information is given by Miller, Ackroyd & Oszlanyi (1994).

The *PD* macro set exists for powder diffraction and general control as detailed by Tang, Miller & Laundy (1996), *4CIRCLE* for single-crystal diffraction and *CLAM* for virtual instruments.

Software environment: MS-DOS and MS-Windows 3.1/95 are the main target platforms, plus a single Microware OS-9 version. Central development and maintenance is carried out under Unix.

The program is coded in ANSI C. The Microsoft Visual C/C++ compiler is used together with National Instruments LabWindows/CVI for the enhanced Windows version.

Hardware environment: Most systems are of ISA/PCI bus PC type controlling a growing number of CAMAC, GPIB, RS232, Harwell 6000 and BEDE MINICAM instruments. A Motorola MVME147 processor hosts the single OS-9 system. Support for VMEbus instrumentation is planned. Development Unix *PINCER* versions run on SG Irix and Sun Solaris workstations.

Program specification: The command interpreter overhead per instruction is less than 0.5 ms on a Viglen 4DX33 PC running Windows 95.

The program occupies 350 kbytes of memory at run-time except for the Labwindows version where the user interface and run-time library increase it to 3 Mbytes. It contains 40 000 lines of C source code, invoking hardware and graphics libraries. The macros contain more than 16 000 lines. Macros are available to provide a number of test cases for all CLI commands.

Documentation: A user guide, system guide and primer are available in MS-Word format and HTML (http://www.dl.ac.uk/SRS/XRD/Pincer.dir). Online help is provided by the CLI and macros.

Availability: Executables and macros can be obtained from the main author for academic use.

Keywords: data acquisition; control; instrumentation; PC; command interpreter.

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VRML general position/symmetry diagrams of the 80 layer groups

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The crystallographic problem: The standard representations of the general position and symmetry diagrams of three-dimensional groups are two-dimensional diagrams. These are projections onto a plane of, respectively, the general positions and the symbols of the symmetry elements. This is the case for space groups (*International Tables for Crystallography*, 1995) and for layer groups (Weber, 1929; Wood, 1964; Chapuis, 1996; Grell *et al.*, 1988; *International Tables for Crystallography*, 1999). Three-dimensional diagrams of only the general position diagrams of the layer groups have been produced by Litvin & Litvin (1993). With this new program we have incorporated both the general position and symmetry diagrams into one three-dimensional diagram for each layer group. Each diagram can be rotated and zoomed to aid the visualization of the general positions and the symmetry of the 80 layer groups.

Method of solution: The three-dimensional diagrams were developed using a commercial product (*WalkThrough Pro* by Virtus Corporation) and converted into VRML format. The general positions are represented by spheres and three-dimensional symbols were introduced and used to represent the symmetry elements.

Software environment: Needed to view the diagrams are a World Wide Web (WWW) browser with a VRML viewer plug-in, for example, *Netscape* with *Cosmo*, both widely available on the internet. Each diagram is individually loaded from hard disk and viewed within the browser.

Hardware environment: The diagrams can be viewed on any platform supporting a WWW browser with a VRML viewer plug-in. Stored on a hard-disk drive, the 80 files use 65 Mbytes of space.

Program specifications: The diagrams are stored on a hard disk and loaded individually into a web browser and viewed with a VRML viewer plug-in.

Documentation: A *symbol* file lists the sequential numbering and symbols of the 80 layer groups and the symbols used to represent the positions and symmetry elements.

Availability: Zipped files of the 80 diagrams and an Adobe *Acrobat* readable *symbol* file containing the documentation can be downloaded from http://www.bk.psu.edu/faculty/litvin. Alternatively, these files can be obtained by sending three formatted 1.44 Mbyte 3.5″ disks to the correspondence author (DBL). Nonzipped files can be obtained by sending a single 100 Mbyte ZIP disk to the correspondence author.

Keywords: layer groups; general position diagrams; symmetry diagrams; VRML; three-dimensional visualization.

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The Royal Swedish Academy of Sciences has awarded the 1998 Gregori Aminoff prize, given for pioneering work in crystallography, to **Aloysio Janner**, **Ted Janssen** and **Pieter Maarten de**