# Is there a low-cost microcomputer that is not a toy?

# There is now!

# FINDEX®

# The portable computer that means business.

FINDEX is a fully portable, inexpensive, feature-packed business computer designed for the professional. FINDEX uses the latest technology... Bubble Memory, micro-electronics, complete keyboard, gas plasma display, and business BASIC software... to bring you the first real breakthrough in computer size, cost, and capability.

**FINDEX is highly versatile;** it has numerous uses in a wide variety of businesses. Typical examples are scientific work; inventory; accounting; mailing list management; real estate; insurance sales and underwriting; retail establishments; automobile dealerships; doctors' offices; churches; and multi-product sales such as hospital supplies, office products, paper, hardware products, and building materials supplies. FINDEX is especially valuable to dealers and distributors of all types; it simplifies complicated tasks, and provides portable access to large data banks.

**FINDEX is portable.** Wherever the business man must go, FINDEX goes with him, as a complete business information system.

**FINDEX has the portability of a compact terminal, with the capability of a central computer!**

**FINDEX is a high-powered, terminal-sized, complete microcomputer!** It has a quarter million characters of mass storage without rotating parts, a video-like display without a bulky cathode ray tube (CRT), plus an integral printout with a built-in mini-printer, all in one highly portable package!

FINDEX is programmed in easy-to-use Business BASIC. The computer includes a comprehensive file management capability, which does away with any need for sorting, and supports a large library of business applications programs.

# 1001 applications.

FINDEX is designed for a wide range of applications. Many of these are uniquely suited to the FINDEX features and capabilities:

**Portable Executive Organizer**

FINDEX keeps track of appointments and deadlines; catalogs miscellaneous notes for later organized recall; acts as a "tickler" for follow-up items; stores address and phone number lists; edits and types memos, directives and correspondence.

**Portable Data Base Reference**

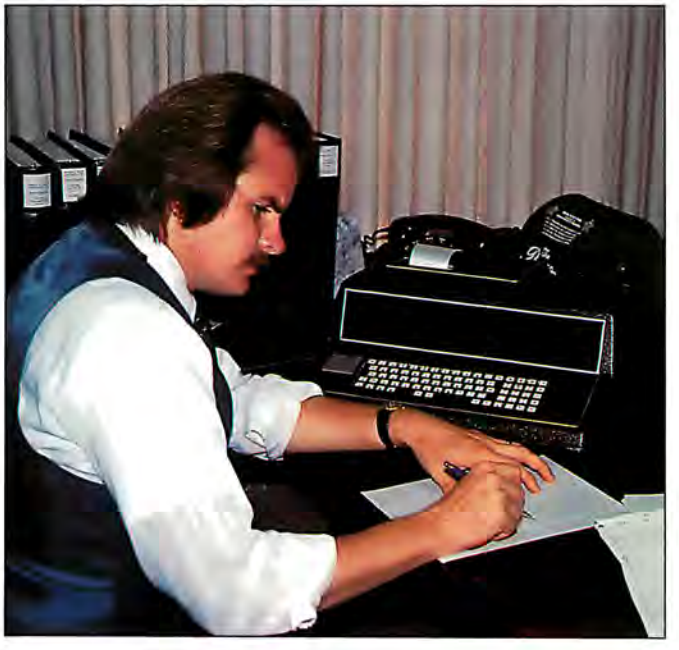
FINDEX can hold a complete data base such as a salesman's catalog and price list; insurance rate tables; on-site construction estimating tables; or pilot's flight plan, weather information, navigational aids, and calculations. Scientists and engineers find the FINDEX invaluable.

**Portable Order Entry**

FINDEX supports salesmen on the move like multi-product jobbers, route salesmen, rack jobbers, and wholesale distributors. It can provide a computerized product catalog, along with built-in pricing, combination order information, and discount schedules, and supply both the salesman and the customer with verification and accurate order pricing—on the spot!

**Portable Construction Estimating**

FINDEX goes to work for the contractor and engineer by performing take-offs from plans and specifications; calculating supplies, labor prices, discounts, and alternate bids; advising on the availability of supplies; handling technical data (dimensional units and conversions); and



even incorporating last minute specification changes.

**Portable Real Estate Search**

FINDEX can hold listing information for more than one thousand homes. The salesman simply enters the features of the desired home, and FINDEX will quickly display all likely properties—right in the client's home or office.

**Portable Insurance Program Planning**

FINDEX accepts the parameters for an insurance program during the salesman's appointment with his client. The information from the system allows him to prepare a plan, showing schedules of cash value growth, "paid-up" point, and all other pertinent benefits. Accurate premium information is also provided—allowing the client to compare alternative plans immediately.

# And more applications.

**Retail Point-of-Sale Register**

FINDEX stores several days transactions in its Bubble Memory, and if needed transfers them to a central computer, via cassette tape or direct data communications.

**General Applications**

In addition to applications uniquely adaptable to the FINDEX (because of its portability and large data base), a complete set of general applications programs is available:

- FINDEX offers just what the office manager wants: general ledger, accounts receivable and payable, name and address file maintenance for mailing lists, tax information reports, payroll, sales records, pricing, inventories and order handling.
- FINDEX fills the business executive's needs too, with programs for updated financial data, production planning, forecasting, market planning, money management, personnel profiles, and product development.
- FINDEX can be used by churches, charities, stores, in mailing list building and management, and in complete single entry inventory accounting and book-keeping systems.

**Printer**

FINDEX includes a self-contained mini-printer. The device prints 23 characters per line of alphanumeric data, at a rate of 113 lines per minute.

**Plasma Display**

FINDEX uses a state-of-the-art, flat, gas plasma display panel consisting of six rows of 40 characters each. A character is comprised of a 5 x 7 dot matrix, approximately 0.2 by 0.3 inch in size.

**Keyboard**

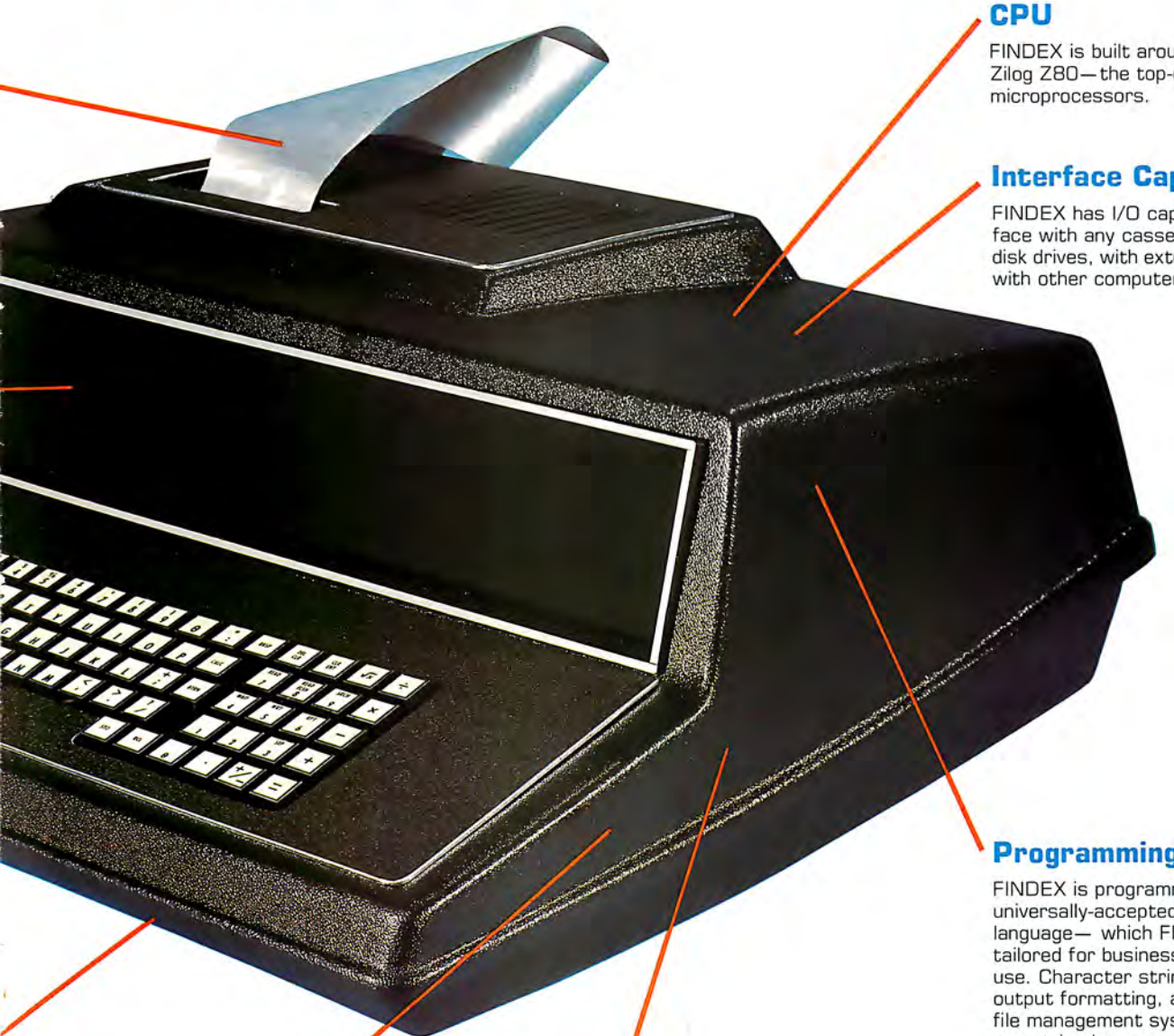
FINDEX contains a built-in, 77-key upper and lower case complete alpha-numeric keyboard and calculator pad, including 17 programmable function keys.

**Portable, Rugged, Reliable**

FINDEX weighs only 20 pounds and is self-contained in a portable, typewriter-sized unit. Its reliability is enhanced by using only three moving components (built-in keyboard, printer, and fan).

# FINDEX®

## Features:



### CPU

FINDEX is built around the Zilog Z80—the top-of-the-line in microprocessors.

### Interface Capability

FINDEX has I/O capability to interface with any cassette recorder, with disk drives, with external printers, and with other computers.

### Programming

FINDEX is programmed in the universally-accepted BASIC language— which FINDEX, Inc. has tailored for business and professional use. Character string manipulation, output formatting, and a full-featured file management system (including any-string key sequential files) are among the many enhancements.

Applications programs for general accounting, data management, and scientific problem solving are available directly from FINDEX, and a vast library of other compatible BASIC programs are offered by alternate sources.

Plus, learning to program the FINDEX computer is simplified by using the clear and comprehensive support documentation supplied with the FINDEX. Write your own programs!

### Memory

FINDEX contains 48 thousand characters of random access memory (RAM)—providing ample room for the BASIC language interpreter, the powerful file management logic and the applications programs. Options can expand this memory up to 2 million characters.

### Mass Storage

FINDEX uses the NASA-developed Bubble Memory as its mass storage medium. A quarter million characters of storage are built into this extremely compact unit, with no rotating parts! Memory is retained even during power interruptions.

