**Charter Communications (Founded 1993 (24 years ago))** is an American [telecommunications](https://en.wikipedia.org/wiki/Telecommunications) company, which offers its services to consumers and businesses under the branding of **Spectrum**. Providing services to over 25 million customers in 41 states,[[1]](https://en.wikipedia.org/wiki/Charter_Communications#cite_note-CharterProfile-1)[[4]](https://en.wikipedia.org/wiki/Charter_Communications#cite_note-latimes-chartercompletespurchase-4) it is the second-largest [cable](https://en.wikipedia.org/wiki/Cable_television) operator in the United States by subscribers, just behind [Comcast](https://en.wikipedia.org/wiki/Comcast), and third largest pay TV operator behind Comcast and [AT&T](https://en.wikipedia.org/wiki/AT%26T) [U-verse](https://en.wikipedia.org/wiki/AT%26T_U-verse)/[DirecTV](https://en.wikipedia.org/wiki/DirecTV).[[5]](https://en.wikipedia.org/wiki/Charter_Communications#cite_note-5) It is the fifth largest telephone provider based upon residential subscriber line count.

Products: Broadband,Cable television,Digital cable,Digital telephone,HDTV,Home security,Internet,Internet security,VoIP phone

## Technology[[edit](https://en.wikipedia.org/w/index.php?title=Charter_Communications&action=edit&section=14" \o "Edit section: Technology)]

Charter utilizes various technologies across its service area. Most customers are still served with older legacy set top boxes and video recorders (DVRs). Charter has indicated that it plans to deploy its new WorldBox across its service area. It also plans to standardize services to the new Time Warner Cable and Bright House Networks customers by moving all customers to an all-digital network, and making Internet speeds standard across its service areas.

Modulation

 Present days we send audio, video, bitstreams from computes through copper wires, co-axial cable, even through wireless radio waves, microwaves, infrared, and in the form visual lights through optical fibre. Baseband signals can be sent to some distance through copper wire but sending those to a long distance has many challenges.  Voice, Video, bit streams from computer are having lower frequency band and can travel few distance with wires but cannot be sent through wireless media. Voice signal has lower Bandwidth therefore it will not propagate through space and will be attenuated.

Definition: **Operation of varying amplitude, frequency or phase of carrier signal accordingly with the instantaneous amplitude of the message signal is called modulation.**

**Modulation is a technique in which message signal is transmitted to the receiver with the help of carrier signal.**

For a signal to be transmitted to a distance, without the effect of any external interferences or noise addition and without getting faded away, it has to undergo a process called as **Modulation**. It improves the strength of the signal without disturbing the parameters of the original signal.

to establish a reliable communication, it needs to take the help of a high frequency signal  (as a **carrier signal** )

Modulation is the **process of changing the parameters of the carrier signal**, in accordance with the instantaneous values of the modulating signal.

**http://www.electronicshub.org/modulation-and-different-types-of-modulation/**

### **Need for Modulation**

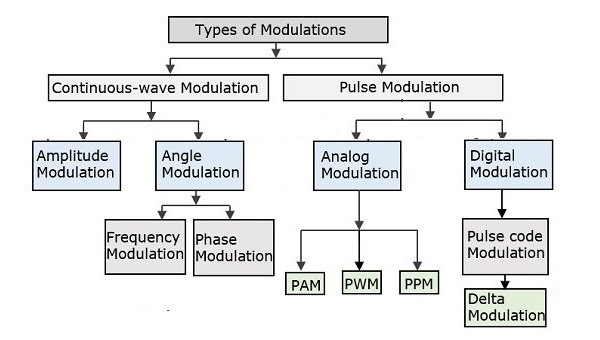
### Baseband signals (Message or Modulating Signal) are incompatible for direct transmission. For such a signal, to travel longer distances, its strength has to be increased by modulating with a high frequency carrier wave,

## Advantages of Modulation

* Reduction of antenna size
* No signal mixing
* Increased communication range
* Multiplexing of signals
* Possibility of bandwidth adjustments
* Improved reception quality

### **Modulated Signal**

* Resultant or combination of modulating signal and carrier signal.



