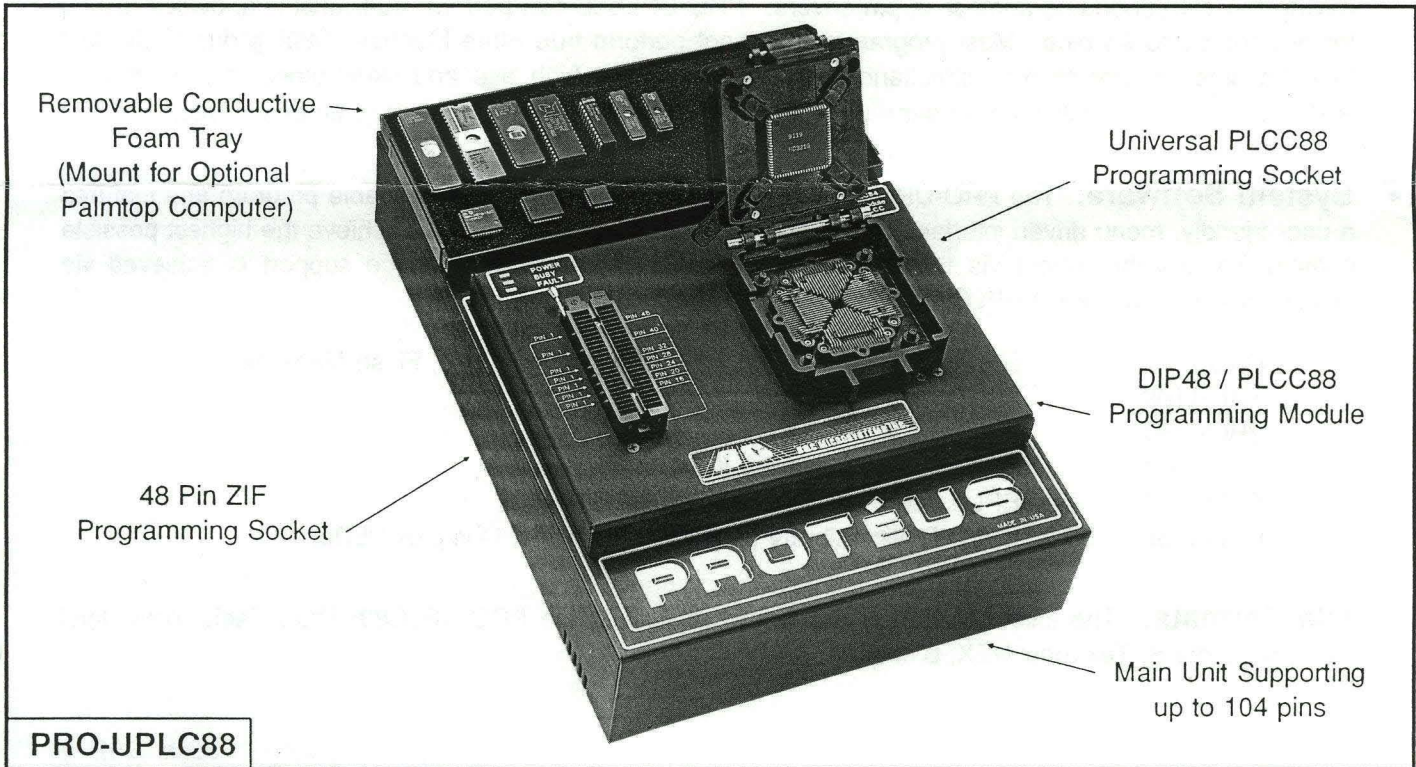# PRO-UPLC88 UNIVERSAL PROGRAMMING SYSTEM

OVERVIEW:

The PROTÉUS104 family of Programming Systems provides universal support for over **3,000 devices** including the latest FPGAs, complex PLDs, memory devices and microcontrollers up to 104 pins.

