

## ICL System 25

### PRODUCT DESCRIPTION

ICL's System 25 is a multiple-user, workstation and communications oriented range based on 16-bit microprocessors. It can act as a terminal to the products of other manufacturers, including, unusually for ICL, those of IBM.

ICL claims that System 25 is four times more powerful than its System Ten, but states that these earlier ex-Singer computers will continue to be marketed. To enable System Ten users to convert easily to the new System 25, ICL will provide a System Ten compatible operating system, DME II. The standard operating system for the System 25 is designated DMF III.

The new systems fit in between ICL's System Ten and ME29, although it's clear that if the memory upper limit of System 25 were allowed to go beyond its current 320K-byte maximum, the System 25 range would be a very definite competitor with the ME29. The new range will also compete with the wares of many other vendors, notably with IBM's System/34 and perhaps, System/38 models 3, 4, and 5.

The market for System 25 will include not only distributed processing and the System Ten replacement market, but also point-of-sale (POS) and factory terminal installations, in which ICL already has specialized products which can be linked to System 25. For word processing, the System 25 can have special larger screens rather than its normal 12-inch, 24-line by 80-character displays.

The architecture of the new range is based on two main microprocessors and a multi-bus structure. The main ▶

**PRODUCT:** ICL System 25, a range of microprocessor-driven systems suited to commercial environments where communications, distributed computing, and transaction processing are the major applications.

**DATE ANNOUNCED:** June 1981

**DELIVERY:** July 1981, although official release of the new system software is scheduled for October 1981.

### BASIC SPECIFICATIONS

**MANUFACTURER:** International Computers Ltd., ICL House, Putney, London SW 15. Telephone (01) 788-7272.

**MODELS:** System 25, models 51, 61, 62, and 63. At the time of writing there is little separation into model categories.

**BASIC DATA UNIT:** 8-bit byte, ASCII code used internally.

**PROCESSORS:** Instruction processor, AMD bit-slice microprocessor with a cycle time of 120 nanoseconds; control processor, AMD bit-slice microprocessor; fast disc processor, Intel 8085 microprocessor.

**MAIN MEMORY:** 16K-bit MOS chips. Basic memory size, 80Kbytes. Maximum memory size, 320K. Increment size, 80K. Cycle Time, 500ms. Parity protection is standard.

**BUSES:** There are three buses. The first services main memory, the instruction and control processors, and the tape and disc controllers. The speed of this 5-byte-wide bus ▶



ICL's new System 25 includes a cabinet that contains processors, memory, a Winchester disc drive, and tape cartridge drives for software exchange. Also shown is a Model 85 visual display unit, one of several workstations available, and, at right, a fixed and exchangeable disc file.

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▷ microprocessors are the instruction processor, which processes program instructions on command from the control processor, and the control processor, which primarily handles terminals and communications.

There are three buses. The main bus, 5 bytes wide, services the memory modules, the instruction processor, the control processor, the disc controllers and the magnetic tape controller. Maximum transfer rate is 10 megabytes per second. The second bus links the control processor to the controllers and couplers for terminals, communications, and the cartridge tape drives. Maximum transfer rate is 100 kilobytes per second. The third bus links the "S" disc controller to the fixed-disc drives and the floppy disc drive. Maximum transfer rate is 1.25 megabytes per second.

System 25 has an automatic fault diagnostic system which starts its checking as soon as the machine is switched on. According to ICL, this system will pick up 95% of any central processor faults.

Main memory is in 80K-byte increments from a basic 80K to a maximum 320K. Cycle time is 500 nanoseconds. Each 80K block of memory has its own link to the main bus.

The functioning of System 25 depends on a partitioning scheme managed by the software, and main memory can be divided into a maximum of 20 partitions plus a Common area. A job can run in each of these partitions. The time allocated to each job is effected on a priority basis and by means of time-slicing. Several hundred instructions will be executed from one program and then several hundred from each of up to 19 succeeding programs. The control software is the Systems Configurator which also allocates peripherals to jobs running in the different partitions. The Systems Configurator also initially establishes the partitions—and the operating system—to communicate with each other. There is no hardware lock-out between either the operating system and jobs or between job partitions.

The ICL System 25 can support a very wide variety of peripherals. How many and of what type will depend on the number and kind of other units attached. The maximum number of system modules is limited to the number that can be plugged into 22 slots. The table shows how many slots each system module requires. The term "new" discs is used to differentiate System 25 discs from those which can be brought over from System Ten installations. These "old" discs are attached to System 25 via the "U" controller.

<u>System Modules</u>	<u>Maximum No. Permitted</u>	<u>No. of Slots Required per Module</u>
Control Processor	1	1
Instruction Processor	1	2
80KB Store Modules	4	1
'S' Controller (New Discs)	1	1
T' Coupler (Slow Devices)	10	1

▶ ranges from 2 megabytes/second to 10 megabytes/second for single-byte and 5-byte-wide traffic, respectively. The second bus connects the control processor to the controller for the cartridge tape drives and the couplers for the terminals and for communications.

