Atlanta RF – Overview

www.AtlantaRF.com

Atlanta RF *Services*
Atlanta RF *Software*
Atlanta RF *Designs*

Atlanta RF
Services, Software & Designs

Atlanta RF

RF *Services, RF Software & RF Designs*

Atlanta RF *Services*:

- Satellite Ground Segment
- Satellite Space Segment
- Radar RF Front-Ends
- ECM/EW Platforms

Atlanta RF provides technical services to the RF/microwave community involved in the Defense industry and Satellite communication industry. Atlanta RF *Services* offers the best-in-class RF Engineers to support your Programs and bring them to success: On-time & within budget. Reach out to Atlanta RF *Services* for timely solutions to your engineering challenges.

Atlanta RF *Software*:

- Transmission Line Software
- Directional Coupler Software
- Filter Software: Various
- Impedance Matching Software

Atlanta RF offers a wide variety of computer-aided engineering (CAE) software, with special emphasis on synthesis algorithms for key RF circuit designs: Transmission lines, Directional Couplers and many Filters. Try our **DEMO software** to explore the many features imbedded in Synthesis and Analysis of RF/microwave circuits that you use every day.

Atlanta RF *Designs*:

Ready-To-Manufacture™ RF Designs for:

- RF Control Products
- Waveguide Products
- Double Ridge Products

Atlanta RF offers engineering designs to RF/microwave Design Engineers and RF System Engineers who need an arsenal of RF products, but don't have the time nor resources to develop them. Atlanta RF *Designs* provides BOM's, fabrication drawings and assembly guidelines for a broad range of Products developed and tested at Microwave Resources (Norcross, GA). Reach out to Atlanta RF *Designs* to purchase our Product Manufacturing Packages for *Ready-To-Manufacture™* product designs you need now.

Atlanta RF

Services, Software & Designs

Atlanta RF *Services*

Best-in-Class Technical Support

Ground Segment:
- Satellite Ground Stations
- Tactical Mobile CDL
- Ku/Ka-band SATCOM
- MILSATCOM

Space Segment:
- Communication Payloads
- Transmit Channels
- Receive Channels
- Beam-Forming Networks

Radar Front Ends:
- Volume Search
- Target Tracking
- Electronic Attack
- Missile Seekers

Overview: Atlanta RF *Services*

Atlanta RF *Services* offers technical support to the Defense community and Satellite community with best-in-class solutions for RF/microwave platforms. Our Subject Matter Experts combine decades of experience and knowledge to support your current projects and create award-winning proposals. Reach out to Atlanta RF *Services* for solutions to your pressing schedule and budget.

Technical Services:

- Spec Evaluation
- Compliance Matrix
- Technical Proposals
- Cost/Mgmt Proposals
- Customer presentations
- RF Systems Analysis
- Supply Chain products
- Program Schedules
- PDR/CDR support
- Risk Management
- Co-Engineering
- Product Development
- Product Roadmaps
- Test Plans/Procedures
- Product Improvement

Contact Atlanta RF *Services* by e-mail: **Services@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your current and future needs.

Atlanta RF

Services, Software & Designs

Atlanta RF *Services*

Best-in-Class Technical Support

Atlanta RF *Services* offers the following support to our Customers:

Engineering:

Our engineering services provide customers with the support needed to bring their programs to success. Our team is committed to serving you thru the synergy of co-engineering that enables us to stand with you for the long haul. We help commercial and government-based customers integrate technology by aligning business operations to improve performance. Our subject matter experts represent a broad range of technical disciplines and contribute unique talent to your team, with innovative thinking and emphasis on customer satisfaction.

Business Development:

Our insight into market needs enables our technical experts to produce superior proposals, thru collaboration with our customers, to bring contracts in-house quickly. We identify technical solutions that bring synergy with customer's existing products and processes, while enhancing those solutions thru co-engineering with strategic partners. Our core competencies in Business Development include: Technical & cost proposals, Product Roadmaps, Quad charts, customer presentations. . . . . and more.

Product Development:

Our team supports product development with leading-edge technology, whether for small or large engineering groups. Our support to product development spans one-of-a-kind items to full-scale production that drive real value into your organization through successful execution of critical initiatives. We combine decades of experience with our sister units: Atlanta RF *Software* and Atlanta RF *Designs*, to bring new products into your portfolio quickly.

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Atlanta RF

Services, Software & Designs

Atlanta RF *Services*

Best-in-Class Technical Support

Ground Segment:
- Satellite Ground Stations
- Tactical Mobile CDL
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- MILSATCOM

Space Segment:
- Communication Payloads
- Transmit Channels
- Receive Channels
- Beam-Forming Networks

Radar Front Ends:
- Volume Search
- Target Tracking
- Electronic Attack
- Missile Seekers

Customer benefits from Atlanta RF *Services*:

- Mutual partnership & knowledge transfer
  - ✓ Build long-term team partnerships
- Capable resources available
  - ✓ Sustainable source of high-end RF engineers
- Move programs & projects more rapidly
  - ✓ Build agile business initiatives
- Reduced design cycles
  - ✓ Meet stringent deadlines: Proposals & programs
- Find optimal design solutions
  - ✓ Quicker exploitation of market opportunities
- Value-based engineering & IP protection
  - ✓ Sustainable & highly-competitive solutions
- Address market dynamics faster
  - ✓Increase your competitive advantage

Contact Atlanta RF *Services* by e-mail: **Services@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your current and future needs.

Atlanta RF
Services, Software & Designs

Atlanta RF *Software*

Where Synthesis enables Analysis™

ARS*lines*™:

Transmission Lines

- Coaxial
- Microstrip
- Stripline
- Waveguide
- Double & Single Ridge Waveguide

Transmission-line software just got more exciting with added features that enhance your products: Synthesis features, Sensitivity Analysis, and Frequency Analysis using **ARS*lines*™**. Learn where the Lion's share of insertion loss occurs in coax. Understand why Power-Current Impedance: Z(P,I) best defines waveguide, both Rectangular & Double Ridge.
Try-out our **DEMO software** to learn more.

ARS*couplers*™:

Directional Couplers

- TEM Coupler Analysis
- Microstrip Edge-Coupled
- Interdigitated Coupler
- Stripline Edge-Coupled
- Waveguide Topwall

Your design of **Directional Couplers** is well enhanced using our RF/Microwave CAE software for the most popular designs needed in your RF circuits. Synthesize and Analyze these popular Directional Couplers with confidence using **ARS*couplers*™**, before you build them.
Try-out our **DEMO software** to learn more.

ARS*filters*™:

Low/High/Bandpass/Stop Filters

- Lumped Element: LPF, HPF, BPF, BSF
- Coax Lowpass Filter
- Parallel Edge-Coupled Bandpass Filter
- Wideband Bandpass
- TEM Filter Analysis

Synthesis and Analysis of popular **RF/Microwave Filters** provides confidence and clarity to the filter designs you use the most. **ARS*filters*™'** product family includes low-frequency Lumped-element Filters thru high-frequency distributed filters in stripline, microstrip and waveguide.
Try-out our **DEMO software** to learn more.

Atlanta RF

Services, Software & Designs

Atlanta RF *Software*

Where Synthesis enables Analysis™

ARS*filters*™:
Low/High/Bandpass/Stop Filters
- Lumped Element: LPF, HPF, BPF, BSF
- Coax Lowpass Filter
- Parallel Edge-Coupled Bandpass Filter
- Wideband Bandpass
- TEM Filter Analysis

ARS*lines*™:
Transmission Lines
- Coaxial
- Microstrip
- Stripline
- Waveguide
- Double & Single Ridge Waveguide

Customer benefits from Atlanta RF *Software*:

- Higher first-design success rate
  - ✓ Synthesis software enables analysis
- Greater technical clarity of your designs
  - ✓ Design risk mitigation
- Confidence to proceed with your designs
  - ✓ Improved productivity
- Fast & accurate design trade-off analysis
  - ✓ Improved system performance
- Affordable, accurate & empowering
  - ✓ Meet your goals & design objectives

ARS*couplers*™:
Directional Couplers
- TEM Coupler Analysis
- Microstrip Edge-Coupled
- Interdigitated Lange Coupler
- Stripline Edged-Coupled
- Waveguide Topwall

Contact Atlanta RF *Software* by e-mail: **Sales@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your RF/microwave CAE software requirements.

