

HOOSIER'S RADIO PRODUCTS ADD UP TO BIG HOBBY BIZ

■ As a practising radio engineer, a hobbyist and modeler, Vernon C. Macnabb of Indianapolis, Indiana, vowed that if the day ever came when a model builder could fly a plane (legally!) under radio control, without the need for taking a special license exam to do it, he would enter the field seriously. Macnabb had built a few free flight and U-control planes and had a large model railroad layout in the basement.

His chance to make good on that vow came when the F.C.C. opened up the 465 mc Citizen's Band spot for radio control purposes in 1949. At that time he was active as a manufacturer's representative in the electronics field (a business he still maintains, but which is being pushed more and more into the background by the rapid growth of his Citizen-Ship Radio Corp.). Since the "rep" business does not require much space and no laboratory or manufacturing equipment, Macnabb in '49 turned to a then-small engineering concern in Indianapolis to design for him a 465 mc transmitter and receiver.

The transmitter proved quite simple, though it took some time to get the necessary type approval from the F.C.C. engineers; this unit bounced back and forth between the designers and the F.C.C. till finally all problems were ironed out. The first "type approval" issued to any Citizen's Band radio control transmitter was granted to the Vernon C. Macnabb Company (this was the name he used for the representative business, and his R/C business also operated under it for a time). Just how tough it was—and still is—to get a 465 mc type okay is seen in the fact that only one other concern ever stuck with it long enough to get such approval for an R/C transmitter.

The 465 mc receiver proved to be a very tough nut to crack. It is a matter of record that the circuit finally used, basically the same as in the present Citizen-Ship 465 mc receiver—was hit upon rather by accident while the designers were trying to reach their goal from an entirely different direction. Considering the frequency, the receiver circuit was relatively simple and only a single tube was required. Again because of the frequency a 6 volt heater-type tube was necessary, which meant use of a fairly heavy filament power supply. This was compensated for to some extent by the fact that B current drain of the receiver was relatively small, though a high grade relay was required.

We are covering this 465 mc equipment in some detail, since it was the first 465 equipment to be sold for R/C—and the first R/C equipment marketed under the then new Citizen's Band setup. With such radical equipment it was felt that extensive field tests should be undertaken and a local, highly experienced model plane builder, Gene Foxworthy, was commissioned to build a plane to test it. Gene took the plane to the Dallas Nationals in 1950 and won the R/C



Vernon C. "Happy Hoosier" Macnabb at one of his Citizen-Ship buildings.

event. All other R/C work was then taking place on the amateur bands, mostly on the 50 mc spot, and the 465 mc equipment was naturally a sensation.

At this early point in the R/C life of the concern, the transmitter and receiver were manufactured by the outfit that developed them, which had then become quite well known under the name of I.D.E.A. The Macnabb office simply took care of distribution and sales. In the early '50's when the F.C.C. finally opened up 27.255 mc for R/C use, I.D.E.A. was again commissioned to develop a transmitter and receiver. Their transmitter was a 2-tube MOPA, quite unusual at that time when practically all R/C transmitters were plain oscillators—crystal controlled or otherwise. This was the "LC" transmitter and a single hard tube receiver—the Model "LR"—was the companion unit. The LR was most successful and many are still in active use after seven years. Citizen-Ship Radio knows this from the fact that they still get them back for crash damage repairs.

By the time the LC and LR had been developed and marketed I.D.E.A. had grown into a rather large concern and was no longer interested in the relatively small hobby business. Macnabb was forced to move from a small office into his own building, where he could set up development and manufacturing facilities. At this time the company name was changed to give a better idea of the growing hobby end, and Citizen-Ship Radio Corporation came into being.

By this time competition was growing keen in the R/C field and it was felt necessary to bring out some lower cost equipment. Since it was not possible to do much at the time to lower cost of the 465 mc units, Mac designed a tiny 27¼ mc transmitter (the model "FL") not much larger than a flashlight. It was one of the first to use a printed circuit plate, had very high output for equivalent input, and has been widely copied ever since. Because the PC plate made it easy to duplicate, the first kit to be marketed by the concern was for this transmitter.

