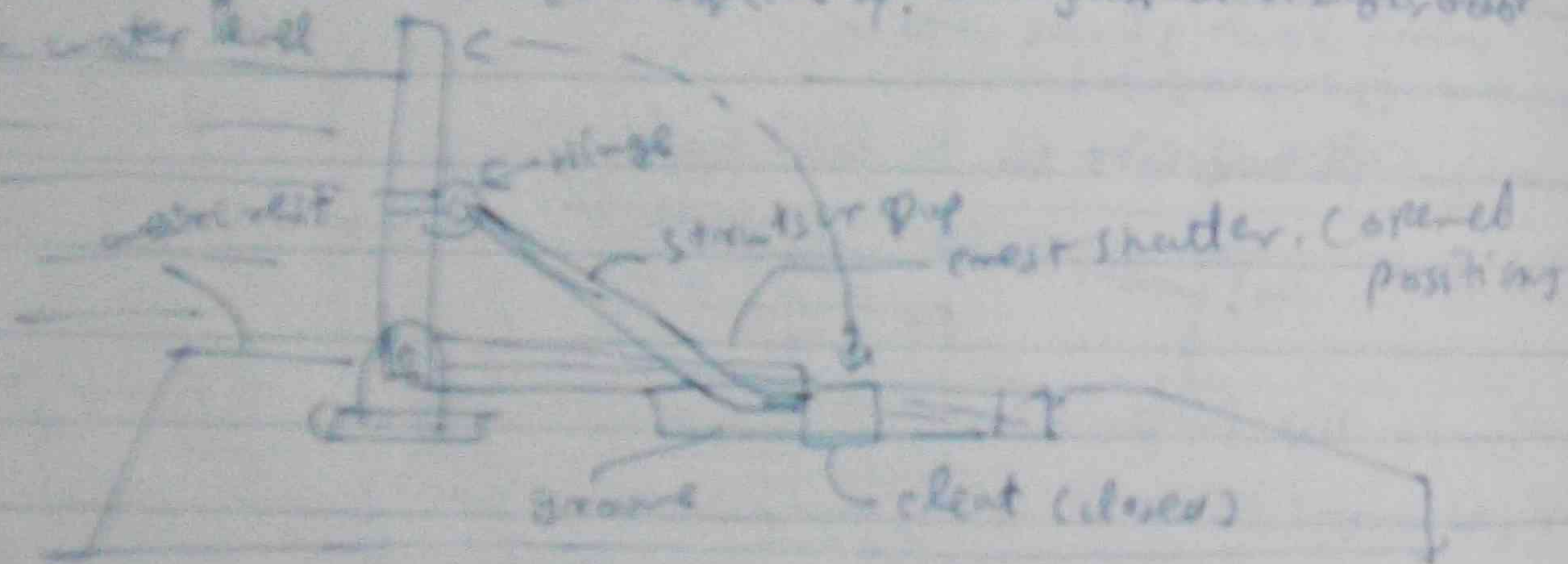


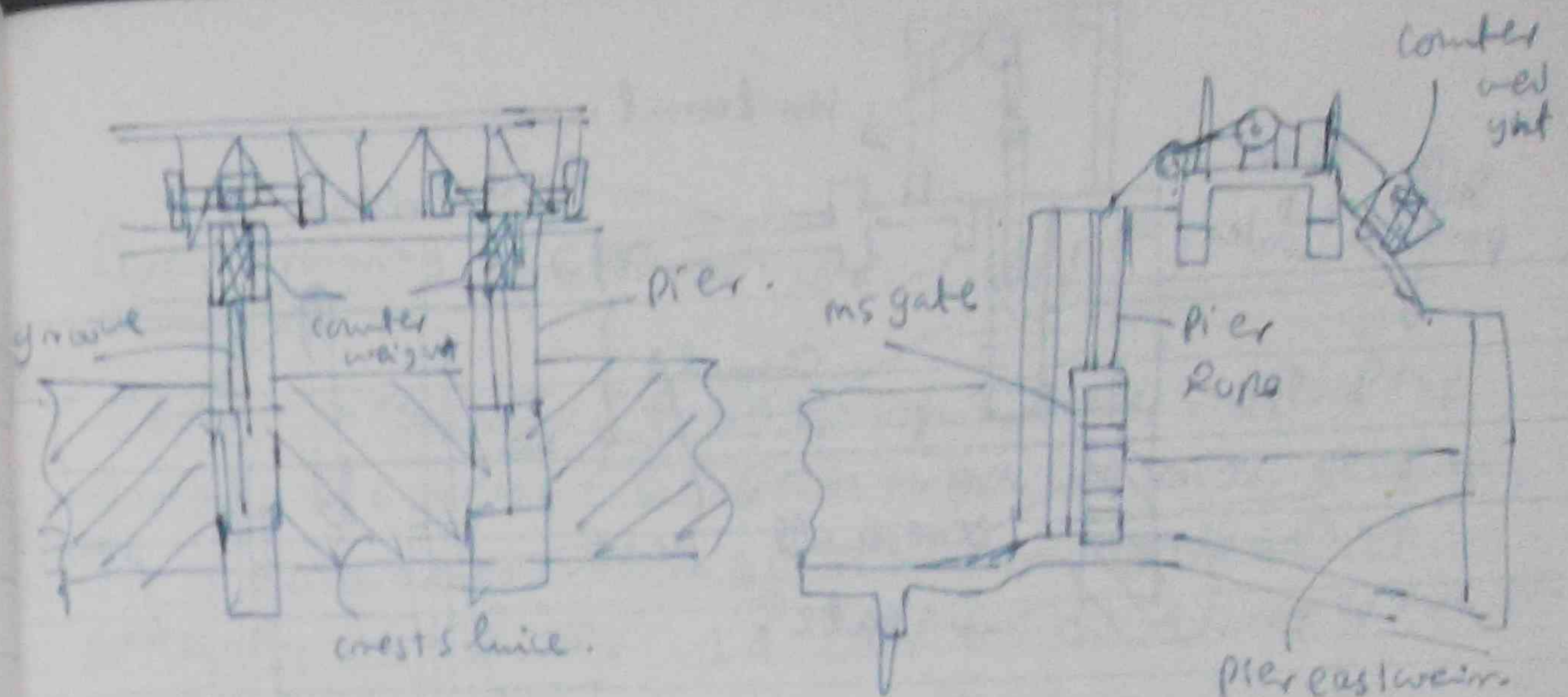
crest shutter

Handwritten text in Odia script, likely describing the function and components of the crest shutter.



Under Shutter Gates

Handwritten text in Odia script, likely describing the components and operation of the under shutter gates.



Divide wall

Handwritten text in Odia script, likely describing the function and components of the divide wall.

Still pond

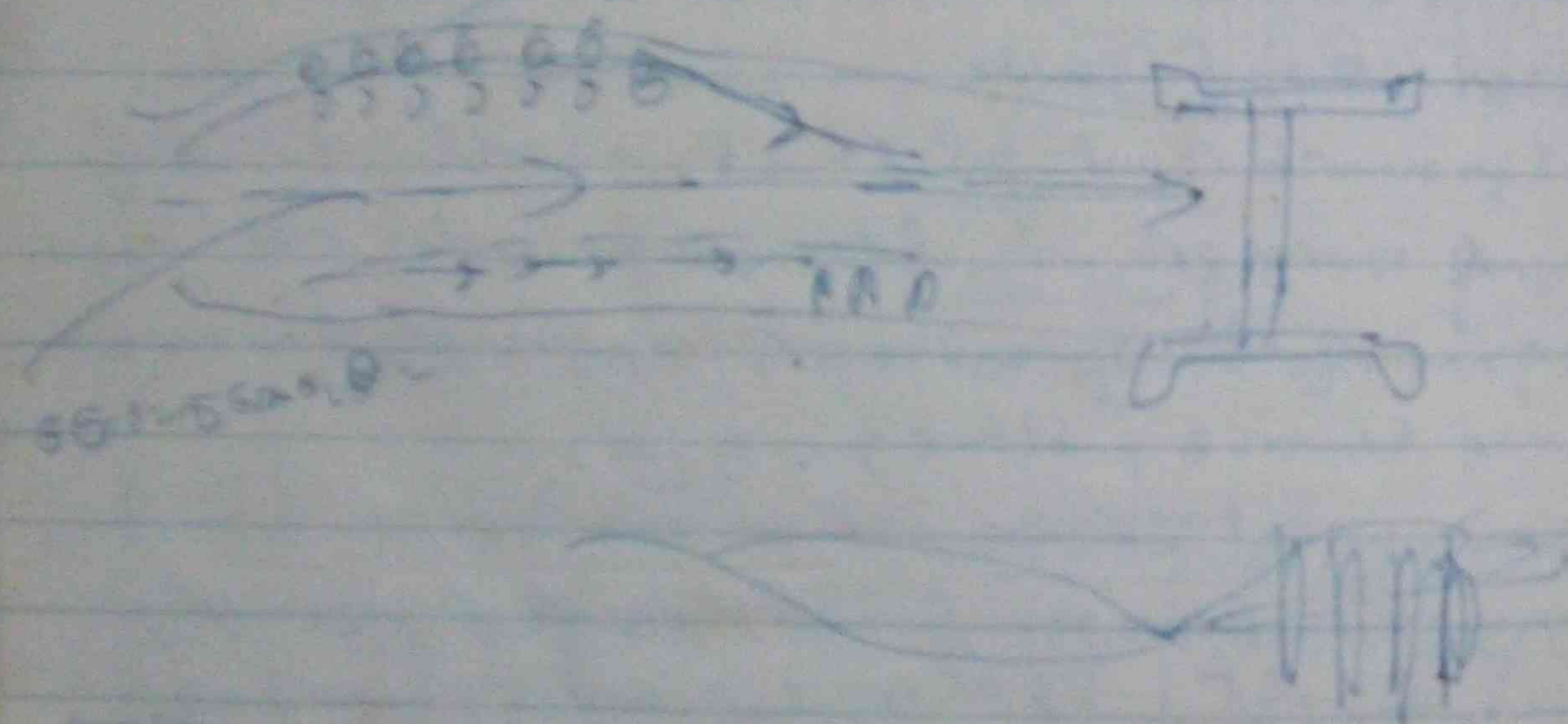
Handwritten text in Odia script, likely describing the function and components of the still pond.

Head Regulator

Handwritten text in Odia script, likely describing the function and components of the head regulator.

Training with stone or pile

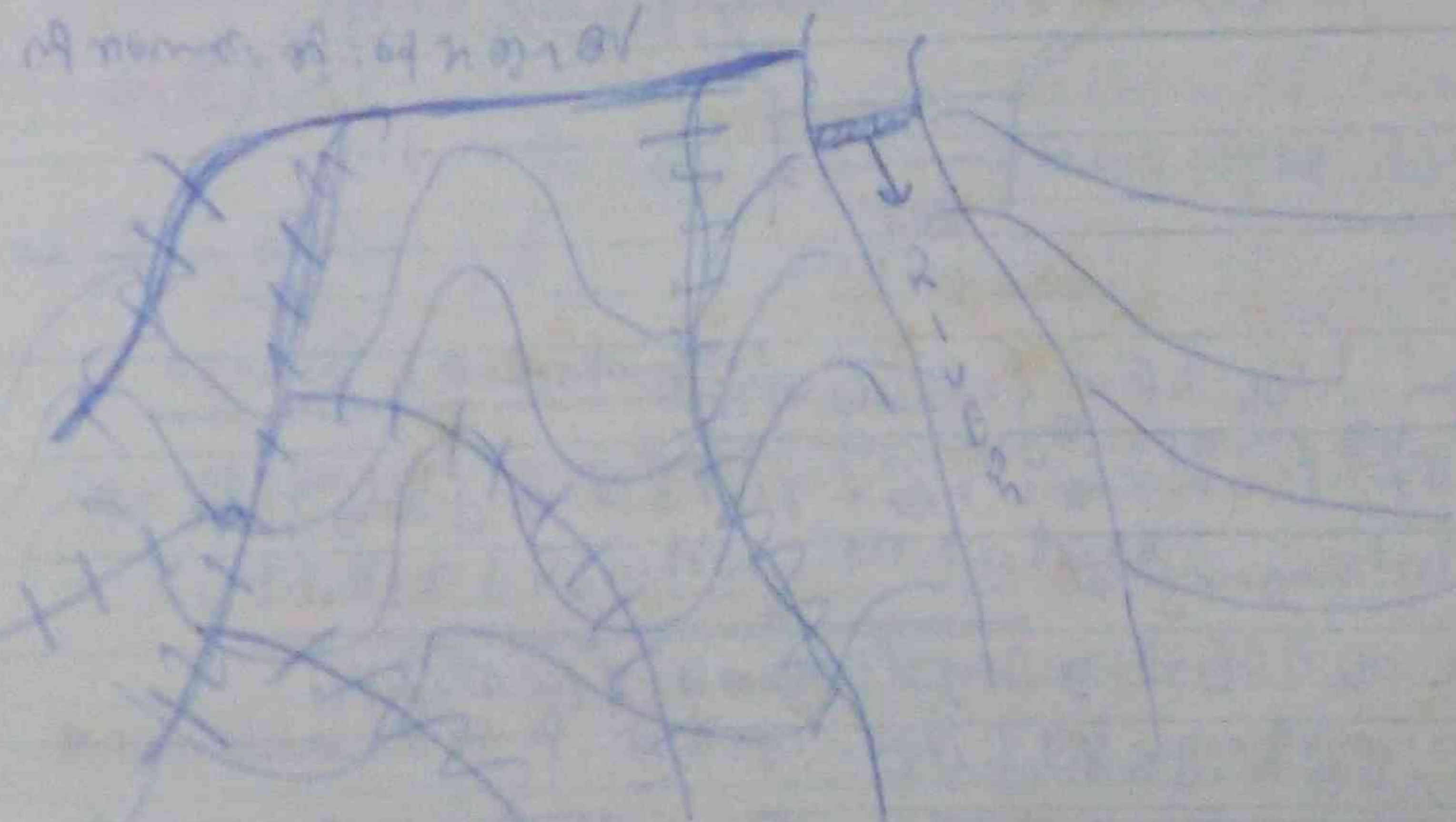
When a canal is constructed in a soft soil, the sides of the canal are liable to collapse. To prevent this, the sides of the canal are trained with stone or pile. This method is used in the construction of canals in soft soil.



When a canal is constructed in a soft soil, the sides of the canal are liable to collapse. To prevent this, the sides of the canal are trained with stone or pile. This method is used in the construction of canals in soft soil.

Alignment of canals

When a canal is constructed in a soft soil, the sides of the canal are liable to collapse. To prevent this, the sides of the canal are trained with stone or pile. This method is used in the construction of canals in soft soil.



When a canal is constructed in a soft soil, the sides of the canal are liable to collapse. To prevent this, the sides of the canal are trained with stone or pile. This method is used in the construction of canals in soft soil.

Command & full supply level

When a canal is constructed in a soft soil, the sides of the canal are liable to collapse. To prevent this, the sides of the canal are trained with stone or pile. This method is used in the construction of canals in soft soil.

Handwritten: 2nd ed. of J. A. G. ...

[illegible]

২৯ জুলাই - ১০

62 m² (Diatyotwater)

626-2844

ϕ_1, ϕ_2, ϕ_3 (Rotation or phase)

maximal common col. of A_1 to A_n is $g_1 + g_2 + \dots + g_n$ and $g_1 \leq g_2 \leq \dots \leq g_n$.

12-01-2019

cannot be a regulated ex.

regulator, or. Branch camel distributor
camel minor, camel at 100 ft. from B.P.

gate pier forms Road Bridge. Top of Pier Top of Gate FSL River gate.

Irrigation outlet

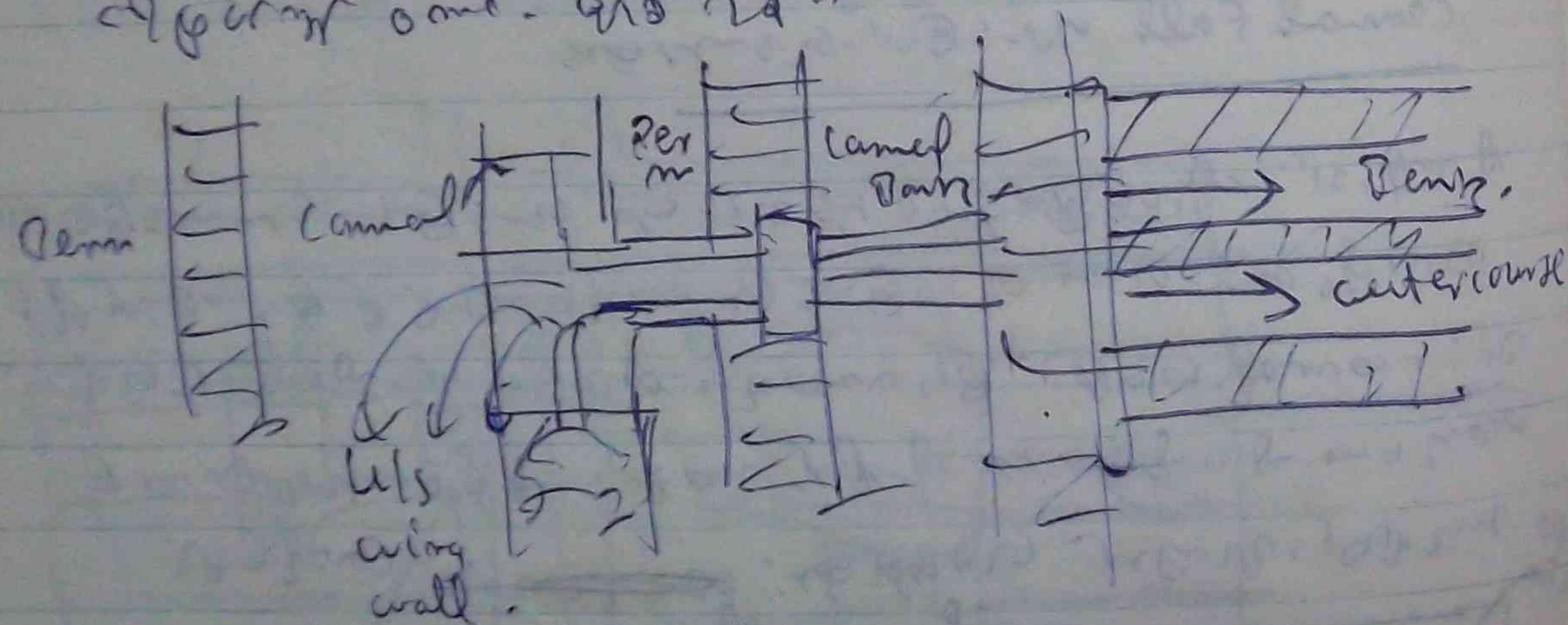
(17) Rigid modular outlet - Discharge of m^3/hr .

[illegible]

(2) Formulas 60 marks - 65-1-50 marks - 10% course
60 marks, 60 marks for 100% (semi modular out let)

2 range cross works

ଶ୍ରୀମତୀ ଶ୍ରୀ. ସରୋଜିନୀ ଦେବୀ, ଶ୍ରୀମତୀ ଶ୍ରୀ. ସରୋଜିନୀ ଦେବୀ,
 ଶ୍ରୀମତୀ ଶ୍ରୀ. ସରୋଜିନୀ ଦେବୀ



an ~~adeg~~duct in super passage
on syon, level crossing

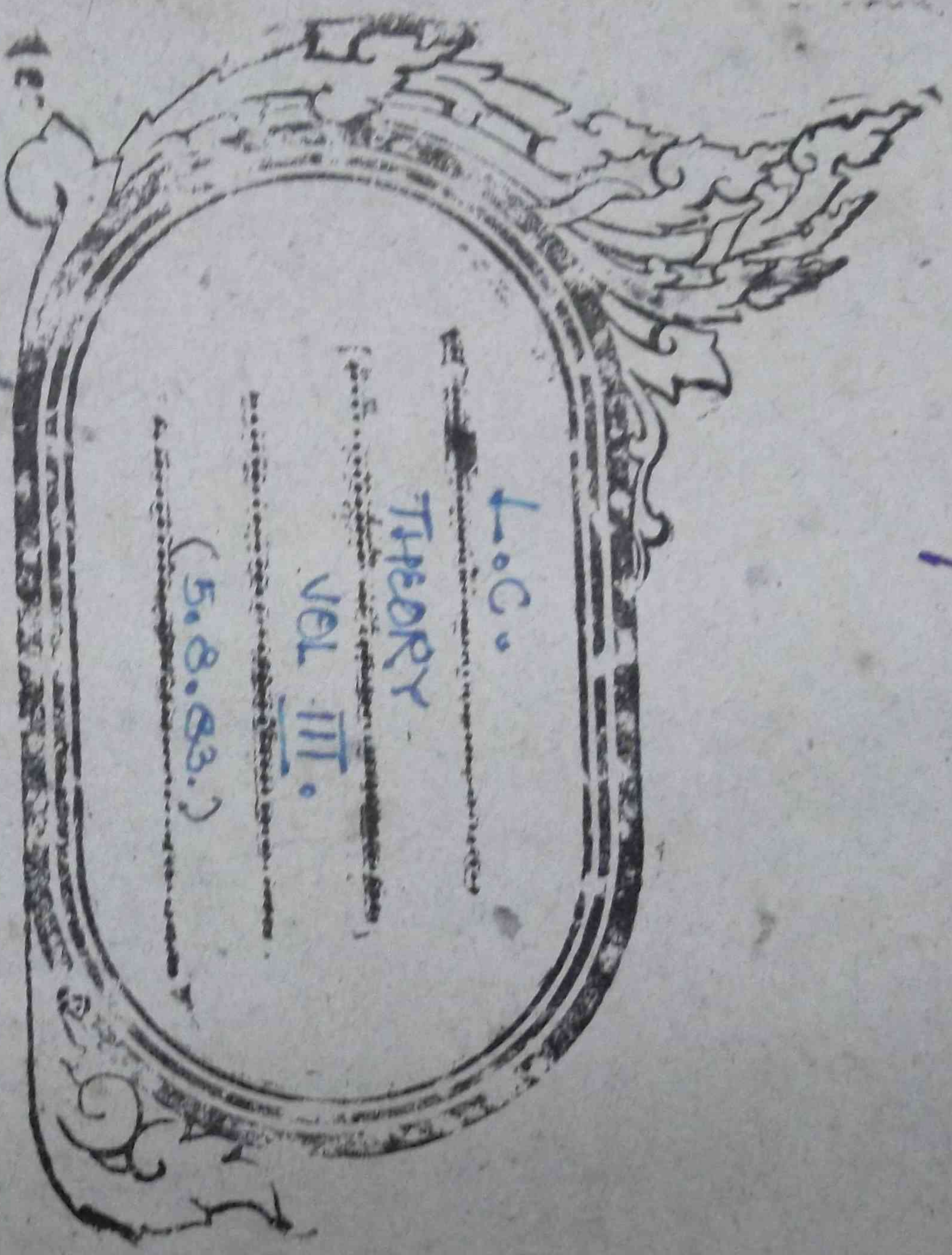
✓ Ring Band up from

$\frac{1}{2} \times 100 = 50$
 $\frac{1}{4} \times 100 = 25$
 $\frac{1}{8} \times 100 = 12.5$
 $\frac{1}{16} \times 100 = 6.25$
 $\frac{1}{32} \times 100 = 3.125$
 $\frac{1}{64} \times 100 = 1.5625$
 $\frac{1}{128} \times 100 = 0.78125$
 $\frac{1}{256} \times 100 = 0.390625$
 $\frac{1}{512} \times 100 = 0.1953125$
 $\frac{1}{1024} \times 100 = 0.09765625$
 $\frac{1}{2048} \times 100 = 0.048828125$
 $\frac{1}{4096} \times 100 = 0.0244140625$
 $\frac{1}{8192} \times 100 = 0.01220703125$
 $\frac{1}{16384} \times 100 = 0.006103515625$
 $\frac{1}{32768} \times 100 = 0.0030517578125$
 $\frac{1}{65536} \times 100 = 0.00152587890625$
 $\frac{1}{131072} \times 100 = 0.000762939453125$
 $\frac{1}{262144} \times 100 = 0.0003814697265625$
 $\frac{1}{524288} \times 100 = 0.00019073486328125$
 $\frac{1}{1048576} \times 100 = 9.5367431640625 \times 10^{-5}$
 $\frac{1}{2097152} \times 100 = 4.76837158203125 \times 10^{-5}$
 $\frac{1}{4194304} \times 100 = 2.384185791015625 \times 10^{-5}$
 $\frac{1}{8388608} \times 100 = 1.1920928955078125 \times 10^{-5}$
 $\frac{1}{16777216} \times 100 = 5.9604644775390625 \times 10^{-6}$
 $\frac{1}{33554432} \times 100 = 2.9802322387695312 \times 10^{-6}$
 $\frac{1}{67108864} \times 100 = 1.4901161193847656 \times 10^{-6}$
 $\frac{1}{134217728} \times 100 = 7.450580596923828 \times 10^{-7}$
 $\frac{1}{268435456} \times 100 = 3.725290298461914 \times 10^{-7}$
 $\frac{1}{536870912} \times 100 = 1.862645149230957 \times 10^{-7}$
 $\frac{1}{1073741824} \times 100 = 9.313225746154785 \times 10^{-8}$
 $\frac{1}{2147483648} \times 100 = 4.656612873077392 \times 10^{-8}$
 $\frac{1}{4294967296} \times 100 = 2.328306436538696 \times 10^{-8}$
 $\frac{1}{8589934592} \times 100 = 1.164153218269348 \times 10^{-8}$
 $\frac{1}{17179869184} \times 100 = 5.82076609134674 \times 10^{-9}$
 $\frac{1}{34359738368} \times 100 = 2.91038304567337 \times 10^{-9}$
 $\frac{1}{68719476736} \times 100 = 1.455191522836685 \times 10^{-9}$
 $\frac{1}{137438953472} \times 100 = 7.275957614183425 \times 10^{-10}$
 $\frac{1}{274877906944} \times 100 = 3.637978807091712 \times 10^{-10}$
 $\frac{1}{549755813888} \times 100 = 1.818989403545856 \times 10^{-10}$
 $\frac{1}{1099511627776} \times 100 = 9.09494701772928 \times 10^{-11}$
 $\frac{1}{2199023255552} \times 100 = 4.54747350886464 \times 10^{-11}$
 $\frac{1}{4398046511104} \times 100 = 2.27373675443232 \times 10^{-11}$
 $\frac{1}{8796093022208} \times 100 = 1.13686837721616 \times 10^{-11}$
 $\frac{1}{17592186044416} \times 100 = 5.6843418860808 \times 10^{-12}$
 $\frac{1}{35184372088832} \times 100 = 2.8421709430404 \times 10^{-12}$
 $\frac{1}{70368744177664} \times 100 = 1.4210854715202 \times 10^{-12}$
 $\frac{1}{140737488355328} \times 100 = 7.105427357601 \times 10^{-13}$
 $\frac{1}{281474976710656} \times 100 = 3.5527136788005 \times 10^{-13}$
 $\frac{1}{562949953421312} \times 100 = 1.77635683940025 \times 10^{-13}$
 $\frac{1}{1125899906842624} \times 100 = 8.88178419700125 \times 10^{-14}$
 $\frac{1}{2251799813685248} \times 100 = 4.440892098500625 \times 10^{-14}$
 $\frac{1}{4503599627370496} \times 100 = 2.2204460492503125 \times 10^{-14}$
 $\frac{1}{9007199254740992} \times 100 = 1.1102230246251562 \times 10^{-14}$
 $\frac{1}{18014398509481984} \times 100 = 5.551115123125781 \times 10^{-15}$
 $\frac{1}{36028797018963968} \times 100 = 2.7755575615628906 \times 10^{-15}$
 $\frac{1}{72057594037927936} \times 100 = 1.3877787807814453 \times 10^{-15}$
 $\frac{1}{144115188075855872} \times 100 = 6.938893903907226 \times 10^{-16}$
 $\frac{1}{288230376151711744} \times 100 = 3.469446951953613 \times 10^{-16}$
 $\frac{1}{576460752303423488} \times 100 = 1.7347234759768065 \times 10^{-16}$
 $\frac{1}{1152921504606846976} \times 100 = 8.673617379884032 \times 10^{-17}$
 $\frac{1}{2305843009213693952} \times 100 = 4.336808689942016 \times 10^{-17}$
 $\frac{1}{4611686018427387904} \times 100 = 2.168404344971008 \times 10^{-17}$
 $\frac{1}{9223372036854775808} \times 100 = 1.084202172485504 \times 10^{-17}$
 $\frac{1}{18446744073709551616} \times 100 = 5.42101086242752 \times 10^{-18}$
 $\frac{1}{36893488147419103232} \times 100 = 2.71050543121376 \times 10^{-18}$
 $\frac{1}{73786976294838206464} \times 100 = 1.35525271560688 \times 10^{-18}$
 $\frac{1}{147573952589676412928} \times 100 = 6.7762635780344 \times 10^{-19}$
 $\frac{1}{295147905179352825856} \times 100 = 3.3881317890172 \times 10^{-19}$
 $\frac{1}{590295810358705651712} \times 100 = 1.6940658945086 \times 10^{-19}$
 $\frac{1}{1180591620717411303424} \times 100 = 8.470329472543 \times 10^{-20}$
 $\frac{1}{2361183241434822606848} \times 100 = 4.2351647362715 \times 10^{-20}$
 $\frac{1}{4722366482869645213696} \times 100 = 2.11758236813575 \times 10^{-20}$
 $\frac{1}{9444732965739290427392} \times 100 = 1.058791184067875 \times 10^{-20}$
 $\frac{1}{18889465931478580854784} \times 100 = 5.293955920339375 \times 10^{-21}$
 $\frac{1}{37778931862957161709568} \times 100 = 2.6469779601696875 \times 10^{-21}$

✓ 628: of 1. 60000.

Mr.

KN 85-



L.C. THEORY

Atre Mo

2002 5.8.83

ROT

$$\left\{ \frac{(X+328) \times 20}{65} \right\} \times 2 = -X = 328$$

അംഗീകരിച്ച
2002.08.05
ഇ.കെ.എസ്.എസ്.എസ്.
പ്രൊഫ. പ്രൊഫ. പ്രൊഫ.
പ്രൊഫ.

4-4 TYPE REPEATER

4-4 type repeater သည် အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

၁။ အောက်ဖော်ပြပါအတိုင်း ဆက်သွယ်ရေး ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။ ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။ ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

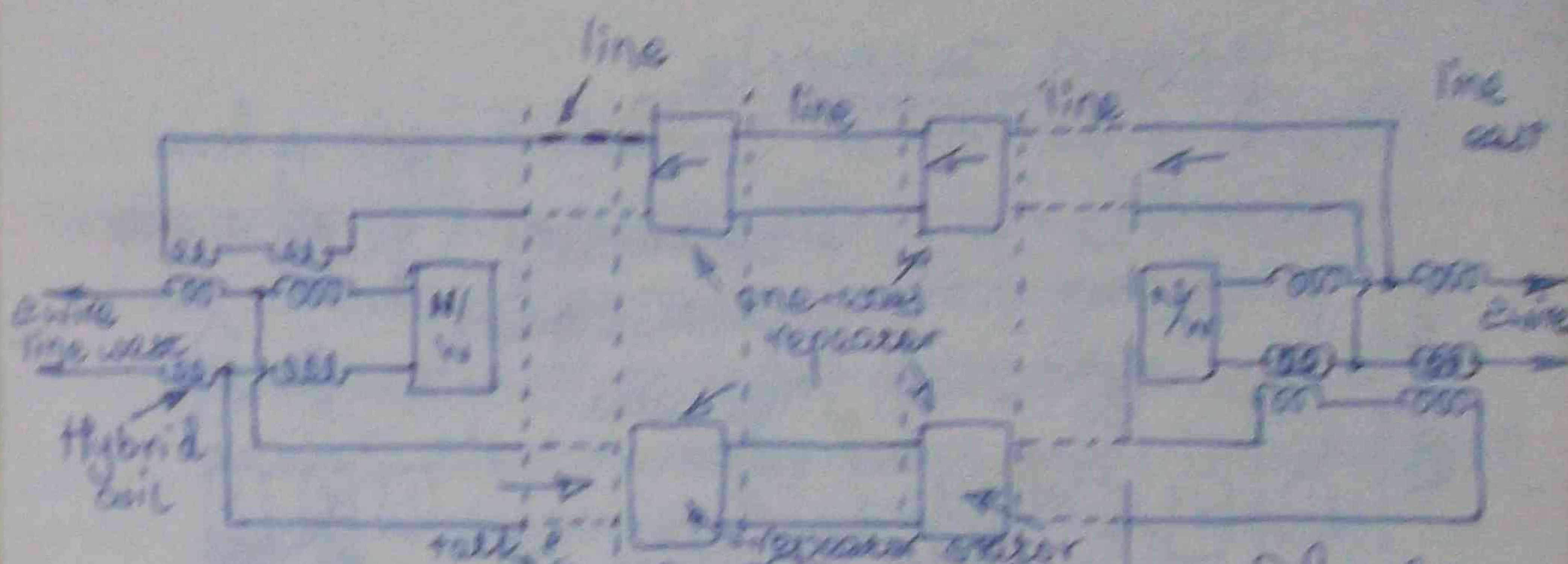
၂။ Bridge ကွန်ပတ်မန်စ်များကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။ ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

Line ကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။ ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

4-4 type သည် ၁ ဝါယာ၊ ၁ စတေးရှင်းပါသည်။

၂။ ၄-၄ type repeater မှာ ၁ stage repeater မှာ အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

4-4 type repeater circuit

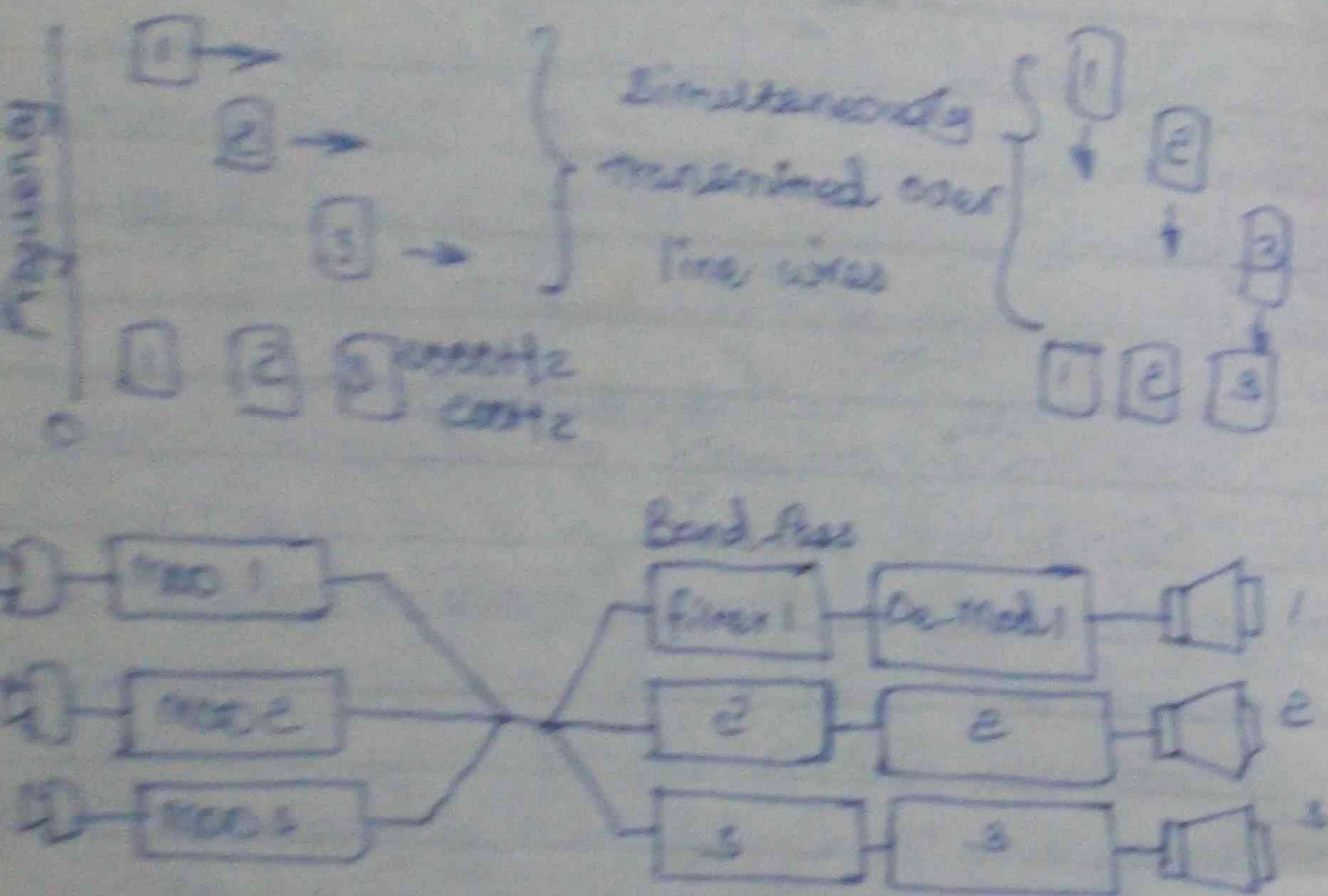


Cross talk သည် အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။ ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

① Magnetic နှင့် electric shield ကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

② ဝါယာ ၁ ခုကို အောက်ဖော်ပြပါအတိုင်း ဖွဲ့စည်းထားသည်။

CARRIER TELEPHONE



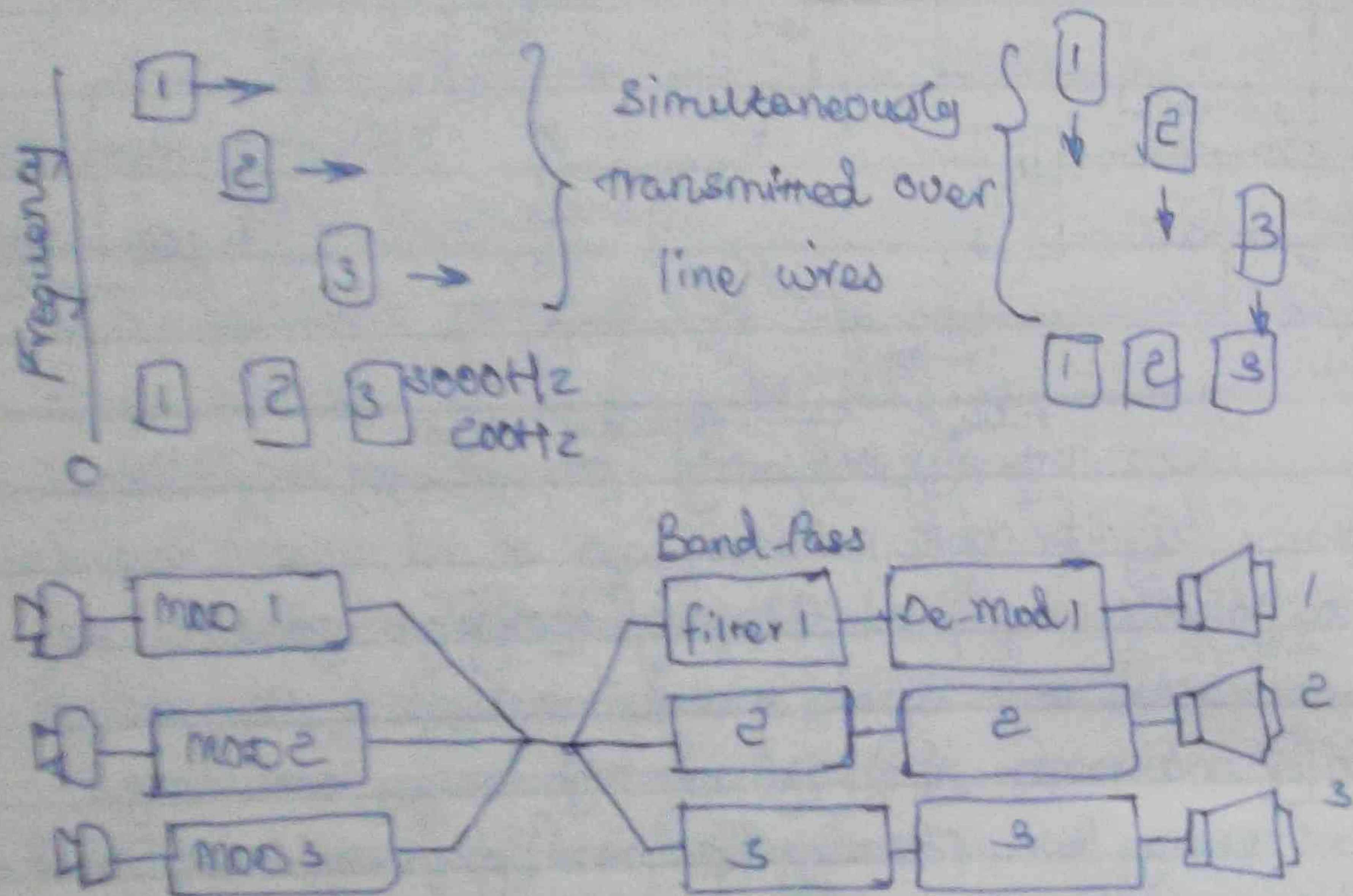
The carrier wave, $\sin 2\pi f_c t$, is a high frequency
sinusoidal wave. The modulating signal, $\sin 2\pi f_m t$, is a
lower frequency sinusoidal wave. The frequency of
the carrier wave is much higher than the frequency of
the modulating signal. The frequency of the carrier wave
is f_c and the frequency of the modulating signal is f_m .
The modulated wave is a sinusoidal wave whose
frequency is $f_c + f_m$ and $f_c - f_m$. The
modulated wave is a sinusoidal wave whose
frequency is $f_c + f_m$ and $f_c - f_m$.
The modulated wave is a sinusoidal wave whose
frequency is $f_c + f_m$ and $f_c - f_m$.
The modulated wave is a sinusoidal wave whose
frequency is $f_c + f_m$ and $f_c - f_m$.

band. ဤသို့ပြုလုပ်၍ ဆိုလိုချင်သော de-modulator မှာ ~~သော~~ ဖြစ်
 နေသည်။ $1000 \pm 3000 \text{ Hz}$ ထိ ပြန့်၍ ဖြန့်ဖြူးသည်။ ဤသို့ ဆက်ပြီး
 line wire ကိုရောက်ပြီး၊ အသံသွင်း အသံထွက်များကို ထပ်မံ
 ဖြန့်ဖြူးသည်။ (ဤ ဖြန့်ဖြူးမှုကို ပုံသွင်းဆက်သွယ်သည်။ ●)
 ထပ်မံ၍ telephone ကိုရောက်ပြီး၊ အသံသွင်း အသံထွက်များကို
~~သော~~ modulator ကိုရောက်ပြီး ● ပြန်၊ ဆိုလိုချင်သော
 H.F. band မှာ ~~သော~~ ^{သော} transmission line ကိုရောက်သည်။
 ထိုစဉ်းမှ ဆက်သွယ်သည်။ Tx line မှာ ဆက်သွယ် ထုတ်သွင်းရာတွင်
 သော H.F. မှာ ဆက်သွယ်သော freq. band မှာ band
pass filter ဖြစ်သည်။ ထိုသို့ပြုလုပ်ပြီးသော H.F. impulse
 မှာ ~~သော~~ de-modulator ကိုရောက်သည်။ ထိုသို့ဆက်သွယ်ရာ de-modulator မှာ
 သော speech impulse မှာ speech impulse ကိုရောက်သည်။
 Rx မှာ speech impulse ကိုရောက်သည်။

၇၆. ထောင်စု အစုအဝေး အဖွဲ့အစည်းတို့၏
အဖွဲ့အစည်းများ အဖွဲ့အစည်းတို့၏ အဖွဲ့အစည်းများ

- c) Oscillator,
ce) Modulator,
cs) De-modulator,
ca) filter.

CARRIER TELEPHONE



carrier telephone system line ကာရီယာတွင်
 telephone ဆက်သွယ်မှုများကို ~~တစ်ခုချင်း~~ တစ်ချင်းချင်း
 လိုက်လံ ဆက်သွယ်ပေးသည်။ Voice frequency ၏
 transmission band ကို 200 to 3000 Hz ခြားရှိရာတွင်
 Tx နှင့် ရင်းနှီးသော speech frequency ကို modulator
 မှုမှ ~~ထုတ်~~ higher frequency band မှုမှ ထုတ်၍ အသံသံ
 ပြုစုပေးသည်။ transmission line မှုမှ လိုက်လံ
 ထုတ်ပေးသည်။ Filter မှုမှ frequency
 လိုက်လံ ဆက်သွယ်ပေးသည်။

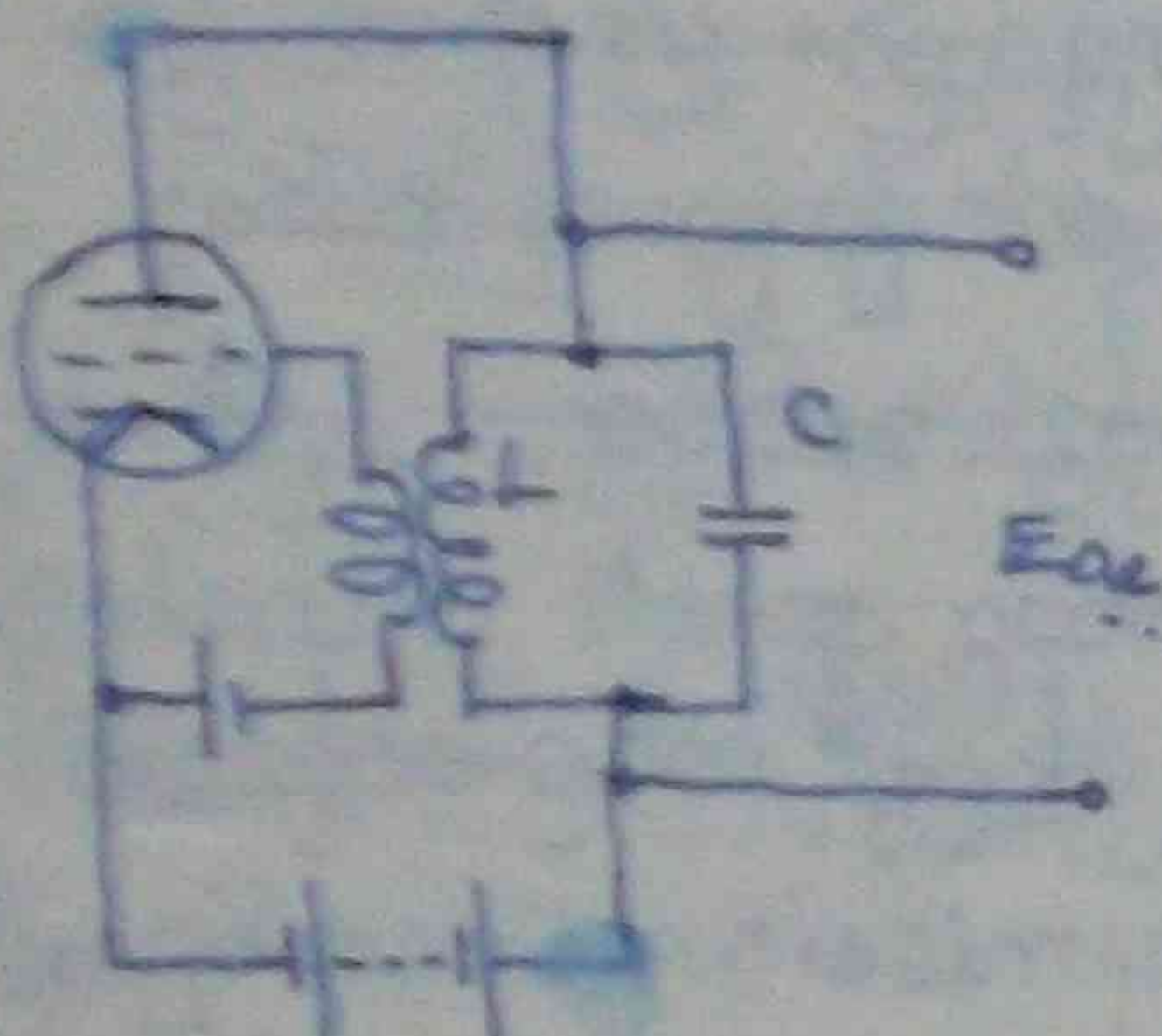
band မှုမှ ကိုက်ညီသော de-modulator မှုမှ ~~ထုတ်~~ ထုတ်
 ပြုစုပေးသည်။ 200 to 3000 Hz ခြားရှိရာတွင် အသံသံ
 line wire တစ်ချင်းချင်း message ကာရီယာ မှုမှ ထုတ်ပေး
 ပြုစုပေးသည်။ (ဒါ ပြုလုပ်ရာတွင် ပုံစံတူသော သံသံ)။
 သံသံတွင် telephone ကိုက်ညီသော speech impulse မှုမှ ကို
 modulator တွင် ~~ထုတ်~~ ထုတ်၍ တစ်ချင်းချင်း
 H.F. band မှုမှ transmission line တစ်ချင်းချင်း
 ထုတ်ပေးသည်။ Tx line မှုမှ ထုတ်ပေးရာတွင်
 H.F. မှုမှ ကိုက်ညီသော frequency band ကို band
 pass filter မှုမှ ထုတ်ပေးသည်။ ထုတ်ပေးရာတွင် H.F. impulse
 မှုမှ de-modulator တွင် ပြုစုပေးသည်။ ထုတ်ပေးရာတွင် de-modulator မှုမှ
 ထုတ်ပေးရာတွင် speech impulse မှုမှ ထုတ်ပေးသည်။
 Rx မှုမှ ထုတ်ပေးသည်။

carrier telephone system မှုမှ လိုက်လံ
 ဆက်သွယ်ပေးရာတွင် လိုက်လံ ဆက်သွယ်ပေးသည်။
 ၄) Oscillator,
 ၅) Modulator,
 ၆) De-modulator,
 ၇) filter မှုမှ ပြုစုပေးသည်။

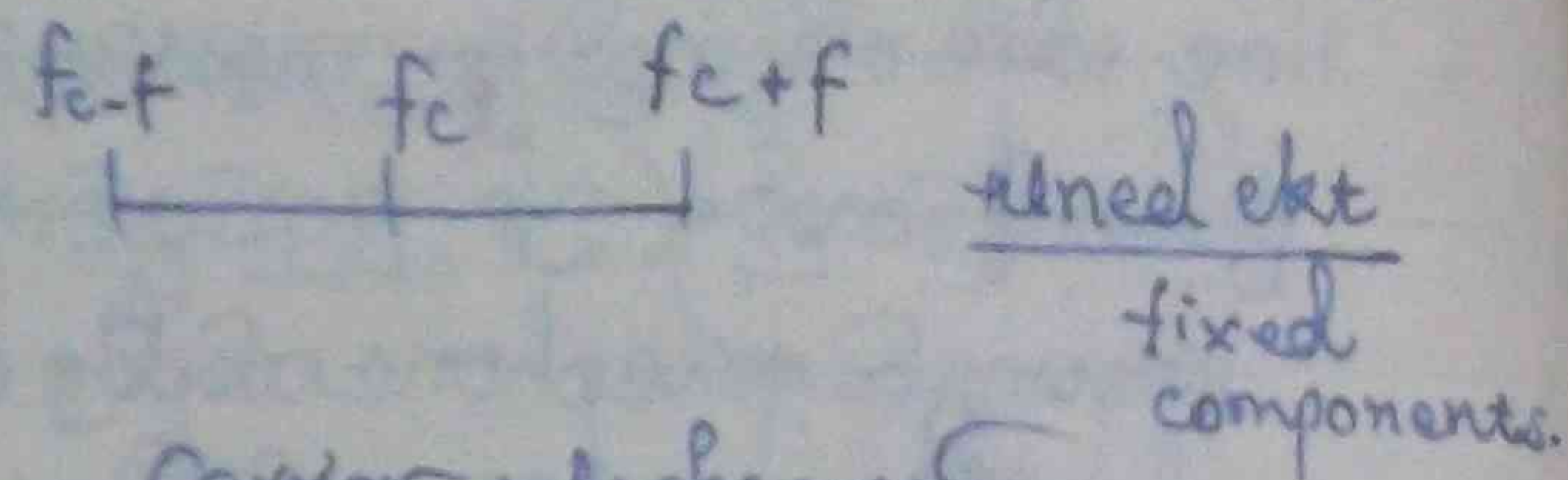
1. Oscillator,
2. Modulator,
3. De-Modulator,
4. Filter Networks.

5.8.83. FRJ:

Oscillator



HF (carrier freq) တစ်ခုတည်းပေးသည်။



Carrier telephony
modulation & de-modulation တို့ကို
high frequency voltage ကိုပေးသည်။

Simple Vacuum Tube Osc:

ဒီလို vacuum tube oscillator ကို တည်ဆောက်သည်။

Vacuum tube osc ကို တည်ဆောက်ရာတွင် အောက်ပါအတိုင်း ရှိသည်။

ဒီလို သီအိုရီ L-C circuit သည် anti-resonant fr. ဖြစ်
alternation voltage ကို ပေးသည်။ ဒီလို L, C ကို တွေ့ရှိရန်
အောက်ပါ အတိုင်း ရှိသည်။ Coil ကို အောက်ပါ အတိုင်း
grid ကို voltage induced ရှိသည်။ Induced voltage
coil ကို current variation ကို ပြုလုပ်သည်။ ထို coil
L ကို အောက်ပါ အတိုင်း ရှိသည်။ grid circuit ကို ပြုလုပ်သည်။
induced voltage ကို တည်ဆောက်ရာတွင် အောက်ပါ အတိုင်း ရှိသည်။
oscillation ကို အောက်ပါ အတိုင်း ရှိသည်။ changing
or transient current ကို ပေးသည်။ changing or
transient current ကို freq. component ကို ပေးသည်။
L-C ကို tuned circuit component သည် Ecc ကို ပေးသည်။

Modulation

mod. ဆိုသည်မှာ speech frequency ကို 200 to 3000 Hz ဖြစ်
သို့မဟုတ် freq. band ကို ပေးသည်။ အောက်ပါ အတိုင်း ရှိသည်။
ဒီလို non-linear distortion ကို ပေးသည်။ အောက်ပါ
sine wave ကို non-linear circuit, impressed ပြုလုပ်သည်။
sine wave harmonic component ကို ပေးသည်။
freq. component sine wave ကို non-linear device ကို impressed
ပြုလုပ်သည်။ ဒီလို wave ကို distortion ကို ပေးသည်။
အောက်ပါ distortion curve ကို ပေးသည်။

- (1) sine wave freq. ကို
- (2) Freq. component ကို
- (3) Freq. component ကို

အောက်ပါ voice freq 1000 Hz ကို carrier frequency 10 000 Hz
သို့မဟုတ် non-linear circuit applied ပြုလုပ်သည်။
current ကို freq. ကို

- (1) Carrier Frequency, 10 000 Hz,
- (2) Voice Frequency 1000 Hz, (Upper side-band)
- (3) Sum of Frequencies 11 000 Hz, (Lower side-band)
- (4) Difference of Frequencies 9000 Hz (Lower side Band)

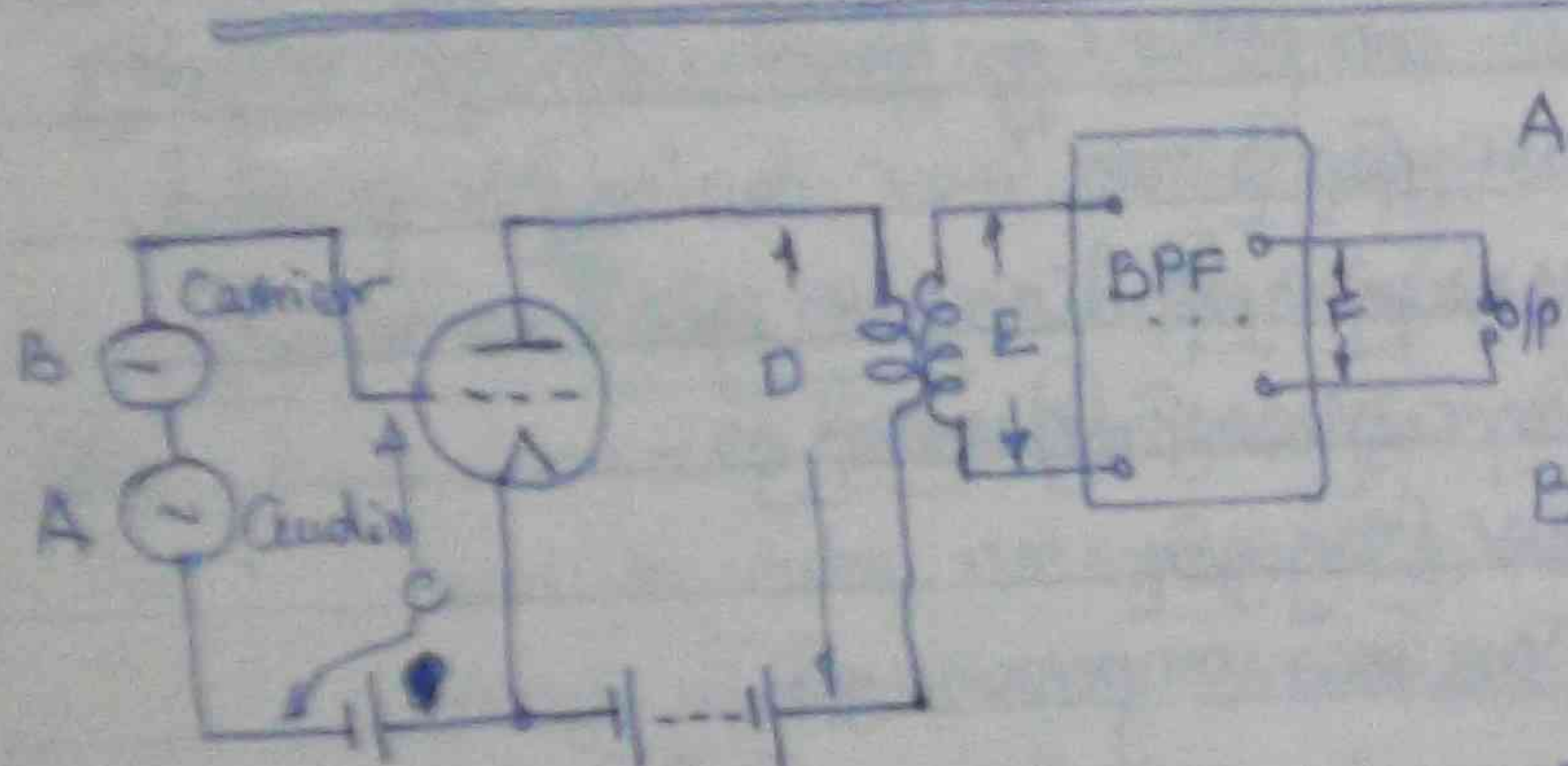
အောက်ပါ voice frequency 200 to 3000 Hz band ကို ပေးသည်။
frequency ကို ပေးသည်။

- (1) Carrier 10000 Hz, (2) 200-3000 Hz, (3) 10 200-13 000 Hz, (4) 7000-9000 Hz.

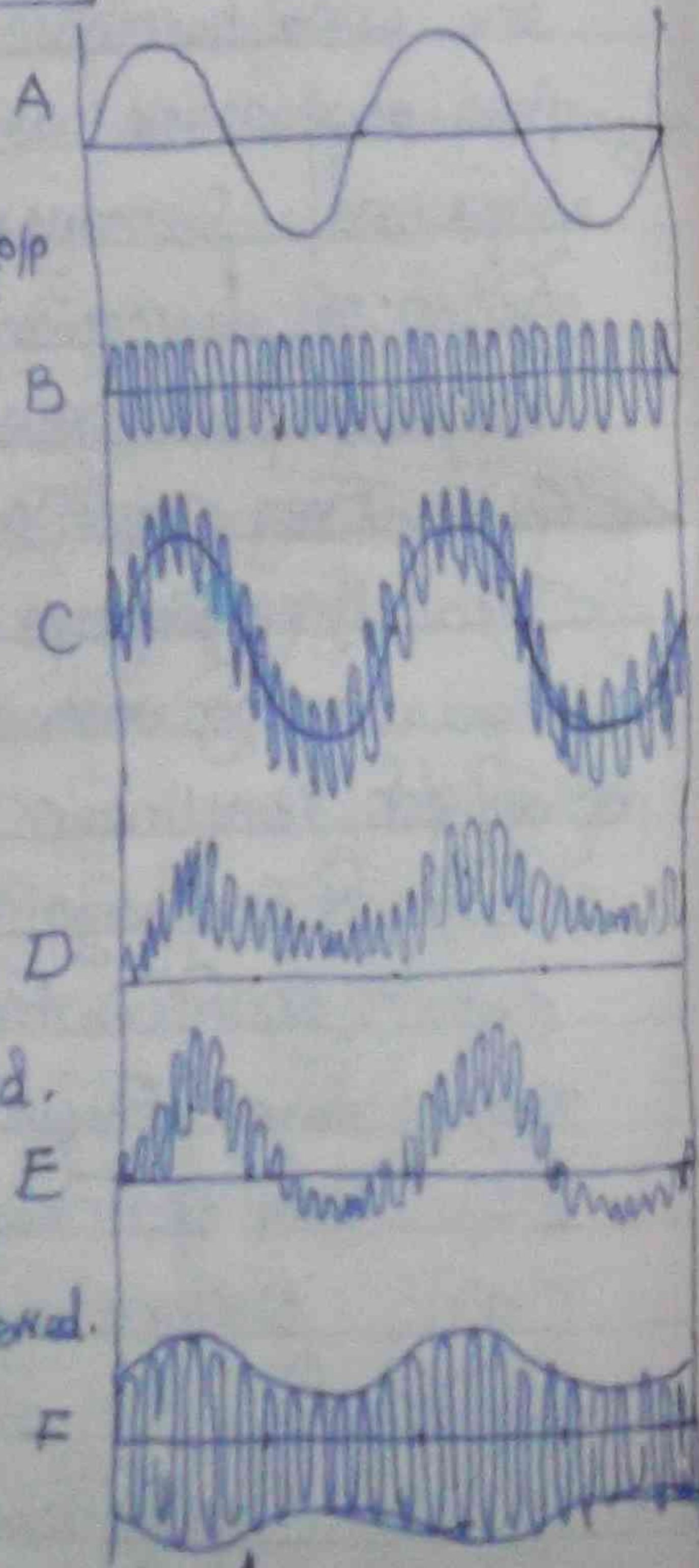
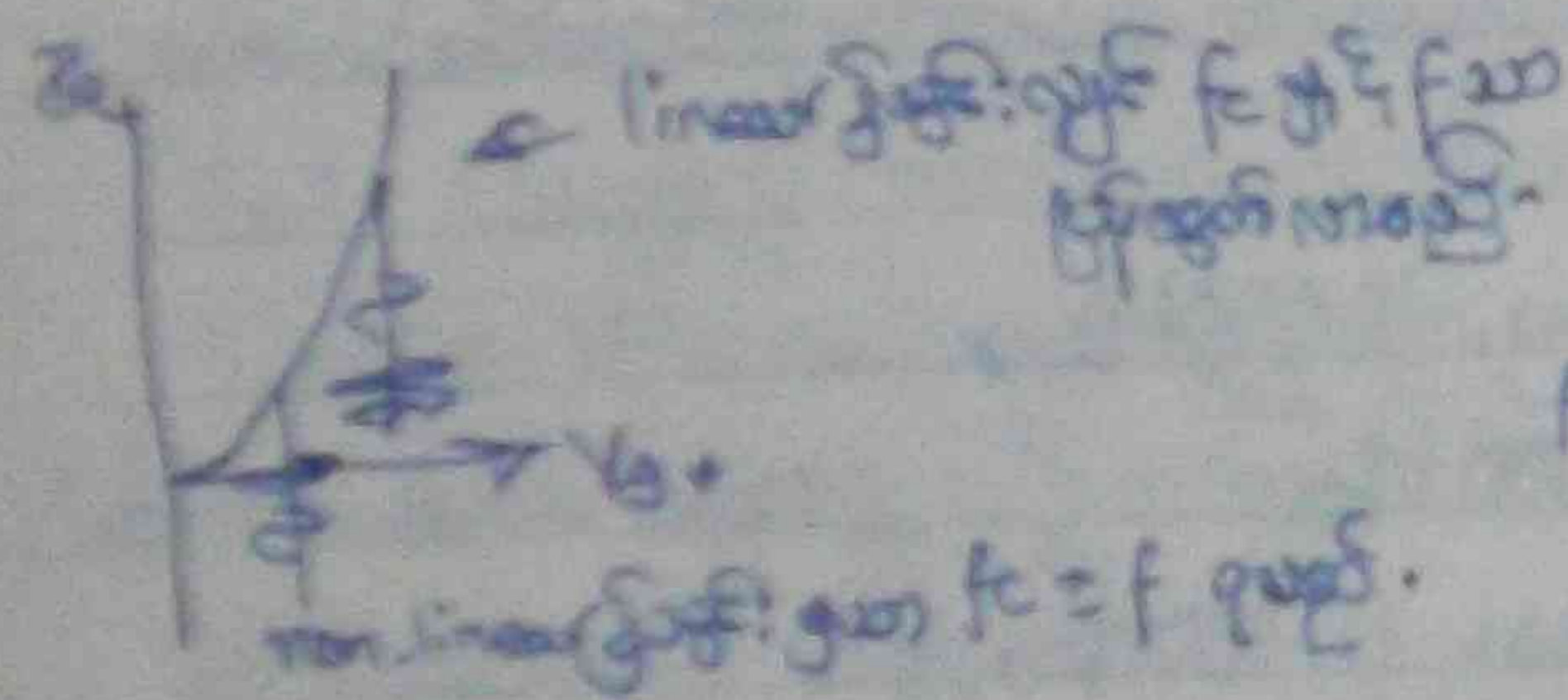
ဆက်(၁) ပလက်(စ်)

ဤစနစ်သည် အချို့သော side band ဖြစ်ပေါ်စေသော side band ဖြစ်ပေါ်စေသော linear transmit-လုပ်ငန်း

Modulation with Vacuum Tubes



Ckt & Bias for illustrating the principle of modulation

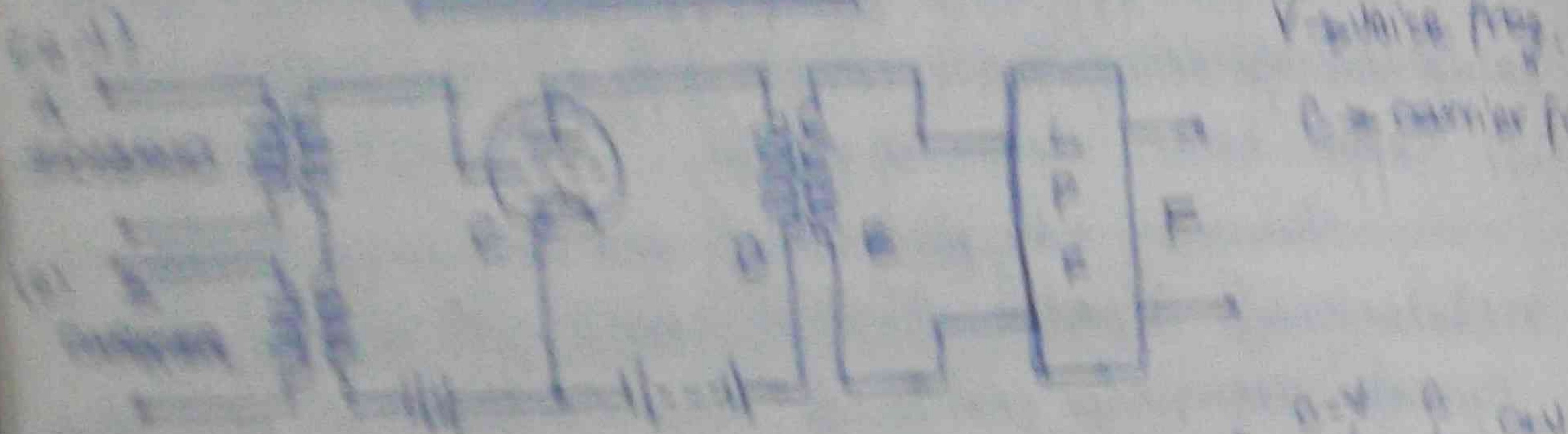


Harmonic distortion. B, f side band components.

Modulation နည်းလမ်းများကို အောက်ပါအတိုင်း ဖော်ပြပါသည်။ Carrier telephone system မှာ အောက်ပါအတိုင်း ဖော်ပြပါသည်။ (၁) Vacuum tube, (၂) Copper-oxide varistor ကို ဖော်ပြပါသည်။

Vacuum tube မှာ အောက်ပါအတိုင်း ဖော်ပြပါသည်။ modulation မှာ distortion ကို ဖြစ်ပေါ်စေသော grid voltage, E_p curved non-linear portion မှာ operation မှာ grid bias ကို လိုက်နာသော အတိုင်း ဖော်ပြပါသည်။ (A) သည် voice freq. B သည် carrier freq. အတိုင်း ဖော်ပြပါသည်။ (C) သည် H.F. carrier voltage ဖြစ်ပြီး low freq. speech impulse voltage ကို ဖော်ပြပါသည်။ (D) သည် sine wave ဖြစ်ပြီး tube charact. curve မှ non-linear portion မှ applied ဖြစ်သော အတိုင်း ဖော်ပြပါသည်။ (E) သည် direct & alternating component ဖြစ်သည်။ (F) သည် primary side band ဖြစ်သည်။ Trans. & sec. side band induced voltage wave shape မှ (E) သည် ဖော်ပြပါသည်။ (F) သည် alternating component မှ ဖော်ပြပါသည်။

- (၁) carrier freq. (၂) voice freq.
 - (၃) side band (၄) harmonic components.
- အထက် BPF ကို ဖော်ပြပါ carrier & side band ဖြစ်သော pass band ဖြစ်သော filter O/P သည် (F) ကို ဖော်ပြပါသည်။



11. 12. 13.

V. 10114 Aug.

Q. 2. Explain the following:

0.1 (0.0-0.2)

Handwritten: *Handwritten*

23-50

1967

By *W. H. H. H.*

John H. Johnson

Wednesday

1. The first part of the paper is devoted to a general discussion of the problem of the existence of a solution of the system of equations (1) for arbitrary values of the parameters α and β . It is shown that the system has a solution for arbitrary values of the parameters α and β if and only if the condition $\alpha + \beta = 1$ is satisfied.

1. The first part of the paper is devoted to a review of the literature on the topic.

message of the carrier system is not bound to the carrier system.

Carrier frequency is generated by a
oscillator, demodulator circuit applied to the
of the p-circuit sideband and carrier both, across grid
voltage variation and generation of sideband by sinusoidal
frequency is dependent on the plate current distortion caused
by the transfer of energy to the voltage E and H.F. & L.F.
components of the signal. Another voltage E and
low pass filter applied to the signal of the filter and components
of the signal are applied to the L.F. impulse
response of the signal.

The following are the main components of the signal:

- Carrier frequency: 1.5 MHz
- Modulation: Frequency Modulation (FM)
- Bandwidth: 10 kHz
- Power: 100 mW
- Frequency range: 1.49 MHz to 1.51 MHz
- Modulation index: 1.0
- Carrier frequency: 1.5 MHz
- Modulation: Frequency Modulation (FM)
- Bandwidth: 10 kHz
- Power: 100 mW
- Frequency range: 1.49 MHz to 1.51 MHz
- Modulation index: 1.0

CARRIER TELEPHONE SYSTEM

၎င်း system ၌ တစ်ခုစီ TALKING CHANNEL ရှိသည်။
 စုံတွဲ LINE WIRE ၌ FREQUENCY COMPONENT များကို ဖြည့်စွက်သည်။
 ဆက်သွယ်သည့် ဤ CHANNEL များကို BAND PASS FILTER ဖြင့် ခွဲထုတ်ပြီး
 TELEPHONE CHANNEL နှစ်ခုစီတစ်ခုစီသို့ အပ်နှံသည်။ ထို့ကြောင့် လိုအပ်သည့်
 TRANSMITTING & RECEIVING IMPULSES များကို ဖြန့်ဖြူးနိုင်သည်။
 ဤသို့ ဖြန့်ဖြူးမှုကို လုပ်ဆောင်ရာတွင် နှစ်ခုစီ ပြုလုပ်သည်။

ဤကဲ့သို့ လုပ်ဆောင်မှုသည် carrier channel ထဲသို့ အပ်နှံသည့် အားကို
 ပိုမို အားကောင်းစွာ အပ်နှံသည်။ ၎င်း Impulses များကို modulated လိုက်လံ
 applied လုပ်သည်။ ဤသို့ လုပ်သည့် နည်းကို carrier ch. of de modulation
 ခေါ်သည်။ ထိုနည်းကိုလည်း ဤနည်းအားဖြင့် Receiving device ကို
 transmitting device နှစ်ခုစီကို bridge transformer များကို
 ဆက်သွယ်သည်။ (direction ပုံစံ)

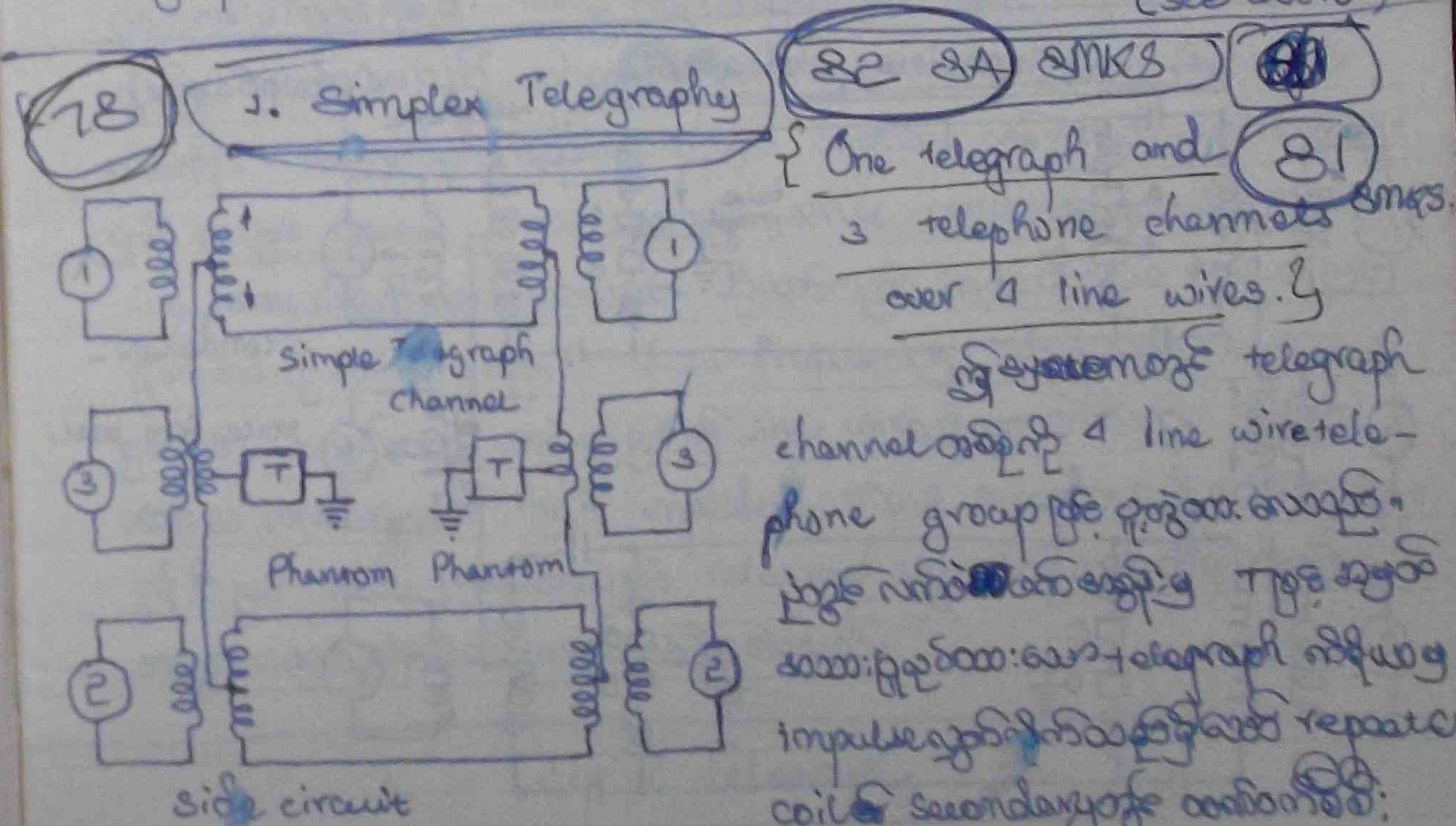
Carrier system ၌ နှစ်ခုစီ bridge တွင် HF carrier
 နှစ်ခုစီ အပ်နှံသည်။ Carrier system ၌ balancing
 လုပ်ဆောင်သည်။ HF ၌ အပ်နှံသည့် လိုက်လံဆောင်ရွက်မှုကို
 ဆက်သွယ်မှု filter များဖြင့် ဖြည့်စွက်ပြီး transmitting & Rx
 impulses များကို ဖြန့်ဖြူးသည်။ ဤသို့ filter များကို directional
 filter ခေါ်သည်။ ဤ filter များသည် Rx နှင့် Tx band များကို
 ထိန်းသိမ်းမှု လုပ်ဆောင်ခြင်း ဖြစ်သည်။

12.9.83.

SIMULTANEOUS TELEPHONE & TELEGRAPHY

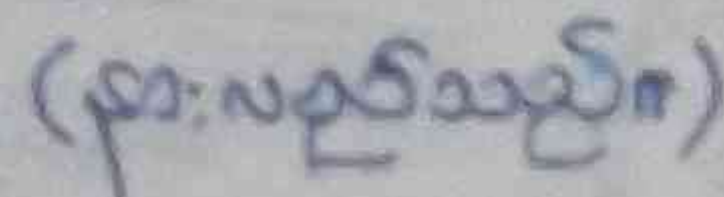
1. Simplex Telegraphy.
2. Composite Telegraphy,
3. Carrier Telegraphy.

Telephone channels များ open wire lines ၌ telegraph
 service များကိုလည်း အပ်နှံနိုင်သည်။ ထိုသို့ telephone နှင့် telegraph
 service များကို တစ်ပြိုင်နက် အပ်နှံခြင်းကို simultaneous telephony &
 telegraphy ခေါ်သည်။ ဤသို့ တစ်ပြိုင်နက် အပ်နှံခြင်းကို ပုံစံ ၃ ခု ပြုလုပ်သည်။
 (see above.)



ဤ system ၌ telegraph
 channel ၌ 4 line wire tele-
 phone group ဖြင့် ဖြန့်ဖြူးသည်။
 ဤကဲ့သို့ လုပ်ဆောင်ရာတွင် ဤသို့
 ဆက်သွယ်သည့် telegraph လိုက်လံ
 impulse များကို လိုက်လံဆောင်ရွက်ရာတွင်
 coil ၌ secondary ၌ ထိန်းသိမ်းသည်။

ထို့ကြောင့်၊ transformer winding များကို တစ်ပြိုင်နက်
 current သွင်းသွင်းသည့် Telegraph signals magnetic effect
 ကြောင့်၊ ထိုသို့ လုပ်ဆောင်ခြင်း ဖြစ်သည်။



condenser-
voice frag. pass.

Telegraph signals dot & dash ပြီးသည့် voice frequency
 ၇၆, ၇၆၆ Hz ရှိသော low frequency component ပြုပြင်ကြသည်။ ထိုကြောင့်
~~inductance~~ inductance coil သည် telegraph impulses သို့မဟုတ် တံခွန်
 တံခွန်ကြောင့်ဖြစ်ပြီး voice frequency သို့မဟုတ် high impedance path ဖြစ်
 ထိုသို့ condenser သည် voice frequency သို့မဟုတ် တံခွန်ကြောင့်
 ဖြစ်ပြီး telegraph impulse သို့မဟုတ် current လျင်မြန်သောကြောင့်
 သို့မဟုတ် speech current ပြုပြင် series condenser ဖြစ်သောကြောင့်
 line ~~wire~~ သို့မဟုတ် wire သို့မဟုတ် inductance coil ကြောင့်
 ground သို့မဟုတ် ground။ Low frequency telegraph current
 ဖြစ်ပြီး သို့မဟုတ် coil သို့မဟုတ် line wire သို့မဟုတ် သို့မဟုတ်
 series condenser ကို high impedance ကြောင့် telephone သို့မဟုတ်
 သို့မဟုတ် voice frequency ကို telegraph signal သို့မဟုတ်
 သို့မဟုတ် သို့မဟုတ် သို့မဟုတ် သို့မဟုတ်

Carrier telephony & principle of work: ပုံမှန် carrier telegraph ဖြစ်လာသည်။ Line wire တစ်ခုတည်းတွင် telegraph channel ခေါင်းစဉ်များစွာသုံးပြုနိုင်သည်။ တစ်ကြောင်းတွင် telegraph channel တစ်ခု

CP
12-13-14

18. 8. 83, THU.



∴ direction of current ∴ current polarityကို ခြေကပ်၍ ကနဦးမှ စ၍
polarized relayကို polar - relay အဖြစ် အသုံးပြုသည်။

WORD

Polar Relay

working air-gap.

armature

contact

flux direction same.

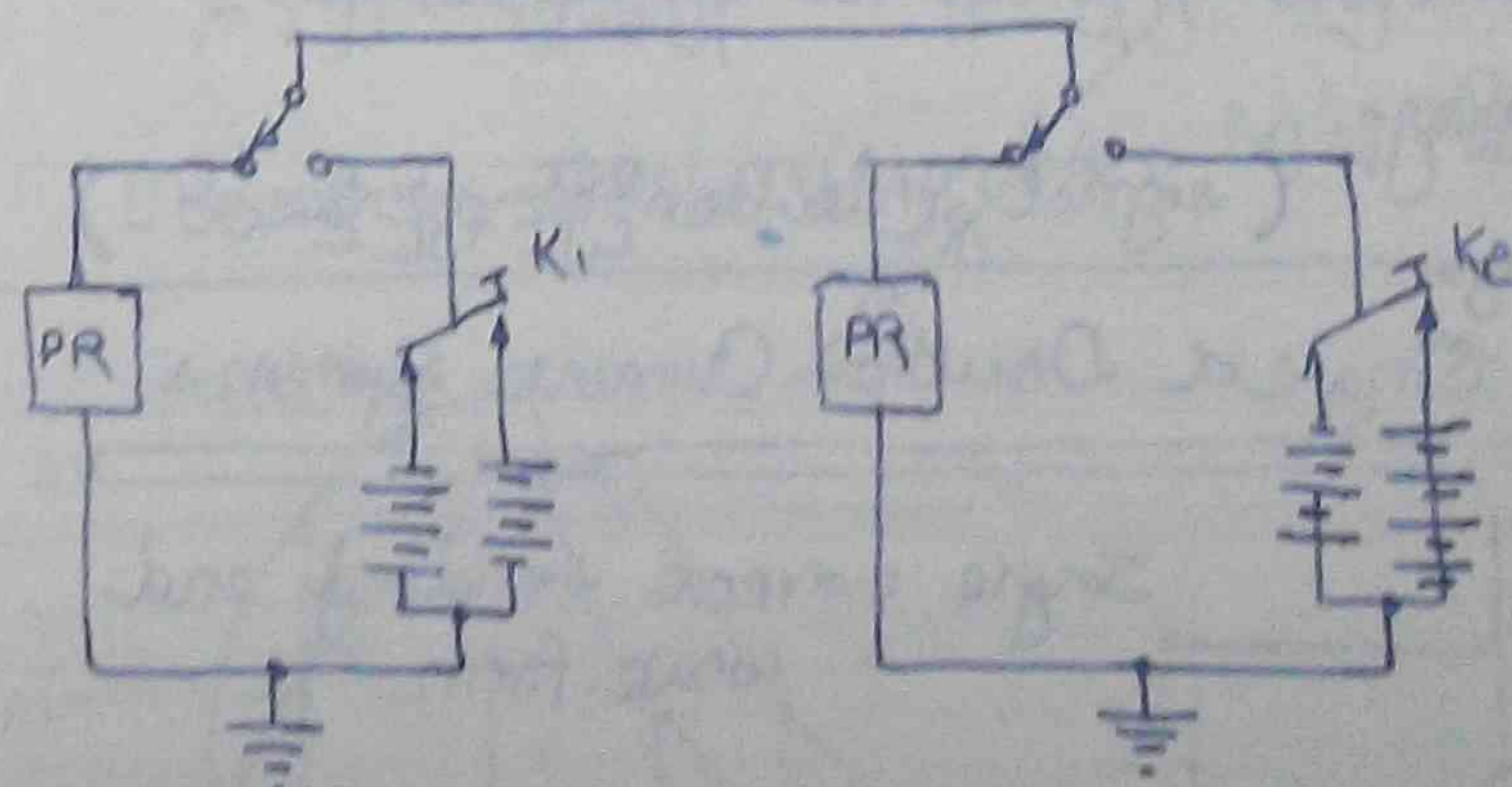
operating wdg.

