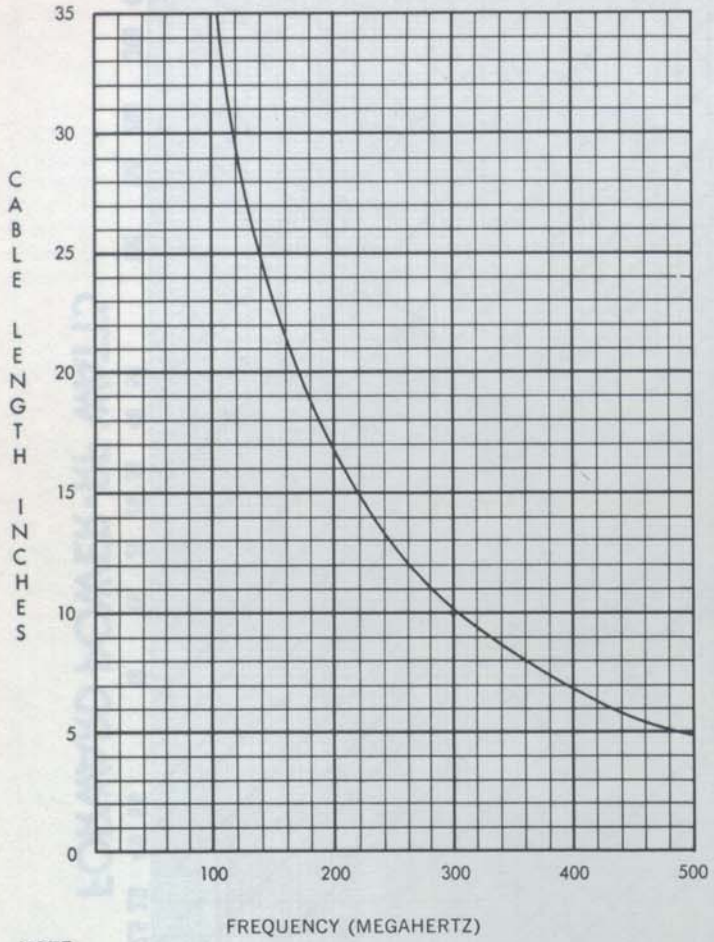
Required Length of RG-8/U Cable With Connectors When added to Bird Model 43 Thruline to Equal 1/2 Wavelength



NOTE:

1. When using UHF Plug 259 the cable length is measured from tip to tip of center pin of plugs.
2. When using other connectors the cable length is measured from end to end of outer conductor of connectors.

When a "43" is used to match a load to a transmitter and a good match is obtained, removing the instrument will not cause any change in the conditions, since a good 50-ohm load can be placed at the end of a 50-ohm transmission line of any length without altering conditions at the transmitter.

What happens when the load is not well matched, like an antenna with a VSWR of 1.5 or 2.0? Since the length of line between a mismatched load and the source transforms the impedance of the load as seen at the source, line length now becomes critical. If the adjustments for maximum power transfer were made with the "43" in place, removing it shortens the line by 4 inches, plus two connectors. This still is no cause for concern at low frequencies, where 4 to 5 inches is a small fraction of a wavelength. At higher frequencies (e.g. above 100 MHz), power output and frequency of the source may be affected.

It is a principle of transmission line theory that the impedance is identical on either side of ½ wavelength. In order to duplicate the conditions in your transmission line with the "43" either in or out of the line, it is only necessary to insert or remove a one-half wavelength.

This is easily done by making up a length of cable which, when added to the THRULINE, equals ½ wavelength at the frequency of measurement. (If more than one frequency is involved, one cable is needed for each frequency.)