

**Black  
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**Serial Audio Video Remote (SAVR)**  
**To**  
**Serial Audio Video Remote v2 (SAVR2)**  
**Upgrade Instructions**

Revision IR – April 23, 2005

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## Revision History

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<b>Rev</b>	<b>Date</b>	<b>Pages</b>	<b>Change Description</b>
IR	Apr 23, '05	All	Initial Version



## Discussion

The SAVR (Serial Audio Video Remote) and SAVR2 (Serial Audio Video Remote v2) are very similar devices, and as a result it is possible to convert a legacy SAVR to the newer, more powerful SAVR2 with very little effort. Some soldering is required, and reasonable care should be taken not to damage the unit during the upgrade process. The upgrade also requires handling of parts sensitive to ESD (Electrostatic Discharge) and again, reasonable care should be taken to ensure proper grounded procedures when handling the parts to prevent damage. This document provides detailed instructions for the end user to make this modification.

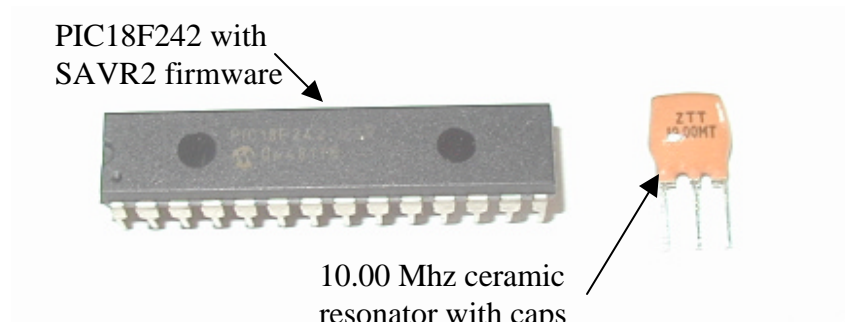
## Required Materials

The following materials are required to upgrade the SAVR to SAVR2 functionality:

- SAVR (P/N: 200000-01)
- PIC18F242 with SAVR2 firmware loaded
- ZTT-10.00MT Resonator with onboard capacitors
- Soldering iron with fine tip
- Tin based flux core solder (fine spool recommended)
- Screw driver
- Pliers
- Drill (optional)
- 3/64 drill bit (optional)

## Modification Instructions

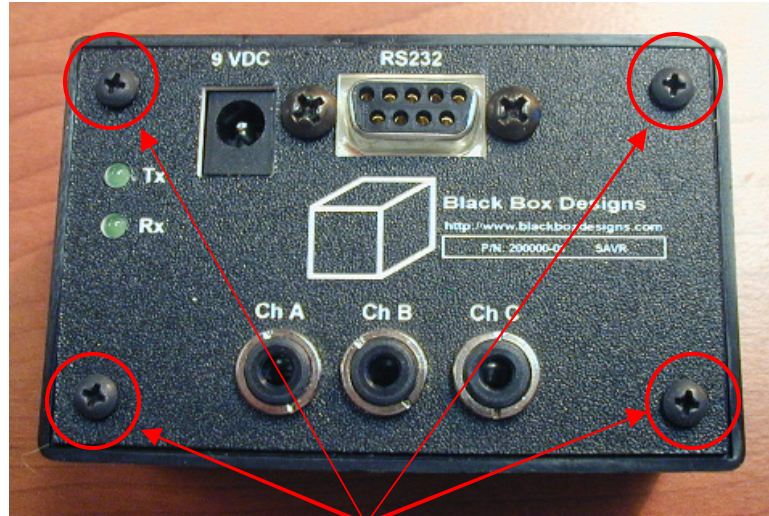
1. Before beginning the modification, ensure that you have obtained the necessary components from BlackBoxDesigns (**Figure 1** below)



**Figure 1:** Required components from BlackBoxDesigns

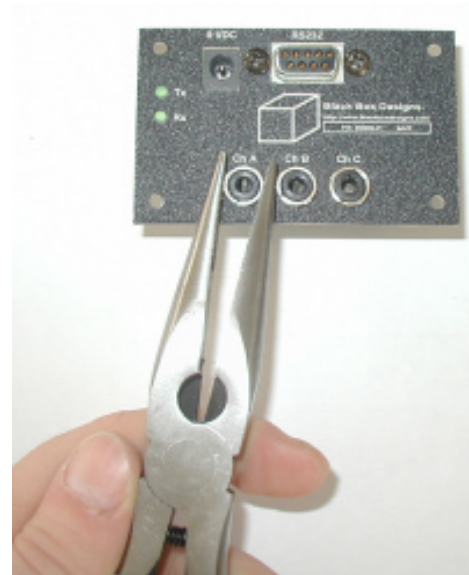


- Using a small screw driver (#1), remove the four screws securing the SAVR cover (**figure 2**).

