

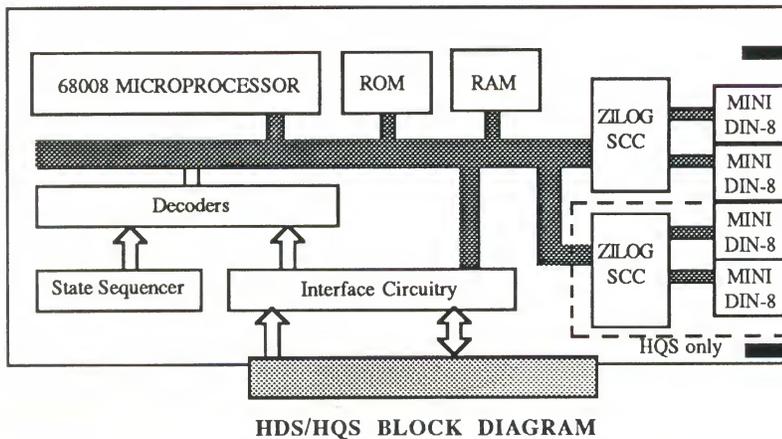
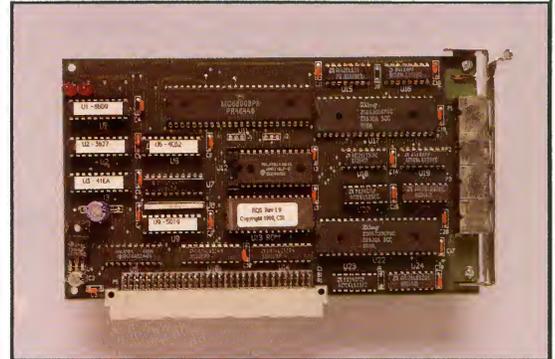
Hurdler II Serial/Parallel Nubus Add-On Boards

Creative Solutions, Inc.

TECHNICAL DATA SHEET

HURDLER-HDS
HURDLER-HQS

Two and Four Channel Serial Interfaces for the Macintosh II



FEATURES

- Very cost effective
- HDS has 2 serial ports; HQS has 4
- RS-232 and RS-422 compatible
- On-board 68008 microprocessor
- Operates at speeds in excess of 38,400 baud per channel
- HDS may be upgraded to 4 ports
- A/UX driver available

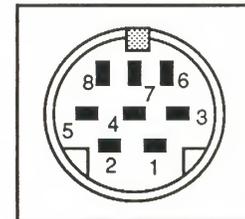
APPLICATIONS

- Connecting modems, printers, plotters
- High speed data acquisition
- Remote process control
- Interface to LocalTalk and other networks
- Interface to other computers

The Hurdler-HDS and HQS are dual and quad port serial boards for the Macintosh II. The Mini-DIN connectors and signals used on this interface are the same as those provided with the Macintosh II (Figure 1).

The local 68008 microprocessor offloads most real-time serial activity from the Macintosh II's 68020 processor. All I/O is buffered to guarantee that no data is lost while the 68020 is busy servicing other higher priority interrupt sources such as floppy disk or LocalTalk (AppleTalk). Sustained rates in excess of 38,400 baud are available on all four channels simultaneously. The 68008 may be custom programmed to handle unique, higher performance end-user applications such as MIDI, process automation and networking.

The Hurdler-HDS/HQS is accessed in exactly the same manner as the existing two serial ports on the Macintosh II. These are named ".ain", ".aout", ".bin" and ".bout". At startup, each Hurdler-HDS/HQS serial channel is automatically configured and assigned the first available driver name in alphabetical sequence. For example, a HDS plugged into slot 9 will have ports that may be accessed as ".cin", ".cout", ".din", and ".dout". The current ".a" and ".b" port drivers may be aliased to HDS/HQS ports via the control panel allowing existing communications applications to operate over HDS/HQS serial channels. Access to the ports by end user applications is also provided via function keys and/or a new INIT feature that provides access to the ports under the new Comm Toolbox. These software tools are included with the board and documentation.



