CμBIT DIV.
Proteus Industries

Dear Microcomputer User:

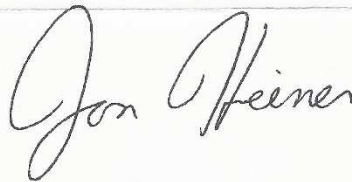We are pleased to enclose data sheets on our two microcomputer lines.

Our 6502 based *KIM bus* line features complete software compatibility with Rockwell's AIM-65. Because of this, programming may be done in BASIC, FORTH, PL/65 or PASCAL. The computer is compact and modular in form, giving great flexibility in packaging.

We have recently announced our first *STD Bus* product. This smart CRT Controller includes an 8085 microprocessor to format data for a CRT, and will also control a printer and keyboard. In many cases, this will off-load all I/O processing from your host CPU. This controller is *not* compatible with the KIM bus line.

Delivery on all of our products is typically stock to two weeks.

Please call us if you have any questions.

Sincerely,

Jon Heiner

CPU

Model 6500-1 CPU Board $195.00
  ● 1K RAM, 72 lines of I/O ● No monitor ROM
Model 6500-4 CPU Board $220.00
  ● 4K RAM, otherwise same as 6500-1
Model 6590 Monitor ROM Set $60.00
  ● Rockwell AIM-65 monitor, compatible with Cubit Model 6500 CPU
Model 6591 Manual Set $15.00
  ● Rockwell manuals for monitor ROM and 6502 chip set. (Cubit hardware manuals are included with the CPU at no charge.)

Printer

Model 6521 Printer/Plotter $130.00
  ● 20 character line length

Display

Model 6520 Display $130.00
  ● 20 character vacuum flourescent display

Keyboard

Model 6550 Instrumentation Keyboard (23 keys) $45.00
  ● Flat, sealed keyboard. Dome technology
Model 6551 Keyboard with Display $175.00
  ● 6520 Display Mounted on 6550 Keyboard
Model 6552 Typewriter Keyboard $60.00
Model 6553 Instrumentation Keyboard (54 keys) $60.00
  ● Flat, sealed keyboard. Dome technology.
Model 6554 Keyboard with Display $190.00
  ● 6520 Display Mounted on Model 6553 Keyboard

EPROM Programmers

Model 6517 EPROM Programmer $165.00
  ● Programs 2532, 2732, 2732A, 2716, 2758, 2516 and 2508 type EPROM's
Model 6533 EPROM Programmer $249.00
  ● Programs same EPROM's as 6517 ● Includes 4K RAM ● On-Board 25 V DC to DC converter
2532 EPROM (4K) $9.00
2716 EPROM (2K) $7.00

Memory Expansion Boards

Model 6515-0 RAM/ROM Expander $125.00
  ● Socketed for 36K RAM/ROM. Memory chips not included
Model 6515-1 RAM/ROM Expander $175.00
  ● Same as above with 8K static CMOS RAM chips
Model 6515-2 RAM/ROM Expander $300.00
  ● Same as above with 28K static CMOS RAM chips
Model 6515-3 RAM/ROM Expander $350.00
  ● Same as above with 36K static CMOS RAM chips ● Other configurations quoted on request

I/O Expansion Boards

Model 6570 Parallel I/O Expander $115.00
Model 6571 Universal I/O Expander $295.00
Model 6572 Serial/Parallel Expander $220.00
Model 6573 Power Switching Interface $145.00
Model 6574 Panel Mount Connector Board $70.00

CRT Controllers

Model 6575 CRT Controller $220.00
Model 6576 CRT Controller with RS-232 ....$295.00

Motherboards

Model 6513 Motherboard $49.00
  ● Connect three Cubit expansion cards to AIM-65
Model 6540 Motherboard $60.00
  ● Connect four Cubit cards and Cubit CPU — 0.5" centers
Model 6541 Card Cage $95.00
  ● Model 6540 Motherboard with card cage — 0.5" centers
Model 6542 Motherboard $60.00
  ● Connect four Cubit cards and Cubit CPU — 0.7" centers, with one double-width slot.
Model 6543 Card Cage $95.00
  ● Model 6542 Motherboard with card cage — 0.7" centers, with one double-width slot.

