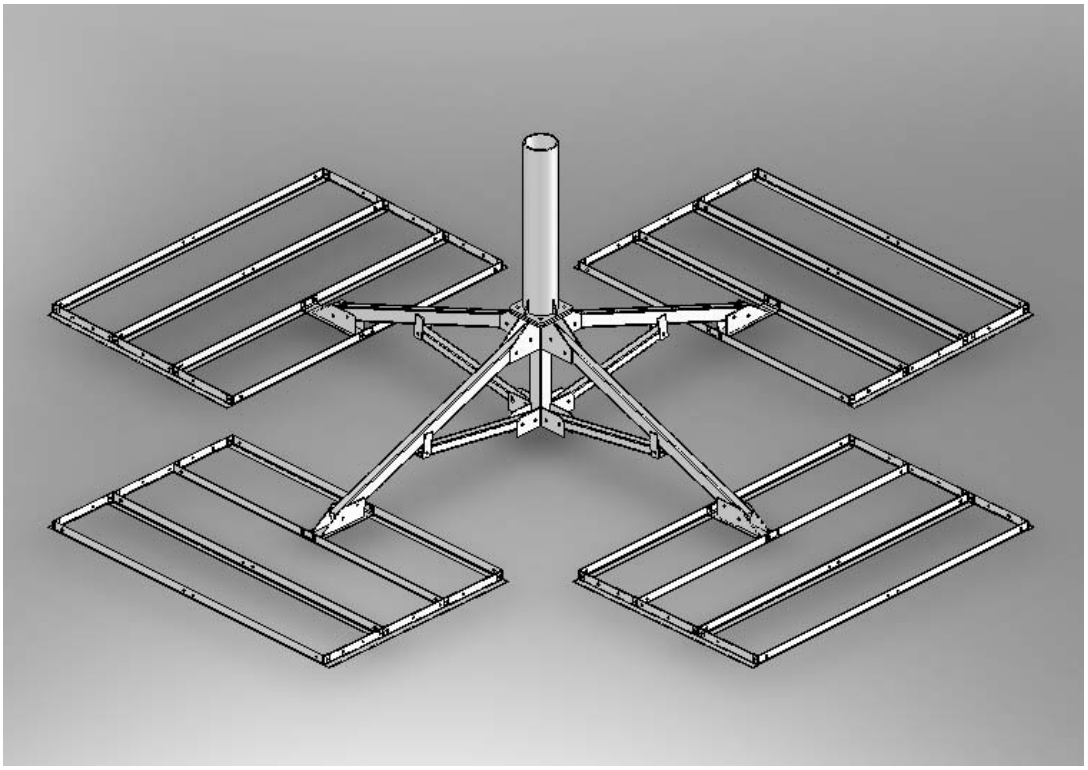
GENERAL DYNAMICS
C4 Systems

4096-755
May 21, 2007

INSTALLATION MANUAL

Non Penetrating Mast Mount for 3.8M Antennas



GENERAL DYNAMICS
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Non-Penetrating Mast Mount
Assembly Instructions

REV.	DESCRIPTION	DATE	APPROVED
-	Released	05/21/2007	DB

ASSEMBLY MANUAL

NON-PENETRATING MAST MOUNT

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SECTION I

1.0 GENERAL INFORMATION

1. Prior to installation, verify that the installation site roof material and supporting structure have been investigated and found capable of withstanding all loads imposed by the proposed antenna system. Confirm that the anchors, and/or safety cables, if required, have been found to be adequate to resist the reactions from the antenna system and that the installation will be in accordance with all applicable local, state, and federal requirements.

2. All antenna installations should be grounded to meet all applicable codes.

3. Rubber pads are provided to protect the roof surface.

4. All necessary hardware is provided.

5. For calculating ballast requirements, refer to chart in section 3.

6. All metal parts are galvanized to help prevent corrosion.

1.1 UNPACKING & INSPECTION

1. UNPACKING & INSPECTING
   The mount should be unpacked and inspected at the earliest date to ensure that all material has been received and is in good condition. A complete packing list for each major component is supplied.

2. FREIGHT DAMAGE
   Any damage to materials while in transit should be immediately directed to the freight carrier. He will instruct you on the matters regarding any freight damage claims.

