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INSTALLATION INSTRUCTIONS for SA-006 COM ANTENNAS
in
COMPOSITE AIRCRAFT

1.0 INTRODUCTION.

- 1.1 GENERAL. These antennas have been designed by Bob Archer of Torrance, California utilizing concepts common to military aircraft and space vehicles. The antenna performance is superior to most in use today in private aircraft. The only requirement for maximum performance is that the antennas must be installed in accordance with the installation instructions contained herein. The aircraft structures into which these antennas are installed must be built of dielectric (plastic, non-conductive) material and the internal dimensions must be at least 26 inches high and 10 inches long. The 26 inch dimension may be a curved measurement.
- 1.2 INSTALLATION. If at any time there is a conflict in the technique of installation, this document shall take priority, unless the conflict is of a mechanical nature. If the latter is true the mechanic shall make the decision. Follow the rules contained herein for electrical information and for any mechanical techniques an aircraft mechanic should be consulted.

2.0 ANTENNA DESCRIPTION.

- 2.1 GENERAL. The SA-006a COM antenna is designed for reception of vertically polarized energy in the frequency range of 118 to 136 MHz. The antenna is constructed of Alclad 2024-T4 aluminum stampings .016” thick riveted together to form a vertical dipole with appropriate pieces for impedance matching. The voltage standing wave ratio (VSWR) is less than 2:1 over the frequency range of 118 to 136MHz. There may be variations in VSWR due to installation variations. This antenna requires a rectangle of space 26” vertically and about 10” horizontally. The antennas were designed to be mounted on the inside surface of fiber glass fuselages or vertical tails. This antenna was designed and tuned to be mounted as described in these instructions and it is unknown what the VSWR might be in other locations though if installed as described it should work just as well.
- 2.2 ANTENNA SHIPPING. The antenna is shipped in a folded configuration to facilitate a smaller package for shipping. As received the two halves of the antenna are held together by one pop-rivet and the halves must be rotated to the position where the other three rivet holes are aligned and the provided rivets installed. The antenna is then ready to install.

3.0 INSTALLATION INSTRUCTIONS

3.1 COAXIAL CABLE. A length of coaxial cable is required for these flush mounted antennas. . The coaxial cable is not supplied. It is recommended that RG-58 C/U or A/U (50 ohm cable) be used for the installation. This cable has a stranded center conductor which contributes to a longer life in a high vibration environment. Any other coaxial cable which has the same or better electrical characteristics and physical properties may be used. RG-58 C/U OR A/U cable is approximately 0.20 inches in diameter. A compatible coaxial connector for the radio end of the cable may also be required though most modern radios have the coaxial cable soldered into the rear of the case. A check with the local electronics supply house should reveal all necessary information.

3.2 CABLE INSTALLATION. Run sufficient cable to reach from the radio equipment to the antenna location with enough excess cable at the antenna to secure the cable to the composite material along the cable route after passing through the cable clamp at the antenna. (Check the installation drawing.) Secure the cable as required to minimize cable movement . Try to maintain a cable bend radius of 2"or greater.

3.3 MOUNTING ANTENNA

A. Tail installation

1. When mounting the antenna in the vertical tail the antenna and rib locations should be laid out and marked so things will go together properly. The antenna may be tilted to rest against the tail post facilitate the best fit into the tail. If the upper part of the antenna is too large fore and aft to fit properly the SA-006b Com antenna might be a better fit. It has a long skinny upper element that has a variable sweep for a possibly better fit. It has the same specifications. Or the upper horizontal portion of the antenna may be cut off and repositioned in a more vertical manner so as to fit in the upper part of most vertical tails. Call if you have any questions.
2. Tape the antenna into the proper location and fasten the antenna permanently to the inside of the skin with rivets, screws or bond in at the installers discretion. Thin BID strips seem to work out well. Do not disturb the nylon screws in the feed strip. The feed strip is the most sensitive portion of the antenna.

B. Fuselage Installation

1. When mounting the antenna inside the fuselage locate the best position, normally about half way between the bulkhead behind the seats and the furthest aft bulkhead in the tail area. The antenna is fabricated of thin aluminum so the antenna can be flexed to conform to the inside curve of most fuselages. Try to keep the antenna away from large vertical conductors.
- 2.. If the fuselage sides and bottom form a corner set the bottom of the antenna at the corner. Tape the antenna into the proper location and fasten the antenna permanently to the inside of the skin with rivets, screws, or bond in at installers discretion. Thin BID strips seem to work out well. Do not disturb the nylon screws in the feed strip. The feed strip is the most sensitive portion of the antenna.

3.4 CONNECTION OF CABLE TO ANTENNA. We have found that the handiest way to do this portion of the installation might be to connect the cable to the antenna before you tape the antenna to the inside surface of the vertical stabilizer or fuselage so the nuts can be tightened properly.

