
}
```

```
/*================================================================
                        LCDキャラクタ表示
----------------------------------------------------------------
    '¥n','¥r','¥f'はLCDクリア処理を行います。
================================================================*/
void PutLCD(char c)
{
    if( c == '¥f' ) ClearLCD();
    else if( c == '¥n' )   ClearLCD();
    else if( c == '¥r' )   ClearLCD();
    else LCDOut4(1,c);
}

/*================================================================
                        LCDカーソル移動
----------------------------------------------------------------
    x = 0～15
    y = 0,1
================================================================*/
void LocateLCD(int x,int y)
{
    LCDOut4(0,0x80 + y*0x40 + x);
}

/*================================================================
                        LCD文字列表示
----------------------------------------------------------------
    パラメータはprintf()と同じです。64文字を超えないように設定してく
```

```
      ださい。'¥f'はLCDクリア、'¥n'は改行。
==========================================================================*/
void PrintLCD(char *fmt,...)
{
      int           i;
      static  char    buff[64];
      va_list arg;
      va_start(arg, fmt);
      *buff = '¥0';
      vsprintf(buff,fmt,arg);
      va_end(arg);
      for(i=0;;i++)
      {
            if( buff[i] == 0 ) break;
            else if( buff[i] == '¥n' ) LocateLCD(0,1); /* 改行 */
            else if( buff[i] == '¥r' ) LCDOut4(0,0x2); /* カーソルホーム */
            else if( buff[i] == '¥f' ) ClearLCD(); /* LCDクリア */
            else LCDOut4(1,buff[i]); /* データ出力 */
      }
}
```

本文

```
/* C.h */

#define USE_THREAD
/* #define USE_BCC */
/* #define USE_LINUX */
/* #define USE_RASPBIAN */
#ifdef USE_RASPBIAN
#define USE_LINUX
#endif
#ifdef USE_LINUX
#define USE_BCC
#endif
#include <stdio.h> /* printf() */
#include <string.h> /* strcmp(), strlen() */
#include <stdlib.h> /* calloc(), free(), rand() */
#ifndef USE_BCC
/* AKI-H8 3052F USB */
#include "h83048.h"
#define SLEEP_PER_SEC 16000.0
#define NOTUSE_FILES
#else
/* time_t, tm, time(), clock(), CLOCKS_PER_SEC */
#include <time.h>
#ifdef USE_LINUX
#include <termios.h> /* kbhit() */
#include <unistd.h> /* kbhit() */
#include <fcntl.h> /* kbhit() */
#ifdef USE_RASPBIAN
/* Raspberry Pi 3 Model B I/O */
#include <wiringPi.h>
#endif
#else
#include <conio.h> /* kbhit(), getche() */
#endif
#define SLEEP_PER_SEC 100000000.0
#endif
#ifdef USE_LINUX
#define CLEAR system("clear")
#else
#define CLEAR system("cls")
#endif
#define OK 0
#define NG 1
#define ONE_MORE_TIME 2
#define ON 1
#define OFF 0
```

```
/* Panel.h */

#ifndef USE_BCC
/*=============================================================
                        外部参照
=============================================================*/
/* asmfile.src 内に定義 */
extern  void EnableInterrupt(void);
extern  void DisableInterrupt(void);
/* lcd.c */
extern  void InitLCD(void);
extern  void PrintLCD(char *fmt,...);
extern  void PutLCD(char c);
/* usb.c */
extern  void InitUSB(void);
extern  void DispUSBPort(void);
/* バッファ処理 */
extern  int get_inbufflen(void);
extern  int write_buff(char *p,int size);
extern  int read_buff(char *p,int size);
/* sci.c */
extern  void InitSCI(void);
extern  void PrintSCI(char *fmt, ...);
extern  int ScanSCI(void);
extern  char GetSCI(void);
/* main.c内定義 */
void H8init(void);
int SetLED(int no,int onoff);
```

```
int GetSW(int no);
#endif
/* 表示を表す列挙体宣言 */
enum PrintF
{
 Panel,
 ClsPnl,
 InputCommand,
 Monitor
};
/* 画面クリア */
void Clear(void);
/* 表示を表す関数のプロトタイプ宣言 */
void PrintF(int mode, char *str);
#ifdef USE_LINUX
int kbhit(void);
#endif
```

```
/* Panel.c */

#include "C.h"
#include "Panel.h"

/* 画面クリア */
void Clear(void)
{
#ifndef USE_BCC
 static char buff[64];
 sprintf(buff,"¥f");
 PrintLCD(buff);
#else
 CLEAR;
#endif
}

/* 表示のための関数 */
void PrintF(int mode, char *str)
{
#ifndef USE_BCC
 static char buff[64];
#endif
 switch(mode)
 {
 case ClsPnl:
#ifndef USE_BCC
  Clear();
```

```
  if(strcmp(str, "¥n¥0") == 0)
  {
      sprintf(str, "%s", "¥n¥f");
  }
  sprintf(buff,"%s", str);
  PrintSCI("%s",buff);
  PrintLCD(str);
#endif
  break;
 case Panel:
#ifndef USE_BCC
  if(strcmp(str, "¥n¥0") == 0)
  {
      sprintf(str, "%s", "¥n¥f");
  }
  sprintf(buff,"%s", str);
  PrintSCI("%s",buff);
  PrintLCD(str);
#else
  printf("%s", str);
#endif
  break;
 case InputCommand:
#ifdef USE_BCC
  printf("%s", str);
#endif
  break;
 case Monitor:
#ifndef USE_BCC
```

```
  sprintf(buff,"%s", str);
  PrintSCI("%s",buff);
  write_buff(buff,strlen(buff)+1);
#else
  printf("%s", str);
#endif
  break;
 default:
  break;
 }
 return;
}

#ifdef USE_LINUX
int kbhit(void)
{
    struct termios oldt, newt;
    int ch;
    int oldf;

    tcgetattr(STDIN_FILENO, &oldt);
    newt = oldt;
    newt.c_lflag &= ~(ICANON | ECHO);
    tcsetattr(STDIN_FILENO, TCSANOW, &newt);
    oldf = fcntl(STDIN_FILENO, F_GETFL, 0);
    fcntl(STDIN_FILENO, F_SETFL, oldf | O_NONBLOCK);

    ch = getchar();
```

```
    tcsetattr(STDIN_FILENO, TCSANOW, &oldt);
    fcntl(STDIN_FILENO, F_SETFL, oldf);

    if (ch != EOF) {
        ungetc(ch, stdin);
        return 1;
    }

    return 0;
}
#endif
```

```
/* Timer.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

/* 疑似スレッド定義 */
#ifdef USE_THREAD
/* 疑似スレッドに使用する定数の宣言 */
#define INITCLOCKNO -1
#define STOPCLOCKNO -2

/* 構造体宣言 */
typedef struct tag_Thread
{
	/* 疑似スレッドID */
	int ID;
	/* 指定開始時 */
	double preClock;
	/* woviClockがpreClockからsetClock秒増えたらRunを呼ぶ */
	double setClock;
	/* Runが呼ばれた回数を調べるために使用(countUpNextRunが呼ばれた回数) */
	long count;
	/* List機能 */
	struct tag_Thread *previous;
	struct tag_Thread *next;
}Thread;
```

```
/* 疑似メソッドとwovi用関数のプロトタイプ宣言 */
/* 宣言の順番は以下の通り */
#endif
double getClock(void);
void SleepMSec(long ms); /* ミリ秒待ち関数 */
#ifdef USE_THREAD
void nextRun(Thread *This, long ms);
void countUpNextRun(Thread *This, long ms);
void Run(Thread *This); /* main.cで内容を定義します */
void Init(Thread *This); /* main.cで内容を定義します */
void Destroy(Thread *This); /* main.cで内容を定義します */
Thread *new_Thread(int id);
void delete_(Thread *This);
void Start(Thread *This);
void Stop(Thread *This);
int Thread_checkAllDelete(void);
int Thread_checkStayAnother(void);
Thread *Thread_getThread(int id);
Thread *Thread_Start(int id);
void Thread_Toggle(int id);
/* タイマ関数 */
void woviRun(void); /* Runを呼ぶタイミング */
void woviInit(void); /* タイマ初期化関数 */
#ifndef USE_BCC
void InitITU(void); /* タイマ割り込み用 */
void InterruptITU0(void); /* タイマ割り込み用 */
#endif
void wovi(double threadPerSec); /* タイマ関数 */
```

```
void initWOVI(void); /* タイマ初期化関数 */
#endif
#ifdef USE_BCC
void PrintCurrentTime(void); /* 現在日時表示 */
#endif
```

```
/* Timer.c */

#include "C.h"
#include "Timer.h"

/* 時間を表す外部変数宣言 */
double woviClock;

/* 疑似スレッド定義 */
#ifdef USE_THREAD
/* wovi用疑似インスタンス宣言 */
Thread woviThreadFirst;
Thread woviThreadLast;
#endif

/* 時刻取得 */
double getClock(void)
{
	return woviClock;
}

/* ミリ秒待ち関数 */
void SleepMSec(long ms)
{
#ifndef USE_BCC
	double start;
	double set;
	double end;
```

```
	start = getClock();
	set = ((double) ms) / 1000;
	end = start;
	while(end < start + set)
	{
		end = getClock();
	}
#else
	double cnt;
	double set;
	cnt = 0.0;
	set = ((double) ms) / 1000;
	while(cnt < set)
	{
		cnt += 1.0 / SLEEP_PER_SEC;
	}
#endif
	return;
}

#ifdef USE_THREAD
/* スレッドのvoid Sleep(int ms)の代用 */
void nextRun(Thread *This, long ms)
{
	This->preClock = getClock();
	This->setClock = (((double) ms) / 1000);
	return;
}
```

```
/* スレッドのvoid Sleep(int ms)の代用 */
void countUpNextRun(Thread *This, long ms)
{
	nextRun(This, ms);
	This->count++;
}

#ifndef USE_BCC
Thread th101;
Thread th102;
Thread th111;
Thread th112;
Thread th113;
Thread th114;
Thread th119;
Thread th120;
Thread th121;
Thread th122;
Thread th123;
Thread th130;
Thread th131;
Thread th141;
Thread th142;
Thread th143;
Thread th144;
#endif

/* スレッドのコンストラクタの代用 */
Thread *new_Thread(int id)
```

```
{
    Thread *List;
    Thread *new_List;
    List = &woviThreadFirst;
    while(List->next->next != NULL)
    {
        List = List->next;
    }
#ifndef USE_BCC
    if(id == 1)
    {
        new_List = &th101;
    }
    else if(id == 2)
    {
        new_List = &th102;
    }
    else if(id == 11)
    {
        new_List = &th111;
    }
    else if(id == 12)
    {
        new_List = &th112;
    }
    else if(id == 13)
    {
        new_List = &th113;
    }
```

```
else if(id == 14)
{
	new_List = &th114;
}
else if(id == 19)
{
	new_List = &th119;
}
else if(id == 20)
{
	new_List = &th120;
}
else if(id == 21)
{
	new_List = &th121;
}
else if(id == 22)
{
	new_List = &th122;
}
else if(id == 23)
{
	new_List = &th123;
}
else if(id == 30)
{
	new_List = &th130;
}
```

```
    else if(id == 31)
    {
        new_List = &th131;
    }
    else if(id == 41)
    {
        new_List = &th141;
    }
    else if(id == 42)
    {
        new_List = &th142;
    }
    else if(id == 43)
    {
        new_List = &th143;
    }
    else if(id == 44)
    {
        new_List = &th144;
    }
#endif
#ifdef USE_BCC
    new_List = (Thread *)calloc(1, sizeof(Thread));
#endif
    if(new_List == NULL)
    {
        PrintF(Panel, "¥n");
        PrintF(Panel, "calloc failed");
        return NULL;
```

```
        }
        new_List->previous = List;
        new_List->next = List->next;
        new_List->next->previous = new_List;
        List->next = new_List;
        new_List->preClock = INITCLOCKNO;
        new_List->setClock = 0;
        new_List->ID = id;
        new_List->count = 0;
        /* スレッドのvoid init(void)の代用 */
        Init(new_List);
        return new_List;
}

/* スレッドのデストラクタの代用 */
void delete_(Thread *This)
{
        Destroy(This);
        This->previous->next = This->next;
        This->next->previous = This->previous;
#ifdef USE_BCC
        free(This);
#endif
        return;
}

/* スレッドのvoid start(void)の代用 */
void Start(Thread *This)
{
```

```
	woviClock = getClock();
	This->preClock = woviClock;
	return;
}

/* スレッドのvoid stop(void)の代用 */
void Stop(Thread *This)
{
	This->preClock = STOPCLOCKNO;
	return;
}

int Thread_checkAllDelete(void)
{
	if(woviThreadFirst.next->next == NULL)
	{
		return OK;
	}
	else
	{
		return NG;
	}
}

int Thread_checkStayAnother(void)
{
	Thread *checkthread = woviThreadFirst.next->next;
	int i = 0;
	while(checkthread != NULL)
```

```
    {
        checkthread = checkthread->next;
        i = i + 1;
    }
    return i;
}

Thread *Thread_getThread(int id)
{
    Thread *th;

    if(woviThreadFirst.next->next == NULL)
    {
        return NULL;
    }
    else
    {
        th = woviThreadFirst.next;
        do
        {
            if(th->ID == id)
            {
                return th;
            }
            else
            {
                th = th->next;
            }
```

```
        }while(th->next != NULL);
    }
    return NULL;
}

Thread *Thread_Start(int id)
{
    Thread *th;

    th = Thread_getThread(id);
    if(th == NULL)
    {
        th = new_Thread(id);
        Start(th);
    }
    else if(th->preClock == STOPCLOCKNO)
    {
        Start(th);
    }
    return th;
}

void Thread_Toggle(int id)
{
    Thread *th;

    th = Thread_getThread(id);
    if(th == NULL)
    {
```

```
            th = new_Thread(id);
            Start(th);
        }
        else if(th->preClock == STOPCLOCKNO)
        {
            Start(th);
        }
        else
        {
            delete_(th);
        }
        return;
    }

    /* タイマ関数 */
    /* Runを呼ぶタイミング */
    void woviRun(void)
    {
        Thread *List;
        Thread *next_List;
        List = &woviThreadFirst;
        List = List->next;
        while(List->next != NULL)
        {
            next_List = List->next;
            if((List->preClock != INITCLOCKNO) && (List->preClock != STOPCLOCKNO))
            {
                if(woviClock >= List->preClock + List->setClock)
                {
```

```
                    List->preClock = woviClock;
                    /* スレッドのvoid run(void)の代用 */
                    Run(List);
                }
            }
            List = next_List;
        }
        return;
}

/* タイマ初期化関数 */
/* 関数main の冒頭で、 */
/* スレッド構造体リスト の 両端 を初期化します。 */
void woviInit(void)
{
        woviThreadFirst.previous = NULL;
        woviThreadFirst.next = &woviThreadLast;
        woviThreadLast.previous = &woviThreadFirst;
        woviThreadLast.next = NULL;
        return;
}

#ifndef USE_BCC
/* タイマ割り込み用 */
/* 関数main の冒頭で、 */
/* タイマ割り込み の専用設定をして、 */
/* タイマ0割り込み を立ち上げます。 */
void InitITU(void)
{
```

```
    ITU.TSTR = 0x01; /* timer 0 enable */
    ITU.TSNC = 0;
    ITU.TMDR = 0x0;
    ITU.TFCR = 0x0;
    ITU.TOER = 0x0;
    ITU.TOCR = 0xff;
    ITU0.TCR = 0x00; /* 分周なし */
    ITU0.TIOR = 0x88;
    ITU0.TIER = 0x04; /* オーバーフロー割り込み許可 */
    /* AKI-H8 3052F USB の演算速度は 25MHz なので、 */
    /* 25Kカウント すると、 1ms です。 */
    ITU0.TCNT = 0xffff - 25000; /* 1 msec interval */
    ITU0.GRA = 0;
    ITU0.GRB = 0;
}

/* タイマ割り込み用 */
/* 周りの関数が 関数main から呼び出されているのに、 */
/* この関数だけは、 asmfile.src の タイマ0割り込み から */
/* 直接呼び出されています。 */
void InterruptITU0(void)
{
    ITU0.TSR &= 0xfb;
    /* AKI-H8 3052F USB の演算速度は 25MHz なので、 */
    /* 25Kカウント すると、 1ms です。 */
    ITU0.TCNT = 0xffff - 25000; /* 1 msec interval */
    /* woviClock はシステムリセット時からの秒数時計です。 */
    woviClock += 0.001;
```

```
	return;
}
#endif

/* タイマ関数 */
void wovi(double threadPerSec)
{
#ifdef USE_BCC
	/* woviClock は秒数時計 */
#ifdef USE_LINUX
	/* threadPerSec で受け取る数値が1に近づく程、 */
	/* スピードが上がります。 */
	/* threadPerSec で受け取る数値が大きくなる程、 */
	/* スピードが下がります。 */
	/* タイマ割り込み を使用できない時に */
	/* threadPerSec を使用します。 */
	woviClock += 1.0 / threadPerSec;
#else
	/* もしくは、 <time.h> の clock() を使用します。 */
	woviClock = (double) (clock() / CLOCKS_PER_SEC);
#endif
#endif
	woviRun(); /* スレッドのためのRunを呼ぶタイミング */
	return;
}

/* タイマ初期化関数 */
void initWOVI(void)
{
```

```
	/* 関数main の冒頭で、 */
	/* 秒数時計woviClock を */
	/* 0.0秒 で初期化します。 */
	woviClock = 0.0;
	/* タイマ割り込み用 */
#ifndef USE_BCC
	/* タイマ0割り込み を立ち上げます。 */
	InitITU();
	/* asmfile.src の 割り込み許可ラベル を呼びます。 */
	EnableInterrupt();
#endif
	/* スレッド構造体リスト の 両端 を初期化します。 */
	wovilnit();
	return;
}
#endif

#ifdef USE_BCC
/* 現在日時表示 */
void PrintCurrentTime(void)
{
	time_t timer;
	struct tm *t_st;

	/* 現在時刻の取得 */
	time(&timer);

	/* 現在時刻を構造体に変換 */
	t_st = localtime(&timer);
```

```
printf("%d",t_st->tm_year+1900);
if(t_st->tm_mon+1 < 10)
{
	printf("0%d",t_st->tm_mon+1);
}
else
{
	printf("%d",t_st->tm_mon+1);
}
if(t_st->tm_mday < 10)
{
	printf("0%d",t_st->tm_mday);
}
else
{
	printf("%d",t_st->tm_mday);
}
printf(" ");
if(t_st->tm_hour < 10)
{
	printf("0%d",t_st->tm_hour);
}
else
{
	printf("%d",t_st->tm_hour);
}
if(t_st->tm_min < 10)
{
```

```
            printf("0%d",t_st->tm_min);
        }
        else
        {
            printf("%d",t_st->tm_min);
        }
        if(t_st->tm_sec < 10)
        {
            printf("0%d",t_st->tm_sec);
        }
        else
        {
            printf("%d",t_st->tm_sec);
        }

        return;
    }
    #endif
```

```
/* EV_Time.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#define OPENTIMEOUT 10

/*==============================================================
 時間を表す構造体
==============================================================*/
struct EV_Time{
	double TimeTemp;
	double *p_TimeTemp;
	int Permit;
	int *p_Permit;
	int tmpTimeSafety;
	Thread *th;
};

/*==============================================================
 時間を表すプロトタイプ宣言
```

```
==========================================================*/
void EV_Time(struct EV_Time *This, Thread *th);
void SetCurrentTime(struct EV_Time *This);
int GetCurrentTime(struct EV_Time *This);
void WaitSecond(struct EV_Time *This, int num_Second);
void SetPermit(struct EV_Time *This, int P);
int GetPermit(struct EV_Time *This);
void Checkfmove(int *p_check, int *p_fmove, int tmp);
void Wait_ms(struct EV_Time *This, int num);
```

```
/* EV_Time.c */

#include "C.h"
#include "EV_Time.h"

/*==========================================================================
  時間を表す関数
==========================================================================*/
void EV_Time(struct EV_Time *This, Thread *th)
{
	This->TimeTemp = 0;
	This->p_TimeTemp = &This->TimeTemp;
	SetCurrentTime(This);
	This->p_Permit = &This->Permit;
	This->Permit = OFF;
	This->tmpTimeSafety = 0;
	This->th = th;

	/* 戻る */
	return;
}

void SetCurrentTime(struct EV_Time *This)
{
	This->p_TimeTemp = &This->TimeTemp;
	*This->p_TimeTemp = getClock();

	/* 戻る */
```

```
	return;
}

int GetCurrentTime(struct EV_Time *This)
{
	This->p_TimeTemp = &This->TimeTemp;
	return (int) (getClock() - *This->p_TimeTemp);
}

void WaitSecond(struct EV_Time *This, int num_Second)
{
	nextRun(This->th, (num_Second * 1000));
	/* 戻る */
	return;
}

void SetPermit(struct EV_Time *This, int P)
{
	This->p_Permit = &This->Permit;
	if(P == ON) This->Permit = ON;
	else if(P == OFF) This->Permit = OFF;

	/* 戻る */
	return;
}

int GetPermit(struct EV_Time *This)
{
	This->p_Permit = &This->Permit;
```

```
	return This->Permit;
}

void Checkfmove(int *p_check, int *p_fmove, int tmp)
{
	if(*p_check != tmp){
		*p_fmove = OFF;
		*p_check = tmp;
	}

	/* 戻る */
	return;
}

void Wait_ms(struct EV_Time *This, int num){

	nextRun(This->th, num);
	/* 戻る */
	return;
}
```

```
/* EV_File.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

/*============================================================
  ファイルを表す構造体
============================================================*/
#ifdef NOTUSE_FILES
typedef struct tag_Handle_EV_Status
{
	char safety;
	char *p_limit;
	char limit[9];
	char motor;
	char command;
	char permitcommand;
	char permitturnopen;
}Handle_EV_Status;

typedef struct tag_EV_Status
{
	Handle_EV_Status *p_status;
}EV_Status;
#endif
```

```
/* ファイルストリーム */
struct EV_File
{
	FILE *fp;
};

/*==========================================================
  ファイルを表すプロトタイプ宣言
==========================================================*/
#ifdef NOTUSE_FILES
void new_EV_Status(EV_Status *This);
#endif

void EV_File(struct EV_File *This);
int Write(struct EV_File *This, char *filename, char ch);
int WriteString(struct EV_File *This, char *filename, char *str);
int Read(struct EV_File *This, char *filename, char *p_ch);
int ReadString(struct EV_File *This, char *filename, char *str, int strlength);
int PermitCommand_Read(struct EV_File *This, char *p_PermitCommand);
int PermitCommand_Write(struct EV_File *This, char PermitCommand);
int Command_Read(struct EV_File *This, char *p_Command);
int Command_Write(struct EV_File *This, char Command);
int PermitTurnOpen_Read(struct EV_File *This, char *p_PermitTurnOpen);
int PermitTurnOpen_Write(struct EV_File *This, char PermitTurnOpen);
void Motor_Write(struct EV_File *This, char Motor);
char Motor_Read(struct EV_File *This);
void Limit_Read(struct EV_File *This, char *str);
```

