

## "WARNING: INSTALLATION OF THIS PRODUCT NEAR POWER LINES IS DANGEROUS. FOR YOUR SAFETY, FOLLOW THE INSTALLATION DIRECTIONS."

## YOU, YOUR ANTENNA, AND SAFETY

Hundreds of accidental deaths and permanent injuries occur each year as a direct result of carelessly installing an antenna. The following information is to help insure your safety and achieve a good installation.

Here are a few simple precautions for you to take. PLEASE read them. Read them again. FOLLOW THEM! They may save your life.

## SITE SELECTION:

**Before** attempting to install your antenna, or if you are taking it down, think how you can best place your antenna for **safety** and performance.

To determine a safe distance from wires and power lines:

- 1. Measure the length or height of your antenna, whichever is longer,
- 2. Add this length to the length of your tower or mast, and then
- 3. Double this total for the minimum recommended **safe** distance.

If you are unable to maintain this safe distance, **STOP!** 

Call your electric power company. Tell them your plans and ask them to come look at your proposed installation. This is a little inconvenience, considering your life is at stake.

CHOOSE A PROPER MOUNTING METHOD: When a particular type of mounting method is recommended by the manufacturer or a professional antenna installer, follow those specific recommendations.

Following are some familiar antenna mountings:



**Telescoping Mast** 

Tower



**Chimney Strap** 







Eave Mount



Although there are many variations to the examples, all appear to be simple — but don't believe it! If you are installing an antenna for the first time, please, for your own safety as well as others, seek professional assistance. Never use plastic pipe, conduit, wood poles or thin walled tubing. Use only masting that is specifically made for antenna support and has a length and wall thickness that is designed to carry the weight and wind load of your antenna.

Hundreds of people have been killed or mutilated trying to install a simple antenna. Consult your dealer. He can explain which mounting method to use for the size and type antenna you are about to install.

To help **remember safety**, you will find a **warning label** in your parts bag. Put this label on your mast, tower or tripod near its base. It will help remind you of safety while installing your antenna. After you have installed your new antenna, you may wish to take it down — This label will again remind you of **safety**.

### EMERGENCY AID FOR SHOCK

It is advisable to work with another person when installing or removing antennas. If your partner does receive a shock, don't touch him since his body could conduct the electricity to you; instead, try to pry or pull him away from the source of electricity with a length of dry wood, rope, a blanket, or another non-metallic object.

If breathing has stopped, use mouth-to-mouth resuscitation until the doctor or ambulance arrives and relieves you. If the heart has stopped, closed-chest cardiac massage must be done simultaneously. The ambulance should be informed when called that an electric shock has occurred; it can bring proper equipment such as an intensive care or cardiac care mobile unit equipped with a heart defibrillator and carrying trained personnel.

## LIMITED WARRANTY

AVANTI warrants all products manufactured by it to be free from defects in material and workmanship under normal use. This warranty shall apply only to defects appearing within one year from date of purchase. This warranty also does not extend to damage caused by misuse, abrasion, corrosion, negligence, accident nor shall it apply to any item which shall have been altered in any way so as to affect its use and operation.

In the event the products manufactured by AVANTI are found to be defective in workmanship or material, AVANTI will repair or replace free of charge such defective material if delivered freight prepaid within the above stated one year period to the factory at 340 Stewart Avenue, Addison, Illinois 60101, with proof of purchase and if found by AVANTI's inspection to be truly defective in workmanship or material.

AVANTI's liability and the purchaser's remedies hereunder are exclusively limited to the repair of such products if defective of the replacement thereof. If inspection of any such products by AVANTI does not disclose any defect in workmanship or material, or if in the opinion of AVANTI the damage was caused by conditions beyond AVANTI's control, repair or replacement will be made at a reasonable charge.

AVANTI does not assume responsibility for loss or damage in transit to products returned for inspection.

On any product returned for inspection or replacement, freight charges to AVANTI must be paid by the purchaser. AVANTI will return all repaired or replaced goods freight prepaid.

