

The world's leading supplier of technology independent PCB, Hybrid, and RF design and layout software

Intercept – About Us

- Incorporated in 1983 as an EDA consulting firm
 - Awarded consulting contracts for Hardware Design and Research and Development.
 - Contracts included Public and Private Sectors, Government, and EDA Industry in Signal Processing, Microelectronics, Electronic Systems, and PCB Design
 - Developed IPC-D-350 Artwork Interface, CAD Translators, Import/Export Artwork and Verify Artwork as OEM Supplier to Mentor Graphics
- Introduced Pantheon Product Family to Public DAC 1996
- First European Office Opened in France July 1997
- Acquired Xynetix PCB Business October 1998
- Opening of New German Sales/Support Office February 1999
- Intercept Design Group formed for Customers Aug. 1999
- Opening of New UK Sales Office October 1999
- Introduced Mozaix schematic capture September 2000
- Introduced Indx Library Management January 2002



Intercept – About Us, Cont'd.

- Introduced redesigned User Interface for Mozaix in 2005.
- Introduced, in partnership with Matrox, new auto interactive routing capabilities in 2006.
- Introduced, in partnership with Calix Networks, new physical hierarchical block reuse in 2006.
- Introduced enhanced block design and design reuse technology in 2007.
- Introduced, in partnership with Honeywell Aerospace, the new Design Automation application suite: DesignX, DrawingX, QCX, and ReleaseX.
- Opened New Milan, Italy Office in 2007.
- Introduced Xtent Technology Rules Editor and Constraint Manager in 2009.
- All development and support is accomplished in US.
- ITAR compliant.



Strategic Partnerships

The Goal: work together to provide a win-win for both parties whether it be improved technology, improved business activity or both.

The Execution of a Successful Partnership:

- Put together a scope of work that both parties agree on and are committed to.
 - Provide the appropriate resources for success.
 - Commit to agreed upon schedules and deliverables.
- B High touch communications through all stages of development
- Assign Liaison who will:
 - Work with Raytheon stake holders to identify needs.
 - Prioritize requirements.
 - Work with Intercept to clearly document requirements.
 - Meet with Intercept for Milestone reviews.
 - Communicate testing results and provide feedback for Alpha/Beta releases
- Dedicated resources
 - Work with Raytheon to define and document requirements
 - Focal point between Raytheon and ITI Engineering
 - Milestone reviews and progress reports with Raytheon
 - Deliver and demo Alpha/Beta releases.



Partnership: Raytheon

1998-Present

Intercept has been working with Raytheon since 1998, when it acquired the Scicards installation at Tewksbury.

Raytheon's guidance for over 10 years has resulted in countless improvements to Intercept's software suite for Hybrid, RF and standard PDB design flows.

These improvements have directly affected Raytheon's design flows, with a history of proven positive results.



Partnership: Raytheon, Continued

• For each of the following eleven years, Raytheon has bought additional Intercept applications at various sites almost annually.

- The number of Raytheon sites using Intercept applications has expanded to four.
- Each time Raytheon has purchased additional licenses, Intercept has provided a corporate discount level well below list price.
- Raytheon currently owns 23 Pantheon Layout licenses, 18 Mozaix Schematic Capture licenses, 17 licenses for technology options and automation products, and 36 licenses for interfaces and translators.
- Raytheon divisions owning Intercept tools include SAS (Dallas and El Segundo), ACS (Tewksbury), and RMS (Tucson).



Raytheon Successes to-date

First two designs in Dallas involving conversion of DXF to intelligent data were completed on time and with no issues during manufacturing.

Several hybrid designs in El Segundo were completed on time. These were built from the ground up and included creation of library parts, schematic and layout. The designs were completed without the users having any formal training and ahead of schedule.

Currently in the process of developing a translator to import Mentor Supermax design directly into Pantheon.



Partnership: Honeywell

1998-Present

- Worked together to enhance the bi-directional interface to Microwave office and the RF user flow in Pantheon.
- Collaborated with the specification and design of the Xtent Technology Rules Editor for high speed design.
- Instrumental partner in specification and development of the automation tools:
 - DesignX
 - DrawingX
 - QCX
 - ReleaseX



Partnership: Matrox

2006-Present

- Worked closely with PCB design team to greatly enhance usability and performance of interactive routing.
- Collaborated on specification and testing of next generation Auto-Interactive Routing
 - Performance and shove-aside are now fluid, with nearly no delays and real-time shove/heal of objects.
- Improved high speed design options.
 - From-to definition and auto-tune is now best-in-class
 - New signal path constraint definitions and auto-tune shortens design time by simplifying design challenges.



Partnership: Calix Networks

2004-Present

- Closely involved in a major full-site migration of 45+ Mentor Graphics designs from DA and Board Station to Mozaix and Pantheon, including LMS library translation.
- Collaborated with the specification and design of the Xtent Constraint Manager for high speed design.
- Instrumental in the specification of the physical and logical design reuse technology in Intercept products.
- Assisted in the specification/definition of the new Backdrill features in Pantheon.



Partnership: National Instruments

2007-Present

- Intercept and NI worked together to enhance Pantheon's RF capabilities.
 - Resulting enhancements provided RF designers with Pantheonexclusive RF functionality that boosts product design cycle times exponentially.
 - Developed a new area fill type that allows RF Engineers to draw any area fill shape without DRCs interfering.
- Aided in site migration from Mentor Design Capture and Expedition by helping test issues and finalize translators for Import DC Edif and Import Expedition.
- **Full translation of Design Capture library to Intercept format.**
- Adopted Intercept IDF interface, which replaced internal customizations for National Instruments' mechanical environment.



Intercept Translators & Interfaces

- Schematic, layout, and library translators enable seamless 'EDA plug & play'
- Pantheon interacts with most CAD/CAM systems
- Includes support for industry standard manufacturing formats
- Import geometries from corporate, design, or user libraries
- Transform manufacturing databases into intelligent PCB data through reverse engineering with Import Artwork
- Correct and refine foreign databases in Pantheon

	Schematic Translators	Design Architect Veribest CAE Protel	Viewlogic/ePD Orcad Edif
	Library Translators	Mentor LMS Veribest	Viewlogic OrCAd
	CAD Translators	Applicon Board Station Cadnetix Calay Prisma Calay V04/V05 CV Cadds CV Theda Expedition EEDP (custom)	ODB++ (export) OrCAD PADS PCAD Protel Scicards Telesis UniCAD Visula
•	Interfaces	CircuitSpace(DA) GDSII GenCAD Generic DXF Quad XTK	Smart DXF Hyperlynx IDF IFF SiSoft



Mozaix Key Features

- Project Explorer panel for browsing one or more schematic designs, parts, and symbols.
 - Drag and drop parts and symbols directly onto sheets.
 - Hierarchical design display.
- Multi-window display for editing sheets, symbols and parts on the fly.
- Quick Search & Place of library parts with Part Browser.

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- Copy or cut/paste design sections from sheet to sheet or merge full sheets and designs from separate databases.
- Net connections recognized across entire design at all times.
- Forward and back annotation with Pantheon.
- Cross-probing and Multiple Design Variant Support



Mozaix Key Features - Continued

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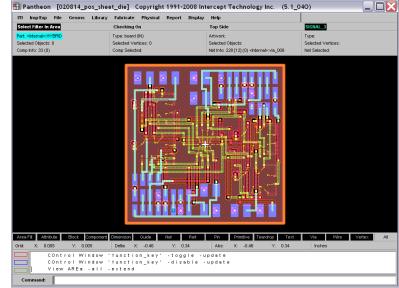
Mozaix's Pin Editor, Part Editor, and Property Editor offer powerful quick-edit features.