P.M.

air gap

non-magnetic spacer.

Joke



Simplex double current system

[illegible]

to sounder.

PM \rightarrow flux of E.S.

wdg. of flux of E.S. in

no.

Direction of rotation

of the rotor

is connected to the

flux

wdg. of direction

of rotation.

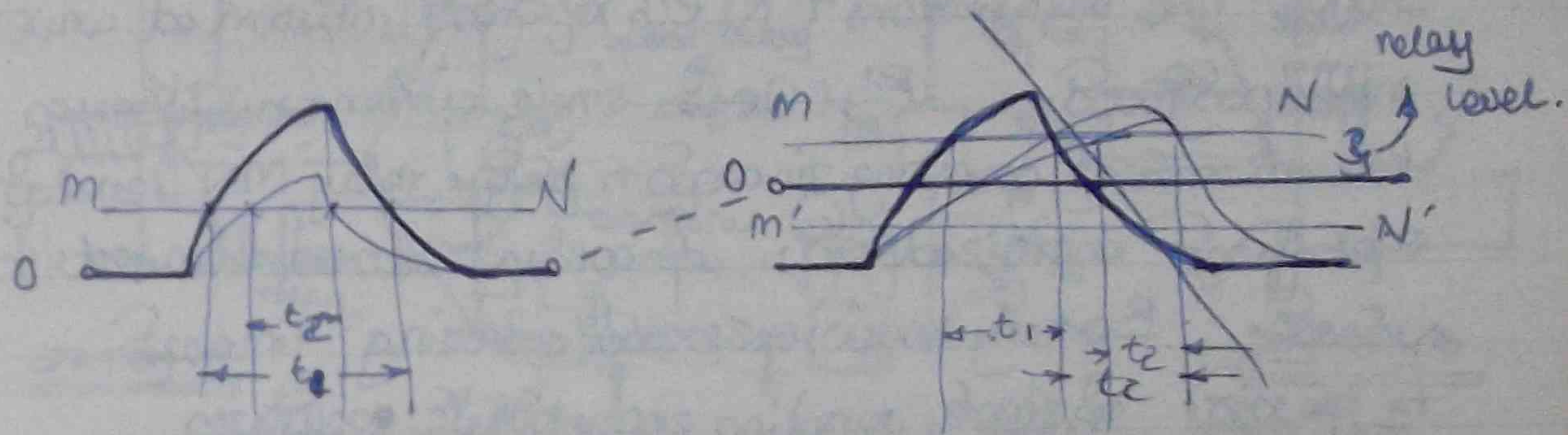
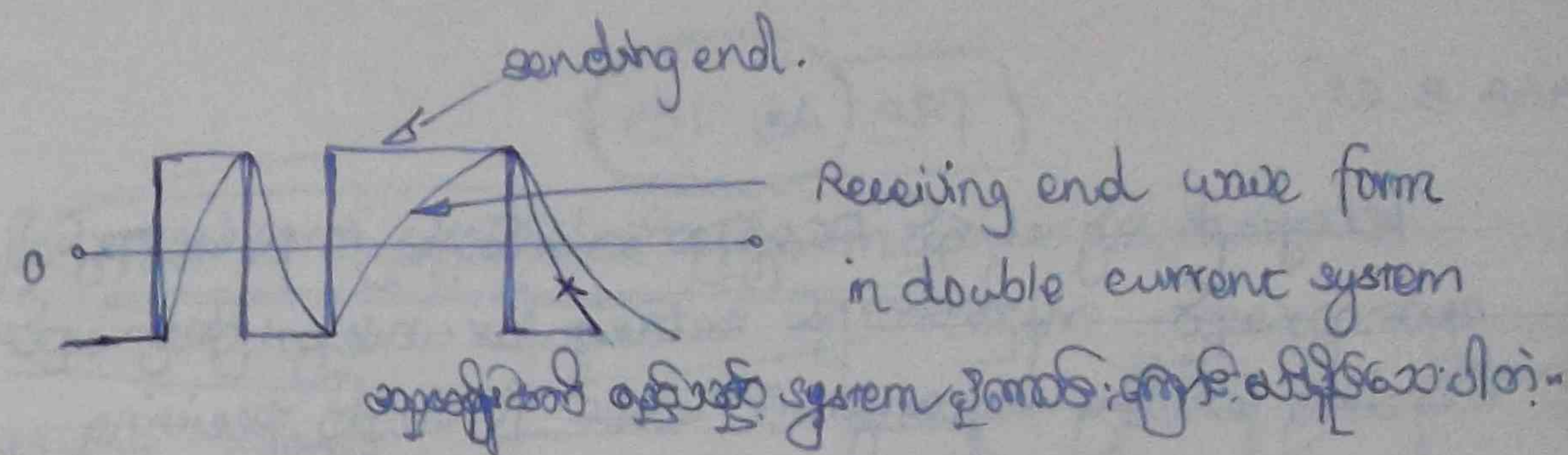
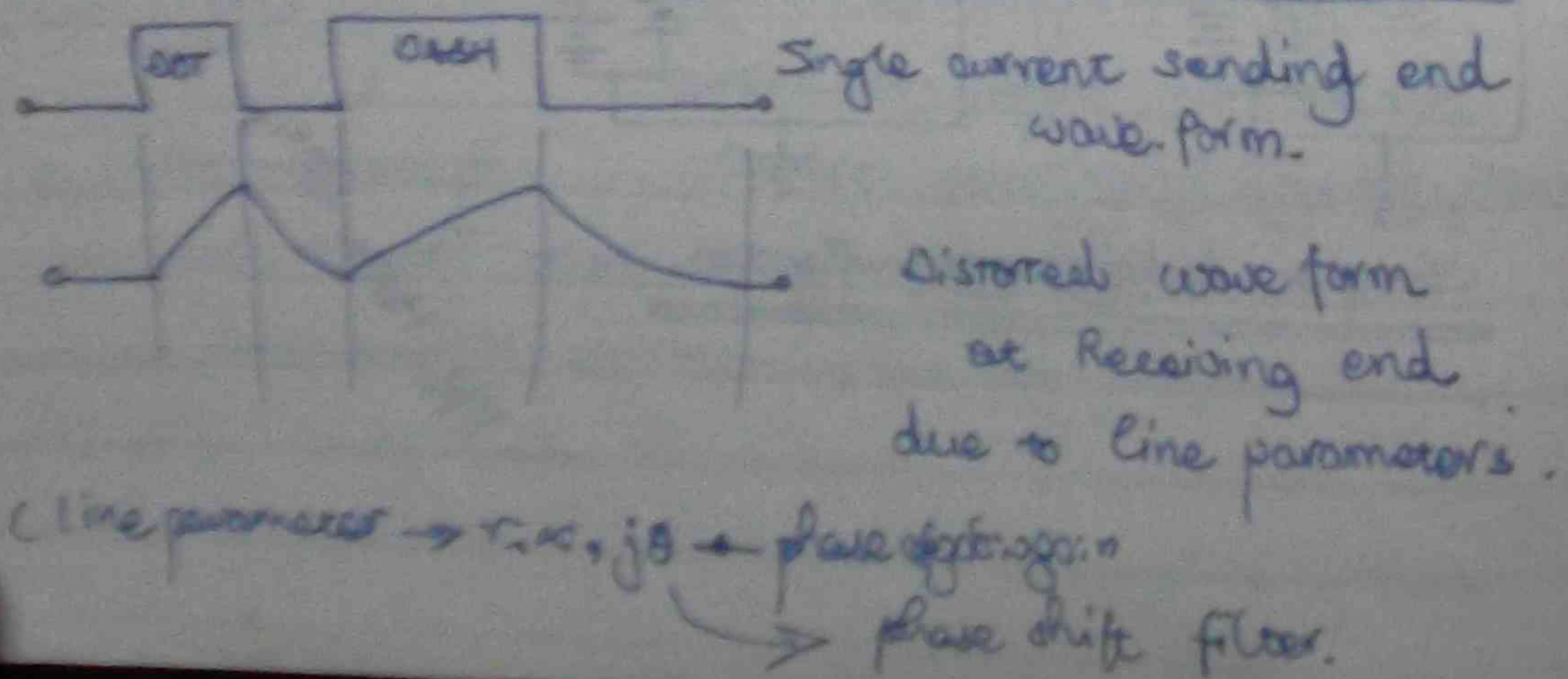
no. of armature winding

K_1 is the current in
the 1^{st} cell.

Mr. Hure Con.

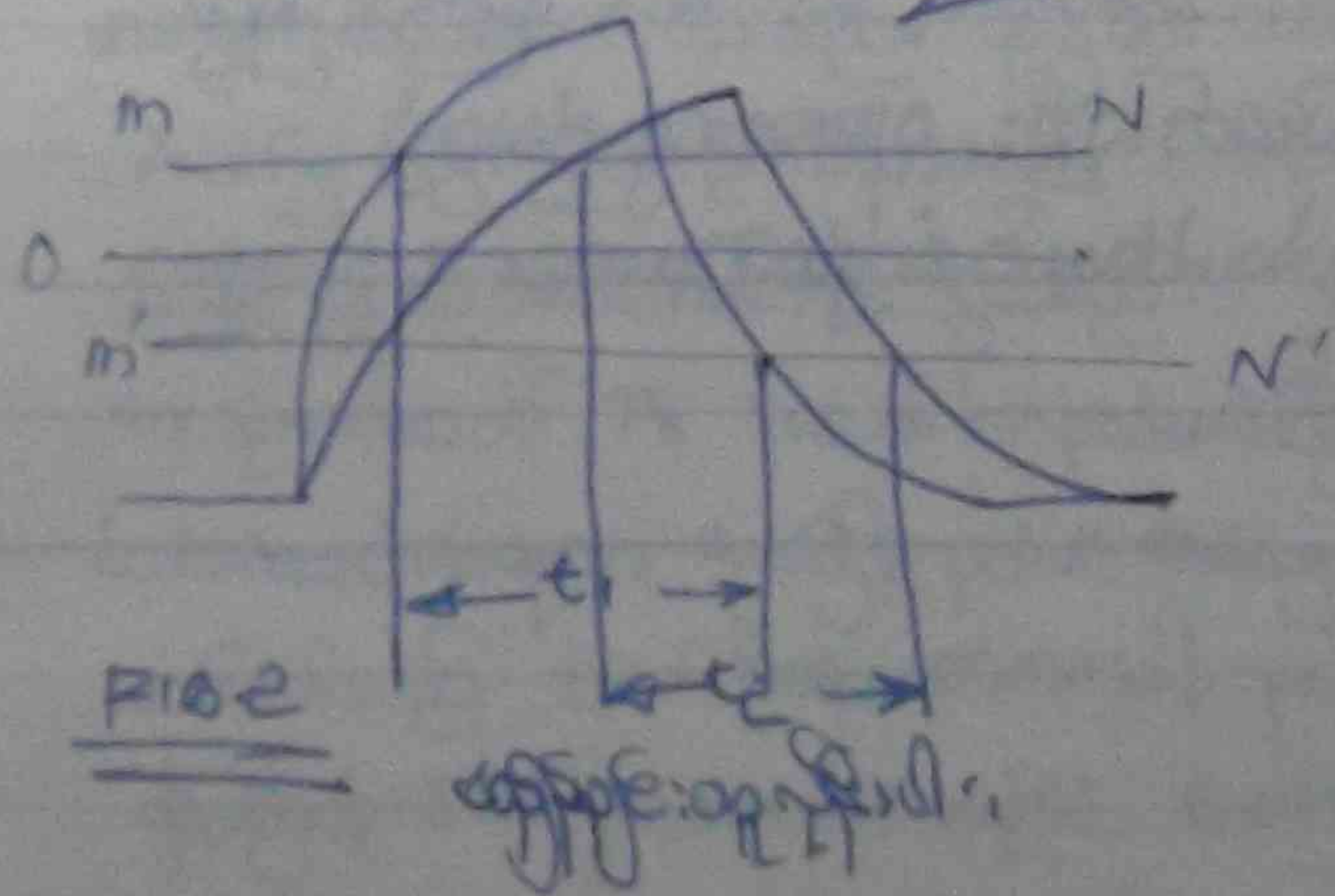
ပုံစံပုံစံအား polar relay အတွက် good magnetic material အဖြစ်
 ရှိသော yoke, operating winding, air gap နှင့် adjust လုပ်ပေး
 pole piece တို့ဖြင့် sounder သို့မဟုတ် အသံထုတ်ပေးသော contact တို့ဖြင့်
 ဖြစ်သည်။ Permanent magnet ပေါ်သို့ အားပေးသည့် ပုံစံရှိသော အောက်တွင်
 ရှိသော ဝတ်ပြားပုံစံဖြင့် working current သို့မဟုတ် yoke နှင့် magnetic
 armature တို့ကြောင့် armature သည် လိုက်လံ၍ ပြန်လည်အားပေးမှုကို
 ခံနိုင်ပေ။ အားပေးမှု သို့မဟုတ် current သည် အားပေးမှု ပုံစံရှိသော
 flux direction သည် ပုံစံရှိသော ဝတ်ပြားပုံစံဖြင့် magnetic
 strength ဖြစ်ပြီး၊ armature သည် အောက်တွင် ဖြစ်သော သို့မဟုတ်
 အောက် contact ဖြစ်သော အောက်တွင် အောက်တွင် sounder ကို
 အောက်တွင် ဖြစ်ပြီး the current သည် sounder ကို ပုံစံရှိသော
 - သို့မဟုတ် current သည် အောက်တွင် ဖြစ်သော အောက်တွင်
 sounder ကို ပုံစံရှိသော (signal ဖြစ်သော အောက်တွင် -)

80 Comparison of Single & Double Current Systems



battery အားပေးမှုဖြင့်, battery အားပေးမှုဖြင့်, relay မှတ်တမ်းပုံစံရှိသော အောက်တွင် relay အောက်တွင်, $t_1 > t_2$.

$MN \rightarrow$ +ve level relay မှတ်တမ်းပုံစံရှိသော $M'N' \rightarrow$ -ve level \rightarrow armature အောက်တွင် ဖြစ်ပြီး, သို့မဟုတ်



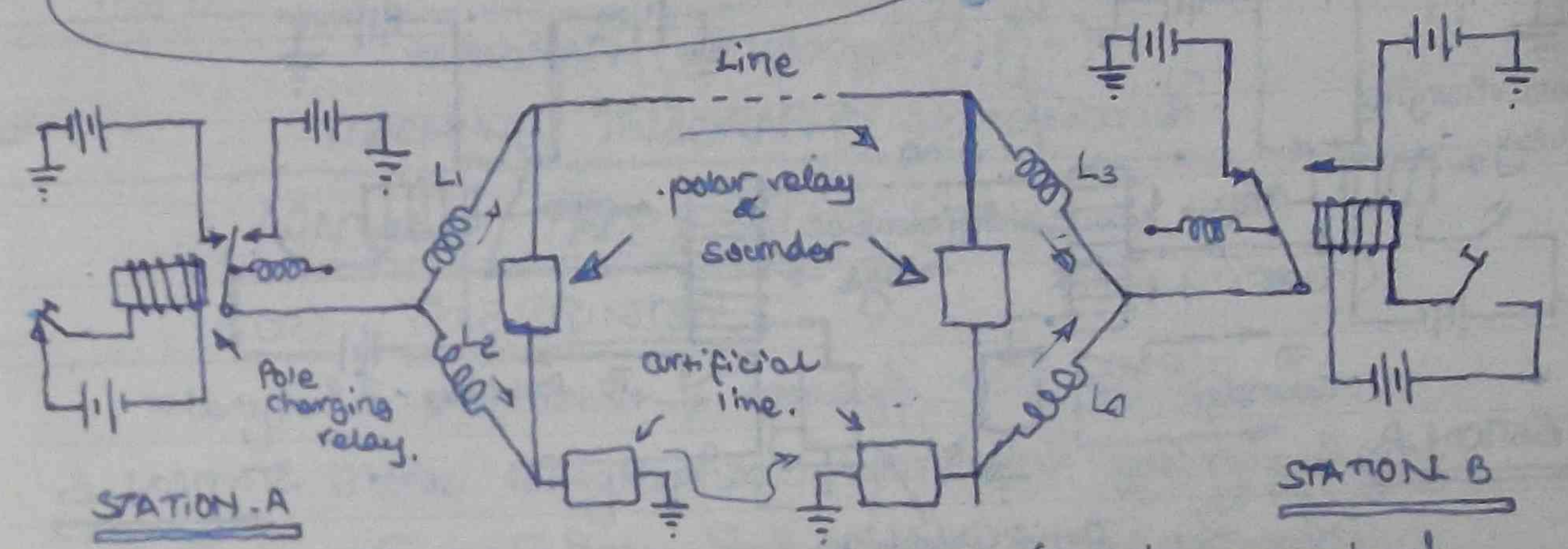
Telegraph signal သည် DC ခုတ်ပြောင်းမှုများ impulse သို့မဟုတ်
 ရှိသည်။ သို့သော် ပုံမှန် rectangular wave ပုံရှိသည်။
 Sending end ၌ rectangular wave form သည် receiving
 end ၌ line parameters (R, L, C) ကြောင့် distorted wave
 ပုံသို့ ပြောင်းလဲသည်။ Fig (1) ၌ single current system ကို
 ပေးထားသည်။ operating time သည် t_1 ဖြစ်ပြီး relay MN level
 ရောက်ရှိသောအခါ energized ဖြစ်ပြီး၊ နောက်မှ released
 ရသည်။ Battery မှာ ပေးထားသော operating time သည်
 t_2 ဖြစ်သည်။ ထို့ကြောင့် sending end ၌ ပုံမှန်
 rectangular wave ပုံရှိသော်လည်း receiving end ၌
 sounder operating time သည် ကွဲပြားသည်။ Fig (2) ၌
 double current system ကို ပေးထားသည်။ polar relay သည် MN level
 ရောက်ရှိသောအခါ MN level ကို မှန်ကန်စွာ ပြန်လည်
 စက်၏ operating time t_1 နှင့် battery မှာ ပေးထားသော operating
 time t_2 ကို ထည့်သွင်းစဉ်းစား၍ double current system သည်
 battery မှာ ပေးထားသော operating time သည်
 ဆိုက်ကွင်းများ နှစ်ခုရှိသော single current system
 ထက် သာမန် အားသာရှိသည်။

37

81 6A 8M

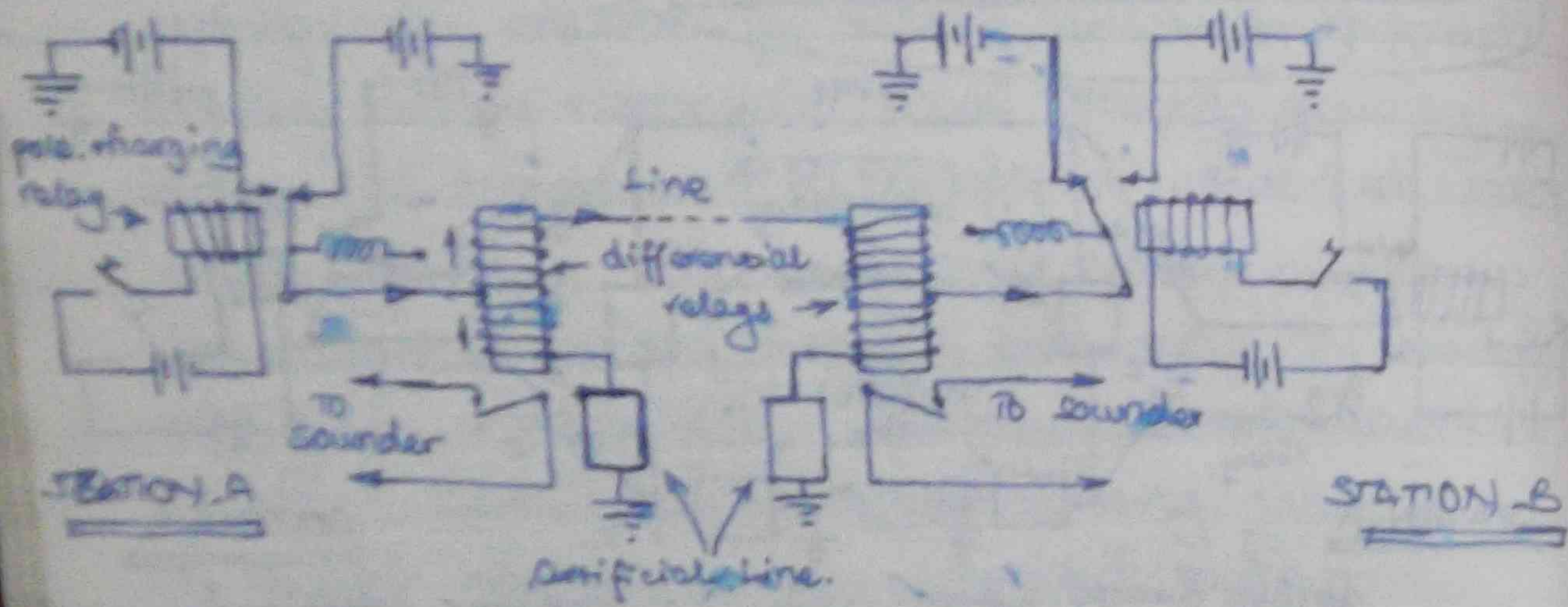
19.8.83 FR

The Bridge Duplex System



double current system used. \therefore 2 batteries contained.
 relay မှာ operating spring tension ဖြစ်သည်။
 Bridge system $\rightarrow L_1 = L_2$ ဖြစ်သော polar relay နှင့် sounder ၌ current
 မှီကပ်နေသည်။ L_3, L_4 မှ မတူညီသောကြောင့်၊
 ထိုအခါ $B \rightarrow A$ ကျန်ရှိသည်။ \therefore ကျန်ရှိသောကြောင့်၊ \therefore Duplex.
 Bridge duplex system သည် Wheatstone bridge ကို
 အသုံးပြုထားသောကြောင့်၊ \therefore double current ကို အသုံးပြုထားသည်။
 A နှင့် B ကျန်ရှိသောကြောင့်၊ \therefore current သည် ကျန်ရှိသောကြောင့်၊
 L_1 နှင့် L_2 ကို ထပ်မံစစ်ဆေးသည်။ Artificial line သည် ဖန်တီးထားသော
 ကျန်ရှိသောကြောင့် T_n line of impedance ဖြစ်သည်။ bridge circuit သည်
 balanced ဖြစ်သောကြောင့်၊ \therefore polar relay ၌ current မရှိ။ Any current
 ထပ်မံစစ်ဆေးသော polar relay နှင့် ဖန်တီးထားသော polar relay
 ထပ်မံစစ်ဆေးသော polar relay ဖြစ်သည်။ L_3, L_4 မှ မတူညီသောကြောင့်၊
 ထိုအခါ A နှင့် B ကျန်ရှိသည်။ \therefore sounder ဖြစ်သည်။ ထိုအခါ
 ကျန်ရှိသောကြောင့်၊ \therefore sounder ဖြစ်သည်။

THE DIFFERENTIAL DUPLEX SYSTEM



အဆိုပါ \rightarrow neutralize ပြန် \therefore no. energized \therefore A နှင့် B sounder ဆီသို့ ပို့မည်။
 Differential duplex system သည် double current ကို
 အသုံးပြုထားသည်။ ဤသို့သည် နည်းတူသော အချက်များကို အသုံးပြုထားသည်။
 ဤ relay သည် လက်ဝဲဘက်တွင် ပိုမိုသော ဖွဲ့စည်းမှုများ ပါရှိသည်။
 Artificial Line သည် line မှတစ်ဆင့် ဆက်သွယ်ထားပြီး ချိတ် 2 ခုနှင့်
 ဆက်သွယ်ထားသည်။

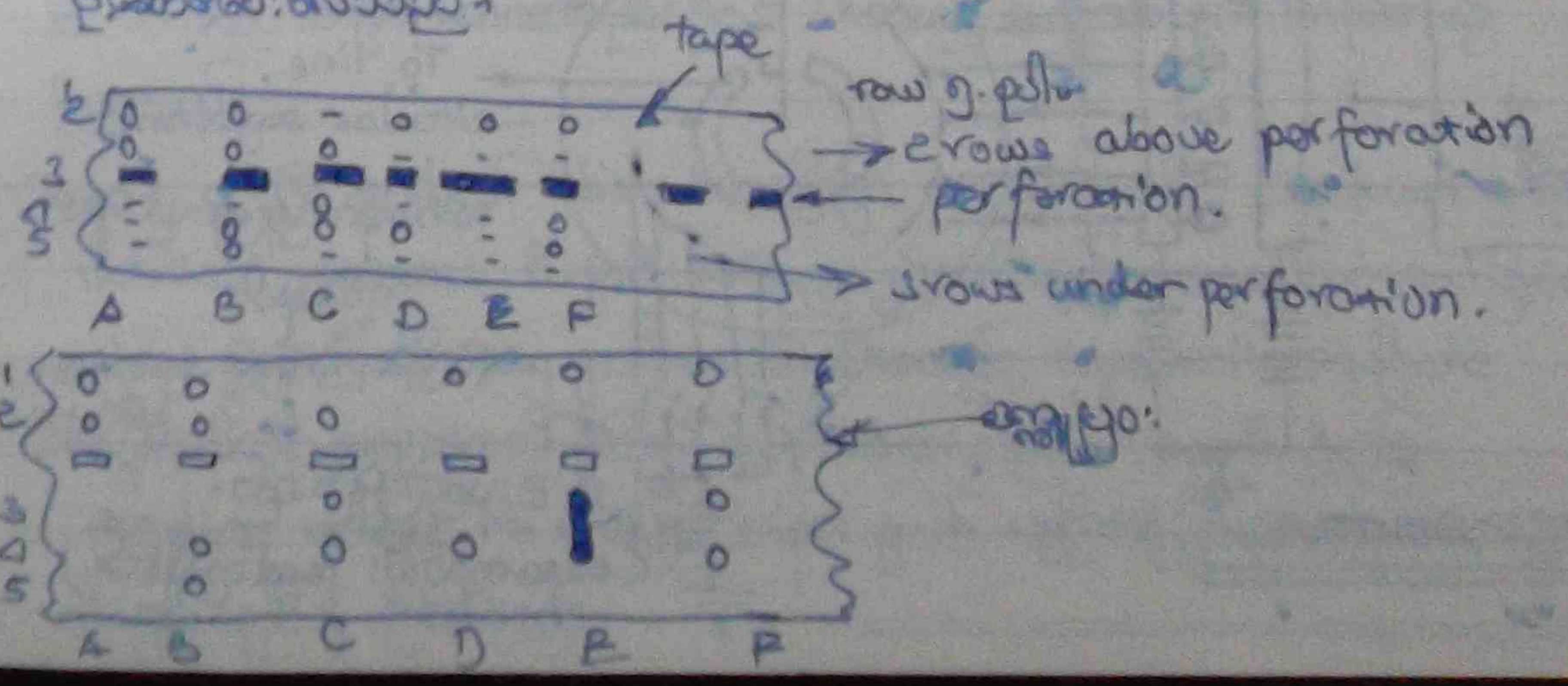
A နှင့် B key မှတစ်ဆင့် +ve current သည် differential
 relay မှတစ်ဆင့် ဆက်သွယ်ပြီး artificial line ကိုယ်တိုင် ground မှ
 ဆက်သွယ်ထားသည်။ ဤသို့သည် line ကို အသုံးပြု၍ ချိတ် 2 ခုကို
 အသုံးပြုထားသည်။ ဤသို့သည် current သည် မှန်ကန်စွာ
 magnetic flux မှတစ်ဆင့် cancelled ပြန်သည်။ \therefore A နှင့် B sounder
 ဆီသို့ ပို့မည်။ ဤသို့သည် ချိတ် 2 ခုကို အသုံးပြု၍ relay မှတစ်ဆင့်
 မှန်ကန်စွာ ဆက်သွယ်ပြီး ချိတ် 2 ခုကို magnetic force မှတစ်ဆင့်
 ဆက်သွယ်ပြီး ဆက်သွယ်ထားသည်။

ဆိုရှပ်စ် A နှင့် B ကို တစ်ဆင့် ဆက်သွယ်ပြီး ဆက်သွယ်ထားသည်။

TELEGRAPH (KEY မှတစ်ဆင့် ပို့ခြင်း) MACHINE TELEGRAPHY သို့မဟုတ်

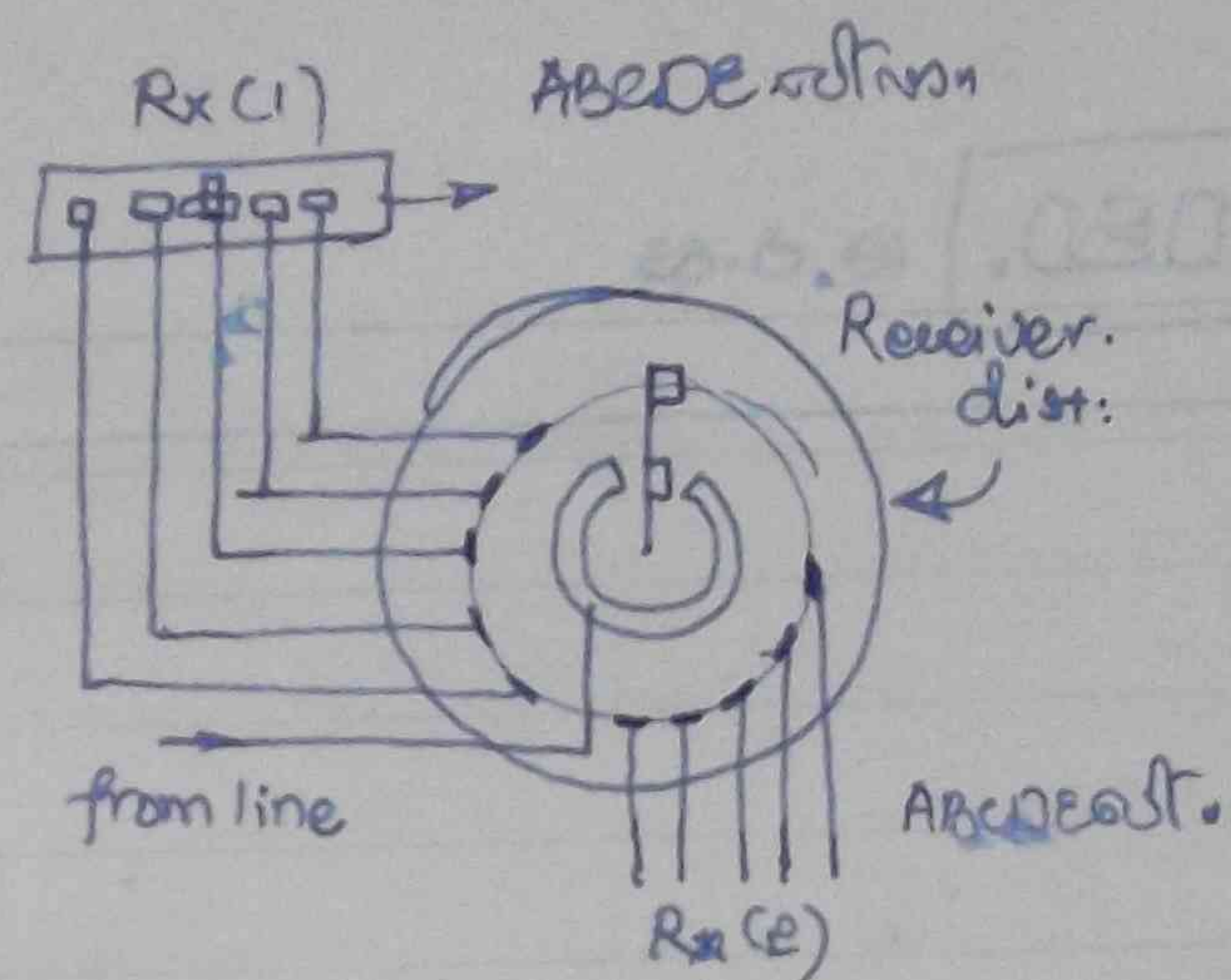
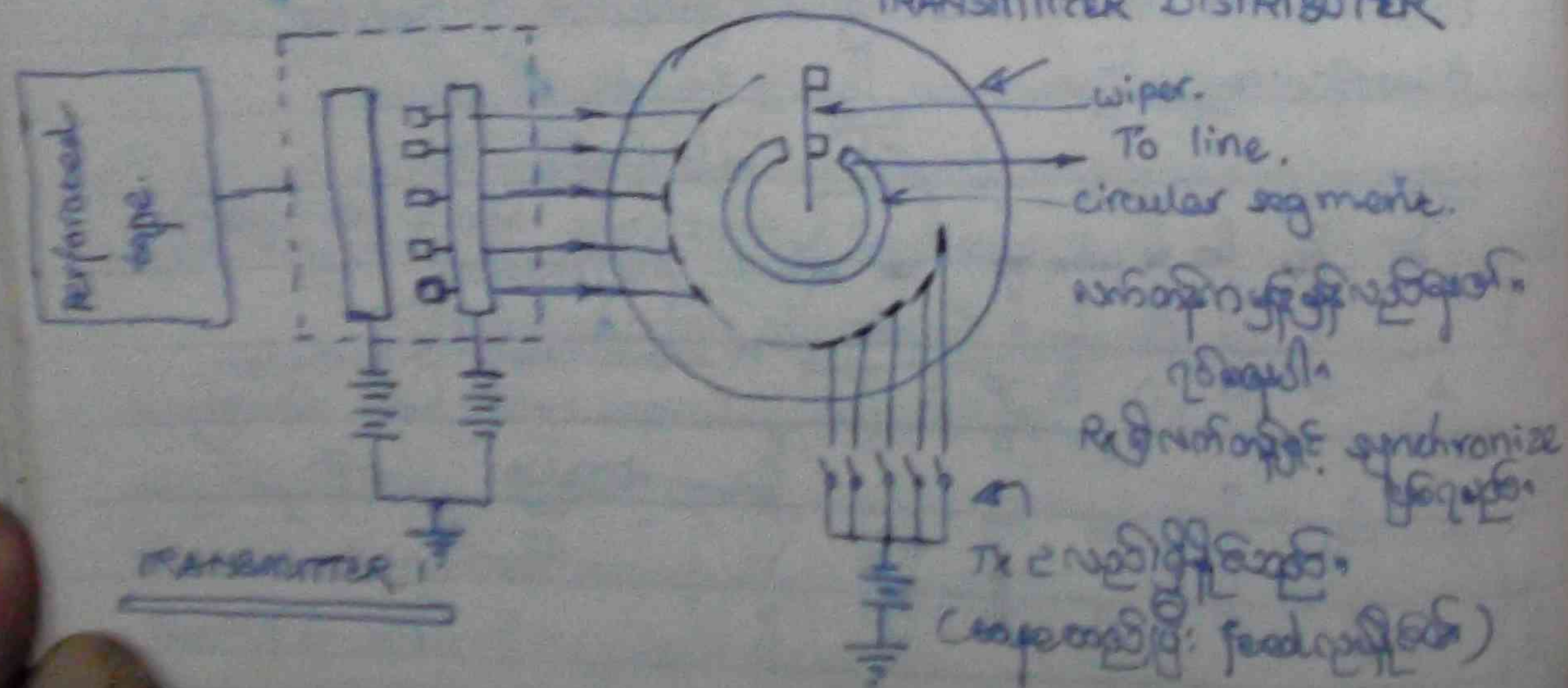
MACHINE TELEGRAPHY (Telecoms. \rightarrow teleprinter) (OR) TELEPRINTER

teletype မှ \rightarrow transmit \rightarrow speed မှ 2500 နှုတ် ပိုမို။
 Morse telegraph သည် operator ကို အသုံးပြုပြီး ပို့ခြင်း ဖြစ်သည်။
 Teleprinter သည် စက်တစ်ခုနှင့် ဆက်သွယ်ပြီး 1500 ခုနှစ်ခန့် ပို့နိုင်သည်။
 Teleprinter ကို ဆက်သွယ်ပြီး ပို့ခြင်း ဖြစ်သည်။ လက်ရှိ ဆက်သွယ်မှုမှာ
 teletype, perforated tape နှင့် transmitting machine မှတစ်ဆင့် ပို့ခြင်း ဖြစ်သည်။
 Teletype နှင့် perforated tape ကို band of code မှတစ်ဆင့် ဆက်သွယ်ပြီး
 ဆက်သွယ်သည်။ ဤ perforated tape ကို transmitting machine မှ
 ပို့ခြင်းသည် electrical signal မှတစ်ဆင့် ပို့ခြင်း ဖြစ်သည်။
 ပို့ခြင်းသည် ဆက်သွယ်သည်။



အတိုင်းအတာ၏ position 1, 2 ကိုသာ ဝါးကောက်သည်။
 အဆင့် position 1, 2, 4, 5 တို့ကို key ပုံစံရှိ ခြိတ်ပြက်တိုင်း တခုတည်း
 ဖြစ်စေရန် လုပ်သည်။ ခပ်တုတည်းက အတိုင်းအတာ၏
 နှစ် mechanism တွေ electric pulse train သို့မဟုတ် လျှပ်စစ်
 line ခေါ်ဆိုခြင်းလည်း ရသည်။

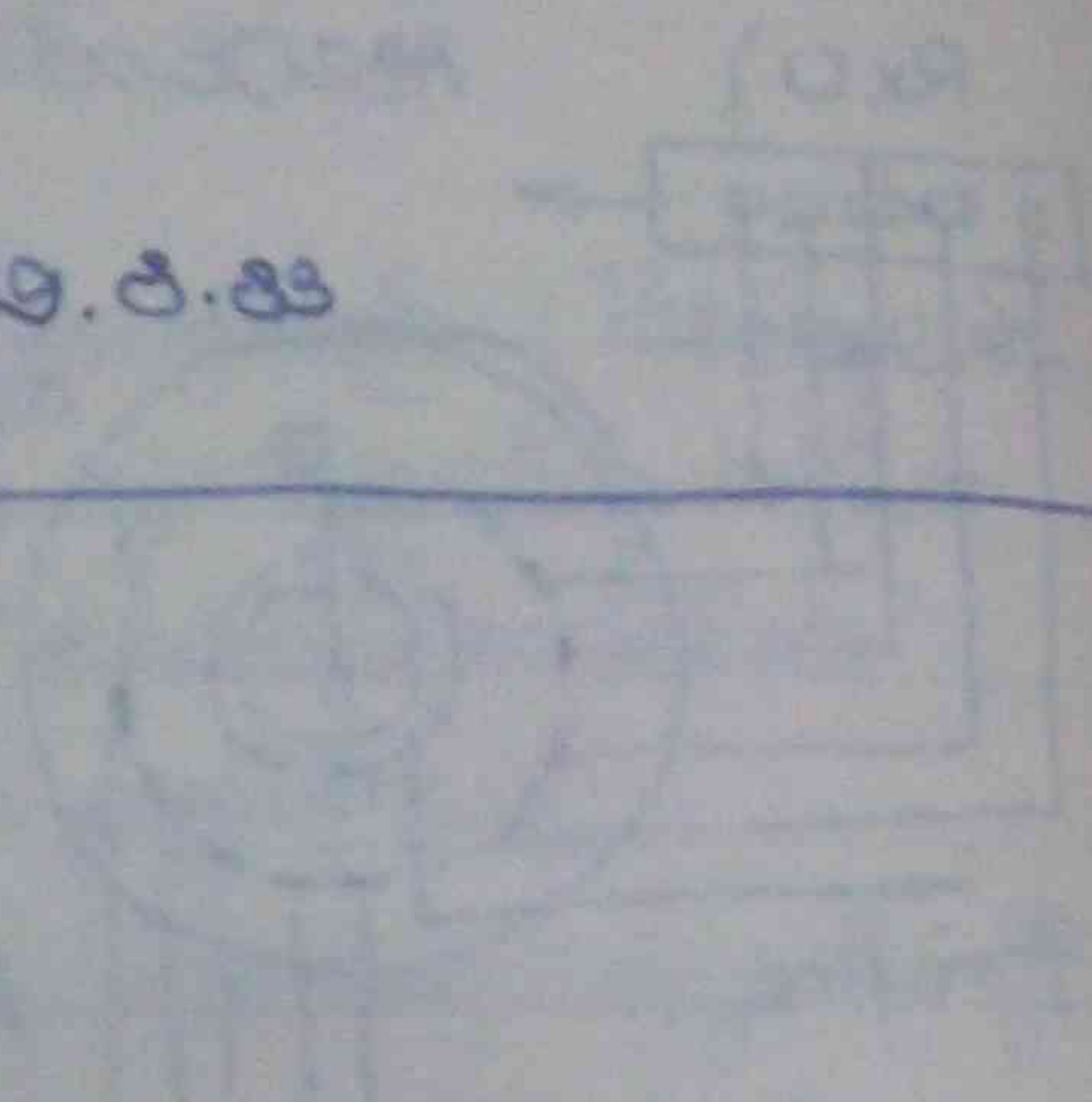
TRANSMITTER DISTRIBUTER

[illegible]

Re ဖလှယ် distribution ပြု၍ အထက်ပါအတိုင်း အာထေး ၅-ခု
 ပါဝင်သော အာထေး ၆-ခုကို ဖလှယ်မှုနှင့်ဆက်သွယ်ထားရမည်။ ရှေ့ကရှိသော
 signal များသည် ထိုဖလှယ် များကိုအသုံးပြုသော type writer ကဲ့သို့ပင်
 ဆွဲကပ်သော စာလုံးများကို ခြိတ်ချပ်ပေးနိုင်စေသည်။ သတိပြုရန်
 encoding, decoding, Re encoding, cipher များ၏ ဖွဲ့စည်းပုံနှင့် ကမ္ဘာ့စာရေးဆရာ
 တို့ကမူကတည်းက ဖွဲ့စည်းခဲ့သည်။

SYLLABUS ENDED.

10.8.83



COMPOSITE FILTER (အဆက်)

$m = 0.6$ အကောင်းဆုံး: $m = 1 \rightarrow$ constant k type
1. 0.9 0.8 0.7 0.6 0.5 0.4 0.3 0.2 0.1 0 $f \propto \omega + 0.1m$ derived sect: ဆက်လက်
variation ပုံစံ: m derived sect: ကို ထပ်ထပ်ကျစပ်

Composite filter ကို design လုပ်ရာတွင် လိုက်နာဆောင်ရွက်ရမည်။
အချက်များမှာ ၁) Constant k (prototype) filter ကို စာအုပ်အရ၊ ကျမ်းများ၊
အတိအကျ design လုပ်ရမည်။

၂) m derived filter section များကို မူရင်းတိုင်း စာအုပ်၊ ဓာတ်ပုံများ၊
မှတ်ချက်များနှင့် design လုပ်ရမည်။

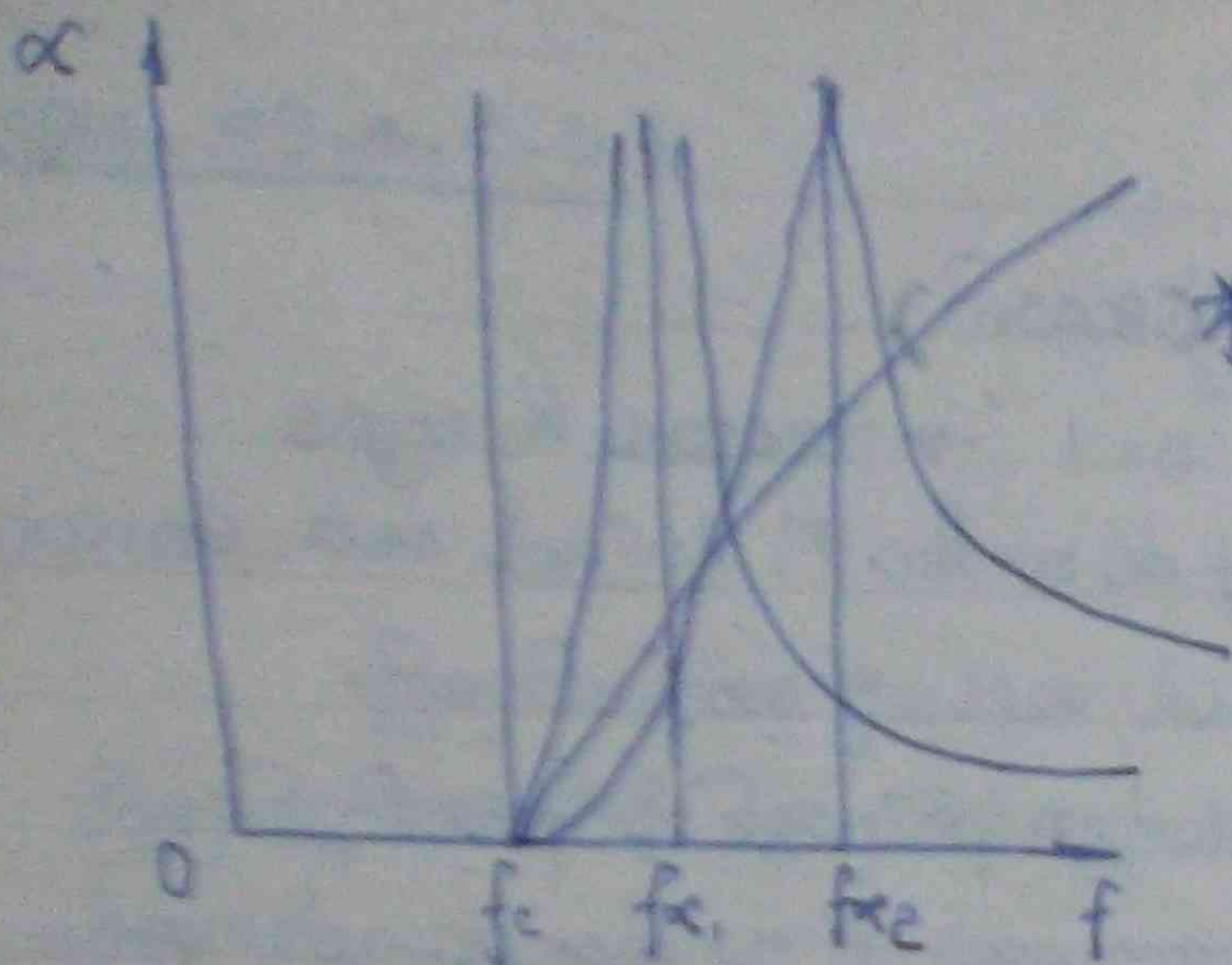
၃) Design လုပ်ရာတွင် constant k နှင့် m derived section များကို
ညှိညှိစပ်စပ် ထည့်သွင်းစိစစ်ရမည်။

၄) အဆုံးအရပ်: ဆက်သွယ်သော filter များကို မူရင်းတိုင်း ၀.၆၅ သို့မဟုတ်
 m derived filter ပုံစံကို ဆိုက်ကွင်း ၄ ခုကို ထပ်ထပ်ကျစပ် အဆုံးအရပ်များ
ညှိညှိစပ်စပ် ထည့်သွင်းရမည်။

Ex: 1 Composite f pass filter ကို design လုပ်ရန် 500 Ω
resistance, ဆက်သွယ်သော ဆိုက်ကွင်း ၄ ခုကို 1000 Hz နှင့် 1065 Hz,
1250 Hz နှင့် 1300 Hz နှင့် ဆက်သွယ်သော attenuation ဖြစ်ရမည်။
ဤ filter ကို design လုပ်ရမည်။

By Saya
APM

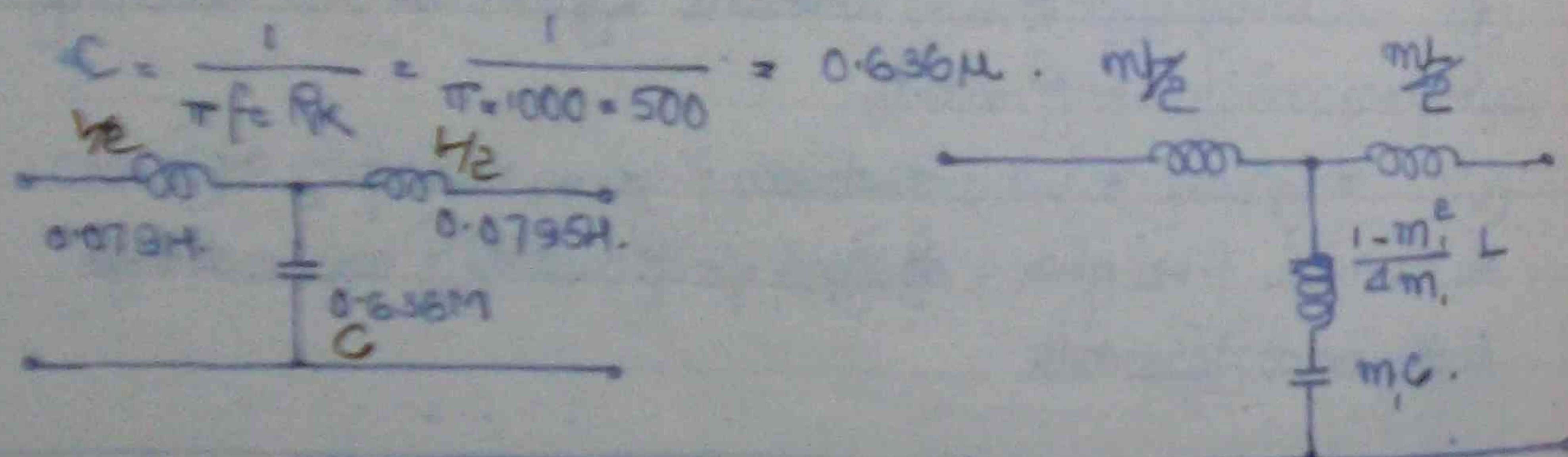
(m နှင့် k တို့ကို $m = 0.6$ သို့မဟုတ် f pass $\frac{1}{2}$ m -derived
section ဖြစ်ရမည်)



* T បំពង់ ប្រេកង់
 ឧបករណ៍: T បំពង់ ប្រេកង់

$f_c = 1000 \text{ Hz}$, $f_{c1} = 1005 \text{ Hz}$ $\rightarrow m_1$, $f_{c2} = 1250 \text{ Hz} \rightarrow m$
 $R_K = 500 \Omega$, $f_c = 1000 \text{ Hz}$, $L = \frac{R_K}{\pi f_c} = \frac{500}{\pi \times 1000} = 0.159 \text{ H}$

$\therefore \frac{L}{2} = 0.0795 \text{ H}$



* $m_1 = \sqrt{1 - \left(\frac{f_c}{f_{c1}}\right)^2} = \sqrt{1 - \left(\frac{1000}{1005}\right)^2} = 0.343$

$\frac{m_1 L}{2} = \frac{0.343 \times 0.159}{2} = 0.0273 \text{ H}$

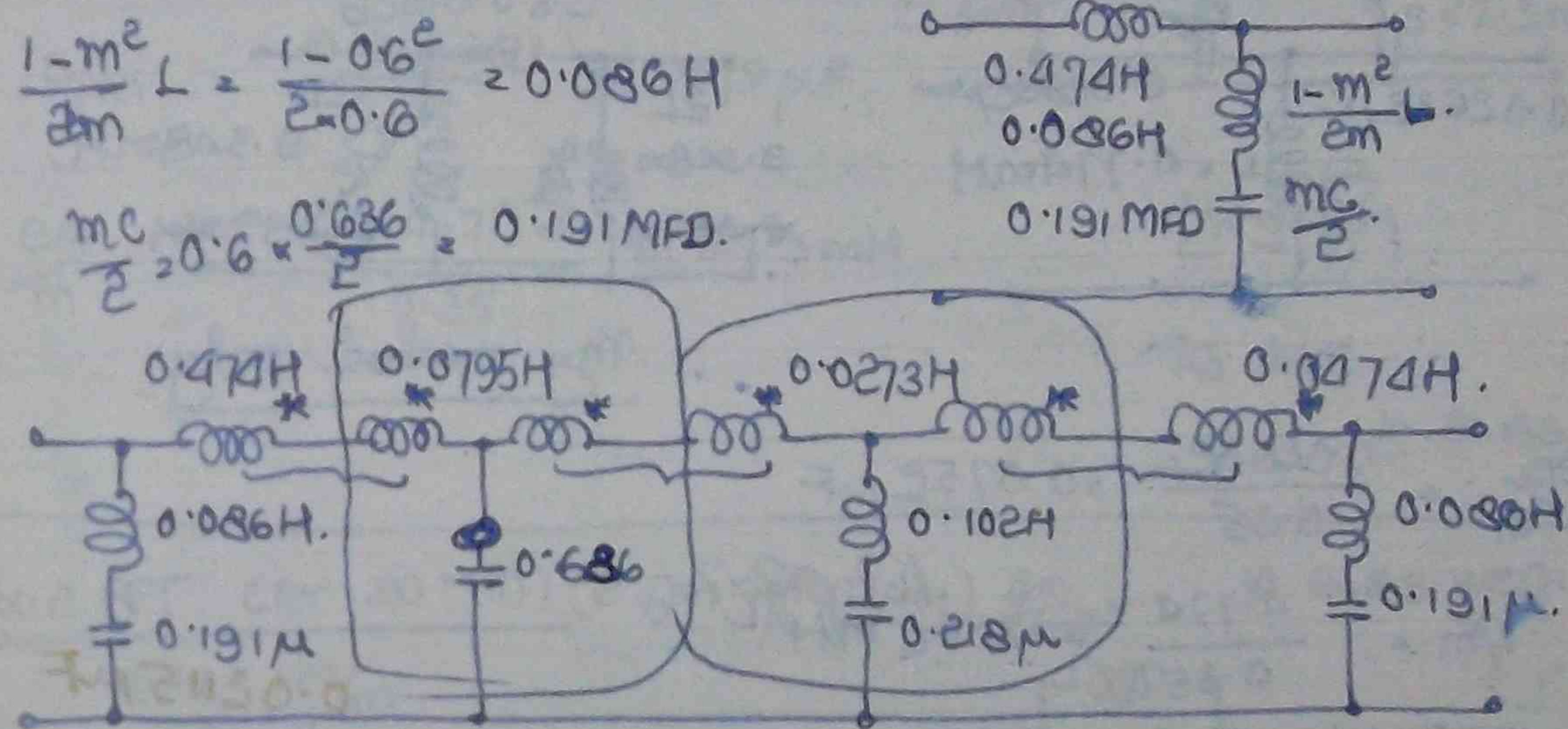
$\frac{1 - m_1^2}{4m_1} L = \frac{1 - 0.343^2}{4 \times 0.343} \times 0.159 = 0.102 \text{ H}$

ឧបករណ៍ ប្រេកង់ បំពង់ ប្រេកង់
 ឧបករណ៍ ប្រេកង់ បំពង់ ប្រេកង់ (T or π)

$m_c = 0.343 \times 0.636 = 0.218 \text{ MFD}$

$m_e = \sqrt{1 - \left(\frac{f_c}{f_{c2}}\right)^2} = \sqrt{1 - \left(\frac{1000}{1250}\right)^2} = 0.6$

$\frac{m_e L}{2} = \frac{0.6 \times 0.159}{2} = 0.0477 \text{ H}$



* ឧបករណ៍ ប្រេកង់ បំពង់ ប្រេកង់: ប្រេកង់ បំពង់ [series]

Ex: 2 f_c = cut-off frequency 10 KHz, impedance 600 Ω
 resistance 600 Ω $m = 0.35$ ឧបករណ៍ m-derived T & π H.P.F.
 ឧបករណ៍ ប្រេកង់ បំពង់ ប្រេកង់ ប្រេកង់ បំពង់ ប្រេកង់
 $f_c = 10 \text{ KHz}$, $R_K = 600 \Omega$
 $m = 0.35$ m-derived T & π H.P.F ឧបករណ៍

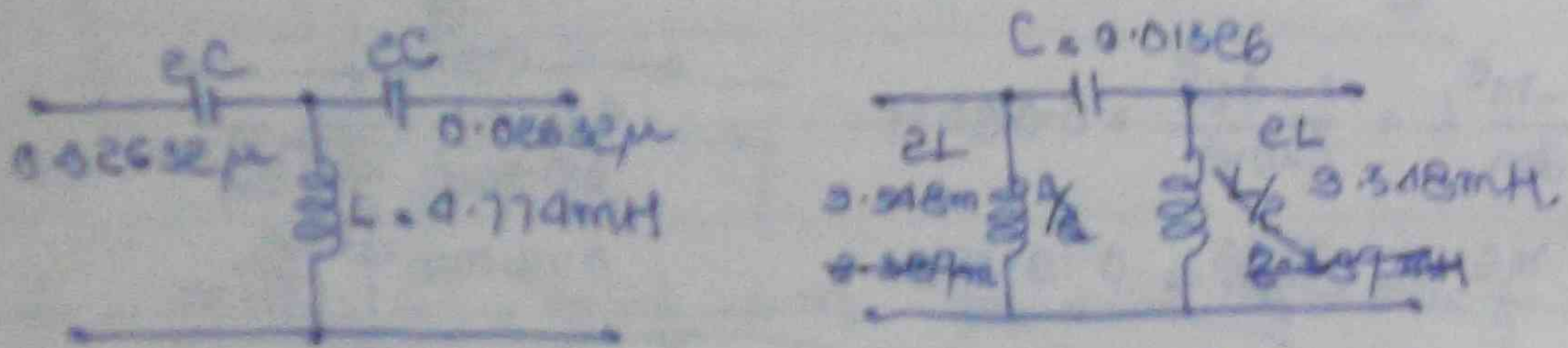
myself

H.P.F $\rightarrow m = \sqrt{1 - \left(\frac{f_c}{f_{\infty}}\right)^2}$

$\frac{f_{\infty}}{f_c} = \frac{1}{1 - m^2} \Rightarrow f_{\infty} = \sqrt{1 - m^2} f_c = 9.375 \text{ KHz} \rightarrow \text{Ans.}$

$$\text{HDF} \rightarrow L = \frac{R_R}{4\pi f_c} = \frac{600}{4\pi \times 10^4} = 4770 \text{ mH.}$$

$$C = \frac{1}{\pi f_c R_e} = \frac{10^9}{\pi \times 10^3 \times 600} = 0.01326 \text{ MFD.}$$

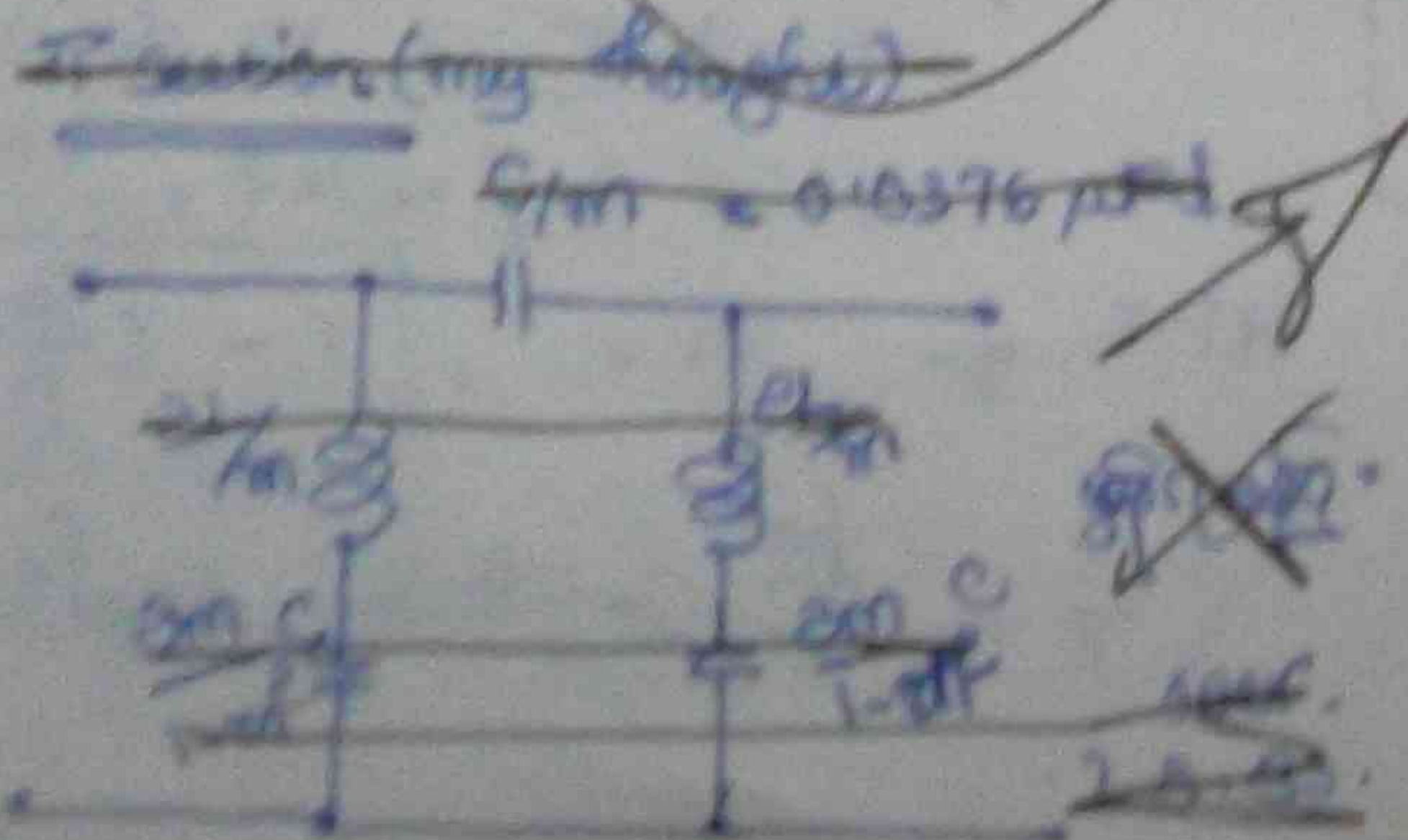
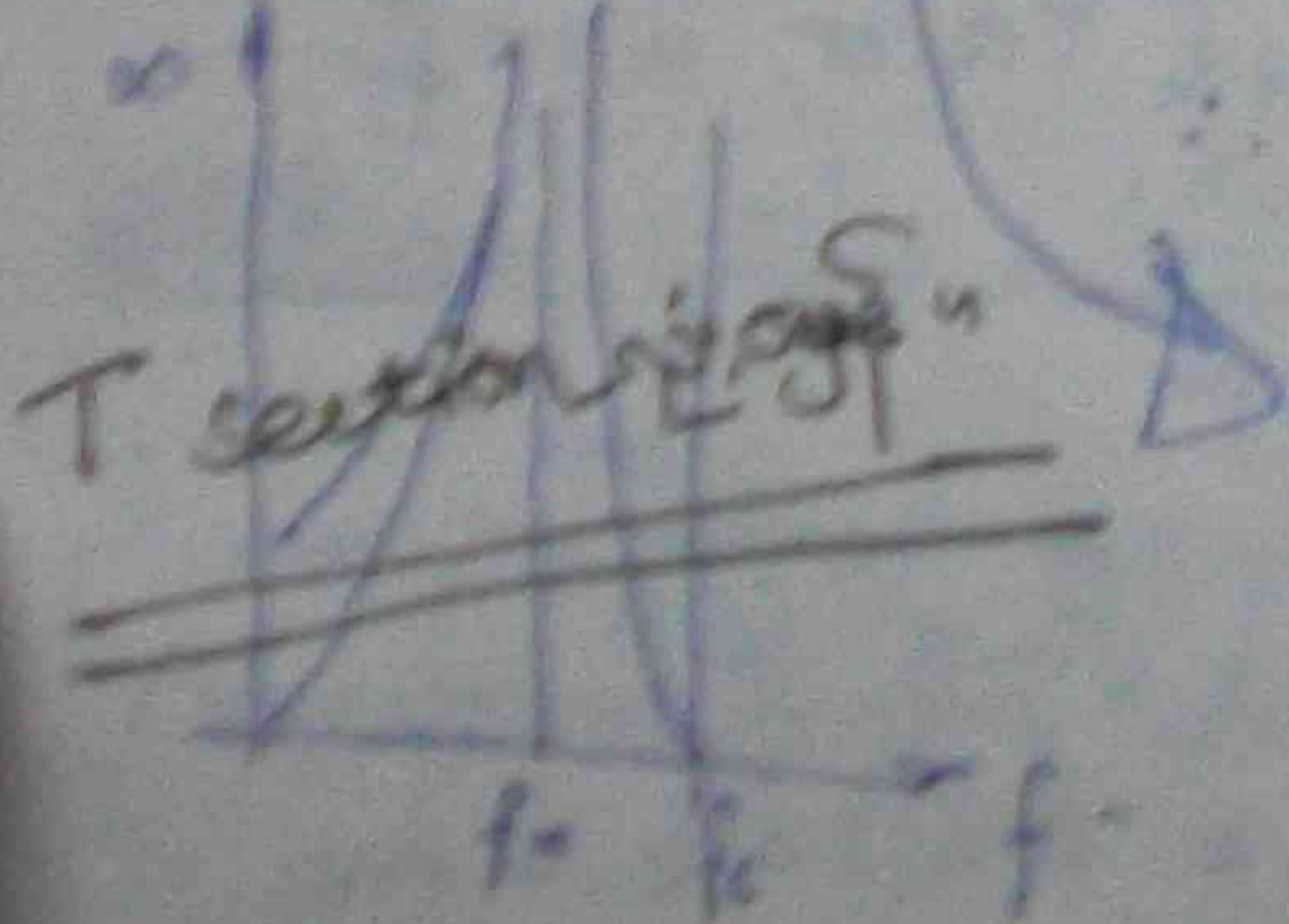
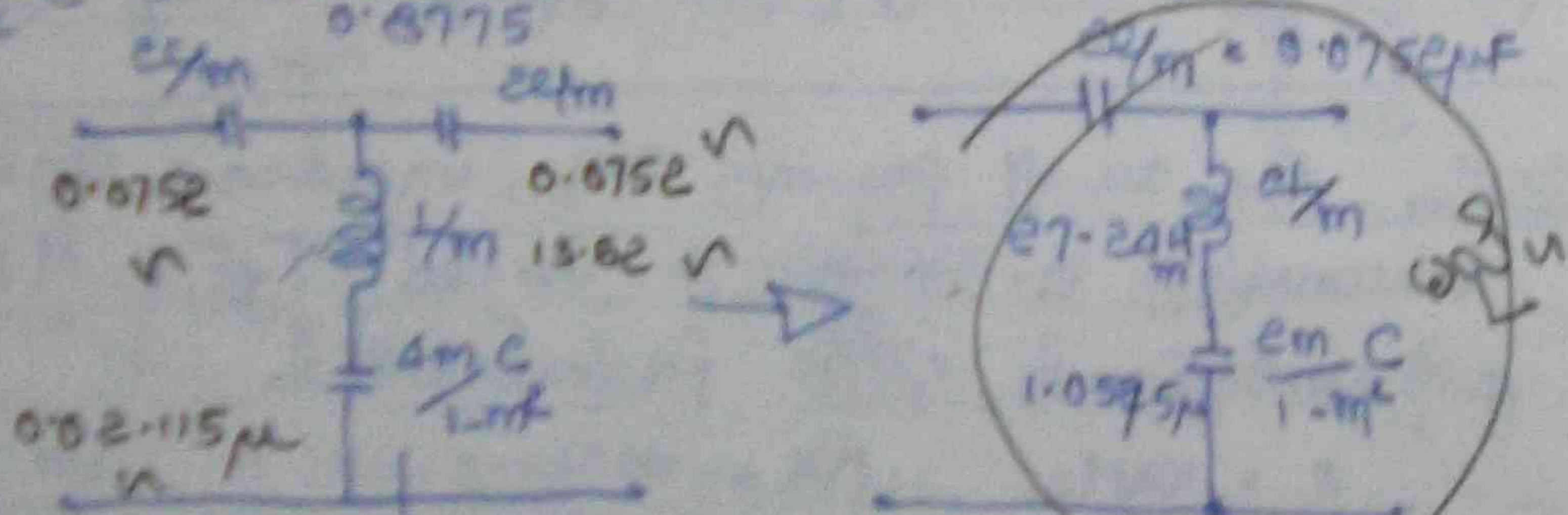


My method only.

$$C_{eq} = \frac{0.0022 \mu F}{0.35} = 0.0075 \mu F$$

$$L_m = \frac{0.774}{0.35} = 13.62 \text{ mH}$$

$$\frac{\Delta m}{1. \text{mL}} \text{ C} = \frac{4 - 0.35}{0.8775} \text{ g} = 1.596 \times 0.01328 = 2.115 \text{ g}$$

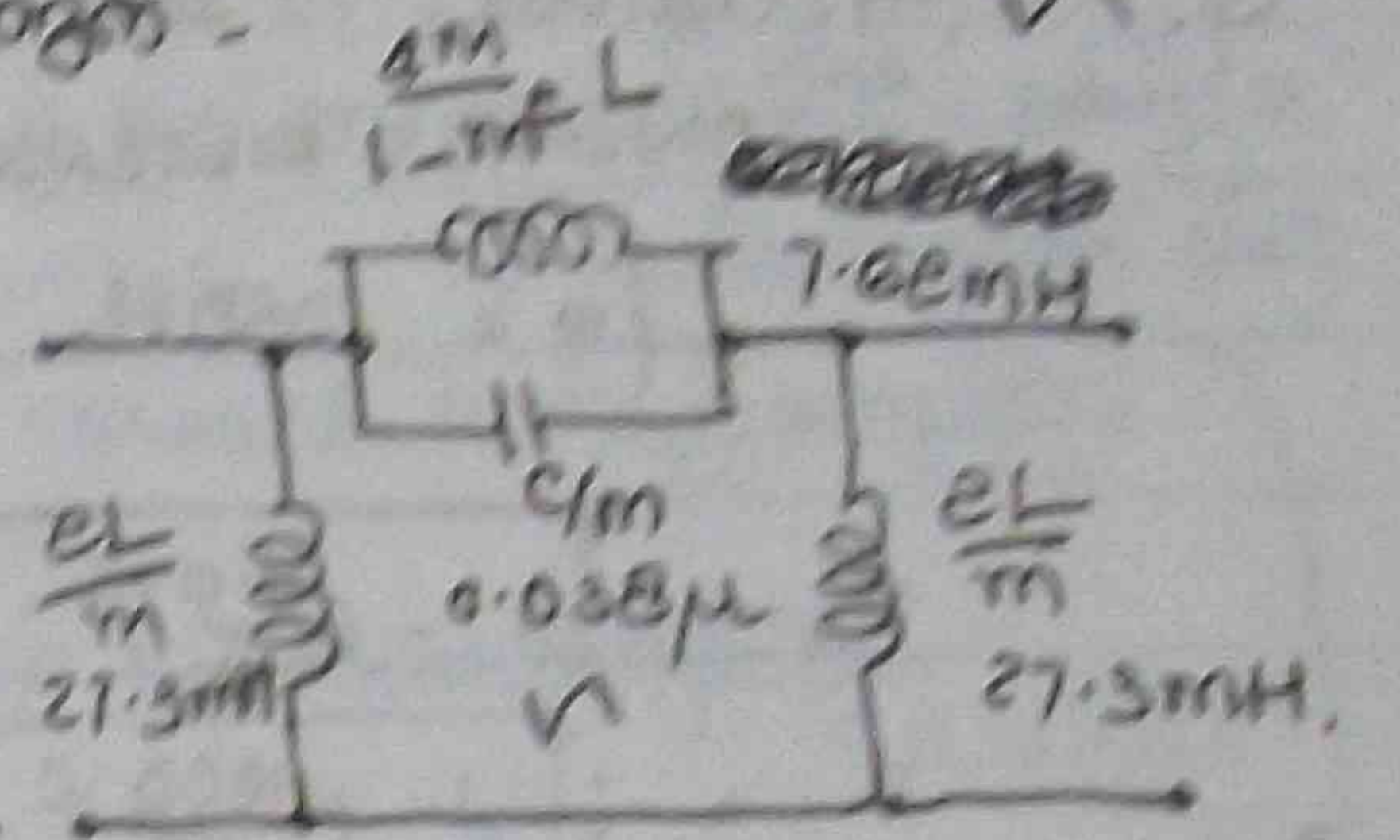


in derived transition H.P.R. graphs.

$$\frac{4m}{1-m} = \frac{4 \times 0.35}{1-0.0225} = 4.774$$

$$C/m = \frac{0.01326}{0.35} = 0.0379 \mu F$$

$$\frac{P_L}{m} = \frac{2 \times 4.774}{0.35} = 27.3 \text{ mN}.$$

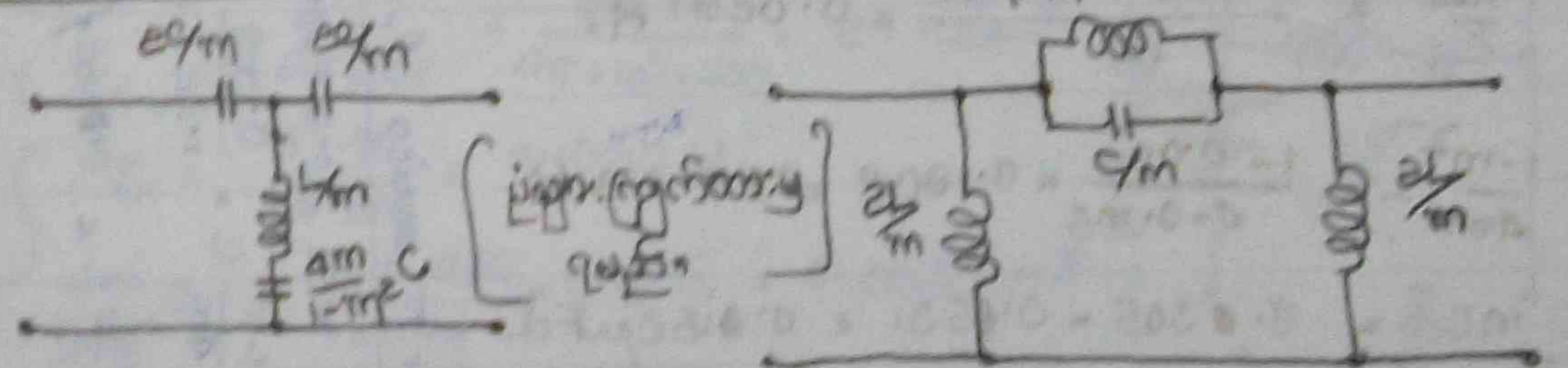


ॐ नमो भगवते वासुदेवाय

MO ARE.

10.2.83.

Ex: 2 APT (Br 20 MTD) (2. gms of 50% solution) $\frac{4m}{1-me} L$ 10. 8. 83. WED:

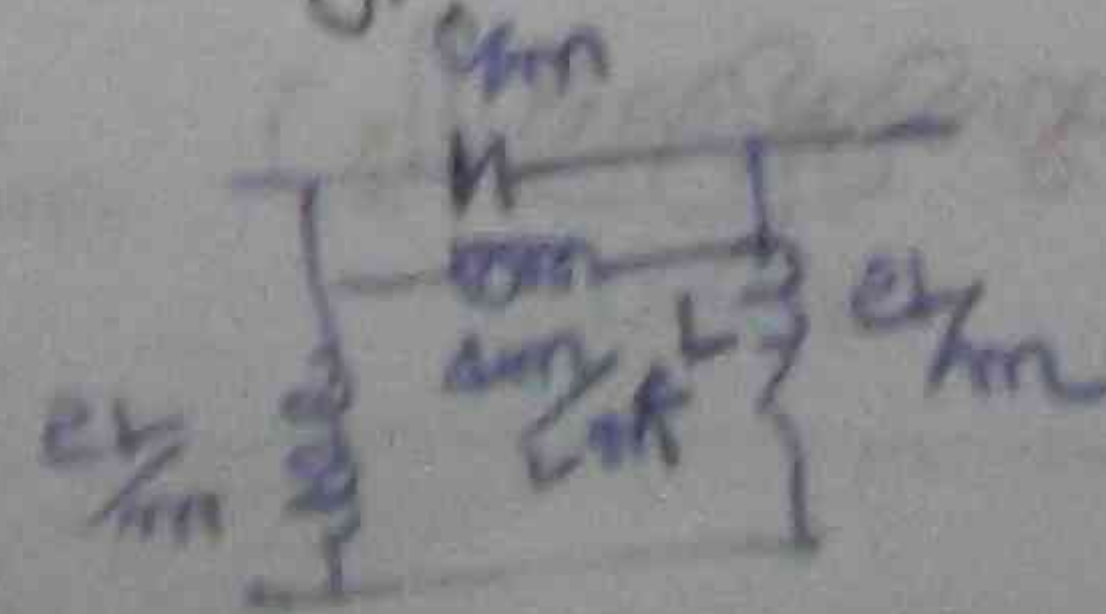


T secretion

Composite work.

II. Section

Ex: 3 . m. derived T section approx can realize an all-pass filter.
 The filter has low-pass characteristics. Cut-off freq. is 1000 Hz.
High attenuation is required at 1000 Hz.
 The series element is inductor.



