Ingénierie d'un récepteur radio AM avec la suite Micro-Cap et Kicad

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CONGRES NATIONAL DE LA RECHERCHE EN IUT
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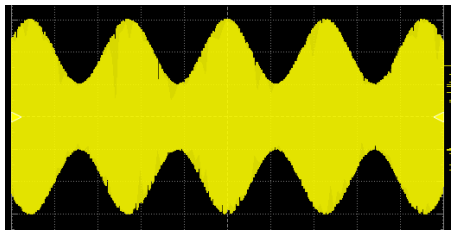
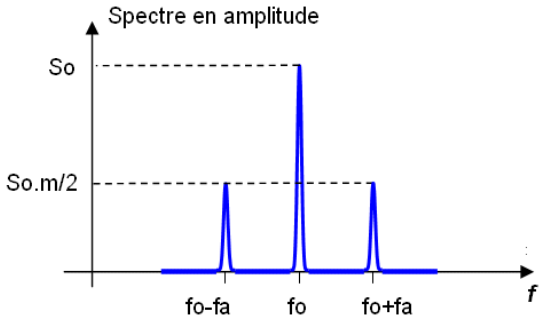
Introduction

- Nécessité d'intéresser les étudiants qui présentent de fortes lacunes en électricité et électronique
- Projet en électronique en adéquation avec le ppn du DUT GIM
- Projet d'ingénierie radio pour les 1ère année du DUT GIM
- Technologie AM choisie



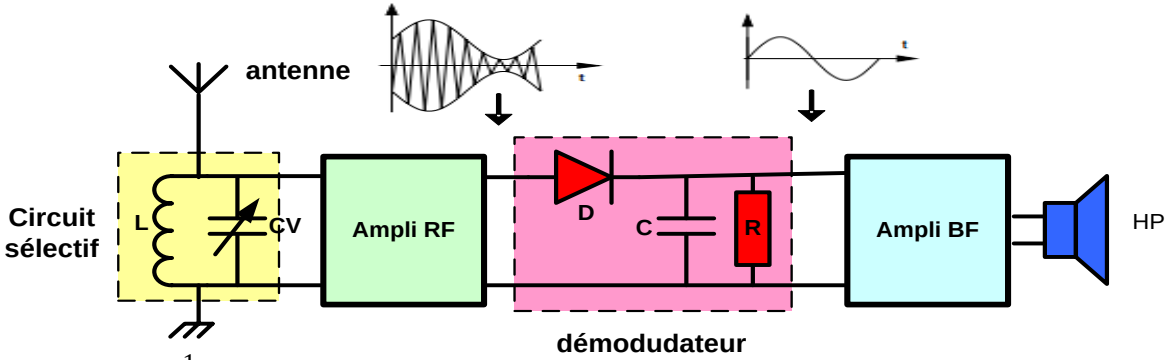


Ingénierie du Projet

- Etude (Cours-TD)
- Simulation (Micro-Cap)
- Conception (Kicad)
- Réalisation (TP)

