



SRI RAAJA RAAJAN

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University)

146 /4B1, Amaravathi Village,
Amaravathipudur (Po.),
Karaikudi – 630 301.
Ph : 04565 – 234230 / 326132

Fax : 04565 – 234430
Mobile : 73737 11322, 73737 11333
E-mail : srrcet2010@gmail.com
Website: www.raajaraajan.org

FUNDED PROJECT

ACADEMIC YEAR(2020-2021)

LOW POWER FM (LPFM) BROADCAST RADIO STATION USING ARDUINO

REPORT

The final year students of Electronics & Communication Engineering came up with an idea of “Low Power FM (LPFM) Broadcast Radio Station using Arduino”. This project was greatly appreciated and funded by the Evolution Careers with whom we have signed Memorandum of Understanding (MOU) for the academic year 2020-2021. This Project was presented before our Chairman Dr.S.Subbiah Former & Vice chancellor of Alagappa University & Principal Dr. Mayilvahanan AL, M.E., Ph.D., & Ms. Harshita Proprietor JRSDC. Our final Year Abinaya C, Carolin J, Nandhini R, Saratha S carried out project under the guidance of Mrs. Isabellarani K Assistant Professor Electronics & Communication Engineering.


The early transmitter for radio broadcasting was so bulky that they occupied large space and heavy circuitry. The circuits were mainly designed with valves and other active components, which are responsible for the large size. With the advent of semiconductor materials such as transistors and integrated circuits, electronic equipments are now becoming miniaturized such that small transmitters are now becoming handy and compact. In line with this, a complete radio broadcasting equipment that is compact and locally designed is constructed in this research.

The system units are of two categories namely: the audio console for processing voice with music mixer and the transmitter unit where the center frequency is generated. This project is aimed at serving community such as villages for broadcasting urgent information using a small radio broadcasting FM transmitting at 98.1 MHz with a power rating of 1 watt and covers a distance of 1 kilometer irrespective of directivity. The output audio signal was tested for different hours of the day and production was received with noticeable voice output. The radio broadcasting transmitter can also be used to transmit information within large industries, hospitals and universities.

Trust Office : No. 1, S.K.M. Building, T.T. Nagar Ist Street, Karaikudi – 630 001.

Ph : 04565 – 234230, Mobile : 73737 11331, 73737 11338




PRINCIPAL
Sri Raaja Raajan College of Engg. & Tech
Amaravathipudur, Karaikudi - 630
Sivagangai Dist. Tamil Nadu

INTRODUCTION

The FM Radio Telephone Transmitter is a project prepared for final year project Communication Engineering, UNIMAP. This project is done to be able to amplify a phone call (incoming call) where everybody can hear the message and also can record the message if it's very important for record-keeping purposes. The FM Telephone Transmitter is yet an ingenious device that connects in series with a phone line, real power from the latter, and transmits both sides of a conversation to an FM radio tuned to between 90 and 95 MHz.

There are many legitimate reasons for wanting to broadcast a telephone call to a FM radio as a receiver. When someone calls long distance, he or she doesn't have the time or can't afford to stay on long, but everybody at home still wants to hear his or her voice or maybe we are calling one of those a lot of information or entertainment lines and everybody wants to hear the message.

The electronic FM transmitter circuit attaches in series to telephoned lines. When there is a signal on the line (that is, when you pick up the handset) the circuit will transmit the conversation a short distance. In particular it will radiate from the telephone line itself. It is a passive device there is no battery. It uses the signal on the telephone line for power. No aerial is needed - it feeds back the RF signal into the telephone line, which radiates it in the FM band. The frequency of transmission was adjusted by the trimmer capacitors.

This Project Report have full information regarding FM Radio, FM Radio Receiver, Radio Antenna, Types of modulations, Amplitude Modulation, Frequency Modulation, Advantages Integrated circuit and Apparatus required for FM Radio Receiver etc.

FM Radio Receiver Project Report. The FM Band transmission has started very recently in India but its superior technique and quality has attracted the listeners. Unlike AM, the FM is a separate band and its frequency



A handwritten signature in black ink, appearing to be "V. S. S." or similar.

