

Q1 COMPUTER SYSTEM



**LOW COST
MULTI-PURPOSE
MICRO COMPUTER**

DESCRIPTION

The design and application of the first low-cost, multipurpose computer system that, in various configurations, is intended to replace :

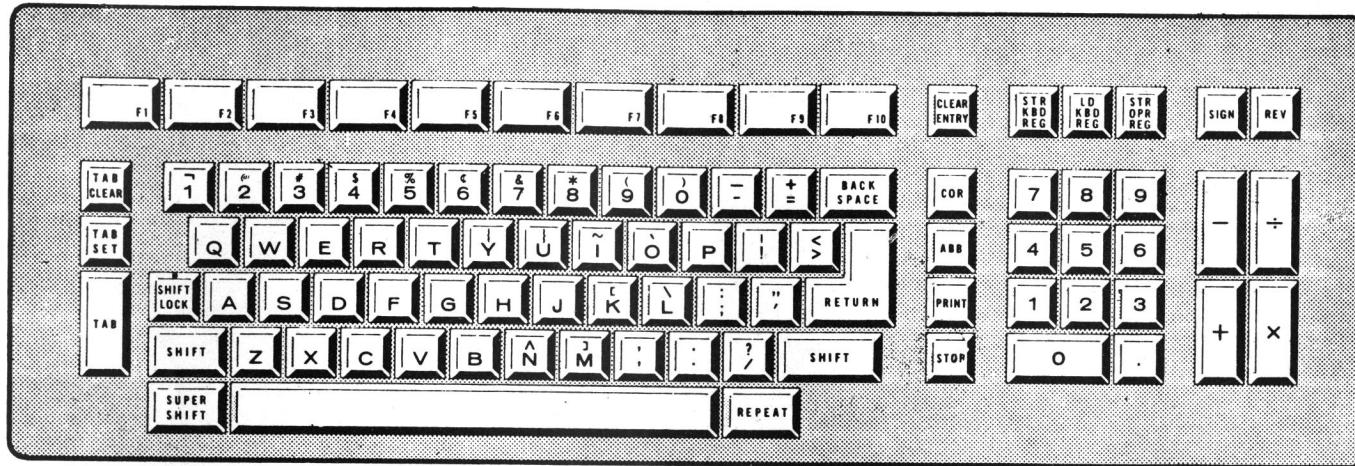
- *** accounting machines
- *** batch-oriented computer systems
- *** data-entry systems
- *** terminal-oriented computer systems
- *** scientific programmable calculator
- *** word-processing machines

With the advent of MOS/LSI, the cost of the central processing unit has become an insignificant part of the total system cost. The use of a high-level language makes the system relatively processor-independent. The languages of the QI/LMC computer are PL/I and assembler. PL/I was designed by IBM to be a replacement for every computer language in widespread use. It includes nearly all of the features found in COBOL, FORTRAN, and ALGOL.

The advantage of the multi-purpose QI computer system approach in the reduction of hardware cost, software cost and training cost. The result is a cost-effective computer that can meet your data handling problems.

FEATURES

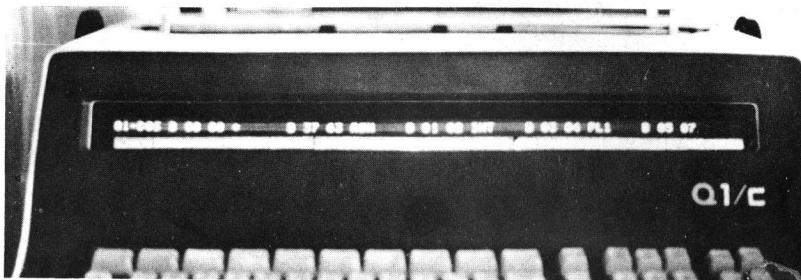
- * Alphametical keyboard.
- * 80 character display.
- * Basic system contains 16K bytes memory.
- * PL/I high-level language and assembler.
- * Powerful, easy disk operation system.
- * Expandable user memory to 64K bytes.
- * Two direct access disc unit.
- * Powerful utility and library.
- * Quiet, extremely reliable, and flexible printer.



Keyboard - Layout "A"

The keyboard entry unit is self-contained in the desk-top unit. Under program control, it performs data entry and processor functions. The function including tabulation, shift, carriage return, line feed, backspacing, spacing, upper/lower case alphabetic, numeric and special symbols entry.

An audio "beep" or "click" can be programmed to gain the operator's attention.



THE QI VISUAL DISPLAY

The visual display unit mounted with the desk-top unit is a single row, 80 position display. The unit has repertoire of 128 characters, and contains its own memory. Each character is displayed in a 5x7 dot matrix format. Under program control :

1. A cursor appears at the next position awaiting a character.
2. Characters may be displayed from any input device or main memory.
3. Characters may be changed from the keyboard.

