M45-1-1

---------------MODIFICATIONS FOR KENWOOD R-5000----------------

by Dom Moman

MW SENSITIVITY INCREASE

Stock MW sensitivity is adequate for most users, but with an unamplified loop or while DXing in very quiet location, more gain could be used to advantage. All mods are performed on the RF board, which is located on the underside of the set, on the side nearest the antenna connections. The MW bandpass input filter contains a fixed attenuator, consisting of R9, R10 and R11. Jumper R10 with a short length of wire, and cut R11. Then simply cut R9 and put a 470 ohm resistor in series to increase the resistance. Values aren't critical but there must be a DC path for the switching control voltage. The 470 ohm resistor allows the DC switching voltage to pass but introduces very little attenuation to the RF signal. A quick version of this mod is to clip either one (not both) of R9 or R11. This gives quite an increase in gain, with minimum effort.

LW SENSITIVITY INCREASE

The LW bandpass filter has no fixed attenuator but R7 can be increased by installing a 470 ohm resistor in series with it. This brings up the sensitivity somewhat but there still is some loss through the lowpass filter components (L7 - L9, C19 - C26). I do not suggest changing or altering this at all, since it provides a large degree of rejection to local signals above 500 khz.

SSB LEVEL INCREASE

The R-5000, with its extremely accurate and stable tuning, good filter options and pleasant audio, is an excellent performer for non-synchronous heterodyne detection (NSHD), a fancy name for tuning an AM signal in the SSB mode. However there is a considerable difference in level when switching between AM and either SSB position. A simple cure is to increase the SSB detector output by paralleling R148 on the IF board with a 22K ohm resistor. R148 is pretty small, physically, and you may wish to lift the IF board and unsolder it, and replace it with a 27K resistor. Again, the value isn't that critical.

BEEP TONE ADJUSTMENT

If you get tired of listening to all those beeps and morse code letters as you attack the various front panel keys, there is an easy way to change it. VR8 on the IF board adjusts the "beep" level from very loud to completely off. Guess where I adjusted mine! The audible beep and morse identifiers can be of use in some situations, as in a dark room or if you are visually handicapped, since they indicate which mode you have selected, or if you have made some sort of error (4 quick beeps). On the CONTROL board (X53-3020-XX) there are additional ways of controlling and modifying the beep tone. Diode D9 enables the "Beep" oscillator. D66 selects between Morse and a single beep for the mode annunciator.

SCANNING MODIFICATIONS

In memory scan, the R-5000 will pause a few seconds on each frequency stored in an SSB mode, regardless of whether a signal is present or not. AM and FM channels halt scan only if a signal is present i.e. BUSY light is on. For more conventional scanning operation, Diode D68 on the CONTROL board (located on the rear of the front panel) should be cut. This lets the scan stop only on a "BUSY" channel, regardless of the mode. The scan will resume after a few seconds. Scan speed and resume time is adjustable via the trimpots on the board attached to the rear of the squelch pot. Jumper W64 on the IF board controls timed or carrier operated scan resume. Cutting W64 will cause the scan to halt as long as a carrier is detected. W64 is located between plug J2 and J10, near the center of the board. Since the scan mode desired may change according the band, mode and operator, it would be very convenient if these functions were switchable without soldering jumpers and diodes! Possibly, some miniature DIP switches or small toggle switches could be mounted on the rear panel.

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Obsolete

Kenwood R-5000 Modifications

by Don Moman

MW Sensitivity Increase

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LW Sensitivity Increase

The LW bandpass filter has no fixed attenuator, but R7 can be increased by installing a 470 ohm resistor in series with it. This brings up the sensitivity somewhat but there still is some loss through the lowpass filter components (L7-L9, C19-C26). I don't suggest changing or altering this at all, since it provides a large degree of rejection to local signals above 500 kHz.

Diode Front End Protection

RF protection is afforded by D6 and D7, which conduct if excessive RF voltage is applied to the input. They may also conduct on strong MW signals, causing severe overload. To prevent this, front panel switchable 10, 20 or 30 dB attenuators are provided. Since the diodes are placed after the attenuators, strong signals can easily be reduced below the conduction level. D6 and D7 should not be removed unless you replace them with an alternate form of RF protection.

SSB Level Increase

The R-5000 is an excellent performer for non-synchronous heterodyne detection (NSHD), a fancy name for tuning an AM signal in the SSB mode, often inaccurately referred to as ECSS tuning. Whatever mode you choose to call it, the R-5000 does it very well with its extremely accurate and stable tuning, good filter options and pleasant audio. However there is a considerable difference in level when switching between AM and either SSB position. A simple cure is to increase the SSB detector output by paralleling R148 on the IF board with a 22k resistor. R148 is pretty small, physically, and you may wish to lift the IF board and unsolder it, and replace it with a 27k resistor. Again, the value isn't that critical.