Notes

Discounts   ● Discounts will be given on quantity purchases of any product. Products can *not* be mixed to obtain discount:
25 to 99 units — less 5%; 100 to 499 units — less 10%; 500 to 999 units — less 15%

Delivery   ● Normal delivery is stock to three weeks on small or moderate quantities.

Shipping   ● All shipments are FOB Mountain View, California.
● UPS charges will be prepaid and billed. Air freight shipments will have freight charges billed directly to the customer.

Payment   ● Payment terms are Net 30 days with credit approval.
● Orders from individual and home businesses will be shipped COD.

CUBIT Div.   •   190 S. Whisman Road   •   Mountain View   •   California 94041   •   Telephone: (415) 962-8237
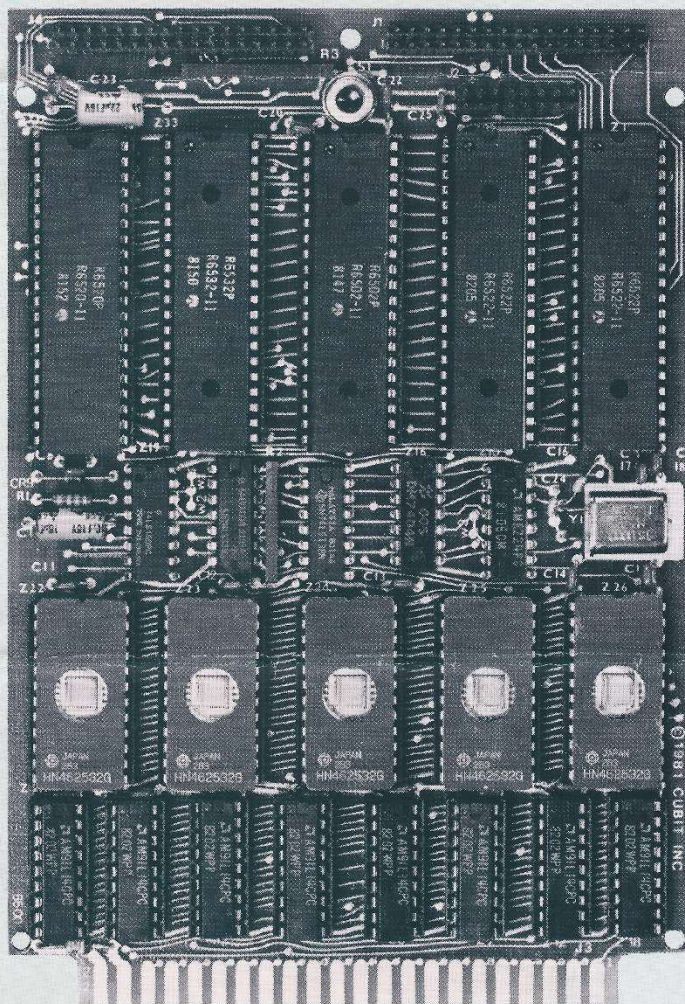
CUBIT
SINGLE BOARD
COMPUTER

- **6502 Based Microcomputer**
- **Modular Design**
- **Low Cost Software Development**
- **72 Lines of I/O**
- **Ample RAM and ROM**
- **Economical for OEM's**

Cubit brings you a single board computer designed specifically for the OEM. No longer will you need to fit your product to a computer that is all things to all people. The Cubit system combines true computer capability with a small, easily packaged size and a modular design that lets you pay for only what you need.

OVERVIEW

At the center of the Cubit system is the Model 6500 single board computer. This 6502 based unit features 72 lines of I/O, 1 to 4 Kbytes of RAM, 2 to 20 Kbytes of ROM, 5 timers and 2 levels of interrupt compressed on to one 4½" by 6½" card.

