



RITEK RIT for Collins KWM-2/2A

10/01/2002

The RITEK RIT (receiver incremental tuning) control was developed for KWM-2/2A in 1992 to "clarify" received signals differing from the transmit frequency indicated by the main tuning dial. The RIT, enabled by a switch, tunes about -1 to +2 kHz with a potentiometer. Transmit frequency is not changed--it is the same as when the RIT is turned off. The RIT controls, SPST switch and a 10 k-ohm linear potentiometer, are not supplied with the RIT. A MIL-Spec pot is available as an extra cost option. The KWM-2 Noise Blanker switch provides a RIT ON/OFF switch.

The RIT installs without modification, added holes, or solder joints in the KWM-2/2A. The RIT comes assembled and tested and needs only to be mounted in the radio with its cable connected to a pot and switch. KWM-2 with 312B-5 version needs a soldered wire. No alignment or adjustments are required with either version.

The RIT board mounts on the back surface of the VFO with two existing case screws and a spring contact connects it to the VFO. A compensating inductor offsets the capacitance of the RIT so dial calibration is essentially unchanged. Fixed valued components are used for best reliability. The RIT is made in USA with fiberglass circuit board, tinned conductors and solder mask. Current drawn is less than 4 mA. Models were tested to 70 C internal temperature in a KWM-2.

The KWM-2 RIT has two cables, one to a 9-pin plug for J17 (for 312B-5 external VFO) and a 5-wire cable goes to external RIT controls. Or, replace the PHONE

jack with the RIT pot, and use the NB switch contact at J-24, pin 4 for ON/OFF control. The RIT pot can be located on or near a cabinet foot, just below the radio.

KWM-2 with 312B-5 version installs in most KWM-2s with one soldered wire added under chassis (LV B+ to SPARE jack); leaves J17 free for 312B-5. Works with or without 312B-5.

RIT may not be compatible with radios equipped with noise blanker. S-line RIT is no longer offered.

Priced at \$79.95 plus \$6.00 for domestic shipping; optional MIL-Spec pot for \$10.00. Specify for KWM-2/2A, or KWM2/2A with 312B-5; provide mail and shipping address. One-year warranty In ten years, there have been no returns. For prompt shipment, send Cashier Check or Money Order made out to JOHN WEBB. RITEK, PO Box 747, Amherst, NH 03031-0747 W1ETC. email: bigspndr@yk.mv.com

RITEK RIT for Collins KWM-2/2A. Instructions 12-2002

Installation: First, be sure you are satisfied with the VFO sideband shift adjustment of C308 as it will be covered by the RIT contact finger. The metal center part of C308 must be clean for electrical contact by RIT contact finger. Use the #4 screw to mount the C308 contact finger on the circuit side of the RIT board in the hole in the middle of the long side of the board. Read the instructions and diagram packed with the RIT and choose KWM-2 #1 or #2, KWM-2 w/312B-5. Early KWM-2/2A may need diode CR-7 in PA screen circuit per Collins SB#6 1-11-62.

With the radio turned off and power cord disconnected from power lines, mount the RIT board on the back of the KWM-2 7OK-2 VFO with the spring contact pressing on C308. Large resistor on the RIT board is 82 k-ohms 2W for KWM-2.

KWM-2/2A: Plug the 9-pin plug into J17 (jumper plug removed).

KWM-2/2A WITH 312B-5 External VFO: RIT interfaces with KWM-2 at rear phono jacks, leaving J17 free for 312B-5. If KWM-2 provides a SPARE jack, wire it to B+ at J17, pin 3; plug in red wire from RIT terminal 8 for power. The control cable from RIT terminal 7 goes to either PA DISABLE. If radio has EXT MUTE instead of SPARE, connect existing wires on PA DISABLE jacks together on jack J6, then wire B+ to J5 (precludes use w/62S-1).

KWM-2 #1. Route the 5-wire shielded cable to an external pot and switch connected as in diagram. Either insert the 4-inch single black wire in pin 4 of J24 (NB socket) for NB switch RIT control, or control the RIT with an optional external switch.

OR KWM-2 #2. Install pot on front panel (in the PHONE jack, or other hole), connect red/green/white wires, and insert the short black wire in pin 4 of NB socket J24. Switch S11 grounds pin 4, J24, in NB position to turn RIT on. See "Phone Jack & Pot".

ADJUSTMENT: Turn the radio on. Zero beat a 100 kHz CAL harmonic with the RIT turned OFF (switch open). Then turn the RIT ON (switch closed) and again zero beat the calibrator with the RIT knob. Loosen the knob set screw and adjust the pointer to UP or 12:00 o'clock and tighten the knob screw. You are done-- clockwise rotation increases frequency with RIT ON.

OPERATION: The RIT draws less than 4.0 mA of current from B+ circuits of the radio with RIT ON or OFF. The available incremental tuning is about -1 to +2.0 kHz. The asymmetry is intended to facilitate CW operation. Wires to switch and pot have voltages less than 20 volts, provided the RIT is mounted on the VFO. Fixed components are used to eliminate alignment and to avoid unreliability of variable parts.

