TYDACOMM

Innovative antenna products for higher network profits

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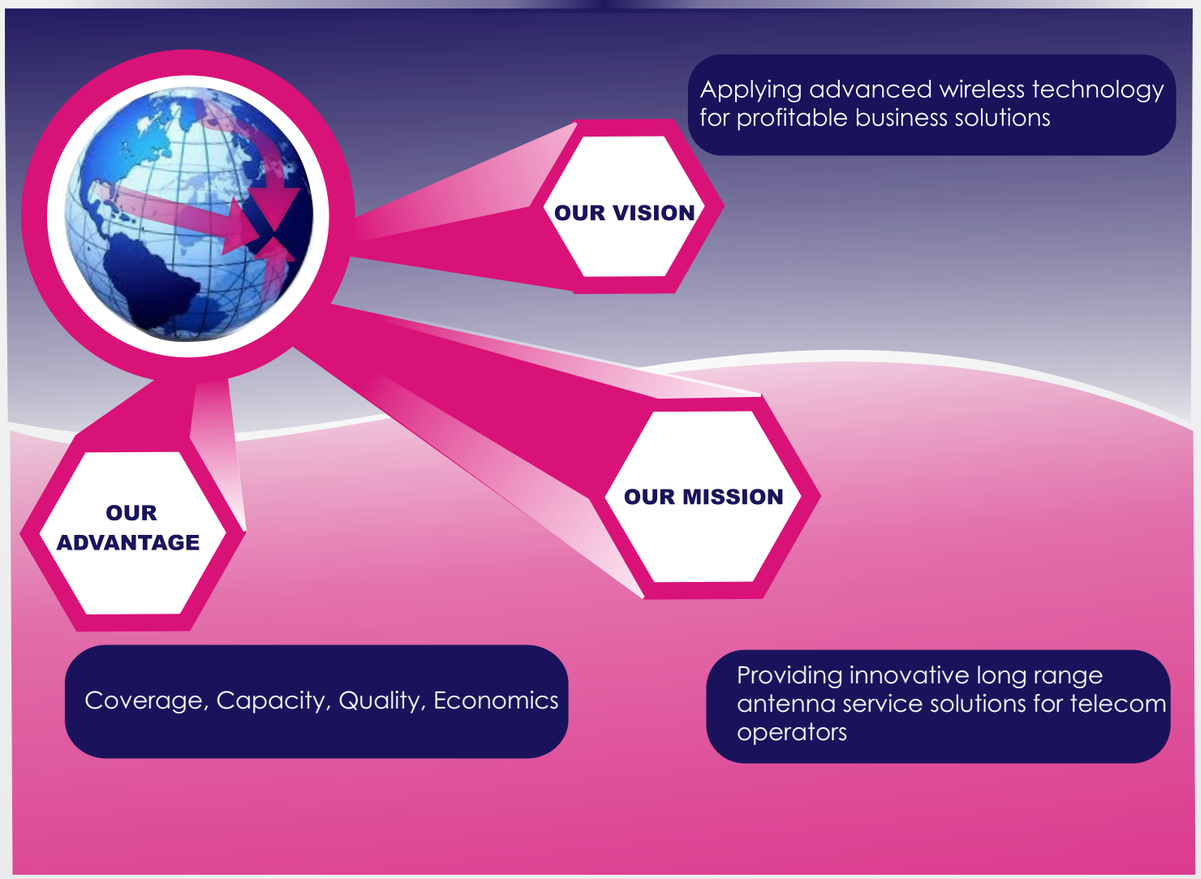
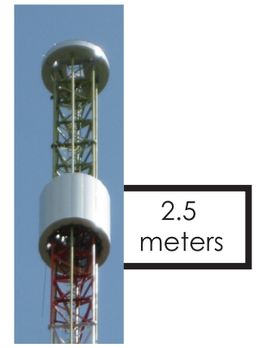
TYDACOMM is an innovative cellular technology solutions provider. Our L-RAS (*Long-Range Antenna Solutions*) product line represents our proprietary, cutting edge, breakthrough technology that is not available anywhere else in the industry. Our products optimize coverage and capacity, improve quality of service, and maximize end-user experience. L-RAS antennas impact operators' profitability by helping them generate significant revenue streams while at the same time reducing operating expenses. L-RAS antennas deliver up to ten times the coverage of standard antennas the industry is relying on today. They are designed to meet the unique requirements of both urban and rural deployment in conjunction with our network planning expertise, which is part and parcel of our offering.