Etude du Projet

- Etude du projet en Cours et TD

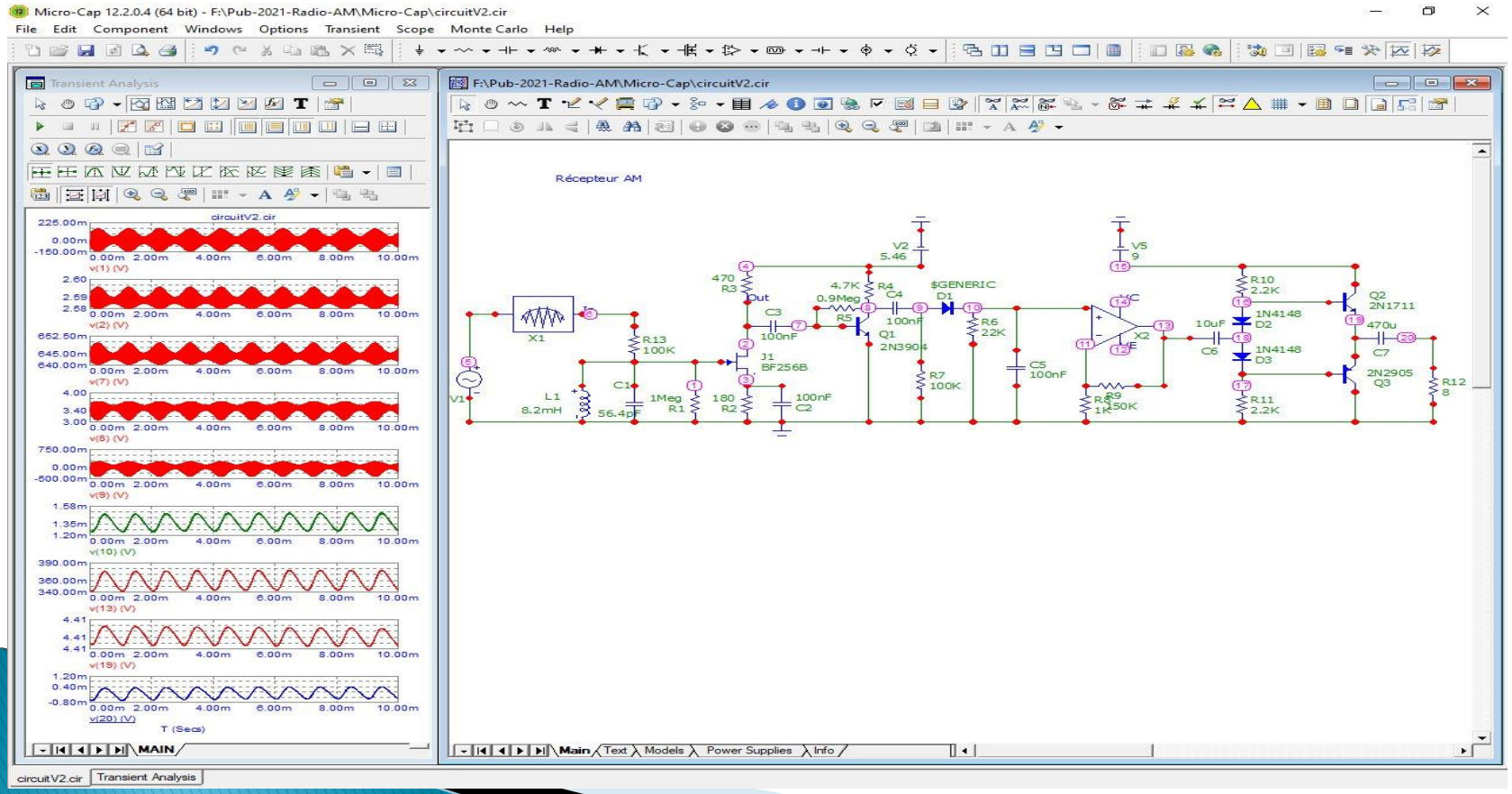


$$Fp = \frac{1}{2\pi\sqrt{LC}} = 234kHz$$

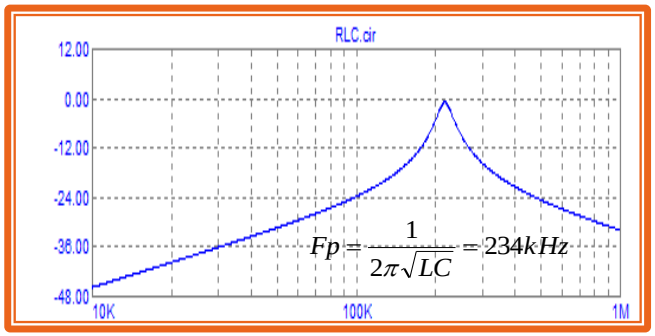
- Choix et dimensionnement des composants qui composent :
  - La réception – station RTL fréquence porteuse 234 kHz
  - L'amplification RF
  - Le démodulateur
  - L'ampli BF

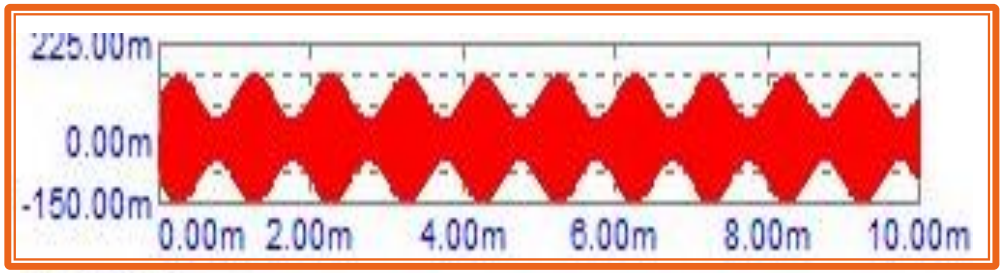
Simulation du Projet

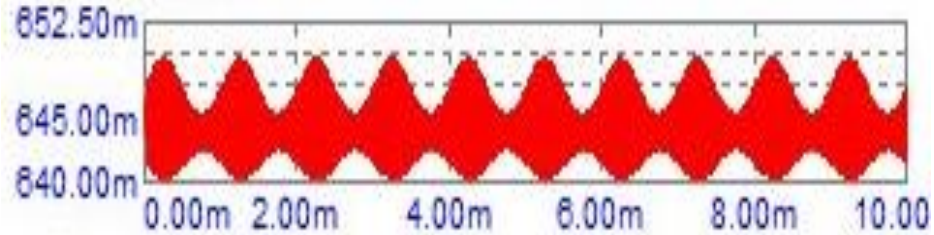
- Le logiciel libre Micro-Cap
- Vérification du choix des composants qui composent :
  - La réception, l'amplification RF, la démodulation, l'amplification BF

