

# Johnson

## SIGNAL SENTRY

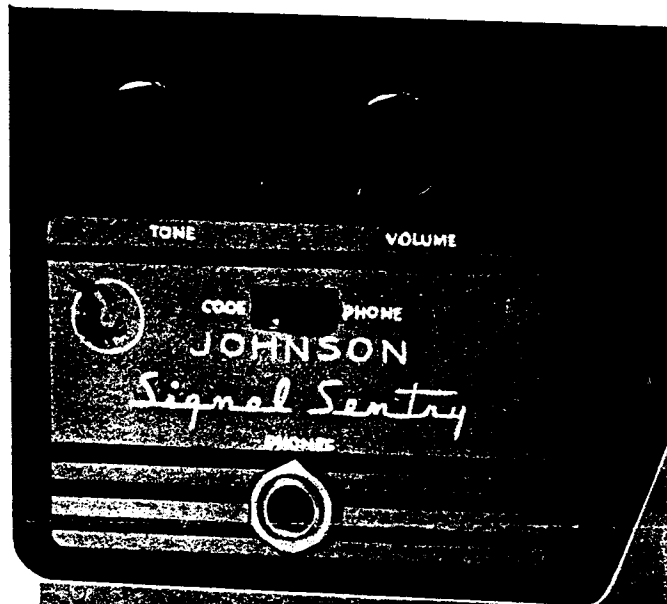
**CW/Phone Monitor • All Bands • No Tuning**

A non-frequency sensitive, RF actuated monitor for either CW or phone, the JOHNSON Signal Sentry also acts as an "on the air" indicator and provides for "break-in" operation. Used in conjunction with any receiver, the unit is designed to operate on all frequencies to 50 mc without tuning.

The Signal Sentry provides a pleasant, non-tiring CW monitoring tone which follows the keyed signal of the transmitter. It also demodulates and amplifies the signal on phone for monitoring audio quality and checking carrier distortion and hum. CW tone is adjustable from the front panel, and a separate audio volume control permits adjusting the Signal Sentry volume independent of the volume setting of the receiver. Because it is triggered directly by transmitter RF energy the unit acts as an "on the air" indicator. The Signal Sentry is also designed to provide "break-in" operation by muting the receiver audio system when it is energized by the transmitter RF. In addition, the Signal Sentry can be easily adapted for use as a code practice oscillator.

Installed simply by connecting external power supply, plugging into receiver headphone jack, plugging phones into monitor and coupling an RF probe to transmitter output. After the initial adjustment, no further attention is required.

The attractive maroon cabinet, only 3 $\frac{3}{8}$ " high, 3 $\frac{3}{8}$ " wide, and 3 $\frac{3}{4}$ " deep, takes up very little space on the operating table. Unit is supplied wired and tested, and includes all cables and connectors for installation. Tubes required but not furnished: One 12AX7, one 12AU7.



### Performs Four Important Station Functions

Monitors CW Signal

Monitors Phone—Checks Audio Quality

"On the Air" Indicator

Mutes Receiver for "Break-In"

**\$14.70**  
Amateur Net



**E. F. JOHNSON CO., WASECA, MINNESOTA**

# INSTALLATION AND OPERATING INSTRUCTIONS

## CIRCUIT & OPERATION

The circuit of the monitor is shown in Figure 1 and consists basically of a 12AX7 tube as a dual amplifier and a 12AU7 tube, one section of which, in conjunction with an NE-2 neon lamp, serves as an oscillator, the other section as a diode.

With the switch in the CW position, as shown in Figure 1, a small amount of RF energy, fed into pin jack J2, is rectified by the diode section of the 12AU7. The negative voltage developed across the diode load resistor R8 is applied to the grid of the remaining 12AU7 section and to the grid of the one section of the 12AX7.

1. The 12AX7 is cut off thus muting the receiver because the audio signal from the receiver (through PL1) cannot pass through to the headphones connected to J1.

2. The negative voltage also cuts off the 12AU7 causing the plate potential to rise to a value which will ignite the neon bulb NE-2. This bulb with C6, R10, R11 and R12 form a relaxation oscillator, the frequency of which is adjustable by means of the TONE control, R11. The output of this oscillator is coupled to the 12AX7 amplifier with the volume level adjusted by the VOLUME control, R6.

It should be noted that the tone heard on the monitor is not an exact reproduction of the transmitter CW signal. A slight click may be noticeable which is a characteristic of the neon type oscillator. If it is desired to check the transmitter for key clicks and/or chirps, the usual methods (such as a shielded receiver) should be used.

