CodeTAP® Emulator
for Intel® 80960 CA/CF Microprocessors

Highlights

- Real-time, source-level debugging for software engineers
- Cost and time-efficient
- Runs in real-time at 40 MHz
- Fully transparent
- Supports all 80960 CA and CF features
- Powerful source-level debugger
- Supports Intel, MRI, and GNU 80960 compilers
- Hardware and software breakpoints
- Instruction trace
- Ethernet communications on SUN and HP workstations
- Big-Endian support
- Profile and code coverage support for Intel's optimizing compilers

Companion Products

- CodeTEST™ embedded software verification tools for 80960 Cx offer developers and testers comprehensive software performance analysis, code coverage analysis memory allocation analysis and software trace
- EL 3200 Emulator for 80960CA/CF provides full-featured, real-time transparent emulation at 40 MHz. Additional features focus on hardware/software debug and integration. Like CodeTAP, it comes complete with the sophisticated MWX-ICE debugger for PC, Sun4 or HP hosts,

Put patented, low-cost CodeTAP emulation technology in your toolkit.

Patented Emulation Technology for Enhanced Productivity

CodeTAP 80960 uses advanced emulation technology to give software engineers all the debugging functions they use most, such as software and hardware breakpoints and modification of memory and processor registers.

With affordable, real-time debugging power at your workstation, CodeTAP helps you maintain your development schedule and your budget.

With CodeTAP, you have full support for all 80960 CA and CF features, including instruction and data caches, burst mode, pipeline and different bus widths.

To round out your development solution, combine deeply-featured EL 3200 emulators, CodeTAPs and CodeTEST™ to put needed functions where they count. You get all the power you need, lower cost-per-seat and increased productivity.

Applied Microsystems Corporation

True Transparency and Full Processor Support

CodeTAP uses a custom ASIC with advanced emulation technology to give software engineers visibility and control for executing and debugging code. Offering true transparency, CodeTAP requires no code modifications and doesn't consume target memory, communication resources, I/O locations, or interrupt vectors.

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Trace and Breakpoints for Access and Control

Instruction trace helps you analyze software performance under real-time conditions. The 8K trace buffer can capture the flow of instruction events during code execution, at full processor speed, with the instruction cache enabled.

Four hardware breakpoints are available. You can set two execution breakpoints on line numbers, program labels, or memory addresses, and two access breakpoints on access or write bus cycles. You can also set as many as 68 software breakpoints.

Just Plug in the Probe and Go

The CodeTAP emulator replaces the 80960 CA or CF microprocessor on the target with a compact Target Access Probe. The probe connects to a PC, Sun or HP workstation with the supplied communications adapter and a narrow ribbon cable. Ethernet communications are available on SUN and HP workstations, with RS-232C communications support on PCs.

Graphical Debugging Speeds Development

MWX-ICE is a function-rich C/C++, source- and assembly-level debugger. Available for PC , Sun4, or HP hosts, MWX-ICE gives you quick and easy visibility and control of code execution in your target.
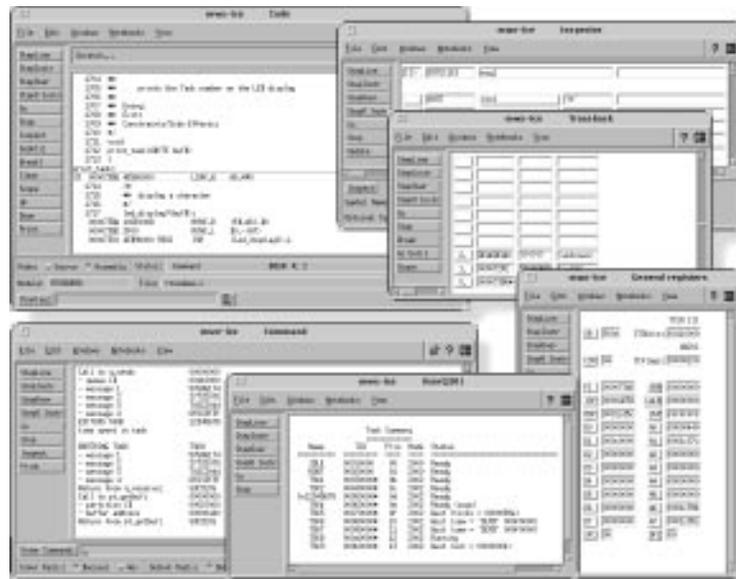
The multi-windowed debugger speeds development with simultaneous display including (clockwise from upper left): symbolic representation of structure elements; stack values; call tracing; register values; interleaved source and assembly; and pure source code.