PRINCIPAL

Sri Raaja Raajan College of Engg. & Tech
Amaravathi Road, Karaikudi - 630 301
Kanyakumari District, Tamil Nadu

ranges from 88MHz to 108 MHz. The FM Band can not be received by the conventional AM receivers. Each and every AM receiver does not incorporate FM facility. The present project is a very low cost project and it can be fitted to any radio receiver audio system to receive FM transmission. The circuit of this project is very simple and can be easily assembled

Objective Of The Project


The objectives of this project are:

- i. The objective of this project is to build and examine the workings of a FM Radio telephone transmitter.
- ii. To study the circuit and determine how the different parts of the circuit function together to make an FM transmitter.
- iii. To understand about the concept of FM frequency transmitter.
- iv. To be familiar with the use of design and simulation tools in the design process. For this project the design and simulation of the FM Telephone Transmitter circuit is using the OrCAD Capture CIS Software.
- v. To be able to construct, analyze and test the complete project of FM Telephone Transmitter designed. In this part of objective the students are required to solve the problem occurred since the circuit does not work as planned earlier. Some alternative and creativity from the student are needed.

Antenna

A theoretical study of radiation from a linear antenna (length l) Power radiated
This implies that for the same antenna length, the power radiated by short wavelength or high frequency signal would be large. Hence the effective power radiated by long wavelength base band signal would be small for a




Sri Raaja Raajan College of Engg. & Tech
Amaravathipuram, Karaikudi - 630 301
Sivagangai Dist. Tamil Nadu

nor by sky wave propagation. The surface wave propagation is not possible for the reason that the ionosphere cannot reflect the electromagnetic waves in this frequency range. Further, in the frequency range 30 cm. to 10 m. FM transmission are made from small antennas.

Advantages

Now-a-days there is a necessity of FM projects in the electronic market. Through this project different FM stations can be tuned but in India. Presently there is one FM channel. As such the project is designed for one channel to avoid possible damage of the coil in tuning again and again. The FM transmission is stereo phonic. As such you can connect it to any stereo deck and enjoy the stereo sound. Now a days two-in-one and radios with FM band are available in the market. But without replacing your old radio set you can connect this project to your old radio/two-in- one and enjoy the FM transmission. It is quite economical too. Unlike AM receivers, the FM receiver is assembled through different stages.

- (i) FM Amplifier
- (ii) Mixer
- (iii) Oscillator
- (iv) AGC
- (v) Discriminator (Detector)
- (vi) (vi) Audio Pre-Amplifier.



A handwritten signature in black ink, appearing to be "V. S. Srinivasan".

PRINCIPAL

Sri Raja Rajan College of Engg. & Tech
Amaravathipuram, Karaikudi - 630 301
Sivagangai Dist. Tamil Nadu



SRI RAAJA RAAJAN COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University)

Plot - 001, Amaravathi Village,
Amaravathipudur (T.S.S),
Karaikudi - 630 301
Tn. (Tamil Nadu) - 744310 (744311)

Phone: 04565-244430
Mobile: 7443111022, 7571741233
E-mail: sri@sriraja.ac.in
Website: www.sriraja.ac.in

This project was funded by Evolution Careers with whom the institution has signed Memorandum of Understanding (MoU) for the academic year 2021-2022. The assembly and fabrication cost was incurred by the project students.



DEMONSTRATION OF LOW POWER FM PROJECT



PRINCIPAL

Sri Raaja Raajan College of Engg. & Tech
Amaravathipudur, Karaikudi - 630 301
Sivagangai Dist. Tamil Nadu

