



MONARCH

MODEL FSI-3

FIELD STRENGTH INDICATOR & STANDING WAVE BRIDGE

The Model FSI-3 is a handy, compact device for the amateur radio station in checking transmitters operation. For SWR measurements, it uses the bridge method of comparing the power supplied to and reflected from the antenna system. The operation is simple, and accurate matching of the transmitter to the antenna can be done quickly. Continuous monitoring of the transmitter output is possible by having the instrument in the circuit at all times. The Model FSI-3 can be used as a simple field strength meter by disconnecting it from the feedline and attaching a small pickup antenna.

SPECIFICATIONS

SWR: 1 : 1 to 1 : 10
ACCURACY: $\pm 5\%$
IMPEDANCE: 52 ohms
INDICATOR: 100 DC microammeter
ANTENNA: 5-section, collapsible
DIMENSIONS: 6" \times 2" \times 2 $\frac{7}{8}$ "
WEIGHT: 14 oz.

OPERATION

SWR Measurement

1. Turn the transmitter off. Disconnect the antenna coaxial cable at the transmitter output.
2. Connect the FSI-3 "TRANSM" connector to transmitter output, and "ANT" to antenna connector. A short cable equipped with male connectors on both ends will be required between the transmitter and FSI-3.
3. Set the center switch to "FWD" and rotate the adjusting knob to near minimum position (counterclockwise).
4. Turn the transmitter on, rotate the adjusting knob for full meter swing.
5. Next set the switch to "REFL." Read the meter scale. The indication will give the SWR (TOPSCALE) reading directly.
6. A perfect matching, viz., 1 : 1 ratio, is ideal from the theoretical point of view. Adjustments on the transmitter and antenna system should be made so that the SWR is as low as possible. An SWR of 1.5 is considered satisfactory, taking into account the line losses and slight mismatching. The

operator is referred to the numerous articles in radio magazines and books dealing with the various proper matching methods of different types of antenna.

7. The power required for the SWR bridge operation is dependent on the frequency, about 25 watts at 3.5 Mc, 15 watts at 7 Mc and proportionately lower powers at higher frequencies. If the transmitter power is not sufficient and a full meter swing cannot be achieved in STEP 5 above, than adjust the transmitter and antenna system for the lowest possible swing at the "REFL" position of the switch.

IN CIRCUIT MONITORING

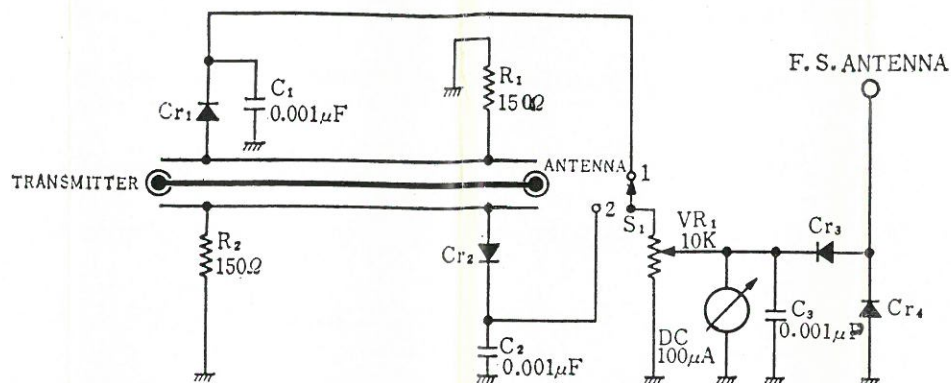
The FSI-3 can be left continuously in the circuit for monitoring the transmitter outputs up to 1KW. Set the switch to "FWD" and adjust the knob for a meter swing to about midscale with the transmitter on. Any abnormal variations in the transmitting system will be detected quickly. The instrument consumes practically no power for this purpose.

FIELD STRENGTH INDICATIONS

This instrument is designed so that comparative RF field strengths can be determined. A pair of diodes has been inserted in the circuit to rectify the RF energy picked up by a small antenna. Remove the instrument from the transmitter output circuit and restore the former transmitter-antenna connections.

1. Set the switch to "FWD".
2. Fasten the collapsible pickup antenna to the jack at the top of the case and extend it to full length.
3. Bring the FSI-3 in the vicinity of the transmitter or antenna system, with the transmitter in operation. Be careful that the pickup antenna does not come in contact with any metallic portions of the transmitter or antenna.
4. The adjusting knob is rotated to obtain a convenient reading on the meter. In presence of strong RF fields, shorten the antenna.

SCHEMATIC DIAGRAM



- ** Cr_1, Cr_2 - - - SD-34 (1N13, 1N-38, 1N-34 etc)
- ** Cr_3, Cr_4 - - - 1NA4G (1F21S, 1N13, 1N-38, 1N-34 etc)
- ** S_1 - - - - - 1. FWD
2. REF

5. After the afore mentioned steps have been taken, any adjustments performed on the transmitter or antenna will be reflected by a increase or decrease on the meter while reading the RF scale.

DETERMINING PERCENTAGE POWER OUTPUT

By utilizing the (%) REF POWER (center scale) reading, the wattage output of your transmitter may be determined by calculations.

WARNING: SEVERE DAMAGE CAN OCCUR IF THE GAIN IS SET TOO HIGH WHEN POWER IS APPLIED.