3. MATERIAL - MISSING OR DAMAGED
   Any questions regarding missing or damaged materials that is not due to freight carrier should be directed to Prodelin's Customer Service Department at:

General Dynamics
1500 Prodelin Drive
Newton NC 28658
USA
(828) 464-4141

1.2 SUGGESTED TOOL LIST

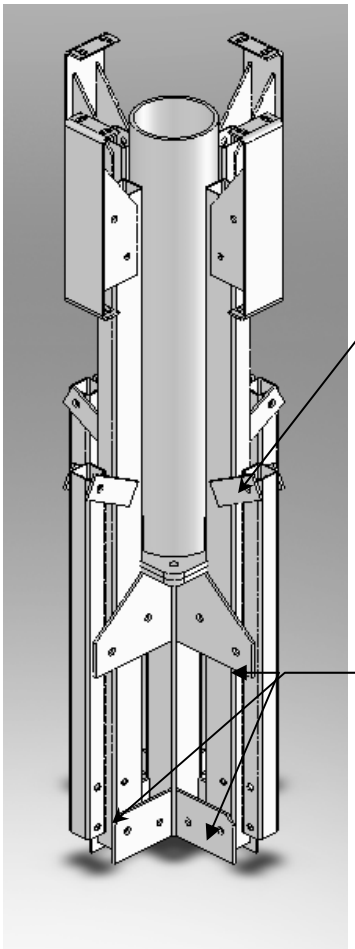
1. The following tools are suggested for site preparation.

    - Shovel (for ground installation)
    - Broom

2. The following tools are suggested for the NPMM installation.

    - Ratchet
    - Sockets: 9/16", 3/4”, 15/16”
    - Wrenches, combination: 9/16", 3/4”, 15/16”
    - Tape measure

SECTION II



Phase 1

1 Loosen (do not remove) hardware on leg support
2 Remove hardware at all other locations where legs are attached to mast assembly

This mount is shipped direct from the factory assembled as shown in figure 1. It must be re-configured on-site in order to properly deploy the mount. Hardware bag is located inside of mast pipe.

