

Ask R-E

WRITE TO:

ASK R-E
Radio-Electronics
500-B Bi-County Blvd.
Farmingdale, NY 11735

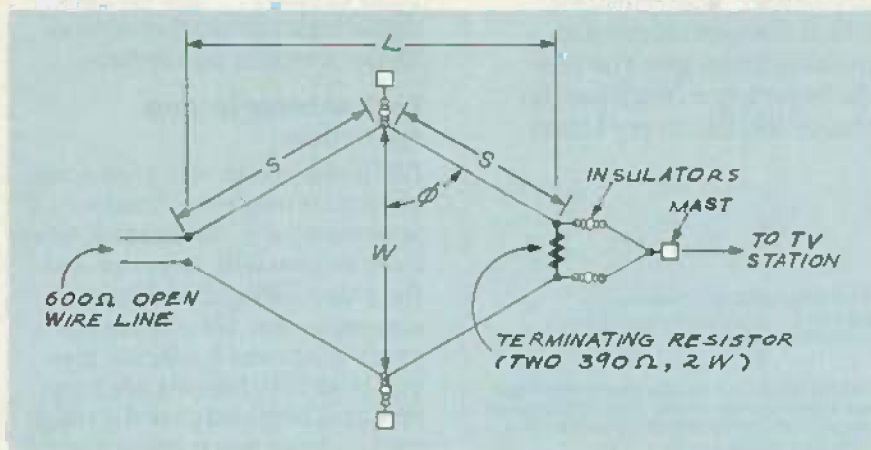


TABLE 1—RHOMBIC DIMENSIONS

	Wavelengths per Leg	S	L	W	Gain dB	Beam Width	φ
VHF TV Channels 2-6	6	87'-0"	162'-0"	66'-0"	12	6°	68°
	4	58'-0"	104'-0"	54'-0"	10	8°	62°
	2	29'-0"	46'-0"	36'-0"	7	13°	52°
FM	3	30'-0"	55'-9"	22'-6"	12	6°	70°
VHF TV Channels 7-13	6	30'-9"	58'-0"	23'-2"	12	6°	68°
	4	20'-6"	36'-6"	19'-0"	10	8°	62°
	2	10'-3"	16'-6"	12'-8"	7	13°	52°
UHF TV Channels 14-47	6	9'-7"	17'-8"	7'-2"	12	6°	68°

TV-RHOMBIC ANTENNAS

Your response to the request for a balun for a TV rhombic left me puzzled. Whoever heard of a rhombic for TV frequencies? I thought that rhombics are used to obtain directivity at low frequencies when you have enough real estate to establish an "antenna farm." What are the dimensions for a TV rhombic? How does its performance compare with

that of a Yagi?—O. K. H., New Strawn, KS.

When the desired TV stations are 75 to 150 miles or so away and all in nearly the same direction, a good rhombic can provide high gain while offering broader frequency response and a constant impedance over a broader range than a Yagi. Specifically, a rhombic provides high gain over a 2:1 fre-

quency range; in other words, the design frequency $\pm 50\%$. Although any antenna for receiving distant stations should be as high as practical, a rhombic two or three wavelengths above ground may outperform a high-gain Yagi on a much higher tower.

Rhombic antennas were widely used in remote areas in the early days of television; they're still not uncommon in many rural areas today. A rhombic with six wavelengths in each leg can provide 12 dB of gain in the forward direction and it can be small enough to fit on many residential lots. Some high-band and UHF TV rhombics are small enough to be mounted on a rotator on a tower.

The diagram of a rhombic for TV frequencies is shown in Fig. 1. The dimensions of each leg for receiving signals at various frequencies are shown in Table 1. A rhombic's beam-width is usually much narrower than that of a Yagi with equal gain, so you must be extremely careful to orient the antenna carefully to within a degree or two. Beam-width decreases and tilt angle increases with the number of wavelengths in each leg. For maximum gain, orientation must be accurate within $\pm 3^\circ$, $\pm 4^\circ$, and $\pm 6.5^\circ$ degrees for rhombics with six, four, and two wavelengths per leg, respectively.

The rhombic should be terminated by an 800-ohm non-inductive resistor. You can use two 390-ohm, 2-watt resistors in series.

DARKROOM TIMER

I need help in designing a darkroom timer for my enlarger. I'd like a countdown timer that can be set from 0 to 120 seconds in 0.1-