The QI serial impact printer is quiet, extremely reliable, and flexible. The programmer controlled

horizontal and vertical spacing make it suitable for plotting graphs and for proportional spacing. The operator can easily load paper, change ribbons and change the print-element. Paper loading is similar to inserting paper on a standard typewriter.

printer speed : 45 characters/sec, average

character set : 96 characters

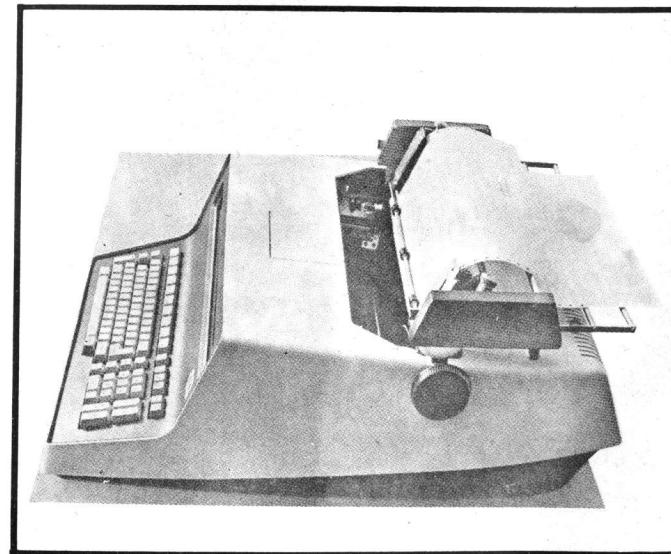
print-element : interchangeable

vertical line spacing : 96 increments per inch

horizontal line spacing : 120 increments per inch

print positions per line : 158 print positions at 12
characters per inch

paper feed speed : 4" per second, nominal indexing
indexing : up or down
carriage return time : 0.4 seconds, maximum
tabulation : direct to addressed horizontal position
optional : tractor form-feed



THE QI PROCESSOR

The QI microprocessor consists of an arithmetic and logic unit, seven 8-bit general-purpose registers, a program counter and stack pointer, and an input/output control unit.

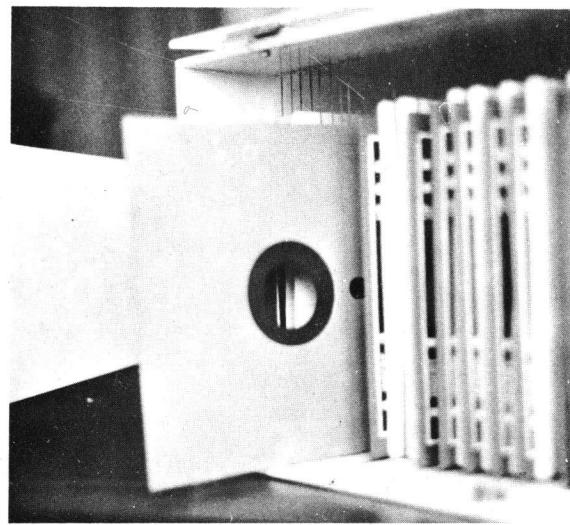
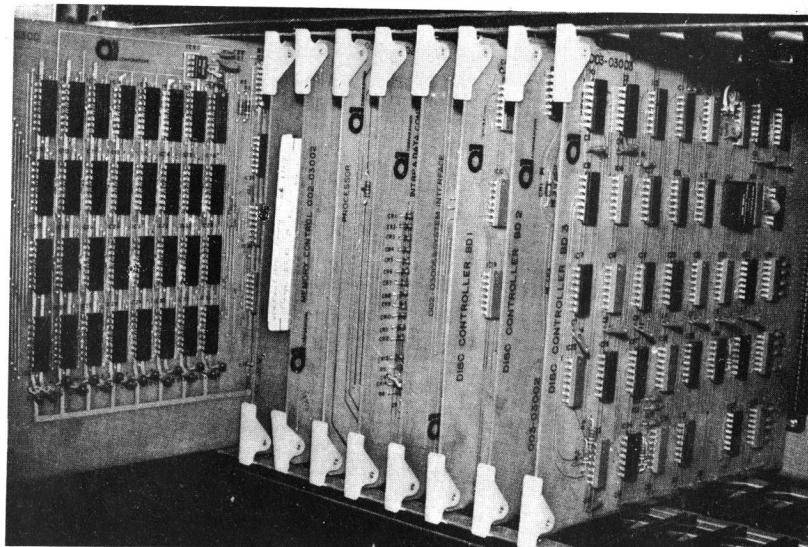
I/O Address : 32

instruction processing time : 2-9 sec.

memory addresses : 64K bytes.

memory cycle time: 470 nanosecond.

Memory is available in increments of 16K bytes.



THE QI DISK UNITS

Disks provide direct-access external storage, efficient scratchpad area, operation systems residence. The QI disks are removable. Unlike the larger, more expensive disk units, changing disks takes a few seconds only.