Atlanta RF
Services, Software & Designs

Atlanta RF *Software*: Transmission Lines

Where Synthesis enables Analysis™

ARS*lines*™:
Transmission Lines

- Coaxial
- Microstrip
- Stripline
- Waveguide
- Double & Single Ridge Waveguide

Advantages:

- Higher first-design success rate
- Greater technical clarity
- Confidence to proceed
- Fast & accurate design trade-off analysis
- Affordable, accurate and empowering

Overview: Transmission Line Software

Atlanta RF *Software* continues to expand our Product Family of RF/microwave computer-aided engineering (CAE) design software for popular Transmission Lines, with special emphasis on Electrical Synthesis, Dimensional Synthesis, Frequency Analysis and Sensitivity Analysis. Atlanta RF *Software* offers the following CAE software for Dimensional Synthesis, Frequency Analysis and Sensitivity Analysis of popular RF/microwave Transmission Lines:

Product	Brief Description
Coax	Synthesis & analysis of Coaxial transmission lines.
Microstrip	Synthesis & analysis of Microstrip transmission lines.
Stripline	Synthesis & analysis of Stripline transmission lines.
WRguide	Synthesis & analysis of Rectangular Waveguide.
WRDguide	Synthesis & analysis of Double & Single Ridge Waveguide.

Contact Atlanta RF *Software* by e-mail: **Sales@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your RF/microwave CAE software requirements.

Atlanta RF
Services, Software & Designs

Atlanta RF *Software*: Directional Couplers

Where Synthesis enables Analysis™

ARS*couplers*™ :
Directional Couplers

- TEM Coupler Synthesis & Analysis
- Microstrip Edge-Coupled
- Interdigitated Lange Coupler
- Stripline Edged-Coupled
- Waveguide Topwall

Advantages:

- Higher first-design success rate
- Greater technical clarity
- Confidence to proceed
- Fast & accurate design trade-off analysis
- Affordable, accurate and empowering

Overview: Directional Coupler Software

Atlanta RF *Software* continues to expand our Product Family of RF/microwave computer-aided engineering (CAE) design software for popular Directional Couplers, with special emphasis on Electrical Synthesis, Dimensional Synthesis and Frequency Analysis. Atlanta RF *Software* offers the following CAE software for Synthesis and Analysis of Directional Couplers operating at RF/microwave frequencies:

Product	Brief Description
TEMcoupler	Synthesis and Analysis of multi-section Symmetrical & Asymmetrical TEM-mode Directional Couplers.
MScoupler	Synthesis & analysis of Microstrip Edge-Coupled Directional Couplers (with or without top cover).
SLcoupler	Synthesis & analysis of Stripline Edge-Coupled Directional Couplers.
Lange	Synthesis & analysis of Interdigitated (Lange-type) Directional Couplers: 4 or 6-finger designs.
WGcoupler	Synthesis & analysis of multi-hole Topwall Directional Couplers constructed in Rectangular Waveguide.

Contact Atlanta RF *Software* by e-mail: **Sales@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your RF/microwave CAE software requirements.

Atlanta RF
Services, Software & Designs

Atlanta RF *Software*: RF/Microwave Filters

Where Synthesis enables Analysis™

ARS*filters*™ :

Low/High/Bandpass/Stop Filters

- Lumped Element: LPF, HPF, BPF, BSF
- Coax Lowpass Filter
- Parallel Edge-Coupled Bandpass Filter
- Wideband Bandpass
- TEM Filter Analysis

Advantages:

- Higher first-design success rate
- Greater technical clarity
- Confidence to proceed
- Fast & accurate design trade-off analysis
- Affordable, accurate and empowering

Overview: RF Filter Design Software

Atlanta RF *Software* continues to expand our Product Family of RF/microwave computer-aided engineering (CAE) design software for popular high-frequency Filters, with special emphasis on Electrical Synthesis, Dimensional Synthesis and Frequency Analysis. Atlanta RF *Software* offers the following CAE software for Synthesis and Analysis of RF/microwave Filters:

Product	Brief Description
LEfilter	Synthesis & Analysis of Lumped-Element Filters: Lowpass, Highpass, Bandpass & Bandstop.
CLPfilter	Synthesis & analysis of Coaxial Lowpass Filters: Electrical Circuit and Distributed Circuit.
PCfilter	Synthesis & analysis of Parallel Edge-Coupled Bandpass Filters realized in Stripline or Microstrip.
WBfilter	Synthesis & analysis of Wideband Bandpass Filters constructed in Stripline or Microstrip.
TEMfilter	Analysis of multi-section Bandpass and Bandstop Filters operating in non-dispersive TEM-mode.

Contact Atlanta RF *Software* by e-mail: **Sales@AtlantaRF.com** or by phone: 678-445-5544 at our Atlanta-area office to discuss your RF/microwave CAE software requirements.

Atlanta RF

Services, Software & Designs

Atlanta RF *Designs*

Ready-To-Manufacture™ RF Designs

Overview: Atlanta RF *Designs*

Atlanta RF *Designs* offers *Ready-To-Manufacture*™ product designs to Customers who need them now, and are ready to manufacture them now.. Our *Ready-To-Manufacture*™ product designs enable rapid completion of your next higher-level subsystem, or can expand your current product family with additional products. These product designs were developed at Microwave Resources (Norcross, GA) during the past several decades, so these product designs include typical swept-frequency RF test data, along with the following items:

Product Manufacturing Package:

- Bill of Materials (BOM) for Product.
- Outline Drawing for Product.
- Fabrication Drawings for Product.
- Assembly Guidelines for Product.
- Typical swept-frequency RF Test Data.

As with many RF/microwave products, certain manufacturing details can affect the product's RF performance after fabrication and assembly, so please contact us before starting your manufacturing process to discuss key process steps to enhance the product's RF performance.

Ready-To-Manufacture™ Product Designs:

RF Control Designs:

- Ferrite Circulators:
  - ✓ Waveguide
  - ✓ Double Ridge
- Ferrite Isolators:
  - ✓ Waveguide
  - ✓ Double Ridge

Waveguide Designs:

- Topwall Couplers
- Cross-Guide Couplers
- Loop-Type Couplers
- Coax Adapters
- Precision Terminations
- High-Power Terminations

Double Ridge Designs:

- Magic Tees/Folded Tees
- Topwall Couplers
- Cross-Guide Couplers
- Loop-Type Couplers
- Coax/End-Launched Adapters
- High RF Power Terminations

Atlanta RF
Services, Software & Designs

Atlanta RF *Designs*

Ready-To-Manufacture™ RF Designs

RF Control Designs:
- Ferrite Circulators:
  - ✓ Waveguide designs
  - ✓ Double Ridge designs
- Ferrite Isolators:
  - ✓ Waveguide designs
  - ✓ Double Ridge designs

Waveguide Designs:
- Topwall Couplers
- Cross-Guide Couplers
- Loop-Type Couplers
- Coax Adapters
- Precision Terminations
- High-Power Terminations

Double Ridge Designs:
- Magic Tees/Folded Tees
- Topwall Couplers
- Cross-Guide Couplers
- Loop-Type Couplers
- Coax/End-Launched Adapters
- High RF Power Terminations

Customer benefits from Atlanta RF *Designs*:

- Ready-To-Manufacture product designs
  - ✓ Breadth & diversity for your product portfolio
- Reduced cost from your R&D budget
  - ✓ Effective product cost management
- Propel product's time-to-market
  - ✓ Quicker exploitation of market opportunities
- Seamless integration into your product family
  - ✓ Re-use the product design over-and-over
- Mature designs: Robust & affordable
  - ✓ BOMs, drawings & assembly guidelines

Visit Atlanta RF *Designs* online: **www.AtlantaRF.com** to explore the many RF product designs that are ***Ready-To-Manufacture***™.

Product Manufacturing Package:
- Bill of Materials (BOM) for Product.
- Outline Drawing for Product.
- Fabrication Drawings for Product.
- Assembly Guidelines for Product.
- Typical swept-frequency RF Test Data.

Atlanta RF
Services, Software & Designs

Atlanta RF *Designs*: RF Control Designs

Ready-To-Manufacture™ RF Designs

Example of **RF Control** product designs available as *Ready-To-Manufacture*™ RF designs from Atlanta RF *Designs*: Ferrite Isolators constructed in Double Ridge Waveguide. Additional product designs include**:**

