

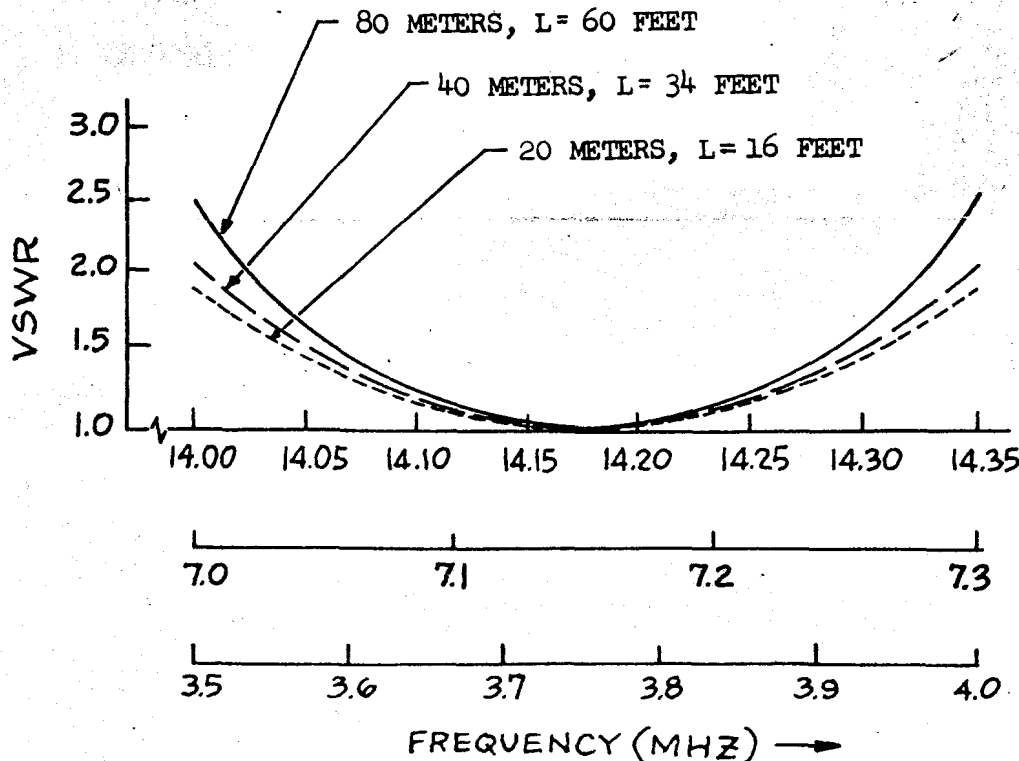
The SLINKY DIPOLE antenna for 80/75, 40 and 20 meters offers advantages in size, convenience and portability not available anywhere. For example, on the 80/75 meter band, the special distributed helical loading permits efficient operation at a length as short as 24 feet (1/10 wave-length) compared to the normal 134 feet required for a full sized half-wave dipole. Another advantage of the SLINKY is that with one setting the complete code and voice segments of each band are covered with low VSWR. The SLINKY can be erected and stored in minutes. No transmatch is required, and the antenna exhibits very low VSWR over all complete bands (see VSWR graph). The antenna was originally developed for indoor or field use, but many use it permanently outdoors by rigging securely. The antenna and materials are resistant to weather deterioration, and the coils are zinc coated for durability, good conductivity, and ease in soldering.

PERFORMANCE of the antenna is as good as that of a full sized dipole in the same environment; VSWR stays low over a very wide bandwidth. Power capacity is at least 1,000 watts CW and 2,000 watts PEP on SSB. The SLINKY dipole does not require an elaborate ground-plane system like a vertical.

THE SLINKY KIT comes with a pair of special 4 inch dia. by 4 inch long coils, balun, 50 feet RG-58/U coax, PL-259 connector, nylon rope, end-hooks and a complete instruction manual including tuning charts. Actually, the antenna can be tuned experimentally to any desired frequency between 3.4 and 70.MHZ! Band switching, which takes less than one minute, is done by changing the number of expanded turns in each arm of the dipole, so access to the antenna is needed to change bands. If access is not possible, additional coil pairs can be fed from the common feed, with each coil pair tuned to a separate band, like a fan dipole.

LENGTH of the antenna is any convenient length from 24 to 70 feet on 80/75, 12 to 35 feet on 40, 6 to 18 feet on 20 meters.