- continuous-wave modulation, a high frequency sine wave is used. This is further divided into amplitude and angle modulation.

- Pulse modulation, a periodic sequence of rectangular pulses, is used as a carrier wave. This is further divided into analog and digital modulation.

There are two types of modulation analog and digital. Analog modulation delas with the voice, video and regular waves of base band signals. Where as digital modulations are with bit streams or symbols from computing vevices as base band signals.

The **OpenCable Application Platform**, or OCAP, is an operating system layer designed for consumer electronics that connect to a cable television system, the Java-based middleware portion of the platform.

**Analog Modulation:**

Baseband signal is always analog for this modulation. There are three properties of a carrier signal amplitute, frequency and phase thus there are three basic types of analog modulations.

1. **Amplitude Modulation (AM) -** AM radio broad cast
2. **Frequency Modulation (FM) -** FM radio broad cast
3. **Phase modulation (PM) -**  Satellite communication. GSM, WiFi,

FM and PM doesn’t catch any channel noise.

|  |  |  |  |
| --- | --- | --- | --- |
| **Feature** | **AM** | **FM** | **PM** |
| Function | amplitude of carrier wave varies as per amplitude or voltage of modulating signal input. | Frequency of carrier wave varies as per voltage of modulating signal input. | Phase of carrier wave varies as per voltage of modulating signal input. |
| Carrier parameter | frequency of carrier wave is kept constant | amplitude of carrier wave is kept constant | amplitude of carrier wave is kept constant |
| Types | AM types include DSB-SC, SSB, VSB etc. Refer [DSB-SC vs SSB-SC](http://www.rfwireless-world.com/Terminology/DSBSC-vs-SSBSC.html) and [SSB vs VSB modulation](http://www.rfwireless-world.com/Terminology/SSB-modulation-vs-VSB-modulation.html) | Digital FM types include FSK, GFSK, Offset FSK etc. Refer [MSK and GMSK modulation](http://www.rfwireless-world.com/Terminology/MSK-GMSK.html) | Digital PM types include BPSK, QPSK, QAM(combination of amplitude and phase modulation types) Refer [BPSK and QPSK](http://www.rfwireless-world.com/Terminology/BPSK-vs-QPSK.html), [QAM](http://www.rfwireless-world.com/Terminology/QAM.html) modulation types. |

**Digital modulation:**

 Digital modulation in somewhat similar to the analog modulation except base band signal is of discrete amplitude level. For binary signal it has only two level, either high or logic 1 or low or logic 0. The modulation scheme is mainly three types.

1. ASK or Amplitude shift Key - infrared remote controls, fibre optical tranmitter and receiver.
2. FSK or Frequency shift key - modems used FSK in telemetry systems
3. PSK or Phase shift key - satellite communication, mobile phones

## TSBroadcaster for OCAP

**TSBroadcaster 3 is a headend server which automatically encodes and plays out OCAP (tru2way)**, ETV and MHP applications according to a defined schedule. It is **suitable for live transmission or lab use.**

TSBroadcaster **also generates the appropriate signalling, which makes the OCAP set-top-box aware of the existence of an application** and specifies whether the application is bound or unbound.

**TSBroadcaster servers are accessed by a web browser.** All aspects of TSBroadcaster's functionality can also be accessible via an API. This allows easy integration with other headend software.

**TSBroadcaster can build multiple transport streams simultaneously.** Delivery of these transport streams requires a TSPlayer software module per transport stream and the default is two outputs per TSBroadcaster system.

**Perforce**

Perforce is an **enterprise version management system** in which users connect to a shared file repository. Perforce applications are used to transfer files between the file repository and individual users' workstations

The Perforce versioning service **manages shared file repositories, or *depots*.** Depots contain every revision of every file under Perforce control. **Files in a depot are referred to as *depot files* or *versioned files*.**

With Perforce, you never work directly on files in the depot. Instead, you use Perforce applications to manage a specially-designated area of your workstation called a ***client workspace****.* A workspace contains a local copy of a portion of a depot.