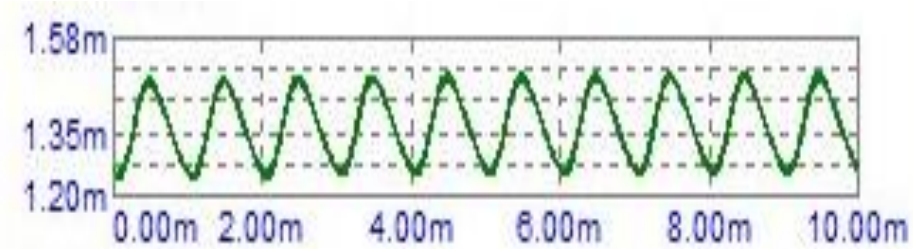


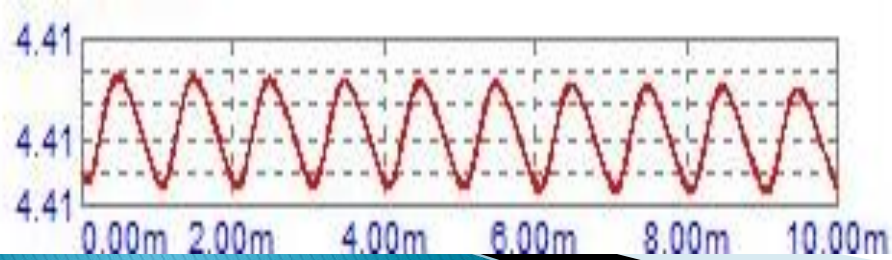
Simulation du Projet

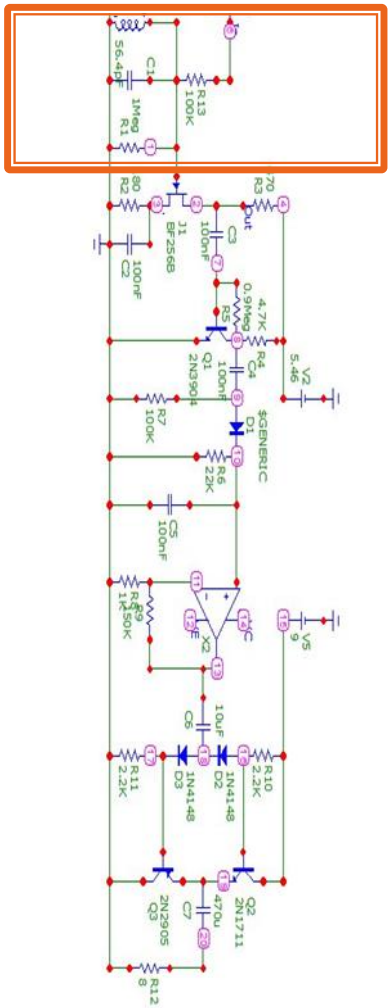






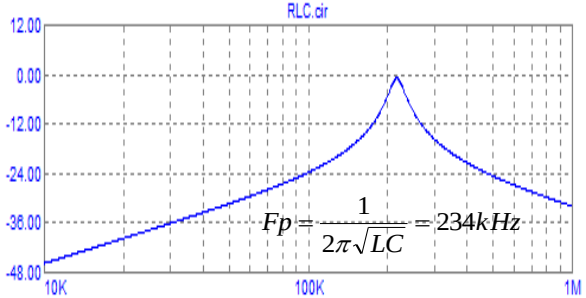






- La sélectivité
- l'amplification RF
- la démodulation
- l'amplification BF

Simulation du Projet



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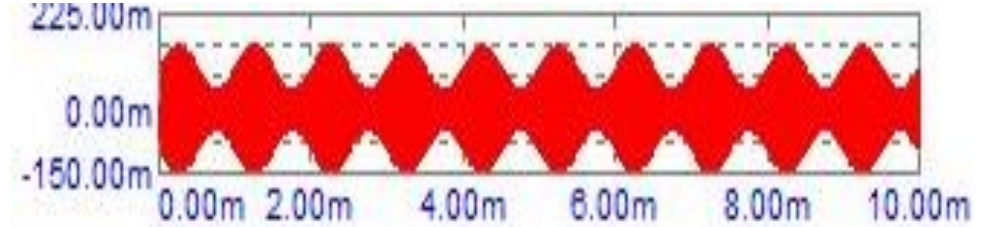