```
/* EV_File.c */

#include "C.h"
#include "EV_File.h"

/*==========================================================================
  ファイル不使用時大域オブジェクト宣言
==========================================================================*/
#ifdef NOTUSE_FILES
Handle_EV_Status status;
#endif

/*==========================================================================
  ファイルを表す関数
==========================================================================*/
#ifdef NOTUSE_FILES
void new_EV_Status(EV_Status *This)
{
	This->p_status = &status;
	status.safety = 'r';
	status.p_limit = &status.limit[0];
	strcpy(status.p_limit, "yynnyynn¥0");
	status.motor = 's';
	status.command = 'N';
	status.permitcommand = 'N';
	status.permitturnopen = 'N';
}
#endif
```

```
void EV_File(struct EV_File *This)
{
	/* 初期値 */
	This->fp = NULL;

	/* 戻る */
	return;
}

#ifdef NOTUSE_FILES
int Write(struct EV_File *This, char *filename, char ch)
{
	switch(filename[0])
	{
	case 'S':
		status.safety = ch;
		break;
	case 'M':
		status.motor = ch;
		break;
	case 'C':
		status.command = ch;
		break;
	case 'P':
		switch(filename[6])
		{
		case 'C':
			status.permitcommand = ch;
```

```
                break;
            case 'T':
                status.permitturnopen = ch;
                break;
            default:
                break;
            }
            break;
        default:
            break;
        }
        return OK;
    }
    #else
    int Write(struct EV_File *This, char *filename, char ch)
    {
        int Ret = OK;
        if((This->fp = fopen(filename, "w")) == NULL){
            Ret = NG;
        }
        else if(fputc((int) ch, This->fp) == ch){
            fclose(This->fp);
            Ret = OK;
        }
        else{
            fclose(This->fp);
            Ret = NG;
        }
        return Ret;
```

```
}
#endif

#ifdef NOTUSE_FILES
int WriteString(struct EV_File *This, char *filename, char *str)
{
	switch(filename[0])
	{
	case 'L':
		status.p_limit = &status.limit[0];
		strcpy(status.p_limit, str);
		break;
	default:
		break;
	}
	return OK;
}
#else
/* 文字列書き込み */
int WriteString(struct EV_File *This, char *filename, char *str)
{
	int Ret = OK;
	if((This->fp = fopen(filename, "w")) == NULL){
		Ret = NG;
	}
	/* ¥nは追記されない */
	else if(fputs(str, This->fp) >= 0){
		fclose(This->fp);
		/* 書き込み成功 */
```

```
        Ret = OK;
    }
    else{
        fclose(This->fp);
        /* 書き込み失敗 */
        Ret = NG;
    }
    return Ret;
}
#endif

#ifdef NOTUSE_FILES
int Read(struct EV_File *This, char *filename, char *p_ch)
{
    switch(filename[0])
    {
    case 'S':
        *p_ch = status.safety;
        break;
    case 'M':
        *p_ch = status.motor;
        break;
    case 'C':
        *p_ch = status.command;
        break;
    case 'P':
        switch(filename[6])
        {
```

```
            case 'C':
                *p_ch = status.permitcommand;
                break;
            case 'T':
                *p_ch = status.permitturnopen;
                break;
            default:
                break;
            }
            break;
        default:
            break;
        }
        return OK;
}
#else
int Read(struct EV_File *This, char *filename, char *p_ch)
{
        int Ret = OK;
        if((This->fp = fopen(filename, "r")) == NULL){
            Ret = NG;
        }
        else if((*p_ch = fgetc(This->fp)) == EOF){
            fclose(This->fp);
            Ret = ONE_MORE_TIME;
        }
        else if(*p_ch == '¥n'){
            fclose(This->fp);
            Ret = ONE_MORE_TIME;
```

```
        }
        else if(*p_ch == 'N'){
            fclose(This->fp);
            Ret = ONE_MORE_TIME;
        }
        else{
            fclose(This->fp);
            Ret = OK;
        }
        return Ret;
    }
    #endif

    #ifdef NOTUSE_FILES
    int ReadString(struct EV_File *This, char *filename, char *str, int strlength)
    {
        switch(filename[0])
        {
        case 'L':
            status.p_limit = &status.limit[0];
            strcpy(str, status.p_limit);
            break;
        default:
            break;
        }
        return OK;
    }
    #else
    int ReadString(struct EV_File *This, char *filename, char *str, int strlength)
```

```
{
	int Ret = OK;
	if((This->fp = fopen(filename, "r")) == NULL){
		Ret = NG;
	}
	else if(fgets(str, strlength, This->fp) == NULL){
		fclose(This->fp);
		Ret = ONE_MORE_TIME;
	}
	else if(str[0] == '¥n'){
		fclose(This->fp);
		Ret = ONE_MORE_TIME;
	}
	else if(str[0] == 'N'){
		fclose(This->fp);
		Ret = ONE_MORE_TIME;
	}
	else{
		fclose(This->fp);
		Ret = OK;
	}
	return Ret;
}
#endif

int PermitCommand_Read(struct EV_File *This, char *p_PermitCommand)
{
	int Ret = OK;
	switch(Read(This, "PermitCommand.txt¥0", p_PermitCommand)){
```

```
	case NG:
		PrintF(ClsPnl, "¥nReading Error");
		Ret = NG;
		break;
	case ONE_MORE_TIME:
		Ret = ONE_MORE_TIME;
		break;
	default:
		Ret = OK;
		break;
	}
	return Ret;
}

int PermitCommand_Write(struct EV_File *This, char PermitCommand)
{
	int Ret = OK;
	switch(Write(This, "PermitCommand.txt¥0", PermitCommand)){
	case NG:
		PrintF(ClsPnl, "¥nWriting Error");
		Ret = NG;
		break;
	case OK:
		Ret = OK;
		break;
	default:
		Ret = NG;
		break;
```

```
	}
	return Ret;
}

int Command_Read(struct EV_File *This, char *p_Command)
{
	int Ret = OK;
	switch(Read(This, "Command.txt¥0", p_Command)){
	case NG:
		PrintF(ClsPnl, "¥nReading Error");
		Ret = NG;
		break;
	case ONE_MORE_TIME:
		Ret = ONE_MORE_TIME;
		break;
	default:
		Ret = OK;
		break;
	}
	return Ret;
}

int Command_Write(struct EV_File *This, char Command)
{
	int Ret = OK;
	switch(Write(This, "Command.txt¥0", Command)){
	case NG:
		PrintF(ClsPnl, "¥nWriting Error");
		Ret = NG;
```

```
        break;
    case OK:
        Ret = OK;
        break;
    default:
        Ret = NG;
        break;
    }
    return Ret;
}

int PermitTurnOpen_Read(struct EV_File *This, char *p_PermitTurnOpen)
{
    int Ret = OK;
    switch(Read(This, "PermitTurnOpen.txt¥0", p_PermitTurnOpen)){
    case NG:
        PrintF(ClsPnl, "¥nReading Error");
        Ret = NG;
        break;
    case ONE_MORE_TIME:
        Ret = ONE_MORE_TIME;
        break;
    default:
        Ret = OK;
        break;
    }
    return Ret;
}
```

```
int PermitTurnOpen_Write(struct EV_File *This, char PermitTurnOpen)
{
	int Ret = OK;
	switch(Write(This, "PermitTurnOpen.txt¥0", PermitTurnOpen)){
	case NG:
		PrintF(ClsPnl, "¥nWriting Error");
		Ret = NG;
		break;
	case OK:
		Ret = OK;
		break;
	default:
		Ret = NG;
		break;
	}
	return Ret;
}

void Motor_Write(struct EV_File *This, char Motor)
{
	switch(Write(This, "Motor.txt¥0", Motor)){
	case NG:
		PrintF(ClsPnl, "¥nWriting Error");
		break;
	case OK:
		return;
		break;
	default:
		break;
```

```
	}

	/* 戻る */
	return;
}

char Motor_Read(struct EV_File *This)
{
	char ch;
	char *p_ch;
	ch = '¥0';
	p_ch = &ch;

	switch(Read(This, "Motor.txt¥0", p_ch)){
	case NG:
		break;
	case ONE_MORE_TIME:
		return '¥0';
		break;
	case OK:
		return ch;
		break;
	default:
		break;
	}
	return '¥0';
}
```

```
void Limit_Read(struct EV_File *This, char *str)
{
	switch(ReadString(This, "Limit.txt¥0", str, 9)){
	case NG:
		PrintF(ClsPnl, "¥nReading Error");
		break;
	case ONE_MORE_TIME:
		return;
		break;
	default:
		return;
		break;
	}

	/* 戻る */
	return;
}
```

```
/* EV_UpDown.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

/*==========================================================================
  上昇下降を表す構造体
==========================================================================*/
struct Position
{
    int m_UNSL;
```

```
    int m_UNST;
    int m_UPSL;
    int m_UPST;
    /* 下降減速位置 */
    int *p_UnderSlow;
    /* 下降停止位置 */
    int *p_UnderStop;
    /* 上昇減速位置 */
    int *p_UpperSlow;
    /* 上昇停止位置 */
    int *p_UpperStop;
    /* Sleep用 */
    int fstop;
    int *p_fstop;
    int fmove;
    int *p_fmove;
};

/* 上昇 */
struct UpMotor
{
    struct EV_File SF;
    struct EV_File MF;
};

/* 下降 */
struct DownMotor
{
    struct EV_File SF;
```

```
	struct EV_File MF;
};

/* エレベーターの位置仮想ログ */
struct WaitPositionChangeLog
{
	struct EV_File LF;
	char strLimit[9];
	char *p_strLimit;
	/* Sleep用 */
	int tmp;
};

/*==========================================================
  上昇下降を表すプロトタイプ宣言
==========================================================*/
void Position(struct Position *This);
/* 上昇 */
void UpMotor(struct UpMotor *This);
void OnUpMotor(struct UpMotor *This, struct Position *P, char *p_Safety);
/* 下降 */
void DownMotor(struct DownMotor *This);
void OnDownMotor(struct DownMotor *This, struct Position *P, char *p_Safety);
/* 経過時間 */
void WaitPositionChangeLog(struct WaitPositionChangeLog *This);
void OnInitWaitPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P);
void OnWaitUpPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P);
void OnWaitDownPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P);
/* 上昇 */
```

```
void Up(struct Position *P, struct UpMotor UPMT, struct WaitPositionChangeLog WPCL, char
*p_Safety);
/* 下降 */
void Down(struct Position *P, struct DownMotor DNMT, struct WaitPositionChangeLog WPCL, char
*p_Safety);
```

```
/* EV_UpDown.c */

#include "C.h"
#include "EV_UpDown.h"

/*==========================================================================
  上昇下降を表す関数
==========================================================================*/
/*
 * Position
 */
void Position(struct Position *This)
{
	/* 初期値 */
	This->m_UNSL = OFF;
	This->m_UNST = OFF;
	This->m_UPSL = OFF;
	This->m_UPST = OFF;
	This->p_UnderSlow = &This->m_UNSL;
	This->p_UnderStop = &This->m_UNST;
	This->p_UpperSlow = &This->m_UPSL;
	This->p_UpperStop = &This->m_UPST;
	/* Sleep用 */
	This->fstop = OFF;
	This->p_fstop = &This->fstop;
	This->fmove = OFF;
	This->p_fmove = &This->fmove;
```

```
	/* 戻る */
	return;
}

/*
 * UpMotor
 */
void UpMotor(struct UpMotor *This)
{
	EV_File(&This->SF);
	EV_File(&This->MF);

	/* 戻る */
	return;
}

/*
 * OnUpMotor
 */
/* 上昇 */
void OnUpMotor(struct UpMotor *This, struct Position *P, char *p_Safety)
{
	if(*P->p_UpperStop == ON){
		/* Sleep用 */
		if(*P->p_fstop == OFF){
			*P->p_fstop = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 's');
			PrintF(ClsPnl, "STOP");
```

```
        }
        if(*p_Safety == 'Y'){
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*P->p_UpperSlow == ON){
        /* Sleep用 */
        *P->p_fstop = OFF;
        if(*P->p_fmove == OFF){
            *P->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'u');
            PrintF(ClsPnl, "UP");
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'j');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*P->p_UnderSlow == OFF){
        /* Sleep用 */
        *P->p_fstop = OFF;
        if(*P->p_fmove == OFF){
            *P->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'U');
            PrintF(ClsPnl, "UP Speedy");
```

```
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'j');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*P->p_UnderStop == OFF){
        /* Sleep用 */
        *P->p_fstop = OFF;
        if(*P->p_fmove == OFF){
            *P->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'u');
            PrintF(ClsPnl, "UP");
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'j');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*P->p_UnderStop == ON){
        /* Sleep用 */
        *P->p_fstop = OFF;
        if(*P->p_fmove == OFF){
            *P->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'j');
```

```
            PrintF(ClsPnl, "UP Start");
        }
        if(*p_Safety == 'Y'){
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }

    /* 戻る */
    return;
}

/*
 * DownMotor
 */
void DownMotor(struct DownMotor *This)
{
    EV_File(&This->SF);
    EV_File(&This->MF);

    /* 戻る */
    return;
}

/*
 * OnDownMotor
 */
/* 下降 */
```

```
void OnDownMotor(struct DownMotor *This, struct Position *P, char *p_Safety)
{
	if(*P->p_UnderStop == ON){
		/* Sleep用 */
		if(*P->p_fstop == OFF){
			*P->p_fstop = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 's');
			PrintF(ClsPnl, "STOP");
		}
		if(*p_Safety == 'Y'){
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
		}
	}
	else if(*P->p_UnderSlow == ON){
		/* Sleep用 */
		*P->p_fstop = OFF;
		if(*P->p_fmove == OFF){
			*P->p_fmove = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 'd');
			PrintF(ClsPnl, "DOWN");
		}
		else if(*p_Safety == 'Y'){
			Motor_Write(&This->MF, 'k');
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
		}
```

```
}
else if(*P->p_UpperSlow == OFF){
	/* Sleep用 */
	*P->p_fstop = OFF;
	if(*P->p_fmove == OFF){
		*P->p_fmove = ON;
		/* 現在実行中の命令を外部に報告 */
		Motor_Write(&This->MF, 'D');
		PrintF(ClsPnl, "DOWN Speedy");
	}
	else if(*p_Safety == 'Y'){
		Motor_Write(&This->MF, 'k');
		*p_Safety = 'r';
		Write(&This->SF, "Safety.txt¥0", 'r');
	}
}
else if(*P->p_UpperStop == OFF){
	/* Sleep用 */
	*P->p_fstop = OFF;
	if(*P->p_fmove == OFF){
		*P->p_fmove = ON;
		/* 現在実行中の命令を外部に報告 */
		Motor_Write(&This->MF, 'd');
		PrintF(ClsPnl, "DOWN");
	}
	else if(*p_Safety == 'Y'){
		Motor_Write(&This->MF, 'k');
		*p_Safety = 'r';
		Write(&This->SF, "Safety.txt¥0", 'r');
```

```
            }
        }
        else if(*P->p_UpperStop == ON){
            /* Sleep用 */
            *P->p_fstop = OFF;
            if(*P->p_fmove == OFF){
                *P->p_fmove = ON;
                /* 現在実行中の命令を外部に報告 */
                Motor_Write(&This->MF, 'k');
                PrintF(ClsPnl, "DOWN Start");
            }
            if(*p_Safety == 'Y'){
                *p_Safety = 'r';
                Write(&This->SF, "Safety.txt¥0", 'r');
            }
        }

        /* 戻る */
        return;
    }

    /*
     * WaitPositionChangeLog
     */
    /* エレベーターの位置仮想ログ */
    void WaitPositionChangeLog(struct WaitPositionChangeLog *This)
    {
        This->p_strLimit = &This->strLimit[0];
```

```
	/* 戻る */
	return;
}

/*
 * OnInitWaitPositionChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnInitWaitPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P)
{
	/* センサ初期値 */
	/* リミットスイッチの読み込み */
	This->p_strLimit = &This->strLimit[0];
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = ((This->strLimit[0] == 'y') ? ON : OFF);
	Checkfmove(P->p_UnderStop, P->p_fmove, This->tmp);
	This->tmp = ((This->strLimit[1] == 'y') ? ON : OFF);
	Checkfmove(P->p_UnderSlow, P->p_fmove, This->tmp);
	This->tmp = ((This->strLimit[2] == 'y') ? ON : OFF);
	Checkfmove(P->p_UpperSlow, P->p_fmove, This->tmp);
	This->tmp = ((This->strLimit[3] == 'y') ? ON : OFF);
	Checkfmove(P->p_UpperStop, P->p_fmove, This->tmp);

	/* 戻る */
	return;
}

/*
```

```
 * OnWaitUpPositionChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnWaitUpPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P)
{
	/* リミットスイッチの読み込み */
	This->p_strLimit = &This->strLimit[0];
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = (This->strLimit[0] == 'y') ? ON : OFF;
	Checkfmove(P->p_UnderStop, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[1] == 'y') ? ON : OFF;
	Checkfmove(P->p_UnderSlow, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[2] == 'y') ? ON : OFF;
	Checkfmove(P->p_UpperSlow, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[3] == 'y') ? ON : OFF;
	Checkfmove(P->p_UpperStop, P->p_fmove, This->tmp);

	/* 戻る */
	return;
}

/*
 * OnWaitDownPositionChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnWaitDownPositionChangeLog(struct WaitPositionChangeLog *This, struct Position *P)
{
	/* リミットスイッチの読み込み */
	This->p_strLimit = &This->strLimit[0];
```

```
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = (This->strLimit[0] == 'y') ? ON : OFF;
	Checkfmove(P->p_UnderStop, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[1] == 'y') ? ON : OFF;
	Checkfmove(P->p_UnderSlow, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[2] == 'y') ? ON : OFF;
	Checkfmove(P->p_UpperSlow, P->p_fmove, This->tmp);
	This->tmp = (This->strLimit[3] == 'y') ? ON : OFF;
	Checkfmove(P->p_UpperStop, P->p_fmove, This->tmp);

	/* 戻る */
	return;
}

/*
 * Up
 */
/* 上昇 */
void Up(struct Position *P, struct UpMotor UPMT, struct WaitPositionChangeLog WPCL, char
*p_Safety)
{
	/* 到着まで */
	if(*P->p_UpperStop == OFF){
		/* エレベーターの位置仮想ログ */
		OnWaitUpPositionChangeLog(&WPCL, P);

		/* 上昇 */
		OnUpMotor(&UPMT, P, p_Safety);
```

```
        /* エレベーターの位置仮想ログ */
        OnWaitUpPositionChangeLog(&WPCL, P);
    }

    /* 戻る */
    return;
}

/*
 * Down
 */
/* 下降 */
void Down(struct Position *P, struct DownMotor DNMT, struct WaitPositionChangeLog WPCL, char
*p_Safety)
{
    /* 到着まで */
    if(*P->p_UnderStop == OFF){
        /* エレベーターの位置仮想ログ */
        OnWaitDownPositionChangeLog(&WPCL, P);

        /* 下降 */
        OnDownMotor(&DNMT, P, p_Safety);

        /* エレベーターの位置仮想ログ */
        OnWaitDownPositionChangeLog(&WPCL, P);
    }

    /* 戻る */
    return;
```

```
}
```

```
/* EV_OpenClose.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

#ifndef EV_UpDown_h
#define EV_UpDown_h
#include "EV_UpDown.h"
#endif

/*==============================================================
```

```
 開閉を表す構造体
==========================================================================*/
struct Door
{
	int m_CLSL;
	int m_CLST;
	int m_OPSL;
	int m_OPST;
	/* 閉減速位置 */
	int *p_CloserSlow;
	/* 閉停止位置 */
	int *p_CloserStop;
	/* 開減速位置 */
	int *p_OpennerSlow;
	/* 開停止位置 */
	int *p_OpennerStop;
	/* Sleep用 */
	int fstop;
	int *p_fstop;
	int fmove;
	int *p_fmove;
};

/* 開 */
struct OpenMotor
{
	struct EV_File SF;
	struct EV_File MF;
};
```

```
/* 閉 */
struct CloseMotor
{
	struct EV_File  SF;
	struct EV_File  MF;
};

/* エレベーターの位置仮想ログ */
struct WaitDoorChangeLog
{
	struct EV_File TOF;
	char chTurnOpen;
	char *p_chTurnOpen;
	struct EV_File LF;
	char strLimit[9];
	char *p_strLimit;
	/* Sleep用 */
	int tmp;
};

/*==========================================================
  開閉を表すプロトタイプ宣言
==========================================================*/
void Door(struct Door *This);
/* 開 */
void OpenMotor(struct OpenMotor *This);
void OnOpenMotor(struct OpenMotor *This, struct Door *DR, char *p_Safety);
/* 閉 */
```

```
void CloseMotor(struct CloseMotor *This);
void OnCloseMotor(struct CloseMotor *This, struct Door *DR, char *p_Safety);
/* 経過時間 */
void WaitDoorChangeLog(struct WaitDoorChangeLog *This);
void OnInitWaitDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR);
void OnWaitOpenDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR);
void OnWaitCloseDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR);
/* 開 */
void Open(struct Door *DR, struct OpenMotor OPMT, struct WaitDoorChangeLog WDCL, char
*p_Safety);
/* 閉 */
void Close(struct Door *DR, struct CloseMotor CLMT, struct WaitDoorChangeLog WDCL, char
*p_Safety);
```

```
/* EV_OpenClose.c */

#include "C.h"
#include "EV_OpenClose.h"

/*==========================================================================
 開閉を表す関数
==========================================================================*/
/*
 * Door
 */
void Door(struct Door *This)
{
	/* 初期値 */
	This->m_CLSL = OFF;
	This->m_CLST = OFF;
	This->m_OPSL = OFF;
	This->m_OPST = OFF;
	This->p_CloserSlow = &This->m_CLSL;
	This->p_CloserStop = &This->m_CLST;
	This->p_OpennerSlow = &This->m_OPSL;
	This->p_OpennerStop = &This->m_OPST;
	/* Sleep用 */
	This->fstop = OFF;
	This->p_fstop = &This->fstop;
	This->fmove = OFF;
	This->p_fmove = &This->fmove;
```

```
	/* 戻る */
	return;
}

/*
 * OpenMotor
 */
void OpenMotor(struct OpenMotor *This)
{
	EV_File(&This->SF);
	EV_File(&This->MF);

	/* 戻る */
	return;
}

/*
 * OnOpenMotor
 */
/* 開 */
void OnOpenMotor(struct OpenMotor *This, struct Door *DR, char *p_Safety)
{
	if(*DR->p_OpennerStop == ON){
		/* Sleep用 */
		if(*DR->p_fstop == OFF){
			*DR->p_fstop = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 's');
			PrintF(ClsPnl, "STOP");
```

```
        }
        if(*p_Safety == 'Y'){
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*DR->p_OpennerSlow == ON){
        /* Sleep用 */
        *DR->p_fstop = OFF;
        if(*DR->p_fmove == OFF){
            *DR->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'o');
            PrintF(ClsPnl, "OPEN");
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'h');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*DR->p_CloserSlow == OFF){
        /* Sleep用 */
        *DR->p_fstop = OFF;
        if(*DR->p_fmove == OFF){
            *DR->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'O');
            PrintF(ClsPnl, "OPEN Speedy");
```

