SYNCHRONIZING THE SG1525A PWM

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1. Synchronizing One Device to an External Clock

A. Program the SG1525A oscillator with R_T and C_T to free-run at a frequency 10% slower than the external clock frequency.

B. Drive the SG1525A SYNC terminal (pin 3) with the external clock. Input impedance is 2K. The clock amplitude should be greater than 2 volts and less than 5 volts. Pulse width should be at least 300nsec. for reliable triggering, but it should not exceed the free-running oscillator clock pulse width by more than 200nsec.

2. Synchronizing Multiple Devices to an External Clock

Two different methods are recommended, depending on the distance between the various SG1525A PWMs. Use method A if the ICs are within 3 inches of each other and on the same printed circuit board. Otherwise, use method B.

A. Designate one of the SG1525A PWMs as the master unit and select R_T, C_T, and R_D to free-run 10% slower than the external sync frequency. Connect all pins together and all OSC pins together, leaving R_T pins and DISCHARGE pins open on the slave units. Drive the SYNC pin of the master with a clock pulse as described in Section 1B above.

B. Program each of the separate devices with R_T, C_T, and R_D to free-run 10% slower than the external sync frequency. Drive each of the SYNC pins with the clock described in Section 1B. (This arrangement avoids routing a high-impedance line [C_T] around a noisy environment.)

3. Synchronizing One Slave Unit to a Master SG1525

As in Section 2, two methods are advised, depending on the distance between the master unit and the slave. Use method A for short distances, and method B otherwise.

A. Program the master unit for desired frequency with R_T, C_T, and R_D. Connect the C_T pin of the master to the C_T pin of the slave, and the OSC pin of the master to the OSC pin of the slave. Leave the R_T and DISCHARGE pins of the slave open.

B. Program the master unit for desired frequency. Program the slave unit to free-run 10% slower than the master. This is best done by choosing C_T and R_D to be the same as the master, and by increasing the value of R_T. Drive the SYNC pin of the slave with the OSC pin of the master.

4. Synchronizing Multiple SG1525A to a Master SG1525A

Again, different techniques are recommended depending on the physical and electrical distances between the various PWM circuits. If all of the devices are separated by no more than 3 inches each, and on the same pc board, then the "cluster" technique described in section 3A (i.e. sharing a master unit's C_T and OSC waveforms with adjacent slave units) will give good results.

If one or more of the devices are remote from the master so that the C_T node cannot be distributed without the possibility of noise pick-up, then each remote unit must be synchronized as described in Section 3B above. Note that it is possible to cluster remote units to decrease the required number of timing components. In other words, if two or more units are close together at one remote location, one of them can be programmed for the required 10% slower free-run frequency, and its C_T and OSC waveforms can be shared with its neighbors.

This description covers all the possibilities normally encountered. NOTE THAT IT IS ALWAYS GOOD ENGINEERING PRACTICE TO GROUND ANY UNUSED SYNC PINS TO ELIMINATE THE POSSIBILITY OF NOISE PICK-UP.