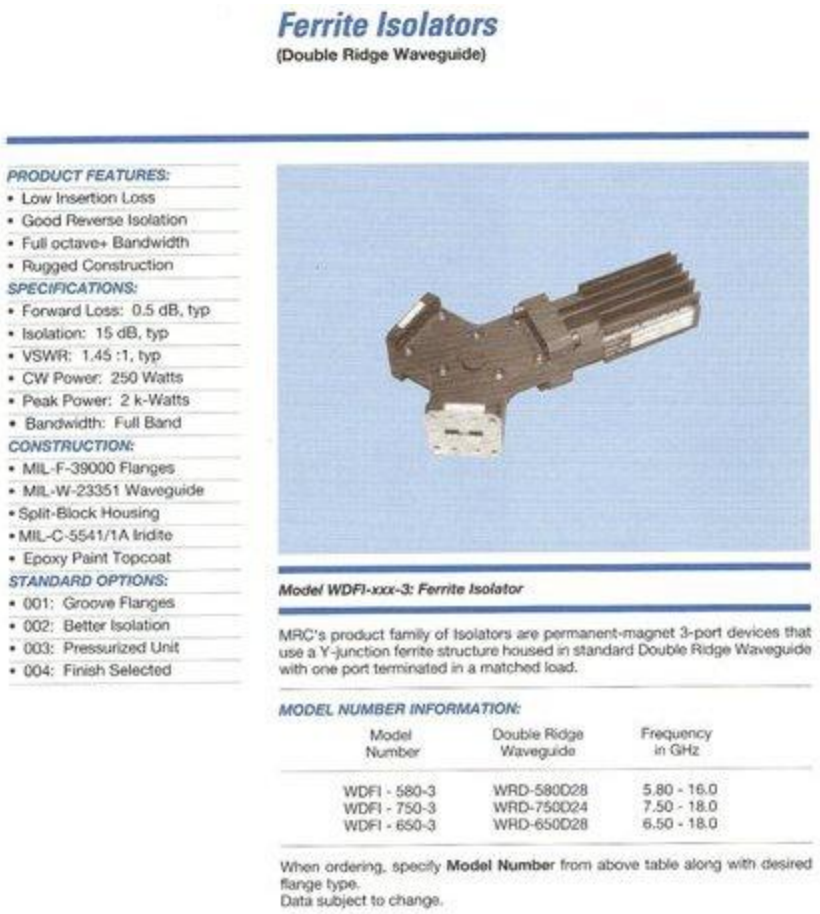
RF Control Designs:

- Ferrite Circulator product designs:
  - ✓ Rectangular Waveguide
  - ✓ Double Ridge Waveguide
- Ferrite Isolator product designs:
  - ✓ Rectangular Waveguide
  - ✓ Double Ridge Waveguide

Each *Ready-To-Manufacture*™ product design is delivered with a **Product Manufacturing Package:**

- Bill of Materials (BOM) for Product.
- Outline Drawing for Product.
- Fabrication Drawings for Product.
- Assembly Guidelines for Product.
- Typical swept-frequency RF Test Data.

Visit Atlanta RF *Designs* online: **www.AtlantaRF.com** to explore the many RF product designs that are *Ready-To-Manufacture*™.



Ferrite Isolators
(Double Ridge Waveguide)

PRODUCT FEATURES:
- Low Insertion Loss
- Good Reverse Isolation
- Full octave+ Bandwidth
- Rugged Construction

SPECIFICATIONS:
- Forward Loss: 0.5 dB, typ
- Isolation: 15 dB, typ
- VSWR: 1.45 :1, typ
- CW Power: 250 Watts
- Peak Power: 2 k-Watts
- Bandwidth: Full Band

CONSTRUCTION:
- MIL-F-39000 Flanges
- MIL-W-23351 Waveguide
- Split-Block Housing
- MIL-C-5541/1A Iridite
- Epoxy Paint Topcoat

STANDARD OPTIONS:
- 001: Groove Flanges
- 002: Better Isolation
- 003: Pressurized Unit
- 004: Finish Selected

Model WDFI-xxx-3: Ferrite Isolator

MRC's product family of Isolators are permanent-magnet 3-port devices that use a Y-junction ferrite structure housed in standard Double Ridge Waveguide with one port terminated in a matched load.

MODEL NUMBER INFORMATION:

Model Number	Double Ridge Waveguide	Frequency in GHz
WDFI - 580-3	WRD-580D28	5.80 - 16.0
WDFI - 750-3	WRD-750D24	7.50 - 18.0
WDFI - 650-3	WRD-650D28	6.50 - 18.0

When ordering, specify **Model Number** from above table along with desired flange type.
Data subject to change.

Atlanta RF
Services, Software & Designs

Atlanta RF *Designs*: Waveguide Designs

Ready-To-Manufacture™ RF Designs

Example of **Waveguide** product designs available as *Ready-To-Manufacture*™ RF designs from Atlanta RF *Designs*: Short Loop-Type Couplers constructed in Rectangular Waveguide. Additional product designs**:**

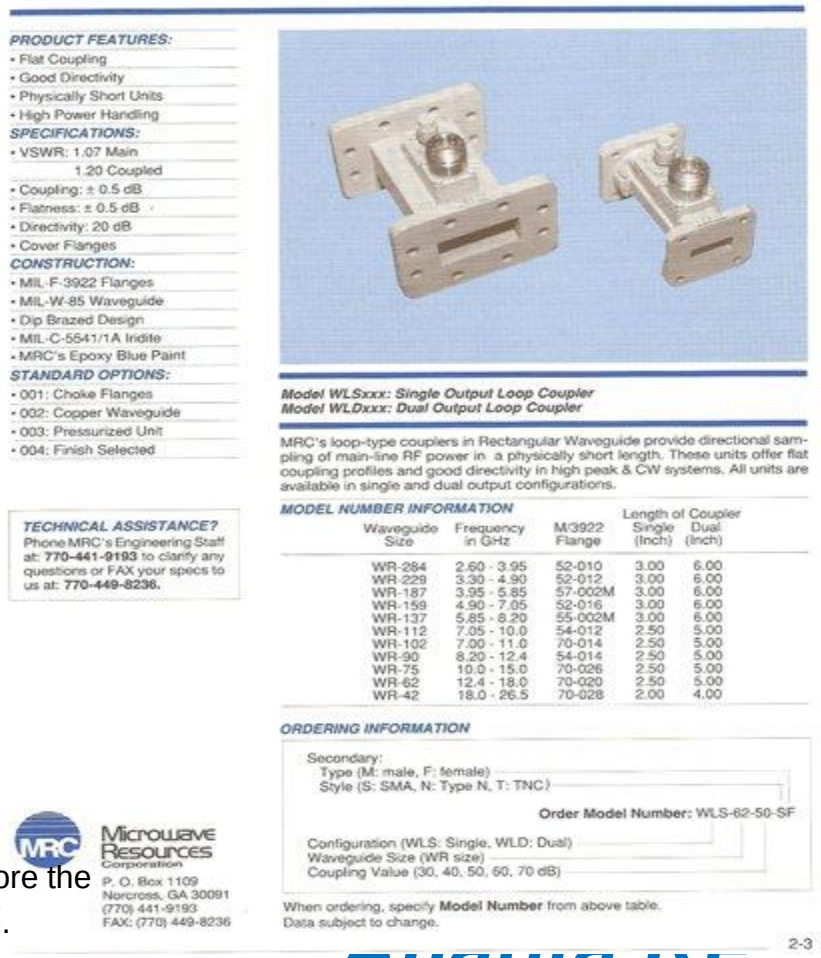
Waveguide Designs:

- Topwall Coupler designs
- Cross-Guide Coupler designs
- Loop-Type Coupler designs
- Coax Adapter designs.
- Precision Termination designs
- High RF Power Termination designs

Each *Ready-To-Manufacture*™ product design is delivered with a **Product Manufacturing Package:**

- Bill of Materials (BOM) for Product.
- Outline Drawing for Product.
- Fabrication Drawings for Product.
- Assembly Guidelines for Product.
- Typical swept-frequency RF Test Data.

Visit Atlanta RF *Designs* online: **www.AtlantaRF.com** to explore the many RF product designs that are *Ready-To-Manufacture*™.



Short Loop-Type Couplers
(Rectangular Waveguide)

PRODUCT FEATURES:
- Flat Coupling
- Good Directivity
- Physically Short Units
- High Power Handling

SPECIFICATIONS:
- VSWR: 1.07 Main
  1.20 Coupled
- Coupling: ± 0.5 dB
- Flatness: ± 0.5 dB
- Directivity: 20 dB
- Cover Flanges

CONSTRUCTION:
- MIL-F-3922 Flanges
- MIL-W-85 Waveguide
- Dip Brazed Design
- MIL-C-5541/1A Iridite
- MRC's Epoxy Blue Paint

STANDARD OPTIONS:
- 001: Choke Flanges
- 002: Copper Waveguide
- 003: Pressurized Unit
- 004: Finish Selected

TECHNICAL ASSISTANCE?
Phone MRC's Engineering Staff at: **770-441-9193** to clarify any questions or FAX your specs to us at: **770-449-8236.**

Model WLSxxx: Single Output Loop Coupler
Model WLDxxx: Dual Output Loop Coupler

MRC's loop-type couplers in Rectangular Waveguide provide directional sampling of main-line RF power in a physically short length. These units offer flat coupling profiles and good directivity in high peak & CW systems. All units are available in single and dual output configurations.