3. m-derived T-section. $R_k = 600 \Omega$
 LOW-PASS FILTERED $f_c = 1000 \text{ Hz}$
 $f_o = 1050 \text{ Hz}$ To find elements.

$$m = \sqrt{1 - \left(\frac{f_c}{f_o}\right)^2}$$

$$= \sqrt{1 - \left(\frac{1000}{1050}\right)^2} = \sqrt{1 - 0.907} = \sqrt{0.093} = 0.305$$

$$L = \frac{R_k}{\pi f_c} = \frac{600}{\pi \times 1000} = 0.1908 \text{ H}$$

$$C = \frac{1}{\pi f_c R_k} = \frac{10^9}{\pi \times 10^3 \times 600} = 0.0531 \mu\text{Fd}$$

$$\frac{mL}{2} = \frac{0.305 \times 0.1908}{2} = 0.0291 \text{ H}$$

$$\frac{1-m^2}{4m} L = \frac{1-0.093}{4 \times 0.305} \times 0.1908 = 0.1418 \text{ H}$$

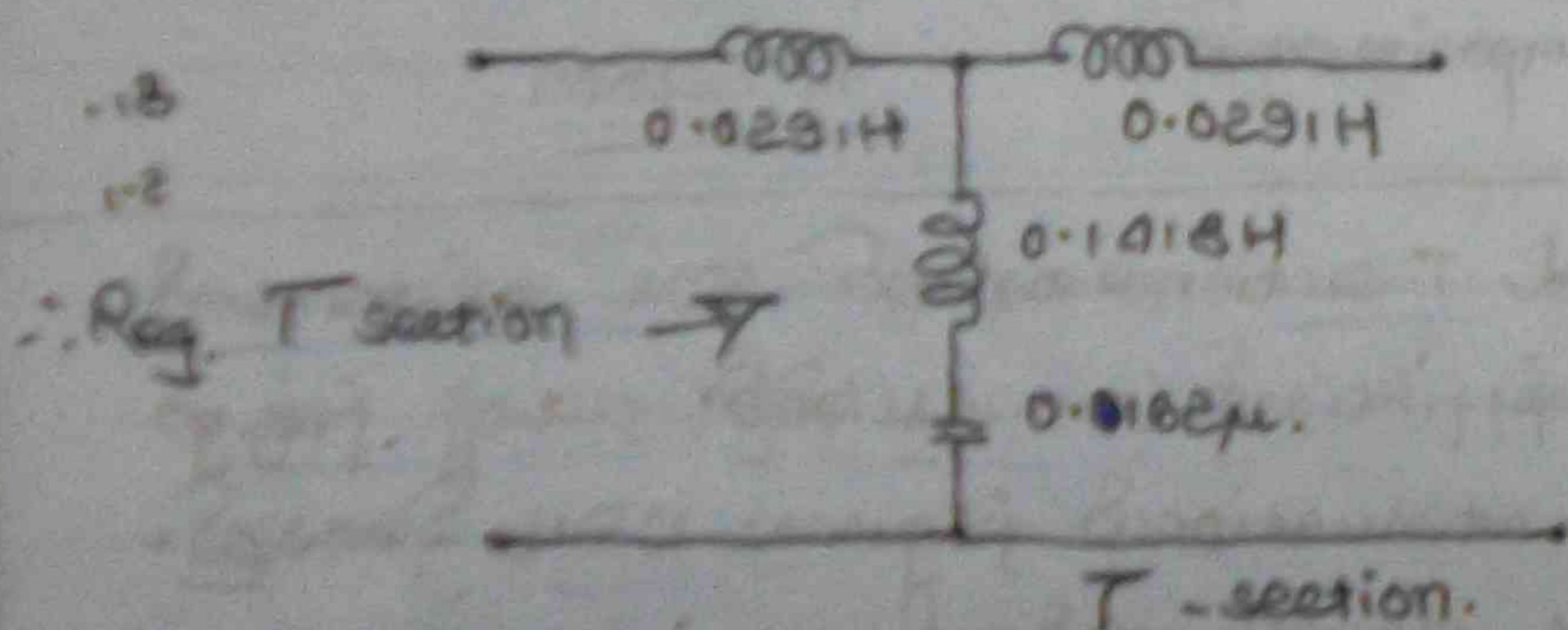
$$mC = 0.305 \times 0.0531 = 0.0162 \mu\text{Fd}$$

for π section (P-10)

$$mL = 0.305 \times 0.1908 = 0.0582 \text{ H}$$

$$\frac{1-m^2}{4m} C = \frac{0.907}{1.22} \times 0.0531 = 0.0395 \mu\text{F}$$

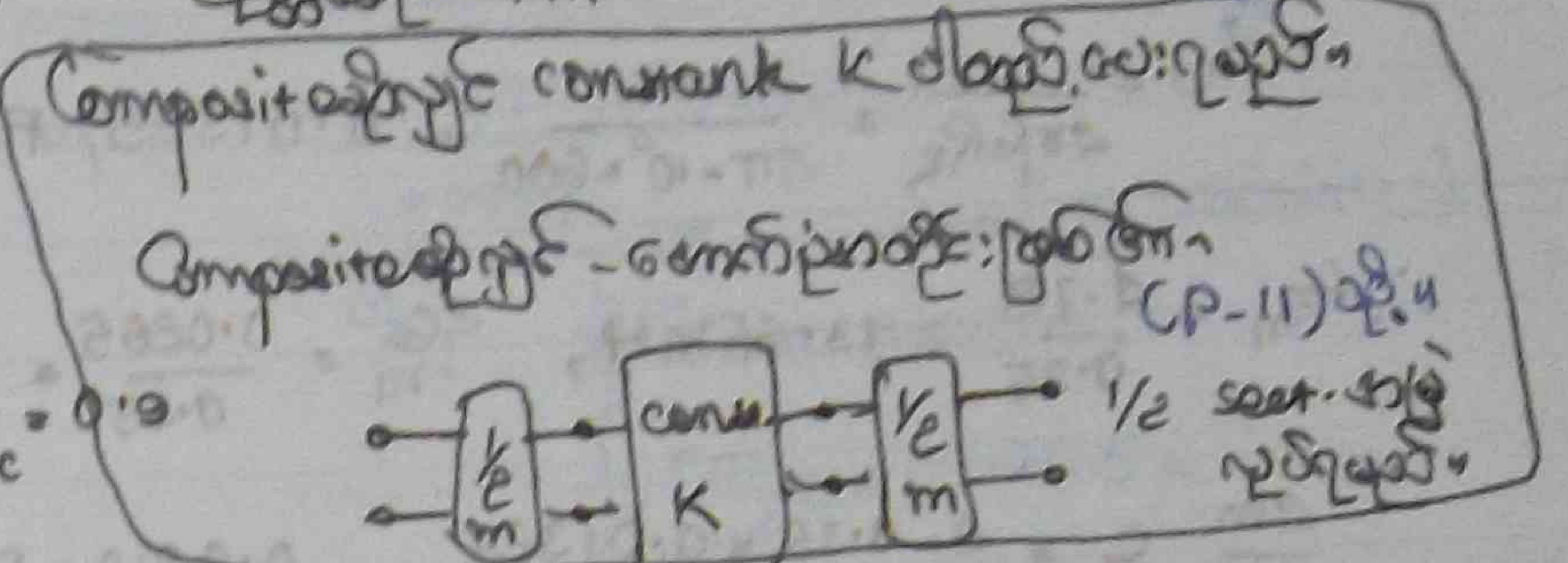
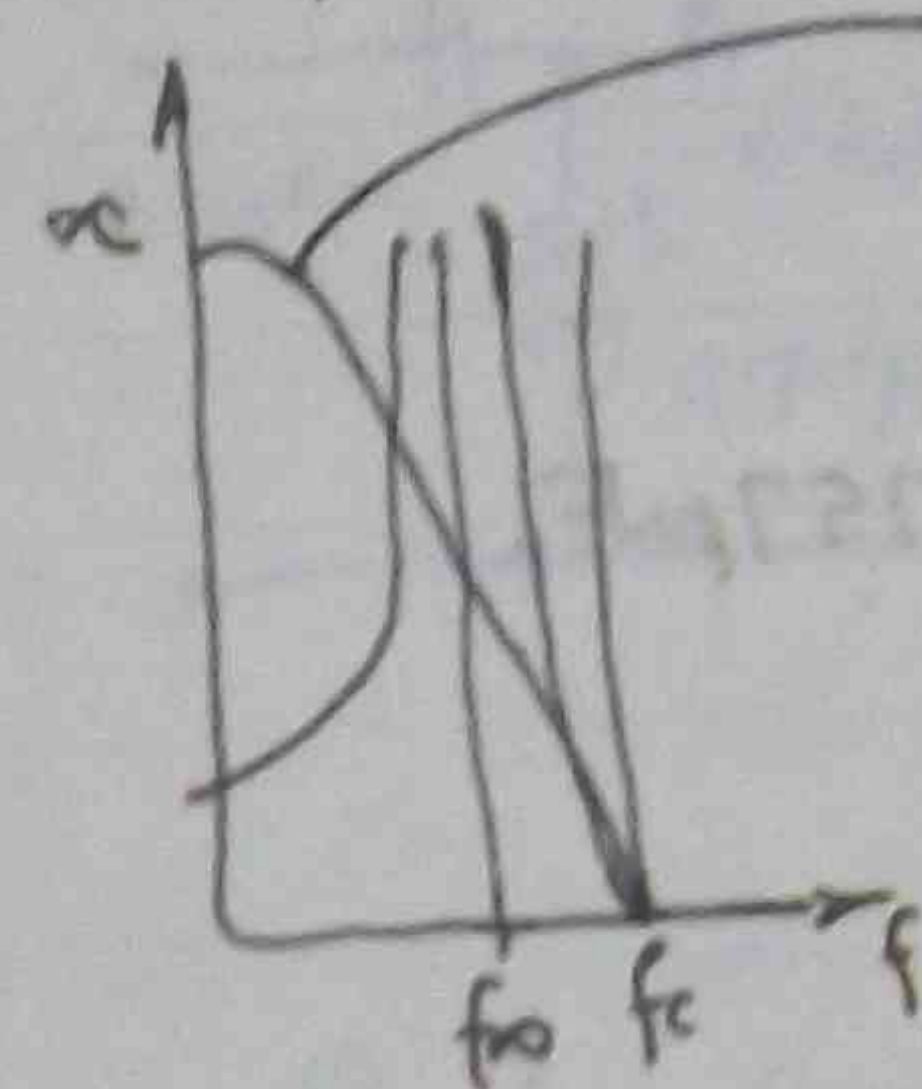
$$mC = 0.305 \times 0.0531 = 0.0162 \mu\text{F}$$



V.G.D

(π -sectionကို ဆွဲကြည့်ရပါမည်။)

Ex. 4 70 DIRECT. $f_c = 1000 \text{ Hz}$ infinite attenuation at $f_o = 1050 \text{ Hz}$.
 Line resistance is 600Ω .
 Design H.P.F. K m-derived section.



$$m = \sqrt{1 - \left(\frac{f_o}{f_c}\right)^2} = \sqrt{1 - 0.81} = 0.436$$

$\therefore f_o = 0.9 \times 1000 \text{ Hz}$

$$L = \frac{R_k}{\pi f_c} = \frac{600}{\pi \times 10^3} = 0.1908 \text{ H}$$

$$C = \frac{1}{\pi f_c R_k} = \frac{10^9}{\pi \times 10^3 \times 600} = 0.0531 \mu\text{Fd}$$

for T Section -

$$\frac{L}{m} = \frac{0.1908}{0.436} = 0.436 \text{ H}$$

$$\frac{4m}{1-m^2} C = \frac{4 \times 0.436 \times 0.0531}{1 - 0.19} = 0.2853 \mu\text{F}$$

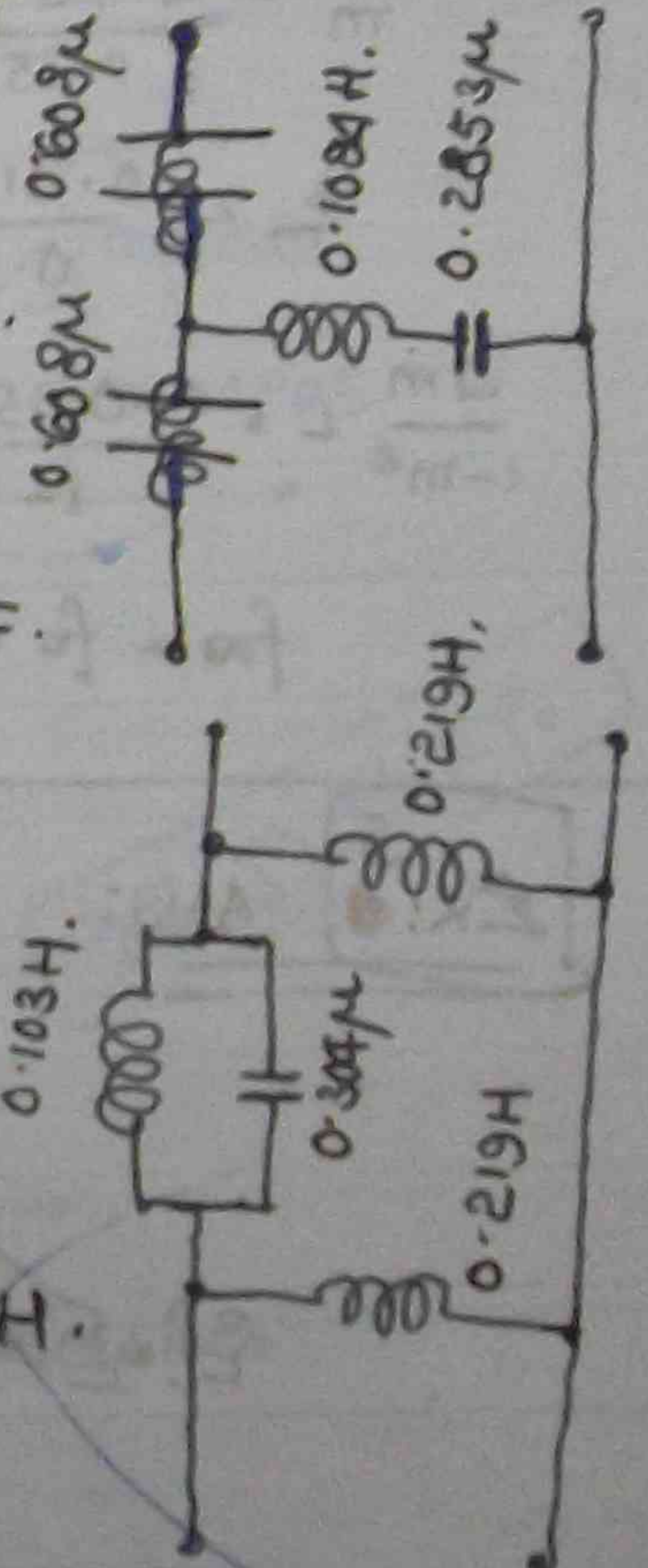
$$\frac{2}{1-m^2} C = \frac{2 \times 0.0531}{0.436} = 0.242 \mu\text{F}$$

for π Section -

$$\frac{2L}{m} = \frac{2 \times 0.1908}{0.436} = 0.872 \text{ H}$$

$$\frac{4m}{1-m^2} L = \frac{4 \times 0.436 \times 0.1908}{0.81} = 0.403 \text{ H}$$

$$C_m = \frac{0.0531}{0.436} = 0.121 \mu\text{Fd}$$



No: 2 Example

$$L = \frac{R_c}{4\pi f} = \frac{600}{4\pi \times 10^4} = 4.775 \text{ mH}$$

$$C = \frac{1}{4\pi f R_c} = \frac{1}{4\pi \times 10^4 \times 600} = 0.01325 \mu\text{F}$$

$$\therefore L_m = \frac{4.78}{0.35} = 13.65 \text{ mH}, \quad \frac{2C}{m} = \frac{0.0265}{0.35} = 0.0757 \mu\text{F}$$

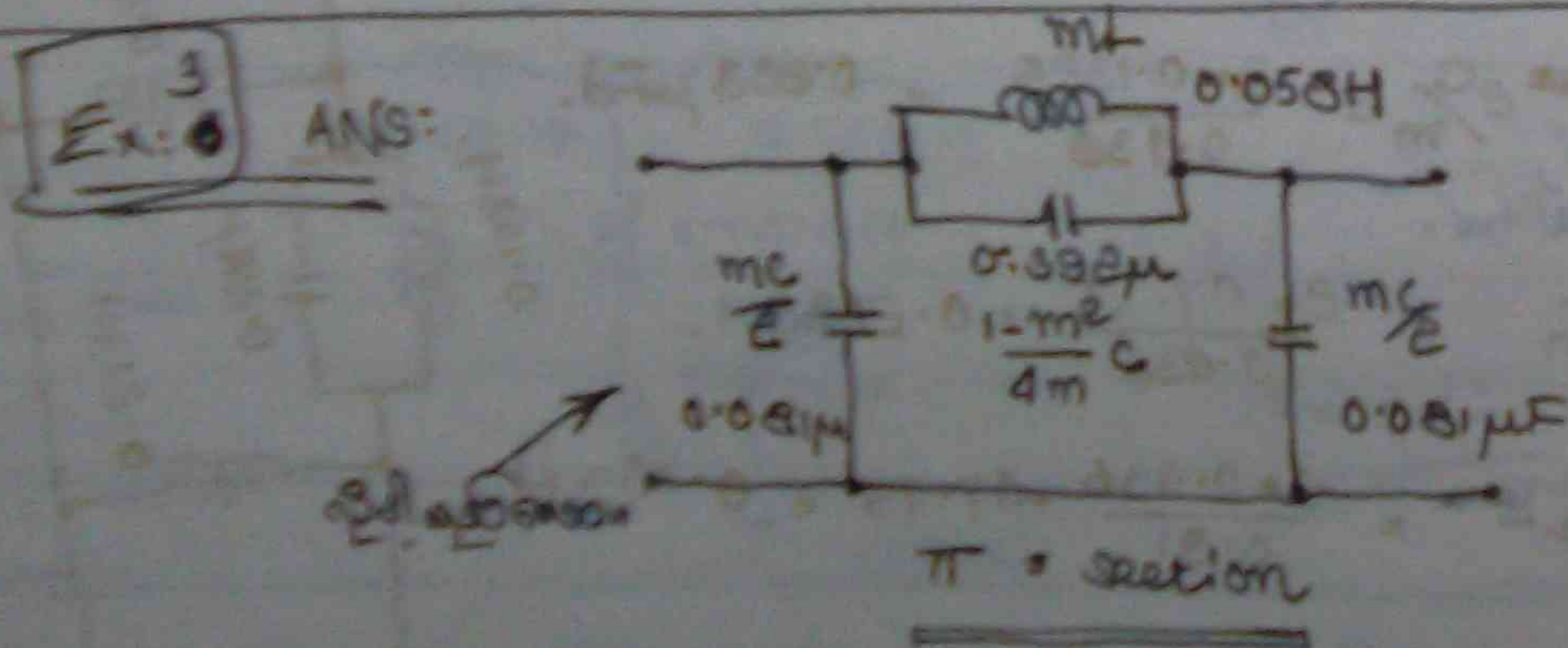
$$\frac{4m}{1-m^2} C = \frac{4 \times 0.35 \times 0.01325}{1-0.1225} = 0.0212 \mu\text{F}$$

$$\frac{2L}{m} = \frac{4.78 \times 2}{0.35} = 27.8 \text{ mH}$$

$$C_m = \frac{0.01325}{0.35} = 0.0379 \mu\text{F}$$

$$\frac{4m}{1-m^2} L = \frac{4 \times 0.35 \times 4.775}{1-0.1225} = 7.6 \text{ mH}$$

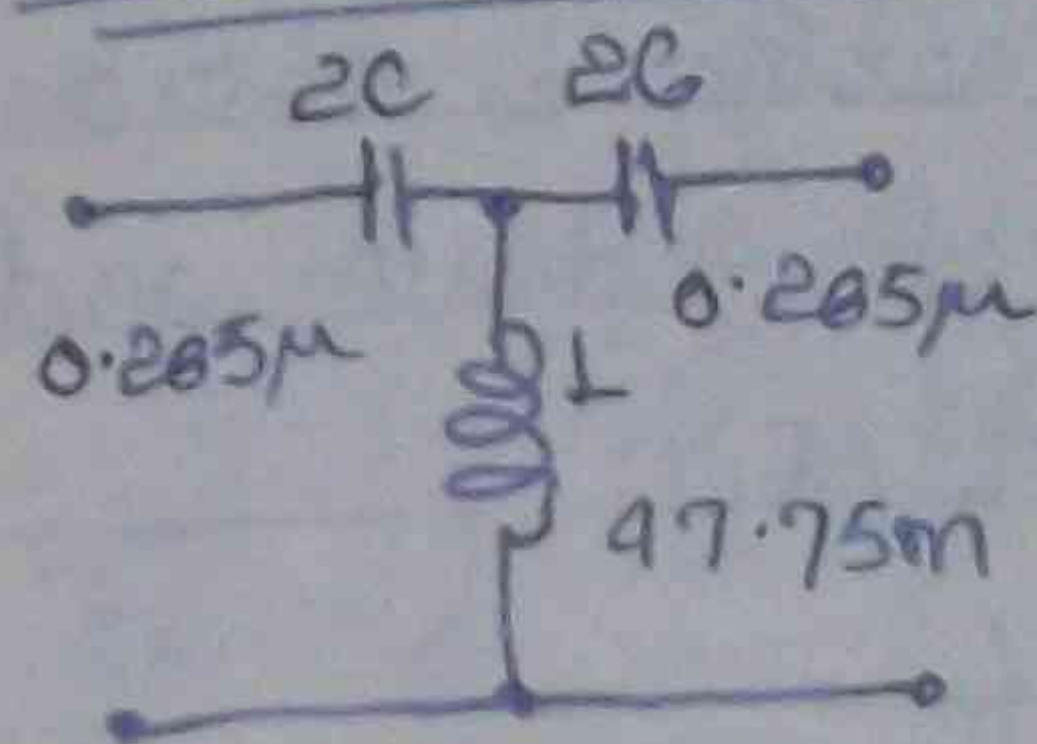
$$f_m = f_c \sqrt{1-m^2} = 10^4 \sqrt{1-0.1225} = 9370 \text{ Hz}$$



QUT. 10.8.83.

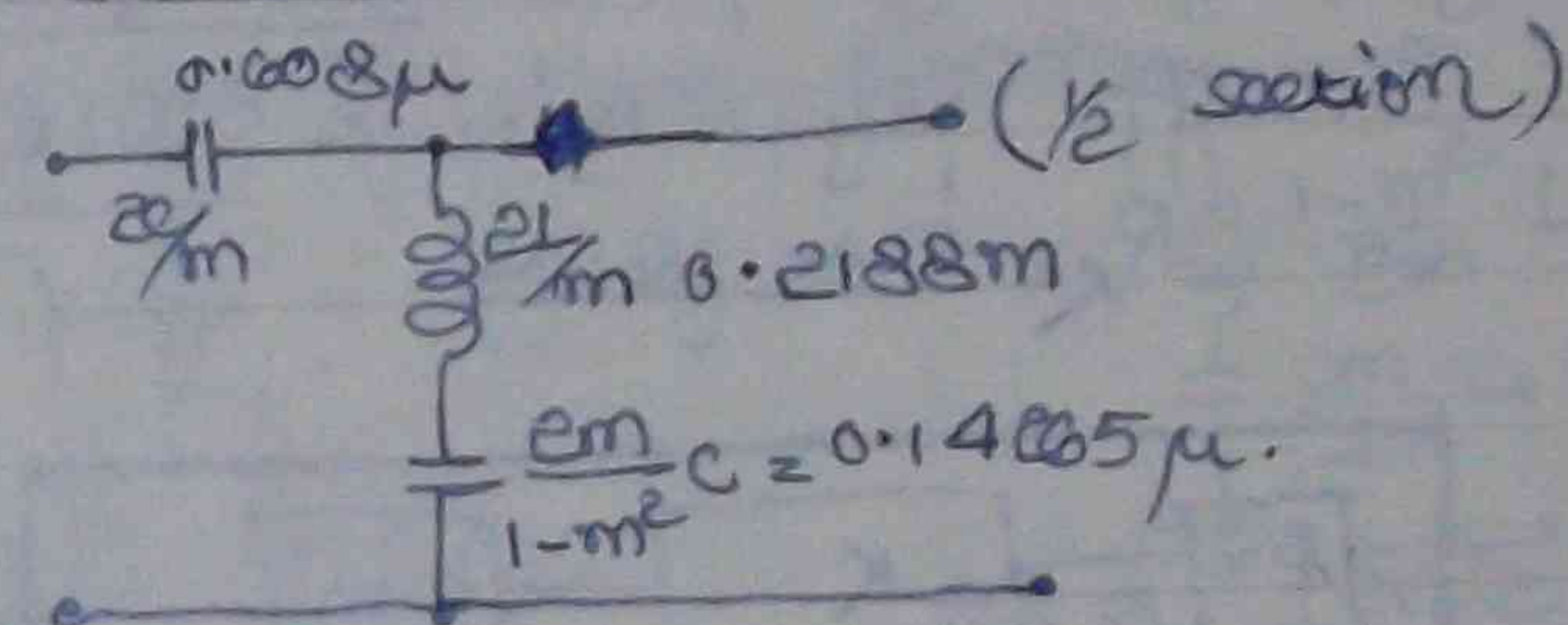
Ex: 4 Composite filter

Const. K filter

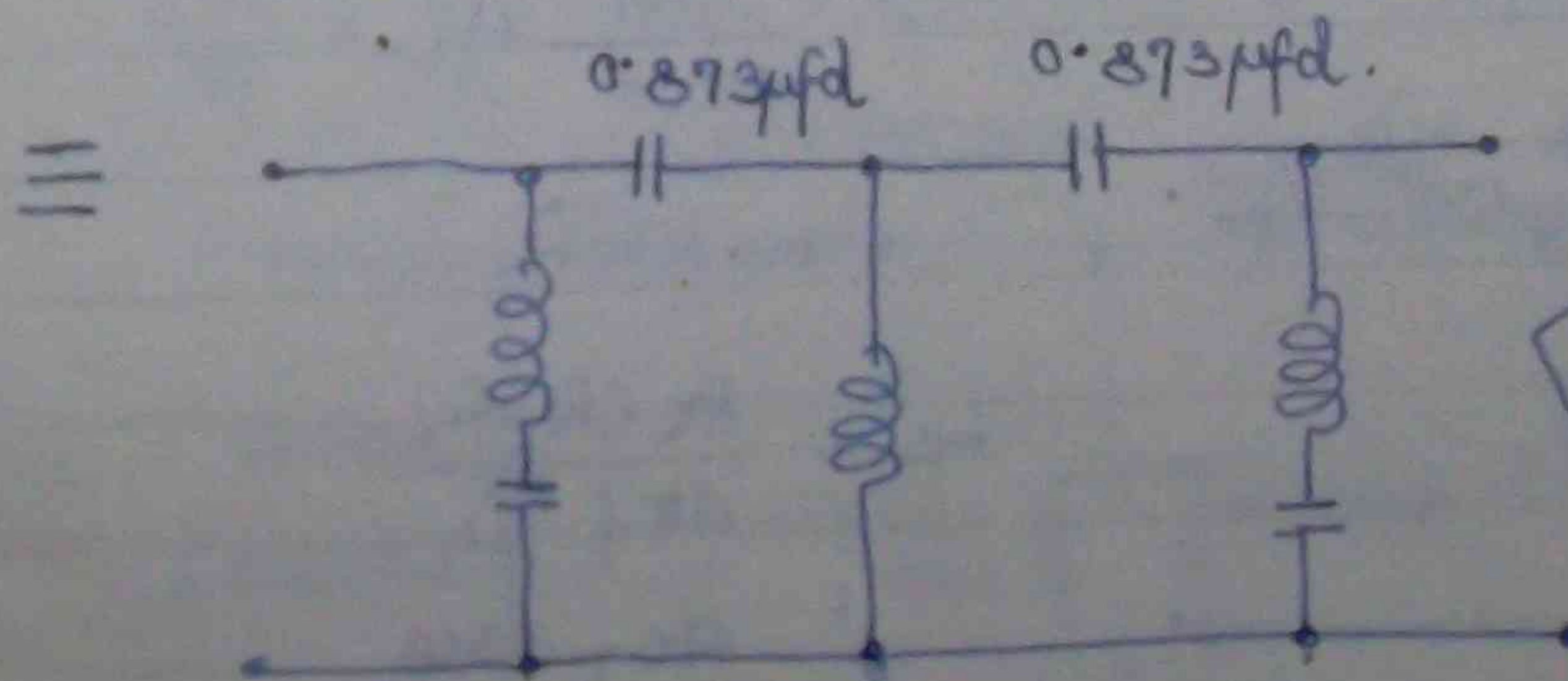
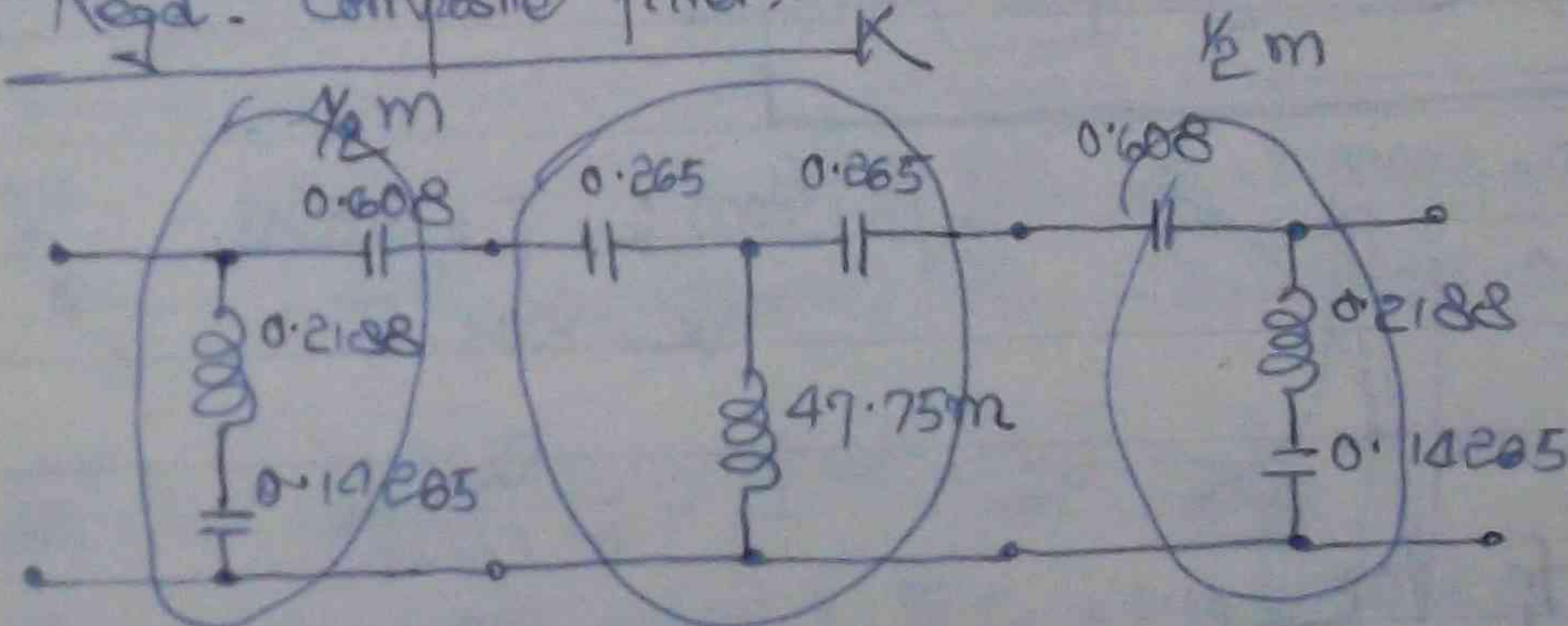


$$2C = 0.1325 \times 2 = 0.265 \mu$$

$$L = 47.75 \text{ mH}$$



\therefore Regd. Composite filter:-



CHMD-PLAY.

No: 2 සමපෝෂණ

$$L = \frac{R_c}{4\pi f} = \frac{600}{4\pi \times 10^4} = 4.775 \text{ mH}$$

$$C = \frac{1}{4\pi f R_c} = \frac{1}{4\pi \times 10^4 \times 600} = 0.01325 \mu\text{F}$$

$$\therefore L_m = \frac{4.78}{0.35} = 13.65 \text{ mH}, \quad \frac{2C}{m} = \frac{0.0265}{0.35} = 0.0757 \mu\text{F}$$

$$\frac{4m}{1-m^2} C = \frac{4 \times 0.35 \times 0.01325}{1-0.1225} = 0.0212 \mu\text{F}$$

$$\frac{2L}{m} = \frac{4.78 \times 2}{0.35} = 27.8 \text{ mH}$$

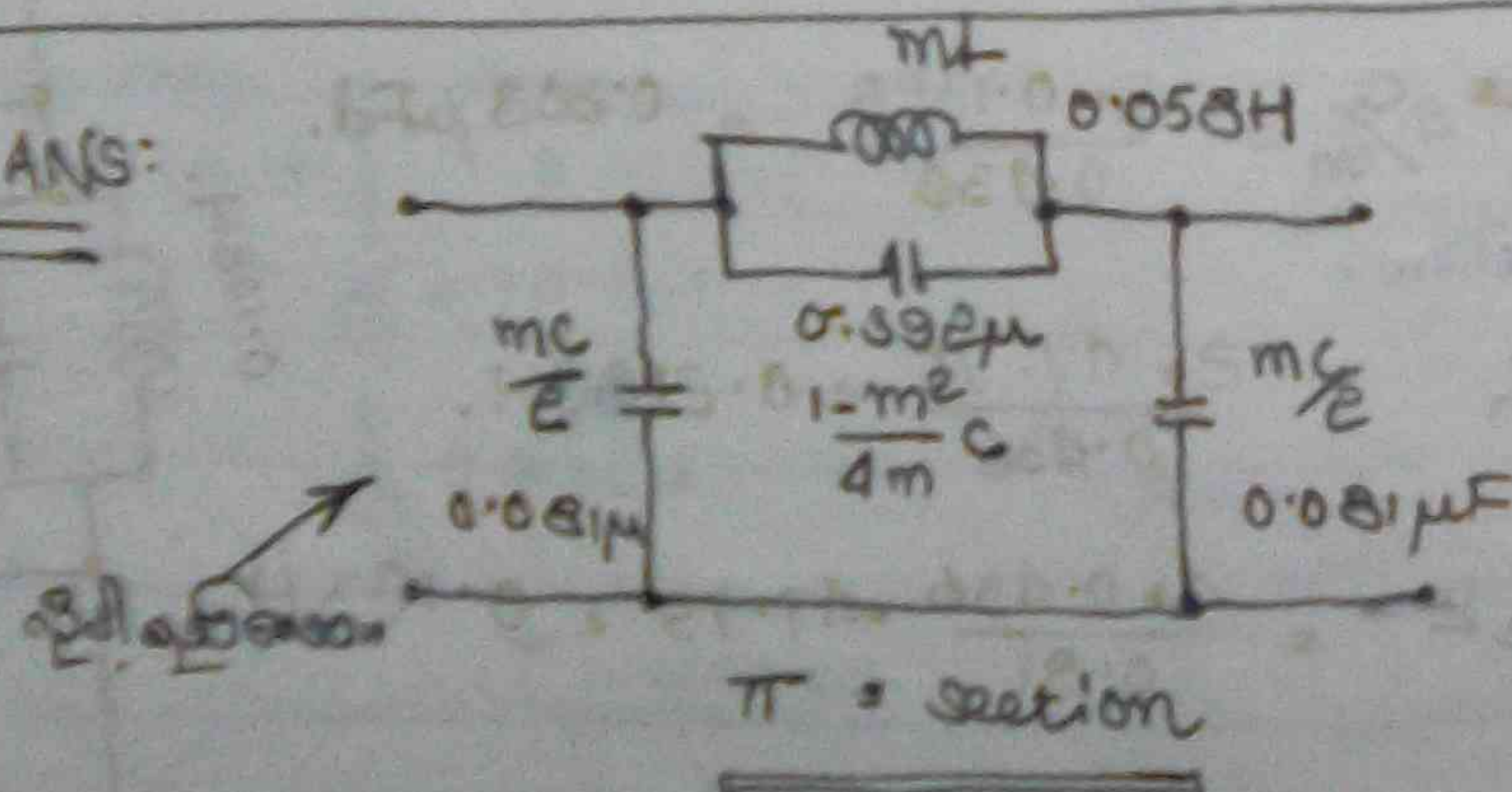
$$C_m = \frac{0.01325}{0.35} = 0.0379 \mu\text{F}$$

$$\frac{4m}{1-m^2} L = \frac{4 \times 0.35 \times 4.775}{1-0.1225} = 7.6 \text{ mH}$$

$$f_{\omega} = f_c \sqrt{1-m^2} = 10^4 \sqrt{1-0.1225} = 9370 \text{ Hz}$$

Ex: 3

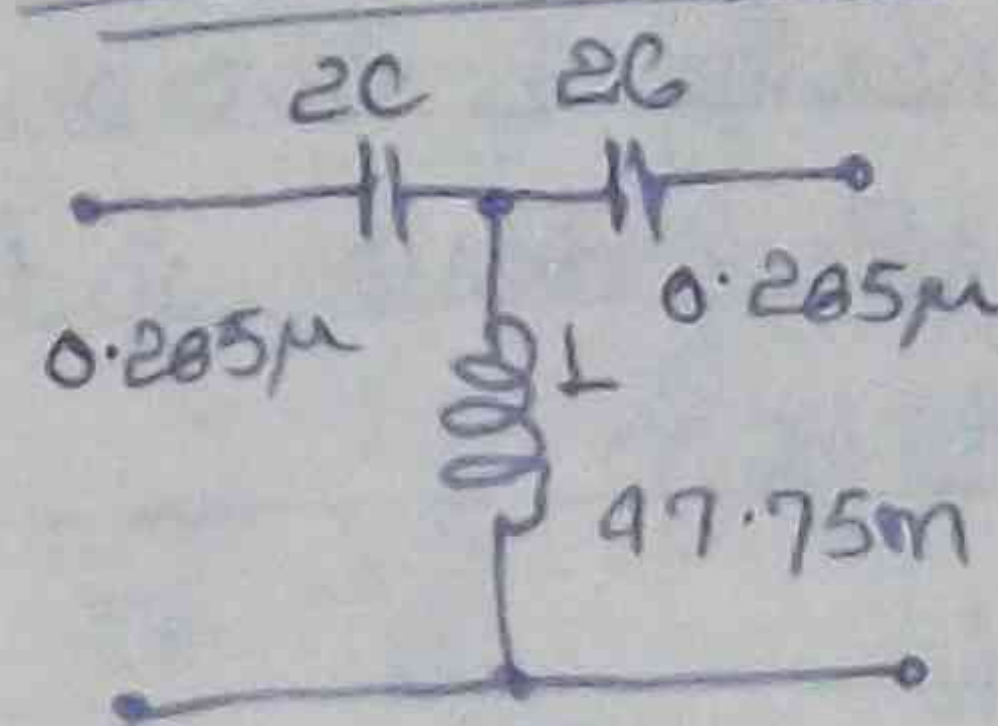
ANS:



QUT. 10.8.83.

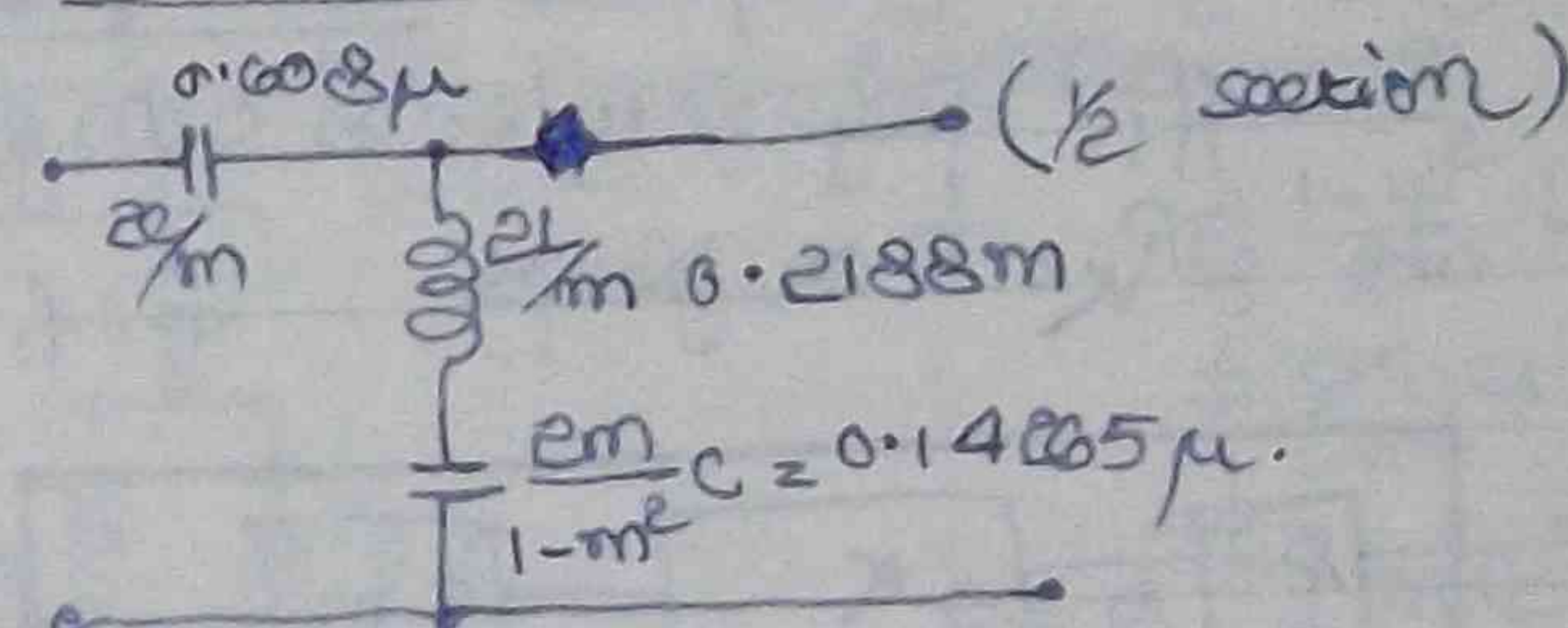
Ex: 4 ප්‍රකාශන සමපෝෂණ සමපෝෂණ

const. K filter

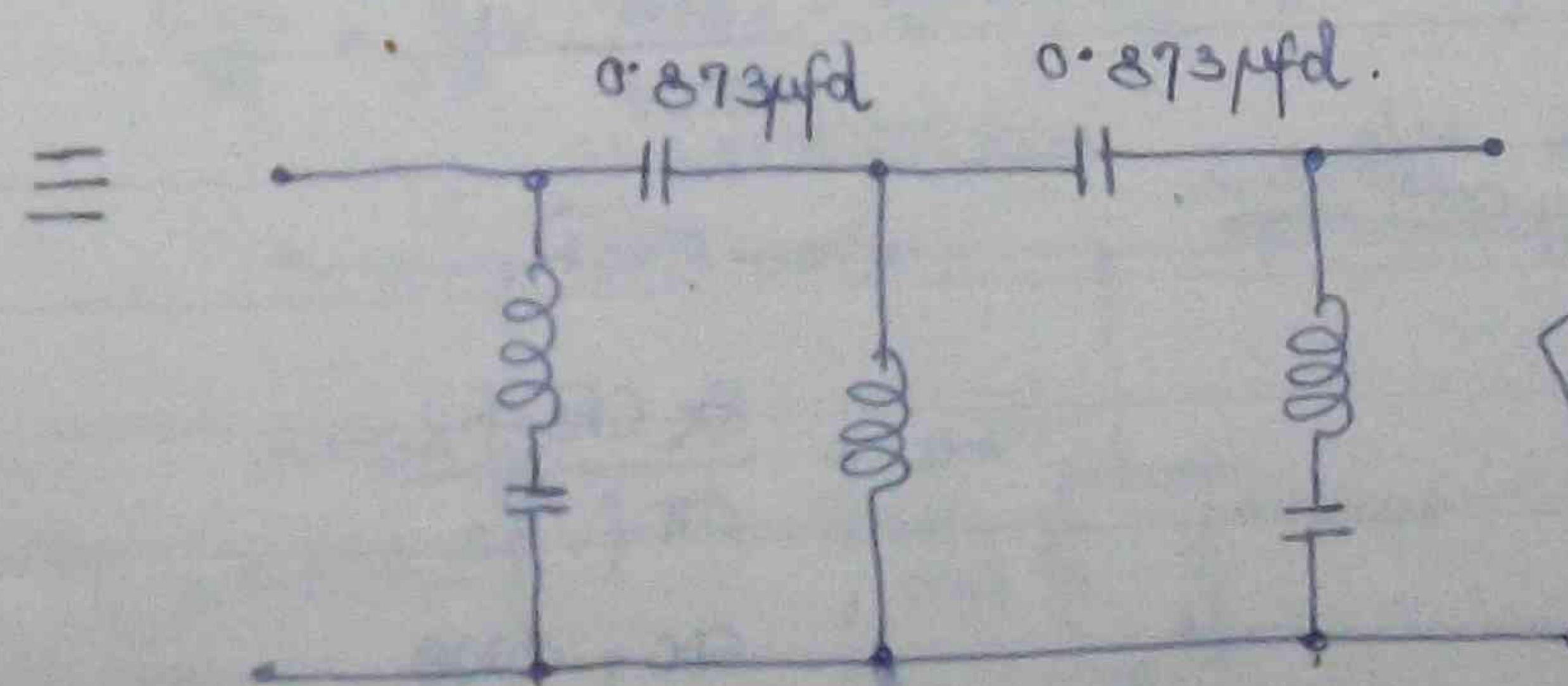
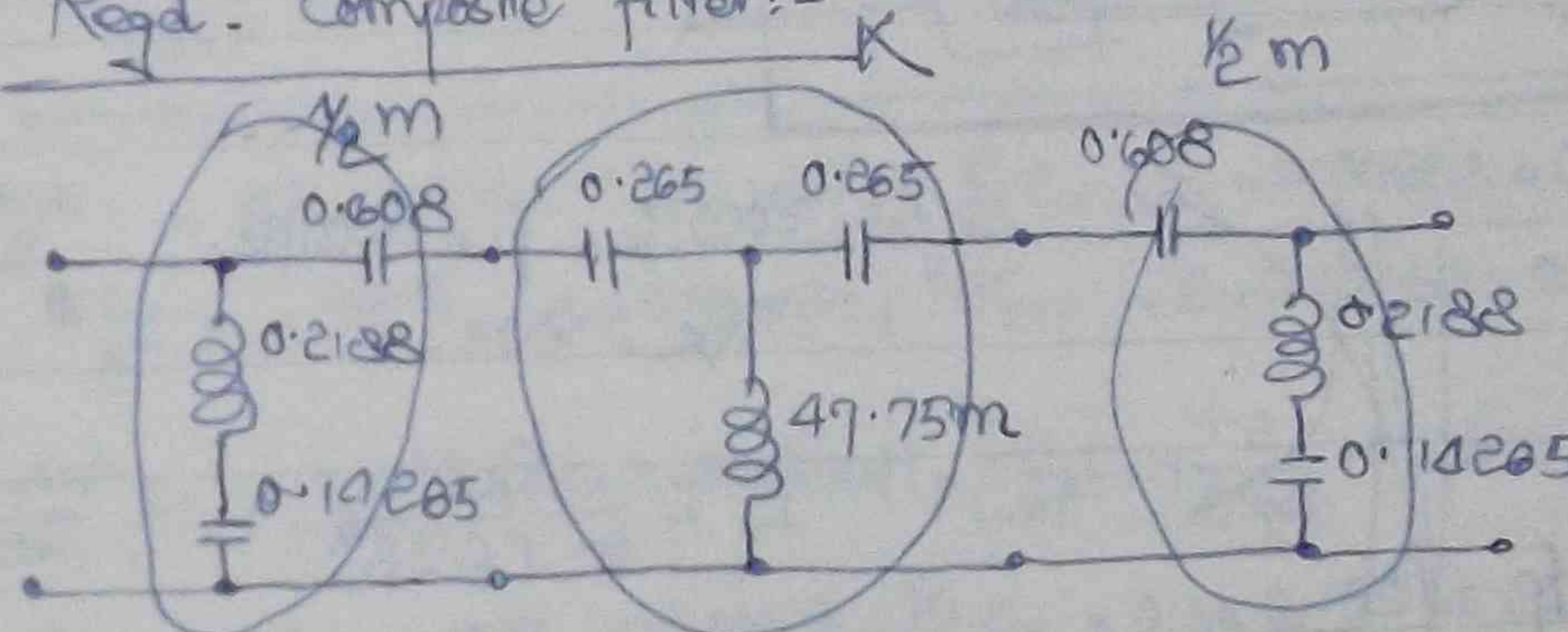


$$2C = 0.1325 \times 2 = 0.265 \mu$$

$$L = 47.75 \text{ mH}$$



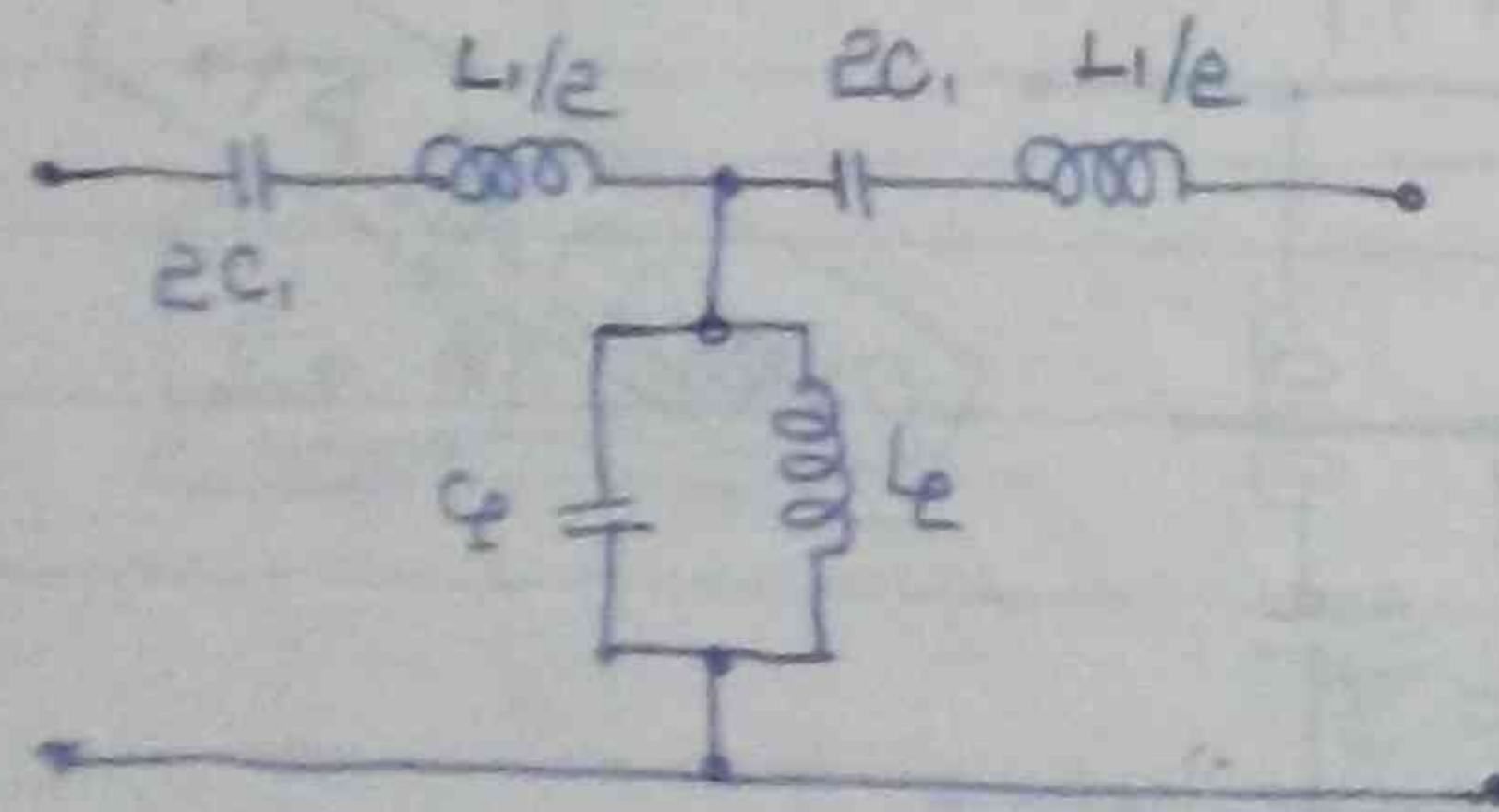
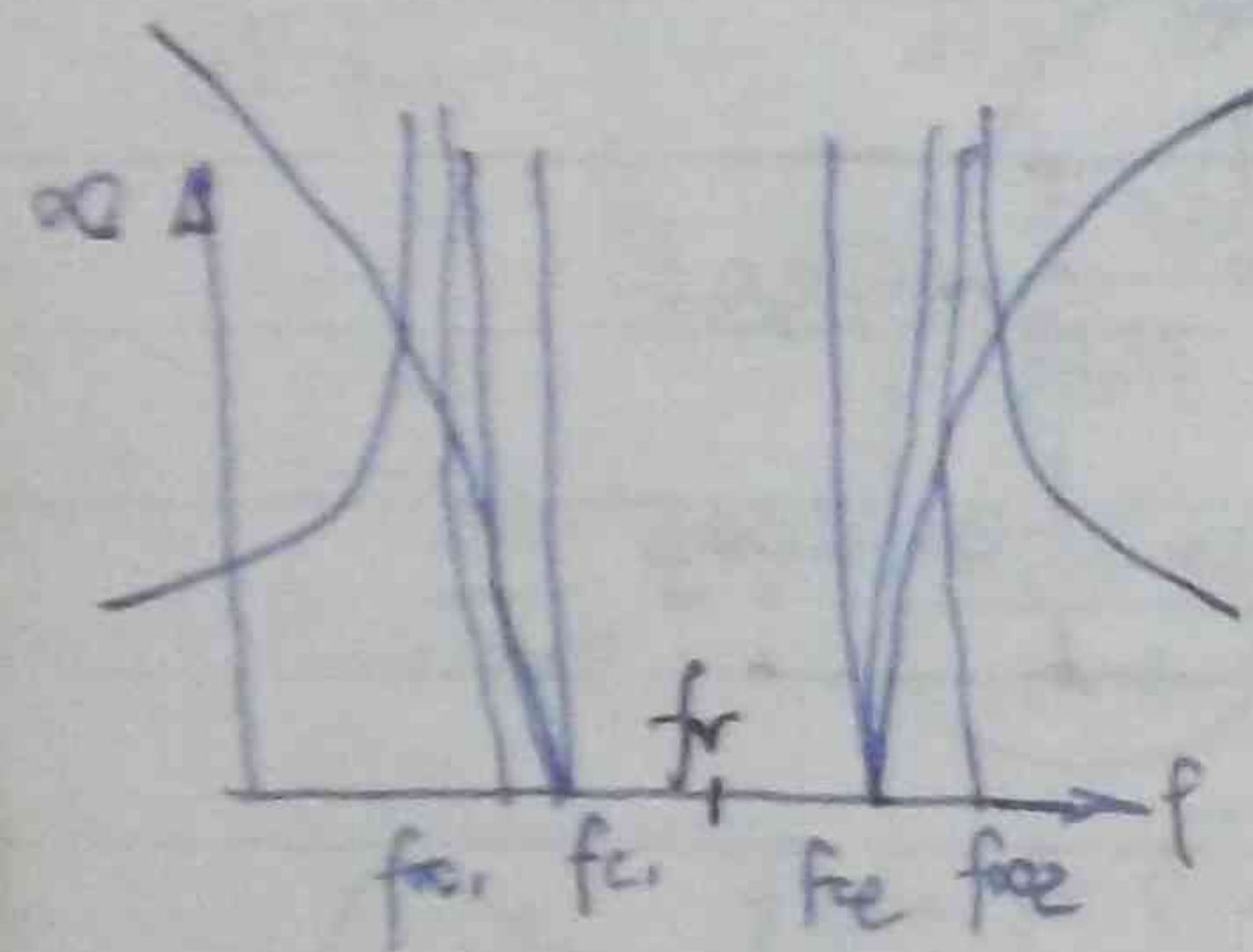
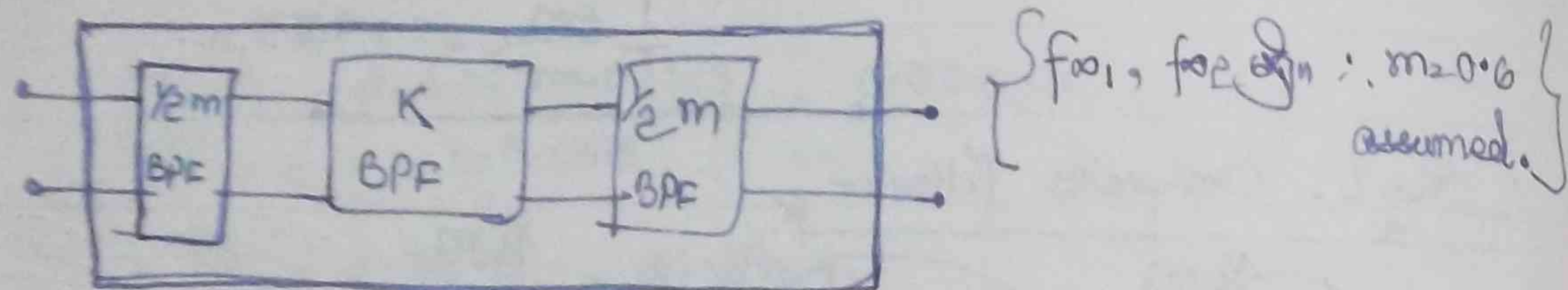
∴ Regd. Composite filter:-



CHMD-PLAY.

(မာ့ကုလေးကုလေး $m = 0.6$ မာ့ကုလေးကုလေး) 17-18.8.83

5. Proto-type T-section of terminating k section
 for design composite band pass filter of design f_c
 but off frequency high 8000 & 12000 Hz
 $R_k = 500 \Omega$ $f_c = 12000$ Hz, $f_1 = 8000$ Hz



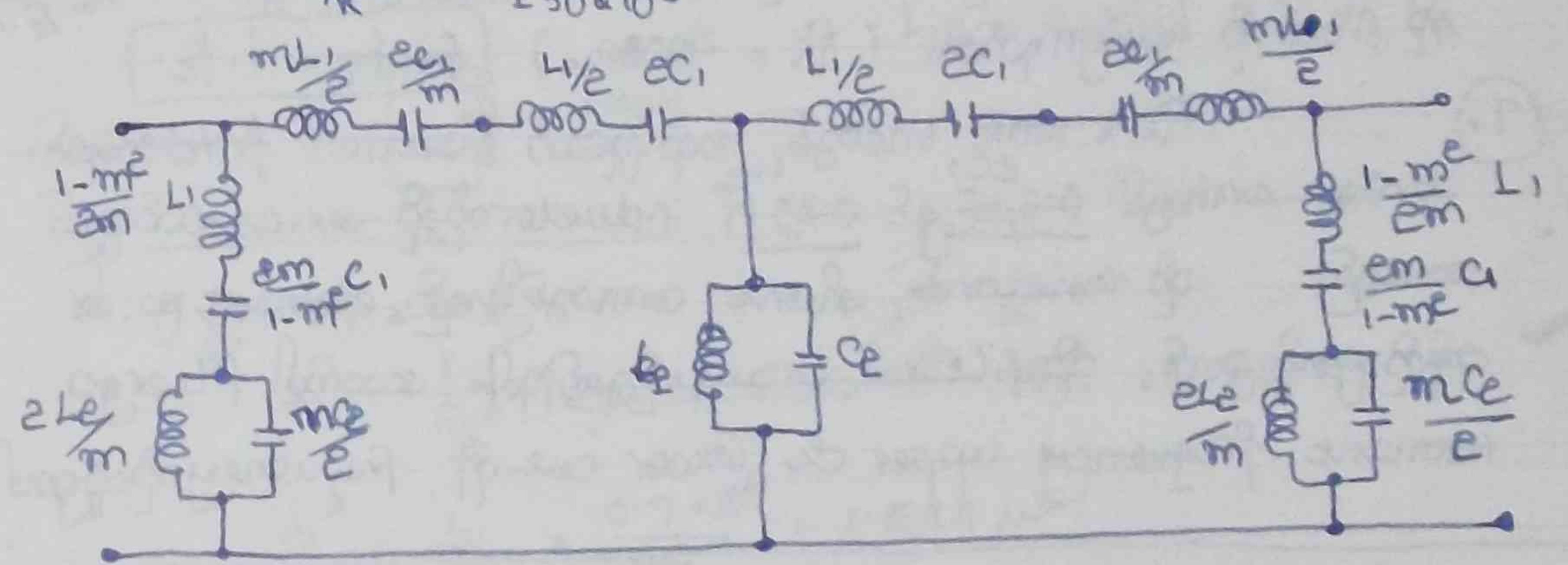
$f_c = 12000$ Hz, $f_1 = 8000$ Hz.
 $R_k = 500 \Omega$

$$L_1 = \frac{R_k}{\pi (f_c - f_1)} = \frac{500}{4000\pi} \text{ H.} = 39.8 \text{ mH.}$$

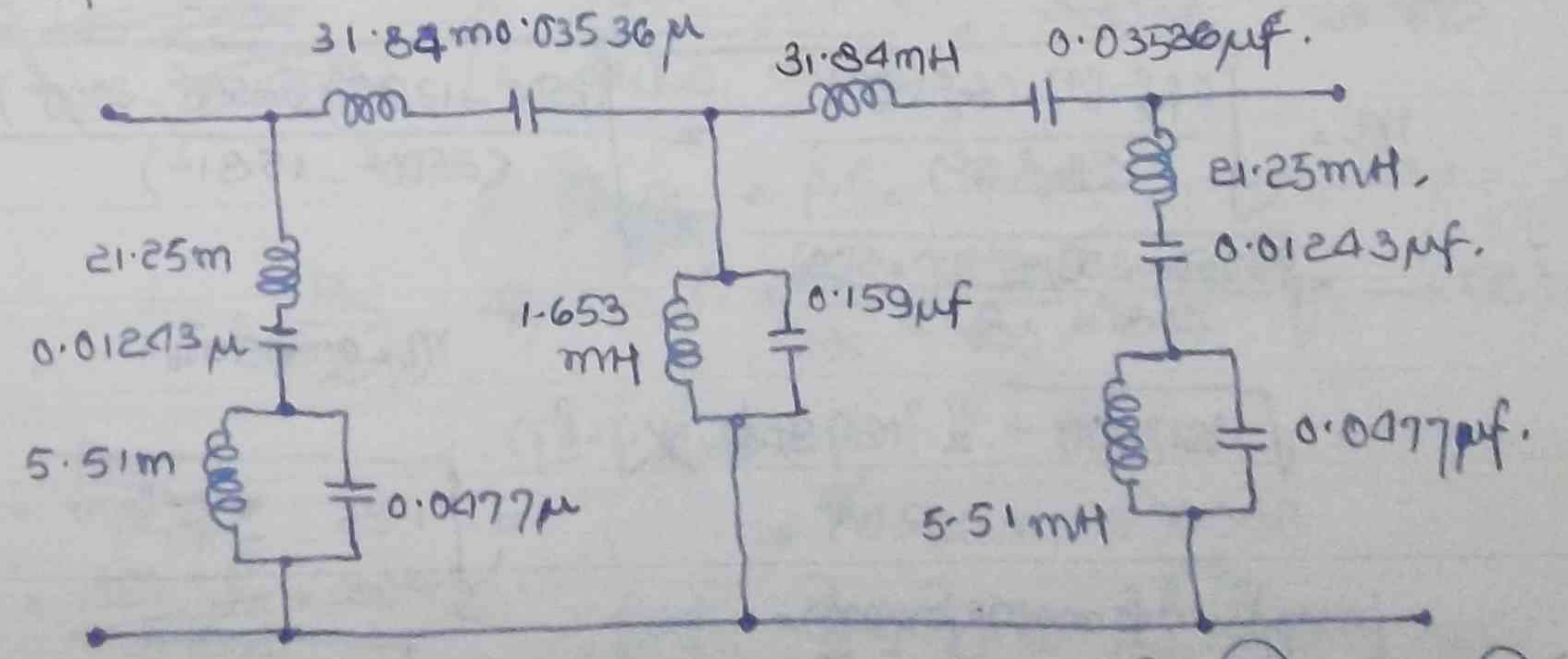
$$L_2 = \frac{R_k (f_c - f_1)}{4\pi f_1 f_c} = \frac{500 \cdot 4000}{4\pi \cdot 12 \cdot 8 \cdot 10^6} = 1.653 \text{ mH.}$$

$$C_1 = \frac{L_2}{R_k} = \frac{1.653 \times 10^{-3}}{250 \times 10^3} = 0.00663 \mu\text{F.}$$

$$C_2 = \frac{L_1}{R_k} = \frac{39.8 \times 10^{-3}}{250 \times 10^3} = 0.159 \mu\text{F.}$$



$\frac{mL_1}{2} = 0.6 \cdot 39.8 = 11.94 \text{ mH, } \frac{2}{m} C_1 = \frac{2}{0.6} \cdot 0.00663 = 0.0221 \mu\text{F.}$
 $\frac{L_1}{2} = \frac{39.8}{2} = 19.9 \text{ mH, } 2C_1 = 2 \cdot 0.00663 = 0.01326 \mu\text{F.}$
 $\frac{1-m^2}{2m} L_1 = \frac{1-0.36}{0.6} \cdot 39.8 = 21.25 \text{ mH, } \frac{2m}{1-m^2} C_1 = \frac{1.2}{0.64} \cdot 0.00663 = 0.01243 \mu\text{F.}$
 $\frac{2Le}{m} = \frac{2}{0.6} \cdot 1.653 = 5.51 \text{ mH, } \frac{m}{2} C_2 = 0.3 \cdot 0.159 = 0.0477 \mu\text{F.}$



REQUIRED CKT

မာ့ကုလေးကုလေး

BPF

6. Filter တစ်ခုသည် 1250 Hz နှင့် 2000 Hz ကြားရှိ freq အားကို transmit ခဲ့၍ 2500 Hz နှင့် high attenuation ဖြစ်သည်။ High attenuation ရှိသော freq: frequency အုပ်စုကို ထို filter ကို design ပြပါ။ ($R_k = 400 \Omega$) $f_o, f_p = f_c$

7. $R_k = 600 \Omega$ line တွင် series ဖြစ်သော T-section filter တစ်ခုကို series arm တွင် $0.5 \mu F$ နှင့် $0.35 H$ inductor တို့ကို series ဆက်သွယ်ထားသော နှစ် resistor စုံတစ်ခုရှိသည်။ element ပုံစံကို ဆုံးဖြတ်ပါ။ ထို filter ကို circuit ပုံဆွဲပါ။ အကယ်၍ filter ရှိ resonant frequency upper & lower cut-off frequency တို့ကိုရှာပါ။

6. Band Pass Filter Design.

$$f_{c1} = 1250 \text{ Hz}, f_{c2} = 2000 \text{ Hz}, f_{p2} = 2500 \text{ Hz}.$$

$$f_{o1} = ?$$

$$R_k = 400 \Omega.$$

$$f_r = \sqrt{f_{c1} \cdot f_{c2}} = 1581.5 \text{ Hz}$$

$$f_{o1}, f_{o2} = f_{c1}, f_{c2}$$

$$\therefore f_{o1} = f_{c1} \cdot f_{c2} / f_{p2} = \frac{1250 \cdot 2000}{2500} = 1000 \text{ Hz}.$$

$$m = \sqrt{\frac{(f_{p2}^2 - f_{c1}^2)(f_{p2}^2 - f_{c2}^2)}{(f_{c2}^2 - f_{c1}^2)}} = \sqrt{\frac{(2500^2 - 1250^2)(2500^2 - 2000^2)}{(2000^2 - 1250^2)}} = \sqrt{\frac{(3750 \cdot 1250)(1500 \cdot 500)}{4031 \cdot 919}} = \sqrt{231,300} = 1520.8 \text{ Hz}$$

$$= \sqrt{231,300} = 1520.8 \text{ Hz}$$

ညွှန်းကိန်းအားဖြင့်ရှာပါ။

$$6.1.1280.$$

$$= \sqrt{1.25 \cdot 0.6} = \sqrt{0.75} = 0.866$$

$$= \sqrt{0.75} = 0.866$$

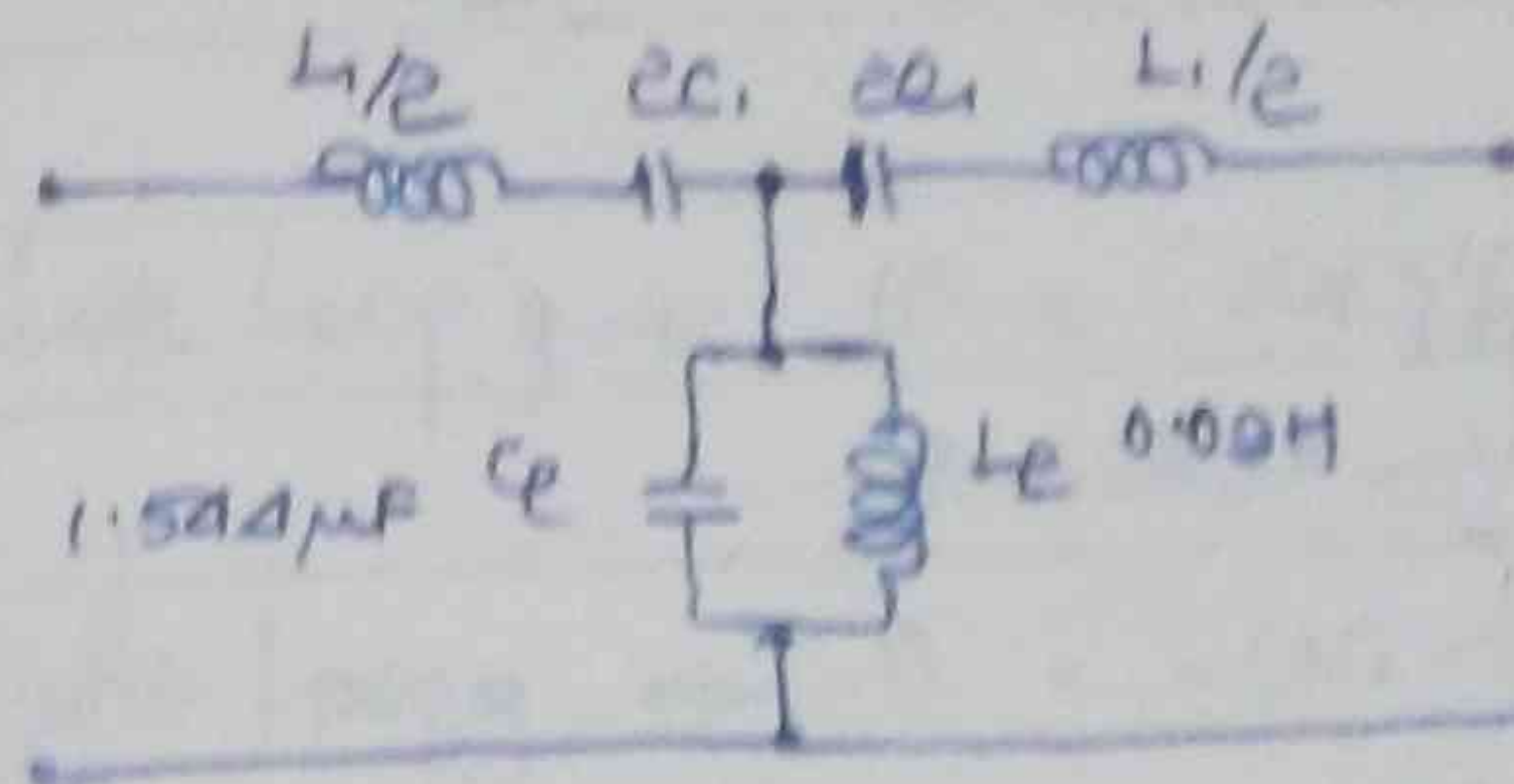
$$= 0.866$$

T-section BPF, constant k type

7.

$$R_k = 600 \Omega.$$

$$f_i = ? f_c = ?$$



$$C_1 = 0.5 \mu F, L_{1/2} = 0.35 H \text{ given.}$$

$$\therefore C_1 = 0.25 \mu F.$$

$$L_1 = 0.7 H.$$

$$R_k = 600 \Omega.$$

$$C_1 = \frac{L_1}{R_k^2} \Rightarrow L_1 = 0.25 \cdot 10^{-6} \cdot 600^2 = 0.09 H.$$

$$C_2 = \frac{L_1}{R_k^2} = \frac{0.7 \cdot 10^{-6}}{600^2} = 1.94 \mu F.$$

$$f_r = \frac{1}{2\pi \sqrt{L_1 C_1}} = \frac{1}{2\pi \sqrt{0.09 \cdot 1.94}} = 379.5 \text{ Hz}$$

$$f_r = \frac{1}{2\pi \sqrt{L_1 C_1}} = \frac{1}{2\pi \sqrt{0.09 \cdot 1.94}} = 379.5 \text{ Hz}$$

$$\therefore f_i, f_c = f_r = 379.5 \text{ Hz} \quad (1)$$

8.

$$L_1 = \frac{R_k}{\pi(f_c - f_i)} \Rightarrow f_c - f_i = \left(\frac{\pi L_1}{R_k}\right)^{-1} = \left(\frac{0.7 \cdot 10^{-6}}{600}\right)^{-1} = 270 \text{ Hz} \quad (2)$$

$$(f_c + f_i)^2 = (f_c - f_i)^2 + 4f_i f_c$$

$$= 74500 + 576000$$

$$f_c = \frac{R_k}{\pi L_1 C_1} = \frac{600 \cdot 10^3}{\pi \cdot 1.94} = 9800 \text{ Hz}$$

$$\therefore f_i, f_c = \pm 807 \text{ Hz} \quad (3)$$

$$\therefore f_{c1} = 267 \text{ Hz}, f_{c2} = 540 \text{ Hz}$$

Ans.

Ex 11.

$$Z_{1a} = 60 + j10, Z_{2a} = 40 + j20, Z_{1x} = 50 + j20.$$

$$Z_L = 20 - j20$$

$\alpha = ?$ $\beta = ?$

$$Z_3 = \frac{Z_{1a}(Z_{2a} - Z_{1x})}{Z_{2a} - Z_{1x}}$$

$$Z_3 = \frac{Z_{1a}(Z_{2a} - Z_{1x})}{Z_{2a} - Z_{1x}}$$

$$Z_3 = \frac{(50 + j20)(40 + j20)}{40 + j20}$$

$$Z_3 = \sqrt{Z_{1a}(Z_{2a} - Z_{1x})}$$

$$= \sqrt{(60 + j10)(10 - j20)}$$

$$= \sqrt{600 - 600j}$$

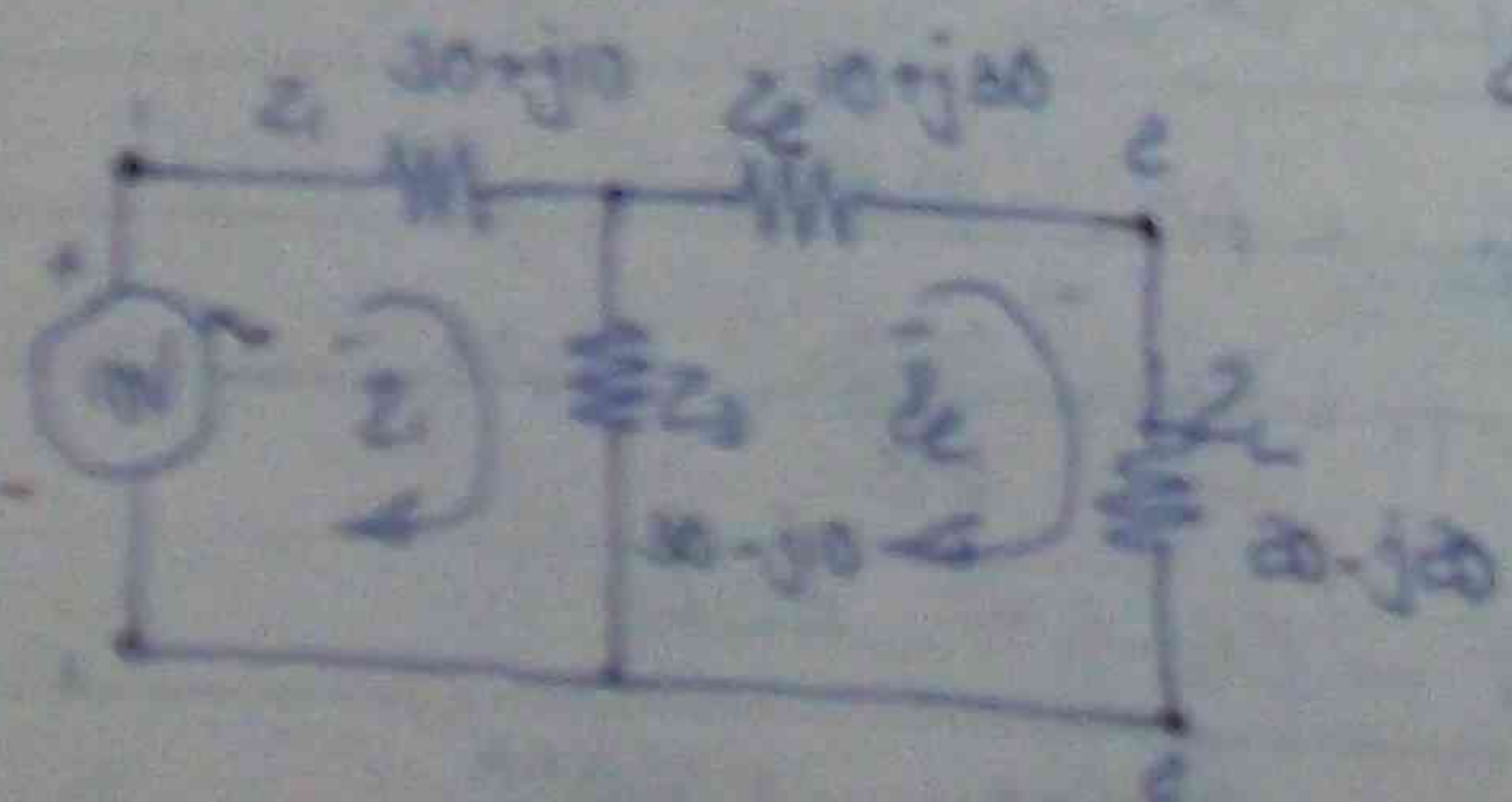
$$= \sqrt{1000 \angle -36.87^\circ}$$

$$Z_3 = 31.65 \angle -18.44^\circ = 30.03 - j10.02 = 30 - j10.$$

$$Z_1 = Z_{1a} - Z_3 = 60 - 30 + j10 = 30 + j10$$

$$Z_2 = Z_{2a} - Z_3 = 40 - 30 + j20 + j10 = 10 + j30.$$

$$Z_L = 20 - j20 \text{ (given)}$$



Mesh Current Method for Z_1 and Z_2 respectively.

$$\text{Left Loop } \rightarrow 10 = (30 + j10 + 30 - j10) Z_1 - (30 - j10) Z_2$$

$$0 = (30 - j10 + 10 + j30 + 20 - j20) Z_2$$

$$\text{Right Loop } \rightarrow 0 = -(30 - j10) Z_1 + (30 - j10 + 10 + j30 + 20 - j20) Z_2$$

$$10 = (60 + Z_1) - (30 - j10) Z_2 \quad \text{--- (1)}$$

$$0 = (j10 - 30) Z_1 + 60 Z_2 \quad \text{--- (2)}$$

$$D = \begin{vmatrix} 60 & 30 - j10 \\ j10 - 30 & 60 \end{vmatrix} = 100 \begin{vmatrix} 6 & 3 - j \\ j - 3 & 6 \end{vmatrix} = 100(36 + (3 - j)^2)$$

$$= 100(36 + 9 - 1 - 6j)$$

$$= 4400 - 600j = 4440 \angle -7.77^\circ$$

$$N_1 = \begin{vmatrix} 10 & 30 - j10 \\ 0 & 60 \end{vmatrix} = 100 \begin{vmatrix} 1 & 3 - j \\ 0 & 6 \end{vmatrix} = 100(6 - 0) = 600 \angle 0^\circ$$

$$N_2 = \begin{vmatrix} 60 & 10 \\ -(30 - j10) & 0 \end{vmatrix} = 100 \begin{vmatrix} 6 & 1 \\ -(3 - j) & 0 \end{vmatrix} = 100(0 + 3 - j)$$

$$= 300 - j300 = 424 \angle -45^\circ$$

$$\therefore Z_1 = \frac{N_1}{D} = \frac{600 \angle 0^\circ}{4440 \angle -7.77^\circ} = 0.135 \angle 7.77^\circ \text{ A.}$$

$$Z_2 = \frac{N_2}{D} = \frac{424 \angle -45^\circ}{4440 \angle -7.77^\circ} = 0.0955 \angle -37.23^\circ \text{ A.}$$

$$\frac{Z_s}{Z_R} = e^{\gamma} = e^{\alpha + j\beta}$$

$$\therefore \frac{0.135 \angle 7.71}{0.955 \angle 37.23} = e^{\alpha} \cdot e^{j\beta}$$

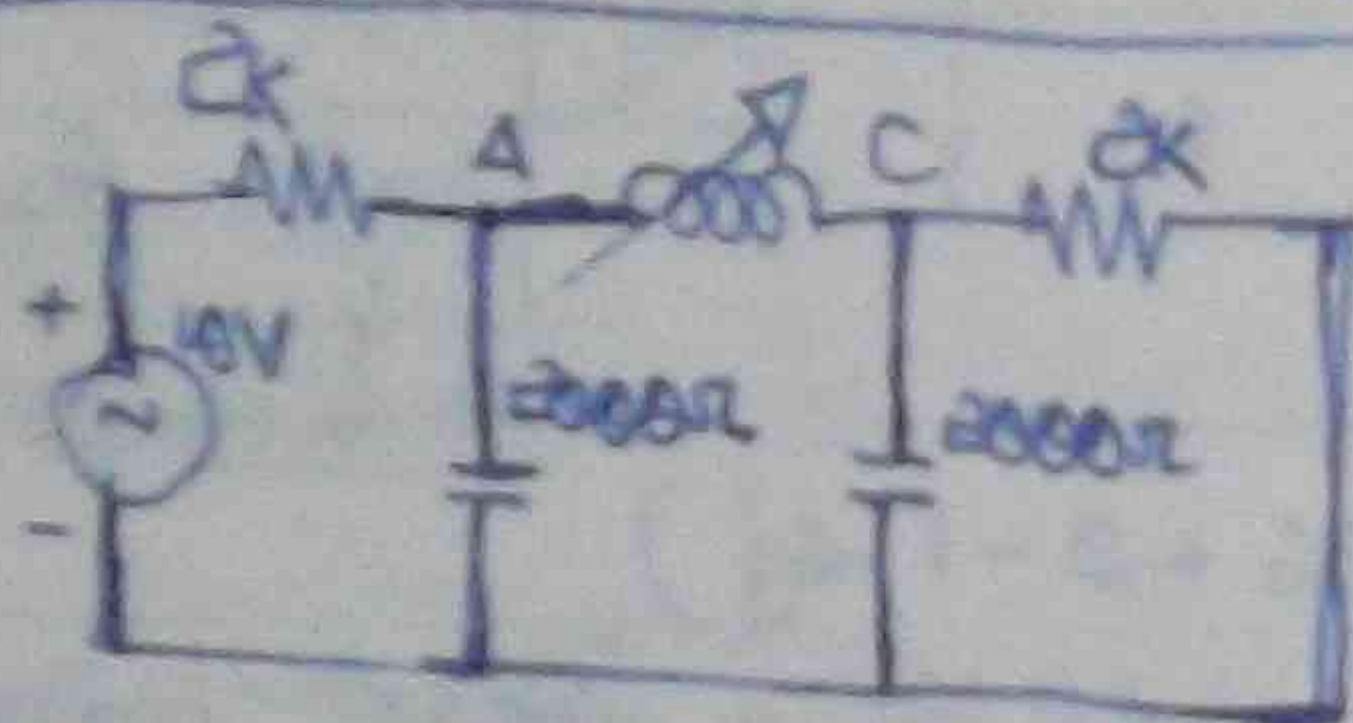
$$\therefore e^{\alpha} = 0.14135 = e^{0.346} \Rightarrow \alpha = 0.346 \text{ Nepers.}$$

$$e^{j\beta} = \frac{7.71 - 37.23}{1.11} \Rightarrow \beta = \frac{-29.46^\circ}{180} = 0.514 \text{ Rad.}$$

CAF? $\frac{1}{\alpha} = \frac{1}{0.346} = 2.89 \text{ dB}$

82/105

AC of Thevenin's Eq Ckt. = ?



AC of inductor max. voltage V_L ?

max. voltage = ?

max. power mode? α ?

82/14

200 miles Ph. line.

79 14.0 V

Z_0 properly terminated.

$$Z_0 = 683 - j183 \Omega, r_c = 0.0074 + j0.055 \Omega/\text{mile}$$

(a) V_s, I_s, P_s (b) V_R, I_R, P_R given

82/5B

$R_K = 500 \Omega$ line.

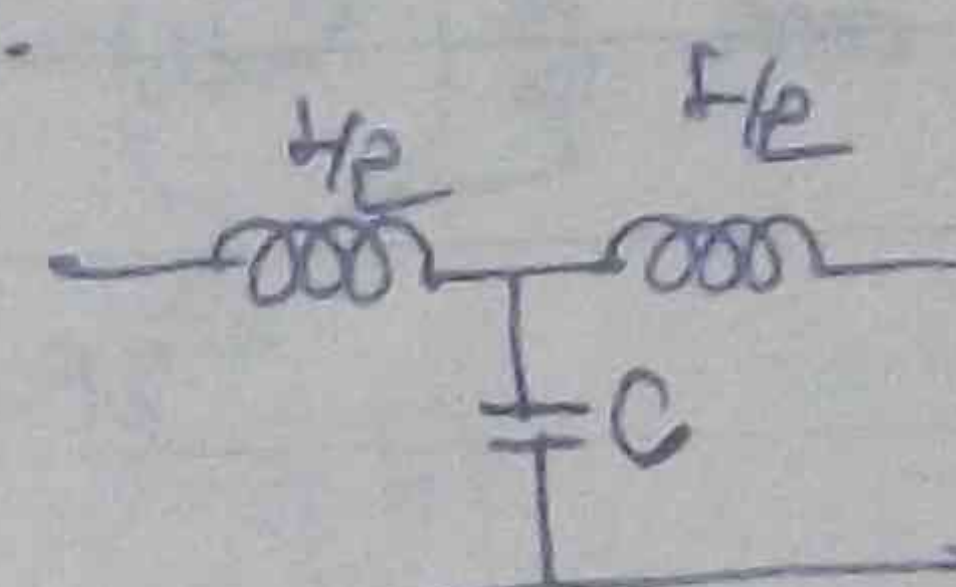
Low pass composite filter design.

$$f_c = 4000 \text{ Hz.}$$

$$f_{o1} = 4500 \text{ Hz, } f_{o2} = 5000 \text{ Hz} \leftarrow \text{m-sections}$$

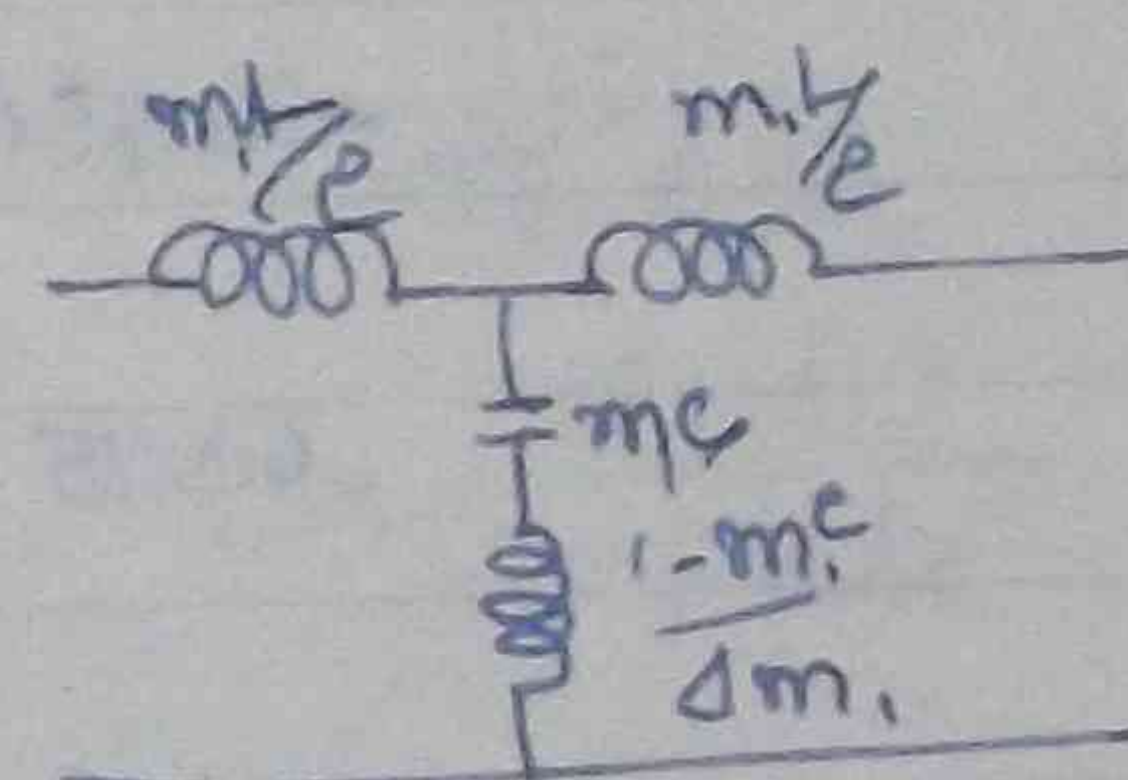
* $f_c = 4000 \text{ Hz}$ $R_K = 500 \Omega$ LPF design.

$$L = \frac{R_K}{\pi f_c}, C = \frac{1}{\pi f_c R_K}$$



* $f_{o1} = 4500 \text{ Hz}$ m-derived section.

