

CHI 2130





Other mainframe features

The CHI 2130 has six index registers. These additional registers can be used for high-speed arithmetic computations and data manipulation schemes.

Standard options include protected XIO and BSI for re-entrant coding. This feature is essential for real-time operations. The spooling of I/O devices, card, printer, and plotter is also accomplished with this feature. This can increase throughput by utilizing the CPU speed more efficiently. Storage Protect is available in a functional equivalent of the IBM feature. Sense/Program switches, Mask and Unmask instructions round out the options that emulate IBM capabilities.

A real-time clock, incremented in $\frac{1}{4}$ seconds, runs continuously when the system is powered, keeping track of time on a 24-hour day, 365-day year basis.

An Interval Timer permits the interruption of the central processor at periodic intervals. It is program-controlled and can operate on a time base of one millisecond or $\frac{1}{60}$ th of a second.

Operator's console

Console design and layout of the CHI 2130 provides the first proof of this new system's superiority. The twin goals of control simplicity and access to machine capability have been achieved to a far greater degree than ever before.

The console is equipped with all standard indicators. 16 Console Entry Switches are provided as are direct program-accessible register switches.

Using this console, a programmer can perform program debugging, entry of data to memory, and display of memory contents without recourse to Console Entry Switches. A hexadecimal keyboard and switches for loading addresses and data into core simplify console interaction.

The hexadecimal display allows binary to hexadecimal conver-

sion in a rapid fashion. Data entry function is transferred to Hexadecimal Entry by positioning a rotary switch. In this mode, the keyboard and display provide rapid access to the storage address register, memory contents, and the IAR. These can be displayed in the hexadecimal display or changed through the hexadecimal keyboard. This enables fast and precise debugging.

When the computer is in Run mode, there is always a simultaneous display of accumulator content in both standard binary and in hexadecimal.

Other console features include selectable inspection of all six index registers, memory address stop and instruction address stop controls, and a Video Display Terminal (VDT) for rapid operator interaction. Hard copy from the console is available from either a slave printer to the VDT or a console printer.

CHI Operating Systems

Timesharing, teleprocessing, and batch processing can now run concurrently under a single operating system. The result is a full function system that enables you to utilize your system resources more efficiently.

The operating system gives remotely located users direct, immediate, and concurrent computer access and response on demand. From his remotely located terminal, the programmer can develop, compile, execute, and modify programs for use in batch processing or time sharing environments with full compatibility between batch and interactive programs developed at the terminals. He can choose from most conventional languages to create programs including Fortran IV, RPG II, Basic, Cobol or APL.

Through the use of terminal application programs, the operating system provides an efficient method for updating data bases and doing online inquiry.

The command language provides commands for entering, storing, editing, and retrieving data sets consisting of text, data, or source programs at the terminal.

A summary of the main features is listed below:

- Asynchronous support for up to 31 lines
- I/O spooling (printer, card punch, plotter, console, typewriter and terminals)
- Upper/lower case support
- Terminal oriented language
- Time of day and calendar routines
- User system control interface
- Terminal accounting information
- Complete set of user interface subroutines
- Capability of compiling programs directly from disk
- High speed card reader double buffering
- Online reload/initial load
- Data security via passwords
- Conversational editor, both a line and context editor
- Editor procedures
- Catalogued procedures
- Online concurrent Bi-sync operations (option)

Software — Data Base

Interactive data retrieval system:

The data retrieval system offers the CHI 2130 user the most sophisticated tool yet developed for rapidly retrieving a desired subset of data from a prestored data base. The user is given —

- a. The ability to select from the data base a subset of data based on a logical analysis of informational requirements which the user has provided and which the subset must satisfy.
- b. The ability to arrange the selected subset to order the values present in one or more categories of the subset, and
- c. The ability to list all, or parts of, the selected and arranged subset, either on the console or a high-speed line printer.

Four simple commands "select," "arrange," "list," and "execute" accomplish this task.

