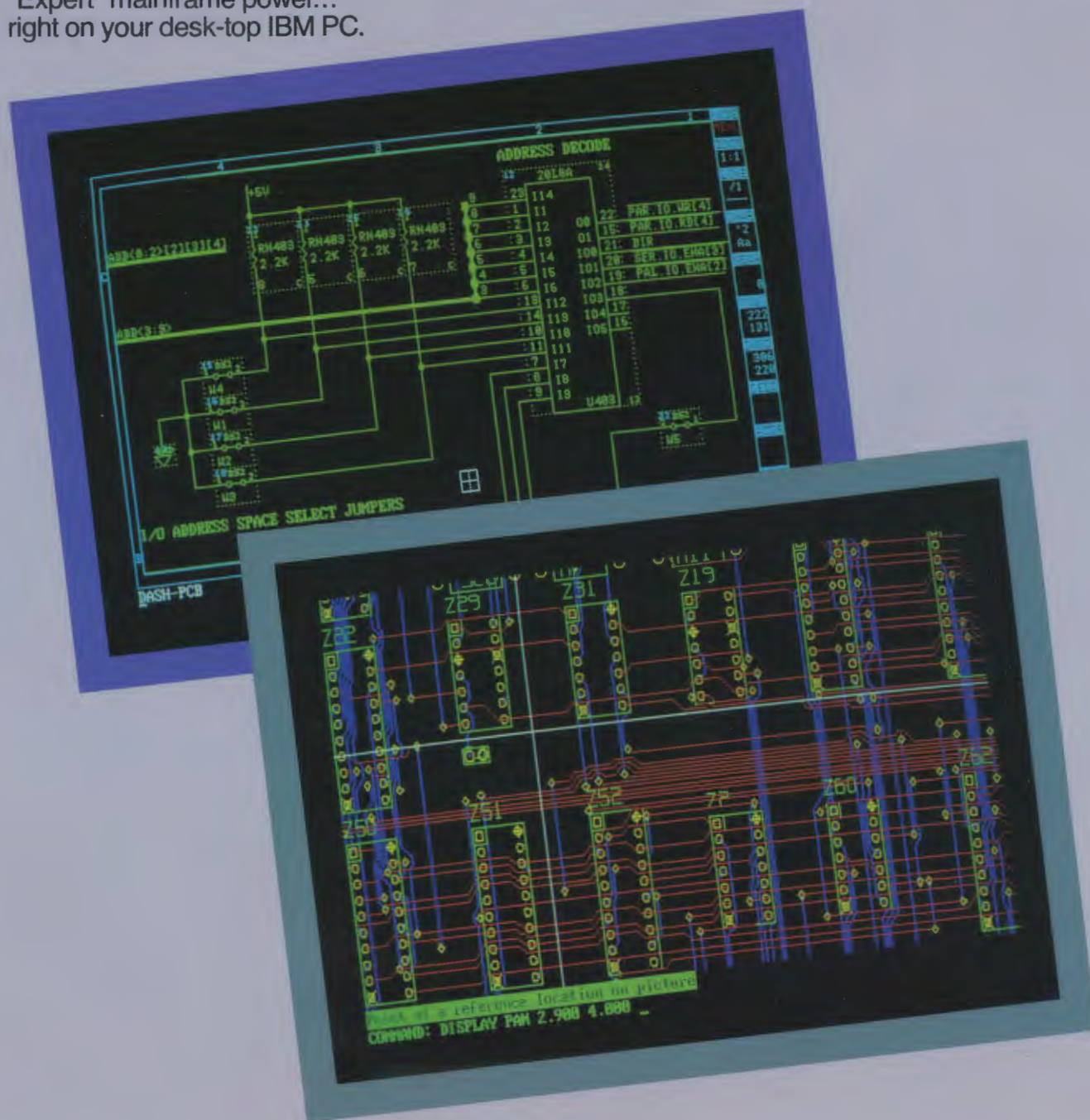


DASH™-PCB

Printed Circuit Board Layout System.
"Expert" mainframe power...
right on your desk-top IBM PC.