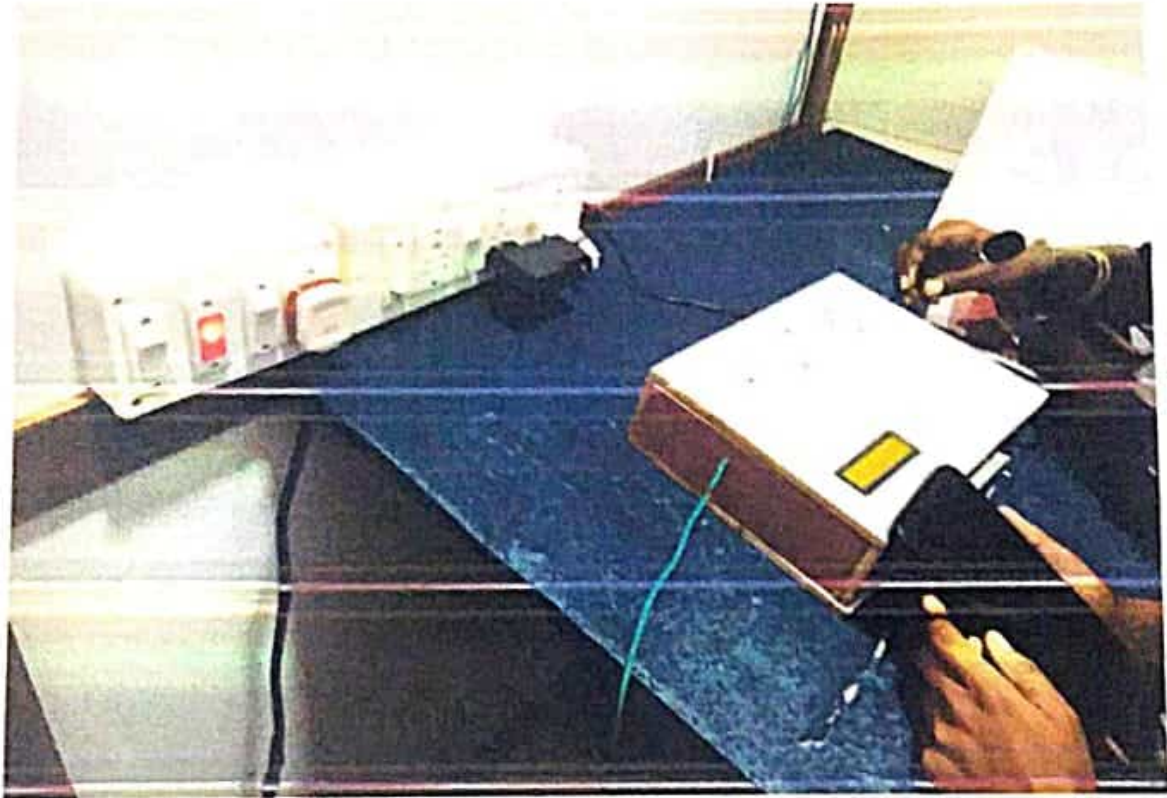


SRI RAAJA RAAJAN COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University)

146, III, Amaravathi Village,
Amaravathipudur (CN) -
Karaikudi - 630 301
Ph: 04565 244340 176112

Fax: 04565 244410
Mobile: 94427 41322, 94427 41333
E-mail: sreec2010@gmail.com
Website: www.raajarajan.org



DEMONSTRATION OF LOW POWER FM PROJECT




PRINCIPAL
Sri Raaja Raajan College of Engg. & Tech.,
Amaravathipudur, Karaikudi - 630 301
Sivagangai Dist. Tamil Nadu



SREE KOPPUDEIYAAL
TECHNOLOGIES

SREE KOPPUDEIYAAL TECHNOLOGIES
KARAIKUDI-630001
CELL 9894471652

Date 9/2/2021.

Bill To
ECE DEPARTMENT

Item	Quantity	Rate	Amount
1. FM Transmitter.	1	5000	5000
2. Receiver.	1	5000	5000
3. UNO. Arduino Board	1	16,000	16,000
4. PCB Board.	1	3000	3000
5. Amplifier	1	1000	1000
6. Speaker.	1	1500	1500
7. Microphone	1	500	500

Subtotal 32,000

Shipping: 500

Total. 32,500

Amount Paid: 32,500.