For the more sophisticated user, many more commands are possible. New data fields can be defined in the terms of an arithmetic or logical expression involving currently stored fields. A count of the number of records which have the same value in a specified field can be obtained. Headings can be added and changed interactively as well as prestored. Output formats can be easily switched. The system permits the input, modification and deletion of data either interactively or in Batch mode from cards. Error checking of data on input is provided and a security feature is available for limiting both the retrieval of sensitive data and the use of data-modification commands to "privileged" users.

XBS-A Data Base Management & Retrieval System:

Designed to allow application programmers to construct easily modules which maintain a data base and which generate various required reports from a data base.



Mapped Mass Memory

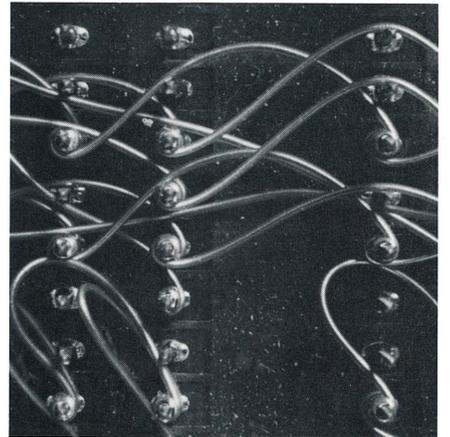
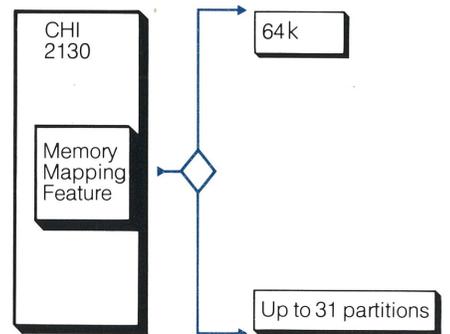
CHI's mass memory makes use of the latest technology in solid state memory. This high density memory system can provide up to 2 million words (4M Bytes) of memory contained entirely within the 2130 CPU. A new level of reliability is assured by automatic error correction within the memory system.

In a timeshared multiuser environment, the mapped mass memory allows all users to remain memory resident. This substantially reduces switching overhead when going from one user to the next. Better than 4 to 1 improvement can be obtained over the standard disk swapping timeshare technique where a large number of users are involved.

The CHI Expanded Memory System provides addressing capabilities for two million words of memory through eight memory mapping registers.

A 23 bit memory word is used to provide single bit error correction and multiple bit error detection for 16 bits of data and the word storage protect bit. An interrupt, which may be inhibited, occurs when error correction has taken place so that the location of the failure may be logged.

Mass Memory Capabilities



Floating point hardware feature

A comprehensive, in-line floating point feature (FPF) is an available option for the CHI 2130. The FPF combined with the CHI supplied software allows improvement of the floating point execution times by as much as a factor of 100 times. CHI supplies replacement software for the thirty-five most commonly used floating point routines. These routines replace the LIBFs with actual floating point instructions, thus reducing execution time to a minimum. An additional mode of operation is offered for the CHI FPF in which the eight floating accumulators in the FPF may be used. If the program performs a series of floating point operations, this mode can further enhance the CHI 2130's performance. See CHI's FPF brochure for further information.

Processing speed

CHI 2130 speed can be appreciated when specific operations are compared to other system execution times. The addition of hardware index registers increases the throughput for each indexed instruction.

The floating Point Hardware Feature can increase this speed multiple from 10 to 30. These, plus the speed of CHI peripherals, can show total throughput increases of up to 50 times, depending upon the particular application.

Console video/keyboard/typer option

CHI offers two console devices. The Console VDT gives fast, reliable, silent operation with the low failure rate typical of electronic hardware. Hard copy attachments to the console VDT give the user the option of a permanent record.