|  |  |
| --- | --- |
| *•* | **P4,** the Perforce Command-Line Client, for all platforms |
| *•* | **P4V,** the Perforce Visual Client, for Mac OS X, UNIX, Linux, and Windows |

|  |  |
| --- | --- |
| *•* | **P4Web**, the Perforce Web Client, a browser-based interface to Perforce |

# Integrated Test Management System (ITMS)

**It is extensive and comprehensive test software infrastructure at STATS ChipPAC.**

**ITMS is used to efficiently and effectively drive test operations and test business processes.**

For STATS ChipPAC customers, ITMS is a generator of new services and capabilities

**TMS Features**

**Systems Integration**

 Test off-load management

 Forecast and WIP management

 RFQs and billing   
  
**Processes Automation**

 Test data / report management

 Test program auto-load  
  
**Process Control**  
The ITMS architecture enables ITMS to manage and monitor the processes within each factory to deliver consistent quality and services to customers from all its factories.

 Test yield monitoring

 Test data analysis

 Real-time test cell controls  
  
**Real-time Utilization Tracking**

 Testers / handlers

 Cards / options / licenses

 Integrated dashboard for inventory and utilization

# Why is cable TV in the USA so expensive?

because you don’t get only cable TV from your provider. We purchase a bundle of services from our provider: phone, internet and cable TV.

It’s difficult in the US because in most places we don’t have a lot of choice. There is one, perhaps two, providers to choose from. For us, it would be Comcast/Xfinity and Verizon, and after introductory offers, etc., the price is about the same.

DVB:

**Digital Video Broadcasting** (**DVB**) is a set of internationally [open standards](https://en.wikipedia.org/wiki/Open_standard) for [digital television](https://en.wikipedia.org/wiki/Digital_television).

DVB systems distribute data using a variety of approaches, including:

* [Satellite](https://en.wikipedia.org/wiki/Satellite_television): [DVB-S](https://en.wikipedia.org/wiki/DVB-S), [DVB-S2](https://en.wikipedia.org/wiki/DVB-S2) and [DVB-SH](https://en.wikipedia.org/wiki/DVB-SH)
  + [DVB-SMATV](https://en.wikipedia.org/w/index.php?title=DVB-SMATV&action=edit&redlink=1) for distribution via [SMATV](https://en.wikipedia.org/wiki/SMATV)
* [Cable](https://en.wikipedia.org/wiki/Cable_television): [DVB-C](https://en.wikipedia.org/wiki/DVB-C), [DVB-C2](https://en.wikipedia.org/wiki/DVB-C2)
* [Terrestrial television](https://en.wikipedia.org/wiki/Digital_terrestrial_television): [DVB-T](https://en.wikipedia.org/wiki/DVB-T), [DVB-T2](https://en.wikipedia.org/wiki/DVB-T2)
  + Digital terrestrial television for [handhelds](https://en.wikipedia.org/wiki/Handheld): [DVB-H](https://en.wikipedia.org/wiki/DVB-H), [DVB-SH](https://en.wikipedia.org/wiki/DVB-SH)
* [Microwave](https://en.wikipedia.org/wiki/Microwave): using [DTT](https://en.wikipedia.org/wiki/Digital_terrestrial_television) ([DVB-MT](https://en.wikipedia.org/w/index.php?title=DVB-MT&action=edit&redlink=1)), the [MMDS](https://en.wikipedia.org/wiki/MMDS) ([DVB-MC](https://en.wikipedia.org/w/index.php?title=DVB-MC&action=edit&redlink=1)), and/or [MVDS](https://en.wikipedia.org/wiki/MVDS) standards ([DVB-MS](https://en.wikipedia.org/wiki/DVB-MS))

These standards define the [physical layer](https://en.wikipedia.org/wiki/Physical_layer) and [data link layer](https://en.wikipedia.org/wiki/Data_link_layer) of the distribution system. Devices interact with the physical layer via a synchronous parallel interface (SPI), synchronous serial interface (SSI), or [asynchronous serial interface](https://en.wikipedia.org/wiki/Asynchronous_serial_interface) (ASI). All data is transmitted in [MPEG transport streams](https://en.wikipedia.org/wiki/MPEG_transport_stream) with some additional constraints (DVB-MPEG).

