A REPORT ON

INDUSTRIAL VISIT AT

"ALL INDIA RADIO,

CHURCHGATE"

Scheduled on:-19th January,2018

Department of Electronics and Communication Engineering

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VIVA INSTITUTE OF TECHNOLOGY

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<u>Acknowlegdement</u>

We shall be failing in our duty, if we will not express our sincere gratitude to all those distinguished personalitites with help of whom we successfully completed our visit.

Our deep gratitude to our **Principal Dr. Arun kumar** and our **The Head Of EXTC Department Prof. Archana Ingle,** Viva Institute Of Technology, who always been playing a great role in all round development of the student.

We would also like to thank our **Faculty In charge Prof.Chitra Takle** and all teaching and non teaching staff for their kind support, help and assistance, which they extended as and when required particularly for taking keen interest in us to give us excellent and unforgettable facilities.

Last but not the least we wish to thank our friends for cooperating with everyone. We hope that this industrial report would meet the high standards of all concerned people and for their continuous co-operation during the whole period of visit that helped us in enhancement of our knowledge.

INTRODUCTION

Radio Broadcasting was pioneered in India by the Madras Presidency Club Radio in 1924. The Club worked a broadcasting service for three years, but owing to financial difficulties gave it up in 1927. In the same year (1927) some enterprising businessmen in Bombay started the Indian Broadcasting Company with stations at Bombay and Calcutta. This company failed in 1930, in 1932 the Government of India took over broadcasting. A separate department known as Indian Broadcasting Service was opened. The Service was later designated 'All India Radio' (AIR) and was placed under a separate Ministry-the Ministry of Information and Broadcasting. The AIR is controlled by a Director General, who is assisted by several Deputy Directors and a Chief Engineer.

Broadcasting, in its significance, reach and impact, constitutes the most powerful medium of mass communication in India. Its importance, as a medium of information and education is particularly great in a vast and developing country like India where the reach of the printed word is not very wide or deep. While the total circulation of all the newspapers in India, including both English and Indian language papers, is around 8 million, there are, according to a recent estimate, nearly 400 million (out of a total population of 625 million) potential listeners to All India Radio. Broadcasting in India is a national service, developed and operated by the Government of India. All India Radio (also known as Akashvani) operates this service, over a network of broadcasting stations located ail over the country.

As a national service, catering to the complex needs of a vast country. All India Radio seeks to represent in its national and regional programmes, the attitudes, aspirations and attainments of all Indian people and attempts to reflect, as fully and faithfully as possible, the richness of the Indian scene and the reach of the Indian mind.

AIR Network:

Starting with 6 broadcasting stations in 1947, the AIR today has a network of 82 broadcasting stations. The 82 radio stations, grouped into five zones, are the following: North Zone: Ajmer, Allahabad, Aligarh, Bikancr, Delhi, Gorakhpur, Jaipur, Jodhpur, Jullundur, Lucknow, Mathura, Rampur, Simla, Udaipur and Varanasi: East Zone: Agartala, Aizawl, Bhagalpur, Calcutta, Cuttack, Dibrugarh. Gauhati, Imphal, Jeypore, Kohima, Kurseong, Ranchi, Pasighat, Patna, Sambalpur, Shillong, Silchar, Siliguri, Tawang and Tezu ; West Zone : Ahmedabad, Bhopal, Bhuj, Bombay, Gwalior, Indore. Jabalpur, Nagpur, Panaji, Parbani, Pune, Raipur, Rajkot and Sangli; South Zone: Alleppey, Bangalore, Bhadravati, Calicut, Coimbatore, Cuddapah, Dharwar; Gulbarga, Hyderabad, Madras, Mysore, Pondicherry, Port Blair, Tiruchirappalli, Tirunelveli, Trichur, Trivandrum. Vijayawada and Vishakhapatnam; and Kashmir Zone: Jammu, Leh and Srinagar.

In addition, there are three auxiliary studio centers at Vado- dara, Darbhanga and Shantiniketan and two Vividh Bharati/commercial centers, one at Chandigarh and the

other at Kanpur. These cover all the important cultural and linguistic regions of the country. The expansion of the broadcasting facility remained limited till independence. In 1947 there were only six radio stations in the country. Today there are as many as 82 AIR stations. With two more stations that will start working soon, India's broadcasting network would cover 89 per cent of the population.