Register to register OP code

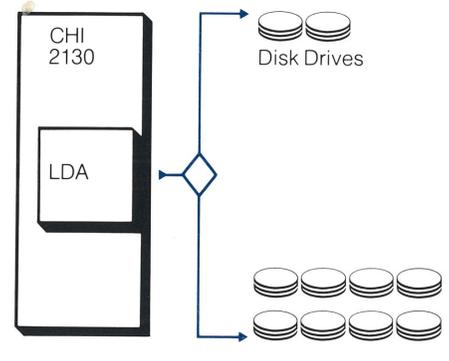
Registers 4, 5, and 6 are accessible only under control of a new instruction group which has been added to the CHI 2130 basic instruction set. This is the Register to Register (RR) OP Code. The CHI 2130 RR OPs have the additional capability of using arguments from memory. In those cases, the memory arguments are combined directly with destination register. This gives the unique capability of "immediate" type instructions.

Double indirect addressing

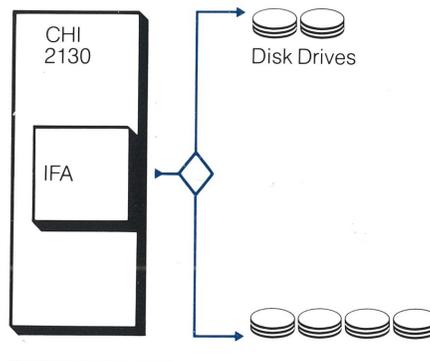
A second level of indirect addressing has been added to the CHI 2130 instruction format. This second level is capable of being post indexed. The result is a capability for direct reference to Fortran arrays through the calling string.

Double indirect with post indexing is a powerful tool that can reduce the execution time of your heavily arrayed Fortran programs significantly.

Large Disk Adaptor



Integrated File Adaptor



Peripheral Capabilities

CHI 1103 or 2103 printer

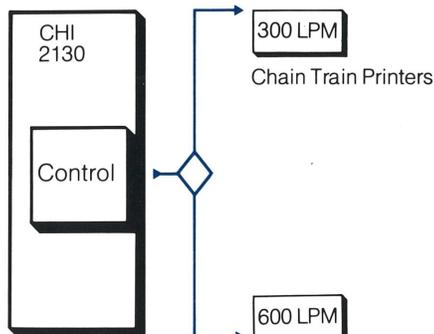
Hard copy at 600 or 300 lines per minute is provided by the CHI line printers. These printers are designed for reliable full-time use with the 2130 system.

The CHI 1103 accepts single or multiple-part continuous forms up to 19½ inches wide and provides vertical forms control with a 12-channel paper tape reader. The printer mechanism, along with the electronics, is housed in a sound-deadening cabinet with hinged top for printer access and hinged front doors for paper supply compartment access.

Specifications include:

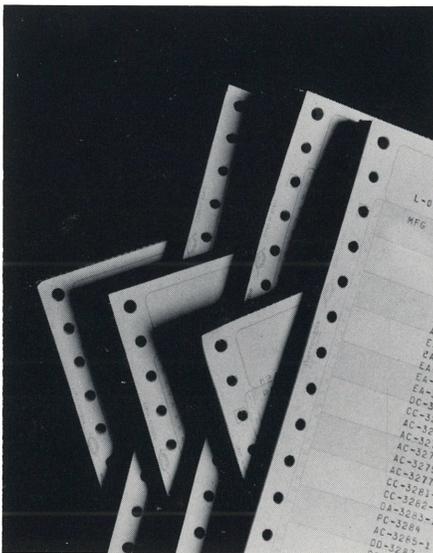
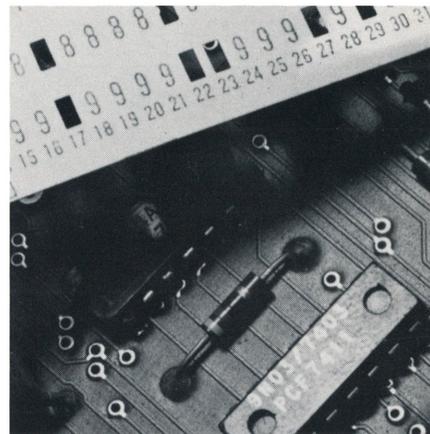
64 character set, 132 print positions, 10 pitch character spacing, 6 or 8 lines per inch spacing, 20 ms/line paper feed rate, 20 inch per second paper slew rate, and superior alignment and position controls. Optional 1000 lines per minute printers are available upon request.