# Systems configuration.

**Standard Configuration:** Self-Contained and Portable...

FINDEX, in its standard configuration, consists of a 20-pound, terminal-sized, portable computer. Its rugged, high-impact molded case houses the electronics, memory and mass storage, display, and mini-printer. Component details include:

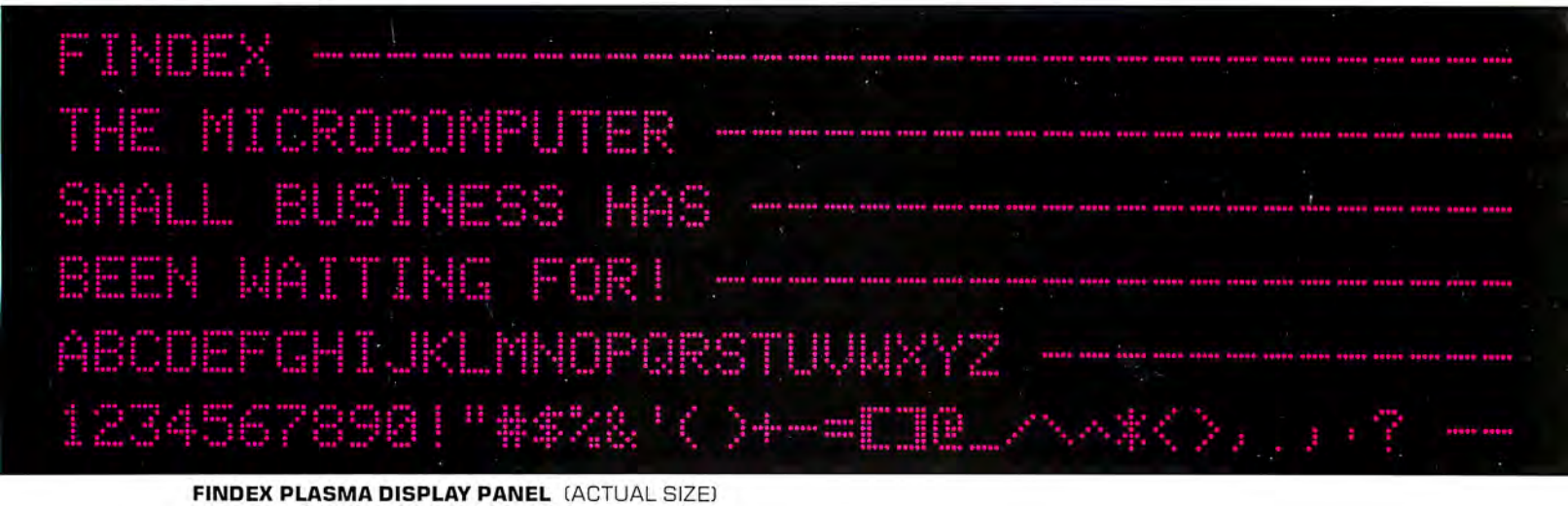
- **CPU:** Zilog Z80 with 2.5 MHz clock, 1.6 micro second minimum add cycle time.
- **Real Time Clock:** Software interrupt settable and readable.
- **Random Access Memory:** 48K bytes of dynamic RAM, 1K bytes of static RAM. Expandable to over 2 megabytes.
- **Read Only Memory:** 8K bytes of ROM. Expandable to 16K bytes.
- **Mass Storage:** 256K bytes of Bubble Memory. Optionally, can interface to disk drives.
- **Parallel I/O:** 46 TTL lines, each can be either input or output. Full interrupt capability, with priority optional.
- **Serial I/O:** Two (optionally four) RS-232C ports, one of which is also a TTY. DB-25S connector provided on back panel. Full interrupt capability with priority optional.
- **Audio:** I/O in the form of two-tone audio, 100 bytes per second, is built in, and is available for data transfer to any standard cassette recorder.
- **Plasma Display:** 6 lines of 40 characters, numeric and upper and lower case alpha; 5 x 7 dot matrix, flat gas plasma display
- **Built-In Printer:** 23 characters (numeric and upper and lower case alpha) per line, 113 lines per minute; uses aluminized paper and electrostatic matrix principle. 5 x 7 dot matrix, resolution 278 dots per line. Optionally, can interface to standard high-speed printers.
- **Built-In Full Keyboard:** 77 keys. Alphanumeric, upper and lower case, 17 programmable function keys, ten-key numeric pad.

### Physical Specifications

Size: 18½ x 18½ x 6 inches
Weight: 20 pounds
Case: high impact, molded polyurethane

### Electrical Specifications

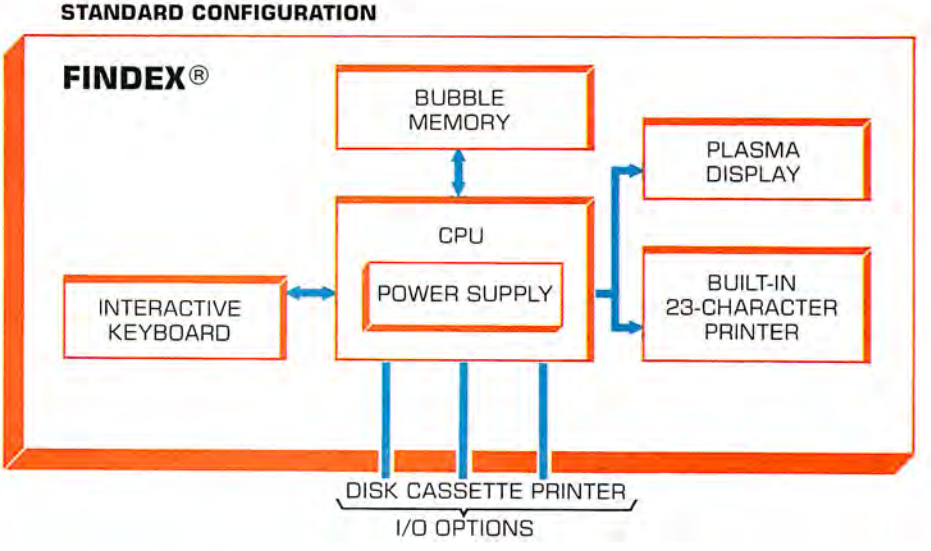
Power: 110/220 V (strap change) ±15%, 47-440 Hz, 110 W




**FINDEX PLASMA DISPLAY PANEL** (ACTUAL SIZE)

## Mechanical Specifications

Functions are modularized into separate printed circuit boards connected by STACKBD®, a proprietary interconnection scheme, eliminating the need for a mother board. Board position and relative order in the chain is arbitrary, and expansion is limited only by the physical size of the unit and the electrical load capacity.

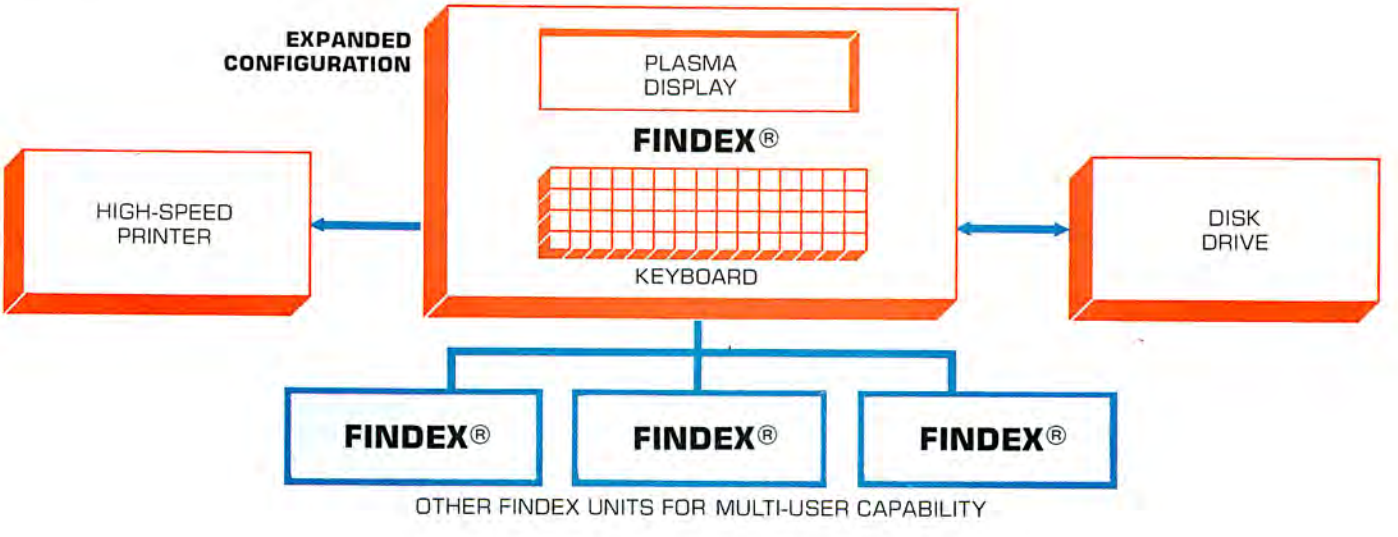



**Expanded Configuration:** Additional Printer and Disk . . .

FINDEX has built-in interface connections to allow peripheral device attachment. In a typical expanded configuration, the FINDEX unit is connected to a printer and disk.

The 132-column printer can accommodate pre-printed, multi-part forms or plain paper, and operates at rates of up to 1,400 lines per minute.

An external disk system can be connected to the FINDEX, to supplement the integral Bubble Memory. Compatible disk units range in capacity from half-million byte "floppies," to 100 megabyte hard-disk systems.



# Operating system.

**FINDEX BASIC offers you:**

- Linked keys (any-string) sequential files—no need for sorting!
- Program files, random and sequential files on Bubble Memory or disk
- Dynamically written variable length records and fields
- One-command cassette read or write
- One-command renumbering of program statements
- Automatic program line number allocation
- Programs merge
- Run (any line number)
- Program tracing
- Extensive printing formatting
- Extensive operators and arithmetic functions
- Extensive string functions
- Extensive BASIC program statements including, but not limited to, dynamically dimensioned arrays, FOR/NEXT loops, GOSUB, ON...GOSUB/TO, IF/ELSE/THEN, DEFINE arithmetic or string functions, ERROR detection codes
- An over 24 K BASIC operating system

**FINDEX is Unique**

Only FINDEX offers:

- Complete portability
- Self-contained mass storage (¼ million byte non-volatile Bubble Memory)
- Gas plasma alphanumeric display
- Built-in 113 line per minute printer
- Built-in, full 77-key keyboard
- Large random access memory (48K bytes dynamic RAM)
- Full-feature business BASIC including complete file-handling capability (no sorting necessary)
- I/O expandability
- Memory expandability
- Audio cassette I/O
- Data communications I/O

**A Challenge from FINDEX**

Before you buy a small computer...mini or micro...look into the outstanding capabilities and economy of FINDEX.

Of all computer systems **only one** offers you small size, full portability, applications versatility, high computing capacity, large built-in storage, ease of programming, and expandability, at the right price.

That one is FINDEX.

Contact your FINDEX Representative.

FINDEX®

P.O. Box 334
Glendale, CA 91209
U.S.A.

Next page...

# FINDEX
# The real microcomputer

# FINDEX–The portable computer with bubble memory

## Not a Toy

FINDEX is a fully portable, inexpensive, feature-packed business computer designed for the professional. FINDEX uses the latest technology: bubble memory, an expanded keyboard, a lightweight, flat, gas plasma display, a built-in 80-132-column, plain paper printer.

This terminal-sized microcomputer can have up to 2 million characters of non-volatile solid state bubble memory mass storage, or up to 400,000 characters on a built-in mini-floppy diskette drive; random access memory from 48 kilobytes to 2 megabytes. It interfaces to a variety of outside peripherals, such as large printers, or multiple hard disk drives (up to 195 megabytes).

It has I/O expandability: serial, parallel and S-100 Bus interface is standard. Audio-cassette recorder jacks and acoustic coupler are optional.

## No sorting

FINDEX is programmed in easy-to-use Business BASIC. It also supports a FORTRAN, a COBOL, or a BASIC compiler, as well as a MACRO assembler; APL and PASCAL can be used too. The BASIC includes a comprehensive file management capability. There is no loss of time for new data to be sorted: as data is typed in, it is immediately entered in its proper place in the desired order: alphabetical, zip code, price, quantity, etc. There is no loss of time for retrieving data either: the computer will access the requested data directly without going through any lengthy search.

## Versatility

The FINDEX has numerous uses in a wide variety of businesses. Typical examples are: scientific work; inventory; accounting; mailing list management; real estate; insurance sales and underwriting; retail establishments; automobile dealerships; doctors' offices; churches; newspaper reporting; and multi-product sales such as hospital supplies, office products, paper, hardware products, and building materials supplies.

FINDEX will place your entire business on computer. It is a portable problem solver, a memory robot that gives you accurate answers fast.

## Fully portable

It weighs 31 pounds (14 kg) and can be taken along in its carrying case on airplanes or in cars. Wherever you go, FINDEX goes with you. Its battery back-up (optional) and built-in printer grant you independence from heavy peripherals.

FINDEX comes with a one-year warranty on parts and labor (90 days on bubble memory) and is maintained by an international service organization.

# A wide range of applications

## Engineers–Researchers

FINDEX can be used for:

- complex mathematical and statistical computations,
- process control,
- laboratory equipment.

## Accountants–Service bureaus

FINDEX meets all your customers' needs:

- general ledger,
- balance sheets,
- accounts payable,
- accounts receivable,
- payroll,
- inventory.

