```
#
/*
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 */

/*
 * GENERAL TTY SUBROUTINES
 */
#INCLUDE "../PARAM.H"
#INCLUDE "../SYSTM.H"
#INCLUDE "../USER.H"
#INCLUDE "../TTY.H"
#INCLUDE "../PROC.H"
#INCLUDE "../INODE.H"
#INCLUDE "../FILE.H"
#INCLUDE "../REG.H"
#INCLUDE "../CONF.H"

STRUCT - INT INT; -;
#DEFINE PS      0177776

CHAR    MAPTAB[]
-
        000,000,000,000,004,000,000,000,
        000,000,000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        000,'-',000,'#',000,000,000,'-',
        '-','-',000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        '@',000,000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        000,000,000,000,000,000,000,000,
        000,000,000,000,000,000,'-',000,
        000,'A','B','C','D','E','F','G',
        'H','I','J','K','L','M','N','O',
        'P','Q','R','S','T','U','V','W',
        'X','Y','Z',000,000,000,000,000,
-;

STRUCT CBLOCK -
        STRUCT CBLOCK *C_NEXT;
        CHAR INFO[6];
-;

STRUCT CBLOCK CFREE[NCLIST];
STRUCT CBLOCK *CFREELIST;

STRUCT -
        INT TTRCSR;
        INT TTRBUF;
        INT TTTCSR;
        INT TTTBUF;
-;
```

```
GTTY()
-
        INT V[3];
        REGISTER *UP, *VP;

        VP = V;
        SGTTY(VP);
        IF (U.U_ERROR)
                RETURN;
        UP = U.U_ARG[0];
        SUWORD(UP, *VP++);
        SUWORD(++UP, *VP++);
        SUWORD(++UP, *VP++);
-

STTY()
-
        REGISTER INT *UP;

        UP = U.U_ARG[0];
        U.U_ARG[0] = FUWORD(UP);
        U.U_ARG[1] = FUWORD(++UP);
        U.U_ARG[2] = FUWORD(++UP);
        SGTTY(0);
-

SGTTY(V)
-
        REGISTER STRUCT FILE *FP;
        REGISTER STRUCT INODE *IP;

        IF ((FP = GETF(U.U_AR0[R0])) == NULL)
                RETURN;
        IP = FP->F_INODE;
        IF ((IP->I_MODE&IFMT) != IFCHR) -
                U.U_ERROR = ENOTTY;
                RETURN;
        -
        (*CDEVSW[IP->I_ADDR[0].D_MAJOR].D_SGTTY)(IP->I_ADDR[0], V);
-

WFLUSHTTY(ATP)
STRUCT TTY *ATP;
-
        REGISTER STRUCT TTY *TP;

        TP = ATP;
        SPL5();
        WHILE (TP->T_OUTQ.C_CC)
                SLEEP(&TP->T_OUTQ, TTOPRI);
        FLUSHTTY(TP);
        SPL0();
-

CINIT()
-
```

```
        REGISTER INT CCP;
        REGISTER STRUCT CBLOCK *CP;
        REGISTER STRUCT CDEVSW *CDP;

        CCP = CFREE;
        FOR (CP=(CCP+07)&-07; CP <= &CFREE[NCLIST-1]; CP++) -
                CP->C_NEXT = CFREELIST;
                CFREELIST = CP;
        -
        CCP = 0;
        FOR(CDP = CDEVSW; CDP->D_OPEN; CDP++)
                CCP++;
        NCHRDEV = CCP;
-

/*
 * FLUSH ALL TTY QUEUES
 */
FLUSHTTY(ATP)
STRUCT TTY *ATP;
-
        REGISTER STRUCT TTY *TP;
        REGISTER INT SPS;

        TP = ATP;
        WHILE (GETC(&TP->T_CANQ) >= 0);
        WHILE (GETC(&TP->T_OUTQ) >= 0);
        WAKEUP(&TP->T_RAWQ);
        WAKEUP(&TP->T_OUTQ);
        SPS = PS->INT;
        SPL5();
        WHILE (GETC(&TP->T_RAWQ) >= 0);
        TP->T_DELCT = 0;
        PS->INT = SPS;
-

/*
 * TRANSFER RAW LIST TO CANONICAL LIST,
 * DOING CODE CONVERSION.
