SMART INDIA HACKATHON 2022

Ministry: ITBP,MHA

PS Code: RV1251

Problem Statement Title: INDIGENOUS MONITORING RECEIVER

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Theme : INTERCEPTION AND MONITERING OF SINGNALS IN BORDER.

PROBLEM STATEMENT

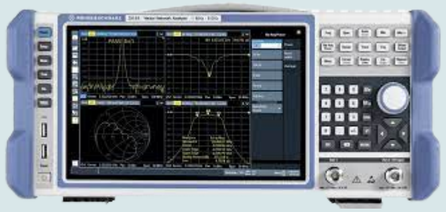
- ITBP is looking for monitoring communication receiver to **interrupt the communication of adversary**
- The available receiver cannot **cover a wide range.**
- ITBP faces issues in the existing receiver that **cannot able to multiple signals simultaneously** at the same time.
- The signal transmitted by ITBP has **less security level** which can be easily tracked by the anonymous person.
- In the receiver end the complications faced are the **language issues** of the tracked signal which are converted to audio.
- To **know the location** from where the anonymous signal is transmitted.
- The received datum are **needed to be stored in a storage bank** for future verification

IDEA

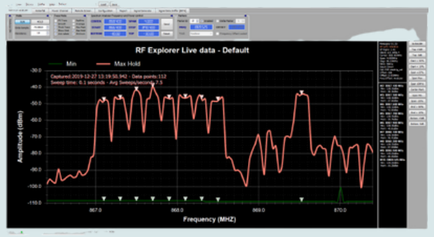
- To develop a receiver that can **simultaneously intercept** and analyze more than **3 to 4 data at the same time**.
- The data which all are received by the antenna will be **stored** in separate data sheets which can be examined whenever needed.
- The proposed model can able to **encrypt and decrypt** the data which are sent and received by ITBP.
- Our innovation in the project is that the audio output can be **translated into any language** that the user needs.
- we achieve this by using **machine learning and deep learning** using pycharm.
- We also designed a **perimeter monitoring** device that can sense whether someone is trying to intercept our boundary and will **alert the outpost near that location**.
- The alertation will send in three stages with **GSM , WIFI and by radio frequency** based on their availability.

FLOW CHART

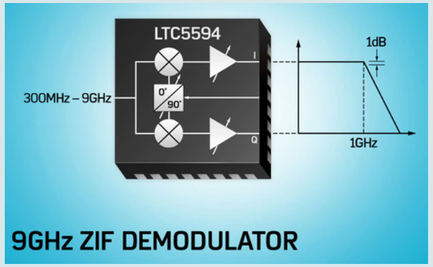
Antenna



spectrum analyzer

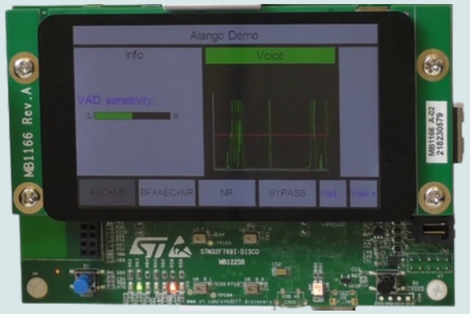


Identifying and intercepting the selective signals by recognizing the amplitude peak



demodulating the frequency to analyse whether the singnal contains audio,image etc..

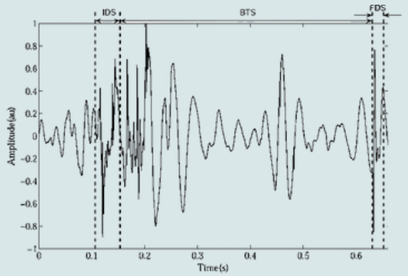
external storage bank is used to store the recogniized datum



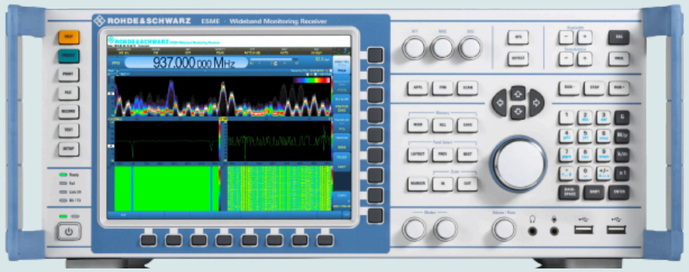
language and speech camparission done using machine learning

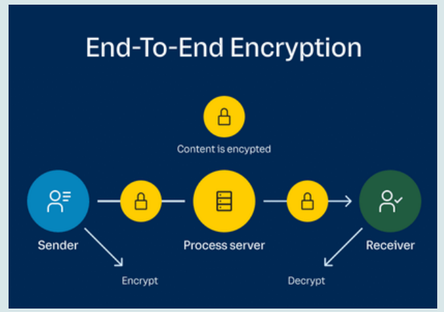
suspicious type of frequencies are stored in [A] storage bank

Non- suspicious frequencies are stored in [B] storage bank

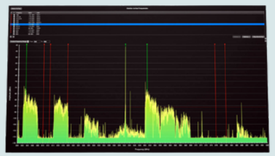


Signals are recieved from other countries transmitter which either have or does not have specific code





Signals recieved from our local transmitter which is already encoded with a specific code



Signals from other countries are analyzed automatically then move on to the process of spectrum analyzer, interrupting, demodulation and it will move to the final stage

Signals from our local transmitter are stored in a storage bank because it has similar code this can be analyzed manually

