

# Cobham Mast Systems

# COBHAM

Cobham Mast Systems is the world leader in high performance composite telescopic masts

The most important thing we build is trust



### TELESCOPIC MAST SYSTEMS

The lightweight telescopic masts are designed to meet the most demanding requirements of mobile communication systems



### SUPERIOR PERFORMANCE

Superior performance, reliability and user-friendliness through the use of advanced composite materials, design and attention to detail



### ANTENNA POINTING DEVICES

A wide range of different antenna pointing devices are available



### VEHICLE MOUNTING KITS

Mounting kits are available for vehicles, shelters and containers



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## Cobham Mast Systems

Cobham Mast Systems' know-how and understanding of customers' needs and requirements, together with material and manufacturing expertise, are based on more than 30 years of experience. While Cobham Mast Systems has the industry's widest range of standard, commercial off the shelf (COTS) composite masts, antenna pointing devices, and vehicle mounting systems available for rapid delivery, Cobham Mast Systems is also able to provide a custom, fully integrated solution precisely tailored to the application.

## Products

Masts provide superior performance, reliability and user-friendliness through the use of advanced composite materials, design and the attention to detail. The masts are designed to meet the most demanding requirements of transportable communications, intelligence, surveillance, reconnaissance and broadcast systems, and are employed whenever there is a need to optimize system performance. The masts are used extensively by various defence forces around the world and are also applicable to the police, fire fighting, rescue, and other emergency services. Combat-proven in the toughest conditions, Cobham Mast Systems' products have earned their enviable reputation for rugged reliability and superior performance in arctic, tropical and desert environments.

Cobham Mast Systems manufactures seven main product lines: TM-, TR-, EX-, EXL- and EXB-masts, telescopic lifting poles and tripods including accessories for deployment. Masts are available from vehicle mounted unguied masts to 50 m stand alone field masts. Every detail is designed for reliability and quick and safe operation. Masts exceed the military's requirements for maintainability and require very little service. Cobham Mast Systems' telescopic masts have been used extensively around the world and have proven to be fully operational after long exposure to sand, dust, ice or snow.

## Quality and Testing

Cobham Mast Systems' quality system fulfills the requirements of ISO 9001 and AQAP 2110 standards.

The carbon and glass fiber composite masts have been proven to meet MIL-STD 810 F requirements to function in all extremes of environmental conditions. Masts are also tested against lightning strikes.

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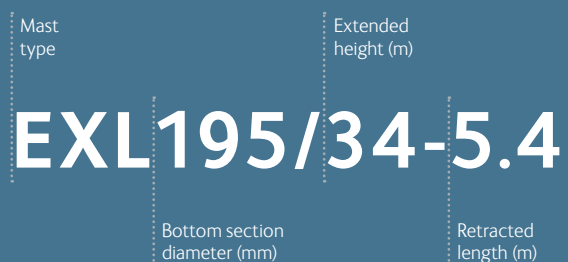
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### Typical Mast Heights and Top Loads

MAST SERIES	HEIGHT	TOP LOAD
EXB	6 - 14 m	20 - 110 kg
EXL	10 - 50 m	50 - 120 kg
EX	5 - 20 m	20 - 50 kg
TX	4 - 8 m	10 - 25 kg
TR	4 - 12 m	5 - 10 kg
TM	4 - 8 m	2 - 5 kg
Tripods	2 - 5 m	2 - 100 kg

Maximum top load depends on mast height and antenna size.

Cobham Mast Systems' mast model numbers are related to the model type and specification as follows:



# EXB-Masts



## EXB-Masts

EXB-masts are designed for highly mobile operations (such as battlefield communications and electronic warfare) where minimal time and man-power for deployment is available. These masts are push-button, vehicle-mounted masts designed for rapid extension and operation without guy ropes. They are designed to extend to heights up to 14 m (payload height at 15 m above ground when vehicle-mounted) with maximum payloads of up to 110 kg. Depending on mast top maximum deflection requirements, EXB-masts utilize composite tube sections varying from pure glass fibre to pure carbon fibre.

