

Millard Towers offers a complete line of meteorological masts that are safe, durable and easy to use. Millard's A Series is designed specifically for aviation applications. Masts comply with ICAO and FAA frangibility requirements and have been verified through 3rd party, full-scale impact testing and FEA Modelling. Masts are made from high-grade Aluminum Alloy and suitable for the most extreme environmental conditions with high wind, ice, UV and saltwater exposure.



### COMPLIANCES:

ICAO DOC 9157 + ICAO ANNEX 14 + FAA AC 150/5345-45C + Transport Canada TP312

#### ICAO DOC 9157, PART 6:

**1.3.6 and 2.1.12:** Approach Light frangibility standards should be applied to AWOS / Anemometer masts as they are located in the operational area of an airfield.

**5.2.8:** Navigational aids having an overall height over 1.20m should be verified for frangibility by dynamic testing. Tests should be conducted with a vehicle-driven impactor.

**5.3.1:** Full-scale testing is complex and costly; however, it is the manufacturer's responsibility to carry out these tests.



# TECHNICAL SPECIFICATIONS

SPECIFICATION	MAST DESIGN			
	225A	300A	525A (CH) <sup>C</sup>	900A
<b>BASIC:</b>	225A	300A	525A (CH) <sup>C</sup>	900A
<b>TYPICAL APPLICATION</b>	RVR Sensors	AWOS	Wind Sensors	AWOS
<b>QTY OF SECTIONS</b>	1	1	2	4
<b>MIN HEIGHT (m)</b>	2.51	2.97	5.23 (5.21)	9.25
<b>MAX HEIGHT (m)<sup>A</sup></b>	3.31	3.77	6.03 (6.01)	10.05
<b>POWDER COATING COLOUR</b>	Orange	Orange	x5 Bands of Orange/White	x7 Bands of Orange/White
<b>STANDARD MOUNT</b>	60mm OD Pipe	60mm OD Pipe	60mm OD Pipe	60mm OD Pipe
<b>TOTAL WEIGHT (kg)<sup>A</sup></b>	10	15	35 (45)	72
<b>SHIPPING:</b>				
<b>DIMENSIONS (cm)</b>	i) 234 x 20 x 20 ii) 61 x 61 x 10	i) 305 x 25 x 25 ii) 61 x 61 x 18	312 x 46 x 53	254 x 104 x 69
<b>VOLUME (m<sup>3</sup>)</b>	0.134	0.263	0.762	1.814
<b>WEIGHT (kg)<sup>A</sup></b>	i) 11 ii) 7	i) 11 ii) 8	42 (82)	140
<b>MAX FOUNDATION LOADS<sup>B</sup>:</b>				
<b>VERTICAL (kg)</b>	42	55	71	193
<b>HORIZONTAL (kg)</b>	112	158	236	335
<b>OVERTURNING (N-m)</b>	2,502	3,862	7,962	15,914
<b>FOUNDATION DETAILS<sup>D</sup>:</b>				
<b>DESIGN</b>	7T	9T	9T (9S)	13S
<b>DIMENSIONS - SLAB (cm)</b>	90 x 90 x 60	100 x 100 x 60	120 x 120 x 60	140 x 140 x 80
<b>VOLUME- SLAB (m<sup>3</sup>)</b>	0.49	0.60	0.86	1.57
<b>ANCHOR BOLT SPACING (mm)</b>	229	330	330	457
<b>SHAPE</b>	Triangle	Triangle	Triangle (Square)	Square
<b>ANCHOR BOLT SIZE</b>	1/2"-13 x 10"	3/4"-10 x 16"	3/4"-10 x 16"	1"-8 x 18"
<b>BOLT FINISH</b>	HD Galvanized	HD Galvanized	HD Galvanized	HD Galvanized

**NOTES:**

- <sup>A</sup> Does not include any instrumentation or accessories
- <sup>B</sup> Based on 170km/h wind or 125km/h wind + 12.5mm ice loads with a top EPA of 0.2m<sup>2</sup>
- <sup>C</sup> 525-CH Design configuration varies from -FB and -TB designs. Variations denoted in brackets.
- <sup>D</sup> For esimtation purposes only. Always confirm design with engineer familiar with local conditions.

