UNIT 2: HISTORY OF RADIO BROADCASTING

UNIT STRUCTURE

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2.1 Learning Objectives

After going through this unit you should be able to:

- Trace the history of radio broadcasting in the West
- Delineate the history and growth of radio broadcasting in India

2.2 Introduction

Radio came to India in the 1920's and started operating in the form of privately owned radio clubs. Thereafter, in the face of financial crisis, the government decided to intervene and from then on radio became a government controlled medium. In the last ninety years of its existence in India, radio has grown from strength to strength to become a close companion of an average Indian listener. And in recent years, radio is also operated by private players apart from the government. The advent of television did challenge the popularity of radio, but this audio medium has demonstrated tremendous resilience and has overcome overwhelming odds to bounce back and regain its popularity among the Indian masses

Radio plays a significant role as a mass medium of instruction and entertainment and its importance cannot be underestimated especially in a country like India. Therefore it is essential to understand this medium thoroughly so that tomorrow when you become mass communicators, you can employ the right broadcast strategies and techniques for effectively communicating with your listeners. In this unit we will look at the history of radio, at the world scenario as well as its origin and growth in India.

Some knowledge of the history of the medium, its development and its spheres of activity will help you to recognise its potentials and its limitations.

Please read the unit, section by section, making your notes in the margin as an aid to memory. Hope you will find the unit informative and useful.

2.3 History of Radio Broadcasting (World Scenario)

In this section we are going to learn about the beginning of radio as a medium of communication.

Radio originated in the West. An experimental physicist at Cambridge, James Clerk-Maxwell (1831-79), made the prediction way back in 1864. Twenty four years later, in 1888 to be precise, the German Physicist Heinrich Hertz (1857-94) demonstrated the existence

and propagation (travel through a medium) of these radio waves. He, however, never realized that one day they would become a means of communication.

The New Zealand born British Physicist Ernest Rutherford (1871 - 1937) succeeded in sending radio signals through a distance of 3 1/4 of a mile. Another Englishman, Oliver Lodge (1851 -1940) discovered and devised the principles of tuning.

Vacuum tube: It is a sealed glass or metal tube from which almost all the air has been sucked out so that electrical current can flow between the electrodes within the tube without the interference of a gaseous surrounding. It is also called a **wireless valve**.

After the discovery of Oliver Lodge, another scientist named Nicola Te making certain electrical devices. It was in the year 1893, at St. Loui Tesla propounded certain principles of his wireless work. His work elements which were later incorporated into radio systems before the d **vacuum tube**. In this context Tesla also performed detailed demonstrati Institute in Philadelphia and the National Electric Light Association.

The first ever radio was called the "wireless telegraph. It did not hav transmit any form of sound. On August 14, 1894 the first public demons telegraphy was conducted by Professor Oliver Lodge and Alexander Muirhead. During the demonstration a radio signal was sent from the neighbouring Clarendon laboratory building, and received by an apparatus at the lecture theatre of the Oxford University Museum of Natural History.

After a year, another scientist Alexander Stepanovich Popov built his first radio receiver. This receiver was created on the basis of Lodge's receiver with the aim of finding out an improved product and it contained a coherer. And it was Guglielmo Marconi (1874-1937), the Italian physicist and electrical engineer, who made use of the knowledge of radio waves and invented the wireless telegraphy as a device of communication. used for transmitting marconigrams or wireless telegrams was named ‘Marconi graph’.

Patent: A set of exclusive rights granted by a state to an inventor or his assignee for a fixed period of time in exchange for a disclosure of an invention. The exclusive right granted to a patentee in most

Thereafter many improvements took place in the field of electrical impulse t radio signaling apparatus. For his great contribution made by the inventio

telegraphy as a device of communication Marconi received the British **patent** 12039 award in 1896. Apart from this, Marconi also has the credit of establishing something very historic. On the Isle of Wight, England, he established the world's first radio station in 1897. He also opened the world's first "wireless" factory in Hall Street, Chelmsford, England in 1898, and deputed around 50 people. On December 12, 1903, he succeeded in his first attempt in sending and receiving messages across the Atlantic Ocean from Poldhu, in Cornwall, England to St. John's in New Foundland, Canada. In 1909, Marconi was awarded the Nobel Prize for science and technology. Although Marconi perfected the knowledge of radio waves to put them to some use, spoken messages could not yet be sent through his marconigraph. It could communicate only dots and dashes.

