Channel Routing

CopperCAD™

CADWare

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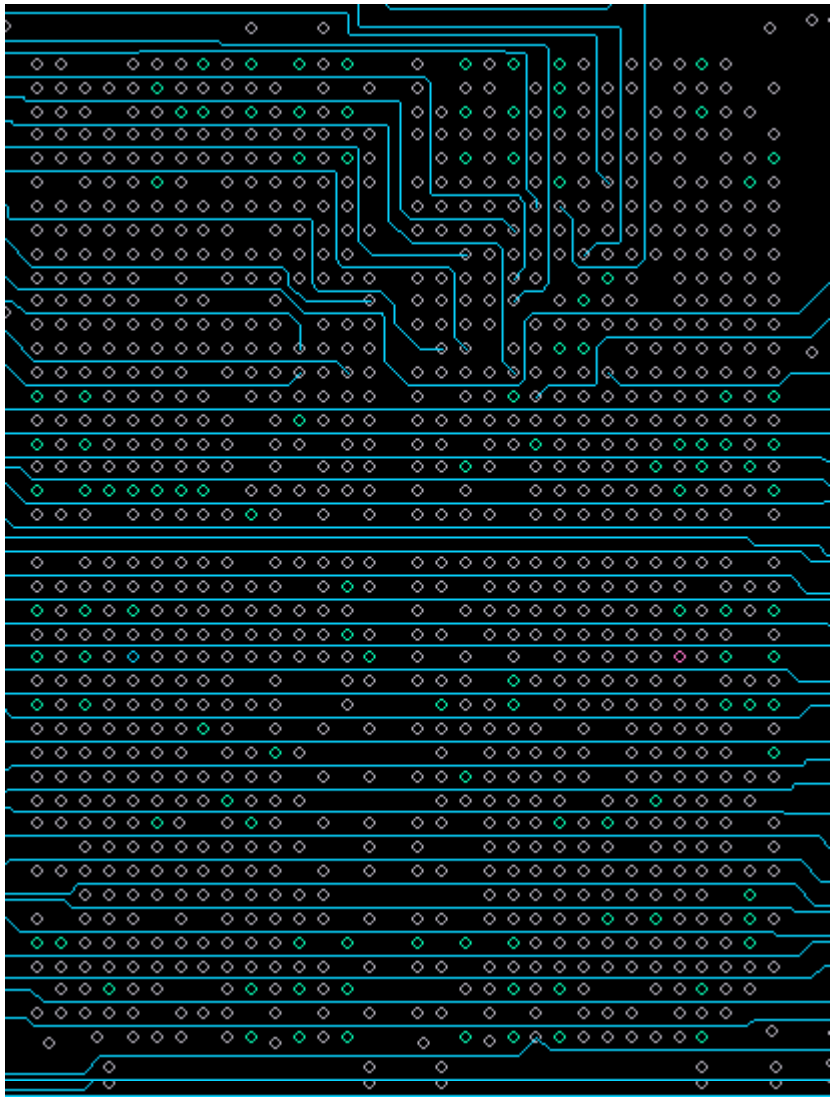
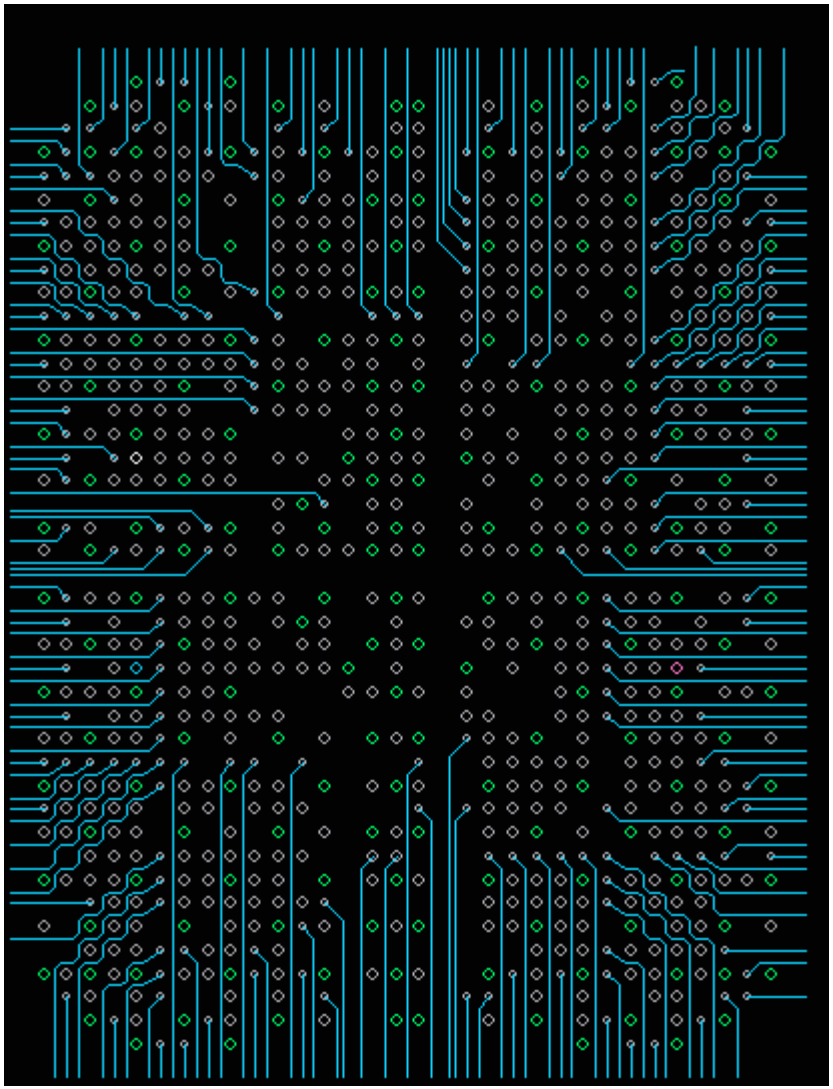
BGA 1247