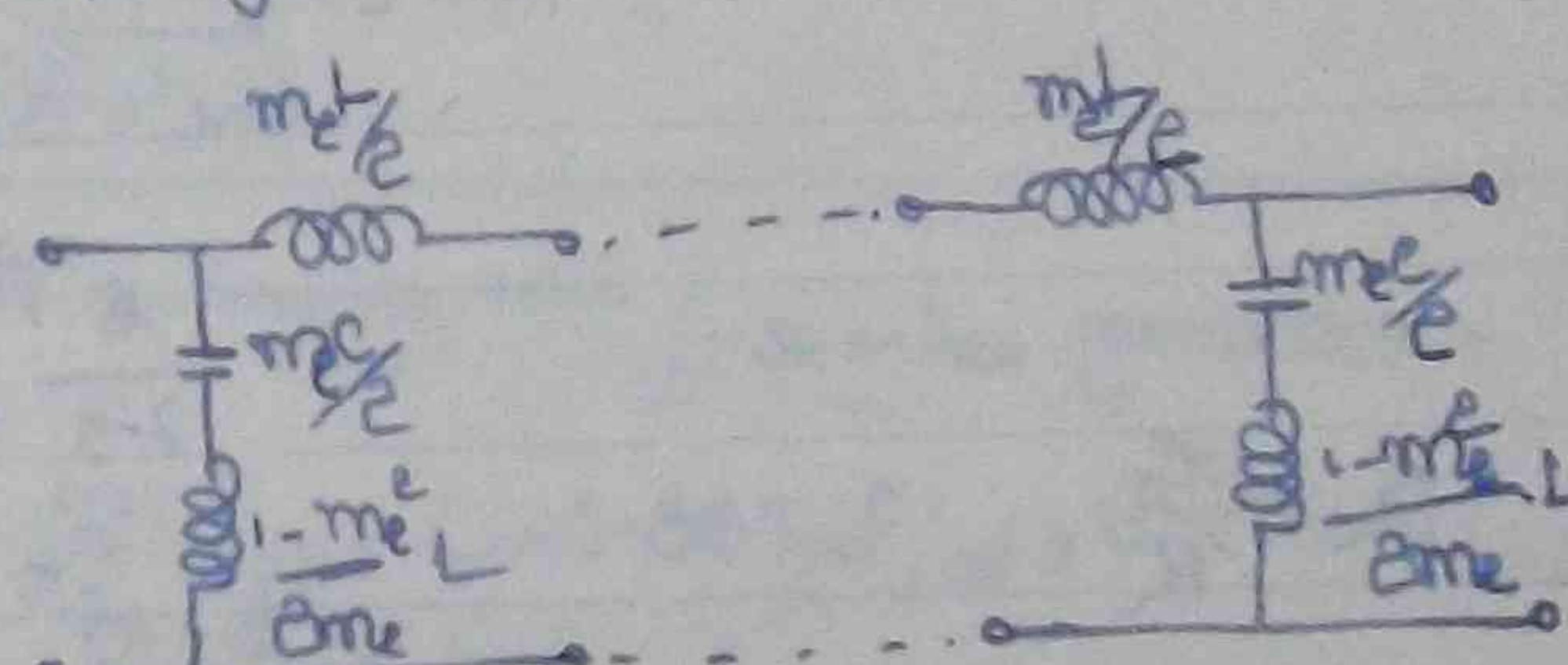
$$m_1 = \sqrt{1 - \left(\frac{f_c}{f_{o1}}\right)^2}$$



$$m_1L/2, m_1C, \frac{(1-m_1^2)L}{m_1}$$

* $f_{o2} = 5000 \text{ Hz}$ $\frac{1}{2}$ m-derived section

$$m_2 = \sqrt{1 - \left(\frac{f_c}{f_{o2}}\right)^2}$$

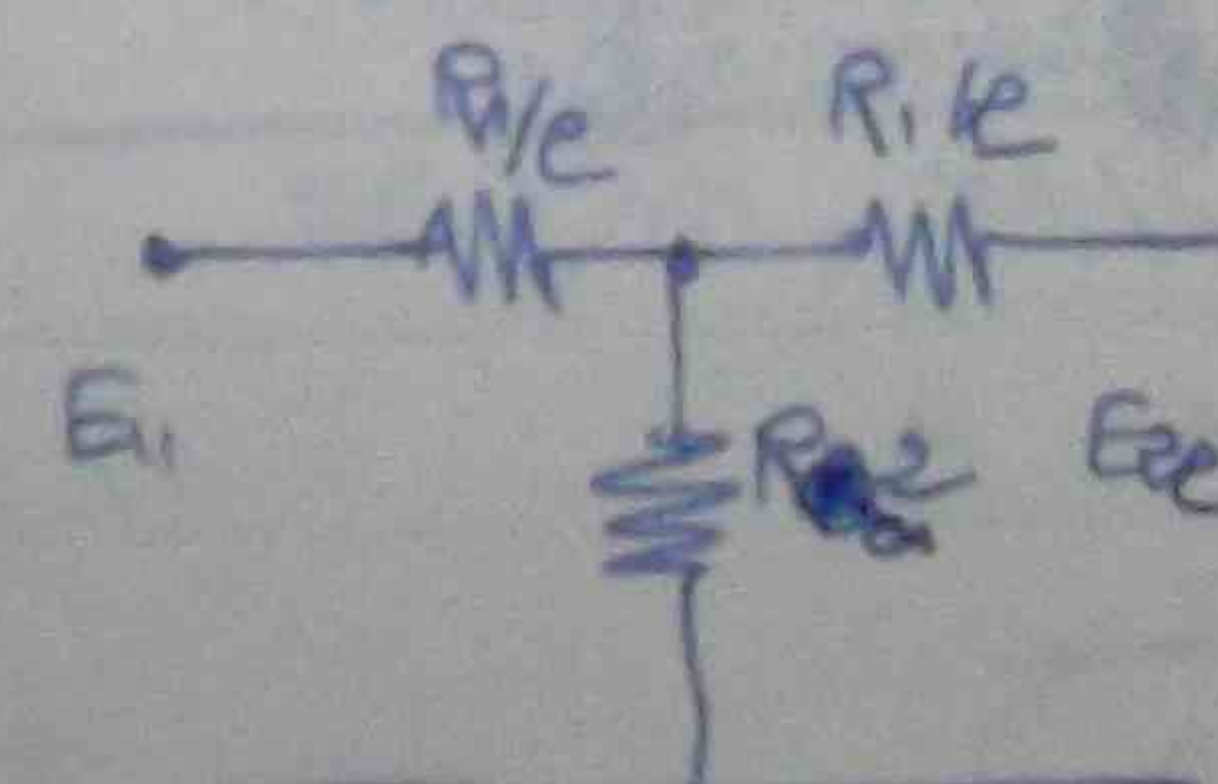


$$m_2L/2, m_2C, \frac{(1-m_2^2)L}{m_2}$$

81/3A

$R_K = 600 \Omega$, Ph. line.

15 dB loss sym. T section pad



$$15 \text{ dB} = 20 \log \frac{E_1}{E_2} = 20 \log \frac{R_K + R_2/2}{R_K - R_2/2}$$

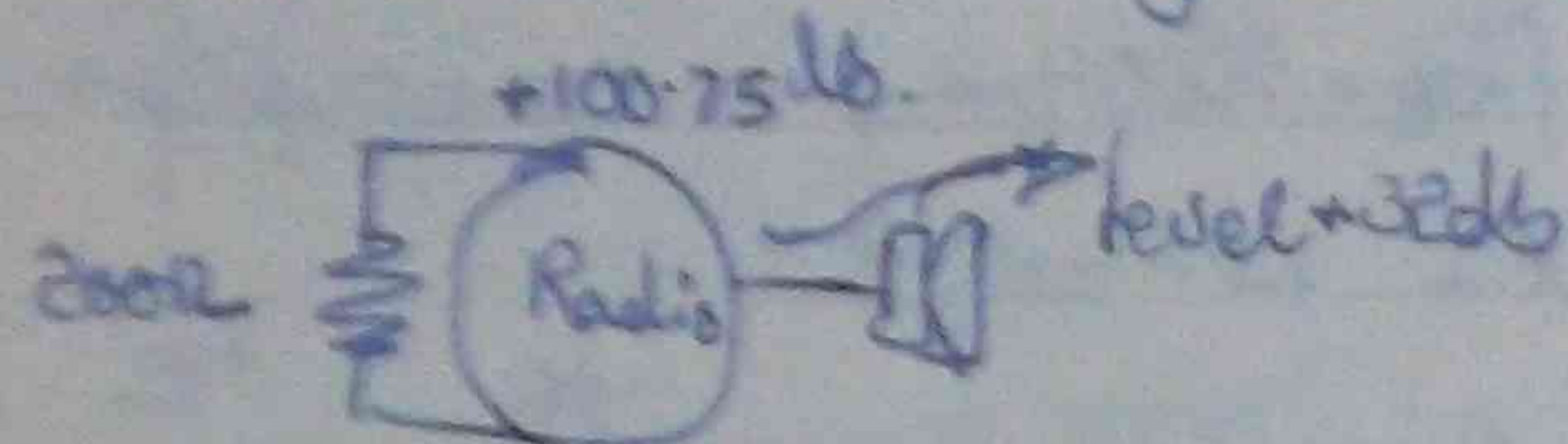
R_1 given

$$\Rightarrow R_K = \sqrt{R_1 R_2 + \frac{R_1^2}{2}}$$

81/38

Radio i/p $Z = 200\Omega$ \rightarrow gain = 100.75 db.
 SRK power level +32db.

Rx i/p induced signal V_z ?



i/p power level = 32 - 100.75 = -68.75 db.

$$\therefore -68.75 \text{ db} = 10 \log \frac{P_i}{6 \cdot 10^{-3}}$$

$$68.75 = 10 \log \frac{6}{P_i} \quad (P_i \text{ in mW})$$

$$\therefore P_i = \frac{6}{\text{ant. } 6.875}$$

$$= \frac{8^{0.0}}{2.5^{0.5}} \times 10^{-9} \text{ W}$$

$$= 8 \cdot 10^{-10} \text{ W}$$

$$P = \frac{E^2}{R}$$

$$\therefore V = \sqrt{P \cdot R} = \sqrt{8 \cdot 10^{-10} \cdot 200}$$

$$= 400 \mu\text{V} \quad \text{Ans.}$$

cal. Vol. 2 $\boxed{P. 62 \text{ pgs}}$ \rightarrow $\boxed{60:000:335}$

81/4

Voice Prog carrier telegraph system.

carrier freq = 1020 Hz \rightarrow channel

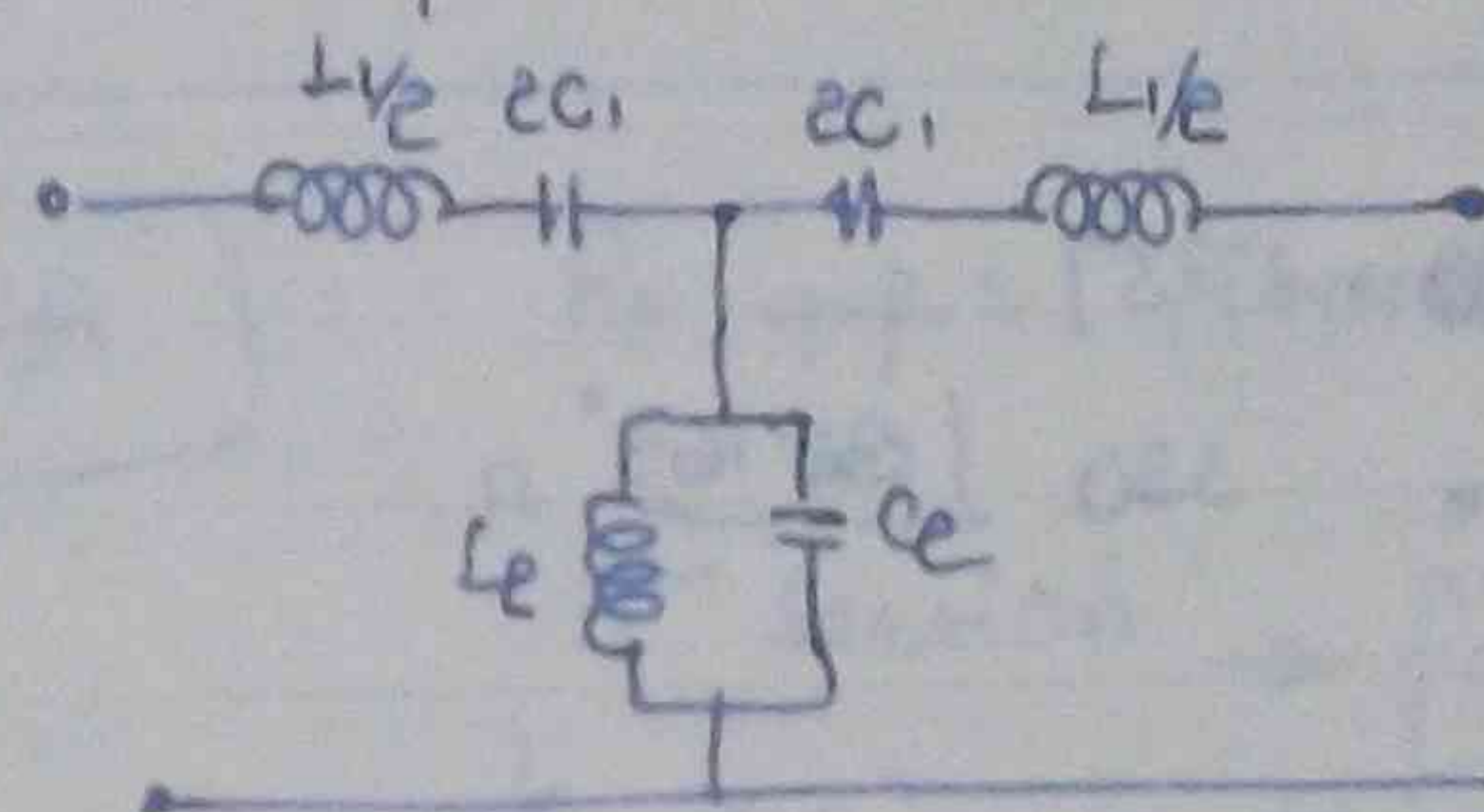
K - BPF design. bandwidth of channel = 80 Hz

line $R_k = 500\Omega$

$f_{\text{car.}} = 10, f_{\text{carrier}} = 40$

$$f_1 = 1020 - 40 = 980 \text{ Hz}$$

$$f_2 = 1020 + 40 = 1060 \text{ Hz}$$



$$L_1 = \frac{R_k}{\pi (f_2 - f_1)}$$

$$C_2 = \frac{1}{\pi (f_2 - f_1) R_k}$$

$$C_1 = \frac{(f_2 - f_1)}{4\pi f_1 f_2 R_k}$$

$$R_k = \frac{L_1}{C_2} = \frac{L_1}{C_1}$$

$$L_2 = \frac{(f_2 - f_1) R_k}{4\pi f_1 f_2}$$

79/38

Cable. $2 \text{ mH} \rightarrow$ loading coil / 1.36 miles. \rightarrow on 5000.

$R = 45\Omega/\text{ml}$, $L = 1.2 \text{ mH}/\text{ml}$, $C = 0.035 \mu\text{f}/\text{ml}$, $G = 5 \mu\text{S}/\text{ml}$.

50 miles no. of attenuation \rightarrow db. z ?

coil $P_f = 0.006$, $f = 3000 \text{ Hz}$ \rightarrow $\frac{3 \cdot 10^8}{3 \cdot 10^3} = 100 \text{ km} = 60.9 \text{ miles}$.

Unloaded cable Voice freq. (300 - 3000 Hz)

$\omega L \gg \omega$, $\omega L \ll R$.

$$\therefore \alpha = \sqrt{\frac{R \omega C}{2}} = \sqrt{\frac{45 \cdot 3 \cdot 10^3 \cdot 0.035 \cdot 10^{-6}}{2}} = 0.01661 \text{ Nepers/mile}$$

0.02325

$$\alpha = \sqrt{0.0002755} = 0.01661 \text{ Nepers/mile}$$

$$= 0.01661 \cdot 8686.50 = 1.44 \text{ db/mile}$$

$$Z = R + j\omega L$$

$$\text{loading } 1/\text{mile} = \frac{22\text{mH}}{1.36} = 16.17\text{mH}$$

$$R = 45\Omega, L = 1.2 + 16.17 = 17.37\text{mH}$$

$$C = 0.065\mu\text{F}, G = 5\mu\text{S}$$

$$Z = R + j\omega L$$

$$= 45 + j2\pi \times 3000 \times 17.37$$

$$= 45 + j 327.3 = 330 \angle 82.165^\circ \Omega$$

$$Y = G + j\omega C = 10^{-6}(5 + j2\pi \times 3000 \times 0.065)$$

$$= 10^{-6}(5 + j1224) = 1224 \times 10^{-6} \angle 90^\circ \text{ S}$$

$$Y = \sqrt{ZY} = \sqrt{330 \angle 82.165^\circ \times 1224 \times 10^{-6} \angle 90^\circ}$$

$$= \sqrt{0.4043 \angle 172.165^\circ} = 0.636 \angle 86.08^\circ$$

$$\therefore \alpha = 0.636 \cos 86.08^\circ = 0.035 \sin 3.92^\circ = 0.0035 \text{ Nepers/mile}$$

$$= 0.0035 \times 50 = 0.175 = 18.91 \text{ db} \leftarrow \text{Ans.}$$

loaded loss frequency \rightarrow (sharp cut off frequency) \rightarrow 0.300033.

$$\alpha = \frac{R}{Z_0} + \frac{G}{Y_0} = 22.5 \sqrt{\frac{0.065 \times 10^{-6}}{17.37}} + 2.5 \times 10^{-6} \sqrt{\frac{17.37 \times 10^{-3}}{0.065}}$$

$$= 22.5 \times 1.935 \times 10^{-3} + 2.5 \times 10^{-6} \times 0.517$$

$$= (43.55 + 1.293) \times 10^{-3} = 0.044843 = 19.47 \text{ db (Ans.)}$$

79/5

$R_k = 600\Omega$ line

$f_c = 1000 \text{ Hz} \rightarrow$ composite LPF design

$f_{o1} = ?$ ($m = 0.305$) \rightarrow m-derived T section

$f_{o2} = ?$ ($m = 0.6$) \rightarrow k_e section

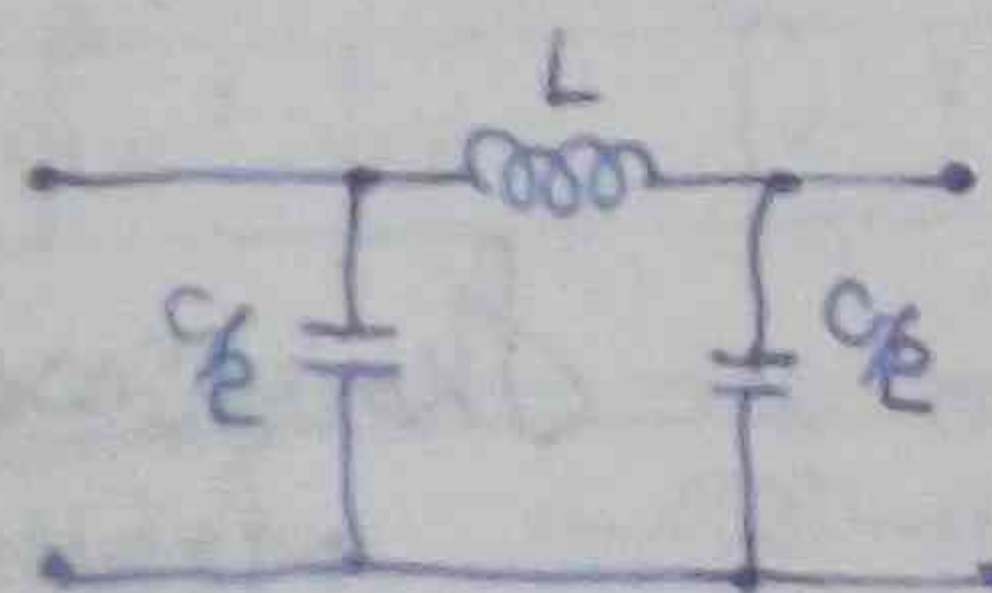
$$m = \sqrt{1 - \left(\frac{f_c}{f_o}\right)^2}$$

82/5B \rightarrow m-derived T section

79/6A

$R_k \rightarrow$ p.s. filter (LPF) 20H series arm
 $20\mu\text{F}$ shunt arm

π section $\rightarrow f_c = ?$



$$f_c = \frac{1}{\pi \sqrt{LC}}$$

GUILDPLAY.

AYE MEE NOT PLAY.

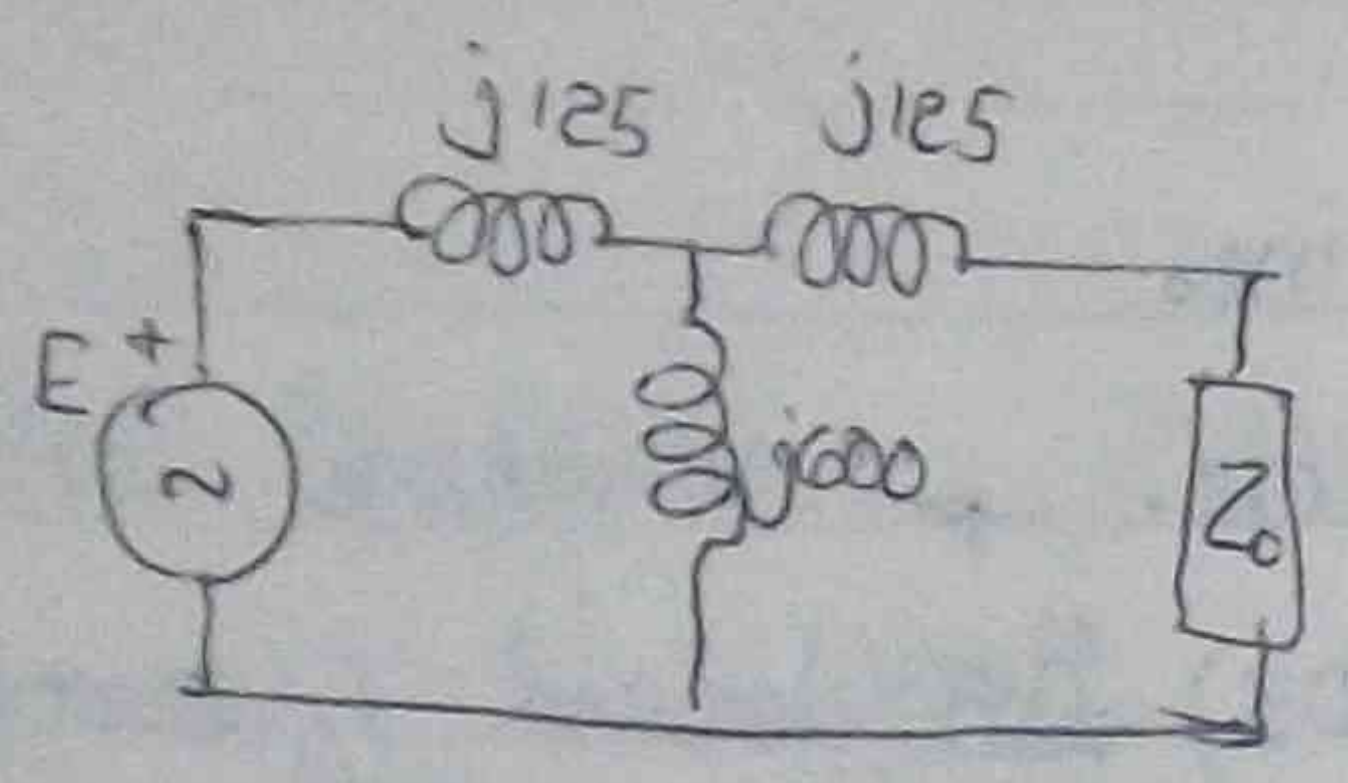
79/6B

$R_k = 600\Omega$ line \rightarrow composite filter

$f_c = 1000 \text{ Hz}$ sharp cut off $\rightarrow f_o = 0.9 f_c$ design.

{ Vol. IV P. 302 direct problem } \rightarrow 0.300033

78/3A



$Z_{1/2} = j125$ $Z_2 = j600$

$$Z_0 = \sqrt{Z_1 Z_2 + \frac{Z_1^2}{4}}$$

$$= \sqrt{j125 \cdot j600 + \frac{(j125)^2}{4}}$$

$$= \sqrt{-150000 - 15625}$$

$$= j\sqrt{165625}$$

$$= j406.5 \Omega$$

635
25
15025

$\frac{E_s}{E_R} = \frac{E_1}{E_2} = e^{\gamma} \cdot \frac{Z_2}{Z_1}$
 တွက်ရန်
 ပုံစံမှာ

$\frac{Z_1}{Z_2} = e^{\gamma} = e^{\alpha + j\beta} = 1 + \frac{Z_1}{Z_2} + \frac{Z_0}{Z_2}$

$$= 1 + \frac{j125}{j600} + \frac{j406.5}{j600}$$

$$= 1 + 0.2083 + 0.678$$

$$= 1.8863 \angle 0^\circ = 1.8863 + j0$$

$\alpha = 0.6345 \text{ Np}$, $\beta = 0^\circ$, $r_2 = 0.6345 \angle 0^\circ$

$\frac{E_1}{E_2} = e^{\gamma} = e^{\alpha + j\beta} = \frac{Z_0 + Z_1}{Z_0 - Z_1} = \frac{j406.5 + j125}{j406.5 - j125}$

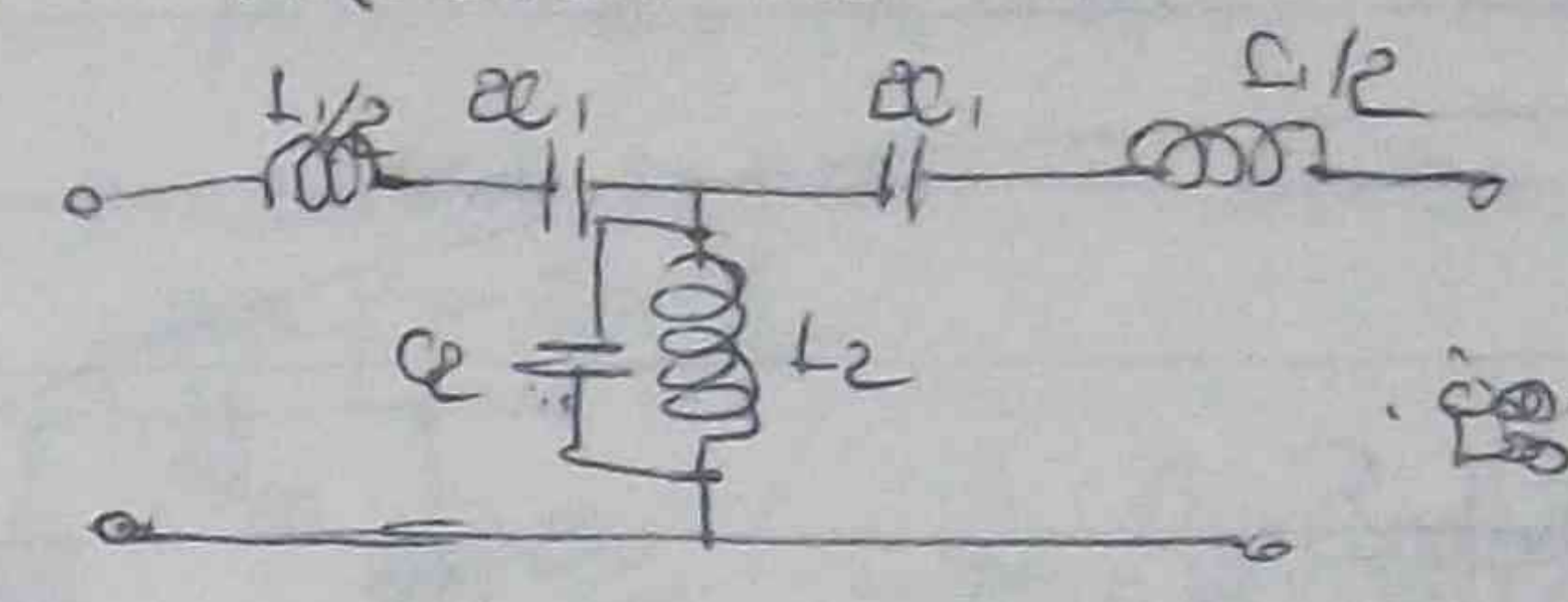
$$= \frac{531.5}{281.5} = 1.888 \angle 0^\circ$$

↓
 ပုံစံမှာ

Vol. 1 P. 7208
 DIRECT PROBLEM

78/4A

$R_k = 600 \Omega$ line T-section Filter.

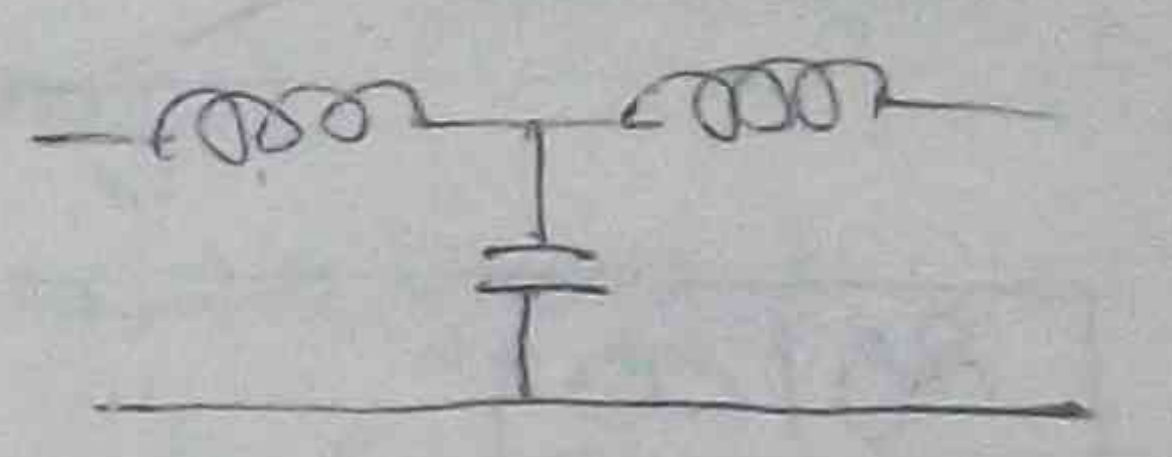


$L_{1/2} = 0.35 \text{ H}$
 $C_{1/2} = 0.5 \mu\text{F}$

$R_k = \frac{L_1}{C} = \frac{L_2}{C_1}$ → elements = ? Filter Type = ? & dec = ?
 CHUDPLAY

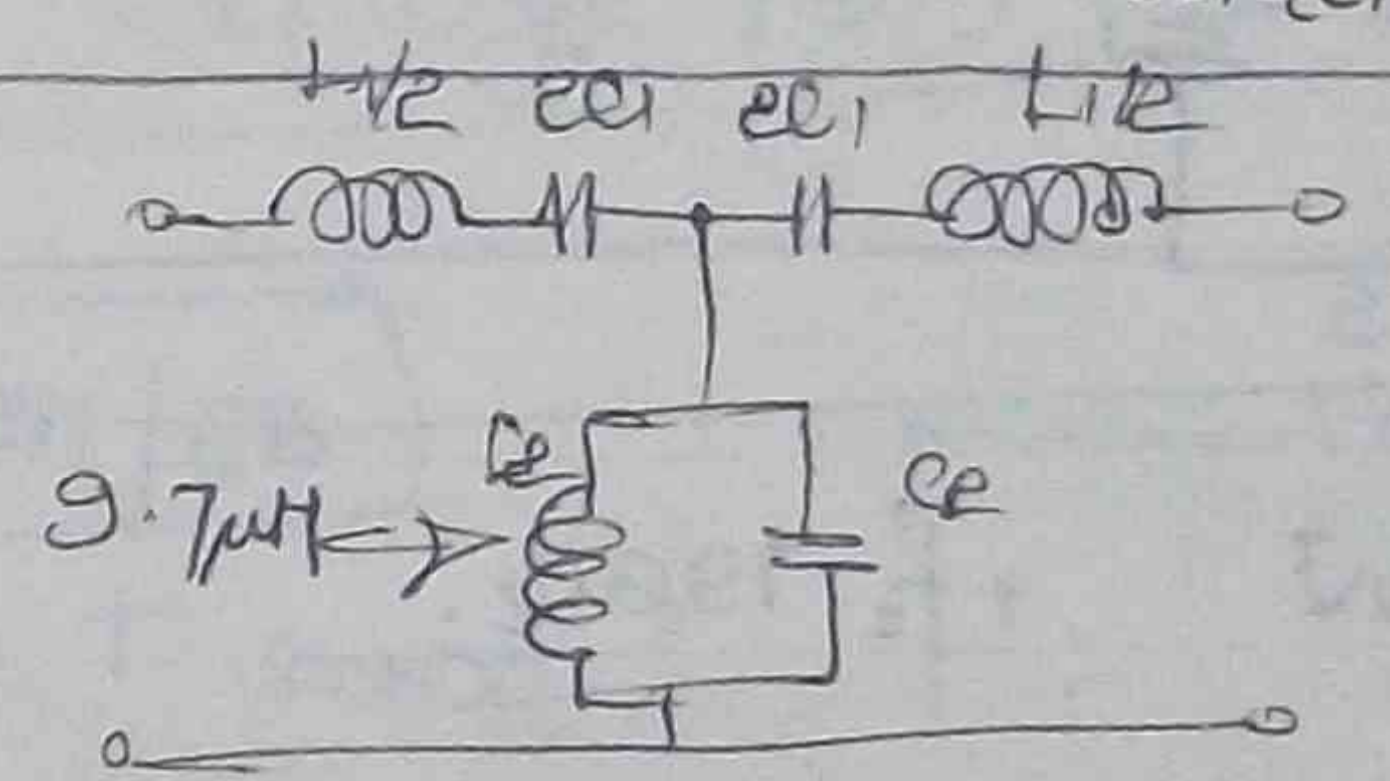
4B

$f_1 = \frac{1}{\pi \sqrt{L_1 C_1}}$, $f_2 = \frac{1}{4\pi \sqrt{L_2 C_2}}$
 $f_r = \sqrt{f_1 f_2}$



$f_1 = ?$, $f_2 = ?$, $f_r = ?$ $f_c = \frac{1}{\pi \sqrt{L_1 C_1}}$

78/5A



$f_1 = 120 \text{ kHz}$, $f_2 = 123 \text{ kHz}$
 k - BPF.

design.
 $L_2 = \frac{R_k (f_2 - f_1)}{4\pi f_1 f_2}$

သုံးခု L_1, C_1, C_2 တွေ

5B

$f = 500 \text{ kHz}$ cable line. $R = 37 \Omega$ $L = 0.5 \text{ mH}$
 $C = 2800 \mu\text{F}$, $C = 0.202 \mu\text{F}$ / nautical miles.

Loaded Voice Freq & Unloaded H.F.

$\alpha = R \sqrt{C/L} + G \sqrt{L/C}$, $\beta = \omega \sqrt{LC}$

Unloaded wire freq

only for cable lines.

$\alpha = \beta = \sqrt{\frac{R G}{L C}}$

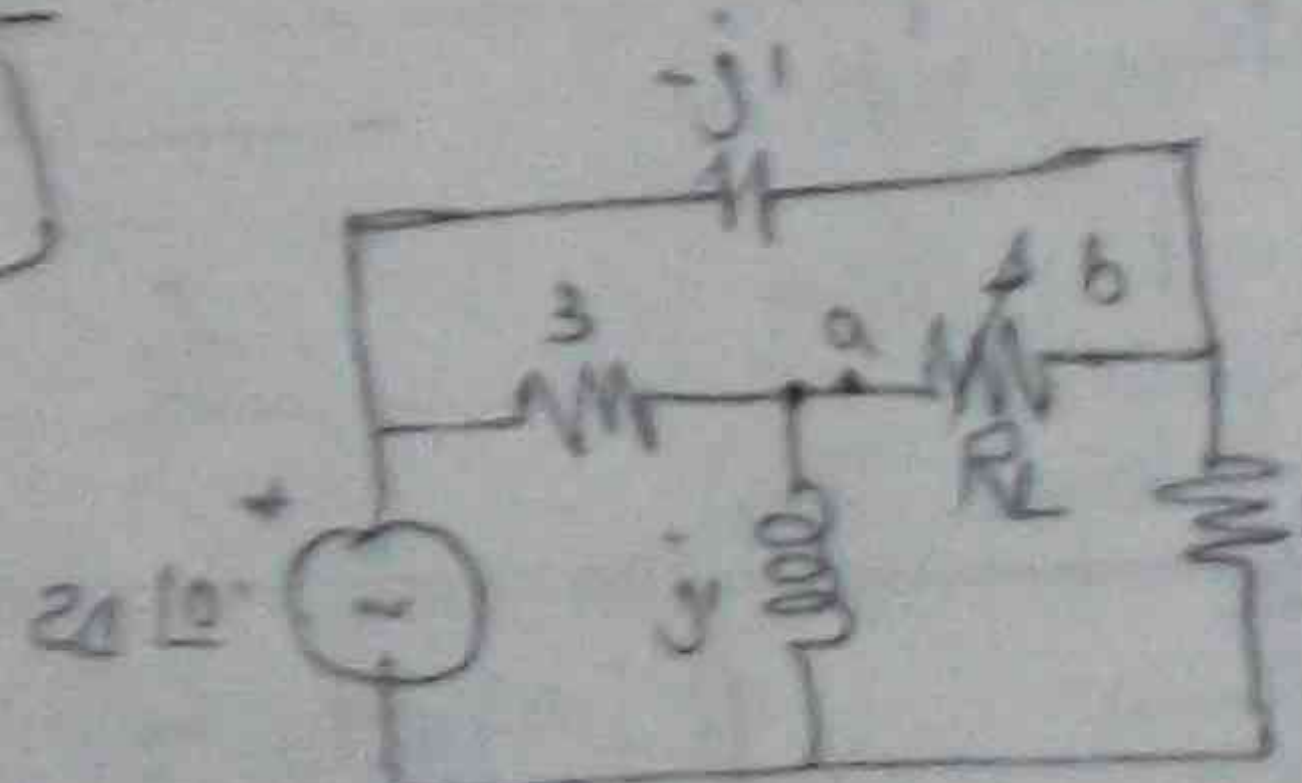
voice?

မေးခွန်းများကို ဖြေဆိုပါ။

အောက်ပါ ပစ္စည်းများကို အသုံးပြုပါ။

အောက်ပါ ပစ္စည်းများကို အသုံးပြုပါ။

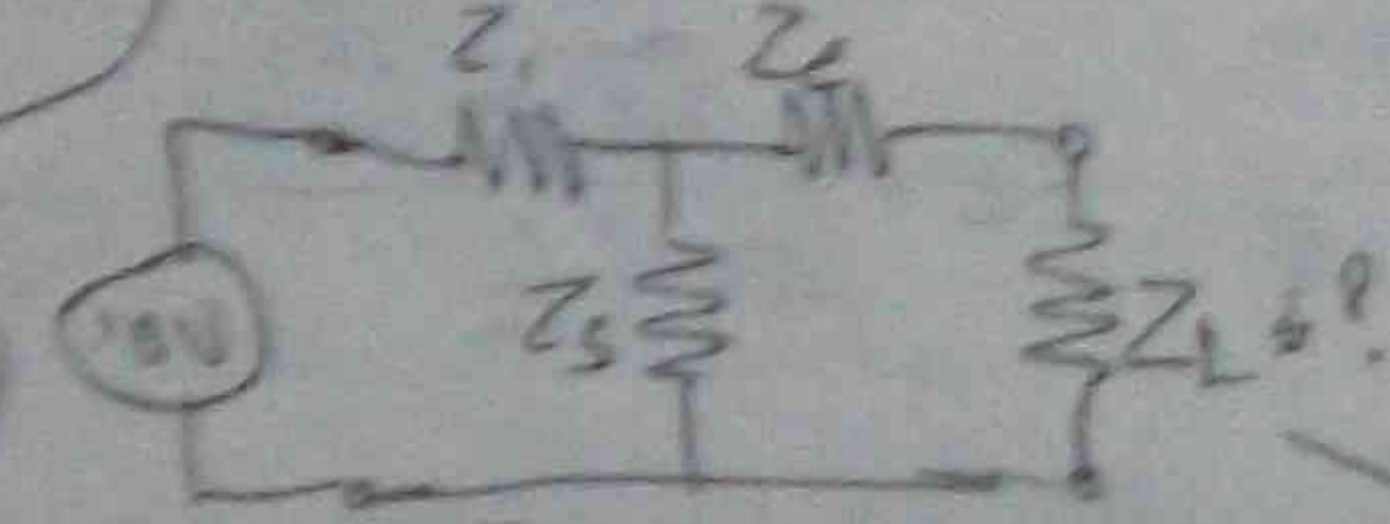
80/28



R_L မှာ max. power ရရှိရန် $R_L = ?$
max. Power = ?

80/3

4 terminals N/W, $f_c = 796 \text{ Hz}$.



$Z_{1oc}, Z_{2oc}, Z_{3oc}$ များကို
 Z_1, Z_2, Z_3 နှင့်

အောက်ပါ Thevenin ဖြစ်ပေါ်စေရန် - max. Power ရရှိရန်

80/4A

$Z_{1e} = 1000 \Omega, Z_e = j1000 \Omega$

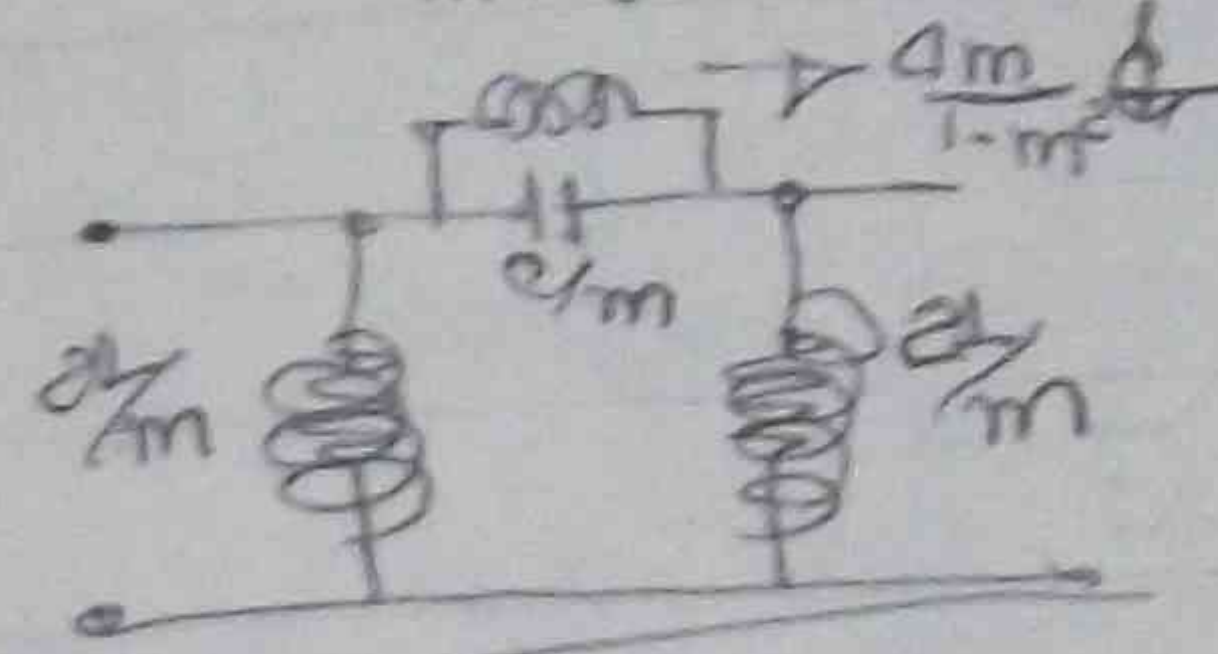
$Z_{2e} = ?$

အောက်ပါ ဖြစ်ပေါ်စေရန်

80/4B

$f_c = 10 \text{ kHz}, R_k = 600 \Omega, m = 0.35, f_{\omega} = ?$

m-derived H.P.F. π section.



အောက်ပါ ဖြစ်ပေါ်စေရန်

80/5B

Composite L.P.F. $R_k = 600 \Omega$

$f_c = 1000 \text{ Hz}, f_{\omega} = 1050 \text{ Hz}$ (m.g.)

$f_{\omega c} = 1250 \text{ Hz}$ (m=0.6) ဖြစ်ရန်

design it! 2 m-ရပ် 25% above f_c ဖြစ်ရန်

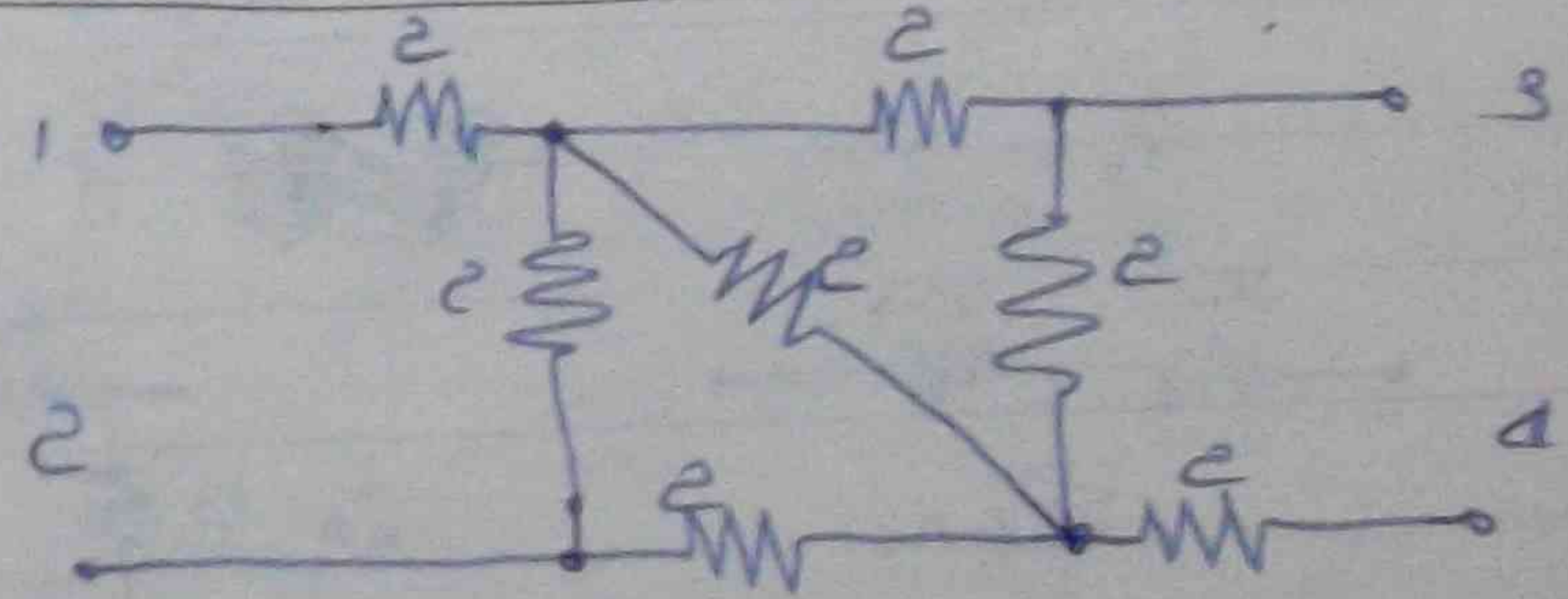
80/5B ဖြ. 79/5

အောက်ပါ ဖြစ်ပေါ်စေရန်

83/PROBLEM/2B

Eq. T section = ?

Eq. π section = ?



$$Z'_{1oc} = \frac{4 \times 2}{4+2} + 2 = \frac{8}{3} + 2 = \frac{14}{3} \Omega$$

$$Z_{1oc} = 2 + \frac{\frac{14}{3} \times 2}{\frac{14}{3} + 2} = 2 + \frac{\frac{28}{3}}{\frac{20}{3}} = 2 + \frac{14}{10} = \frac{13}{5} \Omega$$

$$Z'_{isc} = \frac{3 \times 2}{3+2} + 2 = \frac{6}{5} + 2 = \frac{16}{5} \Omega$$

$$Z_{isc} = \frac{\frac{16}{5} \times 2}{\frac{16}{5} + 2} + 2 = \frac{\frac{32}{5}}{\frac{26}{5}} + 2 = \frac{32}{13} + 2 = \frac{42}{13} \Omega$$

$$Z_3 = \sqrt{Z_{oc}(Z_{oc} - Z_{sc})}$$

$$Z_{oc} = 2 + \frac{4 \times 2}{4+2} = \frac{10}{3} \Omega$$

$$\therefore Z_{sc} = 2 + \frac{\frac{10}{3} \times 2}{\frac{10}{3} + 2} = 2 + \frac{20}{16} = \frac{13}{4} \Omega$$

$$Z_3 = \sqrt{Z_{oc}(Z_{oc} - Z_{sc})}$$

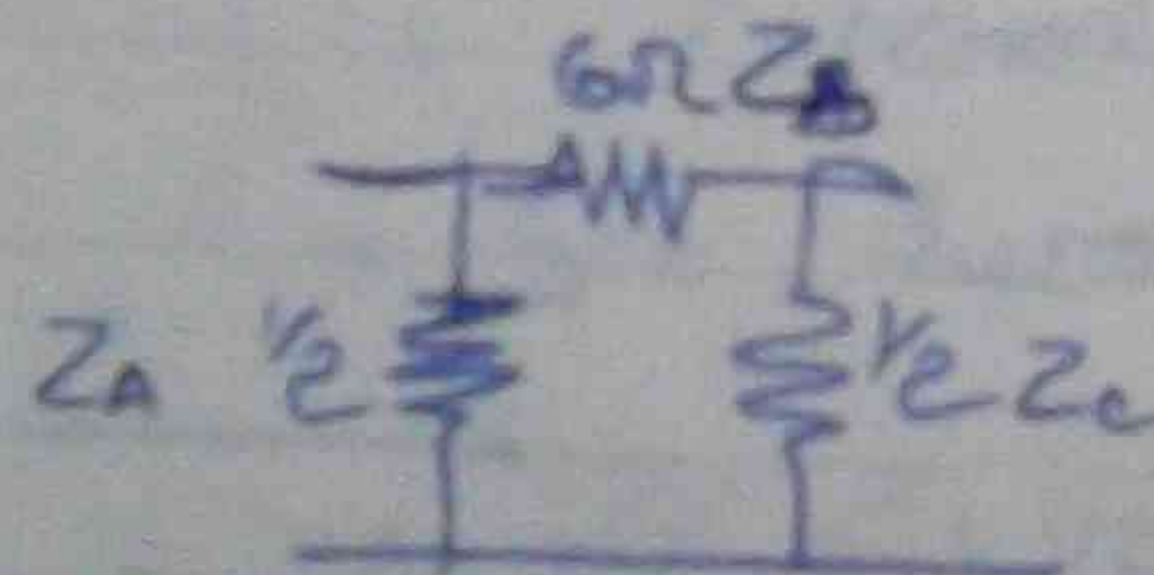
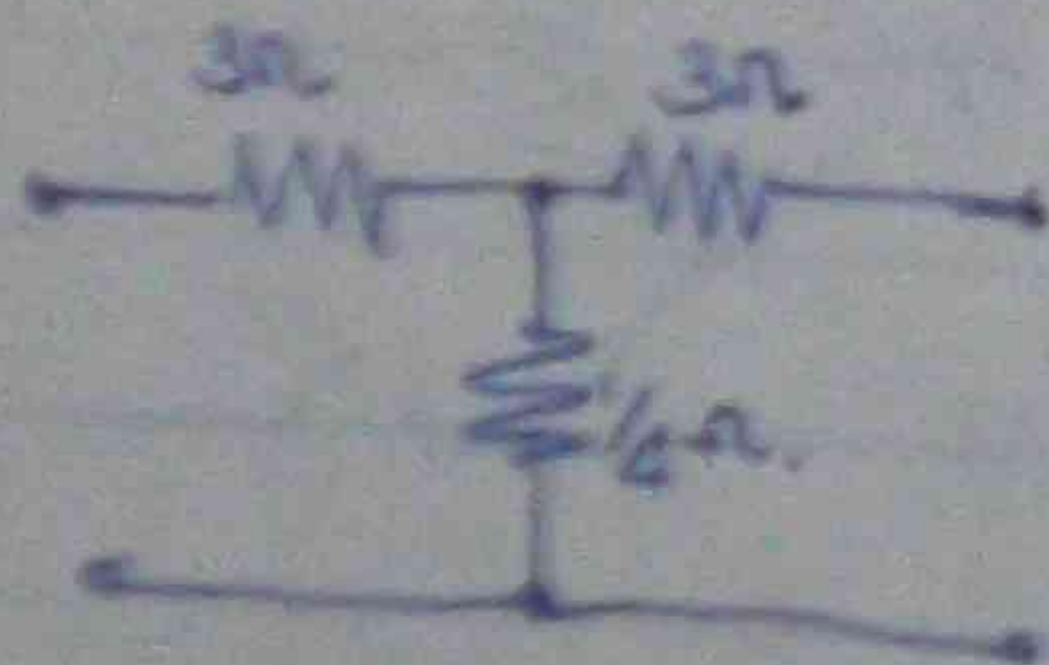
$$= \sqrt{\frac{13}{4} \left(\frac{13}{4} - \frac{10}{3} \right)}$$

$$= \sqrt{\frac{13}{4} \times \frac{109-168}{52}}$$

$$= \frac{1}{4} \Omega$$

$$Z_1 = Z_{oc} - Z_3 = \frac{13}{4} - \frac{1}{4} = 3 \Omega$$

$$Z_2 = Z_{oc} - Z_3 = \frac{13}{4} - \frac{1}{4} = 3 \Omega$$



$$Z_A = Z_1 + Z_3 = \frac{2Z_3}{Z_2}$$

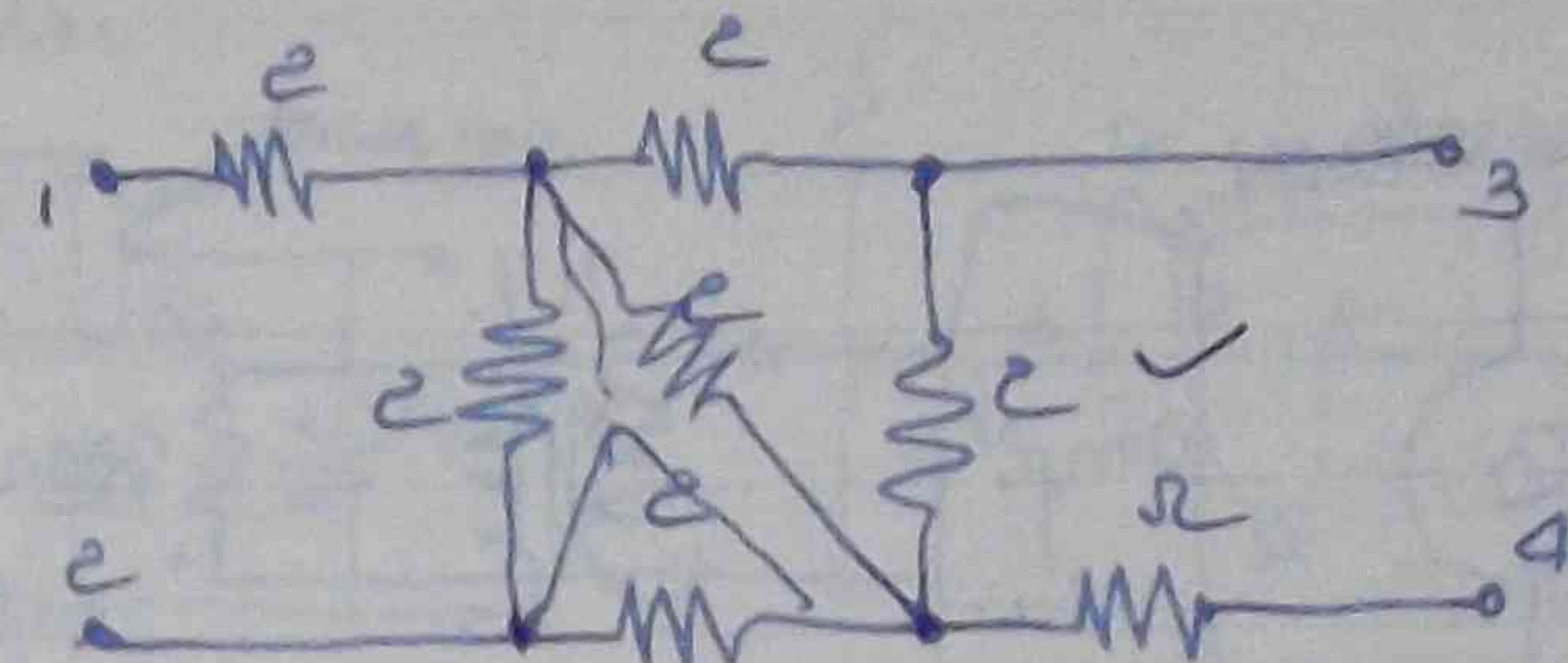
$$= 3 + \frac{1}{4} = 3\frac{1}{4} \Omega$$

$$Z_B = Z_1 + Z_2 = \frac{2Z_2}{Z_1}$$

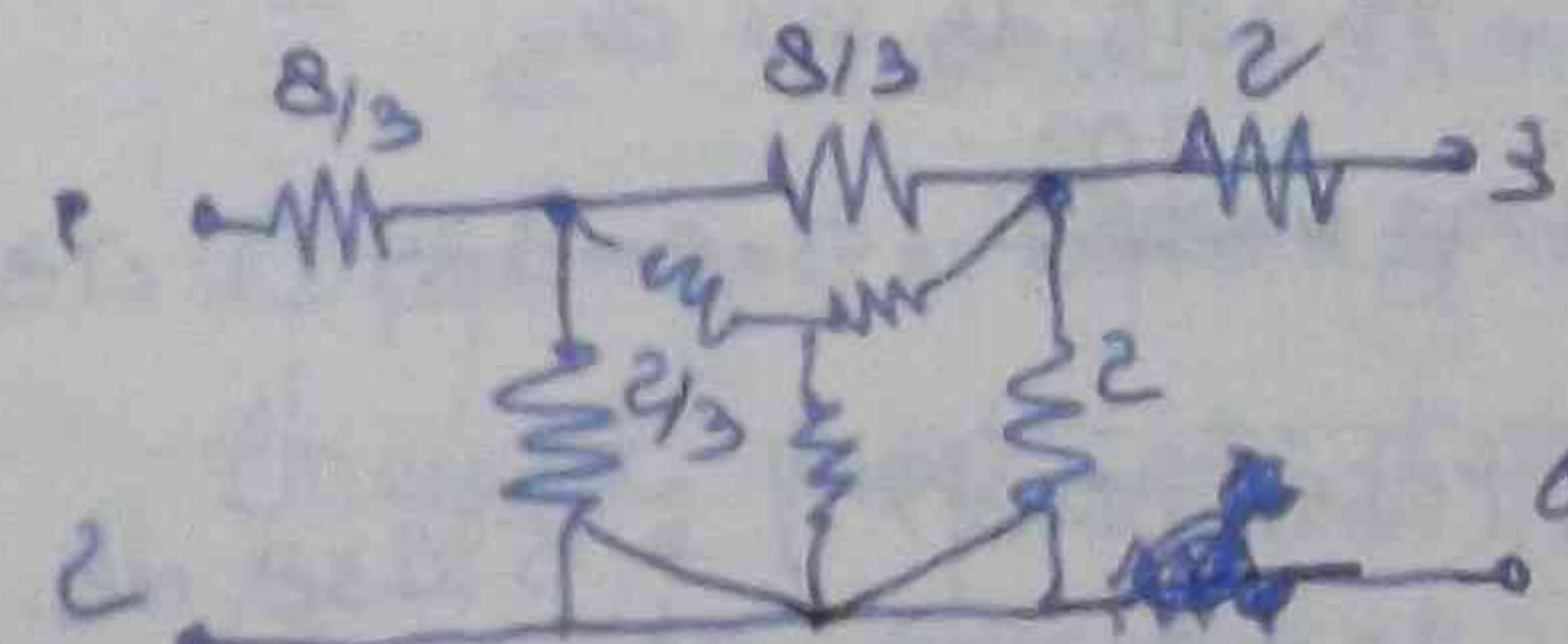
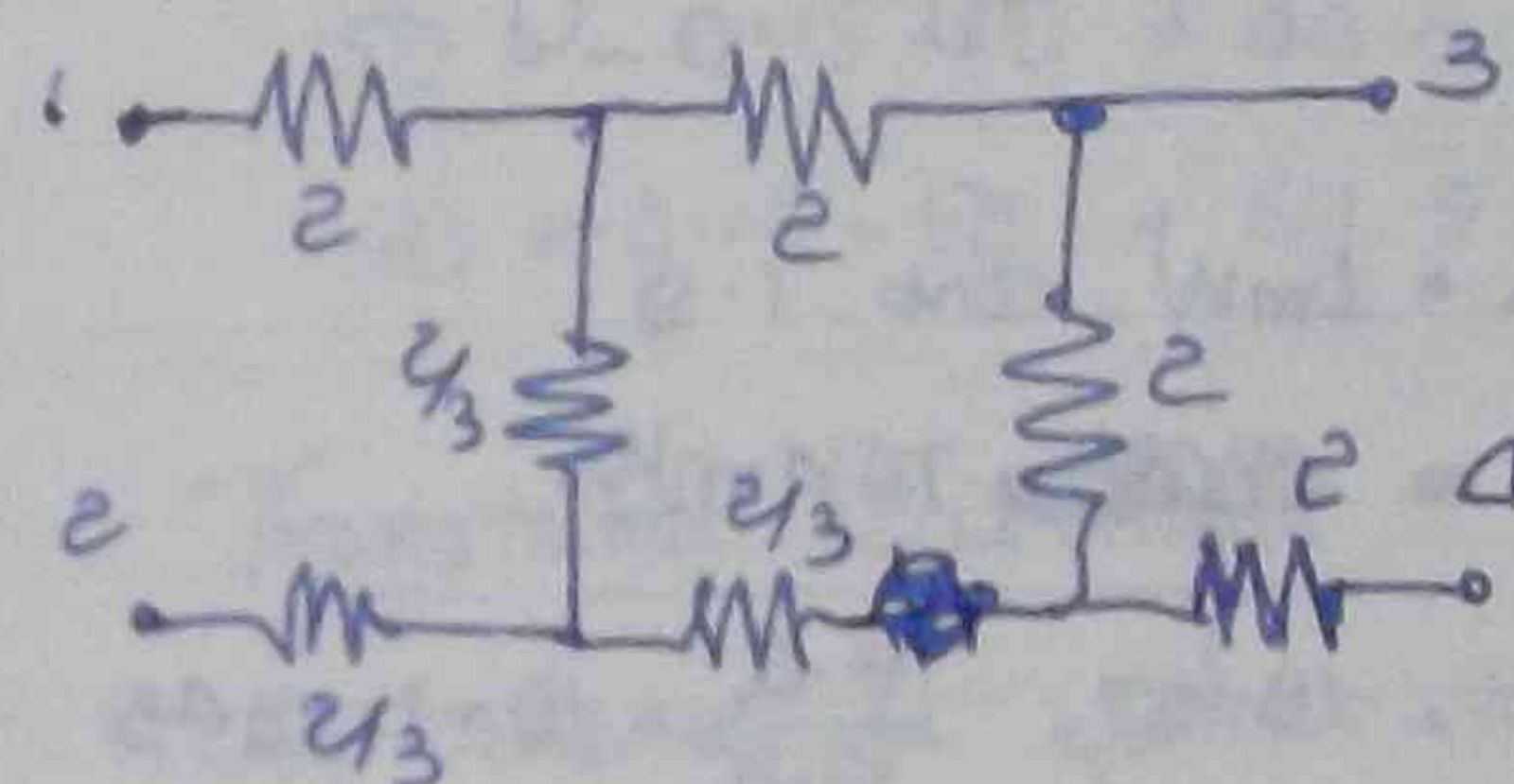
$$= 3 + 3 = 3 \times 3 = 9 \Omega$$

$$Z_C = Z_2 + Z_3 + \frac{Z_2 Z_3}{Z_1}$$

$$= 3 + \frac{1}{4} + 3 \times \frac{1}{4} = \frac{13}{4} \Omega$$



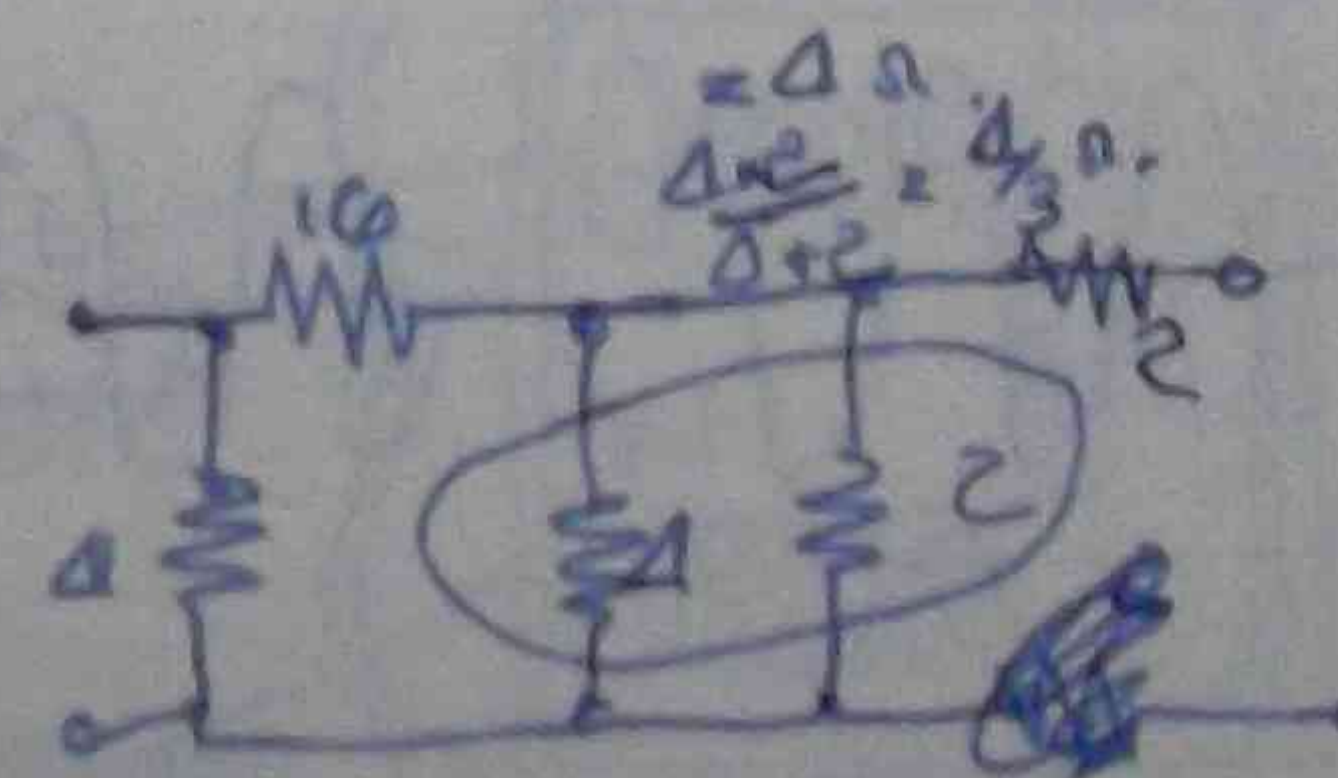
$$Z_1 = Z_2 = Z_3 = \frac{2 \times 2}{2+2+2} = \frac{2}{3} \Omega$$



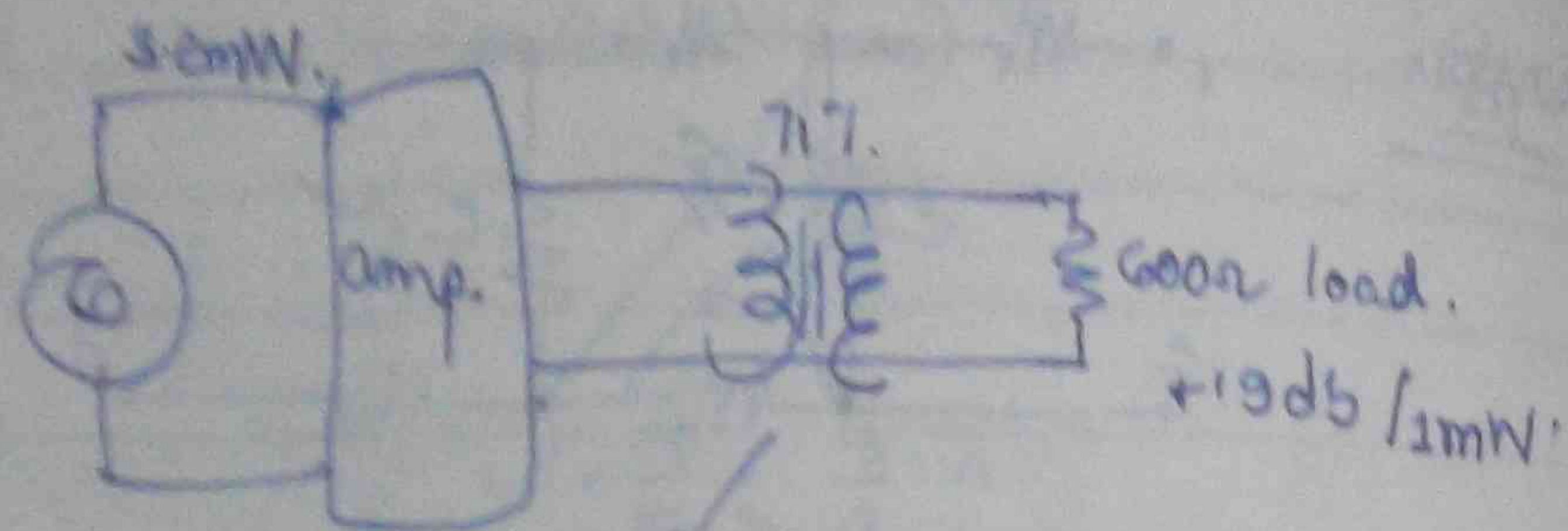
$$Z_A = \frac{8}{3} + \frac{8}{3} + \frac{8}{3} \times \frac{8}{3} = \frac{16}{3} + \frac{32}{3} = \frac{48}{3} = 16 \Omega$$

$$Z_B = \frac{8}{3} + \frac{8}{3} + \frac{8}{3} \times \frac{8}{3} = \frac{16}{3} + \frac{32}{3} = \frac{48}{3} = 16 \Omega$$

$$Z_C = \frac{8}{3} + \frac{8}{3} + \frac{8}{3} \times \frac{8}{3} = \frac{16}{3} + \frac{32}{3} = \frac{48}{3} = 16 \Omega$$



max. amp
GA



db gain = ?

transf. db gain = ?

$$10 \log \frac{P_{out}}{P_{in}} = 19 \text{ db} \rightarrow P_{in} = 1 \text{ mW, and } 1.9$$

$$= 79.4 \text{ mW}$$

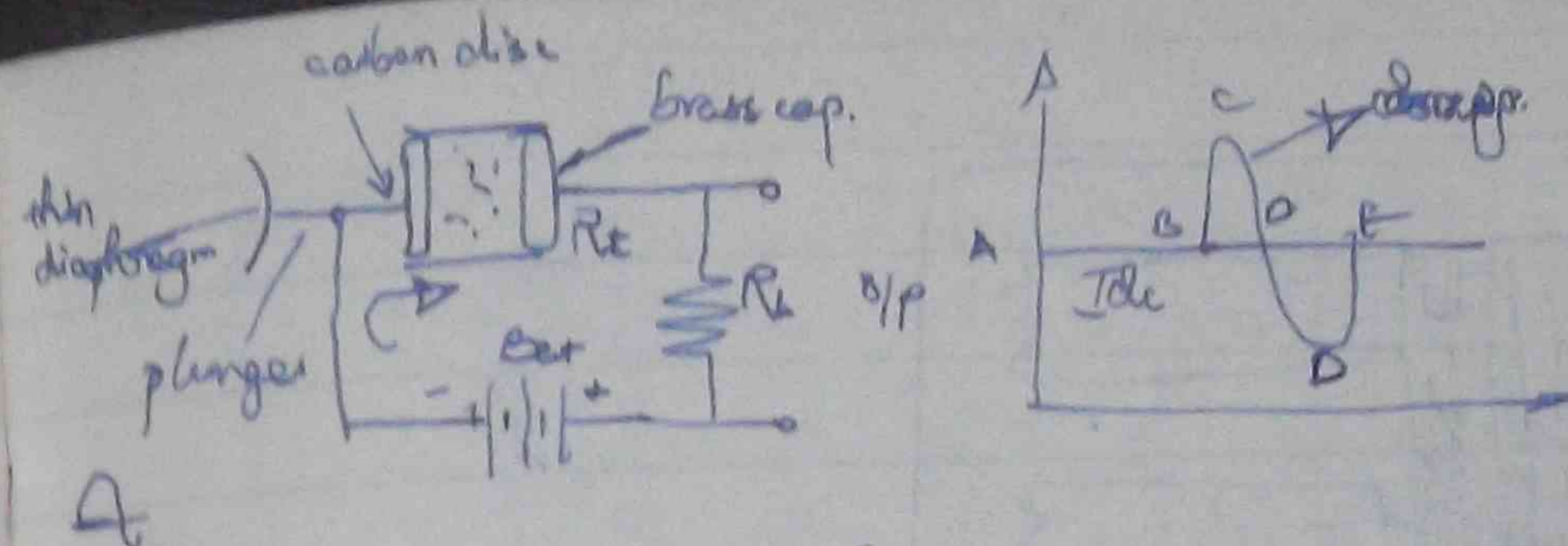
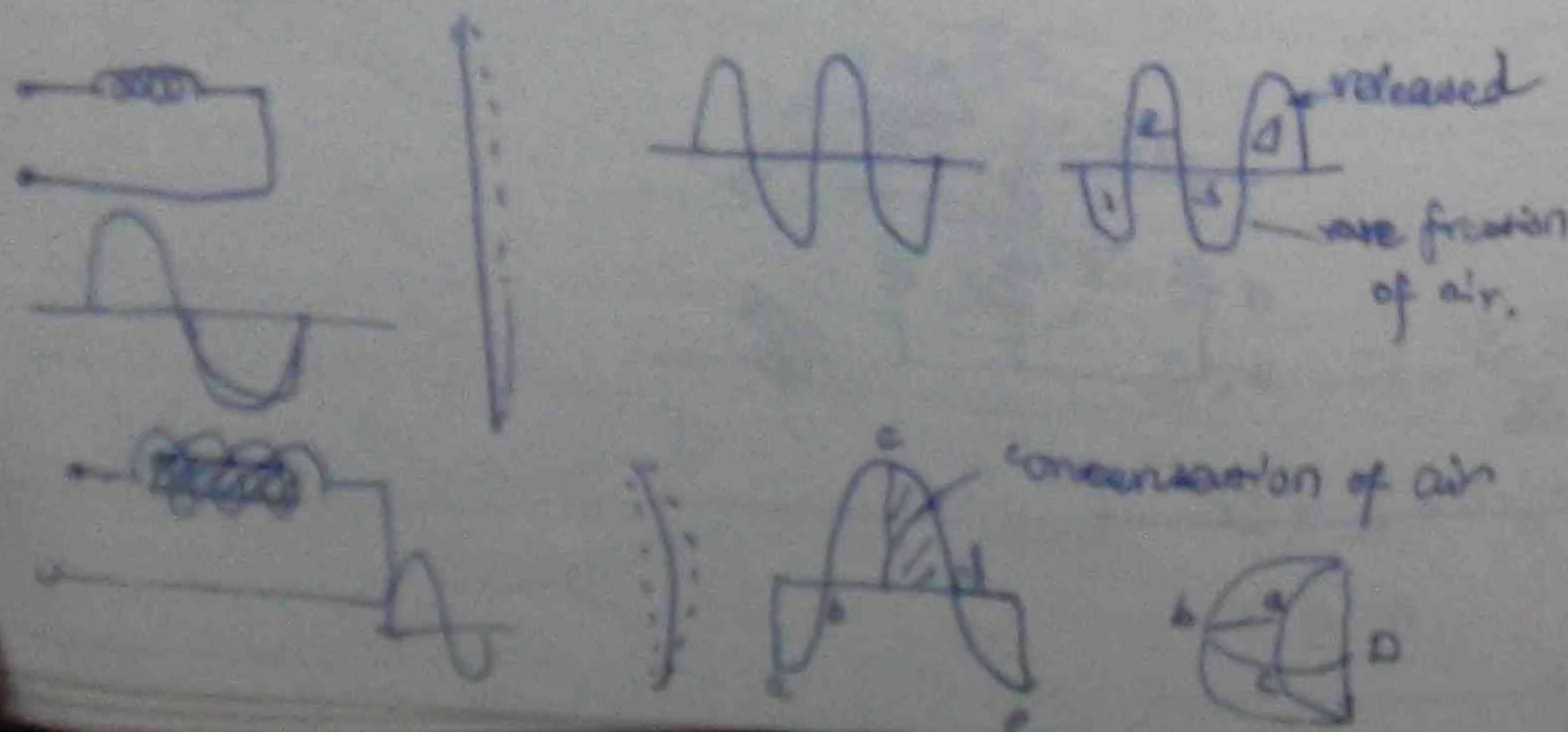
$$\therefore \text{db gain} = 10 \log \frac{79.4}{3.2} = 10 \cdot 1.3945 = 13.945 \text{ db}$$

$$\text{db gain} = 10 \log \frac{1}{0.71} = 10 \log 1.409 = 10 \cdot 0.1487 = 1.487 \text{ db}$$

$$\therefore \text{db gain (with transf)} = 15.432 \text{ db}$$

$$P_{in} = \frac{79.4}{0.71} = 111.8 \text{ mW}$$

$$\therefore \text{db} = 10 \log \frac{111.8}{3.2} = 10 \cdot 1.5433 = 15.433 \text{ db}$$



$$6V, 50 \Omega + 50 \Omega = 60 \text{ mV}$$

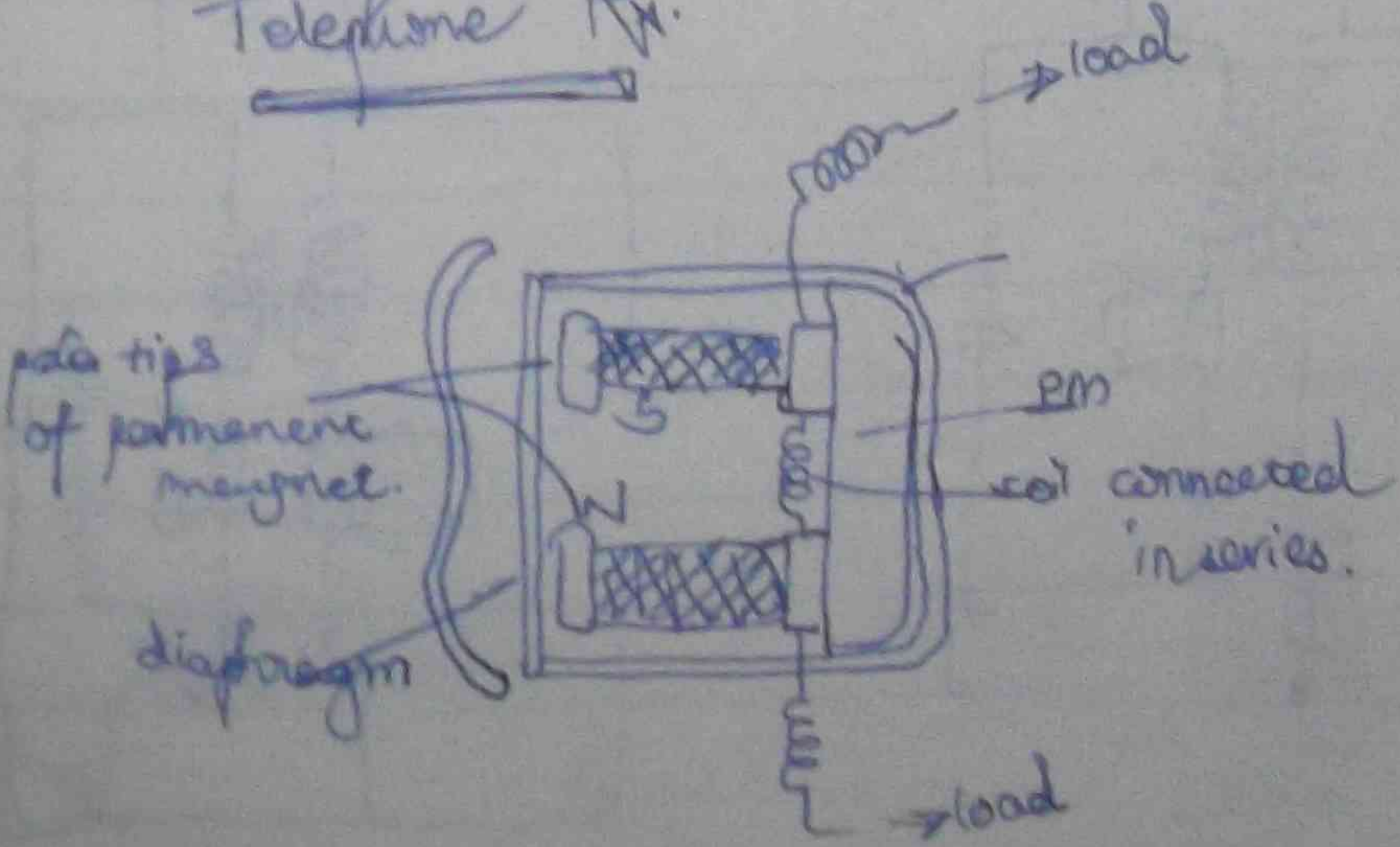
$$50 \cdot -0.15 \cdot 50 = 42.5 \rightarrow 61.8 \text{ mA} \rightarrow 4.8 \text{ mA}$$

$$50 + 0.15 \cdot 50 = 57.5 \rightarrow 55.8 \text{ mA} \rightarrow 4.2 \text{ mA}$$

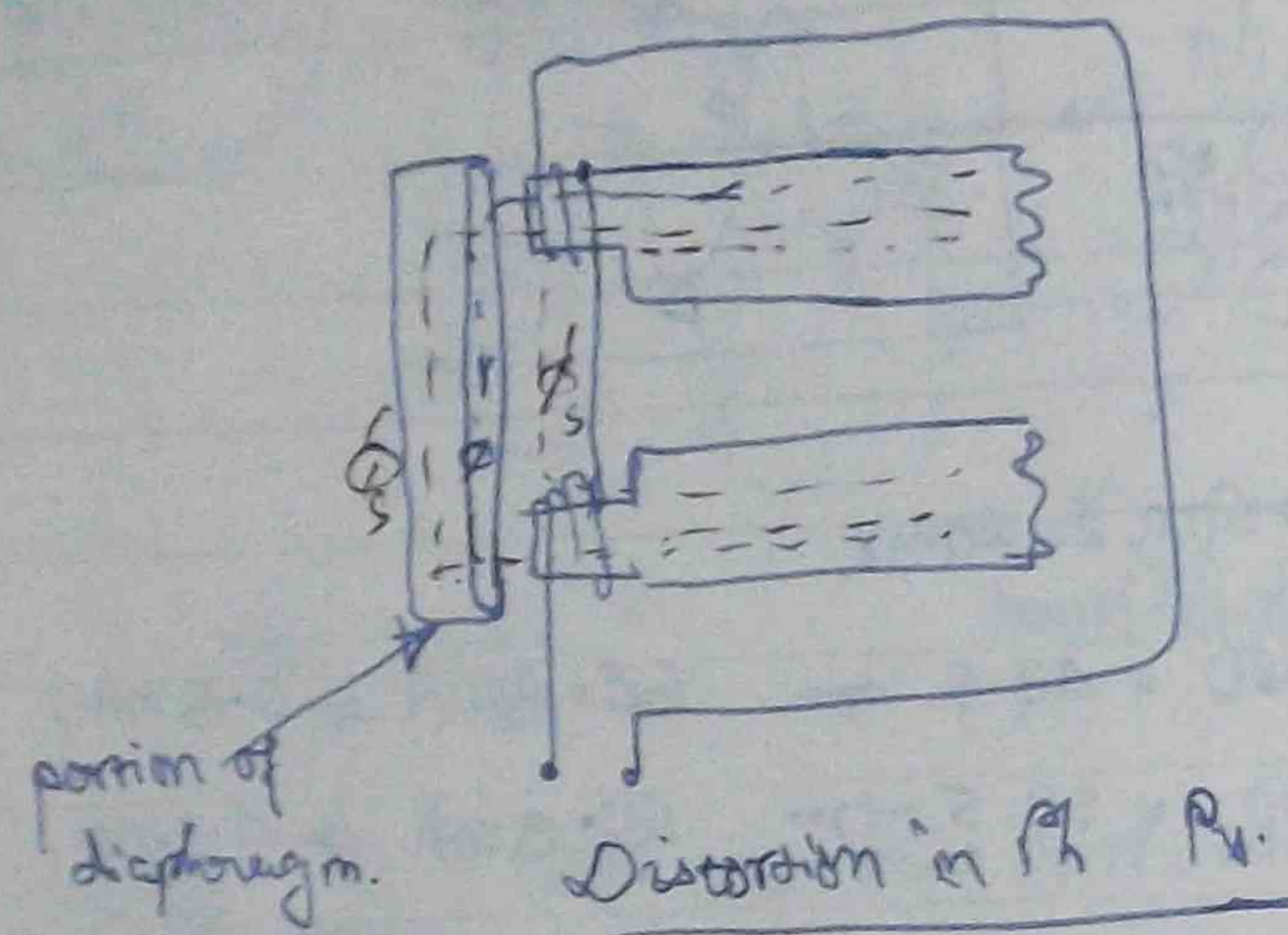
Transmitter Distortions

1. Magnitude of Tx current variation (or) Harmonic Distortion.
2. Diaphragm frequency response distortion.
3. Unusual travel of diaphragm distortion.
4. Unavoidable amount of carbon granules distortion.