FutureNet®



*FutureNet —
The Time Saver*

FutureNet DASH-PCB: Mainframe PCB Layout Power Right at Your Desk, on the IBM PC

DASH-PCB is an innovative PC Board Layout System "expert" that extends your pc-based FutureNet DASH Schematic Design and Documentation System. Combining all the features of a proven layout system previously available only on a DEC VAX-class mainframe, DASH-PCB gives you a package that is cost-effective, easy to learn, easy to use, and highly productive. Circuit layout tasks can be completed four to six times faster than manually. Convenience features such as switched screens, mouse control, hierarchical menus, and command files all contribute to the ease and effectiveness of using DASH-PCB. For the first time, you have mainframe PCB layout power in an easy-to-use package, right at your desk.

Some of DASH-PCB's Powerful Features:

■ **Expert Multi-Strategy Router** — DASH-PCB's Expert Multi-Strategy™ Router gives you the ability to optimize your layout by choosing your auto-routing strategy from several sophisticated routines. You can also define a customized strategy if needed for unique requirements.

■ **Trace Hugging** — To free a maximum number of routing channels, DASH-PCB automatically runs traces as close together as you desire.

■ **Trace Rubber-Banding** — Real time rubber-banding assists in component layout by retaining connections during repositioning of parts while also displaying a full or partial "rat's nest."

■ **Fine Line Rules** — DASH-PCB accommodates fine line rules for high density boards.

■ **Automatic 45 Degree Routing** — Corners are routed at 45 degree angles (not truncated after routing) to reduce lengths of traces, and save space on the board.

■ **Layout to Net List Comparator** — DASH-PCB compares the routed PC board net list to your original schematic net list to assure accuracy.

■ **Any Number of Components** — DASH-PCB can handle as many resistors, capacitors, transistors, diodes, surface mounted devices, and any other discrete or IC components you can physically place on your board.

■ **Large Board Capacity** — DASH-PCB accommodates large or small boards, any shape desired, fitting within a 32 inch by 32 inch square (812.8 mm × 812.8 mm).

■ **18 Trace Layers** — Boards may have up to 18 routable layers including any combination of power and ground planes to handle the most complex designs.



■ **Flexible Grid Sizing** — Grid sizes may be selected down to one mil, yielding performance comparable to so-called "gridless" routers.

■ **Two Displays in One** — Some other layout systems require two display screens, forcing the user to constantly look from one screen to the other. DASH-PCB provides instantly switched displays on a single screen, using mouse control.

Here's How DASH-PCB Helps to Lay Out Boards the Way You Would:

■ **Easy Transition from Schematic** — Once your circuit has been created on the FutureNet DASH Schematic Designer, the DASH pin list becomes the input for DASH-PCB. The DASH pin list contains all the intelligence of the design, including information about parts and interconnections.

■ **Rubber-Banding Helps to Optimize Component Placement** — On your command, a "rat's nest" display appears, showing the origins and destinations of all interconnects. You can use the mouse to position devices for the shortest, most direct interconnect paths and to balance

trace density throughout the board. You can also specify the placement of any critical traces and components before auto-routing. It is also possible to display only the connections to a single package.

As you move parts around the screen, all "rat's nest" connections are "rubber-banded" in real time, to show interconnects.

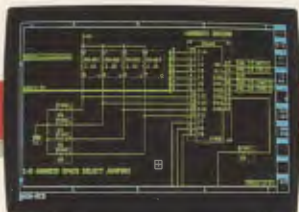
Power and ground traces, as well as rectangles for heat sinks, ground plates, and "keep-out" areas may be added as required. Your board is now ready for auto-routing.

■ **Auto-Routing with the Mind of an Expert** — The DASH-PCB Expert Multi-Strategy auto-routing system has no equal. Using 45 degree lines for direction changes, intelligent feed-through placement, and trace hugging, the system closely parallels the results of an experienced PCB designer. Rather than blindly attempting a 100% routing in the first phase, DASH-PCB will stop at a logical point with an exceptionally clean design. Any few remaining unrouted nets can be completed interactively, or finished by DASH-PCB's second stage finish router. During the automatic routing, DASH-PCB always observes your specified design rules. Your final board design matches your schematic and specifications exactly.