Original Routing – Layer 1

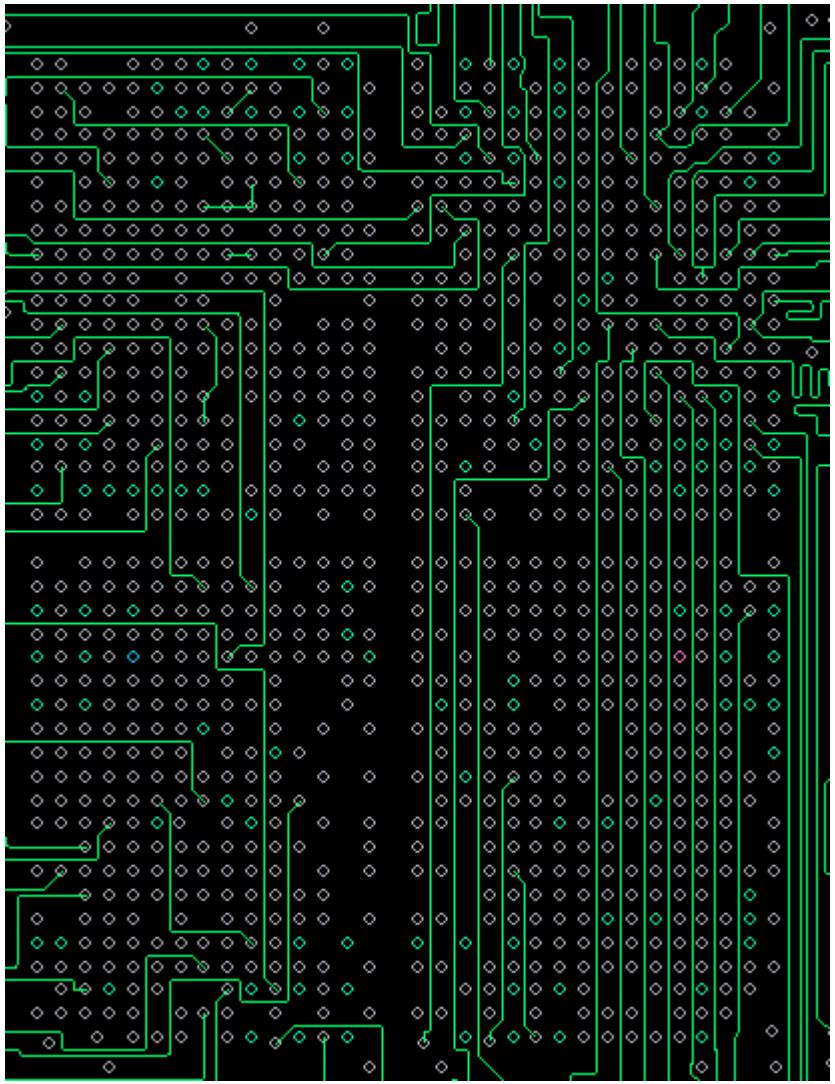


Channel Routing – Layer 1

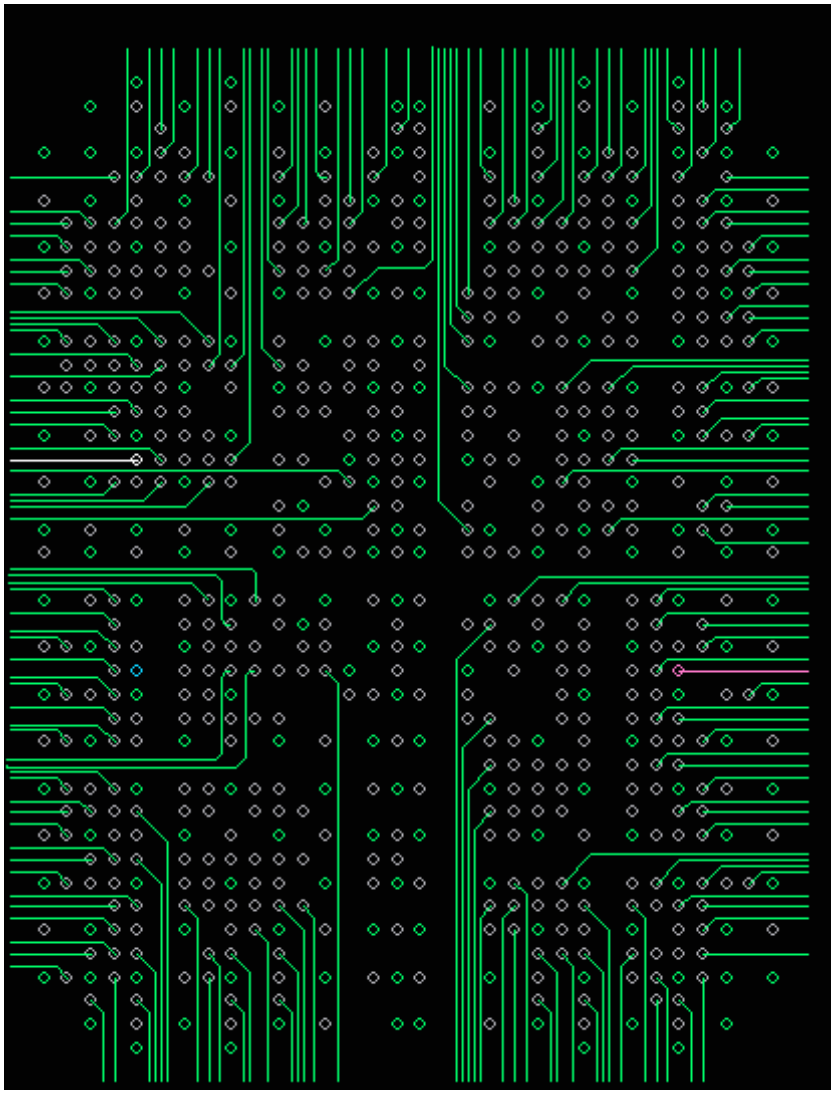


Signal Layer 2

Original Layer 2

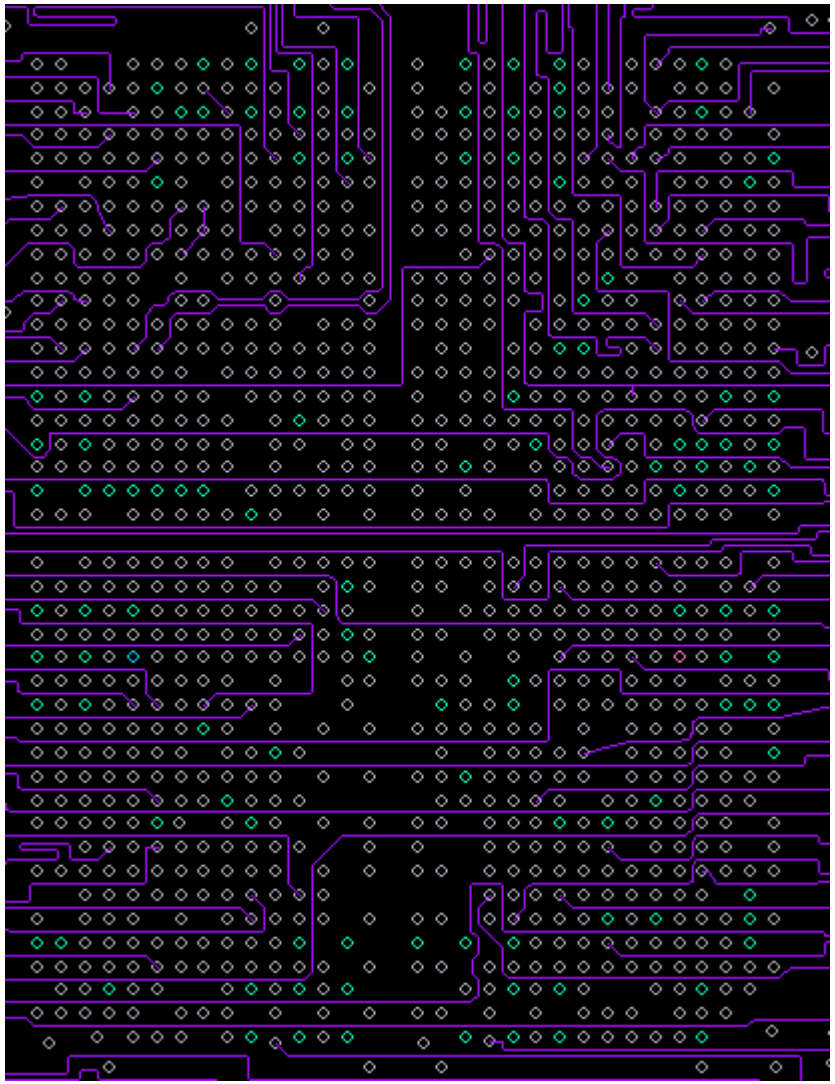


Channel Routing

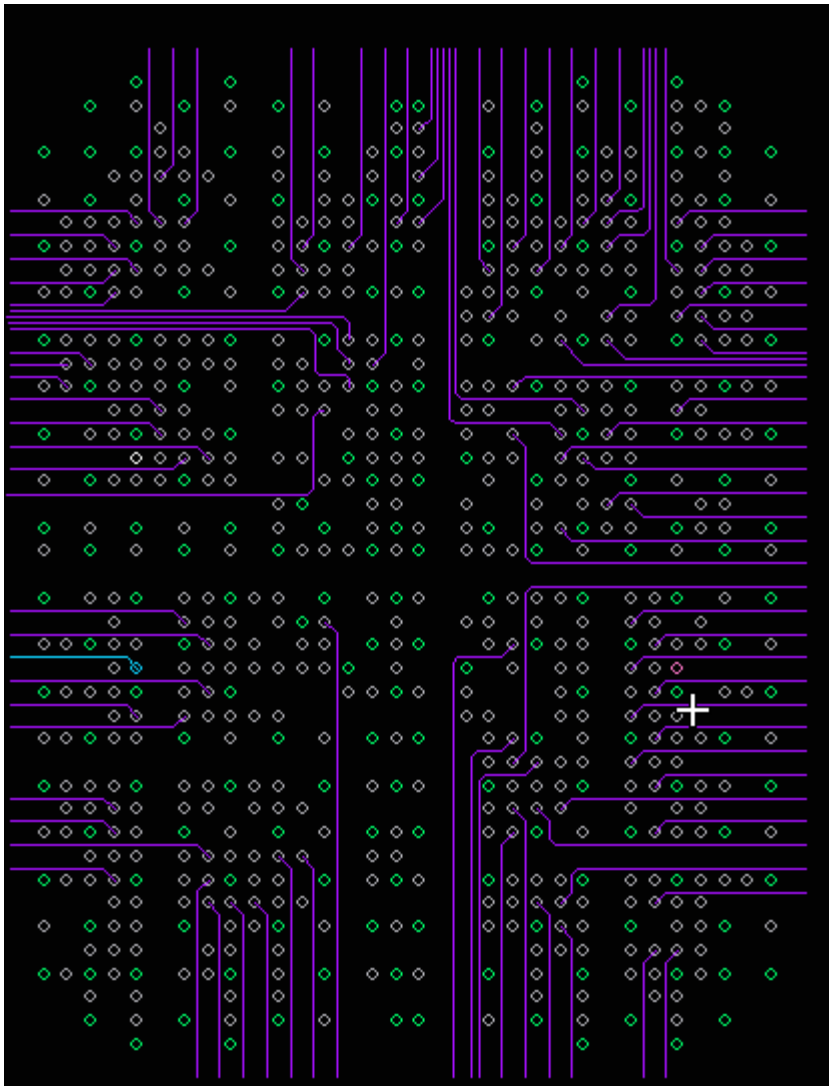


Signal Layer 3

Original Layer 3

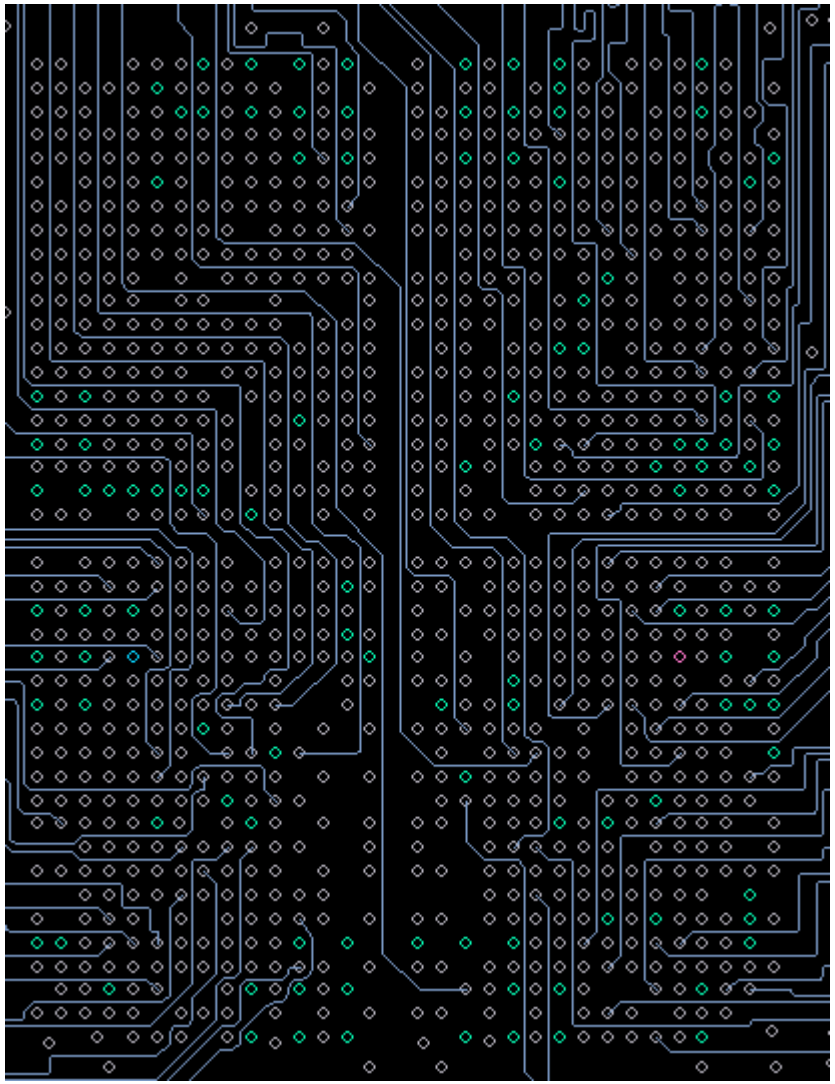


Channel Routing

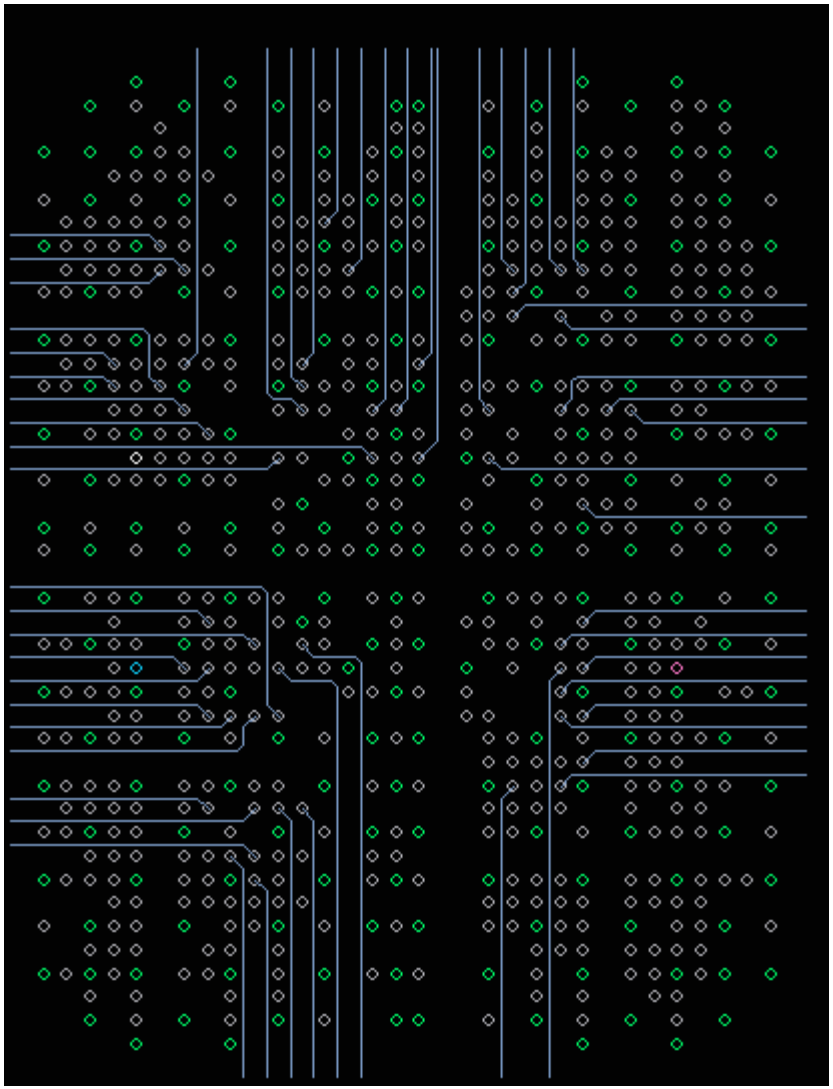


Signal Layer 4

Original Layer 4

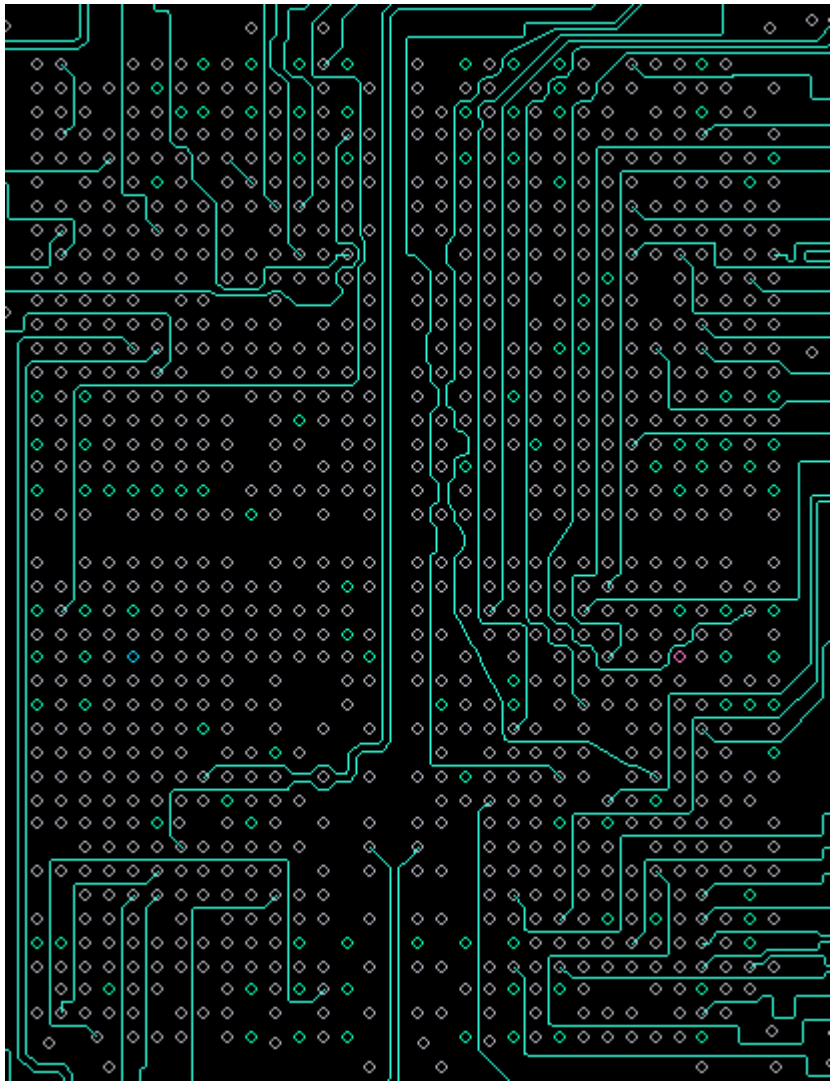