Internal pin driver expansion capability from 24 to 104 pins (296 pins with external expansion module) and individual device libraries for programming E/EEPROMs, MICROs, Bipolar PROMs, CMOS PROMs, Bipolar PLDs, and CMOS/Complex PLDs allow users to start with the configuration that best suits their immediate needs. By being able to upgrade the PROTÉUS104 to support higher pin count devices and to order device libraries as needed, PROTÉUS truly offers the most affordable solution for programming **today's and tomorrow's most advanced devices.**

Additionally, the PROTÉUS104 mainframe provides connectors for interfacing with a variety of external programming modules, including: 40 pin DIP Universal Programming Module, 48 pin DIP and 84 pin PLCC Universal Programming Module, 8/16 Socket Gang Module for E/EEPROMs, 8/16 Socket Gang Module for Memory Card (PCMCIA) Programming Module and "In -Circuit" Programming Module.

PRO-UPLC88 UNIVERSAL PROGRAMMER:

The PRO-UPLC88 programming system is a member of the PROTÉUS104 family. It employs the very **latest in complex device socket technology,** allowing devices of virtually all packages up to 88 pins to be supported in one site. The PRO-UPLC88 consists of the PROTÉUS mainframe and the DIP48/PLCC84 programming module. (see illustration below)


Removable Conductive Foam Tray (Mount for Optional Palmtop Computer)

Universal PLCC88 Programming Socket

DIP48 / PLCC88 Programming Module

48 Pin ZIF Programming Socket

Main Unit Supporting up to 104 pins

PRO-UPLC88

FEATURE HIGHLIGHTS:

- **Host Computer:** Interfaces to any PC (XT, AT, 386, 486) via **standard parallel port**. No special plug-in boards are required. PROTÉUS104 takes advantage of the computer speed. The system function execution speed increases with the speed of the computer used. PROTÉUS104 can also be configured as a stand-alone system with optional palmtop attachable/detachable PC.

- **Direct Support of all DIP and PLCC Packages:** PRO-UPLC88 supports programming of 300 and 600 mil DIP devices up to 48 pins, most LCC devices and PLCC devices of any size (20/28/32/44/52/68/84) pins. High technology, **truly universal PLCC socket** eliminates the need for and expense of pinout adapters, 'matchbook' type inserts, or other socket adapters.

- **Algorithm Development Environment:** PROTÉUS104 is the only universal programmer currently on the market to offer a built-in, fully integrated Algorithm Development Environment. Although PROTÉUS104 supports virtually all devices on the market today, users may want to have the capability to **build up their own device library**. A user library with sample device algorithms is offered for this purpose. (Ask for Application Note "ADEL".)

- **Hardware Self-Calibration & Diagnostics:** PROTÉUS104 employs a built-in A/D converter with a resolution of 25mV used to perform true self-calibration and diagnostics of all voltage sources and pin drivers upon power-up. Recalibration or Diagnostics can also be initiated from the program menu.

- **Hardware Reliability:** All pin drivers are fully overvoltage and overcurrent protected. An accidental short on the programming socket, such as a faulty device, will not damage the programmer.

- **True Functional Testing:** Most devices can be programmed with only 24 or 40 pin drivers. Testing devices with higher pin counts (e.g., 52, 68, 84 pin PLCCs) cannot be performed without the programmer having the corresponding number of pin drivers. PRO-UPLC88 can perform true functional device testing for devices up to 84 pins. Most programmers cannot perform true State Machine Testing due to the fact that the pins are not clocked simultaneously and due to the high rise and skew times of their drivers. PRO-UPLC88 can **clock all pins simultaneously** and has very low rise and skew times (<10ns).

- **System Software:** The PRO-UPLC88 software is based on a single executable program and features a user friendly, menu driven interface. A proprietary technique is employed to achieve the highest possible communications throughput via the standard PC Parallel Printer Port. Device support is achieved via device libraries. The PRO-UPLC88 supports the following libraries:

PRO-LIB1	E/EPROM Device Library (EPROMs, EEPROMs, Flash Memories)
PRO-LIB2	MICRO Device Library (Microcontrollers)
PRO-LIB3	BPROM Device Library (Bipolar PROMs)
PRO-LIB4	CPROM Device Library (CMOS PROMs)
PRO-LIB5	BPLD Device Library (Bipolar PLDs)
PRO-LIB6	CPLD Device Library (CMOS-, EECMOS-, Complex PLDs)

- **File Formats:** The following file formats are supported by the PRO-UPLC88: MOS Technology, Intel HEX, Motorola S, Tektronix HEX, Binary.

