Detailed Specifications of Procedures in the TEX/PASCAL Compilation Unit, SYSDEP

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Contents

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Introduction

The PASCAL compilation unit, SYSDEP, contains some fifty PASCAL procedures; i.e., PROCEDUREs or FUNCTIONs. The purpose of this document is to give complete program specifications for each of these procedures.

The procedures are listed in alphabetical order. Each procedure is identified by name, the names and types of all formal parameters, and the type of its result if it is a FUNCTION.

Some information is given as to the purpose of each procedure, the method used in the procedure, the purpose of each argument and FUNCTION result, and restrictions (such as valid ranges of input parameters).

The author does not have any depth of knowledge about the code being described. This is offered as a first cut at a document that would be more complete and correct.

For more details, see the complementary document called "Brief Functional Characterizations of the Procedures in the TeX/PASCAL Compilation Unit SYSDEP", which gives a higher level perspective on the functional groupings of these procedures, and descibes more accurately the purpose of each procedure. Here we shall content ourselves with shorter functional descriptions.

APPNDREAL

Integer function with the following two parameters:

Name	Type
D	INTEGER
S	REAL

Appends the real number S to string D. The rules for D and the returned value are the same as those in APPNDSTRING below. Before appending, the real number S is converted to a string of five characters that has a decimal point in the fourth position.

APPNDSTRING

Integer function with the following two parameters:

Name	Type
D	INTEGER
S	REAL

Appends the real number S to string D. If S$\leq$FILNAM(0) then the corresponding string can be found in the FILENAME array, otherwise it is an ordinary string in STRNGPOOL. If D$>$FILNAM(0) this procedure does not append but instead creates a new string at the end of the STRNG and STRNGPOOL arrays and fills it with the contents of the source. In any case, the function returns an identifier for the string as required by PRODUCESTRING.

APPENDTONAME

Function of type INTEGER with two parameters.

Name	Type
CMMD	INTEGER
CH	INTEGER

This is related to procedure SCANFILENAME.

CHANPTR

Function of type ASCIICODE with one parameter.

Name	Type
ID	INTEGER

The integer ID must be in the range [1..6]. It selects one of ICHAN1 through ICHAN6 and executes CHANPTR:=ORD(ICHANx↑).

This returns the ordinal value of the current input character in ICHANx.

CLOSE

Procedure with one parameter.

Name	Type
STREAM	INTEGER

The integer STREAM must be in the range [0..9]. It selects one of OCHAN0 through OCHAN9 and executes RESET(OCHANx).

According to page 12 of the Stanford documentation this has the effect of closing and saving the external file previously associated with OCHANx for writing.

CLOSEOUT

Procedure with five parameters.

Var.?	Name	Type
	DVIBYTECNT	INTEGER
	LASTPAGEPTR	INTEGER
	MAXPAGEHEIGHT	REAL
	MAXPAGEWIDTH	REAL
Var	PARBASE	FBASEARRAY

This procedure is called by TₑX just before stopping. It writes the postamble information to file OUTFIL by use of the procedure DVI.

This information appears to be partially system dependent.

DECLAREOFIL

Procedure with one parameter.

Name	Type
FYL	INTEGER

Initializes the output on the file indicated by FYL; that is, sets up correspondence between the internal file name OUTFIL and the external name.

The file OUTFIL will be opened using REWRITE.

DVI

Procedure with one parameter.

Name	Type
BYTE	INTEGER

Packs inteer BYTE into a quarter-word position in DVIWORD.BIT as selected by the global variable BYTENUM which is in the range [1..4]. BYTENUM is incremented.

When DVIWORD.INT is filled it is output to the file OUTFIL.

EOFCHAN

Function of type BOOLEAN with one parameter.

Name	Type
ID	INTEGER

The integer ID must be in the range [1..6]. It selects one of ICXHAN1 through ICHAN6 to be tested, returning the value EOF(INCHANx).

FORCEBUFFEROUT

Procedure with no parameters.

This procedure executes the single nonstandard procedure, BREAK(TEROUT).

GETCHAN

Procedure with one parameter.

Name	Type
ID	INTEGER

The integer ID must be in the range [1..6]. It selects one of ICHAN1 through ICHAN6 to be accessed using GET(ICHANx).

GETFIRSTLINE

Function of type BOOLEAN with six parameters.