Channel Routing



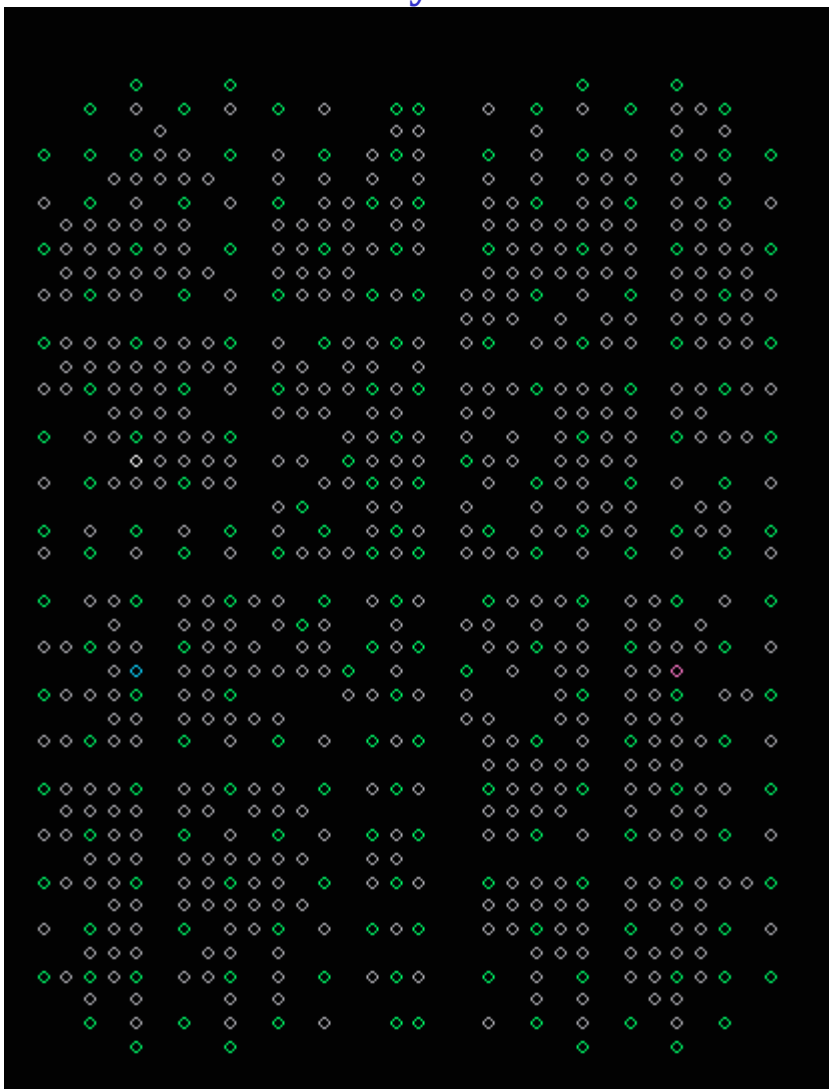
Signal Layer 5

Original Layer 5



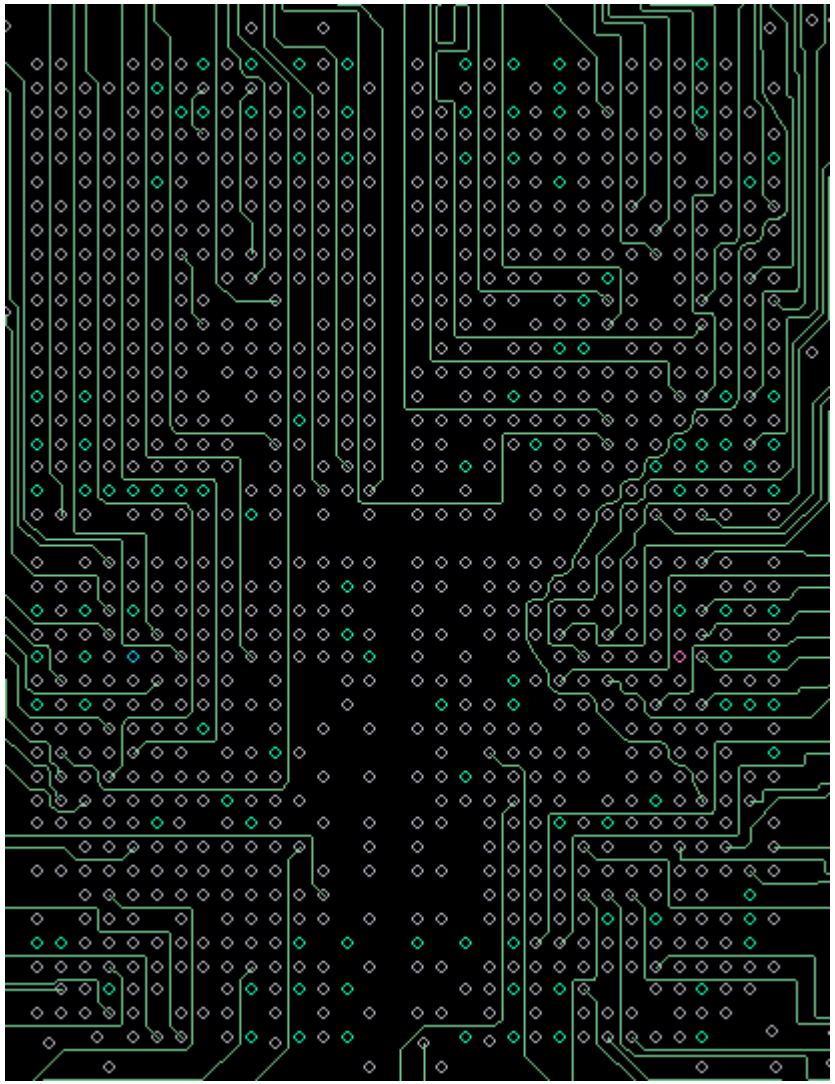
Channel Routing --- empty layer

First Layer Saved



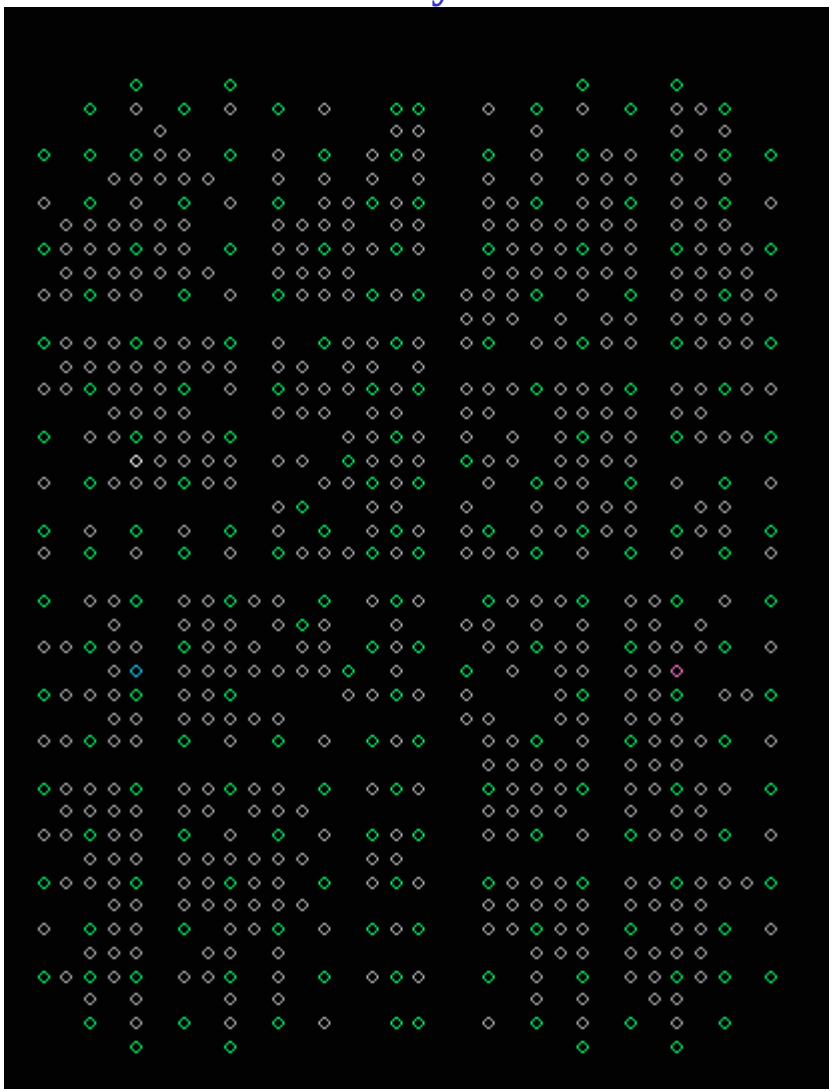
Signal Layer 6

Original Layer 6



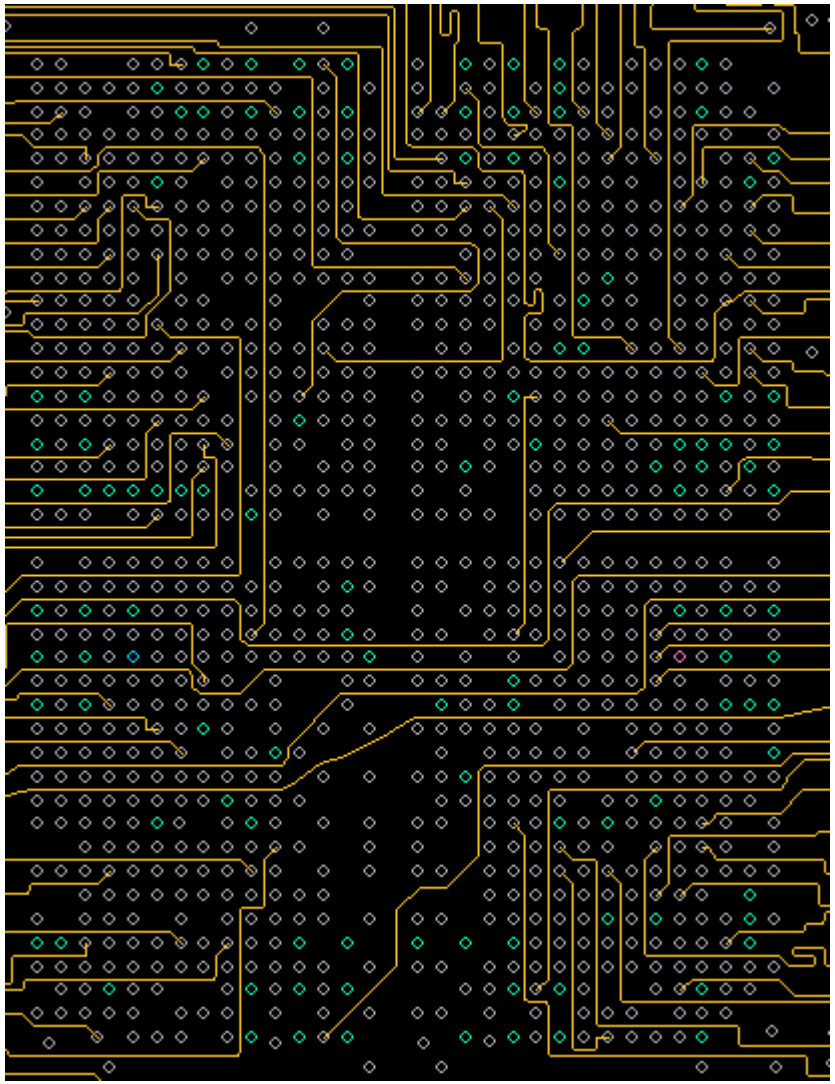
Channel Routing --- empty layer

Second Layer Saved



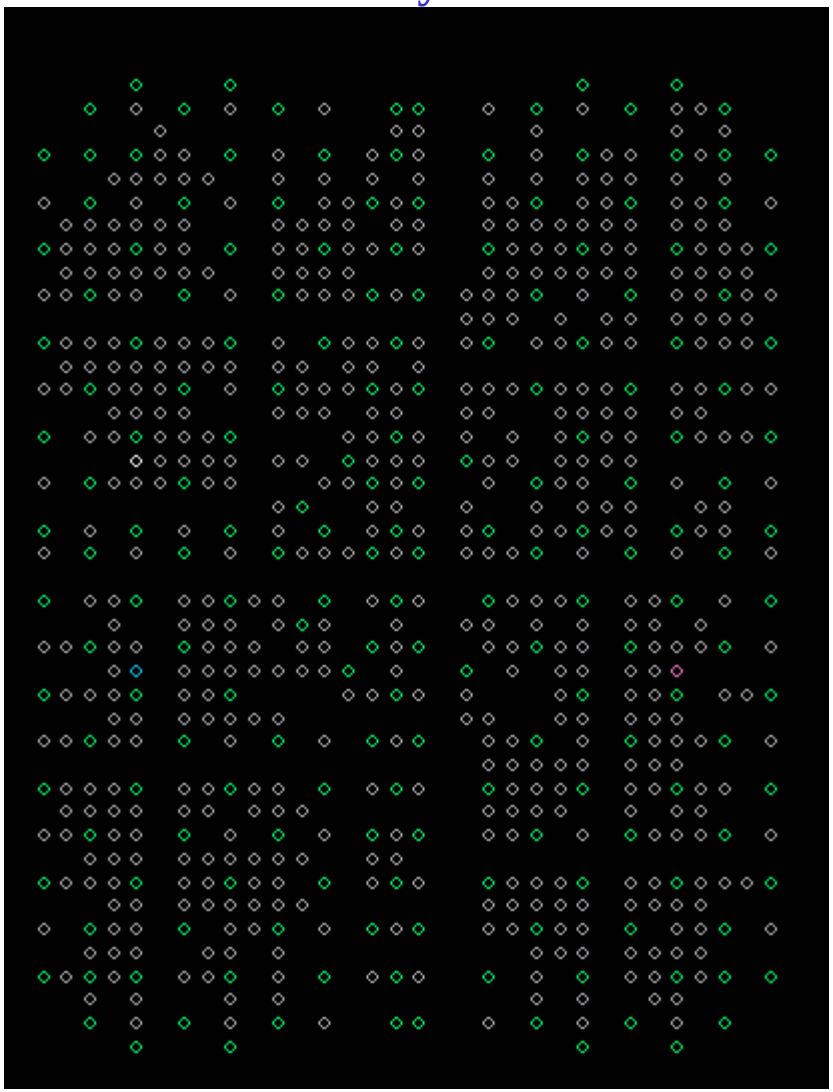
Signal Layer 7

Original Layer 7



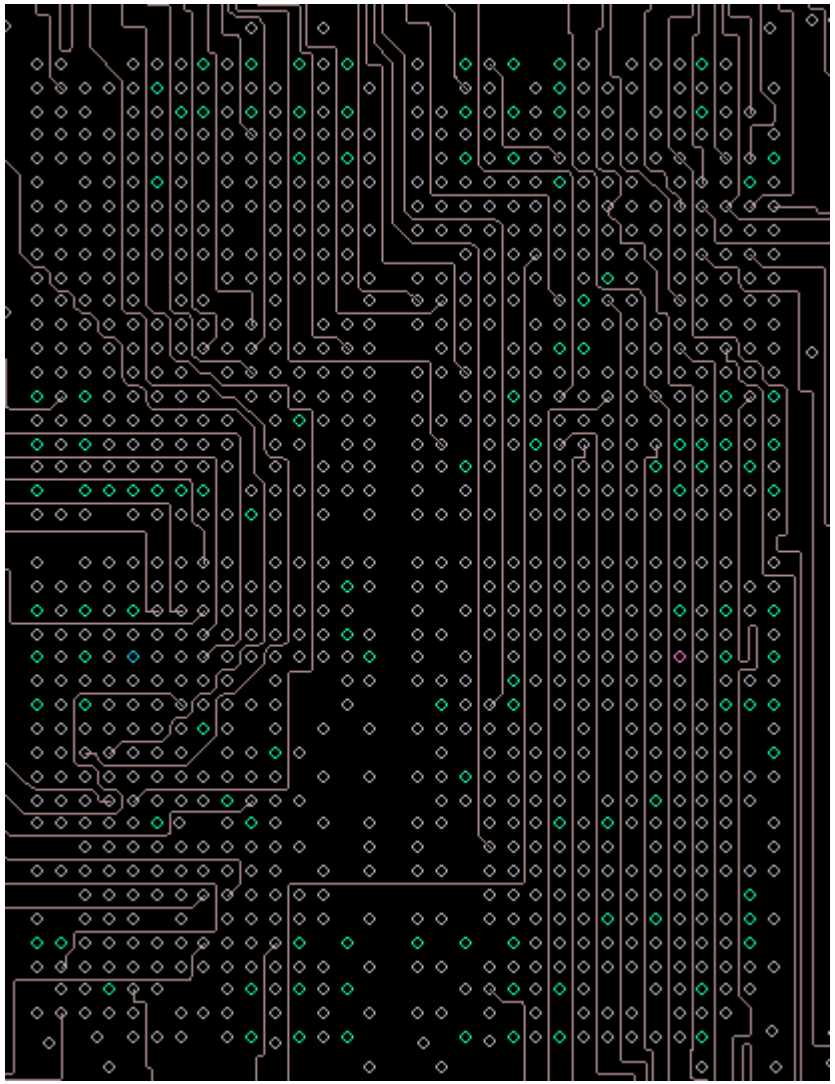