THE FOREGOING WARRANTIES ARE EXCLUSIVE, AND ARE IN LIEU OF ALL OTHER WARRANTIES (WHETHER WRITTEN, ORAL OR IMPLIED), INCLUDING BUT NOT LIMITED TO THE WARRANTY OF MERCHANTABILITY IN OTHER RESPECTS THAN EXPRESSLY SET FORTH ABOVE AND THE WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE. EXCEPT AS HEREIN PROVIDED, EVERY FORM OF LIABILITY FOR DIRECT OR CONSEQUENTIAL DAMAGES OR LOSS IS EXPRESSLY EXCLUDED AND DENIED.

Some states do not allow limitations on how long an implied warranty lasts, so the above limitation may not apply to you. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Mention this no. if you contact us about your purchase.

## 70 81878



TESTS HAVE SHOWN THE ASTRO PLANE OUT PERFORMS ALL LEADING OMNI-DIRECTIONAL CB BASE ANTENNAS!



## ASTRO PLANE™

## CO-INDUCTIVE 5/8 WAVE OMNI DIRECTIONAL CB BASE ANTENNA

Exclusive Top Radiation Design extends communications range beyond that of conventional "bottom radiating" omni antennas. Assures fewer dead spots. Vertical Polarity.

Unique "Parallel Power Signal" efficiently hugs the curvature of the earth without dissipating power up into the air as do conventional omnis! Delivers a stronger signal and better, clearer reception far beyond its 4.46 dB gain specs. Pre-tuned.

Long Lasting Trouble-free Performance Assured! Patented compact design eliminates the need for long drooping radials that ice up and break off. No coils to burnout or detune. Direct ground dissipates static interference.

Lightweight and Durable, Easy To Assemble and Install! Constructed of rigid heavy duty aircraft aluminum tubing yet weighs only 4 lbs; is only 12' tall. Can be strapped to chimney, on a simple pipe mast like a TV antenna.

Superior Value! AVANTI's advanced antenna technology and space age manufacturing techniques provide you with a superior quality product for far less money than ever before.



Ordinary collinear or ground plane antenna signals are blocked...they radiate from the bottom.



Astro Plane gets its signal over obstacles...it radiates from the top.

#### SPECIFICATIONS:

Gain — 4.46 dBi	Polarity - Vertical
Power Multiplication - 2.8X	Band Width — Full 40 Channels
V.S.W.R. — Pre-Tuned To 1.3:1 Or Less	Omni-Directional — No Rotor Required
Static Suppression — D.C. Ground Impedance — 50-52 Ohms	Aluminum Tubing — Aircraft Grade Height — 12 Ft.
R.F. Safety Factor - 2000 W.	Weight - 4 Lbs.
Patented and Made Only by AN	/ANTI. U.S. Patent No.3587109

## PARTS LIST

			PRICE
QTY.	PART NO.	DESCRIPTION	1.35
4	1789	1/8 x 24" Stainless Steel Radials	1.60
2	1050	3/8 x 24" Aluminum tube curved, flat one end with 1/4" hole	1.60
2	2554	3/8 x 24 Aluminum tube curved, flat one end, swaged one end	1.80
2	2737	1/2 x 48" Aluminum tube (Tubes D & E) flattened and swaged	1.80
2 2 2 2	9002	1/2 x 48" Aluminum tube (Tubes B & C) straight	5.10
	SUB-102	5/8 x 48" Aluminum tube slotted one end, threaded other end (Tube A)	9.50
1	SUB-101	Base clamp assembly with SO-239 connector	1.10
1	1313	3/8 x 13" Fiberglass rod	7.30
	SUB-103	Hardware Kit complete	.06
1	1098	1/4-20 Square nut	.06
2	1092	5/16" Hex nut	.06
2 4 7	1099	10-32 square nut	.06
	1090	1/4-20 Hex nut	.06
1	1152	1/4" Flat washer	.06
2	1156	5/16" Star washer	.06
14	1153	1/4" Star washer	.11
4	1196	10-32 x 3/4" Screw	.11
1	1188	1/4-20 x 1" Screw	.11
6 1	1186	1/4-20 x 3/4" Screw	.80
	1187	1/4-20 x 1-1/4" Screw	.11
1	1071	5/16 x 1-3/4" U bolt	.15
1	1010	1/2" Plastic tubing plug	.06
4	1303	Plastic tip for S.S. radial	.90
1	1056	Stainless Steel spreader bar mast clamp	.55
2 2 2	1057	Stainless Steel spreader clamp	.55
2	2556	Stainless Steel loop clamp	.55
2	1304 2786	Retainer clip Instruction Manual	.00
			CE.