 */
CANON(ATP)
STRUCT TTY *ATP;
-
        REGISTER CHAR *BP;
        CHAR *BP1;
        REGISTER STRUCT TTY *TP;
        REGISTER INT C;

        TP = ATP;
        SPL5();
        WHILE (TP->T_DELCT==0) -
                IF ((TP->T_STATE&CARR_ON)==0)
                        RETURN(0);
                SLEEP(&TP->T_RAWQ, TTIPRI);
        -
        SPL0();
```

```
LOOP:
        BP = &CANONB[2];
        WHILE ((C=GETC(&TP->T_RAWQ)) >= 0) -
                IF (C==0377) -
                        TP->T_DELCT--;
                        BREAK;
                -
                IF ((TP->T_FLAGS&RAW)==0) -
                        IF (BP[-1]!='\\') -
                                IF (C==TP->T_ERASE) -
                                        IF (BP > &CANONB[2])
                                                BP--;
                                        CONTINUE;
                                -
                                IF (C==TP->T_KILL)
                                        GOTO LOOP;
                                IF (C==CEOT)
                                        CONTINUE;
                        - ELSE
                        IF (MAPTAB[C] && (MAPTAB[C]==C -- (TP->T_FLAGS&LCASE)))
                                IF (BP[-2] != '\\')
                                        C = MAPTAB[C];
                                BP--;
                        -
                -
                *BP++ = C;
                IF (BP>=CANONB+CANBSIZ)
                        BREAK;
        -
        BP1 = BP;
        BP = &CANONB[2];
        C = &TP->T_CANQ;
        WHILE (BP<BP1)
                PUTC(*BP++, C);
        RETURN(1);
-

/*
 * PLACE A CHARACTER ON RAW TTY INPUT QUEUE, PUTTING IN DELIMITERS
 * AND WAKING UP TOP HALF AS NEEDED.
 * ALSO ECHO IF REQUIRED.
 */
TTYINPUT(AC, ATP)
STRUCT TTY *ATP;
-
        REGISTER INT T_FLAGS, C;
        REGISTER STRUCT TTY *TP;

        TP = ATP;
        C = AC;
        T_FLAGS = TP->T_FLAGS;
        IF ((C =& 0177) == '\R' && T_FLAGS&CRMOD)
                C = '\N';
        IF ((T_FLAGS&RAW)==0 && (C==CQUIT -- C==CINTR)) -
                SIGNAL(TP, C==CINTR? SIGINT:SIGQIT);
                FLUSHTTY(TP);
```

```
                RETURN;
        -
        IF (TP->T_RAWQ.C_CC>=TTYHOG) -
                FLUSHTTY(TP);
                RETURN;
        -
        IF (T_FLAGS&LCASE && C>='A' && C<='Z')
                C =+ 'A'-'A';
        PUTC(C, &TP->T_RAWQ);
        IF (T_FLAGS&RAW -- C=='\N' -- C==004) -
                WAKEUP(&TP->T_RAWQ);
                IF (PUTC(0377, &TP->T_RAWQ)==0)
                        TP->T_DELCT++;
        -
        IF (T_FLAGS&ECHO) -
                TTYOUTPUT(C, TP);
                TTSTART(TP);
        -
-

/*
 * PUT CHARACTER ON TTY OUTPUT QUEUE, ADDING DELAYS,
 * EXPANDING TABS, AND HANDLING THE CR/NL BIT.