To this card may be added a 20 character display, and a 20 character printer, both remotely mounted. Expansion cards, including RAM, ROM, and I/O, can be used to expand the power of the CPU.

The Cubit computer is software compatible with Rockwell AIM-65 and Microflex computers, and software conversion is simple from SYM-1, KIM and other 6502 based computers.

THE COMPUTER

The 6502 is one of the most versatile and popular 8 bit microprocessors. It has found wide acceptance in industrial control and OEM applications.

The Cubit Model 6500 single board computer incorporates this microprocessor in a convenient package. The 6500 features 72 lines of user I/O brought in logical groups to three edge connectors. Two of these connectors may be used for keyboard/display and printer modules, leaving the third connector with 27 lines of user I/O. Alternatively, all 72 lines may be used for your application. The I/O is supplied through the use of two 6522's, one 6520 and one 6532.

The board is shipped with 1K to 4K of 2114L low power RAM. 2K to 20K of user ROM may be added to the board. The computer supports 2716's, 2532's and 2332's (including any Rockwell AIM-65 ROM). Additional RAM and ROM may be added with expansion cards.

A single five volt power supply is needed to run the computer, and any expansion options except the 24 volt printer.

Model 6500 CPU Board
(Actual size)

CµBIT INC.
A Proteus Company

CUBIT EXPANSION BOARDS

FOR CUBIT MODEL 6500 AND ROCKWELL AIM-65 COMPUTERS

Cubit manufactures expansion boards which are compatible with both the Cubit Model 6500 Single Board Computer and Rockwell AIM-65 computers. These extend the capability of either computer with compact 4½" by 6½" modules. These modules are the same size as the Cubit 6500 CPU, making for a particularly convenient package for the OEM who must fit the computer into his product.
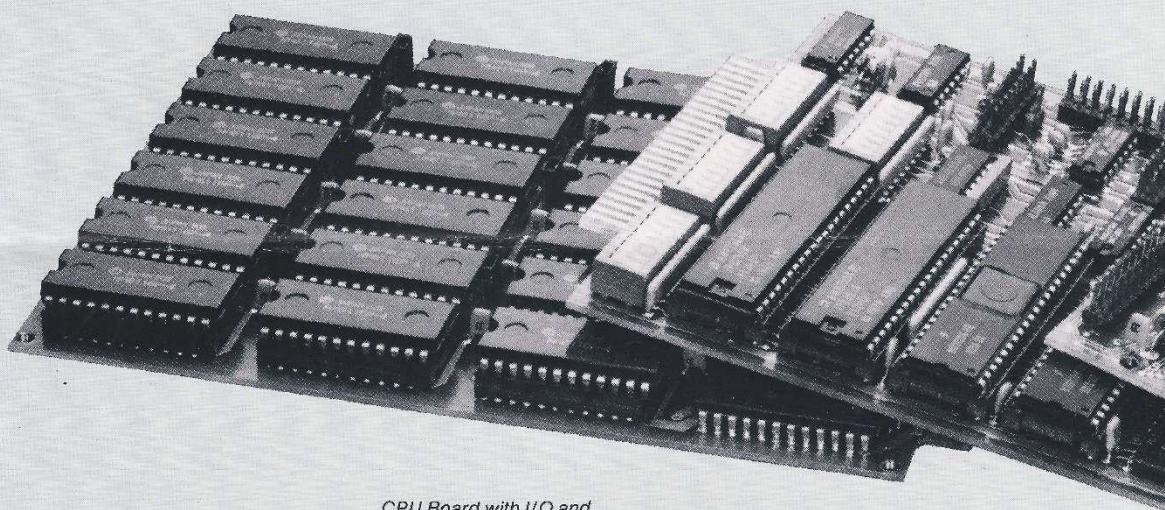
I/O EXPANDERS

Several I/O expanders for the Cubit Model 6500 or the AIM-65 are available. All of these plug into the Model 6540 Motherboard or Model 6541 Card Cage (for Cubit expansion) or the Model 6513 Mother board (for AIM expansion.) All of the expanders are on 4.5" by 6.5" boards.