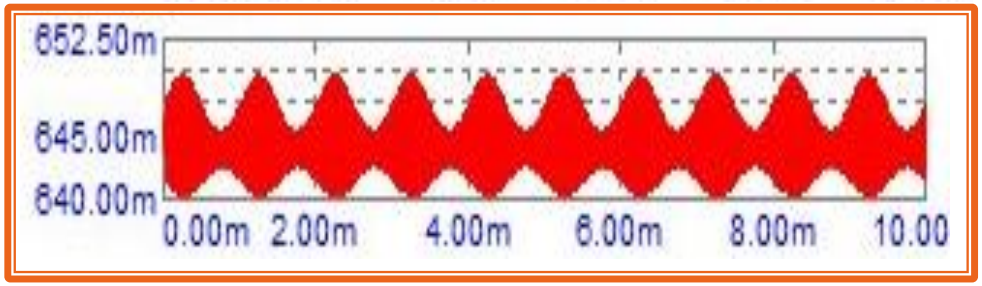

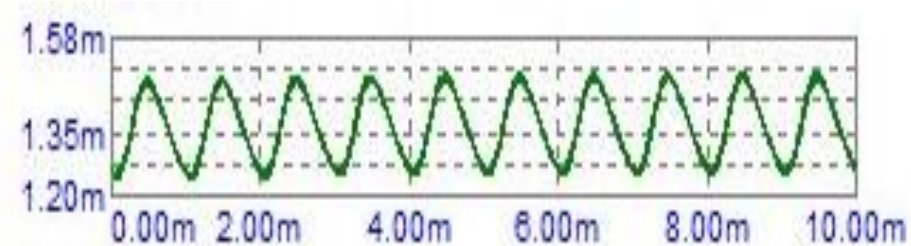

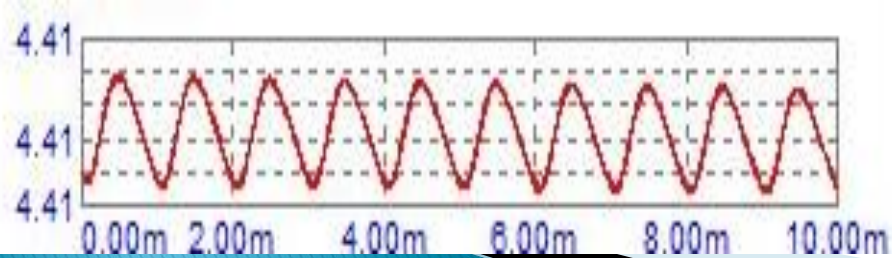

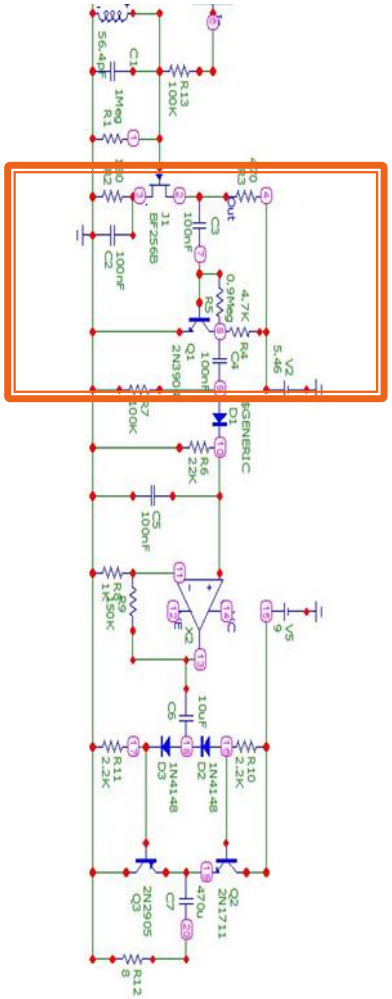

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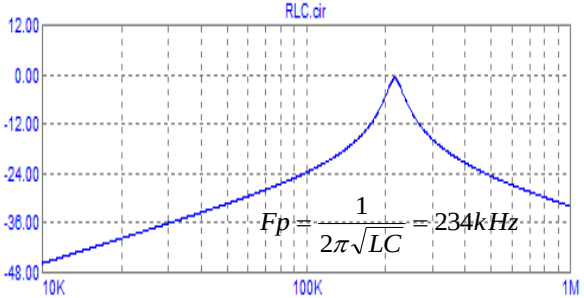
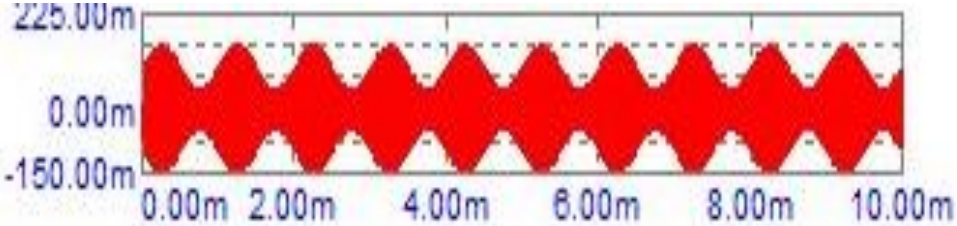
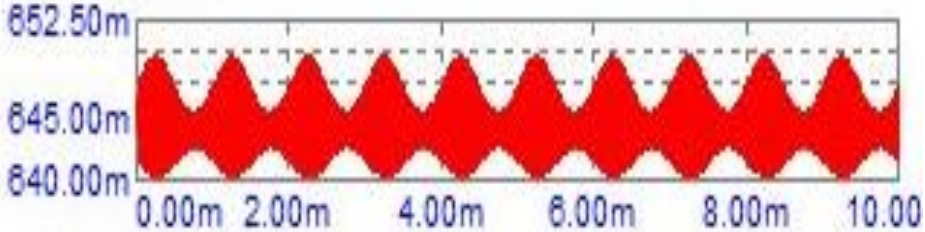
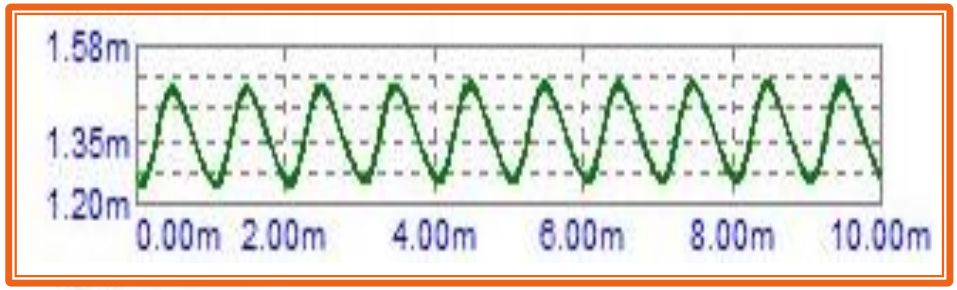
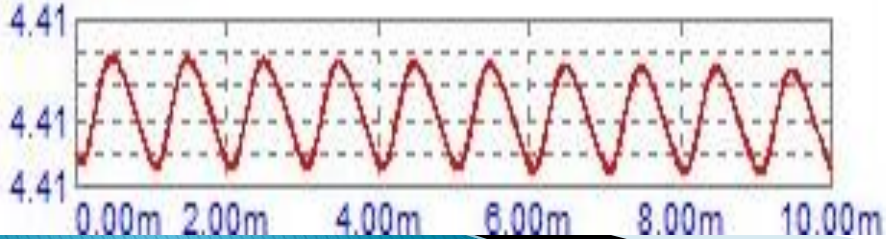
Simulation du Projet