June 1992

pro-plc1
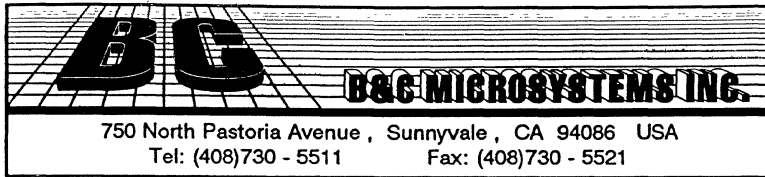
NEW PRODUCT ANNOUNCEMENT ! !

June 19, 1992

To: **ALL PROTÉUS UNIVERSAL PROGRAMMER USERS**

B&C MICROSYSTEMS, INC. is pleased to announce a dynamic advancement in the PROTÉUS PRO-GRAMMER product line. As a current user of the original PROTÉUS-UP40 programmer, you will be glad to see your product's future assured and your application enhanced.

A NEW UNIVERSAL PLCC, LCC and DIP DEVICE PROGRAMMING MODULE is now available for your PROTÉUS system. Virtually ALL programmable logic, memory and microcontrollers ICs can be supported by PROTÉUS, now called the PROTÉUS104 series.

Please review the enclosed Product Marketing Datasheets. We have provided this ADVANCED INFOR-MATION to our current customers only, so that we can make you a very **ATTRACTIVE OFFER.**

Through July 15, 1992, B&C will UPGRADE your present PROTÉUS programmer to 48, 68, or 88 pin drivers, with accompanying Device Libraries and Universal PLCC Socket, at a **PRICE REDUCTION of up to 25%.** This offer is valid only during this period, after which, a new pricing structure will be in effect.

B&C is proud to have you as valued customer and this is our way of showing our appreciation.
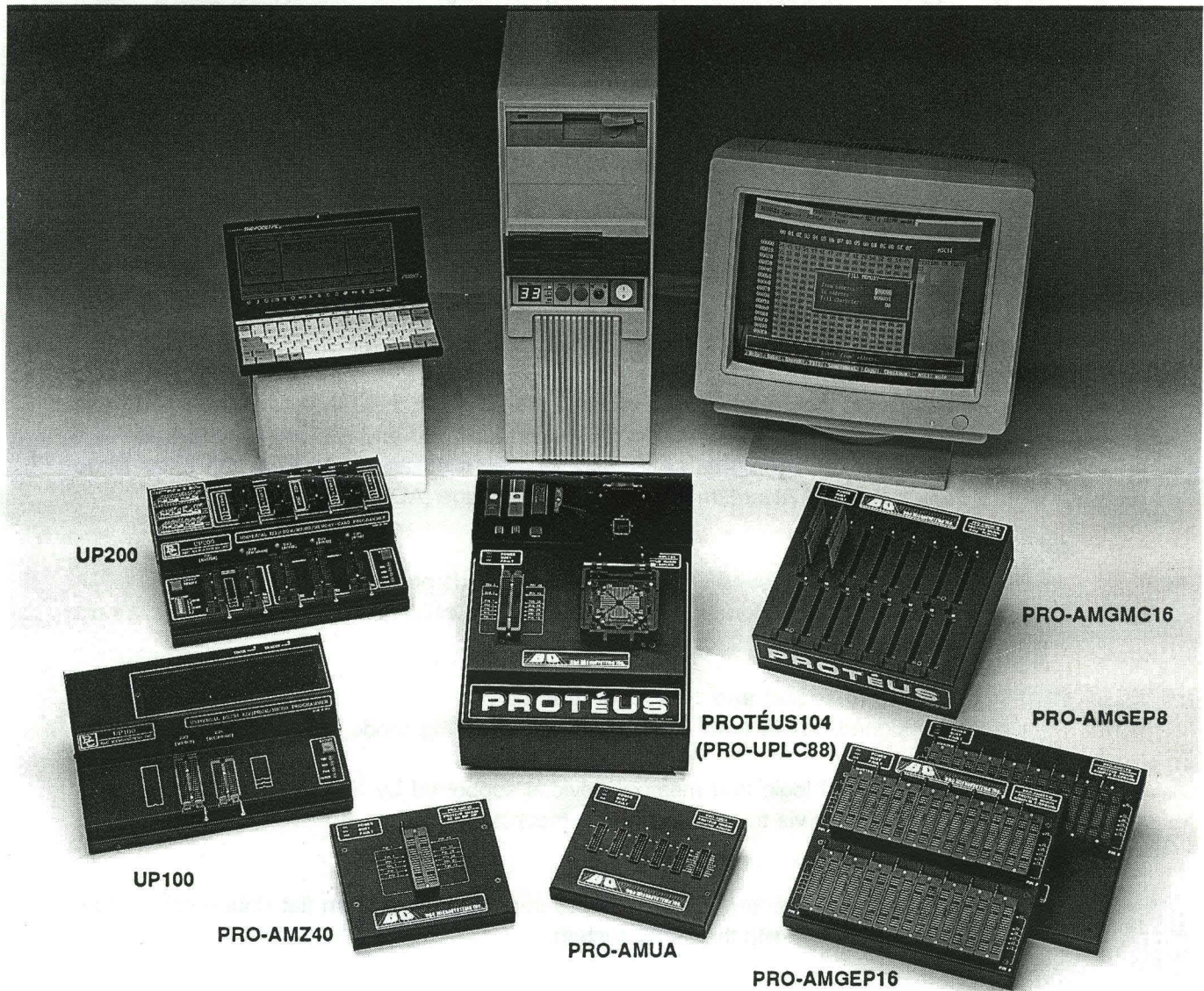
To place your order, call (408) 730-5511. We will FAX a quotation to you, if required. Our FAX is (408) 730-5521