→ Language speech identification → Storage bank

PROTOTYPE - INTERCEPTOR

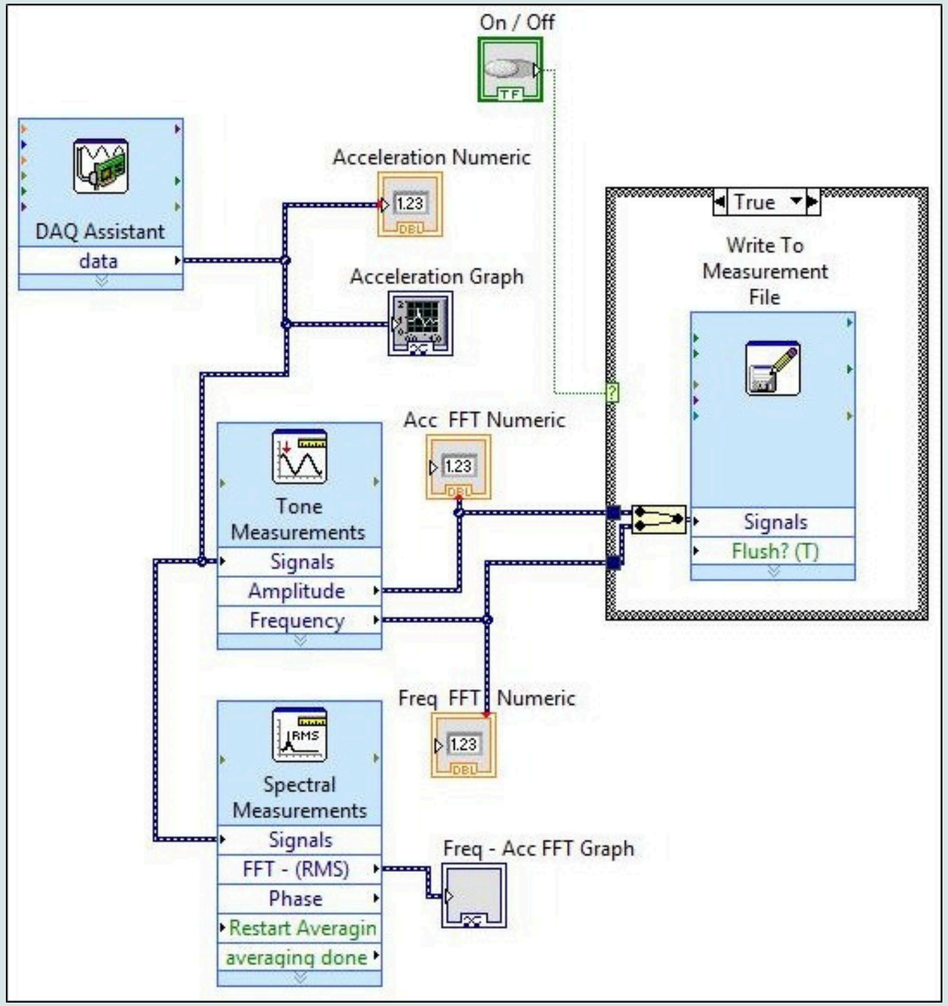
ENCRYPTION

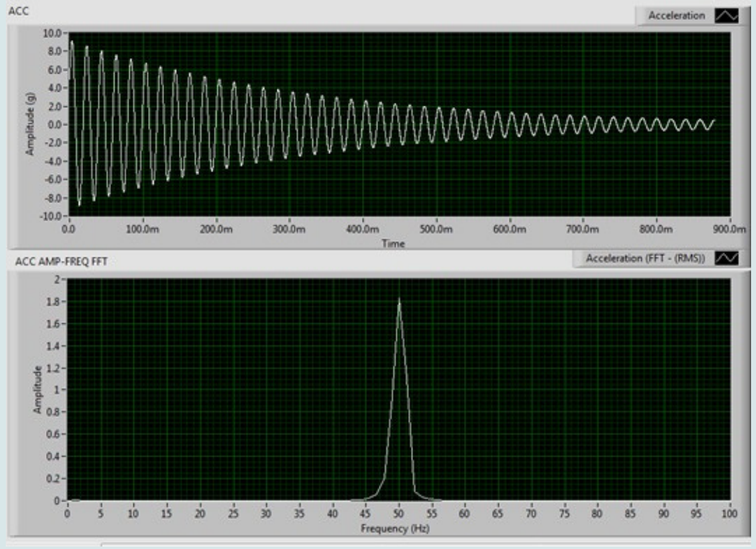
```
jj={'a': 'ra', 'b': 'sp', 'c': 'fi', 'd': 'yu', 'e': 'ro', 'f': 'fy', 'g': 'do', 'h': 'mr', 'i': 'bl', 'j': 'xx', 'k': 'le', 'l':
msg='Someone trying to impersonate at the Border and you should not continue '
gg=''
dict2 = {value:key for key, value in jj.items()}

for i in msg:
    # print('"{}",'.format(jj[i]),end='')
    print(jj[i],end='')
    gg+=jj[i]
print("Encypted Message:",gg)
lol=[gg[i:i+2] for i in range(0, len(gg), 2)]
ll=''
for i in lol:
    # print(dict2[i],end='')
    ll+=dict2[i]
print(ll)
```

