Attempted validation of the GNU Pascal compiler

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1 Introduction

The Pascal Validation Suite (PVS, [2]) was developed by A H J Sale and myself over the period 1979-1984. The purpose of the PVS is to check compliance the ISO-7185. This was originally for the 1980 version of the standard but can also be used for the 1990 version of the standard [1].

The latest version of the PVS, 5.7 states:

- that British Standards Institution (BSI)'s copyright is acknowledged;

- that no representation is made on the basis of use of the Suite which might suggest that a third-party validation had been carried out;

- that any other representation of the results of running the Suite must describe performance on the whole suite and not simply on selected tests.

2 Compiler being tested

The GNU Pascal compiler `gpc-344d2-10.4` downloaded from the Internet on 21st December 2005, and run on an Apple G5 running Tiger (OS X 10.4).

Due to the number of problems listed below, only the 221 conformance tests have been run. All the tests used the `--classic-pascal` option. The original tests were changed from MS-DOS line ending to Unix, and the extension changed from `PAS` to `pas`.

3 The list of compliance issues

The following test programs failed to show compliance:

1. CONF003: Produced a large number of warning (which is acceptable), then

   ```
   CONF003.pas:298: error: set constructor range is empty
   CONF003.pas:299: confused by earlier errors, bailing out
   ```

2. CONF005:

```
CONF005.pas:35: error: 'forward' is a keyword in ISO 7185 Pascal, UCSD Pascal,
CONF005.pas:35: error:  Borland Pascal, Pascal-SC, VAX Pascal, Sun Pascal,
CONF005.pas:35: error:  traditional Macintosh Pascal
```

3. CONF032:

```
CONF 032.pas:26: error: ISO 7185 Pascal allows only simple constants
```

4. CONF041:

```
CONF 041.pas: In function 'MaxChar':
CONF 041.pas:40: error: ISO 7185 Pascal allows only simple constants
CONF 041.pas:41: error: ISO 7185 Pascal allows only simple constants
```

5. CONF063:

```
CONF 063.pas: In main program:
CONF 063.pas:40: error: set constructor range is empty
```

6. CONF065:

```
CONF 065.pas: In main program:
CONF 065.pas:41: error: this use of packed record fields is an extension of Borland
CONF 065.pas:41: error:  Pascal, traditional Macintosh Pascal
CONF 065.pas:41: error: this use of packed record fields is an extension of Borland
CONF 065.pas:41: error:  Pascal, traditional Macintosh Pascal
CONF 065.pas:47: error: operation on incompatible sets
CONF 065.pas:47: error: assignment between incompatible sets
CONF 065.pas:52: error: operation on incompatible sets
CONF 065.pas:52: error: operation on incompatible sets
CONF 065.pas:54: error: operation on incompatible sets
CONF 065.pas:54: error: operation on incompatible sets
CONF 065.pas:56: error: this use of packed record fields is an extension of Borland
CONF 065.pas:56: error:  Pascal, traditional Macintosh Pascal
CONF 065.pas:58: error: this use of packed record fields is an extension of Borland
CONF 065.pas:58: error:  Pascal, traditional Macintosh Pascal
```

7. CONF072:

```
CONF 072.pas: In procedure 'Booleans':
CONF 072.pas:53: error: this use of packed record fields is an extension of Borland
CONF 072.pas:53: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas:65: error: this use of packed record fields is an extension of Borland
CONF 072.pas:65: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas: In procedure 'EnumeratedTypes':
CONF 072.pas:79: error: this use of packed record fields is an extension of Borland
CONF 072.pas:79: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas:92: error: this use of packed record fields is an extension of Borland
CONF 072.pas:92: error:  Pascal, traditional Macintosh Pascal
```

```
CONF 072.pas: In procedure 'Integers':
CONF 072.pas:104: error: this use of packed record fields is an extension of Borland
CONF 072.pas:104: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas:118: error: this use of packed record fields is an extension of Borland
CONF 072.pas:118: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas: In procedure 'Reals':
CONF 072.pas:130: error: this use of packed record fields is an extension of Borland
CONF 072.pas:130: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas:144: error: this use of packed record fields is an extension of Borland
CONF 072.pas:144: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas: In procedure 'SubrangeOfInteger':
CONF 072.pas:160: error: this use of packed record fields is an extension of Borland
CONF 072.pas:160: error:  Pascal, traditional Macintosh Pascal
CONF 072.pas:173: error: this use of packed record fields is an extension of Borland
CONF 072.pas:173: error:  Pascal, traditional Macintosh Pascal
```