Principal
Sri Raaja Raajan College of Engg. & Tech
Amaravathipur, Karaikudi - 630 301
Sivagangai Dist. Tamil Nadu



தமிழ்நாடு தாமலநாடு TAMIL NADU

96AB 037406

23/09/2021

SRI RAJA RAJAN COLLEGE OF
ENG & TECH

S. Yuthavani
S. சிவசுப்பிரமணியன்
பொதுமுகப்பணி அதிகாரியின்
L No 5/2000 Dt.11-7-2000
காரைக்கூடு - காரைக்கூடு

207

ANDARAVATHI PEDUR

Memorandum of Understanding

This is to certify that the Memorandum of Understanding (MOU) is made on 27. of September 2021

BETWEEN

Evolution Careers, hereinafter referred as "EC" , with its head office located at 106/89A , Chamundi Street, Salem 636006, carrying GST No 33ACCPH7511F1Z5 , an Ed-Tech Firm offering services of Training, Placement Support, Workshops, Webinars, FDP, SDP, Software and ITES Services , represented by its Proprietor Ms. Harshita Shah.

And

Sri Raaja Raajan College of Engineering and Technology, Karaikudi, hereinafter Referred as "SRR CET", located at "Karaikudi, Sivaganga District, Tamandu" , recognized by AICTE and Anna University , offering Quality Education and Philanthropy, represented by its Placement Officer , Respected Mr. Sundaravignesh S on the date 21-Sep-2021 has been signed off and both the parties agree to adhere to the MOU.

The details of the above said MOU are as follows:

Objective : To set up EC Development Center at SRR CET

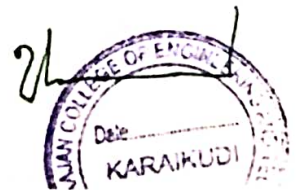
Purpose : (a) To impart Technical knowledge and skills for the students and faculty of SRR CET through Internships, Live Industrial Projects/Case Studies, Training, Workshops etc.,
(b) To create a bridge to reduce the gap between Industries and Institutions.
(c) To Develop Products and Solutions for EC Projects.

Validity : 3 Years from the date of MOU.



Harshita Shah

EVOLUTION CAREERS
NO - 106/89A, CHAMUNDI ST,
GUGAI, SALEM, 636006,
94422 442268



1.Scope of Works:

1.1 Evolution Careers (EC)

- a. Setting up a development center at SRRCET.
- b. Creating awareness about the latest technologies, trends and employability/entrepreneurship skills needed to the students of SRRCET.
- c. Hiring and deploying the students of Sri Raaja Raajan College of Engineering and Technology, Karaikudi for Internships.
- d. Offer Live Industrial Projects to the willing students, as per EC norms.
- e. Felicitate set up of a TBI,with multiple Companies Centers , if required for SRRCET.
- f. Provide Student Development and Faculty Development Programs,whenever possible.
- g. Carry out Development activities that result in Mutual Growth for both EC and SRRCET.
- h. Felicitate Industrial Expertise Interaction SRRCET Innovation activities,wherever possible.
- i. Mentor the students and Faculty for converting their Creative Ideas into Products.

1.2 Sri Raaja Raajan College of Engineering and Technology, Karaikudi (SRRCET)

- a. Provide Infrastructure support to EC, based on the listed down requirements.
- b. Appoint SPOC for Continuous Coordination,Implementation and Execution of this MOU.
- c. Provide minimum 10 interns , and also permit other EC Interns to utilize the center , when required.
- d. Promote the need of having hands on Experience in Live Projects, Industrial Advancements for the students, in order to get their technical skills and Entrepreneurial Skills upgraded.
- e. Promote Faculty to get latest insights about the Industrial sector through FDP Programs, and give preference to Industrial Projects.
- f. Utilize the EC Development Center for Innovation Initiative
- g. s of SRRCET, its Faculty and Students.
- h. Provide Boarding and Lodging for EC Personnel during their Visits/Stay at the Development Center.
- i. Promote the culture of taking up challenges to the students,to have their development and Progress.
- j. Utilize the EC Development Center for creation and implementation of new innovative ideas for the development of Individuals, Institution and the Nation.
- k. Insist the need of Innovation, Entrepreneurship, Learning and Implementing Advanced Technologies, Development of Solutions/Products along with Quality Education to the students of SRRCET.
- l. Ensure discipline,ethical behaviour of the personnel utilizing the development center for growth.