What was needed was a vacuum tube. The first vacuum tube was made in 1903 by John Ambrose Fleming (1849-1945), an Englishman. Fleming's vacuum tube was called a diode. Within a diode, there are two electrical parts: an anode and a cathode.

Two years later Lee De Forest (1873-1961), an American improved upon Fleming's vacuum tube and invented a triode or audion. A triode has three electrical parts. An anode, a cathode and a control grid. There are tetrodes and pentodes: of four and five electrical parts also in use.

It was the Christmas Eve, in 1906, when the first successful radio program broadcast was carried out by Reginald Fessenden, from Ocean Bluff-Brant Rock, Massachusetts. On that day Fessenden played 'O Holy Night' on the violin and read a passage from the Bible which was heard on the radio by the ships at the sea. Radio operators at sea heard a man speak, a woman sing and some music from a violin. Then came an announcement, 'If you have heard this programme, write to Reginald A Fessenden at Brant Rock.' This was the beginning of radio broadcast. But new discoveries, brought in their wake, new problems. People thought that the radio would corrupt people and make them idlers. Big investments had to be made on broadcasting stations, radio sets, etc, and public opposition to the radio also had to be overcome. In 1920, an American Westinghouse Company engineer, Dr. Frank Conrad, began a series of voice broadcast. He also arranged for the sale of radio sets. In the same year another official of Westinghouse built a broadcasting station at Pittsburgh, Pennsylvania. Broadcasting had come to stay.

1920 was another important year in the history of radio. Sociedad Radio Argentina has the credit of broadcasting the first live performance through radio. At 9 pm on August 27 it aired a live performance of Richard Wagner's Parsifal opera from the Coliseo. At that time, only about twenty homes in the city of Buenos Aires had a set of receiver. That year on August 31, station 8MK in Detroit, Michigan started broadcasting the first ever radio news bulletin On the other hand the first campus radio station began broadcasting on October 14 from Union College, Schenectady, New York in the same year. Wendell King, an African-American student at that institute took the initiatives to start the campus radio. October also saw the beginning of the first public entertainment broadcast in the United States. These were a series of Thursday night concerts. This broadcast was initiated by 2ADD, which was later renamed as WRUC in 1940. Initially these programmes were heard within a 100-mile (160 km) radius, but later the audible area spread to a radius of 1,000-mile (1,600 km).Meanwhile in November, the first broadcast of a sports event was on air. Thereafter from 1922 regular entertainment programmes were on air from the Marconi Research Centre placed at Writtle, England.

The earliest practical use, to which the invention was put, was to send messages from ships at sea. The American Navy called the wireless, the ‘Radio-telegraph’ and from it came the abbreviation ‘radio.’

AM refers to amplitude modulation, a mode of broadcasting radio waves by varying the amplitude of the carrier signal in response to the amplitude of the signal to be transmitted. The earliest of all radio broadcasting was carried out with this very mode and were termed as AM stations.

In the early 20th century (1900-1959) the initial developments in the use of commercial AM radio stations took place. At that time, the aircrafts used these radio stations for navigation. This continued until the early 1960s when VOR systems finally became widespread (though AM stations are still marked on U.S. aviation charts).

In 1930s, a very important development took place in the field of broadcasting, when Edwin H. Armstrong invented the **FM** radio. FM radio could overcome the interference

(static) problem of AM radio and hence it gained popularity. Moreover stations could be placed at a greater distance for greater fidelity. In the early 1930s, the amateur radio operators invented single sideband and frequency modulation which became established commercial modes by the end of the decade.

Earlier in 1920s, radio was used to transmit visible pictures as television does today. But it was not until the 1940s when North America and Europe viewed the commercial transmissions of television. Meanwhile Regency introduced a pocket transistor radio in 1954 which was powered by a "standard 22.5 V battery". This pocket radio was named as the TR-1.