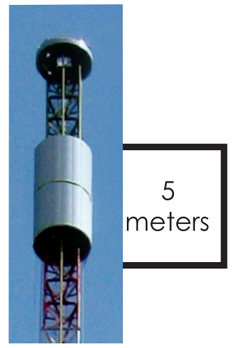
Our corporate culture stresses the need to think outside the box, to look where we, or others, have not looked before, and to always ask: "Why not?"



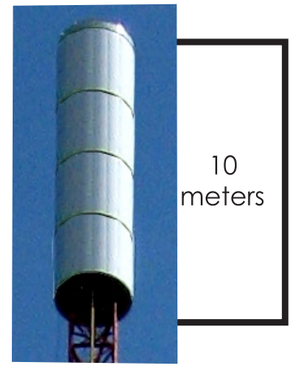
L-RAS Products



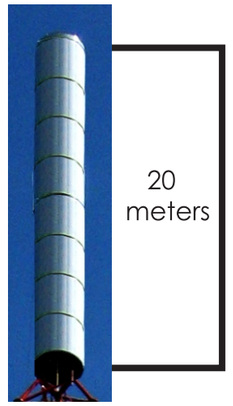
Urban Metro Site (UMS)



Low Margin Site (LMS)



IHS/Rural Green Site (RGS)



Rural Green Site (RGS)

Typical LMS deployment on Existing Tower

GSM 900

- Average Tower Height = 50m
- Tower Type = 3-Legged. Existing
- Antenna Gain/Length = 24dBi/5m
- Antenna Wt./EPA = 396kg/10.5 m^2
- Panel Structure = {5m x 18Θ}
- Mechanical Fixture = YES
- 3/6-Sector Solution
- Horizontal BW= 38°/65°
- Vertical BW = 4°
- Use TMA if necessary
- BTS Configuration. = {2:2:2} or Higher
- TX-PWR = 43dBm

SHOTEL allows Low Band (790MHz-960 MHz) and High Band (1710 MHz-2170 MHz) to coexist

Inter-Highway Sites

TYDACOMM Advantage

Coverage

- King of coverage: Captures minimum of (6) times and up to (20) times area in Sq. miles/Km compared to existing antenna system.
- Delivers powerful signals between 21db to 30db
- Matching capacity for (2G & 3G) and (3G & 4G) footprints.
- Positioned to adapt to future coverage exigencies.

Capacity

- Enhanced capacity achievable without increasing OPEX
- Superior frequency planning with TYDACOMM propriety SOFP scheme
- Efficient spectrum utilization for higher capacity
- Improved capacity translate to overall higher system planning