The **Model 6570 Parallel I/O Expander** adds 72 lines of parallel I/O to the host CPU. It includes a 6520 PIA, two 6522 VIA's and one 6532 RIOT, the same I/O chips as on the Model 6500 CPU. The address structure is the same, except that the address series starting at A000 on the CPU is shifted to 8000 (specify Model 6570-8) or 9000 (specify Model 6570-9) on the I/O expander.

The **Model 6571 Universal I/O Expander** includes the following capabilities:

- Four RS-232C ports (using the Western Digital WD2123 Dual UART) with software controlled baud rates from 75 to 19.2K,
- A Centronics Printer Interface,
- 24 lines of parallel I/O expansion, configured for optional use as a 50-pin Power Switching Bus (interface to Opto-22, Gordos, etc.),
- Four 8-position DIP switches on I/O lines may be used for general purpose system or I/O parameter setting. If this capability is used, the 24 lines of parallel I/O are disabled.

The RS-232 and Centronics ports terminate in header connectors on the board. (The Model 6574 Panel-Mount Connector Board described below provides a D-Connector option.) The 24 lines of parallel I/O terminate on a 50-pin edge connector.

CPU Board with I/O and Memory Expansion

The **Model 6572 Serial/Parallel Expander** includes all of the capability of the Model 6571 Universal I/O Expander, except that only two RS-232C ports and two 8-position DIP switches are provided.

The **Model 6573 Power Switching Interface** provides only the 50-pin Power Switching Bus capability of the Model 6571. It is used to interface to industrial power switching equipment manufactured by Opto-22, Gordos and several other manufacturers.

The **Model 6574 Panel-Mount Connector Board** provides five D-Connectors on a 3.0" by 5.0" PC Board. It includes cables to attach to the Models 6571 or 6572 I/O expanders, thus converting the on-board header connectors for the RS-232C and Centronics ports to convenient panel mounted D-Connectors.

RAM/ROM EXPANSION

The Model 6515 RAM/ROM Expansion Card is socketed for up to 36K of RAM or ROM. Byte-wide CMOS RAM (6116 or equal) is used for low power consumption. 2716's are used when EPROM's are needed. Each 4K block of memory can be assigned by the user to RAM or ROM. The board is offered with and without RAM chips, as shown on the price list.

The first 28K of memory is at fixed addresses, starting at 1000 (Hex), immediately above the 4K of RAM on the Model 6500-4 CPU. The remaining 8K of memory can be assigned to any two 4K address blocks. The board is fully buffered.

Either the Cubit Model 6500 CPU or the AIM-65 can be expanded using the 6515 RAM/ROM board and the appropriate motherboard.

MOTHERBOARDS AND CARD CAGES

The **Model 6540 5-Slot Motherboard** provides five 44-pin connectors on ½" centers. It accepts a Cubit Model 6500 CPU and up to four expansion boards. The board is 2.5" by 4.5" and includes 3" high card guides. A power pig-tail is included.

The **Model 6541 Card Cage** adds stainless steel sheetmetal side panels and full-length card guides to the Model 6540 Motherboard. It is 7.1" high.

The **Model 6513 Motherboard** connects up to three Cubit expansion cards to an AIM-65. The motherboard is 4½" x 5", and includes 3" high card guides.

CRT CONTROLLER

The **Model 6575 CRT Controller** uses a SY6545 controller chip to operate a composite or non-composite CRT. 256 characters may be defined, allowing for simple graphics. Blink, reverse and highlight are supported. The board includes its own off-line memory, and requires only 2K of address space on the host CPU.

The **Model 6576 CRT Controller** is identical to the Model 6575 except for the addition of one RS-232 serial port.

TESTING AND WARRANTY

Cubit boards are fully burned-in and tested. All edge connectors and header connectors are gold-plated.

