

Communication Antenna AT-454(*) /ARC-44

The communication antenna consists of three separate units: a coupler, a base, and the element or whip. The coupler contains an inductance-capacitance network to match the impedance of the whip to the FM receiver-transmitter antenna impedance and the impedance of a 34- 3/4-inch (88cm) coaxial cable that connects to the base. The base is the mounting for the whip.

a. *Antenna Coupler.* The antenna circuit of the FM receiver-transmitter at J803A connects through the keyer to connector J702 on the coupler when Antenna Group AN/ARA-31 is used. When antenna group is not used, the antenna circuit of the FM receiver-transmitter connects directly to J702 on the coupler.

The impedance-matching network in the coupler consists of three tuned circuits: a series-resonant circuit to ground (at approximately 18 megacycles), a parallel-resonant tank circuit (at approximately 40 megacycles), and the resonant circuit of the length of coaxial cable itself. Capacitor C702, together with L702, form the series-resonant circuit. These same two components, together with variable capacitor C703 and trimmer capacitor C701, form the parallel-resonant circuit.

Capacitor C703 is factory adjusted. The entire matching network is designed to either add or subtract inductive or capacitive reactance from the combined capacitive reactance of the whip, the base, and the 34- 3/4-inch (88 cm) coaxial cable over the operating range (24.0 to 51.9 mc) of the equipment. In this manner, the communication antenna always presents a fixed impedance of 52 ohms to the FM receiver-transmitter ARC-44, RF input, and output circuitry.

b. *Antenna Base and Element.* The whip and the upper section of the base form a vertically polarized, quarter-wave length (2m, approximately at the center operating frequency), groundplane antenna. The effective ground plane is formed by the aircraft surface. The bottom section of the base is at the same potential as the aircraft surface.

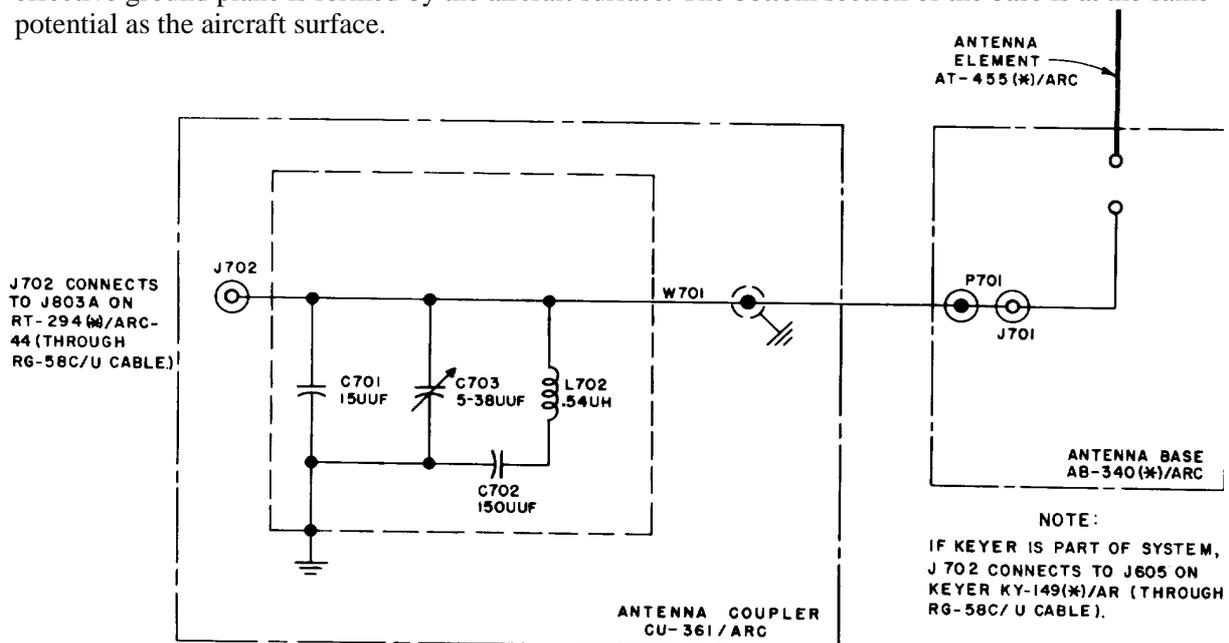


Figure 2-26. Antenna AT-454(*)/ARC, schematic