This bus has a maximum speed of 100 kilobytes/second. The third bus links the fast disc controller to the "new" disc drives (i.e., the purely System 25 discs which cannot be used on System Ten). The maximum speed of this bus is 1.25 megabytes/second.

**DISCS:** Built into the main cabinet is a 70-megabyte Winchester disc drive made by Micropolis. Other discs are connected to the System 25 via controllers with a maximum of two per cabinet. The disc varieties are: EDS 65, an exchangeable unit with a capacity of 65 megabytes, and FDS 130, a fixed-disc unit with a capacity of 130 megabytes. In addition, up to two floppy disc drives, each of 1-megabyte capacity, may be connected. Total possible disc capacity is 592 megabytes.

**MAGNETIC TAPE DRIVES:** Up to two 10-megabyte cartridge tape drives may be used for archiving and for data and program exchange. There can also be a maximum of two 1600-bpi tape drives whose functions could include acting as back-up for the 130-megabyte discs.

**OTHER PERIPHERALS:** These comprise three types of workstations, two line printers, two matrix printers, a hard copy printer, and a daisy wheel printer for word processing.

The workstations comprise two 24-line by 80-character models, one for local and one for remote processing, and a 24-line by 80- or 24-line by 132-character model for word processing. This last model allows A3 size documents to be screen formatted directly. The remote model can have a hard copy printer attached to it.

The two line printers are both band printers giving print speeds of 300 and 600 lpm with a 64-character set. There are also two matrix printers with speeds of 100 and 180 cps. The hard copy printer provides 80 characters/line at a nominal speed of 80 cps. The daisy wheel printer has a maximum speed of 55 cps.

All peripherals can be located without modems up to 1500 meters away from the processor. The hard copy printer has to be within 3 meters of the workstation.

**COMMUNICATIONS:** For distances of up to 1500 meters, a cable is sufficient to link up to 10 terminals. There can be 20 such cables on any System 25. Beyond 1500 meters, modems and telegraph lines can be used. To handle various protocols, ICL provides the intelligent "C" coupler which can be loaded with firmware appropriate to the protocols needed. Current firmware and protocols are: PCA 84 for distant workstations, 2780, 3271 BSC, 3274 SNA, ICL full XBM, and X.25.

**OPERATING SYSTEMS:** The main operating systems for the System 25 are DMF III and DMF II, with DMF II for ICL System Ten users who want to maintain compatibility at the software level. DMF III contains: loading programs, systems maintenance and housekeeping routines, utilities and programming aids, and system configuration programs.

**LANGUAGES:** These consist of COBOL-74, RPG II, and Assembler II. The COBOL-74 is a fairly low-level compiler (below Level 2). Assembler II is compatible with the Assembler on ICL System Ten computers. It contains 25 instructions, each 10 bytes in length.

**APPLICATIONS SYSTEMS:** These consist of POS (Point of Sale) via special ICL equipment, word processing, and factory terminal systems. ▶

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<u>System Modules</u>	<u>Maximum No. Permitted</u>	<u>No. of Slots Required per Module</u>
'C' Coupler (Communications)	4	1
'D' Coupler (Specialized terminals)	9	1
'U' Controller (Retained System Ten peripherals)	1	2
'R' Coupler (Cartridge Tape Controller)	1	1
'M' Controller (1/2" Mag Tape)	1	1
'V' Coupler (Non Standard Devices)	4	1
Small Fixed-Disc Adapter	1	1
Large Disc Adapters	2	2
1MB Floppy Disc Adapter	1	1
Clock Module	1	1

Novel features of the System 25 peripheral set are a 70-megabyte Winchester disc drive made by Micropolis (and first introduced on ICL's ME29 Model 35/1) and 10-megabyte magnetic tape cartridges using 0.25-inch megabyte tape. These tape cartridges will be used by ICL mainly for distribution of software, but can also be used to back-up the Winchester. These tapes are not of the streamer variety and require at least 15 minutes to read or write from end to end. The Winchester drive and the twin cartridge tape drives are built into the desk-top cabinet which houses the system.

In more general terms, the System 25 will support up to 590 megabytes of fixed and exchangeable disc storage, line and matrix printers, and up to 200 terminals of which 40 may be remote.

System 25 has a significant degree of emphasis on communications and a strong potential role in a distributed processing environment. An important aspect of this role will be System 25 acting as a terminal controller. It will present the same interface to both locally and remotely connected display terminals and printers, with the result that applications programs can access these devices directly. Local terminals are linked via the "T" coupler and can be up to 1500 meters away from the processor. Remote terminals and printers are linked via the "C" coupler. Asynchronous terminals (e.g., Teletypes) are connected using the "V" coupler which provides a standard RS232C/V24 interface. If a non-ICL terminal is required, this can also be connected via the "V" coupler using appropriate firmware.

System 25 can also be linked to both IBM networks and other ICL systems. If the IBM network is pre-SNA—that is, it uses BSC (Binary Synchronous) protocols—then the System 25 "C" coupler with BSC firmware and a piece of ICL software called CAM (Communications Access Manager) is used. With these, System 25 can also emulate an IBM 3271 cluster controller.