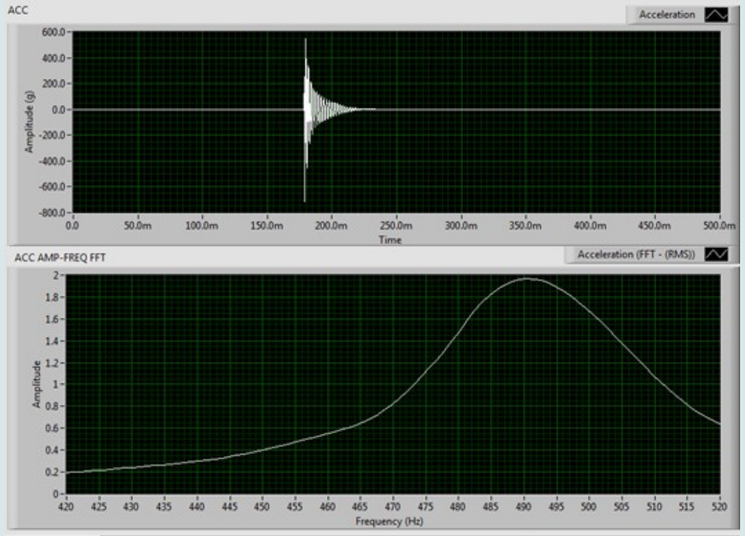
INTERCEPT DATA

```
2022-08-28 19:01:54     Message:  sih hardware edition ersity
2022-08-28 19:01:55     Message: ////hi! centurion university
2022-08-28 19:01:58     Message:  sih hardware edition ersity
2022-08-28 19:01:59     Message: EMERGENCYware edition ersity
2022-08-28 19:02:01     Message:  sih hardware edition ersity
2022-08-28 19:02:01     Message: ////hi! centurion university
2022-08-28 19:02:04     Message:  sih hardware edition ersity
2022-08-28 19:02:07     Message:  sih hardware edition ersity
2022-08-28 19:02:11     Message:  sih hardware edition ersity
2022-08-28 19:02:11     Message: ////hi! centurion university
2022-08-28 19:02:13     Message:  sih hardware edition ersity
2022-08-28 19:02:17     Message:  sih hardware edition ersity
2022-08-28 19:02:22     Message: ////hi! centurion university
2022-08-28 19:02:23     Message:  sih hardware edition ersity
2022-08-28 19:02:24     Message: ////hi! centurion university
```