Cubit warrants its products to be free from defects in materials and workmanship for a period of twelve months from the date of shipment. Cubit's obligation is limited to repair or replacement, at Cubit's option, and is contingent on notification of the defect within 60 days after discovery. This warranty is exclusive and in lieu of all other expressed or implied warranties, except as made in writing by Cubit Inc. Cubit shall not be liable for any defects attributable to acts or omissions of others after shipment, nor any consequential, incidental or contingent damage whatsoever.

Model 6540 Motherboard
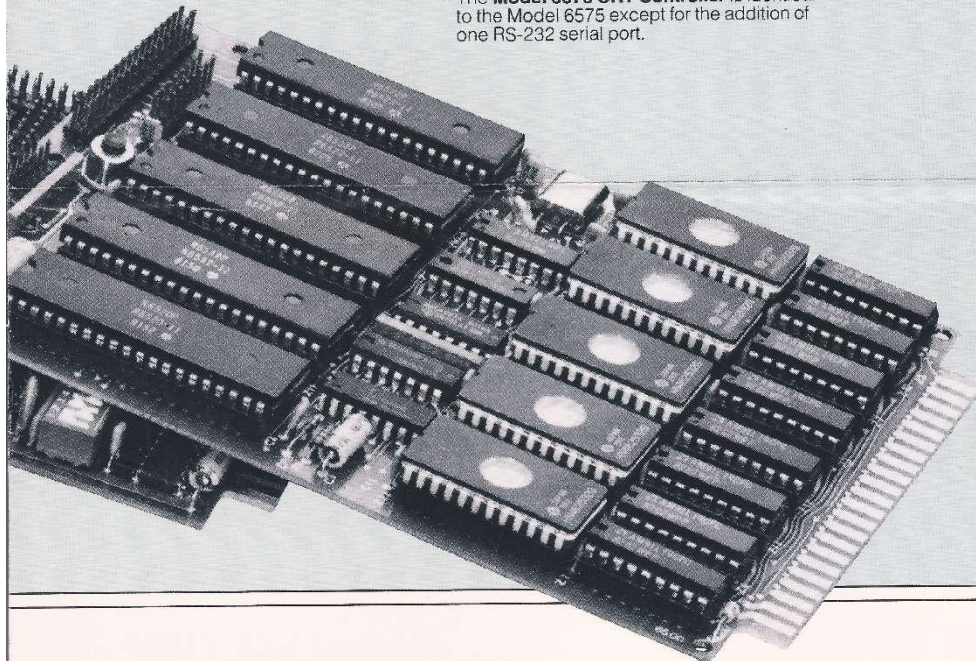
CUBIT EPROM PROGRAMMERS
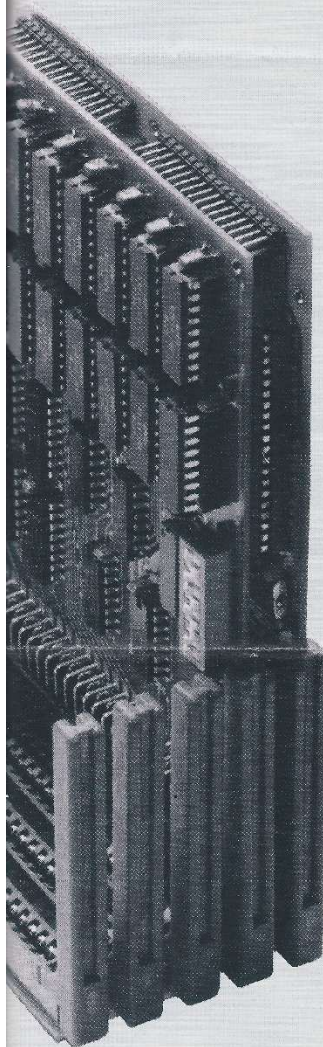
The Cubit Model 6517 and 6533 EPROM Programmers are convenient and simple additions to the Rockwell AIM-65 or Cubit Model 6500 single board computers. These small cards plug directly onto the AIM-65 expansion connector or any Cubit motherboard and provide the capability to program 5 volt type Erasable Programmable Read-Only Memories. Both models program 2532, 2732, 2732A, 2716, 2758, 2516 and 2508 type EPROM's. The model 6533 also provides 4K of RAM/ROM and a DC to DC converter which eliminates the need for an external 25 volt programming power supply.