COMPLIANCES / CERTIFICATIONS	
<b>DESIGN</b>	
<b>ENGINEERING</b>	CSA S37-13 CE 89/106
<b>FRANGIBILITY <sup>E</sup></b>	ICAO DOC 9157
	FAA 150/5345-45C
	TP312 5th Edition
<b>MATERIALS</b>	
<b>ALUMINUM ALLOY 6061</b>	ASTM B221
<b>HARDWARE - STAINLESS STEEL 304</b>	ASTM F593/F594
<b>HARDWARE - HD GALVANIZED</b>	ASTM F2329/A153
<b>TREATMENTS / FINISHING</b>	
<b>POWDER COATING</b>	AAMA 2603
<b>ANODIZING</b>	ASTM B580
<b>GALVANIZING</b>	ASTM A123
<b>SHIPPING</b>	ISPM 15
<b>ACCESSORIES</b>	
<b>OBSTRUCTION LIGHTS</b>	FAA L-810, ICAO Type B, CAR 621.19
<b>LIGHTNING PROTECTION</b>	NFPA 780, CAN/CSA-B72

- NOTES:**
- <sup>E</sup> Confirmed through 3rd party full-scale impact testing, per ICAO requirements.

## SERVICEABILITY OPTIONS



### FIXED BASE

**ANOTATION:** \_\_\_A-FB  
**DESIGNS AVAILABLE:** 225, 300, 525, 900  
**ADVANTAGES:** Simple and cost-effective design.  
**OPERATION:** For designs 6.00m and under, masts are light enough to be lifted into place by 2-3 people during installation. For heights greater than 6.00m, a crane is recommended. Maintenance of equipment should be performed using either a ladder or bucket truck. Masts can be climbed if proper maintenance procedures are followed; however, this is not recommended as it may not be in compliance with local labour laws and safety standards.



### TILT BASE

**ANOTATION:** \_\_\_A-TB  
**DESIGNS AVAILABLE:** 225, 300, 525, 900  
**ADVANTAGES:** Simple installation can be done by hand. Easy maintenance on smaller masts.  
**OPERATION:** A hinged base allows the mast to be assembled along the ground by connecting sections. Instrumentation can also be installed. An optional Tilt Stand supports mast when lowered. Once fully assembled, mast can be lifted into place by 2-3 people. Mast is secured at the base using Stainless Steel hardware. Maintenance can be performed utilizing the hinge base; however, it is not recommended for heights greater than 6.00m. A ladder or bucket truck is the recommended practice.



### CENTER HINGE

**ANOTATION:** \_\_\_A-CH  
**DESIGNS AVAILABLE:** 525, 900  
**ADVANTAGES:** Quick and easy servicing of installed instrumentation.  
**OPERATION:** An elevated hinge point of 2.25m is mechanically operated using a wormgear Winch (self-locking) and Tilt Tube. The Winch is fastened to the mast using three wing nuts, while the Tilt Tube utilizes friction. Both components are removable allowing them to be used for multiple masts on site and to be stored when not in use.