Figure 1

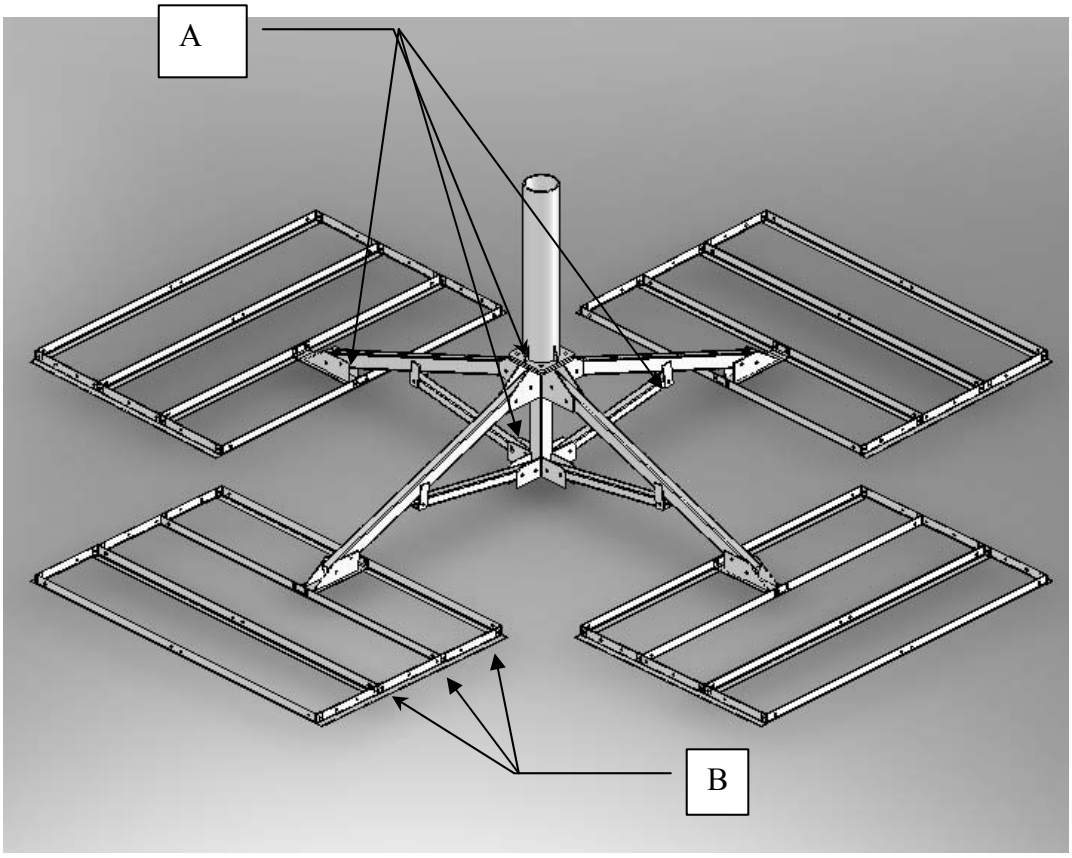


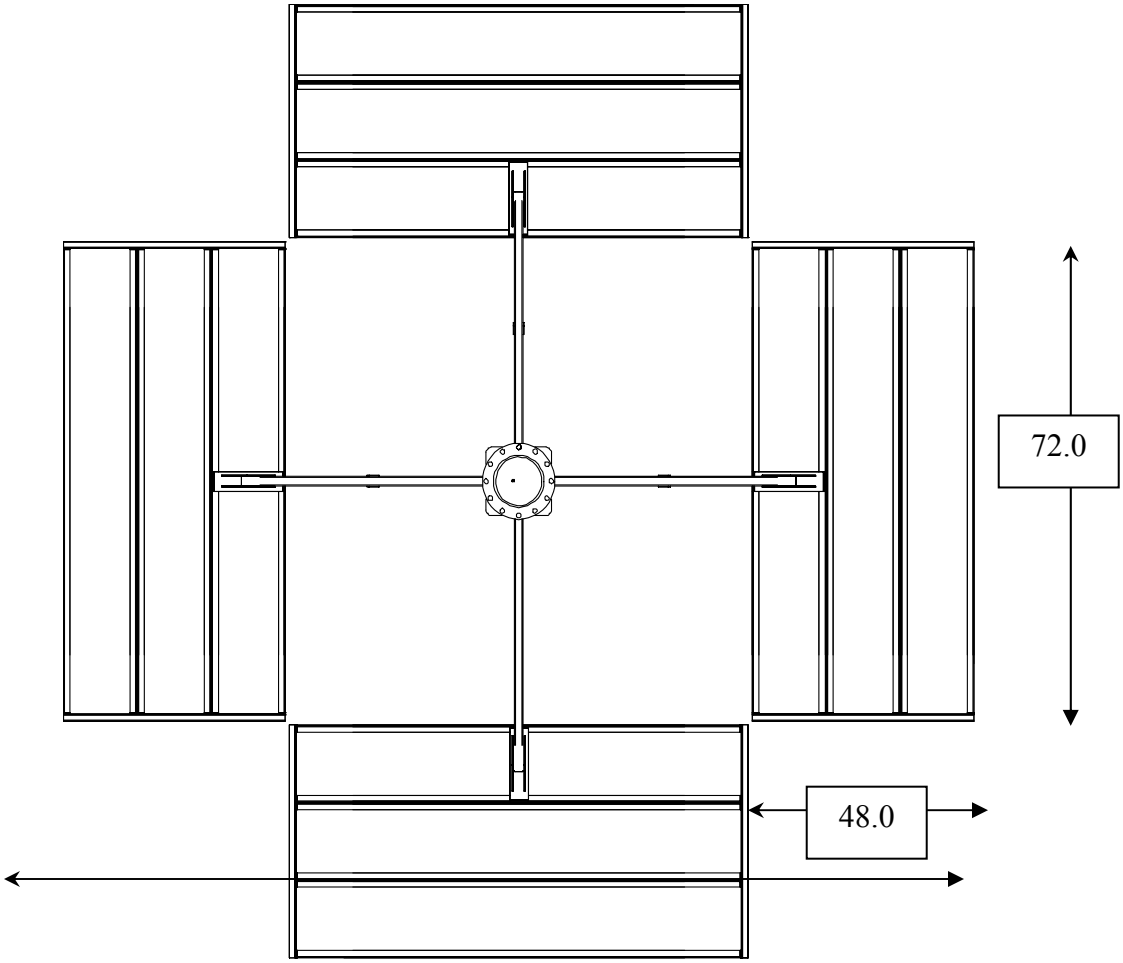
Figure 2

Phase 2

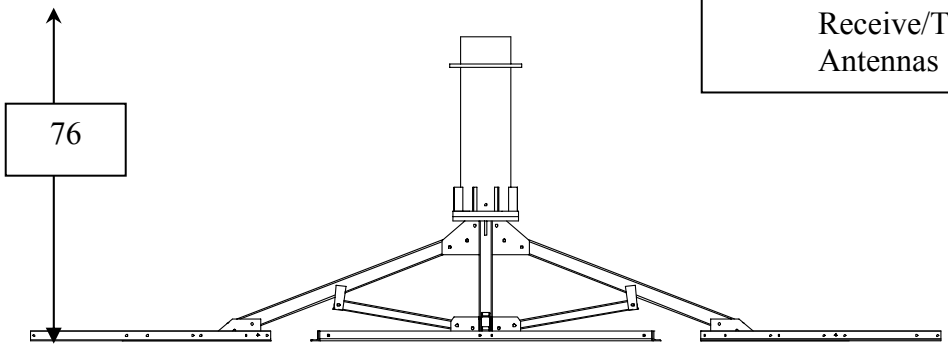
Do not tighten hardware until step 4.

1 Re-assemble mount as shown in figure 2 using ½" hardware at locations marked "A".
2 Assemble ballast trays as shown in figure 2 using 3/8" hardware at locations marked "B".
3 Attach feet to ballast trays using 3/8" hardware. (Marked "B".)
4 Tighten all hardware.

Mount should be positioned such that the legs allow clearance for the reflector at low look angles.



- Pad area: 24 sq ft. ea
- Finish: Hot dip galvanized
- Suitable for Ku and C-Band Receive/Transmit 3.8M Antennas



SECTION III

3.1 EXPOSURE:

1. Exposure B is urban or suburban areas, wooded areas, or other terrain with numerous, closely spaced obstructions having the size of single family dwellings or larger. Obstructions must extend 1500 feet in all directions from the antenna.

2. Exposure C is open terrain with widely scattered obstructions having heights generally less than 30 feet. Includes flat open country and grass lands.

3.2 BALLAST:

1. Ballast tables are based on an overturning design with a 1.5 safety factor. Values shown provide sliding resistance to the wind speed shown with a 1.0 safety factor when used with a rubber friction pad (coefficient of friction = .64).