Telephone Rx.



Cross Sectional View of Phone Rx.

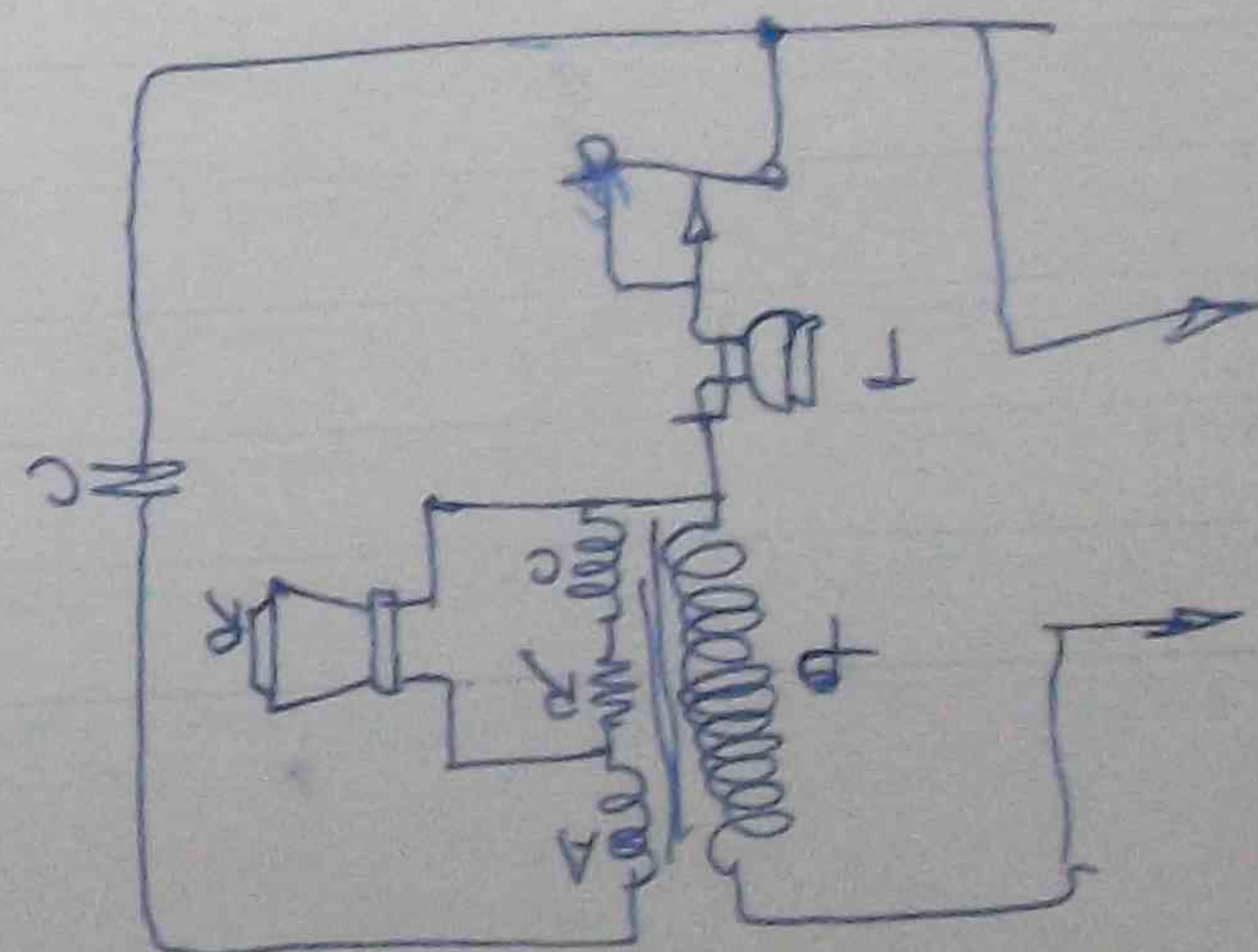
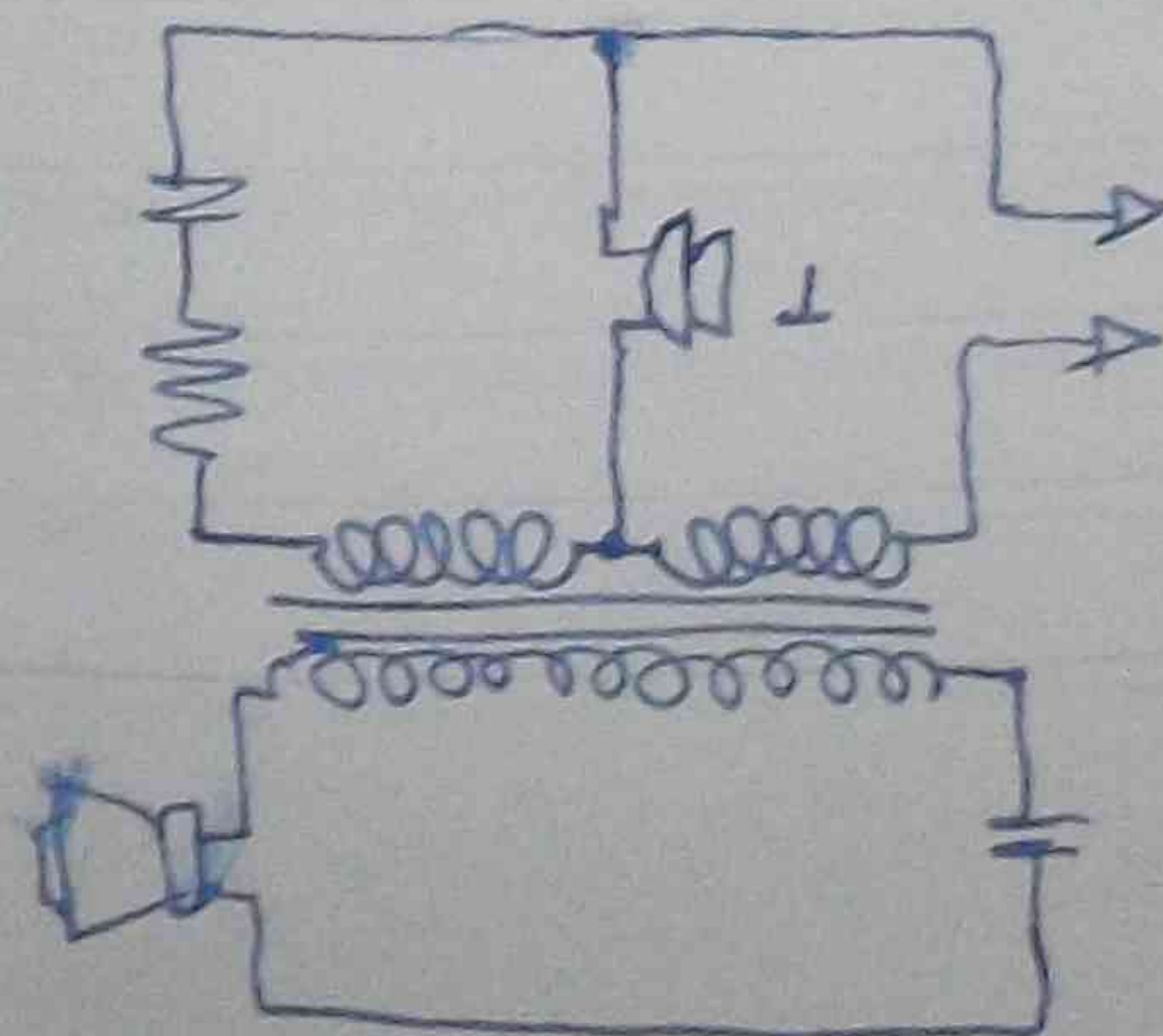
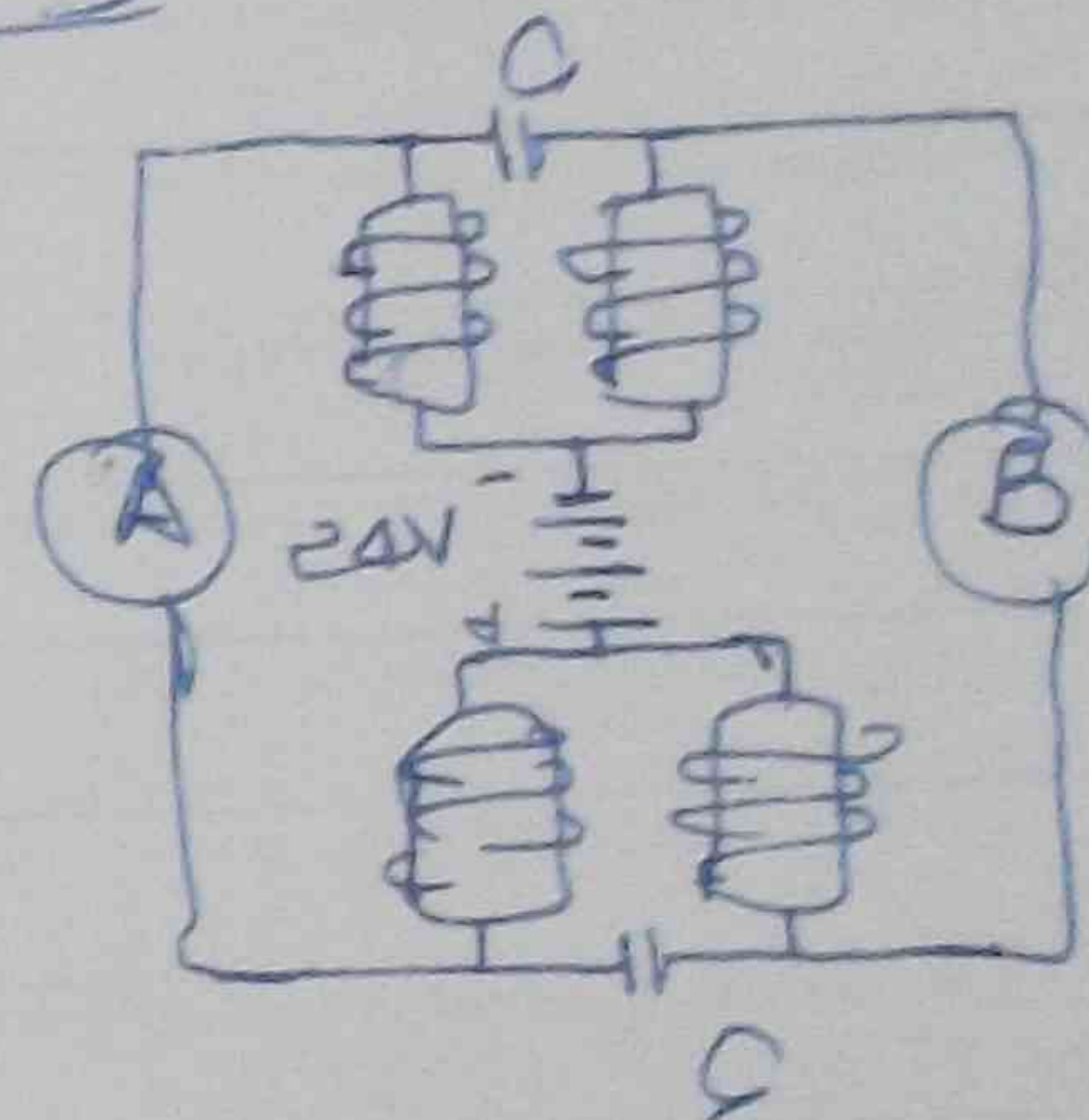
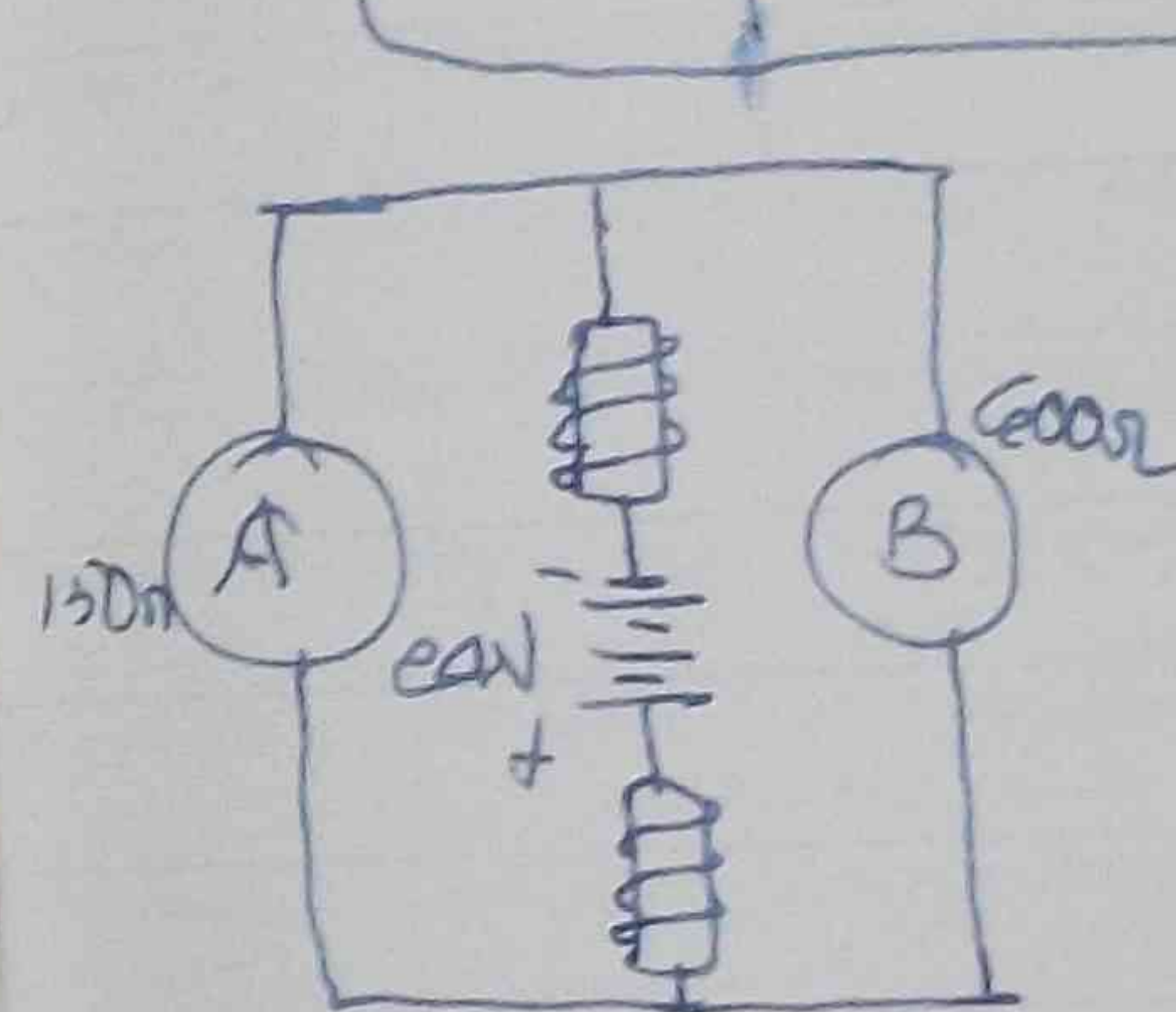
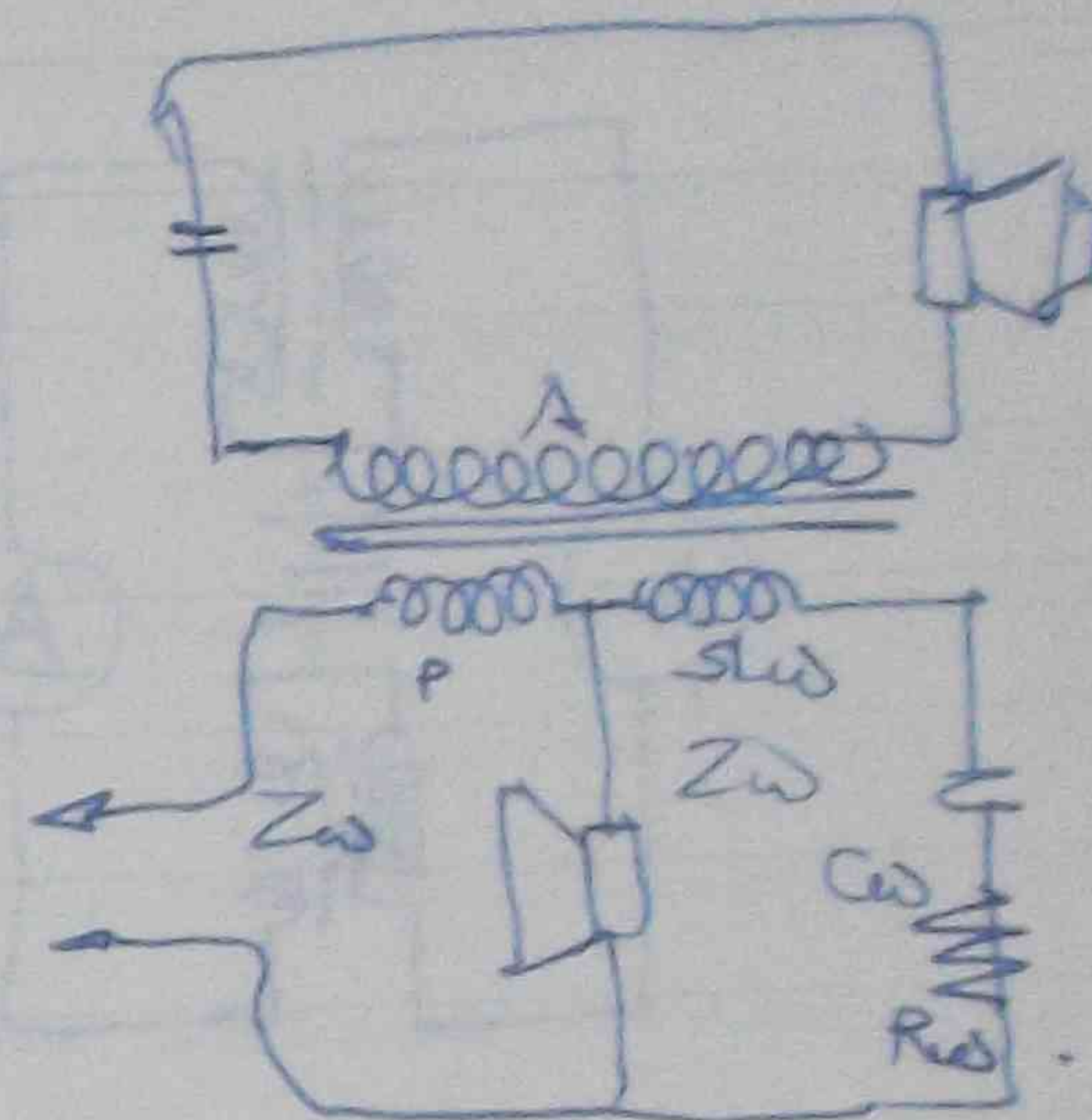
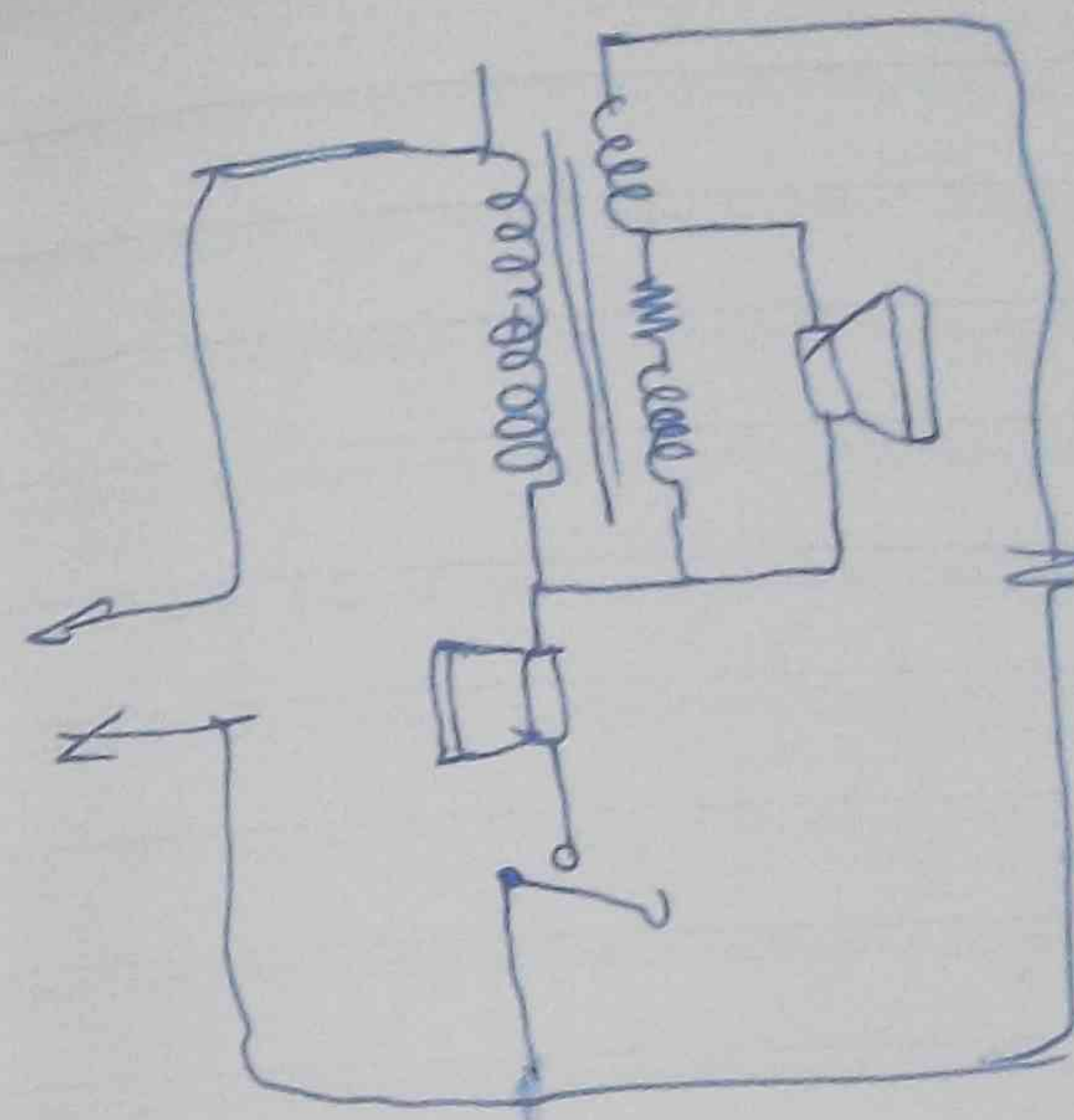
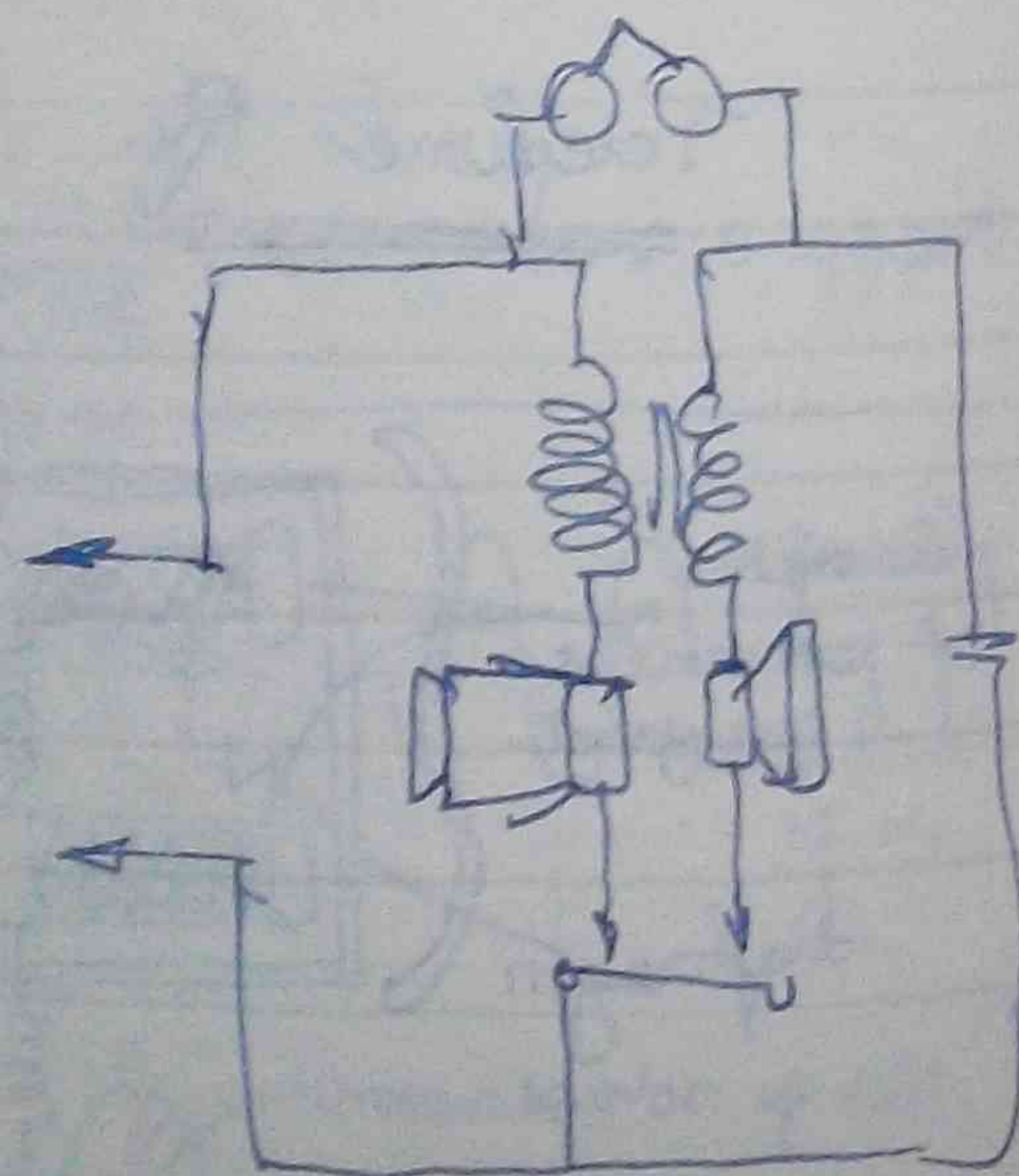
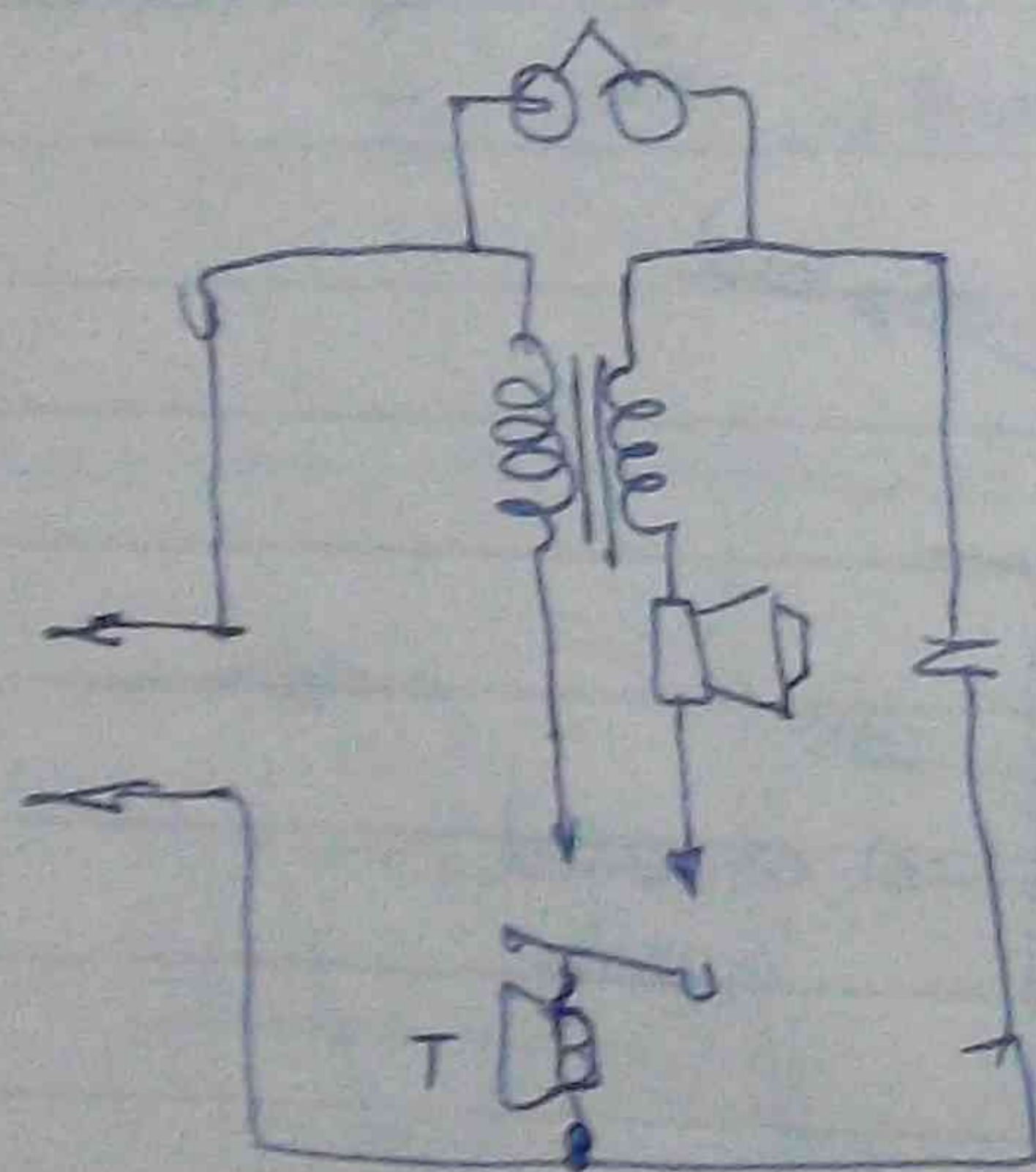


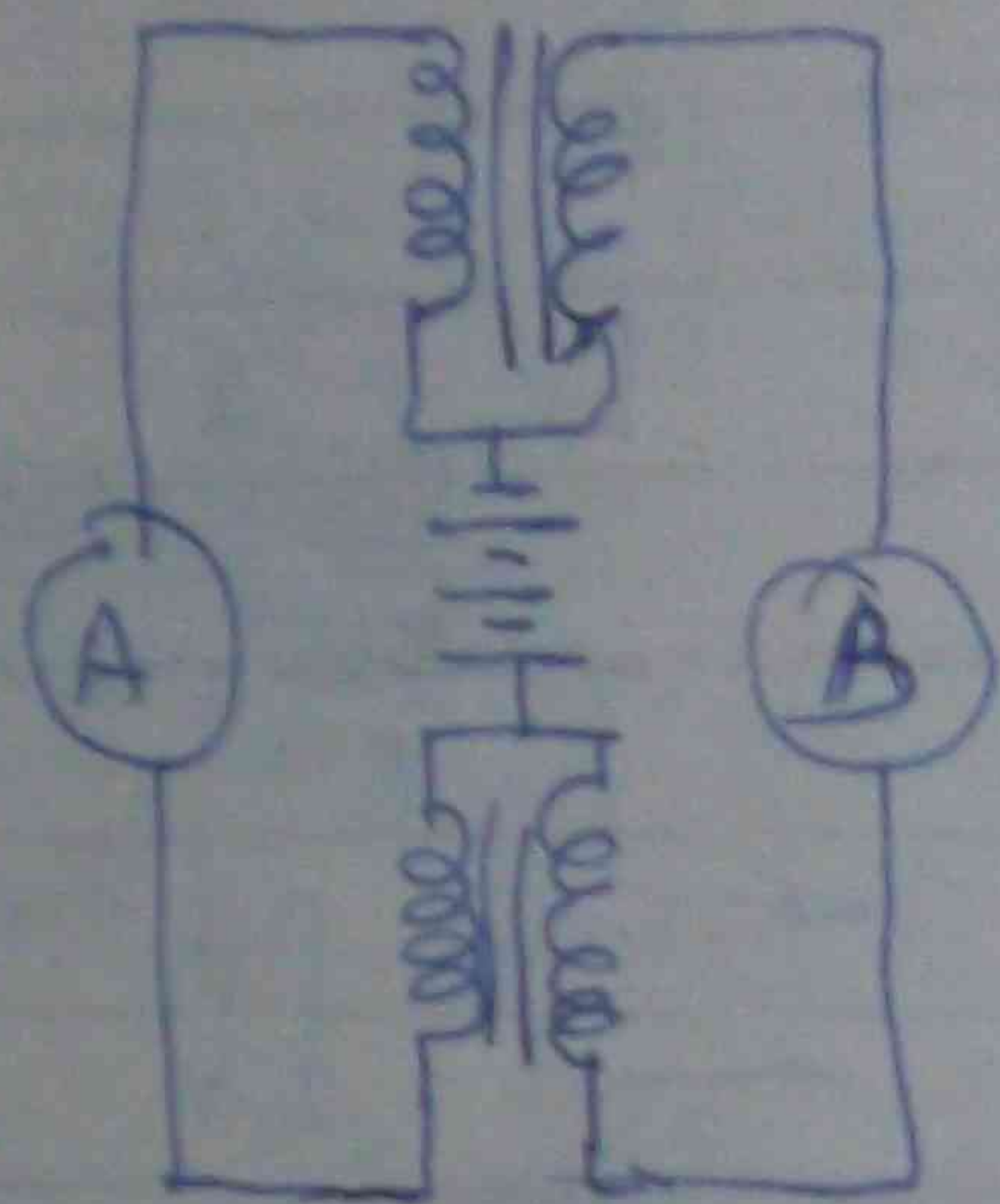
Non-linear distortion

frequency dis:

$E \propto M$ obs dis.

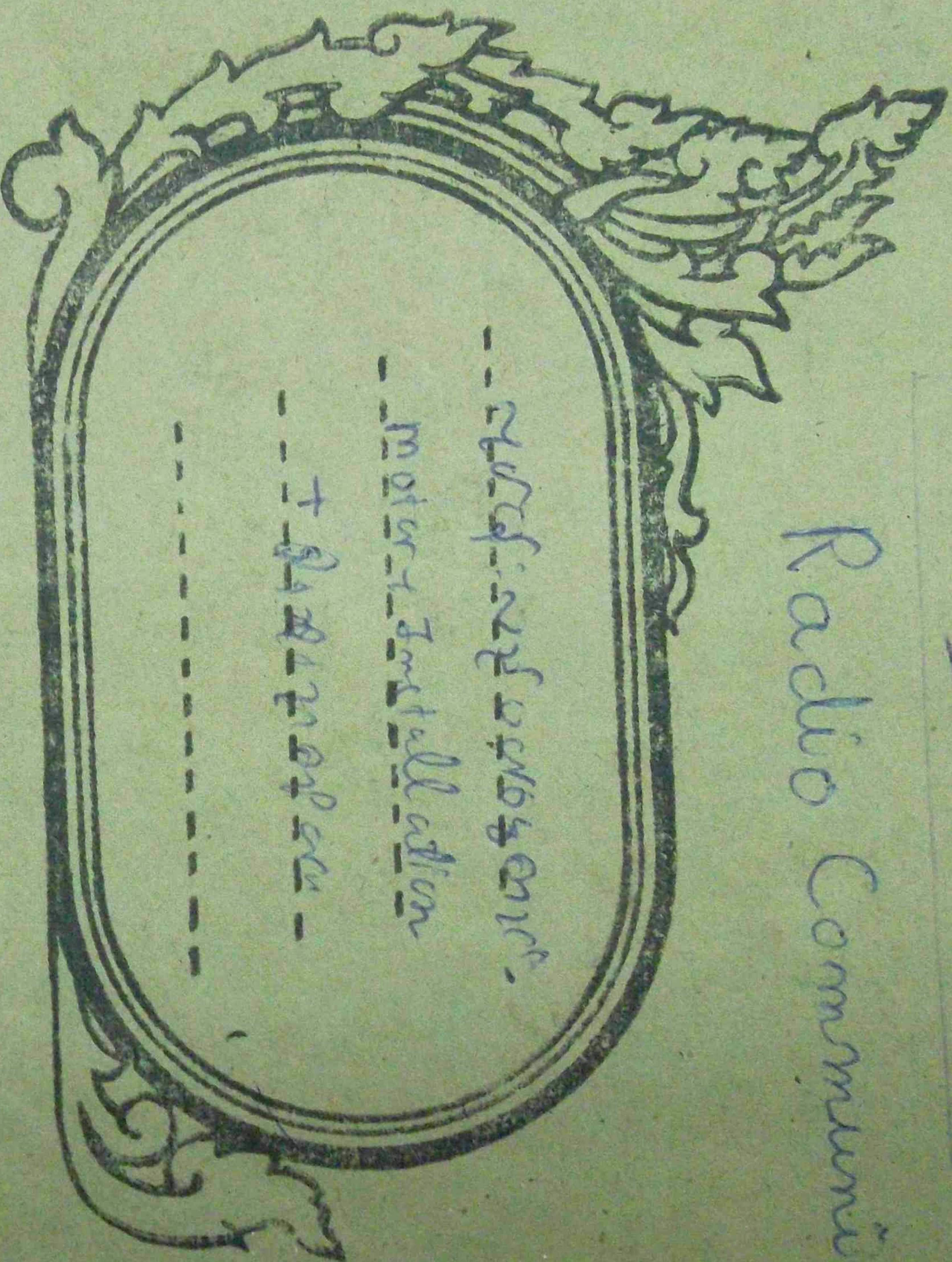
Diaphragm mechanical characteristics





KN 152

Radio Communication



On 1st August

G.T.I Final (E.C) course

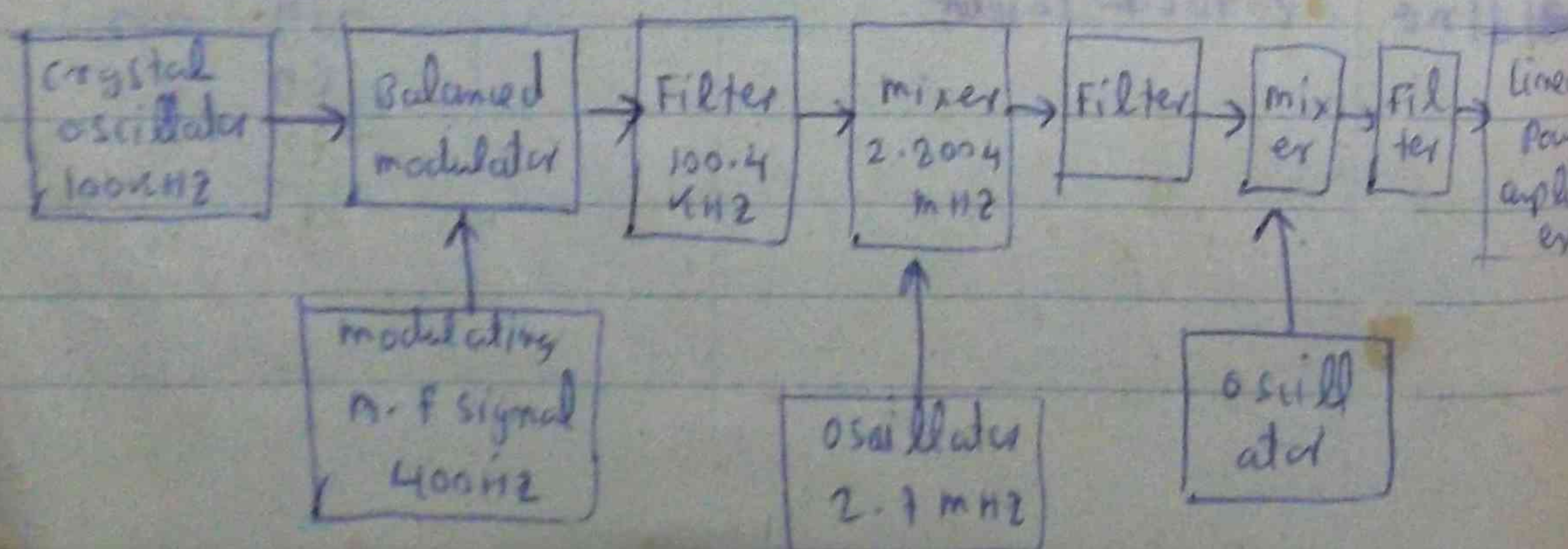
Radio Communication

Single Side Band

Advantages of SSB over DSB system.

- (1) DSB side band up: receiver of side band up
up side, and fading effect on receiver of, and
normal fading effect of receiver of, and
fading effect of receiver of, and
- (2) Transmitter of main signal. All power of transmitter
is in: main power of side band up: main
power of receiver of
- (3) SSB side band width of DSB system of frequency
band width of receiver of
- (4) SSB side band signal to noise ratio power of DSB side
band of receiver of

Block Diagram (D.S.B)



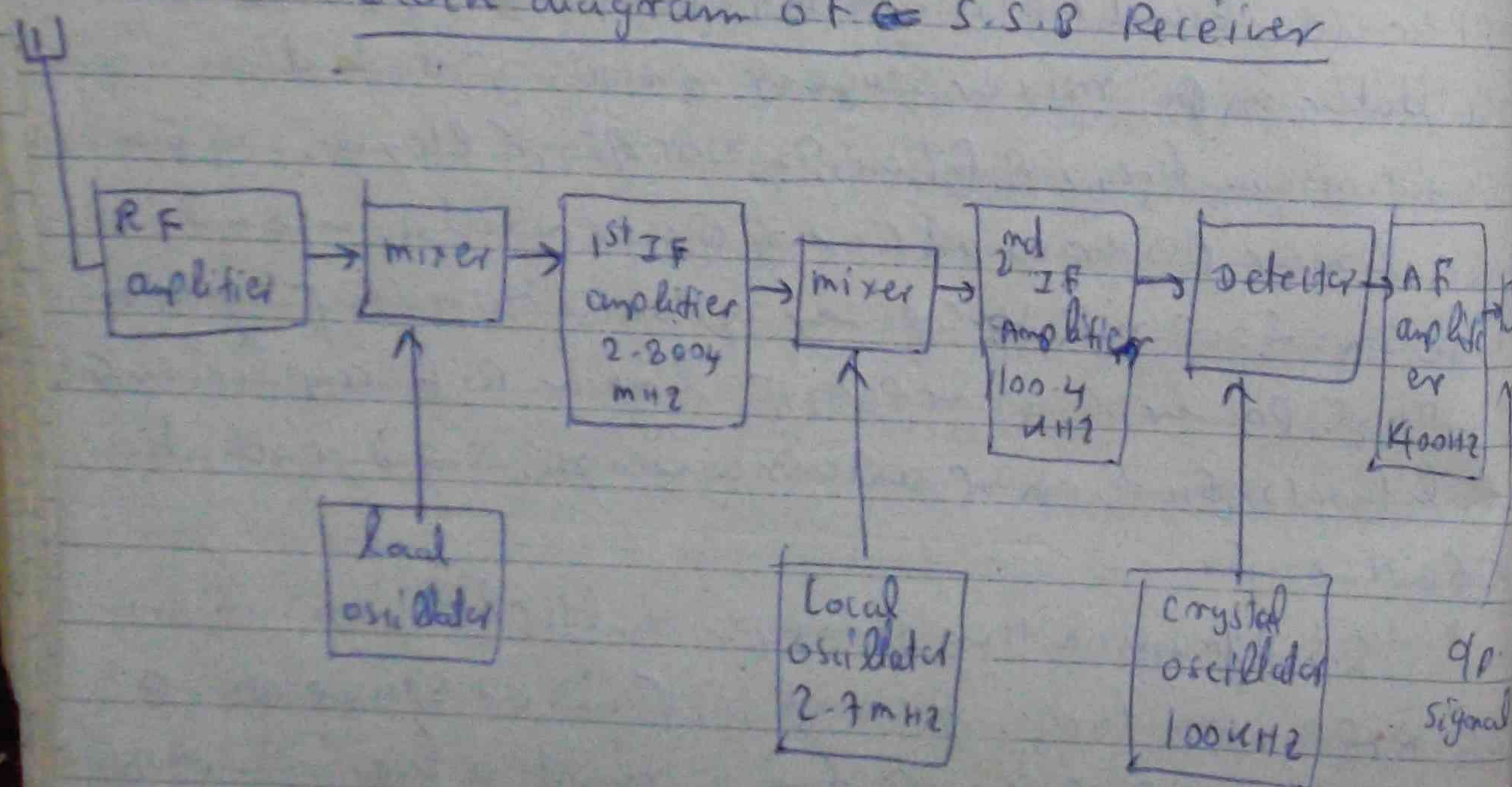
Block Diagram of crystal oscillator 92.6 MHz carrier wave 92.6 MHz & 1600 Hz audio freq. of balance modulator 2nd modulate 1st stage 1st output of crystal oscillator 92.6 MHz

modulate 40% of 2 stage
6162. upper side band and 12.5% of 100.4
412.5% upper side band of 2.7mHz
5.0% filter circuit of 2.3004 mHz
upper side band and 12.5% of 2.3004 mHz
oscillator and 12.5% of 2.3004 mHz
mixture stage of 2.3004 mHz
mixture stage of 2.3004 mHz
linear power amplifier of 2.3004 mHz
stage 2: of 2.3004 mHz
power of 2.3004 mHz
antenna gain of 2.3004 mHz

S.S.B transmitter of freq: multiplier up: 2300:
 6600 of 2500 freq: 2.6000 of mixer stage up: 66
 6600 of 2500 2.6000 of freq: multiplier up: 2300:
 6600 side band up: 66, A.F signal of 2300 multiplier
 2.6000 of 6600 6600 of 2.6000 mixer up: 66 freq:
 2.6000 of 6600 side band up: 66, A.F of 2300
 2.6000

High frequency is modulated with low frequency for modulation and demodulation. Low frequency carrier frequency of 600 kHz is used for high power modulation and low power modulation and demodulation.

Block diagram of SSB Receiver



Signal from antenna goes to SSB signal RF amplifier. The output of mixer stage is 1st local oscillator 2.7 MHz. 1st IF (high IF) of 600 kHz.

Signal of 2.8004 MHz is upper side band of 2.7 MHz. Signal of 100.4 kHz is 2nd IF (low IF) of 2.7 MHz. 2.7 MHz is second local oscillator. The signal from mixer stage is 2nd IF of 2.7 MHz. Signal of detector stage is 2.7 MHz. Signal from transmitter is carrier frequency modulated with 100 kHz side band. The signal from detector stage is original carrier R.F. side band up-beat frequency. The modulated wave of 2.7 MHz is signal of detection. The output of AF stage is 400 Hz audio signal of 2.7 MHz.

100 kHz crystal oscillator is 2.7 MHz frequency of carrier frequency. The signal of incoming signal is 2.7 MHz. The pilot carrier is 2.7 MHz.

Standard Broadcast Station

Standard Broadcast station is Standard Broadcast Band 135 kHz to 160.5 kHz. The signal is channel up-beat. The station is of 100 kHz.

Station is of 100 kHz. The frequency is 100 kHz. The amplitude modulation is 100% and carrier power is 100 watt to 500 watt.

Console (cf.) Control Board & program signal on of
amplitude of 2 & 60% modulation 2 & 60% of control
reducer 2 & 60% monitor receiver on, 60% transmitting out
put of 2 & 60% 2 & 60% 2 & 60% Auxiliary
transmitter of 2 & 60% 2 & 60% 2 & 60% Studio control
board of 2 & 60% switching on 2 & 60%

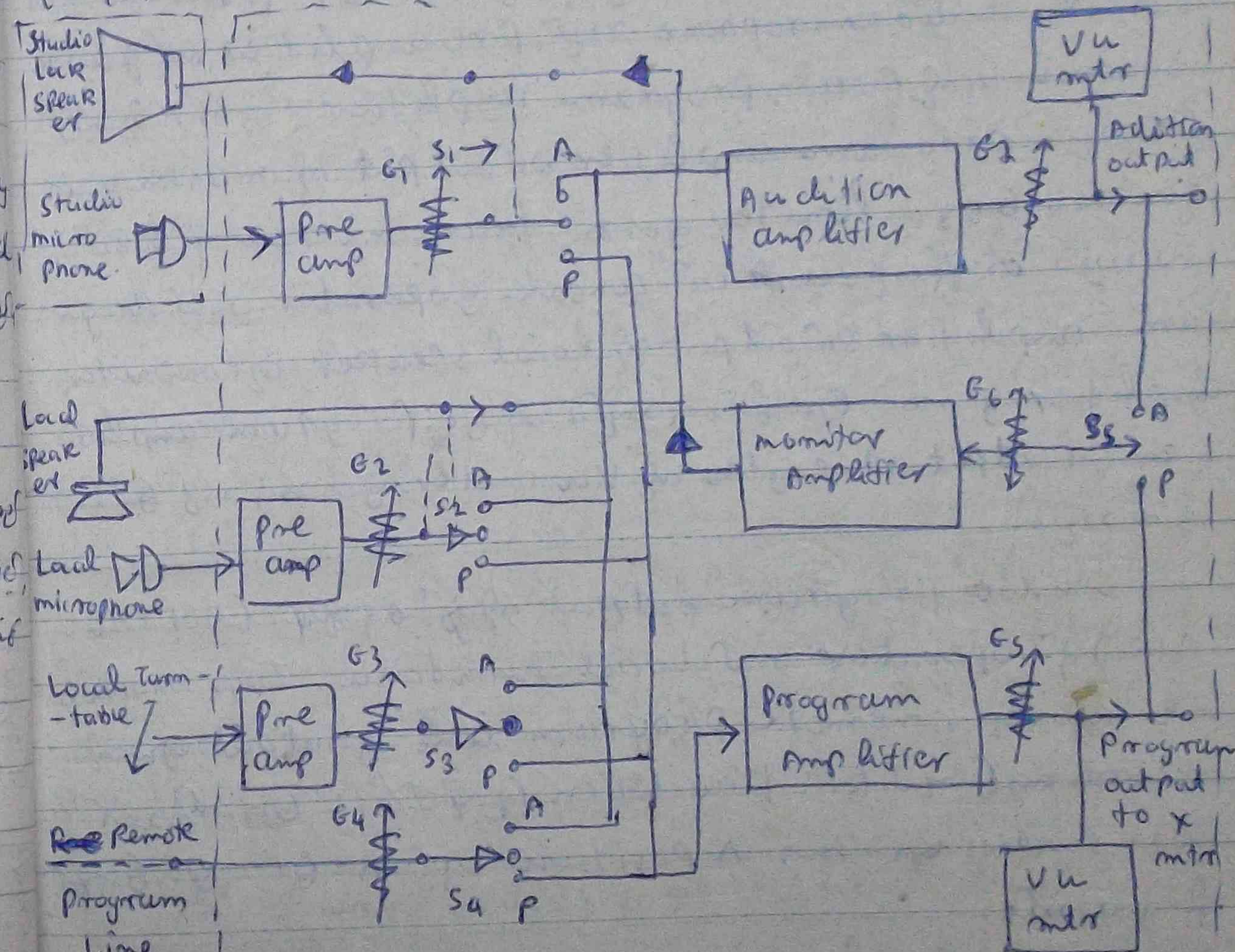
COM ELRAD (Control of Electromagnetic Radiation)

of system of broad casting station in 2000 and
in 2001 the number of stations increased to 1000
and the number of stations increased to 1000
in 2002 the number of stations increased to 1000
in 2003 the number of stations increased to 1000

THE BROADCAST CONSOLE

Console (operator) Control Board and Broadcast station of the: 2nd: 6th and 7th: 8th: 9th: 10th: 11th: 12th: 13th: 14th: 15th: 16th: 17th: 18th: 19th: 20th: 21st: 22nd: 23rd: 24th: 25th: 26th: 27th: 28th: 29th: 30th: 31st: 32nd: 33rd: 34th: 35th: 36th: 37th: 38th: 39th: 40th: 41st: 42nd: 43rd: 44th: 45th: 46th: 47th: 48th: 49th: 50th: 51st: 52nd: 53rd: 54th: 55th: 56th: 57th: 58th: 59th: 60th: 61st: 62nd: 63rd: 64th: 65th: 66th: 67th: 68th: 69th: 70th: 71st: 72nd: 73rd: 74th: 75th: 76th: 77th: 78th: 79th: 80th: 81st: 82nd: 83rd: 84th: 85th: 86th: 87th: 88th: 89th: 90th: 91st: 92nd: 93rd: 94th: 95th: 96th: 97th: 98th: 99th: 100th: 101st: 102nd: 103rd: 104th: 105th: 106th: 107th: 108th: 109th: 110th: 111th: 112th: 113th: 114th: 115th: 116th: 117th: 118th: 119th: 120th: 121st: 122nd: 123rd: 124th: 125th: 126th: 127th: 128th: 129th: 130th: 131st: 132nd: 133rd: 134th: 135th: 136th: 137th: 138th: 139th: 140th: 141st: 142nd: 143rd: 144th: 145th: 146th: 147th: 148th: 149th: 150th: 151st: 152nd: 153rd: 154th: 155th: 156th: 157th: 158th: 159th: 160th: 161st: 162nd: 163rd: 164th: 165th: 166th: 167th: 168th: 169th: 170th: 171st: 172nd: 173rd: 174th: 175th: 176th: 177th: 178th: 179th: 180th: 181st: 182nd: 183rd: 184th: 185th: 186th: 187th: 188th: 189th: 190th: 191st: 192nd: 193rd: 194th: 195th: 196th: 197th: 198th: 199th: 200th: 201st: 202nd: 203rd: 204th: 205th: 206th: 207th: 208th: 209th: 210th: 211th: 212th: 213th: 214th: 215th: 216th: 217th: 218th: 219th: 220th: 221st: 222nd: 223rd: 224th: 225th: 226th: 227th: 228th: 229th: 230th: 231st: 232nd: 233rd: 234th: 235th: 236th: 237th: 238th: 239th: 240th: 241st: 242nd: 243rd: 244th: 245th: 246th: 247th: 248th: 249th: 250th: 251st: 252nd: 253rd: 254th: 255th: 256th: 257th: 258th: 259th: 260th: 261st: 262nd: 263rd: 264th: 265th: 266th: 267th: 268th: 269th: 270th: 271st: 272nd: 273rd: 274th: 275th: 276th: 277th: 278th: 279th: 280th: 281st: 282nd: 283rd: 284th: 285th: 286th: 287th: 288th: 289th: 290th: 291st: 292nd: 293rd: 294th: 295th: 296th: 297th: 298th: 299th: 300th: 301st: 302nd: 303rd: 304th: 305th: 306th: 307th: 308th: 309th: 310th: 311th: 312th: 313th: 314th: 315th: 316th: 317th: 318th: 319th: 320th: 321st: 322nd: 323rd: 324th: 325th: 326th: 327th: 328th: 329th: 330th: 331st: 332nd: 333rd: 334th: 335th: 336th: 337th: 338th: 339th: 340th: 341st: 342nd: 343rd: 344th: 345th: 346th: 347th: 348th: 349th: 350th: 351st: 352nd: 353rd: 354th: 355th: 356th: 357th: 358th: 359th: 360th: 361st: 362nd: 363rd: 364th: 365th: 366th: 367th: 368th: 369th: 370th: 371st: 372nd: 373rd: 374th: 375th: 376th: 377th: 378th: 379th: 380th: 381st: 382nd: 383rd: 384th: 385th: 386th: 387th: 388th: 389th: 390th: 391st: 392nd: 393rd: 394th: 395th: 396th: 397th: 398th: 399th: 400th: 401st: 402nd: 403rd: 404th: 405th: 406th: 407th: 408th: 409th: 410th: 411th: 412th: 413th: 414th: 415th: 416th: 417th: 418th: 419th: 420th: 421st: 422nd: 423rd: 424th: 425th: 426th: 427th: 428th: 429th: 430th: 431st: 432nd: 433rd: 434th: 435th: 436th: 437th: 438th: 439th: 440th: 441st: 442nd: 443rd: 444th: 445th: 446th: 447th: 448th: 449th: 450th: 451st: 452nd: 453rd: 454th: 455th: 456th: 457th: 458th: 459th: 460th: 461st: 462nd: 463rd: 464th: 465th: 466th: 467th: 468th: 469th: 470th: 471st: 472nd: 473rd: 474th: 475th: 476th: 477th: 478th: 479th: 480th: 481st: 482nd: 483rd: 484th: 485th: 486th: 487th: 488th: 489th: 490th: 491st: 492nd: 493rd: 494th: 495th: 496th: 497th: 498th: 499th: 500th: 501st: 502nd: 503rd: 504th: 505th: 506th: 507th: 508th: 509th: 510th: 511th: 512th: 513th: 514th: 515th: 516th: 517th: 518th: 519th: 520th: 521st: 522nd: 523rd: 524th: 525th: 526th: 527th: 528th: 529th: 530th: 531st: 532nd: 533rd: 534th: 535th: 536th: 537th: 538th: 539th: 540th: 541st: 542nd: 543rd: 544th: 545th: 546th: 547th: 548th: 549th: 550th: 551st: 552nd: 553rd: 554th: 555th: 556th: 557th: 558th: 559th: 560th: 561st: 562nd: 563rd: 564th: 565th: 566th: 567th: 568th: 569th: 570th: 571st: 572nd: 573rd: 574th: 575th: 576th: 577th: 578th: 579th: 580th: 581st: 582nd: 583rd: 584th: 585th: 586th: 587th: 588th: 589th: 590th: 591st: 592nd: 593rd: 594th: 595th: 596th: 597th: 598th: 599th: 600th: 601st: 602nd: 603rd: 604th: 605th: 606th: 607th: 608th: 609th: 610th: 611th: 612th: 613th: 614th: 615th: 616th: 617th: 618th: 619th: 620th: 621st: 622nd: 623rd: 624th: 625th: 626th: 627th: 628th: 629th: 630th: 631st: 632nd: 633rd: 634th: 635th: 636th: 637th: 638th: 639th: 640th: 641st: 642nd: 643rd: 644th: 645th: 646th: 647th: 648th: 649th: 650th: 651st: 652nd: 653rd: 654th: 655th: 656th: 657th: 658th: 659th: 660th: 661st: 662nd: 663rd: 664th: 665th: 666th: 667th: 668th: 669th: 670th: 671st: 672nd: 673rd: 674th: 675th: 676th: 677th: 678th: 679th: 680th: 681st: 682nd: 683rd: 684th: 685th: 686th: 687th: 688th: 689th: 690th: 691st: 692nd: 693rd: 694th: 695th: 696th: 697th: 698th: 699th: 700th: 701st:

of an or modulator stage on: o.p.f.b.w. of circuit



console

Operation

Studio & program of 1st, 2nd & 3rd p.p. microphone
6 ~ 2nd Studio microphone with pre amplifier of gain
control 6 ~ 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th, 11th, 12th, 13th, 14th, 15th, 16th, 17th, 18th, 19th, 20th, 21st, 22nd, 23rd, 24th, 25th, 26th, 27th, 28th, 29th, 30th, 31st, 32nd, 33rd, 34th, 35th, 36th, 37th, 38th, 39th, 40th, 41st, 42nd, 43rd, 44th, 45th, 46th, 47th, 48th, 49th, 50th, 51st, 52nd, 53rd, 54th, 55th, 56th, 57th, 58th, 59th, 60th, 61st, 62nd, 63rd, 64th, 65th, 66th, 67th, 68th, 69th, 70th, 71st, 72nd, 73rd, 74th, 75th, 76th, 77th, 78th, 79th, 80th, 81st, 82nd, 83rd, 84th, 85th, 86th, 87th, 88th, 89th, 90th, 91st, 92nd, 93rd, 94th, 95th, 96th, 97th, 98th, 99th, 100th, 101st, 102nd, 103rd, 104th, 105th, 106th, 107th, 108th, 109th, 110th, 111th, 112th, 113th, 114th, 115th, 116th, 117th, 118th, 119th, 120th, 121st, 122nd, 123rd, 124th, 125th, 126th, 127th, 128th, 129th, 130th, 131st, 132nd, 133rd, 134th, 135th, 136th, 137th, 138th, 139th, 140th, 141st, 142nd, 143rd, 144th, 145th, 146th, 147th, 148th, 149th, 150th, 151st, 152nd, 153rd, 154th, 155th, 156th, 157th, 158th, 159th, 160th, 161st, 162nd, 163rd, 164th, 165th, 166th, 167th, 168th, 169th, 170th, 171st, 172nd, 173rd, 174th, 175th, 176th, 177th, 178th, 179th, 180th, 181st, 182nd, 183rd, 184th, 185th, 186th, 187th, 188th, 189th, 190th, 191st, 192nd, 193rd, 194th, 195th, 196th, 197th, 198th, 199th, 200th, 201st, 202nd, 203rd, 204th, 205th, 206th, 207th, 208th, 209th, 210th, 211st, 212nd, 213th, 214th, 215th, 216th, 217th, 218th, 219th, 220th, 221st, 222nd, 223rd, 224th, 225th, 226th, 227th, 228th, 229th, 230th, 231st, 232nd, 233rd, 234th, 235th, 236th, 237th, 238th, 239th, 240th, 241st, 242nd, 243rd, 244th, 245th, 246th, 247th, 248th, 249th, 250th, 251st, 252nd, 253rd, 254th, 255th, 256th, 257th, 258th, 259th, 260th, 261st, 262nd, 263rd, 264th, 265th, 266th, 267th, 268th, 269th, 270th, 271st, 272nd, 273rd, 274th, 275th, 276th, 277th, 278th, 279th, 280th, 281st, 282nd, 283rd, 284th, 285th, 286th, 287th, 288th, 289th, 290th, 291st, 292nd, 293rd, 294th, 295th, 296th, 297th, 298th, 299th, 300th, 301st, 302nd, 303rd, 304th, 305th, 306th, 307th, 308th, 309th, 310th, 311st, 312nd, 313th, 314th, 315th, 316th, 317th, 318th, 319th, 320th, 321st, 322nd, 323rd, 324th, 325th, 326th, 327th, 328th, 329th, 330th, 331st, 332nd, 333rd, 334th, 335th, 336th, 337th, 338th, 339th, 340th, 341st, 342nd, 343rd, 344th, 345th, 346th, 347th, 348th, 349th, 350th, 351st, 352nd, 353rd, 354th, 355th, 356th, 357th, 358th, 359th, 360th, 361st, 362nd, 363rd, 364th, 365th, 366th, 367th, 368th, 369th, 370th, 371st, 372nd, 373rd, 374th, 375th, 376th, 377th, 378th, 379th, 380th, 381st, 382nd, 383rd, 384th, 385th, 386th, 387th, 388th, 389th, 390th, 391st, 392nd, 393rd, 394th, 395th, 396th, 397th, 398th, 399th, 400th, 401st, 402nd, 403rd, 404th, 405th, 406th, 407th, 408th, 409th, 410th, 411st, 412nd, 413th, 414th, 415th, 416th, 417th, 418th, 419th, 420th, 421st, 422nd, 423rd, 424th, 425th, 426th, 427th, 428th, 429th, 430th, 431st, 432nd, 433rd, 434th, 435th, 436th, 437th, 438th, 439th, 440th, 441st, 442nd, 443rd, 444th, 445th, 446th, 447th, 448th, 449th, 450th, 451st, 452nd, 453rd, 454th, 455th, 456th, 457th, 458th, 459th, 460th, 461st, 462nd, 463rd, 464th, 465th, 466th, 467th, 468th, 469th, 470th, 471st, 472nd, 473rd, 474th, 475th, 476th, 477th, 478th, 479th, 480th, 481st, 482nd, 483rd, 484th, 485th, 486th, 487th, 488th, 489th, 490th, 491st, 492nd, 493rd, 494th, 495th, 496th, 497th, 498th, 499th, 500th, 501st, 502nd, 503rd, 504th, 505th, 506th, 507th, 508th, 509th, 510th, 511st, 512nd, 513th, 514th, 515th, 516th, 517th, 518th, 519th, 520th, 521st, 522nd, 523rd, 524th, 525th, 526th, 527th, 528th, 529th, 530th, 531st, 532nd, 533rd, 534th, 535th, 536th, 537th, 538th, 539th, 540th, 541st, 542nd, 543rd, 544th, 545th, 546th, 547th, 548th, 549th, 550th, 551st, 552nd, 553rd, 554th, 555th, 556th, 557th, 558th, 559th, 560th, 561st, 562nd, 563rd, 564th, 565th, 566th, 567th, 568th, 569th, 570th, 571st, 572nd, 573rd, 574th, 575th, 576th, 577th, 578th, 579th, 580th, 581st, 582nd, 583rd, 584th, 585th, 586th, 587th, 588th, 589th, 590th, 591st, 592nd, 593rd, 594th, 595th, 596th, 597th, 598th, 599th, 600th, 601st, 602nd, 603rd, 604th, 605th, 606th, 607th, 608th, 609th, 610th, 611st, 612nd, 613th, 614th, 615th, 616th, 617th, 618th, 619th, 620th, 621st, 622nd, 623rd, 624th, 625th, 626th, 627th, 628th, 629th, 630th, 631st, 632nd, 633rd, 634th, 635th, 636th, 637th, 638th, 639th, 640th, 641st, 642nd, 643rd, 644th, 645th, 646th, 647th, 648th, 649th, 650th, 651st, 652nd, 653rd, 654th, 655th, 656th, 657th, 658th, 659th, 660th, 661st, 662nd, 663rd, 664th, 665th, 666th, 667th, 668th, 669th, 670th, 671st, 672nd, 673rd, 674th, 675th, 676th, 677th, 678th, 679th, 680th, 681st, 682nd, 683rd, 684th, 685th, 686th, 687th, 688th, 689th, 690th, 691st, 692nd, 693rd, 694th

Studio program output of JPL & JPL (ON THE AIR) & operator of Local Turntable Tape machine - e.g. your remote program line & output signal recording by JPL & JPL: 1 audition by JPL & JPL: output and JPL switch up: In: A position of JPL: JPL, JPL & JPL

Remote line of program of 20, 25, 30, 35, 40, 45, 50, 55, 60, 65, 70, 75, 80, 85, 90, 95, 100, 105, 110, 115, 120, 125, 130, 135, 140, 145, 150, 155, 160, 165, 170, 175, 180, 185, 190, 195, 200, 205, 210, 215, 220, 225, 230, 235, 240, 245, 250, 255, 260, 265, 270, 275, 280, 285, 290, 295, 300, 305, 310, 315, 320, 325, 330, 335, 340, 345, 350, 355, 360, 365, 370, 375, 380, 385, 390, 395, 400, 405, 410, 415, 420, 425, 430, 435, 440, 445, 450, 455, 460, 465, 470, 475, 480, 485, 490, 495, 500, 505, 510, 515, 520, 525, 530, 535, 540, 545, 550, 555, 560, 565, 570, 575, 580, 585, 590, 595, 600, 605, 610, 615, 620, 625, 630, 635, 640, 645, 650, 655, 660, 665, 670, 675, 680, 685, 690, 695, 700, 705, 710, 715, 720, 725, 730, 735, 740, 745, 750, 755, 760, 765, 770, 775, 780, 785, 790, 795, 800, 805, 810, 815, 820, 825, 830, 835, 840, 845, 850, 855, 860, 865, 870, 875, 880, 885, 890, 895, 900, 905, 910, 915, 920, 925, 930, 935, 940, 945, 950, 955, 960, 965, 970, 975, 980, 985, 990, 995, 1000, 1005, 1010, 1015, 1020, 1025, 1030, 1035, 1040, 1045, 1050, 1055, 1060, 1065, 1070, 1075, 1080, 1085, 1090, 1095, 1100, 1105, 1110, 1115, 1120, 1125, 1130, 1135, 1140, 1145, 1150, 1155, 1160, 1165, 1170, 1175, 1180, 1185, 1190, 1195, 1200, 1205, 1210, 1215, 1220, 1225, 1230, 1235, 1240, 1245, 1250, 1255, 1260, 1265, 1270, 1275, 1280, 1285, 1290, 1295, 1300, 1305, 1310, 1315, 1320, 1325, 1330, 1335, 1340, 1345, 1350, 1355, 1360, 1365, 1370, 1375, 1380, 1385, 1390, 1395, 1400, 1405, 1410, 1415, 1420, 1425, 1430, 1435, 1440, 1445, 1450, 1455, 1460, 1465, 1470, 1475, 1480, 1485, 1490, 1495, 1500, 1505, 1510, 1515, 1520, 1525, 1530, 1535, 1540, 1545, 1550, 1555, 1560, 1565, 1570, 1575, 1580, 1585, 1590, 1595, 1600, 1605, 1610, 1615, 1620, 1625, 1630, 1635, 1640, 1645, 1650, 1655, 1660, 1665, 1670, 1675, 1680, 1685, 1690, 1695, 1700, 1705, 1710, 1715, 1720, 1725, 1730, 1735, 1740, 1745, 1750, 1755, 1760, 1765, 1770, 1775, 1780, 1785, 1790, 1795, 1800, 1805, 1810, 1815, 1820, 1825, 1830, 1835, 1840, 1845, 1850, 1855, 1860, 1865, 1870, 1875, 1880, 1885, 1890, 1895, 1900, 1905, 1910, 1915, 1920, 1925, 1930, 1935, 1940, 1945, 1950, 1955, 1960, 1965, 1970, 1975, 1980, 1985, 1990, 1995, 2000, 2005, 2010, 2015, 2020, 2025, 2030, 2035, 2040, 2045, 2050, 2055, 2060, 2065, 2070, 2075, 2080, 2085, 2090, 2095, 2100, 2105, 2110, 2115, 2120, 2125, 2130, 2135, 2140, 2145, 2150, 2155, 2160, 2165, 2170, 2175, 2180, 2185, 2190, 2195, 2200, 2205, 2210, 2215, 2220, 2225, 2230, 2235, 2240, 2245, 2250, 2255, 2260, 2265, 2270, 2275, 2280, 2285, 2290, 2295, 2300, 2305, 2310, 2315, 2320, 2325, 2330, 2335, 2340, 2345, 2350, 2355, 2360, 2365, 2370, 2375, 2380, 2385, 2390, 2395, 2400, 2405, 2410, 2415, 2420, 2425, 2430, 2435, 2440, 2445, 2450, 2455, 2460, 2465, 2470, 2475, 2480, 2485, 2490, 2495, 2500, 2505, 2510, 2515, 2520, 2525, 2530, 2535, 2540, 2545, 2550, 2555, 2560, 2565, 2570, 2575, 2580, 2585, 2590, 2595, 2600, 2605, 2610, 2615, 2620, 2625, 2630, 2635, 2640, 2645, 2650, 2655, 2660, 2665, 2670, 2675, 2680, 2685, 2690, 2695, 2700, 2705, 2710, 2715, 2720, 2725, 2730, 2735, 2740, 2745, 2750, 2755, 2760, 2765, 2770, 2775, 2780, 2785, 2790, 2795, 2800, 2805, 2810, 2815, 2820, 2825, 2830, 2835, 2840, 2845, 2850, 2855, 2860, 2865, 2870, 2875, 2880, 2885, 2890, 2895, 2900, 2905, 2910, 2915, 2920, 2925, 2930, 2935, 2940, 2945, 2950, 2955, 2960, 2965, 2970, 2975, 2980, 2985, 2990, 2995, 3000, 3005, 3010, 3015, 3020, 3025, 3030, 3035, 3040, 3045, 3050, 3055, 3060, 3065, 3070, 3075, 3080, 3085, 3090, 3095, 3100, 3105, 3110, 3115, 3120, 3125, 3130, 3135, 3140, 3145, 3150, 3155, 3160, 3165, 3170, 3175, 3180, 3185, 3190, 3195, 3200, 3205, 3210, 3215, 3220, 3225, 3230, 3235, 3240, 3245, 3250, 3255, 3260, 3265, 3270, 3275, 3280, 3285, 3290, 3295, 3300, 3305, 3310, 3315, 3320, 3325, 3330, 3335, 3340, 3345, 3350, 3355, 3360, 3365, 3370, 3375, 3380, 3385, 3390, 3395, 3400, 3405, 3410, 3415, 3420, 3425, 3430, 3435, 3440, 3445, 3450, 3455, 3460, 3465, 3470, 3475, 3480, 3485, 3490, 3495, 3500, 3505, 3510, 3515, 3520, 3525, 3530, 3535, 3540, 3545, 3550, 3555, 3560, 3565, 3570, 3575, 3580, 3585, 3590, 3595, 3600

channel gasol, om air 6/4/50 am 2006-07-08

Audio level in console

Audio level 100

(1) Timing - Program up: ୧ ସଫରାଏ ଓ ଅନ୍ୟ ୩୦
୦୮. ୫୫ ମିନ: ବାର୍ତ୍ତା: ୨୫ ମିନ: ୯୫ ମିନ: ୪୫ ମିନ:
୬୫ ମିନ: (announcement) ୫୫ ମିନ: ୭୫ ମିନ: (station
break) ୨୫ ମିନ: ୩୫ ମିନ:

(2) Fidelity - Amplifier mixing program of distortion of 60mV amplidy 1000

(3) maintaining audio signal amplitude level :-

Transmitter of carrier of modulate 2500 Hz, Program
-am (20, 0 Hz) audio signal of output amplitude
3m, carrier 600 Hz, 600 Hz, modulation 2500 Hz
2000 Hz, 1800 Hz, 600 Hz, 2500 Hz, 2500 Hz

৬৮: ৬৮, ১১৪ ১১৪ ১১৪

$$d_{\text{bar}} = 10 \log \frac{P_o}{P_r} \quad (P_r = P_{\text{new}})$$

$$\bullet \quad v_u = 10 \log \frac{P_o}{P_r} \quad (P_r = 1 \text{ mW})$$

(all 600 ohms impedance circuit).

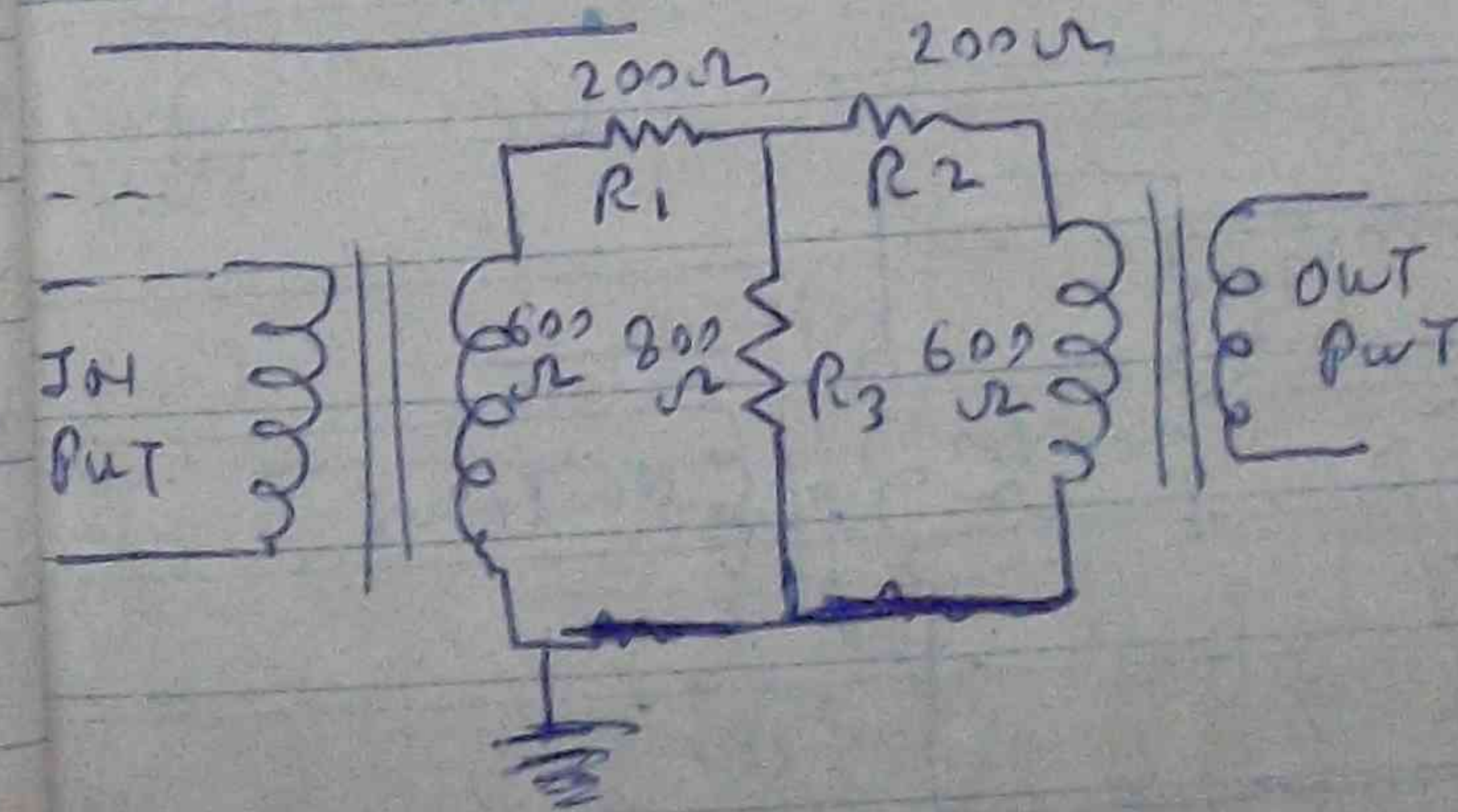
2 uer - microphone in or out put 25 dbm (0), console
25 dbm out console 25 dbm amplifier output 25 dbm
25 dbm gain 25 dbm amplifier output 25 dbm
on zero VU level of 25 dbm 25 dbm Turntable
output, Tape deck output on 25 dbm zero VU 25 dbm
25 dbm amplifier output 25 dbm

[illegible]

ATTENUATOR PADS

ATTENUATOR PADS
consist of high gain preamplifier w.r.t input impedance & high level input impedance of attenuator pad w.r.t pre amplifier output impedance. Transmission line for connecting pad w.r.t. amplifier & transmission line for pad w.r.t. output line must have same frequency response & characteristic impedance & amplifier of distortion free.