PRICE AND SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

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## ASTRO-PLANE MODEL AV-101 ASSEMBLY INSTRUCTIONS

PROPER CONSTRUCTION: If they could, manufacturers would ship all antennas fully assembled in order to eliminate mistakes in construction often found in antenna installations. Even the best instructions are sometimes mis-read and an antenna condemned only because of an error in assembly. If an antenna does not perform up to par, contact your local distributor or dealer, and if he can't help you, call the manufacturer.

If any further information is desired or any difficulties are encountered, contact Avanti Research and Development 312-628-2260 sales service department. We will be happy to assist you.

MOUNTING RECOMMENDATION: Proper mounting requires a stable support. For proper support of the ASTRO-PLANE antenna we recommend the use of a tower, tripod, telescoping mast, eavemount, chimney strap, or ground up mast. This structure must withstand the various weather conditions in your local area. For information regarding which of these supports would best suit your particular point of installation, consult a manufacturer of these products, a professional installer, or your local CB dealer for specific recommendations. Mention that the ASTRO-PLANE weighs 4 lbs. and has a windload area of 1.88 sq. feet (with 12 ft. mast). For your assistance in determining a safe site selection as listed on Page 1, the longest dimension of the ASTRO-PLANE is 12 feet. For best performance and maximum safety mount your antenna away from trees and electric lines of any type.

- Attach four (4) stainless steel radials as shown in exploded view to threaded end of tube A (5/8 x 48" tube slotted one end, threaded other). Slip 1/4" flat washer on to 1/4 x 1-1/4" bolt. Slip one stainless steel radial over bolt, then one star washer. Next, alternate the loop bend and slip another radial over 1/4" bolt. Continue until you have used all four (4) radials. Now place bolt in 1/4-20 thread in end of 5/8" tube. Place radials 90° apart as shown in figure 1-1 and tighten securely.
- 2. (See figure 2.) Insert tube A assembled in step 1 into base clamp until flush with bottom. Be sure coax connector is at top of clamp.
- 3. Insert tube B into tube A until it stops. Install and tighten 1/4-20 bolts, star washers, and nuts, 1 & 2.
- 4. Insert tube C into insulator end of base clamp until flush with top, install and tighten 1/4-20 bolts, star washers, and nuts, 3 & 4. Insert tubing plug into end of tube C. Do not move sleeve in black insulator: SEE SPECIAL NOTE OF CAUTION — FIG. 2.
- 5. At this point, balance of assembly will be easier if you attach the assembly to a mast with the U bolt supplied as shown in figure 2. CAUTION: Make sure the mast is clean and not painted where the U-bolt is located to insure good D.C. grounding and for the proper operation of the antenna.
- 6. Insert swaged ends of loop sections into plain ends. Slip clamps over connections and tighten. See figure 3.