2 Recommended ballast material is concrete cap block, nominal dimensions of 4 x 8 x 16 inches. These blocks will weigh between 25 and 30 lbs each, depending on local variation. Average weight of blocks should be determined for correct ballast amount.

3. Place ballast equally on all frames beginning at opposite corners of each side and working inward. If needed, begin a second layer on top of the first.

4. Under extreme wind conditions, the mount should be tethered with cables.

5. It is the customer's responsibility to ensure that all applicable codes and restrictions are satisfied. If in doubt, please consult a local structural engineer.

Ballast table provided on following page.

TABLE 3.2 – 3.8 M CF VSAT ANTENNAS Code: ANSI/ASCE 7-88

		Building Height (ft)	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40	0-20	20-40
		Wind Speed	70		80		90		100		110		120		125	
Tethered on any type roof	Total Weight Required	Exp "B"	875	1091	1143	1424	1447	1803	1786	2226	2161	2693	2572	3205	2791	3477
		Exp "C"	1481	1721	1934	2247	2448	2844	3022	3511	3657	4249	4352	5056	4722	5487
	Static Roof Load (Pounds per Square Foot)	Exp "B"	9	11	12	15	15	19	19	23	23	28	27	33	29	36
		Exp "C"	15	18	20	23	25	30	31	37	38	44	45	53	49	57
	Net Ballast Required (lbs)	Exp "B"	0	0	0	0	0	0	0	319	254	786	665	1298	884	1570
		Exp "C"	0	0	27	340	541	937	1115	1604	1750	2342	2445	3149	2815	3580