SSB: The RIT allows you to participate in a net and "clarify" stations that are off frequency without changing your transmit frequency. The transmit frequency is the same as when the RIT is turned OFF. Remember that if the RIT is ON and you have tuned it away from the indicated frequency to hear an "off frequency" station, you will not transmit on that frequency.

CW: The RIT makes CW operation much more practical because you can independently tune the receiver without changing the transmit frequency. Remember how if you changed the audio tone by retuning the radio, the other operator heard you on another frequency? With the RIT enabled you can tune a CW signal for a pleasant note without changing the transmit frequency. Remember that the KWM-2 EMISSION switch transmits about 1.5 kHz higher than the dial indicates on CW, in TUNE and LOCK.

TROUBLE SHOOTING RIT PROBLEMS: Normal voltages measured with a VTVM at the white wire are about +8.0 V DC when the RIT is OFF in either Transmit or Receive modes. When the RIT is ON, the control pot varies the voltage from about +4.0 to +12.0 V DC in RECEIVE; the voltage should return to 8 V in TRANSMIT. Receiving frequency should change when the knob is turned with the RIT on, if the spring contact makes a good connection to C308. Low voltage B+ from the radio should be at terminal 8 and on terminal 7 when transmitter is keyed. If these voltages are not found, then look for shorts from the RIT board to ground or the VFO cover and open cable wires.

Installation of the RIT causes no shift of the VFO frequency near 100 on the VFO dial and about 200 Hz at 0 and 200. The shift can be compared to dial readings at all three calibrator harmonics with and without the RIT by separating the RIT from the VFO circuit with a piece of paper under the C308 contact finger. If desired, L302 can be readjusted for best accuracy at 0 and 200 per Collins manual; however it should not be necessary.

Wires to terminal 7 and 8 go to low voltage B+; shorts on these wires will disable the radio. If the RIT tuning circuit malfunctions it may cause the VFO to stop or change frequency. This is evidenced by zero or +17 volts across the 33 k-ohm resistor with RIT installed and input voltage present. RIT can be quickly isolated from VFO with paper under contact finger.

PHONE JACK AND POT (KWM-2/2A: Optional Pot mounting.

The phone jack is easily removed for mounting the RIT pot in a panel hole. Unsolder the two single wires from the jack and join them together; cover with tubing or tape. Unsolder three wires to jack body and tape them (one is grounded). Install RIT pot in PHONE jack hole and save the jack for future reuse. Route control cable to the right of VFO, over upper-right meter screw, and down the side of the radio to pot. Be sure your route allows future removal of the pot without unsoldering wires--or that the pot will pass through the route for RIT removal. Tie a loop of cable over the meter screw for neatness. If you can find a

10k linear pot with push-pull switch that closes on PULL, then the pot and switch are the same part and use of the NB switch position will be unnecessary. Such a pot and switch has not been available. If the NB switch is used, the black and ground cable wires are not used at pot end of the cable; cover them with tape.

WARRANTY: RITEK is not responsible for damage to equipment in which the RIT is installed or equipment modified for use with RIT. The RIT is warranted for component failures and assembly defects (but not for physical damage), for one year and may be returned for repair or replacement at RITEK's option. RIT's sent for repair must be accompanied by funds for return shipping. Prior arrangements are required for return of merchandise. After 10 years, there has never been a RIT return. RITEK, Box 747, Amherst, NH 03031-0747. Email: bigspndr@yk.mv.com

Parts list: RIT board with 5-wire cable, contact finger and #4-40 screw w/nut and two #6-32 nuts.

KWM-2/2A: 6-inch power cable for J17, wire for J24, and 82 k / 2W resistor.

For 312B-5 installation, the power cable is two wires to phone jacks.

Notes: 10 k control pot not supplied; optional at added cost.

CW Notes:

The KWM-2 RIT control is designed to provide 1 kHz of frequency change on the counter-clockwise side (from 12 to 8 o'clock) and 2.5 kHz of frequency change on the clockwise side (from 12 to 4 o'clock). This additional RIT freedom is for CW operation where the radio operates on upper sideband. The intent is to allow +/- 1 kHz of RIT range for lower and upper sideband; and more for CW, where upper sideband uses a frequency offset. Resistors on the board were chosen for different values for upper and lower sideband offset by intent, and the differences were not intended to be symmetrical.

The KWM-2 offsets the radio frequency by TONE OSC V2B by 1,450 to 1,750 Hz depending which Collins version. With the radio dial calibrated, the transmitter frequency is higher by the amount of the TONE OSC. Thus, if we receive on the same frequency as the transmitter frequency, the receiver delivers an audio beat (BFO) frequency of from 1,450 to 1,750 Hz. This is too high to be pleasant for many people; 500 to 1,000 Hz is a more preferred audio note. The RIT lowers the audio frequency in the clockwise direction (12 to 4 o'clock) and may need as much as 2,000 Hz to zero-beat the CW frequency. The RIT provides up to 2,700 Hz with some overlap; and equal RIT control ranges were not intended.

S-Line with RIT: The diagram will show use with S-line radios. RIT for S-line was tested and one is in service. However, there was never a demand, so it no longer appears in the instructions. If there is need for RIT with S-line, contact RITEK.