 */
TTYOUTPUT(AC, TP)
STRUCT TTY *TP;
-
        REGISTER INT C;
        REGISTER STRUCT TTY *RTP;
        REGISTER CHAR *COLP;
        INT CTYPE;

        RTP = TP;
        C = AC&0177;
        IF (C==004 && (RTP->T_FLAGS&RAW)==0)
                RETURN;
        IF (C=='\T' && RTP->T_FLAGS&XTABS) -
                DO
                        TTYOUTPUT(' ', RTP);
                WHILE (RTP->T_COL&07);
                RETURN;
        -
        IF (RTP->T_FLAGS&LCASE) -
                COLP = "(-)-!-^-'-";
                WHILE(*COLP++)
                        IF(C == *COLP++) -
                                TTYOUTPUT('\\', RTP);
                                C = COLP[-2];
                                BREAK;
                        -
                IF ('A'<=C && C<='Z')
                        C =+ 'A' - 'A';
        -
        IF (C=='\N' && RTP->T_FLAGS&CRMOD)
                TTYOUTPUT('\R', RTP);
        IF (PUTC(C, &RTP->T_OUTQ))
```

```
                RETURN;
        COLP = &RTP->T_COL;
        CTYPE = PARTAB[C];
        C = 0;
        SWITCH (CTYPE&077) -

        /* ORDINARY */
        CASE 0:
                (*COLP)++;

        /* NON-PRINTING */
        CASE 1:
                BREAK;

        /* BACKSPACE */
        CASE 2:
                IF (*COLP)
                        (*COLP)--;
                BREAK;

        /* NEWLINE */
        CASE 3:
                IF (*COLP)
                        C = MAX((*COLP>>4) + 3, 6);
                *COLP = 0;
                BREAK;

        /* TAB */
        CASE 4:
                IF ((RTP->T_FLAGS&NTDELAY)==0)
                        C = 1 - (*COLP - -07);
                *COLP =- 07;
                (*COLP)++;
                BREAK;

        /* VERTICAL MOTION */
        CASE 5:
                C = 0177;
                BREAK;

        /* CARRIAGE RETURN */
        CASE 6:
                C = 6;
                *COLP = 0;
        -
        IF (C && (RTP->T_FLAGS&NODELAY)==0)
                PUTC(C-0200, &RTP->T_OUTQ);
-

TTRSTRT(ATP)
-
        REGISTER STRUCT TTY *TP;

        TP = ATP;
        TP->T_STATE =& -TIMEOUT;
        TTSTART(TP);
```

```
-

TTSTART(ATP)
STRUCT TTY *ATP;
-
        REGISTER INT *ADDR, C;
        REGISTER STRUCT TTY *TP;
        STRUCT - INT (*FUNC)(); -;

        TP = ATP;
        ADDR = TP->T_ADDR;
        IF (TP->T_STATE&SSTART) -
                (*ADDR.FUNC)(TP);
                RETURN;
        -
        IF ((ADDR->TTTCSR&DONE)==0 -- TP->T_STATE&TIMEOUT)
                RETURN;
        IF ((C=GETC(&TP->T_OUTQ)) >= 0) -
                IF (C<=0177)
                        ADDR->TTTBUF = C - (PARTAB[C]&0200);
                ELSE -
                        TIMEOUT(TTRSTRT, TP, C&0177);
                        TP->T_STATE =- TIMEOUT;
                -
        -
-

TTREAD(ATP)
STRUCT TTY *ATP;
-
        REGISTER STRUCT TTY *TP;

        TP = ATP;
        IF (TP->T_CANQ.C_CC -- CANON(TP))
                WHILE (TP->T_CANQ.C_CC && PASSC(GETC(&TP->T_CANQ))>=0);
-

TTWRITE(ATP)
STRUCT TTY *ATP;
-
        REGISTER STRUCT TTY *TP;
        REGISTER INT C;

        TP = ATP;
        WHILE ((C=CPASS())>=0) -
                SPL5();
                WHILE (TP->T_OUTQ.C_CC > TTHIWAT) -
                        TTSTART(TP);
                        SLEEP(&TP->T_OUTQ, TTOPRI);
                -
                SPL0();
                TTYOUTPUT(C, TP);
        -
        TTSTART(TP);
-
```

```
TTYSTTY(ATP, AV)
INT *ATP, *AV;
-
        REGISTER  *TP, *V;

        TP = ATP;
        IF(V = AV) -
                *V++ = TP->T_SPEEDS;
                V->LOBYTE = TP->T_ERASE;
                V->HIBYTE = TP->T_KILL;
                V[1] = TP->T_FLAGS;
                RETURN(1);
        -
        WFLUSHTTY(TP);
        V = U.U_ARG;
        TP->T_SPEEDS = *V++;
        TP->T_ERASE = V->LOBYTE;
        TP->T_KILL = V->HIBYTE;
        TP->T_FLAGS = V[1];
        RETURN(0);
-
```