EXB-masts are extended and retracted utilizing hoisting belts driven by a winch. This is an effective, well-proven technique which is more reliable under severe operating conditions (especially sand and dust). EXB-Masts have a double-belt system – one belt is used for mast extension, the second belt is used to provide positive retraction to assure proper operation under adverse conditions of wind and slope. EXB-masts are equipped with an automatic latch mechanism for controlling the order in which tube sections extend. The winch is operated by an electric Winch Power Unit (WPU) with remote control, with WPU versions available for either AC or DC power supplies. A manual hand crank is provided as a back-up for power failure.

EXB-masts can be painted in customer specific colours.



**Customization:**

All masts can be built and customized according to customer’s specification and requirements.

Cobham Mast Systems reserves the right to make changes to manufacture and design without prior notice.



**Typical EXB-Masts**

MAST TYPE	EXB269/ 6-1.2	EXB269/ 10-1.8	EXB333/ 10-1.7	EXB333/ 12-1.75
Extended height (m)	6	10	10	12
Transportation length (m)	1.2	1.8	1.7	1.75
Max. vertical top load (kg)	55	45	110	50
Max. wind area A (m <sup>2</sup> )	0.2	0.2	0.6	0.3
Max. wind speed (m/s)	25	25	36	30
Sections	7	7	8	9
Mast weight (kg)	111	120	127	150

Above listed masts are examples. Other lengths with different top load specifications are available at request.

# EXL-Masts



## EXL-Masts

Lightweight telescopic EXL-masts are mechanical winch and belt-operated masts. EXL-masts are designed for larger and heavier top loads and are available in three sizes: EXL141 series is for heights 15-24 meters with a max. 55 kg top load, EXL167 series is for heights 15-30 meters with a max. 60 kg top load and EXL195 series for heights 20-50 meters with a max. 120 kg top load.

EXL-masts are made of carbon and glass fibre composite material. Masts are delivered with full field deployment accessory kits and they can be supplemented with a wide range of mounting kits for vehicles and shelters.

EXL-masts are deployed by two or three persons and are elevated with a hand-cranked winch or by an optional electric winch motor unit. The entire mast is rotatable by 360°. In EXL-masts sections open one by one and an automatic mechanical locking mechanism allows guying each lower section separately during winching up. This allows safe handling of higher top loads especially under windy conditions.

EXL-masts can be painted in customer specific colours.



**Typical EXL141-Masts**

MAST TYPE	EXL141/ 15-3.6	EXL141/ 18-4.1	EXL141/ 24-5.15
Extended height (m)	15	18	24
Transportation length (m)	3.6	4.1	5.15
Max. vertical top load (kg)	55	55	30
Max. wind area cxA (m <sup>2</sup> )	1.2	1.0	0.5
Max. wind speed (m/s)	35	35	30
Guy radius (m)	14	14	16
Guy and levels	4x4	4x4	4x4
Sections	6	6	6
Mast weight (kg)	59	70	73
Accessories weight (kg)	60	60	57

Above listed masts are examples. Other lengths with different top load specifications are available at request.

**Typical EXL167-Masts**

MAST TYPE	EXL167/ 18-3.8	EXL167/ 21-4.2	EXL167/ 24-4.3	EXL167/ 30-5
Extended height (m)	18	21	24	30
Transportation length (m)	3.8	4.2	4.3	5.0
Max vertical top load (kg)	60	60	55	50
Max wind area A (m <sup>2</sup> )	1.5	1.5	1.0	0.8
Max wind speed (m/s)	35	35	35	35
Guy radius (m)	12	14	16	18
Guy and levels	4x3	4x4	4x4	4x5
Sections	7	7	8	8
Mast weight (kg)	72	80	86	98
Accessories weight (kg)	52	62	67	73

Above listed masts are examples. Other lengths with different top load specifications are available at request.

**Typical EXL195-Masts**

MAST TYPE	EXL195/ 24-3.9	EXL195/ 30-5	EXL195/ 34-5.6	EXL195/ 50-7.6
Extended height (m)	24	30	34	50
Transportation length (m)	3.9	5.0	5.6	7.6
Max. vertical top load (kg)	50	75	100	50
Max. wind area A (m <sup>2</sup> )	1.0	1.5	1.5	1.0
Max. wind speed (m/s)	35	35	35	30
Guy radius (m)	16	25	20	45
Guy and levels	4x4	4x5	4x5	4x7
Sections	10	8	8	8
Mast weight (kg)	108	125	132	160
Accessories weight (kg)	64	85	105	120

Above listed masts are examples. Other lengths with different top load specifications are available at request.