		Wind Speed	70		80		90		100		110		120		125	
Untethered Built-up Roof cu=.75	Total Weight Required	Exp "B"	1628	2028	2126	2649	2690	3352	3322	4139	4019	5008	4783	5960	5190	6467
		Exp "C"	2754	3200	3597	4179	4552	5289	5620	6530	6800	7901	8093	9403	8782	10203
	Static Roof Load (Pounds per Square Foot)	Exp "B"	17	21	22	28	28	35	35	43	42	52	50	62	54	67
		Exp "C"	29	33	37	44	47	55	59	68	71	82	84	98	91	106
	Net Ballast Required (lbs)	Exp "B"	0	121	219	742	783	1445	1415	2232	2112	3101	2876	4053	3283	4560
		Exp "C"	847	1293	1690	2272	2645	3382	3713	4623	4893	5994	6186	7496	6875	8296

		Wind Speed	70		80		90		100		110		120		125	
Untethered Rubber Membrane Roof cu=.70	Total Weight Required	Exp "B"	1744	2173	2278	2838	2883	3592	3559	4434	4306	5365	5125	6385	5561	6929
		Exp "C"	2951	3428	3854	4478	4878	5667	6022	6996	7286	8466	8671	10075	9409	10932
	Static Roof Load (Pounds per Square Foot)	Exp "B"	18	23	24	30	30	37	37	46	45	56	53	67	58	72
		Exp "C"	31	36	40	47	51	59	63	73	76	88	90	105	98	114
	Net Ballast Required (lbs)	Exp "B"	0	266	371	931	976	1685	1652	2527	2399	3458	3218	4478	3654	5022
		Exp "C"	1044	1521	1947	2571	2971	3760	4115	5089	5379	6559	6764	8168	7502	9025

		Wind Speed	70		80		90		100		110		120		125	
Untethered Concrete Roof cu=.64	Total Weight Required	Exp "B"	1907	2377	2491	3104	3153	3929	3892	4850	4710	5869	5605	6984	6082	7578
		Exp "C"	3227	3750	4215	4898	5335	6198	6586	7652	7969	9259	9484	11019	10291	11957
	Static Roof Load (Pounds per Square Foot)	Exp "B"	20	25	26	32	33	41	41	51	49	61	58	73	63	79
		Exp "C"	34	39	44	51	56	65	69	80	83	96	99	115	107	125
	Net Ballast Required (lbs)	Exp "B"	0	470	584	1197	1246	2022	1985	2943	2803	3962	3698	5077	4175	5671
		Exp "C"	1320	1843	2308	2991	3428	4291	4679	5745	6062	7352	7577	9112	8384	10050

3.3 BALLAST REQUIREMENT INFORMATION

1. Ballast requirements are provided to assist in determining the applicability of the NPMM for an antenna installation. The ballast data should not be relied upon without competent local professional examination and verification of its accuracy and suitability for a specific site or application.

2. Specific antenna types may require more strength and ballast requirements and must be investigated for each installation. The load carrying requirements of the supporting surface, the mast, the antenna and the antenna's connection to the mast must also be investigated for each installation.

3. Roof pads are recommended to prevent damage to roof membranes. Pads should be placed under all ballast and under the mast pipe. When roof pads are utilized, the minimum coefficient of friction between the ballast pans and roof pad or between the roof pads and the supporting surface must be used to calculate the wind speeds resulting in sliding.

4. When adhesive, sealant or pads are utilized; they must be compatible with the supporting surface. They must also be durable and have adequate strength. Precautions should also be taken to insure that damage to the supporting surface will not occur upon wind loading. Adhesives and sealants must be capable of resisting shear; otherwise, they may act as a lubricant and decrease the effective coefficient of friction between the ballast and the supporting structure.

5. The installation, roof materials and supporting structure must be capable of withstanding all loads imposed by the antenna system. Supporting structure, anchors and/or safety cables must be sufficient to resist the reactions from the antenna system. The installation must meet all applicable, local, state and federal requirements.

Due to the many variables involved, General Dynamics does not accept responsibility for verifying the applicability of the NPMM for specific installations.