Robert Holzner
V.P. Marketing and Sales

PROGRAMMER   PRODUCT   FAMILY

B&C Microsystems Inc. offers a variety of affordable yet high quality programming solutions covering virtually all user programming needs. Programmer models and configurations include: Low Cost RS232 E/EEPROM Programmer, Low Cost RS232 E/EEPROM and Intel Micro Programmer, Universal Pin-driven Logic and Memory Device Programmers configurable for support of DIP devices to 40 pins, DIP devices to 48 pins, LCC devices and PLCC devices of any size, 8/16 Socket E/EEPROM Gang Programmer, 8/16 Socket Memory Card Programmer and 'In-Circuit' Programmer.

All programmers offered interface via RS232 or standard parallel printer port with the full range of PCs, from palm-top models to the fastest 486 desktop models.

UP200

PRO-AMGMC16

UP100

PROTÉUS104
(PRO-UPLC88)

PRO-AMGEP8

PRO-AMZ40

PRO-AMUA

PRO-AMGEP16

pro_fam2

UP100:
- Interface: RS232; Works with any PC/XT/AT/386/486 via COM1-COM4
- Devices supported: EPROMs, Flash EPROMs, EEPROMs, 874X series Intel Microcontrollers.
- Special features: Optional internal Eraser/Timer module.

UP200:
- Interface: RS232; Works with any PC/XT/AT/386/486 via COM1-COM4
- Devices supported: EPROMs, Flash EPROMs, EEPROMs, 87XX series Intel Microcontrollers, 34 pin Epson/Seiko Memory Cards.
- Special features: Stand-alone device copy/verify capability; 4 socket Gang Programming Module; 34 pin Epson/Seiko Memory Card Programming Module, Optional internal Eraser/Timer module.