# EX-Masts



## EX-Masts

Lightweight telescopic EX-masts are mechanical winch and belt-operated masts. EX-masts are available in three sizes: EX105 series is for heights 8-15 meters with a max. 20 kg top load, EX128 series for heights 10-18 meters with a max. 40 kg top load and EX141 series is for heights 10-20 meters with a max. 50 kg top load.

EX-masts are made of carbon and glass fibre composite material. The masts can be supplemented with a wide selection of mounting kits for vehicles and shelters.

EX-masts can be deployed by one to three persons and are elevated with a hand-cranked winch or by an optional electric winch power unit. The entire mast is rotatable by 360°.

EX-masts can be painted in customer specific colours.





**Typical EX105-Masts**

MAST TYPE	EX105/ 8-2	EX105/ 10-2.3	EX105/ 12-2.7	EX105/ 15-3.2
Extended height (m)	8	10	12	15
Transportation length (m)	2.0	2.3	2.7	3.2
Max. vertical top load (kg)	20	20	20	20
Max. wind area A (m <sup>2</sup> )	0.5	0.3	0.5	0.5
Max. wind speed (m/s)	35	35	35	35
Guy radius (m)	7	7	10	10
Guys and levels	4x2	4x2	4x3	4x3
Sections	6	6	6	6
Mast weight (kg)	20	21	22	27
Accessories weight (kg)	29	29	40	40

Above listed masts are examples. Other lengths with different top load specifications are available at request.

**Typical EX128-Masts**

MAST TYPE	EX128/ 8-2	EX128/ 10-2.3	EX128/ 15-3.4	EX128/ 18-4
Extended height (m)	8	10	15	18
Transportation length (m)	2.0	2.3	3.4	4.0
Max. vertical top load (kg)	40	40	35	35
Max. wind area A (m <sup>2</sup> )	1.2	1.0	1.2	0.9
Max. wind speed (m/s)	35	35	35	35
Guy radius (m)	6	7	10	12
Guys and levels	4x2	4x2	4x3	4x3
Sections	6	6	6	6
Mast weight (kg)	24	27	36	41
Accessories weight (kg)	29	29	40	41

Above listed masts are examples. Other lengths with different top load specifications are available at request.

**Typical EX141-Masts**

MAST TYPE	EX141/ 10-2.4	EX141/ 15-3	EX141/ 18-4	EX141/ 20-4.3
Extended height (m)	10	15	18	20
Transportation length (m)	2.4	3.0	4.0	4.3
Max. vertical top load (kg)	45	45	40	50
Max. wind area A (m <sup>2</sup> )	1.5	1.5	1.2	0.75
Max. wind speed (m/s)	35	35	35	35
Guy radius (m)	7	10	12	12
Guys and levels	4x2	4x3	4x3	4x3
Sections	6	5	6	6
Mast weight (kg)	25	41	48	45
Accessories weight (kg)	31	40	39	45

Above listed masts are examples. Other lengths with different top load specifications are available at request.

# TR-Masts



## Typical TR-Masts

MAST TYPE	TR72/ 9.5-1.7	TR86/ 8-1.35	TR86/ 10-1.7	TR86/ 12-1.7
Extended height (m)	9.5	8	10	12
Transportation length (m)	1.7	1.35	1.7	1.7
Max. vertical top load (kg)	5	5	5	5
Max. wind area A (m <sup>2</sup> )	0.2	0.3	0.2	0.2
Max. wind speed (m/s)	25	25	25	25
Guy radius (m)	5	4	5	5
Guys and levels	3x3	3x3	3x3	3x3
Sections	7	9	8	9
Mast weight (kg)	9	11	12	13
Accessories weight (kg)	11	11	11	11

Above listed masts are examples. Other lengths with different top load specifications are available at request.

