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QST Issue: Mar 1989
Title: Two-Band Loop for 30 and 40 Meters, A
Author: Jim Brenner, NT4B

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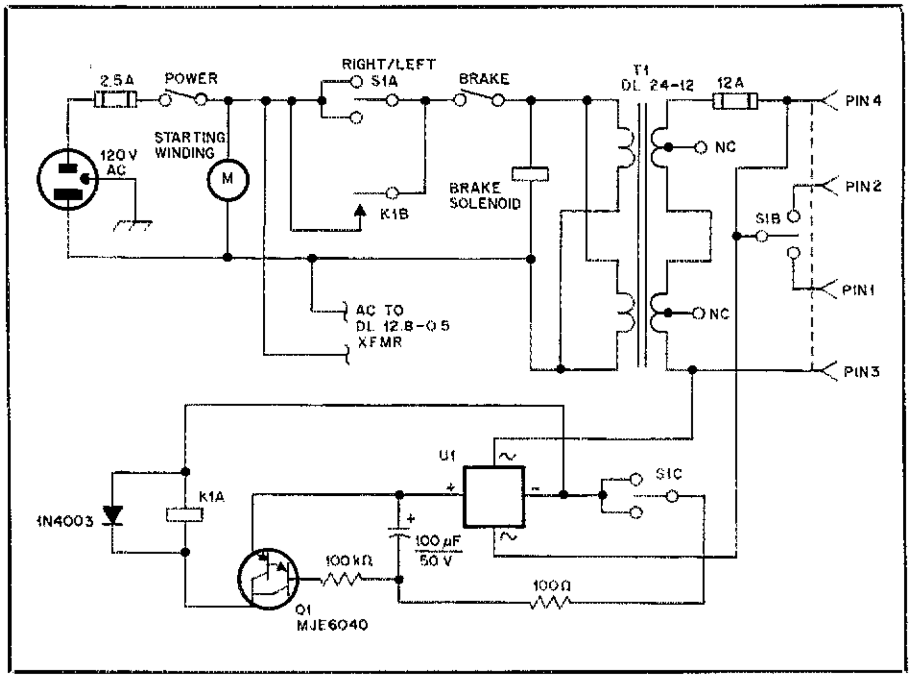

Fig 2—Delayed automatic braking for the Hy-Gain HDR 300 rotator. T1 is shown wired for 120 V ac. K1 is a 28-V dc relay; S1 is a 3PDT, center-off toggle rated for 120 V ac service; U1 is a 4 A, 100-PIV bridge rectifier. Resistors are ½-W carbon film.

between the HDR 300's POWER and BRAKE switches; the third pole serves as part of added brake-control circuitry (also shown in Fig 2).

Whenever S1 (RIGHT/LEFT) is thrown and the rotator BRAKE switch is on, the voltage at the secondary of T1 is rectified, charging the 100-µF capacitor and turning on Q1. Q1 actuates K1. When S1 is released, the rotating motor stops and the path between U1 and Q1's base circuitry is cut by S1C. Q1, K1 and the rotator brake solenoid stay on, however, because of the charge remaining on the 100-µF capacitor. When the capacitor discharges sufficiently through the 100-kΩ resistor to turn off Q1, K1A opens, cutting ac mains current to the brake solenoid and engaging the brake.

With the RC values shown in Fig 2, the delay between opening the RIGHT/LEFT or BRAKE switch and engagement of the brake is about 7 seconds. This allows the rotating antenna stack to coast to a stop before the brake engages.—*Paul D'Anneo, K6UZK, 6126 Ocean View Dr, Oakland, CA 94618*

H & K INTERACTION: SOLDERING TO STAINLESS STEEL

In "Soldering to Stainless Steel—Almost," *QST*, March 1988, Edson B. Snow, W2UN, described a method of welding a brass patch (eminently solderable) to stainless steel (difficult to solder). In response to this, readers write:

☐ I've been soldering to stainless steel for over 20 years, achieving structurally sound joints that compare favorably with joints in iron or brass. There's no trick to it. At one time, I used a special paste flux, but now I use ordinary zinc chloride/hydrochloric acid liquid flux, available at hardware stores. Bar solder (40% tin, 60% lead) or rosin-core wire solder works well.