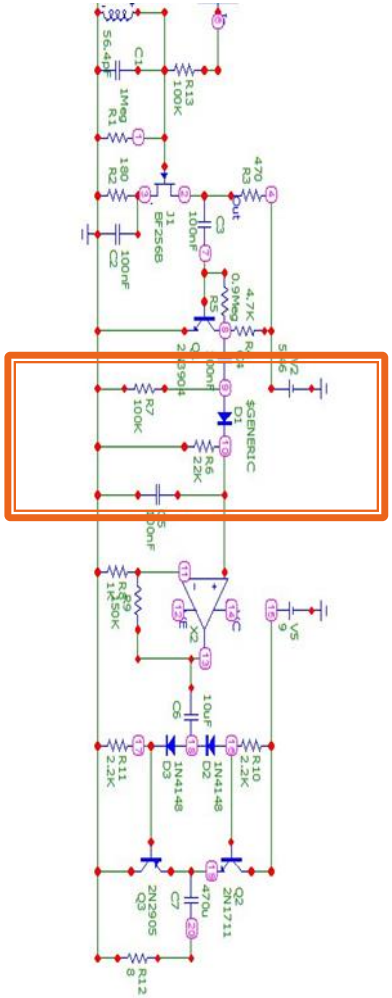












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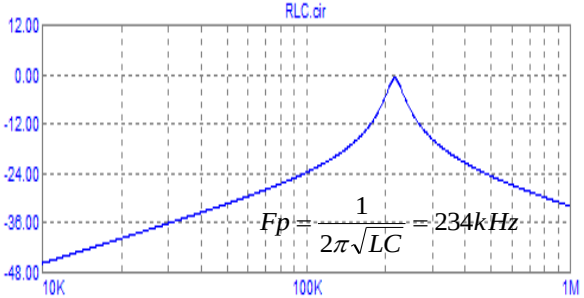
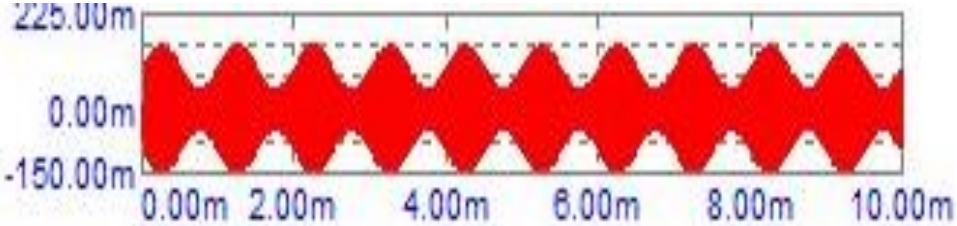
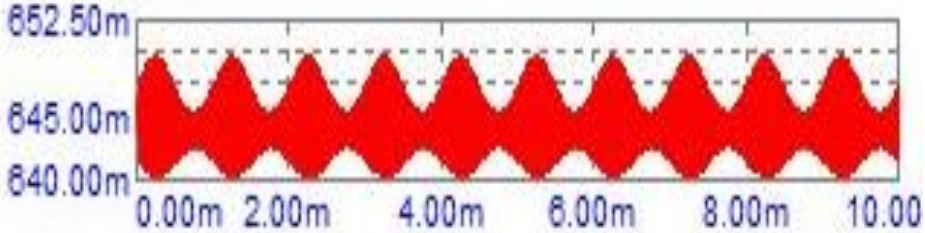
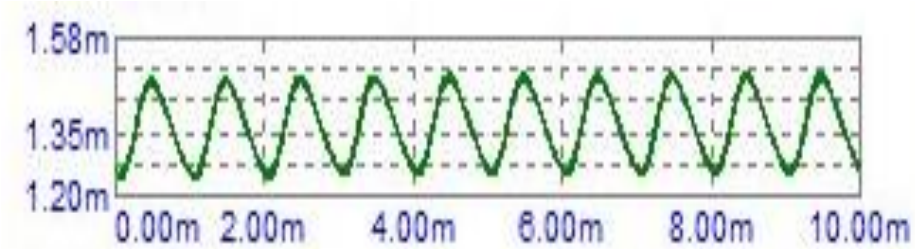
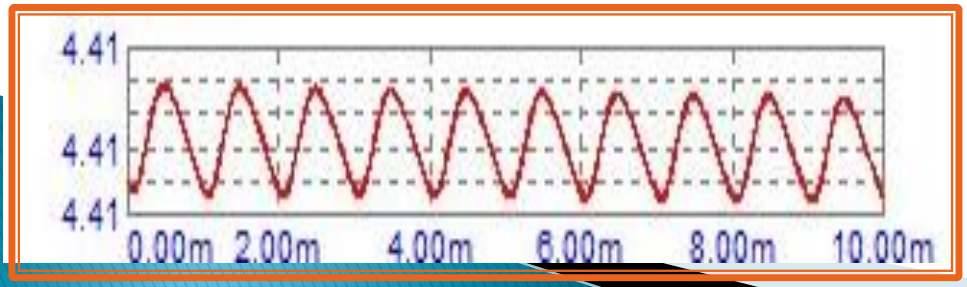
Simulation du Projet