# MAST ACCESSORIES

## LED OBSTRUCTION LIGHT



## LIGHTNING PROTECTION KIT



## MOUNTING CROSSARM



## TILT STAND ASSEMBLY



## REMOVABLE WINCH

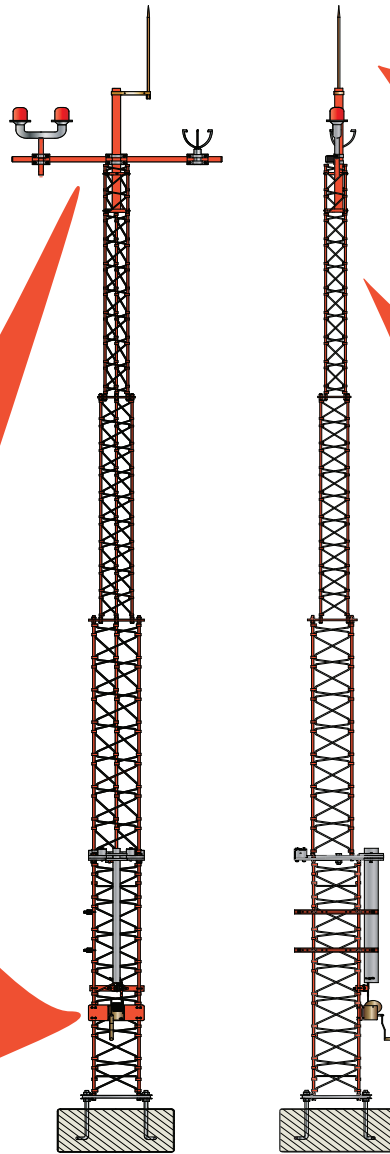


## JUNCTION BOX MOUNT



## FOUNDATION KIT

(Standard supply for each mast)



FRONT VIEW

SIDE VIEW

900A-CH MAST SHOWN

PART NO		DESCRIPTION	NOTES		
XARM-0015		1.50m CROSSARM	Equipment Mounts included		
TILT-STND-AS01		TILT STAND ASSEMBLY	To be used on Tilt Base designs		
JBOX-18		JUNCTION BOX MOUNT	0.45m Long Strut, 2pcs		
SOL1- DOL1- SOL4- DOL4-	A = 100-240VAC D = 12-24VDC	L-810 OBSTRUCTION LIGHT - RED LED	Crossarm Mount	Single Lamp Double Lamp	
			2" NPT Mount	Single Lamp Double Lamp	
				225A/300A - Rod, Mounts, Ground	
				525A - Rod, Mounts, Ground	
LK-300A		LIGHTNING KIT		900A - Rod, Mounts Ground	
LK-525A					
LK-900A					
RMW1		REMOVABLE WINCH		900A-CH Design	
RMW2				525A-CH Design	



# FRANGIBLE METEOROLOGICAL

AWOS + ANEMOMETERS + RVR + LLWAS

## DESIGN WIND AND ICE LOADS

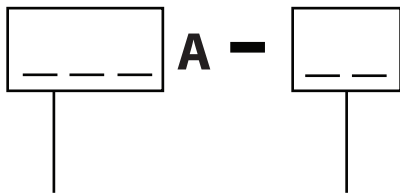
### CUSTOM LOAD AND DESIGN ENGINEERING AVAILABLE

MAX WIND SPEED (km/h)		DESIGN	INSTRUMENTATION EPA (m <sup>2</sup> )						
			0.05	0.1	0.2	0.3	0.4	0.5	0.6
RADIAL ICE (mm)	0	225A	330	286	234	202	181	165	152
		300A	315	279	230	200	179	162	148
		525A	218	199	174	156	142	132	123
		900A	222	210	184	164	149	138	129
	12.5	225A	271	247	214	191	174	161	151
		300A	229	214	191	174	161	151	142
		525A	154	147	135	127	119	113	107
		900A	154	150	142	136	128	120	114
	25	225A	216	203	184	167	157	147	139
		300A	185	176	163	152	143	136	129
		525A	118	115	109	105	100	97	93
		900A	119	117	114	110	107	104	100
	37.5	225A	180	173	160	150	142	134	128
		300A	154	149	141	134	127	122	117
		525A	97	95	92	88	86	83	81
		900A	100	98	96	94	92	90	89

**NOTES:** Maximum wind speed is calculated based on the Effective Projected Area (EPA) in m<sup>2</sup> at the top of the mast. If in doubt, always confirm design with a Millard engineer. Heavy Duty (.HD) designs are available upon request.

## ORDERING INFORMATION

### MAST ASSEMBLY



HEIGHT

225 - 2.50m

300 - 3.00m

525 - 6.00m

900 - 10.00m

SERVICING

FB - Fixed Base

TB - Tilt Base <sup>1</sup>

CH - Center Hinge <sup>2</sup>

### ACCESSORIES

Order by PART NO listed on prior page.

<sup>1</sup> Operates manually.

<sup>2</sup> Operates mechanically using RMW1/2. Only one (1) required per site.

