

KLM's "X"-panded 4 element 2 meter antenna brings a new level of efficiency, performance, and value to point-to-point, repeater, mountain-topping, and portable communications. The 2M-4X uses a broadband folded dipole-driven element to deliver 8.5 dBd at better than 1.5:1 VSWR across the band (see the curve below). The 4X is rear-mounted and excellent in either horizontal or vertical polarization. An RG-142 coaxial balun, rated to 2KW, is supplied for direct connection to your 50 ohm coax. NO tuning or matching is needed. 12420

Physically, the 4X is built to last. The boom and driven element are 6063-T832 and the parasitics are 6061-T6. All hardware is stainless steel except the mounting U-bolts.

KLM 2M-4X SPECIFICATIONS

Bandwidth: 144-148 MHz

Gain: 8.5 dBd

Vswr: 1.4:1 and better

Beamwidth at 3dB points: 62

Feed Impedance: 50 ohms unbalanced
(with balun supplied)

Windload: .32 sq ft

Weight: 1.75 lbs

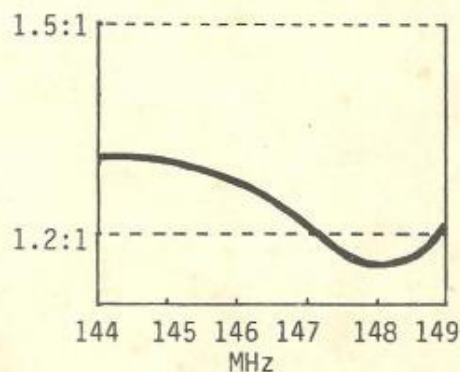
Boom length/Dia: 50.5"/1" O.D.

Mounting: Rear, H or V

Mast size: 1-1/2"

- Perfect for....
- point-to-point
 - repeaters
 - mountain topping
 - portable ops

VSWR - KLM 2M-4X (X-panded)



KLM 2M-4X ASSEMBLY MANUAL

I. BEFORE YOU BEGIN

1. Select an assembly area large enough to comfortably accommodate overall antenna dimensions. A shallow box is handy for holding and sorting the smaller hardware, as is a marking pen for identifying components.
2. Some simple tools are required: A tape measure, screwdriver, and a set of spin-tite, and socket or end wrenches. Common nut sizes are:

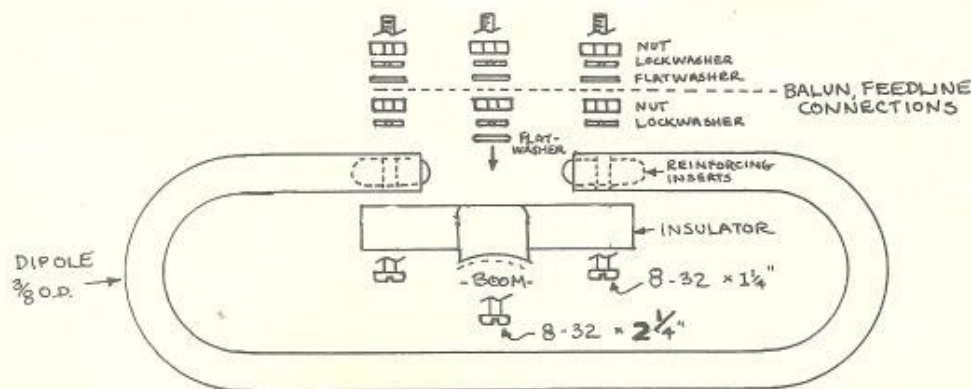
11/32" ...8-32 hdwe

7/16" ... $\frac{1}{4}$ -20 hdwe

To avoid damage to antenna components, be aware that most hardware need only be moderately hand tightened with screwdriver or spintite to be secure. When using tools with mechanical leverage such as socket or end wrenches, care must be taken not to over-torque nuts and damage components.

3. Thoroughly unpack shipping box and check components and hardware against the Parts List. If there is a difference, look for a "Factory Update/Change" sheet accompanying the assembly instructions prior to contacting KLM.
4. For easiest and fastest assembly, take a few moments before starting to familiarize yourself with the assembly guide and the antenna components.