```
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'h');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*DR->p_CloserStop == OFF){
        /* Sleep用 */
        *DR->p_fstop = OFF;
        if(*DR->p_fmove == OFF){
            *DR->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'o');
            PrintF(ClsPnl, "OPEN");
        }
        else if(*p_Safety == 'Y'){
            Motor_Write(&This->MF, 'h');
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }
    else if(*DR->p_CloserStop == ON){
        /* Sleep用 */
        *DR->p_fstop = OFF;
        if(*DR->p_fmove == OFF){
            *DR->p_fmove = ON;
            /* 現在実行中の命令を外部に報告 */
            Motor_Write(&This->MF, 'h');
```

```
            PrintF(ClsPnl, "OPEN Start");
        }
        if(*p_Safety == 'Y'){
            *p_Safety = 'r';
            Write(&This->SF, "Safety.txt¥0", 'r');
        }
    }

    /* 戻る */
    return;
}

/*
 * CloseMotor
 */
void CloseMotor(struct CloseMotor *This)
{
    EV_File(&This->SF);
    EV_File(&This->MF);

    /* 戻る */
    return;
}

/*
 * OnCloseMotor
 */
/* 閉 */
```

```
void OnCloseMotor(struct CloseMotor *This, struct Door *DR, char *p_Safety)
{
	if(*DR->p_CloserStop == ON){
		/* Sleep用 */
		if(*DR->p_fstop == OFF){
			*DR->p_fstop = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 's');
			PrintF(ClsPnl, "STOP");
		}
		if(*p_Safety == 'Y'){
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
		}
	}
	else if(*DR->p_CloserSlow == ON){
		/* Sleep用 */
		*DR->p_fstop = OFF;
		if(*DR->p_fmove == OFF){
			*DR->p_fmove = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 'c');
			PrintF(ClsPnl, "CLOSE");
		}
		else if(*p_Safety == 'Y'){
			Motor_Write(&This->MF, 't');
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
		}
```

```
	}
	else if(*DR->p_OpennerSlow == OFF){
		/* Sleep用 */
		*DR->p_fstop = OFF;
		if(*DR->p_fmove == OFF){
			*DR->p_fmove = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 'C');
			PrintF(ClsPnl, "CLOSE Speedy");
		}
		else if(*p_Safety == 'Y'){
			Motor_Write(&This->MF, 't');
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
		}
	}
	else if(*DR->p_OpennerStop == OFF){
		/* Sleep用 */
		*DR->p_fstop = OFF;
		if(*DR->p_fmove == OFF){
			*DR->p_fmove = ON;
			/* 現在実行中の命令を外部に報告 */
			Motor_Write(&This->MF, 'c');
			PrintF(ClsPnl, "CLOSE");
		}
		else if(*p_Safety == 'Y'){
			Motor_Write(&This->MF, 't');
			*p_Safety = 'r';
			Write(&This->SF, "Safety.txt¥0", 'r');
```

```
            }
        }
        else if(*DR->p_OpennerStop == ON){
            /* Sleep用 */
            *DR->p_fstop = OFF;
            if(*DR->p_fmove == OFF){
                *DR->p_fmove = ON;
                /* 現在実行中の命令を外部に報告 */
                Motor_Write(&This->MF, 't');
                PrintF(ClsPnl, "CLOSE Start");
            }
            if(*p_Safety == 'Y'){
                *p_Safety = 'r';
                Write(&This->SF, "Safety.txt¥0", 'r');
            }
        }

        /* 戻る */
        return;
    }

    /*
     * WaitDoorChangeLog
     */
    /* エレベーターの位置仮想ログ */
    void WaitDoorChangeLog(struct WaitDoorChangeLog *This)
    {
        This->p_chTurnOpen = &This->chTurnOpen;
        This->p_strLimit = &This->strLimit[0];
```

```
	/* 戻る */
	return;
}

/*
 * OnInitWaitDoorChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnInitWaitDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR)
{
	/* センサ初期値 */
	/* リミットスイッチの読み込み */
	This->p_strLimit = &This->strLimit[0];
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = (This->strLimit[4] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserStop, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[5] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[6] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[7] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerStop, DR->p_fmove, This->tmp);

	/* 戻る */
	return;
}
```

```
/*
 * OnWaitOpenDoorChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnWaitOpenDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR)
{
	/* リミットスイッチの読み込み */
	This->p_strLimit = &This->strLimit[0];
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = (This->strLimit[4] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserStop, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[5] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[6] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[7] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerStop, DR->p_fmove, This->tmp);

	/* 戻る */
	return;
}

/*
 * OnWaitCloseDoorChangeLog
 */
/* エレベーターの位置仮想ログ */
void OnWaitCloseDoorChangeLog(struct WaitDoorChangeLog *This, struct Door *DR)
{
	/* リミットスイッチの読み込み */
```

```
	This->p_strLimit = &This->strLimit[0];
	Limit_Read(&This->LF, This->p_strLimit);
	This->tmp = (This->strLimit[4] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserStop, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[5] == 'y') ? ON : OFF;
	Checkfmove(DR->p_CloserSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[6] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerSlow, DR->p_fmove, This->tmp);
	This->tmp = (This->strLimit[7] == 'y') ? ON : OFF;
	Checkfmove(DR->p_OpennerStop, DR->p_fmove, This->tmp);

	/* 戻る */
	return;
}

/*
 * Open
 */
/* 開 */
void Open(struct Door *DR, struct OpenMotor OPMT, struct WaitDoorChangeLog WDCL, char
*p_Safety)
{
	/* 到着まで */
	if(*DR->p_OpennerStop == OFF)
	{
		/* エレベーターの位置仮想ログ */
		OnWaitOpenDoorChangeLog(&WDCL, DR);

		/* 開 */
```

```
        OnOpenMotor(&OPMT, DR, p_Safety);

        /* エレベーターの位置仮想ログ */
        OnWaitOpenDoorChangeLog(&WDCL, DR);
    }

    /* 戻る */
    return;
}

/*
 * Close
 */
/* 閉 */
void Close(struct Door *DR, struct CloseMotor CLMT, struct WaitDoorChangeLog WDCL, char
*p_Safety)
{
    /* 到着まで */
    if(*DR->p_CloserStop == OFF)
    {
        /* エレベーターの位置仮想ログ */
        OnWaitCloseDoorChangeLog(&WDCL, DR);

        /* 閉 */
        OnCloseMotor(&CLMT, DR, p_Safety);

        /* エレベーターの位置仮想ログ */
        OnWaitCloseDoorChangeLog(&WDCL, DR);
    }
```

```
	/* 戻る */
	return;
}
```

```
/* EV_Display.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

/*==========================================================================
  シミュレータを表す関数のプロトタイプ宣言
==========================================================================*/
void DispInput(void);
void Disp(char ch, char str[9]);
```

```
/* EV_Display.c */

#include "C.h"
#include "EV_Display.h"

void DispInput(void)
{
	/* 入力指示 */
	PrintF(InputCommand, "¥nUP = 'u', DOWN = 'd', OPEN = 'o', CLOSE = 'c'");
	PrintF(InputCommand, "¥nEMERGENCY = 's', RECOVERY = 'r'");
	PrintF(InputCommand, "¥n1st Floor CALL = 'y', 2nd Floor CALL = 'Y'");
	PrintF(InputCommand, "¥n1st Floor CLOSE = 'h', 2nd Floor CLOSE = 'H'");
	PrintF(InputCommand, "¥nQUIT = 'q'");
	PrintF(InputCommand, "¥nCOMMAND>");
}

/*
 * 表示関数
 */
void Disp(char ch, char str[9])
{
#ifdef USE_BCC
	int	i;
	/* 画面クリア */
	CLEAR;
	if((((ch == 'o') ¦¦ (ch == 'h')) && (str[3] == 'y') && (str[7] == 'y'))
		¦¦ ((ch == 't') && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'y'))
		¦¦ ((ch == 's') && (str[3] == 'y') && (str[7] == 'y')))
```

```
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n0000       0000");
        }
        for(i = 4; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'O') ¦¦ (ch == 'h')) && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'y'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] ==
'n') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'y')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n 0000     0000 ");
        }
        for(i = 4; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((ch == 's') && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] == 'n') && (str[4]
== 'n'))
    {
        for(i = 0; i < 4; i++)
        {
```

```
            PrintF(Monitor, "¥n  0000    0000  ");
        }
        for(i = 4; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[3] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] ==
'n') && (str[4] == 'n'))
        ¦¦  (((ch == 'C') ¦¦ (ch == 't')) && (str[3] == 'y') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[3] == 'y') && (str[5] == 'y') && (str[4] == 'n')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n   0000  0000   ");
        }
        for(i = 4; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'u') ¦¦ (ch == 'j')) && (str[3] == 'y') && (str[4] == 'y'))
        ¦¦  ((ch == 'k') && (str[3] == 'n') && (str[2] == 'y') && (str[4] == 'y'))
        ¦¦     ((ch == 'h') && (str[3] == 'y') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'y') && (str[4] == 'y'))
        ¦¦  ((ch == 's') && (str[3] == 'y') && (str[4] == 'y')))
    {
        for(i = 0; i < 4; i++)
        {
```

```
            PrintF(Monitor, "¥n    00000000    ");
        }
        for(i = 4; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'y'))
        ¦¦  ((ch == 't') && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] == 'y'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'y')))
    {
        for(i = 0; i < 1; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
        for(i = 1; i < 5; i++)
        {
            PrintF(Monitor, "¥n0000       0000");
        }
        for(i = 5; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'O') ¦¦ (ch == 'h')) && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] ==
'y'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] ==
'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] == 'y')))
```

```
    {
        for(i = 0; i < 1; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 1; i < 5; i++)
        {
            PrintF(Monitor, "¥n 0000     0000 ");
        }
        for(i = 5; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((ch == 's') && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5]
== 'n') && (str[4] == 'n'))
    {
        for(i = 0; i < 1; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 1; i < 5; i++)
        {
            PrintF(Monitor, "¥n  0000    0000  ");
        }
        for(i = 5; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
```

```
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[3] == 'n') && (str[2] == 'y') && (str[7] == 'n') && (str[6] ==
'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  (((ch == 'C') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'y') && (str[5] == 'y') && (str[4] ==
'n'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'y') && (str[5] == 'y') && (str[4] == 'n')))
    {
        for(i = 0; i < 1; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 1; i < 5; i++)
        {
            PrintF(Monitor, "¥n   0000  0000   ");
        }
        for(i = 5; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'U') ¦¦ (ch == 'j')) && (str[3] == 'n') && (str[2] == 'y') && (str[4] == 'y'))
        ¦¦  (((ch == 'd') ¦¦ (ch == 'k')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[4] == 'y'))
        ¦¦     ((ch == 'h') && (str[3] == 'n') && (str[2] == 'y') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'y') && (str[4] == 'y'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'y') && (str[4] == 'y')))
    {
        for(i = 0; i < 2; i++)
```

```
        {
            PrintF(Monitor, "¥n                ");
        }
        for(i = 2; i < 6; i++)
        {
            PrintF(Monitor, "¥n    00000000    ");
        }
        for(i = 6; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'o') || (ch == 'h')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[7] == 'y'))
        || ((ch == 't') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[7]
== 'n') && (str[6] == 'y'))
        || ((ch == 's') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[7]
== 'y')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
        for(i = 4; i < 8; i++)
        {
            PrintF(Monitor, "¥n0000       0000");
        }
        for(i = 8; i < 12; i++)
        {
```

```
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'O') ¦¦ (ch == 'h')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[7] == 'n') && (str[6] == 'y'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[7] == 'n') && (str[6] == 'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[7]
== 'n') && (str[6] == 'y')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 4; i < 8; i++)
        {
            PrintF(Monitor, "¥n 0000     0000 ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((ch == 's') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[7]
== 'n') && (str[6] == 'n') && (str[5] == 'n') && (str[4] == 'n'))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n              ");
```

```
        }
        for(i = 4; i < 8; i++)
        {
            PrintF(Monitor, "¥n  0000    0000  ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[7] == 'n') && (str[6] == 'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  (((ch == 'C') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[5]
== 'y') && (str[4] == 'n')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n                ");
        }
        for(i = 4; i < 8; i++)
        {
            PrintF(Monitor, "¥n   0000  0000   ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n                ");
```

```
        }
    }
    else if(((ch == 'h') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[5]
== 'y') && (str[4] == 'n'))
        ¦¦ (((ch == 'c') ¦¦ (ch == 't')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[4] == 'y'))
        ¦¦ ((ch == 's') && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] == 'n') && (str[4]
== 'y')))
    {
        for(i = 0; i < 4; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 4; i < 8; i++)
        {
            PrintF(Monitor, "¥n    00000000    ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'y'))
        ¦¦ ((ch == 't') && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] == 'y'))
        ¦¦ ((ch == 's') && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'y')))
    {
        for(i = 0; i < 6; i++)
        {
            PrintF(Monitor, "¥n              ");
```

```
        }
        for(i = 6; i < 10; i++)
        {
            PrintF(Monitor, "¥n0000       0000");
        }
        for(i = 10; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'O') ¦¦ (ch == 'h')) && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] ==
'y'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] ==
'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] == 'y')))
    {
        for(i = 0; i < 6; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 6; i < 10; i++)
        {
            PrintF(Monitor, "¥n 0000     0000 ");
        }
        for(i = 10; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
```

```
    else if((ch == 's') && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] == 'n') && (str[5]
== 'n') && (str[4] == 'n'))
    {
        for(i = 0; i < 6; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 6; i < 10; i++)
        {
            PrintF(Monitor, "¥n  0000    0000  ");
        }
        for(i = 10; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[1] == 'y') && (str[0] == 'n') && (str[7] == 'n') && (str[6] ==
'n') && (str[5] == 'n') && (str[4] == 'n'))
        ¦¦  (((ch == 'C') ¦¦ (ch == 't')) && (str[1] == 'y') && (str[0] == 'n') && (str[5] == 'y') && (str[4] ==
'n'))
        ¦¦  ((ch == 's') && (str[1] == 'y') && (str[0] == 'n') && (str[5] == 'y') && (str[4] == 'n')))
    {
        for(i = 0; i < 6; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 6; i < 10; i++)
        {
            PrintF(Monitor, "¥n   0000  0000   ");
```

```
        }
        for(i = 10; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'u') ¦¦ (ch == 'j')) && (str[3] == 'n') && (str[2] == 'n') && (str[1] == 'n') && (str[0] ==
'n') && (str[4] == 'y'))
        ¦¦  (((ch == 'D') ¦¦ (ch == 'k')) && (str[1] == 'y') && (str[0] == 'n') && (str[4] == 'y'))
        ¦¦     ((ch == 'h') && (str[1] == 'y') && (str[0] == 'n') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[1] == 'y') && (str[0] == 'n') && (str[4] == 'y'))
        ¦¦  ((ch == 's') && (str[1] == 'y') && (str[0] == 'n') && (str[4] == 'y')))
    {
        for(i = 0; i < 6; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 6; i < 10; i++)
        {
            PrintF(Monitor, "¥n    00000000    ");
        }
        for(i = 10; i < 12; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[0] == 'y') && (str[7] == 'y'))
        ¦¦  ((ch == 't') && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'y'))
```

```
        ¦¦  ((ch == 's') && (str[0] == 'y') && (str[7] == 'y')))
    {
        for(i = 0; i < 8; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n0000      0000");
        }
    }
    else if((((ch == 'O') ¦¦ (ch == 'h')) && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'y'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] ==
'n') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'y')))
    {
        for(i = 0; i < 8; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n 0000     0000 ");
        }
    }
    else if((ch == 's') && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] == 'n') && (str[4]
== 'n'))
    {
        for(i = 0; i < 8; i++)
```

```
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n  0000    0000  ");
        }
    }
    else if((((ch == 'o') ¦¦ (ch == 'h')) && (str[0] == 'y') && (str[7] == 'n') && (str[6] == 'n') && (str[5] ==
'n') && (str[4] == 'n'))
        ¦¦  (((ch == 'C') ¦¦ (ch == 't')) && (str[0] == 'y') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  ((ch == 's') && (str[0] == 'y') && (str[5] == 'y') && (str[4] == 'n')))
    {
        for(i = 0; i < 8; i++)
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n   0000  0000   ");
        }
    }
    else if(((ch == 'j') && (str[1] == 'y') && (str[0] == 'n') && (str[4] == 'y'))
        ¦¦  (((ch == 'd') ¦¦ (ch == 'k')) && (str[0] == 'y') && (str[4] == 'y'))
        ¦¦     ((ch == 'h') && (str[0] == 'y') && (str[5] == 'y') && (str[4] == 'n'))
        ¦¦  (((ch == 'c') ¦¦ (ch == 't')) && (str[0] == 'y') && (str[4] == 'y'))
        ¦¦  ((ch == 's') && (str[0] == 'y') && (str[4] == 'y')))
    {
        for(i = 0; i < 8; i++)
```

```
        {
            PrintF(Monitor, "¥n              ");
        }
        for(i = 8; i < 12; i++)
        {
            PrintF(Monitor, "¥n    00000000    ");
        }
    }
#endif
    /* 入力指示 */
    DispInput();
    return;
}
```

```
/* EV_Input.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

/*==========================================================================
  入力を表す関数のプロトタイプ宣言
==========================================================================*/
char GetChar(char Ret);

/*==========================================================================
```

```
 入力を表す構造体
==========================================================================*/
struct EV_Input
{
    /* 安全 */
    char Safety;
    char *p_Safety;
    char Command;
    char PermitCommand;
    char *p_PermitCommand;
    char PermitTurnOpen;
    char *p_PermitTurnOpen;
    char ch;
    char *p_ch;
    char str[9];
    char *p_str;

    /* ファイルストリーム */
    struct EV_File SF;
    struct EV_File CF;
    struct EV_File PCF;
    struct EV_File PTOF;
    struct EV_File LF;
    struct EV_File MF;
};

/*==========================================================================
 入力を表すコンストラクタとメソッドのプロトタイプ宣言
==========================================================================*/
```

```
void EV_Input(struct EV_Input *This);
void OnInput(struct EV_Input *This, Thread *th);
```

```
/* EV_Input.c */

#include "C.h"
#include "EV_Input.h"

/*==========================================================================
  入力を表す関数
==========================================================================*/
char GetChar(char Ret)
{
#ifndef USE_BCC
	char sw[4];
	int i;
	int j;
	/* スイッチワーク初期化 */
	sw[0] = sw[1] = sw[2] = sw[3] = 0;
	/* ボタンが押された時にLCD,SCI,USBにメッセージを送る */
	for(j=0;j<4;j++)
	{
		i = GetSW(j);
		if( ((sw[j]^1) & i) ) /* sw = off->onで条件成立 */
		{
			switch(j){
			case 0:
				Ret = 'u'; /* sw0 Up 2階で開く */
				break;
			case 1:
				Ret = 'd'; /* sw1 Down 1階で開く */
```

```
                    break;
                case 2:
                    Ret = 'c'; /* sw2 Close 閉じる */
                    break;
                case 3:
                    Ret = 'q'; /* sw3 Quit 終了 */
                    break;
                default:
                    break;
                }
            }
        }
    #else
    #ifdef USE_LINUX
        if(kbhit())
        {
            Ret = (char) getchar();
        }
    #else
    #ifdef USE_MSVS2005
        if(_kbhit())
        {
            Ret = (char) _getche();
        }
    #else
        if(kbhit())
        {
            Ret = (char) getche();
        }
```

```
#endif
#endif
#endif
	return Ret;
}

/*==========================================================================
 入力を表すコンストラクタとメソッド
==========================================================================*/
void EV_Input(struct EV_Input *This)
{
	/* 初期化 */
	This->Command = '¥0';
	This->p_ch = &This->ch;
	This->p_str = &This->str[0];
	This->str[8] = '¥0';
	/* 安全初期化 */
	This->p_Safety = &This->Safety;
	/* 入力許可初期化 */
	This->p_PermitCommand = &This->PermitCommand;
	/* 反転開許可初期化 */
	This->p_PermitTurnOpen = &This->PermitTurnOpen;

	EV_File(&This->SF);
	EV_File(&This->CF);
	EV_File(&This->PCF);
	EV_File(&This->PTOF);
	EV_File(&This->MF);
```

```
    /* 安全入力 */
    if(Read(&This->SF, "Safety.txt¥0", This->p_Safety) == NG) return;
    /* 入力許可 */
    if(PermitCommand_Read(&This->PCF, This->p_PermitCommand) == NG) return;
    /* 反転開許可 */
    if(PermitTurnOpen_Read(&This->PTOF, This->p_PermitTurnOpen) == NG) return;
    /* モーター命令解読 */
    if(Read(&This->MF, "Motor.txt¥0", This->p_ch) == NG) return;
    /* リミットスイッチの前状態読み込み */
    ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9);
}

void OnInput(struct EV_Input *This, Thread *th)
{
    if(Command_Read(&This->CF, &This->Command) == NG) return;
    This->Command = GetChar(This->Command);

    /* 安全入力 */
    if(Read(&This->SF, "Safety.txt¥0", This->p_Safety) == NG) return;
    /* 入力許可 */
    if(PermitCommand_Read(&This->PCF, This->p_PermitCommand) == NG) return;
    /* 反転開許可 */
    if(PermitTurnOpen_Read(&This->PTOF, This->p_PermitTurnOpen) == NG) return;
    /* モーター命令解読 */
    if(Read(&This->MF, "Motor.txt¥0", This->p_ch) == NG) return;
    /* リミットスイッチの前状態読み込み */
    ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9);

    switch(This->Command){
```

```
case 's':
    /* 命令入力 */
    Write(&This->SF, "Safety.txt", 's');
    Motor_Write(&This->MF, 's');
    This->Command = 'N';
    Command_Write(&This->CF, 'N');
    PermitCommand_Write(&This->PCF, 'N');
    break;
case 'r':
    /* 命令入力 */
    Write(&This->SF, "Safety.txt", 'h');
    This->Command = 'N';
    Command_Write(&This->CF, 'N');
    PermitCommand_Write(&This->PCF, 'c');
    break;
case 'q':
    /* 命令入力 */
    Command_Write(&This->CF, This->Command);
    PrintF(ClsPnl, "QUIT");
    delete_(th);
    break;
default:
    if(This->PermitCommand == 'c'){
        switch(This->Command){
        case 'o':
            if(This->str[4] != 'y'){
                PermitTurnOpen_Write(&This->PTOF, 'o');
            }
```

```
        if(This->Safety == 'h'){
            /* 命令入力 */
            This->Safety = 'Y';
            Write(&This->SF, "Safety.txt", 'Y');
            if((This->ch == 's') && (This->Safety == 'Y') && (This->str[7] == 'n')){
                Motor_Write(&This->MF, 'h');
            }
        }
        /* 命令入力 */
        Command_Write(&This->CF, This->Command);
        PermitCommand_Write(&This->PCF, 'N');
        break;
    case 'c':
        if(This->str[4] != 'y'){
            PermitTurnOpen_Write(&This->PTOF, 'o');
        }
        if(This->Safety == 'h'){
            /* 命令入力 */
            This->Safety = 'Y';
            Write(&This->SF, "Safety.txt", 'Y');
            if((This->ch == 's') && (This->Safety == 'Y') && (This->str[4] == 'n')){
                Motor_Write(&This->MF, 't');
            }
        }
        /* 命令入力 */
        Command_Write(&This->CF, This->Command);
        PermitCommand_Write(&This->PCF, 'N');
        break;
    case 'u':
```