## TR-Masts

Lightweight telescopic TR-masts are push-up masts for heights up to 12 meters and for 5-10 kg top loads. Mast sections are pushed out and locked in place with mechanical latches one by one.

TR-masts are made of glass fibre composite material. The masts can be supplemented with a wide range of mounting kits for vehicles and shelters.

Lightweight telescopic TX-masts, a variant of TR-masts, are push-up masts for heights up to 7 meters and for a max. 25 kg top loads. TX-mast sections are pulled out horizontally to their full length and the mast is then lifted up in vertical position.

TR- and TX-masts can be painted in customer specific colours.

# TM-Masts



## TM-Masts

Lightweight telescopic TM-masts are push-up masts for heights up to 8 meters and for 2-5 kg top loads. Mast sections are pushed out and locked with friction locks one by one.

TM-Masts are made of glass fibre composite material.

Mast tube colour is dark green. Other tube colours are available at request.



## Typical TM-Masts

MAST TYPE	TM51/ 4-1.2	TM51/ 6.3-1.8	TM58/ 4.8-1.2	TM58/ 7.6-1.8
Extended height (m)	4	6.3	4.8	7.6
Transportation length (m)	1.2	1.8	1.2	1.8
Max. vertical top load (kg)	5	3	5	5
Max. wind area A (m <sup>2</sup> )	0.1	0.05	0.1	0.1
Max. wind speed (m/s)	25	25	25	25
Mast weight (kg)	2.8	3.6	4.2	5.2

Above listed masts are examples. Other lengths with different top load specifications are available at request.

# Telescopic Lifting Poles



Typical Telescopic Lifting Poles

POLE TYPE	TLP61/ 10-2.75	TLP61/ 15-4
Extended height (m)	10	15
Transportation length (m)	2.75	4
Max. vertical top load (kg)	3	3
Pole weight (kg)	9.5	12.5

Above listed poles are examples. Other lengths with different top load specifications are available at request.



## Telescopic Lifting Pole

Telescopic lifting poles are mechanical winch and belt-operated access poles designed to be used both at land and sea. Carbon and glass fibre composite poles are available for heights up to 15 meters. All components withstand immersion and salt water and are designed to survive rough handling.

Telescopic lifting poles are designed for covert access on ships or buildings. Poles can be used to securely attach a ladder to a structure in order to gain rapid and covert access or to gain visibility to restricted locations through windows or over fences and roofs via a camera mounted on the pole.

TLP-poles can be painted in customer specific colours.



# Tripods

## Tripods

Tripods can be used for several applications instead of small masts. Lightweight tripods are designed for 2-5 kg top loads and heavy duty tripods for a maximum 100 kg top loads.

Tripods are made of glass fiber composite material. Tripod legs are telescopic and sections are pushed out and locked in place with mechanical latches. For windy conditions, the heavy duty tripods can also be guyed. Tripods are quick to deploy and they provide excellent pointing accuracy for heavy narrow beam antennas. Tripods can also handle inertial loads.

Tripods are applicable, for example, for mountain top link applications as well as deploying a communication system on rooftops in urban areas. Tripods are excellent for temporary communication networks in rescue, police and fire fighting as well as temporary lighting applications.

Tripods can be painted in customer specific colours.



# Accessories



## Accessories

Each mast system is supplied with a full field deployment accessory kit. Mast accessories are designed to enable easy and fast mast deployment in all weather conditions. Accessory kits are packed in all-weather bags. The standard bag colour is green. Other colours are available at request.

Special user friendly guy reel design makes tensioning the guys and plumbing the mast quick and easy. Guy ropes are available in polyester or aramid. Heavy-duty aramid core guy ropes are durable yet easy to use. Hardened guy stakes are suitable for long term use in a wide variety of ground conditions.

All deployment accessories are fabricated from state of the art materials to assure optimal performance.





# Ancillaries

## Tilter and Rotator-Tilter



### Antenna Pointing Devices

Antenna positioners, such as rotators, double rotators, tilters and rotator-tilters, are available for different antenna configurations.

Antenna pointing devices are available in all mast colours.

### Tilter and Rotator-Tilter

Tilter is an antenna pointing device for pointing the antenna in elevation.

Rotator-tilter is an antenna pointing device for pointing the antenna system both horizontally (azimuth) and vertically (elevation).