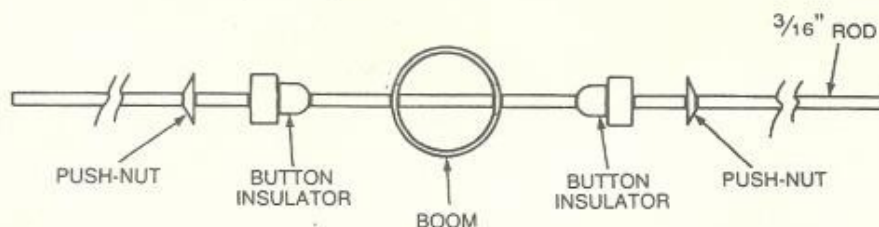
II. DRIVEN ELEMENT ASSEMBLY



1. Slide the reinforcing inserts (peanut shaped) into the open tubing ends of the folded dipole and align the holes.
2. Place the dipole element into the channel on the insulator and secure with the 8-32 x $\frac{1}{4}$ " screws, lockwashers and nuts. See the Assembly Pictorial above for the correct placement of hardware.
3. Mount the insulator/dipole assembly to the #18 hole in the boom (1' 8-13/16" from the rear of the 1" O.D. boom), orienting the element to the front and the mounting screw to the rear. Insert the 8-32 x $2\frac{1}{4}$ " screw through the boom first, then place insulator on the screw stud, and secure with flatwasher, lockwasher, and nut. Handtighten down into insulator cavity avoiding excessive torque. Extra screw length forms ground stud for mounting the coax balun.

4. Place the coax balun lugs onto the feedpoint studs and the ground/insulator stud. Secure with flatwashers, lockwashers, and nuts. Later, feedline will be attached to one of the feedpoint studs and the ground stud.

III. DIRECTOR AND REFLECTOR MOUNTING (parasitic elements)



ROD ELEMENT/INSULATOR ARRANGEMENT

Separate the parasitic elements into two groups of vertical and horizontal elements. Install one group (vertical or horizontal) at a time.

Locate the longest 3/16 inch diameter element (reflector). Slide on one of the "button" mounting insulators small end first. Push the insulator to the element balance point. DON'T WORRY ABOUT THE EXACT LOCATION AT THIS POINT. Repeat this operation for each of the remaining rod elements.

Pick up all the rod elements and settle them in your grasp on a flat smooth surface. Starting with the longest rod, insert it through the end hole in the boom near the driven elements. Next move to the hole directly in front of the driven elements and insert the next longest element. Continue inserting the next longest rod director in the next hole, and the next, and the next, until all the rod directors are in place.

Now return to the reflector and slide on the second button insulator from the opposite side of the boom. Visually center the element in the boom. Consult the antenna dimension sheet and, using a tape measure, set the element position so the element is centered in the boom. THIS CENTERING OPERATION IS VERY CRITICAL FOR PROPER PERFORMANCE OF THE ANTENNA.

Move the next rod director and repeat the second button insulator installation and centering operation. Continue until each rod director is fully mounted and centered.