MODEL NUMBER INFORMATION

Waveguide Size	Frequency in GHz	M/3922 Flange	Length of Coupler Single (Inch)	Dual (Inch)
WR-284	2.60 - 3.95	52-010	3.00	6.00
WR-229	3.30 - 4.90	52-012	3.00	6.00
WR-187	3.95 - 5.85	57-002M	3.00	6.00
WR-159	4.90 - 7.05	52-016	3.00	6.00
WR-137	5.85 - 8.20	55-002M	3.00	6.00
WR-112	7.05 - 10.0	54-012	2.50	5.00
WR-102	7.00 - 11.0	70-014	2.50	5.00
WR-90	8.20 - 12.4	54-014	2.50	5.00
WR-75	10.0 - 15.0	70-026	2.50	5.00
WR-62	12.4 - 18.0	70-020	2.50	5.00
WR-42	18.0 - 26.5	70-028	2.00	4.00

ORDERING INFORMATION

Secondary:
Type (M: male, F: female)
Style (S: SMA, N: Type N, T: TNC)
Order Model Number: WLS-62-50-SF
Configuration (WLS: Single, WLD: Dual)
Waveguide Size (WR size)
Coupling Value (30, 40, 50, 60, 70 dB)

When ordering, specify **Model Number** from above table.
Data subject to change.

Microwave Resources Corporation
P. O. Box 1109
Norcross, GA 30091
(770) 441-9193
FAX: (770) 449-8236

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Services, Software & Designs

Atlanta RF *Designs*: Double Ridge Designs

Ready-To-Manufacture™ RF Designs

Example of **Double Ridge Waveguide** product designs available as *Ready-To-Manufacture*™ RF designs from Atlanta RF *Designs*: Folded E-plane Magic Tees constructed in Double Ridge Waveguide. Additional product designs**:**

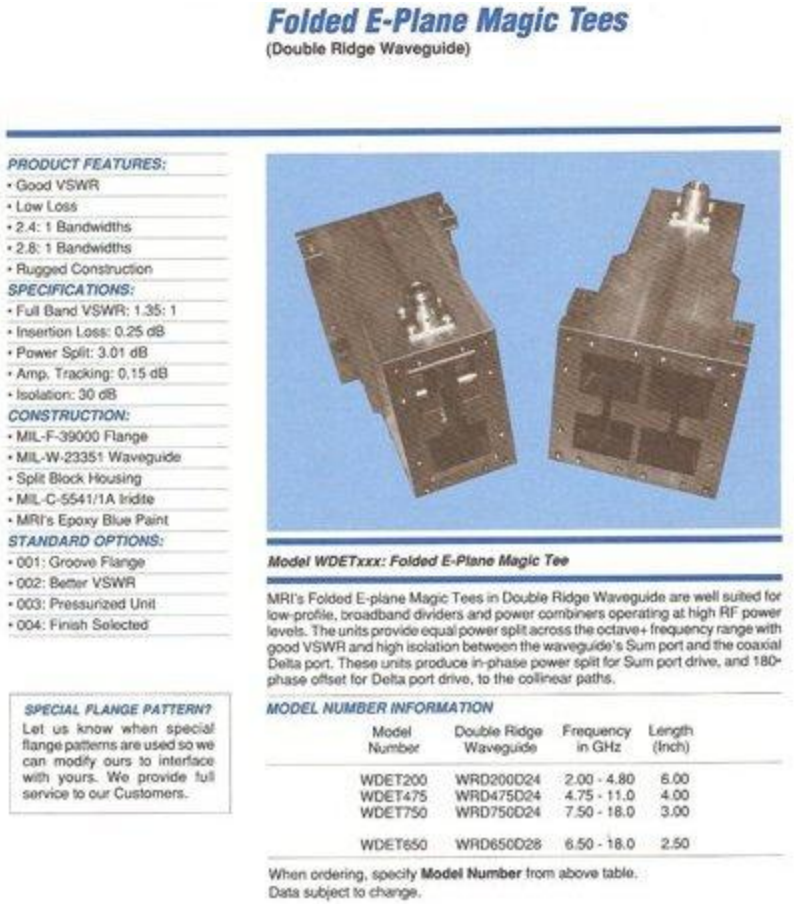
Double Ridge Waveguide Designs:

- Magic Tees & Folded E-plane Tees
- Topwall coupler designs
- Cross-Guide Coupler designs
- Loop-Type Coupler designs
- Coax/End-Launched Adapter designs.
- Precision Termination designs
- High RF Power Termination designs

Each *Ready-To-Manufacture*™ product design is delivered with a **Product Manufacturing Package:**

- Bill of Materials (BOM) for Product.
- Outline Drawing for Product.
- Fabrication Drawings for Product.
- Assembly Guidelines for Product.
- Typical swept-frequency RF Test Data.

Visit Atlanta RF *Designs* online: **www.AtlantaRF.com** to explore the many RF product designs that are *Ready-To-Manufacture*™.



Folded E-Plane Magic Tees
(Double Ridge Waveguide)

PRODUCT FEATURES:
- Good VSWR
- Low Loss
- 2.4: 1 Bandwidths
- 2.8: 1 Bandwidths
- Rugged Construction

SPECIFICATIONS:
- Full Band VSWR: 1.35: 1
- Insertion Loss: 0.25 dB
- Power Split: 3.01 dB
- Amp. Tracking: 0.15 dB
- Isolation: 30 dB

CONSTRUCTION:
- MIL-F-39000 Flange
- MIL-W-23351 Waveguide
- Split Block Housing
- MIL-C-5541/1A Iridite
- MRI's Epoxy Blue Paint

STANDARD OPTIONS:
- 001: Groove Flange
- 002: Better VSWR
- 003: Pressurized Unit
- 004: Finish Selected

SPECIAL FLANGE PATTERN?
Let us know when special flange patterns are used so we can modify ours to interface with yours. We provide full service to our Customers.

Model WDETxxx: Folded E-Plane Magic Tee

MRI's Folded E-plane Magic Tees in Double Ridge Waveguide are well suited for low-profile, broadband dividers and power combiners operating at high RF power levels. The units provide equal power split across the octave+ frequency range with good VSWR and high isolation between the waveguide's Sum port and the coaxial Delta port. These units produce in-phase power split for Sum port drive, and 180° phase offset for Delta port drive, to the collinear paths.

MODEL NUMBER INFORMATION

Model Number	Double Ridge Waveguide	Frequency in GHz	Length (Inch)
WDET200	WRD200D24	2.00 - 4.80	6.00
WDET475	WRD475D24	4.75 - 11.0	4.00
WDET750	WRD750D24	7.50 - 18.0	3.00
WDET650	WRD650D28	6.50 - 18.0	2.50

When ordering, specify **Model Number** from above table.
Data subject to change.

Atlanta RF
Services, Software & Designs

Atlanta RF

Services, Software & Designs

Bob Garvey
Chief Engineer
Atlanta RF, LLC

Thank You!

Contact Atlanta RF by e-mail at:

- Atlanta RF ***Services*** : **Services@AtlantaRF.com**
- Atlanta RF ***Software*** : **Sales@AtlantaRF.com**
- Atlanta RF ***Designs*** : **Designs@AtlantaRF.com**

Or, contact Atlanta RF by phone at: 678-445-5544, to reach our Atlanta-area office in Georgia, USA, and discuss our support to your current or future projects & products.

Atlanta RF

Services, Software & Designs

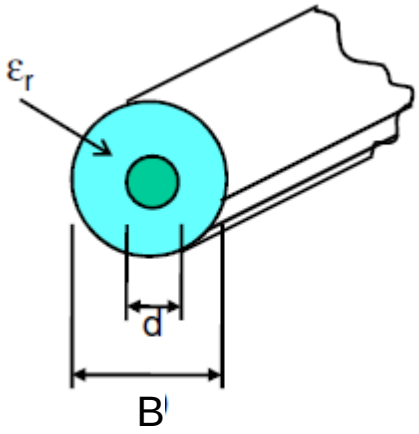
Atlanta RF *Software*: Coaxial Lines

Where Synthesis enables Analysis™

Software Product: Coax

Atlanta RF *Software* offers RF/microwave CAE software product: **Coax,** which performs Dimensional Synthesis and Electrical Analysis of Coaxial transmission lines, and includes the following product features:

1. Synthesis of coaxial physical dimensions from known Impedances.
2. Analysis of Impedances from known physical dimensions.
3. Sensitivity Analysis of coaxial Impedance to:
    a) Inner conductor diameter: D.
    b) Outer conductor diameter: B.
    c) Dielectric Constant: Er.
4. Insertion Loss versus Frequency of:
    a) Inner conductor loss versus Frequency.
    b) Outer Conductor loss versus Frequency.
    c) Dielectric Loss versus Frequency.
5. Capacitance & Inductance per unit length.
6. Peak RF power handling of your coaxial cross-section.
7. Higher-order mode cut-off frequency: TE11 mode.
8. Default values for each User-entered input data.
9. Output Data stored on your hard drive for graphical plots.



Software product: **Coax** is a quick and accurate software product for applying coaxial dimensions to RF/microwave circuits. The insertion loss profile versus frequency includes conductor losses (resistivity & surface roughness), and dielectric loss effects. Impedance sensitivity to small changes in physical dimensions identifies which fabrication parameter most influences your electrical circuit. Ever wonder why the RF/microwave community uses 50 Ohms as the impedance standard for our RF circuits? Explore our software product: **Coax** to learn why.

