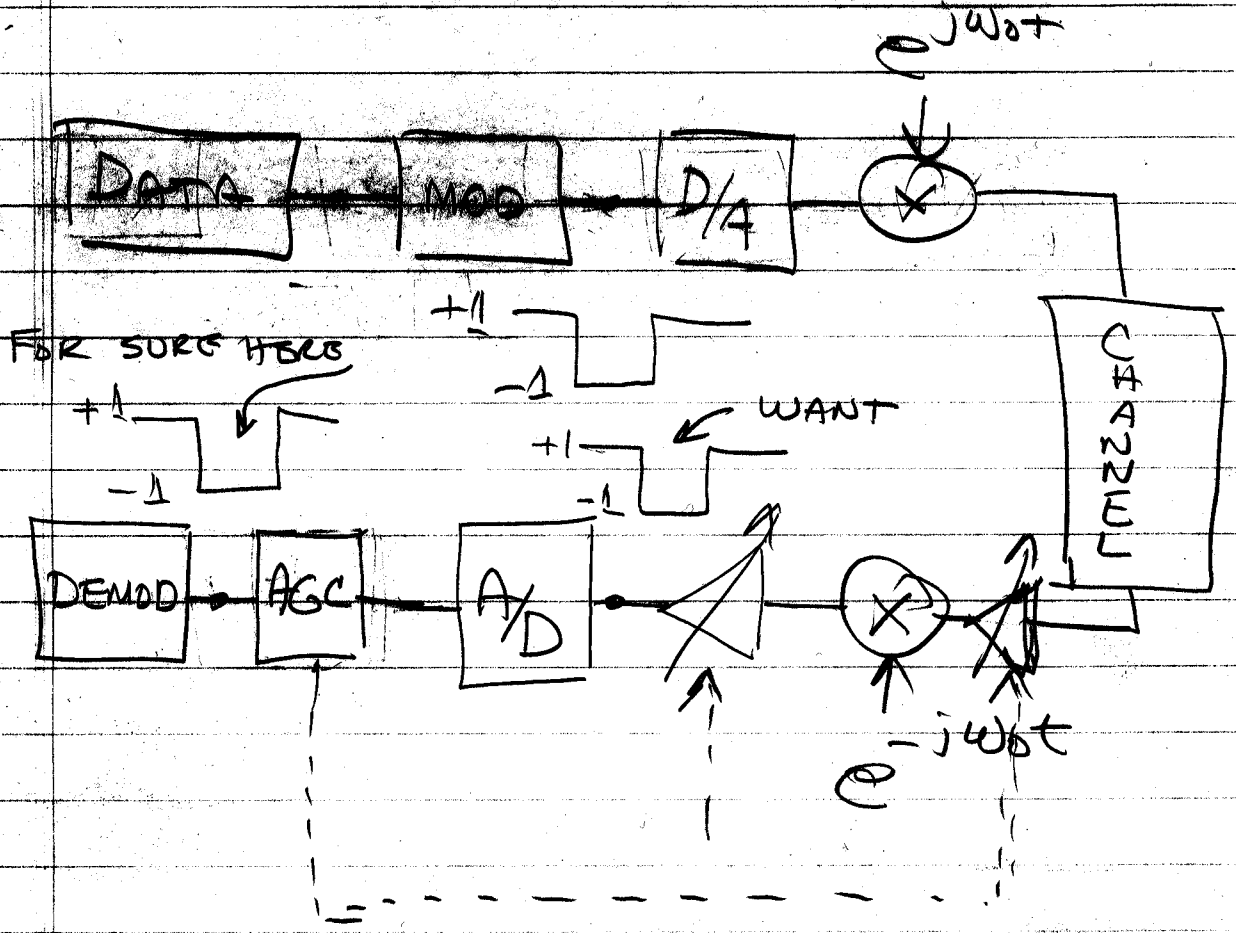
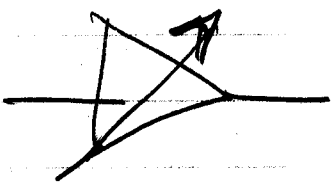
AGC = AUTOMATIC GAIN CONTROL



