

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' 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 available the industry's widest range of standard, commercial off the shelf (COTS) composite masts, antenna pointing devices, and vehicle mounting systems for rapid delivery, Cobham Mast Systems is also able to provide a custom, fully integrated solution precisely tailored to the application.

Products

Experienced users around the globe consider Cobham Mast Systems' products to be the "Gold Standard" in telescopic masts. Masts provide superior performance, reliability and user-friendliness through the use of advanced composite materials, design and through 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 by all branches of the US military, Federal Emergency Management Agency, Federal Bureau of Investigation, National Security Agency, and are also applicable to the police, fire fighting, rescue, and other emergency services. Combat-proven in the toughest conditions, Cobham Mast Systems 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 164 ft 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. Telescopic masts have been used extensively in Iraq and Afghanistan by the U.S. military, and have proven to be fully operational after long exposure to sand and dust

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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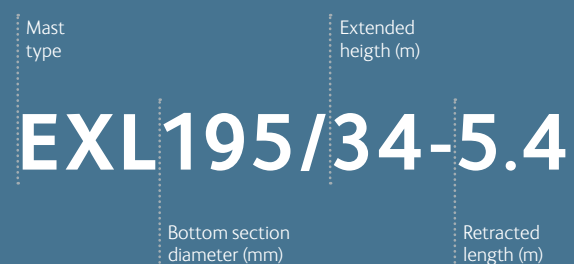
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Typical Mast Heights and Top Loads

MAST SERIES	HEIGHT	TOP LOAD
EXB	20-46 ft	44-243 lb
EXL	33-164 ft	110-220 lb
EX	16-66 ft	44-110 lb
TX	13-26 ft	22-55 lb
TR	13-39 ft	11-22 lb
TM	13-26 ft	4-11 lb
Tripods	7-16 ft	4-220 lb

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 46 ft (payload height at 49 ft above ground when vehicle-mounted) with maximum payloads of up to 242 pounds. Depending on mast top maximum deflection requirements, EXB-masts utilize composite tube sections varying from pure glass fiber to pure carbon fiber.

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 supplied in CARC finish, color as specified by the customer.



Customization:

All masts can be built and customized according to 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 (ft)	19.7	32.8	32.8	39.4
Transportation length (ft)	3.9	5.9	5.6	5.8
Max. vertical top load (lb)	121.3	99.2	242	110.2
Max. wind area cxA (ft ²)	2.2	2.2	6.5	3.2
Max. wind speed (mph)	60	60	80	75
Sections	7	7	8	9
Mast weight (lb)	244.7	264	279.4	330.7

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

EXL-Masts



EXL-Masts

EXL-masts are designed for medium to heavy duty applications with extended heights up to 164 feet. The masts utilize up to 10 composite telescopic sections which are extended by a mechanical winch-driven hoisting belt. Fully automatic latches within the mast control the order of tube section extension. The tube sections extend one at a time from the bottom upwards. As each tube section reaches full extension, the automatic latches engage, locking that section, while releasing the next section in turn. Guy rope attachment rings are located at the top of tube sections at required intervals.

Because the tube sections extend one at a time from the bottom upwards, the crew is able to stabilize the mast throughout the mast extension process by securing the lower ends of the guy ropes as each guy level is reached. This is a key advantage of the EXL design, permitting very large loads to be safely raised to significant heights very quickly and safely, even in strong winds.

The EXL-mast design is available in three families of masts, as follows: EXL141, EXL167, and EXL195. The number corresponds to the diameter of the bottom section in millimeters).

EXL-masts are made of carbon and glass fiber 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 can be supplied in CARC finish, color as specified by the customer.