PROTÉUS104 Family of Programmers:
- General Description: All PROTÉUS104 programmers are based on the PROTÉUS mainframe (housing the PC interface, Controller Unit and Pin Driver Modules), and one of the programmer modules listed below. PROTÉUS104 can be configured to support from 24 to 104 pin devices with internal pin drivers (296 pin drivers with external expansion module).
- Interface: Standard IBM-PC Parallel Printer Port (Centronics); Operates with any PC/XT/AT/ 386/486 via LPT1-LPT4
- Special Features: All pin drivers fully overvoltage and overcurrent protected; True Self-Calibration and diagnostics via built-in 25mV resolution voltmeter; 110W fan cooled power supply.
- Software: Device support based on libraries; Fully integrated Algorithm Development Environment. Updates via diskettes or Technical Support BBS. Menu Mode of Operation as well as Batch Mode of Operation based on Macro Language.

PRO-AMZ40:
- Devices supported: Virtually all EPROMs, EEPROMs, Flash Memories, Microcontrollers, Bipolar PROMs, CMOS PROMs, Bipolar PLDs, CMOS and Complex PLDs currently on the market.
- Special features: 40 pin ZIF handles all 300 and 600 mil DIP devices.

PRO-UPLC88:
- Devices supported: Virtually all EPROMs, EEPROMs, Flash Memories, Microcontrollers, Bipolar PROMs, CMOS PROMs, Bipolar PLDs, CMOS and Complex PLDs currently on the market (over 3,000).
- Special features: Universal PLCC socket handles most LCC size and all PLCC size devices (20-84 pins) in one site; 48 pin ZIF handles all 300 and 600 mil DIP devices; True State Machine Testing capability: all pins are clocked simultaneously, Rise and Skew times <10ns. Fully integrated Algorithm Development Language (ADEL).

PRO-AMGMC16:
- Devices supported: Virtually all PCMCIA Memory Cards presently on the market
- Special features: Can perform functional testing on PCMCIA 2.0 I/O cards. Special 20 pin connector provided for loopback testing.

PRO-AMGEP8/16 (8 socket and 16 socket module):
- Device supported: E/EEPROMs up to 40 pins in gang mode (8/16 sockets simultaneously).
- Special feature: All logic and memory devices supported by PRO-AMZ40 are also supported by this adapter via the Master Socket (socket #1).

PRO-AMUA:
- Special feature: Can perform "In-Circuit" programming via custom flat ribbon cables connecting the PRO-AMUA with the target system.

RomEm-4

4MBIT ROM EMULATOR FOR IBM PC/XT/AT COMPUTERS

OVERVIEW:

- **RomEm-4** is an inexpensive and extremely useful development tool for anyone who develops firmware for EPROM or ROM based systems.

- **RomEm-4** substitutes **RAM** for **ROM** during firmware development so that code can be tested and debugged without burning EPROMS.

- Simply download the code into the emulator and you are ready to test your target system.

- Make instant code changes by editing the RAM buffer using **Display, Edit, Fill,** and **Write** commands.

- **Reset Output** clip provided to enable you to easily reset your target system. This is a high current driver that can be configured for active high/low, and normally high, low or tri-state (to not interfere with target circuit).

- **RomEm-4 is processor independent.** It can operate alone or in conjunction with standard in circuit emulators and can be used to develop code for virtually any type of microprocessor system.

- FAST program loading. **Loads 64K bytes of code in 5 seconds on an IBM-AT/386.** User friendly command driven software permits interactive or batch mode control. **Can be used with batch files or with MAKE type programs.** The RomEm-4 configuration can be saved upon exiting the program.

FEATURES:

- Emulates **2716** through **27040 EPROMS** with a single unit (16K - 4M Bits); 1MB standard, 4MB optional.

- RomEm-4 connects to the standard IBM-PC printer port (LPT1-4) via a supplied parallel printer cable.

- Target interface cable accommodates 24, 28, and 32 pin memory devices.

- Cascadeable up to 16 units (4 per parallel port) to emulate 16 separate devices.

- Can be used for different bus widths.

- Supports **Binary file, Extended Intel Hex file and Motorola-S file formats** to be loaded.

- Includes a comprehensive **RAM Buffer Editor.**

- **Built-in noise protection and current limiting** on both the PC parallel port connection and the emulator pod connection.

- Includes **9V DC** power adapter and target interface cable with a 32 pin DIP plug and two test clips for RESET & VCC IN/OUT.