These distribution systems differ mainly in the [modulation](https://en.wikipedia.org/wiki/Modulation) schemes used and error correcting codes used , due to the different technical constraints.

Besides [digital audio](https://en.wikipedia.org/wiki/Digital_audio) and [digital video](https://en.wikipedia.org/wiki/Digital_video) transmission, DVB also defines data with [return channels](https://en.wikipedia.org/wiki/Return_channel) (DVB-RC) for several media. and protocols.

**Broadcasting:**

**Broadcasting** is the [distribution](https://en.wikipedia.org/wiki/Distribution_(business)) of [audio](https://en.wikipedia.org/wiki/Sound) or [video](https://en.wikipedia.org/wiki/Video) content or other messages to a dispersed [audience](https://en.wikipedia.org/wiki/Audience) via any electronic [mass communications medium](https://en.wikipedia.org/wiki/Medium_(communication)), but typically one using the [electromagnetic spectrum](https://en.wikipedia.org/wiki/Electromagnetic_spectrum) ([radio waves](https://en.wikipedia.org/wiki/Radio_wave)), in a [one-to-many](https://en.wiktionary.org/wiki/one-to-many) model.[[](https://en.wikipedia.org/wiki/Broadcasting#cite_note-1)

[Over the air broadcasting](https://en.wikipedia.org/wiki/Over_the_air_broadcasting) is usually associated with [radio](https://en.wikipedia.org/wiki/Radio) and [television](https://en.wikipedia.org/wiki/Television), though in recent years both radio and television transmissions have begun to be distributed by cable ([cable television](https://en.wikipedia.org/wiki/Cable_television)). The receiving parties may include the general public or a relatively small subset; the point is that anyone with the appropriate receiving technology and equipment (e.g., a radio or television set) can receive the signal. The field of broadcasting includes both government-managed services such as [public radio](https://en.wikipedia.org/wiki/Public_radio), [community radio](https://en.wikipedia.org/wiki/Community_radio) and [public television](https://en.wikipedia.org/wiki/Public_television), and private [commercial radio](https://en.wikipedia.org/wiki/Commercial_radio) and [commercial television](https://en.wikipedia.org/wiki/Commercial_television).

**Transmission of radio and television programs from a radio or television station to home receivers by**[**radio waves**](https://en.wikipedia.org/wiki/Radio_wave) is referred to as **"over the air" (OTA) or**[**terrestrial**](https://en.wikipedia.org/wiki/Terrestrial_television)**broadcasting** and in most countries requires a [broadcasting license](https://en.wikipedia.org/wiki/Broadcast_license). **Transmissions using a wire or cable, like**[**cable television**](https://en.wikipedia.org/wiki/Cable_television)(which also retransmits OTA stations with their [consent](https://en.wikipedia.org/wiki/Retransmission_consent)), are also considered broadcasts, but do not necessarily require a license

Originally all broadcasting was composed of [analog signals](https://en.wikipedia.org/wiki/Analog_signal) using [analog transmission](https://en.wikipedia.org/wiki/Analog_transmission) techniques but in the 2000s, broadcasters have [switched](https://en.wikipedia.org/wiki/Digital_switchover) to [digital signals](https://en.wikipedia.org/wiki/Digital_signal_(broadcasting)) using [digital transmission](https://en.wikipedia.org/wiki/Digital_transmission). In general usage, broadcasting most frequently refers to the transmission of information and entertainment programming from various sources to the general public.

* [Analog audio](https://en.wikipedia.org/wiki/Analog_audio) vs. [HD Radio](https://en.wikipedia.org/wiki/HD_Radio)
* [Analog television](https://en.wikipedia.org/wiki/Analog_television) vs. [Digital television](https://en.wikipedia.org/wiki/Digital_television)
* [Wireless](https://en.wikipedia.org/wiki/Wireless)

**Analog television** or **analogue television** is the original [television](https://en.wikipedia.org/wiki/Television) technology that uses [analog signals](https://en.wikipedia.org/wiki/Analog_signal) to transmit video and audio.[[1]](https://en.wikipedia.org/wiki/Analog_television#cite_note-1) In an analog television broadcast, the brightness, colors and sound are represented by rapid variations of either the [amplitude](https://en.wikipedia.org/wiki/Amplitude), [frequency](https://en.wikipedia.org/wiki/Frequency) or phase of the signal.