Sony, the well known brand of the present days, introduced its first transistorized radio in 1960. This radio had many advantages. It was small enough to fit in a vest pocket and able to be powered by a small battery. Moreover there were no tubes to burn out and hence it was more durable. The transistors operate on Integrated Circuit chips in place of the vacuum tube valves. By 1963 the first (radio) communication satellite, TELSTAR, was launched. And by that time, colour television was being regularly transmitted commercially. Meanwhile the U.S. long-distance telephone network began to be converted to a digital network in the late 1960s.It employed digital radios for many purposes. As soon as LORAN became the premier radio navigation system in 1970s, the U.S. Navy began experimenting with satellite navigation. This resulted in the invention and launch of the GPS constellation in 1987. Till that time tubes were almost completely replaced by the transistors except for very high-power uses. In the early part of 1990s, radio entered into a digital sphere when personal computers with audio cards were started to be used to process radio signals. In 1994, a large scale and successful project, was launched by the U.S. Army in collaboration with DARPA. The techniques of changing the software programming was employed to construct software defined radio that can be programmed to another form of radio. In the late 1990s digital transmissions began to be applied to broadcasting on a larger scale.

In the early years of the 20th century there was some controversy over the regulation of air space and broadcasting rights. Radio waves, like any electromagnetic wave, do not follow the restrictions of boundary lines of nations. They spread in every direction. Without some control, different stations can broadcast on the same frequency and thus impair reception of

any programme on a radio set. Have you come across the word ‘jamming’ with reference to radio broadcast? This means making reception of a radio broadcast programme impossible or difficult by broadcasting another programme on the same wave. Hence a new broadcasting station needs to take a frequency for its broadcasts which does not interfere with that of any existing station.

The International Telecommunications Union (ITU), established in 1947, is an agency of the United Nations that looks into the issue of allocation of radio frequencies to different countries of the world.

In the mid '90s, broadcasting began with the internet based radio which was a totally new medium with no requirement of licensing. The process of establishing a radio station became easier. Now that the need for "over the air" transmitters was no more, the stations could function from anywhere in the globe. In 1996, George Maat started 'A' Net Station (A.N.E.T.) and began broadcasting commercial free from Antarctica.

The beginning of Internet Radio was an added advantage together with the development of the "Radio Locator" system, with the help of which Radio Stations could be easily traced. And for this the credit goes to the Massachusetts Institute of Technology (MIT). After stations started working through the internet, anyone could locate a station's website and listen to a station worldwide, through Radio-Locator. Even if some stations do not have live audio on the net or a website the radio locator also tracks such stations. In such a case station information can be collected by various other search queries.

At present, the numbers of informal internet radio operations have increased to great extent. All these have become possible owing to the popularity of features like cheap or free virtual DJ software, good connection speeds and faster computers. Now a days the complete system of radio and its related aspects are undergoing drastic changes. Ad hoc and local broadcasters with a sound number of audiences are common for a variety of reasons and at certain instances they eve develop into independent stations.

CHECK YOUR PROGRESS A

1. Who invented/discovered the following:
   i. Existence and propagation (travel through a medium) of radio waves.

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   _____

   ii. Principles of tuning

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   _____

   iii. Radio receiver

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   _____

   iv. Wireless telegraphy

   _____
   _____

   v. Vacuum tube (diode)

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   _____

   vi. Vacuum tube (triode)

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   _____

   vii. Vacuum tube detector

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   _____

   viii. FM radio

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   _____

   ix. Pocket transistor radio

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   _____

   x. "Radio Locator"

   _____
   _____

LET US KNOW

Developments in the 20th century:

- Aircraft used commercial AM radio stations for navigation. This continued through the early 1960s when VOR systems finally became widespread (though AM stations are still marked on United States aviation charts).
- In the early 1930s, single sideband and frequency modulation were invented by amateur radio operators. By the end of the decade, they were established commercial modes.
- Radio was used to transmit pictures visible as television as early as the 1920s. Standard analog transmissions started in North America and Europe in the 1940s.
- In 1960, Sony introduced the first transistorized radio, small enough to fit in a vest pocket, and able to be powered by a small battery. It was durable, because there were no tubes to burn out. Over the next twenty years, transistors displaced tubes almost completely except for very high power, or very high frequency, uses.
- In 1963 colour television was commercially transmitted, and the first (radio) communication satellite, TELSTAR, was launched.
- In the late 1960s, the U.S. long-distance telephone network began to convert to a digital network, employing digital radios for many of its links.
- In the 1970s, LORAN became the premier radio navigation system. Soon, the U.S. Navy experimented with satellite navigation, culminating in the invention and launch of the GPS constellation in 1987.
- In the early 1990s, amateur radio experimenters began to use personal computers with audio cards to process radio signals. In 1994, the U.S. Army and DARPA launched an aggressive, successful project to construct a software radio that could

become a different radio on the fly by changing software.

