

Modifications to the PRC-47 Transceiver / AFBJGM

First I do not believe there is any need for VOX operation in the MARS service so we will begin by disabling the vox. To kill true vox operation locate the audio module (am-3506) to the rear of the unit. Now locate R-40 on that module, you may have to remove the cover to get to it. R-40 is located on the center board of the three boards in the module. Now adjust R-40 counter clock wise until you hear it click or reaches the stop this will cut the vox gain off. Now operate the unit and key the push to talk line if the unit will not key up now you will have to add a jumper wire inside the audio module. The jumper wire goes from pin 11 of P-1 to pin 3 of the vox relay at the collectors of Q6 & Q7.

Next, to modify the receiver audio, first put the frequency selector to the 2000 KC position and then remove the three screws from the front panel on the end nearest the power connector. You can now move the front panel out enough to gain access to the audio control. Remove the knob (it has a bristol type of set screw) and nut and save it. Now clip off the three wires going to the control leaving them as long as you can. Remove the old control and install a new 2.5 K audio pot with a 1/4" shaft using the old nut and knob be sure to locate the control with the three solder lugs facing the audio plug.

The black wire from the old control is used as a ground and goes to the lug on the new control closest to the gear train of the frequency selector. The orange/black and the orange/brown wires from the old control get soldered together and insulation put over them. You can now put the front panel back on and install the three screws. You may have to help the shaft couplers back together to do this.

Now drill a hole in panel where Q1 is mounted between the PA housing and the phillips head screw. (See the overall drawing for the exact location.) Now add ground type solder lugs as follows. One to the nut between J2 and K3 to act as ground for the shield on the cable. Second to the screw behind the spare fuse F3. Third to the screw into the PA housing at the front of the unit, you will have to remove the PA cover to do this as it is a screw nut combination. These last two are only used as wire hold downs so you will not have to solder to them. You can now run a length of two conductor shielded cable from J2 to the new audio control dressing the cable through the hole and then under the hold downs. Now add a 3.0 K ohm resistor to the center lug of the new control and then one of the leads of the shielded cable. The other end of that same lead goes to pin 4 of J2. The other lead goes to the third lug of the audio pot and it's other end goes to pin 6 of J2. You now need to rework the audio module (AM-3506) to work with the work you have just done.

Remove the module from the chassis and remove the cover. Now locate the board with the three pots on it. The one pot located closet to the center of the board is R-54. Remove the board and then remove R-54 from the board. Now run a length of shielded wire from pin 6 of the module socket to the point where C29 and C30 meet. Then run a second lead from pin 4 of the module socket to negative side of C31 and solder shields of cables to chassis ground.

Before replacing the audio module you may want to cut down the transmitter audio gain. I think you will find that this will clear up that mushy and clipped sound on transmit. Locate circuit card E2 it has R-27 on it which is the transmitter audio gain control. Position the module so that module socket is towards you and add a 680 ohm resistor to one end to the left side of R4, that trace runs under transformer T1. The other end goes to the top end of C4 which is the positive end of this cap. Be sure to keep the leads short so that the cover will fit back on. This completes the work on this module and you can now reinstall it back into the unit for testing.

Next is my modification for an RF gain control, it is a little trouble to do but it can be done if you just take your time as you work. This modification will cut the RF gain down but not off. I found this to be the best of all the modifications because it helps you cut the noise down.

First be sure that the frequency selector is set to 2000 Kc position, then locate and remove the signal data translator (CV-1377). Remove the bottom cover and carefully move it back out of the way. Locate the TB2 panel in that unit and remove it by removing the three screws and carefully pulling it out. This unit has a small relay on it (K1) and also the second RF amp (V2). Now locate a 100 ohm resistor on it, (R11) and remove it and replace it with a length of shielded cable which you then run over to A3, P2 module, plug pin 5. Now carefully put the module back together and install it back on the chassis, once again you may have to help the shaft couplers fit back together. Now look at the overall view drawing and note the position of the added reed relay marked RY. Fasten the small relay to the chassis between the four lug tie strip and the small circuit board using silicon bath tub sealer. The relay I used was a five volt type so I needed to add a 1.2K 1/2 watt resistor as a voltage drop this my change with the unit you select. Run the resistor from one end of the relay coil to the +24 volt PTT line which is the orange wire on relay K4. Then add a 100 ohm resistor between J6 pin 5 and one of the relay contacts. Ground goes to the other relay contact and also the other end of the relay coil. Now locate and drill a hole between the audio control and the power switch. Mount the small 50 K pot and run a length of shielded cable between the pot and the relay. The cable goes to the wiper and one end of the pot and also across the relay contacts on the other end.