- Spreadsheet-style editors with time saving features.
- Design Reuse with Replicated Hierarchy and/or Physical Hierarchy (Block geometries in Pantheon).
- DRC panel that allows users to view and correct errors on the fly while scrolling through the DRC report.
- Pin Editor with auto generate symbol and block symbol capability.
 Change parts or switch geometries or symbol views in one quick step.
 Perl scripting interface for userspecific customizations.

INTERCEPT

Pantheon Key Features

- Single File Database
- 30+ Interfaces, Translators
- In-Session Geometry Creation
- Rules-Driven Place and Route
- Intuitive Interactive Routing
- Auto-Router Interfaces (SPECCTRA)
- WYSIWYG Area Fills
- PCB/Hybrid/RF in 1 application
- High Speed Features
- Artwork Generation
- Design Verification
- Design Reuse
- PDF Outputs

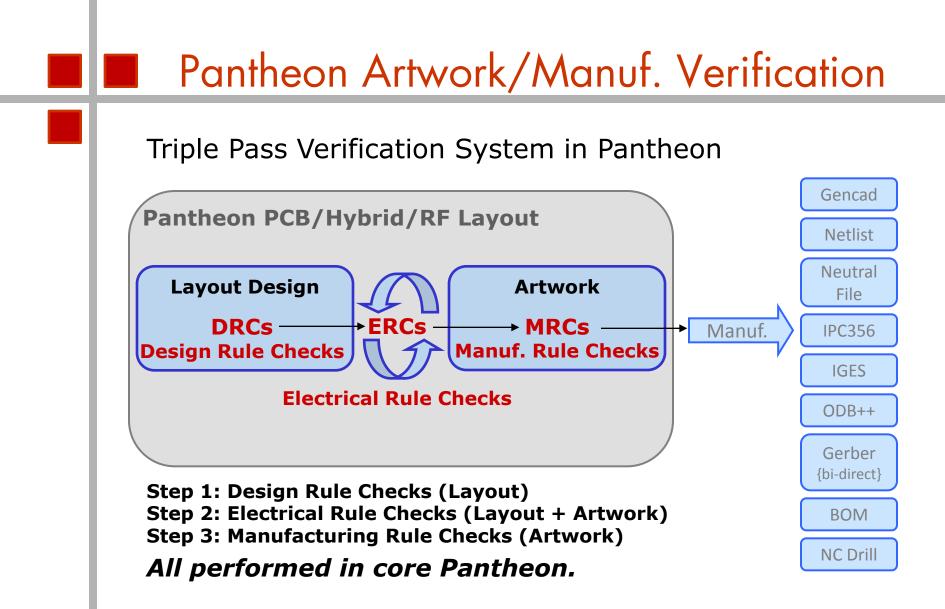




Pantheon Key Features - continued

- Bi-Directional IDF support for 3D mechanical packages:
 - PTC/ProE
 - Solidworks
 - Mechanical Desktop
 - Inventor
 - Etc...
- Bi-Directional DXF support for 2D mechanical.
- Signal Integrity interfaces:
 - Hyperlynx
 - SiSoft
 - ICX
 - Sigrity







Pantheon v6.0: Enhanced Interactive Routing

- Guide Route now over 300% Faster
 - Improved Algorithms for Better Completion
 - Improved Active Cleanup while Routing
 - Improved Shove-Aside Algorithms
 - Radically Faster Route Completion
- Cleanup Improvements
 - Cleanup By Section Option
 - Cleanup Preserving Obstacles Option
 - » Keep Routing around Vias, holes, etc
- Auto Panning while Routing
- Ability to Highlight Nets
- New Dynamic Slide-Via Capability
 - Dynamically drags Affected Wires
 - As with Routing, Ghost Reflects Location Viability
 - » (Red Not Possible, White Completes with DRCs)
- Autotune Option to Add/Remove a Delta Amount



Intercept Standards

Intercept is Fully Committed to Supporting Industry Standards

Intercept currently supports many standards, including:

- IPC350C
- IPC356
- IPC356A
- GenCAD
- Gerber/Gerber 274x
- DXF
- IGES
- GDSII
- ODB++
- ... and more.

GenCAM (IPC2510) is fully certified by the IPC.
 Currently evaluating STEP AP210.

Xtent Technology Rules Editor

- Integrated, single-source technology rules and high speed constraints editor.
- Spreadsheet format with quick copy/paste features.
- Stackup and Via Previews
- Color-coded highlights to indicate violations.
- Easy-to-use formulas for

constraining pin-pin and net lengths.

Technology Rules		Class Name	Layer Nam	e Pin-Pin	Pin-Via	Pin-Wire	Pin-Fill	Pin-Mis
Define Rules		+15V	•	0.012	0.012	0.012	0.012	0.012
Stackup								
-Blind/Buried Via		.012WIDTH		0.012	0.012	0.012		0.012
Component		.030SPACING	111	0.03	0.03	0.03	0.03	0.03
Component Class-Class	->	.030SPACING	Physical_1	0.025	0.025	0.025	0.025	0.025
Net Rule Set		.030SPACING	Physical_2	0.03	0.03	0.03	0.03	0.03
- Net Rules		.030SPACING	Physical_3	0.03	0.03	0.03	0.03	0.03
Net Class-Class Rules		.030SPACING	Physical_6	0.03	0.03	0.03	0.03	0.03
Fill Rules		.075WIDTH		0.05	0.05	0.05	0.05	0.05
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-From-To			· ·					
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Signal Path				Routing				
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- Support for signal paths containing more than one net.
- Ability to assign Signal Path Class rule to any defined signal paths.
- Auto-generate diff-pairs and signal paths with pattern matching formulas.
- Autotune from-to and signal paths in real-time from Xtent.
- Length status column visually indicates violations, updates in real-time.



Design Automation: DesignX

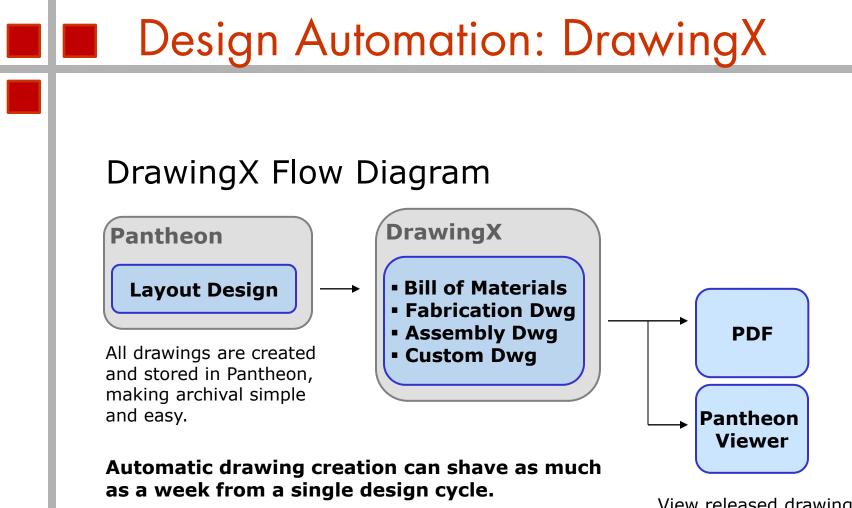
- Enables designers to perform comprehensive design-to-design and design-to-library comparisons of product data.
- This capability proves beneficial for managing team-wide changes to product data as well as for verifying design and library integrity prior to releasing products for manufacturing.
- Specific capabilities of DesignX include:
 - Symbol Check. Identifies graphics, pin, property, and text changes between design and library symbols.
 - Geometry Check. Pinpoints exact changes that are present between design and library geometries.
 - Component Check. Reports all component changes between successive copies of a design.
 - **Net Check**. Reports all net changes between successive copies of a design.
 - Trace Check. Reports all area fill, via, and wire changes between successive copies of a design.