Atlanta RF
Services, Software & Designs

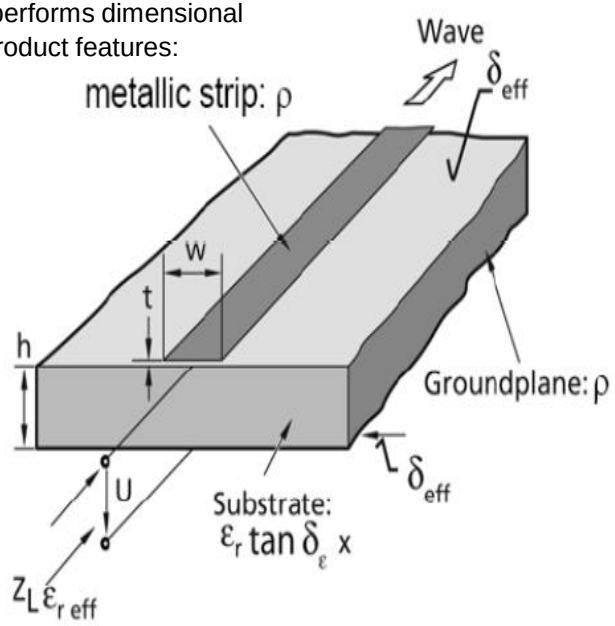
Atlanta RF *Software*: Microstrip

Where Synthesis enables Analysis™

Software Product: Microstrip

Atlanta RF *Software* offers RF/microwave CAE software product: **Microstrip,** which performs dimensional synthesis and electrical analysis of single-strip microstrip, and includes the following product features:

1. Synthesis of physical dimensions from known Impedances.
2. Analysis of Impedances from known microstrip physical dimensions.
3. Sensitivity Analysis of microstrip Impedance to:
    a) Substrate Thickness: H.
    b) Strip Width: W.
    c) Dielectric Constant: Er.
    d) Top cover height: H2.
4. Response profile versus Frequency of:
    a) Characteristic Impedance versus Frequency.
    b) Effective Dielectric Constant: Er' versus Frequency.
    c) Conductor loss versus Frequency.
    d) Dielectric loss versus Frequency.
    e) Unloaded Q (Qu) versus Frequency.
5. Higher-order mode cut-off frequency.
6. Default values for each User-entered input data.
7. Output Data stored on your hard drive for graphical plots.



Software product: **Microstrip** computes the Impedance Sensitivity of your microstrip circuits to the physical dimensions, so mechanical tolerances during fabrication are well-controlled . Dispersion effects on Impedance and effective dielectric constant (Er') are part of **Microstrip**'s Output Data, even when physical dimensions are synthesized.

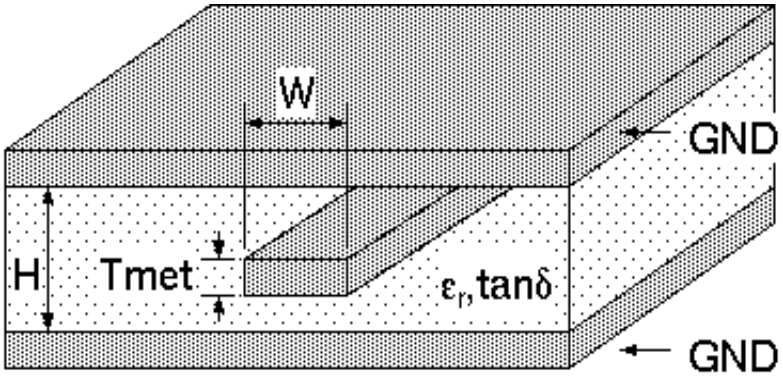
Atlanta RF *Software*: Stripline

Where Synthesis enables Analysis™

Software Product: Stripline

Atlanta RF *Software* offers RF/microwave CAE software product: **Stripline,** which performs dimensional synthesis and electrical analysis of single-strip balanced stripline, and includes the following product features:

1. Synthesis of physical dimensions from known Impedances.
2. Analysis of Impedances from known stripline physical dimensions.
3. Sensitivity Analysis of stripline Impedance to:
    a) Ground-plane spacing: B.
    b) Strip Width: W.
    c) Strip Thickness: T.
    d) Dielectric Constant: Er.
4. Response profile versus Frequency of:
    a) Conductor loss versus Frequency.
    b) Dielectric loss versus Frequency.
    c) Unloaded Q (Qu) versus Frequency.
5. Higher-order mode cut-off frequency.
6. Default values for each User-entered input data.
7. Output Data stored on your hard drive for graphical plots.



Software product: **Stripline** is a quick and accurate software product for applying stripline dimensions to RF/microwave circuits. The insertion loss profile versus frequency includes conductor losses (resistivity & surface roughness), and dielectric loss effects. Impedance sensitivity to physical dimensions identifies which fabrication parameter most influences your electrical circuit.

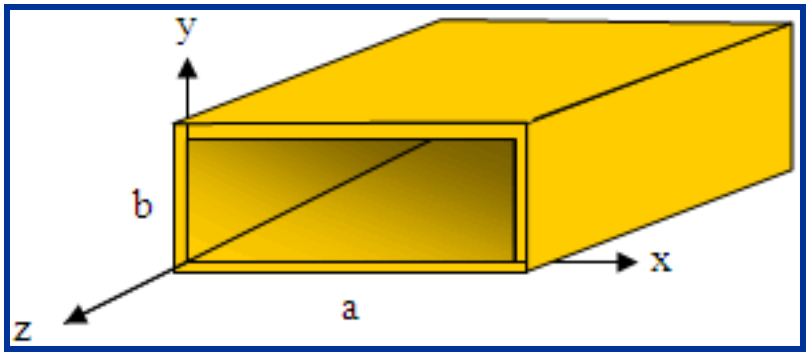
Atlanta RF *Software*: Waveguide

Where Synthesis enables Analysis™

Software Product: WRguide

Atlanta RF *Software* offers RF/microwave CAE software product: **WRguide,** which performs dimensional synthesis and analysis of Rectangular Waveguide, and includes the following product features:

1. Synthesis of physical dimensions from User-selected W/G Impedance:
   a) Power-Voltage Impedance: Z(P,V).
   b) Voltage-Current Impedance: Z(V,I).
   c) Power-Current Impedance: Z(P,I). . . . . perhaps the best!
2. Analysis of Impedances from known waveguide dimensions.
3. Sensitivity Analysis of:
   a) Impedance to waveguide width: A.
   b) Wavelength to waveguide width: A.
   c) Insertion Phase to waveguide width: A.
4. Response profile versus Frequency of:
   a) Waveguide Impedance versus Frequency
   b) Conductor losses versus Frequency.
   c) Unloaded Q (Qu) versus Frequency.
5. Propagation wavelength versus Frequency of:
   a) Dominant TE10 mode wavelength.
   b) TE(m,n) and TM(m,n) higher-order mode wavelengths.
6. Default values for each User-entered input data.
7. Output Data stored on your hard drive for graphical plots.



Software product: **WRguide** assists the RF Design Engineer and End-Users of rectangular waveguide with understanding of this low-loss transmission line during component development, and for predicting over-all system performance. Impedance profiles include the 3 definitions for Impedance in waveguide [Z(P,V), Z(V,I) and Z(P,I)] and their response profile versus frequency.

Atlanta RF
Services, Software & Designs

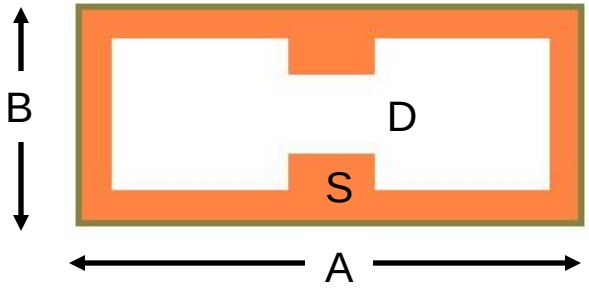
Atlanta RF *Software*: Double Ridge Waveguide

Where Synthesis enables Analysis™

Software Product: WRDguide

Atlanta RF *Software* offers RF/microwave CAE software product: **WRDguide,** which performs dimensional synthesis and analysis of Double Ridge and Single Ridge Waveguide, and includes the following product features:

1. Synthesis of physical dimensions from User-selected WRD Impedance:
    a) Power-Voltage Impedance: Z(P,V).
    b) Voltage-Current Impedance: Z(V,I).
    c) Power-Current Impedance: Z(P,I). . . . . perhaps the best choice!
2. Analysis of Impedances from known ridge waveguide dimensions.
3. Sensitivity Analysis of Impedance to:
    a) Waveguide width: A.
    b) Waveguide Height: B.
    c) Ridge Gap: D.
    d) Ridge Width: S.
4. Response profile versus Frequency of:
    a) WRD Impedance: Z(P,V), Z(V,I) and Z(P,I) versus Frequency.
    b) Guide wavelength versus Frequency.
    c) Conductor losses versus Frequency (Resistivity & Surface Roughness).
    d) Unloaded Q (Qu) versus Frequency.
5. Percent of RF power between the Ridge Gap: D.
6. Default values for each User-entered input data.
7. Output Data stored on your hard drive for graphical plots.



