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V-2R
VHF Collinear Gain Vertical
For 144-148 MHz

INSTRUCTION MANUAL

GENERAL

The new Hy-Gain V-2R, two meter antenna is a collinear 5/8-wave omnidirectional vertical antenna for the 144-148 MHz Amateur band. The V-2R features two sets of 1/4-wave radials which properly decouple the lower 5/8-wave radiator from the mast. It also features a 500 watt enclosed coil that matches the antenna to a nominal 50 ohms. The ruggedized V-2R is suitable for personal use, repeater, and packet BBS service.

The feedpoint is a standard UHF connector that is protected from the weather within the lower radiator. The V-2R also features a mast-to-mast bracket that will accept up to a two inch O.D. mast.

The V-2R can also be used outside of the two meter Amateur band. Graphs are supplied so that the antenna can be set to any frequency between 138 and 174 MHz.

| SPECIFICATIONS | |
|-------------------------------------|---|
| VSWR at Resonance | Less than 1.5:1 |
| 2:1 VSWR Band Width | 10 MHz minimum |
| Power Gain | 3 dBd (5.2 dBi) |
| Antenna/Mast Isolation | 20 dB |
| Power Input | 500 Watts continuous |
| Lightning Protection | DC ground |
| Height (nominal) | 108 inches (2743 mm) |
| Wind Area | 0.67 sq. ft. (.062 sq. m) |
| Maximum Mast O.D. | 2 inches (51mm) |
| Hardware | 18-8 stainless steel except for U-Bolts |
| Maximum Wind Survival (without ice) | 105 mph (168.98 kmph) |
| Net Weight | 6.3 lbs (2.86 kg) |

ASSEMBLY

Unpack the antenna and check the parts against the Parts List and drawings.

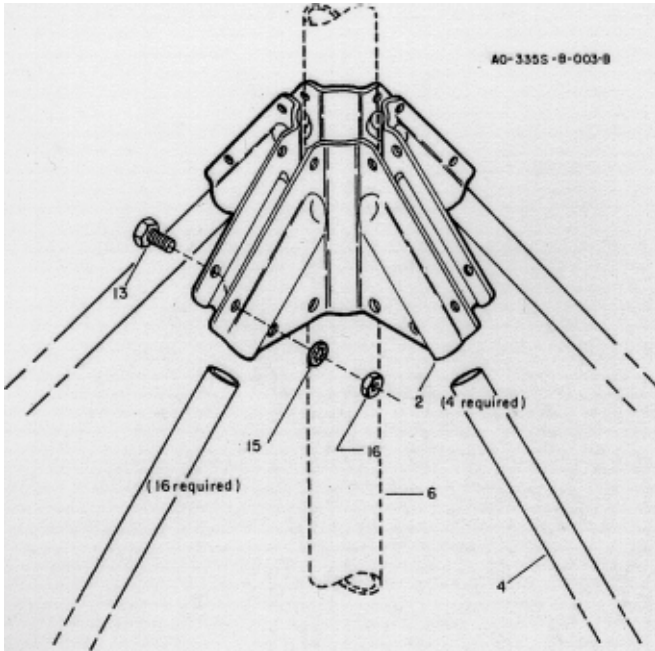
Select four of the radial clamps and associated hardware and loosely assemble them as shown in Figure 1.

Repeat the previous step for the remaining four radial clamps.

Set both assembled clamps upside down on a flat surface.

Select the eight (8) 7/16" x 17 1/8" radial tubes (Item No. 4), and insert them completely into the assembled radial clamps.

Tighten the outer eight (8) screws of each assembly just enough to hold the radial tubes in place. These screws will be securely tightened in a later step.



| Item No. | Description |
|----------|------------------------------|
| 2 | Radial Clamp, 45 degrees |
| 4 | Tube 7/16" x 17 1/8" |
| 6 | Tube, 1" O.D. x 60", slotted |
| 13 | Bolt, X10-24 x 1/2", hex |
| 15 | Lockwasher, X10, internal |
| 16 | Nut, X10-24, hex |

Figure 1 Radial Clamp Assembly

Select the 1" x 60" tube (Item No. 6).

