



## Instructions

### Model HF4V-S

Butternut Electronics Co's Instruction Manual for:  
Model HF4V-S — 1978

**NOTE:**

The HF4V-S Vertical antenna previously manufactured by Butternut Electronics Co. was discontinued in 1981. Parts are no longer available for these antennas. This instruction is made available as a reference.



BUTTERNUT ELECTRONICS CO.

ROUTE 1, LAKE CRYSTAL, MN 56055

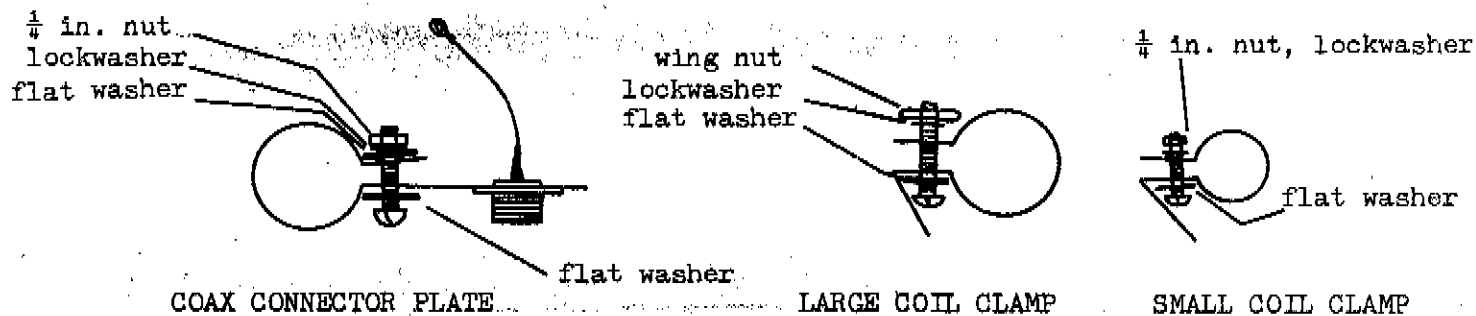
## ASSEMBLY AND INSTALLATION: MODEL HF4V-S (October, 1978)

During assembly and installation take care to avoid contacting power lines with the antenna. Do not mount the antenna in any location where it might blow into or fall upon power lines.

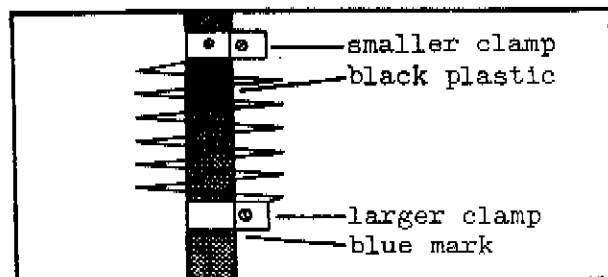
Tools recommended for assembly: standard blade screwdriver, 5/16 in. nutdriver, pliers, pocket knife.

Study the pictorial diagrams and proceed as follows:

1. Check to see that all parts are present. See the parts pictorial page.
2. Plant the mounting post (A) in a hole approximately 21 in. deep so that the upper end of the fiberglass insulator clears the ground by 5 or 6 in. Pack earth tightly around the tubing post to make sure that it remains vertical. Concrete is recommended for more strength. The post may be twisted slightly while the concrete is setting so that it may be removed easily at a later date, if desired. The post should not wobble in the hole. NOTE: Hammering the post into the ground may cause splintering of the fiberglass insulator. If the post must be hammered, protect the top with a block of wood.
3. Mount the coax connector plate (B) on post (A) by positioning (B) 1/4 in. above the screw in (A). The top of the plate should be even with the end of the aluminum tube. The plate should not extend over the fiberglass insulator. Secure with a 1/4 in. x 3/4 in. screw, two flat washers, a lockwasher, and a nut.