```
                if(This->str[4] != 'y'){
                    PermitTurnOpen_Write(&This->PTOF, 'o');
                }
                if(This->Safety == 'h'){
                    /* 命令入力 */
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'y') && (This->str[4] == 'n')){
                        Motor_Write(&This->MF, 't');
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'n')){
                        Motor_Write(&This->MF, 'j');
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'y') && (This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
                }
                /* 命令入力 */
                Command_Write(&This->CF, This->Command);
                PermitCommand_Write(&This->PCF, 'N');
                break;
            case 'd':
                if(This->str[4] != 'y'){
                    PermitTurnOpen_Write(&This->PTOF, 'o');
                }
                if(This->Safety == 'h'){
                    /* 命令入力 */
```

```
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'y') && (This->str[4] == 'n')){
                        Motor_Write(&This->MF, 't');
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'n')){
                        Motor_Write(&This->MF, 'k');
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'y') && (This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
                }
                /* 命令入力 */
                Command_Write(&This->CF, This->Command);
                PermitCommand_Write(&This->PCF, 'N');
                break;
            case 'y':
                if((This->str[0] != 'y') && (This->str[4] != 'y')){
                    PrintF(Panel, "¥nA Basket isn't 1st Floor");
                }
                else{
                    if(This->Safety == 'h'){
                        /* 命令入力 */
                        This->Safety = 'Y';
                        Write(&This->SF, "Safety.txt", 'Y');
                        if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'n')){
                            Motor_Write(&This->MF, 'k');
```

```
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'y') &&
(This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
                }
                /* 命令入力 */
                Command_Write(&This->CF, This->Command);
                PermitCommand_Write(&This->PCF, 'N');
            }
            break;
        case 'Y':
            if((This->str[3] != 'y') && (This->str[4] != 'y')){
                PrintF(Panel, "¥nA Basket isn't 2nd Floor");
            }
            else{
                if(This->Safety == 'h'){
                    /* 命令入力 */
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'n')){
                        Motor_Write(&This->MF, 'j');
                    }
                    else if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'y') &&
(This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
                }
```

```
            /* 命令入力 */
            Command_Write(&This->CF, This->Command);
            PermitCommand_Write(&This->PCF, 'N');
        }
        break;
    case 'h':
        if(This->str[0] != 'y'){
            PrintF(Panel, "¥nA Basket isn't 1st Floor");
        }
        else{
            if(This->str[4] != 'y'){
                PermitTurnOpen_Write(&This->PTOF, 'o');
            }
            if(This->Safety == 'h'){
                /* 命令入力 */
                This->Safety = 'Y';
                Write(&This->SF, "Safety.txt", 'Y');
                if((This->ch == 's') && (This->Safety == 'Y') && (This->str[4] == 'n')){
                    Motor_Write(&This->MF, 't');
                }
            }
            /* 命令入力 */
            Command_Write(&This->CF, This->Command);
            PermitCommand_Write(&This->PCF, 'N');
        }
        break;
    case 'H':
        if(This->str[3] != 'y'){
            PrintF(Panel, "¥nA Basket isn't 2nd Floor");
```

```
            }
            else{
                if(This->str[4] != 'y'){
                    PermitTurnOpen_Write(&This->PTOF, 'o');
                }
                if(This->Safety == 'h'){
                    /* 命令入力 */
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[4] == 'n')){
                        Motor_Write(&This->MF, 't');
                    }
                }
                /* 命令入力 */
                Command_Write(&This->CF, This->Command);
                PermitCommand_Write(&This->PCF, 'N');
            }
            break;
        default:
            break;
        }
    }
    else if(This->PermitTurnOpen == 'o'){
        if((This->str[0] == 'y') && (This->str[7] != 'y')){
            switch(This->Command){
            case 'o':
            case 'd':
            case 'y':
                if(This->Safety == 'h'){
```

```
                    /* 命令入力 */
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[0] == 'y') && (This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
                }
                /* 命令入力 */
                Command_Write(&This->CF, This->Command);
                PermitTurnOpen_Write(&This->PTOF, 'N');
                break;
            default:
                break;
            }
        }
        else if((This->str[3] == 'y') && (This->str[7] != 'y')){
            switch(This->Command){
            case 'o':
            case 'u':
            case 'Y':
                if(This->Safety == 'h'){
                    /* 命令入力 */
                    This->Safety = 'Y';
                    Write(&This->SF, "Safety.txt", 'Y');
                    if((This->ch == 's') && (This->Safety == 'Y') && (This->str[3] == 'y') && (This->str[7] == 'n')){
                        Motor_Write(&This->MF, 'h');
                    }
```

```
                    }
                    /* 命令入力 */
                    Command_Write(&This->CF, This->Command);
                    PermitTurnOpen_Write(&This->PTOF, 'N');
                    break;
                default:
                    break;
                }
            }
        }
        break;
    }
    return;
}
```

```
/* EV_Controller.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

#ifndef EV_UpDown_h
#define EV_UpDown_h
#include "EV_UpDown.h"
#endif

#ifndef EV_OpenClose_h
```

```
#define EV_OpenClose_h
#include "EV_OpenClose.h"
#endif

/*==========================================================================
 制御盤を表す構造体宣言
==========================================================================*/
struct EV_Controller
{
    /* エレベーターの現在位置オブジェクトの宣言 */
    struct Position P;
    struct Position *p_P;

    /* 上昇オブジェクトの宣言 */
    struct UpMotor UPMT;
    /* 下降オブジェクトの宣言 */
    struct DownMotor DNMT;

    /* エレベーターの位置仮想ログ */
    struct WaitPositionChangeLog WPCL;

    /* エレベーターの現在位置オブジェクトの宣言 */
    struct Door DR;
    struct Door *p_DR;

    /* 開オブジェクトの宣言 */
    struct OpenMotor OPMT;
    /* 閉オブジェクトの宣言 */
    struct CloseMotor CLMT;
```

```
    /* エレベーターの位置仮想ログ */
    struct WaitDoorChangeLog WDCL;

    /* 経過時間テンポラリ */
    struct EV_Time T;

    /* 安全 */
    char Safety;
    char *p_Safety;
    /* Limit */
    char str[9];
    char *p_str;
    /* 命令 */
    char Command;
    char *p_Command;
    char PermitCommand;
    char *p_PermitCommand;
    char PermitTurnOpen;
    char *p_PermitTurnOpen;

    /* ファイルストリーム */
    struct EV_File SF;
    struct EV_File LF;
    struct EV_File CF;
    struct EV_File PCF;
    struct EV_File PTOF;
    struct EV_File MF;
};
```

```
/*==========================================================================
  制御を表すコンストラクタとメソッドのプロトタイプ宣言
==========================================================================*/
void EV_Controller(struct EV_Controller *This, Thread *th);
void OnController(struct EV_Controller *This, Thread *th);
```

```
/* EV_Controller.c */

#include "C.h"
#include "EV_Controller.h"

/*==========================================================================
  制御関数
==========================================================================*/
void EV_Controller(struct EV_Controller *This, Thread *th)
{
    /* 初期化 */
    This->p_P = &This->P;
    Position(This->p_P);
    UpMotor(&This->UPMT);
    DownMotor(&This->DNMT);
    WaitPositionChangeLog(&This->WPCL);
    This->p_DR = &This->DR;
    Door(This->p_DR);
    OpenMotor(&This->OPMT);
    CloseMotor(&This->CLMT);
    WaitDoorChangeLog(&This->WDCL);
    EV_Time(&This->T, th);
    EV_File(&This->SF);
    EV_File(&This->LF);
    EV_File(&This->CF);
    EV_File(&This->PCF);
    EV_File(&This->PTOF);
    EV_File(&This->MF);
```

```
    /* 安全初期化 */
    This->p_Safety = &This->Safety;
    /* Limit初期化 */
    This->p_str = &This->str[0];
    /* 命令初期化 */
    This->p_Command = &This->Command;
    This->p_PermitCommand = &This->PermitCommand;
    This->p_PermitTurnOpen = &This->PermitTurnOpen;

    /* モーター停止命令 */
    Motor_Write(&This->MF, 's');

    /* エレベーターの位置仮想ログ */
    /* 初期値 */
    OnInitWaitPositionChangeLog(&This->WPCL, This->p_P);

    /* エレベーターの位置仮想ログ */
    /* 初期値 */
    OnInitWaitDoorChangeLog(&This->WDCL, This->p_DR);

    /* リミットスイッチの前状態読み込み */
    ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9);
    /* 命令初期化 */
    if(Command_Write(&This->CF, 'N') == NG) return;
    if(PermitCommand_Write(&This->PCF, 'c') == NG) return;
    if(PermitTurnOpen_Write(&This->PTOF, 'N') == NG) return;
}
```

```
/*
 * 主制御関数
 */
void OnController(struct EV_Controller *This, Thread *th)
{
	/* 安全入力 */
	if(Read(&This->SF, "Safety.txt¥0", This->p_Safety) == NG) return;
	/* リミットスイッチの前状態読み込み */
	ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9);
	/* 命令入力 */
	if(Command_Read(&This->CF, This->p_Command) == NG) return;
	/* 入力許可 */
	if(PermitCommand_Read(&This->PCF, This->p_PermitCommand) == NG) return;
	/* 反転開許可 */
	if(PermitTurnOpen_Read(&This->PTOF, This->p_PermitTurnOpen) == NG) return;

	switch(This->Command){
	/* 終了命令ならば */
	case 'q':
		Motor_Write(&This->MF, 's');
		delete_(th);
		break;
	/* 非常停止命令ならば */
	case 's':
		SetPermit(&This->T, OFF);
		break;
	/* 復帰命令ならば */
	case 'r':
		break;
```

```
/* 上階呼命令ならば */
case 'Y':
    if((*This->p_P->p_UnderStop == ON) && (*This->p_DR->p_CloserStop == OFF)){
        break;
    }
/* 上昇命令ならば */
case 'u':
    if(*This->p_P->p_UpperStop == ON){
        /* 開完了時 */
        if(*This->p_DR->p_OpennerStop == ON){
            PermitCommand_Write(&This->PCF, 'c');
            SetPermit(&This->T, ON);
            Command_Write(&This->CF, 'N');
            Clear();
            PrintF(Panel, "Hello EV       ");
            break;
        }
        else{
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
            /* 開 */
            Open(This->p_DR,This->OPMT,This->WDCL, This->p_Safety);
        }
    }
    else if(*This->p_DR->p_CloserStop == ON){
        /* 閉完了時 */
        SetPermit(&This->T, OFF);
        SetCurrentTime(&This->T);
        PermitTurnOpen_Write(&This->PTOF, 'N');
```

```
            /* 上昇 */
            Up(This->p_P,This->UPMT,This->WPCL, This->p_Safety);
        }
        else if(*This->p_DR->p_CloserStop == OFF){
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
            /* 閉 */
            Close(This->p_DR,This->CLMT,This->WDCL, This->p_Safety);
        }
        else{
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
        }
        break;
    /* 下階呼命令ならば */
    case 'y':
        if((*This->p_P->p_UpperStop == ON) && (*This->p_DR->p_CloserStop == OFF)){
            break;
        }
    /* 下降命令ならば */
    case 'd':
        if(*This->p_P->p_UnderStop == ON){
            /* 開完了時 */
            if(*This->p_DR->p_OpennerStop == ON){
                PermitCommand_Write(&This->PCF, 'c');
                SetPermit(&This->T, ON);
                Command_Write(&This->CF, 'N');
                Clear();
```

```
            PrintF(Panel, "Hello EV       ");
            break;
        }
        else{
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
            /* 開 */
            Open(This->p_DR,This->OPMT,This->WDCL, This->p_Safety);
        }
    }
    else if(*This->p_DR->p_CloserStop == ON){
        /* 閉完了時 */
        SetPermit(&This->T, OFF);
        SetCurrentTime(&This->T);
        PermitTurnOpen_Write(&This->PTOF, 'N');
        /* 下降 */
        Down(This->p_P,This->DNMT,This->WPCL, This->p_Safety);
    }
    else if(*This->p_DR->p_CloserStop == OFF){
        SetPermit(&This->T, OFF);
        SetCurrentTime(&This->T);
        /* 閉 */
        Close(This->p_DR,This->CLMT,This->WDCL, This->p_Safety);
    }
    else{
        SetPermit(&This->T, OFF);
        SetCurrentTime(&This->T);
    }
    break;
```

```
/* 開命令ならば */
case 'o':
	/* 開完了時 */
	if(*This->p_DR->p_OpennerStop == ON){
		PermitCommand_Write(&This->PCF, 'c');
		SetPermit(&This->T, ON);
		Command_Write(&This->CF, 'N');
		Clear();
		PrintF(Panel, "Hello EV       ");
		break;
	}
	else{
		SetPermit(&This->T, OFF);
		SetCurrentTime(&This->T);
		/* 開 */
		Open(This->p_DR,This->OPMT,This->WDCL, This->p_Safety);
	}
	break;
/* 閉命令ならば */
case 'c':
	SetPermit(&This->T, OFF);
	SetCurrentTime(&This->T);
	/* 閉完了時 */
	if(*This->p_DR->p_CloserStop == ON){
		PermitTurnOpen_Write(&This->PTOF, 'N');
		Command_Write(&This->CF, 'N');
		PermitCommand_Write(&This->PCF, 'c');
		Clear();
		PrintF(Panel, "Hello EV       ");
```

```
            break;
        }
        else{
            /* 閉 */
            Close(This->p_DR,This->CLMT,This->WDCL, This->p_Safety);
        }
        break;
    /* 閉命令ならば */
    case 'H':
        if(*This->p_P->p_UpperStop == ON){
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
            /* 閉完了時 */
            if(*This->p_DR->p_CloserStop == ON){
                Command_Write(&This->CF, 'N');
                PermitTurnOpen_Write(&This->PTOF, 'N');
                PermitCommand_Write(&This->PCF, 'c');
                Clear();
                PrintF(Panel, "Hello EV       ");
                break;
            }
            else{
                /* 閉 */
                Close(This->p_DR,This->CLMT,This->WDCL, This->p_Safety);
            }
        }

        break;
    /* 閉命令ならば */
```

```
    case 'h':
        if(*This->p_P->p_UnderStop == ON){
            SetPermit(&This->T, OFF);
            SetCurrentTime(&This->T);
            /* 閉完了時 */
            if(*This->p_DR->p_CloserStop == ON){
                Command_Write(&This->CF, 'N');
                PermitTurnOpen_Write(&This->PTOF, 'N');
                PermitCommand_Write(&This->PCF, 'c');
                Clear();
                PrintF(Panel, "Hello EV       ");
                break;
            }
            else{
                /* 閉 */
                Close(This->p_DR,This->CLMT,This->WDCL, This->p_Safety);
            }
        }
        break;
    default:
        break;
    }
    if((GetCurrentTime(&This->T) >= OPENTIMEOUT) && (*This->p_DR->p_OpennerStop == ON) &&
(GetPermit(&This->T) == ON)){
        SetPermit(&This->T, OFF);
        SetCurrentTime(&This->T);
        PermitTurnOpen_Write(&This->PTOF, 'o');
        PermitCommand_Write(&This->PCF, 'N');
```

```
            /* 閉 */
            Command_Write(&This->CF, 'c');
        }
        return;
    }
```

```
/* EV_Puls.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

/* Raspberry Pi 3 Model B I/O */
#ifdef USE_RASPBIAN
#define GPIO16 16
#define GPIO17 17
#define GPIO18 18
#define GPIO19 19
```

```
#define GPIO20 20
#endif

/*==========================================================
 送信を表す構造体
==========================================================*/
struct EV_Puls
{
	char ch;
	char *p_ch;
	char Command;
	char *p_Command;
	/* ファイルストリーム */
	struct EV_File CF;
	struct EV_File MF;
};

/*==========================================================
 送信を表す関数のプロトタイプ宣言
==========================================================*/
void EV_Set(int addressDataSet, int dataSet, int addressClockSet,
 int clockSet);
void EV_EnableSet(void);
int EV_AddressSet(Thread *th, int base, int address);
int EV_DataSet(Thread *th, int base, int data);
void EV_AddressDataSet(struct EV_Puls *puls, Thread *th,
 int address_1, int address_2, int address_3, int address_4,
 int data_1, int data_2, int data_3, int data_4);
```

```
/*==========================================================================
  送信を表すコンストラクタとメソッドのプロトタイプ宣言
==========================================================================*/
void EV_Puls(struct EV_Puls *This, Thread *th);
void OnPuls(struct EV_Puls *This, Thread *th);
```

```
/* EV_Puls.c */

#include "C.h"
#include "EV_Puls.h"

void EV_Set(int addressDataSet, int dataSet, int addressClockSet,
 int clockSet){
#ifndef USE_BCC
	/* address data set */
	if(addressDataSet == 0){
		PB.DR &= 0xfe;
	}
	else if(addressDataSet == 1){
		PB.DR |= 0x01;
	}
	/* data set */
	if(dataSet == 0){
		PB.DR &= 0xfd;
	}
	else if(dataSet == 1){
		PB.DR |= 0x02;
	}
	/* address clock set */
	if(addressClockSet == 0){
		PB.DR &= 0xfb;
	}
	else if(addressClockSet == 1){
		PB.DR |= 0x04;
```

```
    }
    /* clock set */
    if(clockSet == 0){
        PB.DR &= 0xf7;
    }
    else if(clockSet == 1){
        PB.DR ¦= 0x08;
    }
    /* disable set */
    PB.DR &= 0xef;
#endif
#ifdef USE_RASPBIAN
    /* address data set */
    digitalWrite(GPIO16, addressDataSet);
    /* data set */
    digitalWrite(GPIO17, dataSet);
    /* address clock set */
    digitalWrite(GPIO18, addressClockSet);
    /* clock set */
    digitalWrite(GPIO19, clockSet);
    /* disable set */
    digitalWrite(GPIO20, 0);
#endif
    return;
}

void EV_EnableSet(void){
#ifndef USE_BCC
    /* address data set */
```

```
        PB.DR &= 0xfe;
        /* data set */
        PB.DR &= 0xfd;
        /* address clock set */
        PB.DR &= 0xfb;
        /* clock set */
        PB.DR &= 0xf7;
        /* enable set */
        PB.DR ¦= 0x10;
    #endif
    #ifdef USE_RASPBIAN
        /* address data set */
        digitalWrite(GPIO16, 0);
        /* data set */
        digitalWrite(GPIO17, 0);
        /* address clock set */
        digitalWrite(GPIO18, 0);
        /* clock set */
        digitalWrite(GPIO19, 0);
        /* enable set */
        digitalWrite(GPIO20, 1);
    #endif
        return;
    }

    int EV_AddressSet(Thread *th, int base, int address){
        int Ret;
        Ret = NG;
        if(th->count == base){
```

```
        EV_Set(address, 0, 0, 0);
        th->count++;
        Ret = OK;
    }
    else if(th->count == base + 1){
        EV_Set(address, 0, 1, 0);
        th->count++;
        Ret = OK;
    }
    return Ret;
}

int EV_DataSet(Thread *th, int base, int data){
    int Ret;
    Ret = NG;
    if(th->count == base){
        EV_Set(0, data, 0, 0);
        th->count++;
        Ret = OK;
    }
    else if(th->count == base + 1){
        EV_Set(0, data, 0, 1);
        th->count++;
        Ret = OK;
    }
    return Ret;
}

void EV_AddressDataSet(struct EV_Puls *puls, Thread *th,
```

```
 int address_1, int address_2, int address_3, int address_4,
 int data_1, int data_2, int data_3, int data_4){
      if(EV_AddressSet(th, 0, address_1) == OK);
      else if(EV_AddressSet(th, 2, address_2) == OK);
      else if(EV_AddressSet(th, 4, address_3) == OK);
      else if(EV_AddressSet(th, 6, address_4) == OK);
      else if(EV_DataSet(th, 8, data_1) == OK);
      else if(EV_DataSet(th, 10, data_2) == OK);
      else if(EV_DataSet(th, 12, data_3) == OK);
      else if(EV_DataSet(th, 14, data_4) == OK);
      else{
           EV_EnableSet();
           th->count = 0;
           switch(puls->Command){
           case 'q':
#ifndef USE_BCC
                /* address data set */
                PB.DR &= 0xfe;
                /* data set */
                PB.DR &= 0xfd;
                /* address clock set */
                PB.DR &= 0xfb;
                /* clock set */
                PB.DR &= 0xf7;
                /* disable set */
                PB.DR &= 0xef;
#endif
#ifdef USE_RASPBIAN
```

```
                /* address data set */
                digitalWrite(GPIO16, 0);
                /* data set */
                digitalWrite(GPIO17, 0);
                /* address clock set */
                digitalWrite(GPIO18, 0);
                /* clock set */
                digitalWrite(GPIO19, 0);
                /* disable set */
                digitalWrite(GPIO20, 0);
#endif
                delete_(th);
                break;
            default:
                break;
            }
        }
        return;
}

void EV_Puls(struct EV_Puls *This, Thread *th){
        This->p_ch = &This->ch;
        This->p_Command = &This->Command;
        EV_File(&This->MF);
        EV_File(&This->CF);
#ifndef USE_BCC
        PB.DDR = 0xff; /* bit7..0 out */
        PB.DR ¦= 0xff;
#endif
```

```
#ifdef USE_RASPBIAN
	if (wiringPiSetupGpio() == -1) exit(NG);
	pinMode(GPIO16, OUTPUT);
	pinMode(GPIO17, OUTPUT);
	pinMode(GPIO18, OUTPUT);
	pinMode(GPIO19, OUTPUT);
	pinMode(GPIO20, OUTPUT);
#endif
	return;
}

void OnPuls(struct EV_Puls *This, Thread *th){
	if(th->count == 0){
		/* 命令入力 */
		Command_Read(&This->CF, This->p_Command);
		/* モーター命令解読 */
		Read(&This->MF, "Motor.txt¥0", This->p_ch);
	}
	switch(This->ch){
	case 's':
		EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 0, 0, 0);
		break;
	case 'j':
		EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 0, 0, 1);
		break;
	case 'u':
		EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 0, 1, 0);
		break;
	case 'U':
```

```
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 0, 1, 1);
        break;
    case 'k':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 1, 0, 0);
        break;
    case 'd':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 1, 0, 1);
        break;
    case 'D':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 1, 1, 0);
        break;
    case 'h':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 0, 1, 1, 1);
        break;
    case 'o':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 1, 0, 0, 0);
        break;
    case 'O':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 1, 0, 0, 1);
        break;
    case 't':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 1, 0, 1, 0);
        break;
    case 'c':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 1, 0, 1, 1);
        break;
    case 'C':
        EV_AddressDataSet(This, th, 0, 1, 1, 1, 1, 1, 0, 0);
        break;
```