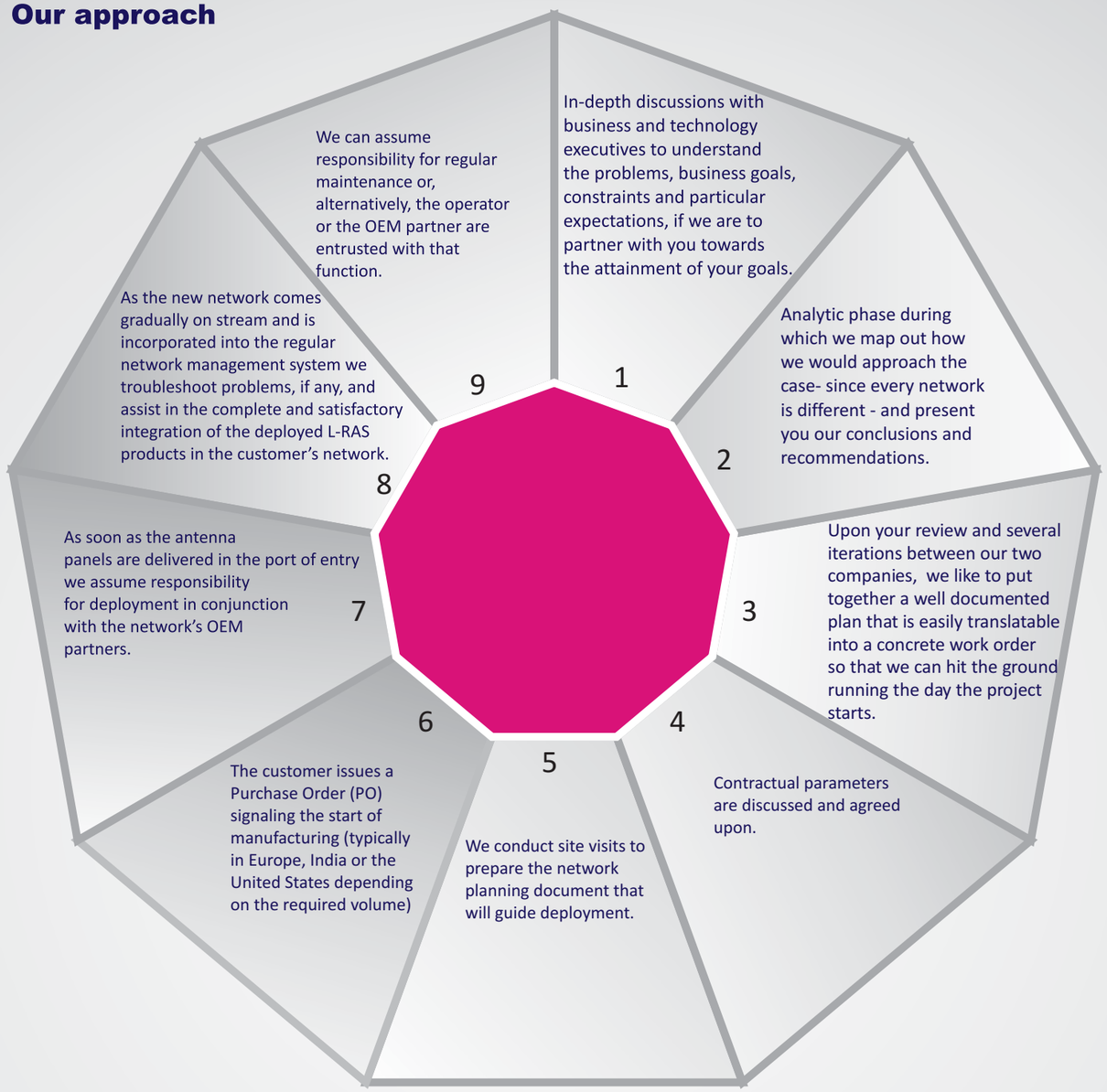
Quality

- Improved indoor penetration for better customer experience
- Better coverage implies better data throughout
- Improved C/I noise ratio.
- Improves customer experience due to less drop calls, less signal overhead and improve HOSR

Economics

- Cost effective
- Maximally Increases margins
- Lowers CAPEX for planned site and OPEX for existing site

Our approach



We take a 360-degree approach to understand your unique requirements and provide solutions, while supporting your activities every step of the way. We provide support in planning, we deploy and we maintain the services we sell.