Channel Routing --- empty layer

Third Layer Saved



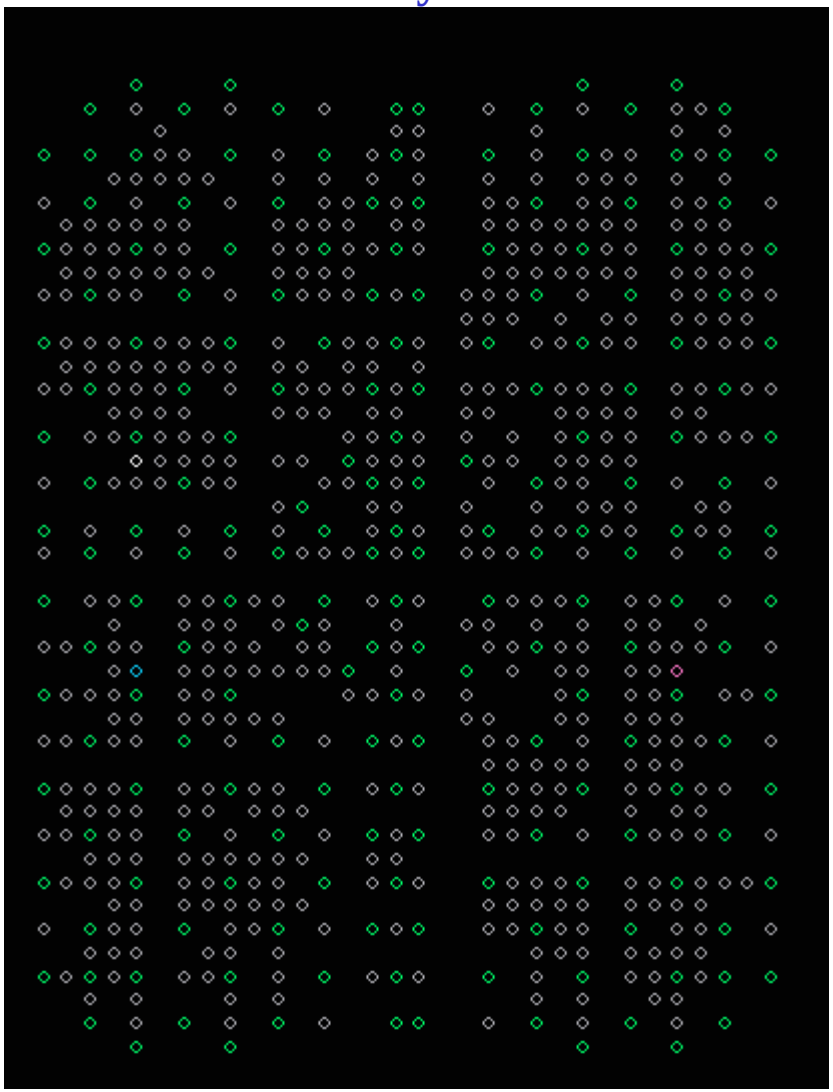
Signal Layer 8

Original Layer 8



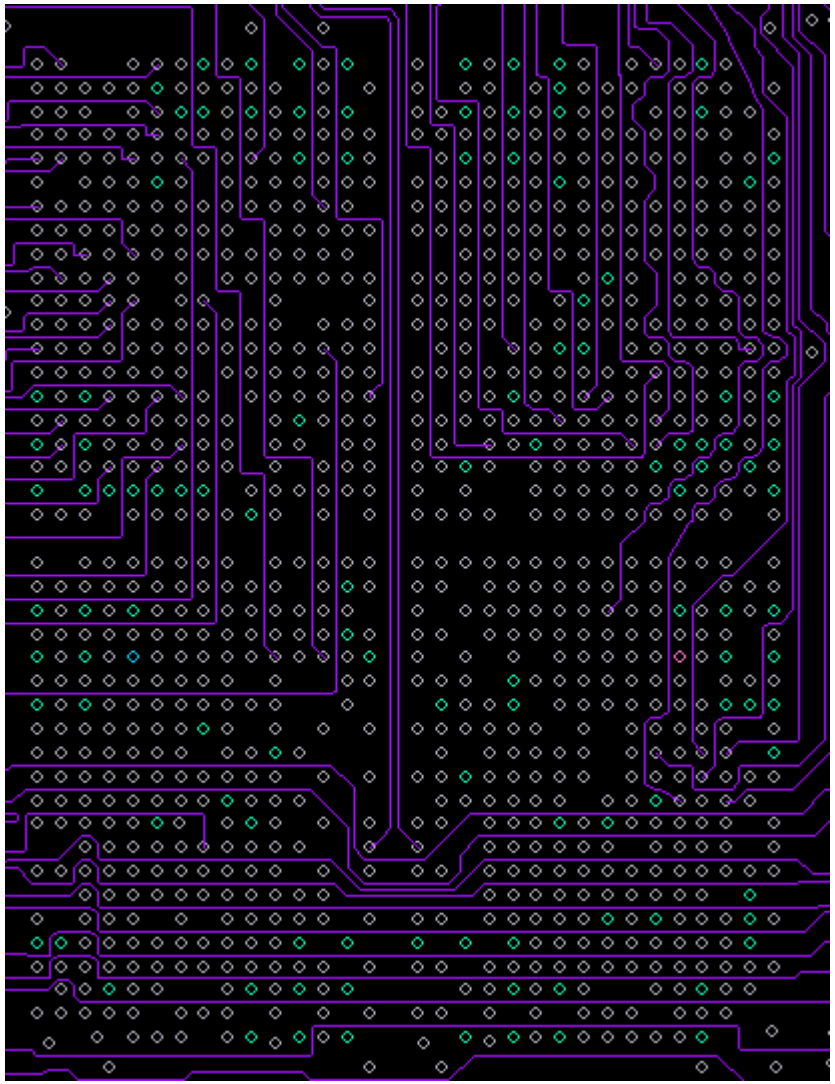
Channel Routing --- empty layer

Forth Layer Saved



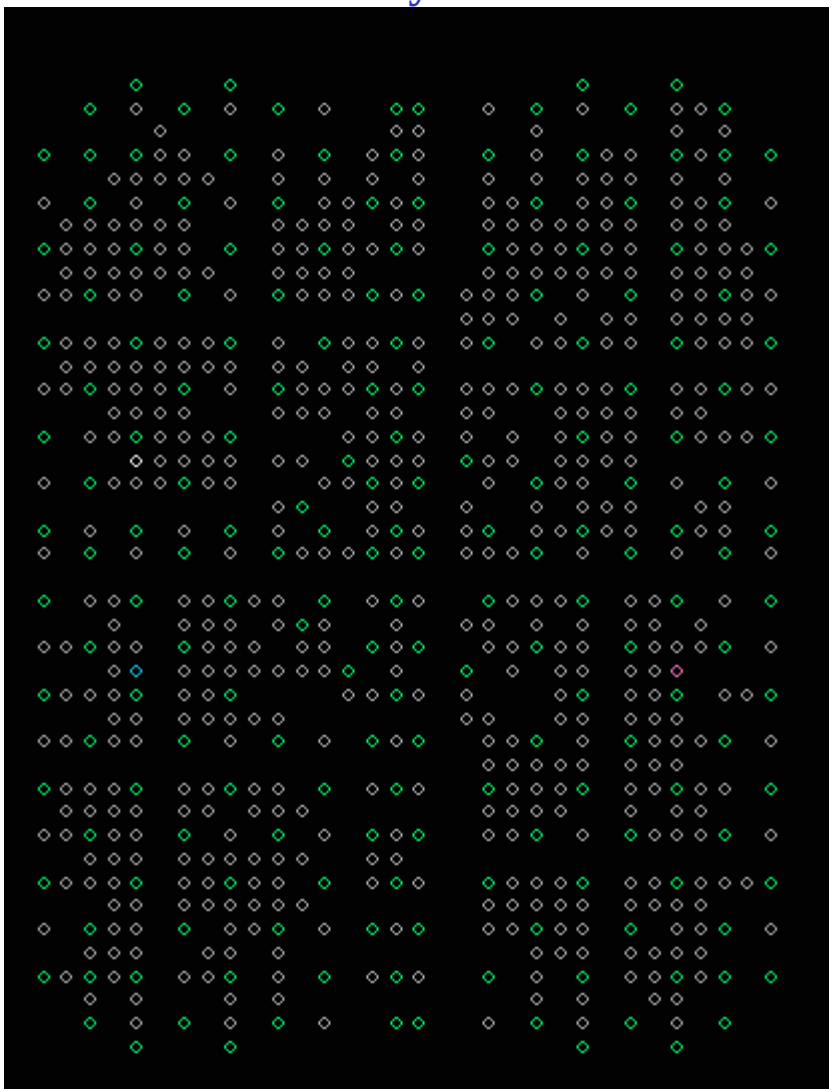
Signal Layer 9

Original Layer 9



Channel Routing --- empty layer

Fifth Layer Saved



Channel Routing

Example of a 1724 pin BGA with a large number of power and same net logic pins that can share vias.

