# THE WEEKENDER

# Easy antenna access for urban apartment dwellers

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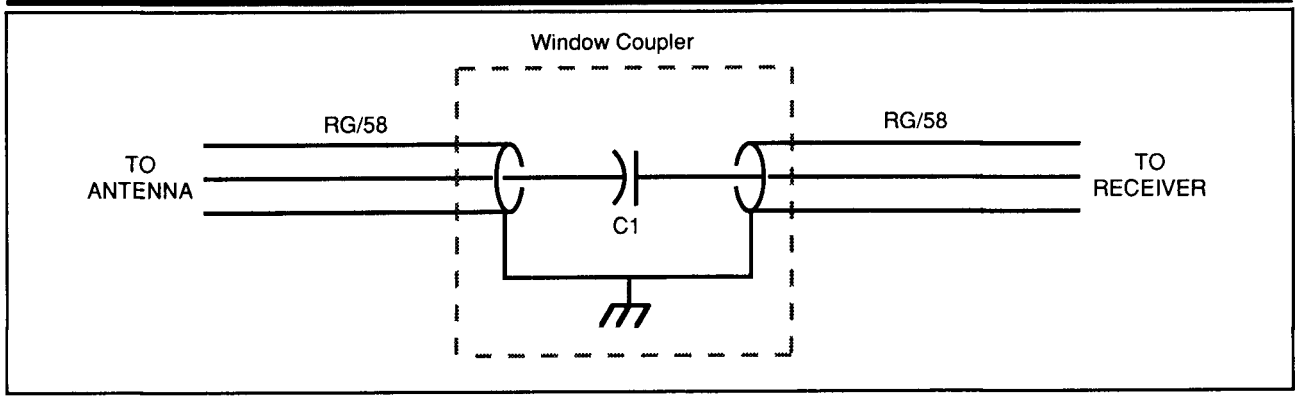
This article is dedicated to those urban HF operators who, because of security or other restrictions, have been unable to have constant access to a good receiving antenna.

My typical operating procedure on the HF bands is to listen to the activity on each band, then attach the appropriate loading coil to a loaded vertical antenna mounted on a pipe on my balcony. Sometimes I simply want to hear the latest solar activity forecast on WWV or catch the news from the BBC. Because I live in an apartment building with brick walls and aluminum-framed windows, this operation normally requires several trips through a sliding-glass door that leads to the balcony. Blasts of cold air entering my small apartment are side effects in the winter.

Confronted with this dilemma (and complaints from my XYL), I sought a solution that would eliminate the outdoor excursions for *receive only* applications or at least limit the ones required to begin HF operation. The most direct solution, drilling holes in either the brick wall or an aluminum window frame for a coaxial feedthrough, isn't allowed by my landlord.

I tried using a window antenna, but the it proved unsatisfactory. It was impossible to secure the window properly against burglars with the antenna installed. Anyway, the antenna I tried is designed for wooden window frames, and must be insulated from an aluminum window mount. I tried using a block of wood drilled to accommodate coaxial cable and wedged in the window frame, but this also resulted in an unacceptable security risk. Because of my location on the ground floor and the construction of the apartment building (an effective Faraday shield!), an indoor antenna proved useless — even for WWV reception.