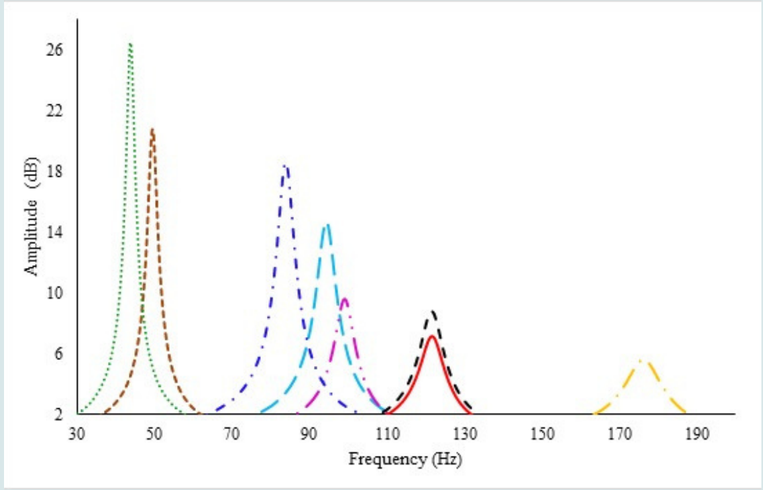
LAB VIEW MODEL

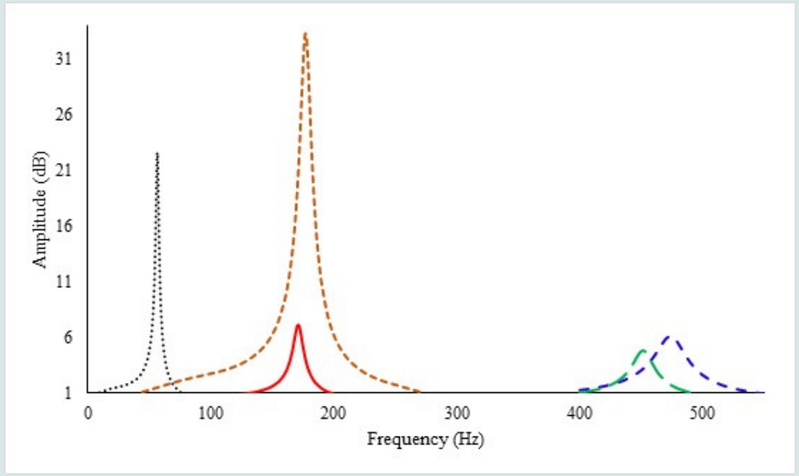


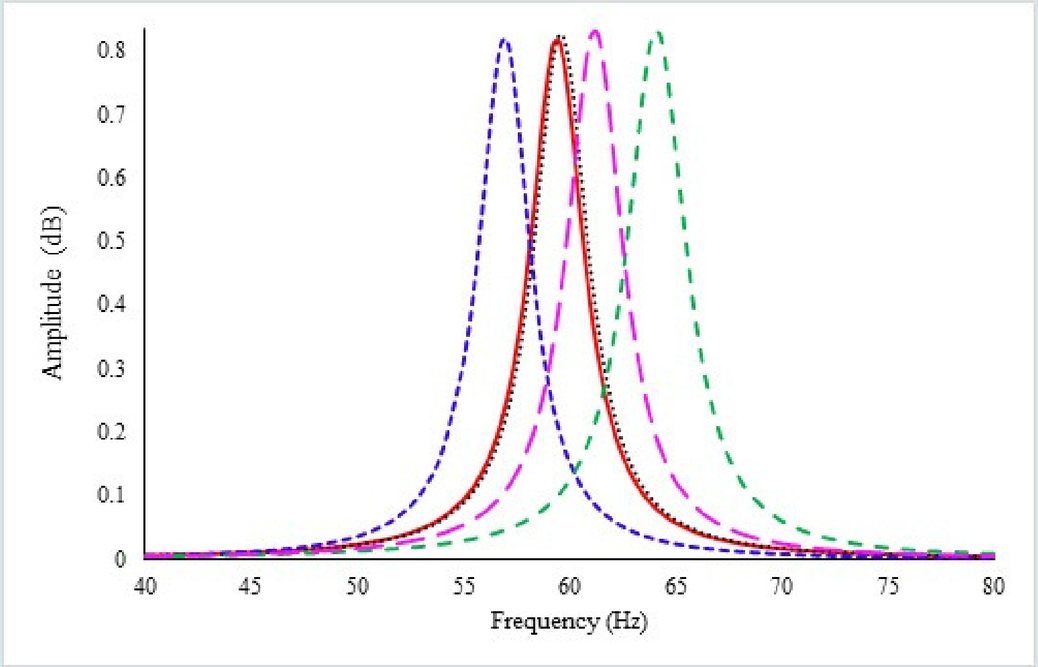




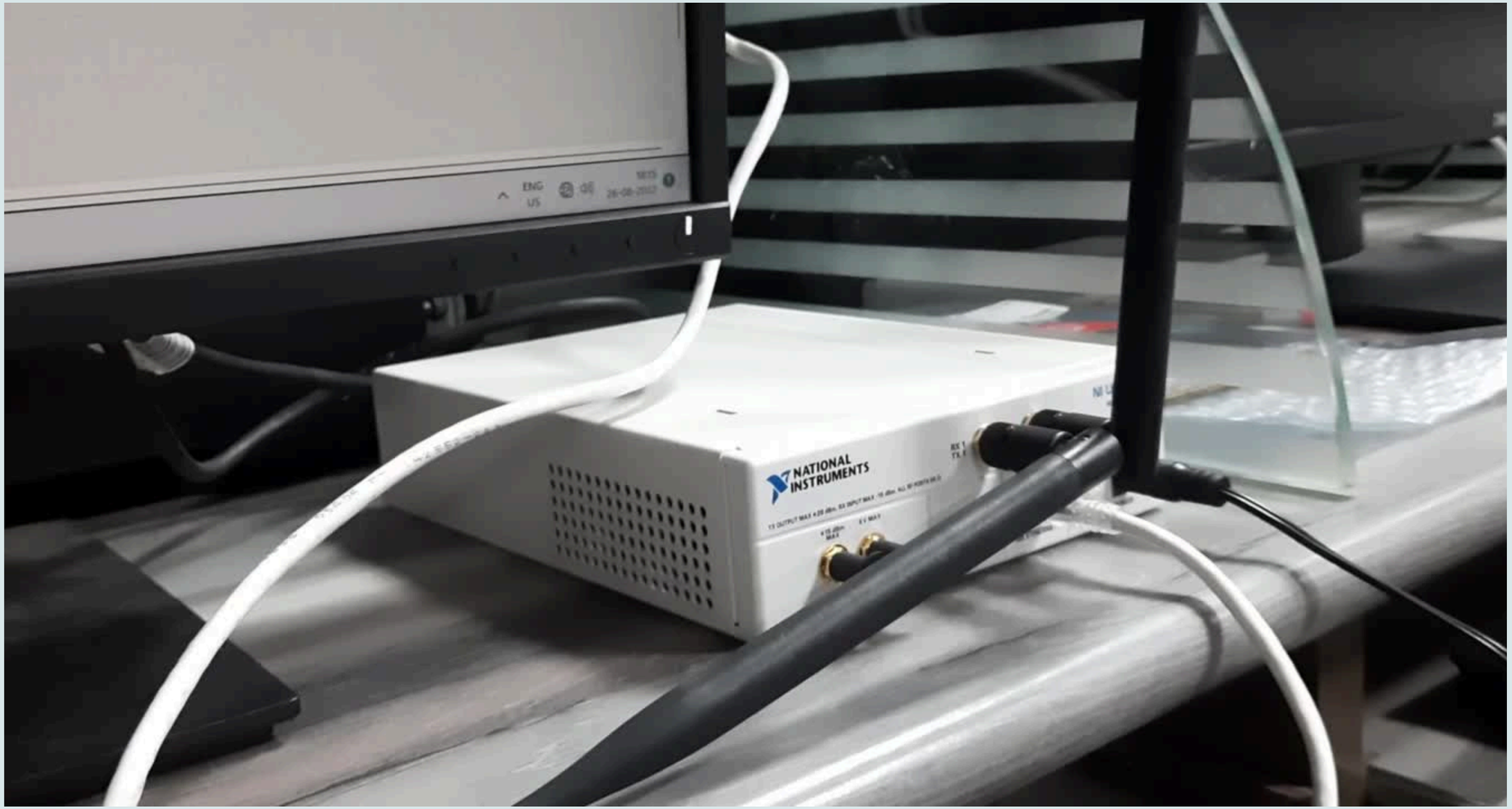
SUM OF THE SAMPLED FREQUENCIES