- 7. Insert tubes D & E into expanded ends of B & C. See figure 1.
- Attach loop sections as shown in figure 4 with 1/4-20 bolts, lockwashers, retainer clips and nuts.
- 9. Slip mast clamp on to 3/8" fiberglass rod, selecting proper holes to match mast diameter. The first set of holes for up to 1-3/4" diameter mast. The second set of holes for up to 1-1/4" diameter mast. Next, install spreader clamps to expanded ends of B & C and slip fiberglass rod through 3/8" holes in spreader clamp. Allow rod to extend 1/4" outside tubes B & C. See figure 5. TIGHTEN ALL CLAMPS!
- 10. Mount antenna in such a way that 4 feet or more clearance exists between loop and support tower. NOTE: Guy lines used with this antenna must be non-metallic or insulated with egg type insulators at the mast and also several feet away. (Ref. Fig. 6) A 4 foot clearance should be allowed between the bottom loop and guy wires or tower.
- 11. Run coax cable down along mast. Be sure to tape securely to mast.

SPECIAL NOTES:

SWR: Standing wave ratio adjustments are normally not necessary for the ASTRO-PLANE antenna.

Your antenna should be mounted high enough to clear all interfering objects such as metal structures, wires, metal poles, and other antennas — especially other C.B. antennas. Besides affecting the radiation pattern the interfering objects could cause the S.W.R. to be higher than normal. Do not stand near the antenna while making S.W.R. measurements. This will affect the the readings. It would be best if the S.W.R. readings are taken with the antenna mounted at its approximate operation height. An antenna being too close to the ground will change the S.W.R. readings.

If your antenna is mounted properly and a high S.W.R. does occur see the "Facts You Should Know About CB Base Antennas" section of this manual, Page 14.

GROUNDING: This AVANTI base station antenna is designed to be D.C. (Direct Current) grounded to the support mast using the mounting hardware provided. Proper grounding of the support mast can provide a considerable amount of lightning protection for the radio equipment. Grounding of the mast can also "bleed off" static preventing any buildup. Be sure your antenna support is properly grounded. Consult the National Electrical Code, local building codes, your local CB dealer, or professional antenna installer for installing a good, safe ground on your antenna.

12. See final checks on page 12 (Fig. 6).



# FIGURE 2



## SPECIAL NOTE OF CAUTION:

Hold metal sleeve inside black plastic insulator with thumb while inserting Tube C. If this is not done and sleeve is moved, a broken connection between coax connector and antenna may develop.



# FIGURE 6

RG58 may be used.



Mast must be metallic and should be a minimum of 12 feet in length.

## COAXIAL CONNECTORS ASSEMBLY INSTRUCTIONS

### GOOD SOLDERING AND TINNING ARE IMPORTANT TO PROPER ANTENNA IMPEDANCE WHICH EFFECTS PERFORMANCE – BE CAREFUL – FOLLOW DIRECTIONS.



## FACTS YOU SHOULD KNOW ABOUT CB BASE ANTENNAS

Occasionally CBer's are heard to remark that a particular antenna is not living up to the advertised performance figures such as gain, S.W.R. or frontto-back ratio. These statements are usually founded on their personal field tests based on comparisons between one antenna and another. The disparity between the tests of the CBer and the factory usually stems from the conditions under which the tests were run. Here are a few conditions that can affect performance.

### EFFECT OF OTHER ANTENNAS

When two antennas are mounted near each other (even if used for different frequencies), a coupling usually results which in some way alters their operation. This coupling is even more pronounced when the antennas are mounted less than one wavelength (36 ft.) apart and may change your antenna's performance in some way.

### THE EFFECT OF METAL STRUCTURES

Not only antennas, but water towers, power lines, buildings, or any material of a conductive nature has the ability to mis-direct transmission. Sometimes these obstacles may act as directors or as reflectors — causing the signal to increase or decrease in the intended direction. Complaints of poor front-to-back ratio or lower than expected gain can usually be traced to this above circumstance — especially in beam-type operation.

#### SIGNAL INTENSITY

The signal strength of a transmitting station can never be assumed to be of the same strength as in previous transmissions. Signals of incoming stations should be recalibrated to the antennas being compared. For this reason, you cannot take down one antenna, put up another one a week later, and expect to make accurate measurements. If the stations being used are using beam type antennas, a slight change in the beams' direction can also be critical. Contacts with mobiles are even less valid. A movement of five feet sometimes makes measureable differences in mobile communications.