The metals to be soldered to *must* be clean. Tin each piece separately, then clamp or otherwise hold the pieces together. Next, heat the work and flow solder into the joint.

For joining thick pieces of stainless-steel at right angles, I clamp them securely into position (*after* tinning), *carefully* preheat the parts with a propane torch (taking care not to discolor the metal) and finish the job with a large soldering iron. This method allows me to pile up enough solder to form fillets that greatly strengthen the joint. —*Ed Nickerson, K4EBF, 610 N Yachtsman Dr, Sanibel, FL 33957*

☐ Ed Snow's H & K note on soldering stainless steel prompted me to look up the solders I've been using. *Stay-bright*™ (manufactured by the J. W. Harris Co, Inc) or Kester® "Sil-Strong" (4% silver, 96% tin) solder will do an excellent job on stainless steel and many other metals. "Sil-Strong" melts at 430 °F and can be applied with a regular soldering iron; it's also claimed to be five times stronger than regular tin-lead solder—a statement that, according to my experience, seems to be true.

I found both products at my local hardware store. They're more expensive than regular soft solders, but since they do the job, they're worth the price.—*Bill Corse, K3YSL, PO Box 125, New Freedom, PA 17349*

☐ Fabricators of kitchen equipment find stainless steel to be one of the easiest metals to solder. The secret is to use the proper flux. A number of such fluxes are available on the market, and these can be obtained at sheet-metal supply houses. I use Lloyd's stainless-steel flux, which is manufactured by the Johnson Mfg Co, Princeton, IA 52768. (Although my name is Lloyd, I have no connection with this company.) I've had no problems with corrosion of the soldered joints; just be sure to rinse or wipe the work clean with a damp rag when finished. —*Lloyd Franklin, W9WUR, 8006 S Kirkland Ave, Chicago, IL 60652*

KEEPING TRACK OF SCRAP WIRE LENGTHS

☐ By winding moderate lengths of wire on an 8-inch-diam form, it is easy to know the approximately total length of the wire (in feet) just by counting the number of turns and multiplying by 2. (Each turn is slightly longer than 2 ft, because the circumference of a circle is equal to π [about 3.1416] multiplied by the circle's diameter.) I do this before putting wire away for storage in the junk box by using an 8-inch kitchen pot as a temporary coil form. —*James A. Herb, W3SHP, 23 E Pine St, Selinsgrove, PA 17870*

A TWO-BAND LOOP FOR 30 AND 40 METERS

☐ After trying to find a way to place a 30-m delta loop inside an existing 40-m loop, I remembered an article in *All About Cubical Quad Antennas*[1] describing a

[1]W. Orr and S. Cowan, *All About Cubical Quad Antennas* (Wilton, CT: Radio Publications, 1970).

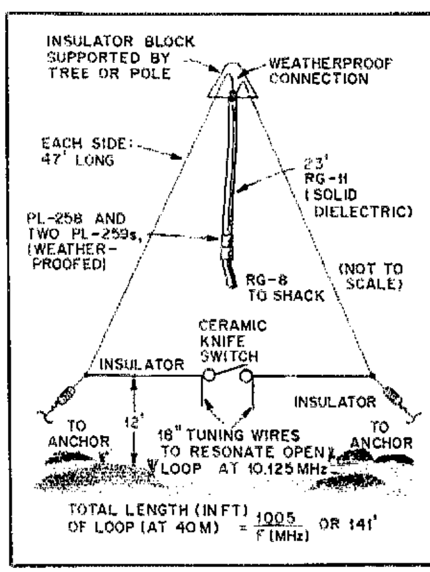

Fig 3—Jim Brenner's 30- and 40-meter loop. Note the 18-inch tuning wires used to lower the antenna's 30-m resonance from 10.5 to 10.125 MHz. The antenna is top-fed via a ¼-λ 40-m matching section. See text.