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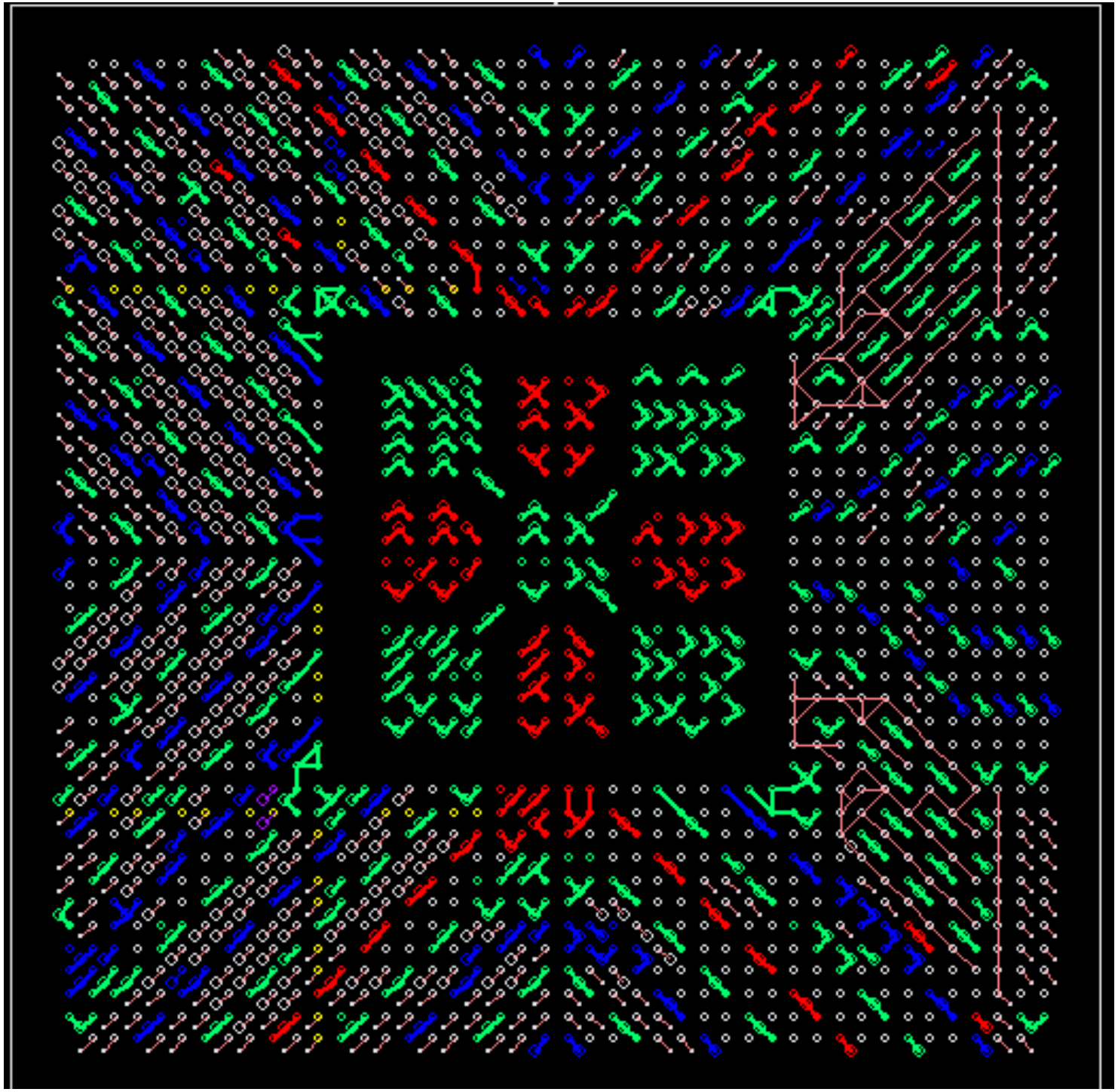
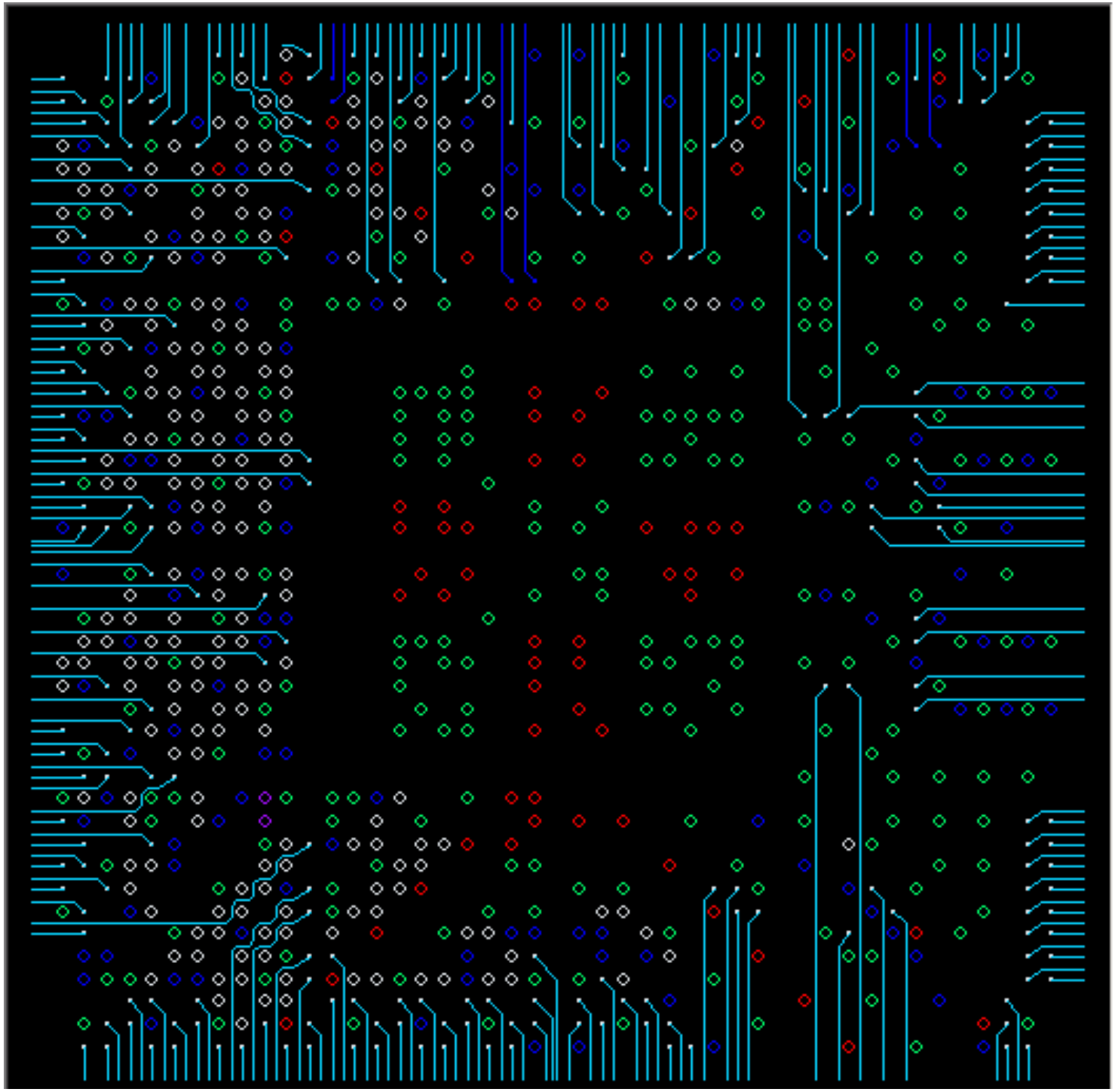


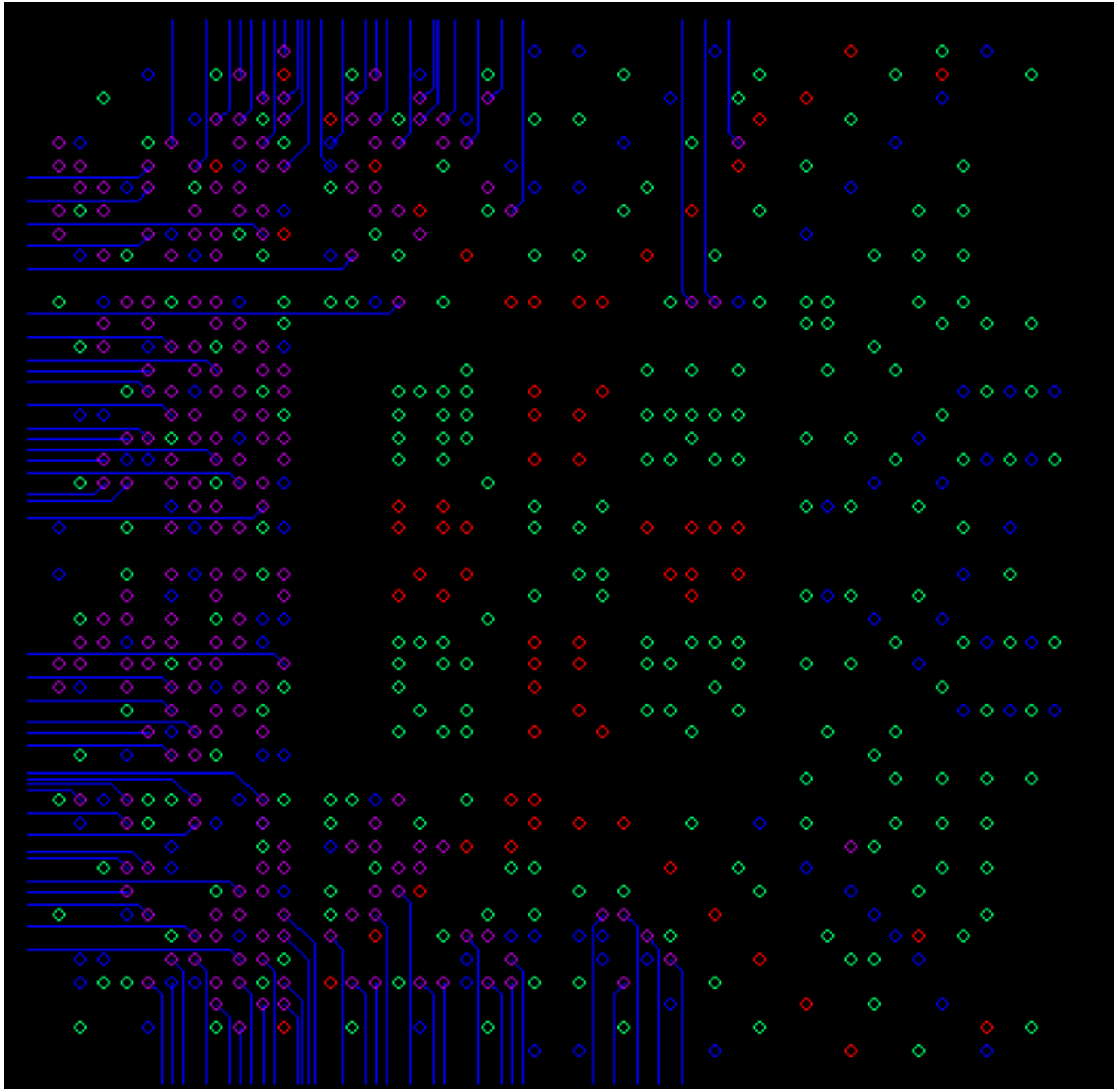
44 x 44 Pins, minus 212 missing pins = 1724 remaining pins

If power and logic pins use the via sharing option….

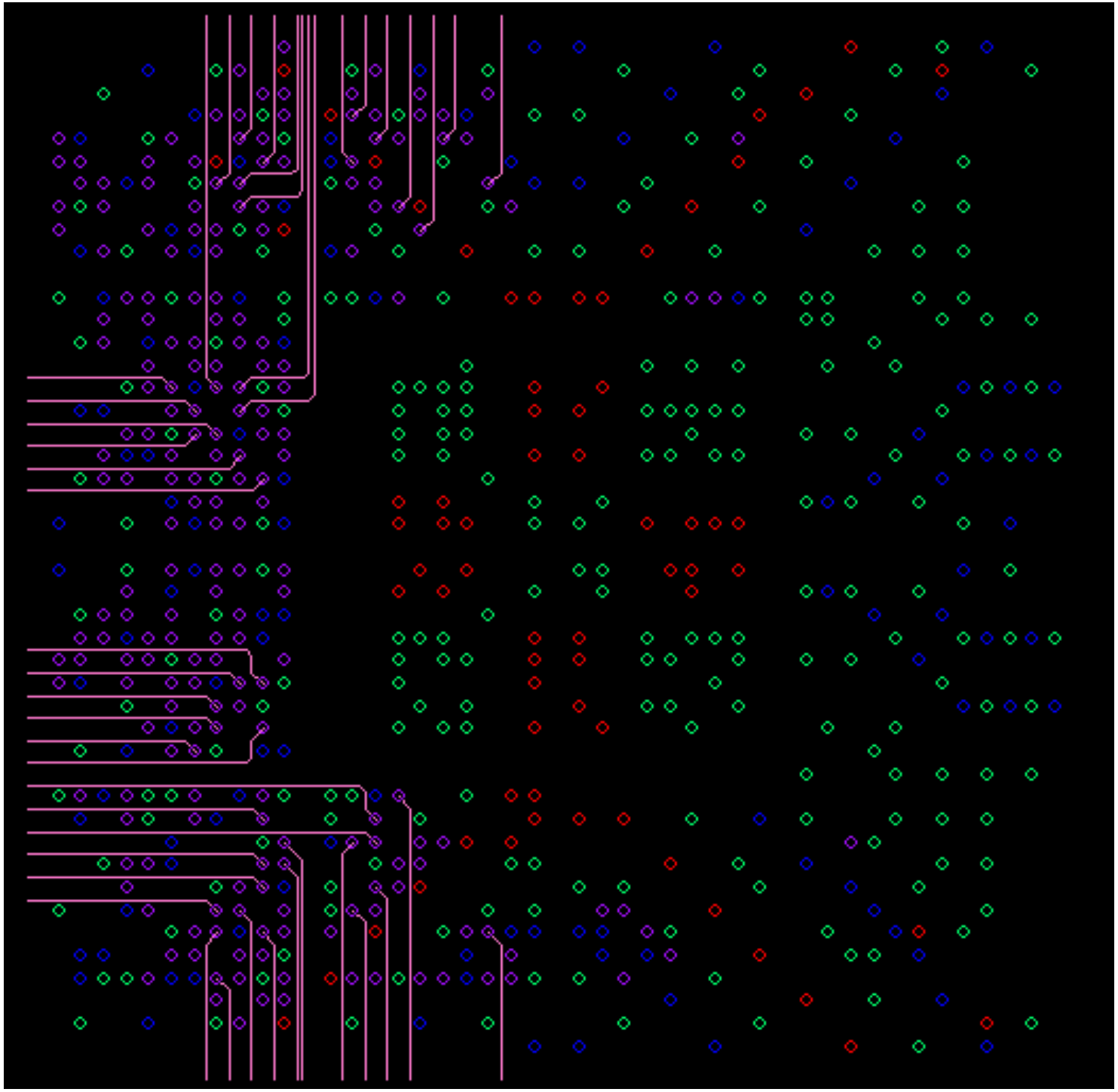
This BGA becomes very easy to route.