Var.?	Name	Type
	FYL	INTEGER
Var	BUFFER	BUFFER
Var	BUFPTR	INTEGER
Var	BRCHAR	ASCIICODE
Var	EOFF	BOOLEAN
Var	PAGE	INTEGER

The integer FYL must be in the range [1..6]. It selects one of the files ICHAN1 through ICHAN6.

This procedure is highly system specific. It is used to skip system header stuff at the beginning of file number FYL. It also prints a "page" number which relates to the fact that DEC-10 files are partitioned into "pages".

The value of GETFIRSTLINE is set to true if the function is successful.

GETTABLESIZES

Function of type BOOLEAN with one parameter.

Var.?	Name	Type
Var	SIZESTABLE	SIZESARRAY

Opens a file for input with internal name TBLFIL and external name "TEXINITBL".

Reads twelve integers into the array SIZESTABLE. Sets GETTABLESIZES:=TRUE if no end of file is encountered.

INCHTER

Function of type ASCIICODE with no parameters.

This function reads one character from the terminal and returns its ordinal value. It first executes BREAK(TROUT) and RESET(TERIN,'FOOBARTTY', , ,). After reading a character it skips to a carriage return.

INITDELIMTB

Procedure with one parameter.

Var.?	Name	Type
Var	DELIMTABLE	DELIMARRAY

Reads-in original contents of delimiters table.

INITEQTB

Name	Type
EQTB	EQTBARRAY
HASH	HASHARRAY
HHEAD	HHEADARRAY
HASHPAR	INTEGER
HASHSEND	INTEGER

Reads-in original contents of equivalents and related tables.

INITFILENAME

Name	Type
FNUM	INTEGER

The function INITFILENAME initializes the data structures that will be used by APPENDTONAME to obtain the name of a file and open it.

If its argument lies in the range 0...MAXFNT+1, the file is a font. The name should be allocated in the corresponding place in the first NFONTS+1 entries of FILENAME and default name conventions for font names apply (Only 0...MAXFNT are used for fonts properly, the extra entry is used for comparisons in DEFINEFONT.) If FNUM is in the range NFONTS+1...NFONTS+10, the file contains an output send stream. A negative FNUM indicates an input file whose name must be allocated in the top position of FILENAME.

INITFMEM

Procedure with nine parameters.

Var.?	Name	Type
Var	FMEM	FMEMARRAY
Var	WDBASE	FBASEARRAY
Var	HTBASE	FBASEARRAY
Var	DPBASE	FBASEARRAY
Var	LGBASE	FBASEARRAY
Var	MSBASE	FBASEARRAY
Var	PARBASE	FBASEARRAY
Var	FONTINFO	FNTINFOARRAY
Var	FMEMPTR	INTEGER

Inputs the font memory from file TBLFIL.

INITHYPHENTB

Procedure with six parameters.

Var.?	*Name*	*Type*
Var	READOUTVARIABLE	TABLEREADOUTTYPE
Var	EXCEPTABLE	EXCPARRAY
Var	EXCEPHYPH	EXCPHYARRAY
Var	SUFFIX	SUFFIXARRAY
Var	PREFIX	PREFIXARRAY
Var	BTABLE	BARRAY

Inputs hyphenation tables from file TBLFIL.

INITPAGETB

Procedure with one parameter.

Var.?	*Name*	*Type*
Var	PAGEMEM	PAGEMEMARRAY

Inputs the page memory from file TBLFIL.

INITSECONDMEM

Procedure with one parameter.

Var.?	*Name*	*Type*
Var	MEM	MEMARRAY

Inputs from file TBLFIL to MEM[J].INT for J:=SECONDMEM to MEMSIZE.

INITSTRINGS

Procedure with no parameter.

Reads the ASCII table from external file "ASCII TBL", and the printable strings from external file "STRINITBL", into the array STRINGPOOL. Reading is done using ICHAN1, which is reset or each of these two external files.

Pointers into STRINGPOOL are set in the array STRNG.

INITSYSDEP

Procedure with one parameter.

Var.?	*Name*	*Type*
Var	FOURBYTESIZE	INTEGER

Initializes the values of FOURBYTESIZE, FOURBYTEMASK, FILPTR, BYTENUM, DVIWORD.INT. Clears the array FILENAME to NULLs.

Opens terminal for ASCII output. Internal name is TEROUT, external name is "FOOBARTTY".

Opens error file for output. Internal name is ERRFIL, external name is "ERRORSTEM".

INLN

Procedure with five parameters.