Till the end of 1976 radio licenses had reached a colossal figure of nearly 1.74 crores, which fetched revenue of Rs. 23.51 crores. Today the radio network has spread to the remote corners of India. It is now possible to bring sense of unity not only political but also cultural among the diverse traditions that enrich our land. AIR's programme pattern combines three main elements: a national channel providing programmes of countrywide interest and significance, a zonal service from each of the four metropolitan centers (Delhi, Bombay, Calcutta and Madras); and regional services from individual stations each catering to the needs and interests of its respective area.

The principal ingredients of AIR's programme output are Music, Spoken Word, Dramas, Features. News and Current Affairs, Commentaries and Discussion, Vividh Bharati and its Commercial Service, Farm and Home Broadcasts, Programmes for Special Audiences (like Youth, Women, Children, Industrial Workers and Tribal Population), and Programmes for Overseas Listeners broadcast in the External Services.   To enable AIR to reach all sections of the Indian people, its programmes in the Home Service are broadcast in 20 principal languages. In addition, the External Services of AIR beam their programmes to listeners all over the world in 24 languages.
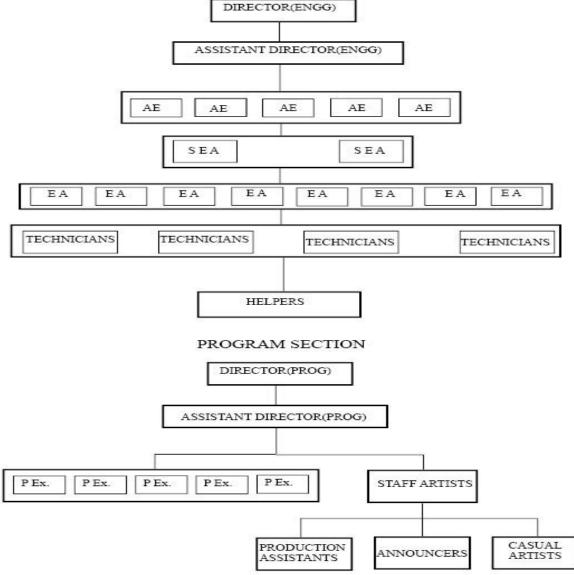
New Services:

The News Services Division of AIR through its central and regional news bulletins and its current affairs, commentaries and discussions, provides accurate, objective, speedy and comprehensive coverage of news to listeners at home and abroad.

AIR now broadcasts a total of 239 news bulletins a day, with duration of 32 hours 17 minutes. Of these, 67 are Central bulletins broadcast from Delhi in 19 languages, with a daily duration of 10 hours 3 minutes; 57 external bulletins (from Delhi) broadcast in 24 languages for a duration of 7 hours 14 minutes and 15 regional bulletins from 34 regional centers (including the Prade- shik desk in Delhi) broadcast in 22 languages and 34 tribal dialects with a total duration of 15 hours every day. The major sources of news for AIR are its correspondents at home and abroad, the news agencies and the monitoring services; AIR has a total of 206 correspondents. Of these, 111 are part-time.

INDUSTRIAL ORGANISATION

ENGINEERING SECTION

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                    DIRECTOR(ENGG)
                         |
              ASSISTANT DIRECTOR(ENGG)
                         |
      [ AE ]  [ AE ]  [ AE ]  [ AE ]  [ AE ]
                         |
         [ S E A ]            [ S E A ]
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  [EA] [EA] [EA] [EA] [EA] [EA] [EA] [EA]
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 [TECHNICIANS] [TECHNICIANS] [TECHNICIANS] [TECHNICIANS]
                         |
                     HELPERS
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PROGRAM SECTION

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                    DIRECTOR(PROG)
                         |
              ASSISTANT DIRECTOR(PROG)
                         |
        _____
       |                                |
 [P Ex.][P Ex.][P Ex.][P Ex.][P Ex.]  STAFF ARTISTS
                                        |
                        _____|_____
                       |                |                |
                  PRODUCTION       ANNOUNCERS         CASUAL
                  ASSISTANTS                          ARTISTS
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There are basically two major units performing their duties for proper functioning of ALL INDIA RADIO STATION

➢ Programming Unit:-arrange Programs Done for Each Day.
➢ Engineering Unit: Looks At All The Software/Hardware For Proper Functioning.