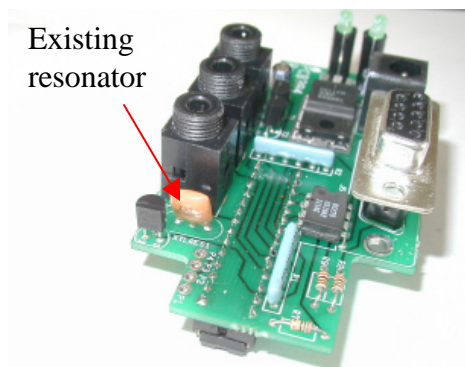


**Figure 2:** SAVR cover screws.

- Remove the face plate from the SAVR by removing two screws from the RS232 connector (#2 screw driver) and three retaining rings around the data ports Ch A, Ch B and Ch C using a pliers (**figure 3**).
- Locate the existing ceramic resonator and remove it (see **figure 4** below).



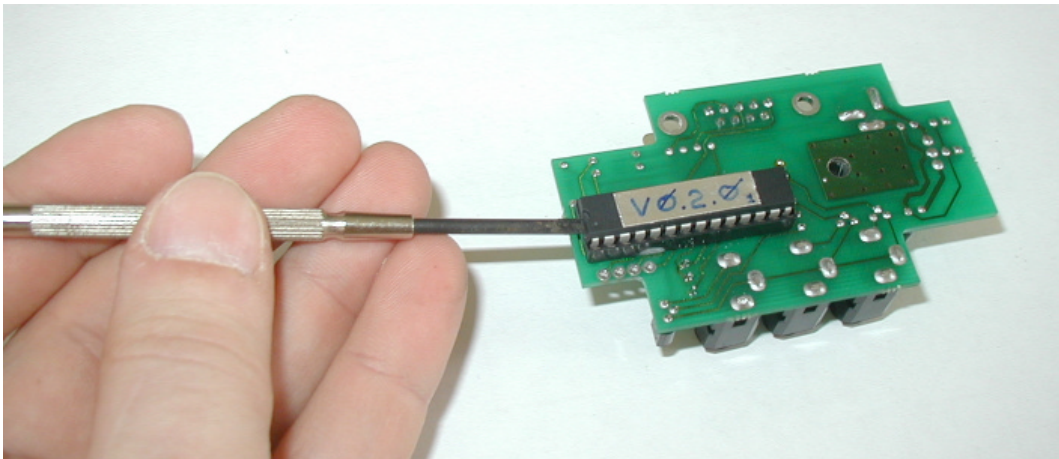
**Figure 3:** Remove the face plate



**Figure 4:** Locate and remove resonator

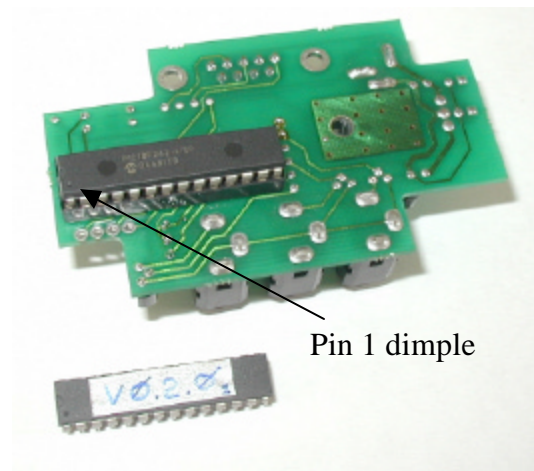


5. After removing the old resonator it may be necessary to remove excess solder from the mounting holes to allow installation of the new part. This can be accomplished using solder suction tools, desoldering braid, or using a 3/64 drill to reopen the holes. For any of these methods care should be taken not to do damage to the circuit traces or solder pads on the circuit board.
6. Install the replacement resonator ZZT-10.00MT in the same location as the old component. Orientation is not critical. Solder into place being careful not to overheat the components, but ensuring a smooth solder bead around the entire component leg and contact pad.
7. Using a small, flat bladed screw driver, remove the existing microcontroller from the SAVR (**Figure 5**).



**Figure 5:** Remove the existing microcontroller from the SAVR

8. Install the replacement microcontroller with the SAVR2 firmware (PIC18F242). Ensure the part is oriented correctly before seating it fully. Pin 1 is indicated by a small dimple in the PIC18F242 and should be at the edge of the board (**Figure 6**).



**Figure 6:** Install new PIC18F242 as shown



9. Check all work to ensure no solder bridges were accidentally created on the circuit board and that the new microcontroller is fully seated in it's socket.
10. Reinstall the face plate and cover screws.

This completes the SAVR to SAVR2 modification. The device will now report SAVR2 and have all the functionality of the newer unit.