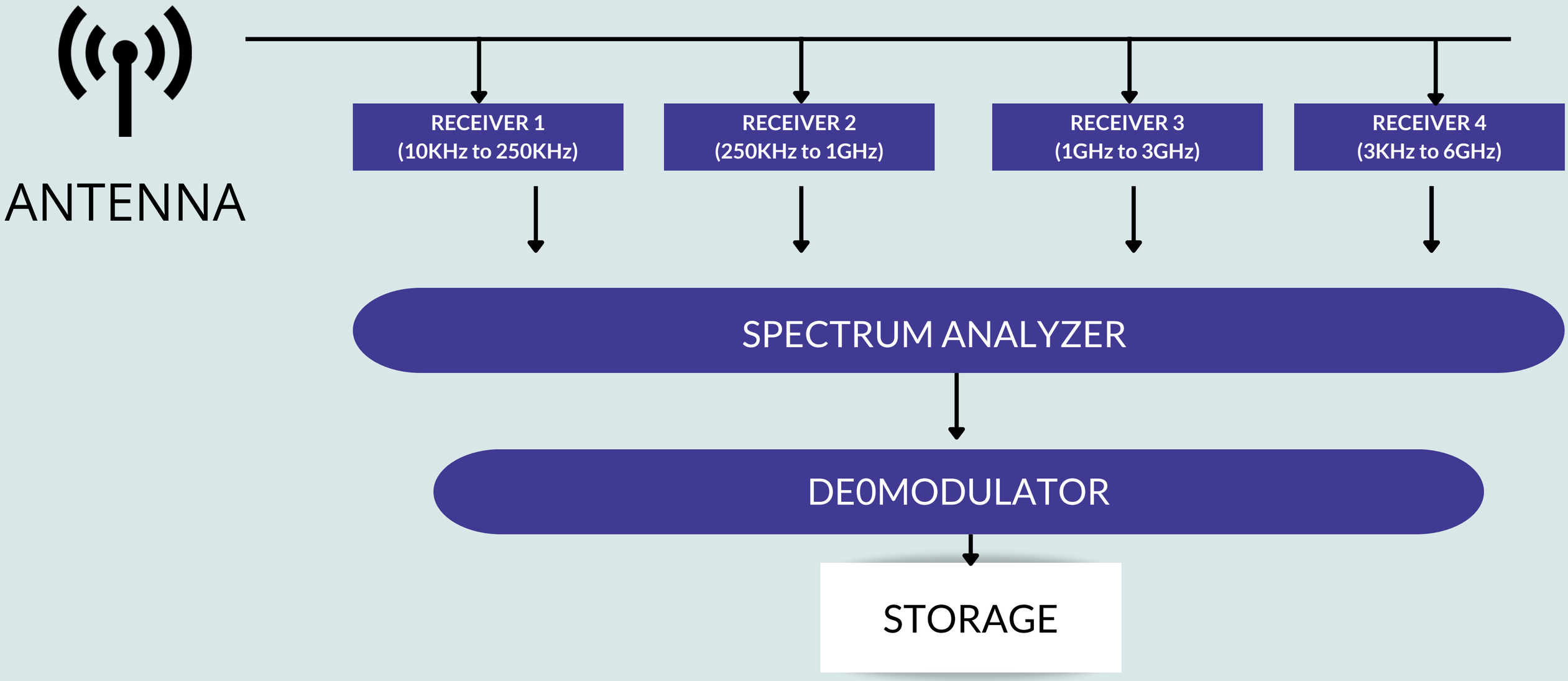
LIVE EXECUTION VIDEO



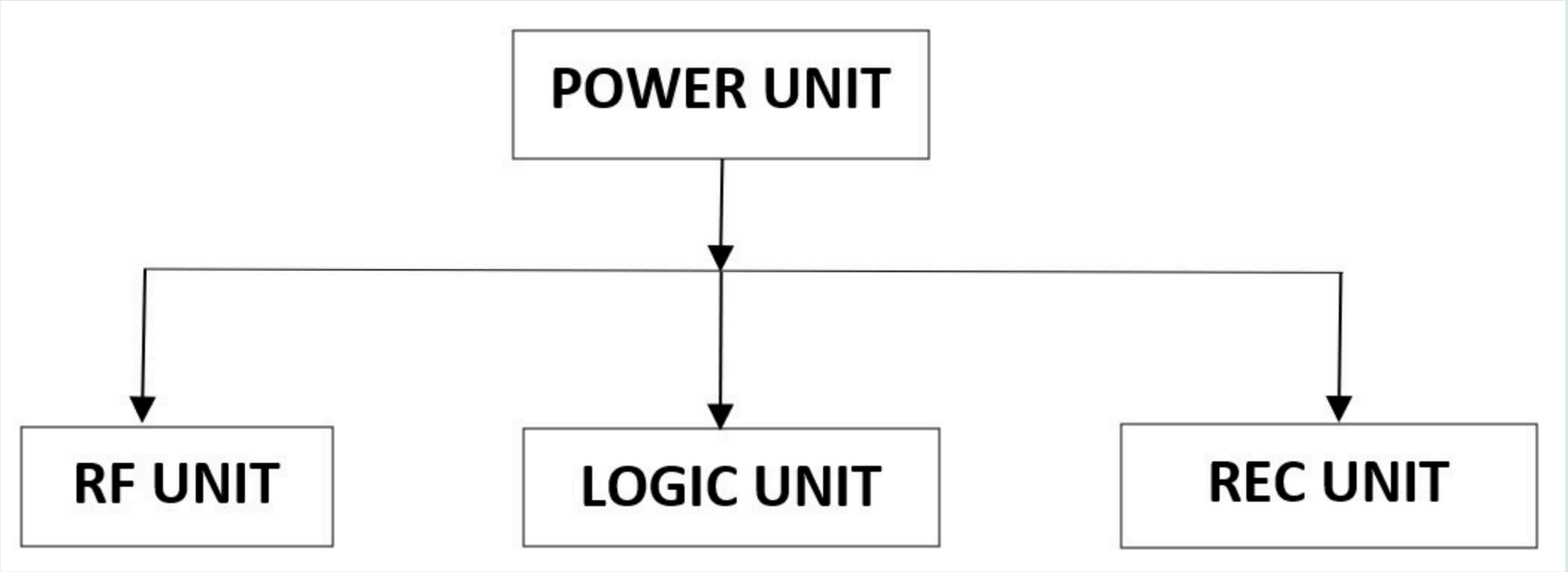
LANGUAGE DETECTION

```
listening.....
Recognizing.....
The User said Indo Tibetan Border Police

Enter the language in which you want to convert : Ex. Hindi , English , etc.

listening.....
Recognizing.....
The User said Hindi

इंडो तिब्बती सीमावर्ती पुलिस

Process finished with exit code 0
```