1½-λ, or "Mini X-Q," loop. The gain of this antenna was said to be about 1 dB more than a 1-λ loop. I installed a large, ceramic SPST knife switch in the center of the delta-loop's bottom leg (see Fig 3). With this switch open, the full-wave, 40-m loop becomes a 1½-λ, 30-m loop! The resonant frequency of this arrangement was 10.5 MHz. By adding 18-inch wires to the loop at both sides of the switch, I obtained resonance at 10.125 MHz.

Since the bottom of the loop is only 12 ft above ground, it's a simple matter to reach the band switch from ground level. (Caution: High RF voltage appears at the switch when the antenna is used for transmitting on 30 m.) Incidentally, the loop also works well on 15 m (SWR under 2:1 across the band) when set for 40 m, and I have used the 30-m configuration successfully on 80 m with the help of an antenna tuner.—*James Brenner, NT4B, 5690 SW 36th Ave, Ocala, FL 31674*

A SOURCE OF SHIELDING MATERIAL FOR RF PROJECTS

☐ I discovered a source of sheet-brass scrap on a recent visit to a local automobile radiator repair/rebuild shop. The sheet brass used at such shops is semisoft and is an excellent material—and very cheap at scrap prices of less than a dollar per pound—for use in building RF-tight boxes. A $5 selection allowed the fabrication of several small boxes for VHF converters and preamplifiers with hand tools and a soldering iron. This material is vastly cheaper than the copper tooling material I've previously used for this purpose. —*Larry Kayser, WA3ZIA, PO Box 6, Alplaus, NY 12008*

AN EASY FOOT SWITCH

☐ An inexpensive PTT switch can be built quickly from a plastic cassette case and a microswitch, as shown in Fig 4. Wire the switch first. Next, file a notch in the side of the case for wire egress, and file off the nib inside the case that resists the cover's movement. Fasten the wired microswitch to the inside front of the case with epoxy adhesive. Connect the wires to the device you wish to activate, and press the cover to close the switch.—*Harold Keenan, KB1US, 85 Topstone Dr, Danbury, CT 06810*

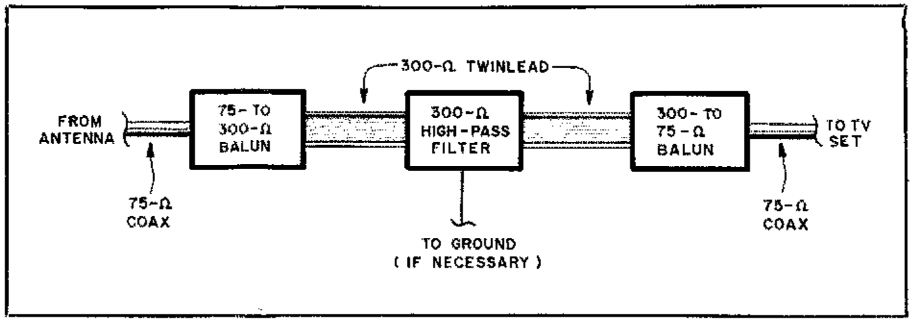

Fig 5—Jim Rafferty's addition to H & K's anti-TVI arsenal: Inserting two transformers and a 300-Ω filter in a 75-Ω TV antenna system quashes RFI caused by shield-borne HF energy.