Typical EXL141-Masts

MAST TYPE	EXL141/ 15-3.6	EXL141/ 18-4.1	EXL141/ 24-5.15
Extended height (ft)	49.2	59.1	78.7
Transportation length (ft)	11.8	13.5	16.9
Max. vertical top load (lb)	121.3	121.3	66.1
Max. wind area cxA (ft ²)	12.9	10.8	5.4
Max. wind speed (mph)	80	80	70
Guy radius (ft)	45.9	45.9	52.5
Guys and levels	4x4	4x4	4x4
Sections	6	6	6
Mast weight (lb)	130.1	154.3	160.9
Accessory weight (lb)	132.3	132.3	125.7

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 (ft)	59.1	68.9	78.7	98.4
Transportation length (ft)	12.5	13.8	14.1	16.4
Max. vertical top load (lb)	132.3	132.3	121.3	110.2
Max. wind area cxA (ft ²)	16.1	16.1	10.8	8.6
Max. wind speed (mph)	80	80	80	80
Guy radius (ft)	39.4	45.9	52.5	59.1
Guys and levels	4x3	4x4	4x4	4x5
Sections	7	7	8	8
Mast weight (lb)	158.7	176.4	189.6	216.1
Accessory weight (lb)	114.6	136.7	147.7	160.9

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 (ft)	78.7	98.4	111.5	164.0
Transportation length (ft)	12.8	16.4	18.4	24.9
Max. vertical top load (lb)	110.2	165.3	165.3	110.2
Max. wind area cxA (ft ²)	10.8	26.9	16.1	10.8
Max. wind speed (mph)	80	80	80	80
Guy radius (ft)	52.5	82.0	65.6	147.6
Guys and levels	4x4	4x5	4x5	4x7
Sections	10	8	8	8
Mast weight (lb)	238.1	275.6	291.0	325.7
Accessory weight (lb)	141.1	187.4	231.5	264.6

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

EX-Masts



EX-Masts

The high performance, user-friendly EX family of masts are used for light and medium weight payloads at heights from around 20 feet up to 100 feet. These are telescopic composite masts utilizing a mechanical winch and hoisting belts. A separate hoisting belt is used to extend each section, such that all sections extend simultaneously, concertina-fashion. With their highly effective deployment accessory kits, these masts are very quick and easy to deploy (49 ft masts are typically deployed in under 15 minutes with a two-person crew).

For heights above 65 feet, versions of the EX-mast utilizing an "autoguying" system are available. This system automatically stabilizes the upper part of the mast as it extends, permitting the masts to be extended safely with minimal crew numbers.

EX-masts are made of carbon and glass fiber 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 supplied in CARC finish, color as specified by the customer.

Typical EX105-Masts

MAST TYPE	EX105/ 8-2	EX105/ 10-2.3	EX105/ 12-2.7	EX105/ 15-3.2
Extended height (ft)	26.2	32.8	39.4	49.2
Transportation length (ft)	6.6	7.5	8.9	10.5
Max. vertical top load (lb)	44.1	44.1	44.1	44.1
Max. wind area cxA (ft ²)	5.4	3.2	5.4	5.4
Max. wind speed (mph)	80	80	80	80
Guy radius (ft)	23.0	23.0	32.8	32.8
Guys and levels	4x2	4x2	4x3	4x3
Sections	6	6	6	6
Mast weight (lb)	44.1	46.3	48.5	59.5
Accessory weight (lb)	63.9	63.9	88.2	88.2

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 (ft)	26.2	32.8	49.2	59.1
Transportation length (ft)	6.6	7.5	11.2	13.1
Max. vertical top load (lb)	88.2	88.2	77.2	77.2
Max. wind area cxA (ft ²)	12.9	10.8	12.9	9.7
Max. wind speed (mph)	80	80	80	80
Guy radius (ft)	19.7	23.0	32.8	39.4
Guys and levels	4x2	4x2	4x3	4x3
Sections	6	6	6	6
Mast weight (lb)	52.9	59.5	79.4	90.4
Accessory weight (lb)	63.9	63.9	88.2	90.4

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 (ft)	32.8	49.2	59.1	65.6
Transportation length (ft)	7.9	9.8	13.1	14.1
Max. vertical top load (lb)	99.2	99.2	88.2	88.2
Max. wind area cxA (ft ²)	16.1	16.1	12.9	8.1
Max. wind speed (mph)	80	80	80	80
Guy radius (ft)	23.0	32.8	39.4	39.4
Guys and levels	4x2	4x3	4x3	4x3
Sections	6	5	6	6
Mast weight (lb)	55.1	90.4	105.8	99.2
Accessory weight (lb)	68.3	88.2	86.0	99.2

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 (ft)	31.2	26.2	32.8	39.4
Transportation length (ft)	5.6	4.4	5.6	5.6
Max. vertical top load (lb)	11.0	11.0	11.0	11.0
Max. wind area A (ft ²)	2.2	0.3	2.2	2.2
Max. wind speed (mph)	60	60	60	60
Guy radius (ft)	16.4	13.1	16.4	16.4
Guys and levels	3x3	3x3	3x3	3x3
Sections	7	9	8	9
Mast weight (lb)	19.8	24.3	26.5	28.7
Accessory weight (lb)	24.3	24.3	24.3	24.3

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 39 ft and for 11-22 lb top loads. Mast sections are pushed out and individually lock in place with mechanical latches.