FINAL ADJUSTMENT of the SLINKY dipole requires only a VSWR bridge and an operating transmitter. Assembly of the kit takes about 1/2 hour.



SLINKY DIPOLE[®] INSTRUCTIONS

PARTS LIST

2 Special Slinky Coils, 4" dia. by 4" length
Center insulator card
Nylon cord
End hooks
50 feet RG58/U
UHF connector, PL259
Instruction sheet

General Guidelines

The Slinky[®] Dipole is a new type of practical, compact, easily erectable dipole antenna for use on 80, 40, and 20 meters. It achieves good impedance match to 50 ohm systems by virtue of the helical inductive loading provided by the spring structure. Its efficiency equals that of a full-sized dipole antenna when properly utilized. In general, it is always desirable to select a location and mounting configuration which will allow for the greatest overall length and as high above ground level and as clear from metallic obstructions as possible. This will allow for the radiation of the best possible signal. Although the Slinky Dipole will work satisfactorily at quite small lengths and low heights, this will be at the expense of efficiency.

Slinky has the advantage of requiring no additional external impedance matching network. When properly adjusted, the helical loading automatically provides the proper resonance and matching conditions. The VSWR of the antenna for 50 ohm systems will be less than 2.5:1 over the 80 meter band and less than 1.8:1 over the 40 and 20 meter bands without any antenna retuning, or can be made to be less than 1.4:1 at any frequency in either band by proper adjustment of the antenna.

The Slinky Dipole also includes a built-in balun to provide a balanced feeding current to the dipole arms. The balun takes the form of a coil of several turns of coaxial feedline. This inhibits the flow of RF current on the outer conductor of the coaxial line.

The entire antenna may be mounted in an attic, a room, hallway, garage, outdoors, or wherever is most practical. It is able to be set up or disassembled in a matter of minutes.

CAUTION. During operation, substantial RF voltages will exist on the antenna, especially at the ends of the dipole arms. Do not touch while in operation. At least one foot separation should always be maintained between any structure and the metal parts of the Slinky Dipole. Keep combustible material at least one foot from the antenna when in use. For protection during lightning storms, disconnect and ground the antenna, or use a lightning arrestor.

Assembly

1) Wind 6 1/2 turns of the RG58/U coax through the large holes in the center insulating card, as shown in Figure 1 through 4. The coil should be 4" in diameter, and should be taped using masking or electrical tape to form a stable coil. Attach PL259 coaxial connector to other end of coax.

2) Wind one turn of the end of each Slinky coil through the pair of 1/8" holes at the edges of the center insulating card. See Figure 1 through 4.

3) Separate the RG58/U coax center and outer conductors at the feed point, and solder the center conductor to one of the Slinky coils and the other (outer) conductor to the other Slinky coil, using rosin core solder (not acid core). Also, solder the Slinky to itself where it winds through the center insulating card. This prevents the Slinky coil from accidentally unwinding from the center insulating card. See Figure 1 through 4.

4) Select the mounting area and drive a nail or screw at each end for the supporting points. Tie the nylon cord to one support, thread the cord through the entire Slinky and balun assembly, and tie the cord to the other support, thus forming a supporting cord for the entire Slinky assembly. A vertical cord center support is desirable if practical, since it takes the strain off the end supports. Use the 1/8" hole in the top of the insulating card for attachment of the center support cord.

5) Measure the overall length available for the antenna, and using the tuning chart supplied, determine the approximate number of active Slinky coils required. Count out this number of turns starting from the center insulator card, and bunch the unused coils together at the end of the antenna using the end hooks and an additional short length of the nylon cord. Tie this cord to the end supports also. This setting, given by the tuning chart, is a good first approximation for average installations. Because of variations in the height above ground and coupling to nearby objects, the actual resonant condition of the antenna may differ from that given in the chart by up to 20%; thus, the need for the next step.

6) Plug the antenna connector to a VSWR bridge or meter. Check the VSWR over the band being used, and center the VSWR curve by adding or subtracting an equal number of turns from the ends of each arm of the antenna. Adding additional turns to the active portion of the antenna will lower the resonant frequency, and subtracting turns will raise it. The antenna is properly tuned when the VSWR is either minimum at the center of the desired band, or minimized at a chosen operating frequency in the band.