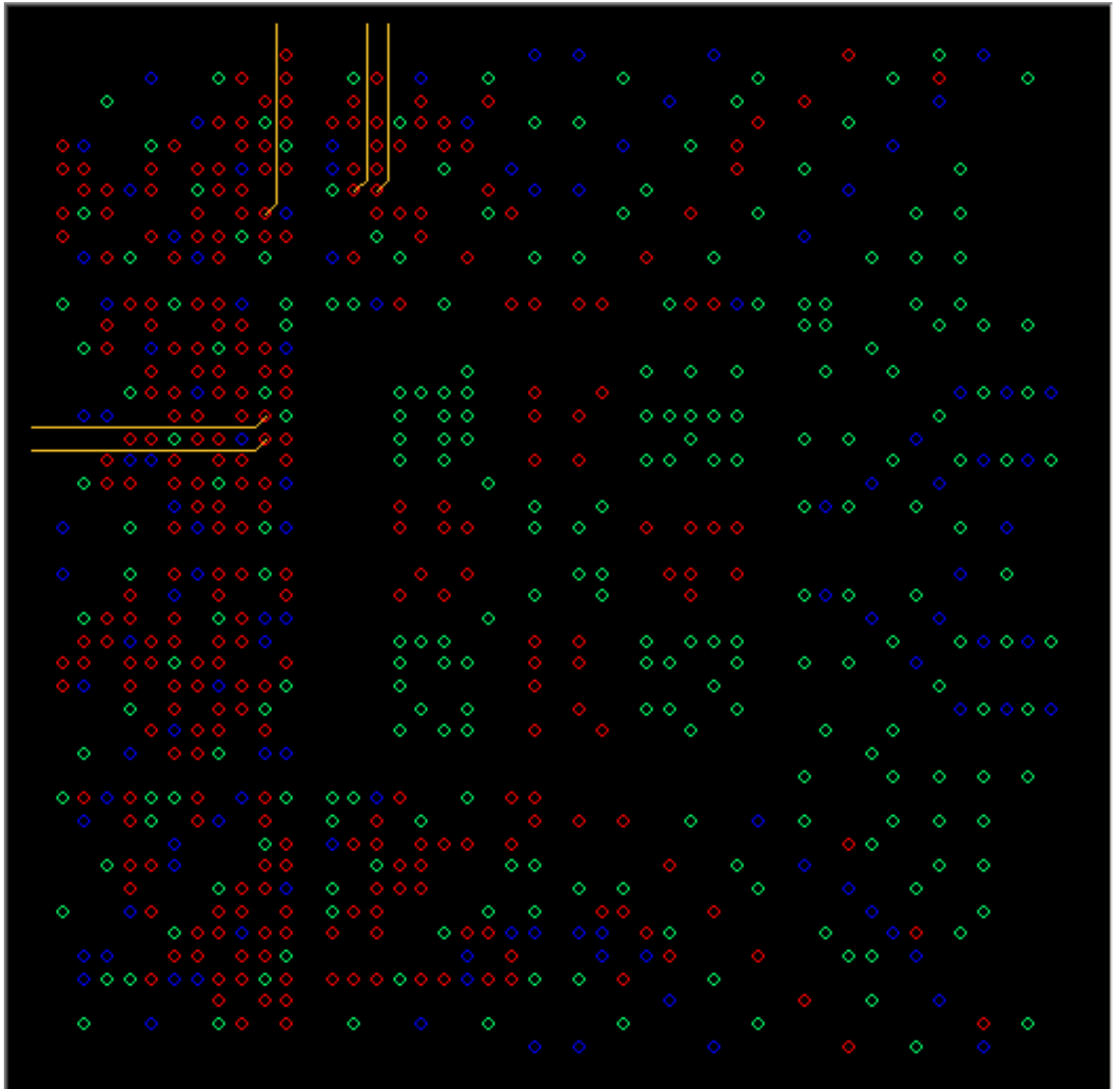
75 percent of the logic signals could be routed on the first inner layer.



The remainder of the signals are routed on the next two layers.

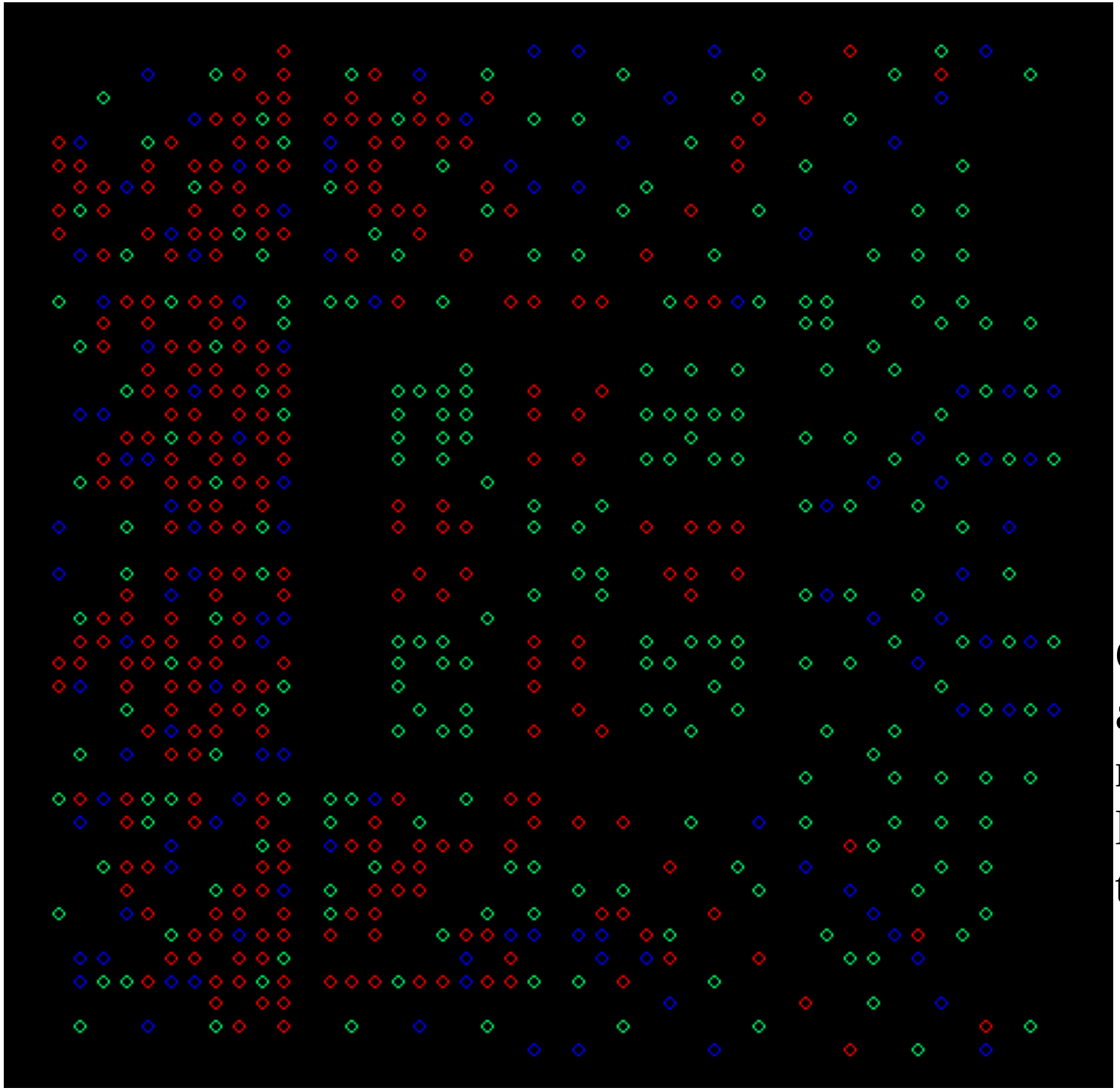


99 percent of the logic signals are routed by the end of the third layer.



The forth layer has only five logic signals to route.

However these could easily be cleaned up and routed on previous layers.



Any other layers under the BGA are now open to allow routing from the rest of the board to pass through.

Chip capacitors also have many more placement locations under the BGA.