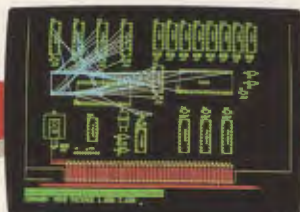
■ **Rules Check Ensures Accuracy** — The DASH-PCB Rules Check Program detects any errors or oversights that may have occurred during interactive routing. DASH-PCB compares the schematic net list to the connections made on the finished board to verify that they are identical. Additionally, full back annotation ensures that your DASH schematic will exactly match your DASH-PCB layout.

■ **Mainframe Power on Your Desk-Top PC** — DASH-PCB's mainframe power comes from a UNIX-based 32-bit co-processor board which plugs directly into your standard IBM XT or AT. DASH-PCB's speed and power approach that of a single-user VAX. DASH-PCB layout software, developed on a DEC VAX mainframe, has been proven in more than eight years of operation in a service bureau environment. The DASH-PCB co-processor can also be used by the DASH-CADAT-PLUS Logic and Fault Simulation Package.

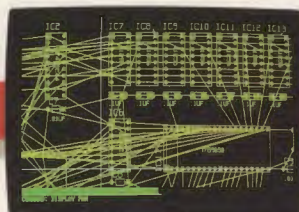
DASH-PCB is another cost-effective product from FutureNet Corporation, the world leader in pc-based CAE workstations. DASH installations are found in America's most important electronics companies and throughout the world. Put the power of FutureNet's DASH-PCB Printed Circuit Board Layout System to work for you, today.



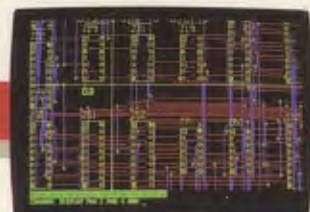
Easy transition from schematic



Rubber-banding helps to optimize component placement

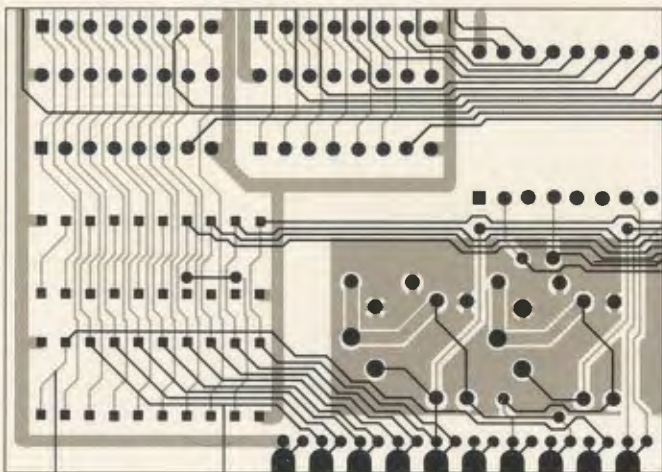


"Rat's Nest" shows origins and destinations of interconnects



Auto-routing with the "Mind of an Expert"

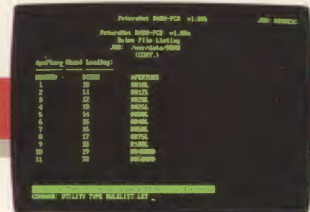
Expert Multi-Strategy Routing System gives you mainframe power and features on your PC



45 degree trace routing Trace "hugging" Analog signal routing Off-grid components and connectors

• Any trace width/air gap (in 1 mil increments) • Standard or fine line rules • Up to 32" x 32" board size with 18 layers

Full or partial ground planes



Rules Check ensures accuracy

EASY-TO-USE DESCRIPTIVE COMMAND MENUS

The DASH-PCB instant command menus use simple English words. The highest level menu specifies the action to be taken. The next level specifies the object to be acted upon, and the lower levels add further definition to the commands. Frequently used command sequences (macros) can be defined for convenience.



Four-level command menus simplify operation



Productivity of the Future... today.

FutureNet®

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