



Smart Technology. Delivered.™

Public Safety & Land/Private Mobile Radio Solutions

Laird designs and manufactures performance engineered antenna and reception solutions for mission and operational critical wireless applications.





Smart Technology. Delivered.™

About Laird

Laird provides systems, components and solutions that protect electronics from electromagnetic interference and heat, which enables connectivity in mission critical systems through wireless applications and antenna systems. We are a leader in the design, development and delivery of innovative technologies that enable people, organisations and applications to connect efficiently and effectively. Our reputation has been built on three guiding principles:

- Innovation- putting our in-depth knowledge of the latest materials and processes to work in creating outstanding products for our customers.
- Reliable fulfillment- delivering what our customers need to their exact specifications, on time and on budget, and in the quantities required.
- Speed- rationalizing the design and delivery cycle to minimize the time from initial concept to final implementation.

Introduction to Public Safety & Land/Private Mobile Radio Solutions Antennas

Public Safety & LMR/PMR (Land/Private Mobile Radio Solutions) antennas ensure interoperable communications in situations like emergencies, where the user can either be in a vehicle (mobile) or on foot (portable). These antennas operate over a wide range of frequencies, and are ideal for simultaneous data transmission to the connected networks of multiple users in government, public safety, and commercial applications.

Laird Public Safety & LMR/PMR antennas are the industry standard for public safety agencies, fleet, and transportation networks. Established in-market presence and innovative molding techniques, with verified platforms and a variety of connection options adds to the reputation for rugged reliability in hazardous situations and harsh environments for these antennas.

World-Leading Solutions

As the industry leader in antenna products, Laird produces antennas in a diverse number of styles while ensuring maximum efficiency, power handling, and high-performance. To meet customer requirements, select antennas can be individually tuned to a specific frequency.

Laird engineers have end-to-end system knowledge and employ advanced, proprietary design tools to bring new thinking and creative designs to market with unrivalled performance that adds value in every application, including best-in-class antenna solutions for fixed and mobile clients, base stations, wireless backhaul, portable radios, telematics and many other applications.

Portable Radio Antennas

Portable radio antennas are used for wireless two-way communication by civil service, military, construction, and transportation organizations, with many custom applications.

Laird portable radio antennas are the world standard for reliable, flexible antennas. Each antenna can be individually tuned to frequency to ensure optimum performance.

As the industry leader in radio antenna products, Laird produces antennas in a diverse number of styles. To ensure maximum performance, radio antennas can be individually tuned to frequency, while delivering highperformance in any environment



Low-band 27 to 88 MHz

FAMILY	FREQUENCY RANGES*	BANDWIDTH	BN	BNX	HT	KR	MD	MX	MXI	PL	SF	SJF	SFU	SM	SMI	SMV	TN	TNX	LENGTH*	NOTES
A Series	27- 88 MHz	6- 12 MHz*	•		•	•		•		•							•		6"-10"*	Lower cost than other low band antennas, uses rugged heat shrink tubing for radome
EXL Series	25- 88 MHz	4- 12 MHz*		•	•	•		•										•	10.75"-11.1"*	Field tunable, more robust than A Series (used molded/machined radome)
EXW Series	30- 88 MHz	58 MHz		•														•	12"	Broadbanded, most robust of the low band portable radio antennas



VHF 118 to 225 MHz

FAMILY	FREQUENCY RANGES*	BANDWIDTH	BN	BNX	HT	KR	MD	MX	MXI	PL	SF	SJF	SFU	SM	SMI	SMV	TN	TNX	LENGTH*	NOTES	
DR Series	118-225 MHz	107 MHz	•		•	•		•		•								•	19"	Broadbanded, uses rugged heat shrink tubing for radome, very flexible	
EXB Series	118-225 MHz	4-13 MHz	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	4.1"-7.8"*	Industry standard, wide range of connector options available	
SXB Series	136-174 MHz	11-13 MHz						•					•						•	5.5"	Lowest cost of the VHF antennas, rigid (uses sheath)
EXH Series	145-175 MHz	10 MHz	•				•	•	•	•	•			•	•	•	•	•	•	10.5"	High gain
EXR Series	136-225 MHz	10 MHz	•	•				•	•	•			•							7"-8"	Flexible, rugged
EXS Series	118-225 MHz	4-15 MHz*	•	•	•	•		•	•	•	•	•	•	•	•	•	•	•	•	3.3"-5.10"	Shorter, less performance
EXW Series	136-240 MHz	5-26 MHz*		•				•											•	8.75"	High gain, flexible, low cost
TS Series	118-174 MHz	56 MHz	•		•	•		•											•	17"	High gain, broadbanded
V Series	118-225 MHz	4-15 MHz*	•		•	•		•											•	17"	Low cost, flexible