Var.?	Name	Type
	FYL	INTEGER
Var	BUFFER	BUFFIT
Var	BUFPTR	INTEGER
Var	BRCHAR	ASCIICODE
Var	EOF	BOOLEAN

The integer FYL must be in the range [1..6]. It selects one of ICHAN1 through ICHAN6 and reads from the selected file into the array BUFFER up to a carriage return, form feed, end of file, or the capacity limit of BUFFER.

On return BUFPTR will be the index of the last item in BUFFER, BRCHAR will be a copy of BUFFER[BUFPTR], and EOF will be true if an end of file was encountered.

INLNTER

Procedure with five parameters.

Var.?	Name	Type
Var	BUFFER	BUFFER
Var	BUFPTR	INTEGER
Var	BRCHAR	ASCIICODE

Reads text into the array BUFFER from the terminal, up to a carriage return or the capacity of BUFFER. It stores ordinal values of the characters in BUFFER.

Sets BUFPTR to index the last value stored into BUFFER.

Sets BRCHAR as a copy of BUFFER[BUFPTR]. This will be either the ordinal value of carriage return or else a zero indicating the capacity of BUFFER was reached.

INTOUT

Procedure with one parameter.

Name	Type
I	ASCIICODE

Breaks the integer I into four quarter-wordbytes and outputs the four bytes to OUTFIL using four calls to the procedure DVI.

OUTCHERR

Procedure with one parameter.

Name	Type
C	ASCIICODE

This procedure outputs the character whose ordinal number is C to the error file, ERRFIL.

OUTCHTER

Procedure with one parameter.

Name	Type
C	ASCIICODE

This procedure outputs the character whose ordinal number is C to the terminal, using the internal file name, TEROUT.

OUTLNERR

Procedure with no parameters.

This procedure outputs a carriage return and line feed to the error file using the internal file name, ERRFIL.

PRINT

Procedure with one parameter.

Name	Type
MES	INTEGER

Outputs string number MES in STRINGPOOL to the terminal, TEROUT, and to the error fill, ERRFIL.

PRINTFILENAME

Procedure with one parameter.

Name	Type
FYL	INTEGER

This procedure prints the name of the file whose integer identifier is FYL. The procedure PRINT is used to output to the terminal and the error file. The terminal printing is forced to complete by use of procedure FORCEBUFFEROUT.

The file name is fetched from FILENAME[FYL].

PRINTINT

Procedure with one parameter.

Name	Type
N	INTEGER

Converts te integer N to decimal digits from printing and outputs the decimal digits, and a minus sign if $N < 0$, to the terminal and the error file using procedure PRINT.

PRINTLN

Procedure with one parameter.

Name	*Type*
MES	INTEGER

Outputs a carriage return and line feed to the terminal, TEROUT, and the error file, ERRFIL, and then uses PRINT to output message number MES from STRINGPOOL to these same wo destinations.

PRINTOCTAL

Procedure with one parameter.

Name	*Type*
N	INTEGER

Converts the integer N to a string of twelve octal digits and outputs these to the terminal and the ercr file using procedure PRINT.

PRINTREAL

Procedure with one parameter.

Name	*Type*
X	REAL

Prints the real number X as an optional sign followed by decimal digits, a period, and four more decimal digits. This string is output to the terminal and the error file using the procedure PRINT.

PRODUCESTRING

Procedure with two parameters.

Var.?	*Name*	*Type*
	X	INTEGER
Var	NAMESTRING	ASCIISTRING

If $C \leq -2$, this procedure returns the file name associated with font number C. The file name will be placed in NAMESTRING terminated by a NULL.

If $C > -2$, this procedure moves string number C from STRINGPOOL into NAMESTRING, with a terminating NULL.

READFONTINFO

This is an integer function that has the following parameters:

Var.?	Name	Type
	FYL	INTEGER
Var	FONTINFO	FNTINFOARRAY
Var	FMEM	FMEMARRAY
Var	WDBASE	FBASEARRAY
Var	HTBASE	FBASEARRAY
Var	DPBASE	FBASEARRAY
Var	ICBASE	FBASEARRAY
Var	LGBASE	FBASEARRAY
Var	KRBASE	FBASEARRAY
Var	EXTBASE	FBASEARRAY
Var	PARBASE	FBASEARRAY
Var	FCKSUM	FBASEARRAY
Var	FPFB	FBASEARRAY
Var	FSIZE	FSIZEARRAY
Var	FPFI	FPIARRAY
Var	FMEMPTR	INTEGER
Var	PSIZE	REAL
Var	ATCLAUSE	BOOLEAN

Reads font information from file FONTFIL. The integr FYL is used as an index in the various array parameters to establish the destination of this information.