(a) T-Type



T-Type Pad of 4000 Gm
 1000 balance of 6000
 line of line error
 ground error: 6000 line
 of 1000 of 6000
 new line voltage
 error (6000) 6000, 6000

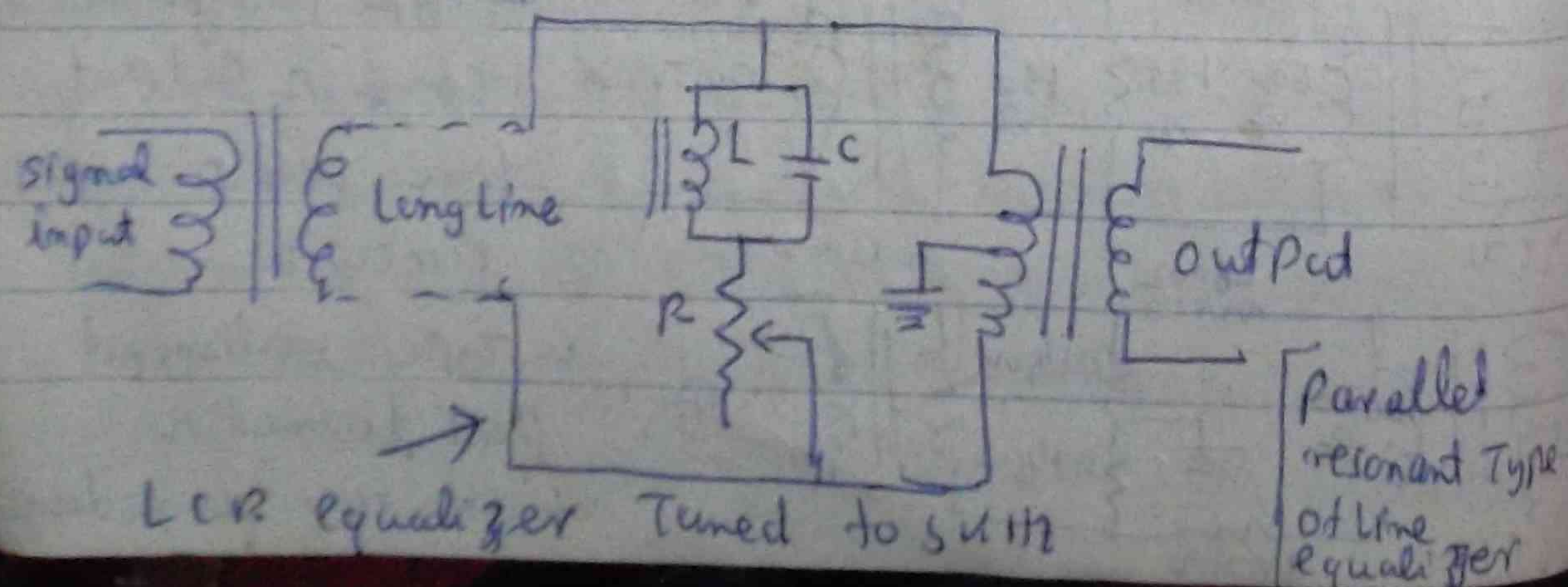
6025 So, transformer Jazid. Match 6002 of
Jazid 6002 of 6002 of 6002 of 6002 of 6002 of
Jazid 6002 of 6002 of 6002 of 6002 of 6002 of

George L type pad of 600 ohm source & 600 ohm load
output is 150 ohm input of match of 60 ohm couple
of 60 ohm & 60 ohm R_1 & R_2 resistor 12 ohm & 12 ohm
loss 18 db loss

George L type pad of balanced line
L type pad of series resistor R_1 of
line & shunt resistor R_2 of
centre tap & ground

Transmission line in 60 ohm capacitive coupling
noise impulse of 100 ohm & 60 ohm output
trans former of primary & secondary of electro
static shield of 2 ohm shield of core of 1 ohm
ground of 2 ohm

Line Equalizer

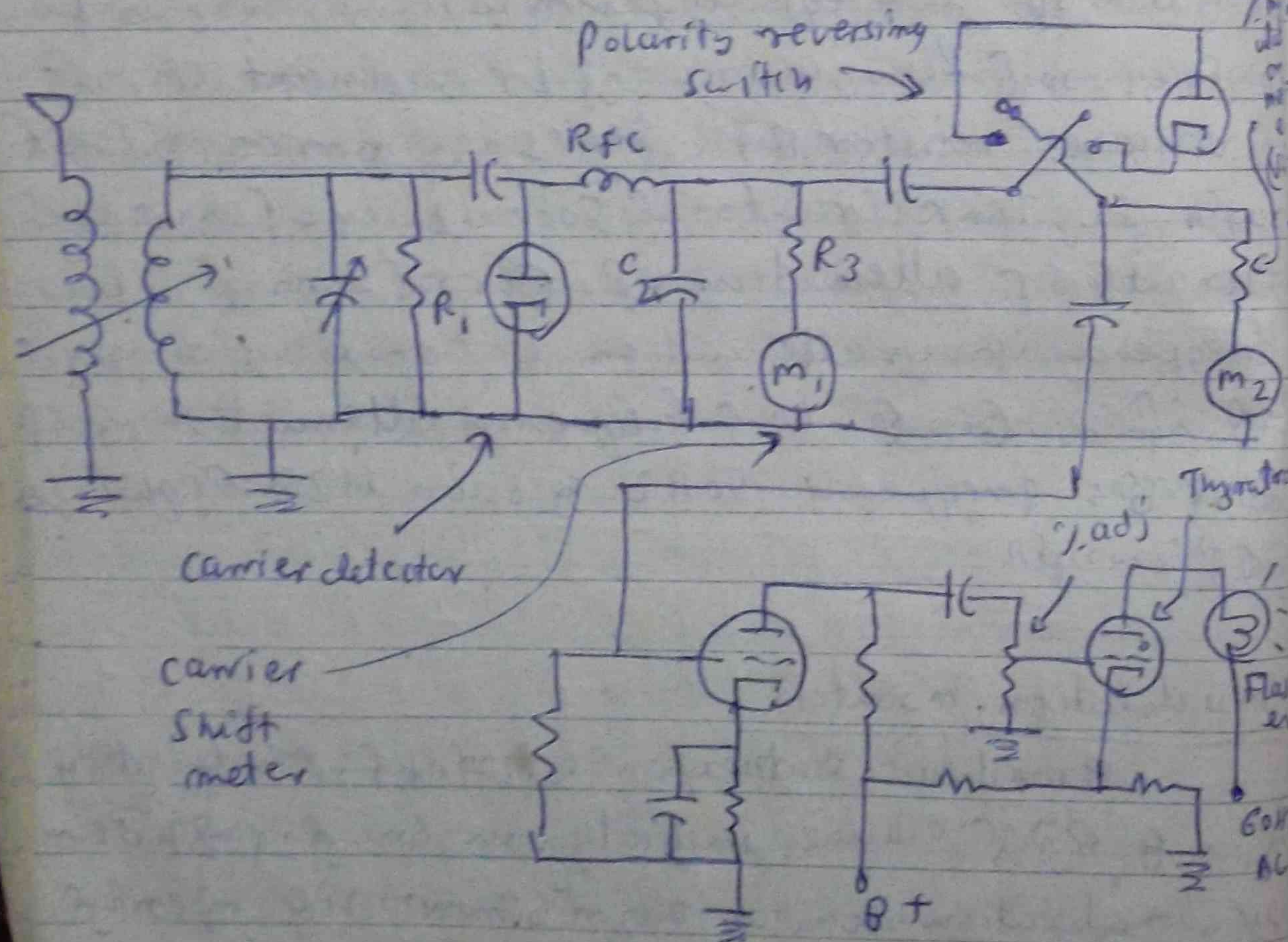


Audio transmission need 600 ohm short line
or attenuation of 60 ohm & 60 ohm
line of distributed L & C of 60 ohm
High frequency need attenuation of 10 ohm
of 10 ohm low frequency of 10 ohm
of 60 ohm line of 10 ohm (Receiving End) of 60 ohm
line equalizer of 10 ohm & 10 ohm
of 10 ohm line across of LC resonant circuit
of variable resistor R of 10 ohm
of 10 ohm LC circuit of 5000 Hz of 10 ohm
resonant of 10 ohm of 60 ohm Low
frequency of 10 ohm of 10 ohm
of 10 ohm of 10 ohm Low frequency attenuation of 10 ohm
of 10 ohm frequency 50 Hz & 5000 Hz of 10 ohm
of 10 ohm

Modulation monitors

Broadcast station of 10 ohm of 10 ohm modulation
of 10 ohm of 10 ohm visual indication of 10 ohm
of 10 ohm modulation monitor of 10 ohm of 10 ohm
of 10 ohm

- [illegible]



1. Transmitter output, modulated RF
 2. ac signal of Tuned circuit of couple
 3. modulation of 60 Hz m, of a steady current in
 4. 60 Hz carrier of diode of rectify of RF of
 5. C₂ of RF of filter of 60 Hz of Tuning
 6. circuit of m, of deflection of 60 Hz of Tune
 7. of 60 Hz of modulation of 60 Hz of m, of Indicat
 8. of 60 Hz of

[illegible]

Over modulation indicator 2G6. Trouble amplifier tube 31. Thyatron tube of no. 6. Glowing. Thyatron oil plate circuit & flasher w. i. & some ac

50 series vacuum tube Thyatron cathode of
 voltage divider ground ground vacuum
 cathode and ground with positive bias
 Thyatron grid of potentiometer ground ground
 vacuum ground grid and cathode with negative bias
 Triode amplifier ground signal vacuum
 Thyatron grid and bias with vacuum
 ionization vacuum conductor 50 Hz ac of
 positive half cycle of 50 Hz Flasher vacuum
 potentiometer diode and vacuum modulation
 vacuum vacuum Flasher vacuum vacuum
 modulation vacuum vacuum Audio vacuum vacuum
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Logs

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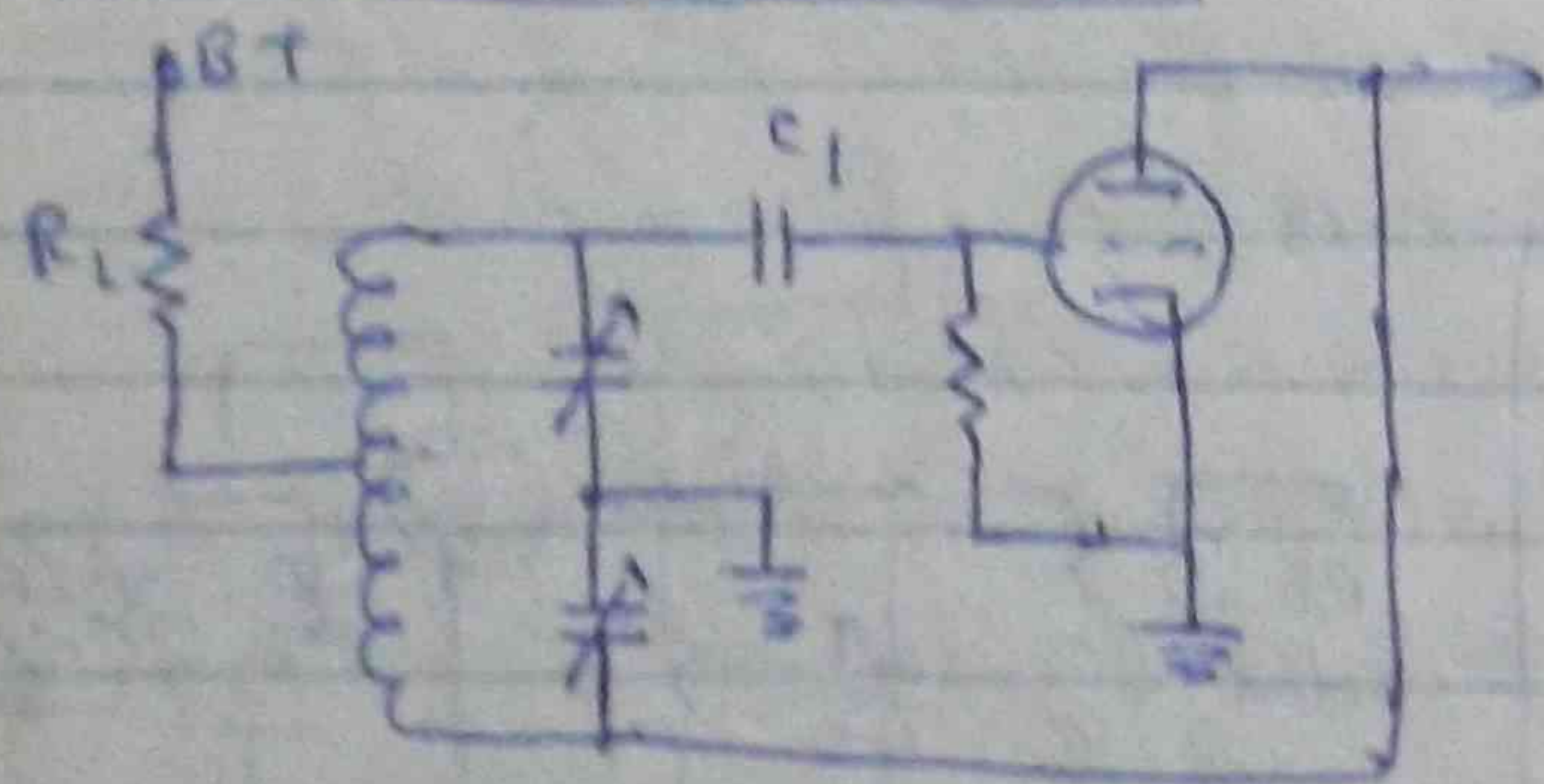
VHF Transmitter and Receiver

VHF Transmission

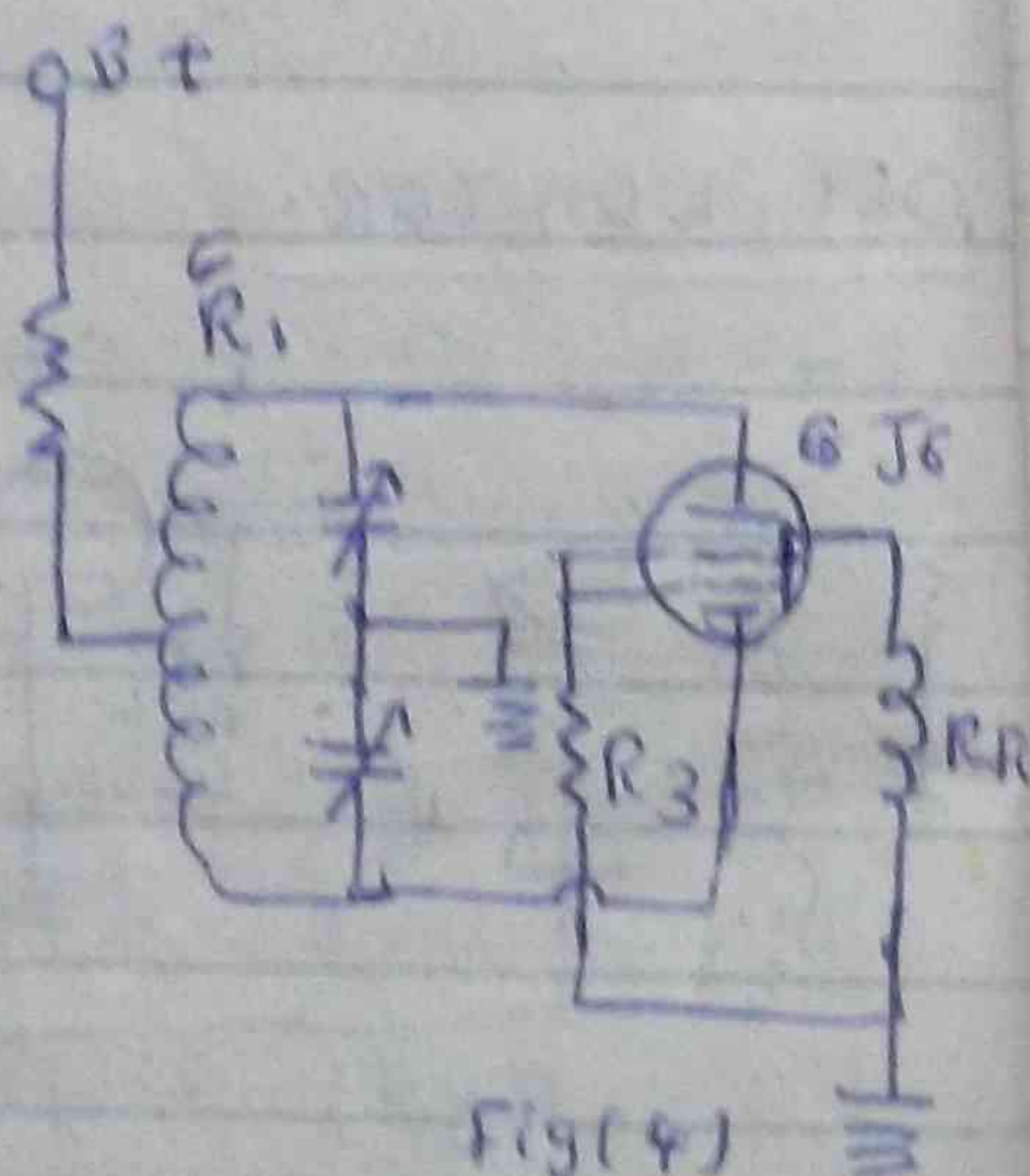
50 MHz vacuum station frequency of VHF vacuum
 frequency range of Transmitter vacuum vacuum
 vacuum Low frequency of Transmitter vacuum vacuum
 vacuum vacuum VHF band width vacuum vacuum
 station vacuum vacuum vacuum vacuum vacuum
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 vacuum vacuum vacuum vacuum vacuum vacuum
 vacuum vacuum vacuum vacuum vacuum vacuum

2. Design of a self-excited oscillator circuit for 500 Hz
3. output of (1) is fed to couple of 50 Hz, R.F. 50 Hz
oscillator freq. of 10 MHz & 50 Hz. (1) is output
plate circuit of 1st stage. Time of 1st amplifier
using couple of 50 Hz

OSCILLATOR STABILITY



Folge 32



Fig(4)

VHF Receiver requires High selectivity from IF amplifier
 spread of: 20 to 30 dB. Not oscillator of wide frequency stability
 of 200 to 300 kHz. Stability required of 100 to 200 kHz
 or crystal control oscillator spread of: 100 to 200 kHz
 multiplier spread of: 100 to 200 kHz. Oscillator required

Q. 1) Mechanical & Electrical stability: and

(2) Timing condenser $\approx 0.05 \mu\text{F}$ Solid built Double bearing type $\approx 2 \mu\text{F}$

(3) wire leads up of vibration ω_1 : 60% of stiff wire
up of ω_2 : 20%

(4) Coiled or winding type of mechanical stable potting cement type of concrete: 20% concrete: 20% concrete

1. ω_c and ω_s of VHF oscillator circuit up to 30 MHz
 2. ω_c and ω_s of single ended oscillator up to 30 MHz
 3. ω_c and ω_s of push pull oscillator up to 30 MHz
 4. ω_c and ω_s of common emitter oscillator up to 30 MHz
 5. ω_c and ω_s of common collector oscillator up to 30 MHz
 6. ω_c and ω_s of common base oscillator up to 30 MHz
 7. ω_c and ω_s of common gate oscillator up to 30 MHz
 8. ω_c and ω_s of common drain oscillator up to 30 MHz
 9. ω_c and ω_s of common source oscillator up to 30 MHz
 10. ω_c and ω_s of common emitter oscillator up to 30 MHz

IR Amplifier

Some of the features of VHF receiver are as follows:
 1. VHF receiver has a range of 30 MHz to 300 MHz.
 2. It has a standard IF of 45.5 MHz.
 3. It has a bandwidth of 12 MHz.
 4. It has a selectivity of 6 dB.
 5. It has a double conversion.
 6. It has a high input impedance.

Diagram of the 50 MHz crystal controlled converter

The diagram is a hand-drawn schematic of a vacuum tube radio receiver. It is divided into three main horizontal sections. The top right section is the power supply, featuring a 6X4 rectifier tube, a 50V transformer, and a 6CB6 pentode detector/AF amplifier. The top left section is the detector and first AF amplifier, also using a 6CB6 tube, with various tuning capacitors (C1, C2, C3) and inductors (L1, L2, L3, L4, L5, L6, L7, L8). The bottom section is the AF amplifier and output stage, featuring a 6AV6 tube, a 50V transformer, and a speaker. The circuit includes various capacitors (C1-C5), inductors (L1-L8), resistors, and a speaker. Frequency labels such as '50-54 MHz', '21.5 MHz', and '43 MHz' are written near specific components. The diagram is labeled 'Fig. 10-10' at the bottom right.

$C_1, C_2, C_3 = 20 \text{ p.p.f}$ (min) variable
 $C_4 = 50 \text{ p.p.f}$ (min) padder
 $C_5 = 25 \text{ p.p.f}$ (min) padder
 $J_1 =$ coaxial fitting
 $J_2 =$ crystal socket for Antennae
 $J_3 =$ four pins male chassis
 fitting Terminals

VHF Receiving Baluns

VHF Receiver operates at very high frequency: 30 MHz to 300 MHz. Antenna is Receiver of RF circuit of couple of stages. RF stage is single ended stage of 1/2 wave coaxial line. Losses are: conductor, open wire line. At 144 MHz, 144 MHz is common. VHF is closed space open wire line. Antenna is Receiver of RF circuit of coupling between 1/2 wave coaxial line of open wire line. Balancing device is used. Antenna is, RF circuit is balanced. Balancing device is used. Balancing device is used.

VHF Transmitter

Frequency multiplier

VHF Transmitter operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage.

anyone?

(2) Frequency multiplier connection leads to high frequency. Frequency multiplier operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage.

Amplifier

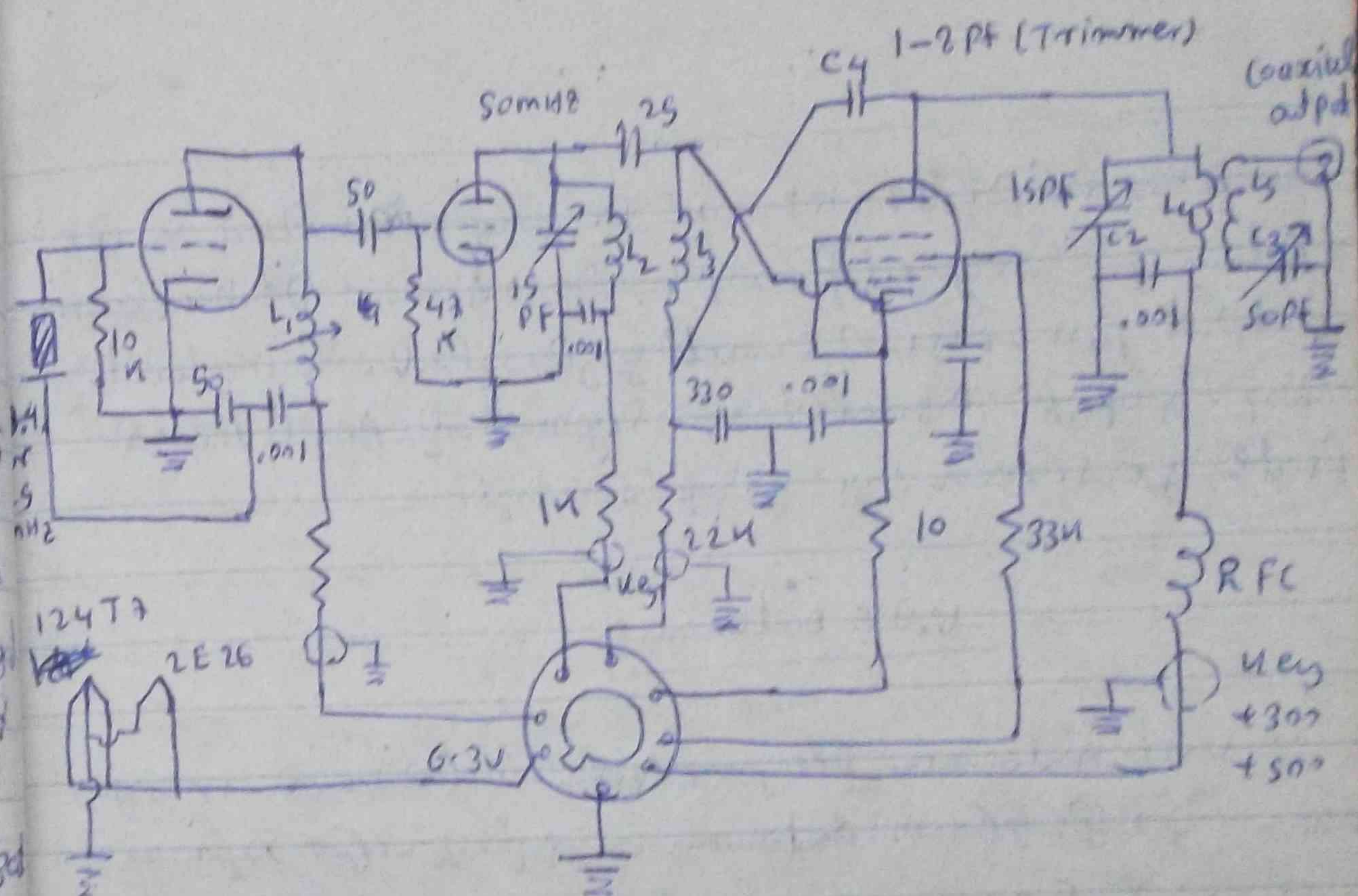
Transmitting Tube operates at frequency: 50 MHz. Frequency multiplier operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage. Frequency multiplier operates at frequency: multiplier stage.

50 MHz to 144 MHz Amplifier using Triode
 using neutralization circuit using
 of 250-2000 pF. range 220 MHz to 250 MHz
 of Neutralization circuit using strong inductance
 & strong capacitance using of 100 pF to 1000 pF
 of grounded Grid Amplifier using
 driving power using of 200-250 pF in circuit
 using grounded Grid circuit using of 100 pF
 using Triode Tube using of 100 pF neutraliza-
 -ion using screen circuit of Resonant circuit filter
 using of 100 pF to 1000 pF effective screen by Pass
 of 100 pF

SOH2 Transmitter

Oscillator circuit of 2.4 MHz of 4 or 25 MHz crystal, controlled by $\frac{1}{2}$ 12 at 7 pin, outputs of 25 MHz of Time base of 2.4 MHz crystal of 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 83

(Amplifier) 2E26



1. 60280m freq: m: $\frac{1}{2} \times 12$ at 7 Tube ϕ , v. Double
 2. ϕ Tube 10 m ϕ 500 Ohm output c. v. Series Tuning ckt
 L₂, c, ϕ . 50mH ϕ of Tube v. ϕ 500 Ohm 2 E26 Tube v.
 Amplifier ϕ 500 Ohm v. ϕ 500 Ohm L₄ v. ϕ Neutralizing
 capacitor ϕ 500 Ohm ϕ . ϕ 500 Ohm v. ϕ 500 Ohm: Tuning ckt:
 L₄, c, ϕ . 50mH ϕ of v. ϕ Tube 10 ϕ L₅ c₃ ϕ 500 Ohm.
 Tube T₁ ϕ , output v. ϕ 500 Ohm Tube T₁ ϕ Antenna
 ϕ . feed v. ϕ 500 Ohm

Keying circuit of Amplifier of Cathode ray tube
 50:1 Screen grid 50:1 or 50:1 50:1 50:1 50:1 50:1 50:1
 Keying circuit of plate current cut off 50:1 50:1 50:1 50:1 50:1 50:1

Doubler of plate (ret: czo keying circuit, key
 Relay of, key of 2000 Hz. Amplifier of maximum
 output power is 35 watt of 2000 Hz. Voice modulation
 2000 Hz. of 2000 Hz. modulating signal of Amplifier of
 Plate of, screen czo of 2000 Hz.

VHF Antenna

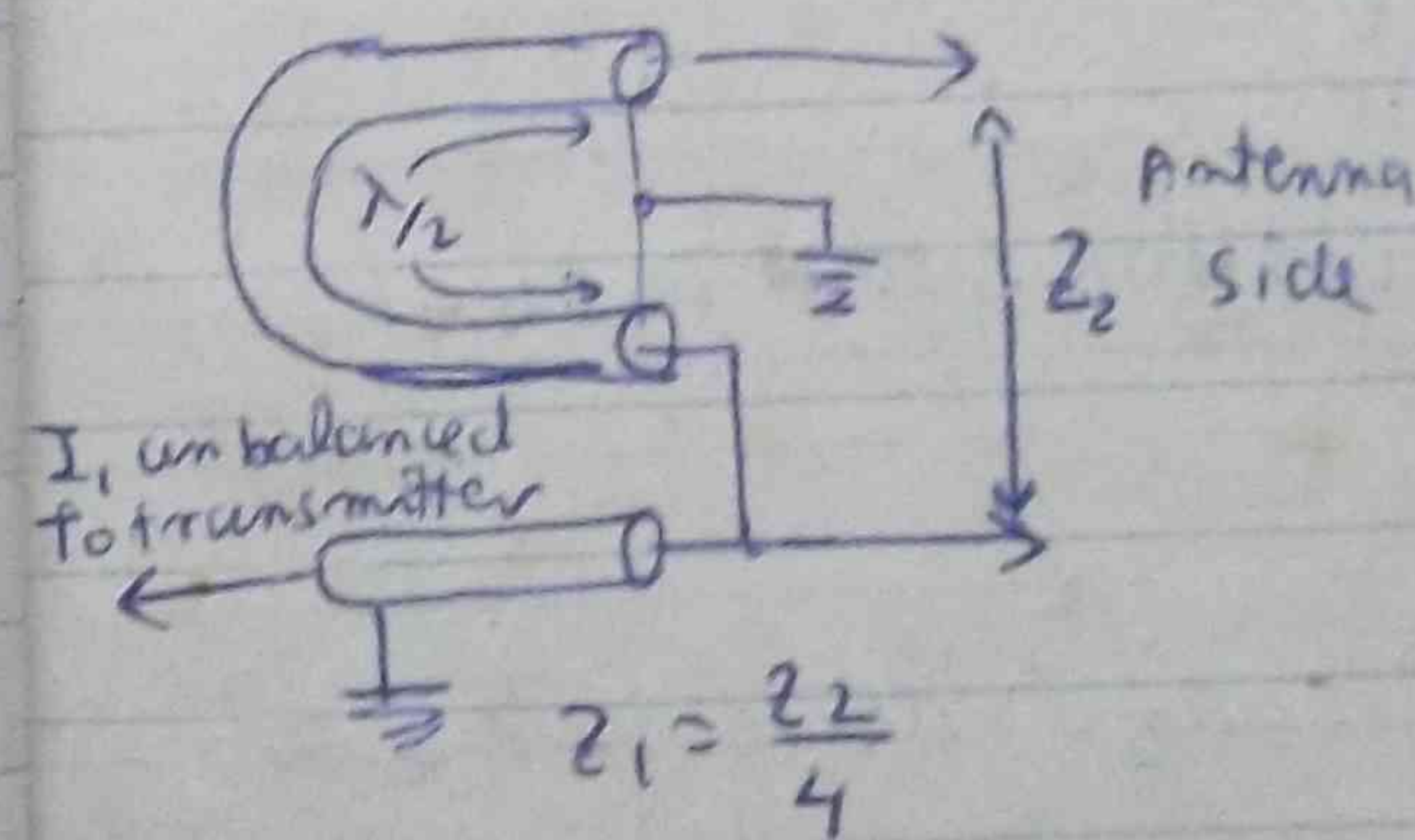
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PROPAGATION

V.H.F Transmission of Vertical Antennas
 ground wave, sky wave, surface wave, horizontal
 plane of all direction of radiation of surface wave
 vertical polarization of sky wave, surface wave
 of sky wave, surface wave, channel wave, mobile

Horizontal Array Directional Antenna
Direction noise floor
Horizontal System Ignition Noise
man made noise
signal to noise ratio
receiving polarization
of noise

Impedance matching



VHF operation ckt line
loss up: 10 dB. Antenna
system in: Line impedan-
-ce 50 Ω . Match $\Gamma = 0.02$
67. $\Gamma = 0.02$ 50 Ω to
50 Ω for open wire

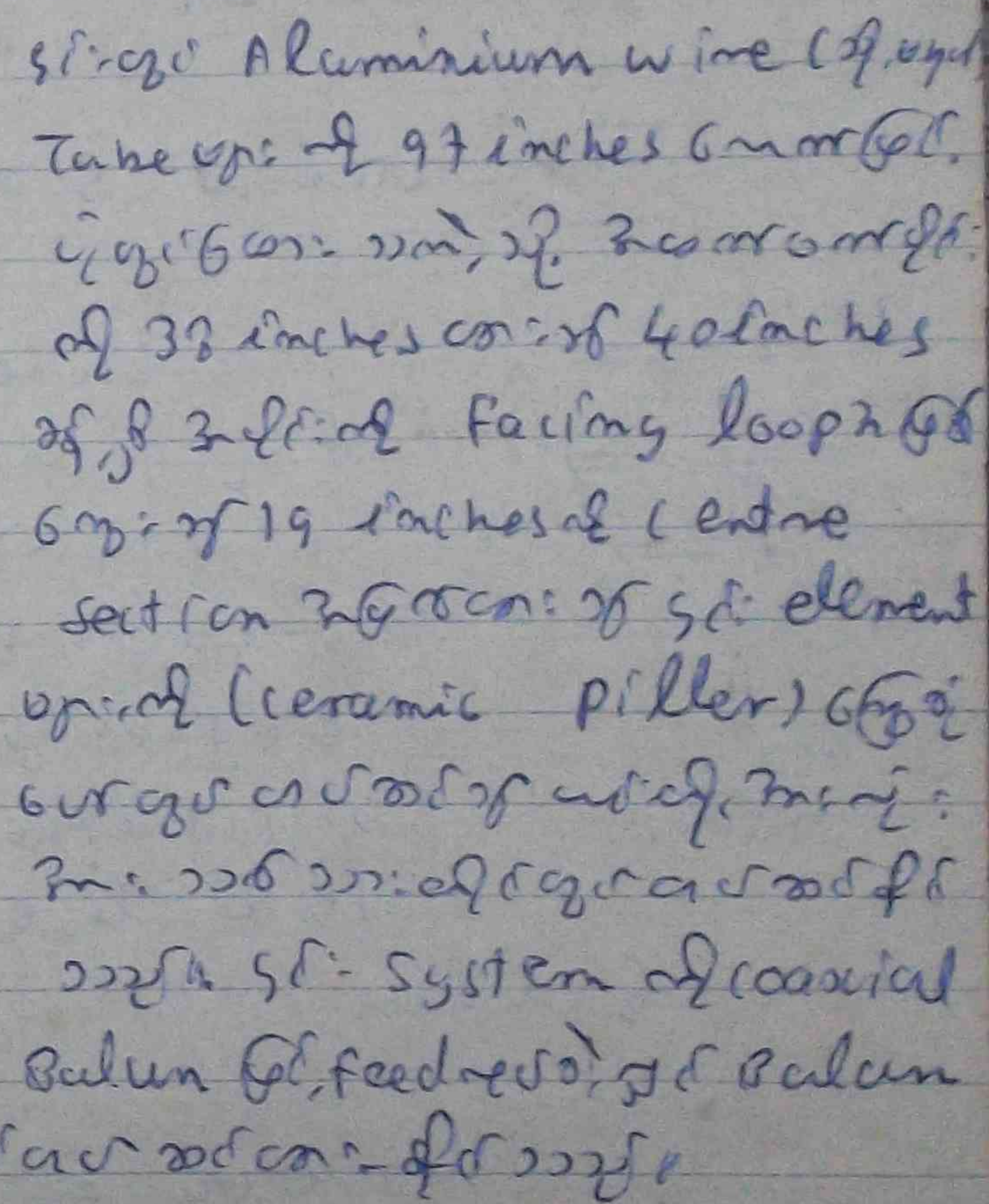
Line up of 0.5 in to 2 inch spacing for Transmissi
on line not 2: 60000 50-30000 insulated
flexible wire up of 2: 60000 50-30000

Antenna & line Impedance matching
System of Transmission line 1, 2, 3, 4, 5, 6
1, 2, 3, 4, 5, 6: T match, @ match, Delta match, & Gamma

CP
11-13-14

collinear for 144 MHz

उप: २००, २००, ६००: ७५००० matching ३०००००: ६५००००



Radiating or driving element

12"

0.15 λ

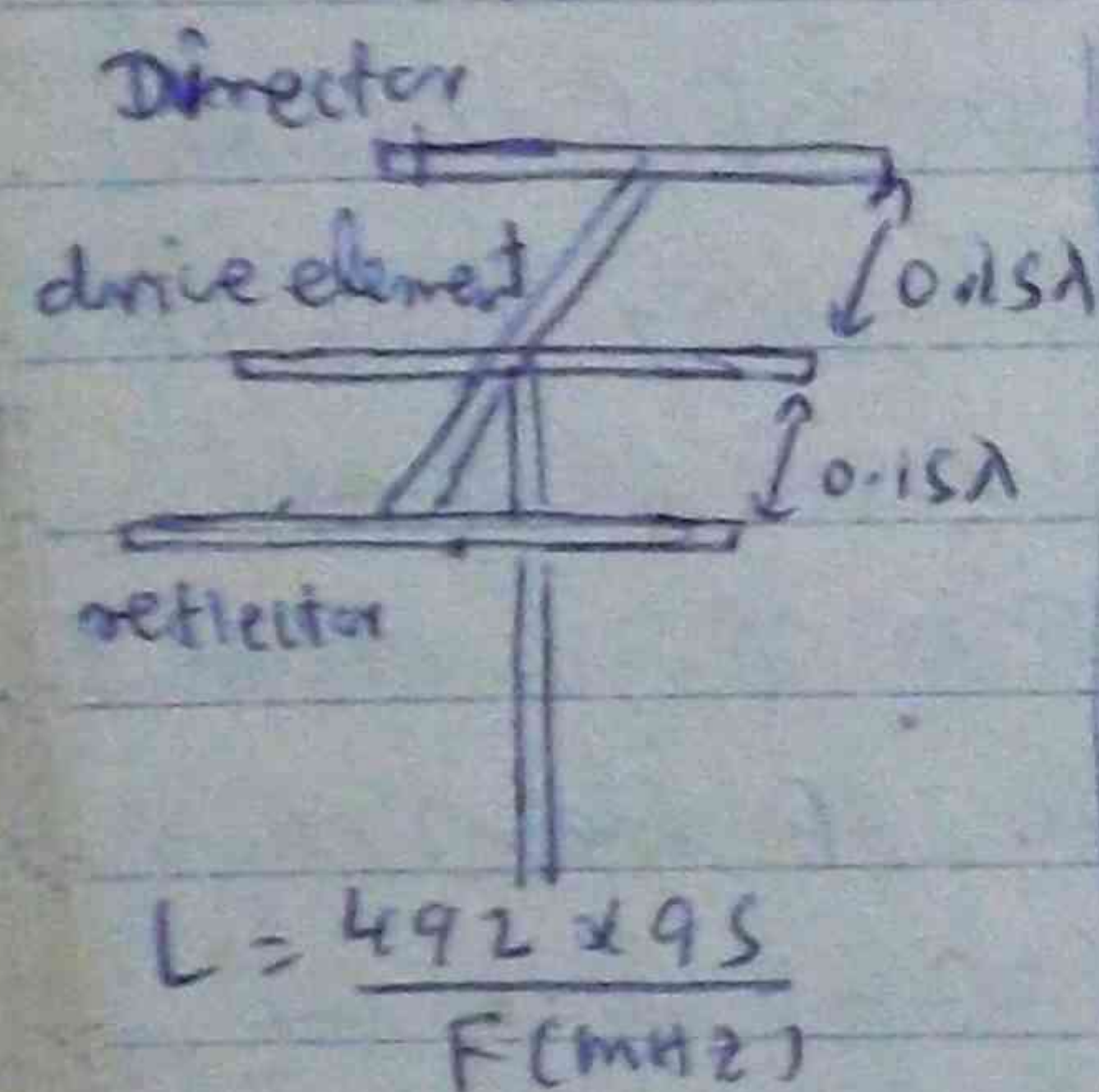
$\frac{1}{2} \lambda$

Parasitic element

Two element 50MHz parasitic
Array system of driving element
w/ 1/2" coaxial Feeder 200V Gamma
matched arm w/ 12" 50PF
variable condenser Q, tune w/ 200V

Parasitic Element Driving Antenna array
 0.15λ $\frac{1}{16}$ $\frac{1}{16}$ $\frac{1}{16}$

Three Element 50 MHz Array



50 MHz Element spacing $\frac{1}{16}$ inch of
 $\frac{1}{2}$ ϕ 1 inch from aluminium tube
 spaced at 1/16 inch. Parasitic: 60 MHz & 100 MHz
 0.15 λ of 1/16 inch. 0.15 λ of 1/16 inch
 Input Impedance 200 Ω of 1/16 inch
 Feeder line impedance 25 Ω coaxial

Line spacing Balun 1/16 inch of 1/16 inch of 1/16 inch

Wave Guides

Electromagnetic waveguide Transmitter
 of Hollow conductor Tube up: 1/16 inch of Hollow
 conductor tube up: 1/16 inch wave guide 1/16 inch UHF
 Microwave freq: up: 1/16 inch wave guide up: 1/16 inch
 Electrical Energy of Transmitter 1/16 inch of 1/16 inch
 Transmission Line 1/16 inch of 1/16 inch wave guide

Transverse Electric mode (TE)

Transverse Electric mode (TE)

Electric field wave guide of Axis of
 Transverse Electric wave guide of Axis of
 Electric field of Electric field of
 magnetic field of wave guide of Axis
 of Transverse Electric mode of
 mode of Transverse Electric mode of

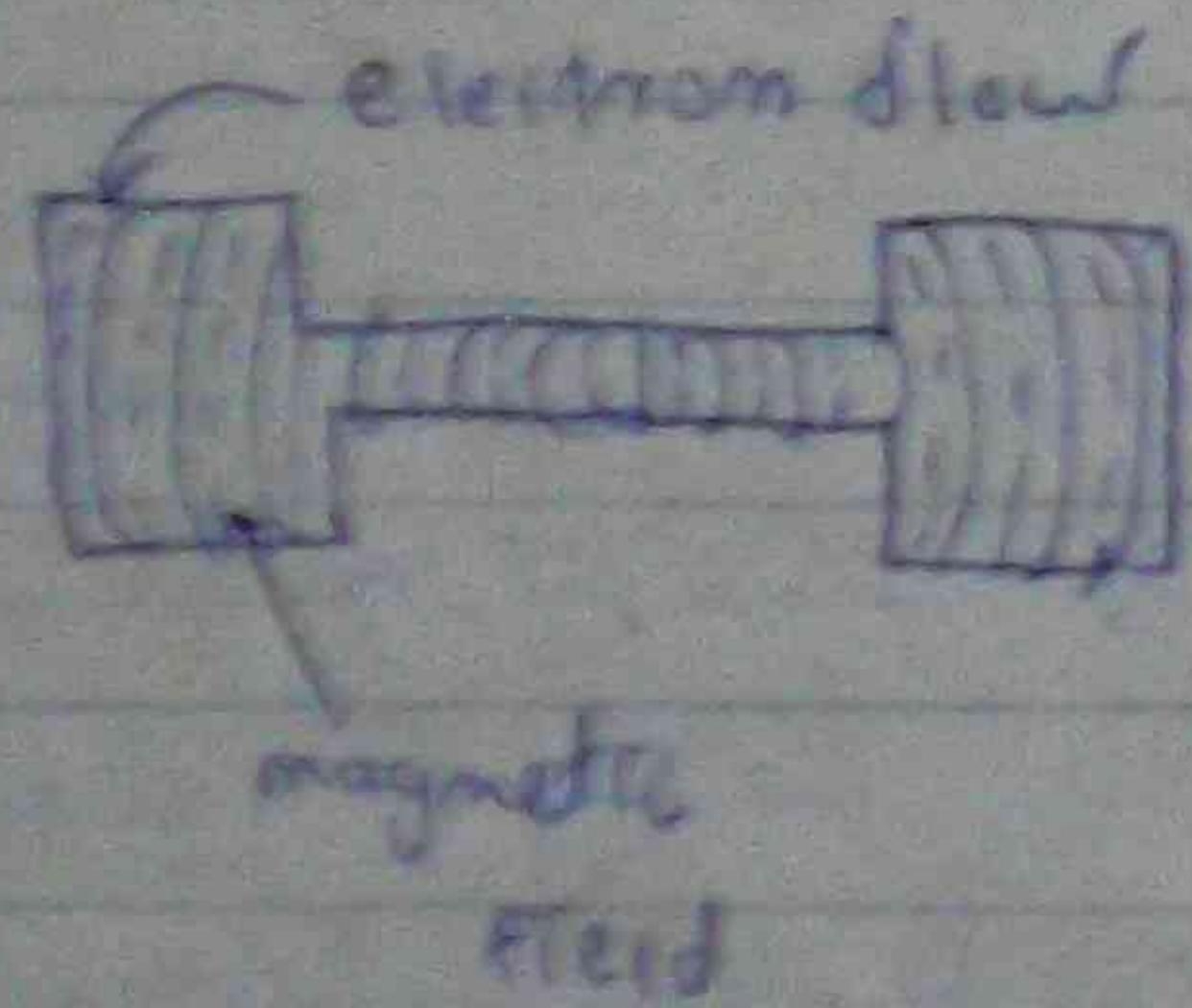
Transverse Magnetic mode (TM)

Electric field of Magnetic field of
 wave guide of Axis of
 wave guide of Axis of
 Transverse magnetic mode of
 Transverse magnetic mode of
 Transverse magnetic mode of

wave guide of
 Transmission Line of
 wave guide of
 wave guide of
 wave guide of

of all, also in high power: High Q, High Shunt Impedance
 High Q, High Shunt Impedance
 High Q, High Shunt Impedance

Cavity Resonator is a device which is used for
 high power, high frequency, high Q, High Shunt Impedance
 Cavity Resonator is a device which is used for
 high power, high frequency, high Q, High Shunt Impedance
 Cavity Resonator is a device which is used for
 high power, high frequency, high Q, High Shunt Impedance



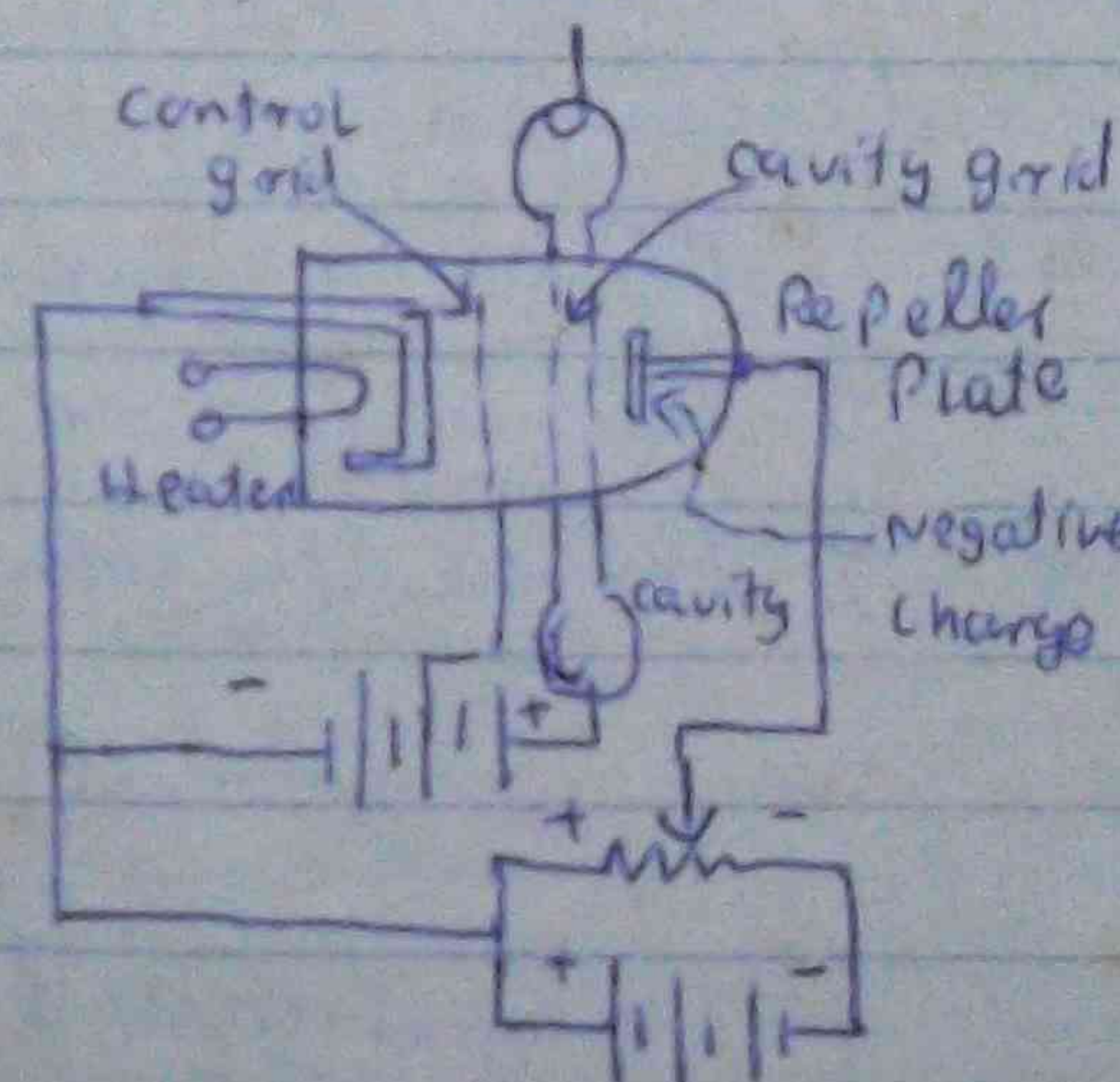
Electron beam is a stream of electrons moving in a vacuum tube. It is used in various applications such as cathode ray tubes, electron microscopes, and particle accelerators. The electron beam is generated by a cathode and is accelerated by an electric field. The magnetic field is used to focus the beam and prevent it from diverging.

Field of the electron beam is a stream of electrons moving in a vacuum tube. It is used in various applications such as cathode ray tubes, electron microscopes, and particle accelerators. The electron beam is generated by a cathode and is accelerated by an electric field. The magnetic field is used to focus the beam and prevent it from diverging.

UHF and Micro Wave Tube

Transit Time is the time taken by an electron to travel from the cathode to the anode. It is a critical parameter in the design of vacuum tubes, especially in the UHF and microwave regions. The transit time must be small compared to the period of the signal to ensure efficient operation.

Ulystron Tube

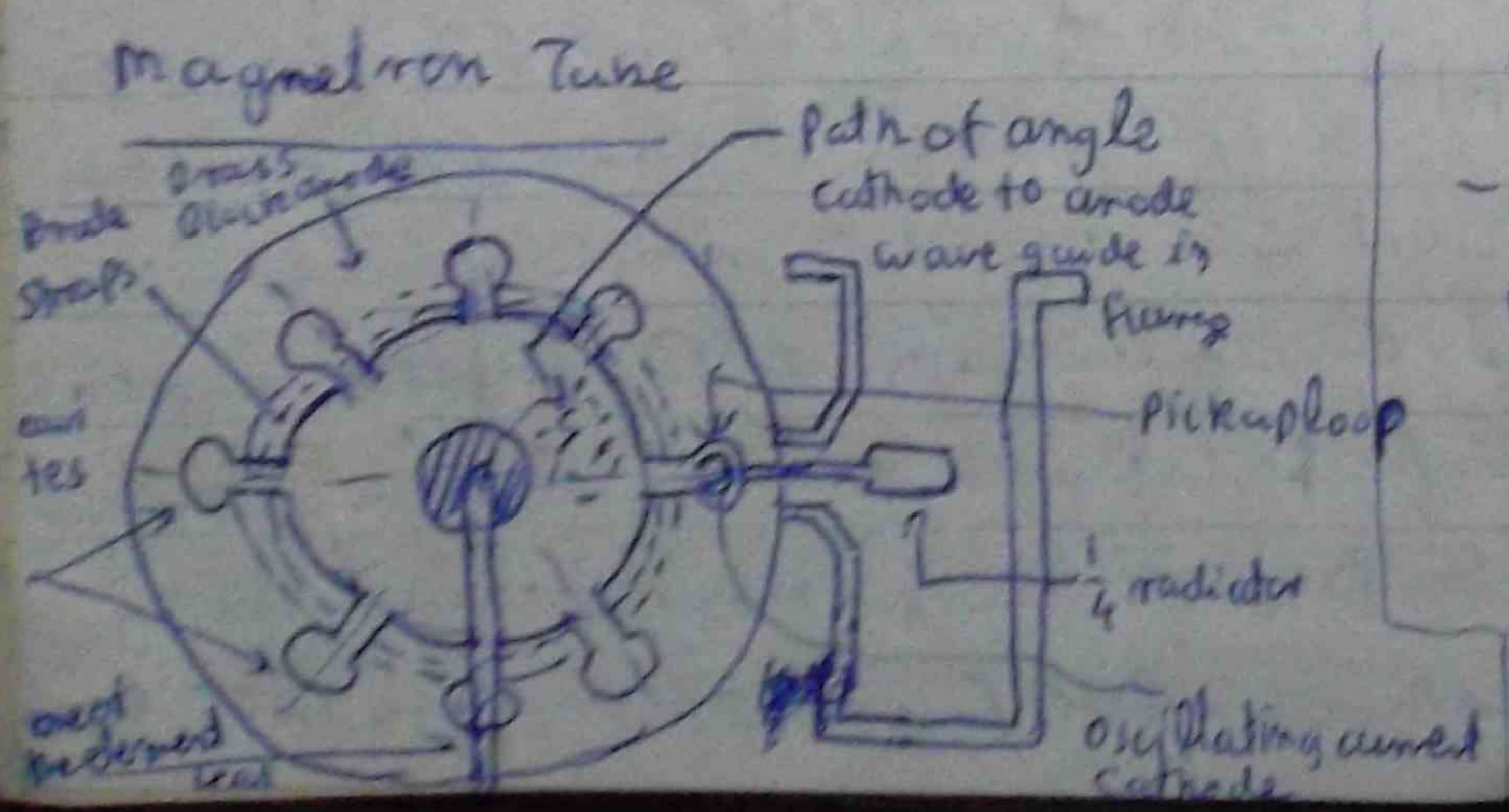


The Ulystron tube is a type of vacuum tube used in the UHF and microwave regions. It is a resonant circuit that consists of a cavity and a grid. The cavity is a resonant circuit that is used to store energy. The grid is a control element that is used to modulate the electron beam. The tube is used in various applications such as oscillators, amplifiers, and mixers.

The Ulystron tube is a type of vacuum tube used in the UHF and microwave regions. It is a resonant circuit that consists of a cavity and a grid. The cavity is a resonant circuit that is used to store energy. The grid is a control element that is used to modulate the electron beam. The tube is used in various applications such as oscillators, amplifiers, and mixers.

Oscillation occurs in cavity grid. Cathode is at negative potential. Repeller plate is at positive potential. Cavity grid is at intermediate potential. Electrons are emitted from cathode and pass through grid. They are then reflected by repeller plate. This causes them to oscillate in the cavity. The oscillation frequency is determined by the dimensions of the cavity. The output energy is taken from the cavity through a loop antenna.

Oscillating frequency is determined by the dimensions of the cavity. Repeller is at negative potential. Oscillation occurs in grid. Cathode is at negative potential. Repeller potential is positive. Output energy is taken from the cavity through a loop antenna. This is the principle of the reflex klystron.



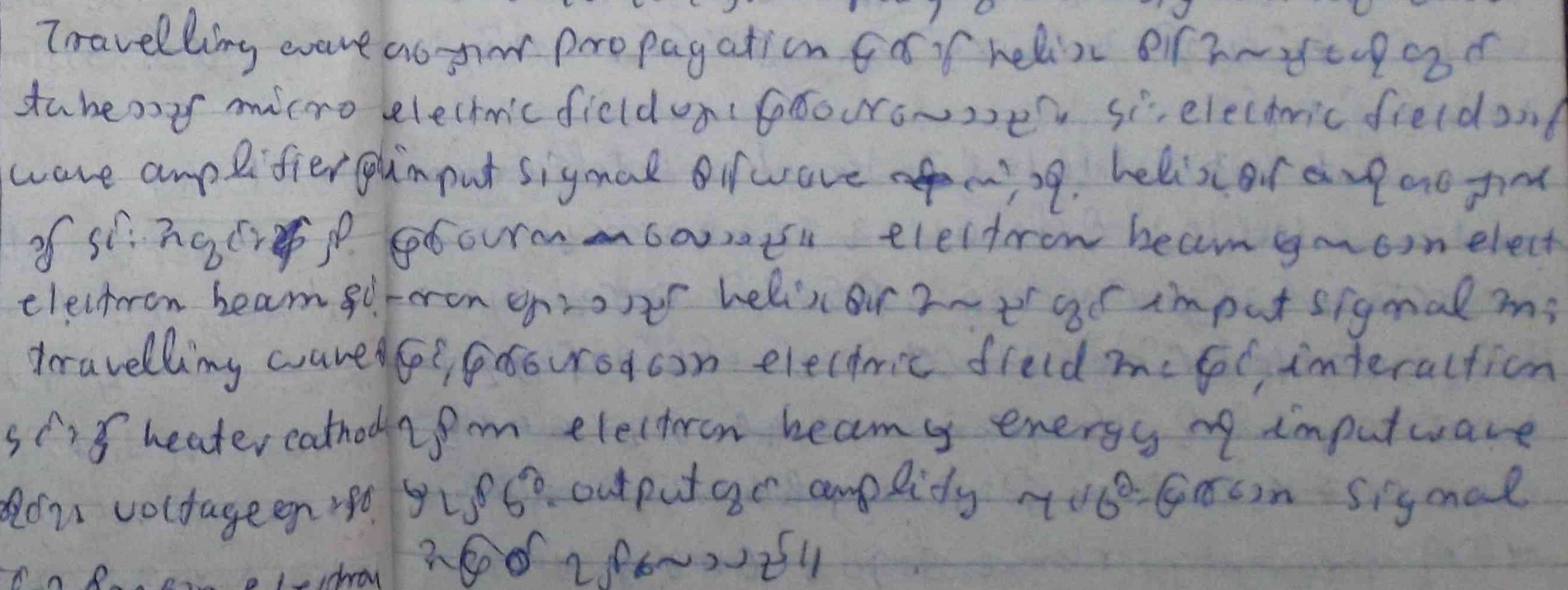
Magnetron oscillates at microwave frequency. Power is taken from the cavity through a loop antenna. This is the principle of the reflex klystron.

Dimensions: 2 1/2 inches. Cathode is at negative potential. Anode is at positive potential. Cavity is at intermediate potential. Electrons are emitted from cathode and pass through grid. They are then reflected by repeller plate. This causes them to oscillate in the cavity. The oscillation frequency is determined by the dimensions of the cavity. The output energy is taken from the cavity through a loop antenna.

operation

Heater of cathode is connected to a power source. Electrons are emitted from the cathode and pass through the grid. They are then reflected by the repeller plate. This causes them to oscillate in the cavity. The oscillation frequency is determined by the dimensions of the cavity. The output energy is taken from the cavity through a loop antenna.

20: 600V electron gun 20: collector & collector
 20: magnetic focusing coil of helix of 600V
 electron beam 20: helix of 200V of 0.5 of 600V
 20: 600V focusing coil 20: and 20: of 600V signal
 20: helix of 20 input of 20: of amp 20: of 60-60
 20: signal of helix of 20: of 20: of 20: output 20
 20: waveguide of 20: input & output terminal of 20
 20: waveguide of 20: of 20: of 20: of 20: of 20: of 20
 20: of amp 20: of 20: of 20: of 20: of 20: of 20
 20: freq: of 20: of 20: of 20: of 20: of 20: of 20

[illegible]

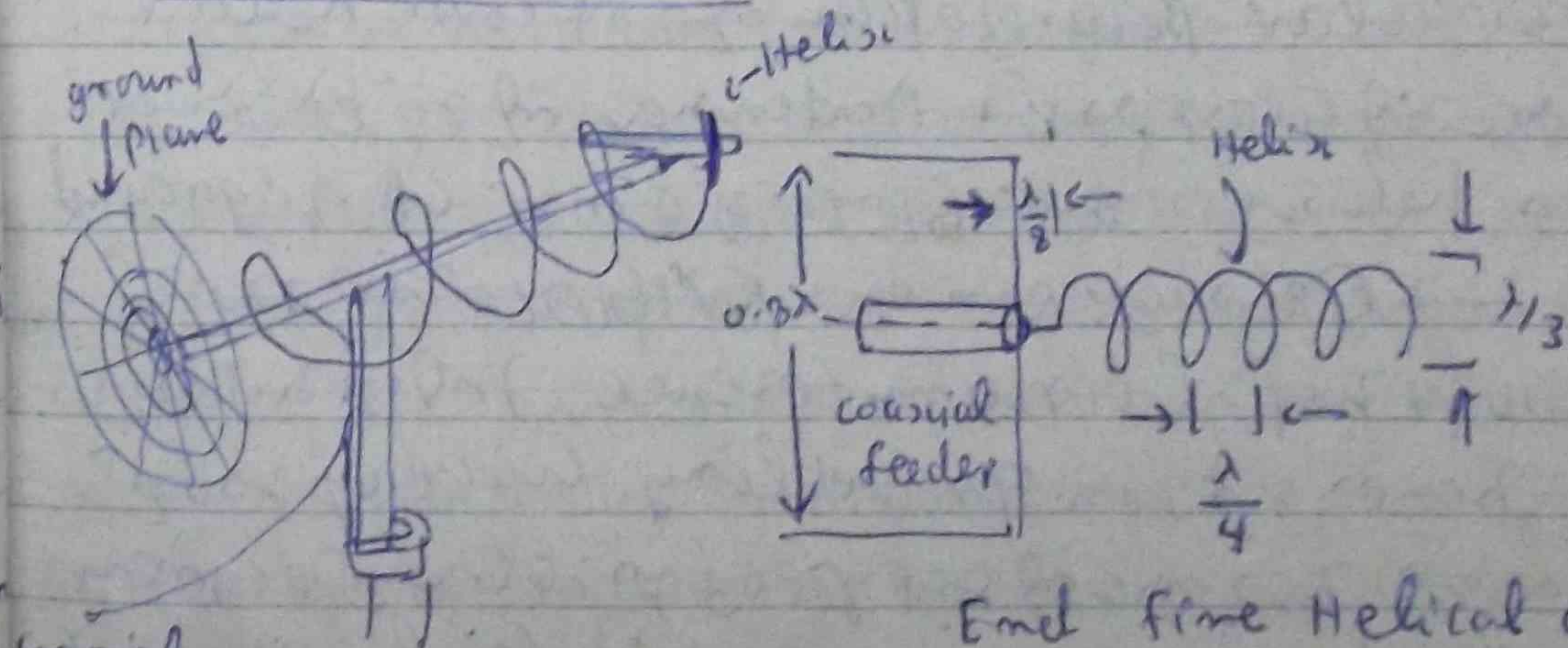
1. The first part of the paper is devoted to the study of the properties of the function $f(x)$ defined by the equation

microwave Technique and satellite communication system

[illegible][illegible][illegible]

Micro Wave Antennas

Helical Antenna



End fire Helical antenna

Radio wave propagation through ionosphere of earth, its
reflection, refraction & total internal reflection polarization
of EM waves, Faraday effect, Faraday rotation.

[illegible][illegible]

612038
 1/2 (2) 205 broad band VHF 50. 4HF frequency
 rectangular polarization of 284600 helical
 antenna of 5000 0000 Antenna of 20 60 000
 0000 helical 0000 6170 0000 60 0000
 Plane - 284600 0000 6170 0000 60 0000
 helical 0000: Circumference 700 0000
 284600: 0000: 0000 Travelling wave 0000
 helical 0000: 0000 0000 0000 0000
 0000 radiant 0000 0000 0000 0000
 wave 0000 end line array antenna 0000, of
 direction of 284600 0000

[illegible]

RADAR EQUATION

d = distant to target

S = equivalent cross sectional area of target

P_T = Peak transmitter power

P_R = Peak echo power absorbed by receiving antenna

G_T = Power gain of transmitter antenna relative to isotropic radiation (having the same properties in all direction)

G_R = Power gain of receiving antenna relative to isotropic radiation

λ = wave length

A = capture area of receiving antenna

A_0 = aperture area of receiving antenna

$$\boxed{E = A/A_0} \quad (a = \text{constant}) \quad \begin{array}{l} 0.65 \text{ for parabolic} \\ \text{antenna} \\ 0.9 \text{ for mattress} \end{array}$$

Consistent unit of length and power antenna

must be used. The equivalent power in the direction of the beam is, $P_T G_T$, while

the surface area of the sphere of the radius

$$d \text{ is } 4\pi d^2$$

$$\text{Power per unit area of Target} = \frac{P_T G_T}{4\pi d^2} \quad \text{--- (i)}$$

The echo power per unit area of wave front at the radar receiver is as following equations.

$$\text{Echo power per unit area of target} = \frac{P_T G_T}{4\pi d^2} \times S \times \frac{1}{4\pi d^2} \quad \text{--- (ii)}$$

The power ~~per unit~~ delivered to the receiving system is this power density multiplied by capture area A of the receiving antenna.

$$\text{received power} = \frac{P_T G_T S \times A}{(4\pi)^2 d^4} \quad \text{--- (iii)}$$

$$G_R = 4\pi \times \frac{A}{\lambda^2} = \frac{4\pi \kappa A_0}{\lambda^2} \quad \text{--- (iv)}$$

$$A = \frac{G_R \lambda^2}{4\pi}$$

When the same antenna is used for receiving and transmission,

$$G_R = G_T$$

$$\therefore P_R = \frac{P_T G_R^2 \lambda^2 S}{(4\pi)^3 d^4} = \frac{P_T S \kappa^2 A_0^2}{4\pi \lambda^2 d^4} \quad \text{--- (v)}$$

If P_R = the minimum value of the available received power

$$d_{max} = \sqrt[4]{\frac{P_T G_R^2 \lambda^2 S}{(4\pi)^3 P_{R \min}}}$$

$$d_{max} = \sqrt[4]{\frac{P_T S K^2 A_0^2}{4\pi \lambda^2 P_{R \min}}} \text{ --- (W)}$$

① Radar or Radar Transmitted power is 250 kW peak of 6. Receiving Antenna or gain is 2000. Target or cross sectional Area is 12.5 sq meter. $\lambda = 10 \text{ cm}$ or 0.1 m. Received power is 1×10^{-13} watt. For max Range of power (in kilometers) is to find.

$$P_T = 250 \text{ kW}, S = 12.5 \text{ sq meter},$$

$$P_R = 1 \times 10^{-13} \text{ watt}, \lambda = 10 \text{ cm} = 0.1 \text{ meter}$$

$$G_R = 2000$$

$$d_{max} = \sqrt[4]{\frac{P_T G_R^2 \lambda^2 S}{(4\pi)^3 P_{R \min}}}$$

$$1 \text{ mile} = 1.6 \text{ Kilometer}$$

$$= \sqrt[4]{\frac{250 \times 10^3 \times (2000)^2 \times (0.1)^2 \times 12.5}{(4\pi)^3 \times 1 \times 10^{-13}}}$$

② Radar or Radar Transmitted power is 250 kW peak of 6. Receiving Antenna or gain is 2000. Target or cross sectional Area is 12.5 sq meter. $\lambda = 10 \text{ cm}$ or 0.1 m. Received power is 1×10^{-13} watt. For max Range of power (in kilometers) is to find.

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$$P_T = 250 \text{ kW}, G_R = 2000, \lambda = 10 \text{ cm} = 0.1 \text{ m}$$

radar or radar Transmitted power is 250 kW peak of 6. Receiving Antenna or gain is 2000.

$$S = 12.5 \text{ sq meter}, \lambda = 10 \text{ cm} = 0.1 \text{ m}$$

$$\therefore \text{Radar or radar Transmitted power} = \sqrt{(5.68)^2 + (30)^2} = 30.5 \text{ miles}$$

$$= 49.6 \text{ km meter}$$

$$P_R = \frac{P_T G_R^2 \lambda^2 S}{(4\pi)^3 d^4}$$

$$= \frac{250 \times 10^3 \times (2000)^2 \times (0.1)^2 \times 12.5}{(4\pi)^3 (49.6 \times 10^3)^4}$$

RADAR PERFORMANCE FACTORS

Equation 5 of (6), (7) & (8) range of (9), (10) or (11) form
received power group (12) (received power is universal
proportional to the fourth power of the range)

[illegible]

power and freq: used in Radar.

Radar transmitter avg output power & peak power
avg pulse width & duty cycle
output pulse voltage & current
range 100mHz to 2500mHz

Duty Cycle

The fraction of time, the radar transmitter is generating pulse power, is termed the duty cycle.

[illegible]

2000 - Radar max 1 sec pulse w. of 1000 pulse/sec
of, carrying out of 500 500 duty cycles

$$1 \times 10^{-6} \times 1000 = 0.001 \text{ sec}$$

$\therefore 0.001 \text{ sec}$ is duty cycle voltage

Radar at an average power of duty cycle $\frac{1}{2}$ peak power of 0.016 W m² of $\frac{1}{2}$ of 2800 Hz

Therefore -- Average power = duty cycle \times Peak power
of a G.T. Peak power 500 kW for radar or 200 W average
power \times 2000 ms duty cycle \approx 200 W for 500 W.

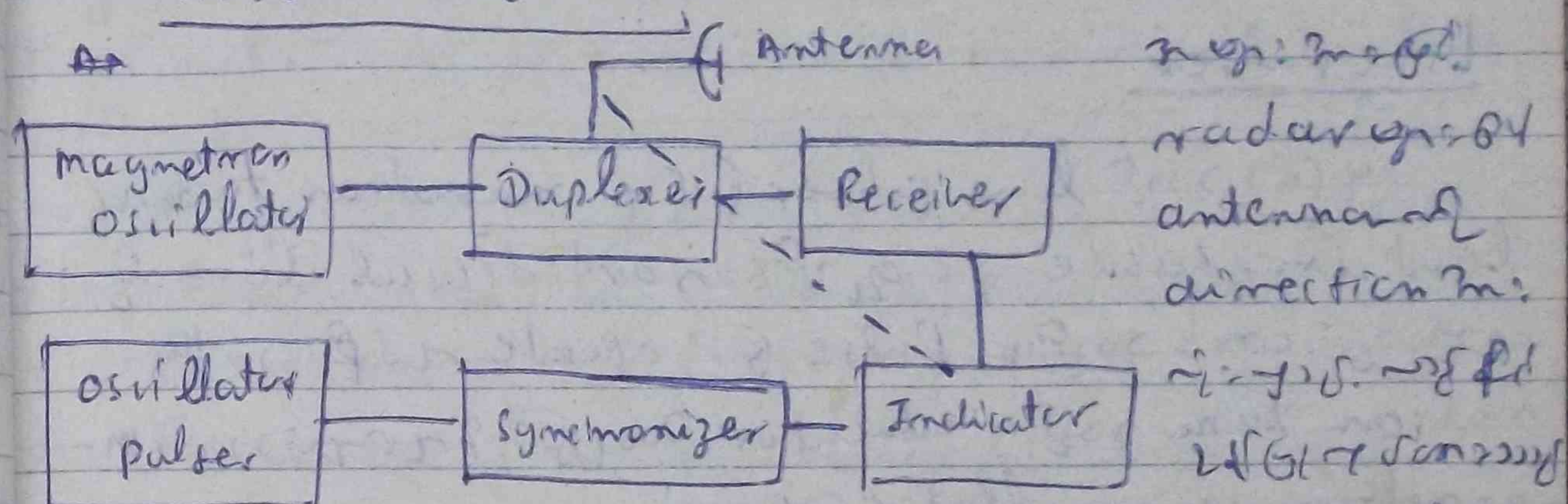
Average power = $0.001 \times 500 \times 10^3 = 500 \text{ W}$.

RADAR TRANSMITTING SYSTEM

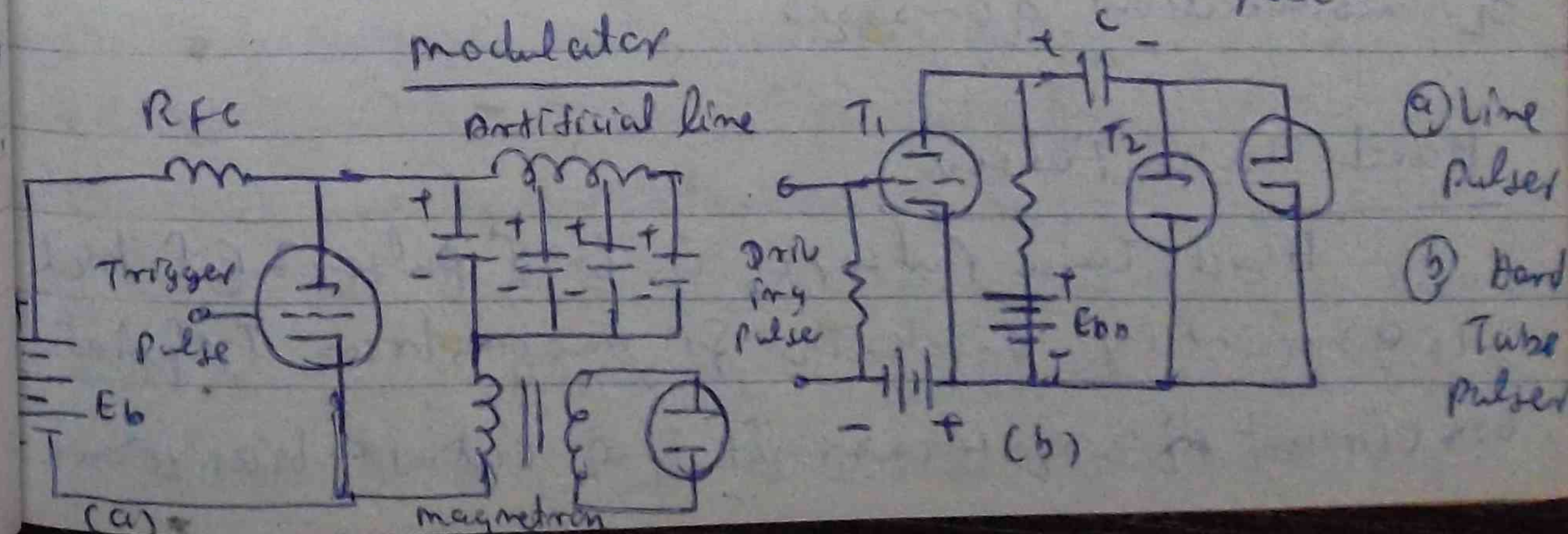
[illegible]

பெரும்பாலும் பெரும்பாலும், அங்கு: உட்புறம்

ANTENNA ROTATOR



of 6" x 6", non screen or magnetic deflection coil of 1/2" x 1/2" x 1/2", target 1/2" x 1/2" x 1/2". direction 1/2" x 1/2" x 1/2".
of 1/2" x 1/2" x 1/2" of 1/2" x 1/2" x 1/2"; and 1/2" x 1/2" x 1/2" of 1/2" x 1/2" x 1/2".
Position Indicator (PPI) 1/2" x 1/2" x 1/2". Target 1/2" x 1/2" x 1/2".
1/2" x 1/2" x 1/2". 1/2" x 1/2" x 1/2". 1/2" x 1/2" x 1/2".
1/2" x 1/2" x 1/2". of pulse Repetition Rate (PRR) 1/2" x 1/2" x 1/2".
1/2" x 1/2" x 1/2". 1/2" x 1/2" x 1/2". 1/2" x 1/2" x 1/2".



2. If on: on modulator just goes on
(1) line pulser (2) hard tune pulser of 100%

Line pulser

4 (a) 1000 line pulser 600 magnetron tube 80
load impedance 50, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000
1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10000
magnetron tube 1000 modulator 200, 300, 400, 500, 600, 700, 800, 900, 1000
magnetron 1000 oscillator 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10000

Theatron output of pulse width
of 500 ns. Line of charge of 2000
Synchronizer pulses of theatron output of 2000
600 ns. Theatron conduct of line of charge of
50, 60, 2000. voltage of discharge of 2000
of 20, 40, discharge of 2000. magnetron oscillator
of modulation of 2000

Hard Tube Pulser

Hard Tube Pulsed cold cathode triode
To ground w/ diode to fit magnetron T₃ of class
on circuit of 2nd Blomington T₁ & cutoff biasatron.

1. In grid of synchronizer pulse is applied
 conduct when the pulse is high resistance
 R of diode is zero, and charge is zero. Diode is
 a charge and charging path is zero. When
 the pulse is high magnetron tube is at plate
 negative potential for conduction and it oscillates
 when the pulse is high. The pulse is applied to
 tube conduct and discharge is zero. The pulse
 magnetron or anode is large positive potential
 and it oscillates output pulse of 200-300
 V. It is equivalent circuit of figure 1.