Design Automation: DrawingX

- DrawingX allows users to automatically generate complex assembly and fabrication drawings according to a defined standard.
- Users may create entire drawing packages simply by choosing a drawing profile from a dialog list.
- To set up drawing templates, users may import existing, completed drawings and characterize the various features present on the drawing.
- DrawingX will automatically generate all required drawing features, such as the stack-up diagrams and part lists.
- Each drawing is automatically assembled with geometric tolerances, if specified.





View released drawings in PDF format or native Pantheon format.



Design Automation: DrawingX

- Users can also utilize features from DrawingX's drawing palette, which includes the following:
 - Added Text
 - Artwork Table of Contents
 - Assembly Notes
 - Board Placement View
 - Board Stack-up Diagram
 - Dimensioned Board View
 - Dimensioned Library Part Prints
 - Drill Schedule
 - Fabrication Notes
 - Parts List
 - Revision History Table
 - Staged Assembly Diagrams



Design Automation: QCX

- Provides a method for encapsulating complex verification processes to ensure DRC's, ERC's and MRC's are performed completely and according to manufacturing requirements.
- Allows users to select a "build-to" process, and automatically performs quality assurance tests to ensure that all design rule guidelines are met.
- Enables CAD users to quickly set up technology rules for designs simply by selecting a process profile that they would like to use with the design.
- Can set up process-specific rules for nets, pins, vias, component clearances, as well as verify that the board and its components meet the standards set for the selected process.



Design Automation: ReleaseX

- Allows users to automatically create all manufacturing files required for each vendor to which product data is supplied.
- Enables businesses to setup up vendor profiles that include contact information, pack and ship instructions, and a complete palette of design files that may be produced from Pantheon that may be included in the data profile.
- May be used to create and/or verify design files prior to release.
- If shipping instructions are included in the profile, design files will be electronically transferred when release package generation is complete.
- ReleaseX takes important steps to ensure that design files used in product QA are those which are released for product build.



Indx Key Features

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- Quick search & edit
- Geometry & Symbol Previews
- Batch edit properties
- Commit history, versioning
- Part, Symbol, Geometry Compare
- Fully customizable



Indx Key Features - Continued

- Synchronize with external database system (SQL Server, Access, MySQL)
- One or more librarians can work in the same library

Part Number	Stat	tus		
CT91013_149	Approved			
СТ91013_155	Developme		_	
CT91013_267	Developn	Parts		
CT91013_299	Developn	adit	•	
CT91013_388	Developn	edit	7	
CT91013_58	Approvec	file	•	Parts File
CT91013_59	Approvec	sql		read selected parts
CT91013_60	Approvec	property	▶	reau selecteu parts
CT91013_61	Approvec	view	•	copy part file
CT91013_98	Approvec		_	delete part file(s)
CT91013_99	Approvec	refresh list window		rename part file
		resize window width	_	rename part me
				commit part changes 🔊
<		>		cancel part changes 🗟
1				revert file version
			_	
				lock part file
				unlock part file

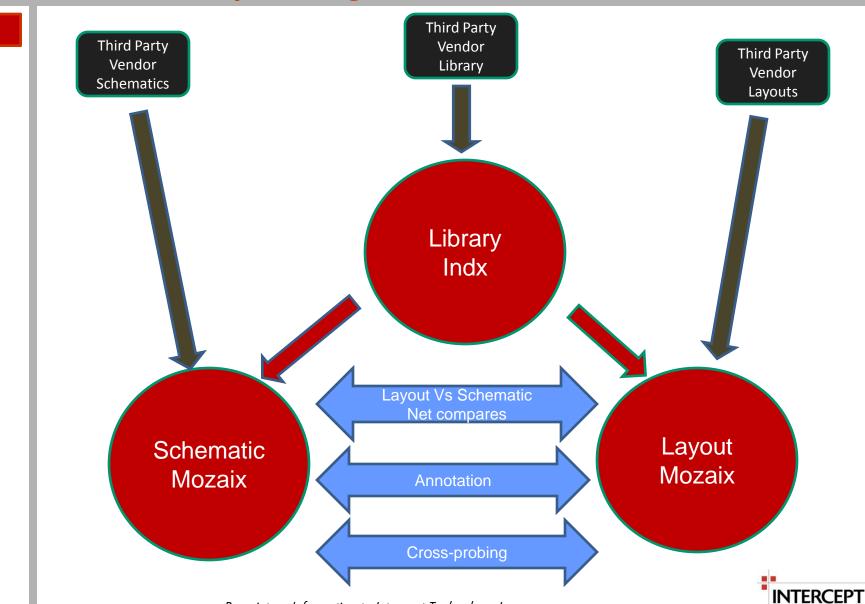
- Multiple approval levels for library objects
- Library objects are protected from users until it has met the proper approval level
- Full history of all changes made, as well as notes history from librarian commits.



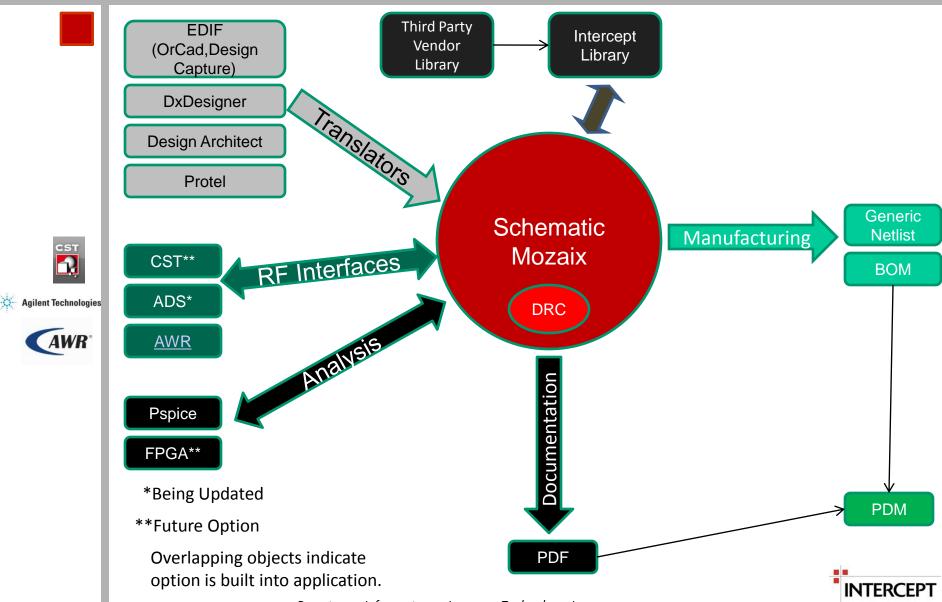
Proprietary Information of Intercept Technology Inc.