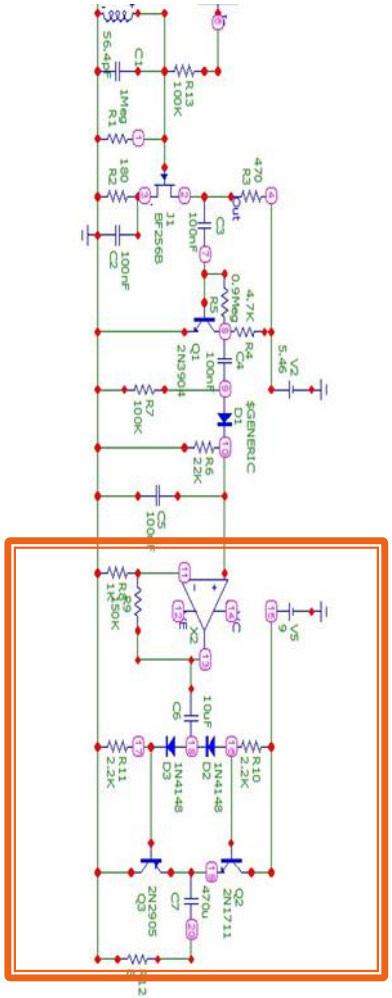












- La sélectivité
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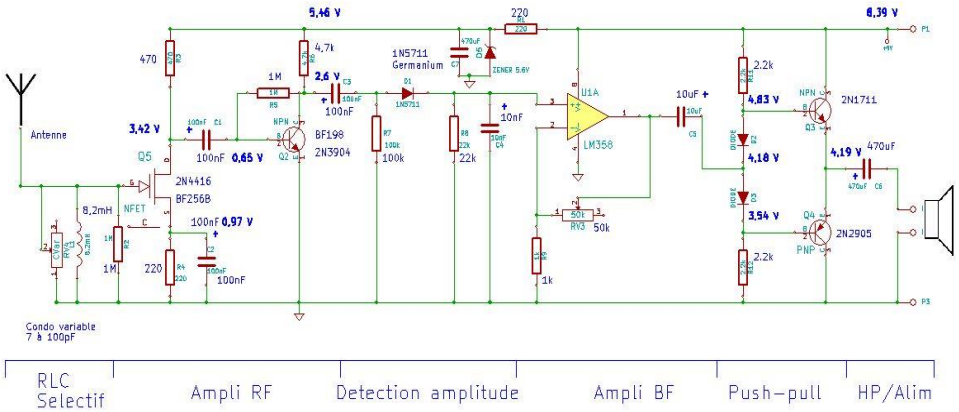
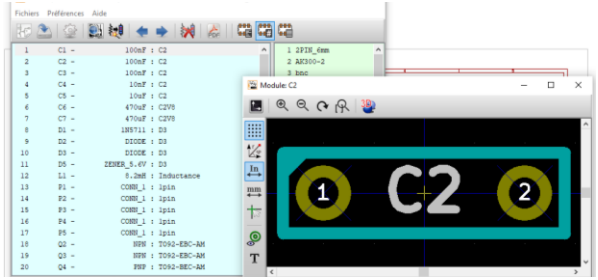
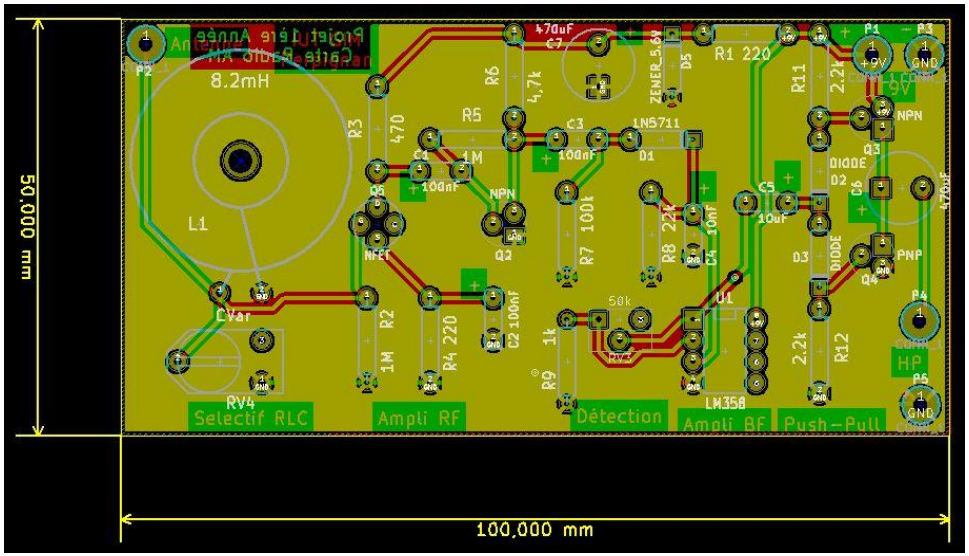
Conception du Projet

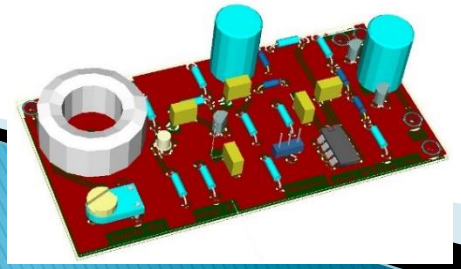
- Le logiciel libre Kicad





- Schéma électrique
- Association des composants/empreintes
- PCB et visu 3D
- Fichiers gerbers



