Introduction

The K45 has a great CW reader but one thing that slows most folks down is connecting audio from their receiver to the K45's audio input. K1EL recommends using audio from the receiver's audio line output jack which, in most cases, is located on the back of the radio. Usually it's in a multi-pin DIN accessory connector, which is certainly not very convenient. The reason the line out works so well is that it is a high impedance output, which matches the K45 audio input, and it is unaffected by the radio's AF gain control. You can turn the AF gain control up and down and K45 copy is unaffected.

The next best option is to plug into the radio's external speaker jack. There are two problems with this, the first is that it is a low impedance output, usually 8 ohms. The second is as soon as you plug something into the external speaker jack, the radio's internal speaker is muted. Our recommendation, up to now, has been to make up a Y cable but that doesn't solve the impedance mismatch. To solve this once and for all, we designed an audio splitter board which takes the place of a Y cable and also solves the impedance mismatch problem. Unfortunately, it doesn't solve the AF gain adjustment issue but it's a good compromise.

The K45 Splitter board has three 1/8 inch jacks, one jack goes to your radio's external speaker jack, a second one goes to you exernal speaker, and a third goes to the K45's audio input jack. The K45 splitter is shipped with one 1/8” cable assuming you already have an 1/8” cable from a K45 cable set.

Features

- 1/8 inch (3.5mm) audio input jack. Connect this to your radio's external speaker jack.
- 1/8 inch (3.5mm) speaker audio output jack. Connect this to your external speaker.
- 1/8 inch (3.5mm) Hi-Z audio output jack. Connect this to the K45's audio input jack.
- K45 audio is coupled through a low level impedance transformer
- 4 - 16 ohm audio input, 4 - 16 ohm speaker output and 4.7K ohm output impedance to K45.
- Audio attenuator to prevent K45 audio overload.
- Negligible effect on external speaker volume or tone.
- Mono/Stereo switch
- External power is not required.
- Assembled and ready to use.