## Small and medium-sized businesses

FINDEX will help:

- your Purchasing Department to keep a running inventory,
- your Accounting Department for all accounts payable, accounts receivable, general ledger and payroll,
- your Marketing Department with an updated mailing list of present or potential customers.

## Wholesalers–Manufacturers

FINDEX can support you with:

- constant inventory control,
- verification and accurate order pricing on the spot, whether by item or by retail outlet,
- customized quotations.

## Auto dealers

FINDEX goes to work for you:

- filling out all installment credit insurance forms,
- providing complete inventory of parts, and complete accounting,
- giving you an up-to-date mailing list of your customers.

## Sales representatives

FINDEX will support you on the move with:

- a constantly updated price list,
- a computerized product catalogue,
- built-in pricing combination order information,
- multiple discount schedules,
- order entry,
- customer lists by preferences.

## Realtors

FINDEX will hold for you:

- on-line portable listing information for over a thousand homes,
- cross-referenced listings, without sorting, under any heading you choose: location, number of rooms, price, specific features, etc.

## Reporters

FINDEX is exactly what you need:

- the optional built-in battery allows you one hour work capability with complete independence on the field,
- you have a full size print-out of your copy immediately,
- the optional acoustic coupler enables you to transmit your copy over the phone.

## Insurance agents

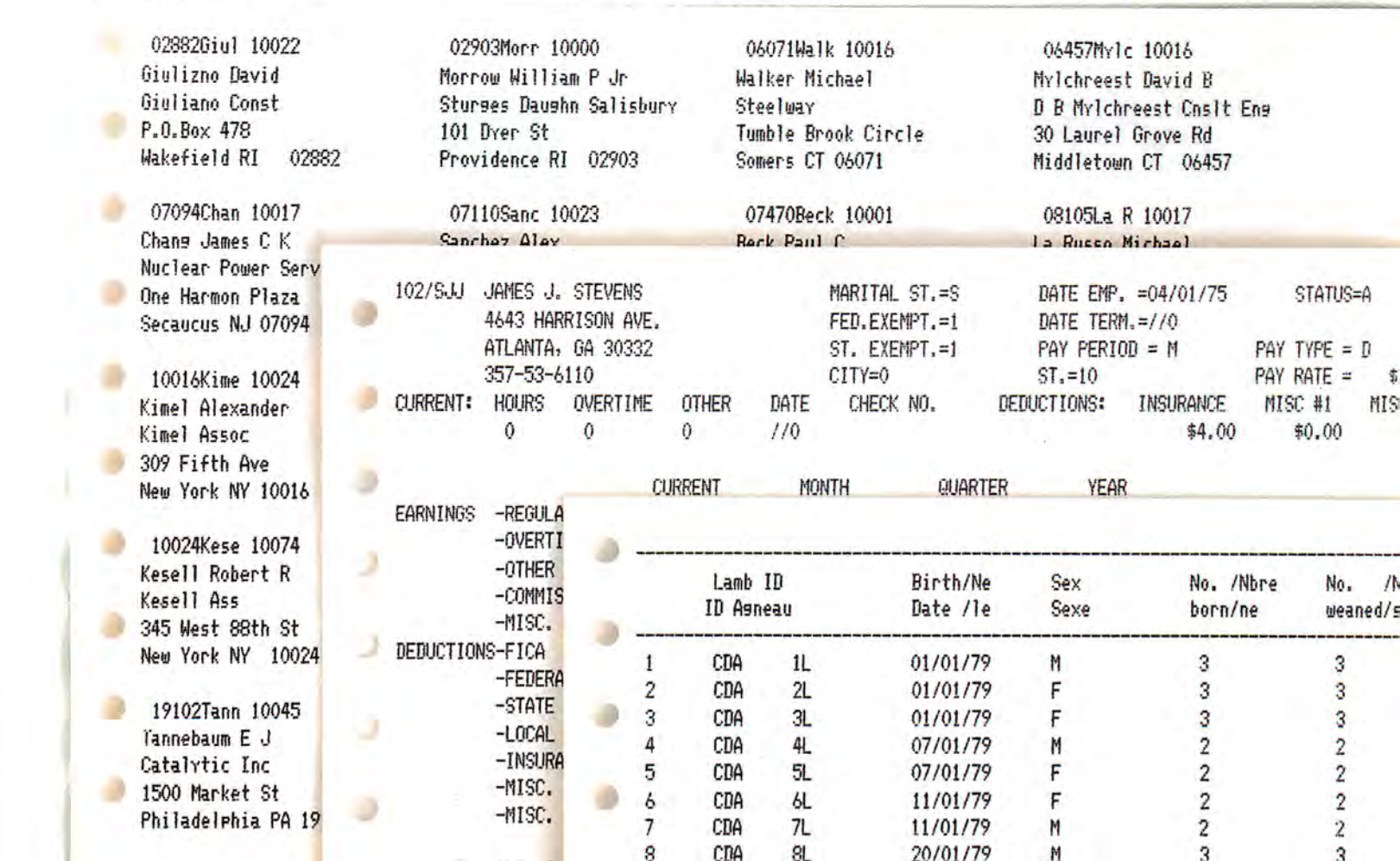
FINDEX will provide you with:

- all necessary rating tables,
- accurate premium information,
- alternative plans for comparison,
- schedules of cash value growth, paid-up point, etc.
- completion of insurance forms.

## Physicians–Dentists

FINDEX is ideal for:

- automatic insurance form preparation,
- automatic patient's billing statements,
- complete medical accounting procedures and records (such as daily activities, patient's recall notices, patient's accounts receivable, delinquent accounts)
- optional programs include general ledger, accounts payable, payroll, inventory management.



# FINDEX features

**Display**
Flat gas plasma display panel consisting of 6 rows of 40 or 80 characters each, numeric and upper and lower case alpha; 5 x 7 dot matrix. Micro-programmed cursor and scroll protocols. Character set under software control. Can be interfaced to full-screen CRTs, although most applications do not need a full screen as computer operators answer only one question at a time.

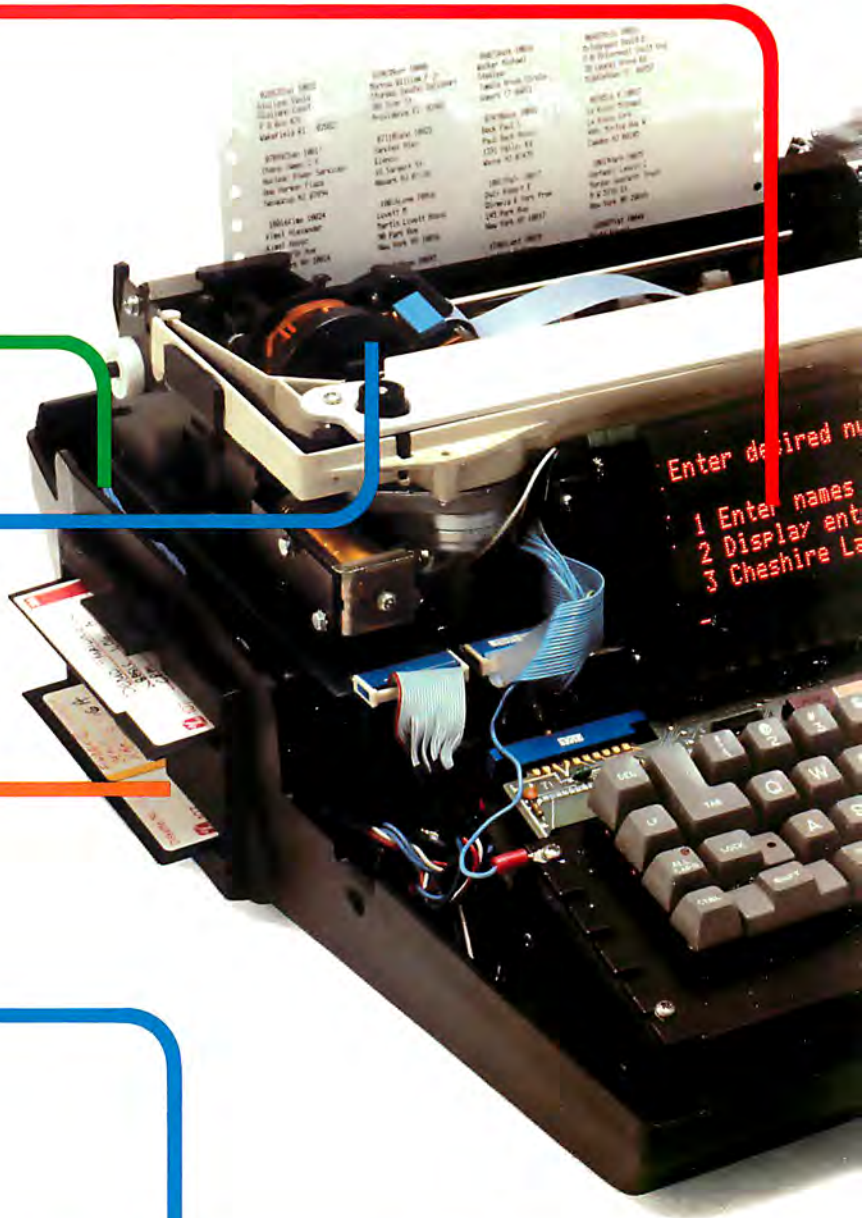
**Audio** (optional)
I/O in the form of two-tone audio, 100 bytes per second (1100 baud), is built in and available for data transfer to any standard cassette recorder.

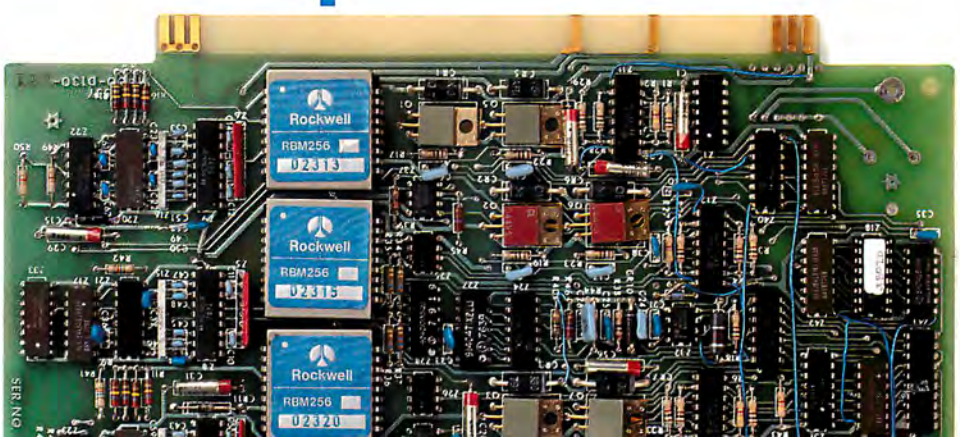
**Printer**
40,80, 96, 132-columns per line, 40 characters/sec. (Numeric, upper and lower case alpha characters, and expanded print) Tractor &/or friction feed. Uses multi-copy plain paper, and 5 x 7 dot matrix impact principle. Character set, forms under software control. Form width: 9 inches.