Cross-section of Double Ridge Waveguide

Software product: **WRDguide** can readily synthesize & analyze all standard Ridge Waveguide cross-sections, plus allow the User to develop new and custom WRD cross-sections that operate across broader operating Frequency ranges. **WRDguide** is useful when developing Double Ridge Waveguide products, like: Magic Tees; transitions to coax/microstrip/stripline; impedance-matching circuits, and many other WRD applications.

Atlanta RF
Services, Software & Designs

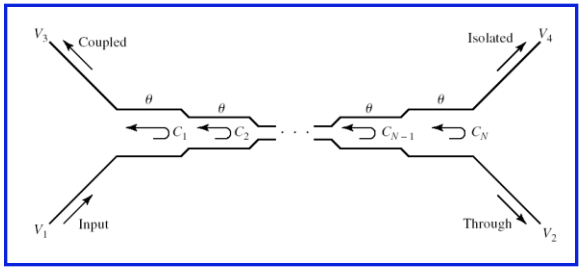
Atlanta RF *Software*: TEM Coupler

Where Synthesis enables Analysis™

Software Product: TEMcoupler

Atlanta RF *Software* offers RF/microwave CAE software product: **TEMcoupler,** which performs electrical and dimensional synthesis of N-section Symmetrical and Asymmetrical Directional Couplers and/or Frequency Analysis of TEM-mode (stripline) or quasi-TEM-mode (microstrip) Symmetrical or Asymmetrical Directional Couplers and includes the following product features:

1. Synthesis of N-section Symmetrical TEM-mode (stripline) and quasi-TEM-mode (microstrip) Directional Couplers, up to N = 9 sections across multiple frequency octaves: Zoe & Zoo.
2. Synthesis of N-section Asymmetrical TEM-mode (stripline) and quasi-TEM-mode (microstrip) Directional Couplers, up to N = 6-sections across multiple frequency octaves: Zoe & Zoo.
3. Synthesis of physical dimensions of N-section Symmetrical & Asymmetrical TEM-mode couplers using broadside parallel-coupled stripline construction, with or without strip offset.
4. Frequency Analysis of multi-section Directional Couplers:
   a. Analysis of N-section Symmetrical (N = 3, 5, 7 & 9-sections) Directional Couplers
   b. Analysis of N-section Asymmetrical (up to N = 6-sections) Directional Coulers.
   c. Can read User's Coupler Data File or User can enter key design data for Analysis:
      1) Even and Odd-Mode Impedances: Zoe & Zoo for each section.
      2) Center Frequency for each section.
5. Frequency Analysis features:
   a. User can select even & odd-mode phase velocity to simulate Microstrip construction.
   b. User can select loss levels (dB/inch) to simulate Insertion Loss effects.
6. Frequency Analysis response profile of key 4-port directional coupler parameters:
   a. 4-port Coupler Response: Scattering Parameters - Magnitude (dB) and Phase (degrees).
   b. VSWR, Coupling, Isolation & Quadrature Phase Error.
7. Default values for each User-entered Input Data.



Software product: **TEMcoupler** is a User-friendly and versatile design tool to characterize practical multi-section directional couplers having a symmetrical or asymmetrical design, whether constructed in stripline or dispersive microstrip.

Atlanta RF
Services, Software & Designs

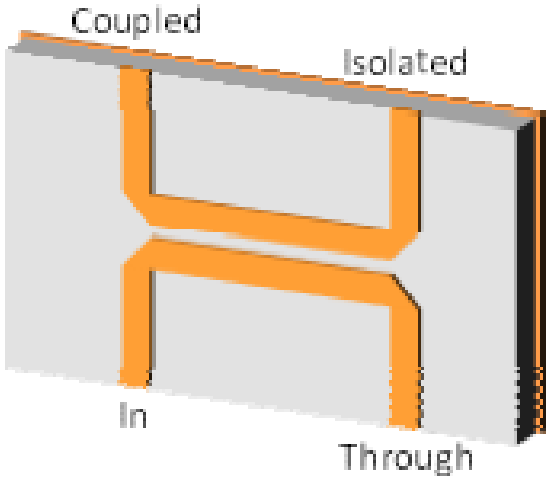
Atlanta RF *Software*: Microstrip Coupler

Where Synthesis enables Analysis™

Software Product: MScoupler

Atlanta RF *Software* offers RF/microwave CAE software product: **MScoupler,** which performs Electrical & Dimensional Synthesis, Sensitivity Analysis and Frequency Analysis of microstrip edge-coupled directional couplers, and includes the following product features:

1. Synthesis of micostrip coupler's physical dimensions (strip width & spacing) from:
    a) Coupling level (dB) and system impedance level (Zo), or
    b) Even and Odd-Mode Impedances: Zoe & Zoo.
2. Analysis of Impedances: Zoe, Zoo & Zo from known physical dimensions:
    a) Range of Strip Widths: Wmin to Wmax.
    b) Range of Strip Spacings: Smin to Smax.
3. Sensitivity Analysis of Impedance : Zoe & Zoo to:
    a) Substrate thickness: H, and Dielectric Constant: Er.
    b) Range of Strip Widths: Wmin to Wmax, and Strip Spacing: S.
    c) Top-cover Height: H2.
4. Frequency Analysis response profile of:
    a) Dispersive Zoe, Zoo and their effective dielectric constants versus Frequency.
    b) Conductor losses versus Frequency (Resistivity & Surface Roughness).
5. Default values for each User-entered input data.
6. Output Data stored on your hard drive for graphical plots.



Software product: **MScoupler** is a User-friendly design tool that reduces design time & cost to develop microstrip directional couplers. Put away your nomographs and rely on **MScoupler** to synthesize accurate & reliable physical dimensions for your next microstrip coupler. Our Frequency Analysis will predict the response profile of your designs before you build the hardware. . . . . including insertion loss from resistivity, roughness & dielectric loss tangent.

Atlanta RF
Services, Software & Designs

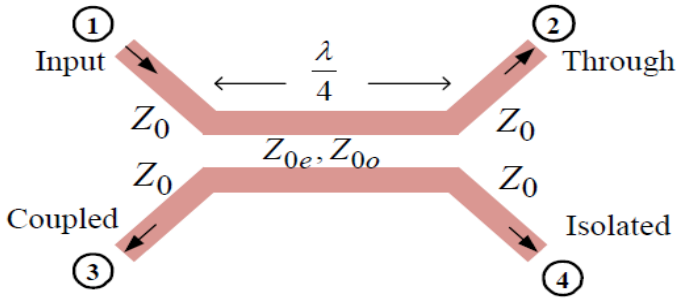
Atlanta RF *Software*: Stripline Coupler

Where Synthesis enables Analysis™

Software Product: SLcoupler

Atlanta RF *Software* offers RF/microwave CAE software product: **SLcoupler,** which performs Electrical & Dimensional Synthesis, Sensitivity Analysis and Frequency Analysis of stripline edge-coupled directional couplers, and includes the following product features:

1. Synthesis of stripline coupler's physical dimensions (strip width & spacing) from:
   a) Coupling level (dB) and system impedance level (Zo), or
   b) Even and Odd-Mode Impedances: Zoe & Zoo.
2. Analysis of Impedances: Zoe, Zoo & Zo from known physical dimensions:
   a) Range of Strip Widths: Wmin to Wmax.
   b) Range of Strip Spacings: Smin to Smax.
3. Sensitivity Analysis of Impedance : Zoe & Zoo to:
   a) Ground-plane Spacing: B.
   b) Range of Strip Widths: Wmin to Wmax.
   c) Range of Strip Spacing: Smin to Smax.
   d) Strip Thickness: T.
4. Frequency Analysis response profile of:
   a) 4-port Coupler Response: VSWR, Coupling, Isolation & Quadrature Phase Error.
   b) Conductor losses versus Frequency (Resistivity & Surface Roughness).
5. Default values for each User-entered input data.
6. Output Data stored on your hard drive for graphical plots.



Software product: **SLcoupler** is a User-friendly and versatile design tool for developing practical directional couplers in stripline. Dimensional Synthesis is readily applied to thin-strip, soft-substrate construction, or thick-strip, air-line coupler designs. **SLcoupler**'s Frequency Analysis feature provides 4-port response profiles of your coupler's design, including insertion loss effects caused by resistivity of metals, their surface roughness, and substrate dielectric losses. Sensitivity Analysis identifies which physical circuit parameter impacts Zoe & Zoo, so you can specify tolerances on Manufacturing drawings for highly reproducible designs. . . . . from unit-to-unit.

