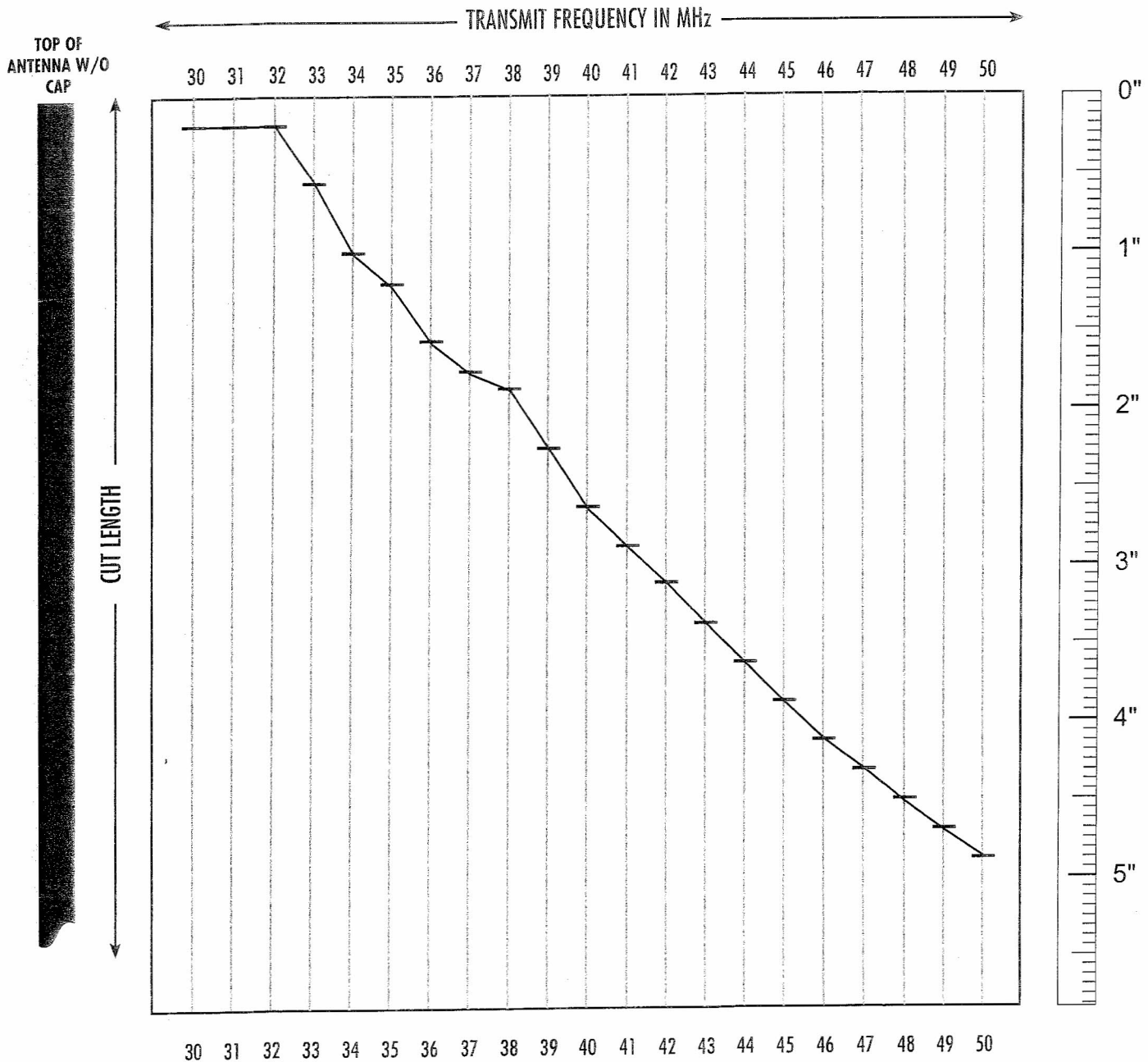


# KRA-21

## Cutting Chart

ORIGINAL STOCK ANT  
LENGTH 11 1/2"