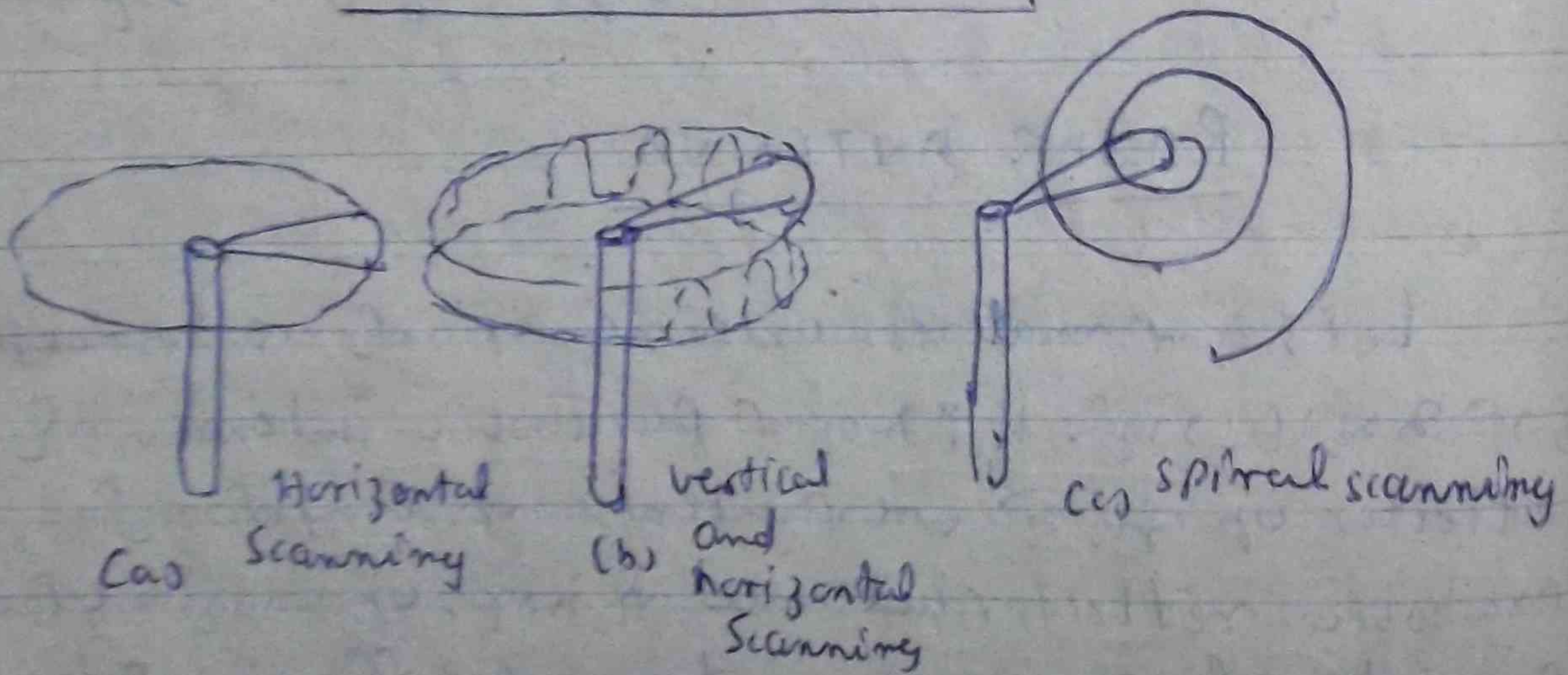
RADAR ANTENNA

1. Effect of mattress antenna up & reflector
of 2nd: 6.000. AF 2nd Parabolic antenna of
reflector up & of antenna up: 6.000
Parabolic reflector antenna of 2nd: up & 6.000
of rotational parabolic antenna & 6.000 Antenna
of directive gain up & 2nd: 6.000 wave length
of 2nd: 6.000 physical size of 2nd: 6.000

Q. 6.6. LF & physical size Q. of HF & physical size
size Q. of HF & physical size Q. of HF & physical size
Q. of HF & physical size Q. of HF & physical size
Q. of HF & physical size Q. of HF & physical size
Q. of HF & physical size Q. of HF & physical size

Directive beam of minor lobes on: 1st of 2
 2nd of 2 minor lobes, 3rd of 2 target of 2, 4th of 2 minor
 lobes on: 1st of 2, 2nd of 2 echo pulse 3rd of 2 minor lobes
 4th of 2, 2nd of 2 echo pulse on: 1st of 2, 2nd of 2 screen of 2 of 2
 3rd of 2, 4th of 2 indication on: 1st of 2, 2nd of 2

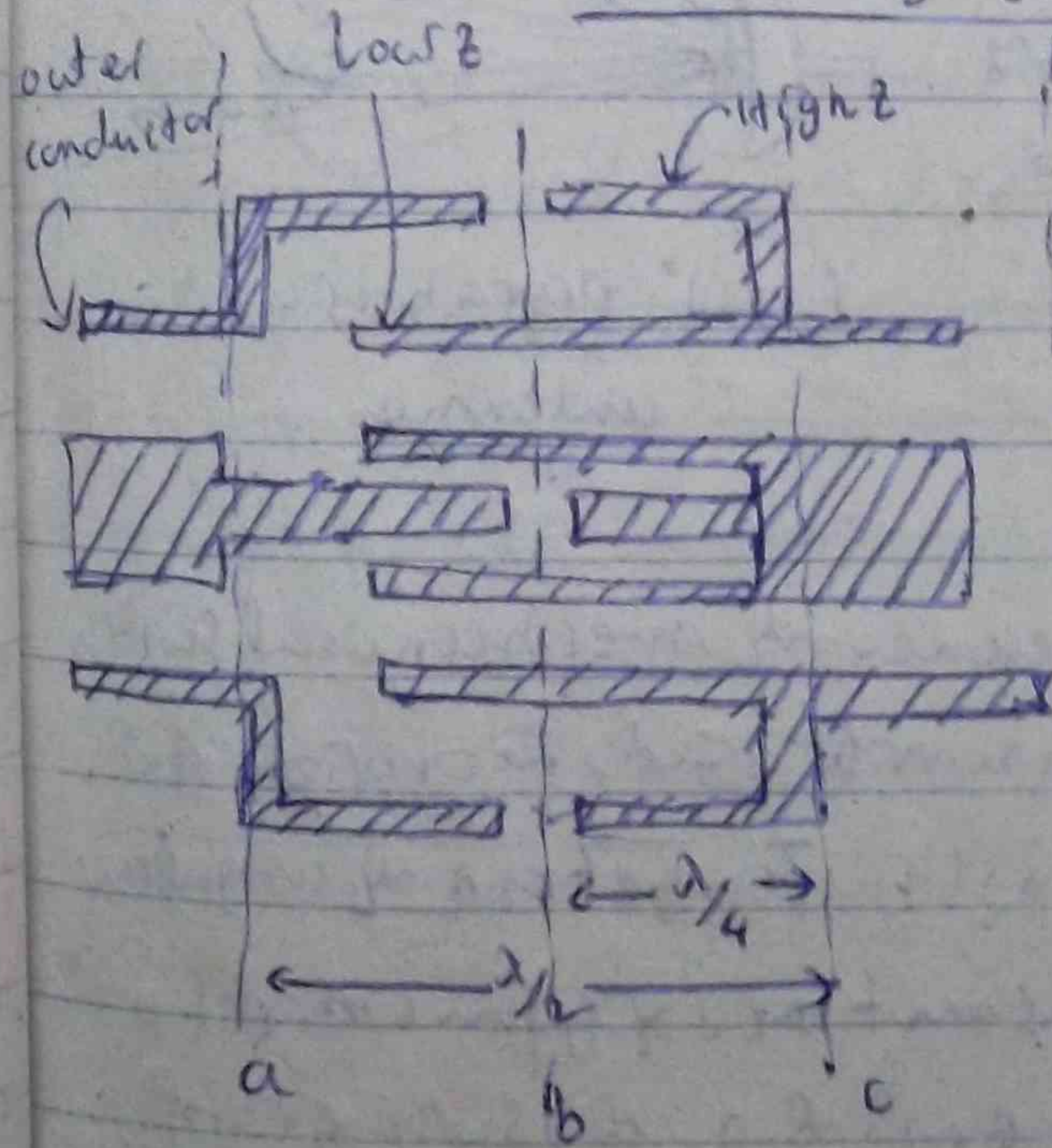
ANTENNA SCANNING



Radar system is a system of antennas beam point
up to 3000 m high to 6000 m high and 1000 m high and 1000 m high

Scanning 4600 5000 5500 6000 general search
(or) navigational 2000 3000 4000 5000 scanning
antennas 5000 vertical axis 6000 7000 8000 9000
of vertical axis 1000 2000 3000 4000 5000 6000
rock motion 7000 8000 height finder 9000 10000
4600 5000 5500 6000 solid angle searching
2000 spiral scanning 3000 4000 5000 6000 hori-
zontal 7000 vertical direction 8000 9000 10000
up

Rotating Joint

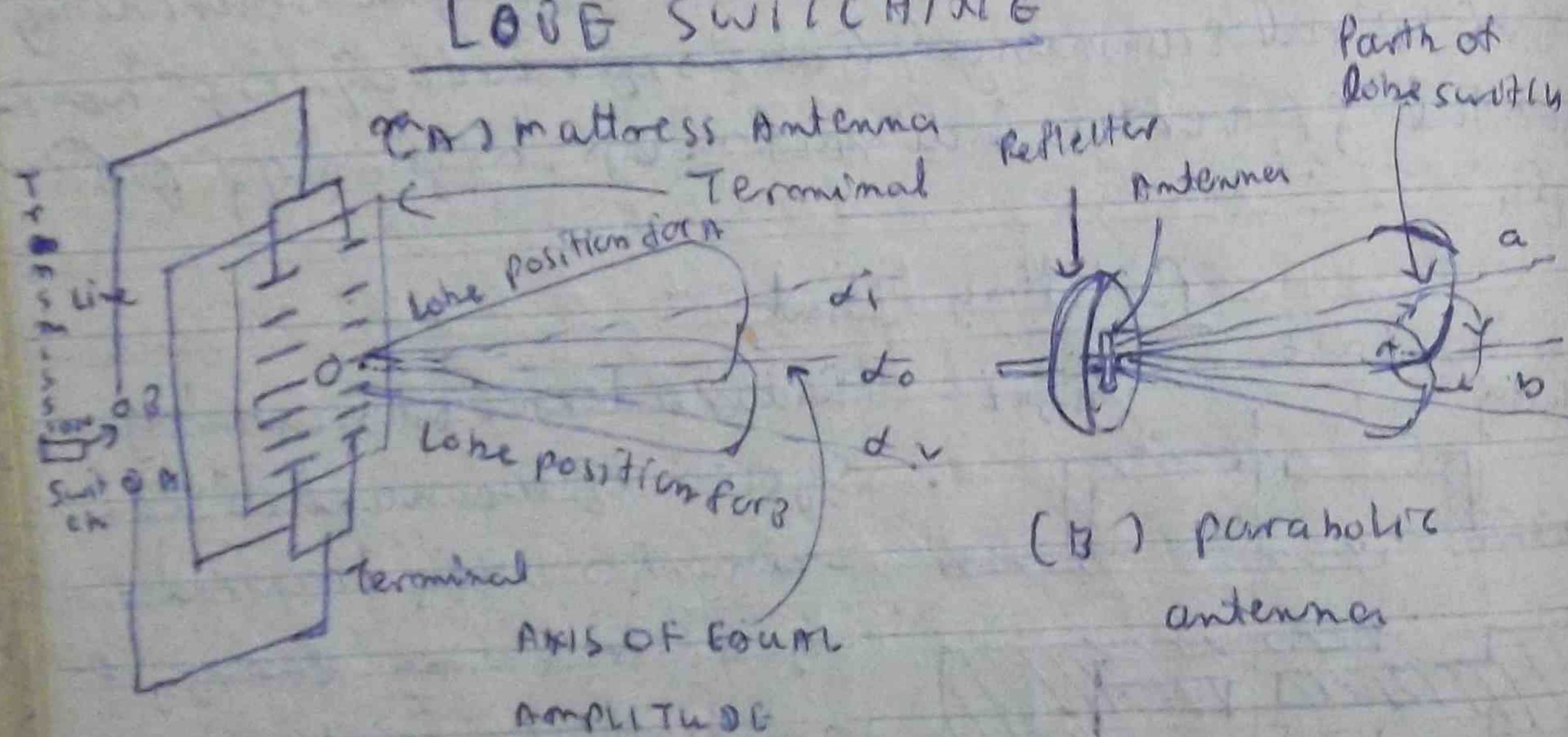


Radar antenna or scanning system of mechanical scanning of i.e. transmission & receiving energy of rotating joint of a rod.
For example: sliding contact of i.e. of a choke joint of i.e. of a gap a outer conductor of i.e. of current of

low z short circuit not necessary

C of $\lambda/2$ impedance of feed line is ∞ at the gap between
 two C of $\lambda/4$ impedance. high impedance at the gap
 centre conductor of the C of $\lambda/4$ is shorted to the
 common return of the C of $\lambda/2$. no electrical contact at the
 gap between the two C of $\lambda/4$ is shorted to the common return

LOBE SWITCHING

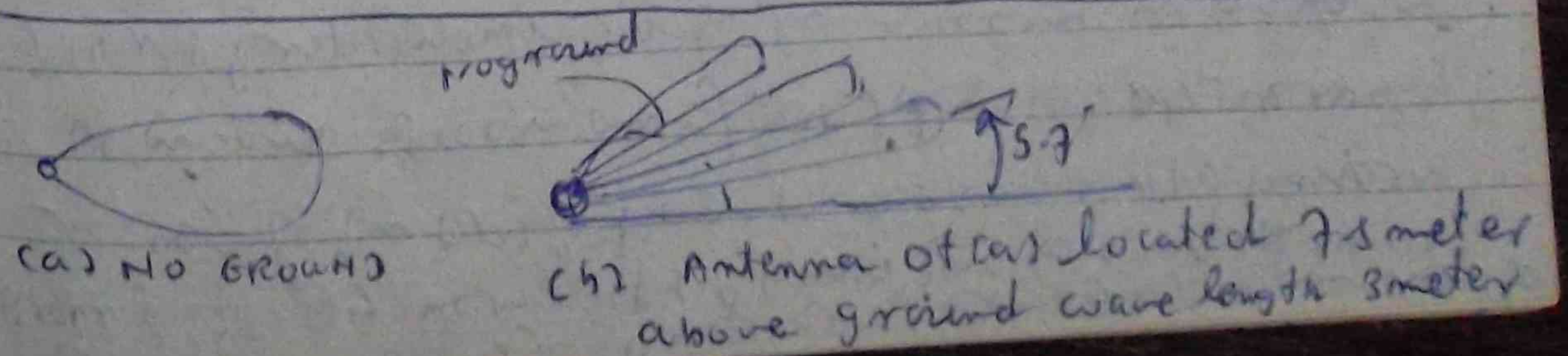


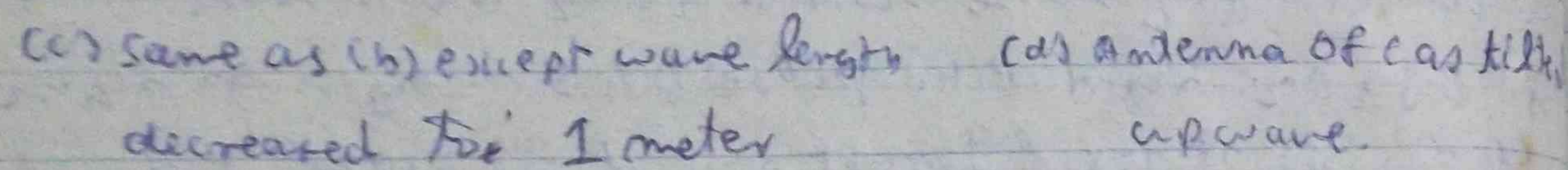
(A) is a mechanical switch of the feeder line in the common ground. The switch can be moved to the lobe position 1 or 2. Target at angular direction of beam of transmit will give an echo pulse of the same strength. The lobe switching will switch the beam of transmit to the lobe position 2. The switch will switch the beam of transmit to the lobe position 1.

(B) is a directional lobe switch. The target at angular position will give an echo pulse of strength proportional to the square of the distance of the target. The lobe switching will switch the beam of transmit to the lobe position 1 or 2. The switch will switch the beam of transmit to the lobe position 1. The target at angular position will give an echo pulse of strength proportional to the square of the distance of the target.

(C) is a scanning antenna of parabolic reflector at focal point of the reflector. The axis of symmetry of the reflector is at the axis of the pulse repetition rate. The spiral scan of the reflector will give horizontal and vertical measurement of the target.

EFFECT OF GROUND ON RADAR ANTENNA CHARACTERISTICS





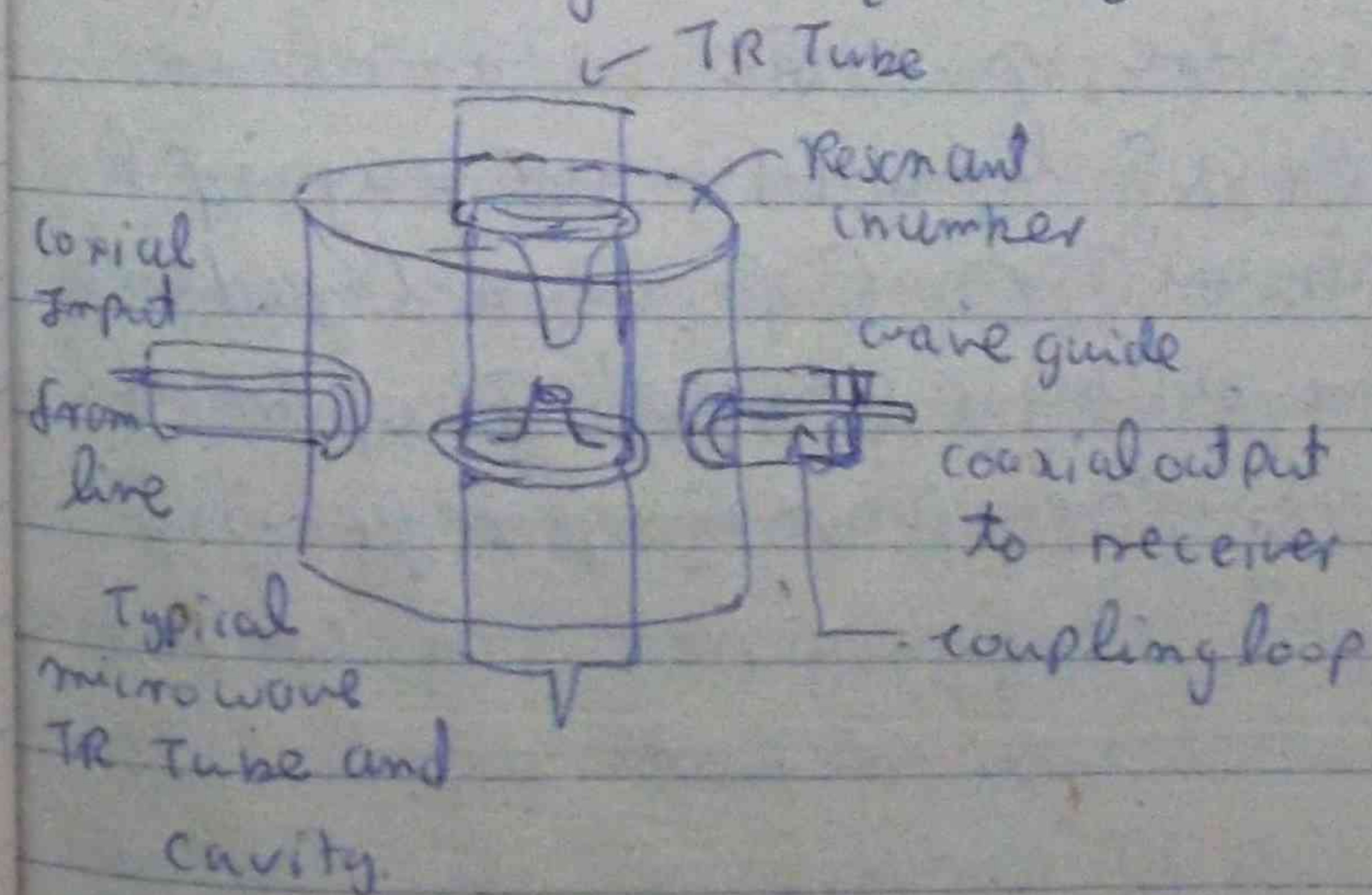
Radar antenna is a type of antenna which is used for the purpose of detecting the presence of objects in the air or on the ground. It is a directional antenna which means it is designed to receive or transmit signals in a specific direction. The radar antenna is used to detect the presence of objects in the air or on the ground by sending out a signal and receiving the reflected signal. The reflected signal is then processed to determine the location and speed of the object. The radar antenna is used in a variety of applications, including air traffic control, weather forecasting, and military operations. The radar antenna is a key component of the radar system and is responsible for the detection and tracking of objects in the air or on the ground.

δ^0 , δ^1 , δ^2 : mitom δ^0 , δ^1 , δ^2 : target δ^0 , δ^1 , δ^2 : detection
 δ^0 , δ^1 , δ^2 : δ^0 , δ^1 , δ^2

THE DUPLEXER (TR TUBE)

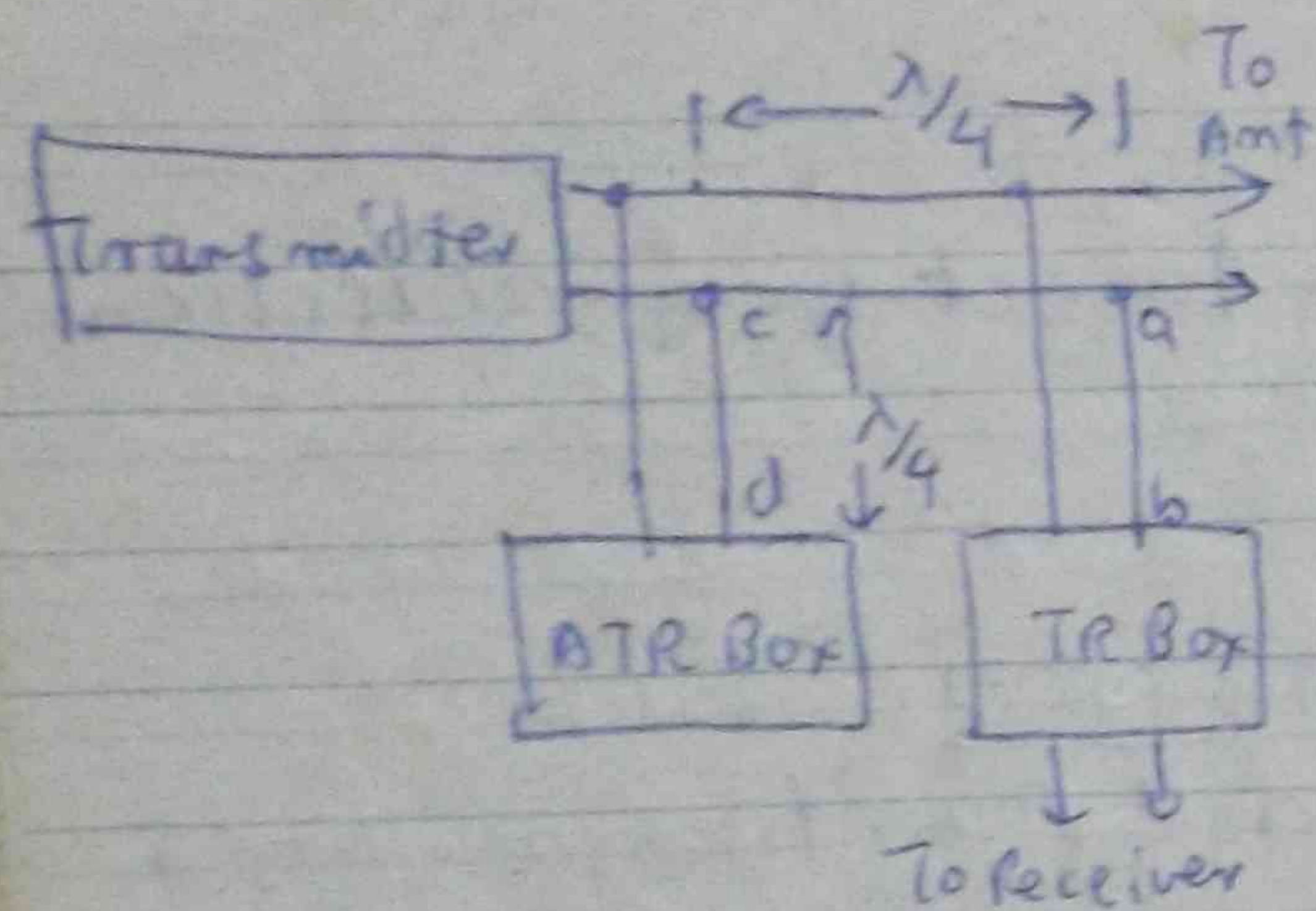
Duplexer is antenna and transmitting & receiving of signal. It is a RF switch system for antenna, transmit, receive box (TR box) and antenna.

Fig. 3. Second TR box of GOR 6 cm: 225, resonant cavity chamber, cold cathode tube or: 225, tube 225, 225, low pressure gas of 225, 225, high power transmitting,



pulse RF energy to:
 (f) gas ionization
 - on Gamshart (let
 750 mV of 20)
 input & output of
 energy transmission
 of gas or gas
 tube & energy from

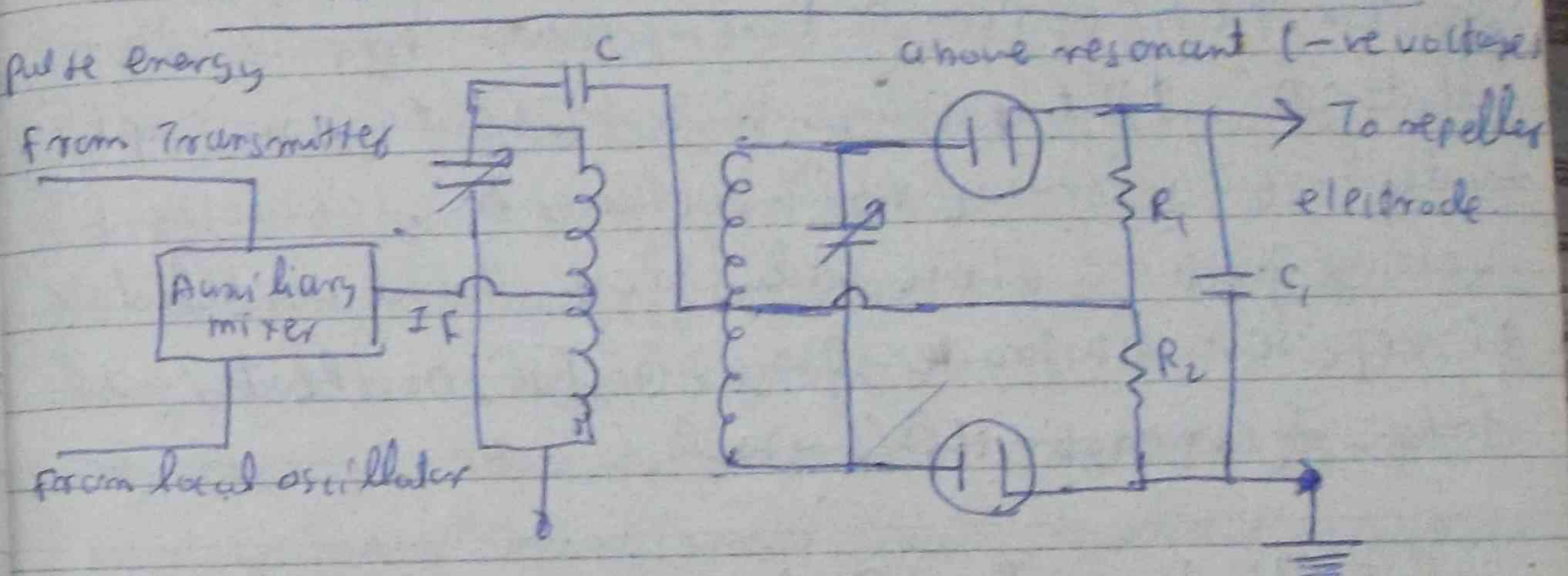
2nd resonant cavity w/ π , 1st resonant for pass
through of signal ATR box w/ π for 1st TR box
2nd output w/ 6311



is a duplexer of 600 ohms
transmitter output and 20
ohms of ATR & TR
box. TR box is a combination of
600 ohms. Short circuit: 600 ohms
of 600 ohms transmitter

At operation of 600 ohms, 600 ohms, 600 ohms ATR & TR box
up: 600 ohms line is $\lambda/4$ wave length impedance of 600 ohms, not
pulse on: 600 ohms high impedance of 600 ohms, TR box
is receiver of output of 600 ohms. 600 ohms of 600 ohms of
transmitter output of 600 ohms ATR & TR box up: 600 ohms
is a combination of 600 ohms pulse up: 600 ohms of 600 ohms
is a 600 ohms open 600 ohms of 600 ohms line of 600 ohms of 600 ohms
impedance of 600 ohms: transmitter not of high impedance
of 600 ohms of 600 ohms line of 600 ohms of 600 ohms. 600 ohms of
600 ohms echo energy up: 600 ohms of 600 ohms of 600 ohms

AUTOMATIC FREQ. CONTROL CIRCUIT (A.F.C.)



Radar system of receiver of IF of 600 ohms transmitted
freq: 600 ohms percentage of 600 ohms of 600 ohms, local
oscillator of 600 ohms of IF amplifier of 600 ohms: band
width of 600 ohms of 600 ohms of 600 ohms of 600 ohms
automatic control circuit of 600 ohms of 600 ohms

Because A.F.C. circuit of 600 ohms of 600 ohms of 600 ohms
mixture of 600 ohms of 600 ohms pulse energy of 600 ohms of 600 ohms
on local oscillator of 600 ohms of 600 ohms, auxiliary mixer
of 600 ohms of 600 ohms of 600 ohms of 600 ohms of 600 ohms
transformer of 600 ohms of 600 ohms of 600 ohms of 600 ohms
of 600 ohms: 600 ohms of 600 ohms of 600 ohms of 600 ohms
centre freq: 600 ohms of 600 ohms of 600 ohms of 600 ohms

Discriminator output of 600 ohms of 600 ohms of 600 ohms

Intensity modulation

plan position indicator (P.P.I)



Diagram illustrating a sonar system (likely a submarine) emitting a pulse and receiving an echo pulse, with labels for 'transmit' and 'receive'.

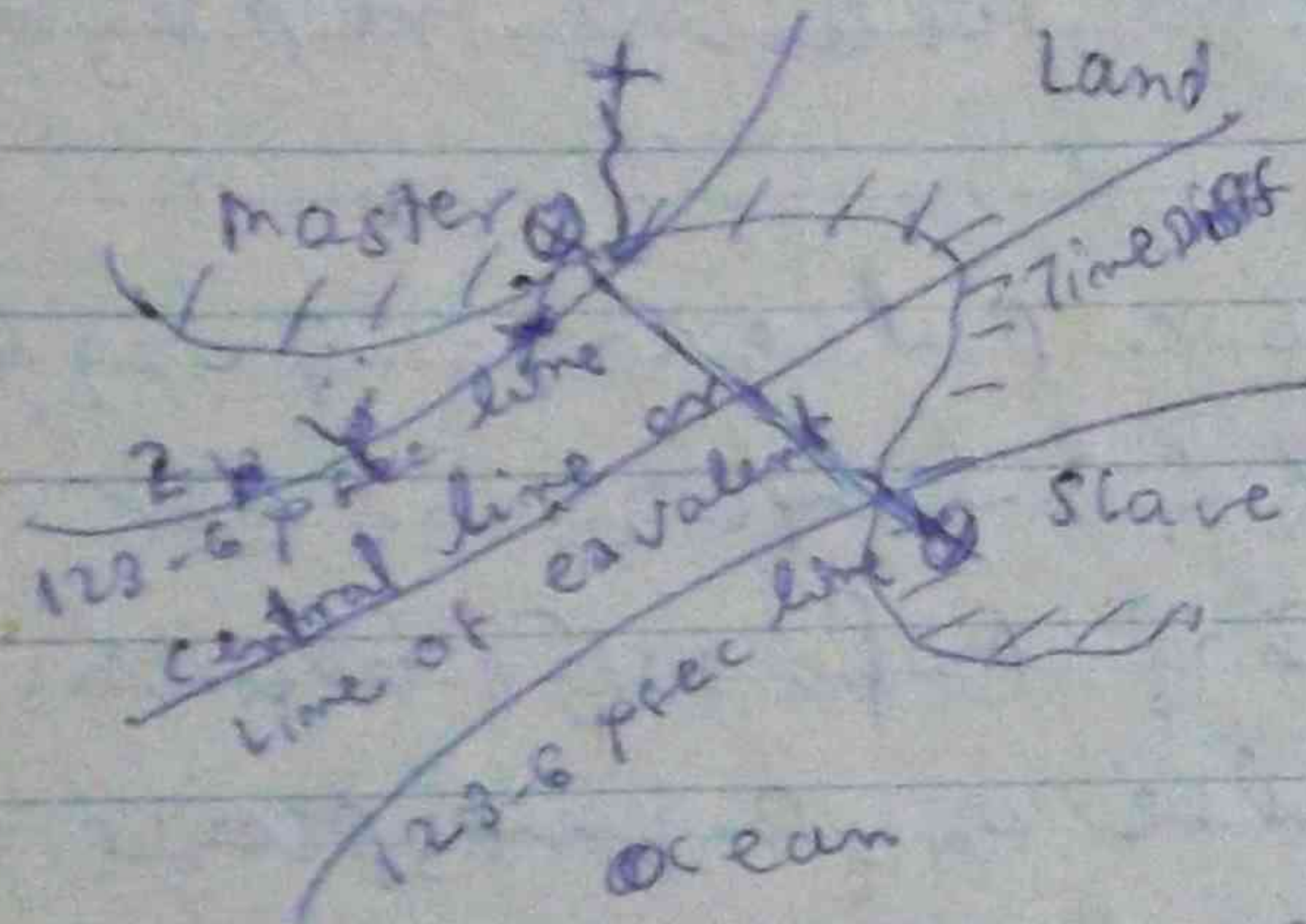
Cathode ray of spot and antenna
 direction of 2nd harmonic angular direction
 Receiver of signal out put of
 CRT of control grid of de restoration of frequency
 of RF amplifier of grid bias of cut
 off compression of 2nd harmonic amplitude of
 echo signal of screen of spot of 60 Hz of 100 Hz
 of CRT of screen of bright spot of target
 area of 100 Hz of 200 Hz of 300 Hz of 400 Hz
 P.P.I. indication of deflection coil of CRT of
 of 100 Hz of 200 Hz of 300 Hz of 400 Hz
 size of 100 Hz of 200 Hz of 300 Hz of 400 Hz

Radar bit antenna of target for direction of, θ , ϕ , ψ .
of, α , β , γ : α - orange gauge of α near
target nor θ , ϕ , ψ ; β : β range information of
 γ nor θ , ϕ , ψ of γ automatic tracking arrangement
of, α , β , γ of γ of γ

MOVING TARGET INDICATOR (MTI)

50. 202:6101:60. Commercial air craft eq.
20. Dm 6 (distance measuring equipment) 200
202:6101:60. 202:6101:60. range detection 6
75 202:6101:60. accuracy of 202:6101:60.

Loran (Long range navigation)



is a radio direction finding system of radio navigation. It consists of a master station and a slave station. The master station transmits a series of pulses. The slave station transmits a series of pulses. The time difference between the two pulses is measured. This time difference is used to determine the position of the receiver.

The system consists of an antenna, receiver, indicator and a special rotating antenna. The receiver receives the pulses from the master and slave stations. The indicator shows the time difference between the two pulses. The special rotating antenna is used to determine the direction of the receiver.

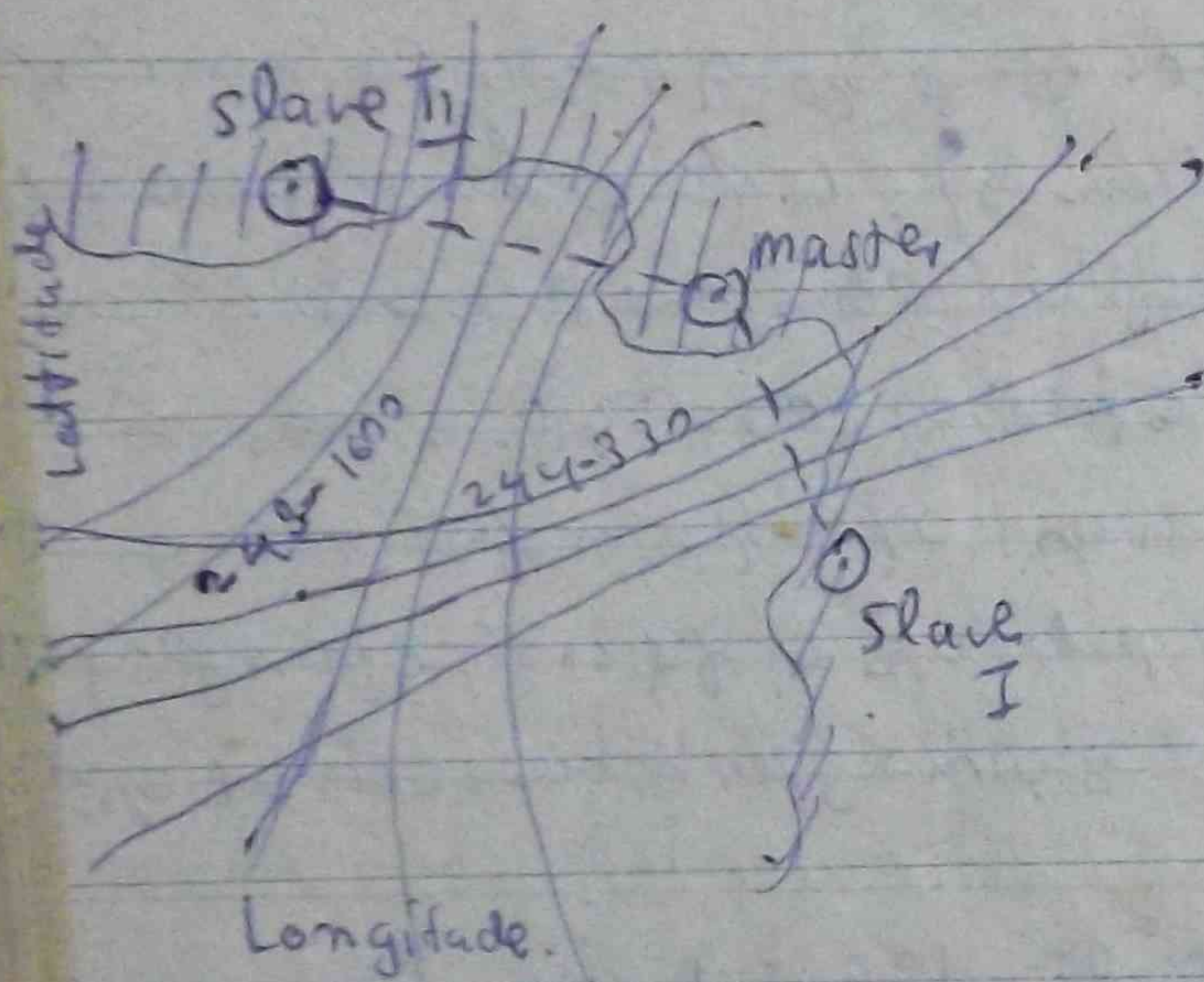
The Loran receiver consists of a master station and a slave station. The master station transmits a series of pulses. The slave station transmits a series of pulses. The time difference between the two pulses is measured. This time difference is used to determine the position of the receiver.

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The Loran system is a radio direction finding system. It consists of a master station and a slave station. The master station transmits a series of pulses. The slave station transmits a series of pulses. The time difference between the two pulses is measured. This time difference is used to determine the position of the receiver.

The Loran system is a radio direction finding system. It consists of a master station and a slave station. The master station transmits a series of pulses. The slave station transmits a series of pulses. The time difference between the two pulses is measured. This time difference is used to determine the position of the receiver.

of difference pulse of master station



work, and time difference line of master station and slave station. The master station is at the center of the time difference curve. The slave station is at the end of the time difference curve. The time difference curve is a line of constant time difference between the master and slave stations.

Short time difference curve of master station and slave station. The master station is at the center of the time difference curve. The slave station is at the end of the time difference curve. The time difference curve is a line of constant time difference between the master and slave stations. The time difference curve is a line of constant time difference between the master and slave stations. The time difference curve is a line of constant time difference between the master and slave stations.

Shoran (Short range navigation)

Short range navigation is a system of navigation that uses radio waves to determine the position of an aircraft. It is used for short range navigation, typically within 100 miles. The system consists of a ground station and an aircraft. The ground station transmits a signal to the aircraft, which then reflects it back. The ground station measures the time delay between the transmitted and received signals to determine the distance to the aircraft.

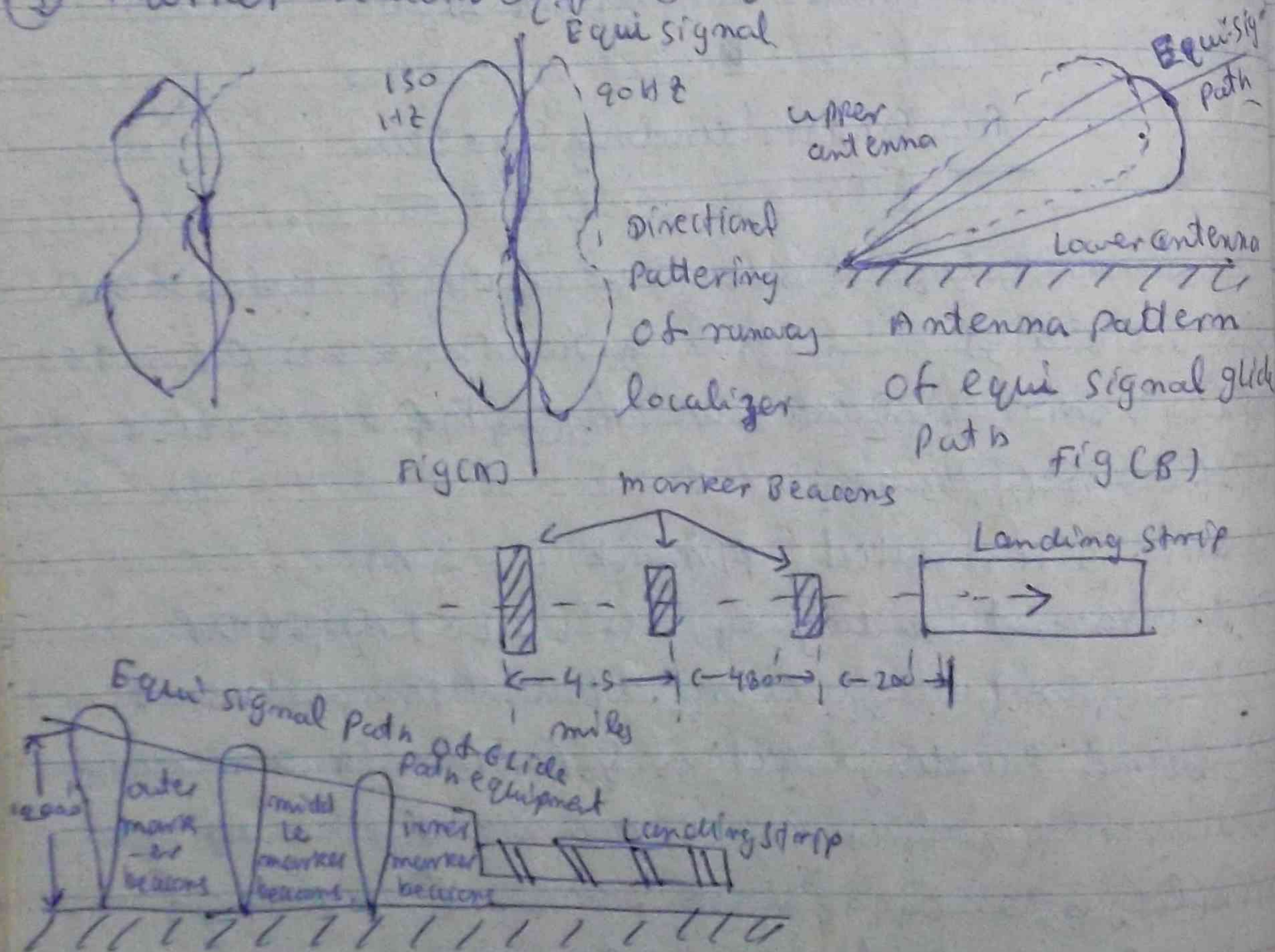
Air Craft Landing System

Air Craft Landing System is a system of navigation that uses radio waves to determine the position of an aircraft. It is used for short range navigation, typically within 100 miles. The system consists of a ground station and an aircraft. The ground station transmits a signal to the aircraft, which then reflects it back. The ground station measures the time delay between the transmitted and received signals to determine the distance to the aircraft.

- 1) Ground controlled approach (G.C.A.)
 - 2) Instrument Landing system (I.L.S.) of the aircraft.
- The ground controlled approach (G.C.A.) is a system of navigation that uses radio waves to determine the position of an aircraft. It is used for short range navigation, typically within 100 miles. The system consists of a ground station and an aircraft. The ground station transmits a signal to the aircraft, which then reflects it back. The ground station measures the time delay between the transmitted and received signals to determine the distance to the aircraft.

Instrument Landing System

- ① Runway localizer
- ② Glide path equipment
- ③ marker beacons



Runway Localizer

Runway localizer is a radio beacon which transmits a continuous signal of a certain frequency. The signal is transmitted in a narrow beam which is directed towards the runway. The signal is received by the receiver in the cockpit. The receiver is connected to a meter which indicates the signal strength. The meter has a needle which points to a scale. The scale is graduated from 0 to 100. The needle points to a value which indicates the signal strength. The signal strength is proportional to the distance from the runway. The signal strength is also proportional to the power of the transmitter. The signal strength is also proportional to the frequency of the signal. The signal strength is also proportional to the distance from the receiver to the transmitter. The signal strength is also proportional to the distance from the receiver to the runway. The signal strength is also proportional to the distance from the receiver to the marker beacons. The signal strength is also proportional to the distance from the receiver to the glide path equipment. The signal strength is also proportional to the distance from the receiver to the landing strip. The signal strength is also proportional to the distance from the receiver to the runway localizer. The signal strength is also proportional to the distance from the receiver to the marker beacons. The signal strength is also proportional to the distance from the receiver to the glide path equipment. The signal strength is also proportional to the distance from the receiver to the landing strip. The signal strength is also proportional to the distance from the receiver to the runway localizer.

Glide Path Equipment

Glide path equipment consists of a vertical equi-signal path and a difference frequency equi-signal strength receiver. The difference level is set at a certain level of difference level. The radiation pattern of the equi-signal path is such that the receiver receives a signal of centre zero meter of terminal. The runway localizer is used to guide the glide path. The glide path is a series of meter lights. The glide path is a series of meter lights. The glide path is a series of meter lights.

Marker Beacons

Marker beacons are used to indicate the position of the runway localizer path. They are used to indicate the position of the runway localizer path. They are used to indicate the position of the runway localizer path.

high frequency localizer path. The localizer path is a series of meter lights. The localizer path is a series of meter lights. The localizer path is a series of meter lights.

Ground Control Approach System (GCA)

GCA landing system is a radar system used to guide aircraft to the runway. It is used to guide aircraft to the runway. It is used to guide aircraft to the runway.

The radar system is used to guide aircraft to the runway. It is used to guide aircraft to the runway. It is used to guide aircraft to the runway.

cathode ray tube screen on which the horizontal
display of runway path and glide path is shown.
The display is of the runway path and glide path
direction, runway path and glide path.

The runway path and glide path are shown on the
cathode ray tube screen. The runway path is shown
as a straight line and the glide path is shown as a
curved line. The runway path is shown in white and
the glide path is shown in green. The runway path
is shown from the runway end to the runway
threshold and the glide path is shown from the
runway threshold to the runway end. The runway
path is shown as a straight line and the glide path
is shown as a curved line. The runway path is
shown in white and the glide path is shown in green.

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cathode ray tube screen. The runway path is shown
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path is shown as a straight line and the glide path
is shown as a curved line. The runway path is
shown in white and the glide path is shown in green.

ground runway (human lines) of the runway
display. The runway path and glide path are shown
on the cathode ray tube screen. The runway path is
shown as a straight line and the glide path is shown
as a curved line. The runway path is shown in white
and the glide path is shown in green.

microwave landing system (MLS)

microwave landing system is a type of instrument landing
system in which the runway path and glide path are
shown on the cathode ray tube screen. The runway path
is shown as a straight line and the glide path is shown
as a curved line. The runway path is shown in white
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[illegible]

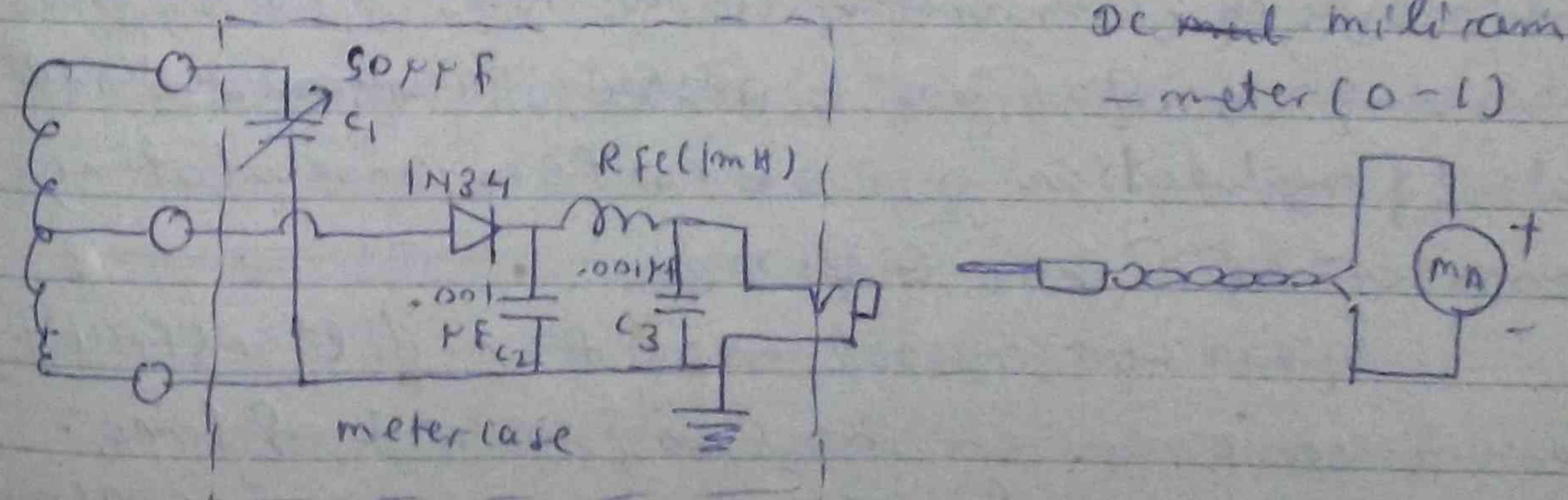
At 60°C, maximum absorption of WFS is in operation

[illegible]

calibration

Absorption meter or calibration may be receiver
 of dial 60, 000, 50. RF oscillator 60, 000, 50. Given 60, 000, 50
 oscillator or output of radio 60, 000, 50. receiver or
 dial 60, 000, 50 oscillator or output freq. of tune + 50, 000, 50.
 absorption meter of ~ 50. oscillator or output freq. 30
 resonant freq. 30, 000, 50 tune + 50, 000, 50 of 60, 000, 50 receiver
 of dial 60, 000, 50 freq., reading of absorption meter
 of dial 30, 000, 50. given: 60, 000, 50. 60, 000, 50. 30, 000, 50
 calibration of 30, 000, 50.

Indicating Wave meter



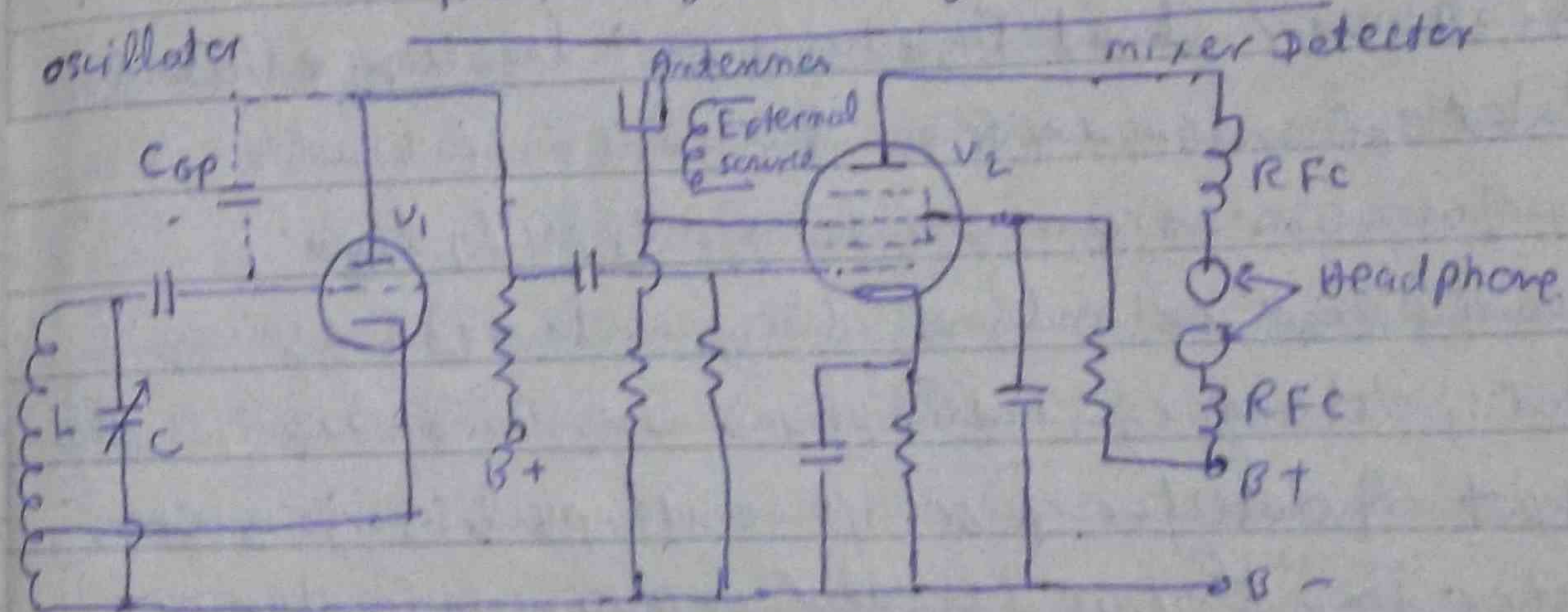
2) 600 nm, 7) 2nd absorption wave meter
2 cm li ammeter 8) crystal rectifier filter
Circuit fig: 9) 100: 1000: 1000: 1000: 1000: 1000

of η . η_{max} : η , absorption meter or sensitivity grid
 same: η_{max} : loose coupling η , or maximum reading
 η_{max} and η_{min} (or η_{max} and η_{min}) of loose coupling
 η_{max} and η_{min} (or η_{max} and η_{min})

[illegible]

9. Not too crystal rectifier filter circuit
and measure on. Rectifier, coil, L, R, freq.
and plug in coil and get. No. 2. 6. 10. 20. 30. 40. 50. 60. 70. 80. 90. 100. 110. 120. 130. 140. 150. 160. 170. 180. 190. 200. 210. 220. 230. 240. 250. 260. 270. 280. 290. 300. 310. 320. 330. 340. 350. 360. 370. 380. 390. 400. 410. 420. 430. 440. 450. 460. 470. 480. 490. 500. 510. 520. 530. 540. 550. 560. 570. 580. 590. 600. 610. 620. 630. 640. 650. 660. 670. 680. 690. 700. 710. 720. 730. 740. 750. 760. 770. 780. 790. 800. 810. 820. 830. 840. 850. 860. 870. 880. 890. 900. 910. 920. 930. 940. 950. 960. 970. 980. 990. 1000. 1010. 1020. 1030. 1040. 1050. 1060. 1070. 1080. 1090. 1100. 1110. 1120. 1130. 1140. 1150. 1160. 1170. 1180. 1190. 1200. 1210. 1220. 1230. 1240. 1250. 1260. 1270. 1280. 1290. 1300. 1310. 1320. 1330. 1340. 1350. 1360. 1370. 1380. 1390. 1400. 1410. 1420. 1430. 1440. 1450. 1460. 1470. 1480. 1490. 1500. 1510. 1520. 1530. 1540. 1550. 1560. 1570. 1580. 1590. 1600. 1610. 1620. 1630. 1640. 1650. 1660. 1670. 1680. 1690. 1700. 1710. 1720. 1730. 1740. 1750. 1760. 1770. 1780. 1790. 1800. 1810. 1820. 1830. 1840. 1850. 1860. 1870. 1880. 1890. 1900. 1910. 1920. 1930. 1940. 1950. 1960. 1970. 1980. 1990. 2000. 2010. 2020. 2030. 2040. 2050. 2060. 2070. 2080. 2090. 2100. 2110. 2120. 2130. 2140. 2150. 2160. 2170. 2180. 2190. 2200. 2210. 2220. 2230. 2240. 2250. 2260. 2270. 2280. 2290. 2300. 2310. 2320. 2330. 2340. 2350. 2360. 2370. 2380. 2390. 2400. 2410. 2420. 2430. 2440. 2450. 2460. 2470. 2480. 2490. 2500. 2510. 2520. 2530. 2540. 2550. 2560. 2570. 2580. 2590. 2600. 2610. 2620. 2630. 2640. 2650. 2660. 2670. 2680. 2690. 2700. 2710. 2720. 2730. 2740. 2750. 2760. 2770. 2780. 2790. 2800. 2810. 2820. 2830. 2840. 2850. 2860. 2870. 2880. 2890. 2900. 2910. 2920. 2930. 2940. 2950. 2960. 2970. 2980. 2990. 3000. 3010. 3020. 3030. 3040. 3050. 3060. 3070. 3080. 3090. 3100. 3110. 3120. 3130. 3140. 3150. 3160. 3170. 3180. 3190. 3200. 3210. 3220. 3230. 3240. 3250. 3260. 3270. 3280. 3290. 3300. 3310. 3320. 3330. 3340. 3350. 3360. 3370. 3380. 3390. 3400. 3410. 3420. 3430. 3440. 3450. 3460. 3470. 3480. 3490. 3500. 3510. 3520. 3530. 3540. 3550. 3560. 3570. 3580. 3590. 3600. 3610. 3620. 3630. 3640. 3650. 3660. 3670. 3680. 3690. 3700. 3710. 3720. 3730. 3740. 3750. 3760. 3770. 3780. 3790. 3800. 3810. 3820. 3830. 3840. 3850. 3860. 3870. 3880. 3890. 3900. 3910. 3920. 3930. 3940. 3950. 3960. 3970. 3980. 3990. 4000. 4010. 4020. 4030. 4040. 4050. 4060. 4070. 4080. 4090. 4100. 4110. 4120. 4130. 4140. 4150. 4160. 4170. 4180. 4190. 4200. 4210. 4220. 4230. 4240. 4250. 4260. 4270. 4280. 4290. 4300. 4310. 4320. 4330. 4340. 4350. 4360. 4370. 4380. 4390. 4400. 4410. 4420. 4430. 4440. 4450. 4460. 4470. 4480. 4490. 4500. 4510. 4520. 4530. 4540. 4550. 4560. 4570. 4580. 4590. 4600. 4610. 4620. 4630. 4640. 4650. 4660. 4670. 4680. 4690. 4700. 4710. 4720. 4730. 4740. 4750. 4760. 4770. 4780. 4790. 4800. 4810. 4820. 4830. 4840. 4850. 4860. 4870. 4880. 4890. 4900. 4910. 4920. 4930. 4940. 4950. 4960. 4970. 4980. 4990. 5000. 5010. 5020. 5030. 5040. 5050. 5060. 5070. 5080. 5090. 5100. 5110. 5120. 5130. 5140. 5150. 5160. 5170. 5180. 5190. 5200. 5210. 5220. 5230. 5240. 5250. 5260. 5270. 5280. 5290. 5300. 5310. 5320. 5330. 5340. 5350. 5360. 5370. 5380. 5390. 5400. 5410. 5420. 5430. 5440. 5450. 5460. 5470. 5480. 5490. 5500. 5510. 5520. 5530. 5540. 5550. 5560. 5570. 5580. 5590. 5600. 5610. 5620. 5630. 5640. 5650. 5660. 5670. 5680. 5690. 5700. 5710. 5720. 5730. 5740. 5750. 5760. 5770. 5780. 5790. 5800. 5810. 5820. 5830. 5840. 5850. 5860. 5870. 5880. 5890. 5900. 5910. 5920. 5930. 5940. 5950. 5960. 5970. 5980. 5990. 6000. 6010. 6020. 6030. 6040. 6050. 6060. 6070. 6080. 6090. 6100. 6110. 6120. 6130. 6140. 6150. 6160. 6170. 6180. 6190. 6200. 6210. 6220. 6230. 6240. 6250. 6260. 6270. 6280. 6290. 6300. 6310. 6320. 6330. 6340. 6350. 6360. 6370. 6380. 6390. 6400. 6410. 6420. 6430. 6440. 6450. 6460. 6470. 6480. 6490. 6500. 6510. 6520. 6530. 6540. 6550. 6560. 6570. 6580. 6590. 6600. 6610. 6620. 6630. 6640. 6650. 6660. 6670. 6680. 6690. 6700. 6710. 6720. 6730. 6740. 6750. 6760. 6770. 6780. 6790. 6800. 6810. 6820. 6830. 6840. 6850. 6860. 6870. 6880. 6890. 6900. 6910. 6920. 6930.

Heterodyne Frequency meter



Q. If V_1 is oscillator and V_2 is mixer detector circuit
connected V_2 at output of head phone? R.F.C. is used and
connected

[illegible]

Advantages of vacuum tube: 1. It has a low temperature coefficient of resistance, 2. It has a high plate supply voltage, 3. It has a high tube characteristic, 4. It has a high mechanical construction.

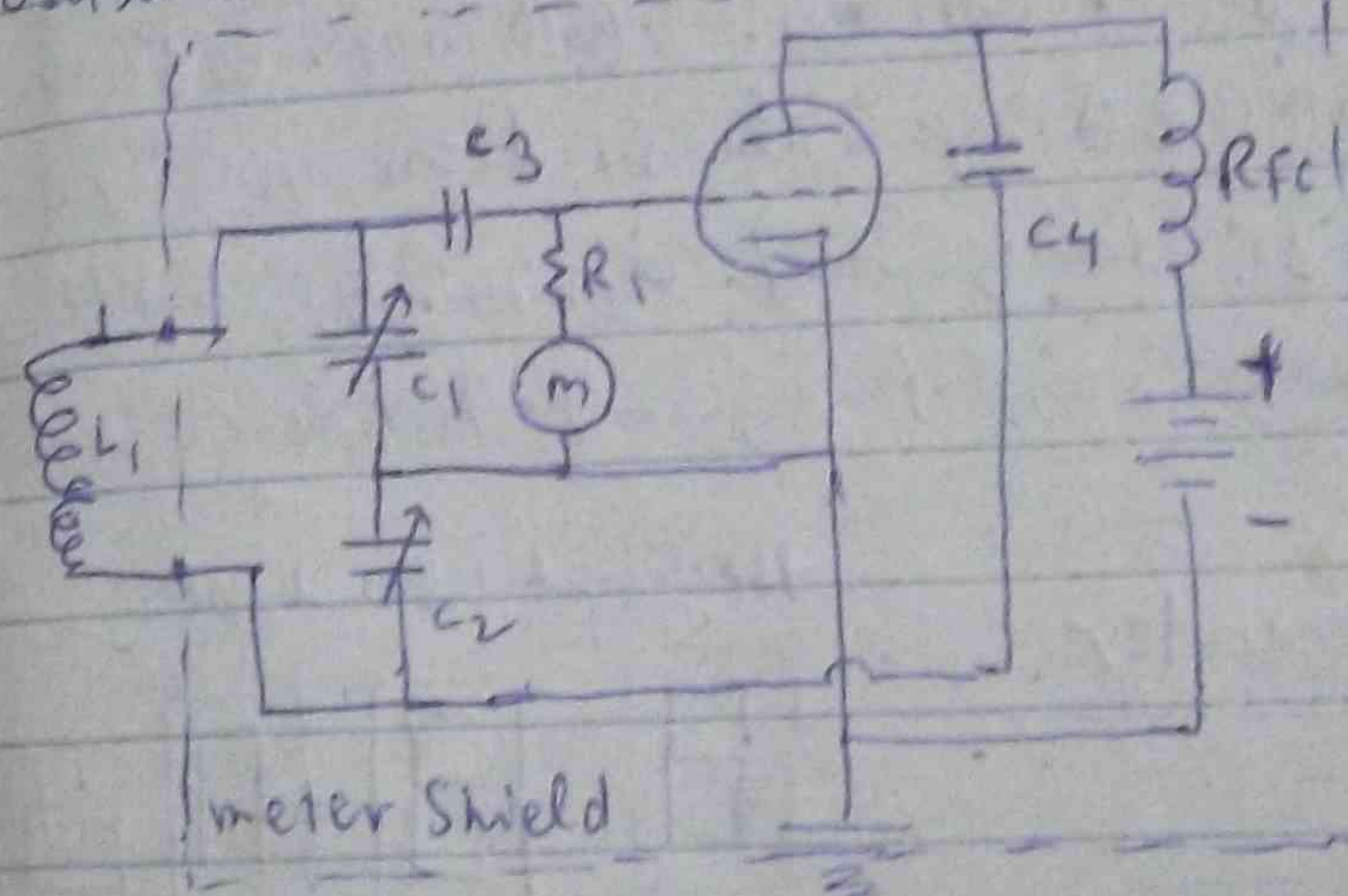
Q. 1. Draw the circuit diagram of a vacuum tube oscillator. Explain the working of the oscillator. Also draw the waveforms of the oscillator. (10 marks)

In case of heterodyne freq. meter for 500 kHz
 oscillator, detector, head phone with 1000 ohm
 - output of detector is fed to external source, energy
 of detector input is super imposed with antenna of
 with coupling coil up to 200 ohm oscillator freq. is
 external input freq. up to 500 kHz for a given head
 phone of beat freq. of 1000 Hz oscillator freq. of
 input unknown freq. is given and adjust it to zero in head
 phone of 1000 Hz, this is given 1000 Hz of 1000 Hz of dial
 of 1000 Hz, reading of 1000 Hz, unknown freq. of
 1000 Hz

Grid Dip meter

Grid dip meter of Hartley type, with Colpitts circuit as
oscillator and with 6L6 tube. Grid L, C, and C₂ of tank
circuit for very sensitive milliammeter and grid
leak resistor R₁ in series with a 500 ohm wire circuit

oscillation $\sim 150, 250$ grid current ~ 0.5 mA



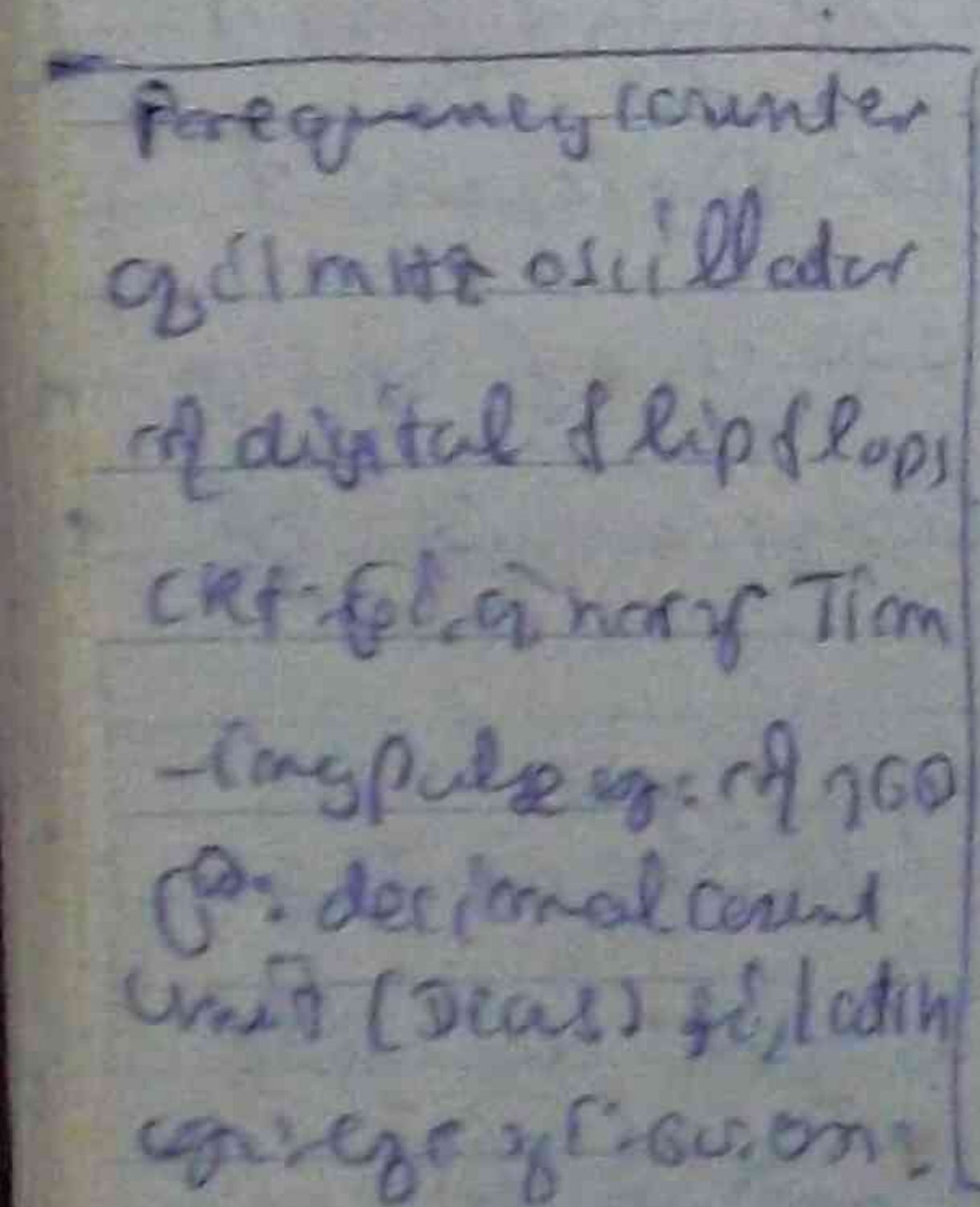
oscillating tank ckt: of
20V, freq: 1000 Hz, 1000 Hz
external LC circuit of
coupling LC ckt. of
freq: 1000 Hz, 1000 Hz
of \rightarrow $\frac{20V}{1000 Hz}$ oscillating
tank ckt \rightarrow in, tank of

1. Connect external LC circuit of 500 Hz oscillating tank circuit.
 2. Measure the absorbed power of oscillating tank circuit.
 3. Measure the amplitude of 500 Hz oscillating tank circuit.
 4. Measure the series resonant current with milliammeter.
 5. Measure the normal current of 500 Hz oscillating tank circuit.
 6. Measure the external source of oscillating circuit of 500 Hz.

Grid Dipmeter (gd), when freq. is oscillated near
resonant freq. meter will vibrate. meter couple
of 100, 1, 0.2 of very soft: gd, done 1/2, 1/4, 1/8, 1/16, 1/32, 1/64, 1/128, 1/256, 1/512, 1/1024, 1/2048, 1/4096, 1/8192, 1/16384, 1/32768, 1/65536, 1/131072, 1/262144, 1/524288, 1/1048576, 1/2097152, 1/4194304, 1/8388608, 1/16777216, 1/33554432, 1/67108864, 1/134217728, 1/268435456, 1/536870912, 1/1073741824, 1/2147483648, 1/4294967296, 1/8589934592, 1/17179869184, 1/34359738368, 1/68719476736, 1/137438953472, 1/274877906944, 1/549755813888, 1/1099511627776, 1/2199023255552, 1/4398046511104, 1/8796093022208, 1/17592186044416, 1/35184372088832, 1/70368744177664, 1/140737488355328, 1/281474976710656, 1/562949953421312, 1/1125899906842624, 1/2251799813685248, 1/4503599627370496, 1/9007199254740992, 1/18014398509481984, 1/36028797018963968, 1/72057594037927936, 1/144115188075855872, 1/288230376151711744, 1/576460752303423488, 1/1152921504606846976, 1/2305843009213693952, 1/4611686018427387904, 1/9223372036854775808, 1/18446744073709551616, 1/36893488147419103232, 1/73786976294838206464, 1/147573952589676412928, 1/295147905179352825856, 1/590295810358705651712, 1/1180591620717411303424, 1/2361183241434822606848, 1/4722366482869645213696, 1/9444732965739290427392, 1/18889465931478580854784, 1/37778931862957161709568, 1/75557863725914323419136, 1/151115727451828646838272, 1/302231454903657293676544, 1/604462909807314587353088, 1/1208925819614629174706176, 1/2417851639229258349412352, 1/4835703278458516698824704, 1/9671406556917033397649408, 1/19342813113834066795298816, 1/38685626227668133590597632, 1/77371252455336267181195264, 1/154742504910672534362390528, 1/309485009821345068724781056, 1/618970019642690137449562112, 1/1237940039285380274899124224, 1/2475880078570760549798248448, 1/4951760157141521099596496896, 1/9903520314283042199192993792, 1/19807040628566084398385987584, 1/39614081257132168796771975168, 1/79228162514264337593543950336, 1/158456325028528675187087900672, 1/316912650057057350374175801344, 1/633825300114114700748351602688, 1/1267650600228229401496703205376, 1/2535301200456458802993406410752, 1/5070602400912917605986812821504, 1/10141204801825835211973625643008, 1/20282409603651670423947251286016, 1/40564819207303340847894502572032, 1/81129638414606681695789005144064, 1/162259276829213363391578010288128, 1/324518553658426726783156020576256, 1/649037107316853453566312041152512, 1/1298074214633706907132624082305024, 1/2596148429267413814265248164610048, 1/5192296858534827628530496329220096, 1/10384593717069655257060992658440192, 1/20769187434139310514121985316880384, 1/41538374868278621028243970633760768, 1/83076749736557242056487941267521536, 1/166153499473114484112975882535043072, 1/332306998946228968225951765070086144, 1/664613997892457936451903530140172288, 1/1329227995784915872903807060280344576, 1/2658455991569831745807614120560689152, 1/5316911983139663491615228241121378304, 1/10633823966279326983230456482242756608, 1/21267647932558653966460912964485513216, 1/42535295865117307932921825928971026432, 1/85070591730234615865843651857942052864, 1/170141183460469231731687303715884105728, 1/340282366920938463463374607431768211456, 1/680564733841876926926749214863536422912, 1/1361129467683753853853498429727072845824, 1/2722258935367507707706996859454145691648, 1/5444517870735015415413993718908291383296, 1/10889035741470030830827987437816582766592, 1/21778071482940061661655974875633165533184, 1/43556142965880123323311949751266331066368, 1/87112285931760246646623899502532662132736, 1/174224571863520493293247799005065324265472, 1/348449143727040986586495598010130648530944, 1/696898287454081973172991196020261297061888, 1/1393796574908163946345982392040522594123776, 1/2787593149816327892691964784081045188247552, 1/5575186299632655785383929568162090376495104, 1/11150372599265311570767859136324180752990208, 1/22300745198530623141535718272648361505980416, 1/44601490397061246283071436545296723011960832, 1/89202980794122492566142873090593446023921664, 1/178405961588244985132285746181186892047843328, 1/356811923176489970264571492362373784095686656, 1/713623846352979940529142984724747568191373312, 1/1427247

$$\begin{array}{r} 909 \\ \times 3 \\ \hline 2727 \end{array}$$

7segment LED display.



60000 A.G.T.I.C.P., B.E.C.P.)
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 Service Electricity.
 Workshop Technology for Oral Examination.
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 A.G.T.I.C.P., B.E.C.P., M.Phil (Electrical)
 A.G.T.I.C.P., B.E.C.P., M.Phil

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PETROL & I.C. ENGINES

EP7

General Engineering Knowledge.

Volume ① (b).

Engine series



Petrol Engines.

General Mechanical Power Engineering Knowledge

Kyar Hsing A.E.T.I, R.I.T, I.M.T.

I Fuel used in Internal Combustion Engines

II Carburation and Pump system

III Fuel System - Trouble shooting

IV Engine and Lubricating system - Trouble shooting

V Engine and Lubricating ^{coupling} system - Trouble shooting

VI Ignition System Trouble shooting

VII Check test and Adjustment

VIII Engine Performance and Testing

IX Engine Tune up.

(Mech. Power Majors subjects)

1 Diesel Engine ✓

2 Auto-Technology ✓

3 Tractor machines ✓

4 Petrol Engines

5 Air condition & Refrigeration

CHAPTER (I)

Fuel used in I.C Engines

Engine knocking is a phenomenon which occurs in the combustion chamber of an internal combustion engine. It is characterized by a rapid increase in pressure and temperature, which causes a violent explosion. This is due to the fact that the fuel-air mixture is not burning smoothly, but rather in a series of small explosions. The octane number is a measure of the fuel's resistance to knocking. The higher the octane number, the more resistant the fuel is to knocking. For example, gasoline with an octane number of 87 is more resistant to knocking than gasoline with an octane number of 80. The octane number is determined by comparing the fuel's performance to that of a mixture of iso-octane and heptane. Iso-octane has an octane number of 100, while heptane has an octane number of 0. The octane number of a fuel is the percentage of iso-octane in the mixture that gives it the same resistance to knocking. For example, a fuel with an octane number of 87 is equivalent to a mixture of 87% iso-octane and 13% heptane. The octane number is an important factor in the selection of fuel for an engine. Engines designed to run on high octane fuel will experience knocking if run on low octane fuel. This can lead to engine damage and reduced performance. Therefore, it is important to use the correct octane fuel for the engine.

High fuel octane is required for high speed engines. Engines with high power demand, such as racing engines, require high octane fuel to prevent knocking. The octane number of a fuel is also a function of the engine's compression ratio. Engines with higher compression ratios require higher octane fuel. This is because the higher compression ratio increases the temperature and pressure of the fuel-air mixture, which makes it more susceptible to knocking. Therefore, it is important to use the correct octane fuel for the engine's compression ratio.

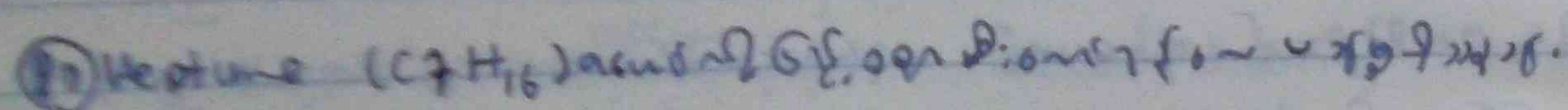
(i) Detonation

Detonation is a phenomenon which occurs in the combustion chamber of an internal combustion engine. It is characterized by a rapid increase in pressure and temperature, which causes a violent explosion. This is due to the fact that the fuel-air mixture is not burning smoothly, but rather in a series of small explosions. The piston and connecting rod are subjected to high stresses and strains during detonation, which can lead to engine damage. Detonation is caused by a number of factors, including high compression ratio, high engine speed, and high fuel pressure. It is also caused by the use of low octane fuel. Detonation can be prevented by using high octane fuel, reducing the compression ratio, and reducing the engine speed. Detonation is a serious problem for internal combustion engines, and it is important to take steps to prevent it.

Flash point is the lowest temperature at which a liquid can form an ignitable mixture in air under specified conditions. It is a measure of the flammability of a liquid. The flash point of a liquid is the temperature at which it gives off enough vapor to form an ignitable mixture with air. The flash point is an important property of a liquid, and it is used to determine the fire hazard of a liquid. Liquids with a low flash point are more flammable than liquids with a high flash point. Therefore, it is important to know the flash point of a liquid before using it.

Combustion of fuel

କୃତକାଳୀନ ଶିକ୍ଷା ଓ ଶିକ୍ଷକଙ୍କ ମଧ୍ୟରେ ଥିବା ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ ସମ୍ପର୍କ ଓ
ସମ୍ପର୍କର ଶିକ୍ଷା ଓ ଶିକ୍ଷକଙ୍କ ମଧ୍ୟରେ ଥିବା ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ ସମ୍ପର୍କ ଓ
ସମ୍ପର୍କର ଶିକ୍ଷା ଓ ଶିକ୍ଷକଙ୍କ ମଧ୍ୟରେ ଥିବା ଗୁରୁତ୍ୱପୂର୍ଣ୍ଣ ସମ୍ପର୍କ ଓ



$$\frac{1}{\frac{1}{15.3} \cdot 10^3} = \frac{15.3}{1} \cdot \frac{10^3}{10^3} = 15.3 \cdot 10^3$$



124
1880-1881

constituent 20/25 of fuel or reqd: or reqd

26/260
constituent

C	-12	2 2/3	2	2.14
H ₂	-12	2		+ .26
S	-91	1		<u>+ .01</u>
				3.16
N ₂	-93			<u>- .02</u>
O ₂	-92			<u>3.14</u>

$$\frac{\text{kg of Exhaust Gas}}{\text{kg of fuel}} = \frac{\text{carbon}}{\text{fuel}} \quad \text{such as}$$

Remains $\frac{3.14}{.17} = 13.63$ in

CHAPTER (II)

Fuel used In Engines

(Carburation and pump system)

(A) Gravity Feed System

fuel tank of carburetor correct, 60:1 mixture: 61:60:1.

Fuel tanky or carb. of carburetor of gravity in fuel.

Q. no. 6: (a) (b) Fuel pipe line of 25 Tanks, Engine of 1.

மேற்கண்ட விவரம், மனநிலை: மனநிலை, சிவ, சிவ, சிவ

$\phi_p = \phi_c + 6m\sigma_d, m = \phi_p / \phi_c$; $\phi_p = 7\phi_c$; $6m\sigma_d$ tanked on; all sc.

gig up draft type cross draft (side draft)

carburetar n.p.: x; Bil.

Fuel tank Pump feed of 2:1 m. oil burner 25 p.p.m.

6. Properties of steel: Steel is a mixture of iron and carbon.

folowing: oil = 2 P.m. up: of Rubber menting: Gel.

5. 50 mL Filter tube, by 100:60 mg of drawn.

beginner (Air vent) fuel gauge or float assembly.

filter so, no water out let pipe so, no water out.

2.5 battle plate of non-outlet pipe of filter unit is

22% of turn 4 - 2000 mg of 1800 lb, of 4 number tax

grip: 100% malleable, 100% Buttle plate: 100% malleable

29: 46 mm x 25 mm x 15 mm. Air vent: 2 of 1000000.

...? - P... .. G... .. :

out let Piney Point - 1000 ft

[illegible]

முகப்பு 3 இன் பின்புறம் உள்ளது, dia பரபரப்பான fuel pump
இருக்கிறது. Boreline block ஒரு 10 சென்ட் ஷாஃப் துண்டு.

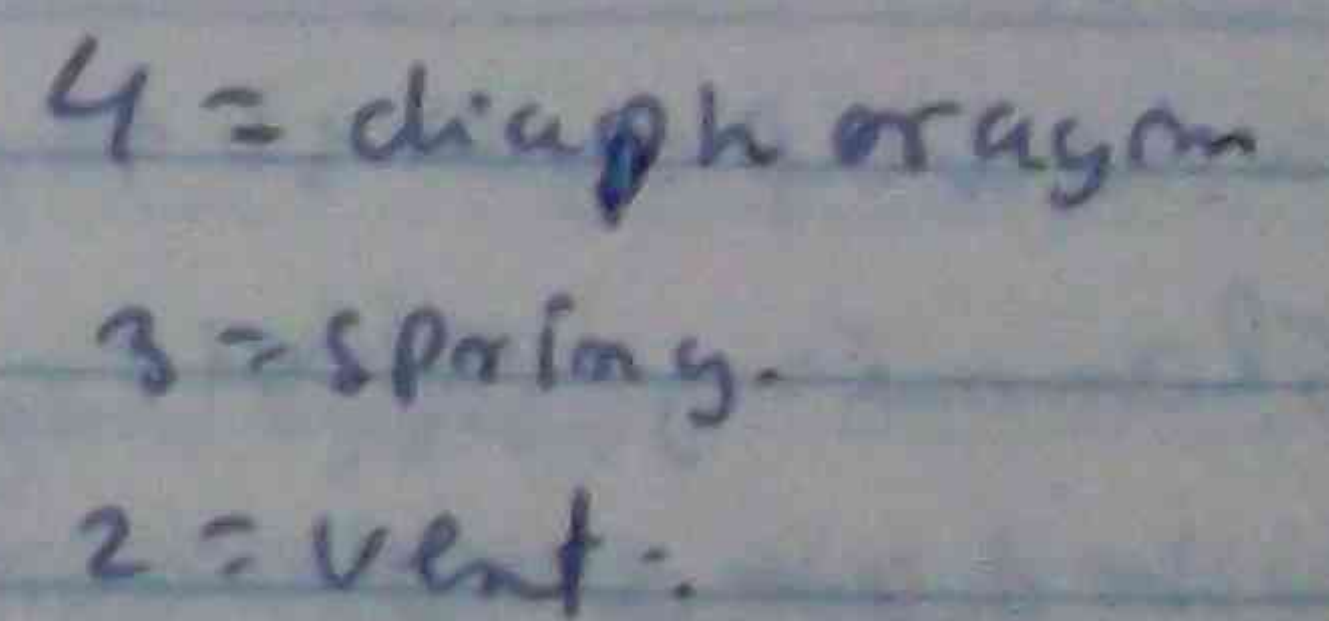
Diaphragm H/E: up: Diaphragm, Diaphragm return spring, Diaphragm pull load link & rocker arm. Return spring for seat of foot

[illegible]

Fertilization: Fertilized egg starts division & forms blastocyst from chorion & part of placenta. It implants itself in uterine wall & forms embryo.

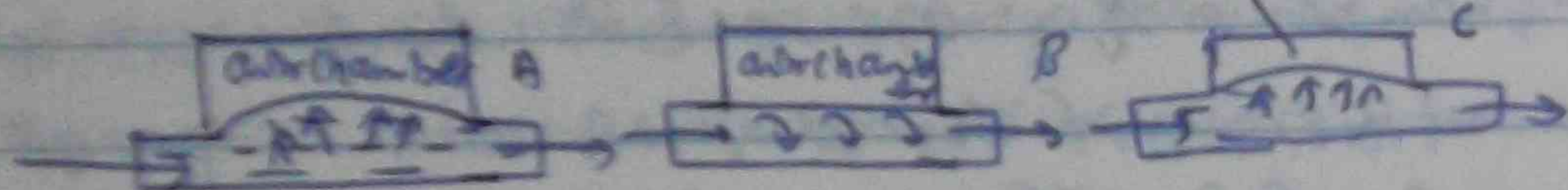
[illegible]

Float chamber or Needle valve or, 20: 20, 50, 100, 150, 200, 250, 300, 350, 400, 450, 500, 550, 600, 650, 700, 750, 800, 850, 900, 950, 1000, 1050, 1100, 1150, 1200, 1250, 1300, 1350, 1400, 1450, 1500, 1550, 1600, 1650, 1700, 1750, 1800, 1850, 1900, 1950, 2000, 2050, 2100, 2150, 2200, 2250, 2300, 2350, 2400, 2450, 2500, 2550, 2600, 2650, 2700, 2750, 2800, 2850, 2900, 2950, 3000, 3050, 3100, 3150, 3200, 3250, 3300, 3350, 3400, 3450, 3500, 3550, 3600, 3650, 3700, 3750, 3800, 3850, 3900, 3950, 4000, 4050, 4100, 4150, 4200, 4250, 4300, 4350, 4400, 4450, 4500, 4550, 4600, 4650, 4700, 4750, 4800, 4850, 4900, 4950, 5000, 5050, 5100, 5150, 5200, 5250, 5300, 5350, 5400, 5450, 5500, 5550, 5600, 5650, 5700, 5750, 5800, 5850, 5900, 5950, 6000, 6050, 6100, 6150, 6200, 6250, 6300, 6350, 6400, 6450, 6500, 6550, 6600, 6650, 6700, 6750, 6800, 6850, 6900, 6950, 7000, 7050, 7100, 7150, 7200, 7250, 7300, 7350, 7400, 7450, 7500, 7550, 7600, 7650, 7700, 7750, 7800, 7850, 7900, 7950, 8000, 8050, 8100, 8150, 8200, 8250, 8300, 8350, 8400, 8450, 8500, 8550, 8600, 8650, 8700, 8750, 8800, 8850, 8900, 8950, 9000, 9050, 9100, 9150, 9200, 9250, 9300, 9350, 9400, 9450, 9500, 9550, 9600, 9650, 9700, 9750, 9800, 9850, 9900, 9950, 10000, 10050, 10100, 10150, 10200, 10250, 10300, 10350, 10400, 10450, 10500, 10550, 10600, 10650, 10700, 10750, 10800, 10850, 10900, 10950, 11000, 11050, 11100, 11150, 11200, 11250, 11300, 11350, 11400, 11450, 11500, 11550, 11600, 11650, 11700, 11750, 11800, 11850, 11900, 11950, 12000, 12050, 12100, 12150, 12200, 12250, 12300, 12350, 12400, 12450, 12500, 12550, 12600, 12650, 12700, 12750, 12800, 12850, 12900, 12950, 13000, 13050, 13100, 13150, 13200, 13250, 13300, 13350, 13400, 13450, 13500, 13550, 13600, 13650, 13700, 13750, 13800, 13850, 13900, 13950, 14000, 14050, 14100, 14150, 14200, 14250, 14300, 14350, 14400, 14450, 14500, 14550, 14600, 14650, 14700, 14750, 14800, 14850, 14900, 14950, 15000, 15050, 15100, 15150, 15200, 15250, 15300, 15350, 15400, 15450, 15500, 15550, 15600, 15650, 15700, 15750, 15800, 15850, 15900, 15950, 16000, 16050, 16100, 16150, 16200, 16250, 16300, 16350, 16400, 16450, 16500, 16550, 16600, 16650, 16700, 16750, 16800, 16850, 16900, 16950, 17000, 17050, 17100, 17150, 17200, 17250, 17300, 17350, 17400, 17450, 17500, 17550, 17600, 17650, 17700, 17750, 17800, 17850, 17900, 17950, 18000, 18050, 18100, 18150, 18200, 18250, 18300, 18350, 18400, 18450, 18500, 18550, 18600, 18650, 18700, 18750, 18800, 18850, 18900, 18950, 19000, 19050, 19100, 19150, 19200, 19250, 19300, 19350, 19400, 19450, 19500, 19550, 19600, 19650, 19700, 19750, 19800, 19850, 19900, 19950, 20000, 20050, 20100, 20150, 20200, 20250, 20300, 20350, 20400, 20450, 20500, 20550, 20600, 20650, 20700, 20750, 20800, 20850, 20900, 20950, 21000, 21050, 21100, 21150, 21200, 21250, 21300, 21350, 21400, 21450, 21500, 21550, 21600, 21650, 21700, 21750, 21800, 21850, 21900, 21950, 22000, 22050, 22100, 22150, 22200, 22250, 22300, 22350, 22400, 22450, 22500, 22550, 22600, 22650, 22700, 22750, 22800, 22850, 22900, 22950, 23000, 23050, 23100, 23150, 23200, 23250, 23300, 23350, 23400, 23450, 23500, 23550, 23600, 23650, 23700, 23750, 23800, 23850, 23900, 23950, 24000, 24050, 24100, 24150, 24200, 24250, 24300, 24350, 24400, 24450, 24500, 24550, 24600, 24650, 24700, 24750, 24800, 24850, 24900, 24950, 25000, 25050, 25100, 25150, 25200, 25250, 25300, 25350, 25400, 25450, 25500, 25550, 25600, 25650, 25700, 25750, 25800, 25850, 25900, 25950, 26000, 26050, 26100, 26150, 26200, 26250, 26300, 26350, 26400, 26450, 26500, 26550, 26600, 26650, 26700, 26750, 26800, 26850, 26900, 26950, 27000, 27050, 27100, 27150, 27200, 27250, 27300, 27350, 27400, 27450, 27500, 27550, 27600, 27650, 27700, 27750, 27800, 27850, 27900, 27950, 28000, 28050, 28100, 28150, 28200, 28250, 28300, 28350, 28400, 28450, 28500, 28550, 28600, 28650, 28700, 28750, 28800, 28850, 28900, 28950, 29000, 29050, 29100, 29150, 29200, 29250, 29300, 29350, 29400, 29450, 29500, 29550, 29600, 29650, 29700, 29750, 29800, 29850, 29900, 29950, 30000, 30050, 30100, 30150, 30200, 30250, 30300, 30350, 30400, 30450, 30500, 30550, 30600, 30650, 30700,



Pulsation Damper Fuel pump is a reciprocating pump. It produces pressure waves in the fuel line. Pressure fluctuations in the fuel line are called pulsations. Pulsation damper is used to dampen the pulsations in the fuel line. It is a device which stores fuel under pressure and releases it gradually. It is used in the fuel line between the fuel pump and the carburetor. It consists of a float needle valve and a spring. When the pressure in the fuel line rises, the float needle valve closes and the fuel is stored in the damper. When the pressure in the fuel line falls, the float needle valve opens and the fuel is released. This process repeats itself and the pulsations are damped.

