



# Millimeter Wave Transceiver

## Why in News?

Recently, [Centre for Development of Telematics \(C-DOT\)](#) has signed an agreement with the **Indian Institute of Technology-Roorkee (IIT-Roorkee)** for the development of a “[Millimeter Wave Transceiver for 5G rural connectivity](#)”.

## Key Points

- **Millimeter Wave Backhaul Technology Project:**
  - It aims to **develop millimeter wave backhaul technology for improved 5G connectivity**, particularly in rural areas.
    - A limited number of **small cell-based stations (SBSs)** will be connected to the network gateway through fiber, reducing infrastructure needs.
  - The transceiver development will use a **combined optical and millimeter wave approach**.
    - It is expected to **reduce the overall size and cost of the technology**, making it more efficient and affordable.
  - It **aims to reduce India's reliance on international semiconductor fabrication industries**, bolstering self-reliance.
  - It will **contribute to generating Intellectual Property Rights (IPRs)** and **developing a skilled workforce** in millimeter wave and Sub-THz technology, preparing for advancements in [5G](#) and [6G](#).
- **Support for Local Industry and Employment:**
  - The project **encourages small and medium-scale industries** to establish manufacturing units in India, especially in **polymer-based and metal-integrated structures**.
  - Increased **local manufacturing will create job opportunities** for Indian engineering graduates.
- **Funding Support under TTDF Scheme:**
  - The agreement is signed under the Department of [Telecommunications' Telecom Technology Development Fund \(TTDF\) scheme](#).
  - TTDF is **designed to fund Indian startups, academia, and R&D institutions, supporting the domestic development and commercialization** of telecom products and solutions.

## Millimeter Wave

- **About:**
  - It is a wireless communication technology that **uses high-frequency radio waves to transmit data**.
  - Millimeter waves have a **frequency range of 30-300 GHz, and a wavelength range of 1-10 millimeters**.
- **Uses:**
  - **5G:** Millimeter waves are **used in 5G to provide high-speed**, increased bandwidth communications.
  - **Explosive detection:** Millimeter waves **can pass through clothing** and reflect off of the

- body, allowing **imaging systems to detect concealed objects**.
- **Other applications:** Millimeter waves can be used for **business and residential broadband access, campus area networks, outdoor Wi-Fi hotspots**, and more.

## Centre for Development of Telematics (C-DOT)

- It was **established in 1984**. It is an **autonomous Telecom R&D (Research and Development) centre of DoT (Department of Telecom)**, Ministry of Communications.
- It is a **registered society under the [Societies Registration Act,1860](https://www.mca.gov.in/Registration/RegistrationAct1860.aspx)**.
- It is a registered public-funded research institution with the **Department of Scientific and Industrial Research (DSIR)**, Ministry of Science and Technology.

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