### CUTTING INSTRUCTIONS

1. Cutting Chart Ruler to the right: Confirm that your chart is 1:1 using a ruler. The cut length will be wrong if printed PDFs or copies are not at a 1:1 size ratio.
2. **Remove cap from antenna.**
3. Align top of antenna with top of graph corresponding to the desired transmit frequency.
4. Mark the antenna where the solid line intersects the antenna and cut at that mark.
5. To replace antenna cap, run a bead of Loctite® # 414 or cyanoacrylate superglue around the inside walls of the antenna cap. Seat the cap fully on the antenna. LOST CAPS are not covered by the warranty.

# KENWOOD

# KRA-21

## Field Tunable Antenna for TK-190 Series Low Band Portable Tranceivers

The KRA-21 comes from the factory center tuned to 29.7 MHz. The antenna may be tuned to another frequency between 29.7 and 50 MHz by cutting off the top part of the antenna. To determine the length, you should first remove the cap from the antenna. Then refer to the chart below or use the cutting chart on the reverse side.

FREQUENCY	CUT LENGTH (IN)	CUT LENGTH (CM)
29.7	0	0.0
30	3/16	0.5
31	3/16	0.5
32	3/16	0.5
33	9/16	1.5
34	1	2.5
35	1 3/16	3.0
36	1 9/16	4.0
37	1 3/4	4.4
38	1 7/8	4.8
39	2 1/4	5.8
40	2 5/8	6.7
41	2 7/8	7.3
42	3 1/8	7.9
43	3 3/8	8.6
44	3 5/8	9.2
45	3 7/8	9.8
46	4 1/8	10.4
47	4 5/16	11.0
48	4 1/2	11.4
49	4 11/16	11.9
50	4 7/8	12.4

### NOTES:

- Antenna Bandwidth is 500 KHz
- Cut the copper-plated coil spring with a pair of hardened cutters.
- CAP gluing instructions: Run a bead of Loctite® # 414 or cyanoacrylate superglue around the inside walls of the antenna cap. Seat the cap fully on the antenna. LOST CAPS are not covered by the warranty.
- AFTER TUNING the antenna, please place the supplied ¼ page colored ANTENNA PERFORMANCE information sheet with the end-user's TK-190 Instruction Manual.

### WARRANTY:

The KRA-21 is an accessory to the TK-190 transceiver, and is covered for a period of one year, as mentioned in the radio warranty statement.

### KENWOOD COMMUNICATIONS CORPORATION

2201 E. Dominguez Street  
PO Box 22745  
Long Beach, CA, 90801-5745  
U.S.A.

PI00015, V4, 12/13/05, 5192.0022  
kra-21im.doc  
© Kenwood Comm Corp jeb

The KRA-21 antenna comes from the factory tuned to 29.7 MHz. Due to production tolerances, not all antennas will be the same length when tuned to the same frequency. This chart is provided so that the approximate frequency of a finished antenna may be estimated. The finished length includes the cap and the connector.

FREQUENCY	FINISH LENGTH (IN)	FINISH LENGTH (CM)
30	11 3/8	28.9
31	11 3/8	28.9
32	11 3/8	28.9
33	10 7/8	27.7
34	10 7/16	26.5
35	10 1/4	26.0
36	10	25.4
37	9 13/16	25.0
38	9 11/16	24.6
39	9 3/8	23.8
40	9	22.9
41	8 3/4	22.2
42	8 1/2	21.5
43	8 1/4	20.9
44	7 15/16	20.2
45	7 11/16	19.6
46	7 1/2	19.0
47	7 3/8	18.7
48	7 1/4	18.4
49	7	17.7
50	6 11/16	17.0

(When wearing the transceiver on your belt & using a Speaker/Mic, tilt the tip of the antenna approximately 4" (10 cm) from your body for better transmitter performance.)

# KRA-21

## Field Tunable Antenna for TK-190 Series Low Band Portable Tranceivers

# KENWOOD

MADE IN THE U.S.A.