UHF 300 to 512 MHz

FAMILY	FREQUENCY RANGES*	BANDWIDTH	BN	BNX	HT	KR	MD	MX	MXI	PL	SF	SJF	SFU	SM	SMI	SMV	TN	TNX	LENGTH*	NOTES	
EXC Series	308-512 MHz	6-42 MHz	•	•		•	•	•	•		•		•	•	•	•	•	•	•	5.9"- 7"	Low cost, rugged, flexible
EXD Series	308-512 MHz	6-42 MHz	•	•	•	•	•	•	•		•	•	•	•	•	•	•	•	•	2.8"- 4.1"	Shorter, less performance
EXR Series	308-512 MHz	6-42 MHz	•					•											•	6.62"- 6.95"	High gain, flexible
EXW Series	400-512 MHz	12 MHz		•															•	9"	High gain, flexible, low cost
G Series	400-512 MHz	20-42 MHz	•																•	10"	High gain, flexible, broadbanded
SXD Series	420-470 MHz	30 MHz*			•			•			•		•							3.5"	Low profile, rigid (uses sheath), low cost



Trunking and SMR Apps 806 to 960 MHz

FAMILY	FREQUENCY RANGES*	BANDWIDTH	BN	BNX	HT	KR	MD	MX	MXI	PL	SF	SJF	SFU	SM	SMI	SMV	TN	TNX	LENGTH*	NOTES	
EXC Series 806	806-866 MHz	60 MHz	•	•	•	•	•	•	•		•		•	•	•	•	•	•	•	3.7"-4.6"	Low cost, rugged, flexible
EXC Series 821	821-902 MHz	81 MHz	•	•			•												•	3.7"-4.6"	Low cost, rugged, flexible
EXC Series 902	902-960 MHz	58 MHz									•	•	•	•	•	•	•	•	•	3.5"-3.65"	Low cost, rugged, flexible
EXE Series	806-960 MHz	19-58 MHz*	•	•				•			•		•	•	•	•	•	•	•	8"-8.9"	High gain, rigid
EXP Series 806	806-960 MHz	63 MHz						•			•	•	•							6.9"	High gain, flexible, rugged
EXP Series 902	896-940 MHz	44 MHz						•			•	•	•							6.9"	High gain, flexible, rugged *SMS Connector
EXR Series	806-960 MHz	58-81 MHz*	•																•	9.16"-9.5"	High gain, flexible
EXR Series 1850	1850-1970 MHz	120 MHz	•																•	9.25"-9.5"	High gain, flexible
EXS Series	806-960 MHz	58-60 MHz*						•			•	•	•	•					•	2.25"	*SMS connector



2.4 GHz

FAMILY	FREQUENCY RANGES*	BANDWIDTH	LENGTH*	NOTES
EXE Series	2400-2500 MHz	100 MHz	8"	Covered TNX- 1/2 wave, high gain, rigid, broadbanded
EXC Series	2400-2500 MHz	100 MHz	2.5"- 4"	SMA, Rev Pol TNC, TNC- 1/4 wave, rigid, low cost, broadbanded
EXR Series	2400-2500 MHz	100 MHz	Right Angle	Rev Pol SMA, SMA, Rev Pol BNC- 1/2 wave, broadbanded
EXR Series	2400-2500 MHz	100 MHz	Right Angle	Rev Pol TNC- 1/4 wave, broadbanded, high gain
EXS Series	2400-2500 MHz	100 MHz	4"	Rev Pol SMA- 1/4 wave, lower gain, low cost, low profile
WRX Series	2400-2500 MHz	100 MHz	4"	TNC- 1/2 wave



*varies by specific PN's

Mobile Radio Antennas

Mobile radio antennas are used for wireless two-way communication with taxi dispatch, police, municipal, etc.; with many custom applications. Along with the use of mounting kits, these antennas can be mounted to any vehicle that is in any environment.

Laird's mobile radio antennas are the industry standard for public safety agencies, fleet and transportation networks. The company

designs and manufactures a wide variety of mobile antennas with a multitude of mounting options.

As the industry leader in mobile radio antenna products, Laird produces antennas in a diverse number of styles that can be mounted to any vehicle for any use. To ensure maximum performance, mobile radio antennas can be individually tuned to frequency, while delivering high-performance in any environment.

