UCSD p-System Configuration™

Texas Instruments Professional Computer
UCSD p-System Configuration
Part No. 2237352-0001
Original Issue: 15 July, 1983

Copyright © 1978 by the
Regents of the University of California (San Diego)
All rights reserved.

by SofTech Microsystems, Incorporated
All rights reserved.

All new material copyright © 1983
by Texas Instruments Incorporated
All Rights Reserved.

No part of this work may be reproduced in any form or by any
means or used to make a derivative work (such as a trans­
lation, transformation, or adaptation) without the permission in
writing of SofTech Microsystems, Inc.

UCSD p-System and UCSD Pascal are trademarks of the
Regents of the University of California. Use thereof in con­
junction with any goods or services is authorized by specific
license only, and any unauthorized use is contrary to the laws
of the State of California.
**UCSD p-System™* Configuration**

The Texas Instruments Professional Computer p-System configuration package allows you to configure the p-System's real-number precision and serial communications support. The PSYS run-time disk is initially configured with four-word real numbers and serial communications support. The configuration package allows you to choose the following:

- The precision used in real-number arithmetic support
- 8087 Numerical Processor Unit (NPU) support
- Whether or not to include support for a serial communications port

The UCSD Pascal™* compiler supports real numbers that use either two or four words of memory to store the value. That is, there is an option at compile time that tells the compiler to allocate either two or four words of memory for each real number used in the program. To execute this program, you must configure the p-System to support the option that you selected at compile time. Whether two-word or four-word real numbers are used depends on the application. If you need more accuracy than two-word real numbers represent, then four-word real numbers must be used. Using four-word real numbers, however, imposes some execution speed penalty. Another option available is no real number support. You can use this option when the applications do not use real numbers. The advantage of not selecting real-number support is that the operating system requires less memory, thus leaving more memory available for applications.

---

*UCSD p-System and UCSD Pascal are trademarks of the Regents of the University of California.
Another parameter in selecting which configuration you need is whether or not you have purchased the 8087 NPU option. The 8087 NPU performs real-number calculations and improves the performance of those applications using real numbers.

The configuration package also allows you to configure the p-System’s serial communications support. The PSYS run-time disk is initially configured with serial communications support. However, if you do not intend to use serial communications, you can configure the p-System without serial communications support. The advantage of eliminating serial communications support when you desire is that the operating system requires less memory (about 2K bytes less), thus leaving more memory available for applications.

The configuration utility creates the files NEW.INTERP, NEW.PASCAL, and (possibly) NEW.LIBRARY if four-word real-number support is selected. The NEW.LIBRARY contains all necessary system units with the addition of the TWOWORD unit, which allows four-word interpreters to use two-word real numbers.

The TWOWORD unit allows simultaneous use of both two- and four-word real numbers in the same program by defining a two-word real data type (real2) with a procedure (strl2), and a function (ldrl2) to deal with them. By utilizing this new data type, it is possible to have four-word real numbers to provide accuracy where it is needed and still minimize storage where accuracy is not required. Because the four-word real interpreter performs all operations, there will be no performance improvement by using two-word real numbers. The following example shows the interface section of the TWOWORD unit and a sample program using the unit.
unit TWO_WORD;
interface
type
  real2 = record a,b: integer end;

procedure strl2 (var X: real2; Y: real);
{
  Store a four-word real-number variable or expression Y to two-word variable X. An overflow or underflow on conversion will cause an execution error.
}
function ldrl2 (X: real2): real;
{
  Load and convert a two-word real number X into a four-word real number in the evaluation stack.
}

PROGRAM TEST_TWOWORD;
  USES Two_Word;
  Var
    i: integer;
    total, temp: real;
    table: array [0..10] of real2;
  Begin
    for i: = 0 to 10 do begin
      write ('Number? ');
      readln (temp);
      STRL2 (table[i], temp)
    end;
    for i: = 0 to 10 do begin
      temp := LDRL2(table[i]);
      total := total * temp;
      writeln(total: 18: 2)
    end;
  End.
You must consider hardware requirements before performing the configuration. The following table describes the minimum system configurations to perform the configuration:

<table>
<thead>
<tr>
<th>Total Size of RAM (K Bytes)</th>
<th>Number of Floppy Disk Drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>128</td>
<td>2</td>
</tr>
<tr>
<td>192</td>
<td>1</td>
</tr>
<tr>
<td>256</td>
<td>1</td>
</tr>
</tbody>
</table>

To begin, initialize the system using the system disk PSYS. Execute the utility PSYS:CONFIG.RAM to configure system memory for the interpreter (see the paragraph entitled RAM Configuration Utility in the *UCSD p-System Operating System Reference Manual*, TI part number 2232395-0001). Respond to the Extended Code Pool Size prompt with 32. Quit the utility and reinitialize the system by pressing the H key.