- Digital transmissions began to be applied to broadcasting in the late 1990s.

2.4 History and growth of radio in India

As in many other countries of the world, broadcasting in India began in the 1920s with the efforts of amateurs followed by private enterprise. The Radio Club of Bombay, broadcast its first programme in June 1923 and the Calcutta Radio Club, in November 1923. The transmitters were loaned by the Marconi Company. The Madras Radio Club, with a forty watt transmitter, began transmitting on July 31 1934. It was assembled by C V Krishnamurthy Chetty who brought the components from England on completion of his studies there. This was replaced by a 200 watt transmitter. Two and half hours of transmission, consisting of music and talks, were broadcast every evening. The service closed down in 1927 due to financial difficulties despite a share of licence fee having been granted by the government to the radio clubs. The Madras Corporation resumed the service on April 1, 1930 and continued it till All India Radio took over in 1938.

Organised broadcasting in India began when the first station of the Indian Broadcasting Company (IBC) was inaugurated at Bombay by the British Viceroy of India Lord Irwin on July 23, 1927. This company had an investment of rupees 15 lakhs, out of which four and a half lakhs were spent on the installation of the Bombay and Calcutta stations. Meanwhile Broadcast Receiver licenses were enforced on December 31st 1927 with a fee of Rs. 10/- per year on every radio set. There were a total of 3,594 radio sets at that time and within a period of two years this figure was seen to be double, but the number of licenses went down by 1930.

However the expenditure of broadcasting was much more than the revenue at that time. In view of this, the company had applied for a government loan which was not granted and this led to the break-up of the company in March 1930.

The liquidation of the company led to many representations to the government for the continuance of the service. This led the government to take over the stations at Bombay and Calcutta at the depreciated value of its assets and people on the existing terms of the company. Thus on April 1, 1930, the 'Indian Broadcasting Service' came into existence. With this broadcasting in India came under the direct control of the government under the Department of Industries and Labour. A central broadcasting advisory committee was set up to advice the government on matters relating to the management and development of broadcasting in India.

Faced with financial stringency, the government reduced IBC's monthly expenditure to Rs. 2400 and reduced it further to Rs. 2200 within a few months after taking over the company. Faced with 'recession' the government finally decided to close down the broadcasting service. This was announced in a press communiqué on October 10, 1931.

Although the decision of closing down the broadcasting service was taken by the government, the people were not ready to accept it. Hence people, particularly in Bengal, took to agitation. The government made a reverse decision on November 23, 1931 to continue the broadcasting service. Duty on the receiving sets and valves were increased separately from the existing 25 per cent to 50 per cent. By May 5, 1932, the government had finally decided to continue the Indian Broadcasting Service under state management.

The BBC started the Empire Service by the end of 1932. At that time the number of receivers was 8557, which drastically increased to 10,872 within a year. Again, by the end of 1934, when the government embarked on a policy of development of broadcasting by sanctioning Rs. 2.5 lakhs for the establishment of a radio station in Delhi the number increased to 16,000. The new Controller of Broadcasting, Lionel Fielden, who was recommended from the BBC took over on August 30, 1935. Meanwhile a sum of Rs. 2 million had been sanctioned for the development of broadcasting in India. The new

Controller and Mr. Kirke, and engineer who also came from the BBC, recommended an investment of Rs. 4 million. In their report, they had pointed out that by that time England had made an investment of over Rs. 100 million on radio.

Despite formation of the Indian Broadcasting Service efforts were on to expand broadcasting. The Marconi Company had started rural broadcasting in the North-West Frontier Province. It sanctioned the transmitters and the receiving sets to the provincial government as loans. Meanwhile the Allahabad based Indian Agricultural Research Institute also started broadcasting rural programmes for the region.

People at Mysore began listening to the radio in September 1935. It was beautifully named as **'Akashvani'** meaning the voice from the sky. A professor of psychology at the Mysore University, Dr. Gopalaswami had set up a 30 watt transmitter at his house and a 250 watt transmitter was later imported. This in-house radio station was broadcasting with support from the public and the Mysore municipality till the time when the Mysore State finally took its charge in 1941. In this connection, it may be pointed out, that the Government of India Act 1935 did not prohibit any province or state from setting up radio stations and operating them according to their rights.