report lock info

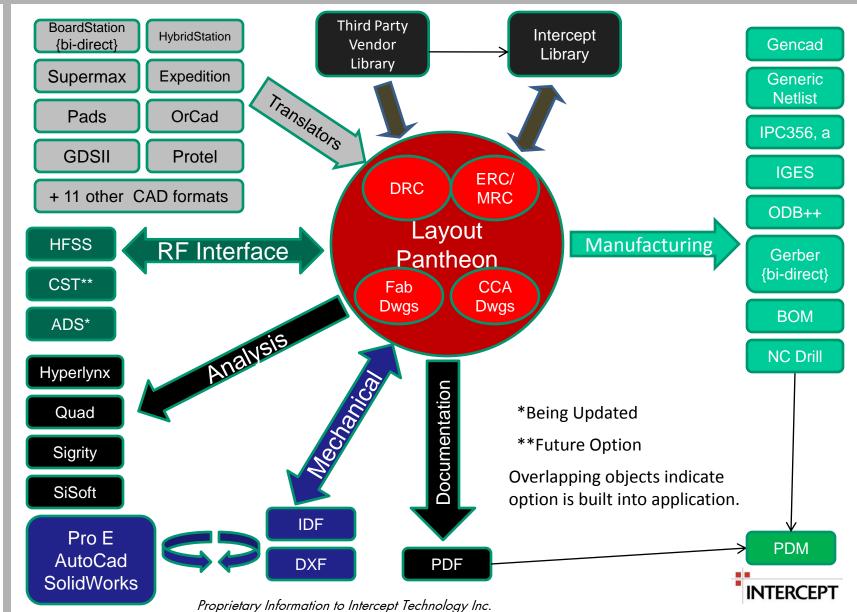
Intercept Migration Path

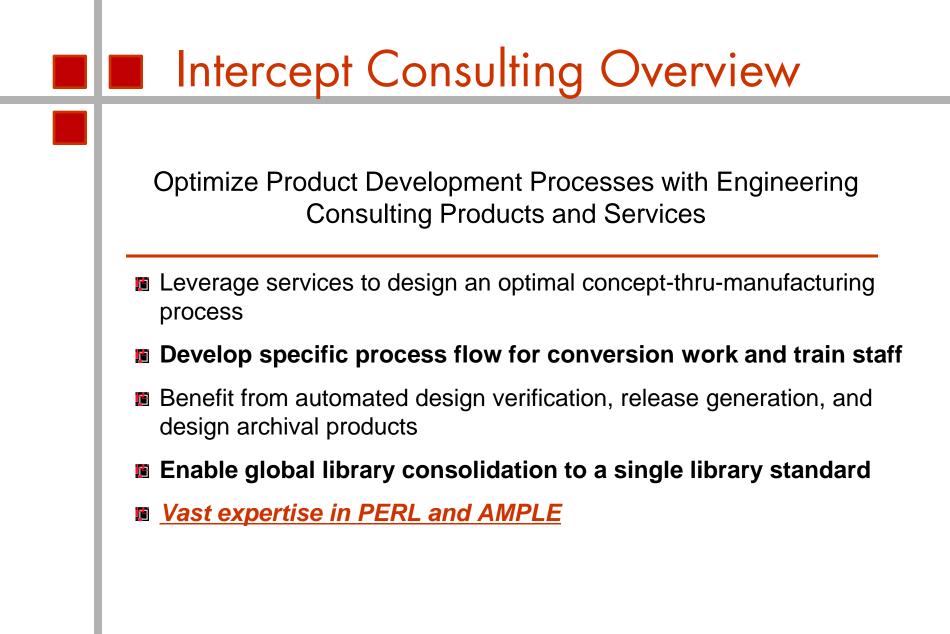


Schematic Migration Path



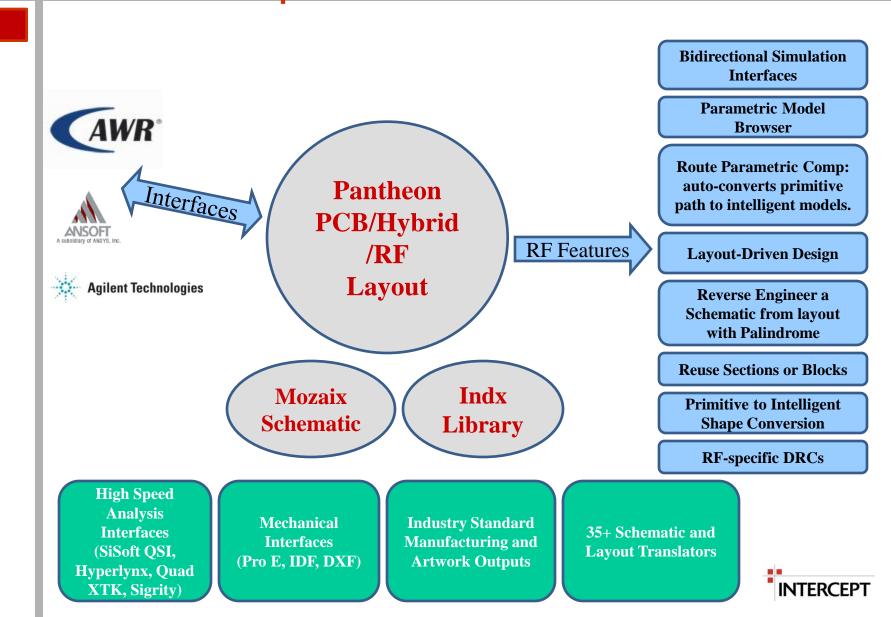
Layout Migration Path







Intercept – RF Leaders



The RF Solution

Time and Cost Savings

Analysis and design processes simplified and shortened with full bidirectional interfaces.

200%+ Productivity Increase

Proven metrics: 8 week design cycle with other vendors shortened to 4 weeks with Intercept solution.

Primitive to Intelligent

Intelligent models and primitive shape-tofill conversions means full benefit of Pantheon's design, electrical, artwork, and manufacturing checks. "Designing such highperformance RF instruments requires very intricate PC board design. The Pantheon tool is well suited to these challenges and gives us the right amount of control over difficult geometries, which is vital to our designs."



Jin Bains R&D Manager National Instruments



PCB/Hybrid/RF Design with Blocks Schematic-Driven Design Block Technology Overview Mane Imp/Exp Geoms Library Fabricate Physical Report Display Help Systest Maneuver Block: blk2 Checking On Top Side Part: siu Type: board (MI) Туре Artwork Selected Objects Place Block: Net In Blocks include both Place Block: physical & logical circuit **Block References:** blk1 blk2 blk3 Utilize One or more Blocks within host design, with any number of blocks placed within blocks. Blocks can be reused in any number of designs. Design blocks can reside at library or design level. Logical and Physical Reuse Blocks are Synchronized

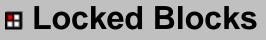


PCB/Hybrid/RF Design with Blocks

ects:

[7] (2) via_1_2_h15

INTERC



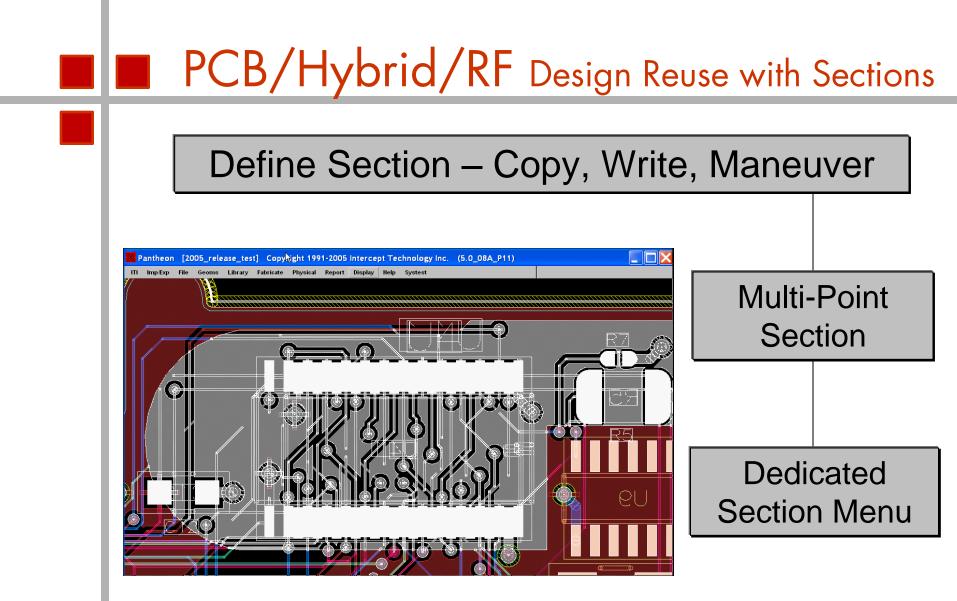
- Placed, Selected, Moved as Single Circuit
- Not Editable at the Design Level
- Block Pins Used to Connect Reuse Block to Host Design

Unlocked Blocks

- Circuit is Flattened, as if Designed on Board
- No link Back to Library
- Cannot Select as Single Entity

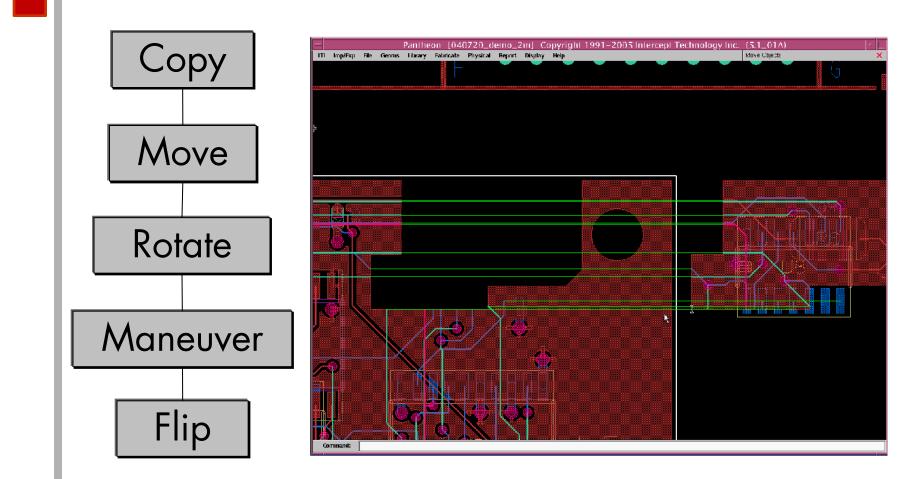
Mozaix Blocks

- Block State Must be Set Prior to Back Annotation
- Back Annotation of a Locked Block is Limited to Location