300-Ω FILTER IN 75-Ω TV COAX CURES SHIELD-CONDUCTED TVI

☐ High-frequency RF traveling on the shield of 75-Ω TV feed tends to bypass 75-Ω high-pass filters installed in the line. Solution: Use two 75-to-300-Ω impedance transformer/baluns and a *300*-Ω high-pass filter as shown in Fig 5. Suitable transformers and filters are available from Radio Shack®, TV dealers, electronics stores and similar sources.—*Jim Rafferty, N6RJ, 5693 Grandview, Yorba Linda, CA 92686*

AK7M: In addition to offering an obstacle to shield-conducted HF energy by breaking the coax shield, this transformer-filter-transformer fix may owe part of its success to inefficiency of the 75-to-300-Ω transformers at HF.

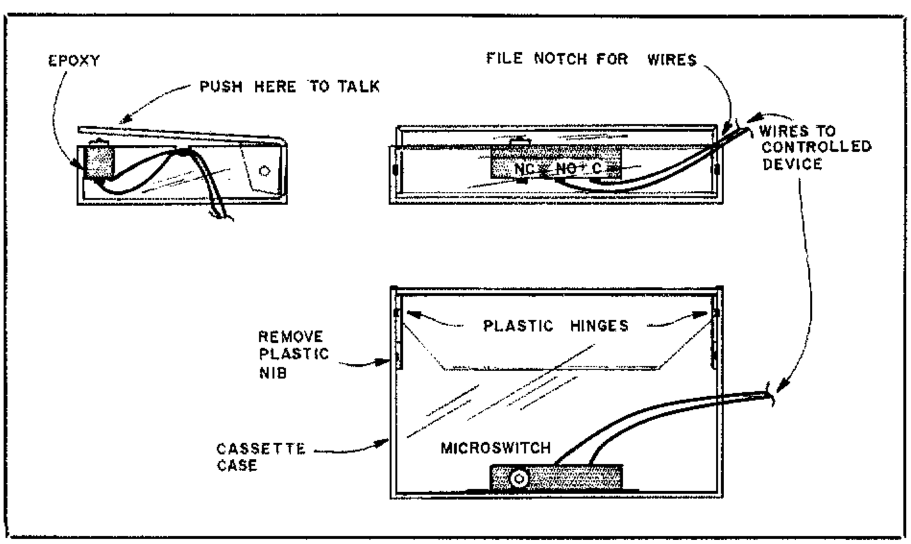

Fig 4—Harold Keenan's foot switch is based on a cassette-tape case and a microswitch.

BEWARE YOUR CRANK-UP, TILT-OVER TOWER!

☐ We've all heard stories of crank-up towers. Here's one that demonstrates potential danger standing in thousands of backyards.

Hurricane Gloria blew through Connecticut in 1985. After coming home from the office just before the storm, I disconnected and walked my 48-ft vertical antenna down in a minute or less. Then I cranked my 60-ft tower down to 40 ft—a level at which the Yagi mounted atop the tower was just above the big maple that has grown up under it. (The tower had not been lowered for six years; now that the tree was much larger than it had been when the tower was installed, lowering the antenna would have to involve alternately tilting the tower and lowering its top section in steps to keep the Yagi clear of the maple while minimizing the overhung load on the tower pivot.)

Initially, I cranked down the top tower section. When the time came to tilt the tower, I called my wife, Shirley, to manage the winch as a check against my pulling the tower bottom away from the post too quickly. Frustratingly, the tower would not pivot! Getting down closer to the ground, I got a grip on the tower base and pulled hard. Although the tower swung out into position, I did not see what had resisted the pivoting.

I then assumed the cranking-over task, with Shirley guiding cables and latch-lock pull ropes, and the 160-m antenna wire, away from tree branches on either side of the tower. As I cranked, I could not believe my eyes as the bottom of the tower moved slowly *sideways*—perhaps as much as a foot! I locked the winch and grabbed the bottom of the tower to halt its motion. The tower seemed to be *barely* attached to the top of the ground post at the hinge. I secured the bottom end of the tower with a line and decided to investigate this strange behavior.

The tower has a 10 × 10-inch steel plate welded into it; this plate is bolted flat against the hinge plate on the ground post. The hinge consists partly of a 4-inch-long