#### S METER CALIBRATION

Depending upon the CB set, an S meter is calibrated so that one S unit is equal to 6 dB. Therefore, an antenna responsible for 1 S unit gain over another has also about 6 dB over that other antenna. Some S meters, however, are calibrated at only 3 dB per S unit and others at 3 or 4 at the low end, and 6 or 7 at the top of the scale.

Another problem encountered with S meters is the inability to measure high strength inputs. Some bounce back at a powerful signal and appear erratic in operation even reading lower on the scale with an increased signal.

### COAX AND CONNECTORS

The quality of a coax and connectors and especially the soldering of the coax to the connector can affect S.W.R. and gain. An unsuspecting CBer may buy a low grade coax and lose 2 or 3 dB after paying good money for an expensive transceiver and antennas. A quick check for good coax and connectors can be run by substituting a dummy load on the antenna end of the coax. If all is right, the S.W.R. with the dummy load should be 1 to 1 match. S.W.R. can also be affected by the length and conductivity characteristics of the coaxial cable. If using solid dielectric coax, cut to multiples of 12 feet. If coax is foam type, cut to 14 foot multiples.

### FREQUENCY VARIATIONS

Mr. A and Mr. B are neighbors and they are comparing the performance of their antennas by their ability to transmit to Mr. C about 20 to 30 miles away. If Mr. A's frequency is slightly higher, he might show a weaker signal to Mr. C even though his operation has more power. This would make A's antenna seem inferior to B's. This problem can be eliminated by Mr. C's having a tunable receiver on his transceiver to match A's variation.

#### ANTENNA HEIGHT

Whenever antennas are being compared, they should be installed at the proper distance above the ground and preferably in an open field. Ideally antennas should be one wave length (36' at CB frequency) or more above the ground. For comparison testing always install test antennas at the same height.

#### TIME VARIATION

Any test of antennas should be performed with a time variation of about 15 minutes or less or variations due to tropospheric shifts and other changes will affect performance.

### **GUY WIRES AND SUPPORTING STRUCTURES**

Guy wires should be of the non-mettalic type using ski tow rope or other plastic lines. If metallic, they should be broken up at uneven intervals along their length to avoid interference and possible high S.W.R. In many cases, the mast or tower is used as a radiating element.

These are just a few of the important variations to consider in antenna installation; understanding them will certainly be to the CBer's benefit and may save time in finding a trouble source. For further technical assistance contact AVANTI Service (312) 628-2260.

**WARNING:** Great care should be exercised in installing any antenna to avoid contact with electrical wires. Assume any overhead lines to be a potential electrocution hazard!

NOTES



AV-101 ASTRO-PLANE Base Station, 4.46 dBi

AV-122 PDL II "Orbital Gamma Match" And AV-501 Switchbox, Dual Polarity

AV-130 STACKING KIT For 2 AV-122's Complete With Harness (Not Illust.)

AV-140 MOONRAKER<sup>®</sup> Base Station With Switchbox, 14.5 dBi

AV-146 MOONRAKER® 6 Base Station With AV-502 Switchbox, 17 dBi

AV-150 ASTRO BEAM Base Station, 40 dB Front to Back, 11 dBi

AV-160 RAMROD Multi-Purpose Base Station (Tunable 25-175 MHz)

AV-170 SIGMA II Base Station - Full 5/8 Wave Length, 5.14 dBi

AV-190 SATURN - Combination Vertical and Horizontal Omni Directional Base, 5.14 dBi