**Digital television** (**DTV**) is the transmission of audio and video by digitally processed and multiplexed signal, Digital TV can support more than one program in the same channel [bandwidth](https://en.wikipedia.org/wiki/Bandwidth_(signal_processing)). Below are the different widely used digital television broadcasting standards (DTB):

* Digital Video Broadcasting ([DVB](https://en.wikipedia.org/wiki/Digital_Video_Broadcasting)) uses coded orthogonal frequency-division multiplexing ([OFDM](https://en.wikipedia.org/wiki/OFDM)) modulation and supports hierarchical transmission. This standard has been adopted in Europe, Singapore, Australia and New Zealand.

# **band**

In telecommunication, a band - sometimes called a [frequency](http://searchcio-midmarket.techtarget.com/definition/frequency) band - is a specific range of frequencies in the radio frequency (RF) spectrum, which is divided among ranges from *very low frequencies* (vlf) to *extremely high frequencies* (ehf). Each band has a defined upper and lower frequency limit.

High frequencies (hf) - also called *shortwaves* - radio broadcasting

Very high frequencies (vhf) range from 30 to 300 MHz. - television and radio broadcasting

Super high frequencies (shf) range from 3 to 30 gigahertz (GHz). -space and satellite communication

Extremely high frequencies (ehf) range from 30 to 300 GHz. - satellite, and earth and space exploration

**I Band –**

obsolete designation given to the [radio frequencies](https://en.wikipedia.org/wiki/Radio_frequency) from 8 000 to 10 000 [MHz](https://en.wikipedia.org/wiki/MHz) (equivalent to [wavelengths](https://en.wikipedia.org/wiki/Wavelength) between 3.75 and 3 cm) during the cold war period.

# **Ku band**

12–18 GHz portion of the [electromagnetic spectrum](https://en.wikipedia.org/wiki/Electromagnetic_spectrum) in the [microwave](https://en.wikipedia.org/wiki/Microwave) range of frequencies. Ku band is primarily used for [satellite communications](https://en.wikipedia.org/wiki/Satellite_communication), most notably for fixed and broadcast services,

### Receiving digital signal

There are several different ways to receive digital television. One of the oldest means of receiving DTV (and TV in general) is from terrestrial transmitters using an [antenna](https://en.wikipedia.org/wiki/Television_antenna) (known as an *aerial* in some countries). This way is known as [Digital terrestrial television](https://en.wikipedia.org/wiki/Digital_terrestrial_television) (DTT). With DTT, viewers are limited to channels that have a terrestrial transmitter in range of their antenna

## The Provisioning Process

Provisioning is the service provider's term for bringing a new subscriber into a network that connects to the rest of the world. The service provider manages this network and sells network services that subscribers buy. Typically, you derive classes of service from allocations of:

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Connectivity

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Bandwidth

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Number of devices supported

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Network access capability

Customers subscribe to the class of service that best fits their needs. In exchange, they pay a fee to you. Your billing system tracks subscribers and their network usage.

In general, the provisioning process consists of the following tasks:

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Selecting the appropriate device, such as a cable modem, digital set-top box, or IP telephone

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Installing the device in the new subscriber's home

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Installing the physical cable to the new subscriber's home

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Choosing a subscriber username and password for the billing system

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Selecting services

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Activating the device

•[http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif](http://www.cisco.com/c/dam/en/us/td/i/templates/blank.gif)Registering the device with your network

The way in which you implement the provisioning process depends on your business policy. You determine and implement a provisioning workflow model that enhances your customer care practices and network operation. Typical workflow models are pre provisioning and self-provisioning.

# Finally ready to cut the cord and find an alternative to cable TV? Any of the following game consoles, set top boxes, or streaming media players are great cable TV alternatives.

