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INSTALLATION INSTRUCTIONS
SA-008 COM ANTENNAS
in the
VERTICAL STABILIZERS of 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 vertical stabilizers into which these antennas are installed must be built of dielectric (plastic, non-conductive) material and the internal dimensions must be at about 46 inches high and 10 inches long in the center. The antennas are shipped with the elements attached with 1 pop rivet and rotated to present a smaller profile for shipping. Two extra rivets are provided to fasten the elements after adjusting for fit.

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 installation 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-008 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 aluminum strips .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 136 MHz. (Usually less than 1.5:1) There may be variations in VSWR due to installation variations. These antennas are shipped with the elements attached with one pop rivet and rotated to present a smaller profile for shipping. The antennas were designed to be mounted on the inside surface of the vertical stabilizer tail of larger composite aircraft. 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 be just as good.

3.0 INSTALLATION INSTRUCTIONS

3.1 COAXIAL CABLE.

A length of coaxial cable is required for the 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.)

1. In the case of an all glass (or all non-conductive) aircraft run the cable from the cabin area down the center top inside surface of the fuselage and up the leading edge of the vertical fin to the level of the ground strip of the antenna, then aft through the cable clamp to the feed point.

2. In the case of conductive material in the tail post install the antenna with the cable leaving the antenna toward the rear, route the cable down the tail post to the bottom of the fuselage and then forward to the cabin area. Routeing the cable in this manner minimizes the effect of the cable on the antenna.

3. Secure the cable as required to minimize cable movement . Try to maintain a cable bend radius of 2" or greater.

3.3 MOUNTING ANTENNA .

1. In all glass (or non-conductive) aircraft install the antenna center portion with the feed point to the rear with the cable going forward through the clamp to the leading edge of the fin with the center portion of the antenna back against the tail post. The top end of the top element should also be at the top forward corner of the fin but the bottom element should be as vertical as possible.

2. With the antenna taped into the correct position mark the location of the rivet holes to fasten the elements in their location , remove the antenna, drill the new #40 rivet holes and rivet the elements to the center section of the antenna with the provided pop rivets. 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 while holding the screw heads.

1. Remove 1.25" 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 0.75 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 and or soldering.
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 if at all effected by horizontal cables, rods or what have you. However all metal devices should be kept as far from the antenna as possible. 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 is at ground potential.

NOTE

If this antenna is to be installed in a solid foam core flying surface it is recommended that the antenna be inletted into the foam then refoamed, sanded again to the airfoil shape and then do the laminations on the foam.

NOTE II

This antenna is perfectly electrically symmetrical although it may not appear to be. If the antenna you have received is the mirror image of the one in the installation drawing just install it in what appears to be reverse manner. Operationally it is perfectly symmetrical.

INSTALLATION INSTRUCTIONS

