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Heath SB400 Modification

The Heath SB400 and SB300 work well together in tranceive but there are times, usually working DX, when it is necessary to operate them apart from each other. It then becomes a chore and takes time to shift plugs and cables in the SB400. The Collins S Line makes a similar change by simply throwing a switch on the front panel of the exciter when the receiver and exciter have been cabled together for tranceive operation. However, at times, this can cause havoc, and pink tickets, should the operator neglect to check the band segment in which the exciter was set. This is what has happened when the CW operator suddenly hears SSB signals from American stations down in the 20 meter CW band. It cannot possibly happen here with the SB400 and SB300 if the following modification is made, because a complete split of the two units has been accomplished by the turn of a switch and they are not interdependent upon one another as in Collins. Furthermore, a messy mix-up of cables is eliminated. The elusive DX station down in the foreign phone band can be heard while he is called, up in the American phone section without delay.

Location of the new switch.

The entire affair is done by the installation of a double throw, 2, 3 or 4 pole rotary switch with two wafers. A common surplus item was used here but others are readily available in the market. The poles of the rotary switch are attached to the lead from the mixer and are thrown to the lead to the receiver LMO or to the lead to the transmitter LMO. At the same time, using the second wafer, when in split operation, the dial lights of the SB400 are energized to indicate that the transmitter is being operated separately and the receiver LMO is grounded out.

This is quite cheap, easy and simple because beside the rotary switch all that is required is a length of RG-58A/U coax, a small piece of aluminum, three phono-plugs, a piece of hook-up wire and a 100 ohm ½ watt resistor. Most of the wiring can be done before the rotary switch is installed. The only modification to the original SB400 is a minor change in the wiring of the two dial lights which are fed normally from two different sources. To control them with one switch, the dial lights, of course, must be fed from one source and wired in parallel.

The accompanying photograph clearly shows the placement of the rotary switch for which a small bracket is constructed from the piece of aluminum. The screw which holds the bracket is already in the LMO cover of the SB400. It is loosened and run through a hole or slot in the bracket and put back into its original hole. The bracket is bent sufficiently to permit the rotary switch being used to fit comfortably in the space to the right of the LMO.

The wiring is relatively simple after the cables have been prepared. All of them can be soldered to the rotary switch before installation. Lay aside the two cables which came with the SB400 and which were used to make the transformation to transceive. Save them, as they may come in handy at a later

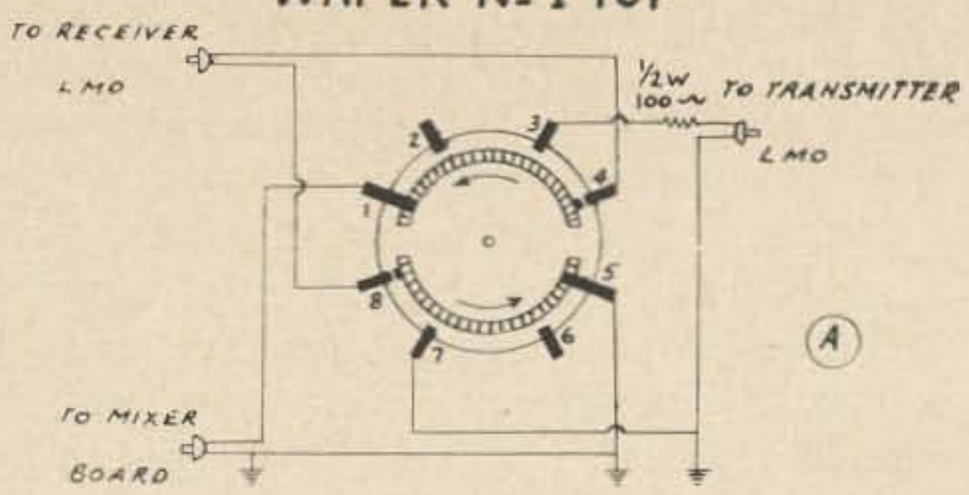

Fig. 1. Wiring of the new switch for the SB-line.

date. Cut four cables from the RG-58A/U. It is suggested that, prior to cutting the coax, you determine the lengths required by using a piece of solid wire which can be threaded between the components and thereby obtain fairly accurate dimensions. Enough cable should be used to be dressed professionally around the components on the chassis. Length is not critical. In the photograph the cables appear to be rather long; but they were shortened for neatness after the picture was snapped.

Two of the cables just cut are fitted with phono-plugs at one end while the remaining end of each of the two is stripped to solder to the lugs on the rotary switch. One cable, which will go between the rotary switch and the transmitter LMO has the 100 ohm resistor inserted in series with its center lead and a phono-lug is fitted immediately after the resistor. (This is the same arrangement as on one of the original cables which came with the SB400.) The other end is also stripped for attachment to a lug on the rotary switch. The fourth cable is rather long and has both ends stripped. One end of that cable will be soldered to a lug on the second wafer of the rotary switch. The other end will be fed through the rear of the cabinet and joined in and at the phono-plug already on the cable which comes from the receiver LMO. There is a small hole in the back of the SB400 cabinet which requires only a little enlarging to admit RG-58A/U. This concludes the preparation of the cables and they should be soldered to the proper lugs on the rotary switch as set out in **Fig. 1.**

At first glance it will appear as if one segment of the top wafer on the rotary switch is not necessary because all the connections thereto go to ground. However, nothing will be saved by connecting the shields of all the cables together. Nothing but an unwieldy mess results, and there will be saved only one segment of the rotary switch—two sections or wafers are still necessary. The rotary switch, therefore, becomes an excellent tie point for all cable shields.

On the lower wafer of the rotary switch a discerning eye might be led to believe that in place of the long cable which goes out through the rear of the cabinet, connections can be made directly at the rotary switch, thus eliminating the long cable. This was tried and the results were quite unsatisfactory. Spurious emissions appeared. As the purpose of this cable is to ground out the receiver LMO when the transmitter LMO is in use and hereby eliminate or prevent beat notes from the combination of both LMOs, it is logical that the grounding should be made away from the transmitter and outside of the receiver.

As for the dial light modification, view the lights from the front of the SB400. Disconnect the brown lead coming from the base of the mixer band-pass circuit board at the left-hand dial light. Lengthen this wire so that it will reach pin #1 on lower wafer of the rotary switch and solder it to pin #1. (See **Fig. 1B.**) Disconnect all the leads on the right dial light. There are a good number attached thereto because it has been used as a tie point. Solder all those leads together and tape them well. They can hang free. Run a lead from the left dial light to the right dial light. Run another lead from the left dial light to pin #4 on the lower wafer of the rotary switch. You now have placed both lights in parallel from one source of power and the switch will complete the circuit only when it places the transmitter LMO into operation. The connections to the switch can be made after the cables have been attached and before the rotary switch is attached to the bracket on the LMO cover.

To embellish the job you can make a little diagram as seen in the photograph to tell you where the pointer lies. This, of course, is not too necessary because if everything is working correctly your dial lights will light when your transmitter LMO is taking over.

Anyone who has the two pieces of gear can immediately discern the inconvenience which this modification removes. Now, all you have to do to leave transceive operation is to lift the transmitter cabinet cover and switch to split operation!

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