With printed circuits becoming all the rage in R/C the 27 mc LR receiver was redesigned to utilize a P.C. plate, which was marketed both in finished form and as the first receiver kit by the company.

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Big Hobby Biz

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own development and manufacturing, Macnabb had only a single employee, in addition to the secretary who had been with him since pre-R/C days, but growth was to be rapid and steady.

Already covering single channel on both of the available Citizen's Band spots, it was decided to branch out into multi-channel and the first such outfit was the "RER" receiver, a two channel job which had the advantage that you could get the channels either singly or simultaneously. This receiver and its matching transmitter ("REX") are still in the line.

It was felt desirable to get into even more channels, due to the fast growing popularity of reed receivers, and by 1958 Macnabb was marketing an advanced 8-channel transmitter and receiver. These units were not only very stable (Mac had followed electric organ techniques and used special inductors from this field for his tone oscillators) but they startled the industry by breaking through the "\$100 barrier"; up to this time 8 channel transmitters and receivers had cost far more than the \$99.95 listed for the C-S units.

The 8-channel receiver had several transistors in it, and in fact Citizen-Ship had gotten into transistors some time before this, by adding transistor relay stages to both the 465 mc and single tube 27 $\frac{1}{4}$ mc receivers. This was especially advantageous for the 465 job as it allowed a big weight reduction (by making the heavy but very sensitive Sigma relay no longer necessary) and size was reduced, too. Thus was born the "TC" receiver that is still being marketed—and the only 465 mc receiver now being manufactured. The same sort of transistor stage was added to the single tube 27 receiver, again allowing a reduction in size and weight. Incidentally, though interest in 465 mc dropped for awhile it is reviving again, due to the serious interference problems now being encountered on 27 $\frac{1}{2}$ mc and nearby R/C spots.

When the F.C.C. assigned 5 new spot frequencies to R/Cers in the fall of 1958—and loaded the spaces between these spots with 20 more channels devoted to Citizen's Band "walkie-talkies" and other radiophone outfits—Citizen-Ship Radio Corp. could see trouble coming and immediately started development of an R/C superhet receiver, which would be sharp enough to work on any of the six R/C spots, and would not be bothered by nearby Class D radio phones.

As with so many other R/C endeavors, one thing leads immediately to another! The single channel superhet is of the tone type, so a single channel tone transmitter had to be added to the line. Since they then had such a transmitter it seemed logical to add a low cost all-transistor super-regen tone receiver, and the little "3VTR" is now part of the line. The superhet front end was also applied to an 8-channel reed receiver, the "MST-8" transmitter already in the line will work well with this new super-selective multi receiver.

Along the way and sandwiched in between the major items on the list have been added escapements of various types. Local RCers had worked out early in 1958 a neat "actuator" servo based upon the Mighty Midget motor and this too was added to the Citizen-Ship line ready to use. It is also the only do-it-yourself

servo we know of on the present market; the kit contains parts to make the unit up in four different forms and has been most popular due to this versatility.

When we visited them, Citizen-Ship Radio was sadly afflicted by growing pains. The building into which Macnabb moved his little company some seven years ago has long since been outgrown, even with a two-car garage on the property crammed to the rafters with stock. A nearby small house has been rented for some time to allow more space but even this isn't enough and land has been acquired to put up a building large enough to house all activities and still permit room for the future. From the original roster of Macnabb and his secretary, there are now 12 people employed full time, with others brought in as needed. Most office work is handled through Mrs. Virginia King (well-known to those in the hobby trade, as she attends many trade conventions and takes care of much correspondence). Shop Foreman is Ed Hughey, an avid modeler with a personal interest in making sure that only the best of equipment leaves the plant for purchase by hobbyists.

As to future products, Vern notes that the R/C field seems to have no visible end—there are *always* new products required. When he heard of current interest in a proportional outfit which will allow the control surfaces to follow exactly the movements of a stick on the transmitter, experiments were started in this line. Having been a long and avid reed flier himself, Mac says he can't see why anyone would need proportional; but a lot of people have expressed interest, so Citizen-Ship Radio may have a go at it.