AV-304 4' Fiberglass RACER with Tunable Tip

AV-306 6' Fiberglass RACER with Tunable Tip

AV-309 96" Fiberglass RACER Whip

AV-318 18" MINI-FAZER

AV-324 4' HIPPO Top Loaded Mobile Antenna – 250 Watts Maximum Power

AV-325 6' HIPPO Base Loaded Mobile - 600 Watts Maximum Power

AV-326 6' HIPPO Top Loaded Mobile Antenna – 350 Watts Maximum Power

AV-327 RACER 27 Base Loaded Mobile With Spring, High Durability Tunable Whip

AV-328 48" FAZER Top Loaded Mobile

AV-369 GATOR-WHIP (Tunable 25-40 MHz)

AV-500 500 Watt AVANTI Matchbox

AV-501 CS-1 Coaxial Switchbox

AV-502 CS-2 Coaxial Switchbox For Use With Standby Antenna

AV-503 RACER ½" SNAP MOUNT For Standard 3/8-24 Thread Antennas

AV-504 Co-Phasing Harness For Installation Of 2 Mobile Antennas

AV-506 3/8-24 Adapter For Use With AV-521's Or Other Trunk Mounts (Not Illustrated)

AV-507 Gutter Clip 3/8-24 Thread Mount

AV-508 AV-506 Installed In AV-521 No-Hole Trunk Lid Mount

AV-509 Bumper Strap Mount For Compact Cars 3/8-24 Threads

AV-510 Bumper Strap Mount For Standard Cars 3/8-24 Threads

AV-514 Suction Cup Tie Down – No Tools Necessary For Installation

AV-515 Camper Mount With 3/8-24 Threads – Fold-Down Feature



ASTRO-PLANE, PDL II, ASTRO BEAM, RAMROD, SIGMA II, SATURN, RACER, FAZER, MINI-FAZER, HIPPO, GA TOR-WHIP, INTERCEPTOR, are AVANTI trademarka AV-516 Truck Side Mounted Mirror Bracket With 3/8-24 Threads

AV-517 Camper Bracket Mount With ½" Hole For AV-327 AV-518 Thumb Screw Fold-Over Camper Mount AV-519 Thumb Screw Camper Mount For 3/8-24 Threaded Antenna

AV-520 18" MINI-FAZER With No-Hole Trunk Mount AV-521 No-Hole Trunk Lid Mount

AV-522 18 MINI-FAZER With Gutter Clip

AV-523 48" FAZER Antenna With No-Hole Trunk Mount

AV-524 48" FAZER Top-Loaded Antenna With Gutter Clip

AV-526 4' HIPPO Mirror Mount Co-phase Package

AV-527 AV-327 With AV-521 No-Hole Trunk Mount AV-528 48" FAZER Stainless Steel Top-Loaded Mirror Mount Co-phase Package

AV-529 4' Fiberglass RACER Mirror Mount Co-phase Package

AV-531 Electro Polished Stainless Steel 3/8-24 Threaded Medium Duty Spring

AV-535 Dual 18" MINI-FAZER Top-Loaded Antennas With Gutter Clips w/Co-phase Harness (Not Illustrated) AV-537 RACER 27 Thumb Screw Camper Mount (Not Illustrated)

AV-540 Cast Aluminum Swivel Ball Mount 3/8-24 Thread AV-701 Special PROTECTIVE SPRING For AV-304's, AV-306's, and AV-328's. (Not Illustrated)

AV-727 RACER 27 Magnetic Mount Base Loaded Mobile With Spring

AV-800 Low Pass TV Interference Filter

AV-801 25-50, 140-174 & 450-512 MHz Base Station Monitor (Tri-Banded)

AV-804 25-50, 140-174 & 450-512 MHz Mobile Monitor 3/8 Thread (Tri-Banded)

AV-806 Same as AV-804 With AV-506 Mount And 17' Coax

AV-808 Same as AV-804 With AV-508 Mount And 17' Coax

AV-810 Same as AV-804 With AV-503 Mount And 17' Coax

AV-811 CB Signal Rejection Filter For TVI, 27 MHz AV-820 A.C. Line Filter For TVI



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