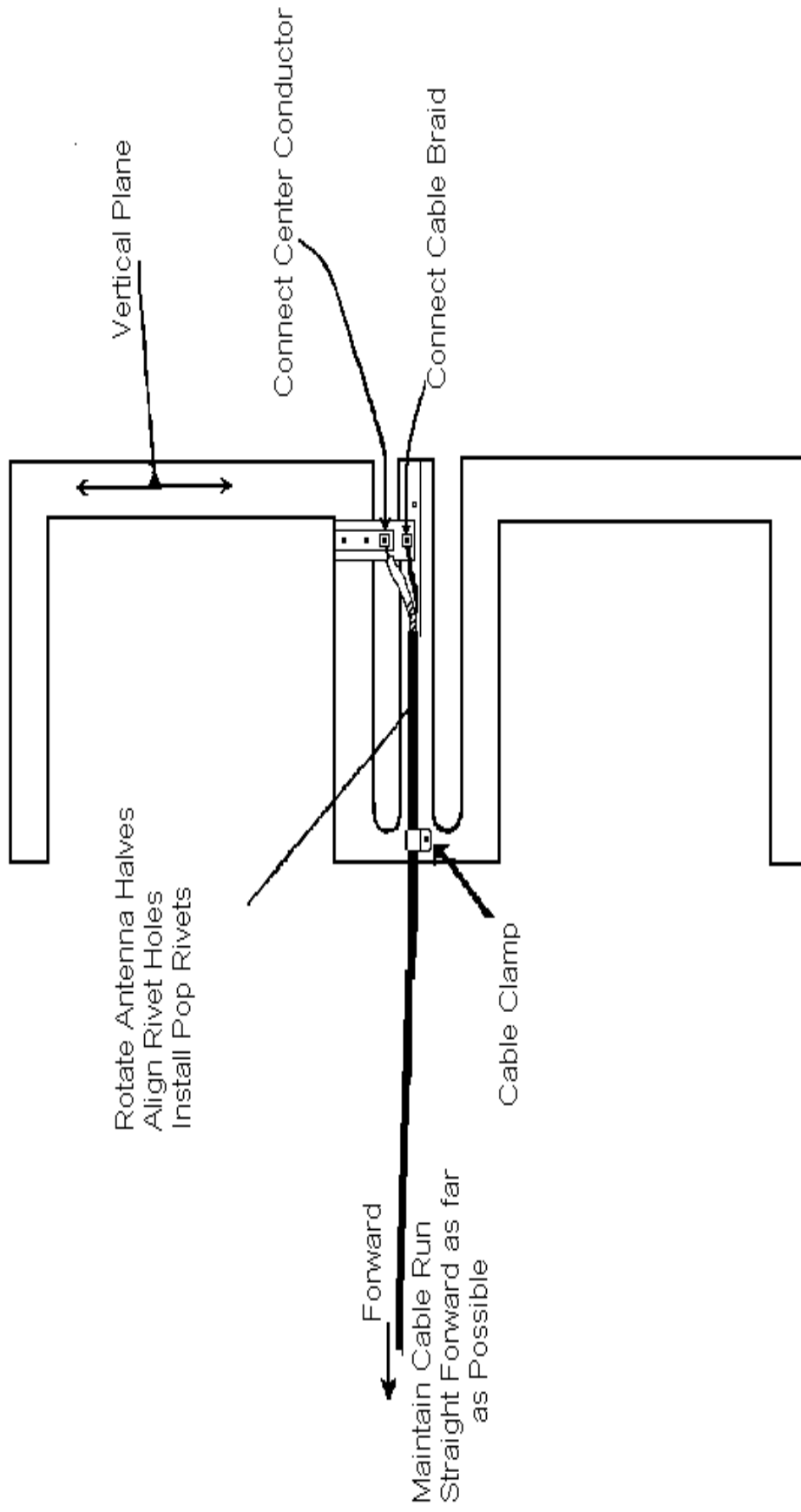
1. Remove 0.75" of the outer insulation from the coaxial cable. Be careful not to cut the braid underneath.
2. Comb out the coaxial cable braid and then twist into a wire for insertion into the provided lug. Trim the braid wire to 0.5 inches.
3. Strip 0.25 inches of insulation from the coaxial cable center conductor.
4. Remove the large wire terminal from the ground side of the antenna connections and install the lug on the twisted braid by using a standard crimping tool and or soldering.
5. Remove the small wire hole terminal from the antenna and install the lug to the center conductor of the coaxial cable by using the crimping tool.
6. Replace the terminal lugs on their respective terminals on the antenna and tighten the nuts on lock washers and lugs. Make sure the lug on the braid side of the coaxial cable goes to the ground side of the antenna. The center conductor connects to the small aluminum strip.

3.5 FINAL ASSEMBLY. Before continuing check all steps and procedures contained herein and check all screws and connections for tightness. Make sure the coaxial cable runs in the proper direction and try to get the cable to lie smoothly for the entire run. (CHECK INSTALLATION DRAWING.) Fasten as required. Connect the antenna cable to the radio equipment in the aircraft; turn on the equipment; do a complete check out. Works Great doesn't it?

3.6 HINTS AND WORDS OF WISDOM. This antenna being vertically polarized will be minimally effected if at all by horizontal cables, rods or what have you. However all metal devices should be kept as far from the antenna as possible. Large vertical conductive nearby objects or parts should be avoided. Tiny ones are no problem. The cable run should ideally be straight toward the cabin area with no droops or loops over the antenna elements which would tend to short the energy to ground. The center strip of the antenna (the riveted together parts) is at ground potential. It is strongly recommended that if at all possible upon installation and before sealing it up this antenna be tested for VSWR and if not at or below 2:1 to check into and correct any problems. Most problems turn out to be at the cable ends. Some builders have advised me that by taping the antenna in and moving it about an optimum location can be found.

NOTE

This antenna is electrically symmetrical in the vertical plane. Any type of horizontal rotation is ok. Just dress the cable as shown on the drawing.
Do not allow cable to droop across antenna



Installation Drawing / SA-006