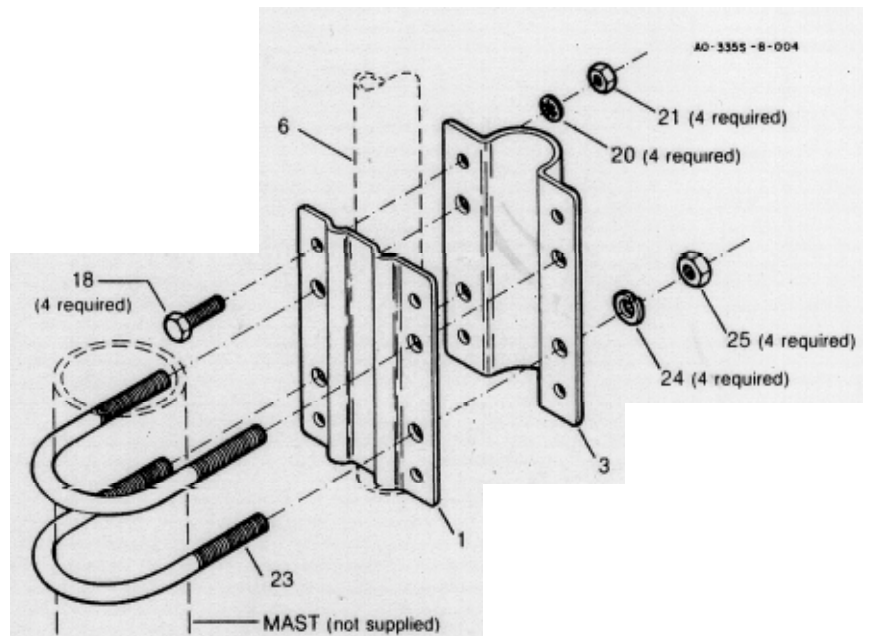
Slip both radial assemblies over the bottom of the 60" tube and position as shown in Figure 4 and Detail A. The unslotted end of the 60" tube is the bottom. Determine the "B" dimension from Figure 7. For example, at 146 MHz, B = 32 3/8" (822 mm).

Tighten all screws in both radial assemblies securely and evenly.

Select the mast-to-mast clamp, plate and associated hardware and loosely assemble them as shown in Figure 2.

Slide the assembled mast-to-mast clamp over the bottom end of the 60" tube as shown in Figure 2 and securely tighten the four (4) 1/4"-20 x 3/4" bolts, nuts and lockwashers (Item Nos. 18, 20 & 21).

| Item No. | Description |
|----------|------------------------------------|
| 1 | Mast-to-Mast Bracket Plate, 1 1/8" |
| 3 | Mast-to-Mast Bracket Clamp, 1 |
| 6 | Tube, 1" O.D. x 60", slotted |
| 18 | Bolt, 1/4"-20 x 3/4", hex head |
| 20 | Lockwasher, 1/4", internal |
| 21 | Nut, 1/4"-20, hex |
| 23 | U-bolt, 5/16" x 2" x 211/16" |
| 24 | Lockwasher, 5/16", split |
| 25 | Nut, 5/16"-18, hex |



NOTE: The end of the 1" x 60" tube (Item 6) should be even with the bottom of the mast-to mast brackets (Item 1 and 3).

Figure 2 Mast-to-Mast Clamp

UPPER RADIATOR/COIL ASSEMBLY

Refer to Figure 3.

Select the V-2R VHF Coil assembly. The coaxial cable will attach to this in a later step.

Select one No. 10 compression clamp (Item 11) and install over the slotted tube end of the coil assembly (Item 8).

Select the $\frac{7}{8}$ " O.D. x 24" tube (Item 7) and insert the plain end into the slotted tube of the coil assembly approximately 2". Position the compression clamp as shown in Figure 5 and tighten securely.

Select one No. 6 compression clamp (Item 10) and place over the swaged/slotted end of the $\frac{7}{8}$ " tube (Item 7).