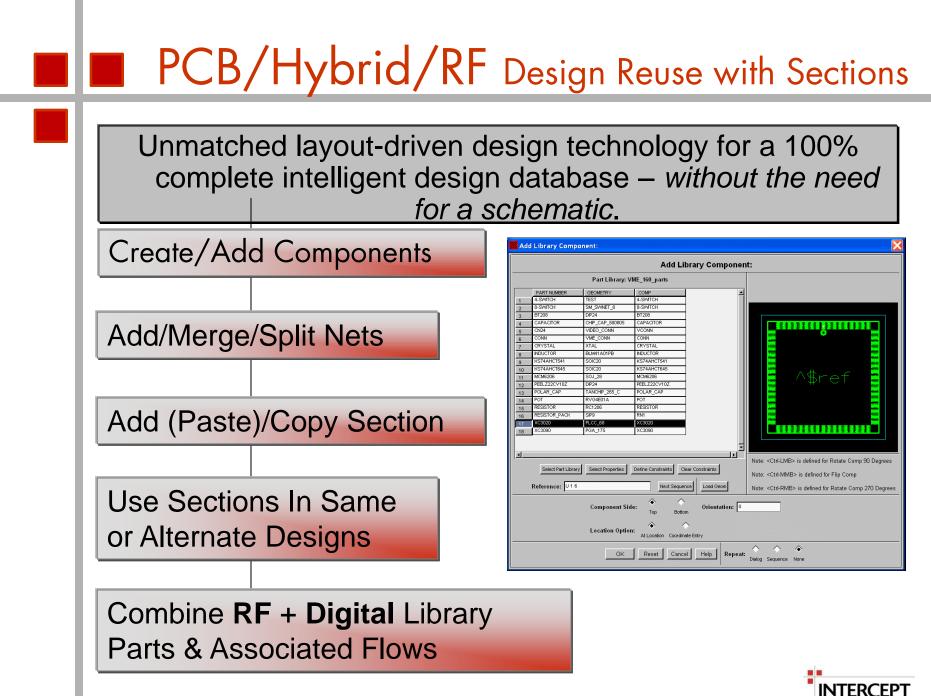


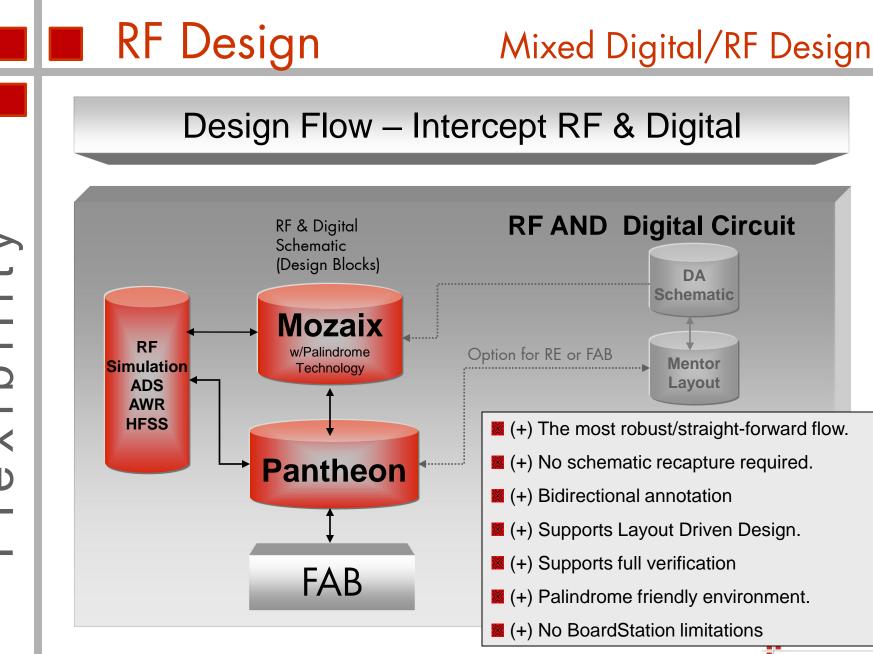


PCB/Hybrid/RF Design Reuse with Sections









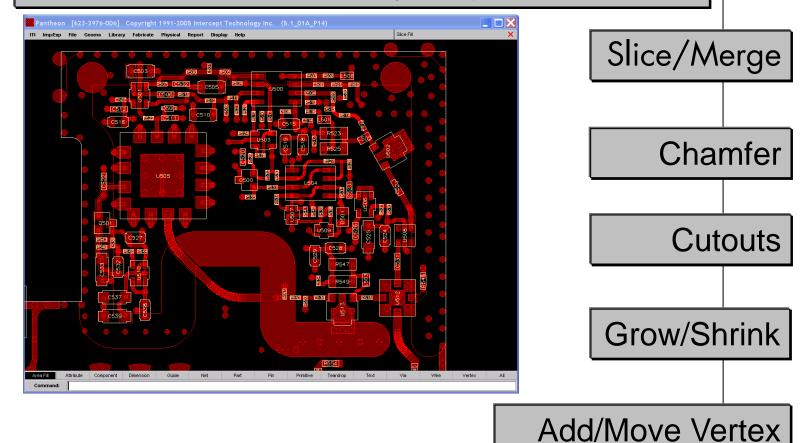
INTERCEPT

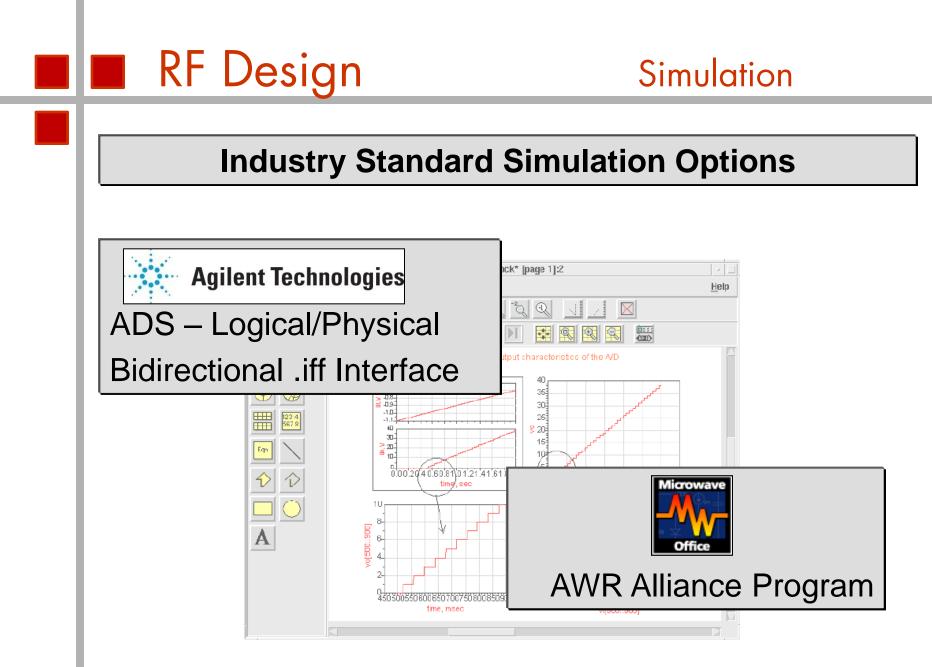
📕 📕 RF Design

Shape/Fill Manipulation

INTERCEPT

Easily create and manipulate complex copper and arbitrary shapes.