Low Band

CATEGORY	FAMILY	ITEM	FREQUENCY RANGES	BANDWIDTH	LENGTH	NOTES
Whip	C-Coil	C(B)**(S)	26.75- 50 MHz	3- 7 MHz *	52.5"- 67.5"*	Available in white or black, with or without shock spring
	Genesis™	CW(B)**(S)	26.75- 48 MHz	3- 9 MHz *	54"- 68" *	

VHF

CATEGORY	FAMILY	ITEM	FREQUENCY RANGES	BANDWIDTH	LENGTH	NOTES
Low Profile	Phantom®	TRA(B)2100	210- 225 MHz	15 MHz	2.9"	NMO only
	Phantom®- Tunable	TRA(B)T****(P)	142- 225 MHz	15- 18 MHz*	2.9"- 3.5"*	NMO or permanent mount (P-mount only available on select models)
	Phantom Elite®	ETRA(B)****	144-225 MHz	4-15 MHz*	2.375"	NMO only (with NMO adaptor); available in black or white
Whip	A-Base	A(B)***(S)	118-896 MHz	Single Frequency	—	Available with spring, field tunable, dual-band available
	QW (Quarterwave)	QW(B)***	136- 970 MHz	8- 15 MHz*	12.5"- 22"*	Available in field tunable model
	B-Coil	B(B)****(W)(N)(S)(SG)	66- 225 MHz	4- 15 MHz*	23"- 59"*	Tunable, available with spring, certain frequencies available in no ground plane or wideband
	C-Coil	C(B)****(S)(SG)	27- 50 MHz	3- 7 MHz*	52.5"- 67.5"*	Available in chrome or black; available as field tunable; available with spring and spring guard
GPS-based	Survivor™	GPSD(L)(S)****(PL)P	137- 170 MHz	10- 24 MHz	7.25"- 22.4"*	Available with magnetic base

UHF & SHF

CATEGORY	FAMILY	ITEM	FREQUENCY RANGES	BANDWIDTH	LENGTH	NOTES
Low Profile	Phantom®- AVL Style	DTRA****(P)	806- 960 MHz	26- 75 MHz*	1.25"	Available in P-mount
	Phantom®	TRA(B)****(N)(P)	300- 6.0 GHz	Varies by specific PN	3.4" or 2.7"	Available as NMO or P-mount; available in black or white; some models available with no ground plane, some frequencies available as dual-band; other options may be available (wall/ceiling mount)
	Phantom Elite®	ETRA(B)****(N)(P)	410- 2500 MHz	15- 110 MHz*	2.7"- 4.025"*	
	Discadoo®	DISC(W)****(M)(PNSM)	760- 2500 MHz	60 MHz- 1 GHz	0.75"	Available as NMO or P-mount w/ adhesive
GPS	GPS only	GPS***** †	1575.42 MHz	Single Frequency	0.43"- 1.875"*	Various form factors available; available in NMO mount, trunk mount, add on bracket, magnetic mount, adhesive mount, and standard AVL
	Dual-band & Tri-band GPS AVL	GPS(D)(T)****P	450- 2500 MHz	20- 100 MHz*	1.25"- 4.125"*	—
	Survivor™	GPSDS****(P)(LP)(G)	380- 960 MHz	60- 110 MHz *	6"- 26.9"*	Available with SS rod or "rubber duck" style antenna; available with mag mount option
	Internal Mercury™	GPST(3/5)***/*	824- 960 MHz / 1710- 1990 MHz / 1575.42 MHz	72- 80 MHz* / 130- 170 MHz* / Single Frequency	—	—
	External Mercury™	GPST3E824/18503	824- 896 MHz/1850 - 1990 MHz/1575.42 MHz	72 MHz / 140 MHz/Single Frequency	—	—
	Roof Mount Tri-band	GPSTR***/*****	824- 896 MHz/ 1850- 1990 MHz/ 1575.42 MHz	72 MHz/140 MHz/Single Frequency	—	Available in most connector options
	Whip	A-Base	A(B)****C(S)	450- 2500 MHz	20- 110 MHz*	—
QW (Quarterwave)		QW(B)***	406- 970 MHz	20- 110 MHz*	3"- 24"*	Available in field tunable model, 806 to 970 MHz model available with open coil flexible
B-Coil		B(B)****(N)(S)	406- 970 MHz	20- 110 MHz*	4.875"- 39.5"*	Tunable, available with spring, available with closed coil collinear, certain frequencies available in no ground plane
C-Coil		C(B)***/*C(S)	144- 174/ 440- 470 MHz	24- 30 MHz*	35.5"- 37.5"*	Closed coil collinear, available with spring, dual-band or single band available
Elevated Feed		E(B)****(C)	450- 970 MHz	20- 110 MHz*	25.375"- 40.25"*	—
MIMO	3-Port	—	2.4/5.0 GHz	—	1.5" height	Available as either dual band element or single band; also various cable and connector configs available
	2-Port w/ GPS	—	2.4/5.0 GHz	—		
	1-Port w/ GPS	—	2.4/5.0 GHz	—		