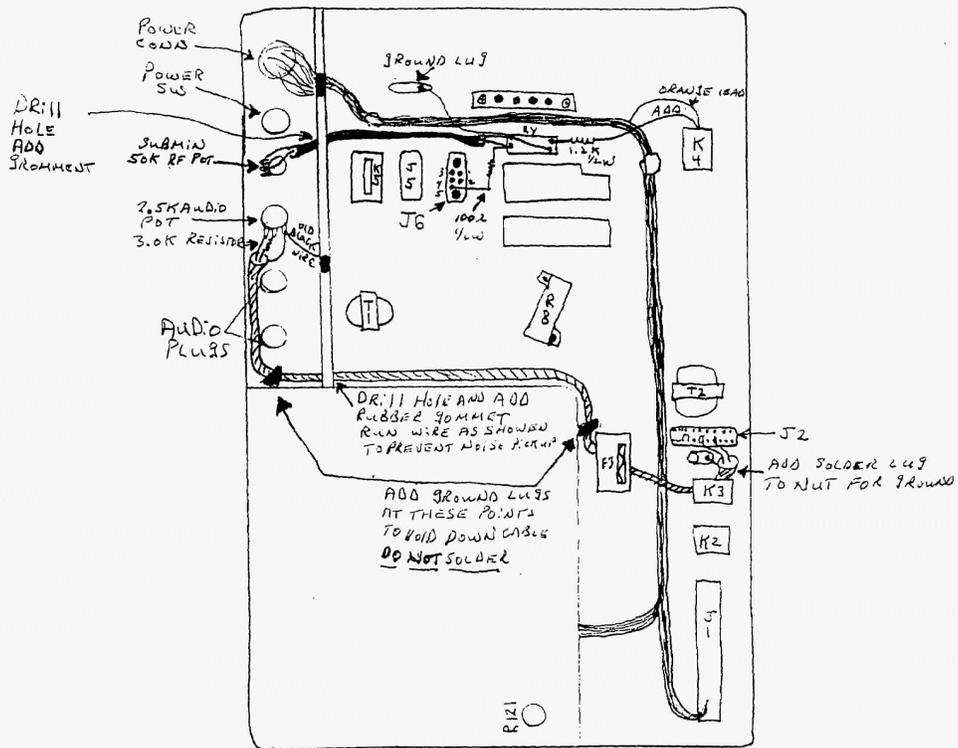
Parts needed for modifications

- 1--Small relay, 275-229 Radio shack or equiv.
- 1--1.2 k 1/2 watt resistor*
- 1--100 ohm 1/2 watt resistor
- 1--3.0 K 1/2 watt resistor
- 1--2.5 K pot 1/4" shaft
- 1-- 50 K pot subminiature with knob
- 2ft length of single lead shielded cable
- 2ft length of two conductor shielded cable

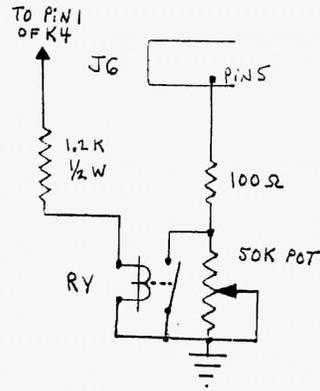
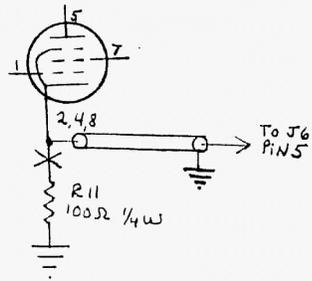
* Value may change with type of relay selected.