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

TX-Masts

TX-masts utilize the same latching mechanism as TR masts (described above). The TX-mast is placed horizontally on the ground, and then each tube section is extended one at a time. Once all tube sections have been extended and locked in place, the mast is tilted upright to the vertical attitude.

TR- and TX-masts can be supplied in CARC finish, color as specified by the customer.

TM-Masts



TM-Masts

Lightweight telescopic TM-masts are push-up masts for heights up to 26 ft and for 4-11 lb top loads. Mast sections are pushed out and are individually locked with friction locks.

TM-Masts are made of glass fiber composite.

Mast tube color is dark green. Other tube colors 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 (ft)	13.1	20.7	15.7	24.9
Transportation length (ft)	3.9	5.9	3.9	5.9
Max. vertical top load (lb)	11.0	6.6	11.0	11.0
Max. wind area A (ft ²)	1.1	0.5	1.1	1.1
Max. wind speed (mph)	60	60	60	60
Mast weight (lb)	6.2	7.9	9.3	11.5

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 (ft)	32.8	49.2
Transportation length (ft)	9.0	13.1
Max. vertical top load (lb)	6.6	6.6
Pole weight (lb)	20.9	27.6

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 on land and at sea. Carbon and glass fiber composite poles are available for heights up to 49 ft. All components withstand immersion and salt water and are designed to survive rough handling.

Telescopic lifting poles are designed for covert access to 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 by mounting a camera to the pole.

TLP-poles can be supplied in CARC finish, color as specified by the customer.



Tripods

Tripods

Tripods can be used for several applications in lieu of small masts. Lightweight tripods are designed for 4-11 lb top loads. Heavy duty tripods for a maximum 220.5 lb top loads.

Tripods are made of glass fiber composite. 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 mountaintop link applications as well as deploying communication systems 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 supplied in CARC finish, color as specified by the customer.



Accessories



Accessories

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

Our 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 ensure 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 pointing functions. Antenna pointing devices are available in all mast colors.

Tilter and Rotator-Tilter

The tilter is used to provide antenna elevation angle adjustment from ground level after the mast has been extended. Depending on size and shape of the antenna, tilter angle adjustment of up to $\pm 30^\circ$ can be provided.

The rotator-tilter is used to provide antenna elevation angle and azimuth angle adjustment from ground level after the mast has been extended. Depending on size and shape of the antenna, tilter angle adjustment of up to $\pm 30^\circ$, and azimuth angle adjustment of 360° can be provided.

Tilters and rotator-tilters are operated from the ground by means of a rope sling (known as a "maneuvering rope") which runs over a pulley wheel. The pulley wheel is contained within a housing with a trap door in such a way as to prevent the maneuvering rope from falling off. Two separate color-coded maneuvering ropes are used to operate the two axes of the rotator-tilter. 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

A rotator is an antenna pointing device designed for pointing an antenna system horizontally (azimuth). A 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 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 an 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 colors.



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 and shelter mounting kits enable the use of mast either attached to the vehicle or shelter or as a freestanding mast.

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



WPU (Winch Power Unit)



WPU (Winch Power Unit)

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

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

WPUs are available in all mast colors.



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 +160°F Operation +131°F
502.4	Low temperature Storage -51°F Operation -40°F
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

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 for the testing of masts with heights up to 164 ft.

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

Questionnaire

ITEM	Description	Unit	Check	Specification
1	Height	ft		
2	Retracted length	ft		
3	Max wind speed for system deployment	mph		
4	Max wind speed for system operation	mph		
5	Max wind speed for system survival	mph		
6	Antenna and cable wind surface	ft ²		
7	Vertical head load: antenna	antenna lb		
		cables lb		
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. *****
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