With switch S1 in the PHONE position, the RF energy is still rectified at the first half of the 12AU7 and modulation on the carrier such as speech, hum, etc. is fed to the second half of the 12AX7 through capacitor C2. Since the switch also opens the B+ circuit to the oscillator, no tone is generated.

When the transmitter is not operating, no energy is fed to J2 and the first section of the 12AX7 operates as an amplifier of the receiver output. The volume level is then controlled by the receiver volume control.

## INSTALLATION

The Signal Sentry is installed by attaching the power cord to a power supply with a plate voltages of 175-300 volts and 6.3 volts filament. Plate power required for the monitor is only 3 MA so the average receiver can easily supply the necessary power. The lead with the red tracer should be connected to B+ (positive plate voltage), the shield to B- (ground) and the leads with no tracer and with black tracer to the 6.3 volt filament source. If the receiver or other power supply has a power outlet socket, the leads can be soldered into the octal plug supplied with the monitor for this purpose.

If the receiver does not have a power outlet socket, a turret type plug-socket can be used in the receiver power output stage. In this case the power output tube is removed, the turret assembly plugged into the socket (after it has been wired to Signal Sentry power cable), and the output tube plugged into the turret socket. Be sure to connect leads straight through on the turret assembly so the power output tube will receive normal operating potentials. The Signal Sentry power cord should be connected to the turret so that B+ is obtained from the screen (usually direct B+ line in receiver). The filaments connect to the filament pins and the shield, B-, to chassis ground.

A bare end of an insulated wire should then be inserted into J2 and the other end loosely coupled to the output of the transmitter or antenna coupler. The coupling should be adjusted on the frequency where power output is lowest (usually the highest operating frequency) for the minimum coupling which will give a consistent and vigorous oscillation of the neon lamp oscillator. The correct value of coupling normally is a little more than necessary to light the neon lamp.

The RF probe should not be inserted into the shielded enclosure of a TVI suppressed transmitter as the probe could radiate harmonic energy. Coupling should be made to the transmission line or antenna coupler \*after the TVI filter. A turn or two around a 300 ohm or open wire transmission line will be sufficient. Where coaxial line is used in a shielded system, a small oval cut out through the shield of the coax line with two or three turns of the probe wrapped tightly around the cable over the shield opening will enable sufficient RF pickup with negligible effect on the impedance continuity of the coaxial transmission line.

## OPERATION AS AN AUDIO OSCILLATOR

The Signal Sentry may be used as an audio oscillator by connecting a flashlight cell to the junction of resistors R8 and R9 and in series with a key to ground as shown in Figure 1. The power cable should be connected and the switch S1 should be in the CW position. There is, of course, no need to feed RF energy into J2 or to plug PL1 into the receiver.

Attempting to secure the Signal Sentry power from AC-DC type receivers is not recommended. In this case a separate power supply or other available source should be used.

For Viking Transmitter owners the monitor power cord can be wired to plug into the VFO power socket if VFO is not used or uses a separate supply. If a Viking VFO is used, power can still be taken from the Viking Transmitter by connecting a "turret" type plug-socket between the VFO plug and the transmitter power socket.

\*The Johnson "Matchbox" antenna coupling system has provision for installing an RF probe for the Signal Sentry monitor.

