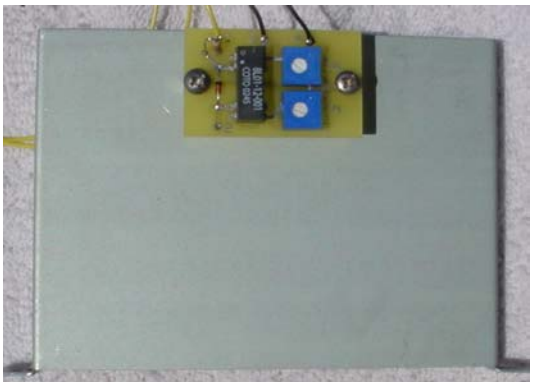
TU-919 Stereo Separation Control PCB Instructions

Introduction

The TU-919 Stereo Separation Control PCB upgrades the unit by allowing control of the stereo separation of both the wide and narrow IF modes of operation. The PCB replaces the single stereo separation adjustment pot found on the audio output PCB. The operation of the PCB is controlled by a relay, which is wired to unused switch contacts of the WIDE/NARROW IF control switch.

***** Before starting any modifications unplug the unit from its power source. Failure to do so may result in serious injury or death from contact with the AC supply of the unit *****

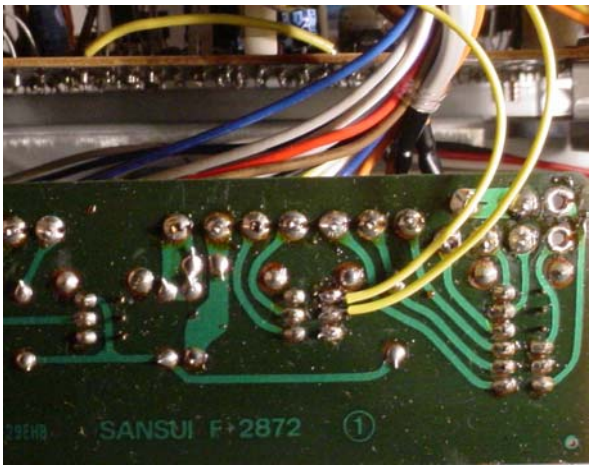
The photo to the right shows a installation of the PCB on the back of the support plate holding the TU-919's audio output PCB. This mounting arrangement keeps the audio path wiring down to a few inches. In this installation 3/8" (9.5 mm) long standoffs were used to mount the new PCB. The two black wires solder in place of the old separation control pot on the audio output PCB. The yellow wire goes to the unit's FM WIDE/NARROW switch on the front panel,



Installation

The picture above shows an excellent place to mount the new separation control PCB. The long yellow attached to the PCB is routed to the bank of front panel switches and is soldered in place to the unused half of the FM Band Wide/Narrow IF switch. The photo below shows the wiring to this switch. The rear two contacts provide a contact closure when the IF switch is in the NARROW position. Solder the yellow wire to the center pin of the switch. Solder another #22 to #26 gauge wire from the end contact of the switch to pin 10 of the TU-919 power supply PCB (positive supply). Be careful not to short out any of the contacts of the switch when installing the wires.

The two short black wires from the new PCB are the signal path wires. Remove VR 01 from the audio output PCB. Insert the two black wires into the holes that that are the opposite ends of the pot. Leave the wiper contact hole of the old pot open. (the legend is silkscreened on the PCB). Solder the in black wires place. There is no orientation between the two black wires. This finishes the installation of the PCB into the TU-919.



Adjustment and Alignment

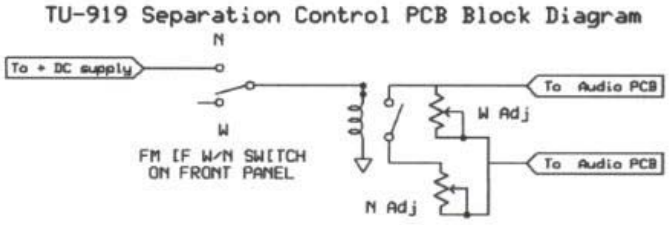
With the PCB now installed the stereo separation of the unit can now be adjusted for both IF bands. Using a high quality FM stereo alignment system, power up the TU-919 and set up the equipment per service manual for this equipment. Set the TU-919 to the WIDE IF mode. There are two adjustment pots on the Stereo Separation Adjustment PCB. One is marked “W” and one is marked “N”. Adjust the “W” pot for optimal stereo separation. Typical separation values of 42 to 55 dB at 1 kHz are typical for the WIDE IF mode of the TU-919 depending on the quality of the alignment gear and the group delay of the ceramic filters used in the WIDE IF chain. The WIDE IF mode separation must be set first since it establishes the base point for both IF bands.

Switch the TU-919 into the NARROW IF mode. Using the “N” control on the new PCB, adjust it for optimal stereo separation. Typical separation values are 30 to 45 dB depending on the bandwidth and group delay of the ceramic filter (or filters) used in the NARROW IF chain. The NARROW IF separation must be set after WIDE separation is adjusted.

Operation

The new PCB replaces the VR 01 pot with a two pot adjustment PCB that is controlled by a relay. The separation control on the TU-919 feeds back a small amount of signal between the two channels to cancel out some of the non-linear elements of the IF and stereo chain. The “W” pot is in the circuit all the time. When the TU-919 is switched to it’s NARROW IF mode, a relay switches the “N” pot in parallel to the “W” pot. The value of the WIDE IF mode pot is higher since there is less feedback needed between channels to optimize separation. As more non-linear elements are introduced into the IF chain (group and phase delay, amplitude roll off), more feedback or coupling of the channels is needed to optimize stereo separation. The “N” pot therefore is half the value of the “W” pot. Pictured below is a block diagram of the PCB and wiring to the IF mode switch.

For units modified with very narrow filters the adjustment range of the “N” part may bottom out. If this happens adjust the value of R35 (stock 330 K) on the audio output PCB downward to 300 K or 270 K. Re adjust the “W” mode again when changing out R35.



Enjoy

This new PCB will allow you to get much better than stock stereo separation performance out of your TU-919. When this PCB is used along with a 3 filter IF FILTER ADDER PCB™, with lower delay ceramic filters, NARROW IF mode stereo separation improves 15 dB on the average over stock performance of the unit

FOR MORE INFORMATION CONTACT

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