*varies by specific PN's

† Inquire about various models/options available



• Phantom® - Tunable



Special Application

Laird special application antennas are designed to provide superior performance and reliability with unparalleled durability and design craftsmanship. With decades of market application experience and proprietary designs our industry leading special application antennas are second-to-none. These antennas are used mostly for public safety applications or private networks.

Laird world class engineering teams utilize proprietary, state-of-the-art design tools to create public safety antenna solutions that maximize total system performance and user satisfaction. These antennas consistently offer the industry's best value proposition and support mission and operational critical communication applications.

Public Safety DAS

- Indoor RF signal strength and the associated in building two way radio coverage is critical to help emergency responders work safer, smarter and enables improved real-time decision-making capabilities that save lives and property.
- The CMS Public Safety Low PIM and Standard DAS antennas are designed to deliver existing single frequency or multiple frequency wide area network signals into a building where adequate signal strength is not present for emergency communications.



PARAMETER	PERFORMANCE
Model Number	CMS38606-30NF Standard
	CMS38606P-30NF Low PIM (<150dBc)
Frequency	380-520 MHz 698-960 MHz 1710-4300 MHz 4300-6000 MHz
VSWR 380-520 MHz	3.0:1 Max
VSWR 698-960 / 1710-6000 MHz	2.0:1 Max
Typical Max Gain	2 dBi @ 380-520 MHz 2 dBi @ 698-960 MHz 6 dBi @ 1710-6000 MHz
Water / Foreign Body Ingress	IP67 Compliant
Antenna Weight	0.8 kg (1.76 lbs)
Dimensions (Diameter x Height)	298 mm x 133 mm (11.7" x 5.2")

Phantom Fin Multi-Band Vehicular Antenna GPS, LTE / EVDO, UHF & WLAN Public Safety DAS

- The Laird Phantom Fin antenna provides an excellent solution for the transportation and public safety markets, as it integrates a wide range of frequencies into one aerodynamic housing. The design covers GPS, Internal or External LTE/EVDO, Internal or External UHF and WLAN antennas.

MODEL NUMBER	GPS ANTENNA	LTE ANTENNA	WIFI ANTENNA	UHF 1 ANTENNA	UHF 2 ANTENNA
FHQ69273CD-518VC3	SMA-MALE	SMA-MALE	SMA-MALE	PL259 CONNECTOR	
FHQ69273CD-518VC4	SMA-MALE	SMA-MALE	SMA-MALE	FME PLUG	
FHQ69273CD-518VC5	SMA-MALE	SMA-MALE	RPSMA-MALE	PL259 CONNECTOR	
FHQ69273CD-518VC6	SMA-MALE	SMA-MALE	RPSMA-MALE	FME PLUG	
FHQ69273CE-518VC3	SMA-MALE	SMA-MALE	SMA-MALE		PL259 CONNECTOR
FHQ69273CE-518VC4	SMA-MALE	SMA-MALE	SMA-MALE		FME PLUG
FHQ69273CE-518VC5	SMA-MALE	SMA-MALE	RPSMA-MALE		PL259 CONNECTOR
FHQ69273CE-518VC6	SMA-MALE	SMA-MALE	RPSMA-MALE		FME PLUG



Dispatch Basestation

Dispatch basestation antennas offer unmatched, maximum null fill to ensure consistent gain close to the tower and extend out toward the horizon. These antennas are used mostly for public safety applications or private networks. The dispatch center coordinates and controls the dispatch units and tracks the location and ID of the dispatched units.

Laird's world class engineering teams utilize proprietary, state-of-the-art design tools to create dispatch base station antenna products that maximize total system performance and user satisfaction. These antennas consistently offer the industry's best value proposition.