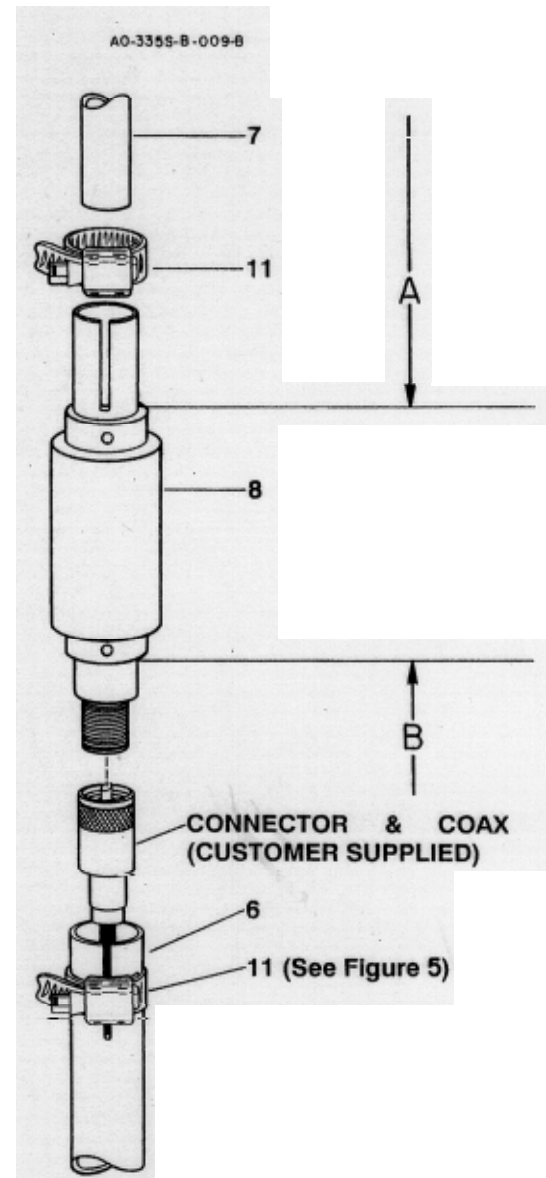
Select the $\frac{5}{8}$ " x 31" (Item 5) tube and insert either end into the $\frac{7}{8}$ " tube (Item 7).

Refer to Figure 4. Adjust the $\frac{5}{8}$ " x 31" tube so dimension "A" is equal to 41 $\frac{1}{2}$ " for two meter operation. Tighten the No. 6 compression clamp (Item 6) securely.

NOTE: The tuning charts in this manual are accurate. However, due to variation in installations some minor adjustments may be required to resonate the antenna on the desired

Select the $\frac{5}{8}$ " caplug (Item No. 12) and slip it over the end of the $\frac{5}{8}$ " tube.

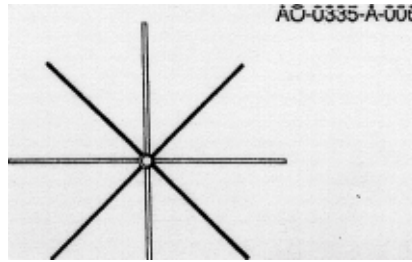
NOTE: Dimension "A" is from the top of the coil form to the tip of the element. Dimension "B" is from the bottom of the plastic coil form to the top of the radial clamps.



| Item No. | Description |
|----------|--|
| 6 | Tube, 1" O.D. x 60", slotted |
| 7 | Tube, $\frac{7}{8}$ " x 24" swaged & slotted |
| 8 | Coil, 500 watt, VHF |
| 10 | Clamp, #6, Tubing |
| 11 | Clamp, #10, Tubing |