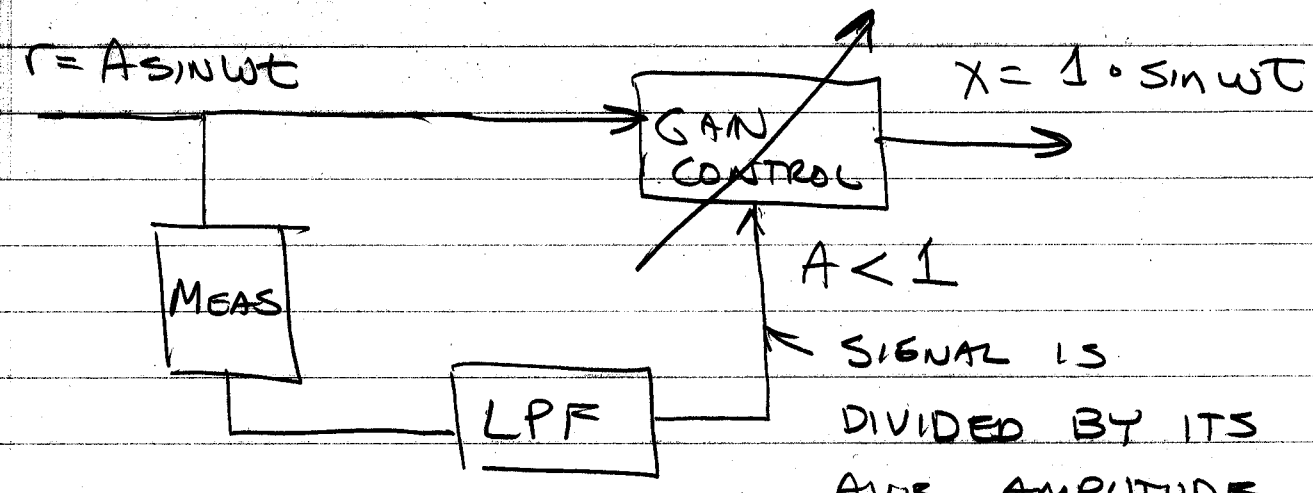
NEED TO ADJUST GAIN BY VARIABLE GAIN AMPLIFIERS OR DIGITALLY.

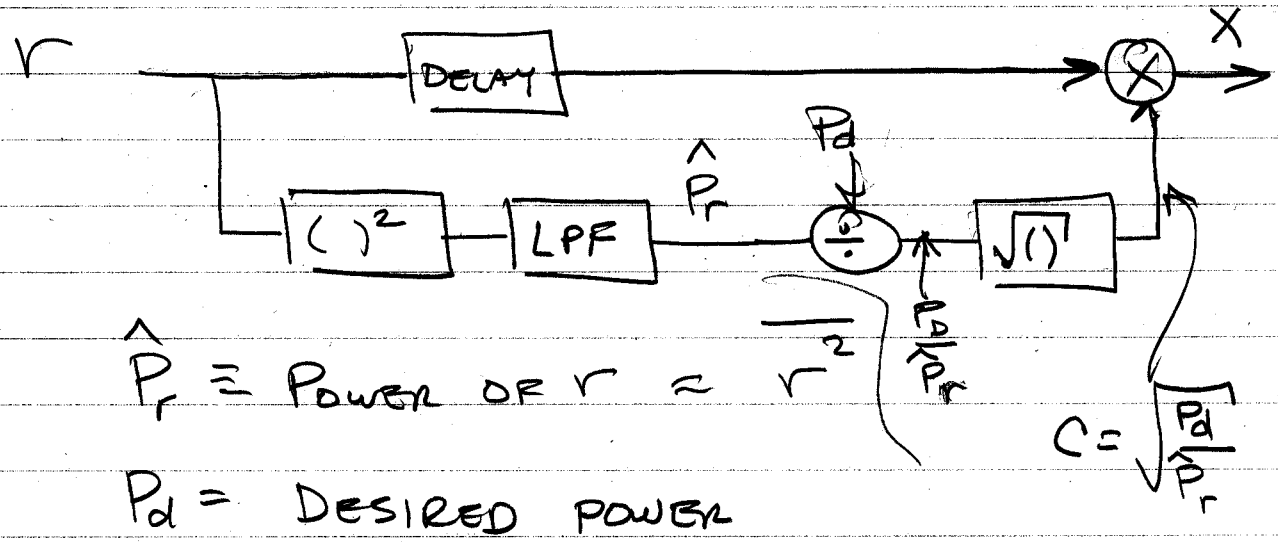


EASIEST WAY IS TO USE A PILOT SIGNAL OR PREAMBLE (802.11) TO ADJUST TO KNOWN VALUE.