VHF



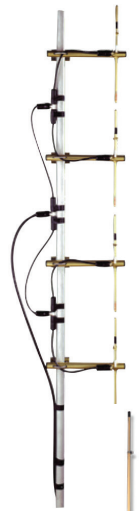
• Fiberglass Omnidirectional

CATEGORY	FAMILY	ITEM	FREQUENCY RANGES*	BANDWIDTH*	GAIN (dBi)	LENGTH	MAXIMUM POWER (WATTS)	NOTES
Omnidirectional	Fiberglass	FG****	140- 260 MHz	4- 6 MHz*	2-7	68" - 107"*	150-200	—
	Voyager®	VG****	132- 225 MHz	18- 25 MHz*	4-8	55" - 102"*	150-200	—
	Ringo	CR(S)(X)***	150- 222 MHz	2- 24 MHz*	4-9	30" - 162"*	150-200	—
Directional Yagis	Gold/Black Series (Rugged)	Y(B)****	136- 250 MHz	14- 30 MHz*	11-13	41.5" - 72"*	150-200	—
	Silver Series (Economy)	YS****	136- 250 MHz	9- 30 MHz*	11-13	41.5" - 72"*	150-200	—
	Heavy Duty PLC	PLC****(N)	129- 220 MHz	2- 8 MHz*	11-13	48" - 161"*	400	—
	Economy P	P****	130- 222 MHz	2- 4.5 MHz*	10	36" - 44"*	400	—
	Lowband	PLHC****(N)	30- 75 MHz	45 MHz	7-11	42" - 136"*	—	—
Dipole Arrays	2 Bays	YDA***2	150- 174 MHz	24 MHz	7	—	—	Single or replacement dipoles available
	4 Bays	YDA***4	136- 174 MHz	14- 24 MHz*	10-13	—	—	Single or replacement dipoles available
	Broadband Arrays	****S	140- 222 MHz	10- 12 MHz*	7-13	132" - 504"	500	—

UHF & SHF

CATEGORY	FAMILY	ITEM	FREQUENCY RANGES*	BANDWIDTH*	GAIN (dBi)	LENGTH	MAXIMUM POWER (WATTS)	NOTES
Omnidirectional	Fiberglass	FG****	360- 2400 MHz	10- 90 MHz*	2-11	15" - 107"*	200	Dual-band also available
	FR Series	FR(X)***	380- 512 MHz	20- 24 MHz*	5-7	77.79" - 118.75"*	150	—
	Voyager®	VG****	406- 512 MHz	44-62 MHz*	7-8	25" - 35"*	200	—
	Ringo	CR(S)(X)***(B)	406- 512 MHz	14- 22 MHz*	4-9	17" - 54"*	250	—
Yagis	Gold/Black Series (Rugged)	Y(B)****	406- 970 MHz	20- 90 MHz*	11-15	16.75" - 68.0625"*	150-200	—
	Silver Series (Economy)	YS****	406- 970 MHz	20- 90 MHz*	10-15	16.75" - 72"*	150-200	—
	Heavy Duty PLC	PLC****(N)	300- 512 MHz	14- 22 MHz*	11-15	31.25" - 66"*	250	—
	Economy P and PE	P(E)****	406-495 MHz	20- 55 MHz*	10-12	15.25" - 36"*	250	—
	Enclosed Yagi	YE*****	2.4- 5.8 GHz	100- 900 MHz	—	—	—	—
Dipole Arrays	2 Bays	YDA***2	450- 470 MHz	20 MHz	7-10	—	—	Single or replacement dipoles available
	4 Bays	YDA***4	450- 512 MHz	20- 22 MHz*	10-13	—	—	Single or replacement dipoles available
	Broadband Arrays	****(S)(P)	350- 512 MHz	10- 22 MHz*	8-13	50.4 " - 288"*	500	—

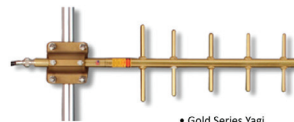
*varies by specific PN's



• 4 Bay Dipole Array



• Enclosed Yagi



• Gold Series Yagi

• Voyager*

What Sets Us Apart

MISSION

A trusted partner delivering technology to the world through innovation, speed, & reliable fulfillment.

VISION

A world where smart technology enables virtually everything to sense, think and communicate; transforming our way of life and empowering us to do more than we can imagine

CULTURE

Working as a global team of talented individuals to make a difference for our employees, business partners and our world

We have an unwavering commitment to being honest and ethical in all situations and treating each other with dignity and respect.

We create an open and engaging environment that thrives on high energy, adaptability and delivering on our commitments.

Laird is a place with great opportunities for personal and professional growth for those who work hard, are willing to learn and deliver results.

29

engineering and manufacturing sites globally

18

customer/market awards in 2013-14

10Bn parts supplied to one client

115+ year heritage

9,000 employees in 50 locations covering 5 continents and 19 countries across the globe



DESIGN



RAPID PROTOTYPING



PRODUCTION



SCALE



SOFTWARE



SYSTEM INTEGRATION



SERVICE



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