This intuitive debugger combines a point-and-click windowed interface, extensive macro capabilities, and a comprehensive hypertext on-line help system with Applied's specially engineered support for all the features of the CodeTAP emulator. It gives you simple, straightforward control of your target and the CodeTAP, whether you prefer to work with a mouse or from the command line.

With the notebook feature, you don't have to remember debugger command language. Instead, you can build even complex command sequences just by pointing and clicking. And the context-sensitive hypertext help system means you don't waste time hunting through manuals.

The multi-windowed graphical interface lets you visually organize your debug environment for a more natural approach to debugging. For

example, you can display source code together with the corresponding assembly language in separate windows to clarify the relationship between them and verify compiler performance.

MWX-ICE accepts executables from the popular tool chains, such as Intel's i960, GCC960 and MRI's C/C++ compilers.

Put CodeTAP in Your Tool Kit
Putting CodeTAPs in your development system lets your entire team be more productive and helps get your product to market sooner. To find out more about how CodeTAP can streamline your embedded system development, call today, 1–800–426–3925.
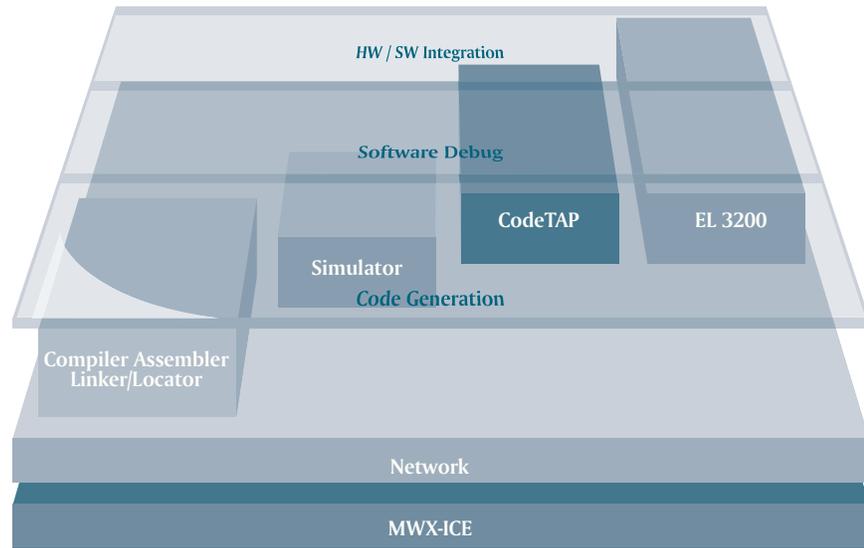
CodeTAP emulators can be used independently, or in an integrated system of development tools from Applied Microsystems.
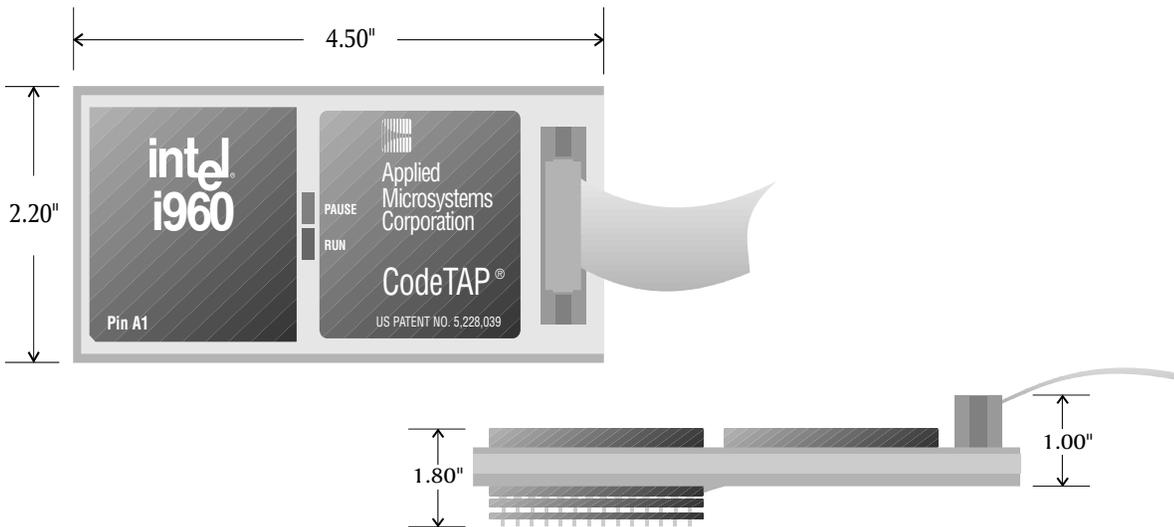
Dimensions of the CodeTAP 960 Cx emulator.