8. CONF073:

```
CONF073.pas: In procedure 'next':
CONF 073.pas:49: warning: constructing limited integer set '0 .. 255';
CONF 073.pas:49: warning:  use '--setlimit=NUMBER' to change the size limit at compile time.
CONF 073.pas:49: error: operation on incompatible sets
CONF 073.pas:50: warning: constructing limited integer set '0 .. 255';
CONF 073.pas:50: warning:  use '--setlimit=NUMBER' to change the size limit at compile time.
CONF 073.pas:50: error: operation on incompatible sets
CONF 073.pas:50: error: assignment between incompatible sets
CONF 073.pas: In procedure 'Sets':
CONF 073.pas:51: error: this use of packed record fields is an extension of Borland
CONF 073.pas:51: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas:66: error: this use of packed record fields is an extension of Borland
CONF 073.pas:66: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas: In procedure 'Arrays':
CONF 073.pas:104: error: this use of packed record fields is an extension of Borland
CONF 073.pas:104: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas:119: error: this use of packed record fields is an extension of Borland
CONF 073.pas:119: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas: In procedure 'Products':
CONF 073.pas:145: error: this use of packed record fields is an extension of Borland
CONF 073.pas:145: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas:160: error: this use of packed record fields is an extension of Borland
CONF 073.pas:160: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas: In procedure 'Unions':
CONF 073.pas:212: error: this use of packed record fields is an extension of Borland
CONF 073.pas:212: error:  Pascal, traditional Macintosh Pascal
CONF 073.pas:227: error: this use of packed record fields is an extension of Borland
CONF 073.pas:227: error:  Pascal, traditional Macintosh Pascal
```

9. CONF120:

```
CONF 120.pas: In function 'MaxChar':
CONF 120.pas:32: error: ISO 7185 Pascal allows only simple constants
CONF 120.pas:33: error: ISO 7185 Pascal allows only simple constants
```

10. CONF132:

   ```
   CONF 132.pas:19: error: ISO 7185 Pascal allows only simple constants
   ```

11. CONF145:

   ```
   CONF 145.pas: In main program:
   CONF 145.pas:23: warning: constructing limited integer set '0 .. 255';
   CONF 145.pas:23: warning:  use '--setlimit=NUMBER' to change the size limit at compile time.
   CONF 145.pas:23: error: set constructor range is empty
   ```

12. CONF147:

   ```
   CONF 147.pas: In main program:
   CONF 147.pas:40: error: operation on incompatible sets
   CONF 147.pas:42: error: operation on incompatible sets
   CONF 147.pas:43: error: operation on incompatible sets
   ```

13. CONF148:

   ```
   CONF 148.pas: In function 'MaxChar':
   CONF 148.pas:48: error: ISO 7185 Pascal allows only simple constants
   CONF 148.pas:49: error: ISO 7185 Pascal allows only simple constants
   ```

14. CONF150:

   ```
   CONF 150.pas: In function 'MaxChar':
   CONF 150.pas:37: error: ISO 7185 Pascal allows only simple constants
   CONF 150.pas:38: error: ISO 7185 Pascal allows only simple constants
   ```

15. CONF163:

   ```
   CONF 163.pas: In function 'MaxChar':
   CONF 163.pas:40: error: ISO 7185 Pascal allows only simple constants
   CONF 163.pas:41: error: ISO 7185 Pascal allows only simple constants
   ```

16. CONF181:

   ```
   CONF 181.pas: In main program:
   CONF 181.pas:24: error: constant out of range
   CONF 181.pas:24: error: constant out of range
   CONF 181.pas:24: warning: ';' after 'do'
   ```

17. CONF200:

   ```
   CONF 200.pas:19: error: ISO 7185 Pascal allows only simple constants
   ```

18. CONF215:

```
CONF 215.pas:16: error: 'forward' is a keyword in ISO 7185 Pascal, UCSD Pascal,
CONF 215.pas:16: error:  Borland Pascal, Pascal-SC, VAX Pascal, Sun Pascal,
CONF 215.pas:16: error:  traditional Macintosh Pascal
```

All the above failed to compiler — there was no instance of a correct Pascal program executing apparently incorrectly. Hence it appears that around 203 tests were correctly processed, but these have not been checked individually.

References

[1] ISO/IEC 7185:1990. Programming Languages — Pascal.

[2] Wichmann B A & Ciechanowicz Z J (Editors). *Pascal Compiler Validation*. Wiley: London, 1983.

A   Document details

1. Started December 2005.