- **RomEm-4 has rechargeable 9V NiCad battery backup** with built-in recharging circuitry. This allows the emulator to be disconnected from the computer after code downloading, for use in **Stand-Alone Mode.**

romem4A

ROMEM-4 TECHNICAL SPECIFICATIONS

Emulation Speed	:	100 nsec typical access time, using standard 80 nsec static RAMs.
Emulator Interface	:	74HCT373 devices.
Emulator Connector	:	DIP header with protective socket provided for emulation of 24, 28 and 32 pin devices.
File Formats	:	Extended Intel Hex, Motorola S, and Binary files supported.
Ease Of Use	:	On-line HELP available for all commands. Full documentation is also included with examples.
Power Supply	:	9V DC power adapter supplied (RomEm-4 has internal 9V NiCad rechargeable battery with built-in charging circuitry).
System Requirements	:	IBM PC/XT/AT or compatible with parallel printer port and cable, at least 110KB RAM available, color or monochrome monitor and DOS 2.0 or above.

TYPICAL FIRMWARE DEBUGGING SESSION WITHOUT ROMEM-4

Step 1. Program editing and assembly.
Step 2. Program downloading to EPROM programming for firmware EPROM programming. (Erase EPROMs if no blanks or new ones are left.)
Step 3. EPROM insertion into the target system.
Step 4. Program debugging without any debugging tools (unless you are using an expensive in-circuit emulator).
Step 5. If bugs are found, repeat from Step 1, else finish the session possibly wondering if there isn't a better way to do all of this.

Advanage:
• EPROM is already programmed when session is over.
Disadvantage:
• Time spent to program and erase EPROMs every time you need to test the code.
• Can't make even a single byte change in the code while testing.
• No debugging capabilities available unless you are using an expensive in-circuit emulator.

TYPICAL FIRMWARE DEBUGGING SESSION WITH ROMEM-4

Note: Before you start debugging a new project you will want to edit your MAKE fole or a BATCH file to include commands for setting up RomEm-4 and for downloading the executable code after each program assembly.

Step 1. Program editing and assambly. Automatic down loading after assembly (5 seconds for 64K bytes).
Step 2. Code debugging. Make code changes using the built-in editor.
Step 3. If major changes are required, repeat from Step 1, else nd the session wondering how you have managed to develop/debug code without RomEm-4 in the past.

Advantage:
• Considerable time and effort savings. (RomEm-4 will pay for itself within a few weeks or months.)
Disadvantage:
• Need to edit your MAKE file or BATCH file to automate the downloading process.

ORDERING INFORMATION:

ROMEM-4-1M	:	1MBit RAM, Target Interface Cable with 32 pin DIP Plug, Parallel Port Cable, Power Adapter ... $ 395
ROMEM-4-4M	:	4MBit RAM, Target Interface Cable, Parallel Port Cable, Power Adapter .... $ 695
ROMEM-4-U4M	:	4MBit RAM upgrade .. .. $ 300
ROMEM-CC4	:	Four connector flat ribbon Cascade Cable for connecting up to four RomEm-4s in parallel ...... $ 13
ROMEM-TIC28	:	Optional 12" Target Interface Cable with 28 pin Dip Plug .... $ 19

MASTER CHARGE, VISA & AMEX accepted.   California residents add local sales tax.

WARRANTY AND MAINTENANCE:

RomEm-4 is guaranteed to be free from manufacturing defects at the time of purchase. B&C Microsystems will repair or replace any malfunctioning units due to manufacturing defects, free of charge for a period of one year from the date of