Tilters and rotator-tilters are operated from the ground level with maneuvering ropes. Antennas can be mounted directly on the tilter or rotator-tilter or on antenna specific brackets.



# Ancillaries

## Rotator, Double-Rotator and RCU

### Rotator and Double Rotator

Rotator is an antenna pointing device for pointing an antenna system horizontally (azimuth). Double-rotator is designed for two antenna systems that can be rotated independently from each other.

Rotators are operated from the ground level with maneuvering ropes. Antennas can be mounted directly on the rotator top tube or on antenna specific brackets. Electric remote control units are also available for antenna rotators and double rotators.

### Remote Control Unit (RCU)

Rotator can be controlled with RCU. Operation voltage is 24 VDC.



# Antenna Brackets



## Antenna Brackets

Antenna brackets for different antenna types are available for various applications.

Antenna brackets are available in all mast colours.

## Vehicle Mounting Kits

### Vehicle mounting kits

Vehicle mounting kits are available for vehicles, shelters and containers. Mounting kits enable safe mast transportation and quick deployment.

Vehicle mounting kits enable the use of mast either attached to the vehicle or shelter or as a free-standing mast.

Vehicle mounting kits are available in all mast and vehicle colors.



# WPU (Winch Power Unit)



## WPU (Winch Power Unit)

WPU can be used with all EX-, EXL- and EXB-type mast winches. Motor unit is an add-on device that is fixed on the winch with two hand screws to replace the crank handle. Motor unit can be easily and quickly detached in case of power failure to enable manual back up. A circuit breaker together with a mechanical torque limiter protects the motor and mast.

WPU kit consists of an electric motor drive, remote controller and power cable packed in a transportation bag. Motor is controlled with a remote controller. Voltage options: 12 VDC, 24 VDC, 48 VDC, 110 VAC and 230 VAC.

WPU's are available in all mast colours.



# Quality & Testing

## Quality and Testing

Cobham Mast Systems quality system fulfills the requirements of ISO 9001 and AQAP 2110 standards.

Masts and accessories have been proven to meet the environmental requirements in accordance with the MIL-STD 810 F and DEF STAN 00-35:9999.