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Services, Software & Designs

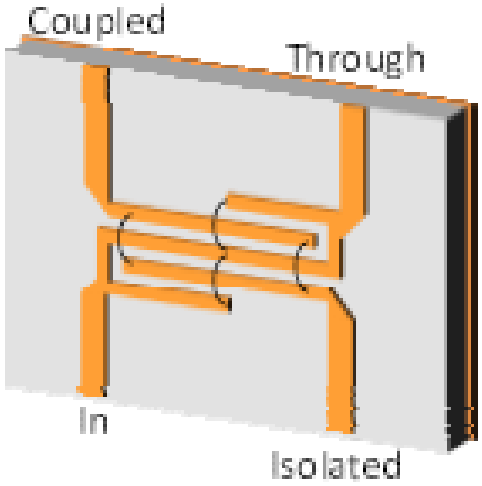
Atlanta RF *Software*: Lange Coupler

Where Synthesis enables Analysis™

Software Product: Lange

Atlanta RF *Software* offers RF/microwave CAE software product: **Lange,** which performs Electrical & Dimensional Synthesis, Sensitivity Analysis and Frequency Analysis of microstrip interdigitated directional couplers, and includes the following product features:

1. Synthesis of interdigitated coupler's physical dimensions (strip width & spacing) from:
   a) Coupling level (dB) and system impedance level (Zo), or
   b) Even and Odd-Mode Impedances: Zoe & Zoo.
   c) 4-strip or 6-strip interdigitated coupler designs.
2. Analysis of Impedances: Zoe, Zoo & Zo from known physical dimensions:
   a) Range of Strip Widths: Wmin to Wmax.
   b) Range of Strip Spacings: Smin to Smax.
3. Sensitivity Analysis of Impedance : Zoe & Zoo to:
   a) Substrate thickness: H, and Dielectric Constant: Er.
   b) Range of Strip Widths: Wmin to Wmax.
   c) Range of Strip Spacings: Smin to Smax,
4. Frequency Analysis response profile of:
   a) Dispersive Zoe, Zoo and their effective dielectric constants versus Frequency.
   b) Conductor losses versus Frequency (Resistivity & Surface Roughness).
5. Default values for each User-entered input data.
6. Output Data stored on your hard drive for graphical plots.



Software product: **Lange** provides the User with full design capability, from Synthesis to Analysis. Hardware Development time is drastically reduced when **Lange** characterizes your coupler prior to manufacturing. Simply enter your dimensions, operating frequency and desired coupling, then let **Lange** do the rest.

Atlanta RF
Services, Software & Designs

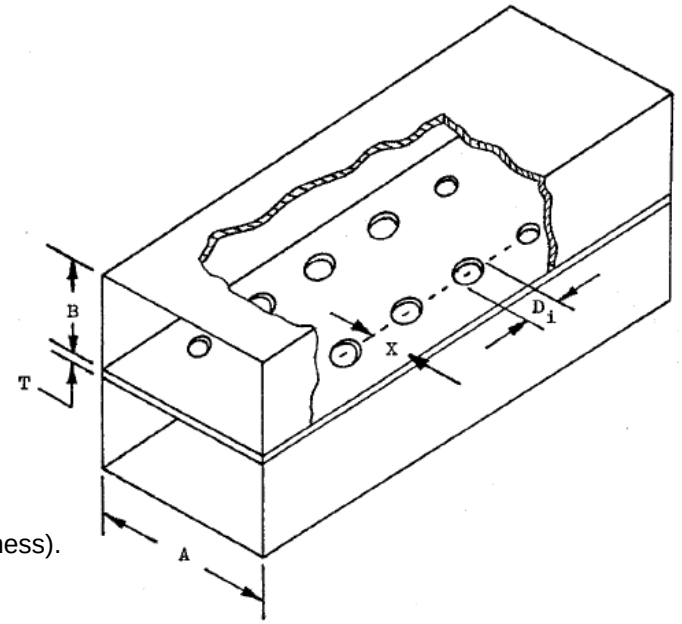
Atlanta RF *Software*: Waveguide Coupler

Where Synthesis enables Analysis™

Software Product: WGcoupler

Atlanta RF *Software* offers RF/microwave CAE software product: **WGcoupler,** which performs Electrical & Dimensional Synthesis and Frequency Analysis of Rectangular Waveguide Multi-Hole Topwall Directional Couplers, and includes the following product features:

1. Synthesis of Waveguide Topwall Couplers having:
   a) Single-line Array of coupling apertures.
   b) Superimposed Array (N x M) of coupling apertures.
   c) Chebyschev or Binomial distribution of coupling response.
2. Synthesis of waveguide coupling hole dimensions with:
   a) Large Aperture theory applied : Field averaging.
   b) Corrections for common-wall thickness (T).
   c) One or two holes per coupling aperture array.
3. Synthesis data at mid-band frequency for:
   a) Equivalent lumped-element circuit.
   b) Longitudinal spacing of coupling apertures.
   c) Minimum length of your Topwall Coupler.
4. Frequency Analysis response profile of:
   a) Input VSWR and Thru-path Insertion Loss.
   b) Coupled-port response and Reverse Isolation.
   c) Conductor losses versus Frequency (Resistivity & Surface Roughness).
5. Default values for each User-entered input data.
6. Output Data stored on your hard drive for graphical plots.



Software product: **WGcoupler** provides the User with full design capability, from Synthesis to Frequency Analysis of Rectangular Waveguide Multi-hole Topwall Couplers. Narrow-band or full waveguide bandwidth Topwall Couplers are readily designed & characterized, prior to manufacturing.

Atlanta RF
Services, Software & Designs

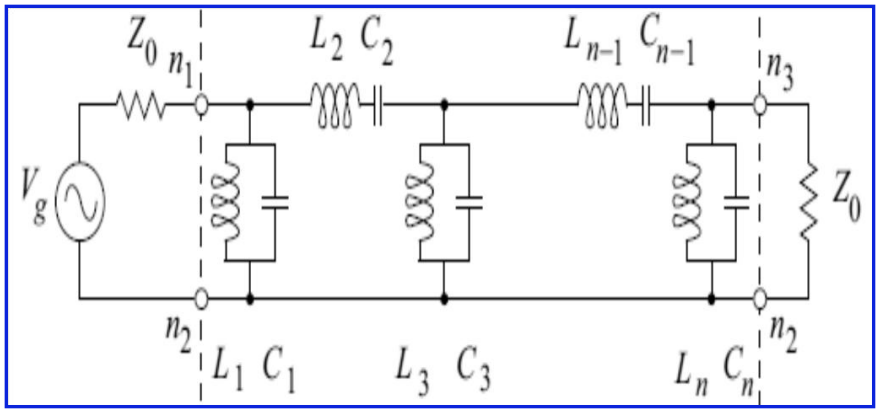
Atlanta RF *Software*: Lumped Element Filters

Where Synthesis enables Analysis™

Software Product: LEfilter

Atlanta RF *Software* offers RF/microwave CAE software product: **LEfilter,** which performs Electrical Synthesis and Frequency Analysis of multi-section Lumped-element Filters, and includes the following product features:

1. Synthesis of multi-section Lumped-element Filter designs:
   a) Lowpass Lumped-element Filters.
   b) Highpass Lumped-element Filters.
   c) Bandpass Lumped-element Filters.
   d) Bandstop Lumped-element Flters.
2. Synthesis of various Filter Design Options:
   a) Chebyschev or Butterworth frequency response.
   b) Standard electrical circuit or its Dual electrical circuit.
   c) Prototype Lowpass Circuit Elements included.
3. Frequency Analysis response profile of:
   a) Real & Imaginary Input Impedance: R + jX.
   b) Input VSWR and Thru-path Insertion Loss.
   c) Insertion Phase and Time Delay.
4. Default values for each User-entered input data.
5. Output Data stored on your hard drive for graphical plots.



Software product: **LEfilter** provides the User with full design capability, from Synthesis to Frequency Analysis of Lowpass, Highpass, Bandpass & Bandstop Lumped-element Filters. User Data Files can be read into **LEfilter** so your popular filter designs are analyzed and understood, prior to manufacturing.

