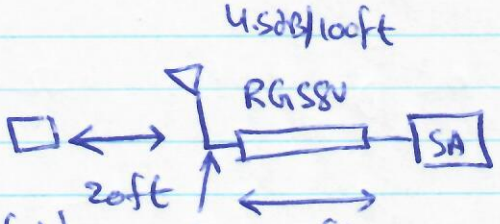
ECE 4320/5230

TOPIC 2

Ex1 All @ 100 MHz



$V_{out,ant} = 6.31V$ for 1 V/m E-field

(a) now, $V_{SA} = 53\ dB\mu V$

@ cable input / out of ant: $V_a = 53\ dB\mu V + \left(4.5 * \frac{3}{10}\right)$

$= 54.35\ dB\mu V$

Convert to Volts to be able to find field strength

$V_{a,volts\ dB} = V_{a,\mu V\ dB} - 120\ dB$

$= -65.65\ dBV$

$\rightsquigarrow V_{a,volts} = 10^{-3.282} = 522.4\ \mu V$

now to get field value, $6.31V \longrightarrow 1\ V/m$

$522.4\mu V \longrightarrow x\ V/m$

$\rightsquigarrow$ E-field strength $= 82.79\ \mu V/m$

$\equiv \underline{38.36 dB\mu V/m}$

(b) $20\ ft \equiv 6.1\ m$ (slide 6)

FCC Class B @ 3m & 100 MHz, Level is: $43.5 dB\mu V/m$

So, @ 6.1m, we need to scale, field strength will reduce as $3/6.1 \rightsquigarrow 20 \log_{10} \frac{3}{6.1} = -6.16\ dB$

$\rightsquigarrow$ Standard limit becomes: $43.5 - 6.16 = \underline{37.34\ dB\mu V/m}$

So, $38.36 > 37.34 \Rightarrow$ fail by 1 dB