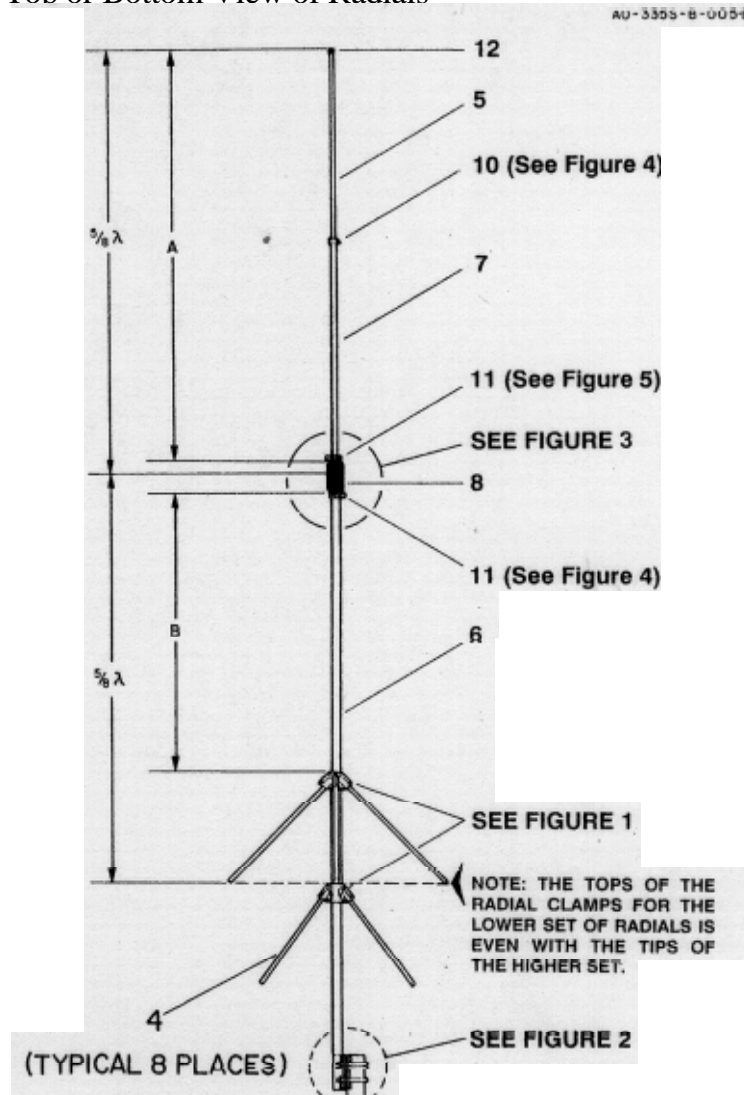
Figure 3
Upper Radiator/Coil Assembly

NOTE: At 146 MHz, A = 41 1/2" (1054 mm),
 = 32 3/8" (822 mm).



RADIALS AS SEEN FROM
 EITHER THE TOP OR THE
 BOTTOM.

Detail A
 Top or Bottom View of Radials

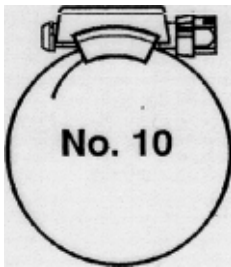
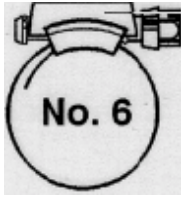


| Item # | Description |
|--------|--|
| 5 | Tube, 5/8" x 81" |
| 6 | Tube, 1" O.D. x 60", slotted |
| 7 | Tube, 7/8" x 24" swaged, drilled & slotted |
| 8 | Coil, 500 Watt, VHF |
| 10 | Clamp, #6, Tubing |
| 11 | Clamp, #10, Tubing |
| 12 | Caplug, 5/8" black |

Figure 4
 Overall View

Select the proper size tube clamp as shown in Figure 5. When installing the clamps, place the clamp near the tube end with the top of the clamp over the slot in the tube as shown.

After adjustment of the tubing lengths, tighten the clamp with a 5/16 inch nut driver, socket, or open end wrench until the tubing will not twist or telescope.



| Part No. | Description | Fits Tubing Sizes |
|----------|--|-------------------|
| 358756 | Clamp, Size #6 all stainless steel 5/16" hex head screw | 1/2" and 3/4" |
| Part No. | Description | Fits Tubing Sizes |
| 358757 | Clamp, Size #10 all stainless steel 5/16" hex head screw | t" |

