

ICU 2003 Specctra Top-5 Issues

1. **Title:** Net/class/group/group set Keepin and keepout
Description: By defining a keepout that only effects the specified net/class/group/group set provides guidance to the autorouter to keep sets of routing in or out of specified areas. This allows control of high speed nets in pairs/bundles far beyond the current fence and temp keepout select. Examples: Certain Nets cannot cross power moats on adjacent layers. Certain nets must be kept within/outside the area of a specified gnd plane on an adjacent layer. Certain sets of nets should go out and around congested areas to avoid noise and solve congested routing issues.

Cadence Response: Although the specific feature as defined above is not currently planned, investigation is currently being done for Return Path routing which would address the issue/example as explained above.

2. **Title:** True Diagonal Layer Routing

Description: Give Specctra true diagonal layer routing capability.

Cadence Response: SPECCTRA currently supports diagonal routing and diagonally preferred layers when in Diagonal Always mode. However, this mode is not recommended for all designs due to possible degradation in performance and route completion. In those designs which require diagonal routing, the diagonal mode set to always will converge better in most cases.

Our research has indicated that the vast majority of designs do not require diagonal routing during the route convergence phase and is required more for routing through dense BGA's and connectors, manufacturability, and aesthetics. For these reasons, we have made major investments in new algorithms in Miter and Turbo Stagger. Miter enhancements through the 10.x releases have made major improvements to help produce a more diagonal route through a recursive process, which produces longer diagonals, and better pin/pad entry and exits. Turbo Stagger was introduced in 10.0 and is intended specifically to route traces through diagonal and off grid BGA's and Connectors. By default, the router will route true diagonals through standard 45 degree BGA's and Connectors.

3. **Title:** Command to make every net on board as short as possible.

Description: Command to make every net on board as short as possible while maintaining rules. Possibly with options such as removing vias. Provide a faster more effective alternative to the do file sequence "wringer" needs to fix (WHEN EASY). Frees up real estate for increased completion and length rule use. In general length reduction improves signal integrity as well improving customer acceptance of auto routing as compared to manual routing. Help address the "we want it as short as possible" This can follow the model of what was done on miter in 15.0.

Cadence Response: Nothing specific is planned prior to 16.0. The do file strategy can be incorporated into 15.5 planned improvements for Integration Optimization. Our current strategy for dealing with this is through Miter and Clean processes. However, if this is not sufficient, then we would like to understand the details as to "why". For example, should all net lengths be minimized or should the minimization of the nets be address in priority order? Cadence will need input on these types of requirements before committing to a schedule for deliver.

4. **Title:** "DO" Language Enhancements

Description: The DO language used to control Specctra is an undocumented and unsupported language. This is unacceptable. This language is so unsupported that system variables have been known to change type! When this was reported to Cadence they could not even give a time period for resolution they just recommended not using DO files. This is completely unacceptable. The DO Language should be brought up to date and include the following functionality:

- 1) ADDED LANGUAGE CONSTRUCTS Real language constructs such as SUBROUTINES ELSEIF DO...WHILE and/or CASE statements should be added.
- 2) LOCAL AND GLOBAL VARIABLES The concept of local and global variables should be included into the language.
- 3) LANGUAGE OPERATORS FOR STATISTICS The language operators should be expanded to include the ability to do statistical analysis with the systems variables.
- 4) SYNTAX CHECKING Syntax checking should flag errors and give reasonable feed back as to their origin (i.e. the line numbers). This could be accomplished with a good DO

Cadence Response: Nothing is currently planned to incorporate any of these items. We understand that the Do file language is used by many users to enhance the routing performance on their designs. However, our complete focus is making the core router better and stronger to deal with today's tough designs. Hopefully, many of these improvements have helped to minimize "workarounds" required in Do files to get better routing performance.

5. **Title:** Tandem Diff pairs.

Description: Tandem Diff pairs, Need the ability to auto and manually control and route tandem diff pairs.

Cadence Response: Currently being discussed for either 15.5 or 16.0. Schedule greatly depends on the ability to support our entire flow from SPECCTRAQuest, Allegro, and SPECCTRA.