Beep Tone Adjustment

If you get tired of listening to all those beeps and morse code letters as you attack the farious front panel keys, there is an easy way to change it. VR8 on the IF board adjusts the "beep" level from very loud to completely off. Guess where I adjusted mine! The audible beep and morse identifiers can be of use in some situations, as in a dark room or if you are visually handicapped, since they indicate which mode you have selected, or if you have made some sort of error (four quick beeps). On the CONTROL board (X53-3020-XX) there are additional ways of controlling and modifying the beep tone. Diode D9 enables the "Beep" oscillator. D66 selects between Morse and a single beep for the mode annunciator.

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The Lowe HF-125

via Ben Peters

This British receiver was described in the March 7, 1987 Technical Column. Since then, articles describing its circuit design have appeared in the British magazines Practical Wireless (March and April 1987) and Electronics and Wireless World (April 1987). What is really stunning is how little of the space on the circuit board actually processes the signal. It is a dual conversion set using two Plessey SL6440 mixers, while the IF amplifier/AGC and detection circuitry are on a Plessey SL6700 IC, i.e. there are three active devices between the antenna and the audio amplifier! Mind you, there are RF and IF filters and an RF attenuator controlled by the AGC line in there too, but the bulk of the board is taken up with the synthesized oscillator, memory circuitry, and the large amount of electronic switching necessary to make a receiver like this function. The Plessey IC's are described in QST of April 1981, and the SL6700 is covered in the DXM of April 16, 1983.

Unfortunately, a review of performance appears only in the Practical Wireless article, and it mostly states that laboratory tests verify that the given specs are accurate. It does point out the the 2.5, 4 and 7 kHz IF filters have a shape factor of better than 1.6, and that the S-meter is quite accurate. The keyboard tuning option is recommended, especailly as the reviewer had difficulty in getting the tuning knob to zero in on a signal due to overshoot, a not unusual problem with electronic tuning knobs which automatically speed up tuning as you turn the knob more quickly. The optional synchronous AM detector worked best on signals suffering some types of selective fades, but was not always effective.

An extensive review of the Lowe HF-125 is available from IBS, Box 300, Penn's Park, PA 18943 for US$4 (overseas US$6). The set is sold in the USA by Universal Shortwave, 1280 Aida Drive, Reynoldsburg, OH 43068.

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More on Sloping Random Wire Antennas

by NHP

In DXM #719, dated April 27, 1985, Jim Herkimer gives a brief description of his use of a random wire antenna which sloped down to ground level. The antenna was directional from the low end, whether the receiver was fed by the high end or the low end of the wire. He also found that grounding the low end of a 120' long sloper (receiver was fed at the high end) meant increased antenna directionality.

I used an 85' sloper during the day at Pender Island, B.C. which was pointed at 275°, and could be grounded in salt water. The receiver used was a SONY 2010 with a step attenuator. As most of my test stations were off the back of the antenna, it wasn't too surprising that a 15' high vertical gave better signal strengths (up to +12 or 14 dB, though most were in the 3-4 dB range), than the ungrounded sloper, on all but the few signals within 50° of the end of the sloper. These signals were about equal on the sloper and the vertical. An anomaly was that a couple of signals directly off the back of the sloping antenna were also about equal in strength of the vertical and the sloper.

Below about 1350 kHz, there were not really significant signal strength differences between the grounded and ungrounded sloping antennas. However, there were no signals in this frequency range which were really off the end of the antenna, not within ±90°. Above 1350 kHz, there were stations located off the end of the wire, and these increased in strength about 8 to 10 dB when the end of the wire was grounded in salt water.

I was not able to try the sloper and vertical at night on skywave (antenna comparisons are often difficult on such signals anyway), nor on any Australians which may have been coming in at dawn. My results were not too spectacular in favor of the grounded sloper, but such results may have been due to the less than optimum angle of the sloper (about 30°) and relative shortness of the wire. Perhaps Jim will be able to give us some conclusions from his own sloper observations at some future date.

In the meantime, Jim offers a few words on the "snake" antenna: "The snake antenna is quickly gaining popularity among 160 meter amateur radio operators as a simple, yet effective low noise receiving antenna and as a makeshift transmitting antenna. It consists of 130 to 150 feet of coaxial cable, of which any type of coax will work fine. The far end of the coax has the center conductor tied to the braided shield. The other end, where it is connected to the receiver, has the braided shield broken approximately an inch back from the end, leaving only the center conductor connected to the receiver. Amateur radio operators claim that the coax is simply stretched out on the ground, in a straight line, and the antenna is directional off its far end. (Therefore, the longer the better). It is generally used with a matching device to accept power from a transmitter. However, I'm not sure if a matching device is necessary for receiving purposes only. A fellow in Florida worked another ham in Italy with such an antenna, running a transceiver "barefoot", i.e. no linear amplifier, so it does indeed work"