

Using the Spooky2 Frequency Generator with the PA3 or the SPA4 Amplifier

To properly drive the PA3 or the SPA4, the Spooky software must be set as follows:

AMPLITUDE RAMP = 0

WAVEFORM = Square Wave only.

For both Output 1 and Output 2:

AMPLITUDE = 5 volts - For correct drive voltage for the SPA4. Set the voltage to 10 volts for the PA3.

OFFSET = 100 (percent) - Sets the square wave output to go positive only.

Note that the default setting of the Spooky program causes the output signal to go equally above and below zero volts. This will cause the PA3 OR THE SPA4 to output a full carrier (overload) pulse for up to 10 seconds after the end of a frequency set. This can cause failure of the STW20NK50Z Mosfet if high power is being used with the PA3 OR THE SPA4. To prevent this from happening, it is necessary to set the OFFSET value in the Spooky program to 100 for full positive voltage waveform offset.

When the Spooky program is properly adjusted, either output channel of the Spooky2 generator may be directly connected to the input of the SPA4 without the need for an additional terminating resistance unless the connecting cable is more than three meters in length. For longer cables, it is suggested that a terminating resistor with a value of 50 or 51 Ohms should be connected to the SPA4 end of the connecting cable. When the termination resistor is used on the SPA4, the AMPLITUDE value in the Spooky program should be set to 10 volts. Note that the input of the PA3 includes the terminating resistor on the PA3 circuit board, so the cable length previously mentioned does not apply.

Mixing frequencies from Output 1 and Output 2

Unfortunately, the outputs from the spooky2 cannot be directly combined. Due to the nature of the output amplifiers used in the Spooky2, the two signals are added one on top of the other, so that it is impossible to obtain the proper mix of both signals.

To overcome this problem, it is necessary to install an external mixer, which performs either the logical XOR function or the logical AND function.

Using the TTL Output Jack

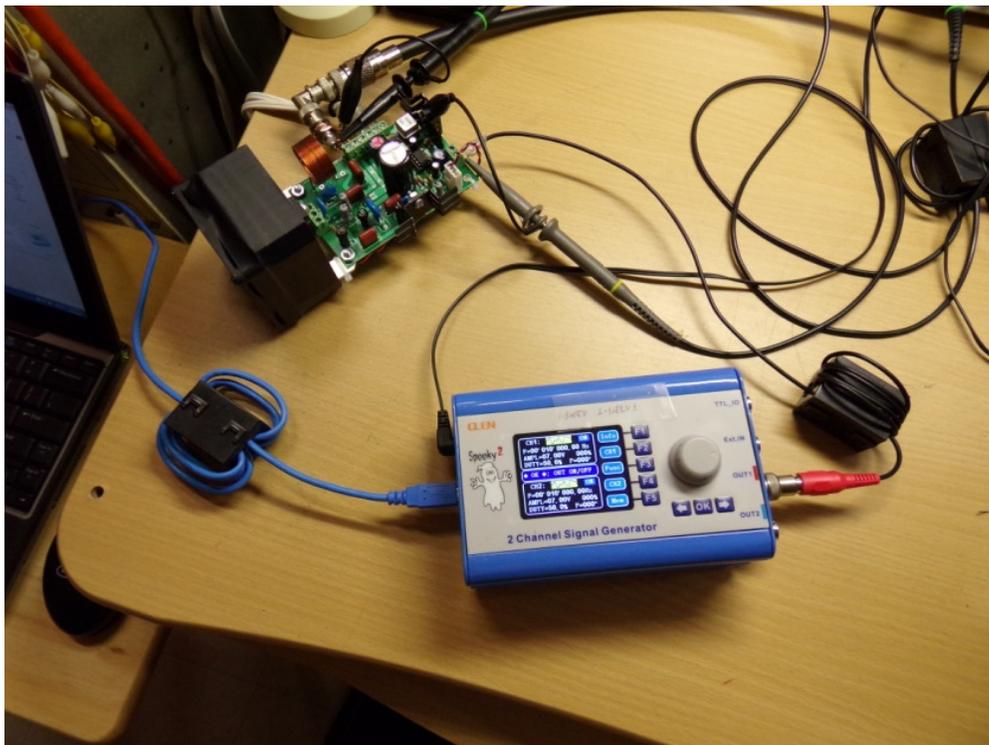
It is not advisable to use the TTL output of the Spooky2 to drive the PA3 or the SPA4 amplifier. The TTL output on some Spooky2 generators outputs random noise in the absence of a defined signal command from the computer. The TTL output also goes to the HIGH state (+5 volts) when the currently running frequency set ends. This causes the output of the PA3 or the SPA4 to go to 100%, which may damage the amplifier when it is being operated at high power levels.

RF Interference to the Spooky2 Generator and Computer

Some Spooky2 generators are susceptible to RF interference from the local RF field produced by the plasma tube. This unwanted RF signal gets into the USB cable that connects the Spooky2 and the computer, and the output signal cable that connects the Spooky2 to the PA3 or the SPA4 amplifier. This usually results in the Spooky2 generator refusing to change frequencies. It is often noted that the Spooky program loses control of the Spooky2 generator. In some cases, the computer itself may malfunction, with the mouse or keyboard becoming unresponsive until the plasma tube is turned off.

The solution to this problem is to install two Mix #31 ferrite chokes, one on each cable. These chokes should be installed as close to the Spooky2 generator as possible, preferably no more than 5 inches of cable between the choke and the Spooky2.

Please see the picture below for the correct installation location of the chokes.



A suitable choke is manufactured by Fair-Rite Corporation. It is their part number 0431176451. It is available from Newark Electronics (<http://www.newark.com>) as Newark's part number 03H8829.

The direct link to the choke is:

http://www.newark.com/fair-rite/0431176451/ferrite-core-split-18mm-380-ohm/dp/03H8829?ost=03H8829&mckv=sCISshxTZ_dc|pcrid|72350935835|plid|lkword|+fair-rite++0431176451|match|b&CMP=KNC-GUSA-GEN-SKU-MDC&gclid=COS3dS7rsgCFQwzaQoditcHVA

When using this choke, a total of 5 turns of one of the two cables should be wound through the center of one of the two chokes. Do the same thing with the other cable. Each cable must have its own choke installed. Note that each time the wire or cable passes through the center of the choke, it is counted as one turn.

Ralph Hartwell,
Spectrotek Services

14 November 2015