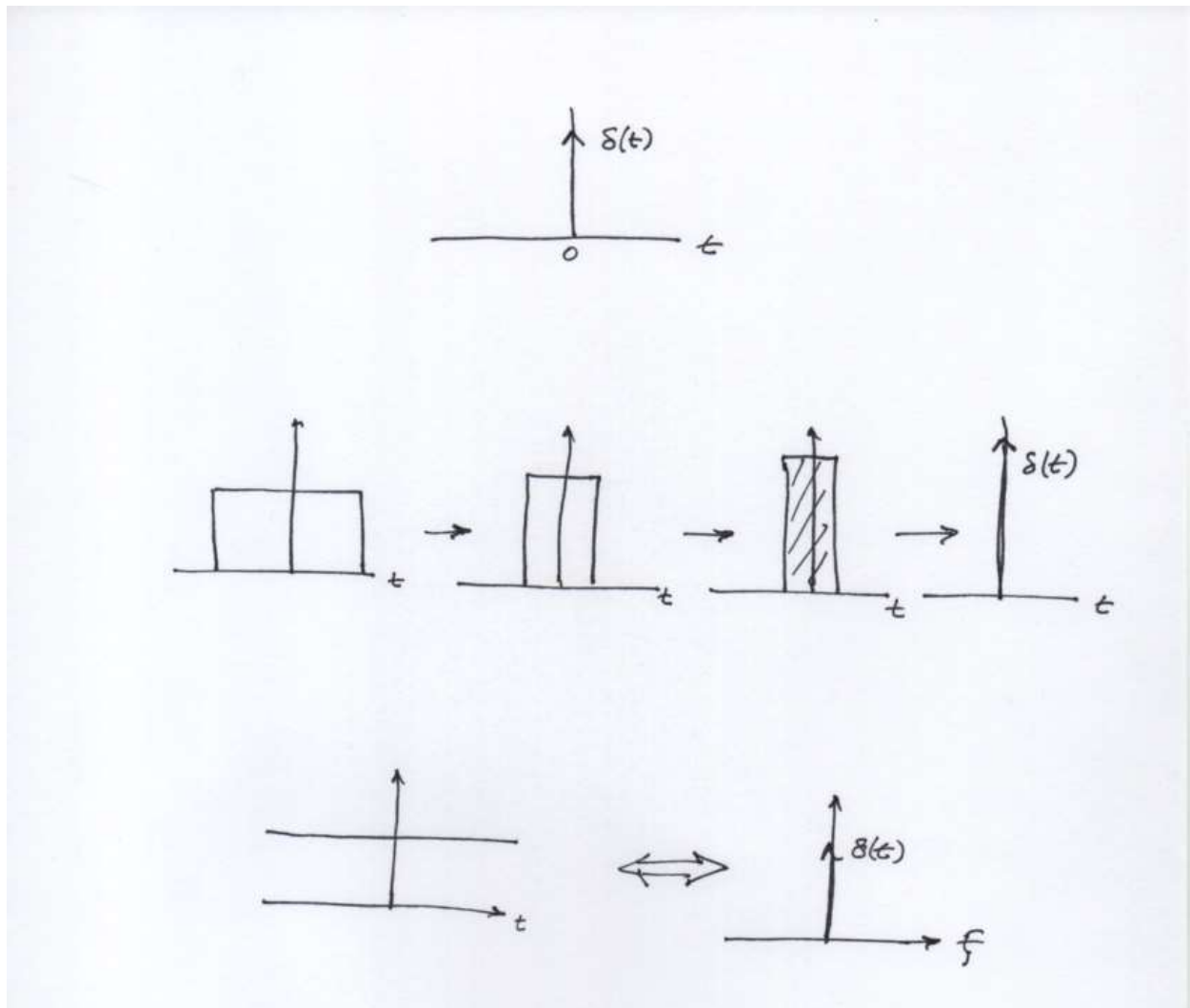## 13A   THE CROSS AND THE DELTA FUNCTION

(By Bill)

How could one man die for the sins of the whole world? Even if He were sinless how could that be?

In control theory and signal theory we often encounter a mathematical function named for the physicist PAM Dirac. We call it the Dirac delta function, or simply the delta function $\delta(t)$.

It is considered to be a perfect impulse to a system, causing an output (impulse function) that characterizes the system in the time domain. $\delta(t)$ is represented as having an infinite magnitude but zero width at t=0. It can be approximated by taking a finite width pulse and shrinking its width to zero. At each step along the way the area under the curve will remain the same.

In the limit the magnitude will become infinite and the width will become infinitesimal. If we look at an infinitely long signal in the time domain its corresponding frequency spectrum will be a delta function (and vice versa).

What could take care of an infinite guilt incurred by a huge number of people? The suffering of an infinite Person for a finite length of time.

If Jesus was just a man, a perfect man who never sinned, He could die for someone else's sin. He

could die for just one other person's sin. No more, because he only has the weight of one person.

He could go to hell for one person forever, and that person could take his place in heaven. That

would be the situation if Jesus was not God and was just a perfect man.

But Yeshua, the Messiah, is man _and_ God. His death, therefore, counts as the punishment for the sins of a_ll_ men, since He has the "weight" of being God. Furthermore, since He is God, He was able to take the punishment of an eternity of hell in the finite time He was on the cross.