7) Do not make the overall length of the antenna longer or shorter than the extremes listed in the tuning chart. If the antenna is operated at a shorter length than given in the chart, the efficiency will tend to be poor and the bandwidth narrow. If the antenna is longer than that given by the chart, the Slinky will permanently deform and not recover to its original compact form when stored.

8) The Slinky Dipole is now ready for use. Remember, do not touch the antenna while it is in operation or a serious RF burn can result, as is the case with any transmitting antenna.

9) For storage, simply disconnect the strings and allow the antenna to resume its original compact cylindrical form.

Operating Hints

1) Always try to operate with the antenna as long as possible, but without exceeding the tabulated lengths.

2) The overall length and effective height of the antenna can both be increased effectively by keeping the center of the antenna high and drooping the ends of the antenna towards opposite low corners of the room or attic.

3) The antenna, especially when operating at short lengths, is a highly tuned structure and will be quite sensitive to the location and size of objects in the close vicinity of it. Therefore, try to choose a location which is free from other wires, metal walls, or pipes.

4) The antenna will withstand severe outdoor exposure better if a stronger nylon support rope is used, and if several of the Slinky coils are taped to the support rope to minimize shifting.

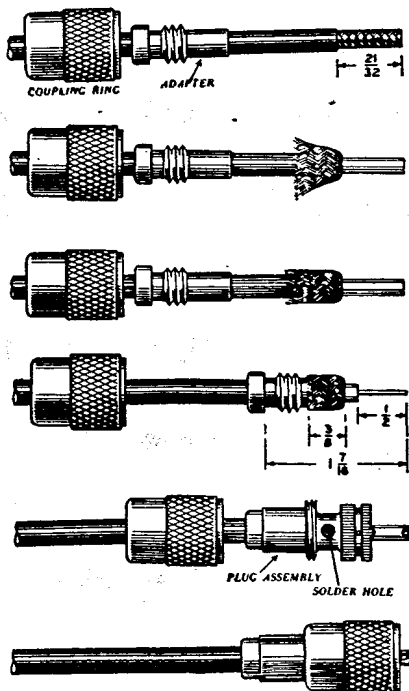
5) The higher the antenna is off the ground, the better will be its performance.

6) It is very helpful to mark the Slinky every 20 or 25 turns with tape. This simplifies the counting of the number of turns during initial setup. Once the antenna has been properly resonated on all bands, mark the resonant length in a similar manner with tape. This makes subsequent re-setting very easy.

7) Multi-element Approach - Additional Slinky coils can be fed from the original Slinky balun feed, but tuned to different bands, thus eliminating the need for any re-adjustment at all in switching bands. This method can be used where the antenna is rather inaccessible, as outdoors or in a tight crawl-space attic. For "permanent" installations, solder a shorting wire across the unused turns.

TELETRON DATA CORP.
BOX 84
KINGS PARK, NY 11754

83-ISP (PL-259) Plug with Adapters



1. — Cut end of cable even. Remove vinyl jacket $\frac{3}{8}$ " — don't nick braid. Slide coupling ring and adapter on cable.

2. — Fan braid slightly and fold back over cable.

3. — Compress braid around cable. Position adapter to dimension shown. Press braid down over body of adapter to dimension shown. Press braid down over body of adapter and trim.

4. — Bare $\frac{1}{2}$ " of center conductor — don't nick conductor. Pre-tin exposed center conductor.

5. — Screw the plug assembly on adapter. Solder braid to shell through solder holes. Solder conductor to contact sleeve.

6. — Screw coupling ring on back shell.

APPROXIMATE TUNING CHART

L = Overall Antenna Length in Feet

N = Number of Turns in each Half-Length

80 Meters (3.5 - 4.0 MHz)

L	N
70	92
68	94
66	95
64	97
62	98
60	100
58	102
56	104
54	105
52	107
50	109
48	112
46	114
44	116
42	118
40	121
38	124
36	126
34	129
32	132
30	135
28	139
26	143
24	147

40 Meters (7.0 - 7.3 MHz)

L	N
35	45
34	46
33	47
32	48
31	49
30	50
29	51
28	52
27	53
26	54
25	55
24	56
23	57
22	58
21	59
20	60
19	61
18	62
17	63
16	65
15	66
14	68
13	70
12	72

20 Meters (14 - 14.35 MHz)

L	N
18	22
16	24
14	25
12	27
10	28
8	28
6	28

NOTE: As explained in the accompanying text, the above tuning chart is to be used as a first approximation to tuning your antenna. The effect of local environment can only be compensated for by final tuning in your particular installation.