Best of luck. AFB3GM

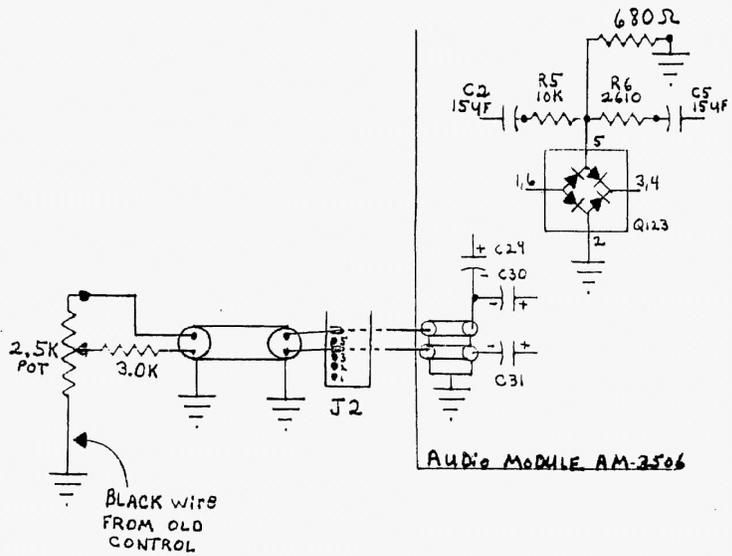
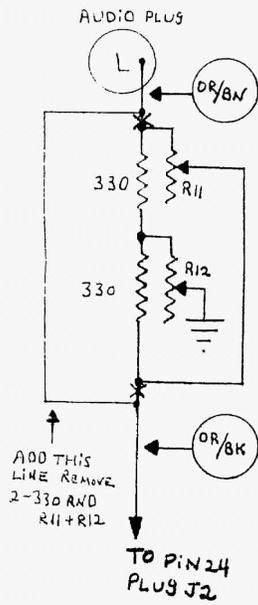
PRC-47 / AFB3 GM



V2 7761
2ND RFAMP



PRC-47 RF GAIN CONTROL AFB36M



Modifications to PRC-47

This first modification will allow for PTT transmit operation as well as VOX operation.

Remove the Audio Module (AM-3506) and check to see if a connection exists to pin 11 of P-1. (Should be present on all high serial numbered sets.) If none is present install a wire connecting pin 11 to the junction of pin 3 of the vox relay, collector of Q-6 & Q-7 and R-44. Install a miniature toggle switch midway between the receive volume control and the power switch. Locate pin F on the microphone/speaker socket on the front panel. Connect a wire from pin F to one terminal of the toggle switch. To the other terminal of the toggle switch run a wire to pin 11 of the audio module socket. When the switch is "ON" the operation will be PTT. When the switch is "OFF" it will be VOX.

The audio gain of the transmit section is very high. when transmitting both the compressor and the audio limiter come in to play. This makes the transmitted audio sound mushy and clipped. The audio gain can be reduced by installing a resistor from the junction of R-5 and R-6 to ground. A 620 ohm resistor was used in the first two units modified.

The next modification is a bit more difficult. As the units were built the audio on receive is run "Wide open". This causes the receiver to be very noisy. For this modification the following parts will be required.

- a. a short length of 2 conductor shielded and insulated wire.
- b. a 1000 ohm audio taper volume control.
- c. a 5000 ohm 1/2 watt resistor.

Remove the knob and mounting nut from the receive volume control located on the front panel Clip the wires close to the volume control then remove the two resistors on the control. The control can be removed by separating the panel from the chassis or by destroying the control then removing the pieces. It should be possible to get the new control into place using a bit of force. Install the nut and the knob on the new control. After stripping one end of the two conductor cable it can be soldered to the control. The only ground on the control should be the shield of the newly installed cable. Run the cable To the audio module socket (P1). Do not run it along side the main cable. The main cable carries the switched output of the power supply transistors and the inductive coupling will produce a loud 400Hz buzz in the speaker when transmitting. Connect the shield of the two conductor cable to pin 1 of the audio module socket. Connect the lead of the two conductor cable that to the clockwise terminal of the new volume control to pin 6 on the audio module socket. Connect one end of the 5000 ohm resistor to pin 4 of the audio module. Connect the second wire of the two conductor cable to the other end of the resistor.

Remove the audio module from the set. Remove the cover and then the screws holding the boards in place. Unsolder and remove the receive volume control (R54). Run a wire from where pin 3 of the removed control connected to pin 6 of the audio module plug (P1). Run another wire from where terminal 2 of the removed control was connected to pin 4 of P-1. Replace the boards and the cover on the audio module and install in the PRC-47.

B. Kellner AFF3WI 11-83