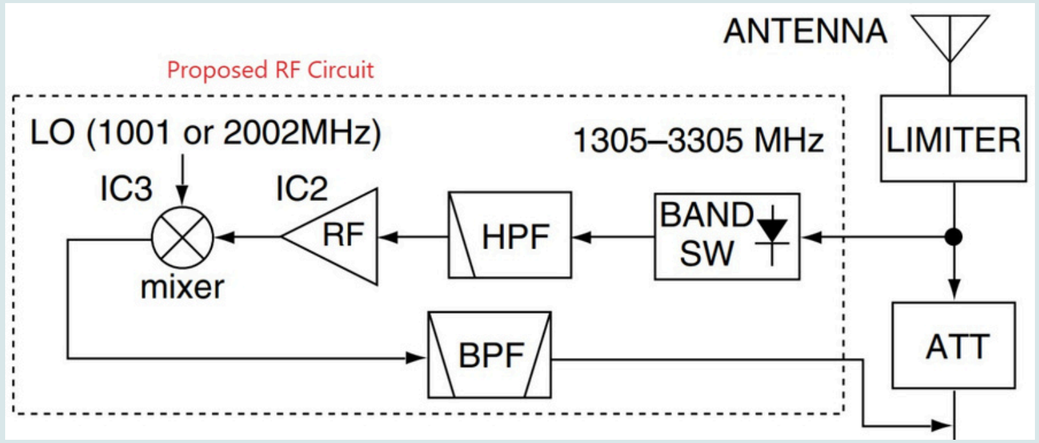
FUTURE APPROACH

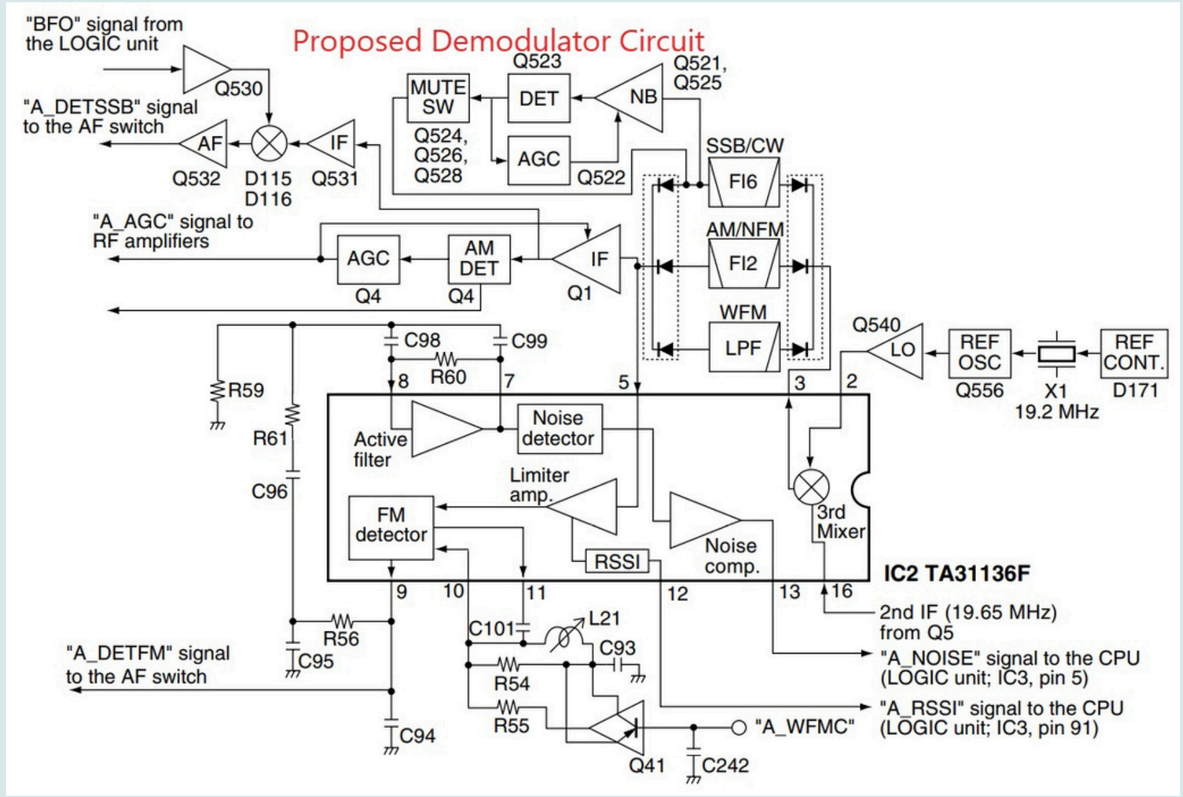


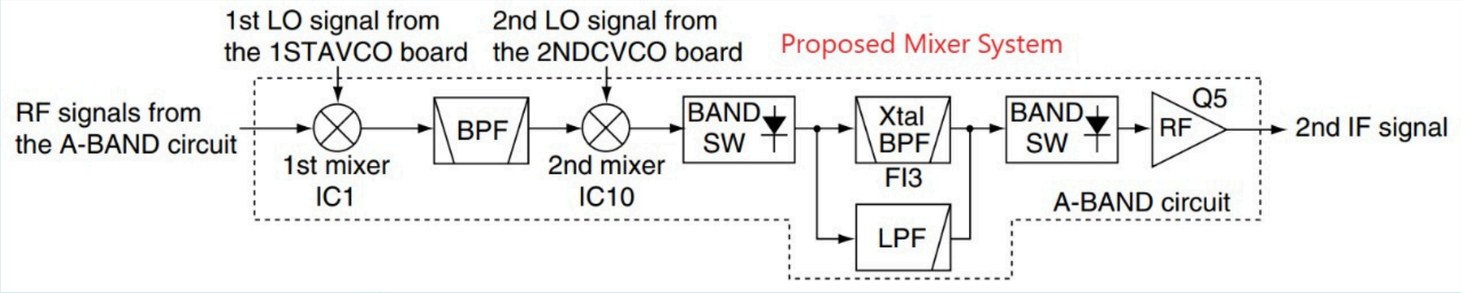
FUTURE RECEIVER MODEL



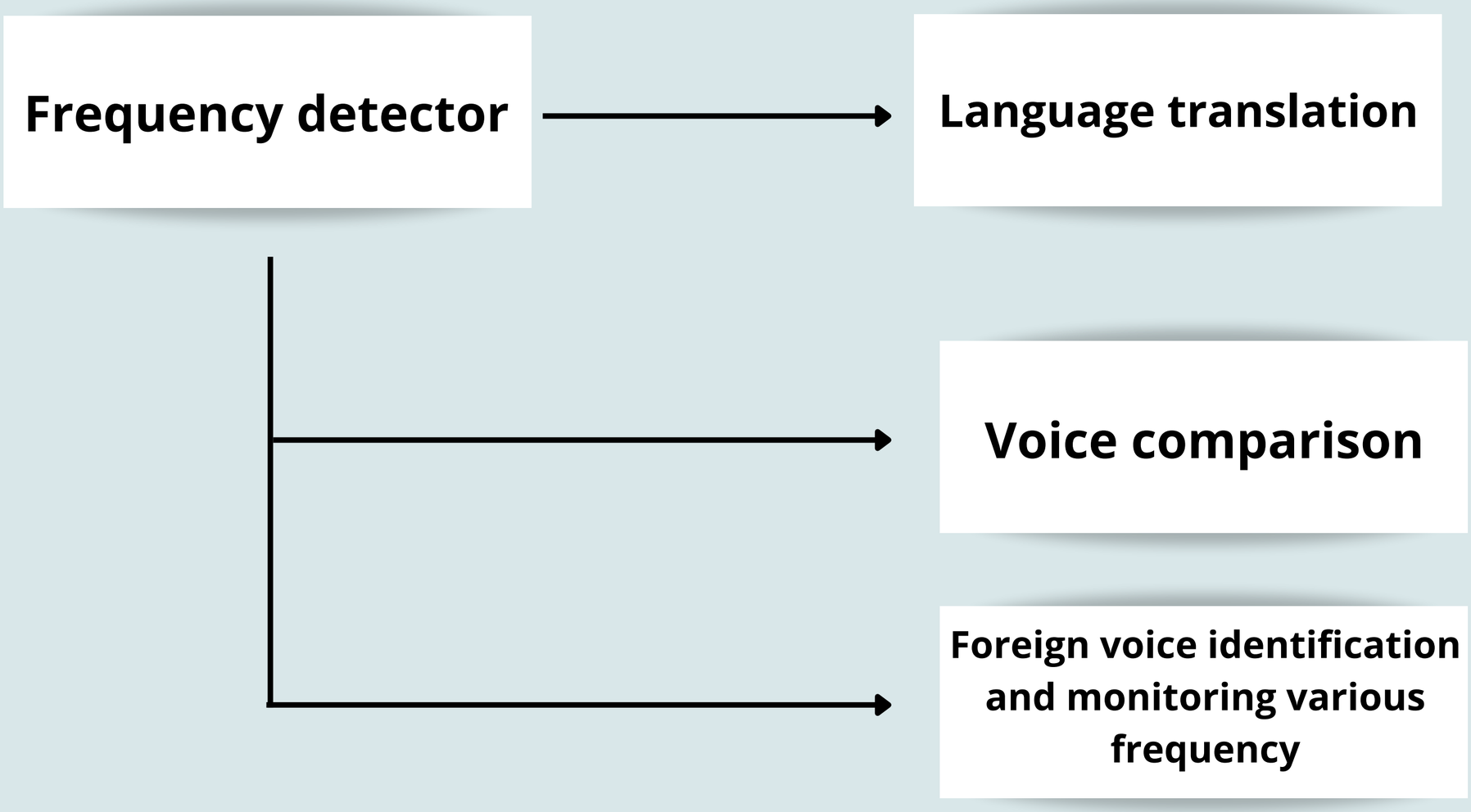