Channel Routing

Available options for Channel creation Include

BASIC CROSS AND “L” WITH EXTENTS

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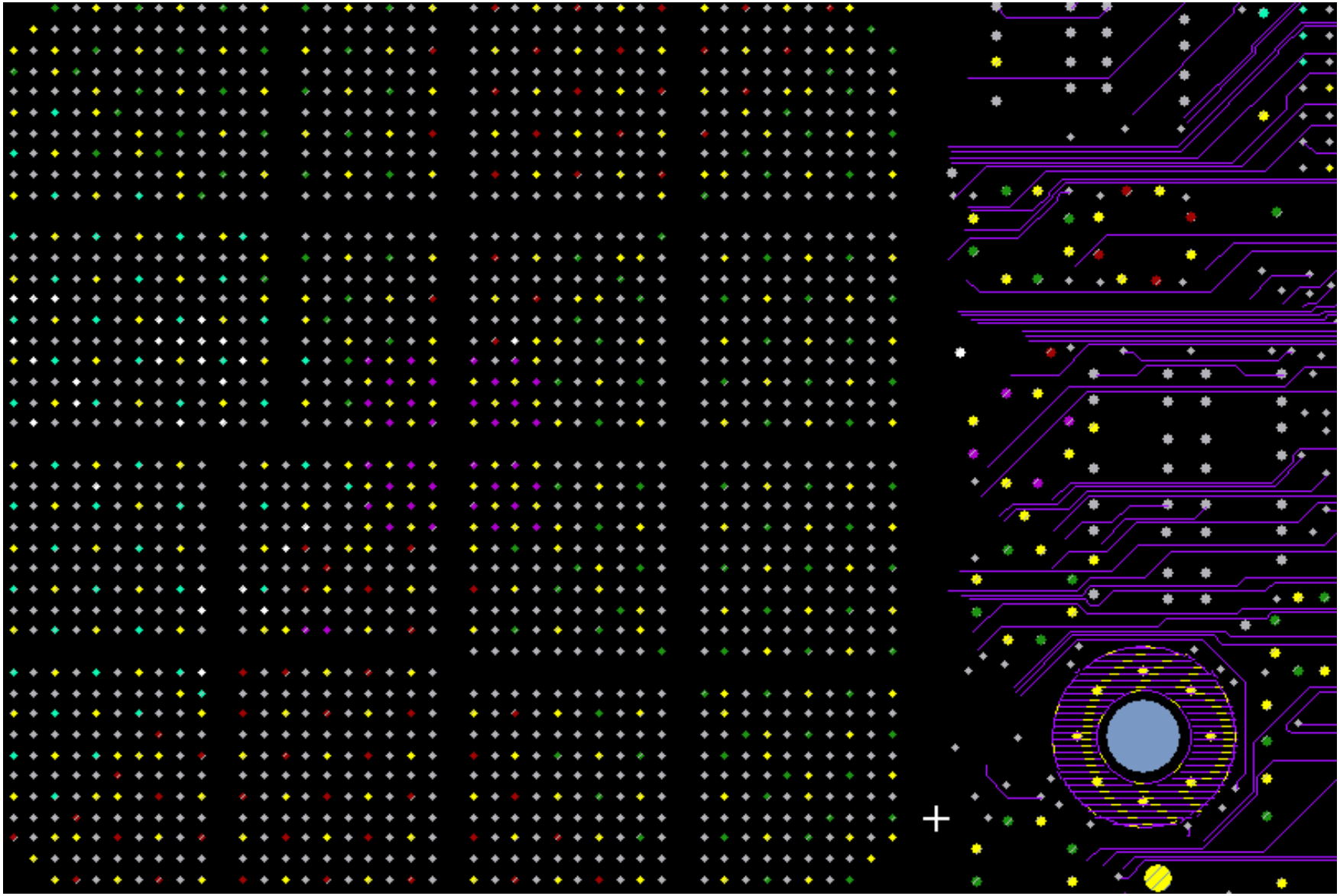
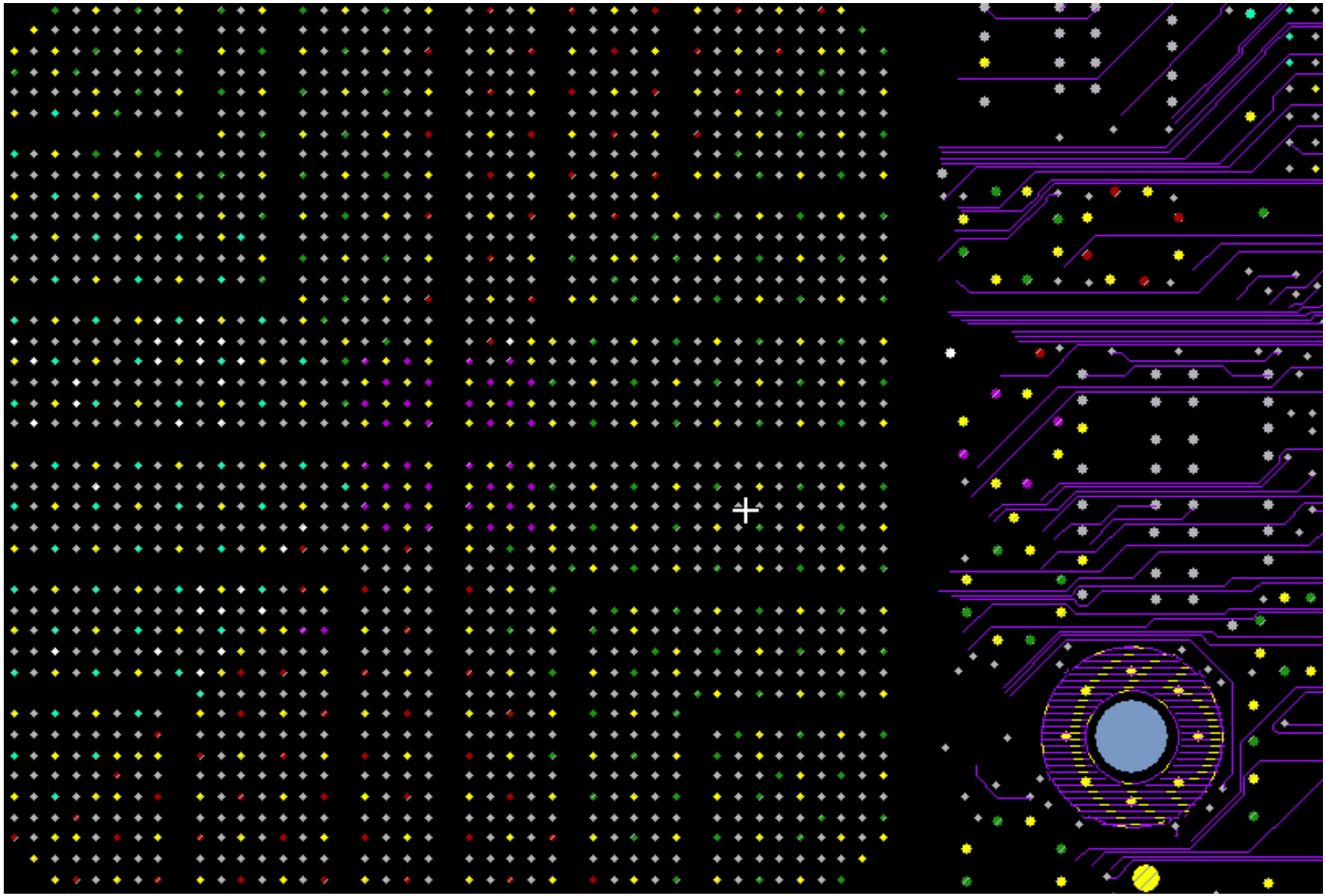
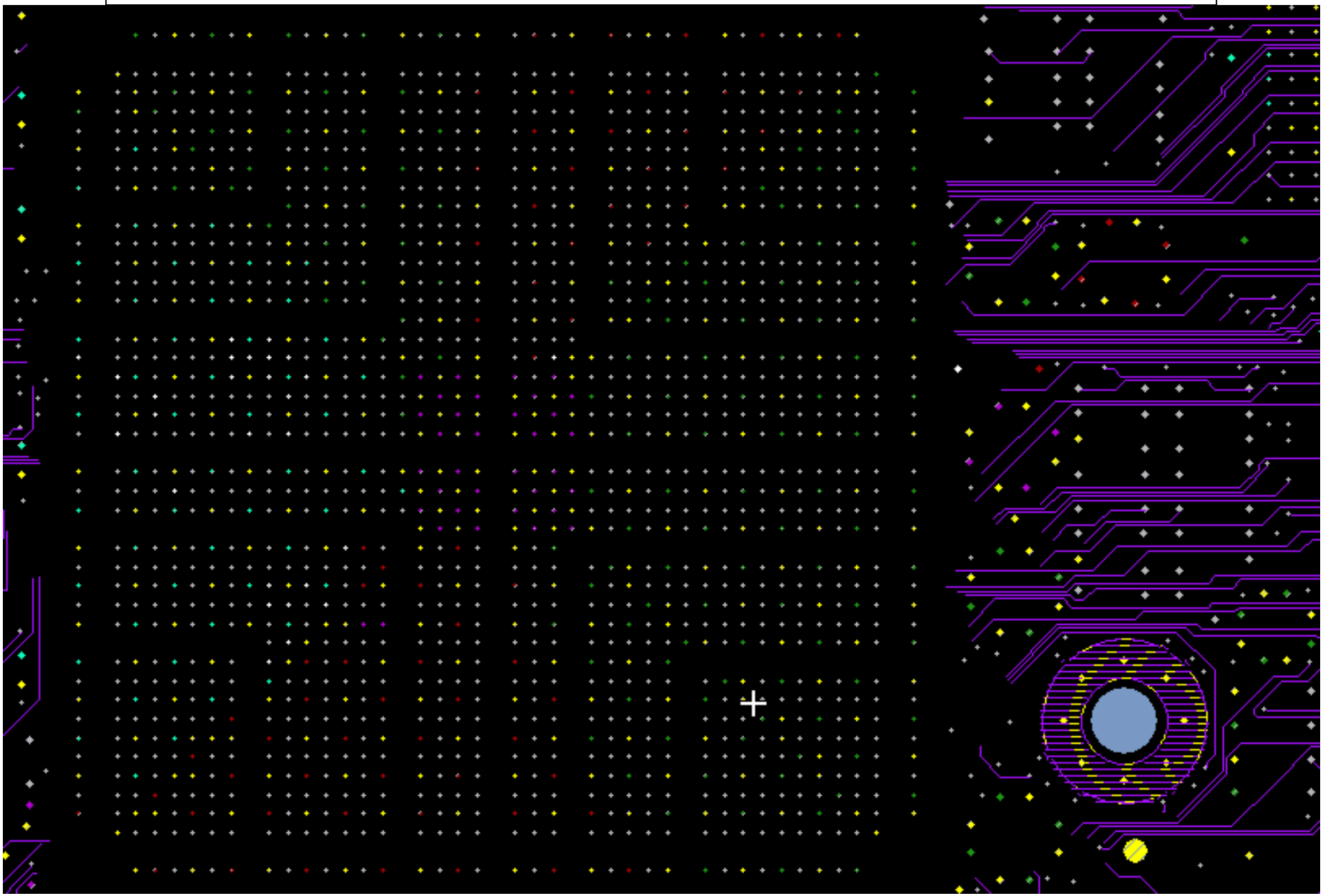
BASIC CROSS ROUTING LAYER