If the IBM network is SNA, then the "C" coupler is used with SDLC/SNA firmware and CAM. Emulation in this case will be of an IBM 3274 Model IC (or IBM 3276) cluster controller.

## ▷ PRICING

**SMALL SYSTEM:** System 25/51 with 80K memory, two 35-megabyte fixed disc drives, two 10-megabyte cartridge tape drives, three workstations, and a 180-cps printer. Purchase price: £26,385. Maintenance: £610, quarterly.

Software includes DMF III, utilities, Assembler, and Interactive Application Support (IAS): £204, quarterly.

**MEDIUM SYSTEM:** System 25/61 with 160K memory, two 65-megabyte exchangeable disc drives, one 10-megabyte cartridge tape drive, a 300-lpm printer, and a coupler for one communications line. Purchase price: £47,425. Maintenance: £1,104, quarterly.

Software includes DMF III, utilities, COBOL, Interactive Applications Support (IAS), and secondary communications link software: £450, quarterly.

**LARGE SYSTEM:** System 25/63 with 240K memory, three 130-megabyte fixed-disc drives, a 65-megabyte exchangeable disc drive, a 10-megabyte cartridge tape drive, a magnetic tape drive, 12 workstations, a 600-lpm printer, and a communications coupler for two lines. Purchase price: £95,540. Maintenance: £1,804, quarterly.

Software includes DMF III, utilities, COBOL, Interactive Applications Support (IAS), and secondary communications link software: £450, quarterly.■

The same "C" coupler is used to communicate with ICL systems such as those associated with ICL's ME29 or 2900 series with the relevant protocol.

X.25 networks also can be accessed by System 25.

There is no doubt that with the ever-escalating cost of staff and also the practically non-stop downward movement in both absolute and relative costs of hardware, the software provided by a manufacturer or that which can be obtained from other sources is of very great importance. In the case of System 25, there is a wide range of systems software scheduled for release in October 1981. Systems delivered before that date will have pre-release versions of these programs.

At the forefront of these system programs will be DMF III—an operating system developed from DMF II, which runs on ICL's System Ten range of computers and which will also run on System 25.

Two other system software packages of high significance in terms of the workstation and communications orientation of System 25 are IAS (Interactive Applications Support) and CSM (Conversational Systems Manager). IAS is used for communications, screen handling, and output and will enable workstations and printers to be switched independently between applications. CSM facilitates housekeeping and operating functions.

Standard languages available with System 25 are COBOL, RPG II, and Assembler II. COBOL conforms to the low intermediate level of the ANSI 1974 standard and contains additional elements for interactive operation. Assembler II is a macro language. ▷

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- System 25 will also support ICL's IPA (Information Processing Architecture), which specifies how different computers in the ICL range should be linked at both operating systems level and at file access level. IPA enables a user to access files on one ICL computer from another ICL computer.

### CONFIGURATIONS AND PRICES

The Systems 25 range includes four models: 51, 61, 62, and 63. At present, there does not appear to be a very clear-cut division between these models.

A very basic Model 51 configuration which would cost "under £22,000" (excluding Value Added Tax) would include System 25 processors, 80K main memory, one tape cartridge drive, one 70-megabyte Winchester fixed disc; one 100-cps matrix printer, and one standard workstation. In addition, the DMF III software, IAS, and the COBOL compiler would together cost £100 per month.

A Model 62 configuration which, according to ICL, would be very suitable for an overloaded System Ten user, among others, would comprise: System 25 processors with 160K of main memory, 130 megabytes of fixed disc, 65 megabytes of exchangeable disc, 8 standard workstations, a 300-lpm printer, and a 100-cps matrix printer. The price of this configuration is quoted at "less than £55,000."

### RELATIONSHIP TO CURRENT PRODUCT LINE

System 25, with its compatible DMF II operating system and Assembler II, offers an attractive upgrade path for

System Ten users. Particular attractions are the vast increase in disc storage available on System 25 compared with System Ten (590 megabytes on System 25 against a maximum 160 million characters on System Ten), the existence of COBOL, which is not provided on System Ten, and the general improvement in communications facilities.

System 25 is almost directly competitive with ICL's ME29/35 but is pitched well below the ME29/45 and the 2946 (the entry point now to the 2900 series). The "new" discs on System 25 differ only slightly in capacity from those offered on the ME29. The System 25 Winchester disc is also available on the ME29/35-1. There is no direct compatibility between System 25 and other ICL ranges other than the System Ten.

### COMPETITIVE POSITION

The System 25 is a very strong competitor to IBM's System/34. It offers more main memory than the 34 and almost twice as much disc storage capacity. Although it's difficult to assess the comparative attributes of the System 25 and IBM's 34 in time-sharing terms, it seems likely that ICL's System 25 will have a definite edge, if only because it has more "intelligence" (i.e., more local microprocessors) than the 34. System 25 may also offer stiff competition to all models of the IBM System/38 and the IBM 8100.

As for other manufacturers, ICL's new range may also tread heavily on the toes of Hewlett Packard, DEC, and Data General, among others. □