```
        default:
            break;
        }
        return;
    }
```

```
/* EV_Simulator.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

#ifndef EV_Display_h
#define EV_Display_h
#include "EV_Display.h"
#endif

/*============================================================
```

```
 シミュレータを表す構造体
==========================================================================*/
struct EV_Simulator
{
	char ch;
	char *p_ch;
	char ch2;
	char *p_ch2;
	char ch3;
	char *p_ch3;
	char str[9];
	char *p_str;

	/* 時間管理 */
	struct EV_Time T;

	/* ファイルストリーム */
	struct EV_File SF;
	struct EV_File CF;
	struct EV_File MF;
	struct EV_File LF;
};

/*==========================================================================
 シミュレータを表すコンストラクタとメソッドのプロトタイプ宣言
==========================================================================*/
void EV_Simulator(struct EV_Simulator *This, Thread *th);
void OnSimulator(struct EV_Simulator *This, Thread *th);
```

```
/* EV_Simulator.c */

#include "C.h"
#include "EV_Simulator.h"

/*==========================================================================
  シミュレータ関数
==========================================================================*/
void EV_Simulator(struct EV_Simulator *This, Thread *th)
{
	/* 初期化 */
	EV_Time(&This->T, th);
	SetCurrentTime(&This->T);
	This->p_ch = &This->ch;
	This->p_ch2 = &This->ch2;
	This->p_ch3 = &This->ch3;
	This->p_str = &This->str[0];
	This->str[8] = '¥0';
	EV_File(&This->SF);
	EV_File(&This->CF);
	EV_File(&This->MF);
	EV_File(&This->LF);

	/* モーター命令解読 */
	if(Read(&This->MF, "Motor.txt¥0", This->p_ch) == NG) return;
	/* リミットスイッチの前状態読み込み */
	if(ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9) == NG) return;
	/* 籠表示 */
```

```
	Disp(This->ch, This->str);
}

void OnSimulator(struct EV_Simulator *This, Thread *th)
{
	/* 終了条件 */
	Read(&This->CF, "Command.txt¥0", This->p_ch3);
	if(This->ch3 == 'q'){
		Clear();
		delete_(th);
		return;
	}

	/* モーター命令解読 */
	Read(&This->MF, "Motor.txt¥0", This->p_ch);

	/* リミットスイッチの前状態読み込み */
	ReadString(&This->LF, "Limit.txt¥0", This->p_str, 9);

	/* 停止条件 */
	Read(&This->SF, "Safety.txt¥0", This->p_ch2);
	if(This->ch2 == 's'){
		Write(&This->CF, "Command.txt¥0", 'N');
		/* 籠表示 */
		Disp(This->ch, This->str);
		return;
	}

	/* リミットスイッチの新状態作成 */
```

```
if(This->ch == 'u'){
        if(This->str[0] == 'y');
        else if(This->str[1] == 'y') This->str[1] = 'n';
        else if(This->str[2] == 'n');
        else if(This->str[3] == 'n') This->str[3] = 'y';
}
else if(This->ch == 'U'){
        if(This->str[0] == 'y');
        else if(This->str[1] == 'y');
        else if(This->str[2] == 'n') This->str[2] = 'y';
        else if(This->str[3] == 'n');
}
else if(This->ch == 'j'){
        if(This->str[0] == 'y') This->str[0] = 'n';
        else if(This->str[1] == 'y') This->str[1] = 'n';
        else if(This->str[2] == 'n') This->str[2] = 'y';
        else if(This->str[3] == 'n') This->str[3] = 'y';
}
else if(This->ch == 'd'){
        if(This->str[3] == 'y');
        else if(This->str[2] == 'y') This->str[2] = 'n';
        else if(This->str[1] == 'n');
        else if(This->str[0] == 'n') This->str[0] = 'y';
}
else if(This->ch == 'D'){
        if(This->str[3] == 'y');
        else if(This->str[2] == 'y');
        else if(This->str[1] == 'n') This->str[1] = 'y';
        else if(This->str[0] == 'n');
```

```
}
else if(This->ch == 'k'){
	if(This->str[3] == 'y') This->str[3] = 'n';
	else if(This->str[2] == 'y') This->str[2] = 'n';
	else if(This->str[1] == 'n') This->str[1] = 'y';
	else if(This->str[0] == 'n') This->str[0] = 'y';
}
else if(This->ch == 'o'){
	if(This->str[4] == 'y');
	else if(This->str[5] == 'y') This->str[5] = 'n';
	else if(This->str[6] == 'n');
	else if(This->str[7] == 'n') This->str[7] = 'y';
}
else if(This->ch == 'O'){
	if(This->str[4] == 'y');
	else if(This->str[5] == 'y');
	else if(This->str[6] == 'n') This->str[6] = 'y';
	else if(This->str[7] == 'n');
}
else if(This->ch == 'h'){
	if(This->str[4] == 'y') This->str[4] = 'n';
	else if(This->str[5] == 'y') This->str[5] = 'n';
	else if(This->str[6] == 'n') This->str[6] = 'y';
	else if(This->str[7] == 'n') This->str[7] = 'y';
}
else if(This->ch == 'c'){
	if(This->str[7] == 'y');
	else if(This->str[6] == 'y') This->str[6] = 'n';
	else if(This->str[5] == 'n');
```

```
        else if(This->str[4] == 'n') This->str[4] = 'y';
    }
    else if(This->ch == 'C'){
        if(This->str[7] == 'y');
        else if(This->str[6] == 'y');
        else if(This->str[5] == 'n') This->str[5] = 'y';
        else if(This->str[4] == 'n');
    }
    else if(This->ch == 't'){
        if(This->str[7] == 'y') This->str[7] = 'n';
        else if(This->str[6] == 'y') This->str[6] = 'n';
        else if(This->str[5] == 'n') This->str[5] = 'y';
        else if(This->str[4] == 'n') This->str[4] = 'y';
    }

    /* リミットスイッチの新状態書き込み */
    WriteString(&This->LF, "Limit.txt¥0", This->str);

    /* 籠表示 */
    Disp(This->ch, This->str);

    return;
}
```

```
/* main.h */

#ifndef Panel_h
#define Panel_h
#include "Panel.h"
#endif

#ifndef Timer_h
#define Timer_h
#include "Timer.h"
#endif

#ifndef EV_Time_h
#define EV_Time_h
#include "EV_Time.h"
#endif

#ifndef EV_File_h
#define EV_File_h
#include "EV_File.h"
#endif

#ifndef EV_UpDown_h
#define EV_UpDown_h
#include "EV_UpDown.h"
#endif

#ifndef EV_OpenClose_h
#define EV_OpenClose_h
#include "EV_OpenClose.h"
#endif

#ifndef EV_Display_h
#define EV_Display_h
#include "EV_Display.h"
#endif

#ifndef EV_Input_h
#define EV_Input_h
#include "EV_Input.h"
#endif

#ifndef EV_Controller_h
#define EV_Controller_h
#include "EV_Controller.h"
#endif

#ifndef EV_Puls_h
#define EV_Puls_h
#include "EV_Puls.h"
#endif

#ifndef EV_Simulator_h
#define EV_Simulator_h
#include "EV_Simulator.h"
#endif
```

```
#ifdef USE_THREAD
typedef struct tag_Count
{
#ifndef USE_BCC
	int cnt[2];
#else
	int cnt[8];
#endif
}Count;
#endif
```

```
/* main.c */

#include "C.h"
#include "main.h"

#ifdef USE_THREAD
Count Cnt;
int i_cnt, j_cnt;
#ifndef USE_BCC
/* 擬似スレッドの擬似インスタンス宣言 */
Thread* th[2];
#else
/* 擬似スレッドの擬似インスタンス宣言 */
Thread* th[8];
#endif
/* 疑似スレッドの疑似インスタンス宣言 */
Thread *th1[4];
Thread *th19;
Thread *th20;
Thread *th41;
Thread *th42;
Thread *th43;
Thread *th44;
#endif
#ifdef NOTUSE_FILES
EV_Status s;
#endif
```

```
/*==========================================================================
 入力オブジェクト宣言
==========================================================================*/
struct EV_Input in;

/*==========================================================================
 制御オブジェクト宣言
==========================================================================*/
struct EV_Controller cntrl;

/*==========================================================================
 送信オブジェクト宣言
==========================================================================*/
struct EV_Puls puls;

/*==========================================================================
 シミュレータオブジェクト宣言
==========================================================================*/
struct EV_Simulator simu;

void main(void)
{
#ifndef USE_BCC
    char sw[4];
    int i;
    int j;
    int f;
    int cnt;
    static char buff[64];
```

```
#endif
#ifdef USE_THREAD
    Thread *th30;
    Thread *th31;
#endif
#ifndef USE_BCC
    for(i=0;i<0x7fff;i++) {}
    H8init(); /* H8 レジスタ初期化 */
    InitSCI(); /* SCI1初期化(serial) */
    InitLCD(); /* LCD初期化 */

    /* LED OFF */
    SetLED(0,0);
    SetLED(1,0);
    SetLED(2,0);
    SetLED(3,0);

    /*-----------------------------------------------*/
    /* USB初期化 */
    InitUSB();
    INTC.ISCR &= (-1^0x20);  /* IRQ_5 ｾﾝｽｺﾝﾄﾛｰﾙ Active Low */
    INTC.IER ¦= 0x20; /* IRQ5 Enable */
    /*-----------------------------------------------*/
    EnableInterrupt(); /* 割り込み許可 ccr */

    f = 0;
    PrintSCI("CPU MODE %02X¥n",MDCR); /* MODE 6 */
    PrintLCD("¥fReady!3052"); /* '¥f'はLCDクリアに利用 */
```

```
    /* スイッチワーク初期化 */
    sw[0] = sw[1] = sw[2] = sw[3] = 0;
#else
    printf("¥nHello BCC");
#endif
#ifdef NOTUSE_FILES
    /* ファイル初期化 */
    new_EV_Status(&s);
#endif
#ifdef USE_THREAD
    /* タイマー初期化 */
    initWOVI();
    /* 2秒待機 */
    SleepMSec(2000);
    /* LEDTEST */
    th30 = new_Thread(30);
    th31 = new_Thread(31);
    Start(th30);
    Start(th31);
    for(;;)
    {
        /* タイマー呼び出し */
        wovi(5000000.0);
        if(Thread_checkAllDelete() == OK)
        {
            break;
        }
    }
#endif
```

```
    Clear();
    PrintF(Panel, "NEXT          ");
    /* 2秒待機 */
    SleepMSec(2000);
    Clear();
#ifndef USE_BCC
    for(;;)
    {
        /*-----------------------------------------------*/
        /* ボタンが押された時にLCD,SCI,USBにメッセージを送る */
        for(j=0;j<4;j++)
        {
            i = GetSW(j);
            if( ((sw[j]^1) & i) ) /* sw = off->onで条件成立 */
            {
                SetLED(j,1); /* LED押した瞬間点灯 */
                sprintf(buff,"sw%u",j+1);
                PrintSCI("%s¥n",buff);
                /* NULL(0x00)まで送信 */
                write_buff(buff,strlen(buff)+1);
                PrintLCD(buff);
            }
            else    SetLED(j,0);
            sw[j] = i;
        }

        /*-----------------------------------------------*/
        /* HOSTからのシリアル入力をLCD,USBに送る */
```

```
        if( ScanSCI() ) /* SCIに受信データあり? */
        {
            i = GetSCI(); /* シリアル入力 */
            PutLCD(i); /* LCD出力 */
            buff[0] = i;
            write_buff(buff,1); /* USB出力 */
        }

        /*-----------------------------------------------*/
        /* USBからデータを受信した場合、そのままHOSTへリダイレクトする  */
        if( get_inbufflen() ) /* 受信データあり? */
        {
            /* データ取得(buffサイズは64byteまで) */
            cnt = read_buff(buff,64);
            PrintLCD("¥f"); /* LCDクリア */
            PrintLCD(buff); /* LCDへ表示 */
            PrintSCI(buff); /* シリアル出力 */
            write_buff(buff,cnt); /* USBへリダイレクト */
        }

        /*-----------------------------------------------*/
        /* 動作確認のため点滅 */
        SetLED(3,f);
        f ^= 1;
        for(i=0;i<10000;i++) {} /* 適当にウエイト */
    }
#else
    printf("END");
    /* 5秒待機 */
```

```
	SleepMSec(5000);
	return;
#endif
}

#ifdef USE_THREAD
/*
 * 擬似スレッドの擬似メソッド関数
 */
 /* public void paint(Graphics g)の代用 */
void Repaint(void)
{
#ifndef USE_BCC
	int i;
#else
	int i,j;
#endif
	Clear();
#ifndef USE_BCC
	for(i = 0; i < Cnt.cnt[0]; i++)
	{
		PrintF(Panel, " ");
	}
	PrintF(Panel, "<1>");
	PrintF(Panel, "¥n");
	for(i = 0; i < Cnt.cnt[1]; i++)
	{
		PrintF(Panel, " ");
	}
```

```
        PrintF(Panel, "<2>");
#else
        for(i = 0; i < 8; i++)
        {
                for(j = 0; j < Cnt.cnt[i]; j++)
                {
                        printf(" ");
                }
                printf("<%d>", (i + 1));
                for(j = 0; j < 13 - Cnt.cnt[i]; j++)
                {
                        printf(" ");
                }
                printf("¦");
                printf("¥n");
        }
#endif
        return;
}

/*
 * 疑似スレッドの疑似メソッド関数
 */
/* スレッドのpublic void run()の代用 */
void Run(Thread *This)
{
        int i;
        Thread *th11;
#ifdef USE_BCC
```

```
    char key = '¥0';
#else
    int j;
    char sw[4];
    /* スイッチワーク初期化 */
    sw[0] = sw[1] = sw[2] = sw[3] = 0;
#endif
    if(This->ID == 1)
    {
        Repaint();
#ifndef USE_BCC
        Cnt.cnt[0]++;
        nextRun(This, (((rand() % 9) + 10) * 100));
#else
        if(kbhit())
        {
#ifdef USE_LINUX
            key = (char) getchar();
#else
            key = (char) getche();
#endif
        }
        if(key == 'r')
        {
            Cnt.cnt[0]++;
        }
        nextRun(This, (((rand() % 9) + 10) * 30));
        while(kbhit())
```

```
            {
#ifdef USE_LINUX
                key = (char) getchar();
#else
                key = (char) getche();
#endif
            }
#endif
        }
        else if(This->ID == 2)
        {
            Repaint();
#ifndef USE_BCC
            Cnt.cnt[1]++;
            nextRun(This, (((rand() % 9) + 10) * 100));
#else
            if(kbhit())
            {
#ifdef USE_LINUX
                key = (char) getchar();
#else
                key = (char) getche();
#endif
            }
            if(key == 'l')
            {
                Cnt.cnt[1]++;
            }
            nextRun(This, (((rand() % 9) + 10) * 30));
```

```
            while(kbhit())
            {
#ifdef USE_LINUX
                key = (char) getchar();
#else
                key = (char) getche();
#endif
            }
#endif
        }
#ifdef USE_BCC
        else if(((This->ID) >= 3) && ((This->ID) <= 8))
        {
                Repaint();
                Cnt.cnt[(This->ID) - 1]++;
                nextRun(This, (((rand() % 9) + 10) * 40));
        }
#endif
        else if(This->ID == 11)
        {
            if(This->count == 1)
            {
                Clear();
                PrintF(Panel, "<1>1st         ");
                countUpNextRun(This, (1900 * 1));
            }
            else if(This->count == 2)
            {
                Clear();
```

```
            PrintF(Panel, "<1>2nd");
            PrintF(Panel, "<1>Stop   ");
            Stop(This);
        }
        else if(This->count == 3)
        {
            Clear();
            PrintF(Panel, "<1>3rd        ");
            countUpNextRun(This, (1500 * 1));
        }
        else if(This->count == 4)
        {
            Clear();
            PrintF(Panel, "<1>Stop       ");
            Stop(This);
        }
    }
    else if(This->ID == 12)
    {
        if(This->count == 1)
        {
            Clear();
            PrintF(Panel, "<2>1st        ");
            countUpNextRun(This, (1700 * 2));
        }
        else if(This->count == 2)
        {
            Clear();
            PrintF(Panel, "<2>2nd        ");
```

```
            countUpNextRun(This, (1700 * 2));
        }
        else if(This->count == 3)
        {
            Clear();
            PrintF(Panel, "<2>3rd         ");
            countUpNextRun(This, (1700 * 2));
        }
        else
        {
            Clear();
            PrintF(Panel, "<2>Stop");
            Stop(This);
            delete_(This);
        }
    }
    else if(This->ID == 13)
    {
        if(This->count == 1)
        {
            Clear();
            PrintF(Panel, "<3>1st         ");
            countUpNextRun(This, (1700 * 3));
        }
        else if(This->count == 2)
        {
            Clear();
            PrintF(Panel, "<3>2nd         ");
```

```
            countUpNextRun(This, (1700 * 3));
        }
        else if(This->count == 3)
        {
            Clear();
            PrintF(Panel, "<3>3rd         ");
            countUpNextRun(This, (1700 * 3));
        }
        else
        {
            Clear();
            PrintF(Panel, "<3>Stop");
            Stop(This);
            delete_(This);
        }
    }
    else if(This->ID == 14)
    {
        if(This->count == 1)
        {
            Clear();
            PrintF(Panel, "<4>1st         ");
            countUpNextRun(This, (1500 * 4));
        }
        else if(This->count == 2)
        {
            Clear();
            PrintF(Panel, "<4>2nd");
            countUpNextRun(This, (1500 * 4));
```

```
            PrintF(Panel, "<1>Start  ");
            th11 = Thread_Start(11);
            countUpNextRun(th11, (1500 * 1));
        }
        else if(This->count == 3)
        {
            Clear();
            PrintF(Panel, "<4>3rd         ");
            countUpNextRun(This, (1500 * 4));
        }
        else if(This->count == 4)
        {
            th11 = Thread_getThread(11);
            if(th11 != NULL)
            {
                delete_(th11);
            }

            PrintF(Panel, "<4>Sto");
            Stop(This);
            delete_(This);
        }
    }
    else if(This->ID == 19)
    {
#ifdef USE_LINUX
        nextRun(This, 4000);
#else
```

```
        nextRun(This, 1);
#endif
#ifndef USE_BCC
        /* ボタンが押された時にLCD,SCI,USBにメッセージを送る */
        for(j=0;j<4;j++)
        {
            i = GetSW(j);
            if( ((sw[j]^1) & i) ) /* sw = off->onで条件成立 */
            {
                Thread_Toggle(j + 20);
                nextRun(This, 1000);
            }
        }
#else
        key = '¥0';
        key = GetChar(key);

        if(key == '1')
        {
            Thread_Toggle(21);
        }
        else if(key == '2')
        {
            Thread_Toggle(22);
        }
        else if(key == '3')
        {
            Thread_Toggle(23);
        }
```

```
else if(key == '4')
{
	Thread_Toggle(24);
}
else if(key == '5')
{
	Thread_Toggle(25);
}
else if(key == '6')
{
	Thread_Toggle(26);
}
else if(key == '7')
{
	Thread_Toggle(27);
}
else if(key == '8')
{
	Thread_Toggle(28);
}
else if(key == '9')
{
	Thread_Toggle(29);
}
else if(key == '0')
{
	Thread_Toggle(20);
}
```

```
#endif
    }
    else if(This->ID == 20)
    {
        PrintF(Panel, "0");
        countUpNextRun(This, 2000);
    }
    else if(This->ID == 21)
    {
        PrintF(Panel, "1");
        countUpNextRun(This, 2000);
    }
    else if(This->ID == 22)
    {
        PrintF(Panel, "2");
        countUpNextRun(This, 2000);
    }
    else if(This->ID == 23)
    {
        PrintF(Panel, "3");
        countUpNextRun(This, 2000);
    }
#ifdef USE_BCC
    else if((This->ID >= 24) && (This->ID <= 29))
    {
        printf("%d", This->ID - 20);
        nextRun(This, 2000);
    }
#endif
```

```
#ifndef USE_BCC
    else if(This->ID == 30)
    {
        if(This->count == 0)
        {
            This->count++;
            PB.DR &= 0x0e;
            nextRun(This, 1000);
        }
        else if(This->count == 1)
        {
            This->count--;
            PB.DR ¦= 0x01;
            nextRun(This, 1000);
        }
    }
#endif
    else if(This->ID == 31)
    {
        if(This->count == 0)
        {
            /* 第1部分 */
#ifdef USE_BCC
            printf("¥nThread Ready GO! There are 8 cources on a race.");
            printf("¥nThere are 14 cells to a GOAL.");
            printf("¥nFor the <1> cource, You click a 'R' button.");
            printf("¥nFor the <2> cource, You click a 'L' button.");
#endif
#ifndef USE_BCC
```

```
            countUpNextRun(This, 0);
#else
            /* 5秒待機 */
            countUpNextRun(This, 5000);
#endif
        }
        else if(This->count == 1)
        {
            /* 擬似スレッド開始 */
            PrintF(Panel, "¥n");
            PrintF(Panel, "Thread Ready GO!");
            /* 2秒待機 */
            countUpNextRun(This, 2000);
        }
        else if(This->count == 2)
        {
#ifndef USE_BCC
            /* 擬似スレッドの擬似インスタンス初期化 */
            for(i = 0; i < 2; i++)
            {
                th[i] = new_Thread(i + 1);
            }
#else
            /* 擬似スレッドの擬似インスタンス初期化 */
            for(i = 0; i < 8; i++)
            {
                th[i] = new_Thread(i + 1);
            }
#endif
```

```
            countUpNextRun(This, 1);
        }
        else if(This->count == 3)
        {
#ifndef USE_BCC
            if(Cnt.cnt[0] >= 13)
            {
                i_cnt = 1;
                This->count++;
            }
            else if(Cnt.cnt[1] >= 13)
            {
                i_cnt = 2;
                This->count++;
            }
#else
            i_cnt = Cnt.cnt[0];
            j_cnt = 0;
            for(i = 1; i < 8; i++)
            {
                if(i_cnt < Cnt.cnt[i])
                {
                    i_cnt = Cnt.cnt[i];
                    j_cnt = i;
                }
            }
            if(i_cnt >= 13) This->count++;
#endif
```

```
            nextRun(This, 1);
        }
        else if(This->count == 4)
        {
            Clear();
            if(i_cnt == 1)
            {
                PrintF(Panel, "GOAL!<1>WON    ");
            }
            else if(i_cnt == 2)
            {
                PrintF(Panel, "GOAL!<2>WON    ");
            }
#ifdef USE_BCC
            else
            {
                printf("GOAL!¥n<%d>WON", (j_cnt + 1));
            }
#endif
#ifndef USE_BCC
            delete_(th[0]);
            delete_(th[1]);
#else
            for(i = 0; i < 8; i++)
            {
                delete_(th[i]);
            }
#endif
#ifdef USE_LINUX
```

