

Application Areas for the ICL 2903 Educational System

The 2903 is a small general purpose computer which is equally suited to technical calculations and large volumes of data processing for management. By virtue of its communications abilities, the 2903 can provide this broadly based computing service to neighbouring schools and colleges as well as to the establishment where it is installed. In this way the 2903 can satisfy the total demands for computing in education for the whole spectrum of potential users in a significant section of a County.

The list below is not intended to be an exhaustive description of how a 2903 would be used, but an indication of the breadth of subject areas where computer techniques are needed.

Teaching Subjects

1. Languages

Concordances
Preparation of indexes
Stylistic analysis
Text analysis
SNCEOL 4 text processing
English to French translation

2. Geography

Drainage basin simulation, with optional use of a graph plotter.

3. Social Studies

Survey analysis
Evaluation of single-factoredness or unidimensionality of attitude scales
Information retrieval

4. Management Science

House purchase financial model
Investment portfolio management game
Supermarket management game
Decision making simulation
Input/output analysis of industrial flows in a hypothetical economy
Calculation of GNP and government spending
Electricity billing simulation
Business management game
Project resource allocation game
PERT critical path analysis
Linear Programming
CSL simulation language
PROSPER financial models with Discounted Cash Flow

5. Physics

Nuclear decay - half-life calculation
Satellite orbits
Scatter experiment simulation
Analysis of light interference patterns

6. Chemistry

Spectrophotometric determination of concentration
Questions on ideal gas law via a terminal
Pi-electron densities of molecules by the Huckel method
Calculation of electric dipole moments
Perspective drawings of molecules on a graph plotter
Titration calculations
Spectroscopy calculations
Bond lengths and angles from X-ray crystallography
Calculation of molecular weights in Polymer Chemistry

7. Biology

Genetic simulation according to Mendel's laws

Qualitative organic compound analysis - question and answer via terminal

Competition between crops or species

Enzyme experiment simulation

8. Biochemistry

Efficiency of an antibiotic - mean single survivor time

9. Electrical Engineering

D.C. Circuit analysis

A.C. load flow and circuit analysis

10. Mechanical Engineering

Numerical control of machine tools

Trim loss minimisation

11. Civil Engineering

Motorway planning game

Contractor's management game

Traverse computation

Plane frames, space frames, grids

Continuous beam analysis

Storm sewer design

12. Mathematics

Fourier analysis

Polynomial equations

Simultaneous linear equations

Curve and surface fitting using a graph plotter

Function plotting

13. Statistics

Mean and standard deviation
Covariance and correlation
Multiple regression
Analysis of variance
Cluster analysis
Discriminant analysis
Scatter diagrams for principal components
Canonical correlation analysis
Multivariate analysis
Contingency table formation
Chi-square test for contingency tables
Simulation of simple probabilistic situations
Data vet - validates format and consistency of survey data

14. Computer Studies

Fortran
Basic for colleges and schools
Cobol
Algol
Pascal
RPG-2
CESIL for schools computing
SIR for schools computing
LISP
Sort/merge
Database
Isometric and perspective drawings on graph plotter
GINO-F drawings on graphics terminal
Data preparation - Direct Data Entry
Flowcharting

Administration in Education

Student enrolments

DES returns

Analysis of examination entries for GCE, RSA, C&G

Analysis of examination marks

Objective test examinations

Recording subject options chosen by students

Lecturing timetables

Parents evening timetable

School timetable

Library records

Analysis of library resources

CAMOL - Computer Assisted Management of Learning

This package is designed to manage individualised instruction in a modular course environment.

1. Marking students answers
2. Calculating and recording students' results
3. Notifying students of their results
4. Notifying teachers of test results and the progress of each course
5. Giving teachers on request a progress report for a student
6. Giving teachers on request accumulated results for a student or all students on a course
7. Analysis of examinations with respect to test reliability
8. Routing - guiding students to appropriate assignments
9. Recording detailed exam answers for subsequent analysis
10. Modification by teachers of the parameters controlling test marking and routing.