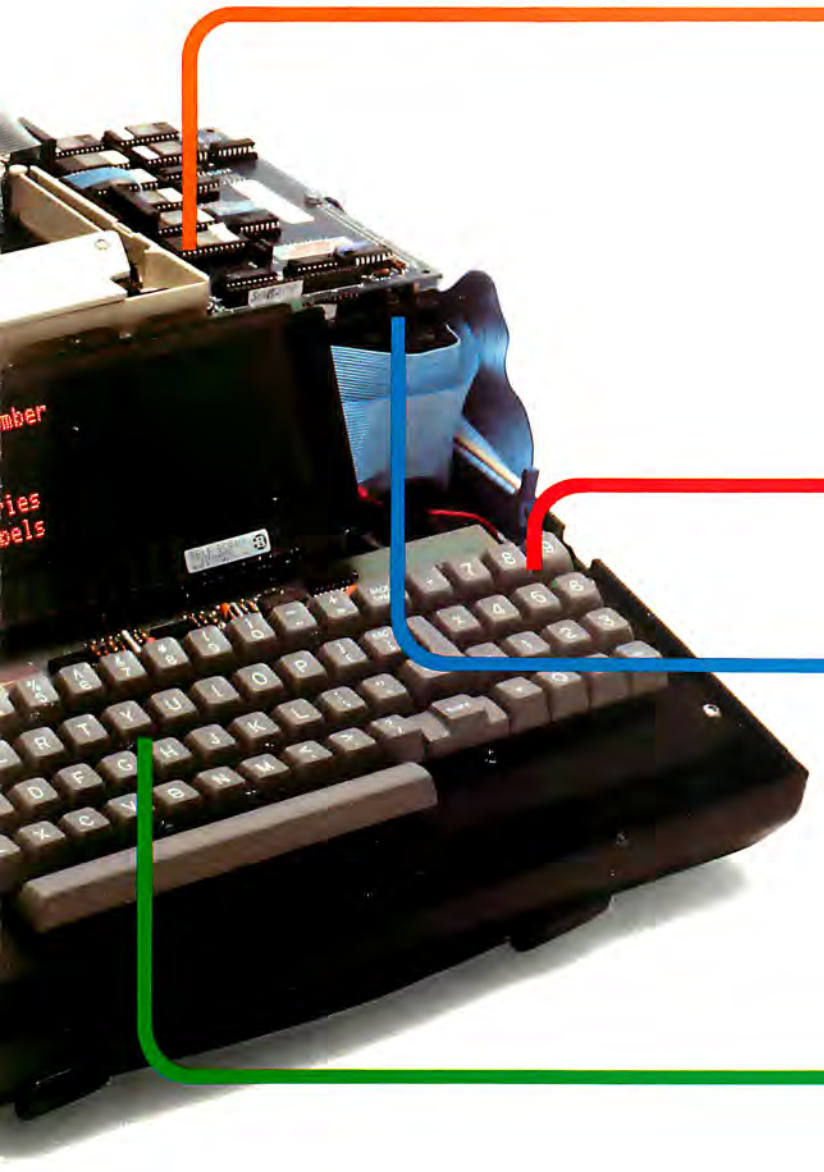
**Mass storage:**
**Built-in mini-floppy diskette drive**
System 100C includes one built-in mini-floppy diskette drive holding 200k bytes, expandable to 400k bytes. Access time: 40-75 milliseconds. Option available for built-in dual mini-floppy disk drive.

**Bubble memory**
System 128C uses 128k of bubble memory, expandable to 2 megabytes on the same controller. (½ million only inside the case) Access time: 8 milliseconds. Memory is retained even during power interruptions. No rotating parts.

**Hard Disk**
Optionally 10, 20, 39, 90 and 195 Megabyte drives available. Data transfer up to 2 Megabytes/sec.





### Serial I/O
Four RS-232C ports, one of which is also a TTY. 4 DB-25s connectors provided on back panel. Full interrupt capability with priority optional.

### Parallel I/O
64 TTL lines, each can be either input or output. Full interrupt capability, with priority optional.

### S-100 Bus Adaptor
Allows interfacing to any S-100 bus devices.

### Acoustic Coupler
Optionally built-in, 300 or higher baud rate.

### Battery (optional)
A continuously charged battery pack maintains the information in the RAM memory in the event of a temporary power failure and gives one hour plug-off work capability.

### CPU
Zilog Z-80 with 2.5 MHz clock (4 MHz optional), 1.6 microsecond minimum add cycle time.

### Real Time Clock
Software interrupt settable and readable.

### Random Access Memory
48k bytes of dynamic RAM, expandable to over 2 megabytes. 1k bytes of static RAM.

### Read Only Memory
8k bytes of ROM. Expandable to 32k bytes.

### Keyboard
72 sculptured keys, alphanumeric, upper and lower case, up to 35 programmable function keys, ten-key numeric pad, electronic shift lock, all-caps lock, LED indicator, N-key rollover, autorepeat.

### Physical specifications
Size: 17½ x 21½ x 8¼ inches
(44.4 x 54.6 x 21 cm)
Weight: 31 pounds (14 kg)
Case: high impact, molded Kydex
Temperature resistant: 32°–122° F
(0°–50° C)
Humidity resistant: 20–85% relative

### Baud Rate
Up to 19,200 entirely under software control.

### Peripherals
Standard floppy and large hard disc drives, printers, other computers. Asynchronous, synchronous or bisynchronous communications.

### Electrical specifications
Power: 110/220V (optional),
±15%, 47-440 Hz, 200 W max.

### Mechanical specifications
Functions are modularized into separate printed circuit boards connected by STACKBD®, a proprietary interconnection scheme which eliminates the need for a mother board. Board position and relative order in the chain is arbitrary, and expansion is limited only by the physical size of the unit and the electrical load capacity.

# Operating system and programming languages

The FINDEX computer is extremely versatile, allowing the user to program it in assembly language as well as in several high level languages such as BASIC FORTRAN, COBOL or PASCAL. The FINDEX can also be a powerful software developing system by making use of its MACRO assembler.

## CP/M

FINDEX uses CP/M as an operating system. The combination of CP/M and Z-80 microprocessor produces a system that approaches the versatility of large computers. All of the features necessary in a disk operating system are combined in CP/M. It also includes a monitor, text editor, assembler and debugger. It can address 128 megabytes of hard disk storage with up to 8 megabytes per file.

## BASIC

The FINDEX BASIC is the most extensive Z-80 BASIC available. It contains features rarely found in other BASICs:

- Direct access to CPU I/O ports (INP, OUT);
- Ability to read or write any memory location (PEEK, POKE);
- Matrices with up to 255 dimensions;
- Dynamic allocation and deallocation of matrices at execution time (DIM A [I, J], ERASE A);
- IF . . . THEN . . . ELSE and nested IF . . . THEN . . . ELSE;
- Direct (immediate) execution of statements;
- Error trapping;
- Full PRINT USING for formatted output (includes asterisk fill, floating $ sign, scientific notation, trailing sign, comma insertion);
- Extensive program editing facilities via EDIT line command, RENUM, AUTO, etc.;
- Trace facilities (TRON, TROFF);
- Ability to call up to 10 assembly language subroutines;
- Boolean operators OR, AND, NOT, XOR, EQV, IMP;
- Extensive string functions as well as a complete mathematical package, 16 digits precision;
- Sequential files with variable length records;
- Random files (record I/O);
- Linked keys (any-string indexed sequential files—no need for sorting);
- Dynamically written variable length records and fields;
- Complete set of file manipulation statements: OPEN, CLOSE, GET, PUT, KILL, NAME, KEY$, ACCESS, etc.;
- Programs chaining;
- Programs merge;
- Multiple statements on one line.

## Basic Compiler

Error-free interpretive basic programs can be compiled now for fast execution (approx. 6 times faster) and for maximum memory utilization (the program requires only the run-time package).

## COBOL

The COBOL-80 is comparable to COBOL systems found on minicomputers and large mainframes. Consequently it greatly enhances the usefulness of the FINDEX because it gives users access to the incredibly large number of programs already written in COBOL. Because COBOL-80 is a standard, COBOL programs written on other computers may be run easily on the FINDEX.

COBOL is based on the 1974 ANSI (X3.23-1974) standard and contains all Level 1 features and the most useful Level 2 options for the "Nucleus" and for Sequential, Relative and Indexed file handling facilities. Additionally, Level 1 Table Handling, Library and Inter-


Easy to use, portable yet powerful, with broad expansion capabilities. →

program Communication facilities are provided. Of the advanced Level 2 features, COBOL-80 includes the verbs STRING, UNSTRING, COMPUTE, SEARCH, and PERFORM (varying/until), along with convenient condition specification by way of condition-names, compound conditions and abbreviated conditions. Furthermore a data format called COMP-3 allows numeric data to be packed two digits to the byte so that mass storage requirements are reduced. Lastly a batch-style Debug technique is implemented to get programs running in a minimum of on-line time.

The COBOL system consists of two complete packages: a compiler for translating source code into relocatable object code (which, incidentally, is compatible with the object code of the FORTRAN-80 compiler and a MACRO-80 assembler), and a runtime system for running the program by interpreting the object code at execution time.

## FORTRAN

All of the ANSI Standard FORTRAN X3.9-1966 is included in FORTRAN except the COMPLEX data type. Therefore users may take advantage of the many applications programs already written in FORTRAN.

FORTRAN-80 is unique in that it provides a microprocessor FORTRAN and assembly language development package that generates relocatable object modules. This means that only the subroutines and system routines required to run FORTRAN-80 programs are loaded before execution. Subroutines can be placed in a system library so that users develop a common set of subroutines that are used in their programs. Should one module only of a program be changed, it is necessary to re-compile that module only.

The FORTRAN-80 compiler has a number of enhancements of the ANSI standard:

- LOGICAL variables which can be used as integer quantities in the range +127 to −128;
- LOGICAL DO loops for tighter, faster execution of small valued integer loops;
- Mixed mode arithmetic;
- Hexadecimal constants;
- Literals and Holleriths allowed in expressions;
- Logical operations on integer data. .AND., .OR., .NOT., .XOR. can be used for 16-bit or 8-bit Boolean operations;
- READ/WRITE End of File or Error Condition transfer. END=n and ERR=n (where n is the statement number) can be included in READ or WRITE statements to transfer control to the specified statement on detection of an error or end of file condition;
- ENCODE/DECODE for FORMAT operations to memory.

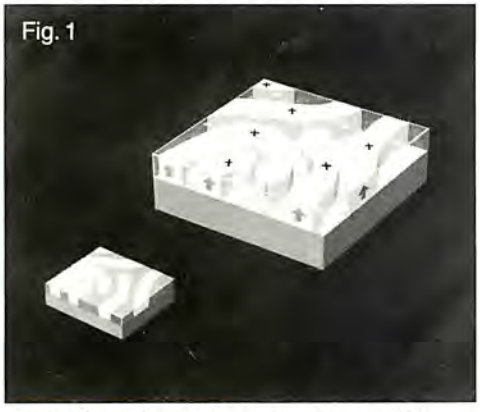
A relocating MACRO assembler (MACRO-80) and relocating linking loader (LINK-80) are included in the FORTRAN-80 package.

The relocating assembler is compatible with INTEL's assembler and uses approximately 12k bytes of memory. In particular, MACLIB (macro library) allows the user to define a particular set of macros to generate machine code for any specific 8-bit or 16-bit machine which does not match the Intel 8080 or the Z-80 instruction set. Detailed descriptions of all capabilities associated with CP/M and the other languages are available in the different manuals.

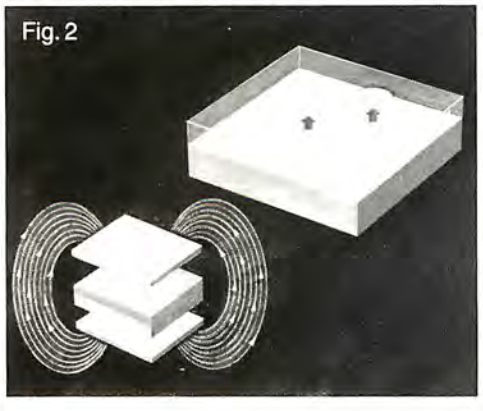

1 Reset button
2 ON/OFF switch
3 Fuses
4 DB-25S connectors
5 Power cord
6 Aux. disk drive
7 Acoustic coupler
8 Spec. I/O

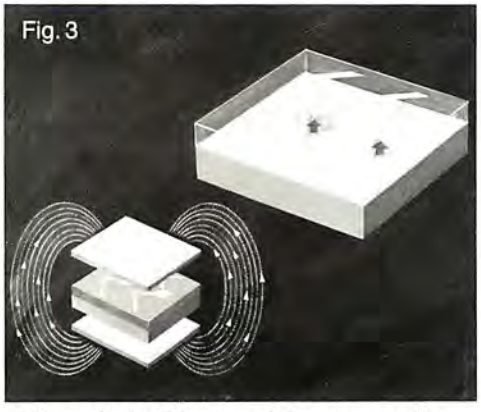
# Inside the bubble memory

Bubble memory technology is really coming into its own, and more and more bubble memory devices will be available in the near future. For those who are unfamiliar with this technology, here's a quick look at how the bubble memory works.




Thin films of certain magnetic materials (i.e., a layer of magnetic garnet artificially grown on a nonmagnetic garnet substrate) contain randomly shaped domains (Fig. 1). When a magnetic bias field is applied by two permanent magnets placed on either side of the device, in a direction perpendicular to the thin film, these randomly shaped domains shrink into "bubbles" (actually cylindrical magnetic domains of fixed volume), the polarization of which is opposite to that of the thin film (Fig. 2). If the polarization of the film is south, then the bubbles would be like floating islands of "North" in a sea of "South." These bubbles can be seen under great magnification in polarized light as contrasts within the film.