Printer Capabilities



1442 Card Reader Punch

The recommended card peripheral for the CHI 2130 is the IBM 1442 and is rented from IBM by the customer. Cold start procedures can be initiated through the 1442 reader, and it may be tested using standard IBM Customer Engineer Diagnostics when installed in the CHI 2130 system.



CHI 1660-2

The CHI 1660-2 disk drive is a high-performance, direct access storage device for use in data processing systems. It is connected with other system peripheral equipment and operated at a computer center for running programs or reading and writing data. The drive employs an interchangeable disk pack which stores data on magnetic recording surfaces.

Single or multiple 1660 drives may be controlled by an Integrated File Adapter (IFA), depending on the requirements. The operator can monitor and/or intervene at any time to stop and restart a drive, to interchange disk packs between drives, or to install a pack from off the shelf.

Seeking may be overlapped on disk drives minimizing the amount of rotational delay between the time a command is issued and the actual execution of read or write.

Other IFA features include sector protect, cyclical redundancy, and bit appendage checks. Capability is also provided to transfer data from disk drive to core at a maximum memory cycle time of the CPU. The disk format is arranged so that consecutive sectors are transferred to the CPU without excessive rotational delay.



CHI 2330-2 Disk Storage Drive

The CHI 2330-2 Disk Storage Drive is a large capacity random access memory device used for input/output in a data processing system. The 2330 is designed to fulfill the user's requirements for access up to 1200 megabyte user capacity per system. The CHI 2330 attaches to the CHI 2130 via a Large Disk Adaptor. The user may have up to eight 2330s on a 2130.

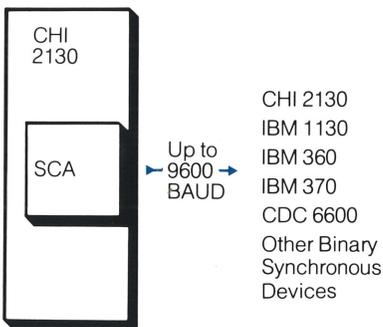
Data is stored on a disk pack containing 10 recording disks (19 recording surfaces). The disk pack spins at 3600 RPM, with data being read or written at a 6.45-MHz rate. The maximum storage capacity of one pack is 78,504,906 words. Data is recorded on the disk surface using Modified Frequency Modulation (MFM).

A closed-loop servo system is used to position the read/write heads. The carriage is driven by a linear positioning motor with feedback from the disk pack servo surface. The system provides an average access time of 28.5 milliseconds. The read/write heads are maintained at 45 microinches over the disk surface.

Synchronous communications adapter

The CHI 2130 can be equipped with a Synchronous Communications Adapter. The Synchronous Communications Adapter operates in both BSC and STR modes at speeds up to 9600 Baud. Communication with other 2130s, IBM 1130s, System 360s and 370s, CDC 6600s, and other binary synchronous devices is possible with this feature.

Synchronous Communication Adaptor



Storage access channel

The CHI 2130 system can be equipped with up to three functional equivalents of the IBM Storage Access Channel or SAC II. A SAC provides an easy method of attaching standard CHI and IBM peripherals as well as other SAC devices. It also provides a method of attaching an IBM System 7 to the CHI 2130.

Transfer time for the CHI 2130 SAC is 3.2 microseconds per 16-bit words, which is exactly four times the CPU cycle time and one-fourth the rate for devices controlled by integrated adaptors within the CHI 2130 CPU.