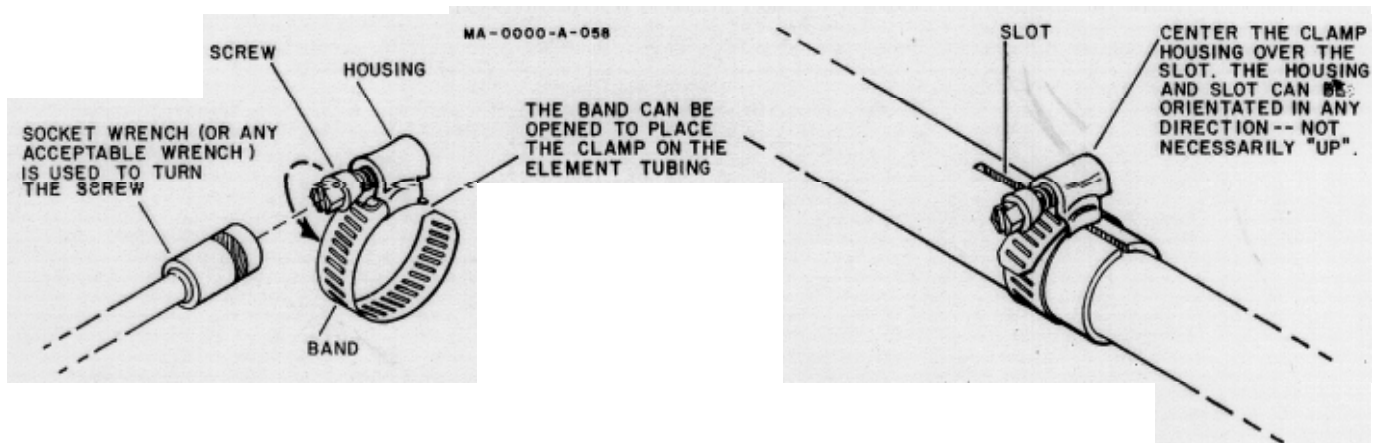


Figure 5 Compression Clamps

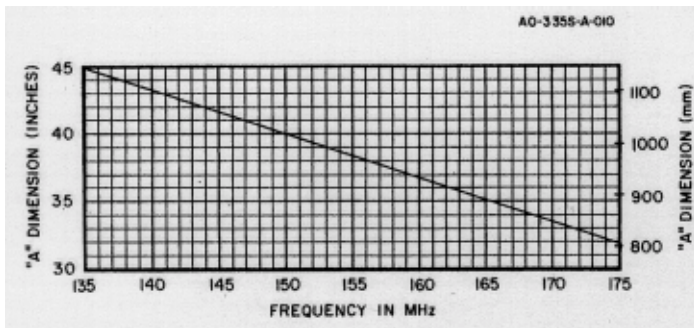


Figure 6
Dimension "A" Chart

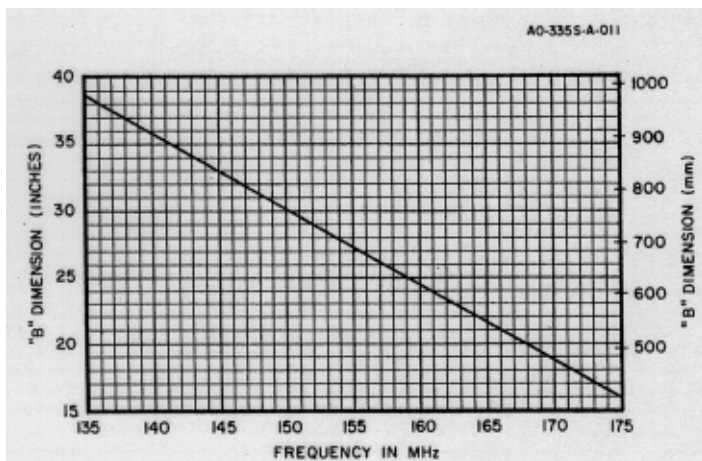


Figure 7
Dimension "B" Chart

Select the No. 10 tube clamp and slip it over the top end of the 1" x 60" tube. Position it as shown in Figure 3 and tighten it just enough to prevent it from sliding down the tube.

INSTALLATION

There are two ways to attach your coax to the V2R antenna. The first method involves attaching a short length of coax to the antenna before attaching the antenna to the supporting mast.

The remaining length of coax can then be attached and routed to the radio. The short length of coax must be at least 6 feet long, so the connection between coax lengths can be made below the mast-to-mast bracket.

The second method involves attaching the complete length of coax to the antenna before attaching the antenna to the supporting mast. In this method, the antenna and entire coax length must be carried up the tower or mast.

Choose one of the suggested methods of attaching the coax to the V-2R.

Insert one end of the coax into the bottom of the 1" x 60" tube. Push the coax through until the connector emerges from the top of the

Screw the coax connector onto the V-2R coil connector.

Push the coax cable into the top of the 1" x 60" tube until the matching coil rests on the one inch tube. Tighten the one inch compression clamp.

The antenna can now be mounted on a mast (2" O.D. max.). For adequate lightning protection, the antenna supporting structure must be well grounded.