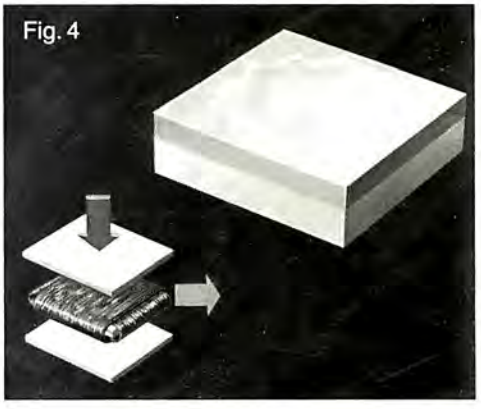

Magnetic bubbles are stable over a wide range of conditions, and they can be moved from point to point at very high speeds. (When the bubbles "move," it is not matter that moves, but rather the very rapid transfer of magnetic properties of the crystalline elements of the garnet.)

To guide and control the movement of the bubbles, a permalloy pattern of chevrons is applied to the surface of the film to form "paths" (Fig. 3). When, in addition to the bias magnetic field, a rotating magnetic drive field in the plane of the film is applied by two coils that are part of the magnetic bubble device (Fig. 4), the bubbles can move at extremely high speed along these paths.

The permalloy paths are formed as loops. The presence of a bubble in a certain position on the loop corresponds to a "ONE bit;" the absence, to a "ZERO bit." A "block" consists of bubbles in the same relative position in each loop.

The output circuitry on the bubble memory device includes a detector that exactly transforms the bubble to be read into an electronic pulse. This "read" operation preserves the bubbles as they are on the device, making nondestructive readout a prominent feature of bubble memories. A different kind of output can be used to transfer, or erase, the bubbles.

Data is entered by generators at the other end of the chip. Bit information is transferred at gates, thus forming bubbles at known positions in the loop.




FINDEX

20775 South
Western Ave.
Torrance, 90501
California, USA
Phone 213-380-6950
TWX 910-321-3000

Represented in:
the United Kingdom,
the Netherlands (for Benelux),
South Africa, Australia.

Next page...

Is there a
low-cost
microcomputer
that is
not a toy?
FINDEX!

# FINDEX–The portable computer with bubble memory

FINDEX is a fully portable, inexpensive, feature-packed business computer designed for the professional. FINDEX uses the latest technology: bubble memory, an expanded keyboard, a lightweight, flat, gas plasma display, and extended Business BASIC software . . . to bring you the first real breakthrough in computer size, cost, and capability.

**FINDEX is a high-powered, terminal-sized, complete microcomputer!**

It can have up to 2 million characters of mass storage without rotating parts, or up to 400,000 characters on a built-in mini-floppy diskette drive. It also has a video-like display with excellent message readability, doing away with the bulky CRT, plus an integral printout with a built-in mini-printer, all in one highly portable, rugged package. It interfaces to a variety of outside peripherals, such as large printers, large disc drives, etc.

FINDEX is programmed in easy-to-use Business BASIC. It supports also a FORTRAN or COBOL compiler. The operating system includes a comprehensive file management capability, which requires no sorting, and supports a large library of business applications programs.

**FINDEX is highly versatile**

It has numerous uses in a wide variety of businesses. Typical examples are scientific work; inventory; accounting; mailing list management; real estate; insurance sales and underwriting; retail establishments; automobile dealerships; doctors' offices; churches; newspaper reporting; and multi-product sales such as hospital supplies; office products, paper, hardware products, and building materials supplies. FINDEX is especially valuable to dealers and distributors of all types; it simplifies complicated tasks, and provides portable access to large data banks.

**FINDEX is portable**

It weighs less than 20 lbs (or 10 kg). Wherever the businessman must go, FINDEX goes with him, as a complete business information system.

**FINDEX has the portability of a compact terminal, with the capability of a central computer!**

FINDEX will place your entire business on computer. And this, for under $10,000, includes a 132 column, 60 line/minute printer and one million character stand alone dual disc drive. It is a portable problem solver, a memory robot that gives you accurate answers fast.

FINDEX handles your business data flow: inventory (updates and deletes without any presorting), sales analysis, business reports, computations of all kinds.

FINDEX also does your receivables, payables, general ledger, payroll–all quickly and efficiently.

FINDEX is designed for a wide range of applications. Many of these are uniquely suited to the FINDEX features and capabilities:

**Portable executive organizer**
FINDEX keeps track of appointments and deadlines; catalogs miscellaneous notes for later organized recall; acts as a tickler for follow-up items; stores address and phone number lists; edits and types memos, directives and correspondence.

**Portable data base reference**
FINDEX can hold a complete data base such as a salesman's price list; insurance rate tables; on-site construction estimating tables; or pilot's flight plans, weather information, navigational aids, and calculations. Scientists can handle complex mathematical and statistical computations. Engineers are able to use it for process control, laboratory equipment, even in adverse environment, where a rugged reliable memory is needed.

**Portable order entry**
FINDEX supports salesmen on the move like multi-product jobbers, route salesmen, rack jobbers, and wholesale distributors. It can provide a computerized product catalog, along with built-in pricing, combination order information, and discount schedules, and supply both the salesman and the customer with inventory control, and with verification and accurate order pricing-on the spot!

**Portable construction estimating**
FINDEX goes to work for the contractor and engineer by performing take-offs from plans and specifications; calculating labor prices, discounts, and alternate bids; advising on the availability of supplies; handling technical data (dimensional units and conversions); and even incorporating last minute specification changes.

**Portable real estate search**
FINDEX can hold listing information for more than one thousand homes. The salesman simply enters the features of the desired home, and FINDEX will quickly display all likely properties–right in the client's home or office.

**Portable insurance program planning**
FINDEX accepts the parameters for an insurance program during the salesman's appointment with his client. The information from the system allows him to prepare a plan, showing schedules of cash value growth, paid-up point, and all other pertinent benefits. Accurate premium information is also provided–allowing the client to compare alternative plans immediately.

**Portable accounting records**
FINDEX can be used as a complete on-site accounting system. Accountants can feed it with data, protocol it on its small built-in printer, produce complete records on large printers in their head office, or transmit data over a phone modem to a large main frame computer.

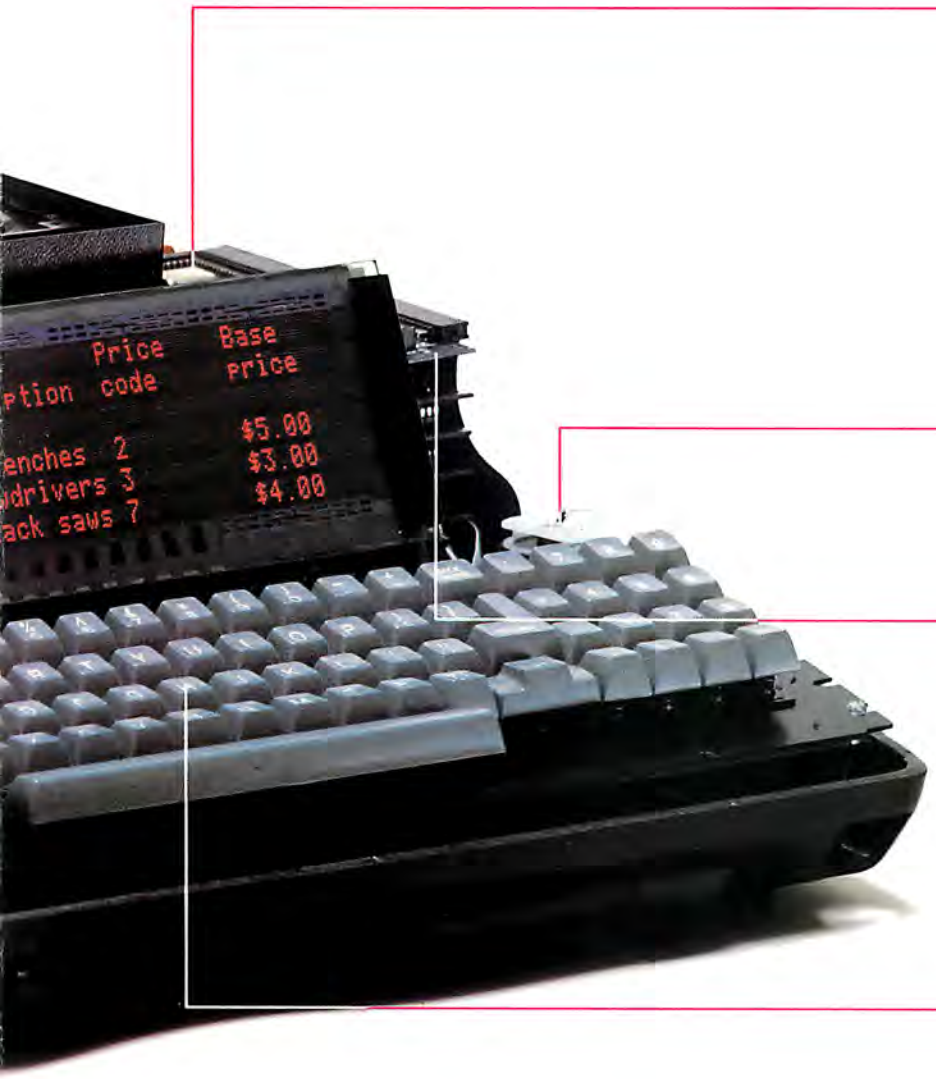
# FINDEX features

**Display:** Flat gas plasma display panel consisting of 6 rows of 40 characters each, numeric and upper and lower case alpha; 5 x 7 dot matrix. Micro-programmed cursor and scroll protocols. Character set under software control. Can be interfaced to full-screen CRTs, although most applications do not need a full screen as computer operators answer only a few questions at a time.

**Audio:** I/O in the form of two-tone audio, 100 bytes per second (1100 baud), is built in and available for data transfer to any standard cassette recorder.

**Mass storage:**
**Built-in mini-floppy diskette drive:** System 100 includes a built-in mini-floppy diskette drive holding 200k bytes, expandable to 400k bytes. Access time: 10–40 milliseconds.
**Bubble memory:** System 128 uses 128k of bubble memory, expandable to 2 megabytes on the same controller. (½ million only inside the case) Access time: 8 milliseconds. Memory is retained even during power interruptions. No rotating parts.


**Printer:** 21 characters (numeric and upper and lower case alpha) per line, 113 lines per minute; uses aluminized electrosensitive paper and matrix principle. 5 x 7 dot matrix, resolution 278 dots per line. Optionally a 40-column, plain paper, 7 x 7 dot matrix, 120 lines per minute, built-in printer is available. Character set under software control. Can interface to stand-alone high-speed printers.




**Serial I/O:** Two (optionally four) RS-232C ports, one of which is also a TTY. 4 DB-25s connectors provided on back panel. Full interrupt capability with priority optional.

**Parallel I/O:** 64 TTL lines, each can be either input or output. Full interrupt capability, with priority optional.

**S-100 Adaptor:** allows interfacing to any S-100 devices.

**Acoustic Coupler:** optionally built-in, 1200 baud rate.

**Battery:** A continuously charged battery pack preserves the information in the RAM memory in the event of a temporary power failure and gives one hour plug-off work capability.

**CPU:** Zilog Z-80 with 2.5 MHz clock (4 MHz optional), 1.6 microsecond minimum add cycle time.

**Real Time Clock:** Software interrupt settable and readable.

**Random Access Memory:** 48k bytes of dynamic RAM, expandable to over 2 megabytes. 1k bytes of static RAM.

**Read Only Memory:** 8k bytes of ROM. Expandable to 32k bytes.

**Keyboard:** 72 sculptured keys, alphanumeric, upper and lower case, up to 35 programmable function keys, ten-key numeric pad, electronic shift lock, LED indicator, N-key rollover, autorepeat.

**Peripherals:** standard floppy and large hard disc drives, printers, other computers. Asynchronous, synchronous or bisynchronous communications.

**Portable, Rugged, Reliable:** FINDEX weighs only 20 pounds (10 kg) and is self-contained in a portable unit, smaller than a typewriter. Its reliability is enhanced by using only three moving components: built-in keyboard, printer, and fan. (Optionally a mini-floppy diskette drive.)