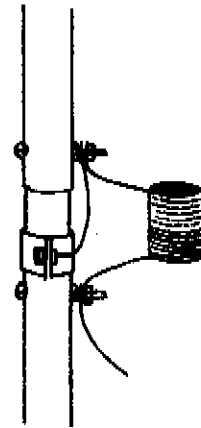


4. Note that the 40m resonator coil (F) has two clamps, one large and one small. Pass the top of (E) first through the larger clamp of (F), then through the smaller clamp. The larger clamp should be below the black plastic on (E).
5. Pass a 1/4 in. x 1 in. screw through a flat washer, then through the screw holes in the smaller clamp of (F). Line up the small screw hole in the curved part of the clamp with the screw hole in the top of (E). Tighten the 1/4 in. hardware, then put a #10-24 self tapping screw into the small hole and tighten, further securing the clamp to (E).
6. Pass a 1/4 in. x 1 in. screw through a flat washer, then through the holes in the larger clamp. Secure with a lock washer and a wing nut, but do not tighten, as the clamp will be moved in the next step.



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7. Slide the larger clamp of (F) down section (E) until the bottom of the clamp touches the blue mark on (E). Tighten the wing nut. This coil extension gives the preliminary 40m setting. Set assembly (E-F) aside.
8. Slide one end of tube (D) into the end of (C) with one screw hole. Line up the screw holes and secure with a #10-24 self-tapping screw. Set assembly (C-D) aside.
9. Slide the end of (G) with the screw hole into the bottom of the 10m trap. Line up the screw holes and secure with a #10-24 self-tapping screw.
10. Slide tube (I) over the top of the 10m trap, line up the screw holes, and secure with a #10-24 self-tapping screw.
11. Slide the end of (J) with the screw hole into the bottom of the 15m trap (K). Line up the screw holes and secure with a #10-24 self-tapping screw.
12. Slide tube (L) into the top of the 15m trap, line up the screw holes, and secure with a #10-24 self-tapping screw.
13. Place a 5/8 in. stainless steel clamp over the slotted end of (L). Telescope tube (M) into (L). Measure 51-1/2 in. from the black plastic part of the 15m trap to the tip of (M) and tighten the clamp.
14. Place a 1 in. stainless steel clamp over the slotted end of (J). Telescope (I) into (J). Measure the distance between the black plastic of the traps to 22 in. and tighten the clamp.
15. Place a 1 in. stainless steel clamp over the slotted end of (G). Telescope (E) into (G). Measure the distance between the bottom of the 10m trap and the clamp of (F) to 12-1/2 in. and tighten the clamp.
16. Slide (D) into (E), line up the screw holes, and secure with a #10-24 self-tapping screw.
17. WATCH OUT FOR POWER LINES! Raise the antenna and place it atop the mounting post. Line up the screw holes at the bottom of (C) with the hole in the fiberglass and secure with a #8 x 1-3/4 in. screw, lockwasher, and nut.
18. Prepare the impedance / grounding coil (N) as shown in the pictorial.
19. Place the lug from (B) onto the screw installed in step 17. Follow it with a flat washer, point 1 of coil (N), and another flat washer. Secure with a lockwasher and #8 nut.
20. Place a #8 flat washer onto the screw below the coax plate. Follow it by point 2 of coil (N) and another flat washer. Secure with a lockwasher and nut.



Detail: Steps 19, 20.

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21. Connect point 3 of coil (N) to a ground rod. Radials, if used, may be connected to the same screw as point 2, to the ground rod, or soldered to point 3. The lead to the radial system must not be over 6 in. long. For installations above ground, radials MUST be used. SEE RADIAL INFORMATION PAGE.
22. Feed the antenna with 50-53 ohm coaxial cable. Be sure that the transmitter is grounded and/or disconnected from the AC mains when connecting the coax to avoid a possible shock hazard.

## CHECKOUT AND ADJUSTMENT

The dimensions given in the instructions should result in mid-band resonances on 20-10m, but some variation may be expected. Tuning on 40m is accomplished adjustment of the air-wound resonator coil.

1. Determine the frequency of minimum SWR on 40m. If the lowest SWR occurs at too high a frequency, loosen the lower clamp of coil (F) and reposition it slightly higher on section (E), thus compressing the turns and increasing inductance. If the point of minimum SWR occurs at too low a frequency, move the clamp down, decreasing inductance. One setting should suffice for below 2:1 coverage of either the phone or cw band.
2. Determine the frequency of minimum SWR on 10m. To lower the resonant point, lengthen the section between the 40m resonator coil and the 10m trap. To raise the resonant point, shorten the section.
3. Determine the frequency of minimum SWR on 15m. To lower the resonant point, lengthen the section between the traps. To raise resonance, shorten.
4. Determine the frequency of minimum SWR on 20m. To lower the resonant point, lengthen the top section. To lower resonance, shorten.
5. Recheck 40m. If resonance has shifted, repeat step 1.