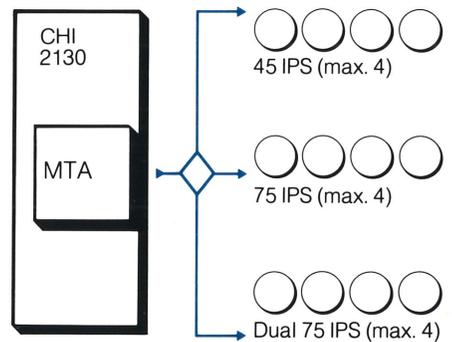
Asynchronous communications

CHI offers three modes of Asynchronous Communications: RS 232, Current Loop, and Balanced Line. Local and remote asynchronous devices such as teletypes, video display terminals (VDT), and printers may be attached to the CHI 2130 through the asynchronous communications adaptor. Up to 30 separate adaptors may be installed on the CHI 2130 system in any combination of the three types. Local distances up to 1000 cable feet from the CPU are supported by the balanced line adaptor.

Magnetic tape transports

CHI offers magnetic tape transports for the CHI 2130 computing system with capabilities ranging from 45 IPS to 75 IPS; nine track; and 800 BPI, 1600 BPI, and 800/1600 BPI switchable density. The magnetic tape sub-system for the CHI 2130 includes 10½ inch reels, NRZI or PE mode, and industry compatibility.

Magnetic Tape Capabilities



Plotter

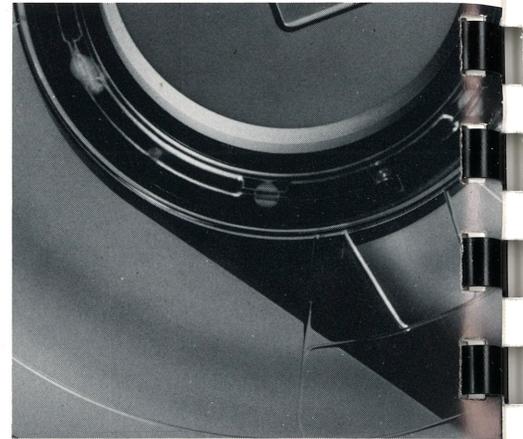
The CHI 2130 plotter adaptor supports the IBM 1627 models 1 & 2 and the Cal Comp 500, 600, 700, and 900 series plotters.

Paper tape equipment

Both photo-electric paper tape readers and 110 character-second paper tape punches are available from CHI on the 2130. The reader operates at 300 characters per second. The CHI 2130 will not IPL from paper tape.

Card readers

The CHI 2101 Card Reader has 600 or 1000 card-per-minute read speeds. Options for the 2101 include the capability to read marked and/or punched cards or the option to read 51 column cards. This unit gives 2 to 3 times the speed of the 1442.





Our home office and main manufacturing plant are in Sacramento, California. Sales and service centers are located in major United States cities. You'll find interested and interesting people in every one of our offices, eager to show you how to save money.

Call us collect, write us a letter, or drop into one of our offices today. It will be the beginning of a most advantageous relationship for your company.



Computer Hardware Inc.

4111 N. Freeway Boulevard
Sacramento, California 95834

Sales and service available at the following major cities:

Atlanta, Georgia
Bakersfield, California
Birmingham, Alabama
Charlotte, North Carolina
Chattanooga, Tennessee
Chicago, Illinois
Detroit, Michigan
Greensboro, North Carolina
Houston, Texas
Jacksonville, Florida
Knoxville, Tennessee
Los Angeles, California
Memphis, Tennessee
Miami, Florida
New Orleans, Louisiana
New York City, New York
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania
Rochester, New York
Sacramento, California
San Diego, California
San Francisco, California
Seattle, Washington
St. Louis, Missouri
Tampa, Florida
Washington, D.C.

Call Toll free 800-824-8418
for the name and address
of the Distributor nearest you.
(Within California call
collect 916-929-2020)

DATAMATIC GMBH
THURGAUERSTR. 68
8050 ZÜRICH

