The Heath SB-400

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Last year it became my misfortune to sell a well stocked ham station in order to purchase a new home. This turned out to be a blessing in disguise, since it gave me a chance to become reaquainted with the family, get a lot of house fixing done and play a few rounds of golf to boot. This spring, the financial picture was again being painted black, the family had seen enough of me and my golf score wasn't improving much. It was time!

I had been keeping a close eye on the rapid development of new equipment being offered on the amater market. There were single and multiple band transceivers, high and low powered transmitters etc., etc. One thing was sure. It had to be SSB and definitely offer provisions for good ol' CW. It seemed like a tough decision, but Benton Harbor had again come up with something which offered the highest ratio of performance to price. I therefore took the plunge and ordered the new "SB" line and waited impatiently for the goodies to arrive.

Construction

After a somewhat lengthy wait (or so it seemed) the SB-400 finally arrived. I locked the ham-shack door and eagerly began to piece it together. The kit was completed in slightly less than 50 hours.

Construction was simplified considerably through the use of two circuit and two terminal boards. The instruction book was apparently well planned, minimizing difficulty in placing the tightly packed components. Heath even supplied the solder. The finished product, which bears a faint resemblance to a high priced Brand X was plugged in and worked right off the bat. Alignment was completed in approximately ½ hour and required only the use of a VTVM and rf probe. I did have a little difficulty in producing sufficient drive near 28.5 mc but resolved this by tightly dressing down all of the coil leads in the grid and plate circuits of the 6CL6 driver.

Circuit Description

The transmitter design can be broken down into four separate systems, an exciter, a vfo, a heterodyne oscillator and an amplifying stage. First, the LSB, CW, and USB signals are produced at 3393.4, 3395.4 and 3396.4 kc. This is mixed with the variable frequency oscillator (LMO) which operates between 5 and 5.5 mc. Using a little arithmetic we find a mixer product varying between 8.395 and 8.895 mc. This in turn is mixed with a signal from another crystal controlled oscillator to produce the desired transmitting frequency. The signal is finally amplified through a 6CL6 driving a pair of AB_1 6146s. We end up with full 80-10 meter coverage, (all crystals supplied, gentlemen) with approximately 100 watts output.

The circuit design also features such important items as an automatic level control (ALC) system. This allows a higher level of talk power without risking attendant flat-topping and distortion. It increases one's signal effectiveness considerably. In addition, an audible sidetone is generated in the CW function to allow for self monitoring. This also trips the VOX system allowing for semi-break-in keying. In the SSB position, one has the choice of push to talk or straight VOX operation. The antenna changeover relay is built in, although provisions for an external changeover are there for those who prefer it. The power supply makes good use of tiny semiconductor rectifiers. Separate medium and high voltage windings eliminate the need for power robbing dropping resistors and voltage regulators on the 6146 screens.

Operating Performance

After using the rig for a little while, one gets used to it and wonders "what else can they possibly come out with?". I have used the SB-400 with a Drake 2B and more recently, the companion SB-300 receiver. The transmitter is a dead mirror image of the latter. I have operated it in both the transceive and separate transmit/receive functions. All one has to do is change a couple of cables, which takes no

time at all and adds great versatility to the line. Tuneup amounts to resonating the driver and final and choosing the desired mode. The CW signal is removed one kc from the USB frequency. Therefore, in the transceive position, one tunes in the desired CW note at 1 kc, which centers it in the receiver 400 cycle band pass. This places the transmitter on dead zero beat. The meter is switchable between grid and plate current, plate voltage and relative power output.

Reports on distortion, signal width and sideband and carrier suppression have been excellent. There is no frequency drift that I have been able to detect, even from a cold start. My own scope measurements have confirmed the very fine comments on signal quality. To sum it up, gang, it would be mighty tough to beat this deal at twice the price of $325.

Letter

Dear Wayne:

For these past eleven months I've been reading and quietly checking your efforts on behalf of the General licensees, and your healthy opposition to the QRM from QST headquarters. Your July appraisal of your efforts seemed to reflect a sense of discouragement and defensive thinking. I hope I read this incorrectly, Wayne. Perhaps the amateur body has not responded as readily and as freely as you had anticipated. Many are more than ready to give lip service, Wayne, but cash is another matter. It's pretty hard, in a lot of cases, to let go of the ten bucks for the IoAR, or even for shoes for the kids, for that matter. There seem to be many hams who just aren't in a position to send ten dollars. Would it be wise to appeal for lesser amounts? My membership in the ARRL expired on January 1 this year, and I did not renew it on the grounds that I did not want the crew at the ARRL to interpret my renewal and subscription to QST as a "yes" vote on all the crackpot or insane proposals they could dream up, and appealed to them to instill a bit of democracy in the organization by submitting serious questions to a vote of membership. I got the standard reply of "If a republican form of government is good enough for America, it is good enough for the ARRL." Perhaps I'm wrong, and you're wrong, and those who take the position we have taken are wrong, but I cannot help but wonder. The ego that makes for disregard of the opinions of the membership of a group can only lead to revolution by the members, and the ARRL does not have the means of control to suppress an uprising. I should say also, that not all hams are members, and not all hams care. To many hams, the final disposition of the ham bands is not of **great** importance. Ham radio is still a hobby, as it should be, and not a way of life. I'm afraid to continue, Wayne, to write in this vein, as it only leads to a reflection on injustice as it seems to be practiced by the government of the ARRL. The upshot of all this writing is that, enclosed, find two checks: one for the renewal of 73, and the other for my IoAR membership. I was going to send you money for the QST magazine too, but I'm still mad at them, but leaning toward rejoining so I can vote against the director, although what good that would do, I'm at all sure.

At any rate, Wayne, I am only one of many who hope you can be successful in your fight for justice—justice without discrimination for or against any amateur.

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