```
            This->count = 15;
#else
            This->count++;
#endif
            /* 2秒待機 */
            nextRun(This, 2000);
        }
        else if(This->count == 5)
        {
            Clear();
            PrintF(Panel, "NEXT          ");
            /* 2秒待機 */
            countUpNextRun(This, 2000);
        }
        else if(This->count == 6)
        {
            Clear();
            /* 第2部分 */
            PrintF(Panel, "CountUp       ");
            /* 2秒待機 */
            countUpNextRun(This, 2000);
        }
        else if(This->count == 7)
        {
            /* 疑似スレッド開始 */
            Clear();
            /* 疑似スレッドの疑似インスタンス初期化 */
            for(i = 0; i < 4; i++)
            {
```

```
            th1[i] = new_Thread(i + 11);
        }
        countUpNextRun(This, 1);
    }
    else if(This->count == 8)
    {
        if(Thread_checkStayAnother() == 2)
        {
            This->count++;
        }
        nextRun(This, 1);
    }
    else if(This->count == 9)
    {
        /* 2秒待機 */
        countUpNextRun(This, 2000);
    }
    else if(This->count == 10)
    {
        Clear();
        PrintF(Panel, "NEXT          ");
        /* 2秒待機 */
        countUpNextRun(This, 2000);
    }
    else if(This->count == 11)
    {
        Clear();
        /* 第3部分 */
        PrintF(Panel, "Toggle        ");
```

```
        /* 2秒待機 */
        countUpNextRun(This, 2000);
    }
    else if(This->count == 12)
    {
        th19 = new_Thread(19);
        Start(th19);
        th20 = new_Thread(20);
        Start(th20);
        countUpNextRun(This, 1);
    }
    else if(This->count == 13)
    {
        if(Thread_checkStayAnother() == 3)
        {
            delete_(th19);
            This->count++;
        }
        nextRun(This, 1);
    }
    else if(This->count == 14)
    {
        countUpNextRun(This, 2000);
    }
    else if(This->count == 15)
    {
        Clear();
        PrintF(Panel, "NEXT          ");
```

```
        /* 2秒待機 */
        countUpNextRun(This, 2000);
    }
    else if(This->count == 16)
    {
        Clear();
        /* 第4部分 */
        PrintF(Panel, "Hello EV       ");
        /* 2秒待機 */
        countUpNextRun(This, 2000);
    }
    else if(This->count == 17)
    {
        /* 擬似スレッドの擬似インスタンス初期化 */
        th41 = new_Thread(41);
        th42 = new_Thread(42);
        th43 = new_Thread(43);
        th44 = new_Thread(44);

        delete_(This);

        /* LEDTEST */
        delete_(Thread_getThread(30));
    }
}
else if(This->ID == 41)
{
    nextRun(This, 100);
    OnInput(&in, This);
```

```
    }
    else if(This->ID == 42)
    {
        nextRun(This, 100);
        OnController(&cntrl, This);
    }
    else if(This->ID == 43)
    {
        nextRun(This, 110);
        OnPuls(&puls, This);
    }
    else if(This->ID == 44)
    {
        nextRun(This, 2000);
        OnSimulator(&simu, This);
    }
    return;
}

/* スレッドのコンストラクタのpublic void init()の代用 */
void Init(Thread *This)
{
    if(This->ID == 1)
    {
        Cnt.cnt[0] = 0;
        nextRun(This, (((rand() % 9) + 10) * 30));
    }
    else if(This->ID == 2)
    {
```

```
        Cnt.cnt[1] = 0;
        nextRun(This, (((rand() % 9) + 10) * 30));
    }
    else if((This->ID >= 3) && (This->ID <= 8))
    {
        Cnt.cnt[(This->ID) - 1] = 0;
        nextRun(This, (((rand() % 9) + 10) * 200));
    }
    else if(This->ID == 11)
    {
        PrintF(Panel, "<1>Init");
        countUpNextRun(This, (1500 * 1));
    }
    else if(This->ID == 12)
    {
        PrintF(Panel, "<2>Init  ");
        countUpNextRun(This, (1500 * 2));
    }
    else if(This->ID == 13)
    {
        PrintF(Panel, "¥n");
        PrintF(Panel, "<3>Init");
        countUpNextRun(This, (1500 * 3));
    }
    else if(This->ID == 14)
    {
        PrintF(Panel, "<4>Init  ");
        countUpNextRun(This, (1500 * 4));
    }
```

```
else if(This->ID == 20)
{
	Clear();
	PrintF(Panel, "<0>Init	");
	PrintF(Panel, "¥n");
	countUpNextRun(This, 2000);
}
else if(This->ID == 21)
{
	Clear();
	PrintF(Panel, "<1>Init	");
	PrintF(Panel, "¥n");
	countUpNextRun(This, 2000);
}
else if(This->ID == 22)
{
	Clear();
	PrintF(Panel, "<2>Init	");
	PrintF(Panel, "¥n");
	countUpNextRun(This, 2000);
}
else if(This->ID == 23)
{
	Clear();
	PrintF(Panel, "<3>Init	");
	PrintF(Panel, "¥n");
	countUpNextRun(This, 2000);
}
```

```
#ifdef USE_BCC
    else if((This->ID >= 24) && (This->ID <= 29))
    {
        printf("¥n<%d>Init¥n", This->ID - 20);
        nextRun(This,2000);
    }
#endif
#ifndef USE_BCC
    else if(This->ID == 30)
    {
        PB.DDR = 0xff; /* bit7..0 out */
        PB.DR ¦= 0xff;
    }
#endif
    else if(This->ID == 41)
    {
        nextRun(This, 100);
        EV_Input(&in);
    }
    else if(This->ID == 42)
    {
        nextRun(This, 100);
        EV_Controller(&cntrl, This);
    }
    else if(This->ID == 43)
    {
        nextRun(This, 110);
        EV_Puls(&puls, This);
    }
```

```
    else if(This->ID == 44)
    {
        nextRun(This, 2000);
        EV_Simulator(&simu, This);
    }
    return;
}

/* スレッドのデストラクタの代用 */
void Destroy(Thread *This)
{
    if(This->ID == 11)
    {
        Clear();
        PrintF(Panel, "<1>Destroy");
    }
    else if(This->ID == 12)
    {
        PrintF(Panel, "<2>Destro");
    }
    else if(This->ID == 13)
    {
        PrintF(Panel, "<3>Destro");
    }
    else if(This->ID == 14)
    {
        PrintF(Panel, "¥n");
        PrintF(Panel, "<4>Destroy     ");
    }
```

```
    if(This->ID == 20)
    {
        Clear();
        PrintF(Panel, "<0>Destroy     ");
        PrintF(Panel, "¥n");
    }
    else if(This->ID == 21)
    {
        Clear();
        PrintF(Panel, "<1>Destroy     ");
        PrintF(Panel, "¥n");
    }
    else if(This->ID == 22)
    {
        Clear();
        PrintF(Panel, "<2>Destroy     ");
        PrintF(Panel, "¥n");
    }
    else if(This->ID == 23)
    {
        Clear();
        PrintF(Panel, "<3>Destroy     ");
        PrintF(Panel, "¥n");
    }
#ifdef USE_BCC
    else if((This->ID >= 24) && (This->ID <= 29))
    {
        printf("¥n<%d>Destroy¥n", This->ID - 20);
    }
```

```
#endif
	return;
}
#endif

#ifndef USE_BCC
/*=====================================================================
                                LEDコントロール
---------------------------------------------------------------------
	int SetLED(int no,int onoff)

	int		no		LEDナンバー 0～3
	int		onoff		0=OFF,1=ON
	戻り値			以前のLEDの状態	(0=OFF,else=ON)

	LEDをコントロールします。
=====================================================================*/
int SetLED(int no,int onoff)
{
	int f;
	f = PB.DR&(1<<no);
	if( onoff == 0 ) PB.DR ¦= (1<<no); /* off (1) */
	else PB.DR &= 0xff^(1<<no); /* on (0) */
	return( f );
}

/*=====================================================================
                                SW状態取得
```

```
----------------------------------------------------------------
    int GetSW(int no)

    int         no              SWナンバー 0～3
    戻り値                      SWの状態(0=OFF,else=ON)

    SWの状態を取得します。
================================================================*/
int GetSW(int no)
{
    return( ((PA.DR&(1<<no))?0:1) );
}

/*================================================================
                                H8初期化
----------------------------------------------------------------
    BUSモードや、ポートの初期化

    P1    bit1  BUS       USB A0
    P3          BUS       USB D7..0
    P6 bit4     BUS       USB RD
    P6 bit5     BUS       USB WR
    P8 bit2     BUS       USB CS
    P9 bit5     BUS       USB INT(IRQ5)
    P9 bit3     BUS       RS232C
    P9 bit1     BUS       RS232C

    PA bit0..3  IN        SW0..3
    PB bit0..3  OUT       LED0..3  LCD DB4..7
```

```
    PB bit4     OUT             LCD RS
    PB bit7     OUT             LCD E
==========================================================================*/
void H8init()
{
    BSC.ABWCR = 0x06; /* 8bit BUS MODE */

    P1.DDR = 0xff; /* all OUT */
    P2.DDR = 0xff; /* all OUT */
    P2.PCR = 0x00; /* Pull up off */
    P5.DDR = 0xff; /* all OUT */
    P5.PCR = 0x00; /* Pull up off */
    P6.DDR = 0xff; /* all OUT */
    P9.DDR = 0xdf; /* Bit5 IN */
    P8.DDR = 0xff; /* all OUT */
    PA.DDR = 0xf0; /* bit7..4 out , bit3..0 in */
    PB.DDR = 0xff; /* bit7..0 out */
}
#endif
```

実行環境

```
-I"c:\borland\Bcc55\include"
-L"c:\borland\Bcc55\lib"
```

-L"c:\borland\Bcc55\Lib"

```
# makefile.mak
CC = bcc32
LL = ilink32
INCLUDE = -I"C:\borland\bcc55\Include"
LIB = -L"C:\borland\bcc55\Lib"
CFLAGS = -O2 -w -tWC -D"USE_BCC"
LFLAGS = /Tpe
TARGET = main.exe
OBJS = Panel.obj Timer.obj EV_Time.obj EV_File.obj EV_UpDown.obj EV_OpenClose.obj EV_Display.obj
EV_Input.obj EV_Controller.obj EV_Puls.obj EV_Simulator.obj main.obj
$(TARGET): $(OBJS)
	$(LL) $(LFLAGS) $(LIB) \
	$(OBJS) c0x32.obj,$(TARGET),,cw32.lib import32.lib
main.obj : main.c main.h EV_Simulator.h EV_Puls.h EV_Controller.h EV_Input.h EV_Display.h EV_OpenClose.h
EV_UpDown.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c main.c
EV_Simulator.obj : EV_Simulator.c EV_Simulator.h EV_Display.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Simulator.c
EV_Puls.obj : EV_Puls.c EV_Puls.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Puls.c
EV_Controller.obj : EV_Controller.c EV_Controller.h EV_OpenClose.h EV_UpDown.h EV_File.h EV_Time.h
Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Controller.c
EV_Input.obj : EV_Input.c EV_Input.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Input.c
EV_Display.obj : EV_Display.c EV_Display.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Display.c
EV_OpenClose.obj : EV_OpenClose.c EV_OpenClose.h EV_UpDown.h EV_File.h EV_Time.h Timer.h Panel.h
C.h
	$(CC) $(CFLAGS) -c EV_OpenClose.c
EV_UpDown.obj : EV_UpDown.c EV_UpDown.h EV_File.h EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_UpDown.c
EV_File.obj : EV_File.c EV_File.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_File.c
EV_Time.obj : EV_Time.c EV_Time.h Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c EV_Time.c
Timer.obj : Timer.c Timer.h Panel.h C.h
	$(CC) $(CFLAGS) -c Timer.c
Panel.obj : Panel.c Panel.h C.h
	$(CC) $(CFLAGS) -c Panel.c
clean:
	del *.obj
	del main.tds
	del main.ilc
	del main.ild
	del main.ilf
	del main.ils
```

```
; asmfile.src

 .CPU 300HA
 .SECTION V,CODE,LOCATE=H'000000

; C言語の関数 を参照
 .IMPORT _main ; C言語の関数main を参照
 .IMPORT _usb_int ; C言語の関数usb_int を参照
 .IMPORT _InterruptITU0 ; C言語の関数InterruptITU0 を参照

;------------------------------------------------------------
; リセットベクタ の 転送先ラベル が _start になっています
; リセットベクタ
 .DATA.L _start

;------------------------------------------------------------
; リセットベクタ に続く1番から60番までの 割り込みベクタ
; について、使用しない 割り込みベクタ は ラベルint_error
; に転送されます
; 割り込みベクタ
; 1 Reserved
_INT_Reserved1: .DATA.L int_error
; 2 Reserved
_INT_Reserved2: .DATA.L int_error
; 3 Reserved
_INT_Reserved3: .DATA.L int_error
; 4 Reserved
_INT_Reserved4: .DATA.L int_error
```

```
; 5 Reserved
_INT_Reserved5: .DATA.L int_error
; 6 Reserved
_INT_Reserved6: .DATA.L int_error
; 7 NMI
_INT_NMI: .DATA.L int_error
; 8 TRAP
_INT_TRAP1: .DATA.L int_error
; 9 TRAP
_INT_TRAP2: .DATA.L int_error
; 10 TRAP
_INT_TRAP3: .DATA.L int_error
; 11 TRAP
_INT_TRAP4: .DATA.L int_error
; 12 IRQ0
IRQ0: .DATA.L int_error
; 13 IRQ1
IRQ1: .DATA.L int_error
; 14 IRQ2
IRQ2: .DATA.L int_error
; 15 IRQ3
IRQ3: .DATA.L int_error
; 16 IRQ4
IRQ4: .DATA.L int_error
; 17 IRQ5
IRQ5: .DATA.L usb_interrupt ; USB割り込み
; 18 Reserved
_INT_Reserved18: .DATA.L int_error
; 19 Reserved
```

```
_INT_Reserved19: .DATA.L int_error
; 20 WOVI
_INT_WOVI: .DATA.L int_error
; 21 CMI
_INT_CMI: .DATA.L int_error
; 22 Reserved
_INT_Reserved22: .DATA.L int_error
; 23 Reserved
_INT_Reserved23: .DATA.L int_error
; 24 IMIA0
_INT_IMIA0: .DATA.L int_error
; 25 IMIB0
_INT_IMIB0: .DATA.L int_error
; タイマ0割り込み は、 ラベル_ITU_OVI_0 に転送されます
; 26 OVI0
_INT_OVI0: .DATA.L _ITU_OVI_0 ; タイマ0割り込み
; 27 Reserved
_INT_Reserved27: .DATA.L int_error
; 28 IMIA1
_INT_IMIA1: .DATA.L int_error
; 29 IMIB1
_INT_IMIB1: .DATA.L int_error
; 30 OVI1
_INT_OVI1: .DATA.L int_error
; 31 Reserved
_INT_Reserved31: .DATA.L int_error
; 32 IMIA2
_INT_IMIA2: .DATA.L int_error
; 33 IMIB2
```

```
_INT_IMIB2: .DATA.L int_error
; 34 OVI2
_INT_OVI2: .DATA.L int_error
; 35 Reserved
_INT_Reserved35: .DATA.L int_error
; 36 IMIA3
_INT_IMIA3: .DATA.L int_error
; 37 IMIB3
_INT_IMIB3: .DATA.L int_error
; 38 OVI3
_INT_OVI3: .DATA.L int_error
; 39 Reserved
_INT_Reserved39: .DATA.L int_error
; 40 IMIA4
_INT_IMIA4: .DATA.L int_error
; 41 IMIB4
_INT_IMIB4: .DATA.L int_error
; 42 OVI4
_INT_OVI4: .DATA.L int_error
; 43 Reserved
_INT_Reserved43: .DATA.L int_error
; 44 DEND0A
_INT_DEND0A: .DATA.L int_error
; 45 DEND0B
_INT_DEND0B: .DATA.L int_error
; 46 DEND1A
_INT_DEND1A: .DATA.L int_error
; 47 DEND1B
_INT_DEND1B: .DATA.L int_error
```

```
; 48 Reserved
_INT_Reserved48: .DATA.L int_error
; 49 Reserved
_INT_Reserved49: .DATA.L int_error
; 50 Reserved
_INT_Reserved50: .DATA.L int_error
; 51 Reserved
_INT_Reserved51: .DATA.L int_error
; 52 ERI0
_INT_ERI0: .DATA.L int_error
; 53 RXI0
_INT_RXI0: .DATA.L int_error
; 54 TXI0
_INT_TXI0: .DATA.L int_error
; 55 TEI0
_INT_TEI0: .DATA.L int_error
; 56 ERI1
_INT_ERI1: .DATA.L int_error
; 57 RXI1
_INT_RXI1: .DATA.L int_error
; 58 TXI1
_INT_TXI1: .DATA.L int_error
; 59 TEI1
_INT_TEI1: .DATA.L int_error
; 60 ADI
_INT_ADI: .DATA.L int_error

;---------------------------------------------------------
```

```
 .SECTION P,CODE,ALIGN=2
; _start の ラベル から処理を開始
; リセットベクタ の転送先
_start:
 mov.l #H'0FFFF10,er7
; 初期化付きデータを使用する場合、RAMに転送する
; c_thread.MAP のメモリアドレス使用状況を見る
; メモリアドレスが重複するとコンパイルエラーになる
; linkfile.sub も D(99C0), C(9A00) 等必要があれば合わせる
 mov.l #H'99C0, er0 ; 転送元(99C0)
 mov.l #H'0FFE000, er1 ; 転送先
 mov.l #DATA_END, er2 ; 転送終了
init_loop:
 cmp.l er1, er2
 beq init_end
 mov.b @er0+, r3l
 mov.b r3l, @er1
 inc.l #1, er1
 bra init_loop
init_end:
; C言語の関数main を呼び出しています
; C言語の関数main は、 void main(void); という形で、
; main.c に記述があります
 jsr @_main
; 割り込み未使用
int_error:
; rte (returnと同じ意味) で終了
 rte
```

```
;---------------------------------------------------------
; USB割り込み からの転送先
usb_interrupt:
; スタック 退避
 push.l er0
 push.l er1
 push.l er2
 push.l er3
 push.l er4
 push.l er5
 push.l er6
; C言語の関数usb_int を呼び出しています
 jsr @_usb_int
; スタック 戻
 pop.l er6
 pop.l er5
 pop.l er4
 pop.l er3
 pop.l er2
 pop.l er1
 pop.l er0
; 終了
 rte

;---------------------------------------------------------
; タイマ0割り込み からの転送先
_ITU_OVI_0:
; スタック 退避
 push.l er0
```

```
 push.l er1
 push.l er2
 push.l er3
 push.l er4
 push.l er5
 push.l er6
; C言語の関数InterruptITU0 を呼び出しています
; C言語の関数InterruptITU0 は void InterruptITU0(void);
; という形で、 Timer.h Timer.c に記述があります
 jsr @_InterruptITU0
; スタック 戻
 pop.l er6
 pop.l er5
 pop.l er4
 pop.l er3
 pop.l er2
 pop.l er1
 pop.l er0
; 終了
 rte

;---------------------------------------------------------
; C言語から
; _EnableInterrupt (割り込み許可)
; _DisableInterrupt (割り込み禁止)
; を呼び出せるようにしています
; C言語の Panel.h に 外部参照プロトタイプ宣言 があります
; extern void EnableInterrupt(void);
; extern void DisableInterrupt(void);
```

```
; C言語からの呼び出し名は、
; EnableInterrupt();
; DisableInterrupt();
; です
; 割り込み許可、禁止ルーチン
 .EXPORT _EnableInterrupt,_DisableInterrupt
_EnableInterrupt:
 andc.b #H'3f,ccr
 rts
_DisableInterrupt:
 orc.b #H'c0,ccr
 rts

;------------------------------------------------------
 .SECTION D,DATA

 .SECTION B,DATA
DATA_END: .RES.W 1

 .END
```

```
OUTPUT c_thread
PRINT c_thread
INPUT asmfile, main, EV_Simulator, EV_Puls, EV_Controller, EV_Input, EV_Display, EV_OpenClose,
EV_UpDown, EV_File, EV_Time, Timer, Panel, sci, lcd, usb
LIB c:\h8\akic\c38hab
START R(0FFE000), P(200), D(99C0), C(9A00)
ROM (D, R)
EXIT
```

```
@rem build.bat
C:
set bccDir="C:\borland\bcc55\Bin"
set akih8asmDir="c:\h8\akiasm"
set akih8cDir="c:\h8\akic"
set path=%bccDir%;%path%
set path=%akih8cDir%;%akih8asmDir%;%path%
set CurrentDir="%~dp0"
cd %CurrentDir%
del error.txt
make -f makefile.mak >> error.txt
make -f makefile.mak clean >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% usb.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% sci.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% lcd.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% Panel.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% Timer.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Time.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_File.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_UpDown.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_OpenClose.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Display.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Input.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Controller.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Puls.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% EV_Simulator.c >> error.txt
cc38h.exe -cpu=300ha -include=%akih8cDir% main.c >> error.txt
a38h.exe asmfile.src >> error.txt
l38h.exe -subcommand=linkfile.sub >> error.txt
c38h.exe c_thread.abs >> error.txt
del %CurrentDir%*.obj >> error.txt
del %CurrentDir%c_thread.abs >> error.txt
error.txt
exit
```

```
#!/bin/bash
cd `dirname $0`
find $PWD -name LINUXBuild.bash
rm ./LINUXError.txt
gcc -D"USE_LINUX" -o LINUXExe main.c EV_Simulator.c EV_Puls.c EV_Controller.c EV_Input.c
EV_Display.c EV_OpenClose.c EV_UpDown.c EV_File.c EV_Time.c Timer.c Panel.c &>>./LINUXError.txt
exit
```

```
#!/bin/bash
cd `dirname $0`
find $PWD -name LINUXStart.bash
./LINUXExe
exit
```

```
#!/bin/bash
cd `dirname $0`
find $PWD -name RaspberryPi3ModelBBuild.bash
rm ./RaspberryPi3ModelBError.txt
gcc -D"USE_RASPBIAN" -o RaspberryPi3ModelBExe main.c EV_Simulator.c EV_Puls.c EV_Controller.c
EV_Input.c EV_Display.c EV_OpenClose.c EV_UpDown.c EV_File.c EV_Time.c Timer.c Panel.c -
I/usr/local/include -L/usr/local/lib -lwiringPi &>>./RaspberryPi3ModelBError.txt
exit
```

```
#!/bin/bash
cd `dirname $0`
find $PWD -name RaspberryPi3ModelBStart.bash
./RaspberryPi3ModelBExe
exit
```

実行環境状態ファイル

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出力ファイル

```
 Start         Length     Name                   Class
 0001:00401000 000010C0CH _TEXT                  CODE
 0002:00412000 0000039A4H _DATA                  DATA
 0003:004159A4 000000B6CH _BSS                   BSS
 0004:00000000 0000000A4H _TLS                   TLS
```

PROGRAM NAME =