CodeTAP Emulator for Intel 80960 CA/CF Microprocessors

Microprocessors Supported
Intel 80960 CA/CF
Runs in real-time from 10–40 MHz

Packages Supported
PGA direct
PQFP with optional adapters
Rotation adapters also available

Minimum Host Requirements
PC 386 or better
Microsoft Windows 3.1 or higher,
12 MB RAM minimum,
16 MB recommended
Sun SPARC
16 MB RAM minimum, 20 MB swap,
Sun OS 4.1.x, Solaris 2.2/2.3,
Ethernet port
HP 9000/700
16 MB RAM minimum, 20 MB swap,
HP/UX 9.0 or later, Ethernet port

Communications
PC Environment
RS232C serial
Sun/HP Environments
IEEE 802.3
10base2, 10base5, 10baseT

User Interface
Integrated Source Level Debugger
Multi-Windowed interface (X-windows/Motif on workstations, Windows on PC)
Support for Intel, GNU, and MRI C/C++ and assembly language
Access to all global, local, stack-based and register-based symbols with full data typing features
Execution breakpoints can be set on line numbers, source statements, program labels and memory addresses
High-level control of all emulation subsystems
Profile support for Intel's optimizing C compilers and code coverage utilities
Macros use C-like statements and debugger commands, can access source code variables and can be tied to breakpoints
Big-Endian support
Common interface with Applied's EL 3200 and CodeICE emulators

Extended Register Support
Explode MCONs, PRCB, and IBR for quick access to states and meanings of bit fields comprising these values

Trace System
8K deep
Captures program activity

Breakpoint System
Four hardware breakpoints:
Two execution breakpoints on line numbers, program labels, and memory addresses
Two access breakpoints on read or write bus cycles
68 software execution breakpoints

CodeTAP 80960 Components
Target Access Probe
RS-232C Communications Adapter
Ethernet Communications Adapter
CodeTAP 80960 Reference Guide
Source-Level Debugger
Debugger User Documentation

Power Requirements
Source: Target
Consumption: 4.5 watts (CPU)
                      2.2 watts (CodeTAP)

Physical Specifications
Target Access Probe:
4.5" x 2.2" x 1.0"
(11.4 cm x 5.59 cm x 2.54 cm)
Ethernet Communications Adapter:
5.88" x 3.19" x 1.12"
(15.08 cm x 8.17 cm x 2.87 cm)
Port:
10Base5
10BaseT and 10Base2 adapters available
RS232C Communications Adapter:
4.75" x 3.5" x 1.18"
(12.07 cm x 8.89 cm x 3.05 cm)
TAP cable: 20" (50.8 cm)
Weight: 10 oz. (280g)
Storage temperature: -40° C to 70° C
(-40° to 150° F)
Operating temperature: 0° to 40° C
(32° to 104° F)

Warranty and Support
Applied Microsystems products include a standard limited warranty on software and hardware. An extended support agreement that provides additional coverage of one or two years is also available.

For more information, call 1-800-426-3925, e-mail info@amc.com, or browse http://www.amc.com