NOTE: Antenna length adjustments cannot substitute for a good ground system. If adjustments do not yield reasonable SWR, suspect losses in the ground.

Impedance matching: This is accomplished by changing the spacing between the turns of coil (N). Squeezing the turns together or spreading them apart is all that is required. Find the adjustment that gives the lowest SWR on 40m. DO NOT ADJUST THIS COIL IF THERE IS NOT A GOOD GROUND SYSTEM. Try to get a low SWR BEFORE changing this coil. This coil may need no adjustment. Some installations may yield a lower SWR without coil (N), in which case it may be removed entirely. If this is done, a lightning arrestor should be installed in the line.

Operation: The HF4V-S operates on 40 through 10m with automatic bandswitching. This is accomplished by the use of parallel resonant traps on 10 and 15m and by the introduction of appropriate reactances on 40 and 20m. The HF4V-S may be operated at the legal limit on 20 through 10m SSB/CW. Reduced power should be used in other modes. Up to 1500 watts P.E.P./ 500 watts CW may be used on 40m. High power tune-up into the antenna is undesirable. Use a dummy load. If high power operation is contemplated, extra care must be taken during installation. Locate roof radials carefully, and insulate the ends well. Do not allow them to contact the roof, trees, etc. A protective fence around the base of a ground mounted vertical is a good idea if children or animals are nearby.

Technical advice: If problems are encountered, please write or call us for help.