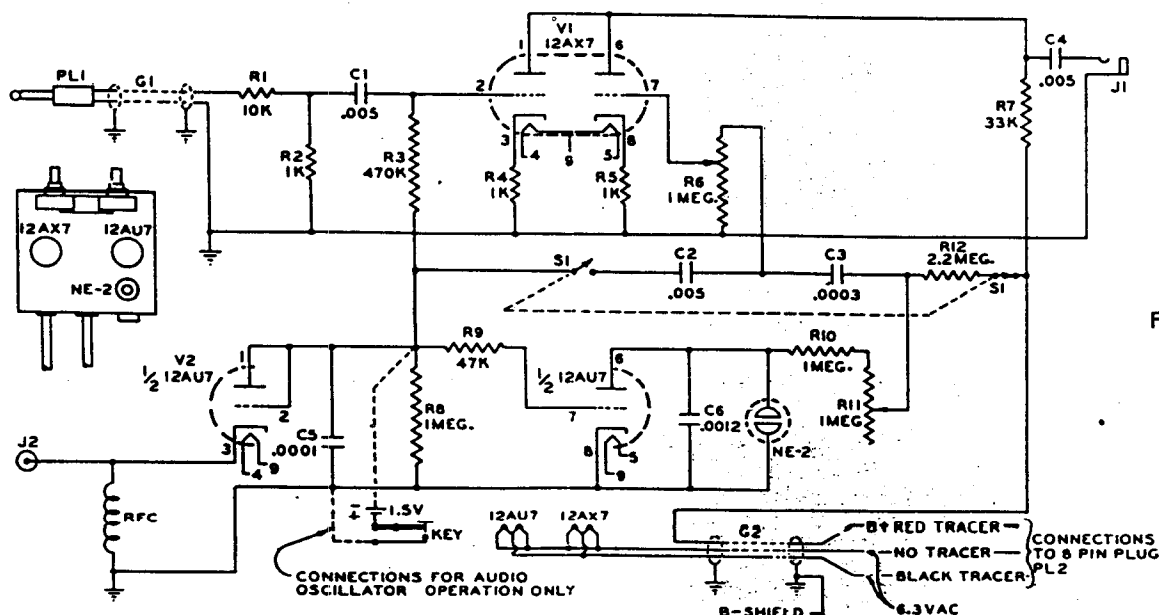


Figure 1

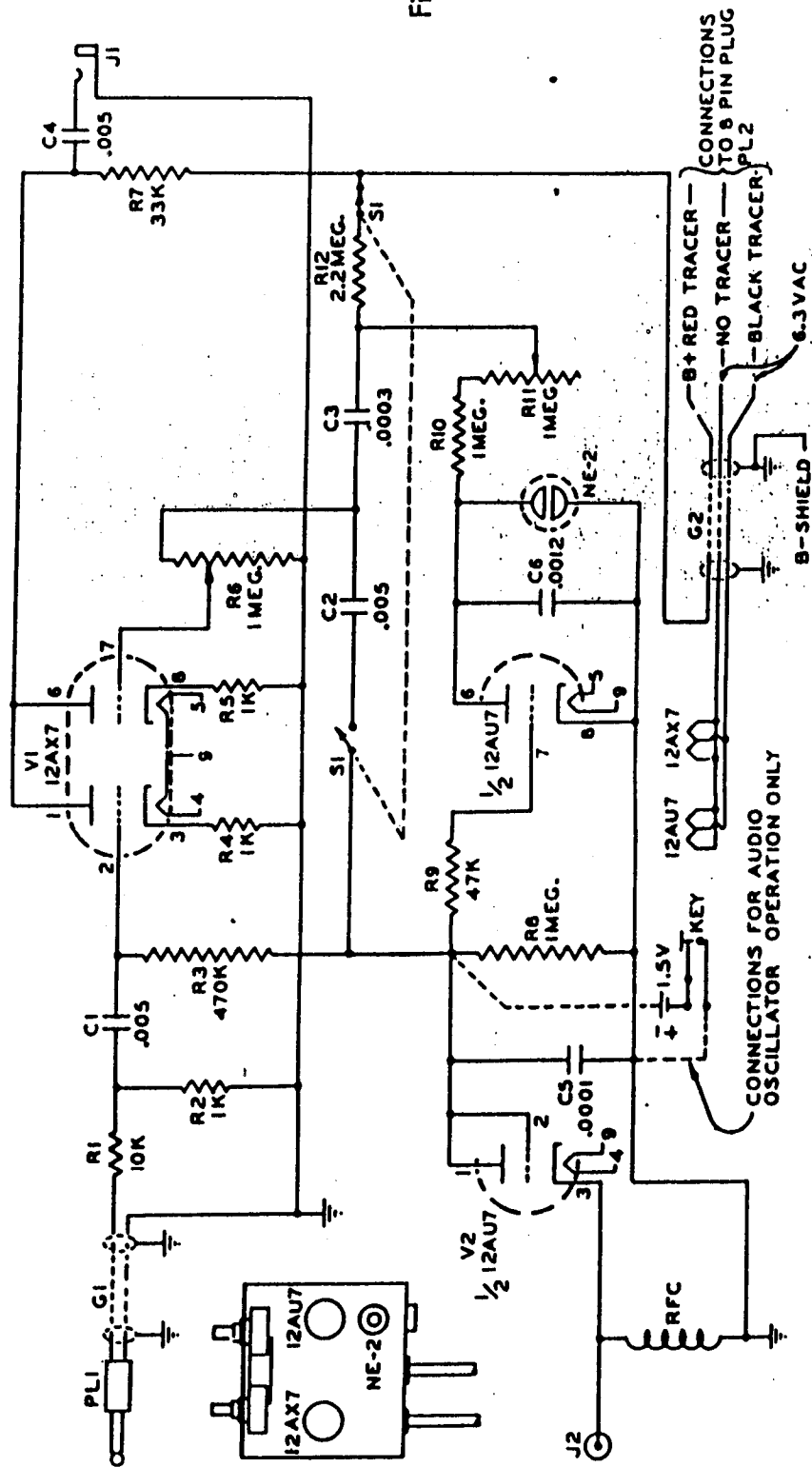


Figure 1