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A Ham Looks at the Knight Kit R-100A

and likes it

A recent survey of the stations being contacted here at W6EUM revealed that well over 50% were using some form of a kit transmitter. The same stations, meanwhile, indicated that less than 1% of them were using kit receivers. A little investigation into this situation uncovered a rather widespread belief that the assembly of such a receiver would leave something to be desired in the way of results.

Now if you are one of the more fortunate ones who can tap the family budget for $500 for a new super-delux job the validity of this belief is of little concern, however if you're like most of us where even $100 bends the monthly balance, perhaps you should examine the situation a little more closely. With this in mind, and since I am one who believes that a receiver kit costing less than $100 would be inadequate (some will argue that), a search was made into available units costing around that figure. The results of this search was the purchase of a Knight Receiver Kit Model R-100A and the following article is a review of this kit as a ham sees it, and not necessarily as the Knight Company might.

If you have not assembled, or seen, a modern ham kit in recent years you're in for a surprise when you unpack your R-100A. In contrast to what you may have heard or to what you may have remembered of early kits you will find the components of this unit to be of first class quality throughout—the chassis is heavy gauge steel, the tubes RCA, all resistors and condensers top quality and, in fact, no indication at all that Knight cut cost corners on components or hardware. Everything is furnished, even the solder.

Now for the assembly—the mechanical portion proved easy, being straight forward with no tricky adjustments or hard to get at parts or screws. The wiring itself is almost all printed circuit boards—only three of the fifty resistors used are not on these boards. This simplifies the wiring to an enormous degree and allows anyone, regardless of radio experience, to do the job. The resistors themselves are even mounted on cardboard with their "R" identification number alongside so you can even be color blind and still get the correct value.

The circuit itself is a nine tube (performing the function of 13) single conversion general coverage superhetrodyne. It's a fairly standard circuit starting with a 6BZ6 rf stage using four rf coils—the 14, 21 and 28 mc bands are all on one rf coil. There is an rf trimmer condenser controlled from the front panel which is used to trim the rf coil in use. This allows peak performance from the stage for any antenna loading, which is especially desirable from the ham operators standpoint.

The mixer stage uses a 6HB6, the pentode section of which is used for the mixer and the triode section for the conversion oscillator. There is nothing special about this circuit except, possibly, for the use of an OB2 regulator tube for the oscillator plate supply—nothing

else is on this regulator tube.

One thing about the circuit so far which does deserve mention is the band switch. This switch is a printed circuit board type and is the greatest thing invented since suspenders. It simply plugs into the main board and is soldered in place—36 connections made in approximately two minutes with no possibility of a mistake. The two *if* stages use the pentode section of two 6AZ8 tubes and are nothing unusual. The demodulator (detector) uses one section of a triple diode 6BC7 in a typical diode detector circuit. The second diode of this tube is a AVC rectifier which has a built in delay to remove all AVC action on weak signals. The third section is a series noise limiter which automatically adjusts itself for the average level of the received signal. This works real well for ham use. The two stage audio section is entirely normal and needs no comment. The BFO uses the triode section of a 6AW8 and is unusual in that the BFO output signal is fed into the circuit at the input to the second *if* stage, and there at a very low level. This seems to allow better operation on SSB and, when this feature is combined with the real smooth vernier action of the BFO frequency control, it allows excellent SSB reception. This from what is normally considered an AM detector—SSB is AM by the way. A product detector would probably operate a little better but this circuit does do a good job.

The Q multiplier is really something. Some multipliers of this type seem to be unstable and hard to operate when used in the "peak" mode, but this receiver seems to have licked the problems and its use makes a world of difference when you are trying to beat some bad QRM—and who isn't? Fact is if you have never operated one of these little jobs you will be amazed at the way you can pull a signal out from a big pileup of QRM. It's also valuable as a null device but, in my opinion, it is not as fine a performer there as a notch filter. Nothing else about the circuit is unusual enough to mention except that the power supply filter uses an LC combination instead of the more common RC, with the result that there is no discernible hum at all in the output.

A check on the sensitivity indicated that the specifications were reasonably close. However you must expect to do an alignment job to get real good results. Knight has complete alignment instructions and even suggests a way to do the job without a signal generator. However I would strongly recommend the use of a good rf signal generator. The coils are all pre-aligned but, that is not good enough if you want top results. The AVC does not operate on CW or SSB. This, in my opinion, is not especially important and only means that you must use the rf gain control for a volume control when in those modes.

The overall construction of this kit was so straight-forward and easy that no special instructions to you, as the builder, seem necessary. Just the usual caution to "do it their way." Use the manual and follow directions and you can't go wrong. The only trouble you might experience is in the identification of some things such as switches, controls, etc., and even there you will find, somewhere on the pictorials, the information you want.

Now for a few general comments on this little job. The rig is much better looking than the pictures would indicate, the combination of jet black, silver and gray is real nice. When used with its matching transmitter it makes a very nice looking station. I do think, however, that the average ham will deplore the fact that it is not a "hambands only" receiver. While the bandspread feature spreads the bands over approximately 165 degrees of the bandspread dial, the markings are not especially easy to read. They look a little crowded. Also the bandspread dial has a ratio of about six to one in reduction and that also would be better if it were 12 or 15 to one. It's not hard to tune as is, but any help along that line is desirable. Maybe if enough of you would write Knight they would put out a ham band only model of this same receiver where a better dial and tuning ratio could be used.

Since this is a general coverage type receiver you should purchase the 100 kc calibration accessory, which is available quite reasonably. This I feel is important and just might save you a pink ticket. The S meter accessory makes the outfit look much nicer but adds nothing to the actual operation.

There is no more than the normal amount of drift in the conversion oscillator as it warms up, and after a few minutes this settles down well. No drift in the BFO was noticeable. A remote connection is brought out on the rear of the chassis to silence the receiver while you are on transmit and it works well.

To summarize—I think that the only conclusion that can be drawn is—if you have several hundred dollars to spend, go ahead and buy a SX115 or the S-line, but if not, take a good look at this kit receiver. If you want a general coverage job I doubt if you can touch a better receiver for the $100 asked.

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