WITHOUT PREAMBLE OR PILOT

A) FEEDFORWARD (OPEN LOOP) GAIN CONTROL



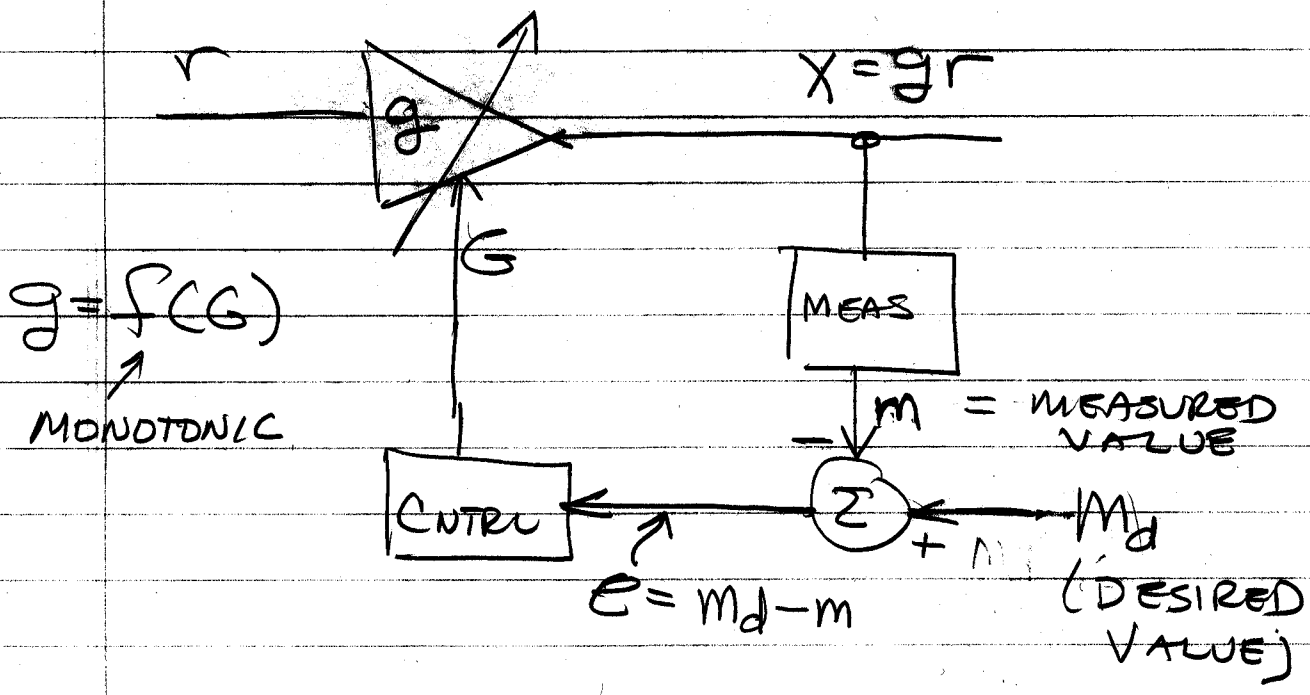


$\hat{P}_r \cong$ POWER OF $r \approx \overline{r^2}$

P_d = DESIRED POWER

$$P_x = C^2 P_r = \frac{P_d}{\hat{P}_r} P_r \rightarrow P_d \quad \text{IF } \hat{P}_r \simeq P_r$$

B) LOCAL FEEDBACK, NON DECISION AIDED



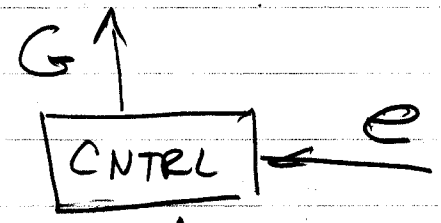
MEAS. BLOCK: a) m = PEAK(X)