On January 1, 1936 the Indian State Broadcasting Service went on air through its Delhi station. The 20 kilo watt Medium Wave transmitter was located at Mall Road and the broadcasting studios were temporarily placed at 18 Alipur Road. On the other hand the adoption of the name All India Radio had faced opposition from the Secretariat. But the then Controller Lionel Fielden was able to persuade the Viceroy Lord Linlithgow to adopt that very name and thus the new name was adopted from June 8, 1936. Fielden had also left the history of the development of radio at that time in his autobiography "*The Natural Bent".* He was impatient with the leisurely ways of the imperial secretariat in Delhi. Cecil Goyder, another BBC man, took over as Chief Engineer of All India Radio on August 19, 1936. Charles Barnes, another Englishman came as news editor on September 9, 1937. Later in December, the fifth radio station was commissioned at Lahore.

Fielden's contribution to broadcasting in India should be greatly remembered. Apart from the name All India Radio and getting together a group of dedicated young people, Fielden and his Chief Engineer Goyder worked for the shortwave coverage of the entire country which they achieved quickly by 1938. Goyder was also not in support of Mr. Kirke's plans for medium wave coverage of the country. Goyder felt that it would take a long time to do so and large parts of the country would remain uncovered from the radio waves. The first 10 kilo watt shortwave transmitter was commissioned at Bombay on February 4, 1938. The Lucknow station, with a five kilo watt Medium Wave transmitter, went on air on April 2, 1938 and Madras with five kilo watt medium wave and 10 kilo watt short wave transmitters was commissioned on June 16, 1938. Delhi had its short wave transmitter of five kilo watt on June 1, 1938 and Calcutta was commissioned with a 10 kilo watt short wave transmitter on August 16, 1938. The first inter-station relays between Bombay and Delhi, on short wave, began early in 1939. The same year saw the opening of a five kilo watt medium wave station at Tiruchirapalli, in the Madras province, on May 16, 1939. With the beginning of World War II, news bulletins in Tamil, Telugu, Gujarati, Marathi and Pashtu were started from Delhi on October 1, 1939 in addition to English, Hindustani and Bengali which already existed. They were relayed to other stations over short wave transmitters. Fielden was responsible for another decision also. This was the banning of the harmonium on March 1, 1940. Even though the matter was raised in the Station Director's conference in 1939 and endorsed by it, the decision came mainly as a result of Fielden's initiative following an article by a western music expert Mr. John Foulds. Foulds had pointed out that the tempered scales of the harmonium into 12 mechanical divisions were not suited to produce the microtones *(shrutis)* which formed the basis of Indian music.

After Fielden ,Ahmed Shah Bokhari remained as the Director General. He remained in that position for all the years of war and thereafter till the partition of the country. When the Ministry of Information was set up on October 24, 1941, All India Radio became a part of it. The functioning of AIR began from its new Broadcasting House in Parliament Street in February 1943. On June 3, 1947, Viceroy Lord Louis Mountbatten, Jawaharlal Nehru and Mohammed Ali Jinnah made their historic broadcasts on the partition of India through Akashvani. The transfer of power on the midnight of 14-15 August, 1947 was broadcast live with Jawaharlal Nehru's famous speech 'tryst with destiny' which is preserved in the archives of All India Radio. The AIR network, by then, had nine stations of which six - Delhi, Calcutta, Bombay, Madras, Lucknow and Tiruchirapalli -- remained with India; Lahore, Peshawar and Dacca having gone to Pakistan. When the princely states were integrated with India, low power radio stations at Mysore, Trivandram, Hyderabad,

Aurangabad and Baroda were taken over by All India Radio to be made part of the network by 1950.

By the end of 1950, AIR network had 25 stations with an output of 60,000 hours per annum, in all the regional languages which could be received by 21 per cent of the population covering about 12 per cent of the area of the country. The External Services were separated from what was then known as Central News Organisation (now News Services Division) on September 15, 1948. When the Constitution of India came into force on January 26, 1950, broadcasting along with post, telegraphs, telephones and wireless was placed in the Union List of the Seventh Schedule.

ACTIVITY A

1. Trace the history of radio in the city you live in.
2. Visit a private FM channel and make a list of the programmes they broadcast every day.
3. Do a survey among a small number of people and find out how many of them listen to the radio and what they listen to.
4. Conduct a survey to find radio usage patterns among listeners. Talk to 25 people each from among people living in rural areas and those living in urban areas. See if there is any difference in radio listening habits.