1. Output Handshake (DTR)
2. Input Handshake (CTS)
3. Transmit data -
4. Ground
5. Receive data -
6. Transmit data +
7. (DCD)
8. Receive data +

Fig 1. Serial port connector

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301-984-0262, technical questions

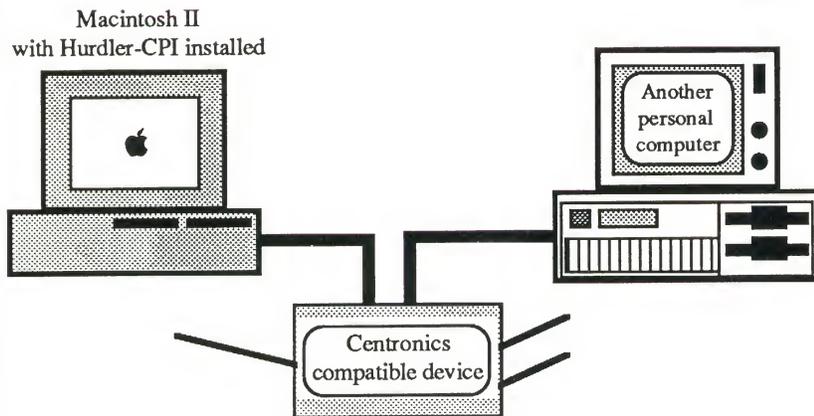
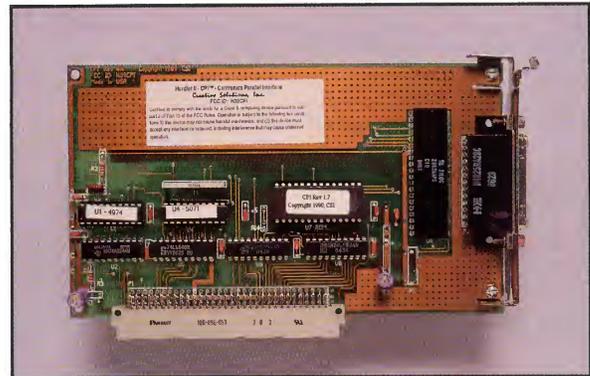
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TECHNICAL DATA SHEET

HURDLER-CPI

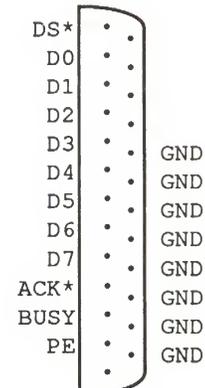
Centronics Parallel Interface for the Macintosh II



FEATURES

- Centronics interface
- Very cost effective
- 25 pin D-connector
- Same connector pinout as IBM PC printer interface

Hurdler-CPI Connector



The Hurdler-CPI is used to connect a Macintosh II to any of hundreds of devices that use a Centronics compatible interface. For years the Centronics port has been the standard interface to printers in the micro-computer world.

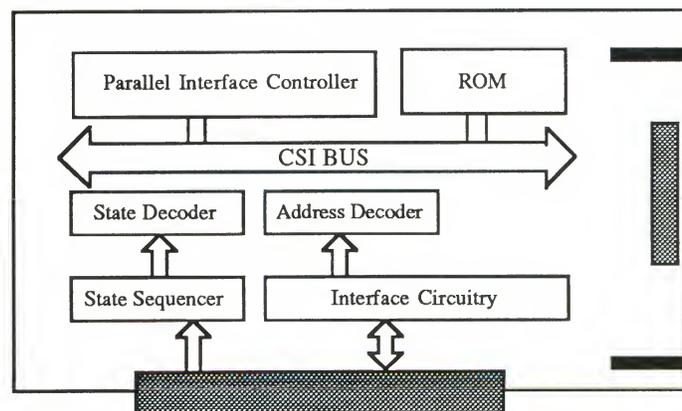
The Hurdler-CPI has a 25-pin D-type connector. The connector and signals are the same as that on IBM PCs and compatible printer interfaces. So the same printers and cables used on IBM PCs and compatible computers may now be used with the Macintosh II.

The ROM on the Hurdler-CPI contains a self-installing driver under the Macintosh operating system. Shortly after power is applied to a Macin-

tosh II, the ".Hurdler-CPI" driver is automatically installed in the system heap and opened. Those familiar with other Macintosh drivers (such as the serial drivers) should feel right at home interfacing to this driver. The driver provides classical Macintosh Open, Close, Write, Status, and Control operations which are discussed in the User's Manual.

The Hurdler-CPI has been used to interface to laser printers, color printers, plotters and various other devices with Centronics interfaces.

The ROM on the Hurdler-CPI may be customized for OEMs wishing to have a custom driver installed.