FIG. 1 PERSPECTIVE VIEW

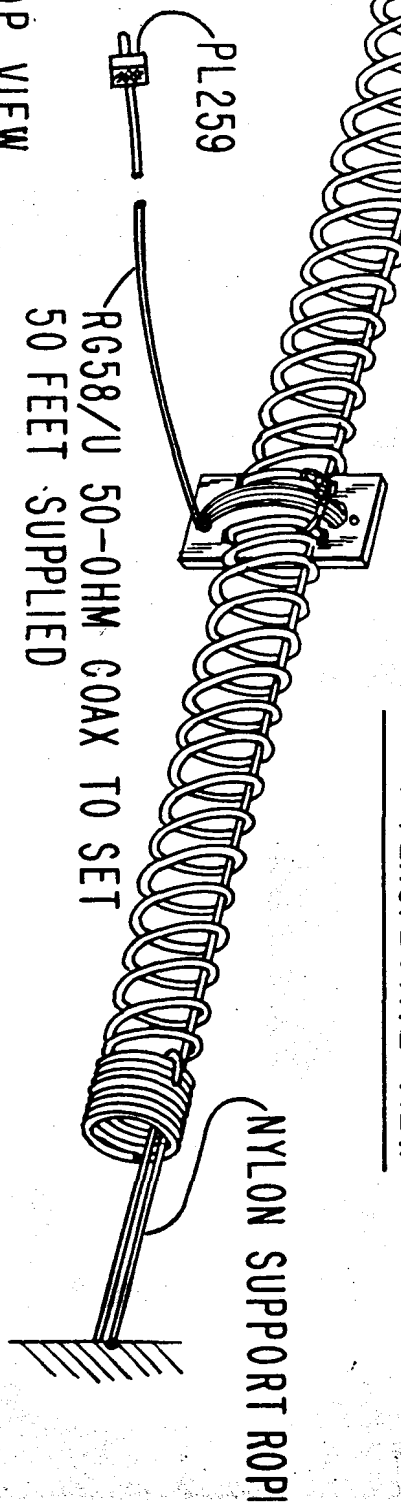


FIG. 2 TOP VIEW

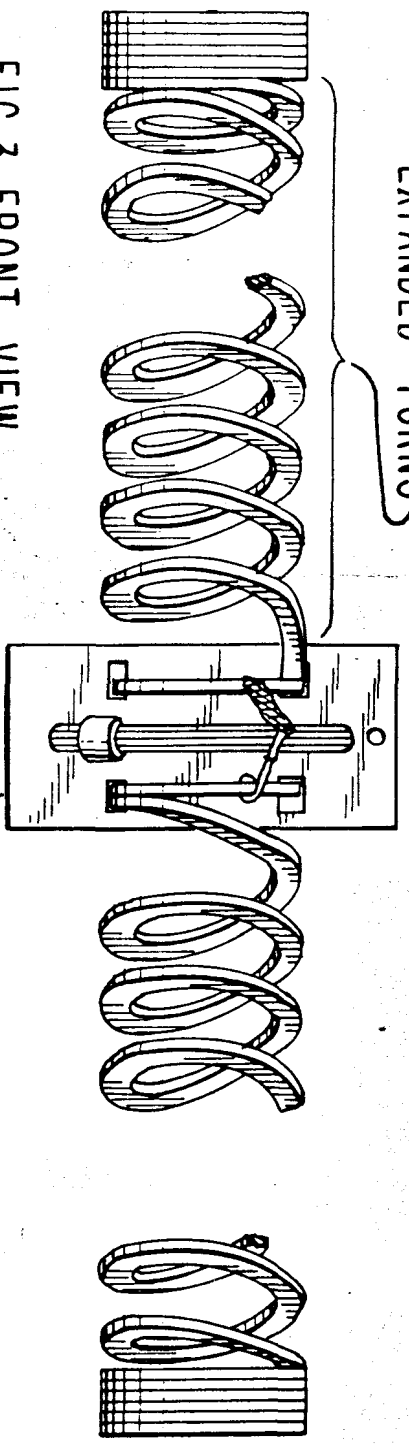
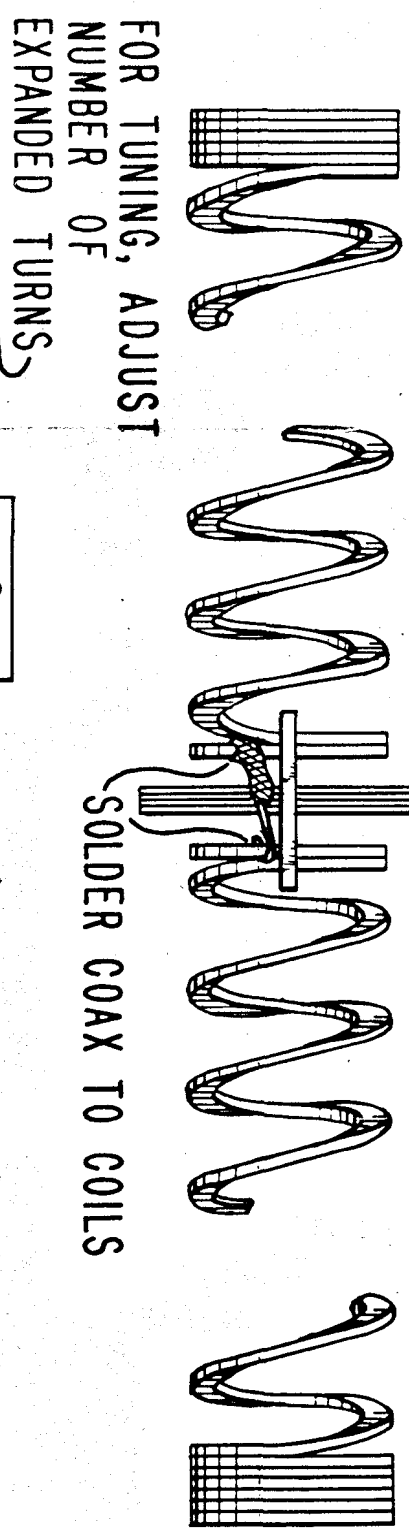