```
 1                1  ; asmfile.src
 2                2
 3                3   .CPU 300HA
 4 000000         4   .SECTION V,CODE,LOCATE=H'000000
 5                5
 6                6  ; C言語の関数 を参照
 7                7   .IMPORT _main ; C言語の関数main を参照
 8                8   .IMPORT _usb_int ; C言語の関数usb_int を参照
 9                9   .IMPORT _InterruptITU0 ; C言語の関数InterruptITU0 を参照
10               10
11               11   ;------------------------------------------------------
12               12   ; リセットベクタ の 転送先ラベル が _start になっています
13               13   ; リセットベクタ
14 000000 00000000      14   .DATA.L _start
15               15
16               16   ;------------------------------------------------------
17               17   ; リセットベクタ に続く1番から60番までの 割り込みベクタ
18               18   ; について、使用しない 割り込みベクタ は ラベルint_error
19               19   ; に転送されます
20               20   ; 割り込みベクタ
21               21   ; 1 Reserved
22 000004 00000000      22   _INT_Reserved1: .DATA.L int_error
23               23   ; 2 Reserved
24 000008 00000000      24   _INT_Reserved2: .DATA.L int_error
```

```
25                      25    ; 3 Reserved
26 00000C 00000000      26    _INT_Reserved3: .DATA.L int_error
27                      27    ; 4 Reserved
28 000010 00000000      28    _INT_Reserved4: .DATA.L int_error
29                      29    ; 5 Reserved
30 000014 00000000      30    _INT_Reserved5: .DATA.L int_error
31                      31    ; 6 Reserved
32 000018 00000000      32    _INT_Reserved6: .DATA.L int_error
33                      33    ; 7 NMI
34 00001C 00000000      34    _INT_NMI: .DATA.L int_error
35                      35    ; 8 TRAP
36 000020 00000000      36    _INT_TRAP1: .DATA.L int_error
37                      37    ; 9 TRAP
38 000024 00000000      38    _INT_TRAP2: .DATA.L int_error
39                      39    ; 10 TRAP
40 000028 00000000      40    _INT_TRAP3: .DATA.L int_error
41                      41    ; 11 TRAP
42 00002C 00000000      42    _INT_TRAP4: .DATA.L int_error
43                      43    ; 12 IRQ0
44 000030 00000000      44    IRQ0: .DATA.L int_error
45                      45    ; 13 IRQ1
46 000034 00000000      46    IRQ1: .DATA.L int_error
47                      47    ; 14 IRQ2
48 000038 00000000      48    IRQ2: .DATA.L int_error
49                      49    ; 15 IRQ3
50 00003C 00000000      50    IRQ3: .DATA.L int_error
51                      51    ; 16 IRQ4
52 000040 00000000      52    IRQ4: .DATA.L int_error
53                      53    ; 17 IRQ5
```

```
 54 000044 00000000          54    IRQ5: .DATA.L usb_interrupt ; USB割り込み
 55                          55    ; 18 Reserved
 56 000048 00000000          56    _INT_Reserved18: .DATA.L int_error
 57                          57    ; 19 Reserved
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
 PAGE    2
 PROGRAM NAME =


 58 00004C 00000000          58    _INT_Reserved19: .DATA.L int_error
 59                          59    ; 20 WOVI
 60 000050 00000000          60    _INT_WOVI: .DATA.L int_error
 61                          61    ; 21 CMI
 62 000054 00000000          62    _INT_CMI: .DATA.L int_error
 63                          63    ; 22 Reserved
 64 000058 00000000          64    _INT_Reserved22: .DATA.L int_error
 65                          65    ; 23 Reserved
 66 00005C 00000000          66    _INT_Reserved23: .DATA.L int_error
 67                          67    ; 24 IMIA0
 68 000060 00000000          68    _INT_IMIA0: .DATA.L int_error
 69                          69    ; 25 IMIB0
 70 000064 00000000          70    _INT_IMIB0: .DATA.L int_error
 71                          71    ; タイマ0割り込み は、 ラベル_ITU_OVI_0 に転送されます
 72                          72    ; 26 OVI0
 73 000068 00000000          73    _INT_OVI0: .DATA.L _ITU_OVI_0 ; タイマ0割り込み
 74                          74    ; 27 Reserved
 75 00006C 00000000          75    _INT_Reserved27: .DATA.L int_error
 76                          76    ; 28 IMIA1
 77 000070 00000000          77    _INT_IMIA1: .DATA.L int_error
 78                          78    ; 29 IMIB1
```

```
 79 000074 00000000          79    _INT_IMIB1: .DATA.L int_error
 80                          80    ; 30 OVI1
 81 000078 00000000          81    _INT_OVI1: .DATA.L int_error
 82                          82    ; 31 Reserved
 83 00007C 00000000          83    _INT_Reserved31: .DATA.L int_error
 84                          84    ; 32 IMIA2
 85 000080 00000000          85    _INT_IMIA2: .DATA.L int_error
 86                          86    ; 33 IMIB2
 87 000084 00000000          87    _INT_IMIB2: .DATA.L int_error
 88                          88    ; 34 OVI2
 89 000088 00000000          89    _INT_OVI2: .DATA.L int_error
 90                          90    ; 35 Reserved
 91 00008C 00000000          91    _INT_Reserved35: .DATA.L int_error
 92                          92    ; 36 IMIA3
 93 000090 00000000          93    _INT_IMIA3: .DATA.L int_error
 94                          94    ; 37 IMIB3
 95 000094 00000000          95    _INT_IMIB3: .DATA.L int_error
 96                          96    ; 38 OVI3
 97 000098 00000000          97    _INT_OVI3: .DATA.L int_error
 98                          98    ; 39 Reserved
 99 00009C 00000000          99    _INT_Reserved39: .DATA.L int_error
100                         100    ; 40 IMIA4
101 0000A0 00000000         101    _INT_IMIA4: .DATA.L int_error
102                         102    ; 41 IMIB4
103 0000A4 00000000         103    _INT_IMIB4: .DATA.L int_error
104                         104    ; 42 OVI4
105 0000A8 00000000         105    _INT_OVI4: .DATA.L int_error
106                         106    ; 43 Reserved
107 0000AC 00000000         107    _INT_Reserved43: .DATA.L int_error
```

```
 108                    108    ; 44 DEND0A
 109 0000B0 00000000        109    _INT_DEND0A: .DATA.L int_error
 110                    110    ; 45 DEND0B
 111 0000B4 00000000        111    _INT_DEND0B: .DATA.L int_error
 112                    112    ; 46 DEND1A
 113 0000B8 00000000        113    _INT_DEND1A: .DATA.L int_error
 114                    114    ; 47 DEND1B
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
PAGE    3
PROGRAM NAME =

 115 0000BC 00000000        115    _INT_DEND1B: .DATA.L int_error
 116                    116    ; 48 Reserved
 117 0000C0 00000000        117    _INT_Reserved48: .DATA.L int_error
 118                    118    ; 49 Reserved
 119 0000C4 00000000        119    _INT_Reserved49: .DATA.L int_error
 120                    120    ; 50 Reserved
 121 0000C8 00000000        121    _INT_Reserved50: .DATA.L int_error
 122                    122    ; 51 Reserved
 123 0000CC 00000000        123    _INT_Reserved51: .DATA.L int_error
 124                    124    ; 52 ERI0
 125 0000D0 00000000        125    _INT_ERI0: .DATA.L int_error
 126                    126    ; 53 RXI0
 127 0000D4 00000000        127    _INT_RXI0: .DATA.L int_error
 128                    128    ; 54 TXI0
 129 0000D8 00000000        129    _INT_TXI0: .DATA.L int_error
 130                    130    ; 55 TEI0
 131 0000DC 00000000        131    _INT_TEI0: .DATA.L int_error
```

```
132                     132    ; 56 ERI1
133 0000E0 00000000         133    _INT_ERI1: .DATA.L int_error
134                     134    ; 57 RXI1
135 0000E4 00000000         135    _INT_RXI1: .DATA.L int_error
136                     136    ; 58 TXI1
137 0000E8 00000000         137    _INT_TXI1: .DATA.L int_error
138                     138    ; 59 TEI1
139 0000EC 00000000         139    _INT_TEI1: .DATA.L int_error
140                     140    ; 60 ADI
141 0000F0 00000000         141    _INT_ADI: .DATA.L int_error
142                     142
143                     143    ;------------------------------------------------------
144 000000                  144    .SECTION P,CODE,ALIGN=2
145                     145    ; _start の ラベル から処理を開始
146                     146    ; リセットベクタ の転送先
147 000000                  147    _start:
148 000000 7A0700FFFF10        148    mov.l #H'0FFFF10,er7
149                     149    ; 初期化付きデータを使用する場合、RAMに転送する
150                     150    ; c_thread.MAP のメモリアドレス使用状況を見る
151                     151    ; メモリアドレスが重複するとコンパイルエラーになる
152                     152    ; linkfile.sub も D(99C0), C(9A00) 等必要があれば合わせる
153 000006 7A00000099C0      153    mov.l #H'99C0, er0 ; 転送元(99C0)
154 00000C 7A0100FFE000        154    mov.l #H'0FFE000, er1 ; 転送先
155 000012 7A0200000000        155    mov.l #DATA_END, er2 ; 転送終了
156 000018                  156    init_loop:
157 000018 1F92             157    cmp.l er1, er2
158 00001A 58700008         158    beq init_end
159 00001E 6C0B             159    mov.b @er0+, r3l
160 000020 689B             160    mov.b r3l, @er1
```

```
 161 000022 0B71            161     inc.l #1, er1
 162 000024 40F2            162     bra init_loop
 163 000026                 163     init_end:
 164                        164     ; C言語の関数main を呼び出しています
 165                        165     ; C言語の関数main は、 void main(void); という形で、
 166                        166     ; main.c に記述があります
 167 000026 5E000000        167     jsr @_main
 168                        168     ; 割り込み未使用
 169 00002A                 169     int_error:
 170                        170     ; rte (returnと同じ意味) で終了
 171 00002A 5670            171     rte
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
PAGE    4
PROGRAM NAME =


 172                        172
 173                        173     ;---------------------------------------------------------
 174                        174     ; USB割り込み からの転送先
 175 00002C                 175     usb_interrupt:
 176                        176     ; スタック 退避
 177 00002C 01006DF0        177     push.l er0
 178 000030 01006DF1        178     push.l er1
 179 000034 01006DF2        179     push.l er2
 180 000038 01006DF3        180     push.l er3
 181 00003C 01006DF4        181     push.l er4
 182 000040 01006DF5        182     push.l er5
 183 000044 01006DF6        183     push.l er6
 184                        184     ; C言語の関数usb_int を呼び出しています
 185 000048 5E000000        185     jsr @_usb_int
```

```
186                     186    ;スタック 戻
187 00004C 01006D76         187     pop.l er6
188 000050 01006D75         188     pop.l er5
189 000054 01006D74         189     pop.l er4
190 000058 01006D73         190     pop.l er3
191 00005C 01006D72         191     pop.l er2
192 000060 01006D71         192     pop.l er1
193 000064 01006D70         193     pop.l er0
194                     194    ;終了
195 000068 5670             195     rte
196                     196
197                     197    ;-------------------------------------------------------
198                     198    ;タイマ0割り込み からの転送先
199 00006A                  199    _ITU_OVI_0:
200                     200    ;スタック 退避
201 00006A 01006DF0         201     push.l er0
202 00006E 01006DF1         202     push.l er1
203 000072 01006DF2         203     push.l er2
204 000076 01006DF3         204     push.l er3
205 00007A 01006DF4         205     push.l er4
206 00007E 01006DF5         206     push.l er5
207 000082 01006DF6         207     push.l er6
208                     208    ;C言語の関数InterruptITU0 を呼び出しています
209                     209    ;C言語の関数InterruptITU0 は void InterruptITU0(void);
210                     210    ;という形で、 Timer.h Timer.c に記述があります
211 000086 5E000000         211     jsr @_InterruptITU0
212                     212    ;スタック 戻
213 00008A 01006D76         213     pop.l er6
214 00008E 01006D75         214     pop.l er5
```

```
 215 000092 01006D74          215     pop.l er4
 216 000096 01006D73          216     pop.l er3
 217 00009A 01006D72          217     pop.l er2
 218 00009E 01006D71          218     pop.l er1
 219 0000A2 01006D70          219     pop.l er0
 220                  220    ; 終了
 221 0000A6 5670              221     rte
 222                  222
 223                  223    ;--------------------------------------------------------
 224                  224    ; C言語から
 225                  225    ; _EnableInterrupt (割り込み許可)
 226                  226    ; _DisableInterrupt (割り込み禁止)
 227                  227    ; を呼び出せるようにしています
 228                  228    ; C言語の Panel.h に 外部参照プロトタイプ宣言 があります
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
PAGE    5
PROGRAM NAME =


 229                  229    ; extern void EnableInterrupt(void);
 230                  230    ; extern void DisableInterrupt(void);
 231                  231    ; C言語からの呼び出し名は、
 232                  232    ; EnableInterrupt();
 233                  233    ; DisableInterrupt();
 234                  234    ; です
 235                  235    ; 割り込み許可、禁止ルーチン
 236                  236     .EXPORT _EnableInterrupt,_DisableInterrupt
 237 0000A8             237     _EnableInterrupt:
 238 0000A8 063F              238     andc.b #H'3f,ccr
```

```
 239 0000AA 5470            239     rts
 240 0000AC                 240    _DisableInterrupt:
 241 0000AC 04C0            241     orc.b #H'c0,ccr
 242 0000AE 5470            242     rts
 243                        243
 244                        244    ;--------------------------------------------------------
 245 000000                 245     .SECTION D,DATA
 246                        246
 247 000000                 247     .SECTION B,DATA
 248 000000 00000002        248     DATA_END: .RES.W 1
 249                        249
 250                        250     .END
 *****TOTAL ERRORS      0
 *****TOTAL WARNINGS    0
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
PAGE    6

*** CROSS REFERENCE LIST

NAME                    SECTION  ATTR VALUE          SEQUENCE

B                       B       SCT  00000000    247*
D                       D       SCT  00000000    245*
DATA_END                        B          00000000    155   248*
IRQ0                     V          00000030    44*
IRQ1                     V          00000034    46*
IRQ2                     V          00000038    48*
IRQ3                     V          0000003C    50*
IRQ4                     V          00000040    52*
```

```
IRQ5                    V       00000044    54*
P                       P       SCT  00000000   144*
V                       V       SCT  00000000     4*
_DisableInterrupt       P       EXPT 000000AC   236   240*
_EnableInterrupt        P       EXPT 000000A8   236   237*
_INT_ADI                V       000000F0   141*
_INT_CMI                V       00000054    62*
_INT_DEND0A             V       000000B0   109*
_INT_DEND0B             V       000000B4   111*
_INT_DEND1A             V       000000B8   113*
_INT_DEND1B             V       000000BC   115*
_INT_ERI0               V       000000D0   125*
_INT_ERI1               V       000000E0   133*
_INT_IMIA0              V       00000060    68*
_INT_IMIA1              V       00000070    77*
_INT_IMIA2              V       00000080    85*
_INT_IMIA3              V       00000090    93*
_INT_IMIA4              V       000000A0   101*
_INT_IMIB0              V       00000064    70*
_INT_IMIB1              V       00000074    79*
_INT_IMIB2              V       00000084    87*
_INT_IMIB3              V       00000094    95*
_INT_IMIB4              V       000000A4   103*
_INT_NMI                V       0000001C    34*
_INT_OVI0               V       00000068    73*
_INT_OVI1               V       00000078    81*
_INT_OVI2               V       00000088    89*
_INT_OVI3               V       00000098    97*
_INT_OVI4               V       000000A8   105*
```

```
_INT_RXI0               V       000000D4  127*
_INT_RXI1               V       000000E4  135*
_INT_Reserved1          V       00000004  22*
_INT_Reserved18         V       00000048  56*
_INT_Reserved19         V       0000004C  58*
_INT_Reserved2          V       00000008  24*
_INT_Reserved22         V       00000058  64*
_INT_Reserved23         V       0000005C  66*
_INT_Reserved27         V       0000006C  75*
_INT_Reserved3          V       0000000C  26*
_INT_Reserved31         V       0000007C  83*
_INT_Reserved35         V       0000008C  91*
_INT_Reserved39         V       0000009C  99*
_INT_Reserved4          V       00000010  28*
_INT_Reserved43         V       000000AC  107*
_INT_Reserved48         V       000000C0  117*
_INT_Reserved49         V       000000C4  119*
```


*** CROSS REFERENCE LIST

```
NAME                SECTION  ATTR VALUE     SEQUENCE

_INT_Reserved5          V       00000014  30*
_INT_Reserved50         V       000000C8  121*
_INT_Reserved51         V       000000CC  123*
_INT_Reserved6          V       00000018  32*
_INT_TEI0               V       000000DC  131*
```

```
_INT_TEI1               V       000000EC   139*
_INT_TRAP1              V       00000020    36*
_INT_TRAP2              V       00000024    38*
_INT_TRAP3              V       00000028    40*
_INT_TRAP4              V       0000002C    42*
_INT_TXI0               V       000000D8   129*
_INT_TXI1               V       000000E8   137*
_INT_WOVI               V       00000050    60*
_ITU_OVI_0              P       0000006A    73  199*
_InterruptITU0                IMPT 00000000     9  211
_main                         IMPT 00000000     7  167
_start                  P       00000000    14  147*
_usb_int                      IMPT 00000000     8  185
init_end                P       00000026   158  163*
init_loop               P       00000018   156*  162
int_error               P       0000002A    22   24   26   28   30   32   34   36   38   40   42   44
                                    46   48   50   52   56   58   60   62   64   66   68   70
                                    75   77   79   81   83   85   87   89   91   93   95   97
                                    99  101  103  105  107  109  111  113  115  117  119  121
                                   123  125  127  129  131  133  135  137  139  141  169*
usb_interrupt           P       0000002C    54  175*
*** H8/300H ASSEMBLER (Evaluation software) Ver.1.0 ***     04/22/18 20:24:55
PAGE    8

*** SECTION DATA LIST

SECTION                 ATTRIBUTE   SIZE        START
```

V ABS-CODE 00000F4 000000

P REL-CODE 00000B0

D REL-DATA 0000000

B REL-DATA 0000002

S00E0000635F7468726561644D4F54C8
S1130000000002000000022A0000022A0000022A67
S1130010000022A0000022A0000022A0000022A2D
S1130020000022A0000022A0000022A0000022A1D
S10B00300000022A0000022A6D
S1130038000022A0000022A0000022A0000022C03
S1130048000022A0000022A0000022A0000022AF5
S1130058000022A0000022A0000022A0000022AE5
S10B00680000026A0000022AF5
S1130070000022A0000022A0000022A0000022ACD
S1130080000022A0000022A0000022A0000022ABD
S1130090000022A0000022A0000022A0000022AAD
S10B00A00000022A0000022AFD
S11300A80000022A0000022A0000022A0000022A95
S11300B80000022A0000022A0000022A0000022A85
S11300C80000022A0000022A0000022A0000022A75
S10B00D80000022A0000022AC5
S11300E00000022A0000022A0000022A0000022A5D
S10700F00000022ADD
S11302007A0700FFFF107A00000099C07A0100FF0F
S1130210E0007A0200FFE0101F92587000086C0B98
S1130220689B0B7140F25E0002B0567001006DF0E6
S113023001006DF101006DF201006DF301006DF439
S113024001006DF501006DF65E004F5C01006D76F7
S113025001006D7501006D7401006D7301006D7215
S113026001006D7101006D70567001006DF00100A9
S11302706DF101006DF201006DF301006DF40100F9
S11302806DF501006DF65E00493C01006D760100DD
S11302906D7501006D7401006D7301006D720100D5
S11302A06D7101006D705670063F547004C0547038
S11302B05E0060727A370000000A790B000119337F
S11302C00FF47A0600FFE1E019550B5579257FFFFE
S11302D04DF85C000FD85E004AD85E004C580D38CC
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H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0

LINK COMMAND LINE

LNK -subcommand=linkfile.sub

LINK SUBCOMMANDS

```
OUTPUT c_thread
PRINT c_thread
INPUT asmfile, main, EV_Simulator, EV_Puls, EV_Controller, EV_Input, EV_Display, EV_OpenClose,
EV_UpDown, EV_File, EV_Time, Timer, Panel, sci, lcd, usb
LIB c:\h8\akic\c38hab
START R(0FFE000), P(200), D(99C0), C(9A00)
ROM (D, R)
EXIT
```


*** LINKAGE EDITOR LINK MAP LIST ***

SECTION	NAME	START - END	LENGTH	UNIT NAME	MODULE NAME
ATTRIBUTE : CODE NOSHR					
V		H'00000000 - H'000000F3	H'000000F4	asmfile	asmfile
* TOTAL ADDRESS *		H'00000000 - H'000000F3	H'000000F4		
ATTRIBUTE : CODE NOSHR					
P		H'00000200 - H'000002AF	H'000000B0	asmfile	asmfile
		H'000002B0 - H'000012D9	H'0000102A	main	main
		H'000012DA - H'00001799	H'000004C0	EV_Simulator	EV_Simulator
		H'0000179A - H'00001B15	H'0000037C	EV_Puls	EV_Puls
		H'00001B16 - H'00002491	H'0000097C	EV_Controller	EV_Controller
		H'00002492 - H'00002DCF	H'0000093E	EV_Input	EV_Input
		H'00002DD0 - H'00002E21	H'00000052	EV_Display	EV_Display

```
                H'00002E22   -   H'00003689   H'00000868
                                 EV_OpenClose                EV_OpenClose
                H'0000368A   -   H'00003ED1   H'00000848
                                 EV_UpDown                   EV_UpDown
                H'00003ED2   -   H'000042C5   H'000003F4
                                 EV_File                     EV_File
                H'000042C6   -   H'0000441D   H'00000158
                                 EV_Time                     EV_Time
                H'0000441E   -   H'00004981   H'00000564
                                 Timer                       Timer
                H'00004982   -   H'00004AD7   H'00000156
                                 Panel                       Panel
                H'00004AD8   -   H'00004BA9   H'000000D2
                                 sci                         sci
                H'00004BAA   -   H'00004DE7   H'0000023E
                                 lcd                         lcd
                H'00004DE8   -   H'000058D9   H'00000AF2
                                 usb                         usb
                H'000058DA   -   H'00005913   H'0000003A
                                 rand                        rand
                H'00005914   -   H'00005971   H'0000005E
                                 sprintf                     sprintf
                H'00005972   -   H'0000599B   H'0000002A
                                 strcmp                      strcmp



                H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0   PAGE :    2

                   ***    LINKAGE EDITOR LINK MAP LIST     ***


SECTION   NAME                START     -     END       LENGTH
                                 UNIT NAME                   MODULE NAME


ATTRIBUTE :   CODE  NOSHR

P                  H'0000599C   -   H'000059B7   H'0000001C
                                 strcpy                      strcpy
                H'000059B8   -   H'000059D3   H'0000001C
                                 strlen                      strlen
                H'000059D4   -   H'00005A03   H'00000030
                                 vsprintf                    vsprintf
                H'00005A04   -   H'00005CDD   H'000002DA
                                 addd3                       addd3
                H'00005CDE   -   H'00005F0F   H'00000232
                                 divd3                       divd3
                H'00005F10   -   H'00005F89   H'0000007A
                                 dtol3                       dtol3
                H'00005F8A   -   H'00005F95   H'0000000C
                                 eqd3                        eqd3
                H'00005F96   -   H'00005FA5   H'00000010
                                 ged3                        ged3
                H'00005FA6   -   H'00005FB5   H'00000010
                                 ltd3                        ltd3
                H'00005FB6   -   H'00005FFB   H'00000046
```