CHECK YOUR PROGRESS B

1. Who was appointed the first controller of Broadcasting in India?

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2. When did broadcasting in India come directly under govt. control?

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3. When was the name Akashvani given?

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4. Name Lionel Fielden's Autobiography.

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5. Which musical instrument did Fielden ban on radio?

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6. When was Jawaharlal Nehru's 'Tryst with destiny' speech broadcast?

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7. Name the Englishman who took over as News Editor of AIR in 1937.

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8. When was the External Service Division of AIR separated from Central News Organisation?

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9. When was broadcasting placed in the Union List of the Seventh Schedule?

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2. 5 Let us sum up

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- Radio originated in the West. The experimental physicist at Cambridge, James Clerk-Maxwell (1831-79) made the prediction way back in 1864. Twenty four

years later, in 1888, the German Physicist Heinrich Hertz (1857-94) demonstrated the existence and propagation (travel through a medium) of these radio waves.

- In 1896, Marconi was awarded the British patent 12039, Improvements in transmitting electrical impulses and signals and in apparatus there-for, for radio. In 1897 he established the world's first radio station on the Isle of Wight, England.

- The earliest practical use to which the invention was put, was to send messages from ships at sea. The American Navy called the wireless, the ‘Radiotelegraph’ and from it came the abbreviation ‘radio.’

- Broadcasting in India began in the 1920s with the efforts of amateurs followed by private enterprise. The Radio Club of Bombay broadcast its first programme in June 1923 and the Calcutta Radio Club in November 1923.

- Organised broadcasting in India began when the first station of the Indian Broadcasting Company (IBC) was inaugurated at Bombay by the British Viceroy of India Lord Irwin on July 23, 1927.

- Following acute financial difficulties, IBC went into liquidation and thus from April 1, 1930, broadcasting in India came under the direct control of the government. It was placed in the Department of Industries and Labour under the designation ‘Indian Broadcasting Service (IBS).

- The then Controller Lionel Fielden, persuaded the Viceroy Lord Linlithgow to adopt the name All India Radio despite opposition from the Secretariat. The new name was adopted from June 8, 1936.

2.6 Further readings

- Mass Communication in India: Keval J Kumar

- Handbook of Journalism and Mass Communication: V S Gupta and V B Agarwalla
- Mass Communication Today: Subir Ghosh
- This is All India Radio: U L Baruah
- India's Communication Revolution- From Bullock Carts to Cyber Marts: Arvind Singhal and Everett Rogers
- Making News-Handbook of the Media in Contemporary India : Uday Sahay
- Broadcasting in India: P C Chatterjee

2.7 Answers to check your progress

A.

i. The German Physicist Heinrich Hertz (1857-94) demonstrated the existence and propagation (travel through a medium) of these radio waves.

ii. An Englishman, Oliver Lodge (1851 -1940) discovered and devised the principles of tuning.

iii. In 1895 Alexander Stepanovich Popov built his first radio receiver, which contained a coherer.

iv. It was Guglielmo Marconi (1874-1937), the Italian physicist and electrical engineer, who made use of the knowledge of radio waves and invented the wireless telegraphy as a device of communication

v. The first vacuum tube was made in 1903 by John Ambrose Fleming (1849-1945), an Englishman.

vi. Lee De Forest (1873-1961), an American improved upon Fleming's vacuum tube and invented a triode or audion.

vii. The vacuum tube detector was invented by Westinghouse engineers including Reginald Fessenden

viii. FM radio was invented by Edwin H. Armstrong in the 1930s

ix. In 1954, Regency introduced a pocket transistor radio, the TR-1, powered by a "standard 22.5 V Battery.

x. Massachusetts Institute of Technology (MIT) developed the "Radio Locator" List of Radio Stations.

B.

1. Lionel Fielden was the first controller of Broadcasting in India.

2. April 1, 1930

3. September 1935

4. The Natural Bent

5. The harmonium

6. Midnight of 14th August 1947

7. Charles Barnes

8. 15 September, 1948

9. 26 January, 1950

10. 25 nos.

2.8 Possible Questions

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1. Trace the history of radio in India.
2. Discuss the major technological advancements that took place in different phases leading to the development of commercial radio broadcasting in the world.