FIG. 3 FRONT VIEW

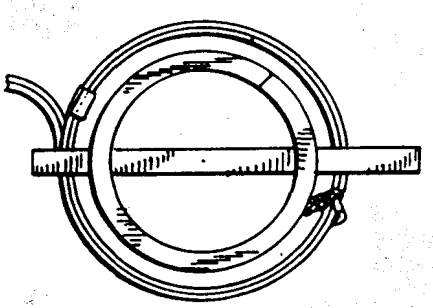


FIG. 4 END VIEW

New Products

Frequency and Time

The new Pride TF-1000 offers a combined frequency counter and selectable 12- or 24-hour digital clock. Utilizing FET switching techniques, the TF-1000 provides an accurate visual readout to ensure that a transceiver is operating within channel tolerances during transmission. In addition, the TF-1000 functions as an accurate clock with a large, bright, six digit LED display. The unit has the capability to automatically switch from the clock to the frequency counter mode when the transmitter is activated.

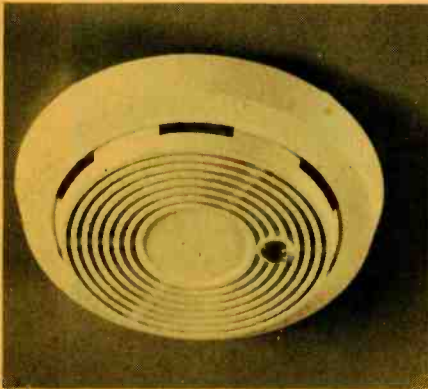


CIRCLE 59 ON READER SERVICE COUPON

The clock continues to count during transmission and the digital time display returns automatically when the transmission is completed. The Pride TF-1000 operates from 1.0 to 40 MHz and can be utilized with Citizens Band and amateur transceivers with outputs from 3 to 200 watts. The TF-1000 is installed in the coaxial antenna line and does not require additional accessory equipment. It causes negligible transmitting or receiving loss in the antenna system. Suggested retail price is \$179.95. For more information, contact Pride Electronics, 7322 Convoy Court, San Diego, CA 92111.

