Modifying the SX-190 and AX-190 Bandswitch

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The SX-190, made in 1971-1973, and sold variously under the names Allied, Radio Shace, or Realistic, is a good receiver in most respects, but for the serious SWL, it suffers from a lack of ranges. The purpose of this article is to tell you how to increase the number of 500 kHz wide bands below 10 MHz. For each band below 10 MHz you add, a band above 10 MHz is removed. This change is not reversible; **once made, it cannot be undone**, so you should be certain before you start exactly what you want. The AX-190 is the ham band version of the SX-190. The circuitry is similar, but it has even fewer bands below 10 MHz.

First, let's see exactly what the bandswitch is doing. Two of the five switch wafers select the proper crystal for the band selected. The other three wafers, SW1-a, SW1-b and sw1-c, select one of two possible preselector ranges, 3.5 to 10 MHz or 10 to 30 MHz. I have followed the practice of calling the low range 3.5-10 MHz to agree with the instruction/service manual, but Ed Shaw, in the NASWA publication "ALLIED SX-190 Receiver A Consumer's Report" reports that the preselector section actually tunes down to 3.0 MHz, and a 3.0-3.5 MHz band can be added by obtaining the proper crystal. Refer to Figure one for a partial schematic of the SX-190. The preselector tuning capacitor, VC1, resonates with the secondary of T1 to tune from 3.5 to 10 MHz as the preselector tuning control is turned. This is if the bandswitch is on one of the low frequency bands, and SW-1 is open. If the bandswitch is on one of the high frequency bands, SW1 is closed and coil L4 is in parallel with T1. When T1 is shunted by L4, the total inductance is much lower, and the preselector tuning range becomes 10-30 MHz.

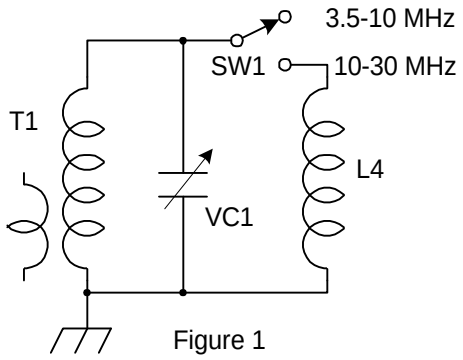
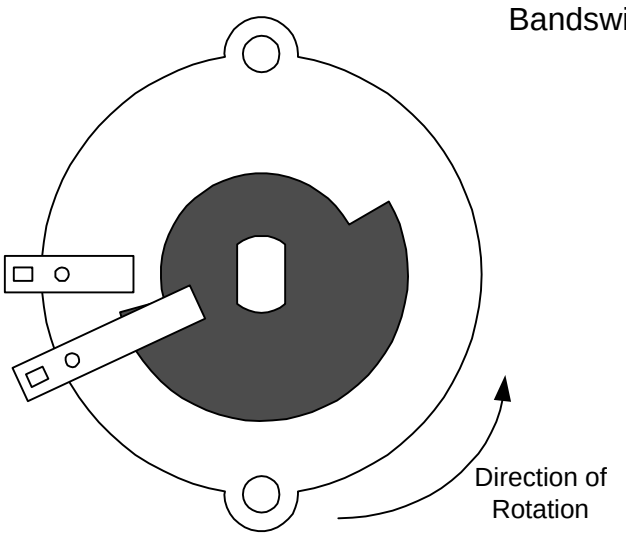


Figure 1

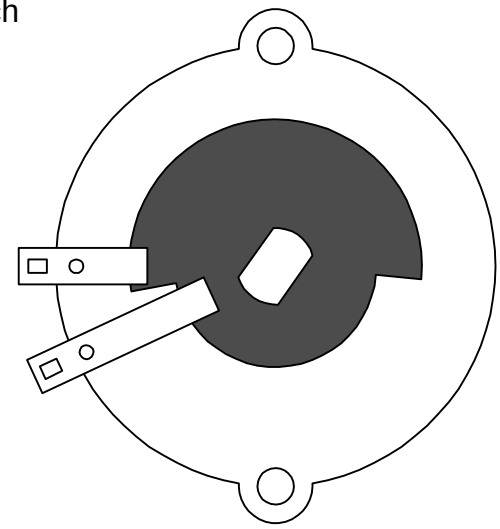
Refer to Figures 2 and 3 to see how switch SW1 operates. This is a view of the preslector switch wafers from the rear of the receiver, with the bottom cover removed. Figure 2 is the switch position in the low band optional position. This is the maximum counter-clockwise position from the front, as you turn the switch, maximum clockwise as viewed from the rear. The lined area is the metal disc which is the moving arm portion of the switch SW1 as shown on the schematic. There are two fixed contacts on the wafer, one long and one short. The short contact make an electrical connection to the disc only part of the time, when the wide part of the disk overlaps the short contact. When there is an electrical path between the two contacts, as shown in Figure 3, then L4 is connected to T1, and the preselector tunes from 10 to 30 MHz.

It now becomes obvious what must be done to increase the number of low band positions. Part of the metal disk must be cut away, so then the two contacts are joined in fewer of the 11 possible switch positions. This is why the change is permanent. Once the disk has been altered, it can't be corrected. The same



Preselector Low Band, 3.5-10 MHz
Max CCW Rotation
Switch Open

Figure 2



Preselector High Band, 10-30 MHz
Switch Closed

Figure 3

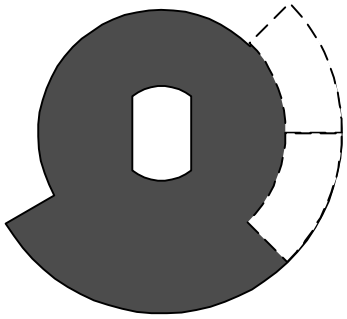


Figure 4

applies to the actual work; only enough material for the desired change must be removed. The best way I know of is to use a small hobby grinder such as Moto-tool, with a small conical grinding wheel. You will cut away part of the disc, as shown in Figure 4, depending on how many bands you want to add. There are three switch wafers to be modified, the three closest to the rear of the receiver. The two front wafers, SW1-d and SW1-e, are used for crystal selection and are not modified. First decide how many bands you want to add. If one band, set the bandswitch to the 11.5 MHz band: if two, set to the 14 MHz band. This will give a wafer position similar to Figure 3. All the wide contact area, which contacts the short fixed contact, is the area to be cut away. Mark the disk with a felt tipped pen just above the short contact. This will be the place to stop cutting. Now turn the bandswitch back to the 3.5 MHz band to turn the disc to that it's easy to access the work area. Carefully grind away the required material, remembering at all

times that the material cannot be restored once removed. The disc is flat to pass between the two contact surfaces of the contacts and must remain so. If it is bent, warped, or has a burred edge, it may deform the fixed contacts, causing a bandswitch failure. Remove all metal filings with a vacuum cleaner, and then spray the discs with a good contact cleaner. Remove the crystals used for the high bands for the switch positions modified and replace with suitable frequencies for the low bands desired. Make new labels for the front panel so that the bandswitch is labeled correctly.

Please make sure you understand this modification thoroughly before beginning, think through each step before taking action, and be careful. Most mistakes in this sort of project cannot be corrected.