MONITOR PROGRAM
Both the 6517 and 6533 programmers include an on-board programming monitor. This versatile monitor contains all routines necessary for EPROM programming. Like the AIM-65, monitor functions are called via a simple single letter command. Once called, each command prompts the user for any additional information which may be needed.

EPROM PROGRAMMING
Programming can start and stop at any EPROM location. Thus, the user can program any number of bytes at a time. Automatic verification of each byte programmed provides confidence in the EPROM's data. Source data for the programmer may be located anywhere in the host computer memory or on a cassette tape object file.

EXTRA CAPABILITIES
In addition to the EPROM programming routine, the monitor includes many other useful routines such as EPROM erasure verification, fill memory with a constant, compare memory to EPROM, transfer data from EPROM to memory, move memory, and a relocating tape loader.

HARDWARE
The Model 6517 and 6533 hardware is designed for dependable operation. A zero insertion force socket is provided for programming EPROM's. Interface to an AIM-65 expansion bus may be via either of the two 44-pin connectors. The female connector plugs directly onto the AIM-65 expansion connector without any additional hardware. The male edge connector allows the programmer to plug into an expansion motherboard for AIM-65 or Cubit computers.

The 4K of RAM on the 6533 may be mapped to any 4K address boundary in the host computer. The use of byte-wide RAM permits user substitution of two 2716 EPROM's for the RAM.
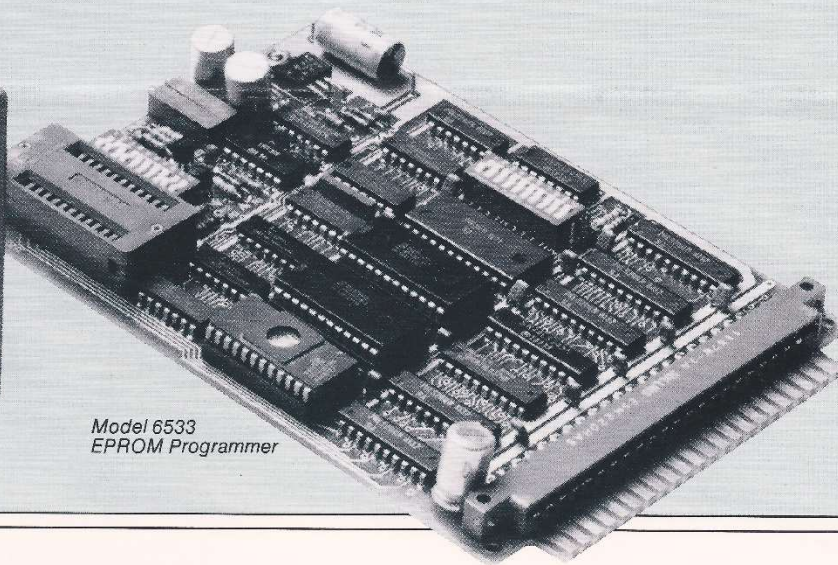
Model 6533
EPROM Programmer

SOFTWARE

The Rockwell AIM-65 computer may be used with the Cubit 6517 or 6533 EPROM programmer to form a very inexpensive development system. The AIM-65 permits development of programs in 6502 assembler, BASIC, PL/65 and FORTH with a development system hardware cost under $1000. The Cubit computer is compatible with all AIM-65 software, including the keyboard, display and printer driver routines in the Rockwell monitor (Cubit Model 6590.) Other 6502 development systems may also be used.

REMOTE-MOUNTED DISPLAY

A 20 character display, Cubit Model 6520, is available as an option. It connects to the computer via flat cable, and may be panel-mounted, or located in any other convenient place.

The display features 14-segment vacuum flourescent characters. The display card includes an auto-vector circuit that will automatically bring up a user program on powering up a computer using AIM-65 Monitor ROM's. An on-board 8035 microprocessor controls the display and interfaces to the CPU.