# **Roku**

The **Roku Streaming Player**, or simply **Roku** ([/ˈroʊkuː/](https://en.wikipedia.org/wiki/Help:IPA_for_English) [***ROH****-koo*](https://en.wikipedia.org/wiki/Help:Pronunciation_respelling_key)),[[1]](https://en.wikipedia.org/wiki/Roku#cite_note-1) is a series of [digital media player](https://en.wikipedia.org/wiki/Digital_media_player) [set-top boxes](https://en.wikipedia.org/wiki/Set-top_box) manufactured by [Roku, Inc.](https://en.wikipedia.org/wiki/Roku,_Inc." \o "Roku, Inc.) Roku partners provide [over-the-top content](https://en.wikipedia.org/wiki/Over-the-top_content) in the form of channels.

A Roku streaming device gets data (the video stream) via a wired or [Wi-Fi](https://en.wikipedia.org/wiki/Wi-Fi) connection to an Internet [router](https://en.wikipedia.org/wiki/Router_(computing)). The data is output via an audio cable, video cable, or [HDMI](https://en.wikipedia.org/wiki/HDMI) cable. The device can be connected to any television set (or other video display device) with appropriate input connections.

## TV signal sources

The signal source might be an [Ethernet](https://en.wikipedia.org/wiki/Ethernet) cable, a [satellite dish](https://en.wikipedia.org/wiki/Satellite_dish), a [coaxial cable](https://en.wikipedia.org/wiki/Coaxial_cable) (see [cable television](https://en.wikipedia.org/wiki/Cable_television)), a [telephone](https://en.wikipedia.org/wiki/Telephone) line (including [DSL](https://en.wikipedia.org/wiki/Digital_Subscriber_Line" \o "Digital Subscriber Line)connections), [broadband over power lines](https://en.wikipedia.org/wiki/Broadband_over_power_lines) (BPL), or even an ordinary [VHF](https://en.wikipedia.org/wiki/Very_high_frequency) or [UHF](https://en.wikipedia.org/wiki/Ultra_high_frequency) [antenna](https://en.wikipedia.org/wiki/Antenna_(radio)).

# **Set-top box /**  cable box /  **set-top unit** (**STU**)

an [information appliance](https://en.wikipedia.org/wiki/Information_appliance) device that generally contains a [TV-tuner](https://en.wikipedia.org/wiki/Tuner_(radio)#Television) input and displays output to a [television set](https://en.wikipedia.org/wiki/Television_set) and an external source of [signal](https://en.wikipedia.org/wiki/Signal_(information_theory)), turning the source signal into [content](https://en.wikipedia.org/wiki/Content_(media_and_publishing)) in a form that can then be displayed on the [television screen](https://en.wikipedia.org/wiki/Television_screen) or other [display device](https://en.wikipedia.org/wiki/Display_device). They are used in [cable television](https://en.wikipedia.org/wiki/Cable_television), [satellite television](https://en.wikipedia.org/wiki/Satellite_television), and [over-the-air television](https://en.wikipedia.org/wiki/Over-the-air_television) systems, as well as other uses.

# **Electromagnetic spectrum**

The electromagnetic spectrum is the term used by scientists to describe the entire range of light that exists. From radio waves to gamma rays, most of the light in the universe is, in fact, invisible to us!

 The larger the frequency, the smaller the wavelength

The **electromagnetic spectrum** is a collective term; referring to the entire range and scope of frequencies of electromagnetic radiation and their respective, associated [photon](https://en.wikipedia.org/wiki/Photon) wavelengths.

The electromagnetic spectrum extends from below the low frequencies used for modern [radio](https://en.wikipedia.org/wiki/Radio" \o "Radio)communication to [gamma radiation](https://en.wikipedia.org/wiki/Gamma_radiation) at the short-[wavelength](https://en.wikipedia.org/wiki/Wavelength) (high-frequency) end

Nearly all types of electromagnetic radiation can be used for [spectroscopy](https://en.wikipedia.org/wiki/Spectroscopy), to study and characterize matter.[[5]](https://en.wikipedia.org/wiki/Electromagnetic_spectrum#cite_note-em-spectrum-5) Other technological uses are described under [electromagnetic radiation](https://en.wikipedia.org/wiki/Electromagnetic_radiation).

