

PL/I-80™ APPLICATION PROGRAMMING SYSTEM

PL/I-80™ Is The World's First General Purpose Application Programming Language for 8080, 8085 and Z80 microprocessors. PL/I-80 offers the power of minicomputer PL/I at a tenth of the cost. It is designed for applications ranging from business and education to science and research.

Why PL/I? PL/I is the most popular structured language in the "mainframe" world. There are tens of thousands of PL/I programmers. But full PL/I is too large even for minicomputers. To correct this situation the American National Standards Institute (ANSI) formed a committee to define a compact, but powerful general-purpose subset of PL/I, called Subset G. ANSI subset G includes all necessary features of full PL/I while eliminating redundant forms, and is upward-compatible with full PL/I. Subset G is currently supported by DEC(TM), Data General, Wang, and Prime, and more minicomputer support is developing every day.

PL/I-80 is based on Subset G. To protect your programming investment, PL/I-80 programs run under full PL/I as well as the other subset G implementations. Your PL/I-80 programs expand with your needs. And PL/I-80 uses a standard relocation format to access subroutine libraries created by other



popular language translators. No other programming language offers such standardization.

PL/I-80 Features. PL/I-80 works with your CP/M®, MP/M™ or CP/NET™ based computer to provide features that match your expectations:

- **Program Control Structures** that support contemporary structured programming practices. PL/I-80 is a block structured, procedure-oriented language for ease in program formulation and debugging.
- **Data Types** for all applications: 15 digit arithmetic for business, and fast fixed and float binary for scientific applications, as well as structures, arrays, and based and pointer variables.
- **Character and Bitstring Operations** to simplify text processing and real-time applications.
- **Device-Independent** access to CP/M or MP/M files in random or sequential mode.

- **Exception Processing** to allow your program to intercept run-time error conditions which would normally cause termination of the program.
- **Picture Specifications** for use as format items for editing numeric data on output.
- **Menu-Driven** application programs using the overlay features of LINK-80.

```
expression:
  proc options(main);
  decl
    sysin file,
    value float,
    token char(10) var;

  on endfile(sysin)
    stop;

  on error(1)
    /* conversion or signal */
  begin;
  put skip list('Invalid Input at ',token);
  get skip;
  go to restart;
  end;
```

EXCERPT OF PL/I-80 PROGRAM

Specifications. The PL/I-80 programming system consists of six major components:

- **PL/I-80 Compiler;**
- **LINK-80 Linkage Editor;**
- **LIB-80 Librarian;**
- **RMAC Relocating Macro Assembler;**
- **PL/I-80 Run-time Library.**
- **XREF Assembly Language Cross-reference Utility.**

```
put file (output) edit/
First Year Reduction in Taxable Income
-----
Depreciation          ,FYD,
Sales Tax             ,sales tax,
ITC (Adjusted)       ,adj ITC,
Bonus Depreciation   ,bonus dep,
-----
Total for First Year  ,total,
Direct Reduction in Tax ,direct,
(2(skip,column(indent),a),
  2(4(skip,column(indent),a,
    p'5z,zzz,zz9',99',x(3),a),
    skip,column(indent),a));
```

DOUBLE DECLINING			
	\$114,608.00 Used	\$40,000.00 Residual Value	
	10 Months Left	06% Tax	50% Tax Bracket
Y	Depreciation For Year	Depreciation Remaining	Book Value
1	\$ 61,416.66	\$ 193,383.34	\$ 233,383.34
2	\$ 58,345.83	\$ 135,037.51	\$ 175,037.51
3	\$ 43,759.37	\$ 91,278.14	\$ 131,278.14
4	\$ 32,819.54	\$ 58,458.60	\$ 98,458.60
5	\$ 24,614.64	\$ 33,843.96	\$ 73,843.96
6	\$ 18,460.98	\$ 15,382.98	\$ 55,382.98

First Year Reduction in Taxable Income	
Depreciation	\$ 61,416.66
Sales Tax	\$ 17,808.00
ITC (Adjusted)	\$ 20,000.00
Bonus Depreciation	\$ 2,000.00
Total for First Year	\$ 101,224.66
Direct Reduction in Tax	\$ 50,612.33

SAMPLE OF PICTURE SPECIFICATION

The **PL/I-80 Compiler** directly produces optimized relocatable 8080 machine code, resulting in surprising speed increases over interpreter-based translation. The compiler requires 40K of main memory for its three passes, so it will operate in a 48K CP/M system.

LINK-80 combines relocatable machine code generated by PL/I-80, RMAC or a compatible language translator with subroutines from the PL/I-80 Run-time Library. Linked machine code size varies from as little as 600 bytes up to the capacity of your computer's memory. The overlay feature can extend program size to the size of your disk memory. As a bonus, LINK-80 will optionally produce symbol information for symbolic debugging, as well as page-relocatable files for operation under MP/M. For "menu-driven" or "chained" programs, LINK-80 supports overlays.

LIB-80, our library manager, can concatenate a group of

relocatable object modules into a library, select modules from a library, insert modules into a library and remove modules from a library.

RMAC expands upon the basic MAC facilities to include generation of relocatable machine code.

The **PL/I-80 Run-time Library** contains over 300 individual subroutines.

XREF uses the output from RMAC to produce a complete cross-reference of symbols used throughout a program.

```
f:
proc options(main);
dcl
  i fixed;
do i = 0 repeat(i+1);
  put skip list('factorial(',i,')=' ,fact(i));
end;
stop;

fact:
procedure(i) returns(fixed) recursive;
dcl i fixed;
if i = 0 then return (1);
return (i * fact(i-1));
end fact;
end f;
```

EXCERPT OF PL/I-80 PROGRAM

Documentation. The PL/I-80 programming system is described in three manuals:

- The PL/I-80 Language Manual gives the details necessary to formulate PL/I-80 statements.
- The PL/I-80 Applications Guide explains the operation of the compiler, discusses commercial processing, and provides over thirty working sample programs from business and science.
- The LINK-80 Manual details the operation of the linkage editor and the relocation dependent operations of RMAC.

A PL/I-80 Command Summary is also included with the software package.

Independent Software Vendor Support Plan.

Independent Software Vendors, supplying software packages

tailored to specific requirements, promise to be the next major influence in the small computer revolution. Digital Research is committed to supporting vendors by providing the basic tools, information and licensing required to conduct a viable and profitable software business. Because it is a time-tested, structured and self-documenting production language and is portable to any number of minicomputer systems, PL/I-80 is an intelligent choice for application programming.

Commercial Vendor

Licensing. One goal of our Independent Software Vendor Support Plan is to provide a clearly defined procedure for licensing our products for use with independent software packages. PL/I-80 programs written by you can be sold in three ways:

- 1) As unlinked developed programs distributed for use on systems with LINK-80 and the PL/I-80 Run-time Library;
- 2) As "composite programs" which contain portions of the run-time system under a simple royalty agreement;
- 3) Or as "composite programs" distributed under a yearly subscription.

For more information on these options, contact the Marketing Department at Digital Research.

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