b) m = PEAK TO PEAK (X) INSENSITIVE TO OFFSET

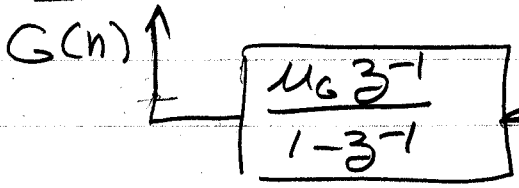
c) m = |X| OR X^2

CNTRL BLOCK:

e=0	DO NOTHING	
e<0	G ↘	g ↘
e>0	G ↗	g ↗

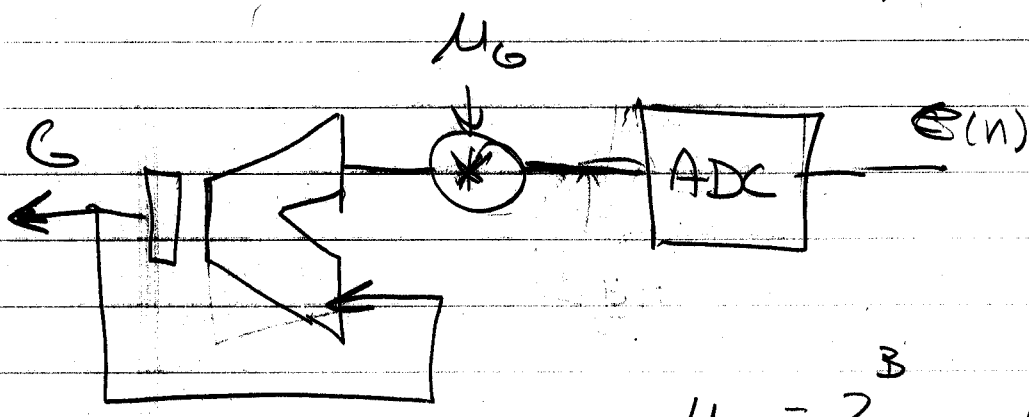


$$G(n) = G(n-1) + \mu_G e(n-1)$$

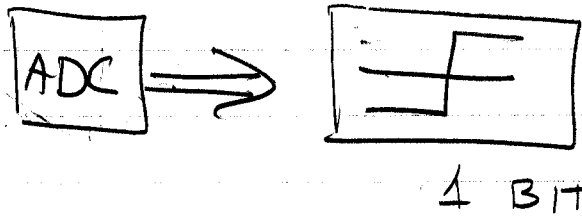


STEADY STATE:

$$G(n) = G(n-1) + \mu_G e(n-1)$$

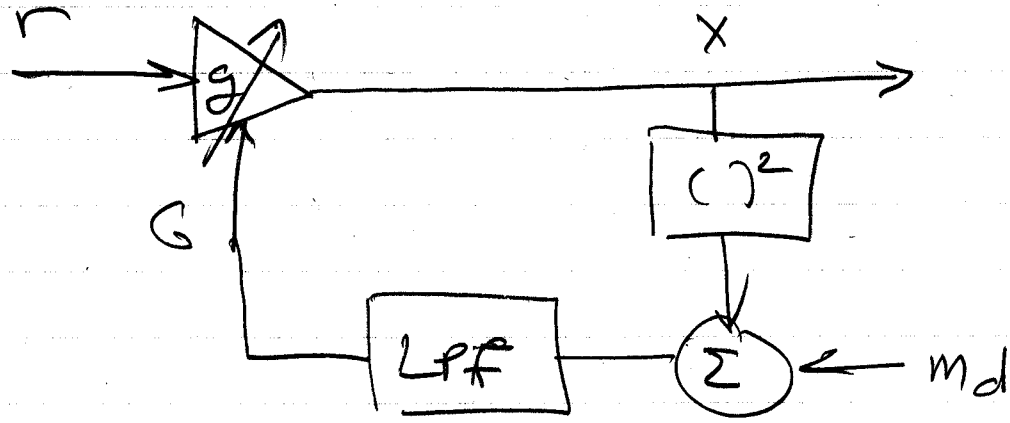


$$\mu_G = 2^{B}$$ ⊛ ⇒ SHIFT



$$G(n) = G(n-1) + \mu_G \, \mathrm{SGN}(e(n))$$

IF MEASURING $|X|$ OR $(X^2$



CONTROLS SIGNAL POWER

$$G(n) = G(n-1) \rightarrow \overline{e} = 0$$

$$e = m_d - \overline{X^2} = m_d - X^2 \Rightarrow 0$$