

## Lightning

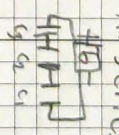
- $300 \times 10^6$  Volts (avg)
- 30,000 Amperes (avg)
- NWS
- $9 \times 10^9$  KW
- $I = \frac{dq}{dt}$
- $\int I dt = Q$
- 30,000  $\frac{C}{s}$
- speed of light
- 299,792 km/s
- 917,614,546 C = Q

## House Consumption

- 11,000 kWh (avg)
- 1 year = 8766 hours
- 1.25 KW
- 2022 Average 10.140/kWh
- 1540 annually

## Capacitors

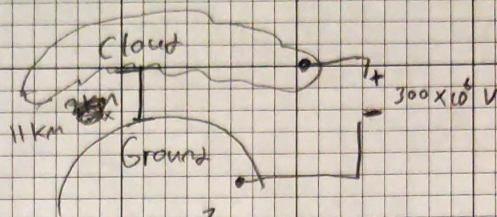
- $Q = CV$
- Use many capacitors in series



# Capacitors

$$E = \frac{Q}{A} \cdot d$$

$$C = \frac{QA}{d} =$$

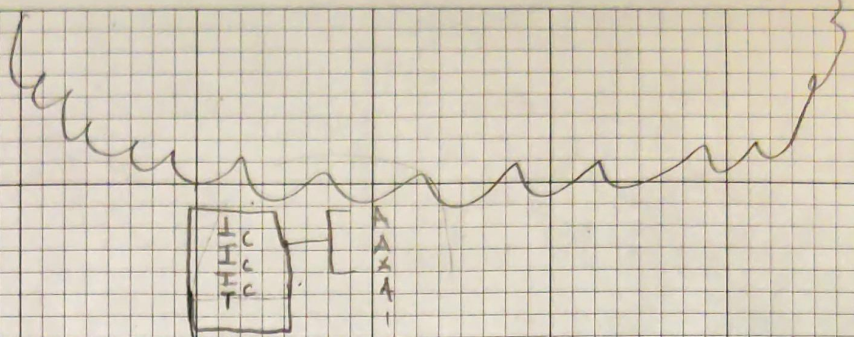


$$\frac{11 \text{ km}}{299,792,458 \frac{\text{m}}{\text{s}}} = 3.67 \times 10^{-5} \text{ s}$$

$$C = \frac{Q}{V} = \frac{817,614,546 \text{ C}}{300 \times 10^6 \text{ V}} = 2.73 \text{ F}$$

# Parts

- Planet Audio (A)
- PCB LK 3.5
- 3.5F
- 20V
- 15 million
- 842.4 billion (USD)
- $9 \times 10^9$  Kw



House Consumption  
Annual cost

$$\frac{1.75 \text{ Kw}}{1540}$$

$$8.12 \times 10^{-4} \text{ Kw/d}$$

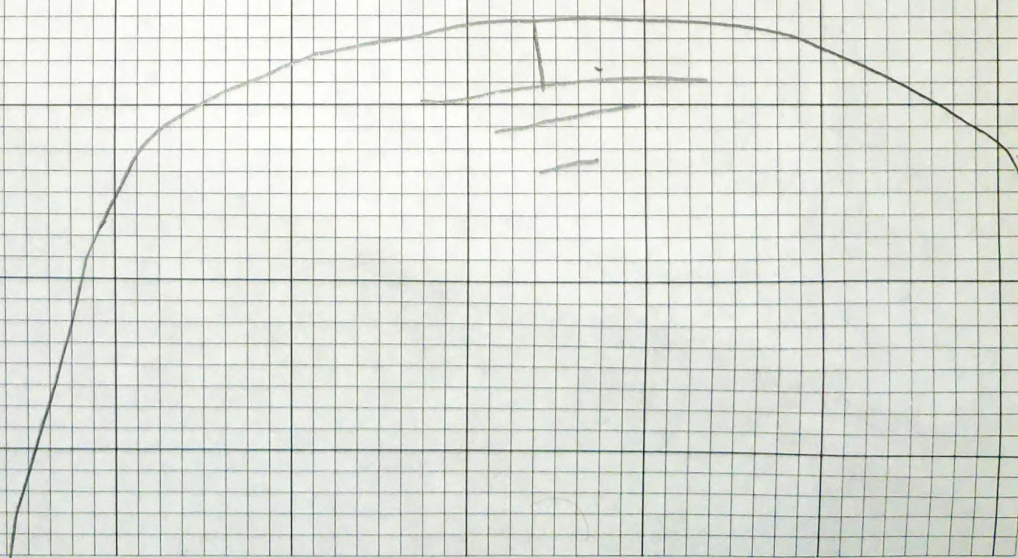
Plan Provided  
Plan costs

$$\frac{9 \times 10^9 \text{ Kw}}{842.4 \times 10^9}$$

$$0.1 \text{ Kw/d}$$

123x  
Economic

Plan A



$$300 \times 10^6 \sqrt{201} = 15 \times 10^6$$

56.16

842400,000

$$\frac{9 \times 10^9 \text{ kW}}{1.25}$$

7200000000