If your system uses a Winchester disk as the system disk or has two flexible diskette drives, skip the following three paragraphs and resume with the paragraph regarding the configuration utility.

Prepare the system disk for the system initialization from random access memory (RAM). Depending upon the amount of memory of the system, the size of the RAM disk may be limited (see the paragraph on the RAM disk in the *UCSD p-System Operating System Reference Manual*). Therefore, the required system files needed in RAM may have to be repositioned in order to fit. The following listing is an example of how to arrange the files:

```
PSYS:
SYSTEM.PASCAL  126 11-Jul-83
SYSTEM.MISCINFO 1 11-Jul-83
SYSTEM.LIBRARY  35 11-Jul-83
```
To initialize from RAM, a file called RAM.INIT must be placed on the system disk. The RAM.INIT file signals the system to initialize from RAM. This file should be located immediately after the required system files. However, if there is not enough space after the system files to make a RAM.INIT file one block long, you must move files back on the disk to provide enough space to create the file. To move files back on the disk, use the extended directory listing command, E(xt-dir, of the filer to determine the starting block number to move. The following is an example of an extended directory listing:

```
PSYS:
SYSTEM.PASCAL       126 11-Jul-83    6 512 Datafile
SYSTEM.MISCINFO     1 11-Jul-83    132 226 Datafile
SYSTEM.LIBRARY      35 11-Jul-83    133 512 Datafile
SYSTEM.EDITOR       50 11-Jul-83    172 512 Codefile
```

Using the example above, the RAM.INIT file should be placed after SYSTEM.LIBRARY. Therefore, the files starting from block number 172 must be moved back on the disk. This is done by using the filer’s K(runch command, responding to the prompt From end of disk, block nnn ? (Y/N) with N, then entering the number 172 for the starting block number. After K(runching the disk, use the M(ake command of the system filer to create the file RAM.INIT.

After placing RAM.INIT on the PSYS disk, reinitialize the system using the ON/OFF power switch. The system will then load all files located above RAM.INIT into the RAM disk and initialize from RAM. After the system is initialized, remove the system disk PSYS and insert the CONFIG disk into the diskette drive.

**NOTE**

Before reusing the configuration utility to configure a new interpreter, remove the old system files NEW.PASCAL, NEW.INTERP, and (possibly) NEW.LIBRARY from the CONFIG disk. Remove the file RAM.INIT from the PSYS disk to prevent the system from initializing from RAM.
To run the configuration utility, execute the file CONFIG:CONFIG.INT and the following prompt appears:

Configure System Interpreter Utility

Real number support
1 no real support
2 two word real support
3 two word real support using 8087 NPU
4 four word real support
5 four word real support using 8087 NPU
[] Selection

Press the number of the type of real-number support that you want to configure (or press the space bar to quit the utility).

After you select real-number support, the following prompt appears:

Serial communications support (Y/N)? []

Press the Y key if you want serial communications support; otherwise, press the N key (or press the space bar to exit the utility).
The configuration utility creates the new system parts automatically. The configuration process takes five minutes or less to complete. When the main prompt line appears on the display unit, the configuration is complete. Using the T(transfer) command of the system filer, transfer the newly created files NEW.PASCAL and NEW.INTERP (and NEW.LIBRARY when you select either type of four-word real support) to your desired system disk. Use the C(hange) command of the system filer to change the file names as follows:

```
NEW.PASCAL  --->  SYSTEM.PASCAL
NEW.INTERP  --->  SYSTEM.INTERP
NEW.LIBRARY --->  SYSTEM.LIBRARY
```

The new system parameters are effective the next time you initialize the system from that system disk.

**NOTE**

The utilities provided on the PSYS run-time disk (CONFIG.RAM, CONFIG.PTR, CONFIG.REM) should be used only with interpreters configured with four-word real numbers without 8087 support.
THREE-MONTH LIMITED WARRANTY
TEXAS INSTRUMENTS PROFESSIONAL COMPUTER SOFTWARE MEDIA

TEXAS INSTRUMENTS INCORPORATED EXTENDS THIS CONSUMER WARRANTY ONLY TO THE ORIGINAL CONSUMER/PURCHASER.

WARRANTY DURATION

The media is warranted for a period of three (3) months from the date of original purchase by the consumer.

Some states do not allow the exclusion or limitation of incidental or consequential damages or limitations on how long an implied warranty lasts, so the above limitations or exclusions may not apply to you.