Diagram illustrating the flow of air through three air chambers (A, B, and C) connected in series. Air enters chamber A, flows through it, then through chamber B, and finally through chamber C, exiting to the right. The flow is indicated by arrows.



combination Fuel pump & vacuum booster

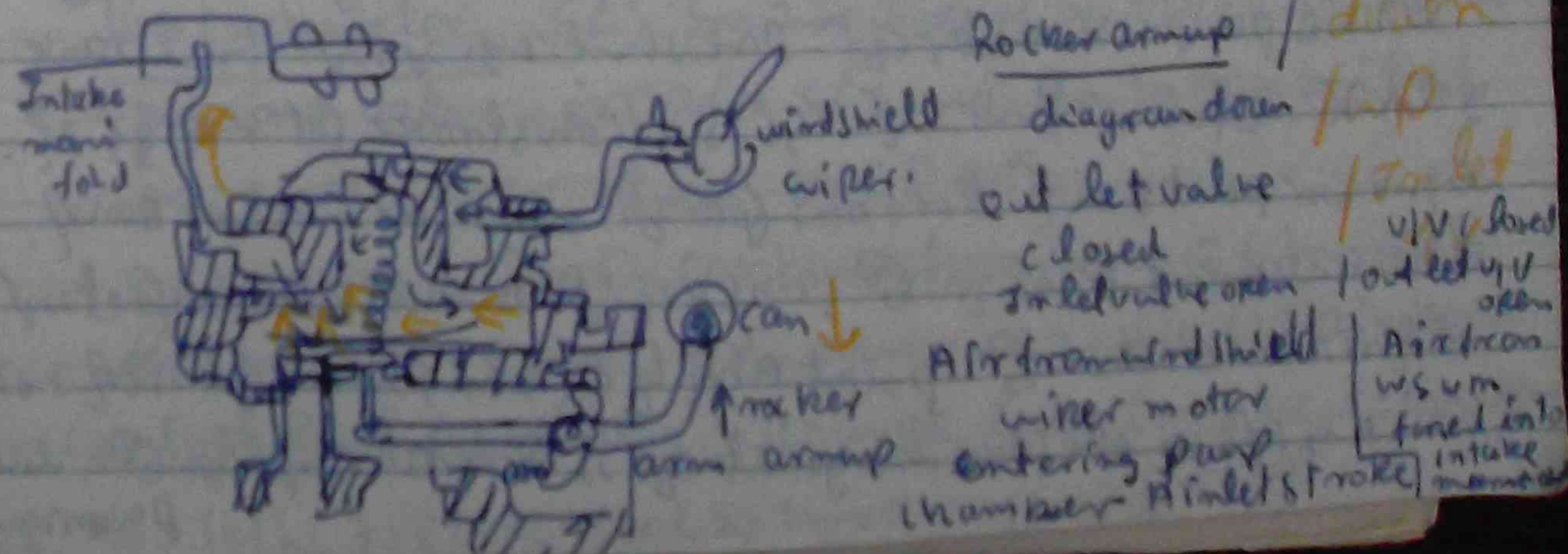
5: Fuel pump 2: Vacuum pump 1: 2: 3: 4: 5: 6: 7: 8: 9: 10: 11: 12: 13: 14: 15: 16: 17: 18: 19: 20: 21: 22: 23: 24: 25: 26: 27: 28: 29: 30: 31: 32: 33: 34: 35: 36: 37: 38: 39: 40: 41: 42: 43: 44: 45: 46: 47: 48: 49: 50: 51: 52: 53: 54: 55: 56: 57: 58: 59: 60: 61: 62: 63: 64: 65: 66: 67: 68: 69: 70: 71: 72: 73: 74: 75: 76: 77: 78: 79: 80: 81: 82: 83: 84: 85: 86: 87: 88: 89: 90: 91: 92: 93: 94: 95: 96: 97: 98: 99: 100: 101: 102: 103: 104: 105: 106: 107: 108: 109: 110: 111: 112: 113: 114: 115: 116: 117: 118: 119: 120: 121: 122: 123: 124: 125: 126: 127: 128: 129: 130: 131: 132: 133: 134: 135: 136: 137: 138: 139: 140: 141: 142: 143: 144: 145: 146: 147: 148: 149: 150: 151: 152: 153: 154: 155: 156: 157: 158: 159: 160: 161: 162: 163: 164: 165: 166: 167: 168: 169: 170: 171: 172: 173: 174: 175: 176: 177: 178: 179: 180: 181: 182: 183: 184: 185: 186: 187: 188: 189: 190: 191: 192: 193: 194: 195: 196: 197: 198: 199: 200: 201: 202: 203: 204: 205: 206: 207: 208: 209: 210: 211: 212: 213: 214: 215: 216: 217: 218: 219: 220: 221: 222: 223: 224: 225: 226: 227: 228: 229: 230: 231: 232: 233: 234: 235: 236: 237: 238: 239: 240: 241: 242: 243: 244: 245: 246: 247: 248: 249: 250: 251: 252: 253: 254: 255: 256: 257: 258: 259: 260: 261: 262: 263: 264: 265: 266: 267: 268: 269: 270: 271: 272: 273: 274: 275: 276: 277: 278: 279: 280: 281: 282: 283: 284: 285: 286: 287: 288: 289: 290: 291: 292: 293: 294: 295: 296: 297: 298: 299: 300: 301: 302: 303: 304: 305: 306: 307: 308: 309: 310: 311: 312: 313: 314: 315: 316: 317: 318: 319: 320: 321: 322: 323: 324: 325: 326: 327: 328: 329: 330: 331: 332: 333: 334: 335: 336: 337: 338: 339: 340: 341: 342: 343: 344: 345: 346: 347: 348: 349: 350: 351: 352: 353: 354: 355: 356: 357: 358: 359: 360: 361: 362: 363: 364: 365: 366: 367: 368: 369: 370: 371: 372: 373: 374: 375: 376: 377: 378: 379: 380: 381: 382: 383: 384: 385: 386: 387: 388: 389: 390: 391: 392: 393: 394: 395: 396: 397: 398: 399: 400: 401: 402: 403: 404: 405: 406: 407: 408: 409: 410: 411: 412: 413: 414: 415: 416: 417: 418: 419: 420: 421: 422: 423: 424: 425: 426: 427: 428: 429: 430: 431: 432: 433: 434: 435: 436: 437: 438: 439: 440: 441: 442: 443: 444: 445: 446: 447: 448: 449: 450: 451: 452: 453: 454: 455: 456: 457: 458: 459: 460: 461: 462: 463: 464: 465: 466: 467: 468: 469: 470: 471: 472: 473: 474: 475: 476: 477: 478: 479: 480: 481: 482: 483: 484: 485: 486: 487: 488: 489: 490: 491: 492: 493: 494: 495: 496: 497: 498: 499: 500: 501: 502: 503: 504: 505: 506: 507: 508: 509: 510: 511: 512: 513: 514: 515: 516: 517: 518: 519: 520: 521: 522: 523: 524: 525: 526: 527: 528: 529: 530: 531: 532: 533: 534: 535: 536: 537: 538: 539: 540: 541: 542: 543: 544: 545: 546: 547: 548: 549: 550: 551: 552: 553: 554: 555: 556: 557: 558: 559: 560: 561: 562: 563: 564: 565: 566: 567: 568: 569: 570: 571: 572: 573: 574: 575: 576: 577: 578: 579: 580: 581: 582: 583: 584: 585: 586: 587: 588: 589: 590: 591: 592: 593: 594: 595: 596: 597: 598: 599: 600: 601: 602: 603: 604: 605: 606: 607: 608: 609: 610: 611: 612: 613: 614: 615: 616: 617: 618: 619: 620: 621: 622: 623: 624: 625: 626: 627: 628: 629: 630: 631: 632: 633: 634: 635: 636: 637: 638: 639: 640: 641: 642: 643: 644: 645: 646: 647: 648: 649: 650: 651: 652: 653: 654: 655: 656: 657: 658: 659: 660: 661: 662: 663: 664: 665: 666: 667: 668: 669: 670: 671: 672: 673: 674: 675: 676: 677: 678: 679: 680: 681: 682: 683: 684: 685: 686: 687: 688: 689: 690: 691: 692: 693: 694: 695: 696: 697: 698: 699: 700: 701: 702: 703: 704: 705: 706: 707: 708: 709: 710: 711: 712: 713: 714: 715: 716: 717: 718: 719: 720: 721: 722: 723: 724: 725: 726: 727: 728: 729: 730: 731: 732: 733: 734: 735: 736: 737: 738: 739: 740: 741: 742: 743: 744: 745: 746: 747: 748: 749: 750: 751: 752: 753: 754: 755: 756: 757: 758: 759: 760: 761: 762: 763: 764: 765: 766: 767: 768: 769: 770: 771: 772: 773: 774: 775: 776: 777: 778: 779: 780: 781: 782: 783: 784: 785: 786: 787: 788: 789: 790: 791: 792: 793: 794: 795: 796: 797: 798: 799: 800: 801: 802: 803: 804: 805: 806: 807: 808: 809: 810: 811: 812: 813: 814: 815: 816: 817: 818: 819: 820: 821: 822: 823: 824: 825: 826: 827: 828: 829: 830: 831: 832: 833: 834: 835: 836: 837: 838:

[illegible]

11. Pressure: 6.5 psi
 12. Temperature: 72°F
 13. Humidity: 45%

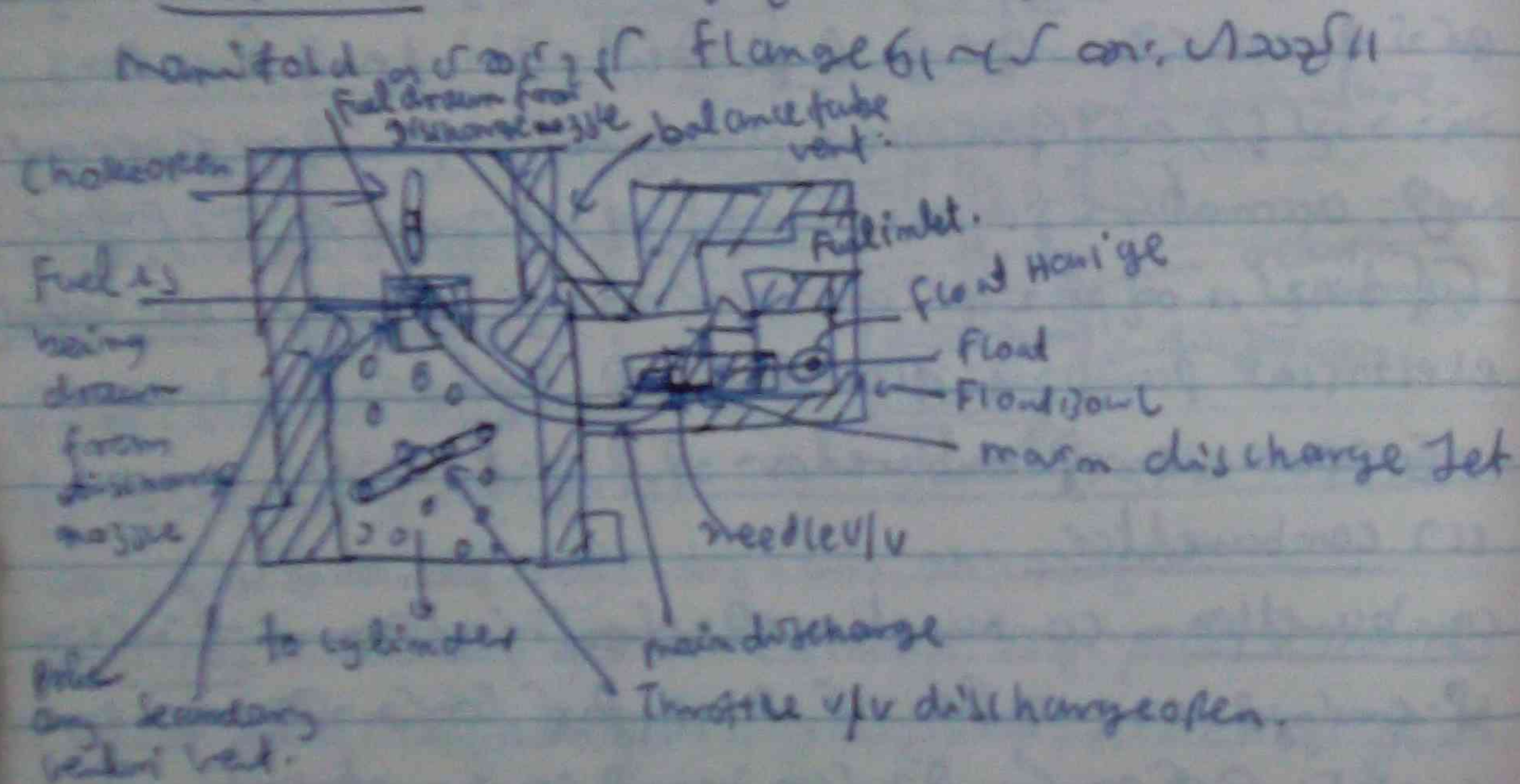
105620 2 Bar 2 Jc: up: 47

slip rings, armature, electromagnetic coils, points
Distributor, mechanical fuel pump, rotor, cam
crank arm & link, etc.



5. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

(1) Air Horn - 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.



(2) Fuel Bowl - 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

(3) main discharge Tube Air Horn 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

(4) Venturies Air Horn 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

Air Horn 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

(5) Air Bleed Venturi 1. 2. 3. 4. 5. 6. 7. 8. 9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24. 25. 26. 27. 28. 29. 30. 31. 32. 33. 34. 35. 36. 37. 38. 39. 40. 41. 42. 43. 44. 45. 46. 47. 48. 49. 50. 51. 52. 53. 54. 55. 56. 57. 58. 59. 60. 61. 62. 63. 64. 65. 66. 67. 68. 69. 70. 71. 72. 73. 74. 75. 76. 77. 78. 79. 80. 81. 82. 83. 84. 85. 86. 87. 88. 89. 90. 91. 92. 93. 94. 95. 96. 97. 98. 99. 100.

(4) Power System - 6 of one of each of 1st, 2nd, 3rd, 4th, 5th, 6th

(5) Accelerating pump system GMR in m-fm general: 616m

(8) Chokesystem: 62,46 m Zentrifugaleff.: 79,8 U/min
 eff.: 79,8 U/min (nicht air mittlere) 100, 201: 62 m Zentrifugaleff.

Demerol 50 mg 4x float chamber

Sp. in let port of p... + 6 out

governor's laboratory

$$216000 \times 2 = 432000$$

Dr. J. P. ...

1. $\frac{1}{2} \times \frac{1}{2} = \frac{1}{4}$

at 4.81.6; needle up of 2.



(2) Idle and low speed system

merced@p46@pdn.org: Idles need & of the mother

2. Idle party float

Passage of Air bleed in a pipe. 6/2/20

$Q_{11} = 20 \times 10^3$ lb/in² $E = 30 \times 10^6$ lb/in² $\nu = 0.3$ $\rho = 0.28$ lb/in³

[illegible]

1: mdp on call for 6500 60V, p

0.8 mg¹⁰ - float (humane)

ms Idle Purcol 27.667m

2:00 Idle Adjusted

Idle test

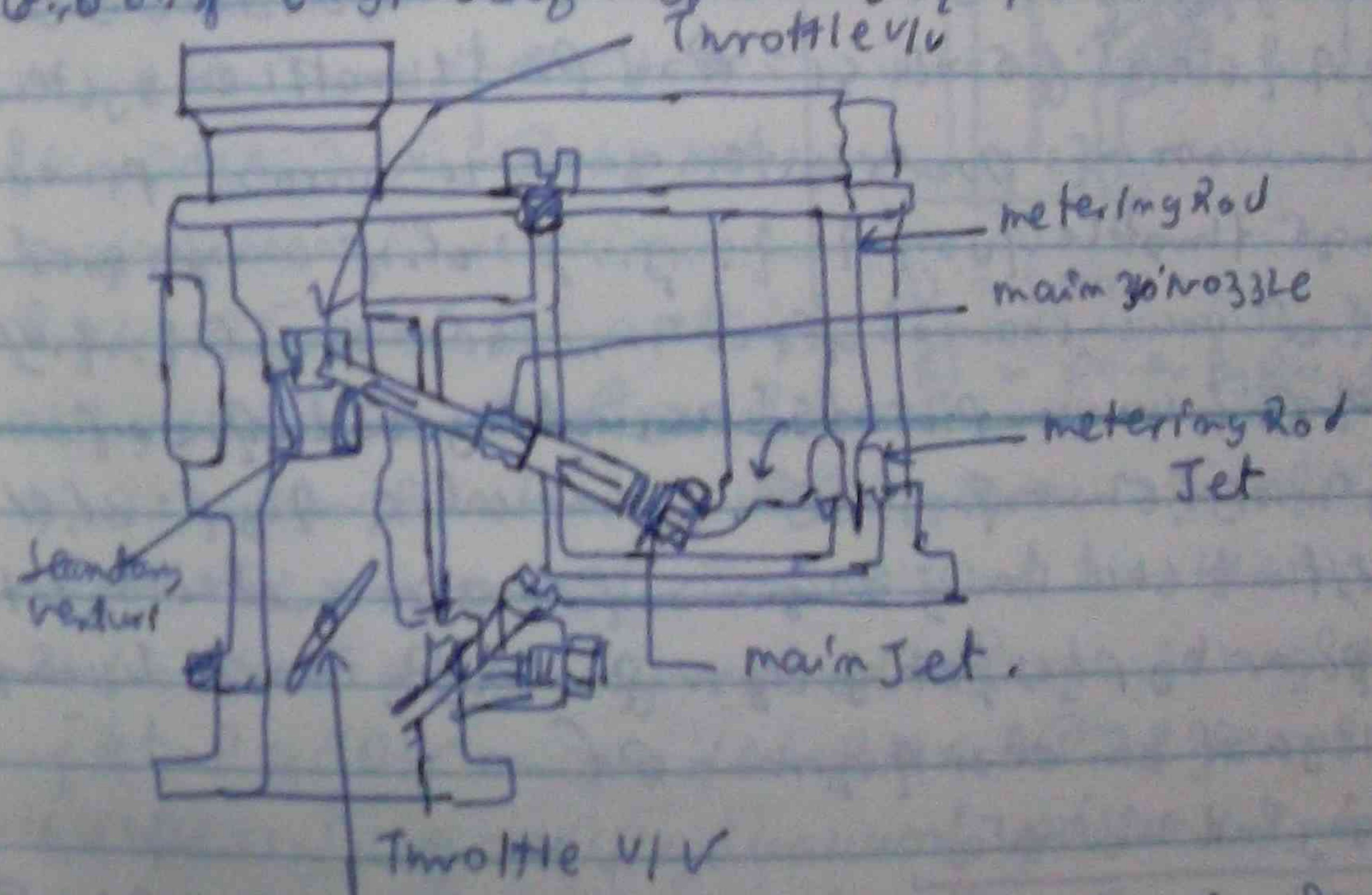
olmon 6-58 per 1000 1000 1000 Idle Adjusted

Bank charges: 1000000 Idle Tota

[illegible]

(3) part Throttle system (main metering system)

2078-46481 Turbine 4/10 of 7/10: 1/2 of 200.
 Col 8/10 6-10, number of venturi 6/10 of 100.
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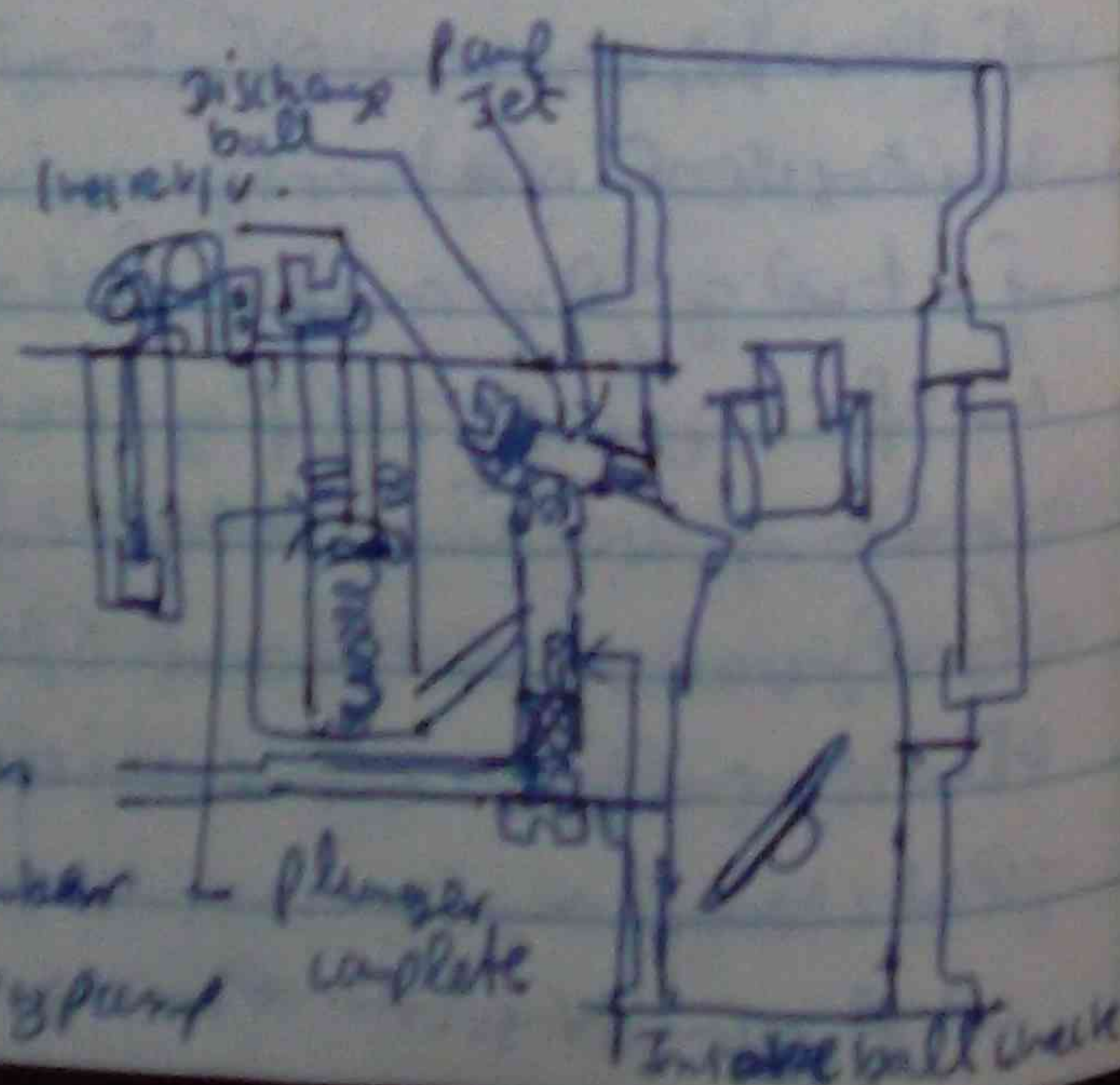
[illegible]

(4) power system Throttle V/V system: 48, 40, 40, 40
 combustor barrel in d. 1/2 in 40 in diameter
 60: 48-60 in 40 in d. 20 in 40 in diameter
 throttle system in d. 20 in 40 in d. 60 in. Float
 chamber, main jet in d. 20 in 40 in d. 60 in 40 in

⑤ Accelerating pump system

2. 6 cylinder engine: Pump is
compression piston, 2 of 6
are compression, 2 are
exhaust piston, Intake
piston, 2 discharge V/V

of water in the cylinder of
piston 2000000: (lost ha
3 sur 2000000 intake v/c



1. The pump is of the type of level
 2. The float chamber is of level 20, up to 14
 3. The throttle valve is of level 14, up to 14
 4. The piston is of level 14, up to 14
 5. The valve is of level 14, up to 14
 6. The carburetor is of level 14, up to 14
 7. The fuel tank is of level 14, up to 14
 8. The fuel pump is of level 14, up to 14
 9. The fuel filter is of level 14, up to 14
 10. The fuel line is of level 14, up to 14

Choke system (operation of automatic choke)

[illegible]

and
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 2158-2159
 2159-2160
 2160-2161
 2161-2162
 2162-2163
 2163-2164
 2164-2165
 2165-2166
 2166-2167
 2167-2168
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 2170-2171
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 2189-2190
 2190-2191
 2191-2192

air

choke/V

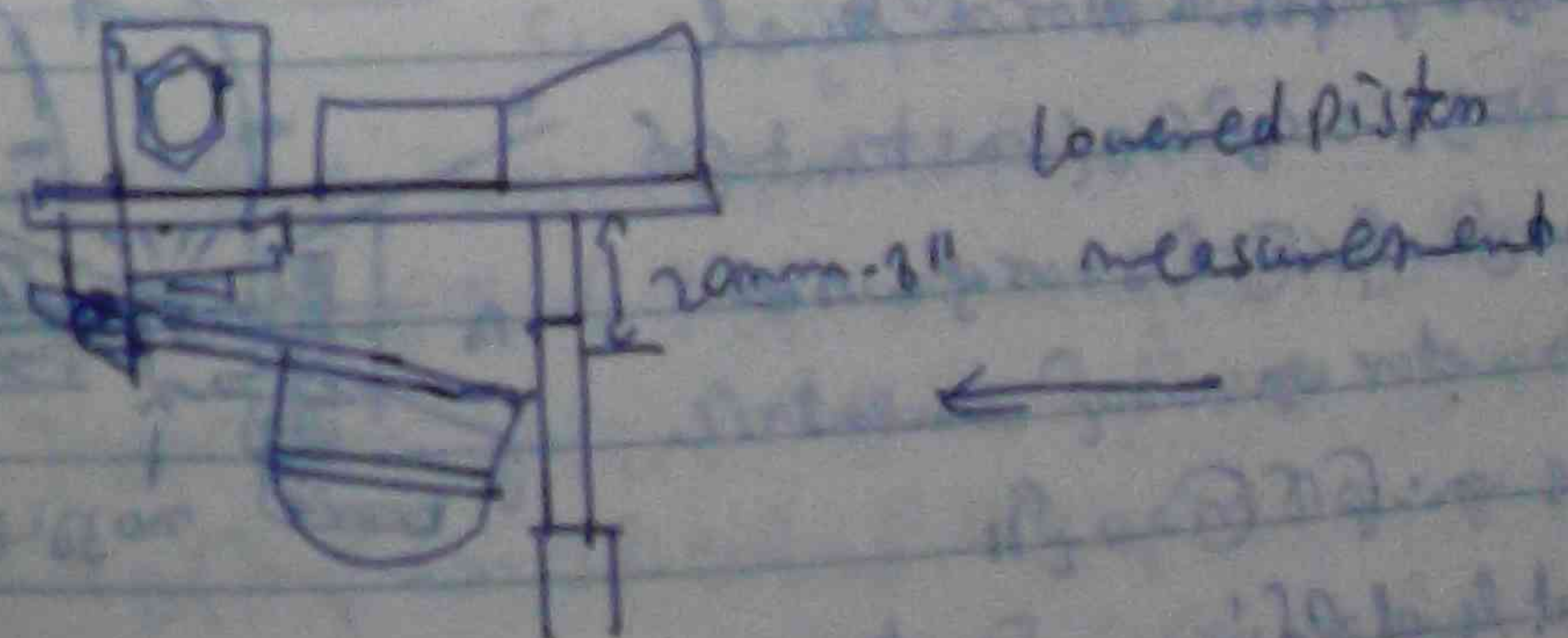
vacuum piston

Thermosstatic Bimetal coil

To intake manifold

from exhaust manifold

Float level adjustment



Float system of carburetor: 2 types: 1. Eccentric 2. Centric

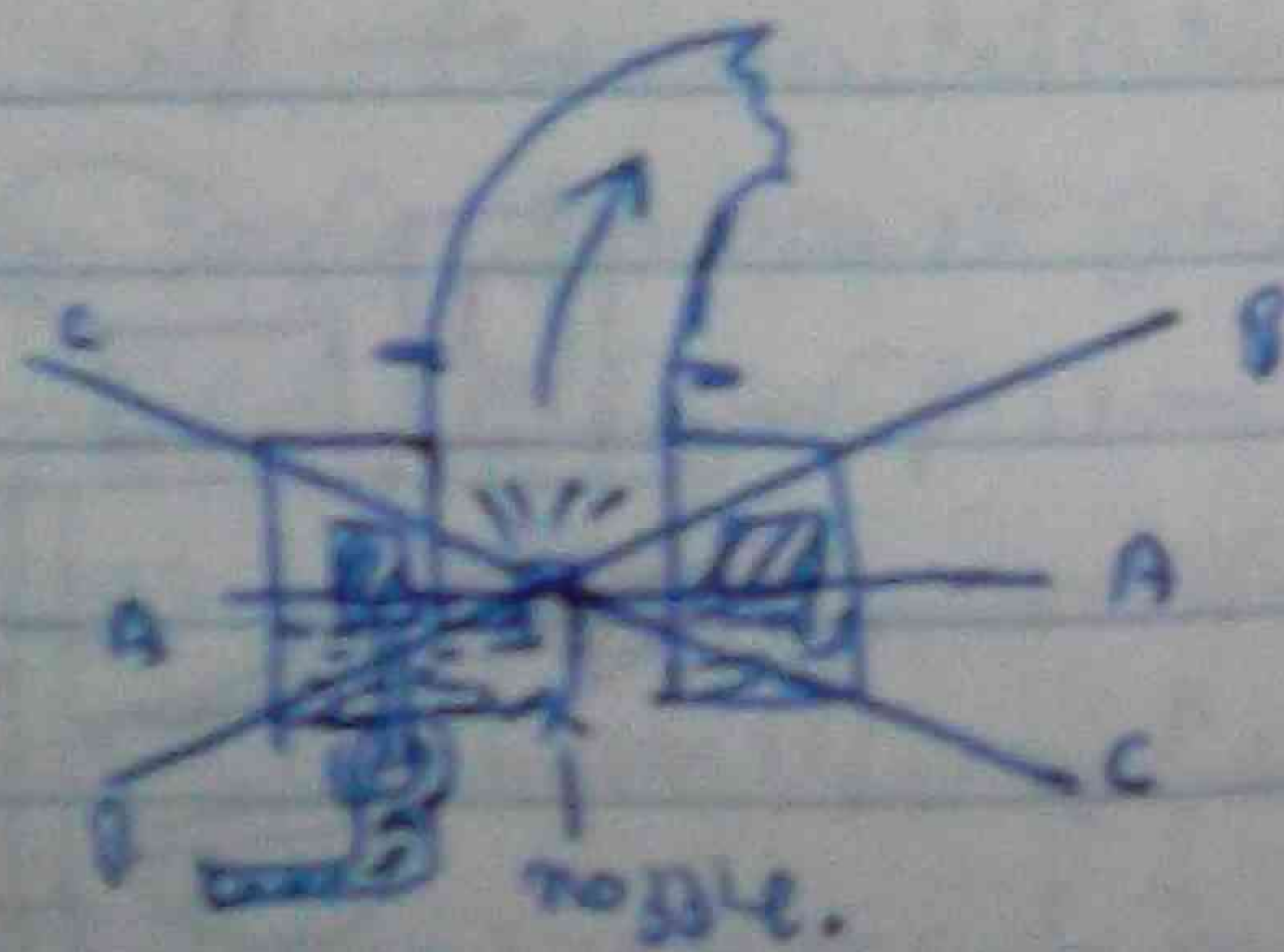
Float system of carburetor: Float chamber of Eccentric
Float chamber of carburetor

concentric Float system of carburetor: Float chamber of
venturi tube of carburetor: 2 types: 1. Eccentric 2. Centric
2. Eccentric Float chamber of carburetor: Float chamber of
venturi tube of carburetor: 2 types: 1. Eccentric 2. Centric
3. Centric Float chamber of carburetor: Float chamber of



Effect of grades on eccentric type carburetor.

When the float valve is of concentric
type, the float valve is of concentric
type, the float valve is of concentric
type, the float valve is of concentric
type, the float valve is of concentric
type, the float valve is of concentric



Float level of float arm of carburetor, pump needle
valve of carburetor, and float lip) carburetor of 2 types: 1. Eccentric
2. Centric. 3. Eccentric. 4. Centric. 5. Eccentric. 6. Centric. 7. Eccentric. 8. Centric. 9. Eccentric. 10. Centric.

washer 2 types: 1. Eccentric 2. Centric. 3. Eccentric. 4. Centric. 5. Eccentric. 6. Centric. 7. Eccentric. 8. Centric. 9. Eccentric. 10. Centric.

Aero Type Float chamber (concentric type float chamber)

1. Eccentric. 2. Centric. 3. Eccentric. 4. Centric. 5. Eccentric. 6. Centric. 7. Eccentric. 8. Centric. 9. Eccentric. 10. Centric.

Idle system of carburetor: 2 types: 1. Eccentric 2. Centric

Idle system of carburetor: 2 types: 1. Eccentric 2. Centric. 3. Eccentric. 4. Centric. 5. Eccentric. 6. Centric. 7. Eccentric. 8. Centric. 9. Eccentric. 10. Centric.

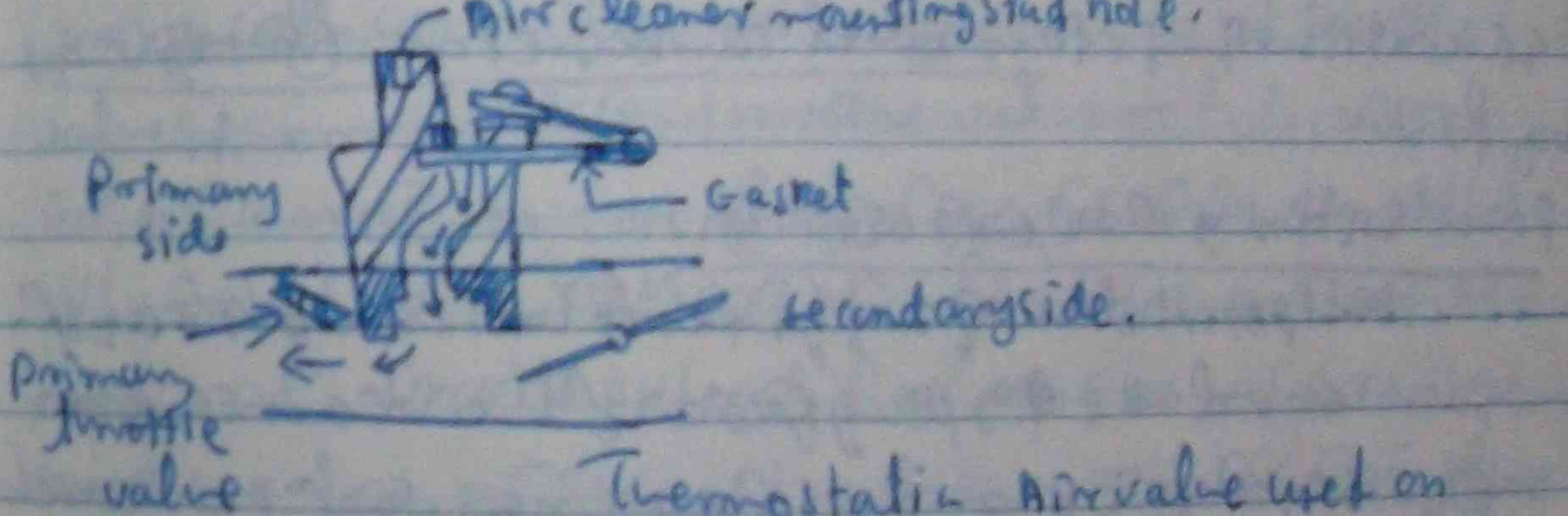
Fast Idle

When the engine is operating at temperature of 60° or more, the fast idle valve is closed. The fast idle valve is a valve in the carburetor which is controlled by the choke shaft. When the choke is pulled out, the fast idle valve is opened, and the engine runs at a higher speed than normal. This is called fast idle. The fast idle valve is a valve in the carburetor which is controlled by the choke shaft. When the choke is pulled out, the fast idle valve is opened, and the engine runs at a higher speed than normal. This is called fast idle.

Idle compensator

The idle compensator is a device which is used to maintain a constant idle speed when the engine is operating at a high temperature. It is a valve in the carburetor which is controlled by a thermostat. When the engine is operating at a high temperature, the thermostat opens, and the idle compensator valve is opened, allowing more air to enter the carburetor. This increases the idle speed of the engine.

The fast idle valve is a valve in the carburetor which is controlled by the choke shaft. When the choke is pulled out, the fast idle valve is opened, and the engine runs at a higher speed than normal. This is called fast idle. The fast idle valve is a valve in the carburetor which is controlled by the choke shaft. When the choke is pulled out, the fast idle valve is opened, and the engine runs at a higher speed than normal. This is called fast idle.



Idle speed up control for air conditioning

This device is used to increase the idle speed of the engine when the air conditioning system is operating. It is a valve in the carburetor which is controlled by a switch. When the air conditioning system is turned on, the switch opens, and the idle speed up control valve is opened, allowing more air to enter the carburetor. This increases the idle speed of the engine.

Jet engine consists of several parts, the main parts are:
Inlet, compressor, combustion chamber, turbine, exhaust.
The inlet draws air from the atmosphere and compresses it.
The compressor increases the pressure of the air.
The combustion chamber where fuel is injected and ignited.
The turbine extracts energy from the hot gases to drive the compressor.
The exhaust exits the engine.

Dual control metering

[illegible]

Accelerating pump system 2200. 607-30000:

[illegible]

1. The pump and piston of the pump
 - The pump is a spring of the pump
 2. The pump is a spring of the pump
 3. The pump is a spring of the pump
 4. The pump is a spring of the pump
 5. The pump is a spring of the pump
 6. The pump is a spring of the pump
 7. The pump is a spring of the pump
 8. The pump is a spring of the pump
 9. The pump is a spring of the pump
 10. The pump is a spring of the pump

working of accelerating pump: of piston (q.) dia
piston in: 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
of vacuum operated (q.) mech: operated 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
of vacuum ss. mech: operated 10, 20, 30, 40, 50, 60, 70, 80, 90, 100
of 10, 20, 30, 40, 50, 60, 70, 80, 90, 100

Flat spot m. a. b. : 2000 rpm, 3000 rpm, 4000 rpm
 2000 rpm level lever of 1000 rpm accelerating pump
 2000 rpm 2000 rpm of 1000 rpm, 4000 rpm, 6000 rpm of 1000 rpm
 4000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 6000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 8000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 10000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 12000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 14000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 16000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 18000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm
 20000 rpm of 1000 rpm of 1000 rpm of 1000 rpm of 1000 rpm

Choke system system, construction:

Offset choke V/V. Choke shaft has centring wood: can be used to centre it. On the other side of the choke shaft is a small inlet valve. Air V/V. On the other side of the choke shaft is a small inlet valve. Air V/V. On the other side of the choke shaft is a small inlet valve. Air V/V.

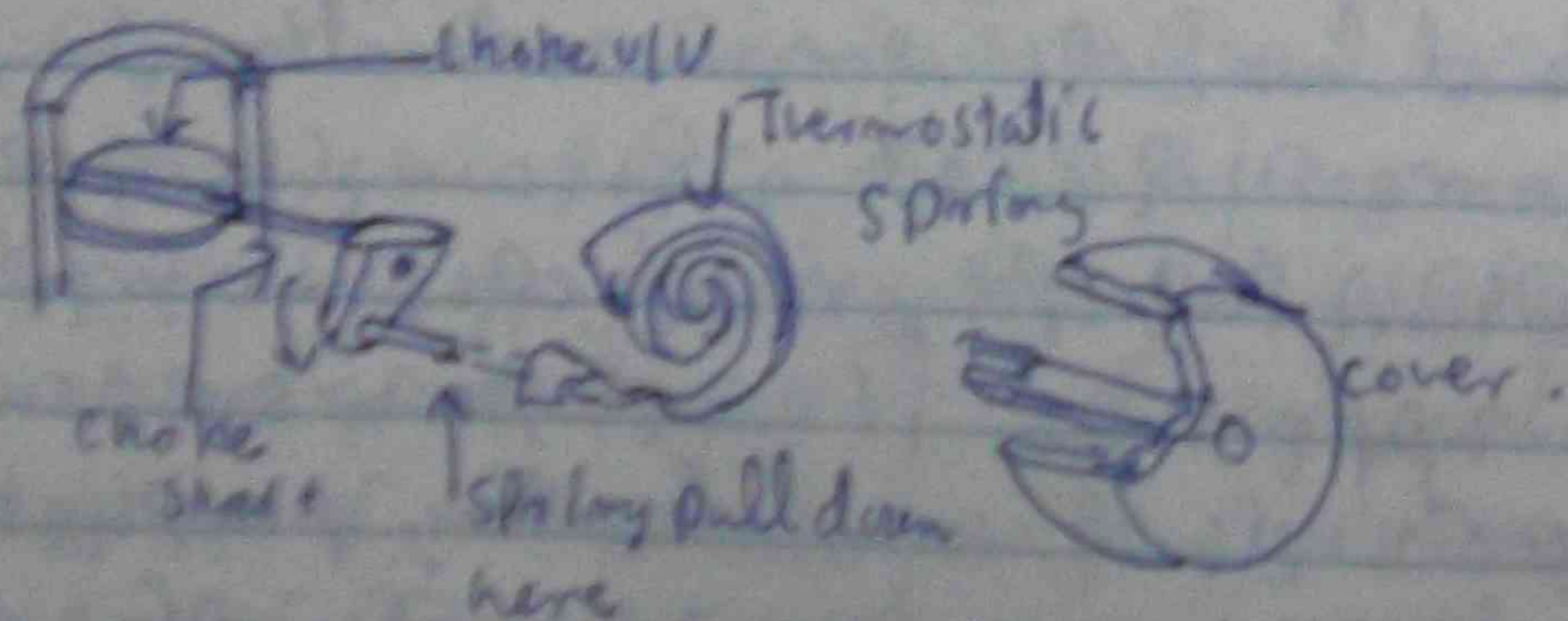
Automatic choke

contains thermostatic coil, vacuum piston & f.

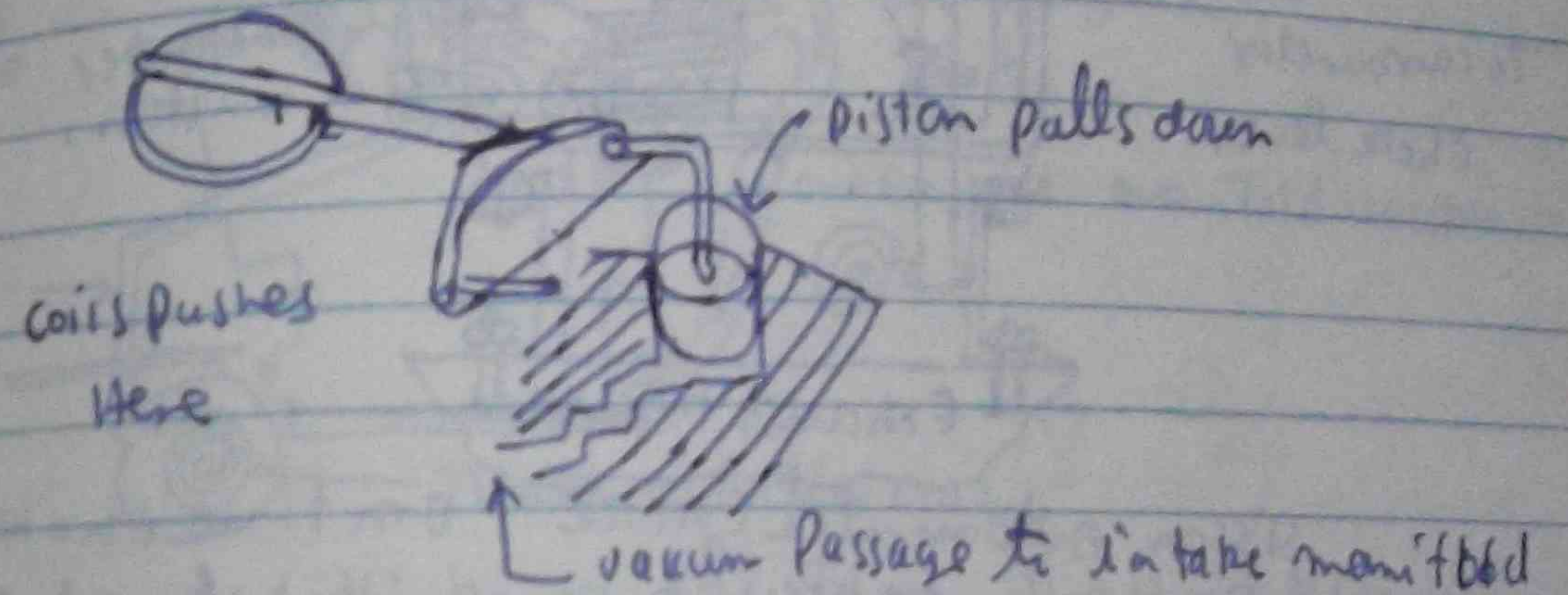
Choke V/V stored. of choke shaft is offset on valve. less air is pushed inside A and as a result side B is pushed down and partially opened against pull of thermostatic coil. Sometimes a small auxiliary air V/V is set in choke valve C.



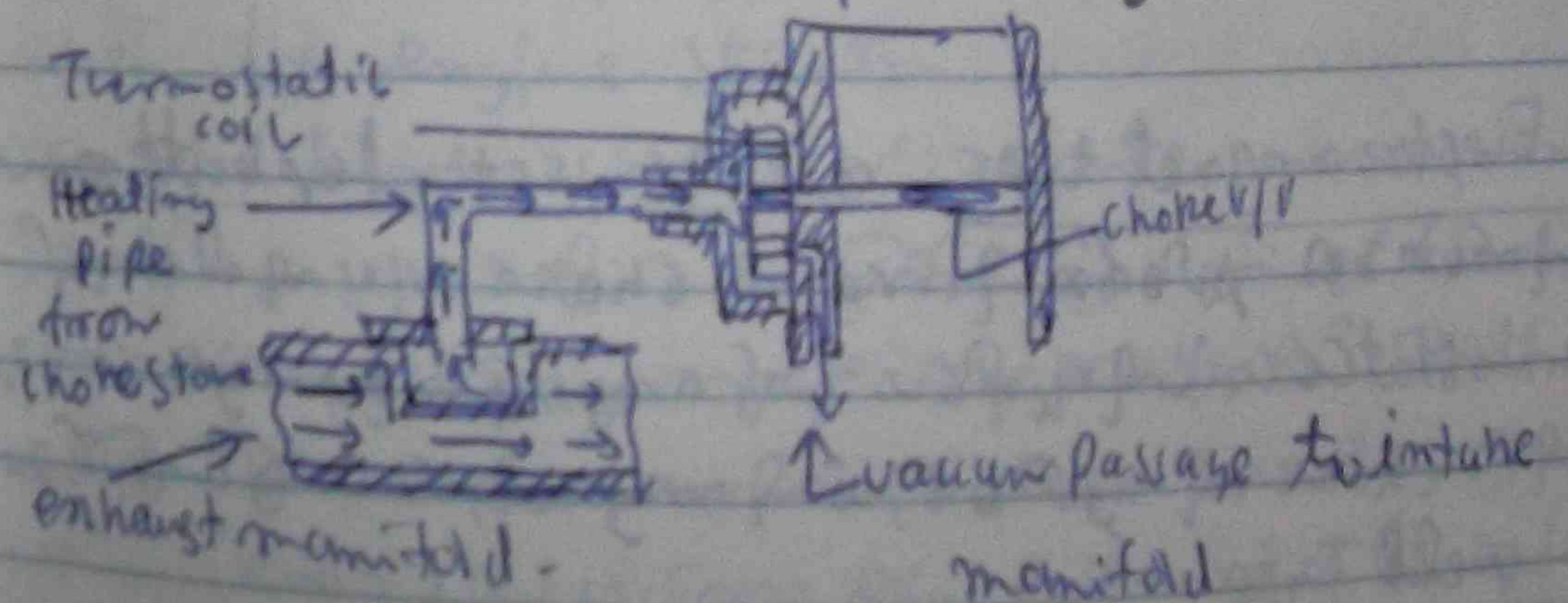
[Choke shaft is offset on valve. less air is pushed inside A and as a result side B is pushed down and partially opened against pull of thermostatic coil. Sometimes a small auxiliary air V/V is set in choke valve C.]



Thermostatic coil and cover when cold spring pulls down in direction of arrow. The cover can be turned to tighten or loosen spring tension.

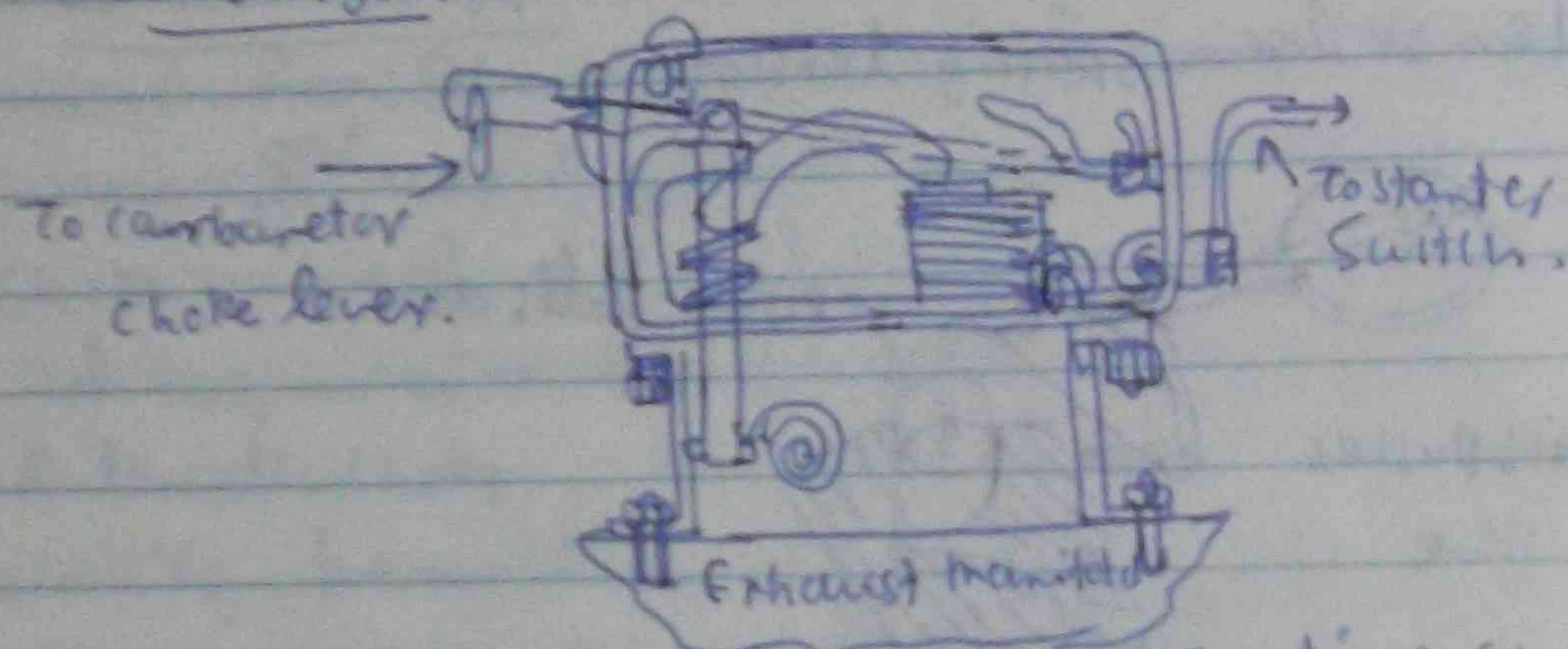


Choke vacuum piston. Vacuum in manifold during draws on bottom of piston causing it to pull down against force of coil. This will partially open choke V/V.



Choke stone notice how fast Exhaust gases warm Choke stone clean heated air is then drawn up through vacuum passage this soon

Other types

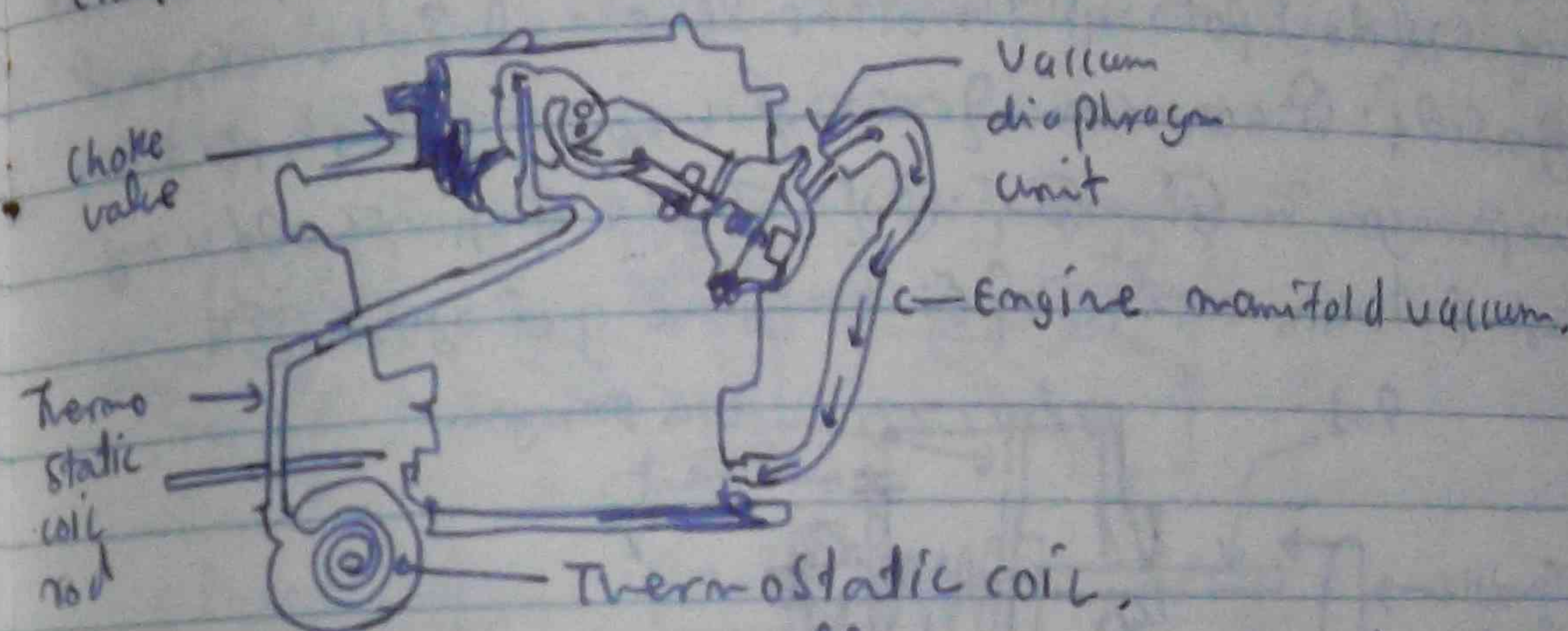


2.5-6 m diameter choke springs (1) Electromagnet type auto choke off. (2) well type auto choke off for 50W (3) manual control choke off. ref. 11 & 12

(1) Electromagnet type or thermostatic butt contact
 In this type of relay, a choke coil is used in the
 thermosstatic coil circuit. The choke coil is used to
 delay the operation of the relay. The choke coil is used
 to delay the operation of the relay. The choke coil is used
 to delay the operation of the relay.

4. 4. 3. Thermostatic coil & Exhaust manifold (V) Exhaust gas cross section (V type engine) & Linkage & Choke lever

Answer: All of vacuum in diaphragm of i.e.
choke of; 10802 5.8-6000



Automatic choke well Type. Thermostatic coil may be placed in the exhaust crossover (hot) area or the intake manifold. This setup uses a diaphragm unit instead of a piston to partially open choke when the engine starts.

(2) Manual control choke is a type of choke which is used to control the current in the circuit. It is a flexible cable or a rod which is used to choke the current. It is a shaft like structure. It is used to control the current in the circuit. It is a knob like structure. It is used to control the current in the circuit. It is a knob like structure. It is used to control the current in the circuit.

warming fuel charges: 2nd of: on a warm up
3rd of: Exhaust gas at 2nd of room air fuel
Exhausted at 3rd of 2nd of Intake manifold p
Cylinder at 7th of 2nd of 3rd, 4th, 5th, 6th, 7th, 8th, 9th, 10th

Plant lyopen

Heat medium

offer

Heat off

how hot gases are directed upward around the intake manifold passages.

water hooded munitold 3rd. munitold 1919 fuel

mixture of Al and Zn or 2nd cooling system is, 4th of

Intake manifold 0216 or 60011

Carburetor icing 70% 2:6: Humidity 100%

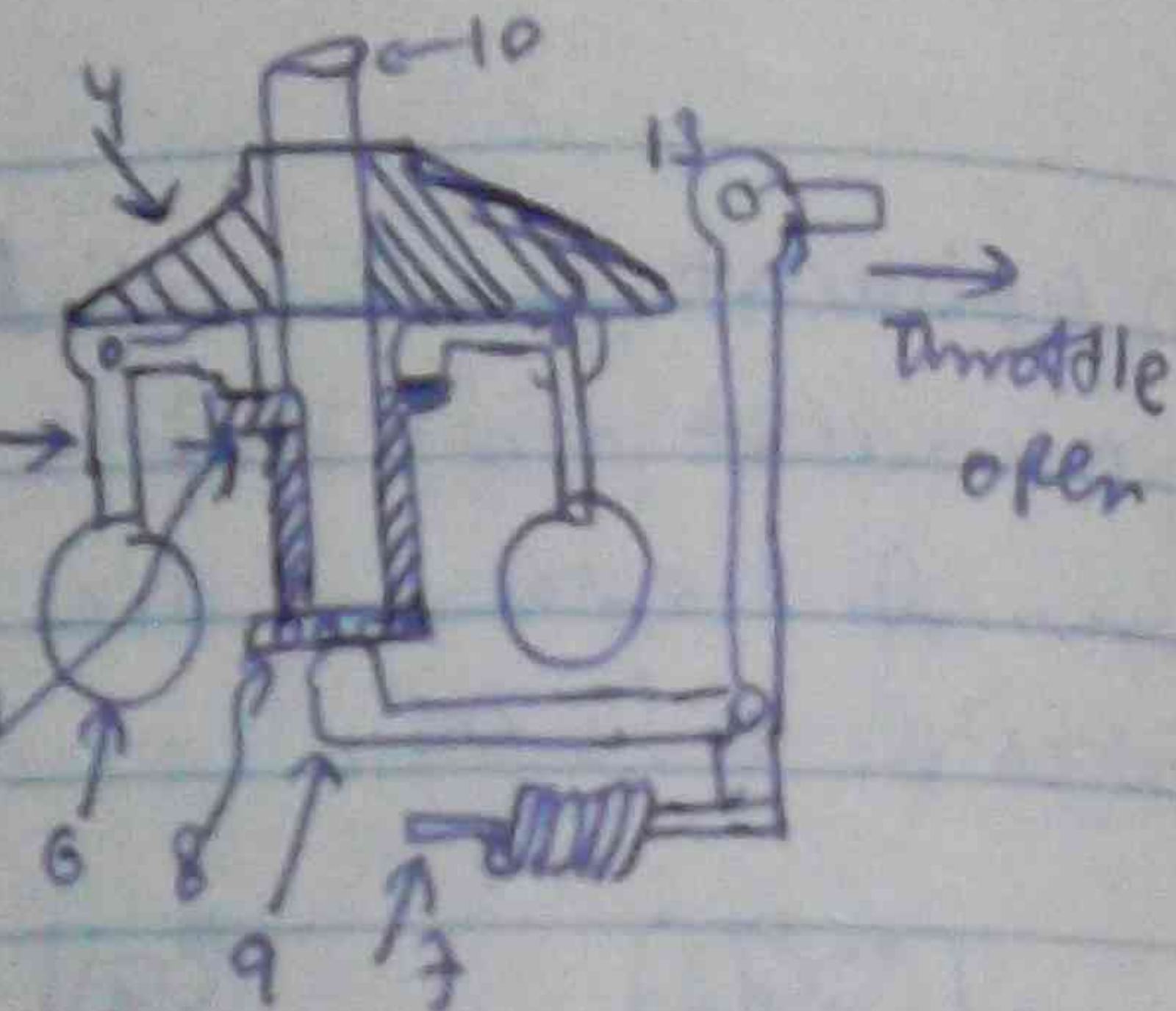
7th 9th 11th 13th 15th 17th 19th 21st 23rd 25th 27th 29th 31st

Throttle plates of throttle

une adreſſe 7 7662: 2201. 61019: 26031, 010112

Page 6 of 10

Governers of carburetor
 are of 2 types: 1. Centrifugal governor
 2. Slide valve governor
 1. Centrifugal governor: As speed of engine increases, weights 6 swing outward drawing rounded ends of 2 downward. This shoves 4 down and causes it to pass on 9. Friction is lessened by ball bearing 8. As weight continue outward, 9 is depressed and throttle lever is pulled back slowing engine. Return spring 7 attempts to keep throttle shutt 13 in open position.

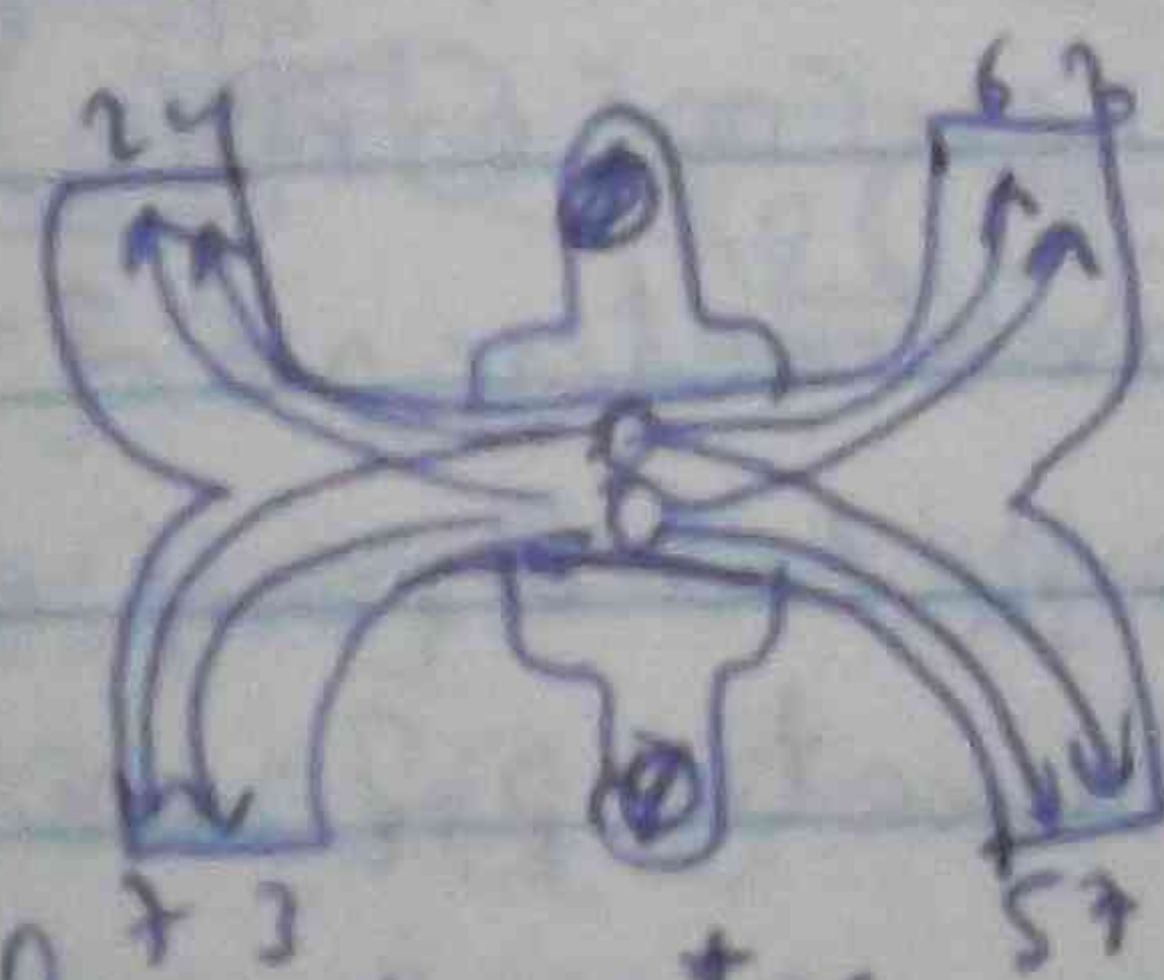


Centrifugal governor. Shaft 10 & valve causing assembly 4 to rotate entire unit. As rate of spin increases weights 6 swing outward drawing rounded ends of 2 downward. This shoves 4 down and causes it to pass on 9. Friction is lessened by ball bearing 8. As weight continue outward, 9 is depressed and throttle lever is pulled back slowing engine. Return spring 7 attempts to keep throttle shutt 13 in open position.

Two barrel carburetor

Dual carburetor is of single barrel carburetor & 2nd barrel. It has 2 discharge nozzles. Idle port, accelerator discharge jet & throttle valve are common. Fuel bowl air horn, choke & throttle shaft are common to both barrels.

Barrel carburetor Intake of air & fuel mixture is common to both barrels. U.S. Engineers cylinder 1, 4, 6, & 7 of 60:60 ratio of air & fuel. High speed or Air fuel mixture of 16:1 of 60:60. Power of 60:60 is large diameter barrel of 1.5 inch diameter. Venturi action is common.



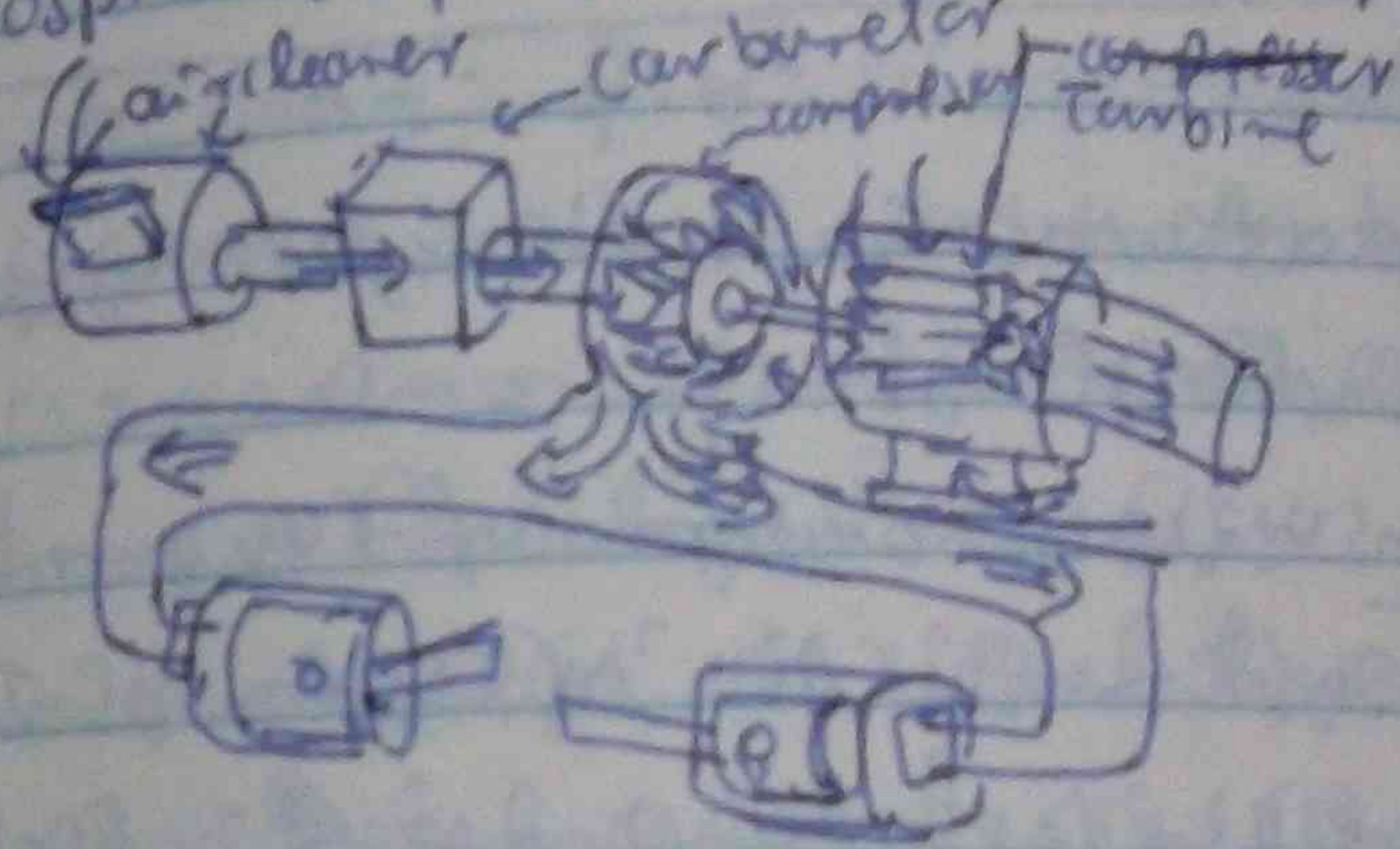
Four Barrel carburetor

Quad carburetor is of dual carburetor & 2nd barrel. It has 4 discharge nozzles. Idle port, accelerator discharge jet & throttle valve are common. Fuel bowl air horn, choke & throttle shaft are common to all four barrels. The barrels are arranged in a cross pattern. The primary side of the barrels is connected to the engine. The secondary side of the barrels is connected to the engine. The throttle valve is common to all four barrels. The fuel bowl is common to all four barrels. The air horn is common to all four barrels. The choke is common to all four barrels. The throttle shaft is common to all four barrels.

31. Defn. of transformer mixture of 220V. vol. 100mV
Efficiency 60%; power loss: 24W

[illegible][illegible]

gross air fuel mixture of cylinder w/ 8 of id.
surf of carburetor mixture PR pressure, carburetor
atmospheric pressure corr 6 lb/sq in of air, PR
carburetor carburetor



Superhunger

[illegible]

fuel mixture of

8f: 60, 2/5/1 Power

out put of cond: cond

Spider Turbocharged Engine. Supercharger vs.

1. Compressor: It is a device which compresses the gas. It is used in the gas turbine engine. It is a rotating machine which compresses the gas. It is a device which compresses the gas. It is a device which compresses the gas.

Turbine & Rotating Gd. gr: gr Blade spring Exhaust

Factor: power of 2, $\neq 2$ on; $\text{Bit} \rightarrow 64$; High speed

Exhaust gases: self cooled blade & of approx. 600°C

valve and crank pin and compressor rotor

③ Carbonyl compound is a fine mixture of methyl and ethyl.

gleichgültig: $\Delta p = 0$ (da Δp von der Druckmessung)

of 2000-2001 and 2001-2002.

Superficial pressure 8 kPa

Plumage - 7-9-26

2000 rpm 9 ft x 11 ft turbocharger 4000 rpm turbine

High supercharge of exhaust gas

200: Engine ~ if (cf. belt (cf.)) gear of 60 ~ 8000
schematic layout of a turbo supercharger & of an
exhaust gas turbine 200: Engine ~ if 30 (cf. belt (cf.))
gear of 60 ~ 8000

[schematic layout of a turbo supercharger system on a flat disc cylinder engine]

[illegible]

CHAPTER (III)

Fuel System Trouble Shooting

(a) Fuel not reaching carburetors

3. Problems: 1. Fuel pump not working properly. 2. Fuel line clogged. 3. Fuel line leakage. 4. Fuel line blockage. 5. Fuel line rust. 6. Fuel line sag. 7. Fuel line kink. 8. Fuel line twist. 9. Fuel line break. 10. Fuel line joint loose. 11. Fuel line joint leak. 12. Fuel line joint blockage. 13. Fuel line joint rust. 14. Fuel line joint sag. 15. Fuel line joint kink. 16. Fuel line joint twist. 17. Fuel line joint break. 18. Fuel line joint joint loose. 19. Fuel line joint joint leak. 20. Fuel line joint joint blockage. 21. Fuel line joint joint rust. 22. Fuel line joint joint sag. 23. Fuel line joint joint kink. 24. Fuel line joint joint twist. 25. Fuel line joint joint break.

[illegible]

② pump pressure up. Pushrod stroke up, rocker arm free plug of. ③ carburetor & accelerating pump stroke up for linkage. ④ stroke of ⑤ carburetor passage up for jet up. ⑥ choke up/v. ⑦ float level of. ⑧ float level of. ⑨ float level of. ⑩ float level of. ⑪ float level of. ⑫ float level of. ⑬ float level of. ⑭ float level of. ⑮ float level of. ⑯ float level of. ⑰ float level of. ⑱ float level of. ⑲ float level of. ⑳ float level of. ㉑ float level of. ㉒ float level of. ㉓ float level of. ㉔ float level of. ㉕ float level of. ㉖ float level of. ㉗ float level of. ㉘ float level of. ㉙ float level of. ㉚ float level of. ㉛ float level of. ㉜ float level of. ㉝ float level of. ㉞ float level of. ㉟ float level of. ㊱ float level of. ㊲ float level of. ㊳ float level of. ㊴ float level of. ㊵ float level of. ㊶ float level of. ㊷ float level of. ㊸ float level of. ㊹ float level of. ㊺ float level of. ㊻ float level of. ㊼ float level of. ㊽ float level of. ㊾ float level of. ㊿ float level of.

⑤ float level of. ⑥ float level of. ⑦ float level of. ⑧ float level of. ⑨ float level of. ⑩ float level of. ⑪ float level of. ⑫ float level of. ⑬ float level of. ⑭ float level of. ⑮ float level of. ⑯ float level of. ⑰ float level of. ⑱ float level of. ⑲ float level of. ⑳ float level of. ㉑ float level of. ㉒ float level of. ㉓ float level of. ㉔ float level of. ㉕ float level of. ㉖ float level of. ㉗ float level of. ㉘ float level of. ㉙ float level of. ㉚ float level of. ㉛ float level of. ㉜ float level of. ㉝ float level of. ㉞ float level of. ㉟ float level of. ㊱ float level of. ㊲ float level of. ㊳ float level of. ㊴ float level of. ㊵ float level of. ㊶ float level of. ㊷ float level of. ㊸ float level of. ㊹ float level of. ㊺ float level of. ㊻ float level of. ㊼ float level of. ㊽ float level of. ㊾ float level of. ㊿ float level of.

Excessive fuel consumption (poor mileage)

Fuel system ① air cleaner up. ② choke up/v. ③ idle fuel mixture up. ④ pump pressure up. ⑤ carburetor passage up. ⑥ float level of. ⑦ float level of. ⑧ float level of. ⑨ float level of. ⑩ float level of. ⑪ float level of. ⑫ float level of. ⑬ float level of. ⑭ float level of. ⑮ float level of. ⑯ float level of. ⑰ float level of. ⑱ float level of. ⑲ float level of. ⑳ float level of. ㉑ float level of. ㉒ float level of. ㉓ float level of. ㉔ float level of. ㉕ float level of. ㉖ float level of. ㉗ float level of. ㉘ float level of. ㉙ float level of. ㉚ float level of. ㉛ float level of. ㉜ float level of. ㉝ float level of. ㉞ float level of. ㉟ float level of. ㊱ float level of. ㊲ float level of. ㊳ float level of. ㊴ float level of. ㊵ float level of. ㊶ float level of. ㊷ float level of. ㊸ float level of. ㊹ float level of. ㊺ float level of. ㊻ float level of. ㊼ float level of. ㊽ float level of. ㊾ float level of. ㊿ float level of.

Ignition system ① Ignition timing up. ② Ignition advanced unit up. ③ spark plug up.

③ contact point cam. ④ compression up. ⑤ exhaust pipe up. ⑥ intake air up. ⑦ brake up. ⑧ Hand brake up. ⑨ Time up. ⑩ wheel alignment up. ⑪ Fuel system up. ⑫ Air cleaner up. ⑬ choke up. ⑭ idle fuel mixture up. ⑮ pump pressure up. ⑯ carburetor passage up. ⑰ float level of. ⑱ float level of. ⑲ float level of. ⑳ float level of. ㉑ float level of. ㉒ float level of. ㉓ float level of. ㉔ float level of. ㉕ float level of. ㉖ float level of. ㉗ float level of. ㉘ float level of. ㉙ float level of. ㉚ float level of. ㉛ float level of. ㉜ float level of. ㉝ float level of. ㉞ float level of. ㉟ float level of. ㊱ float level of. ㊲ float level of. ㊳ float level of. ㊴ float level of. ㊵ float level of. ㊶ float level of. ㊷ float level of. ㊸ float level of. ㊹ float level of. ㊺ float level of. ㊻ float level of. ㊼ float level of. ㊽ float level of. ㊾ float level of. ㊿ float level of.

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Ignition system ① Ignition timing up. ② Ignition advanced unit up. ③ spark plug up.

[illegible][illegible]

Engine And Lubricating System Trouble Shooting

[illegible]

1. 1/2" x 1/2" x 1/2" timing of 1000.
 2. 1/2" x 1/2" x 1/2" timing of 1000.
 3. 1/2" x 1/2" x 1/2" timing of 1000.
 4. 1/2" x 1/2" x 1/2" timing of 1000.
 5. 1/2" x 1/2" x 1/2" timing of 1000.
 6. 1/2" x 1/2" x 1/2" timing of 1000.
 7. 1/2" x 1/2" x 1/2" timing of 1000.
 8. 1/2" x 1/2" x 1/2" timing of 1000.
 9. 1/2" x 1/2" x 1/2" timing of 1000.
 10. 1/2" x 1/2" x 1/2" timing of 1000.

Ignition system improperly adjusted or worn
valves of valves and spark plug gap. If gap is not
set properly, gap will be too wide or too
narrow. Coil output and spark plug wire
resistance. If resistance is too high, it will
point ground. If resistance is too low, it will
not ground. Check for turning light off,
advance of spark plug.

[illegible]

Engine of 1000 cc
 displacement. It is a 4-stroke engine.
 The fuel pump is driven by the crankshaft.
 The pump stroke is 40 mm.
 The cam shaft is driven by the crankshaft.
 The cam shaft is 180° out of phase with the crankshaft.
 The float level is 10 mm above the fuel level.
 The air fuel mixture is 15:1.
 The throttle is controlled by the accelerator pedal.
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The engine is a 4-stroke engine.
 The fuel pump is driven by the crankshaft.
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 The throttle is controlled by the accelerator pedal.

② Ignition Ignition system of primary circuit
 1. Secondary circuit of winding of magnet
 2. High pressure coil
 3. Timing mechanism
 4. Vibration dampers
 5. Timing light
 6. Plug wires

Experiments:
 1. Preparation of carburetor gas
 2. Preparation of acetylene gas
 3. Preparation of ethylene gas
 4. Preparation of propylene gas
 5. Preparation of butylene gas
 6. Preparation of pentylene gas
 7. Preparation of hexylene gas
 8. Preparation of heptylene gas
 9. Preparation of octylene gas
 10. Preparation of nonylene gas
 11. Preparation of decylene gas
 12. Preparation of undecylene gas
 13. Preparation of dodecylene gas
 14. Preparation of tridecylene gas
 15. Preparation of tetradecylene gas
 16. Preparation of pentadecylene gas
 17. Preparation of hexadecylene gas
 18. Preparation of heptadecylene gas
 19. Preparation of octadecylene gas
 20. Preparation of nonadecylene gas
 21. Preparation of eicosylene gas
 22. Preparation of heneicosylene gas
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[illegible]

② Distribution timing 60%

Distributor Timing gear on 700-760 Nm
I 250 mm front cover of gear, cam shaft timing
0060-660 Nm.

① Rotor shaft geometry:

[illegible]

(d) Lams an everly and balklines

2. carburetor adjustment - engine speed 2000 rpm
 3. carburetor adjustment - engine speed 2000 rpm
 4. carburetor adjustment - engine speed 2000 rpm
 5. carburetor adjustment - engine speed 2000 rpm

(3000000) in backfire but does not start from
of 6000000 or 7000000 engine & 8000000. 9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-10

① Ignition faults ② lean mixture ③ cylinder

① 2 valve faults

④ Ignition faults - Ignition system.
 (66631) ① Ignition faults - Ignition system.
 4. 66631 of 6000. 66631 distributor
 - or cap terminal plate of 66631. 66631
 1. 66631 distributor

shorted by an inductor - the full duration of the spark advance unit is required for the spark to advance unit

① lean mixture - Ignition system of 1000 rpm, fuel mixture too lean for 2500 rpm of 2500 rpm, 0000-6000 rpm

[illegible]

④ Valve faults Engine's Idle speed, RPM: 600-1100
 In 10-15 sec. Carburetor has to be adjusted. If it is not
 adjusted properly, the engine will not run properly. The
 engine will not run properly if the valve clearance is not
 adjusted properly. The valve clearance is the gap between
 the valve and the valve seat. If the valve clearance is not
 adjusted properly, the engine will not run properly. The
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 The valve clearance is the gap between the valve and the valve seat.