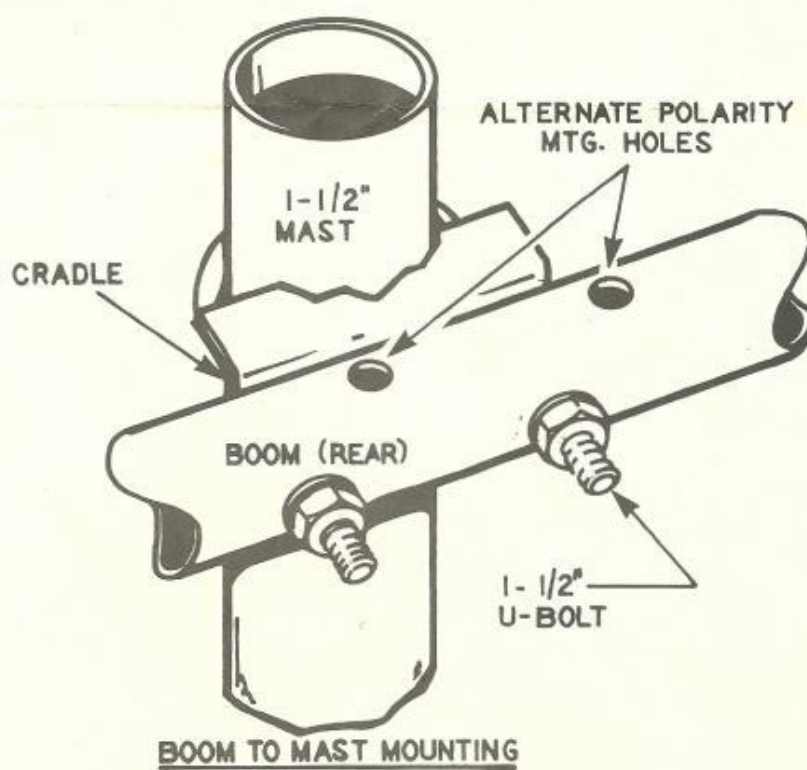
Return to the reflector now and install the element keeper washers on each side. BEFORE PUSHING THEM TIGHTLY UP AGAINST THE BUTTON INSULATORS, CHECK FOR PROPER CENTERING ONE MORE TIME. Proceed by adding the keeper washers to the rest of the rod directors until all have been center-checked and have the keepers installed.

IV. FEEDLINE PREPARATION

1. Use quality 50 ohm coax for your feedline, and eliminate one major cause of mismatches, losses, and distorted patterns. KLM recommends RG-213, Belden 8214, Times FM-8, etc.
2. Strip off 1" of the outer jacket.
3. Unravel the braid shield and twist it off to the side at a right angle.
4. Strip center conductor insulation back 1/4" exposing center conductor.
5. Solder on #8 lug.
6. Cut the twisted outer braid to 3/4" and solder on #8 lug.
7. Tape or seal this assembly with TRV (silicon rubber).
8. Remove flatwashers, lockwashers and nuts from one feedpoint stud (your choice) and the ground/insulator stud. Attach the center conductor lug to the feedpoint stud and the braid lug to the ground/insulator stud. Resecure with flatwashers, lockwashers, and nuts. Secure feedline to boom and mast for support.

V. BOOM TO MAST MOUNTING

1. The KLM 2M-4X can be rear mounted to a 1½" mast with either vertical or horizontal polarity. Holes are provided in the rear of the boom for both options. Place the 1½" U-bolt around the mast. Add the cradle, slide boom onto U-bolt studs, and secure with ½-20 lockwashers and nuts. Tighten only enough to firmly secure antenna.



KLM 2M-4X DIMENSIONS

Distance from rear of boom:

Front

Element Length:

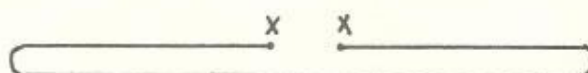
4' 1-5/8"

2' 11-5/8"

2' 8-3/4"

3' 1/4"

1' 9-1/4"



6' (folded)