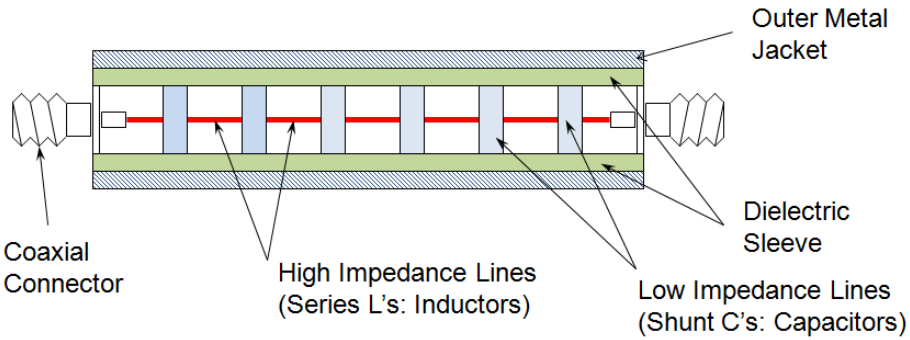
Atlanta RF *Software*: Coax Lowpass Filter

Where Synthesis enables Analysis™

Software Product: CLPfilter

Atlanta RF *Software* offers RF/microwave CAE software product: **CLPfilter,** which performs Synthesis of the Electrical circuit and Synthesis of the Dimensional circuit of multi-section Coaxial Lowpass Filters, and performs a Frequency Analysis, and includes the following product features:

1. Synthesis of multi-section Coaxial Lowpass Filter designs:
   a) Synthesis of Electrical circuit for your Lowpass Filter.
   b) Synthesis of the Distributed circuit for your Coaxial Lowpass Filter.
   c) Synthesis of the number of sections (N) needed to achieve a skirt attenuation.
2. Synthesis of various Filter Design Options:
   a) Chebyschev or Butterworth frequency response.
   b) Standard electrical circuit or its Dual electrical circuit.
   c) Prototype Lowpass Circuit Elements included.
3. Frequency Analysis response profile of:
   a) Real & Imaginary Input Impedance: R + jX.
   b) Input VSWR and Thru-path Insertion Loss.
   c) Insertion Phase and Time Delay.
   d) Peak RF power handling of your Coax Lowpass Filter.
   e) Higher-order TE11 modes for your Coax Lowpass Filter.
4. Default values for each User-entered input data.
5. Output Data stored on your hard drive for graphical plots.



Software product: **CLPfilter** provides the User with full design capability, from Synthesis to Frequency Analysis of Lumped-element Lowpass Filters and their Distributed Coaxial form. User Data Files can be read into **CLPfilter** so your popular filter designs are analyzed and understood, prior to manufacturing. **CLPfilter** may also find favor when analyzing a new or existing coaxial connector. . . . .

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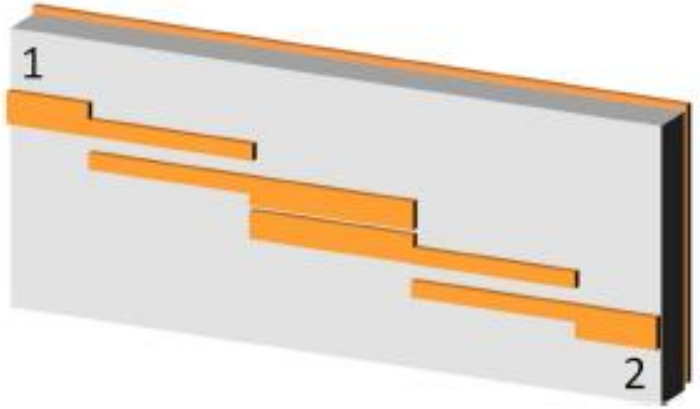
Atlanta RF *Software*: Parallel Coupled BPF

Where Synthesis enables Analysis™

Software Product: PCfilter

Atlanta RF *Software* offers RF/microwave CAE software product: **PCfilter,** which performs Synthesis of the Electrical circuit and Synthesis of the Dimensional circuit of multi-section Parallel-Edge Coupled Bandpass Filters constructed in stripline or microstrip, and includes the following product features:

1. Synthesis of multi-section Paralell Edge-Coupled Bandpass Filter designs:
    a) Synthesis of Electrical circuit : Zoe & Zoo for each section.
    b) Synthesis of the Distributed circuit : Line Widths (W) & Strip Spacing (S).
    c) Synthesis of three popular design approaches:
        a) Design per Seymour Cohn.
        b) Design per George Matthaei.
        c) Design per Ed Cristal.
2. Synthesis of various Filter Design Options:
    a) Chebyschev or Butterworth frequency response.
    b) Construction in Stripline or Microstrip.
    c) Prototype Lowpass Circuit Elements included.
3. Frequency Analysis response profile of:
    a) Input VSWR and Thru-path Insertion Loss.
    b) Higher-order TE11 modes.
4. Default values for each User-entered input data.
5. Output Data stored on your hard drive for graphical plots.



Software product: **PCfilter** provides the User with full design capability, from Synthesis to Frequency Analysis of Parallel Edge-Coupled Bandpass Filters and their Distributed form, when constructed in stripline or microstrip.

Atlanta RF
Services, Software & Designs

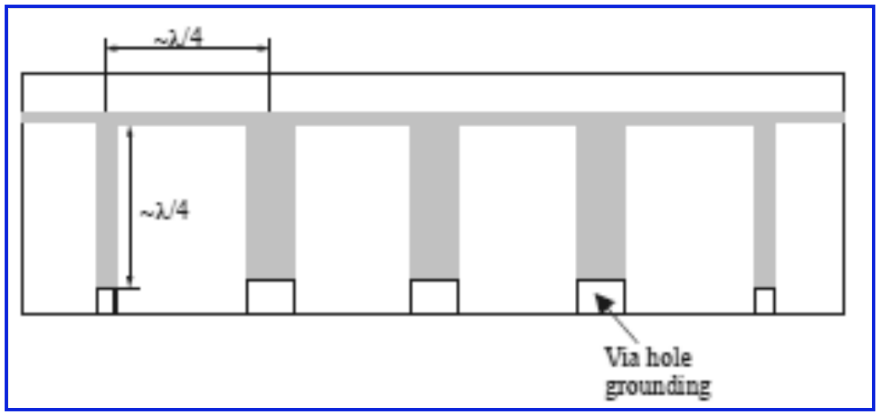
Atlanta RF *Software*: Wideband Bandpass Filter

Where Synthesis enables Analysis™

Software Product: WBfilter

Atlanta RF *Software* offers RF/microwave CAE software product: **WBfilter,** which performs Synthesis of the Electrical circuit and Synthesis of the Dimensional circuit of multi-section Wide Bandwidth Bandpass Filters realized as quarter-wavelength short-circuited stubs separated by quarter-wavelength connecting lines constructed in stripline or microstrip, and includes the following product features:

1. Synthesis of multi-section Wideband Bandpass Filter designs:
    a) Synthesis of Electrical circuit : Zo for each section.
    b) Synthesis of the Distributed circuit : Line Widths (W) & Line Lengths (L).
    c) Synthesis of two popular design approaches:
        a) Design per George Matthaei.
        b) Design per Ed Cristal.
2. Synthesis of various Filter Design Options:
    a) Chebyschev or Butterworth frequency response.
    b) Construction in Stripline or Microstrip.
    c) Prototype Lowpass Circuit Elements included.
3. Frequency Analysis response profile of:
    a) Input VSWR and Thru-path Insertion Loss.
    b) Higher-order TE11 modes.
4. Default values for each User-entered input data.
5. Output Data stored on your hard drive for graphical plots.



Software product: **WBfilter** provides the User with full design capability, from Synthesis to Frequency Analysis of multi-section Wide Bandwidth Bandpass Filters and their Distributed form, when constructed in stripline or Microstrip with quarter-wavelength short-circuited stubs separated by quarter-wavelength connecting lines.

Atlanta RF
Services, Software & Designs

Atlanta RF *Software*: TEM Filter Analysis

Where Synthesis enables Analysis™

Software Product: TEMfilter

Atlanta RF *Software* offers RF/microwave CAE software product: **TEMfilter,** which performs a Frequency Analysis of multi-section non-dispersive (TEM-mode) Bandpass and/or Bandstop Filters, and includes the following product features:

1. Frequency Analysis of multi-section TEM-mode Filter designs:
    a) Frequency Analysis of multi-section Bandpass Filters.
    b) Frequency Analysis of multi-section Bandstop Filters.
    c) Frequency Analysis of Bandpass & Bandstop Filters (both).
2. Frequency Analysis of various Filter Design Options:
    a) Chebyschev frequency response.
    b) Butterworth Frequency response.
    c) User-defined Unloaded Q (Qu) for Insertion Loss.
3. Frequency Analysis response profile of:
    a) Wavelength and Input VSWR.
    b) Insertion Loss & Insertion Phase.
    c) Time Delay versus Frequency.
4. Output Data stored on your hard drive for graphical plots.

Software product: **TEMfilter** provides the User with full analysis capability of any multi-section Bandpass or Bandstop Filter operating in the non-dispersive TEM-mode, regardless of the Filter's operating bandwidth. **TEMfilter** uses pure mathematics, which does not include the construction medium for your Filters.