romem4Bd   March 1992
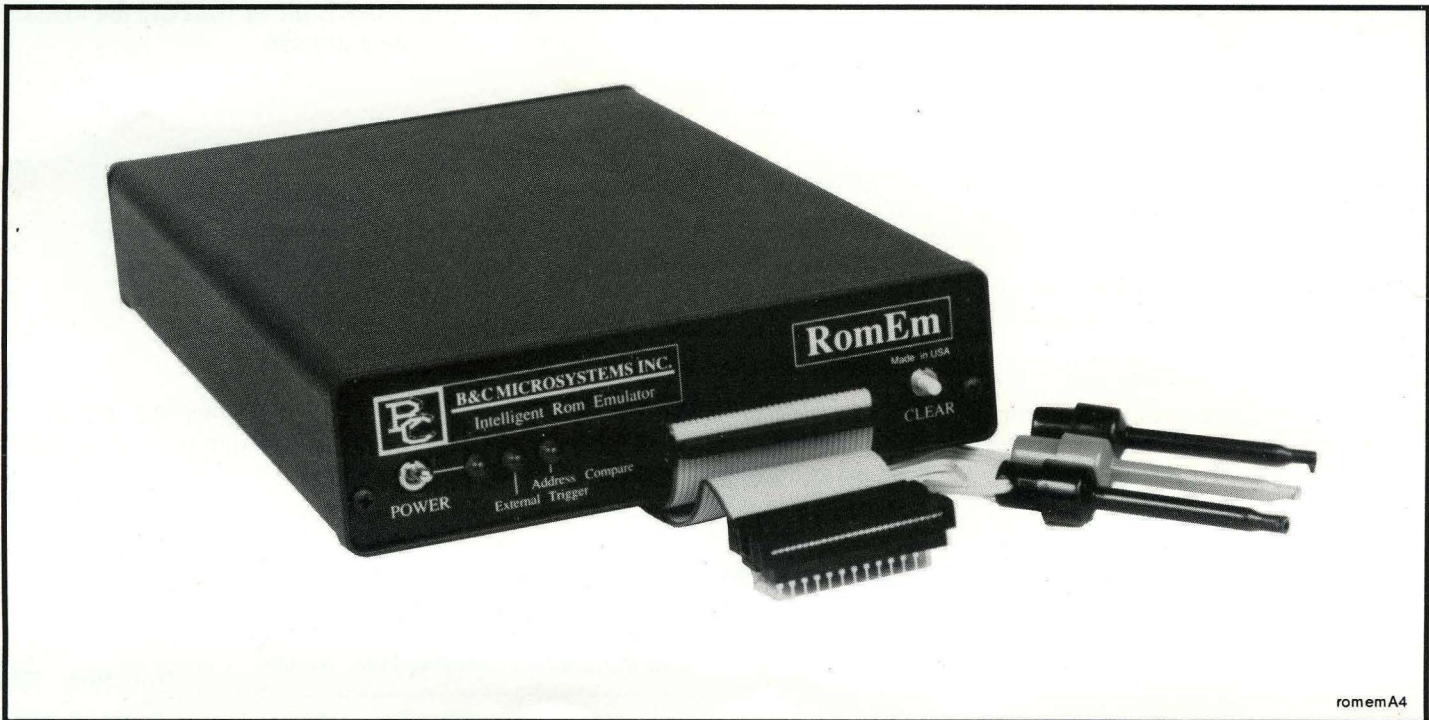
RomEm

November 1991

INTELLIGENT ROM EMULATOR FOR IBM PC/XT/AT COMPUTERS

OVERVIEW:

- **RomEm** is an inexpensive and extremely useful development tool for anyone who develops firmware for EPROM or ROM based systems.
- **RomEm** substitutes **RAM** for **ROM** during firmware development so that code can be tested and debugged without burning EPROMS.
- Simply download the code into the emulator and you are ready to test your target system.
- Make instant code changes by editing the RAM buffer using **Display, Edit, Fill,** and **Write** commands.
- **Intelligent built-in debugging features:**
  Address Compare - tells you if a given address was accessed during program execution
  Address Snapshot - informs you what address is being accessed when tapping the SPACE bar
  Trigger Input - monitors an event and saves the accessed address when the event occurred
  Halt Output - goes high when a given address is being accessed; can be used for halting the CPU
  Reset Output - lets you reset the target system
- **RomEm is processor independent.** It can operate alone or in conjunction with standard in circuit emulators and can be used to develop code for virtually any type of microprocessor system.