Disk specification :

1 disk : 64 tracks

1 track : 16 sectors

1 sector : 256 bytes

1 disk : 262,144 bytes

Disk operating specification :

rotational speed : 375 r.p.m.

track to track access time : 10ms .

setting time : 10ms.

environment-temperature : 40 F to 140 F

data transfer rate : 250 Kilo bits/sec.

relative humidity : 20% to 90%

heat generated (max) : 346 BTU/hr.

The disks is IBM compatible as used on IBM 3740.

THE QI COMMUNICATION CONTROLLER

The Communication Interface Unit (CTU) contains all the hardware required to communicate synchronously through a standard modem such as 201 type. interface signals : EIA specifications RS-232c operating mode : half-duplex

In addition to communications hardware, the CIU contains the hardware required to generate a Block Check Character (BCC) when transmitting in a Binary Synchronous mode using CRC-16 error checking as defined by IBM specifications GA-273004. The CIU also has the capability to control 801 type Automatic Calling Equipment (ACE) as defined by EIA specifications RS-366.

THE QI SYSTEM OPERATIONAL SPECIFICATION

1. physical dimension :

desk : 27"H x 51"W x 28"D

console : 9.5"H x 21.5"W x 27"D

2. weight : 325 lbs.

3. power requirements :

standard : 1200 Watts.

114V or 230V

50 or 60 HZ.

THE QI EXTENDED SYSTEM

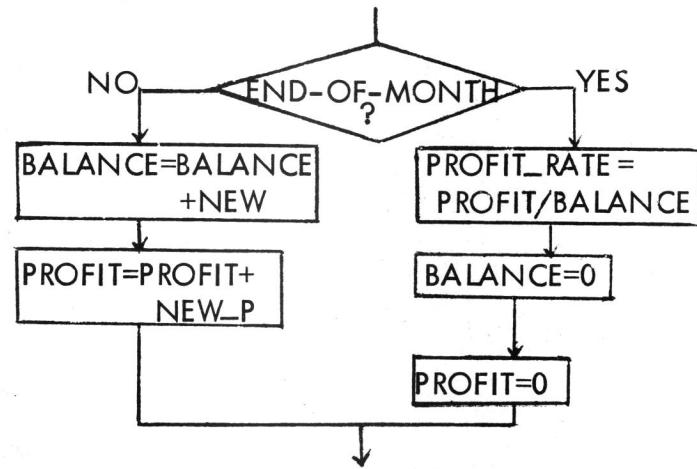
1. Memory can be added to 64K bytes in the desk unit.
2. Multi-Keyboard configuration is available.
Up to 6 wordstations can be handled.
3. Up to 4 disk drives can be housed in the desk cabinet .
4. Line printer, large disc memory, TTY interface can be connected.

THE QI SYSTEM SOFTWARE

PL/I High-level Programming Language

The language is designed to reduce the cost of training programmers, the cost of debugging, and in particular, the cost of program maintenance. It contains data types and operations that make it a more efficient substitute for assembly language than other high-level languages. Its default options and free format make it possible for the novice programmer to use a small subset of the language without being aware of the wide range of possibilities.

A flow chart and PL/1 language are shown below for comparison :



```
IF END-OF-MONTH='YES' THEN DO;  
  PROFIT_RATE=PROFIT/BALANCE;  
  BALANCE=0;  
  PROFIT=0;  
END;  
ELSE DO;  
  BALANCE=BALANCE + NEW;  
  PROFIT=PROFIT+NEW_P;  
END;
```

The Q1 PL/1 compiler run on 8K bytes CPU, can detect error with underline messages for easy program development.

The Q1 8K MACRO Assembler

It is useful for some dedicated systems required some powerful instructions. The assembler reads the source program, translates the mnemonic operation codes. The translation process makes two passes over the source code and includes error diagnostics to detect certain types of coding errors.

The Q1 Disk Operation System

The Q1 Disk Operation System interprets user commands given at the keyboard, checks their validity and performs the tasks indicated. These tasks include among other things: loading programs which are stored on the disks, monitoring system errors, copying, creating and modifying files.

The Q1 Editor

The Q1 Editor records in ASCII file on disk, changes external files, and displays any given file.

The Q1 Trace Routine

The Q1 Trace Routine is a useful debugging aid.

The Q1 Sort Routine

Sorting is an essential processing function in business application. Q1 Sort Routine sort the records on a sort-key of 9 decimal digits may take about an hour on a tape-cassette system. The Q1 Sort Routine will accomplish this task in just one minute.

The Q1 Print Routine

To print an ASCII file with or without page adjustment which has been recorded by editor.

Other useful routine such as Disc Dump, Join Routine for ASCII file or binary file, and Function Library are very useful in program development. And these useful are valid for end users.

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