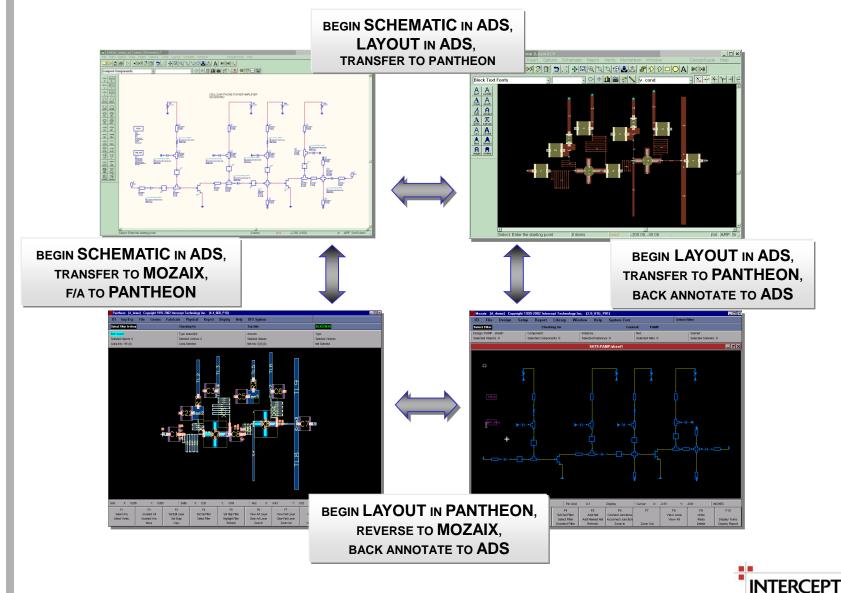






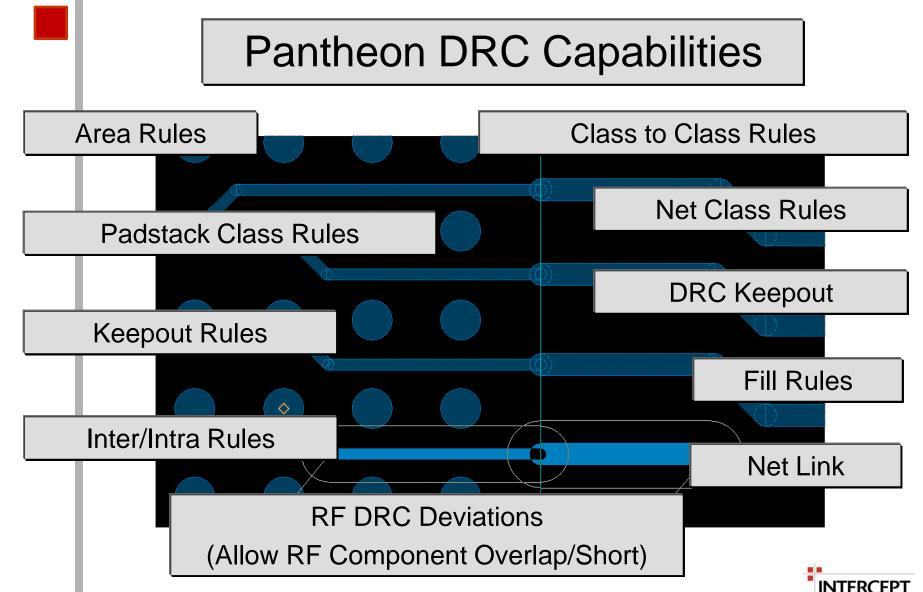


Simulation



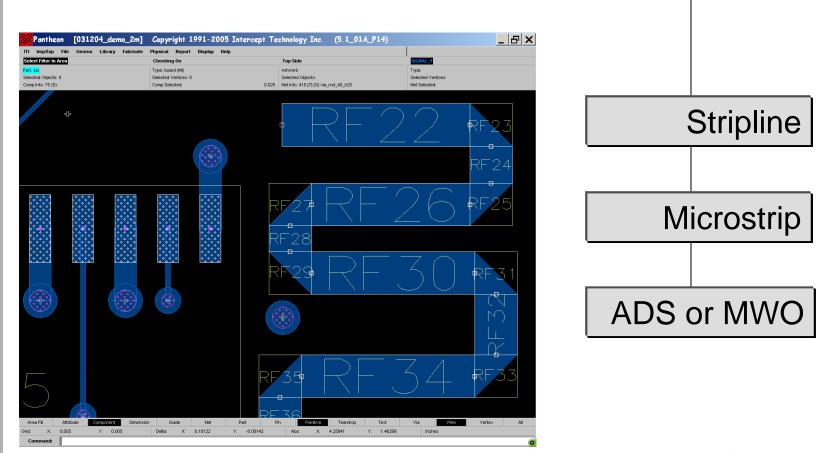


RF Specific DRCs



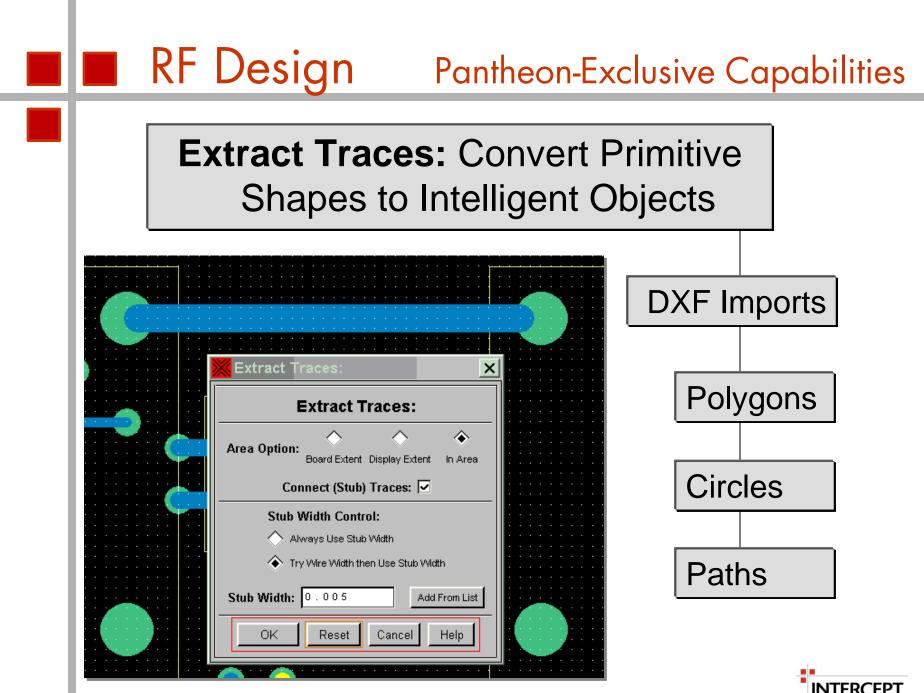
RF Design Pantheon-Exclusive Capabilities

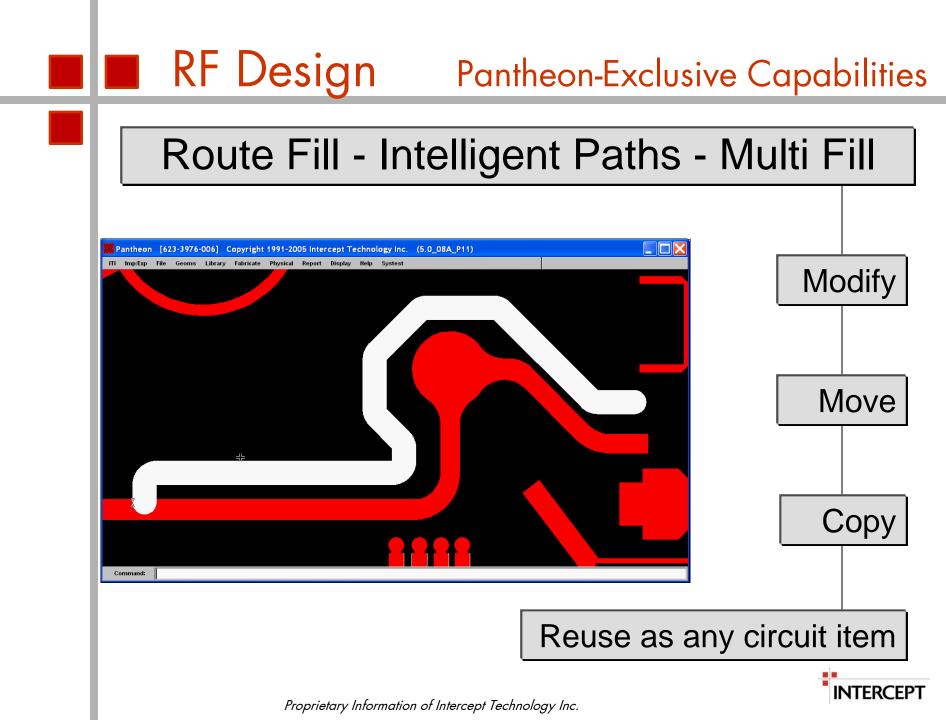
Route Parametric Component: Converts a routed path to RF models



INTERCEPT

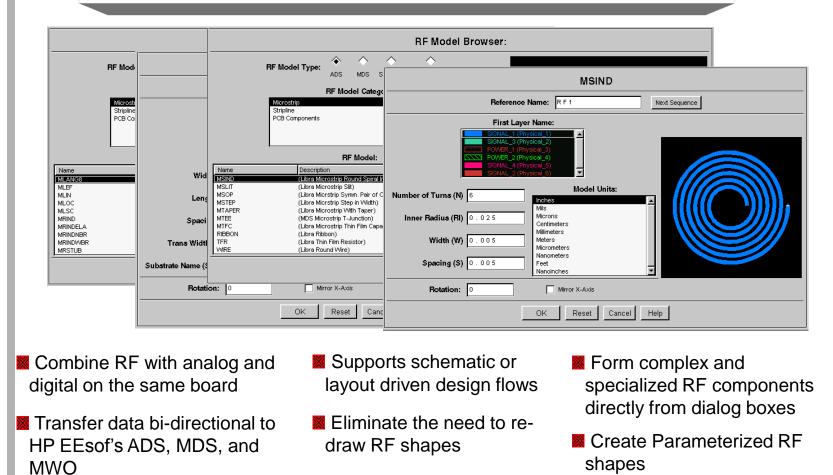
Proprietary Information of Intercept Technology Inc.