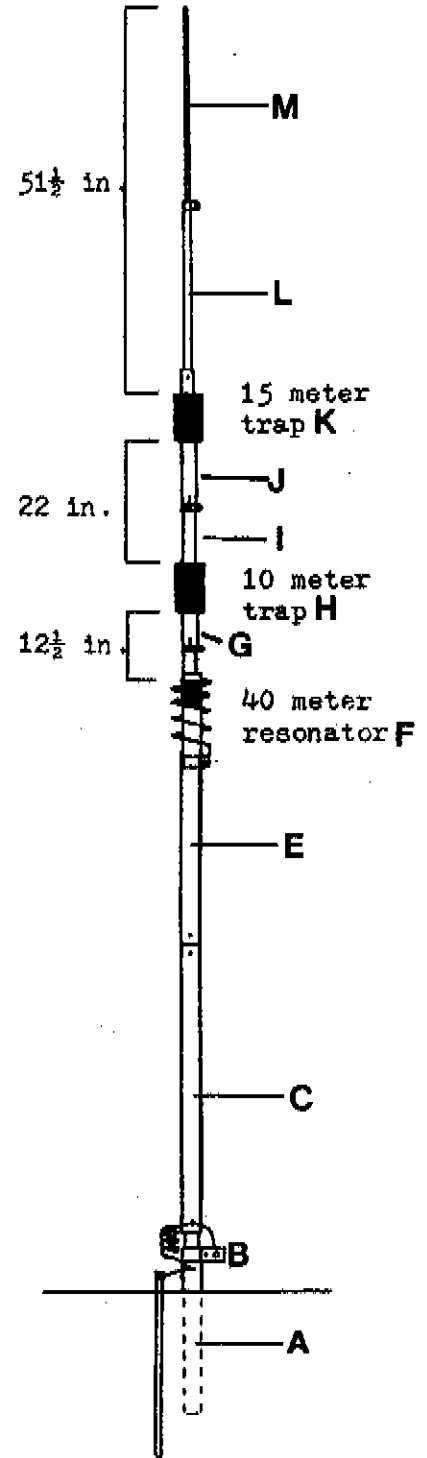
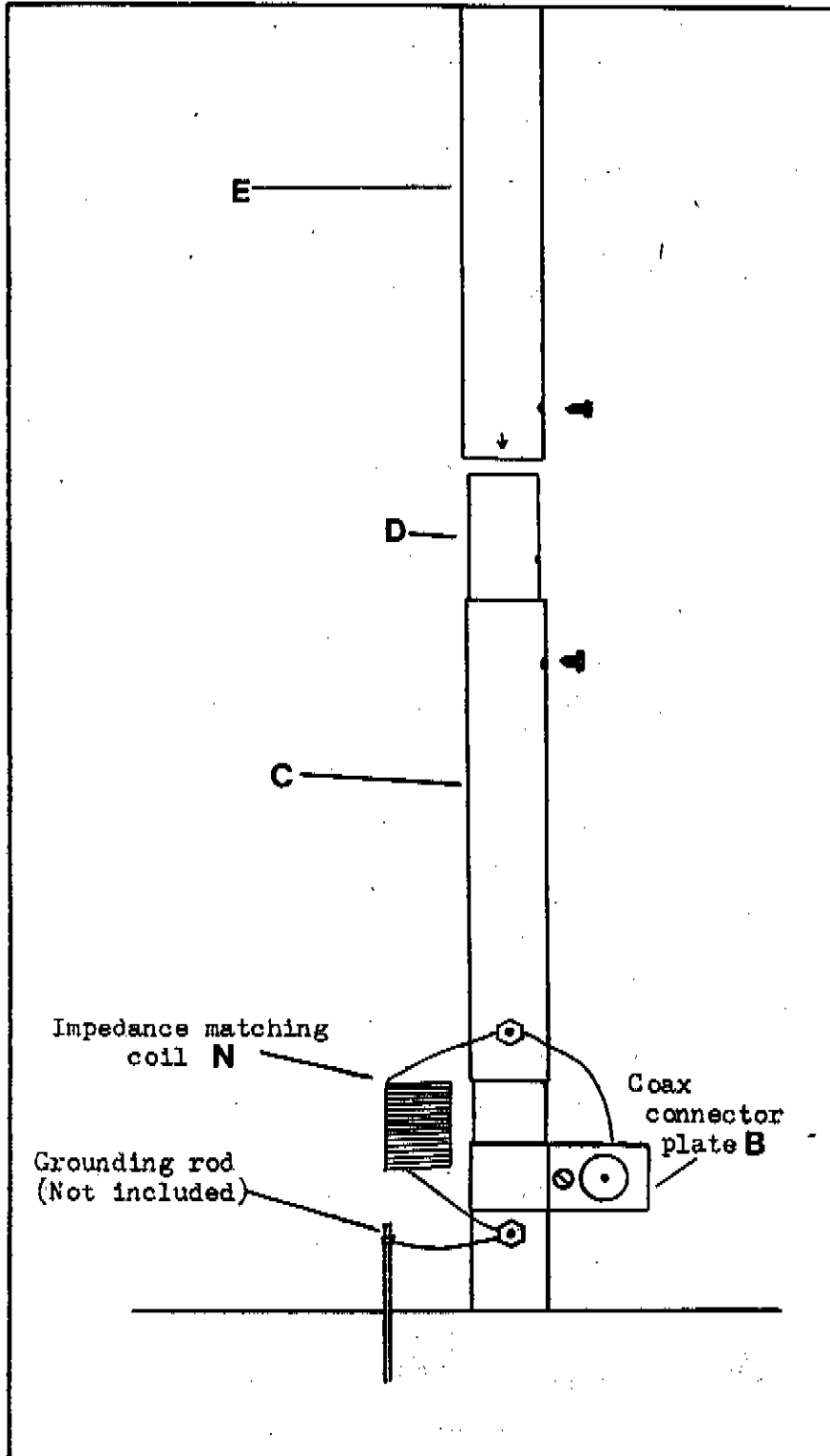