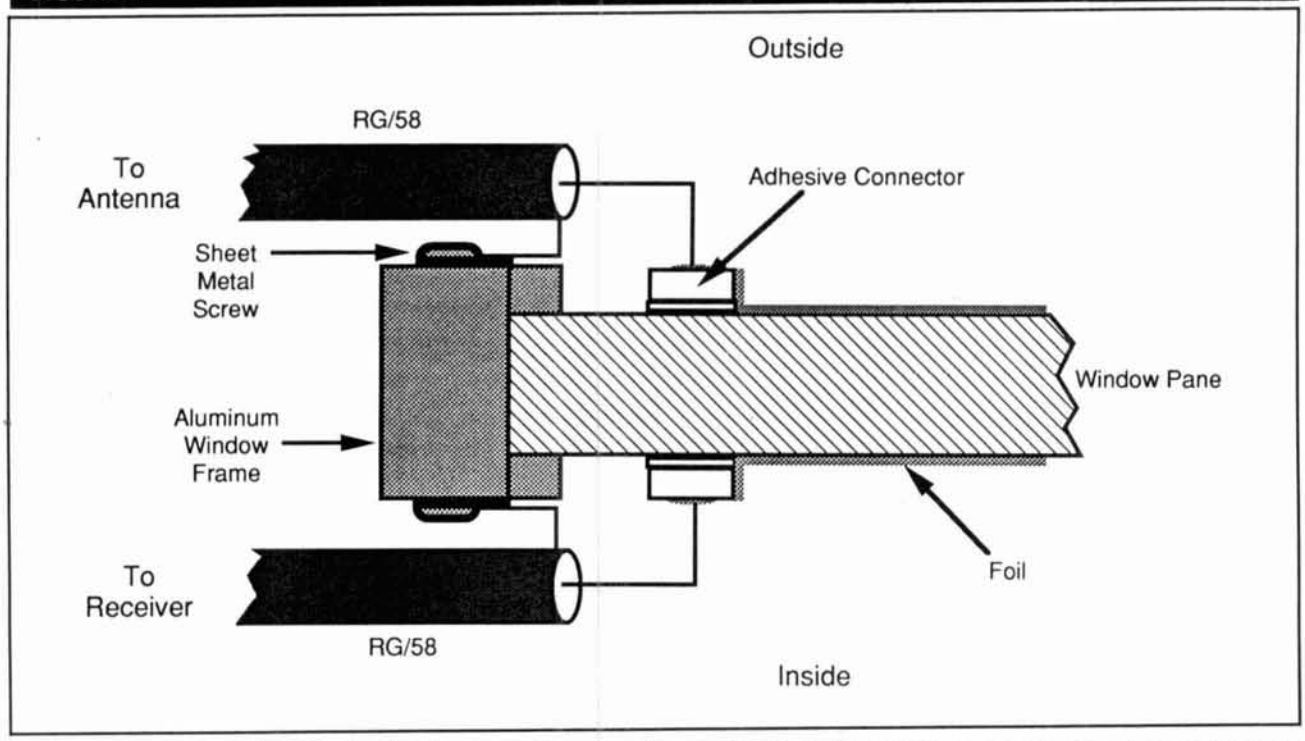
FIGURE 1




**Schematic diagram of the window coupler. An effective RF connection is provided through coupling capacitor C1.**

It occurred to me that I might try coupling RF from an external antenna through my window, adapting a method similar to those used in some mobile window-mount VHF antennas. The schematic in **fig. 1** shows the basic concept involved in what I call the "window coupler." The coaxial cable from my receiver (an ICOM R-71A) is connected, through coupling capacitor C1, to an external coaxial cable that feeds a "stealth" dipole antenna. The window cross section in **fig. 2** shows the details of the window coupler. Notice that coupling capacitor C1 is formed by two strips of aluminum foil mounted exactly opposite each other, on either side of and along the width of the window. The single-pane glass of the window forms the dielectric of C1. The two parallel foil strips, each 3/8″ × 48″, form the capacitor's plates. The braids of both the internal and external coaxial cables are connected to

**FIGURE 2**




**Window cross-section showing the details of coupling capacitor construction. The center conductor of each coaxial cable is connected to parallel foil strips with the aid of adhesive connectors designed for connecting the foil to burglar alarm systems. The braids of each cable are connected to the aluminum window frame.**

**Parts list**

**Adhesive-backed foil—Radio Shack part no. 49-502 (120 foot roll—$5.99)**

**Adhesive connectors—Radio Shack part no. 49-504 (3 pair for $2.59)**

**Krylon Acrylic Spray Coating, Crystal Clear no. 1301 (about $3)**

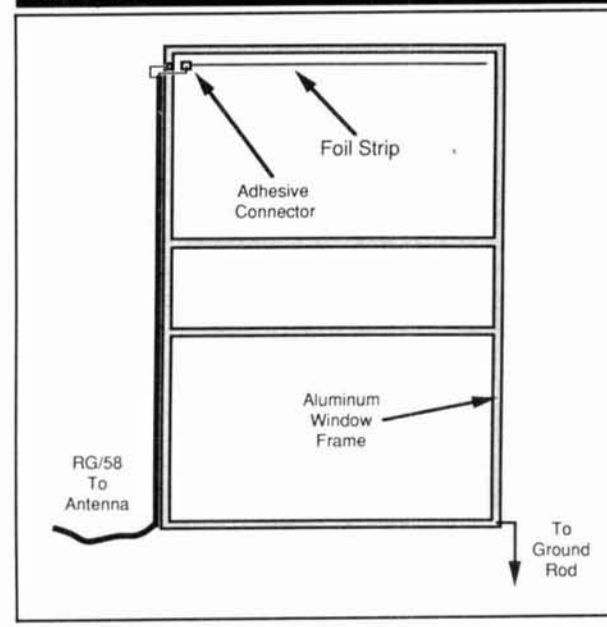
**Silicone sealer**

the aluminum window frame by the existing sheet metal screws. The frame is grounded through a short length of coaxial braid connected directly to a 6-foot copper ground rod (see **fig. 3**).

Both the adhesive-backed aluminum foil and adhesive-backed connectors used for building the coupling capacitor are available from Radio Shack. Adhesive foil and connectors, designed orginally for burglar alarm systems, make for a quick and aesthetically pleasing installation (see **fig. 3**). To keep the outside connections clean and free of corrosion, make sure that you cover the coaxial connection with a small amount of silicone sealer. To prevent the foil from deteriorating, I sprayed the outside strip with a thin layer of clear acrylic spray coating. Clear fingernail polish or clear enamel will work as well.

The window coupler performs magnificently as a means of providing a connection to an external receive antenna. There's no detectable degradation in received signal strength on the HF bands when using it, com-

**FIGURE 3**




**The window coupler as seen from the outside. The foil strip along the top edge of the window provides for an inconspicuous installation.**

pared with a direct connection to my dipole antenna. Now I have constant access to WWV and the shortwave bands. I can listen for band openings at the wee hours of the morning or late at night without disturbing my family, compromising the security of our apartment, or incurring the wrath of my landlord.

Now the obvious question: Is the window coupler any good for transmission? Well, I've made several contacts through the coupler with a QRP rig (an HW-8) on 15 meters. With an MFJ-900 Transmatch and a long-wire antenna attached immediately to the outside foil strip, I've been able to achieve an SWR ratio of less than 1.3:1 across the CW segment of the 15-meter band. Because the foil strips are so thin, I haven't tried to transmit through the window coupler with my Swan 500 — for fear of vaporizing the aluminum foil! For high-power applications, you might want to try extending the strip in an "L" shape, or use several strips in parallel.

I hope that you enjoy this simple and easy to build window coupler. Let me know if you have any questions and/or enjoy using the system.

*Article B* **HAM RADIO**