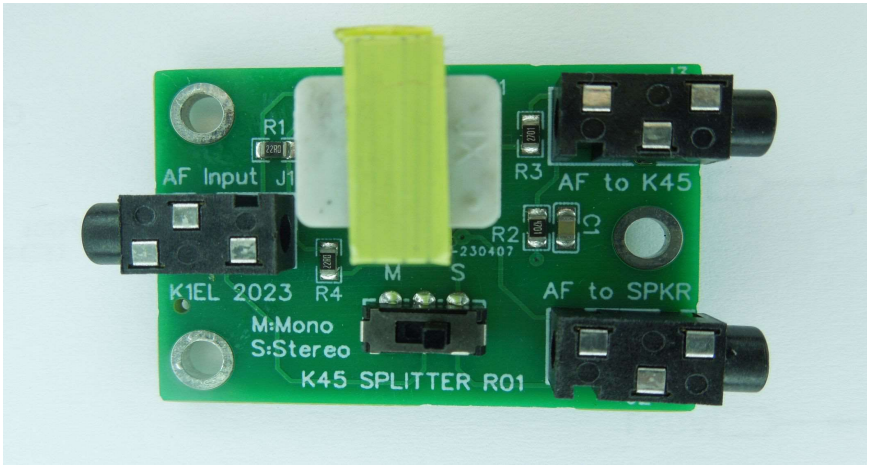

Figure 1 – K45 Audio Splitter board

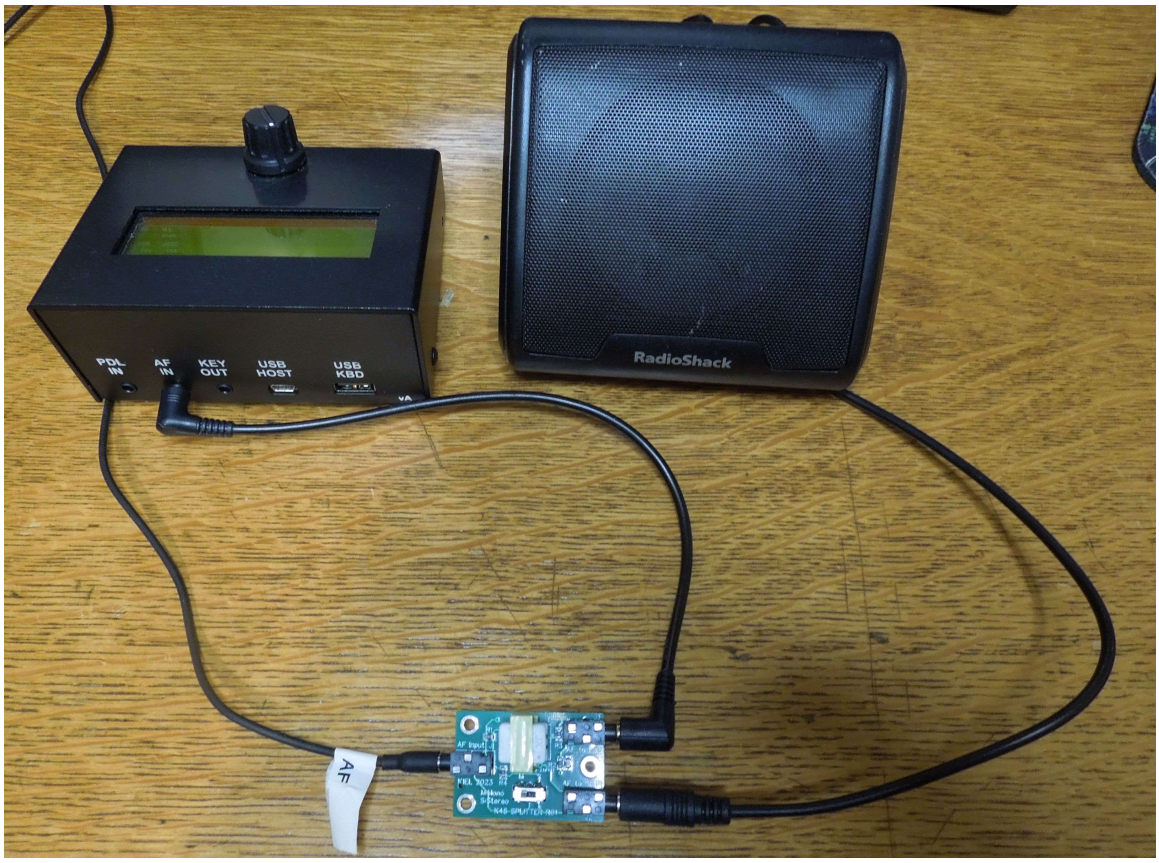

Figure 3 – K45 Audio Splitter cabing example

Here we have connected the K45-SPLT to accept audio input from a receiver (cable marked AF) and splitting it between a K45 AF input and and an external speaker. Since the receiver output is mono and is feeding a mono speaker, we set the switch to M for mono. If the receiver output was stereo and we were feeding a set of stereo headphones, we would set the switch to S (stereo). Note that the connection to the K45 is very simple, just one cable from K45-SPLT J2 to K45 Audio Input.

In general, the stereo switch position is used mostly when the audio destination is a set of stereo headphones. Most modern receivers headphone jacks are formatted in right and left outputs with both channels being the same. This will work fine with the K45 splitter set set to stereo.

An external speaker jack may or may not be stereo, if it's mono set the switch to mono and it will work fine driving a mono speaker.

The K45 audio input takes audio from tip and sleeve and ignores the ring so this works fine with the switch set either way.

K45 CW Reader Settings, or how to get the best copy out of your CWR

1) *The K45 CWR does not like noise*. If you set the signal level properly, noise will be less of an issue. Before trying to copy any stations, find a frequency where there is no activity. If there is a lot of band noise, you may see the LEDs respond to the noise and climb up two or three LEDs. This is a bad setup. Use the K45's gain adjustment (SHIFT+ENCODER CCW) to reduce the gain until either the first LED never or just barely lights. A gain setting of 3 is a typical high noise setting but it is highly dependent on the signal level you feed into the K45. Once the gain is set correctly, you will find that the LEDs will respond accurately to CW signals and provide much better copy.
2) *Find the optimal gain setting in quiet band conditions*. Again find a quiet band spot and adjust the CWR gain until the first LED just barely lights. If you encounter very strong stations, you may have to reduce gain as described in the next paragraph.
3) *Avoid overloading the K45's CW decoder.* Too much gain can be just as bad as not enough. In general, you should set maximum signal level to the point where the 5th LED on the right just barely lights when a station is tuned in. This is the point where signal clipping first occurs. While the K45 CWR handles overload pretty well, reducing the gain gives you the narrowest filtering. If the signal increases beyond clipping, the 5th and 1st or 2nd LEDs will light at the same time. This is an extreme overload condition and can happen with very strong signals. You should back the CWR gain off to get the signal level under control. In extreme cases you may need to reduce the receiver's RF gain setting.
4) *The CWR's noise filtering setting does matter*. This filter, adjusted by ALT-ENCODER, essentially controls the width of signal dropout correction. These dropouts are caused mostly by fast burst noise such as static crashes. These dropouts are very short in comparision to the width of a CW dit or dah and can be filtered out automatically. The higher the filter setting, the more aggressively dropout reduction is employed. Not surprisingly, very high settings will distort the CW integrity and will result in copy errors, especially at higher CW speeds (25 WPM and above). Our recommendation is to leave the filter at a low setting and use it only when there is a lot of atmospheric noise.
5) *A receiver's automatic noise blanker does not help.* Due to the way a noise blanker works, it really confuses the CWR and for that reason we suggest not using it. In addition, a fast AGC setting should also be avoided. Fast changes in signal level will also confuse the CWR and affect copy. We suggest always using a slow attack AGC.
6) *Narrow CW filters are not always worth using*. Narrow CW filters (200 and 400 Hz) do ring and distort the detection timing of the CWR. If the detected element widths aren't correct then the CWR will make incorrect decoding decisions and misdecode letters. The CWR has a built-in 6 pole narrow bandpass filter and in most cases this is all you really need. That said, a good 2.3 KHz SSB filter with steep skirts does a good job in filtering out adjacent signals and in most cases that's all you will need.