Smoke Detector

An attractive solid state smoke detector has been introduced by Mountain West Alarm Supply Company of Phoenix, Arizona. Developed to save lives by detecting smoke at the very early stages of a fire, the B6 self-contained ionization



CIRCLE 60 ON READER SERVICE COUPON

smoke detector is of special interest to apartment managers, homeowners, warehouse owners, and office tenants. A single unit can protect your entire house

(a maximum of 900 sq. feet). It has a solid state lamp to indicate proper operation. The B6 detects the earliest fire indications long before visible smoke, flames and elevated temperatures can be detected by other devices. The attention getting loud alarm (85 decibels) is enough to waken heavy sleepers through closed bedroom doors. This unit meets FHA, HUD and California requirements and is also listed by Underwriters Laboratories. Weighing 8 oz., measuring only 6-in. in diameter and using 120 VAC house current permits quick installation in hallways, living rooms or in furnace rooms where smoke from fires is likely to collect. Attractively priced at only \$49.50 each in small quantities. Write for an illustrated brochure with full details and quantity prices. Mountain West Alarm Supply Company, 4215 North 16th Street, Phoenix, AZ 85016.

Darkroom Exposure Meter.

PixTronics' new Model 200 Super Sensitive Electronic Darkroom Meter is used to determine the correct exposures of all black-and-white and color negatives for printing enlargements. The Model 200 is simple to utilize with any enlarger and its use eliminates the need for constantly making costly and time-consuming test strips. The unit works on 110 volts AC, measures 6¾ by 5¼ by 2¼ inches, weighs 2½ pounds, and is supplied with its own plug-in easel probe. The probe has two apertures (¼-in. and ½-in.) taking care of all exposure requirements. The 4½-inch illuminated dial of the meter makes it easy to read the scales in the dark. The meter has three sensitivity ranges for reading photographic nega-



CIRCLE 67 ON READER SERVICE COUPON

tives of any density. It also has a Sensitivity Control for making the necessary reference reading of a test negative for quick-and-easy exposure determination of any new negative. The Sensitivity Control is also utilized in conjunction with the Easel probe to find the correct paper grades for black-and-white projection printing. The Model 200 sells for \$87.50. Two accessory probes, priced at \$10.50 each, are also available. A special density probe and a simple pin-hole light box provide a practical, inexpensive, and accurate way to read directly the density of any negative. A regular probe, cylindrical in shape, ¾-inch diam. by 2 inches along with 3-foot cable, is available for ground glass photography and many other applications. For more information, please write to PixTronics, Dept. NREE, 681 East 46th Street, Brooklyn, New York 11203, or Circle No.67 on the Reader Service Coupon. ■



TVI Killers

Hank, what can I buy to kill TVI?
—W. P., Waco, TX

There are many things you can do to clean up TVI. At the transmit end you can clean up the transmitter. Kill the harmonics as best you can by matching the transmitter and antenna. Also, keep modulation below 100 percent—85 percent is a good modulation limit to shoot for. You can also add a low pass between the transmitter and antenna. At the receiver, be sure the antenna system is in tip-top shape. Just because you put in a new antenna system last year does not mean the effect of weather on it has not done its worst. Even a good antenna system cannot stop TVI, so you may want to install a high pass filter that'll attenuate CB and other signals below 54 MHz by up to 40 dB. If you can talk to the transmitter operator who is causing TVI problems on your TV set, encourage him to buy a low-pass filter for his rig. This way he will kill the TVI at the source and all his neighbors will be happy. Write to R. L. Drake Company, 540 Richard Street, Miamisburg, OH 45342 for their catalog on high and low-pass filters. Tell 'em Hank sent you.

Slinky Boinger

I noticed that in your May-June, 1976 issue of ELEMENTARY ELECTRONICS you published an article on the use of a "Slinky" toy as an antenna. You may not have known that we manufacture the Slinky Dipole Antenna, for use as either a transmitting or receiving antenna. We use special oversize coils made specially for us, but they resemble the toy coils. Our coils, however, have over 335 feet of radiating (or receiving) conductor. Incidentally, our unit forms a helical resonator which is impedance-matched to a 50-ohm coaxial transmission line. This results in much greater efficiency and a greater received signal. The antenna may be tuned to any frequency from about 3.4 MHz to over 60 MHz.

—Ellen J. Arnow, Chief Engineer
Teletron Data Corp.
P.O. Box 84
Kings Park, NY 11754

The world is getting smaller! Our antenna project, called Boinger, used a toy Slinky coil to form a retractable, vertical antenna. The Slinky Dipole Antenna is another cat—it's horizontally polarized for the 80-, 40-, and 20-meter shortwave bands. Why not get all the facts by writing to E. J. Arnow at the address given above.