### Regions of the spectrum

The types of electromagnetic radiation are broadly classified into the following classes:[[5]](https://en.wikipedia.org/wiki/Electromagnetic_spectrum#cite_note-em-spectrum-5)

1. Gamma radiation (high freq : 300 EHZ, low wavelength: 1 pm (petameters))
2. X-ray radiation
3. Ultraviolet radiation
4. Visible radiation (3PHZ – 3 THZ, 100 nm – 100um)
5. Infrared radiation
6. Terahertz radiation
7. Microwave radiation
8. Radio waves (low freq 3 KHZ, high wavelength 100 KM)

# **Electromagnetic radiation**

In [physics](https://en.wikipedia.org/wiki/Physics), **electromagnetic radiation** (**EM radiation** or **EMR**) refers to the waves (or their quanta, [photons](https://en.wikipedia.org/wiki/Photon)) of the [electromagnetic field](https://en.wikipedia.org/wiki/Electromagnetic_field), propagating (radiating) through space carrying electromagnetic [radiant energy](https://en.wikipedia.org/wiki/Radiant_energy). It includes [radio waves](https://en.wikipedia.org/wiki/Radio_wave), [microwaves](https://en.wikipedia.org/wiki/Microwave), [infrared](https://en.wikipedia.org/wiki/Infrared), [(visible) light](https://en.wikipedia.org/wiki/Light), [ultraviolet](https://en.wikipedia.org/wiki/Ultraviolet), [X-](https://en.wikipedia.org/wiki/X-radiation), and [gamma](https://en.wikipedia.org/wiki/Gamma_radiation) radiation.

[Classically](https://en.wikipedia.org/wiki/Classical_electromagnetism), electromagnetic radiation consists of **electromagnetic waves**, which are synchronized [oscillations](https://en.wikipedia.org/wiki/Oscillation" \o "Oscillation)of [electric](https://en.wikipedia.org/wiki/Electric_field) and [magnetic fields](https://en.wikipedia.org/wiki/Magnetic_field) that propagate at the [speed of light](https://en.wikipedia.org/wiki/Speed_of_light) through a [vacuum](https://en.wikipedia.org/wiki/Vacuum).

Electromagnetic waves are produced whenever [charged particles](https://en.wikipedia.org/wiki/Charged_particle) are [accelerated](https://en.wikipedia.org/wiki/Acceleration), and these waves can subsequently interact with other charged particles. EM waves carry [energy](https://en.wikipedia.org/wiki/Energy), [momentum](https://en.wikipedia.org/wiki/Momentum) and [angular momentum](https://en.wikipedia.org/wiki/Angular_momentum) away from their source particle and can impart those quantities to [matter](https://en.wikipedia.org/wiki/Matter) with which they interact.

**STB**

STB is an electronic device which converts the digital signal to audio or video formats. Set top box is also known by **Settop box, Settopbox, STB, Digital TV converter, Smart TV converter cable box** etc. The STB is placed between the TV and the provider such as satellite, cable or terrestrial operator. One of the advantages of STB is that it provides more TV channels on the less number of frequencies.

They are used in [cable television](https://en.wikipedia.org/wiki/Cable_television), [satellite television](https://en.wikipedia.org/wiki/Satellite_television), and [over-the-air television](https://en.wikipedia.org/wiki/Over-the-air_television) systems, as well as other uses.

## TV signal sources

The signal source might be an [Ethernet](https://en.wikipedia.org/wiki/Ethernet) cable, a [satellite dish](https://en.wikipedia.org/wiki/Satellite_dish), a [coaxial cable](https://en.wikipedia.org/wiki/Coaxial_cable) (see [cable television](https://en.wikipedia.org/wiki/Cable_television)), a [telephone](https://en.wikipedia.org/wiki/Telephone) line (including [DSL](https://en.wikipedia.org/wiki/Digital_Subscriber_Line) connections), [broadband over power lines](https://en.wikipedia.org/wiki/Broadband_over_power_lines) (BPL), or even an ordinary [VHF](https://en.wikipedia.org/wiki/Very_high_frequency) or [UHF](https://en.wikipedia.org/wiki/Ultra_high_frequency) [antenna](https://en.wikipedia.org/wiki/Antenna_(radio)).