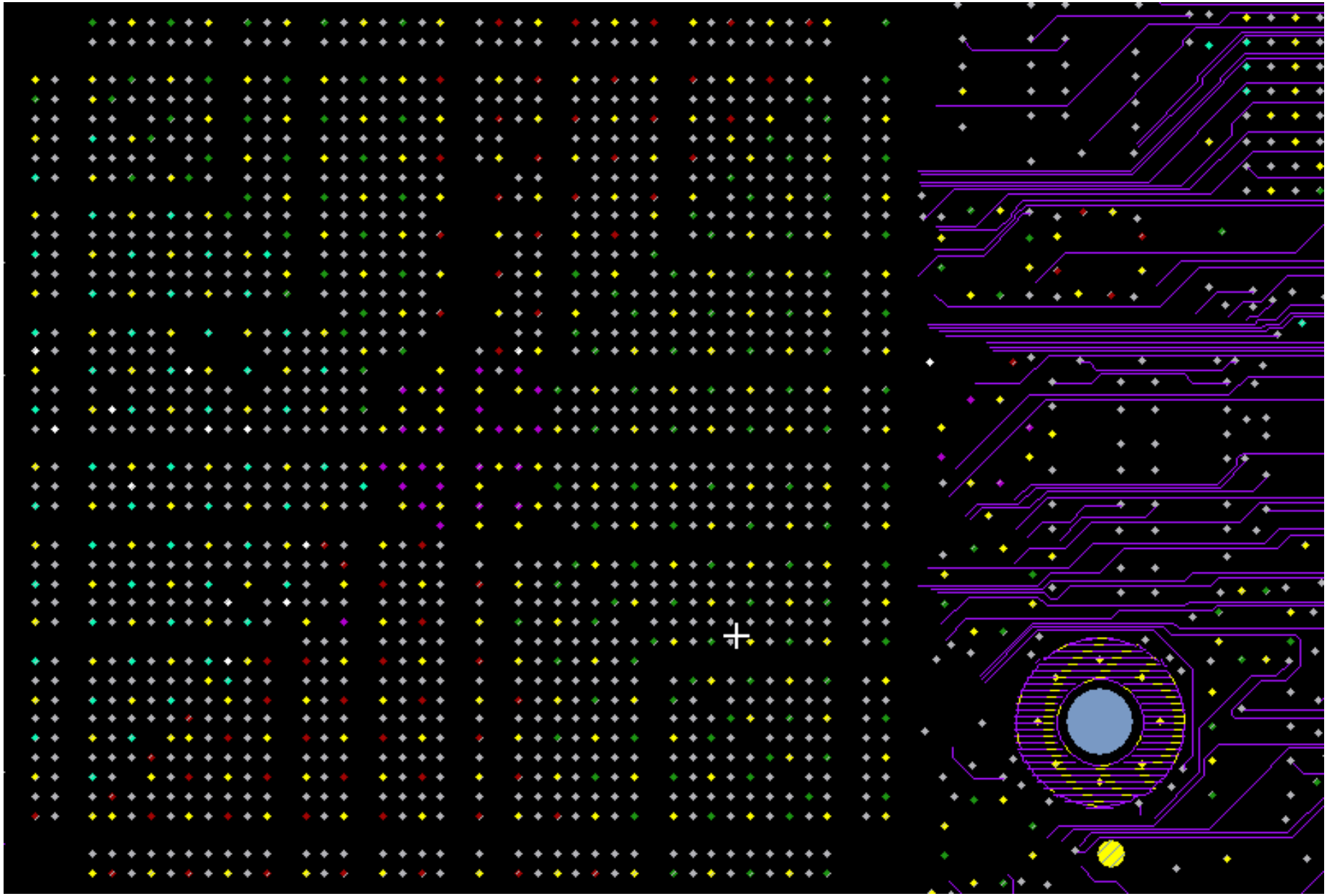
BASIC “L” ROUTING LAYER



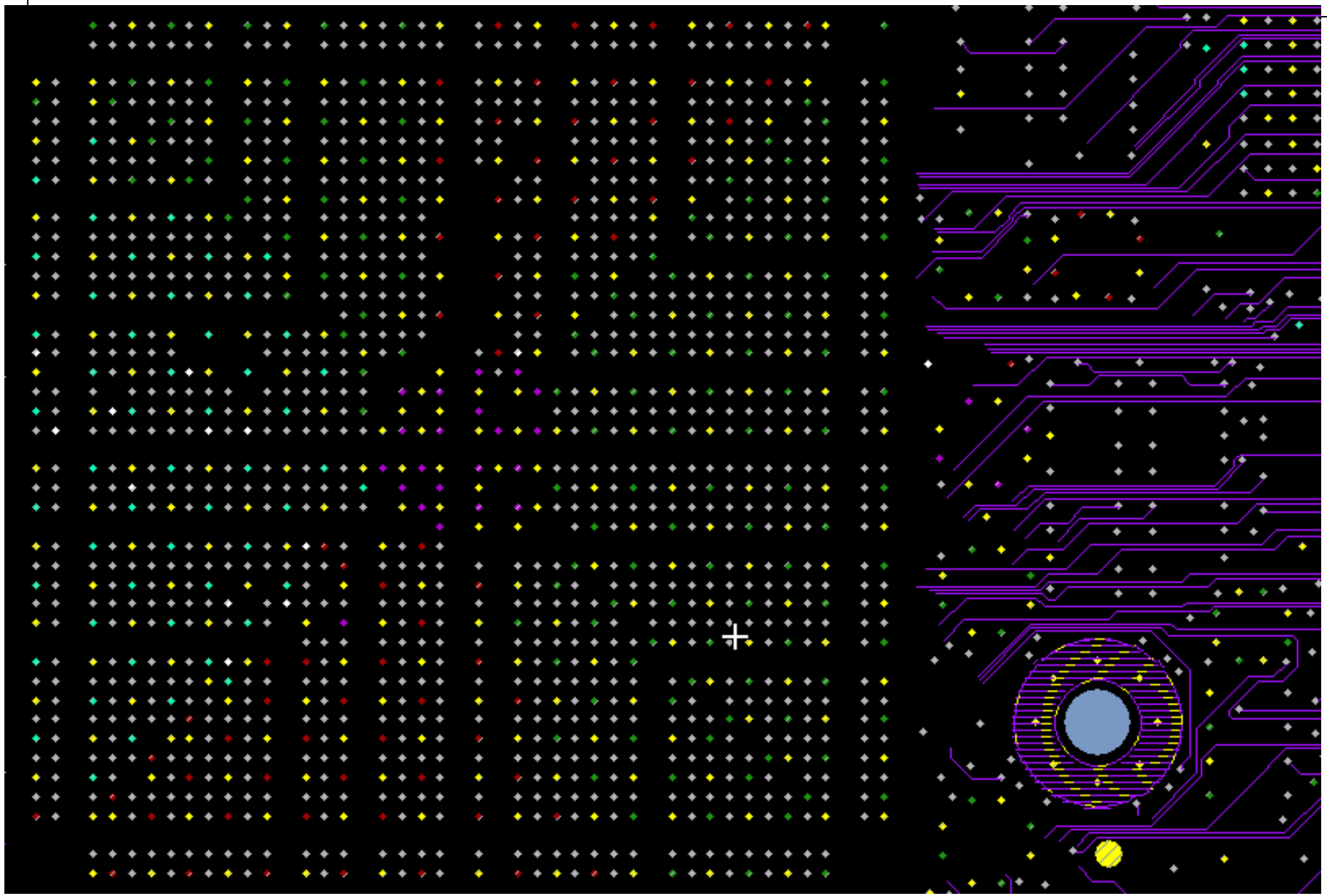
1 ROW EXTENT “L” ROUTING LAYER



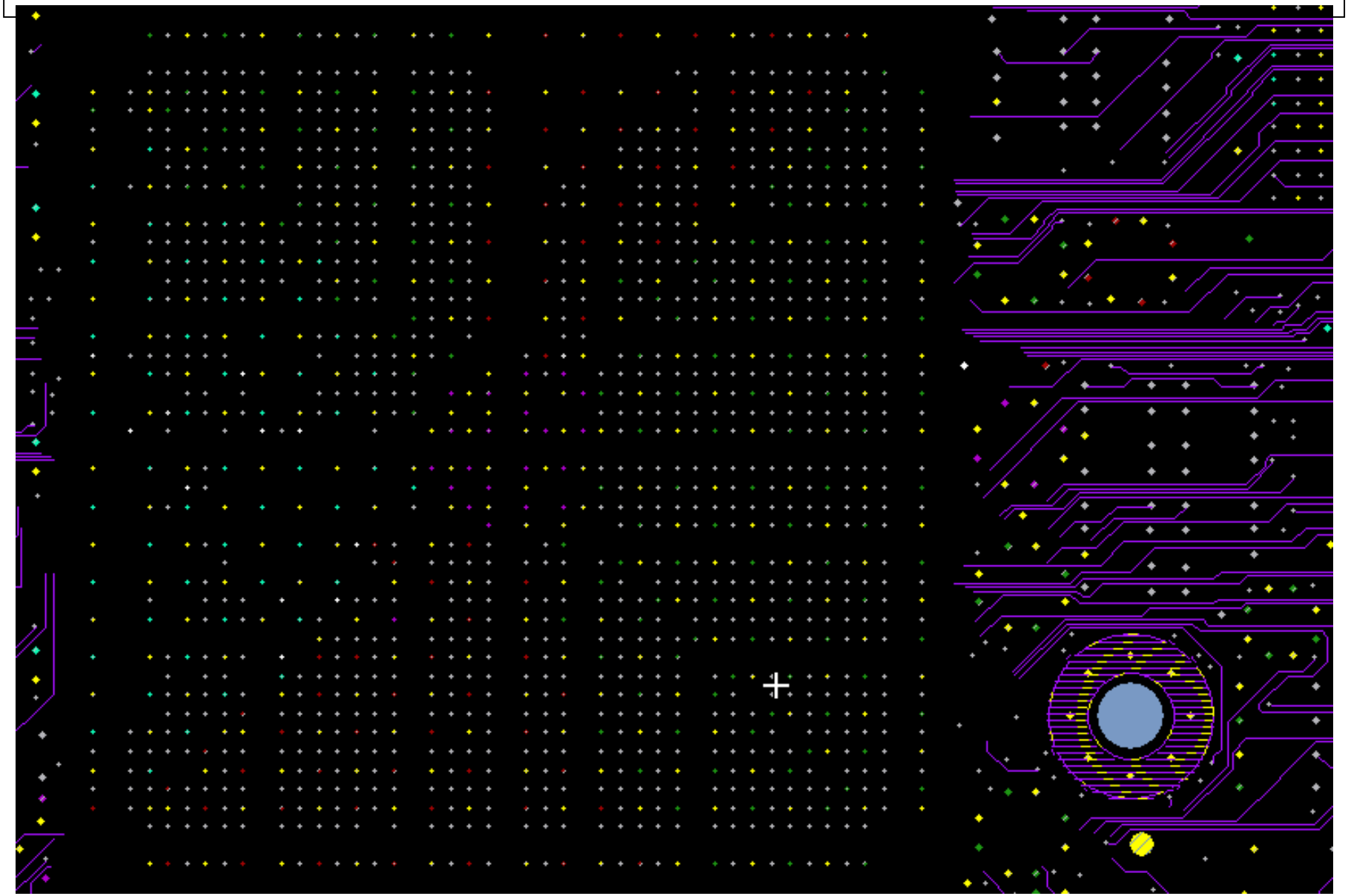
2 ROW EXTENT “L” ROUTING LAYER



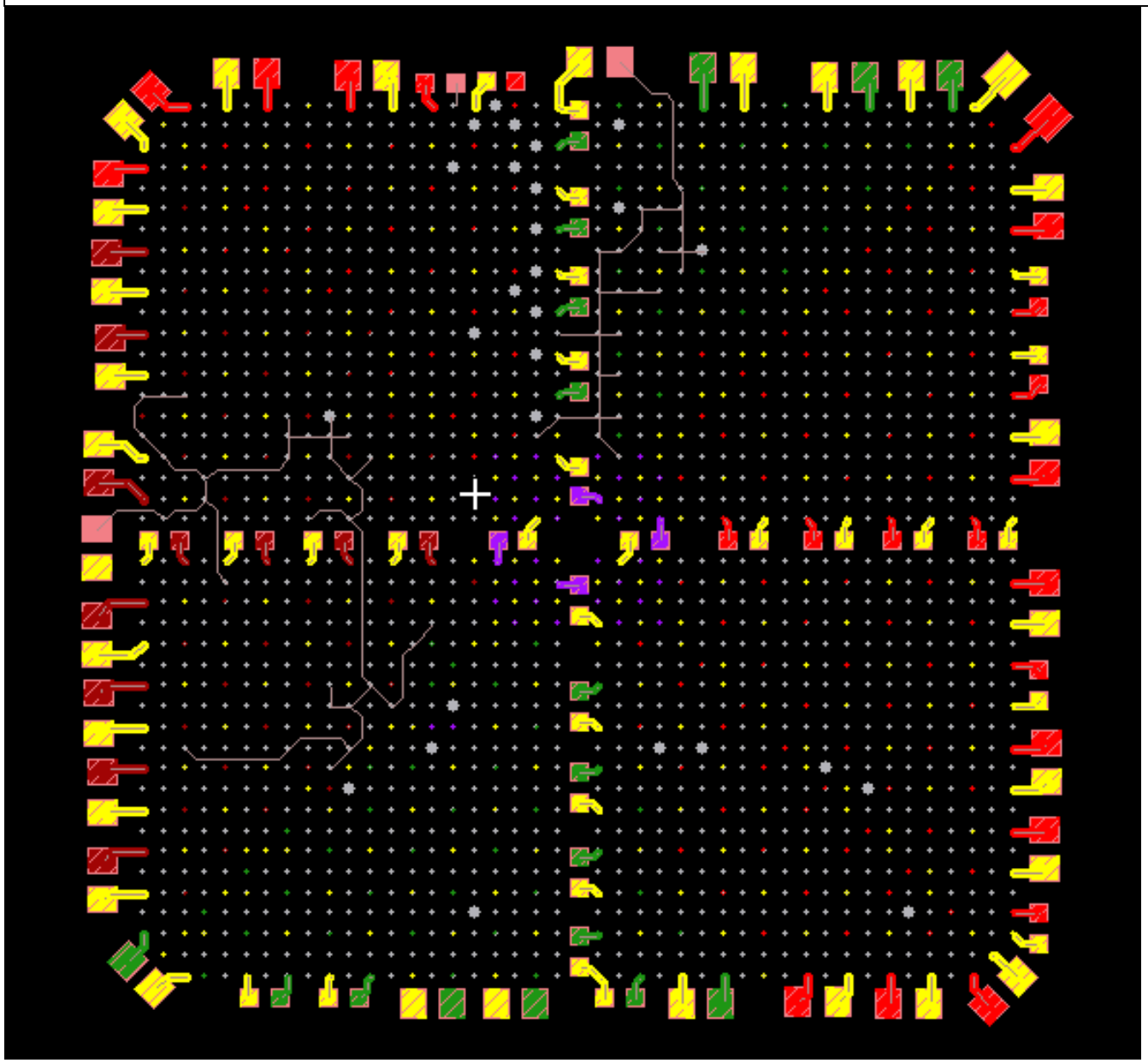
2 ROW EXTENT "L", PWR & LOGIC SHARE ROUTING LAYER



1 ROW EXTENT "L", PWR & LOGIC SHARE AND UNUSED NOT FANNED OUT

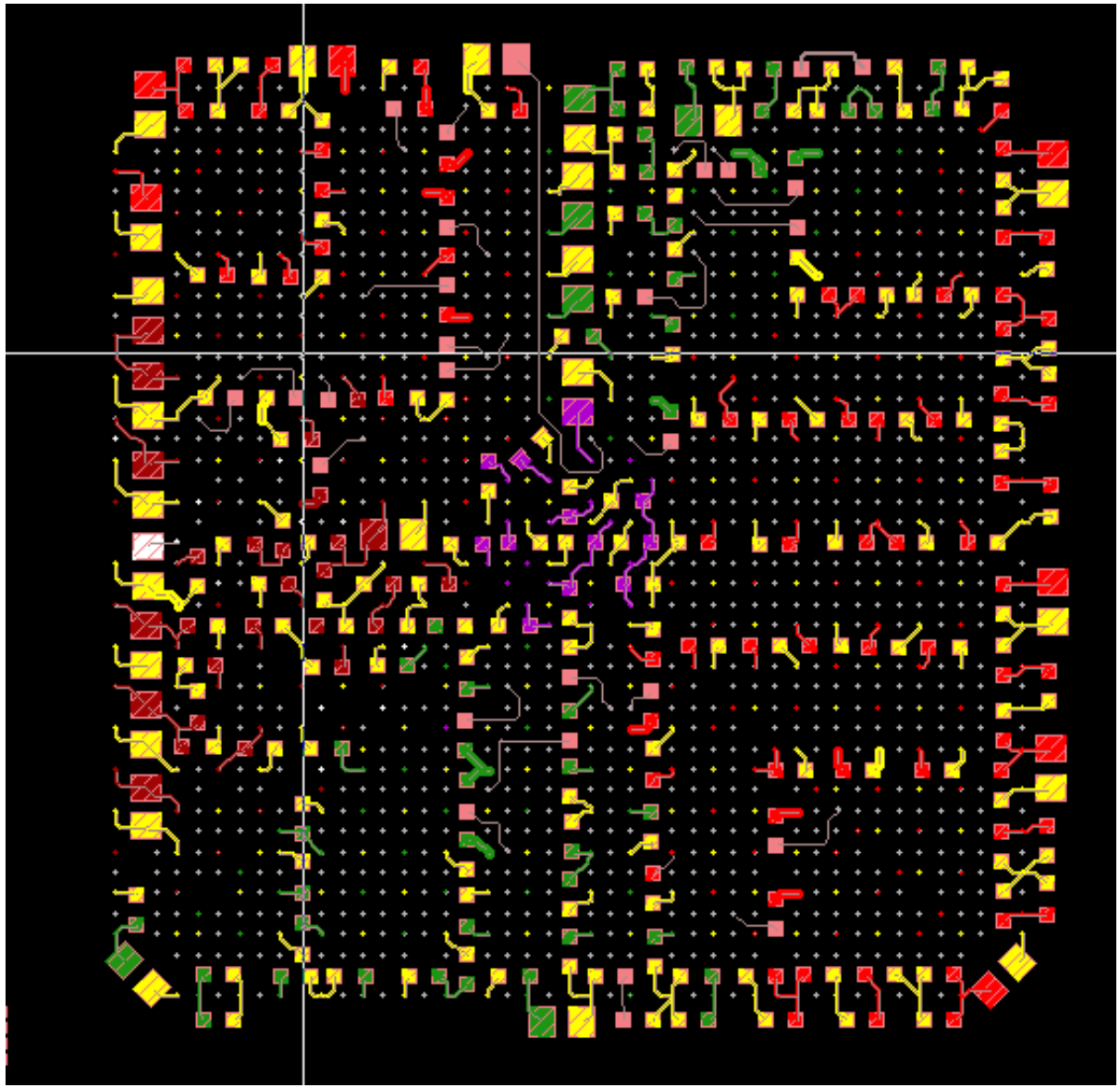


REGULAR DISCRETE PLACEMENT



58 DISCRETES connected under the BGA sharing **116** VIAS.

1 ROW EXTENT "L", PWR & LOGIC SHARE AND UNUSED NOT FANNED OUT BOTTOM



183 DISCRETES connected under the BGA sharing **366** VIAS compared to 116.

More than 3 times as much sharing