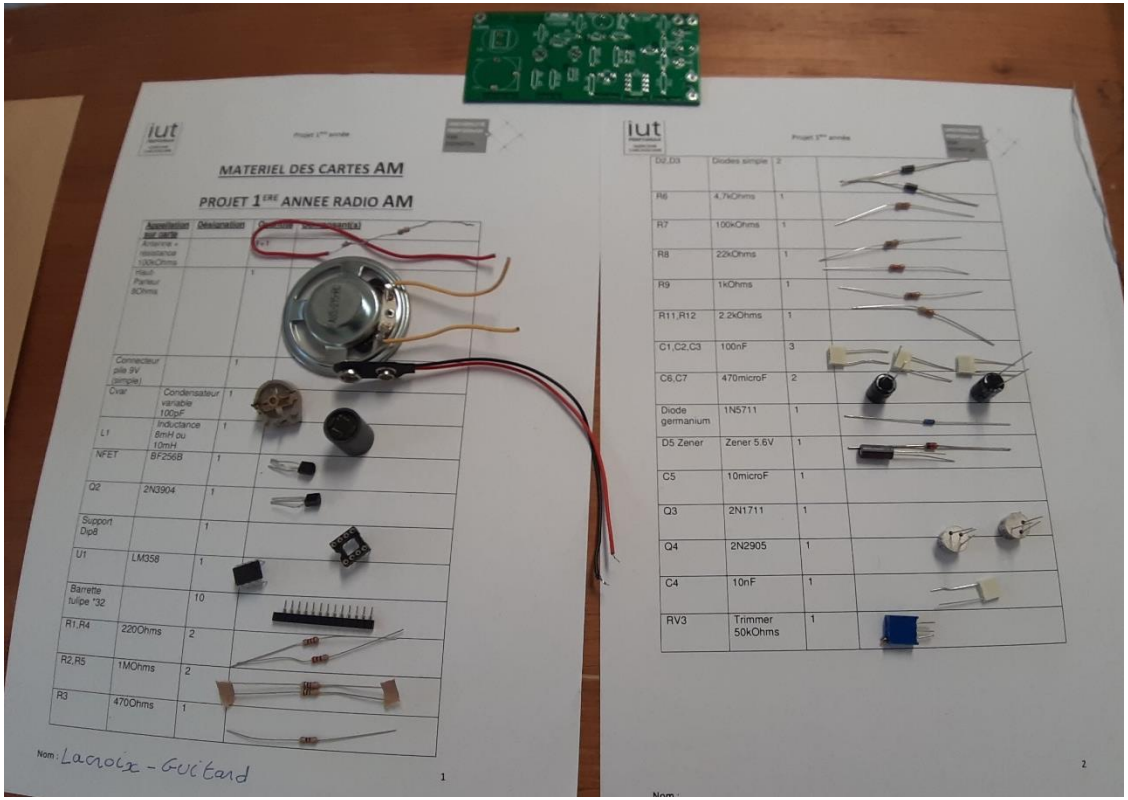


PCBelectronics

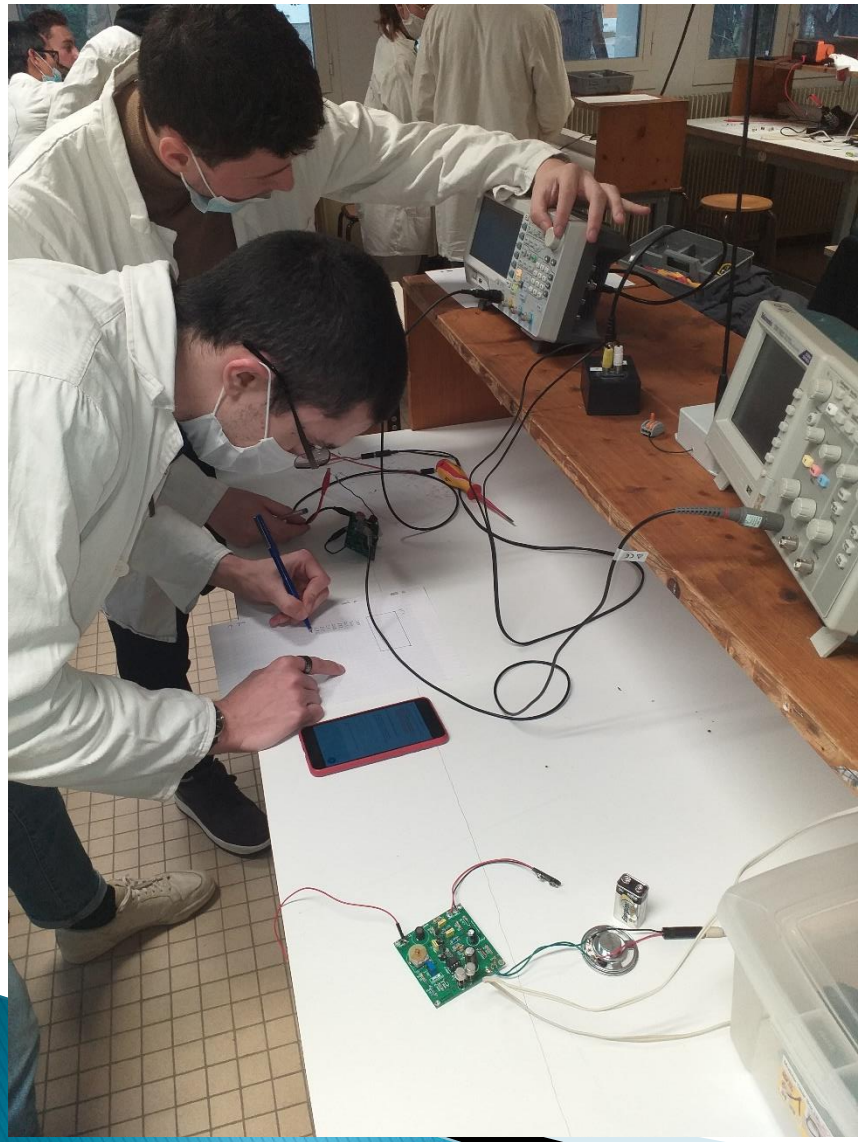
Réalisation du Projet

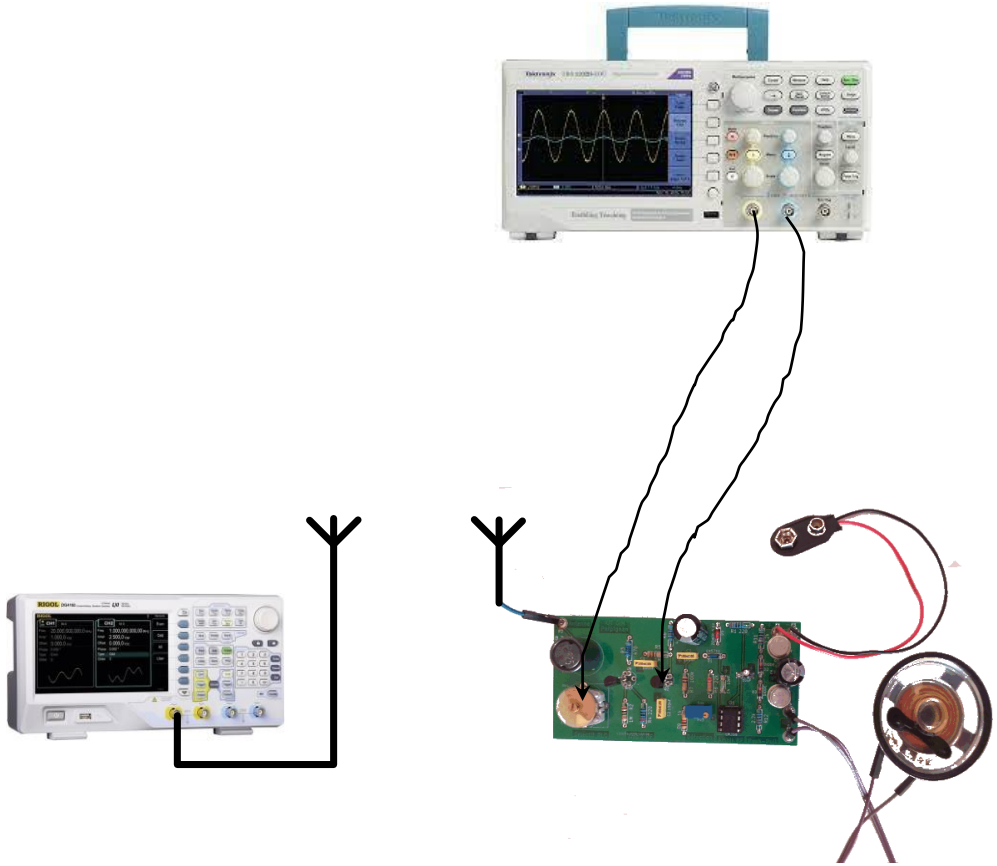
- Réception de la carte et des composants
- Tri des composants
- Implantation et soudage