PRINTER

A 20 character, 120 LPM thermal printer may be added to the system. The Cubit Model 6521 printer uses an Olivetti PU-1800 printer mechanism and connects to the computer card via flat cable. The light weight board is 5.3" by 3.75" and 2"

high. The printer mechanism has a lifetime of 1,000,000 lines, or about 3 miles of print. A 24 volt unregulated power supply is required for printer operation.

KEYBOARDS

Three keyboards are available for the Cubit computer.

The Model 6550 Instrumentation Keyboard is a flat, panel-mounted unit. It includes 23 keys (16 Hex keys, F1, F2, F3, Space, ".", Return and Delete), and a rectangular window for optional mounting of the Model 6520 Display. Dome technology is used to give the effect of a membrane keyboard with tactile response. The combination keyboard and display (Model 6551) gives a particularly compact and cost-efficient terminal. The keyboard with or without the display requires 6.5" by 3.1" of panel space.

The Model 6552 Typewriter Keyboard is an inexpensive, 54-key unit for use in program development and in applications that require a full keyset or frequent typing of large amounts of data. The 12" by 4" unit has full-action keys in a conventional keyboard layout.

The Model 6553 Instrumentation Keyboard is a flat keyboard using dome technology with a full 54-key repertoire. Like the Model 6550, it includes a window for optional mounting of the Model 6520 Display.

Model 6520
Display

Model 6551
Keyboard
with Display

Model 6521
Printer

Model 6552
Typewriter Keyboard

SPECIFICATIONS

6500 COMPUTER BOARD
RAM — 1K to 4K Bytes (2114L)
ROM — 2K to 20K Bytes
(2716, 2532 or 2332)
Microprocessor: 6502
Clock: 1MHz
Word size: 8 bits
I/O Lines: Total of 72 (see text) divided:
    4 ea. 8 bit ports each with two
      control lines;
    4 ea. 8 bit ports without control
      lines.
Total Addressable Memory: 64K
Interface Bus: Rockwell AIM-65
Timers: 5
Interrupts: 2 levels
Board Size: 4½" by 6½"
Electrical Requirements: 5 volts, 0.75 Amp

6520 DISPLAY BOARD
Board Size: 6½" by 3⅛"
Electrical Requirments: 5 volts, 0.25 Amp.

6521 PRINTER
Board Size: 5.3" x 3.75"
Electrical Requirements: 24 volts
  unregulated @ 2.5 Amp peak, 0.5 Amp
  average;
  5 volts, 0.5 Amp.

EPROM PROGRAMMERS
Model 6517: +5 volts @ 250 ma.
            +25 volts @ 30 ma.
Model 6533: + 5 volts @ 500 ma.

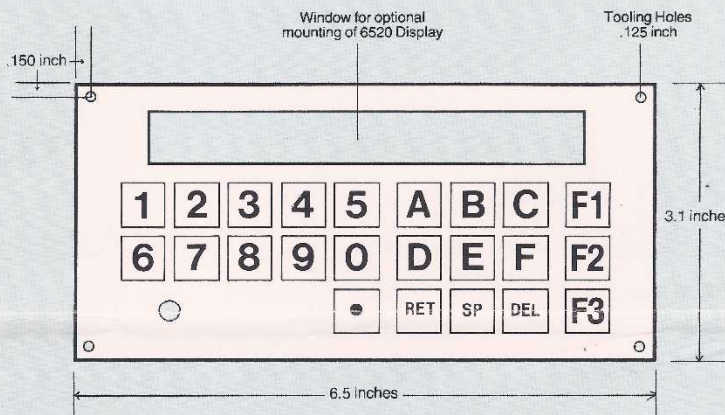**Memory Usage —**
8000 Hex thru 9FFF Hex

Size —
Length — 6.5"
Width — 4.5"
Height — 0.8"

Shipping Weight —
1 lb.

Model 6550
Instrumentation Keyboard