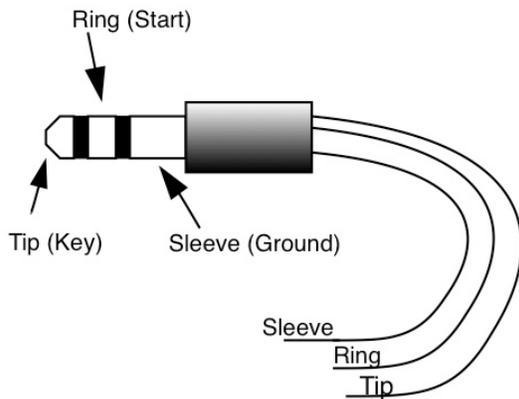


LDG ELECTRONICS TUNER INTERFACE

Congratulations on selecting an LDG Electronics automatic tuner! Nearly all LDG tuners include a tuner interface jack, which will control most Icom and many Yaesu radios when used with the appropriate interface cable. This jack may also be used to control other radios, if a “homebrew” interface cable is constructed. This application note describes the specifications of the LDG tuner interface jack, in order to aid in designing your own interface cable.

TUNER CONNECTOR

The tuner interface uses a standard 1/8” stereo jack. There are three contacts on the stereo plug; the tip, the middle ring, and the ground sleeve.



The tip, or **KEY** line, is an *output* to the radio. The tuner shorts this pin to ground to instruct the radio to begin transmitting a carrier.

The ring, or **START** line, is an *input* from the radio. Short this pin to ground to request a tuning operation from the tuner.

The **GROUND** connection is digital system ground (zero volts).



KEY LINE DESCRIPTION

The **KEY** line output from the tuner is an open-collector output, which can sink an absolute maximum of 100 mA. There is no onboard pullup resistor on the tuner, so this pin is floating when not active. When using an external pullup, do not connect the pullup resistor to a source of more than 30 volts DC.

The **KEY** line is pulled low to signal to the radio that a CW tuning carrier is requested. The **KEY** line will remain low for the duration of the tuning cycle.

START LINE DESCRIPTION

The **START** line input to the tuner should be driven with an open collector driver or SPST switch that shorts the **START** line to **GROUND** to request a tuning operation. The **START** input consists of a very weak (1 MΩ) pullup resistor to either 5 or 12 volts DC (depending on model), and a comparator which checks to see if the input voltage is less than 700 mV.

The operation requested by the **START** input depends upon the length of time the **START** line is held low.

Duration	Operation
64-96 mS	Toggle Bypass
430-620 mS	Request Memory Tune
>2.5 Sec	Request Full Tune

The requested action does not take place until the **START** line goes high again (no longer shorted to **GROUND**).

EXAMPLE APPLICATIONS

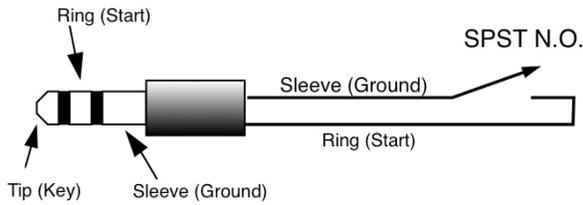
While the most common application of the tuner interface is to directly control a transceiver automatically via the **TUNE** button on the tuner, other applications are possible.

Ex. 1 - Remote Tune Switch

Simply connecting a momentary contact, normally open SPST pushbutton switch to the **START** and **GROUND** terminals of the tuner interface yields a remote tune request switch. This would be useful if the tuner is mounted far from the radio, for example, in an automobile.

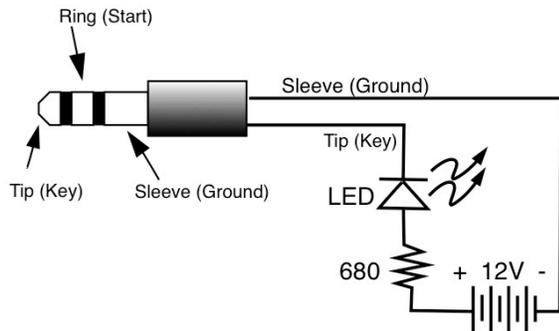
Ex. 1 (continued)

The following diagram shows an example remote tuning switch:



Ex. 2 - Remote Tune Request Indication

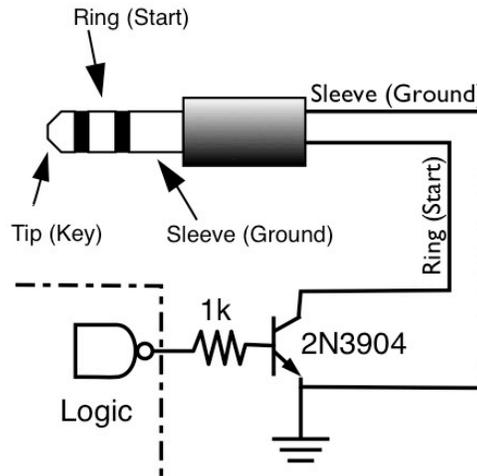
The tuner interface's **KEY** line can sink up to 100 mA when the tuner is requesting a carrier from the radio. You can take advantage of this and create a remote tuning indicator lamp using a DC source, a series resistor, and an LED. When you push the **TUNE** button on the tuner, the LED will light up until the tuning cycle is completed.



Note that the tune request indication is only active when a tune is requested by pushing the **TUNE** button on the tuner. Tuning cycles that are initiated because of fully automatic tuning (SWR exceeded preset threshold) will not activate the tune request (**KEY**) line.

Ex. 3 - Control Tuner with External CPU

In some cases, you may wish to control the tuning function of your LDG tuner with some external logic, such as a microcontroller or PC parallel port. If this is the case, it is best to use an open-collector transistor driver to pull the **START** line to ground, for the specified length of time required to perform the desired tuning operation.



BEYOND THE EXAMPLES

While the above examples are practical applications of the LDG tuner interface, undoubtedly you will discover more uses. Perhaps the most common usage would be to invent one's own radio interface to a radio not presently supported by LDG Electronics directly. The circuitry shown in the examples should provide a basis for designing one's own interface hardware for whatever the intended use.

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