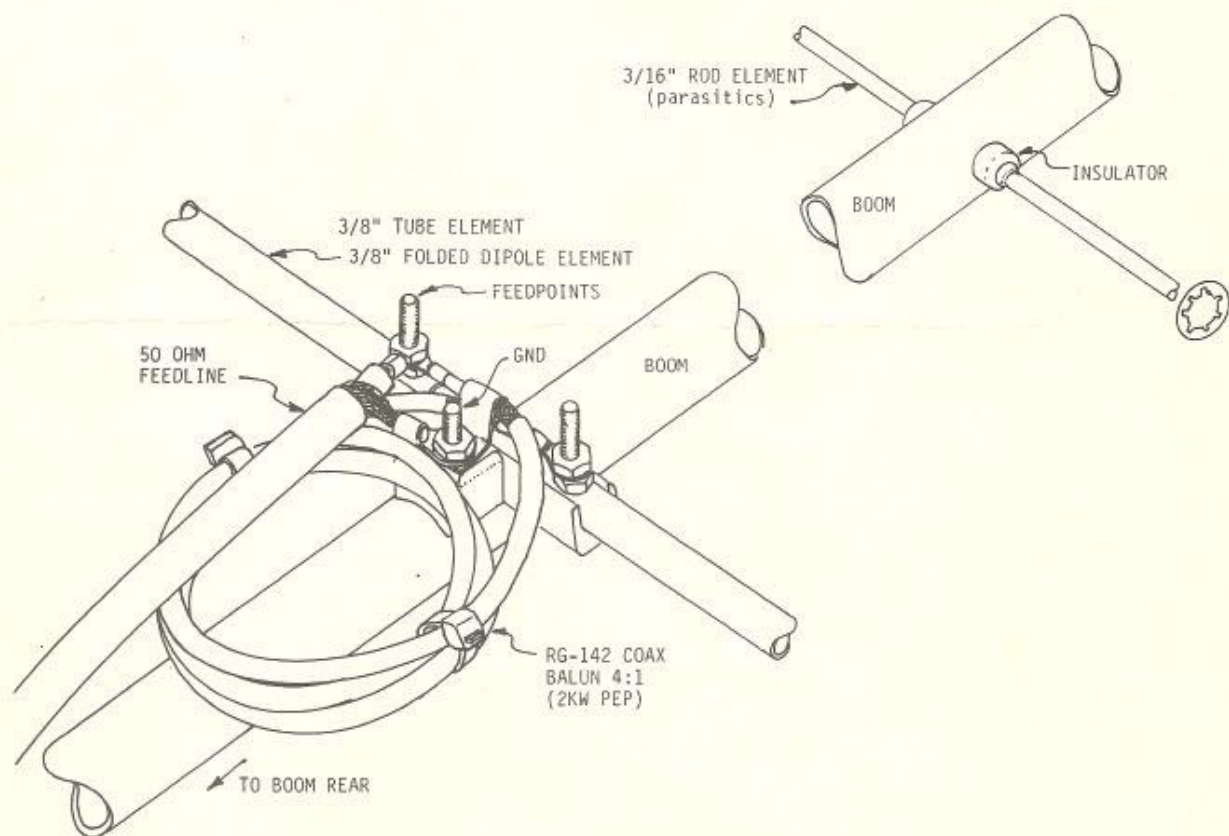
5-1/2"

Rear

3' 4-5/8"

XX = Feedpoints, 200 ohms balanced. Use KLM 4:1 Coax Balun (2KW PEP)

KLM 2M-4X
HARDWARE ARRANGEMENT ONLY - NO SCALE



PARTS LIST
2M-4X

KLM PART NO.	QTY	SIZE	PART DESCRIPTION
	1	1" X 50-1/2"	BOOM
	1	3/8" O.D. X 72"	DIPOLE ELEMENT
	1	3/16" O.D. X 40-5/8"	ROD ELEMENT
	1	3/16" O.D. X 36-1/4"	ROD ELEMENT
	1	3/16" O.D. X 35-5/8"	ROD ELEMENT
	1	4:1	COAX BALUN (WITH 2-#8 SOLDER LUGS)
	1	HARDWARE BAG INCLUDING:	
28404	1	1-1/2"	U-BOLT & CRADLE (GOLD)
28204	2	1/4-20	NUTS
28354	2	1/4"	LOCKWASHERS
28018	1	8-32 X 2-1/4"	SCREW
28014	2	8-32 X 1-1/4"	SCREWS
28202	6	8-32	NUTS
28352	6	#8	LOCKWASHERS
28302	4	#8	FLATWASHERS
66106	2		PEANUT INSERTS
66119	4	LARGE	NYLON TIES
66113	1	3/8" X 1" TYPE II	INSULATOR
28218	8	3/16"	PUSHNUTS
66125	6		BUTTON INSULATORS
66116	2	1"	BOOM CAPS
84045	1		ASSEMBLY MANUAL