**Physical specifications:**
Size: 18½ x 18½ x 6 inches
(46 x 46 x 17.5 cm)
Weight: 20 pounds (10 kg)
Case: high impact, molded Kydex
Temperature resistant: 32°–125° F
(0°–69° C)
Humidity resistant: 20–85% relative

**Baud Rate:** Up to 19,200 entirely under software control.

**Electrical specifications:** Power: 110/220V (strap change), ±15%, 47-440 Hz, 110 W max.

**Mechanical specifications:** Functions are modularized into separate printed circuit boards connected by STACKBD®, a proprietary interconnection scheme which eliminates the need for a mother board. Board position and relative order in the chain is arbitrary, and expansion is limited only by the physical size of the unit and the electrical load capacity.

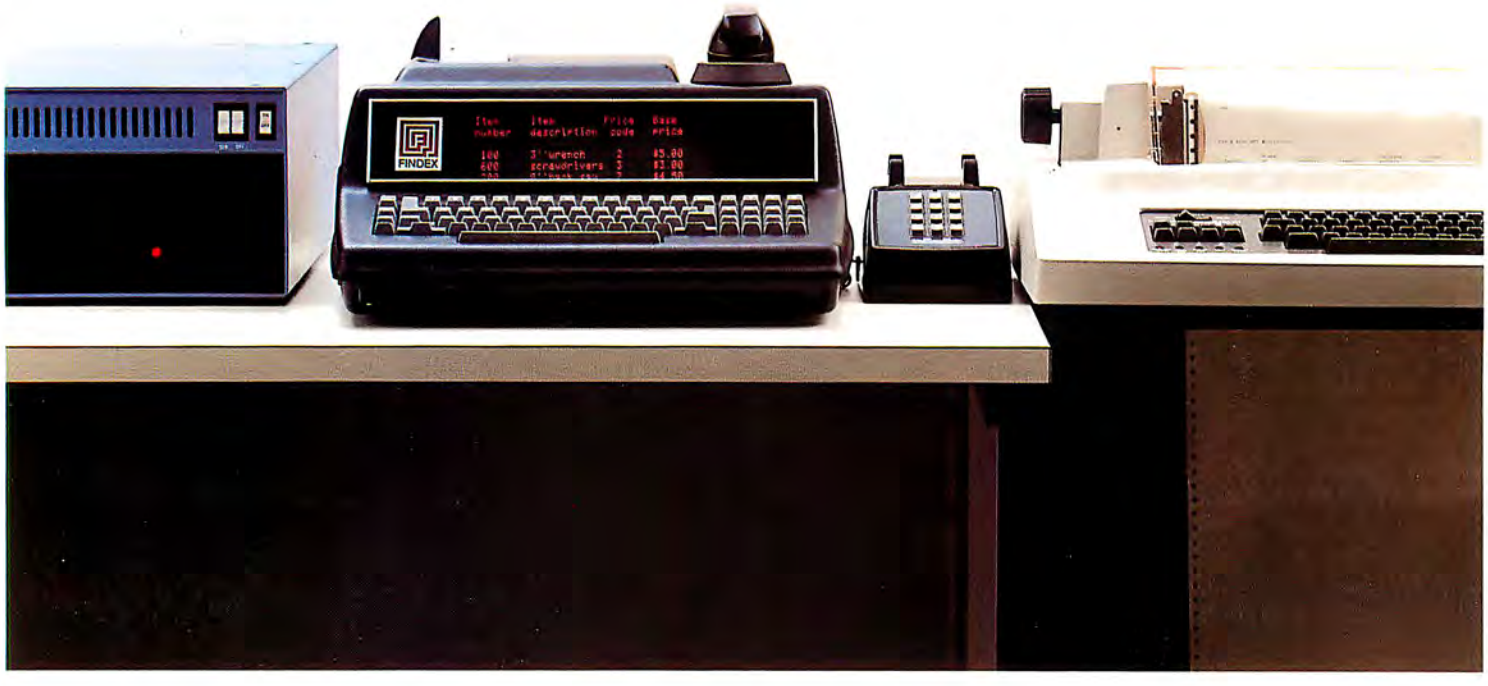
# Operating system

**FINDEX BASIC offers you:**

- Linked keys (any-string) sequential files–no need for sorting!
- Program files, random and sequential files on bubble memory or disc
- Dynamically written variable length records and fields
- One-command cassette read or write
- One-command renumbering of program statements
- Automatic program line number allocation
- Programs chaining
- Programs merge
- Multiple statements on one line
- Run (any line number)
- Program tracing
- Extensive printing formatting
- Extensive operators and arithmetic functions
- Double precision (16 digits) variables
- Extensive string functions
- Extensive BASIC program statements including, but not limited to, dynamically dimensioned arrays, FOR/NEXT loops, GOSUB, ON...GOSUB/TO, IF/ELSE/THEN, DEFINE arithmetic or string functions, ERROR detection codes
- An over 30k bytes BASIC operating system

FINDEX is programmed in the universally accepted BASIC language–which FINDEX INC. has tailored for business and professional use. Character string manipulation, output formatting, and a full-features file management system (including any-string-key-sequential files) are among the many enhancements. FINDEX can also handle a FORTRAN or COBOL compiler.

Application programs, on disc or cassette, such as: Utilities, Accounting, Inventory, Business Applications (Mailing List Management), Financial Investment, Mathematical, Statistical, Engineering, Games, are avail-



## FINDEX is unique

able directly from FINDEX INC.

A vast library of other compatible BASIC, FORTRAN, or COBOL programs are offered by alternate sources. Learning to program the FINDEX computer is simplified by using the clear and comprehensive support documentation supplied with it. You can write your own programs.

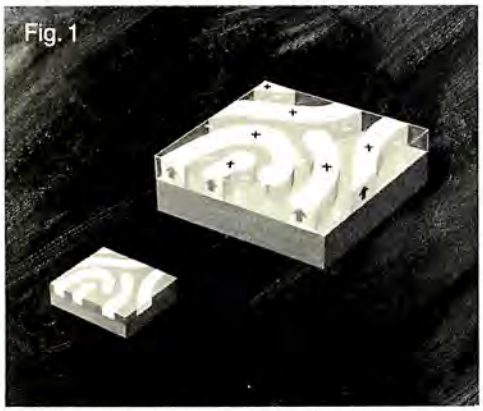
- Self-contained mass storage (2 megabyte non-volatile bubble memory or a 400k bytes disc drive)
- Flat gas plasma alphanumeric display
- Built-in 113 line per minute printer
- Built-in full 72-key sculptured keyboard
- Large random access memory (48k bytes dynamic RAM, expandable to 2 megabytes)
- BASIC interpreter, FORTRAN or COBOL compiler
- Full-feature business BASIC including complete file-handling capability (no sorting necessary)
- I/O expandability (serial, parallel, S-100)
- Battery back-up
- Peripherals expandability
- Audio cassette I/O
- Data communications I/O
- One-year warranty on parts and labor (90 days for bubble memory)
- Maintenance by an international computer repair service
- Full portability


← Easy to use, portable yet powerful, with broad expansion capabilities.

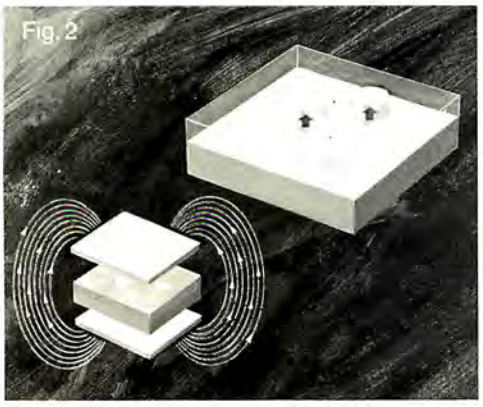
1 Reset button
2 ON/OFF switch
3 Fuses
4 DB-25S connectors
5 Power cord
6 Cassette interface jacks
7 Inside parallel and S-100 I/O

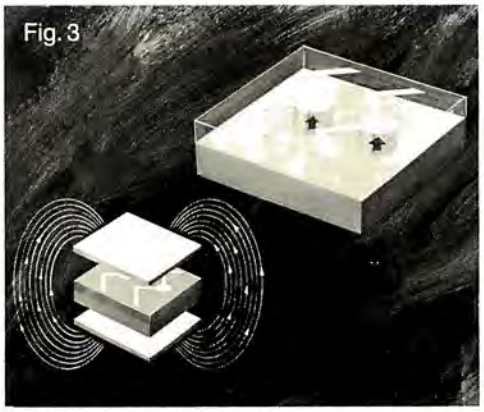
# Inside the bubble memory

Bubble memory technology is really coming into its own, and more and more bubble memory devices will be available in the near future. For those who are unfamiliar with this technology, here's a quick look at how the bubble memory works.




Thin films of certain magnetic materials (i.e., a layer of magnetic garnet artificially grown on a nonmagnetic garnet substrate) contain randomly shaped domains (Fig. 1). When a magnetic bias field is applied by two permanent magnets placed on either side of the device, in a direction perpendicular to the thin film, these randomly shaped domains shrink into "bubbles" (actually cylindrical magnetic domains of fixed volume), the polarization of which is opposite to that of the thin film (Fig. 2). If the polarization of the film is south, then the bubbles would be like floating islands of "North" in a sea of "South." These bubbles can be seen under great magnification in polarized light as contrasts within the film.



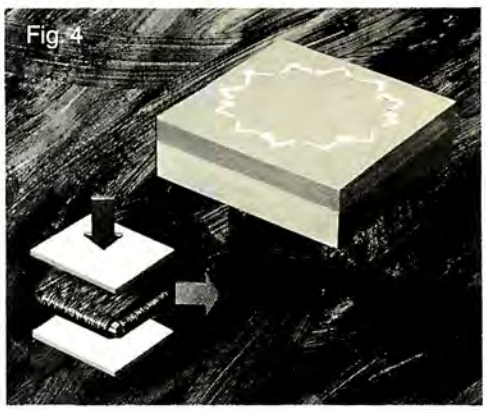

Magnetic bubbles are stable over a wide range of conditions, and they can be moved from point to point at very high speeds. (When the bubbles "move," it is not matter that moves, but rather the very rapid transfer of magnetic properties of the crystalline elements of the garnet.)

To guide and control the movement of the bubbles, a permalloy pattern of chevrons is applied to the surface of the film to form "paths" (Fig. 3). When, in addition to the bias magnetic field, a rotating magnetic drive field in the plane of the film is applied by two coils that are part of the magnetic bubble device (Fig. 4), the bubbles can move at extremely high speed along these paths.

The permalloy paths are formed as loops. The presence of a bubble in a certain position on the loop corresponds to a "ONE bit;" the absence, to a "ZERO bit." A "block" consists of bubbles in the same relative position in each loop.

The output circuitry on the bubble memory device includes a detector that exactly transforms the bubble to be read into an electronic pulse. This "read" operation preserves the bubbles as they are on the device, making nondestructive readout a prominent feature of bubble memories. A different kind of output can be used to transfer, or erase, the bubbles.

Data is entered by generators at the other end of the chip. Bit information is transferred at gates, thus forming bubbles at known positions in the loop.




FINDEX

1625 W. Olympic Blvd.
Suite 707
Los Angeles 90015
California, U.S.A.
(213) 7-FINDEX

Next page...