WARNING

Installation of this product near power lines is dangerous. For your safety, follow the installation directions.

Several antennas may be mounted on the same mast. Your V-2R should be mounted above the other antenna for best performance. When side mounting the V-2R on a tower, it should be kept at least 20 inches away from the tower.

ANNOUNCING

Hy-Gain now makes a similar antenna for 400470 MHz called the V-4R. Inquire at your local Hy-Gain dealer for more information.

PARTS LIST

| Item No. | Part No. | Description | Qty |
|----------|----------|---|-----|
| 1 | 160011 | Mast-to-Mast bracket plate, 1 1/8" | 1 |
| 2 | 160012 | Radial clamp, 45 degrees | 8 |
| 3 | 160047 | Mast-to-mast bracket clamp, 1 1/8" | 1 |
| 4 | 170445 | Tube, 7/16" O.D. x 17 1/8" | 8 |
| 5 | 170614 | Tube, 5/8" O.D. x 31" | 1 |
| 6 | 191001 | Tube, 1" O.D. x 60", slotted | 1 |
| 7 | 190204 | Tube, 7/8" x 24", swaged & slotted | 1 |
| 8 | 878630 | Coil, 500 watt, VHF | 1 |
| | 878631 | Parts Pack, 335S-1, Stainless Steel | 1 |
| 9 | | (Not Used) | |
| 10 | 358756 | Clamp, #6 tube | 1 |
| 11 | 358757 | Clamp, #10 tube | 2 |
| 12 | 450503 | Caplug, 5/8", black | 1 |
| 13 | 500158 | Bolt, #10-24 x 1/2", hex head | 33 |
| 14 | | (Not Used) | |
| 15 | 565697 | Lockwasher, #10, internal | 33 |
| 16 | 554071 | Nut, #10-24, hex | 33 |
| 18 | 505266 | Bolt, 1/4"-20 x 3/4", hex head | 4 |
| 20 | 562961 | Lockwasher, 1/4", internal | 5 |
| 21 | 554099 | Nut, 1/4"-20, hex | 4 |
| 23 | 540036 | U-bolt, 5/16" x 2" x 2 11/16" | 2 |
| 24 | 564792 | Lockwasher, 5/16", split | 4 |
| 25 | 555747 | Nut, 5/16"-18, hex | 4 |

NOTE: Some extra small parts are included but not used.

hy-gain® LIMITED WARRANTY

Hy-Gain Warrants to the original owner of this product, if manufactured by **Hy-Gain** and purchased from an authorized dealer or directly from **Hy-Gain** to be free from defects in material and workmanship for a period of 12 months for rotator products and 24 months for antenna products from date of purchase provided the following terms of this warranty are satisfied.

1. The purchaser must retain the dated proof-of-purchase (bill of sale, canceled check, credit card or money order receipt, etc.) describing the product to establish the validity of the warranty claim and submit the original or machine reproduction of such proof of-purchase to **Hy-Gain** at the time of warranty service. **Hy-Gain** shall have the discretion to deny warranty without dated proof-of-purchase. Any evidence of alteration, erasure, or forgery shall be cause to void any and all warranty terms immediately.
2. **Hy-Gain** agrees to repair or replace at **Hy-Gain's** option without charge to the original owner any defective product under warranty, provided the product is returned postage prepaid to **Hy-Gain** with a personal check, cashiers check, or money order for \$8.00 covering postage and handling.
3. Under no circumstances is **Hy-Gain** liable for consequential damages to person or property by the use of any **Hy-Gain** products.
4. Out-of-warranty Service: **Hy-Gain** will repair any out-of-warranty product provided the unit is shipped prepaid. All repaired units will be shipped COD to the owner. Repair charges will be added to the COD fee unless other arrangements are made.
5. This warranty is given in lieu of any other warranty expressed or implied.
6. **Hy-Gain** reserves the right to make changes or improvements in design or manufacture without incurring any obligation to install such changes upon any of the products previously manufactured.
7. All **Hy-Gain** products to be serviced in-warranty or out-of-warranty should be addressed to **hy-gain, 308 Industrial Park Road, Mississippi 39759, USA** and must be accompanied by a letter describing the problem in detail along with a copy of your dated proof-of-purchase.
8. This warranty gives you specific rights, and you may also have other rights which vary from state to state.