FEATURES:

- Emulates **2716** through **27512 EPROMS** with a single unit (2K to 64K bytes).
- Cascadeable up to **8 units** to emulate 8 separate devices. Can be used for different bus widths.
- RomEm connects to the standard **IBM-PC printer port (LPT1-4)** via a standard parallel printer cable.
- Supports **Binary file, Extended Intel Hex file** and **Motorola-S file formats** to be loaded.
- FAST program loading. **Loads 64K bytes of code in under 10 seconds on an IBM-AT.**
  User friendly command driven software permits interactive or batch mode control and usage of the intelligent features. **Can be used with batch files or with MAKE type programs.** RomEm configuration can be saved upon exiting the program.
- Includes a comprehensive **RAM Buffer Editor.**
- Includes **9V DC power adapter** and target interface cable with 28 pin DIP plug and three test clips for TRIGGER / HALT / RESET.
- **RomEm has rechargeable 9V NiCad battery backup** with built-in recharging circuitry. This allows the emulator to be disconnected from the computer after code downloading, for use in **Stand-Alone Mode.**

romemA4

ROMEM   TECHNICAL   SPECIFICATIONS

Emulation Speed	:	125 nsec typical access time, using standard 100 nsec static RAMs.
Emulator Interface	:	74AHCT373 devices.
Emulator Connector	:	DIP header with protective socket provided for emulation of both 24 and 28 pin devices.
File Formats	:	Extended Intel Hex, Motorola S, and Binary files supported.
Ease Of Use	:	On-line HELP available for all commands. Full documentation is also included with examples.
Power Supply	:	9V DC power adapter supplied. (RomEm has internal 9V NiCad rechargeable battery with built-in charging circuitry.)
System Requirements	:	IBM PC/XT/AT or compatible with parallel printer port and cable, at least 110KB RAM available, color or monochrome monitor and DOS 2.0 or above.

TYPICAL FIRMWARE DEBUGGING SESSION WITHOUT ROMEM

Step 1.   Program editing and assembly.

Step 2.   Program downloading to EPROM programmer for firmware EPROM programming. (Erase EPROMs if no blanks or new ones are left.)

Step 3.   EProm insertion into the target system.

Step 4.   Program debugging without any debugging tools (unless you are using an expensive in-circuit emulator).

Step 5.   If bugs are found, repeat from Step 1, else finish the session possibly wondering if there isn't a better way to do all of this.

Advantages :
■ EPROM is already programmed when session is over.
Disadvantages:
■ Time spent to program and erase EPROMs every time you need to test the code.
■ Can't make even a single byte change in the code while testing.
■ No debugging capabilities available unless you are using an expensive in-circuit emulator.

TYPICAL FIRMWARE DEBUGGING SESSION WITH ROMEM

Note: Before you start debugging a new project you will want to edit your MAKE file or a BATCH file to include commands for setting up RomEm and for downloading the executable code after each program assembly.

Step 1.   Program editing and assembly. Automatic downloading after assembly (less than 10 sec. for 64K bytes).

Step 2.   Code debugging using the intelligent features (Address Compare, Address Snapshot, Trigger Input, Halt Output, Continuous Monitor.) Make code changes using the built-in editor.

Step 3.   If major changes are required, repeat from Step 1, else end the session wondering how you have managed to develop/debug code without RomEm in the past.

Advantages:
■ Considerable time and effort savings. (RomEm will pay for itself within a few weeks or months.)
Disadvantages:
■ Need to edit your MAKE file or BATCH file to automate the downloading process.

ORDERING INFORMATION:

ROMEM :	Includes rechargeable battery backup for stand-alone operation
ROMEM-CC4 :	Four connector flat ribbon Cascade Cable for connecting up to four RomEms in parallel
ROMEM-PC6 :	6 ft. Parallel Printer Port Cable

California residents add local sales tax.
MASTER CHARGE, VISA & AMEX accepted.

WARRANTY AND MAINTENANCE:

RomEm is guaranteed to be free from manufacturing defects at the time of purchase. B&C Microsystems will repair or replace any malfunctioning units due to manufacturing defects, free of charge for a period of one year from the date of purchase. Excluded from the above are units damaged by means of improper use, abuse or negligence.