RF Design Pantheon-Exclusive Capabilities

Parametric RF Model Generator











Indx



Basic Indx Features

Indx 4.1_03A_P56 [Libraries]							
File Edit View Settings DRCs Libraries	Help						
		👯 Real-Time Status Display					
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⊕	Reset Filters Refresh Properties Displ # Fully Customizable						
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Advanced Indx Features

- * One or more librarians can work in the same library
- Multiple approval levels for library objects
- # Library objects are protected from users until they are approved
- Full history of all changes made, as well as notes history from librarian commits
- * Synchronize with external database system (SQL Server, MySQL)

Commit	Changes	to Library									?X			
Parts s	Symbols													
State	Library	Status	Part Class	Part Number	Symbol	Geometry	Version	Unfreeze	Commit	1	^			
ID*	ic_digital	QA-Fail	digital	785-00007	cy2305:cy2305	SO8N	6							
ID*	ic_digital	Obsolete	digital	785-00034	100el33:100el33	SO8N	6	-	-					
ID*	ic_digital	Obsolete	digital	785-00031	pm7347:power 🗸	BGA256_50MIL	6	✓						
ID*	ic_digital	Obsolete	digital	785-00030	tps2828:tps2828								60.0	
ID*	ic_digital	Inactive	digital	785-00041	sy100lvel11:sy100lvel11	Override	Lock or	Part(s)						
ID*	ic_digital	Inactive	digital	785-00040	sy100elt20v:sy100elt20v									
ID*	ic_digital	Inactive	digital	785-00039	xx14:xx14		The fellow	ing part ()) is look	ad by by	h dubn a	an realist	
ID*	ic_digital	Inactive	digital	785-00038	100xx23:100xx23		The following part (622-00009) is locked by bob_dylan Do you want to override the lock on this part?							
ID*	ic_digital	Inactive	digital	785-00037	sy100el15l:sy100el15l									
ID*	ic_digital	Inactive	digital	785-00036	sy100el57l:sy100el57l									
ID*	ic_digital	Inactive	digital	785-00035	sy100el195:sy100el195	195 Yes No Cancel								
ID*	ic_digital	Development	digital	785-00011	xx16244:16244	7		-3	110	<u> </u>	Can			
ID*	ic_digital	Development	digital	785-00005	mxt5116:ADDR_DATA	r								
ID*	ic_digital	Approved	digital	785-00018	V00vv00vv00	5014N	6						<u> </u>	
ID*	ic_digital	Approved	digital	785-00016	Run DRCs									
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					Remove From Sess	ion								
					OK Cancel	Help								
													ERCE	

Intercept Parts: Auto-Packaging on the Fly

- * Parts contain live, DRC-able references to their symbol(s) and geometry(ies).
- Intercept part information includes complete packaging information
- **#** Fully packaged parts = faster placement on the schematic using auto-packaging.
- # Placing parts is a one step process.

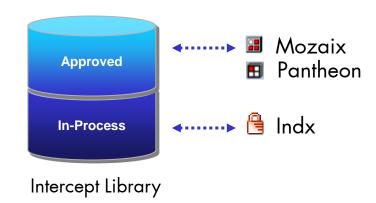
Parts Symbols Geometries ic_microproc ⊕ 100016 ⊕ → ppc405gpr-d BGA456_1MM_227MM	Library Part - 791	-00016 ×		Symbol Preview Pkg: pkg1 Slot: A				
Indx Project Explorer	⊕ ∰ pkg1 ∰ A[0] ∰ B[0] ∰ C[0]	ic_microproc : 791-00016 : pkg1 Part Information						
		Part Cla Ref Pre Stat Geome	t us Developr	cessor	v v MV Edit	Geometry Preview		<pre>< 1 of 3 >> Symbol: ppc405gpr-d</pre>
		Pins						View: i_o_bus
		Slot	Туре	Name	Number	Swap Code	<u>^</u>	Reference Designator
		A	slot	DMAACK0	D16	0	_≡_	
		A	slot slot	DMAACK1 DMAACK2	B15 B14	0		U1-A Display Designator
		A	slot	DMAACK2	C12	0		Display Power Pins

Indx Part Editor View

Mozaix Add Part Auto-Packager



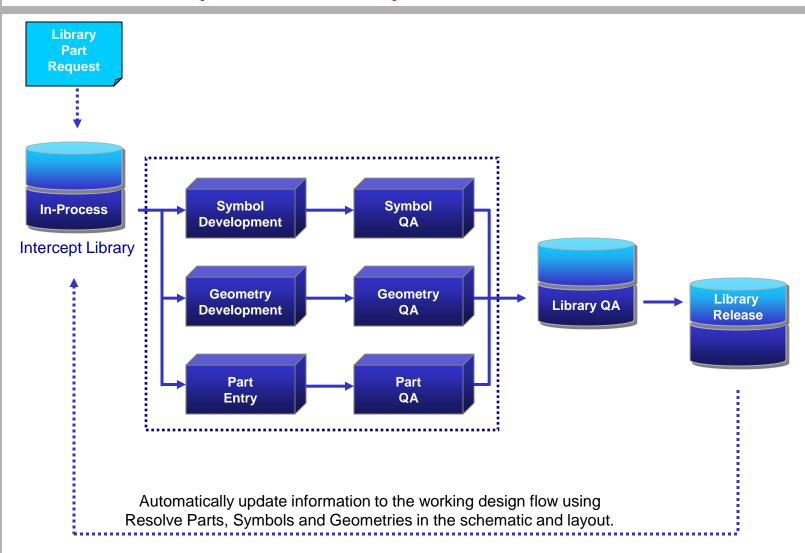
Intercept Edit-in-Place Library Flow



- "Development" parts, symbols, and geometries stored at same location as "Released" parts.
- # Librarian checks out the object, which leaves the last known version active.
- Mozaix/Pantheon users are warned when using a library object that is actively being edited by a Librarian. Design work continues using last active version.
- Any librarian commits are inaccessible to users until Librarian "unlocks," or "releases" the new part, symbol, or geometry version.
- Upon running batch DRCs in Mozaix & Pantheon, users are notified that a newer version of the part, symbol or geometry is now available.
- # Automatic Update or Library Resolve synchronizes schematic/layout with updated library objects.



Intercept Part Request Flow

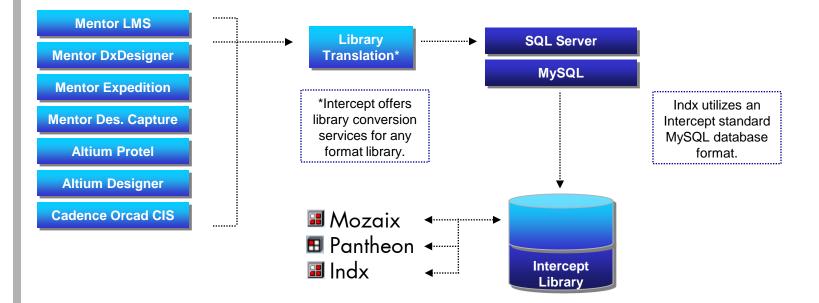




Library Migration Flow

Legacy libraries are converted to Intercept format in a one time translation.

This allows full migration to Intercept products.



- Create and edit database parts in Indx
- # Finalize and check parts, symbols, geometries
- # Commit data for use in Mozaix and Pantheon



The spirit of innovation knows no bounds.

Let us help you embrace the endless possibilities. Intercept's superior RF, Hybrid, and PCB design software gives you total design flexibility from analysis to layout to manufacturing. Our RF solution includes bidirectional analysis interfaces, parametric RF models, a parametric model route mode and model generator. Design with or without a schematic, or create one automatically from a layout. Visit us at **www.intercept.com** to learn more about how we can drive your next innovation.



PANTHEON ADVANCED PCB, HYBRID, RF LAYOUT MOZAIX NEXT GENERATION SCHEMATIC CAPTURE XTENT TECHNOLOGY RULES EDITOR/HIGH SPEED CONSTRAINT MANAGER INDX FLEXIBLE LIBRARY MANAGEMENT DRAWING X, QC X, RELEASE X DESIGN AUTOMATION PALINDROME REVERSE ENGINEERING INTERFACES TO RF, SMULATION, AUTOROUTERS 30+ DATABASE TRANSLATORS



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