Pour la plupart des étudiants, il s'agit d'une première, c'est la première fois qu'ils manipulent et soudent des composants électroniques, ce qu'ils apprécient beaucoup



Essais en salle de TP

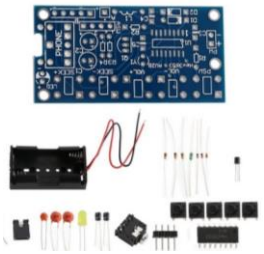
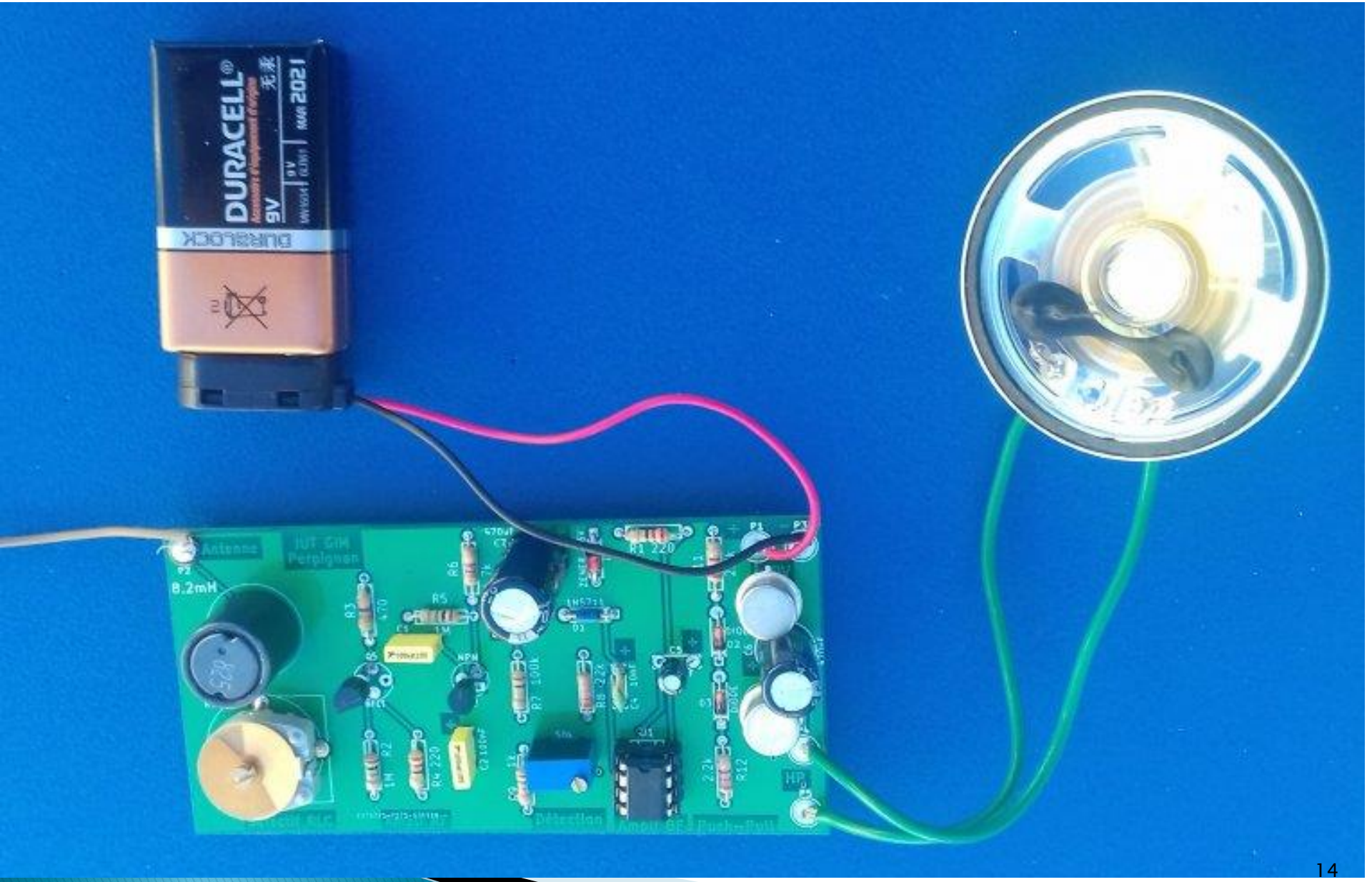




Simulation de la station RTL sur table

Conclusion

- Projet complet et apprécié par les étudiants
- De la théorie à la pratique
- Lecture des datasheets
- Technique de soudure
- Utilisation des appareils de mesures
- Bonne introduction au traitement du signal pour la 2ème année.
- Etudiants plus captivés par l'électronique



Merci de votre attention