

# The Heath SB-103?

... Not Quite

**W**ell...the "hams at Heath" have done it again! Just as I've almost completed my set of matching Heath SB gear — out comes an entirely new line (SB-104 & accessories) that puts whiskers on my SB-102 and its matching equipment.

Being a resourceful ham (translation: short of funds...) I figured I could update my SB-102 by adding those state-of-the-art features which obsoleted it. All I did was to compare the two rigs and make the necessary changes. What follows is a description of this conversion, which should also work on the KWM-2!

A comparison of the specifications and features of the SB-102 versus the SB-104 indicated the following features needed to be added to my SB-102:

- 1) solid-state circuitry
- 2) digital readout
- 3) broadbanded receiver & transmitter
- 4) QRP output
- 5) call sign light

The first two features seemed rather difficult, so I decided to work on my list from the bottom up...to build confidence. This technique is highly recommended as it led to the ultimate completion of all five features of the conversion!

## #5 Call-sign Light

First, I selected a clear strip of Dymo label-maker tape and press-typed my call, K9WQY. Then I peeled off the self-adhesive backing and applied it in the middle of the lighted dial. I was careful to put it in the exact middle of the dial for maximum visibility during contest operation (I always

seem to forget my call in the middle of a contest...and who cares what frequency I'm on in the heat of a contest anyway?) Having accomplished the first conversion with remarkable ease, I plunged upward through the list.

## #4 QRP Output

Actually, the SB-102 was capable of QRP operation all the time. I discovered the QRP output jack on the back of the SB-102 was mis-labeled, "Driver output." Of course, then I had to use my secondary receiver and antenna to hear any replies. I considered installing a TR switch or antenna relay and using the receiver antenna jack on the rear panel of the SB-102, but I wanted to avoid any major changes in the rig to keep re-sale value high.

As it turned out, I found an even better way to QRP operation. Read on...

## #3 Broadbanded Receiver & Transmitter

SB-102 owners have always been plagued by the "bothersome Preselector, Load, and Tune controls." (Heath catalog) The "hams at Heath" have eliminated this "problem".

This was a "toughie" until I realized... no controls = no tuning = **broadbanded!**

Once over this hump in logic, I began the conversion to broadbanded operation in earnest. First, I removed the following control knobs from the front panel:

- 1) driver tune
- 2) final tune
- 3) final load

The tuning shafts now protruded from the front panel and seemed to defy me. I



decided to hack saw them off flush with the front panel bushings for a neater appearance. To complete the job, I got some matching green-flake paint (from Heath) and covered both the front panel bushings and the end of each shaft. I made a mental note to do "something" about the panel lettering, too . . . at a later date.

I achieved a couple of unexpected benefits from this step in the conversion process, namely:

1) I no longer needed to use the "driver output" jack for QRP operation, and . . .

2) my receiver sensitivity now exceeds the reduced sensitivity of the SB-104 (<1.0 uV versus < .35 uV for 10 dB S+N/N for the SB-102). In fact, sometimes I can't even tell if the band is open.



The "SB-103." Notice the critical placement of call sign in full view of operator, and "clean look" of front panel with tuning controls eliminated.

## #2 Digital Readout

Heath has had a digital frequency display, the SB-650, available for the SB-102 at a good price for some time now. A good price, that is, unless you're a "resourceful ham" like myself.

First, I constructed a power supply for 8 Nixie readout tubes (I wanted one cycle resolution. . . I *never* do things halfway!). Next, I connected 8 decade switches so that I could turn on any digit in any place at will. Thus, I can "dial up" any frequency I want down to that one cycle resolution. How's

that for accuracy! This really works great sitting atop the SB-102 and really impresses non-ham visitors to the shack. However, the transceiver frequency doesn't seem to follow the Nixie tube readout at all. I plan to work that out sometime.

## #1 Solid-state

The first step toward solid-state was to partially integrate the circuits by bussing the fuses. Complete integration would require bussing the wires as well. At this point, however, I realized that the biggest disadvantage to my tubes in the SB-102 was the large amount of energy that was wasted in the heating of the filaments. So. . . I added a switch in my HP-23B power supply so that when I want to conserve power I just switch off the filaments. Simple, eh?

However, a couple of disadvantages to this scheme were noticed immediately:

1) the dial lights usually go out and I can't see my lighted call sign any more. . . which means I'll probably go on forgetting my call during contests, and. . .

2) signals tended to fade out rather quickly on receive, but this deficiency was offset by the transmitter becoming *truly* QRPp.

Having completed the conversion, a new model designation seemed in order. After all, my rig was no longer a "mere" SB-102. Not having all of the features of an SB-104, the "skipped over" SB-103 designation seemed to fit. Let's see, where did I put my label-maker. . . ?

All is not right, however. The rig has been in use for several hours and some undesirable characteristics have appeared:

1) the "SB-103" does not work well on transmit or receive with the filaments turned off.

2) with the filaments on, I can operate high power only on 7302 kHz (which is where I was operating before the conversion).

3) no replies to my numerous transmissions have been heard as yet.

4) the green flake paint *is* flaking off.

Does anybody know how to work on an SB-103?

...K9WQY