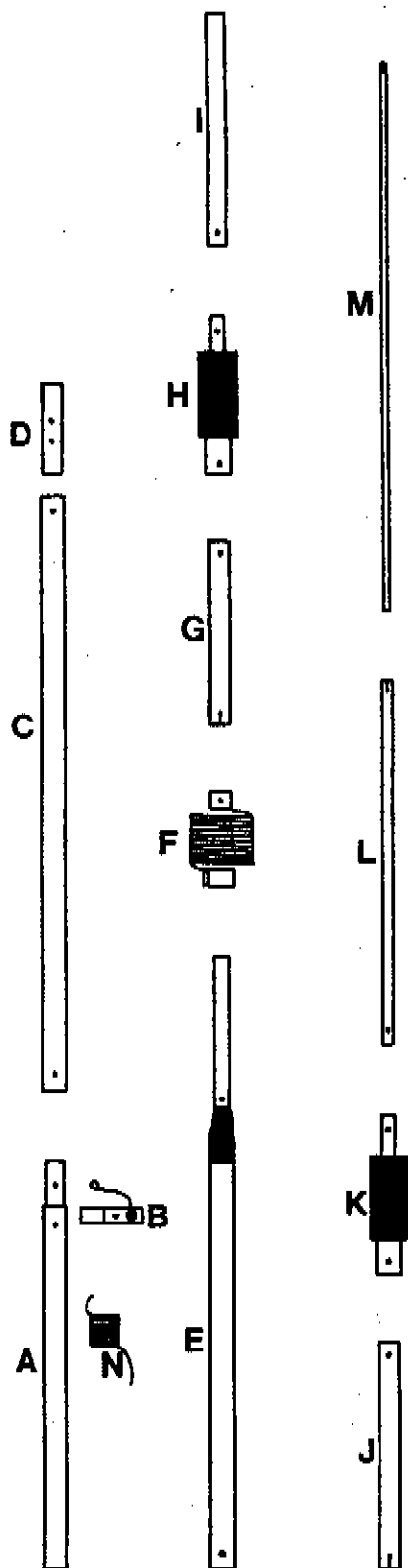
**BUTTERNUT ELECTRONICS CO.**

ROUTE 1, LK. CRYSTAL, MN. 56055

**PICTORIAL:**

**Model HF4V-S**





## Parts list:

- (A) Mounting post: 2 ft. x 1-1/8 in. tube with fiberglass insulator insert.
- (B) Coax connector plate.
- (C) 1-1/8 in. dia. x 38 in. tube.
- (D) 1 in. dia. x 6 in. tube.
- (E) 40m resonator capacitor section: 3-1/2 ft.
- (F) 40m resonator coil: 8 turns.
- (G) 1 in. dia. x 12 in. tube, slotted.
- (H) 10m trap: marked "10m".
- (I) 7/8 in. dia. x 15 in. tube.
- (J) 1 in. dia. x 15 in. tube, slotted.
- (K) 15m trap: marked "15m".
- (L) 5/8 in. dia. x 2 ft. tube, slotted.
- (M) 1/2 in. dia. x 3 ft. tube, end closed.

## Hardware Packet:

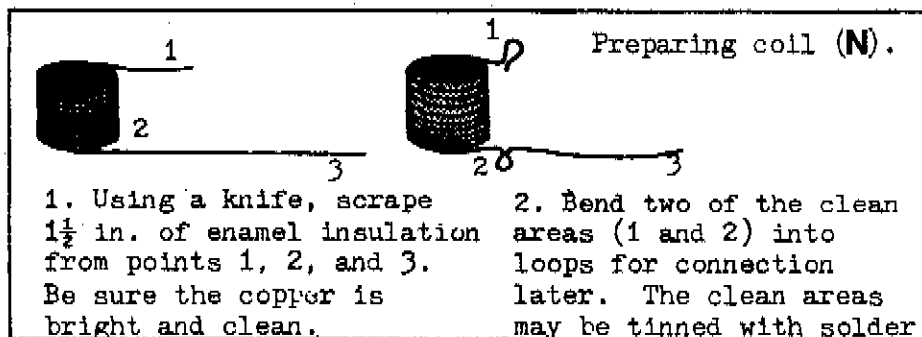
#8 Hardware: 1 screw 1-3/4 in. long, 5 flat washers, 3 nuts, 3 lockwashers.

Self-tapping screws: 7 of #10-24 slotted hex head type.

1/4 in. hardware: one 3/4 in. screw, two 1 in. screws, 2 nuts, one wing nut, four flat washers, three lockwashers.

Clamps: Two 1 in. clamps and one 5/8 in. clamp, stainless steel.