HURDLER-CPI BLOCK DIAGRAM

TECHNICAL DATA SHEET

HURDLER-II

The NuBus HURDLER™

Prototyping Card

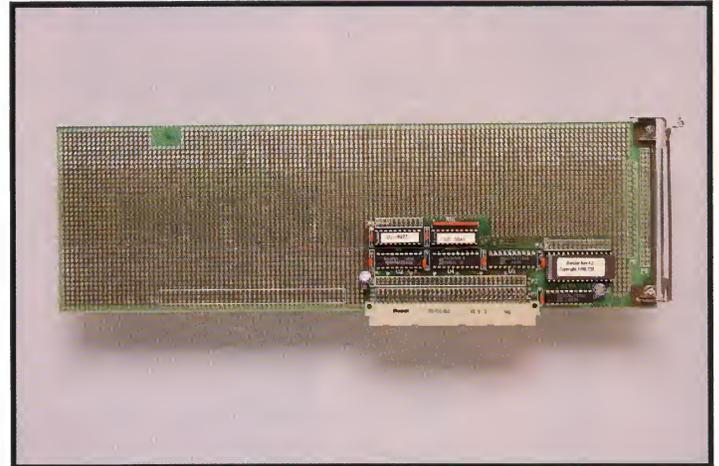
NuBus is the new expansion bus for the Macintosh II. It details mechanical and electrical specifications for all expansion cards. This presents an exciting opportunity for scientists, engineers and hobbyists to produce custom tailored interface cards for the Macintosh II.

Although selection of the NuBus by Apple is certainly a wonderful long term solution, it does impose two short-term barriers that can impede development of interface cards.

First, the NuBus is a 10MHz multiplexed address and data, synchronous bus. Peripheral chips require that address and data lines be demultiplexed, and appropriately sequenced. Suitable control signals also must be synthesized. This is a lot more complicated than the conventional Intel-Zilog or Motorola peripheral chip bus interfaces with which most potential card developers are familiar.

Second, all NuBus slot cards, in order to be accepted by the Macintosh operating system, are required to contain a "Slot Declaration ROM". This ROM specifies critical interface parameters, and allows uniform logical access regardless of the actual physical implementation of the card. This may require a significant software engineering effort.

The NuBus Hurdler prototyping card is intended to allow both personal and professional card developers to quickly leap over these barriers, and be productive in hours, rather than weeks. Anyone familiar with digital logic will easily be able to attach I/O cards, devices or LSI integrated circuits to create new and innovative hardware products.



The "Hurdler" prototyping card features:

- Complete interrupt driven NuBus slave interface to conventional Motorola, Intel or Zilog type busses and peripheral devices.
- 3800 pin wire-wrap area
- Hard copy source code for ROM driver in manual
- 8 bit interface can be expanded up to 32 bits by adding additional transceivers and using existing control lines.
- Schematic and timing diagrams provided in manual
- 28 Pin ROM/RAM socket with generic configuration ROM can hold up to 32K of RAM or ROM
- Software driver that provides high level interface to card, accessible from any development language
- Application notes included with the Hurdler documentation provide examples for interfacing to some of the most popular IC peripheral chips.
- Reasonably priced, \$199.

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Price List
September 1, 1990

Software Pricing:

MacFORTH Plus *The Language of Innovation™* **\$199.00**

•Royalty Free License Agreement

- Multi-Tasking
- Floating Point
- "TE Edit" Support
- Snapshot (for fast startup)
- Overlay Manager*
- Text Editor
- Mac User Interface
- Real Time Trace & Debug
- Mac II Tools
- Online Glossary Tool
- In-line Assembler
- "Controls" Support
- Advanced Graphics
- Complete Turnkey Capability
- Combined Glossaries
- Language/Operating System
- User Defined Menus & Windows
- Sound Feature
- Standalones (XCMDs, DAs drivers)

MacForth Tools Available - Call for newsletter & pricing

MacForth Upgrade - Level 1, 2, or 3 to MacForth Plus \$ 79.00

Hardware Pricing:

Hurdler II - add on boards for the Macintosh II:

Hurdler II - Proto wirewrap version **\$199.00**
CPI - Centronics Parallel Interface for the NuBus **\$199.00**
CER - Compression/Expansion/Rotation Card **\$995.00**
HDS - Two Channel Serial Interface (\$80 upgrade to HQS) **\$299.00**
HQS - Four Channel Serial Interface **\$379.00**
HEXT - Extender brings card out of Mac chassis for development **\$ 59.00**
SUPERSCSI - SCSI accelerator card **\$989.00***
ROM Development System - source code and script examples for use as templates to create your own ROMs. Software utility for Hurdler clients. **\$149.00**

Hurdler SE/30 - Macintosh SE/30 Boards:

Proto - blank breadboard for developers w/120 pin connector **\$59.95**
Extender - right angle extender to bring proto board out of chassis **\$49.95**

Hurdler FX - Macintosh IIfx Boards:

Proto - blank breadboard with NuBus & PDS connector **\$99.00**
Extender - to bring proto board out of the Mac chassis- also has NuBus & PDS connectors **\$99.00**

*Products may not be eligible for standard volume discounts.
Site licenses and group/dealer discounts available upon request.

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1-800-FORTH-OK (367-8465) or 301-984-0262 in MD