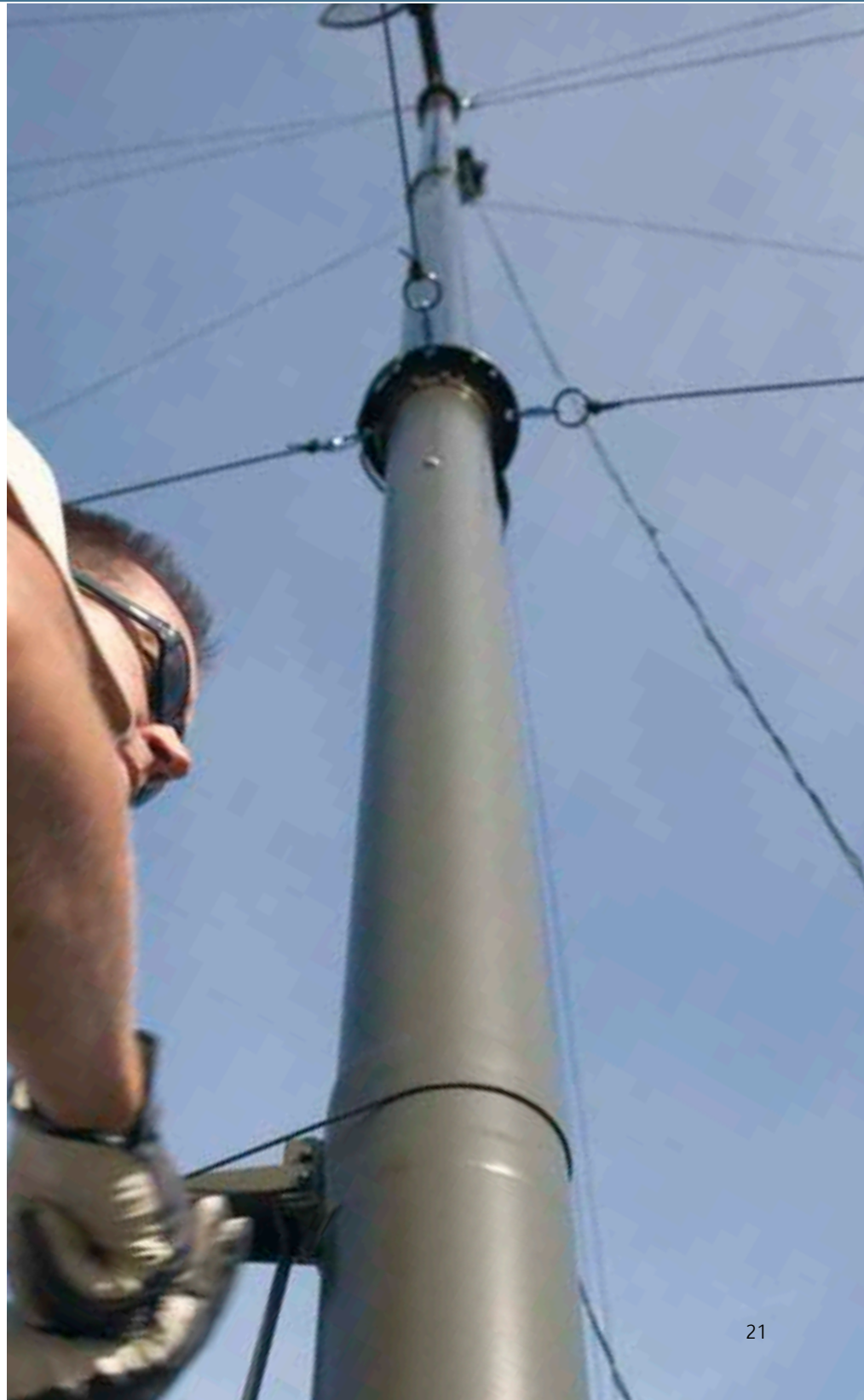
### MIL-STD 810 F Tests:

500.4	Low pressure
501.4	High temperature Storage +71°C Operation +55°C
502.4	Low temperature Storage -46°C Operation -40°C
504	Contamination by fluids
505.4	Solar radiation
506.4	Rain
507	Humidity
508.5	Fungus
509.4	Salt fog
510.4	Sand and dust
512	Immersion
514.5	Vibration
516.5	Functional shock
516.5	Transit drop
521.2	Icing/freezing rain

### DEF STAN 00-35:9999 Test:

Test CL19 Blowing dust
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Mast construction is also tested against lightning strikes.



# Services



## Services

Cobham Mast Systems designs all masts according to application specific requirements.

Full-scale simulated wind load tests are performed to verify mast specification compliance, when required. Wind load test facilities allow testing of masts with up to 50 m height.

Mast system deployment and service training is normally included in system deliveries. Mast maintenance and repair services in factory are available at request.

**Questionnaire**

ITEM	Description	Unit	Tick Off	Specification
1	Height	m		
2	Retracted length	m		
3	Max wind speed for system deployment	m/s		
4	Max wind speed for system operation	m/s		
5	Max wind speed for system survival	m/s		
6	Antenna and cable wind surface	m <sup>2</sup>		
7	Vertical head load: antenna	antenna kg		
		cables kg		
8	Required antenna pointing accuracy at operational wind speed	.		
9	Application			
	- Field mast		<input type="checkbox"/>	
	- Vehicle mast		<input type="checkbox"/>	
	- Trailer mounted mast		<input type="checkbox"/>	
10	Description of antenna system			
	- Antenna type			
	- Manufacturer product code			
11	Antenna pointing devices			
	Azimuth (Rotation)		<input type="checkbox"/>	
	Elevation (Tilting)		<input type="checkbox"/>	
	Motorized		<input type="checkbox"/>	
12	No. of persons available to operate the system			
13	Deployment time			
14	Surface treatment, color			
15	Quantity			
16	Special requirements			

**\*\*\* Please fill in the questionnaire and email or fax it to us for a quotation. \*\*\***  
**E-Mail: mastsystems@cobham.com Fax +358 (0)13 737 7113**



Customers around the world put their trust in Cobham

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