(N) Impedance matching/grounding coil.



Low-profile antennas for mobile home parks and other restricted height areas! Same quality construction and 80/40 meter resonator circuits as used in the larger HF models; traps for 10 and 15 meter operation, but entire radiator length is active on all other bands. Both models complete with mounting post, base shunt inductor for d.c. grounding, and socket for PL-259 coax plug. May be ground or roof/tower mounted.

**ELECTRICAL AND MECHANICAL SPECIFICATIONS:**

**Model HF5V-S -- Automatic bandswitching 80-10 meters.**

Shipping weight: 9 lbs./4 kg.

Height: 16 ft./4.8 meters

Power Rating: legal limit SSB/C.W. 20, 15 and 10 meters: 1200 W PEP/500 W C.W. 40 meters: 500 W PEP/250 W C.W. 75/80 meters.

Feedpoint impedance: nominal 50 ohm all bands.

VSWR at resonance: 1.5:1 or less all bands.

Bandwidth for VSWR of 2:1 or less:  
 10 meters -- 1500 Khz; 15 and 20 meters -- entire band; 40 meters -- 150 Khz; 75/80 meters -- 30-50 Khz.

Wind survival rating (unguyed): 80 m.p.h./128 km.p.h.

**Model HF4V-S -- Automatic bandswitching 40-10 meters.**

Shipping weight: 8 lbs/3.6 kg.

Height: 14 ft./4.2 meters

Except for operation on 75/80 meters, all other specifications are identical to those given above for the HF5V-S.

**HF5V-S**

**HF4V-S**

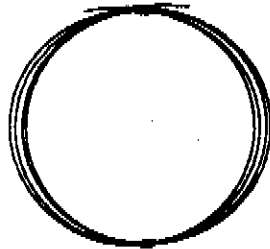


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ROUTE 1, LA CRYSTAL, MN. 56055

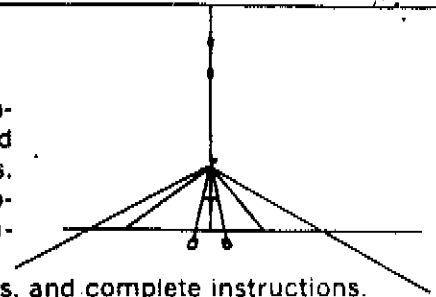
### Radial wire

Copper clad #18 steel wire in 35 ft. (nominal) coil. Ideal for ground radials. Sold only to antenna customers.



### Roof mounting kit

For vertical antennas. Includes 3 ft. steel tripod tower, plated lag screws, mast section, four stub-tuned radials, end insulators, extra tie-off wire, four plated eye screws, and complete instructions.



MODEL TBR -- 160 Meter base resonator unit. Tunes the 1800-1900 KHz range when attached to base of model HF5V-II or model HF3V (not recommended for use with Model HF5V-S). Permits "top band" operation and simultaneous resonance on all other bands with readjustment of 80 and 40 meter resonator inductances for 6-band automatic operation with the HF5V-II.

#### SPECIFICATIONS:

Bandwidth for 2:1 VSWR: 160 meters: approximately 20 KHz; 75/80 meters: 30-50 KHz; normal bandwidths on 40-10 meters.

VSWR at resonance: 1.5:1 or less on 160 meters in the average ground-mounted installation; does not appreciably affect VSWR on other bands when 80 and 40 meter resonator circuits are readjusted.

Power rating: 200 W PEP/150 W C.W. on 160 meters; reduced power levels on other bands are recommended during operation with the TBR.

Shipping weight: 4 lbs./1.8 kg.



### Posts

"T" fence posts of solid white fiberglass. Three feet long. A variety of uses. . . tie off inverted vee's, etc.

\$1.50 each (For orders of fewer than five, add 45¢ each for shipping, handling.)



### STR kit



Kit of four stub-tuned radials. Wire is pre-cut. End insulators and 35' of tie-off wire included. May be used in above-gnd installations instead of tuned radials.

### Warranty

Butternut will repair or replace defective parts for a period of 90 days following the date of purchase. Defective parts, if returned for repair or replacement, must be sent to the factory. The purchaser bears the cost of shipping to the factory; we pay the return shipping.