# FINDEX

1625 W. Olympic Blvd.
Suite 707
Los Angeles 90015
California, U.S.A.
Phone (213) 380-6950
(213) 7-FINDEX


## RETAIL PRICE LIST

March, 1979

| | Retail Price | Lease rates (approximate) 2 years (over $500) | Lease rates (approximate) 5 years (over $3000) |
|---|---|---|---|
| **FINDEX System 100:** Z-80 CPU with 2.5 megaHz clock, 21-column built-in printer. 72-key sculptured keyboard, flat gas plasma display, two RS-232C ports, cassette recorder ports, 8k ROM, 48k RAM, 19200 baud rate max., FINDEX extensive BASIC software operating system, 200k bytes built-in mini-floppy diskette drive | $4,980 | $259 | $120 |
| **FINDEX System 128:** Same as System 100 but with 128k bytes built-in bubble memory instead of built-in mini-floppy drive (bubble memory may be expanded to 2 megabytes on the same controller, only 0.5 megabytes inside the case). BASIC operating system bubble memory resident | $8,230 | $416 | $207 |
| **Complementary Features and Peripherals** | | | |
| One-hour built-in rechargeable battery pack | $300 | | |
| 400k bytes double-sided, double density, for the mini-floppy disc drive (add to #100) | $850 | $ 45 | |
| 128k bytes bubble memory modules (add to #128) | $ 3,000 | $158 | $ 78 |
| bubble memory controller | $1,300 | $ 68 | |
| Dual double density floppy disc drive (1 megabyte) | $2,800 | $147 | $ 76 |
| Double side and double density (2 megabytes) (add to above) | $1,600 | $ 84 | |
| 10 megabyte hard disc drive, fixed and removable | $10,000 | $505 | $252 |
| 40-column, plain paper, built-in printer (add to #100 or #128) | $660 | $ 35 | |
| 5.25″ stand-alone mini-floppy disc drive | $600 | $ 33 | |

(over)

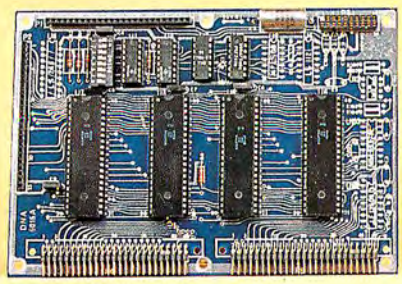
| Complementary Features and Peripherals | Retail Price | Lease rates 2 years | 5 years |
|---|---|---|---|
| 16k bytes RAM modules (RAM may be expanded to 2 megabytes) | $360 | | |
| 32k ROM (BASIC ROM resident) | $800 | $42 | |
| Outside acoustic coupler 300 baud rate (add to any system) | $500 | $27 | |
| Built-in acoustic coupler 1200 baud rate (add to any system) | $1,100 | $58 | |
| Additional 2 RS-232C ports | $300 | | |
| Additional parallel ports (64 I/O lines) | $500 | $27 | |
| Additional S-100 bus adaptor | $200 | | |
| Full screen, 1920-character, 80 x 24 line, 75-key CRT | $1,700 | $89 | |
| Interface cables, 10′ | $50 | | |
| Aluminized paper rolls | $1.50 | | |
| Plain paper rolls | $1.50 | | |
| FINDEX cassette recorder | $90 | | |
| Cassette recorder cables | $30 | | |
| 5.25″ floppy diskettes | $8 | | |
| 8″ floppy diskettes | $8 | | |
| Hard disc (5 megabytes) | $130 | | |
| 132-column plain paper matrix printer, 120 CPS | $2,200 | $115 | |
| 132-column plain paper matrix printer, 180 CPS | $3,200 | $166 | $83 |
| 4 megaHz clock (add to any system) | $600 | $31 | |
| Program modules available on cassettes or discs | $10 to $2,500 per module | | |
| COBOL compiler instead of BASIC interpreter | $900 | $48 | |
| FORTRAN compiler instead of BASIC interpreter | $600 | $31 | |
| Programming manuals | $15 | | |
| Operating manual | $10 | | |
| Findex carrying case | $150 | | |

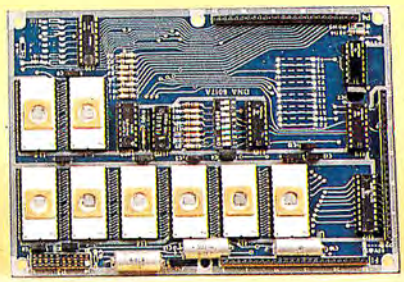
Prices F.O.B Los Angeles.
Delivery: 45-60 days.
Terms: 30% down payment with order. Full payment COD.
Freight and insurance to be paid by customer.
Warranty: One year on FINDEX parts and labor free.
90 days on bubble memory and peripherals.
A two-hour free demonstration will be given at our main office in LA (unless there is a local distributor) with every delivery.
Unless exclusive territory dealership has been appointed, service under warranty provided in Los Angeles by Sorbus.
Service after warranty expiration: 12% of retail price/year.
Third-party leasing agreements may be entered into by clients with approval of credit.
Prices subject to change without notice.

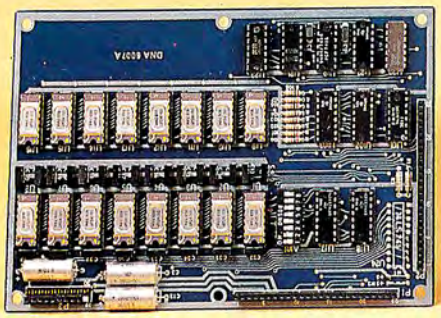
Next page...

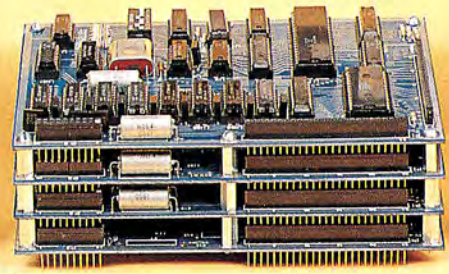
DNA

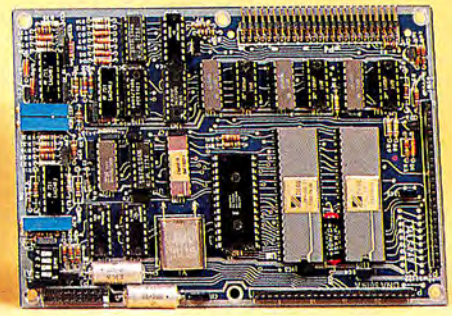
*ECONOMICAL CUSTOM ELECTRONIC HARDWARE & SOFTWARE*

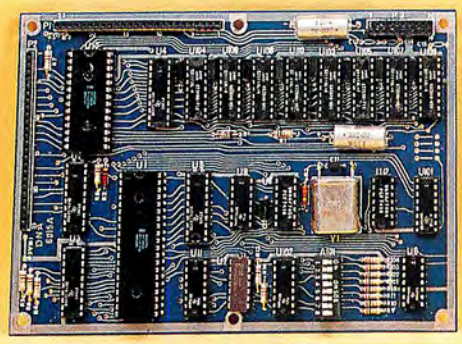


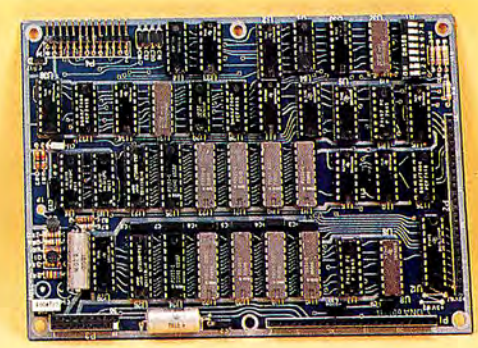












# STACKBD®

## This one will fit!

**Revolutionary STACKBD® & Z-BUS® concepts provide the most compact commercial microcomputer available, as well as the most flexible capability for custom usage. Expands from a simple Ik controller to a 2-megabyte cruncher!**

August 4, 1978

30147 Via Borica • Rancho Palos Verdes, Ca. 90274 • (213) 541-2220

Next page...

# FINDEX

20775 South
Western Ave.
Torrance, 90501
California, USA
Phone 213-533-6842
TWX 9103213000


## BASIC Applications software library

**7000 UTILITIES** (No charge)

List or cross reference statement numbers, statements, strings, and all variables of a BASIC program. Copy file. Print or display disc or Bubble contents (ASCII/HEX). Change baud rates on any port. Disc formating, verify, copy. Write the Operating System on floppy disc, bubble memory, hard disc.

**7010 TRAINING PACKAGE** (No charge)

Chess. Nim. Banners. Peanuts characters. Maze. Calendar printing. Baccarat. Blackjack. Tic-Tac-Toe. Bio-rhythm. Poker. Bingo. Craps. Football. Hexpawn. Life. Slots. Synonym. 3D Plot. Tower of Hanoi. Boxing. Keno. Baseball. Message encyphering.

**7100 TERMIO: FINDEX-MAIN FRAME COMMUNICATIONS PROTOCOL** ($650 per module)

The terminal I/O communications package is designed to allow the FINDEX computer to be connected to a host computer as a terminal. The microcomputer will respond as an intelligent terminal with the additional functions which are built into the program.

This communications package is set up to have an acoustic coupler connected to port one of the microcomputer.

TERMIO now allows communications with four mainframe computers. These are: an IBM-370, a Honeywell, a DEC-System 10, and a NCR 8250.

**BUSINESS PROGRAMS**

**7200 Mailing list management** ($480 per module)

Create, name, address, attribute, record, file. Random input or delete of records. Display/print records in zip code and alphabetical order within zip codes, by attributes, start and stop any place, no pre-sort, Cheshire label 2-up format. Automatic delete of double record entries.

**7210 Hard document filing** ($480 per module)

Saves considerable filing work. Allows random entries under n different headings or subjects. Information may be retrieved in alphabetical order by any subject.

**7300 Word processing system** ($480 per module)

In addition to the usual word processing features, this package offers easy-to-use commands, global search and replace capability, automatic margin justification, automatic page numbering, both left and right indentation, floating spaces to allow for insertion of diagrams, the ability to handle either single sheet stationery or continuous forms, and complete self-instructing documentation.

**7500 ACCOUNTING PACKAGE** ($2,000 for all 5 modules, or $400 per module)

**7510 General ledger.** Chart of accounts list. Transaction registers. Trial balance (detail report). Balance sheet. Comparative balance sheet. Income statement. Comparative income statement. Statement of financial changes. Department income statement.

**7520 Accounts receivable.** Customer account list. Transaction registers. Aged accounts receivable. Statements. Invoices. Account status. End of period report.

**7530 Accounts payable.** Vendor account list. Transaction registers. Aged accounts payable. Cash requirements. Vendor checks. Check register. End of period report.

**7540 Payroll.** Employee list. Pay checks. Check register. Monthly State withholdings. Quarterly report. W-2 forms.

**7550 Inventory for retail stores.** Detail inventory report. Inventory status report. Reorder report. Inventory price list. Physical inventory worksheet. End of period report. Department summary.

**7600 PROPERTY MANAGEMENT** ($600 per module)

Timely and accurate statements, ready access to up-to-date Tenant information, and ageing by account enable the Property Manager to (1) speed collections and (2) spot potential losses early enough to take corrective action.

Files interact to provide information analysis. The Property Manager has such handy tools as a Vacancy List and an Action-Date Report at his fingertips.

Open-item statements facilitate accurate posting of payments and readily justify amounts due. Save time by posting rent charges directly from the Lease File.

Late notices may be prepared for delinquent accounts.

**REPORTS:**

Property Reports; Rental Unit Reports; Tenant Reports; Lease Reports; Vacancy List; Action-Date Report; Rent Worksheet; Transaction Reports; Tenant Activity Report; Accounts Receivable Ageing Report; Statement Generation; Mailing Labels.

**8000 PATIENT ACCOUNTING SYSTEM** ($13,640 - both hardware and software)

This is a complete patient accounting system for health care professionals of all specialties. The system will contain all accounting information for approximately 2,000 family or master accounts, and automatically prepares patient billing statements (whenever desired), both Medi-Cal and Standard Insurance Forms, and a wide range of management reports such as Account Ageings, Delinquent Accounts, Inactive Accounts, and a Master Account List.

The system has the capacity to store over 1,000 procedures, payments, adjustments, and diagnostic codes. Each procedure is listed on a Daily Log showing patient, date, physician, procedure (or payment or adjustment), and amount. These items are also listed on the Patient Billing Statements, which can be run whenever, and as frequently as, desired. These statements will also contain a collection message depending upon the age of the account balance.

Insurance forms can be printed whenever desired, and are automatically generated from the daily entries, thus saving considerable time.

A Patient Recall System is included which will type a letter to specified accounts informing them that it is time to contact the office for some specific visit or follow-up procedure.

Should practice grow, system is easily expandable.