TYDACOMM L-RAS Products

Urban Metro Site (UMS)	Low Margin Site (LMS)	Inter-Highway Site (IHS)	Rural Green Site (RGS)
• Usually employed with high band(1800/2500Mhz) products in urban environments • 2.5m high and can be mounted on existing rooftop or stand-alone towers • The vertical beam width is 4 degrees, with 38° (6 sectors) or 65° (3 sectors) solution. • High number of inputs ports, typically four or more • Superior indoor penetration supporting - demand high capacity	• Increasing the capacity of existing sites that are not used to their fullest extent • Used in conjunction with GSM 900/1800MHz products that are mountable on existing 40m/50m towers Gain depends on coverage requirements it ranges between 21dBi and 24dBi • Height usually 5m configured in two- bay systems, This depends on operational frequencies i.e., low or high band products. The vertical beam width is between 4 and 8 degrees • High spectrum utilization for improved RMS & CMS • High capacity per site translates directly to improved RMS	• This class of products is designed specifically to provide continuous service along a nation's highways • Can support inter-site distance of up to 30km • 2-6 sector solutions depending on need • Mounted on existing sites and super efficient towers (SET)	• Delivers extraordinarily high coverage— more than 10 times than standard antennas • In a GSM 900/1800 ecosystem with high gain of up to 30 dBi • Six-sector solution characterized by a near 1 vertical beam pattern with high front to back lobe ratio • Panels are 10m -20m high and are mounted on our proprietary 100m Super- Efficient Tower (SET) • Alternate energy source provisioning including solar and wind turbine to reduce carbon footprint

TYDACOMM L-RAS antenna Specifications

		GSM 900	GSM 1800
1.0	**ELECTRICAL PARAMETER**		
1.1	Frequency range	790 - 960MHz	1710MHz - 2170MHz
1.2	Antenna sector peak gain	30 dBi 27 dBi 24 dBi	30 dBi 27 dBi 24 dBi
1.3	Antenna VSWR	<1.20 full band	<1.20 full band
1.4	Isolation	>30dB (L45-R45)	>30dB (L45-R45)
1.5	Polarization	L45, R45	L45, R45
1.6	Impedance	50 Ohms	50 Ohms
1.7	Input power (Average)	Up to 80W/input	Up to 40W/input
1.8	Intermodulation products (Im3)	<110dBm (153dBc) (2 Tones) @+43dBm tones)	<110dBm (153dBc) (2 Tones) @+43dBm tones)
2.0	**Mechanical parameter specification**		
2.1	Antenna panels/Sector	8 Panels 4 Panels 2 Panels	4 Panels 2 Panels 1 Panel
2.2	Panel length	20 m 10 m 5 m	10 m 5 m 2.5 m
2.3	Panel width	32 cm	32 cm
2.4	Ports/Sector (Variable)	2, 4, 6, 8 PORTS (TRX or MIMO)	2, 4, 6, 8 Ports (TRX or MIMO)
3.0	**Horizontal (Azimuth) Pattern**		
3.1	Beam width	38° at 960MHz	38° at 1880MHz
3.2	Side lobe level suppression	> 30dB at 960MHz	>30dB at 1880 MHz
3.3	Front to back ratio	>30dB at 960MHz	>30dB at 1880 MHz
4.0	**Vertical pattern**		
4.1	Beam width	0.92° at 960MHz 1.85° at 960MHz 3.75° at 960MHz	0.92° at 1880MHz 1.85° at 1880MHz 3.75° at 1880MHz
4.2	Sidelobe suppression for first sidelobe above main lobe	>25dB	>25dB
5.0	**Environmental characteristics (VLNA, PA)**		
5.1	Ambient operating temperature	-45C to +60C	-45C to +60C
5.2	Wind load @170Km/h & Epa for SHOTEL	67.4 KN/ 42m^2	33.7kn/ 21m^2
5.3	MTBF	4,000,000 HOURS	4,000,000 HOURS
5.4	Dimensions (D x W x H)(without RADOM)	'0.35 X 0.283 X 20 m^3 '0.35 X 0.283 X 10 m^3 '0.35 X 0.283 X 5 m^3	'0.35 X 0.283 X 10 m^3 '0.35 X 0.283 X 5 m^3 '0.35 X 0.283 X 2.5 m^3
5.5	Panel weight without cable (kg.)/EPA (m2)	24kg/0.175 m^2 per panel	24kg/0.175 m^2 per panel