RELEASE

Procedure with one parameter.

Name	Type
FYL	INTEGER

The integer FYL must be in the range [1..6]. It selects one of ICHAN1 through ICHAN6 and executes RESET(ICHANx) followed by FILPTR:=FILPTR-1.

This closes and releases the indicated file and frees the entry in FILENAME.

RSETFILE

Procedure with four parameters.

Name	Type
ID	INTEGER
FNAME	CHAR9
FDIRECTORY	INTEGER
FDEVICE	CHAR6

The integer *ID* must be in the range [1..6]. It selects one of ICHAN1 through ICHAN6 to be opened for input and associates it with FNAME, FDIRECTORY, and FDEVICE.

RWRITEFILE

Procedure with four parameters.

Var.?	Name	Type
	ID	INTEGER
	FNAME	CHAR9
	FDIRECTORY	INTEGER
	FDEVICE	CHAR6

The integer *ID* must be in the range [0..9]. It selects one of OCHAN0 through OCHAN9 to be opened for output and associates it with FNAME, FDIRECTORY, and FDEVICE.

SCANFILENAME

This function has only one parameter.

Name	Type
FYL	INTEGER

It belongs to the main module of TEX/PASCAL, but because file names are very system dependent, the parsing is done in the system dependent module. Refer to the Functional Description of SYSDEP.

SENDCH

Procedure with two parameters.

Name	Type
STREAM	INTEGER
C	ASCIICODE

The integer STREAM must be in the range [0..9]. It selects one of OCHAN0 through OCHAN9 and outputs the character CHR(C) to file OCHANx.

SENDLN

Procedure with one parameter.

Name	Type
STREAM	INTEGER

The integer STREAM must be in the range [0..9]. It selects one of OCHAN0 through OCHAN9 and outputs a carriage return and line feed to OCHANx.

SENDSTARTED

Function of type BOOLEAN with one parameter.

Name	Type
STREAM	INTEGER

The integer STREAM must be in the range [0..9]. It selects one of OCHAN0 through OCHAN9 and executes SENDSTARTED:=EOF(OCHANx). The result is true only if this output stream has been started and not closed.

SETTABLESIZES

Procedure with no parameters.

This procedure opens a file for output with internal name TBLFIL and external name "TEXINITBL". It writes twelve numbers to this file giving sizes of various tables.

TRACELINE

Procedure with four parameters.

Var.?	Name	Type
Var	BUFFER	BUFFER
Var	BUFPTR	INTEGER

This procedure prints the line in BUFFER to the terminal, and the error file, and then reads a character from the terminal. A carriage return means leave BUFFER as it is. Anything else means read a new line from the terminal into BUFFER.

WRITEDELIMTB

Procedure with one parameter.

Name	Type
DELIMTABLE	DELIMARRAY

Outputs the delimiters table to TBLFIL.

WRITEEQTB

This procedure has the following parameters:

Name	Type
EQTB	EQTBARRAY
HASH	HASHARRAY
HHEAD	HHEADARRAY
HASHPAR	INTEGER
HASHSEND	INTEGER

Outputs the parameter arrays and variables to file TBLFIL.

WRITEFMEM

Procedure with nine parameters.

Name	Type
FMEM	FMEMARRAY
WDBASE	FBASEARRAY
HTBASE	FBASEARRAY
DPBASE	FBASEARRAY
LGBASE	FBASEARRAY
MSBASE	FBASEARRAY
PARBASE	FBASEARRAY
FONTINFO	FNTINFOARRAY
FMEMPTR	INTEGER

Write the font memory to TBLFIL.

WRITEHYPHENTB

Procedure with six parameters.

Name	Type
READOUTVARIABLE	TABLEREADOUTYPE
EXCEPTABLE	EXCPARRAY
EXCEPHYPH	EXCPHYARRAY
SUFFIX	SUFFIXARRAY
PREFIX	PREFIXARRAY
BTABLE	BARRAY

Outputs the parameter arrays to the file TBLFIL.

WRITEPAGETB

Procedure with one parameter.

Name	Type
PAGEMEM	PAGEMEMARRAY

Outputs the parameter array to TBLFIL.

WRITESECONDMEM

Procedure with one parameter.

Var.?	Name	Type
Var	MEM	MEMARRAY

Outputs MEM[J].INT for J:==SECONDMEM to MEMSIZE to the file TBLFIL.