## END USER PRICE LIST March 1981 (D)

| Part No. | Price | Quantity | Part No. | Price | Quantity |
|---|---|---|---|---|---|
| 4300 | $ 6,980 | | 1212 | quoted on request | |
| 4040 | 4,780 | | 1810 | 10 | |
| 4400 | 13,350 | | 2201 | 40 | |
| 2600 | 600 | | 2200 | 8 | |
| 2603 | 500 | | 2205 | 150 | |
| 2605 | 600 | | 2700 | 700 | |
| 2612 | 500 | | 2702 | 500 | |
| 2630 | 300 | | 2703 | 700 | |
| 2645 | 740 | | 2701 | 100 | |
| 3700 | 8,900 | | 2710 | 700 | |
| 3720 | 10,000 | | 2720 | 700 | |
| 3702 | 7,625 | | 2900 | 30 | |
| 3766 | 9,100 | | 2902 | 30 | |
| 3715 | 10,350 | | 2901 | 30 | |
| 3717 | 3,000 | | 2904 | 30 | |
| 3901 | 700 | | 2906 | 30 | |
| 3908 | 1,215 | | 2903 | 30 | |
| 1209 | 1,090 | | 2910 | 30 | |
| 1211 | 2,000 | | 2920 | 30 | |
| 1210 | 55 | | 2930 | 30 | |

☐ Send me a purchase agreement for items I have checked above.

☐ I want a free demonstration of the Findex computer. Call me for an appointment!

Name _____ Title _____

Company _____

Address _____ City _____

State _____ Zip _____ Country _____

Phone _____ Telex _____

## End User Price List

March 1981 (D)

| Part No. | | |
|---|---|---|
| 4300 | **FINDEX System 234**<br>Z-80 CPU with 2.5 megaHz clock, 80-132 column built-in plain paper printer, 72-key sculptured keyboard, flat gas plasma display, one parallel I/O back panel DD-50S connector, four RS-232C channels (DB-25S connectors), one connector for auxilliary mini-floppy drives, 8k ROM, 64k bytes RAM, 400k built-in mini-floppy diskette drive. Weight: 32 lbs. | $6,980 |
| 4040 | **FINDEX System 103**<br>Same as system 234 but without keyboard, printer, plasma screen, or disk drive. A bare CPU with all system and programming software, 64k user RAM, 64 parallel I/O lines, and 4 serial channels to attach CRTs, drives or high speed printers. Weight: 17 lbs. | $4,780 |
| 4400 | **FINDEX System 256**<br>Same as system 234 but with 256k bytes built-in bubble memory instead of a mini-floppy disc drive. BASIC and operating system bubble memory resident. Weight: 32 lbs. | $13,350 |

**Options**

| | | |
|---|---|---|
| 2600 | 4 megaHz clock instead of 2.5 | $600 |
| 2603 | 800k built-in floppy disc drive instead of 400k | $500 |
| 2605 | Built-in acoustic coupler, 300 baud rate.<br>Additional Weight: 2 lbs. | $600 |
| 2612 | Built-in DC power supply with 12V car adaptor and one half hour portable external battery pack.<br>Additional Weight: 8 lbs. | $500 |
| 2630 | FINDEX carrying case. Weight: 10 lbs. | $300 |
| 2645 | IEEE-488 BUS | $740 |

**Peripherals** (includes interface and cables)

| | | |
|---|---|---|
| 3700 | Hard disk drive, fixed and removable (10 megab).<br>Up to 4 additional drives on same controller.<br>Weight: 120 lbs. | $8,900 |
| 3720 | Hard disk, 20 megabyte (15 fixed, 5 removable).<br>Weight: 120 lbs. | $10,000 |
| 3702 | Winchester hard disk drive (29 megabyte).<br>Weight: 20 lbs.<br>Available July 1981 | $7,625 |
| 3766 | Winchester hard disk drive (66 megabyte).<br>Weight: 52 lbs.<br>Available April 1982 | $9,100 |
| 3715 | Winchester hard disk drive (154 megabyte).<br>Weight: 52 lbs.<br>Available December 1981 | $10,350 |
| 3717 | 17 Mbytes tape drive for back-up. Weight: 20 lbs.<br>Available December 1981 | $3,000 |
| 3901 | 5.25" stand-alone mini-floppy disk drive (400k).<br>Weight: 8 lbs. | $700 |
| 3908 | 5.25" stand-alone mini-floppy disk drive (800k).<br>Weight: 8 lbs. | $1,215 |
| 1209 | Full-screen, 1920-character, 80 x 24 line, 75-key CRT.<br>Weight: 40 lbs. | $1,090 |
| 1211 | Stand-alone 132 column, plain paper printer | $2,000 |
| 1210 | Terminal interface cable, 10' | $50 |
| 1212 | Custom I/O cables | Quoted on request |

**Supplies**

| | | |
|---|---|---|
| 1810 | Centronix ribbons | $10 |
| 2201 | Printer paper, case (8.5" wide plus 1" for tractor holes) | $40 |
| 2200 | 5.25" floppy diskettes (double-sided, double density, 40/80 track, 10 hard sectors certified) | $8 |
| 2205 | Removable hard disc cartridge (5 megab.) | $150 |

**Software**

Program modules available on cassettes or discs (see Software list)

| | | |
|---|---|---|
| 2700 | COBOL compiler | $700 |
| 2702 | FORTRAN compiler | $500 |
| 2703 | BASIC compiler | $700 |
| 2701 | MACRO assembler | $100 |
| 2710 | PL/1 compiler | $700 |
| 2720 | PASCAL compiler | $700 |

**Manuals**

| | | |
|---|---|---|
| 2900 | FINDEX BASIC Interpreter and compiler manual | $30 |
| 2902 | COBOL compiler manual | $30 |
| 2901 | FORTRAN compiler manual | $30 |
| | MACRO assembler manual | $30 |
| 2906 | PASCAL assembler manual | $30 |
| 2903 | CP/M manual | $30 |
| 2910 | FINDEX operating manual | $30 |
| | APPLICATIONS Software manuals (per module; see Software list) | |
| 2920 | Microsoft BASIC Interpreter and compiler manual | $30 |
| 2930 | PL/1 manual | $30 |

Delivery 30-60 days.
Terms: 30% down payment with order. Full payment 30 days net on approved credit. Freight and insurance to be paid by customer.
Warranty: 90 days on FINDEX parts and labor free when returned to service center. Unless territory dealership has been appointed, service under warranty provided in Los Angeles.
A two-hour free demonstration will be given at our office (unless there is a local distributor) with every delivery.
Service Contract after warranty expiration: 14% of retail price/year.
Third party leasing agreements may be entered into by clients.
Prices and specifications subject to change without notice.
When calculating shipping weight increase weight by 30% per item (plus 10 lbs. per shipping container).

PLACE STAMP HERE

**FINDEX**, INC.
Sales Department
20775 S. Western Ave.
Torrance, CA 90501
USA

Next page...

# FINDEX
# electronic
# design
# services

FINDEX

Design a micro-processor, a digital display, or just a digital dial into your product and make it think!

Micro-electronics has revolutionized the tasks of document composing, drafting, analog to digital conversions, designing of everything from plastic extrusion to printed circuits, parts counting and weighing, data capture and display, instrument monitoring and testing.

**Easier to operate**

Instead of turning a knob here, lifting a lever there, pulling on a clunky handle, repeating commands, as you have to do with mechanical components, the brain in your electronic device will implement what it has been designed to do.

**More profits**

Micro-electronics gives you products that think, manufacturing processes that monitor themselves and can even predict or alert you to different problems, whether in an office or in a factory. Logic control allows you to obtain information immediately and to use it right away.

# How can FINDEX Electronic Design Services help you?

Before you decide to implement your new idea and enter the electronic age, you need feasibilities studies, price projections, budget and schedule planning, component and vendor selection.

FINDEX will help you with that and more: FINDEX is at home with anything in electronics. FINDEX will not sell you a black box.

**Call FINDEX!**
The first consultation is free... with no research but with a qualified engineer. We can sign a non-disclosure agreement from the start. You tell us your problems. FINDEX will contract with you a development plan in several phases:

**Phase I**
We will analyze your need, and evaluate how electronics would improve your product, its appearance, its usefulness or its sales, estimate what will be the bottom line as far as profits are concerned.

At the end of Phase I you have a clearer picture of the situation. You will know whether to place the project on the back-burner for a while, scrap it altogether, or go ahead with it.

**Phase II**
Several alternatives are now open to you: you may want to limit yourself to a conceptual design; or require a small experimental modification of your own equipment. You may also choose to purchase an off-the-shelf micro-electronic component, a system, or even a computer, and ask FINDEX Electronic Design Services to program it for you. Or you may want a more specific implementation.

**Turn-key development**
Upon request, FINDEX will build for you a prototype or a small production run, design PC boards, testing equipment, or give you on-site engineering help to fit your exact requirements. FINDEX Electronic Design Services know where to find the talent you need to put your decision into practice.

# The first computer with bubble memory

FINDEX Electronic Design Services has built the first computer using bubble memory, the space age technology breakthrough. The FINDEX® is a fully portable, inexpensive, feature-packed business computer designed for the professional.

System 128 uses the latest technology: bubble memory, a permanent solid state memory developed by NASA, while System 100 comes with a built-in mini-floppy diskette drive. The full size keyboard and light-weight flat gas plasma display make it a highly versatile system. It is programmable in Business BASIC, FORTRAN or COBOL.

**Standard Configuration:** Self-contained and portable, the FINDEX, in its standard configuration, consists of a terminal-sized computer, weighing less than 20 pounds (10 kg). Its rugged, high-impact molded case houses the electronics memory and mass storage, display, and mini-printer.

**Component details**

**CPU:** Zilog Z-80 with 2.5 MHz clock (4 MHz optional), 1.6 micro second minimum add cycle time.

**Real Time Clock:** Software interrupt settable and readable.

**Random Access Memory:** 48k bytes of dynamic RAM, 1k byte of static RAM. Expandable to over 2 megabytes.

**Read Only Memory:** 8k bytes of ROM. Expandable to 32k bytes.

**Mass Storage inside the case:**
**System 128:** 128k of bubble memory (access time: 8 milliseconds), expandable to 2 megabytes on the same controller (½ million only inside the case)

**System 100:** Built-in mini-floppy diskette drive (access time: 10–40 milliseconds) holding 200k bytes, expandable to 400k bytes.

**Peripherals:** interfaces to fast printers, hard disc drives, other computers.

**Parallel I/O:** 64 TTL lines, each can be either input or output. Full interrupt capability, with priority optional.

**Serial I/O:** Two (optionally four) RS-232C ports, one of which is also a TTY. 4 DB-25S connectors provided on back panel. Full interrupt capability with priority optional.

**Audio:** I/O in the form of two-tone audio, 100 bytes per second (1100 baud), is built in and is available for data transfer to any standard cassette recorder.

**Accoustic Coupler:** optionally built-in phone modem, 1200 baud rate.

**S-100 BUS:** an adaptor is built in, making the computer interfaceable to all S-100 BUS boards.

**Flat Gas Plasma Display:** 6 lines of 40 characters, numeric and upper and lower case alpha; 5 x 7 dot matrix. Optionally can interface to other full screen CRTs.

**Built-In Printer:** 21 characters (numeric and upper and lower case alpha) per line, 113 lines per minute; uses aluminized paper and electrosensitive paper. 5 x 7 dot matrix, resolution 278 dots per line. Optionally a 40 column, plain paper, built-in printer is available. Can interface to stand-alone high-speed printers.

**Built-In Full Keyboard:** 72 sculptured keys, alphanumeric, upper and lower case, up to 35 programmable function keys, ten-key numeric pad, electronic shift lock, N-key rollover, autorepeat.

**Baud Rate:** Up to 19,200 entirely under software control.

**Battery:** Optionally a built-in battery can be included. Gives one hour of plug-off worktime.

**Physical Specifications**

Size: 18½ x 18½ x 6 inches (46 x 46 x 17.5 cm)
Weight: 20 pounds (10 kg)
Case: high-impact, molded Kydex
Temperature resistant: 32°–125°F (0°–69°C)
Humidity resistant: 20–85% relative

**Electrical Specifications**

Power: 110/220 V (strap change), ± 15%, 47–440 Hz, 110 W.

**Mechanical Specifications**

Functions are modularized into separate printed circuit boards connected by STACKBD®, a proprietary interconnection scheme which eliminates the need for a mother board, and facilitates service. Board position and relative order in the chain is arbitrary, and expansion is limited only by the physical size of the unit and the electrical load capacity.


FINDEX

1625 W. Olympic Blvd.
Suite 707
Los Angeles 90015
California, U.S.A.
(213).7-FINDEX