Steve's Scanner Shop

Further Experiments With The ICOM IC-R3

By Steve Donnell

Over the past month or so, we have been taking a closer look into the design and performance of the Icom ICR3 portable video receiver. One issue that we covered was to see how well the R3 can demodulate FM video from various wireless camera transmitters. We had already seen from earlier tests using the transmitter half of our Radio Shack 151971, that the R3 seemed to require a very strong signal in order to lock onto the video image. This is similar to numerous user reports we had seen posted on various Internet discussion groups. Just what the basis to this condition is still unclear; Wether it has to do with the basic sensitivity and noise figure of the receiver, or the IF bandwidth, or simply how "fault tolerant" the video demodulator is unknown.

We also found similar results while doing some additional field tests using the R3 and the 151971 receiver. Note: For those who have not read our earlier series on mods for the Radio Shack 151971 2.4 GHz audio/video transmitter and receiver earlier this year, the 151971 is nearly the same device as the 151972 that is currently sold, and is also basically the same product as those "x10" wireless cameras sold on the Internet.

In several instances of going out to locations where we had previously logged 2.4 GHz video camera signals, we compared the signals received on the R3, to those from the 151971 receiver, which had it's video output connected to a small 5" B&W TV operating on 12 volts. To further even the playing field, we used the exact same antenna for both receivers. In each case where we were able to get a perfect(P5) or near perfect(P4) signal using the 151971, the R3 would only produce a weak/noisy P2 or P3 picture, or

Here is an image our author captured via his Radio Shack camera set up!

none at all. In one instance, where we were able to get a P5 picture using just the "patch antenna" on board the 151971, we could barely get a P4 image on the R3, using the "can antenna", which had much higher gain.

One additional good aspect of these test was that we logged a couple of new wireless camera signals. We also took along a VCR to capture some of the images we received. The one shown here is from a "traffic cam" located along I95 in York, Maine. This is allows supervisors at the Toll Plaza about a mile further north to monitor traffic flow. A second camera is also located about a mile north of the Toll plaza as well. Besides simply monitoring traffic conditions, with all of the recent emphasis on "homeland security", you can expect to find many more of these kind of surveillance systems being installed on bridges and along heavily traveled waterways too.

One recent addition to our 2.4 GHz monitoring bag of tricks that we alluded to earlier is that of the "can antenna". This antenna is very simple to make, and is a very easy way to improve 2.4 GHz reception. The initial information about the can antenna we found on the Internet at: http://www.qsl.net/wk8l/ . This site carries a great deal of information and links about 2.4 GHz Amateur Radio Television(ATV). Upon closer examination, the design of the can antenna is not exactly new, as it's description is nearly identical to ones I had seen many years ago for use with Amateur 2,300 MHz down converters, typically intended for use as MDS(2160 MHz) receivers.

Still, the antenna is an extremely simple and cheap way to get an extra 8 to 10 Db of signal gain over the standard "patch" antenna. The antenna uses an empty 1 pound coffee can. Start by measuring 2 inches up from the bottom of the can along the outside. At this point, make an indentation using either a nail or metal punch. Drill a hole here that is large enough to accommodate with some additional clearance, the center pin and insulator of a chassis mounted coaxial connector of your choice. This can be either an SMA or BNC, or even an N type. The connector can be one that attaches by way of either a flange or jam nut.

However if at all possible, solder it to the can, which will provide a much better ground connection. Before attaching the connector, you will need to add a short and straight length of solid wire to the center pin of the connector. Trim the length of this wire so that when the connector is attached to the can, the wire will protrude into the center, and will have a length of 1.15 inches, or just about one and one eighth inches. You may also wish to attach some type of handle to the back or bottom of the can to make it easier to hold and aim. Remember, this is a directional "horn" antenna, where the greatest degree of signal pickup will be out away from the open end.

Pictured is the ICOM R-3, an excellent receiver. With a few modifications and a better antenna, you increase the receivers capabilities!

Getting back to our discussion about the IC R3, there are a couple of potential mods for it that some folks are interested in, one being able to use FM Video mode in the 1.3 to 2.3 GHz range to be able to receive certain commercial video links. While I have not fully studied this, it would appear as though a VDC type of mod is possible that could manually force the R3 into receiving FM Mode video signals, such as it can already in the 900 MHz and 2.4 GHz Amateur bands. This "hotwire" mod would seem to be possible by simply swapping the outputs of transistors Q202 and Q204. Q202 provides DC power to the AM Video Demod section and Q204 powers the FM Video Demod section.

However aside from knowing just how the "polarity" of the any FM video signals would be handled, there is still the basic question of wether this sort of mod would be worthwhile, given the overall performance of the R3 in the upper frequency range of it's design. Still, the simple fact remains that the IC R3 is a very unique portable receiver, and that any type of mod that ADDS to the capabilities of a radio should be thought of as worthwhile just so long as it can be accomplished without detracting from the original appearance or features. But I should also add, that you should check to see if any "improvements" that you make to any radio, violate any local laws or regulations.