FUTURE APPROACH CIRCUITS



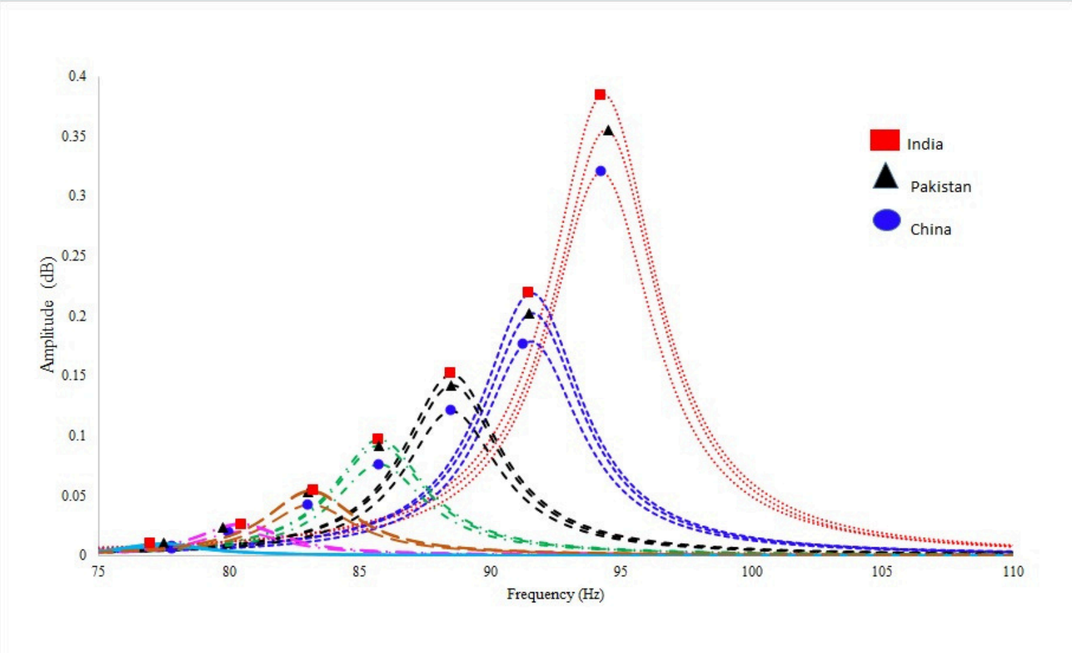


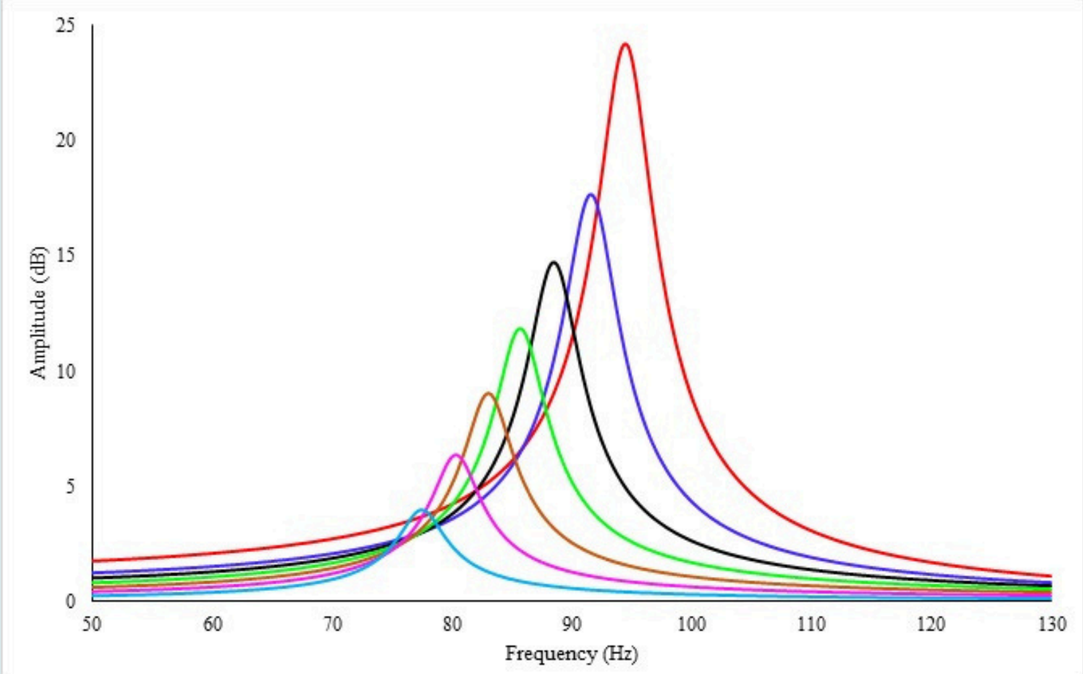


FUTURE APPROACH - SOFTWARE



FREQUENCY VARIATIONS





THANK YOU

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