WARRANTY COVERAGE

This limited warranty covers the cassette or diskette (media) on which the computer program is furnished. It does not extend to the program contained on the media or the accompanying book materials (collectively the Program). The media is warranted against defects in material or workmanship. THIS WARRANTY IS VOID IF THE MEDIA HAS BEEN DAMAGED BY ACCIDENT, UNREASONABLE USE, NEGLECT, IMPROPER SERVICE, OR OTHER CAUSES NOT ARISING OUT OF DEFECTS IN MATERIALS OR WORKMANSHIP.
PERFORMANCE BY TI UNDER WARRANTY

During the above three-month warranty period, defective media will be replaced when it is returned postage prepaid to a Texas Instruments Service Facility listed below or an authorized Texas Instruments Professional Computer Dealer with a copy of the purchase receipt. The replacement media will be warranted for three months from date of replacement. Other than the postage requirement (where allowed by state law), no charge will be made for the replacement. TI strongly recommends that you insure the media for value prior to mailing.

WARRANTY AND CONSEQUENTIAL DAMAGES DISCLAIMERS

ANY IMPLIED WARRANTIES ARISING OUT OF THIS SALE INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE LIMITED IN DURATION TO THE ABOVE THREE-MONTH PERIOD. TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL COSTS, EXPENSES, OR DAMAGES INCURRED BY THE CONSUMER OR ANY OTHER USER ARISING OUT OF THE PURCHASE OR USE OF THE MEDIA. THESE EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED BY, COST OF REMOVAL OR REINSTALLATION, OUTSIDE COMPUTER TIME, LABOR COSTS, LOSS OF GOODWILL, LOSS OF PROFITS, LOSS OF SAVINGS, OR LOSS OF USE OR INTERRUPTION OF BUSINESS.

LEGAL REMEDIES

This warranty gives you specific legal rights, and you may also have other rights which vary from state to state.
TEXAS INSTRUMENTS
CONSUMER SERVICE FACILITIES

U.S. Residents: 

Texas Instruments
Service Facility
P.O. Box 1444, MS 7758
Houston, Texas 77001

Canadian Residents:

Geophysical Service Inc.
41 Shelley Road
Richmond Hill, Ontario
Canada L4C 5G4

Consumers in California and Oregon may contact the following Texas Instruments offices for additional assistance or information.

Texas Instruments
Consumer Service
831 South Douglas St.
Suite 119
El Segundo, California 90245
(213) 973-2591

Texas Instruments
Consumer Service
6700 S.W. 105th
Kristin Square, Suite 110
Beaverton, Oregon 97005
(503) 643-6758

IMPORTANT NOTICE OF DISCLAIMER
REGARDING THE PROGRAM

The following should be read and understood before using the software media and Program.

TI does not warrant that the Program will be free from error or will meet the specific requirements of the purchaser/user. The purchaser/user assumes complete responsibility for any decision made or actions taken based on information obtained using the Program. Any statements made concerning the utility of the Program are not to be construed as expressed or implied warranties.
TEXAS INSTRUMENTS MAKES NO WARRANTY, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, REGARDING THE PROGRAM AND MAKES ALL PROGRAMS AVAILABLE SOLELY ON AN "AS IS" BASIS.

IN NO EVENT SHALL TEXAS INSTRUMENTS BE LIABLE FOR SPECIAL, COLLATERAL, INCIDENTAL, OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH OR ARISING OUT OF THE PURCHASE OR USE OF THE PROGRAM. THESE EXCLUDED DAMAGES INCLUDE, BUT ARE NOT LIMITED BY, COST OF REMOVAL OR REINSTALLATION, OUTSIDE COMPUTER TIME, LABOR COSTS, LOSS OF GOODWILL, LOSS OF PROFITS, LOSS OF SAVINGS, OR LOSS OF USE OR INTERRUPTION OF BUSINESS. THE SOLE AND EXCLUSIVE LIABILITY OF TEXAS INSTRUMENTS, REGARDLESS OF THE FORM OF ACTION, SHALL NOT EXCEED THE PURCHASE PRICE OF THE PROGRAM. TEXAS INSTRUMENTS SHALL NOT BE LIABLE FOR ANY CLAIM OF ANY KIND WHATSOEVER BY ANY OTHER PARTY AGAINST THE PURCHASER/USER OF THE PROGRAM.

COPYRIGHT

All Programs are copyrighted. The purchaser/user may not make unauthorized copies of the Programs for any reason. The right to make copies is subject to applicable copyright law or a Program License Agreement contained in the software package. All authorized copies must include reproduction of the copyright notice and of any proprietary rights notice.
Texas Instruments reserves the right to change its product and service offerings at any time without notice.