```
                    ltod3                   ltod3
H'00005FFC  -  H'00006019  H'0000001E
                    mv83                    mv83
H'0000601A  -  H'00006041  H'00000028
                    mvn3                    mvn3
H'00006042  -  H'0000604F  H'0000000E
                    ned3                    ned3
H'00006050  -  H'00006071  H'00000022
                    spregld3                spregld3
H'00006072  -  H'00006099  H'00000028
                    spregsv3                spregsv3
H'0000609A  -  H'00007E47  H'00001DAE
                    _fmtout                 _fmtout
H'00007E48  -  H'00007F03  H'000000BC
                    cmpd3                   cmpd3
H'00007F04  -  H'00007F29  H'00000026
                    divl3                   divl3
H'00007F2A  -  H'00007F49  H'00000020
                    mull3                   mull3
H'00007F4A  -  H'0000832F  H'000003E6
                    _dti                    _dti
H'00008330  -  H'000084D3  H'000001A4
                    _its                    _its
H'000084D4  -  H'0000852D  H'0000005A
                    memcpy                  memcpy
H'0000852E  -  H'00008569  H'0000003C
                    divul3                  divul3


H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0   PAGE :    3

    ***    LINKAGE EDITOR LINK MAP LIST     ***


SECTION   NAME              START    -    END      LENGTH
                    UNIT NAME               MODULE NAME


ATTRIBUTE :  CODE  NOSHR

P                   H'0000856A  -  H'00008591  H'00000028
                    _allzero                _allzero
H'00008592  -  H'00008689  H'000000F8
                    _calcnpw                _calcnpw
H'0000868A  -  H'0000872D  H'000000A4
                    _log10                  _log10
H'0000872E  -  H'000087A5  H'00000078
                    _lsfts                  _lsfts
H'000087A6  -  H'000087D3  H'0000002E
                    _pow5                   _pow5
H'000087D4  -  H'0000884D  H'0000007A
                    _rsfts                  _rsfts
H'0000884E  -  H'000088F9  H'000000AC
                    _sub                    _sub
H'000088FA  -  H'0000899D  H'000000A4
                    _unpack                 _unpack
```

```
                H'0000899E   -   H'000089DB   H'0000003E
                                 memcmp                  memcmp
                H'000089DC   -   H'00008A63   H'00000088
                                 _mult64                 _mult64
                H'00008A64   -   H'00008BC5   H'00000162
                                 _power                  _power
                H'00008BC6   -   H'00008CAF   H'000000EA
                                 _rnd                    _rnd
                H'00008CB0   -   H'00008D4B   H'0000009C
                                 _setsbit                _setsbit
                H'00008D4C   -   H'00008E51   H'00000106
                                 frexp                   frexp
                H'00008E52   -   H'00008F87   H'00000136
                                 modf                    modf
                H'00008F88   -   H'00008FA9   H'00000022
                                 dslc3                   dslc3
                H'00008FAA   -   H'00008FCB   H'00000022
                                 dsruc3                  dsruc3
                H'00008FCC   -   H'00009001   H'00000036
                                 itod3                   itod3
                H'00009002   -   H'000092EF   H'000002EE
                                 muld3                   muld3
                H'000092F0   -   H'00009341   H'00000052
                                 _duchek                 _duchek
                H'00009342   -   H'00009393   H'00000052
                                 _lsft                   _lsft
                H'00009394   -   H'00009521   H'0000018E
                                 _mult                   _mult
                H'00009522   -   H'000095BD   H'0000009C
                                 _pow10                  _pow10


                H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0   PAGE :    4

                   ***    LINKAGE EDITOR LINK MAP LIST     ***


SECTION   NAME              START    -    END      LENGTH
                                UNIT NAME                MODULE NAME


ATTRIBUTE :  CODE  NOSHR

P                 H'000095BE   -   H'00009605   H'00000048
                                 _add                    _add
                H'00009606   -   H'00009635   H'00000030
                                 memset                  memset

* TOTAL ADDRESS *          H'00000200   -   H'00009635   H'00009436


ATTRIBUTE :  DATA  NOSHR ROM

D                 H'000099C0   -   H'000099C0   H'00000000
                                 asmfile                 asmfile
                H'000099C0   -   H'000099CF   H'00000010
```

usb usb

* TOTAL ADDRESS * H'000099C0 - H'000099CF H'00000010

ATTRIBUTE : DATA NOSHR

C H'00009A00 - H'00009C8D H'0000028E
main main
H'00009C8E - H'00009CBC H'0000002F
EV_Simulator EV_Simulator
H'00009CBE - H'00009CC8 H'0000000B
EV_Puls EV_Puls
H'00009CCA - H'00009CF1 H'00000028
EV_Controller EV_Controller
H'00009CF2 - H'00009D57 H'00000066
EV_Input EV_Input
H'00009D58 - H'00009E17 H'000000C0
EV_Display EV_Display
H'00009E18 - H'00009E63 H'0000004C
EV_OpenClose EV_OpenClose
H'00009E64 - H'00009EA6 H'00000043
EV_UpDown EV_UpDown
H'00009EA8 - H'00009F19 H'00000072
EV_File EV_File
H'00009F1A - H'00009F21 H'00000008
EV_Time EV_Time
H'00009F22 - H'00009F59 H'00000038
Timer Timer
H'00009F5A - H'00009F64 H'0000000B
Panel Panel
H'00009F66 - H'0000A01F H'000000BA
usb usb

*** LINKAGE EDITOR LINK MAP LIST ***

SECTION NAME START - END LENGTH
UNIT NAME MODULE NAME

ATTRIBUTE : DATA NOSHR

C H'0000A020 - H'0000A027 H'00000008
_fmtout _fmtout
H'0000A028 - H'0000A127 H'00000100
_ctype _ctype
H'0000A128 - H'0000A1AF H'00000088
_its _its
H'0000A1B0 - H'0000A1B7 H'00000008
_log10 _log10
H'0000A1B8 - H'0000A297 H'000000E0
_pow5 _pow5

```
                    H'0000A298   -   H'0000A39B   H'00000104
                                    _power                  _power
                    H'0000A39C   -   H'0000A3A3   H'00000008
                                    frexp                   frexp
                    H'0000A3A4   -   H'0000A3AB   H'00000008
                                    modf                    modf

* TOTAL ADDRESS *           H'00009A00   -   H'0000A3AB   H'000009AC


ATTRIBUTE :  DATA  NOSHR RAM

R                   H'00FFE000   -   H'00FFE000   H'00000000
                                    asmfile                 asmfile
                    H'00FFE000   -   H'00FFE00F   H'00000010
                                    usb                     usb

* TOTAL ADDRESS *           H'00FFE000   -   H'00FFE00F   H'00000010


ATTRIBUTE :  DATA  NOSHR

B                   H'00FFE010   -   H'00FFE011   H'00000002
                                    asmfile                 asmfile
                    H'00FFE012   -   H'00FFE21F   H'0000020E
                                    main                    main
                    H'00FFE220   -   H'00FFE233   H'00000014
                                    EV_File                 EV_File
                    H'00FFE234   -   H'00FFE475   H'00000242
                                    Timer                   Timer
                    H'00FFE476   -   H'00FFE4F5   H'00000080
                                    Panel                   Panel
                    H'00FFE4F6   -   H'00FFE545   H'00000050
                                    sci                     sci
                    H'00FFE546   -   H'00FFE585   H'00000040
                                    lcd                     lcd



                    H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0   PAGE :    6

                       ***    LINKAGE EDITOR LINK MAP LIST     ***


SECTION   NAME              START     -     END       LENGTH
                                UNIT NAME                   MODULE NAME


ATTRIBUTE :  DATA  NOSHR

B                   H'00FFE586   -   H'00FFE859   H'000002D4
                                    usb                     usb
                    H'00FFE85A   -   H'00FFE895   H'0000003C
                                    _fmtout                 _fmtout
                    H'00FFE896   -   H'00FFE899   H'00000004
                                    _rnext                  _rnext
                    H'00FFE89A   -   H'00FFE89B   H'00000002
```

_errno _errno

* TOTAL ADDRESS * H'00FFE010 - H'00FFE89B H'0000088C

H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0 PAGE : 1

*** LINKAGE EDITOR EXTERNALLY DEFINED SYMBOLS LIST ***

SYMBOL NAME	ADDR	TYPE
$ADDD$3	H'00005ACE	DAT
$CMPD$3	H'00007E48	DAT
$DIVD$3	H'00005D78	DAT
$DIVL$3	H'00007F04	DAT
$DIVUL$3	H'0000852E	DAT
$DSLC$3	H'00008F88	DAT
$DSRUC$3	H'00008FAA	DAT
$DTOL$3	H'00005F10	DAT
EQD3	H'00005F8A	DAT
GED3	H'00005F96	DAT
$ITOD$3	H'00008FCC	DAT
LTD3	H'00005FA6	DAT
$LTOD$3	H'00005FB6	DAT
$MULD$3	H'000090B8	DAT
$MULL$3	H'00007F2A	DAT
$MV8$3	H'00005FFC	DAT
MVN3	H'0000601A	DAT
NED3	H'00006042	DAT
$SUBD$3	H'00005A9E	DAT
sp_regld3	H'00006050	DAT
sp_regsv3	H'00006072	DAT
_Checkfmove	H'000043E0	ENT
_Clear	H'00004982	ENT
_ClearLCD	H'00004CC8	ENT
_Close	H'00003642	ENT
_CloseMotor	H'000030F6	ENT
_Cnt	H'00FFE012	DAT
_Command_Read	H'000040DC	ENT
_Command_Write	H'00004128	ENT
_Destroy	H'00001144	ENT
_DisableInterrupt	H'000002AC	DAT
_Disp	H'00002E20	ENT
_DispInput	H'00002DD0	ENT
_DispUSBPort	H'00004EF8	ENT
_Door	H'00002E22	ENT
_Down	H'00003E8A	ENT
_DownMotor	H'0000395E	ENT
_EV_AddressDataSet	H'000018EA	ENT
_EV_AddressSet	H'00001806	ENT
_EV_Controller	H'00001B16	ENT
_EV_DataSet	H'00001878	ENT
_EV_EnableSet	H'000017F0	ENT
_EV_File	H'00003F26	ENT
_EV_Input	H'000024FE	ENT
_EV_Puls	H'000019BA	ENT

_EV_Set	H'0000179A	ENT
_EV_Simulator	H'000012DA	ENT
_EV_Time	H'000042C6	ENT
_EnableInterrupt	H'000002A8	DAT
_GetChar	H'00002492	ENT
_GetCurrentTime	H'00004328	ENT

*** LINKAGE EDITOR EXTERNALLY DEFINED SYMBOLS LIST ***

SYMBOL NAME	ADDR	TYPE
_GetPermit	H'000043C2	ENT
_GetSCI	H'00004B08	ENT
_GetSW	H'00001288	ENT
_H8init	H'000012AE	ENT
_Init	H'00000EB0	ENT
_InitITU	H'00004906	ENT
_InitLCD	H'00004C58	ENT
_InitSCI	H'00004AD8	ENT
_InitUSB	H'00004DFE	ENT
_InterruptITU0	H'0000493C	ENT
_LCDOut4	H'00004C00	ENT
_Limit_Read	H'00004282	ENT
_LocateLCD	H'00004D08	ENT
_Motor_Read	H'00004234	ENT
_Motor_Write	H'000041FC	ENT
_OnCloseMotor	H'00003112	ENT
_OnController	H'00001CB6	ENT
_OnDownMotor	H'0000397A	ENT
_OnInitWaitDoorChangeLog	H'0000337E	ENT
_OnInitWaitPositionChangeLog	H'00003BD8	ENT
_OnInput	H'0000262A	ENT
_OnOpenMotor	H'00002EB2	ENT
_OnPuls	H'000019F8	ENT
_OnSimulator	H'000013C4	ENT
_OnUpMotor	H'0000371A	ENT
_OnWaitCloseDoorChangeLog	H'00003526	ENT
_OnWaitDownPositionChangeLog	H'00003D74	ENT
_OnWaitOpenDoorChangeLog	H'00003452	ENT
_OnWaitUpPositionChangeLog	H'00003CA6	ENT
_Open	H'000035FA	ENT
_OpenMotor	H'00002E96	ENT
_PermitCommand_Read	H'0000404C	ENT
_PermitCommand_Write	H'00004098	ENT
_PermitTurnOpen_Read	H'0000416C	ENT
_PermitTurnOpen_Write	H'000041B8	ENT
_Position	H'0000368A	ENT
_PrintF	H'000049AA	ENT
_PrintLCD	H'00004D2C	ENT
_PrintSCI	H'00004B28	ENT
_PutLCD	H'00004CDC	ENT
_PutSCI	H'00004AF8	ENT
_Read	H'00003FBA	ENT

_ReadString	H'00004014	ENT
_Repaint	H'000004DC	ENT
_Run	H'00000548	ENT
_ScanSCI	H'00004B18	ENT
_SetCurrentTime	H'0000430A	ENT
_SetLED	H'0000123A	ENT
_SetPermit	H'0000438E	ENT
_SleepMSec	H'00004430	ENT
_Start	H'000046F2	ENT

*** LINKAGE EDITOR EXTERNALLY DEFINED SYMBOLS LIST ***

SYMBOL NAME	ADDR	TYPE
_Stop	H'00004720	ENT
_Thread_Start	H'000047B8	ENT
_Thread_Toggle	H'000047F6	ENT
_Thread_checkAllDelete	H'0000473E	ENT
_Thread_checkStayAnother	H'00004758	ENT
_Thread_getThread	H'0000477E	ENT
_Up	H'00003E42	ENT
_UpMotor	H'000036FE	ENT
_WaitDoorChangeLog	H'00003356	ENT
_WaitPositionChangeLog	H'00003BBE	ENT
_WaitSecond	H'0000436C	ENT
_Wait_ms	H'00004402	ENT
_Write	H'00003F30	ENT
_WriteString	H'00003F82	ENT
__add	H'000095BE	ENT
__allzero	H'0000856A	ENT
__calcnpw	H'00008592	ENT
__ctype	H'0000A028	DAT
__dti	H'00007F4A	ENT
__duchek	H'000092F0	ENT
__errno	H'00FFE89A	DAT
__fmtout	H'0000609A	ENT
__its	H'00008330	ENT
__log10	H'0000868A	ENT
__lsft	H'00009342	ENT
__lsfts	H'0000872E	ENT
__mult	H'00009394	ENT
__mult64	H'000089DC	ENT
__pow10	H'00009522	ENT
__pow5	H'000087A6	ENT
__power	H'00008A64	ENT
__rnd	H'00008BC6	ENT
__rnext	H'00FFE896	DAT
__rsfts	H'000087D4	ENT
__setsbit	H'00008CB0	ENT
__sub	H'0000884E	ENT
__unpack	H'000088FA	ENT
_cntrl	H'00FFE08C	DAT
_countUpNextRun	H'00004506	ENT

delete	H'000046BE	ENT
_frexp	H'00008D4C	ENT
_getClock	H'0000441E	ENT
_get_inbufflen	H'000058B2	ENT
_get_outbufflen	H'000058C6	ENT
_i_cnt	H'00FFE016	DAT
_in	H'00FFE04E	DAT
_initWOVI	H'00004968	ENT
_init_usbbuff	H'00005716	ENT
_j_cnt	H'00FFE018	DAT
_main	H'000002B0	ENT
_memcmp	H'0000899E	ENT

*** LINKAGE EDITOR EXTERNALLY DEFINED SYMBOLS LIST ***

SYMBOL NAME	ADDR	TYPE
_memcpy	H'000084D4	ENT
_memset	H'00009606	ENT
_modf	H'00008E52	ENT
_new_EV_Status	H'00003ED2	ENT
_new_Thread	H'00004526	ENT
_nextRun	H'000044C2	ENT
_puls	H'00FFE184	DAT
_rand	H'000058DA	ENT
_read_buff	H'00005854	ENT
_read_outbuff	H'000057F6	ENT
_s	H'00FFE04A	DAT
_simu	H'00FFE198	DAT
_sprintf	H'00005914	ENT
_status	H'00FFE220	DAT
_strcmp	H'00005972	ENT
_strcpy	H'0000599C	ENT
_strlen	H'000059B8	ENT
_th	H'00FFE01A	DAT
_th1	H'00FFE022	DAT
_th101	H'00FFE278	DAT
_th102	H'00FFE296	DAT
_th111	H'00FFE2B4	DAT
_th112	H'00FFE2D2	DAT
_th113	H'00FFE2F0	DAT
_th114	H'00FFE30E	DAT
_th119	H'00FFE32C	DAT
_th120	H'00FFE34A	DAT
_th121	H'00FFE368	DAT
_th122	H'00FFE386	DAT
_th123	H'00FFE3A4	DAT
_th130	H'00FFE3C2	DAT
_th131	H'00FFE3E0	DAT
_th141	H'00FFE3FE	DAT
_th142	H'00FFE41C	DAT
_th143	H'00FFE43A	DAT
_th144	H'00FFE458	DAT

_th19	H'00FFE032	DAT
_th20	H'00FFE036	DAT
_th41	H'00FFE03A	DAT
_th42	H'00FFE03E	DAT
_th43	H'00FFE042	DAT
_th44	H'00FFE046	DAT
_usb_int	H'00004F5C	ENT
_vsprintf	H'000059D4	ENT
_wovi	H'00004964	ENT
_woviClock	H'00FFE234	DAT
_woviInit	H'000048D4	ENT
_woviRun	H'0000483A	ENT
_woviThreadFirst	H'00FFE23C	DAT
_woviThreadLast	H'00FFE25A	DAT
_write_buff	H'00005790	ENT

*** LINKAGE EDITOR EXTERNALLY DEFINED SYMBOLS LIST ***

SYMBOL NAME	ADDR	TYPE
_write_inbuff	H'00005734	ENT

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	bcc32 -O2 -w -tWC -D"USE_BCC" -c Panel.c

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Panel.c:

	bcc32 -O2 -w -tWC -D"USE_BCC" -c Timer.c

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

Timer.c:

警告 W8057 Timer.c 398: パラメータ 'threadPerSec' は一度も使用されない(関数 wovi)

	bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Time.c

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

EV_Time.c:

	bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_File.c

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

EV_File.c:

警告 W8004 EV_File.c 74: 'Ret' に代入した値は使われていない(関数 Write)

警告 W8004 EV_File.c 108: 'Ret' に代入した値は使われていない(関数 WriteString)

警告 W8071 EV_File.c 166: 変換によって有効桁が失われる(関数 Read)

警告 W8004 EV_File.c 162: 'Ret' に代入した値は使われていない(関数 Read)

警告 W8004 EV_File.c 203: 'Ret' に代入した値は使われていない(関数 ReadString)

警告 W8004 EV_File.c 229: 'Ret' に代入した値は使われていない(関数 PermitCommand_Read)

警告 W8004 EV_File.c 247: 'Ret' に代入した値は使われていない(関数 PermitCommand_Write)

警告 W8004 EV_File.c 265: 'Ret' に代入した値は使われていない(関数 Command_Read)

警告 W8004 EV_File.c 283: 'Ret' に代入した値は使われていない(関数 Command_Write)

警告 W8004 EV_File.c 301: 'Ret' に代入した値は使われていない(関数 PermitTurnOpen_Read)

警告 W8004 EV_File.c 319: 'Ret' に代入した値は使われていない(関数 PermitTurnOpen_Write)

警告 W8066 EV_File.c 343: 実行されないコード(関数 Motor_Write)

警告 W8066 EV_File.c 364: 実行されないコード(関数 Motor_Read)

警告 W8066 EV_File.c 367: 実行されないコード(関数 Motor_Read)

警告 W8066 EV_File.c 382: 実行されないコード(関数 Limit_Read)

警告 W8066 EV_File.c 385: 実行されないコード(関数 Limit_Read)

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_UpDown.c

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EV_UpDown.c:

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_OpenClose.c

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

EV_OpenClose.c:

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Display.c

Borland C++ 5.5.1 for Win32 Copyright (c) 1993, 2000 Borland

EV_Display.c:

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Input.c

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EV_Input.c:

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Controller.c

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EV_Controller.c:

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Puls.c

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EV_Puls.c:

警告 W8057 EV_Puls.c 53: パラメータ 'addressDataSet' は一度も使用されない(関数 EV_Set)

警告 W8057 EV_Puls.c 53: パラメータ 'dataSet' は一度も使用されない(関数 EV_Set)

警告 W8057 EV_Puls.c 53: パラメータ 'addressClockSet' は一度も使用されない(関数 EV_Set)

警告 W8057 EV_Puls.c 53: パラメータ 'clockSet' は一度も使用されない(関数 EV_Set)

警告 W8057 EV_Puls.c 182: パラメータ 'th' は一度も使用されない(関数 EV_Puls)

bcc32 -O2 -w -tWC -D"USE_BCC" -c EV_Simulator.c

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EV_Simulator.c:

警告 W8019 EV_Simulator.c 68: コードは効果を持たない(関数 OnSimulator)

```
警告 W8019 EV_Simulator.c 86: コードは効果を持たない(関数 OnSimulator )
警告 W8019 EV_Simulator.c 104: コードは効果を持たない(関数 OnSimulator )
警告 W8019 EV_Simulator.c 122: コードは効果を持たない(関数 OnSimulator )
        bcc32 -O2 -w -tWC -D"USE_BCC" -c main.c
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main.c:
警告 W8004 main.c 293: 'key' に代入した値は使われていない(関数 Run )
        ilink32 /Tpe -L"C:¥borland¥bcc55¥Lib"   Panel.obj Timer.obj EV_Time.obj EV_File.obj
EV_UpDown.obj EV_OpenClose.obj EV_Display.obj EV_Input.obj EV_Controller.obj EV_Puls.obj
EV_Simulator.obj main.obj c0x32.obj,main.exe,,cw32.lib import32.lib
Turbo Incremental Link 5.00 Copyright (c) 1997, 2000 Borland
MAKE Version 5.2  Copyright (c) 1987, 2000 Borland
        del *.obj
        del main.tds
        del main.ilc
        del main.ild
        del main.ilf
        del main.ils
H8/300H ASSEMBLER (Evaluation software) Ver.1.0
  *****TOTAL ERRORS      0
  *****TOTAL WARNINGS    0
H8/300H LINKAGE EDITOR (Evaluation software) Ver.1.0

: OUTPUT c_thread
: PRINT c_thread
: INPUT asmfile, main, EV_Simulator, EV_Puls, EV_Controller, EV_Input, EV_Display, EV_OpenClose,
EV_UpDown, EV_File, EV_Time, Timer, Panel, sci, lcd, usb
: LIB c:¥h8¥akic¥c38hab
: START R(0FFE000), P(200), D(99C0), C(9A00)
```

: ROM (D, R)

: EXIT

LINKAGE EDITOR COMPLETED

H8/300H OBJECT CONVERTER (Evaluation software) Ver.1.0

OBJECT CONVERTER COMPLETED

著作者:

しのみや　ひでみね

篠宮　　英峰