

FIGURE 1.

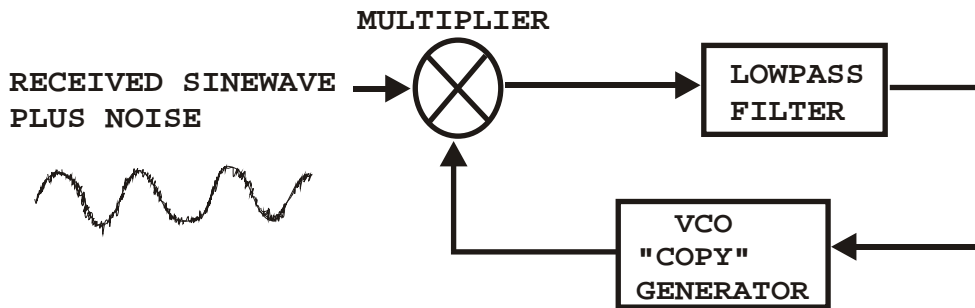
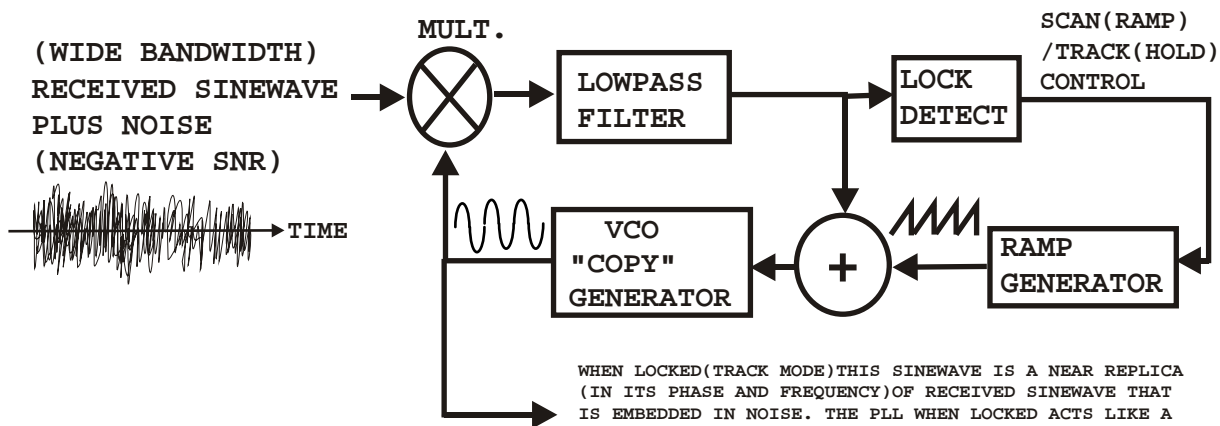


FIGURE 2.



WHEN LOCKED (TRACK MODE) THIS SINEWAVE IS A NEAR REPLICA (IN ITS PHASE AND FREQUENCY) OF RECEIVED SINEWAVE THAT IS EMBEDDED IN NOISE. THE PLL WHEN LOCKED ACTS LIKE A BPF ON RECEIVED S+N, WITH A BANDWIDTH EQUAL TO TWICE THAT OF THE LPF. AS BANDWIDTH DECREASES SNR INCREASES. AS LPF BANDWIDTH DECREASES, "LOOP" SNR WILL EVENTUALLY BECOME POSITIVE FOR ANY GIVEN NEGATIVE SNR AT THE INPUT. IN SHORT, THIS SYSTEM IS WAY TO BUILD A SUPER NARROW BPF AT THE CARRIER FREQUENCY.

FIGURE 3.