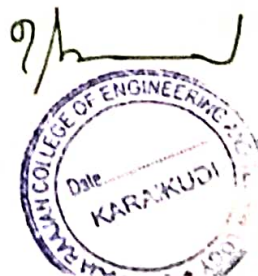
2. Infrastructure Requirements to be provided by SRRCET

- a. Work space of minimum 300 sq ft/ 30 sq.m with provision for Displaying EC Name board and Center details, One Shelf and required Stationery.
- b. Minimum of 5 Desktops/ Laptops with a configuration of minimum 4GB RAM/500GB HDD, 2 GHZ Clock Speed with USB/Optical Drives, uninterrupted power supply and Internet Connectivity (Existing Systems from Labs can be used on Sharing basis).
- c. MS Office (All tools) ,Photoshop, Adobe, AnyDesk/Teamviewer , Antivirus and other basic softwares used for the major course related subjects (Like AutoCad,IT Softwares, Ansys , Primavera, Matlab etc).
- d. Support to install any additional software tools required for the development center.
- e. Provide necessary support in the PLM Cycle of EC Products/Solutions.

3. Activities to be carried out by EC as part of MOU.

- Internships and Training for Interns.
- Industrial Awareness for Students and Faculty.
- Insights about Latest Technology and Industrial Trends to create awareness.
- Support in creative ideas, Innovation activities of SRRCET and Patent/IPR support.
- Live Industrial Projects/Case Studies and working experience.
- Carry out Product/Solution development at the center.
- Provide Placements for Students.

Harshita Shah.



EVOLUTION CAREERS
HO : 106/89A, CHAMUNDIRI

4. Financials:

This MOU does not cover any financial liabilities on both the parties.

In case of any additional services needed by SRRCET, apart from the above indicated ones, the charges will be mutually discussed and agreed on case-to-case basis. The charges, if any, are subject to the applicable taxes and necessary supporting bills should be accompanied.

5. Non-Disclosure and Confidentiality:

By Signing on this MOU, both the parties agree that confidential information about both the parties, will never be disclosed by any one of the parties, to any third party without the consent of the other party. Also, this document is confidential and both the parties can utilize it only for the purpose of Accreditation / Recognition / Incorporation from any Professional/Government Bodies only. Any other usage apart from the above has to be done with the written consent of the other party.

6. Termination:

Both Parties can mutually terminate this MOU, with a prior written notice of 6 months. Upon termination both the parties shall return the infrastructure / Confidential information / any other tools/programs to each other.

7. Renewal of MOU:

The MOU can be renewed upon its expiry for an additional period of 1 to 3 years, based on mutual agreement between both the parties.

8. Annexures to MOU

Through Annexures to this MOU, both the parties can perform below activities.

- Add any additional services based on mutual agreement between both parties.
- List down the details of the Development activities.
- Indicate any activities that are being carried out(Non-Commercial or Commercial) with specific details.

9. Jurisdiction

This MOU falls under the jurisdiction of the courts in Salem, Tamil Nādu, India.

For EC

For SRRCET

Harshita

Ms.Harshita
Associate Director

Witness:

1. *V. [Signature]*

2. *S. [Signature]*

EVOLUTION CAREERS
HO : 106/89A, CHAMUNDI ST,
GUGAI, SALEM, 636006,
T.N, Tel : 0427 4043369



[Signature]
Dr.S.Subbiah
College Chairman



Witness:

1. *[Signature]*

2. *D. [Signature]*

Annexure 1 to MOU dated 21-Sep-2021 between EC and SRRCET:

EC Projects Planned for Development 2020-2021

1. Integrated Optimized Skill Training for Rural India(IOSTRI) - Academic Management System covering Administration, Online Learning Management System, Infrastructure Management, Course Management, Faculty Management, Student Management, Live Classes at low data consumption, containing features similar to SAP, Cisco Webex, SalesForce and other related needs as one integrated solution, loaded with skill upgradation content, needed for current Industrial demands.
2. Economic Web Based ERP for MSME Industries.
3. Web based tools and Smartphones Apps development based on Client needs.

Hashib Shuk.

EVOLUTION CAREER
HQ : 106/89A, CHAMUNDI T,
GUGAI, SALEM, 636006.
T.N, Tel : 0427 4043369



[Signature]
PRINCIPAL
Sri Raaja Raajan College of Engg. &
Amaravathipudur, Karaikudi - 630 004
Sivagangai Dist. Tamil Nadu