Each unit has been assigned a daily task which they have to complete accordingly.

PRESENT SETUP

Currently there are two complexes in All India Radio, Churchgate(Mumbai).

They are:

1. STUDIO CUM OFFICE COMPLEX

2. EARTH STATION.

STUDIO CUM OFFICE COMPLEX

A broadcasting studio is a room in studio complex which has been specially designed and constructed to serve the purpose of originating broadcasting programs. Whenever any musician sings and we sit in front of a performing musician to listen to him, we enjoythe program by virtue of the superb qualities of our sensory organs namely ears.However, when we listen to the same program over the broadcast chain at our homethrough domestic receivers, the conditions are entirely different. These changes that we experience is because of the audio processing that are performed in a broadcasting studio.

There are three studios at AKASHVANI studio complex. They are:
- MUSIC STUDIO
- TALK STUDIO
- PLAYBACK STUDIO

Music and talk studio are together known as **RECORDING STUDIO**. A Recording studio is a facility for sound recording and mixing. Ideally both the recording and the monitoring spaces are specially designed by an acoustician to achieve optimum acoustic properties (acoustic isolation or diffusion or absorption of reflected sound that could otherwise interface with the sound heard by the listener).

Recording studios may be used by recording musicians, voice over dialogue replacement in film, television or animation, Foley or to record their accompanying musical sound tracks. The typical recording studio consists of a room called **"Studio"** or **"Live room"**, where instrumentalists and vocalists perform; and the **"Control room"**, where sound engineers operate professional audio for analog or digital recording to route and manipulate the sound.

Following equipment are generally provided in a recording/dubbing room:
  i. Console tape recorders
 ii. Console tape decks
iii. Recording/dubbing panel having switches jacks and keyset
 iv. Mics used in studios are of standard gain of 70db.
  v. There are two types of mics used :-1.dynamic mics.   2.condensor mics
 vi. AIR uses GSAT-10 Satellite For Transmission Of Its Programs.

The above equipment can be used for the following purpose
- For recording of programmes originating from any studio.
- For recording of programmes available in the switching.
- Consoles in control room.
- For dubbing of programmes available on cassette tape.

- For editing of programmes.
- For mixing and recording of programmes.

We can brief the studio arrangements at AIR-Churchgate (Mumbai) as follows:

❖ MUSIC STUDIO

The **MUSIC STUDIO** is an acoustically treated room attached to a control room. The studio consists of five microphones and sufficient musical instruments. The control room consists of workstations/computers and a control console for adjusting and checking the quality of the program. These arrangements together are used for producing musical programs. Live musical programs can be also conducted here. **RADIO ASSIST** is the software which is commonly used for processing the raw version of the recorded program. The processed version of the recording is saved to the server and then it is made available for broadcasting by scheduling it to the program list using the software **VIRTUAL STUDIO.**
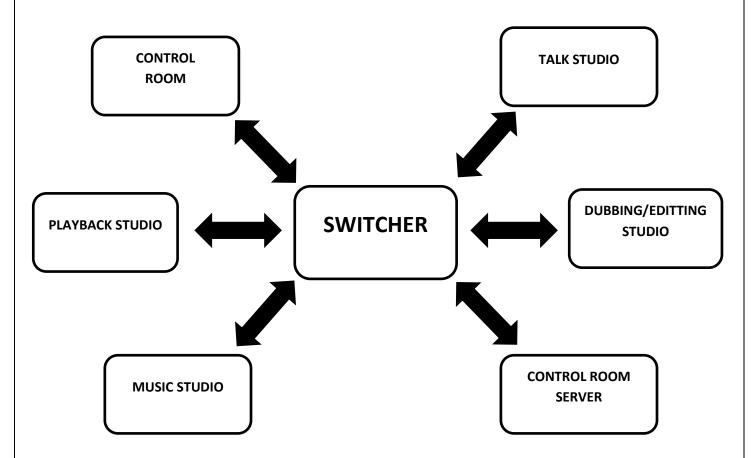
❖ TALK STUDIO

The **TALK STUDIO** is similar to a music studio with an acoustically treated LIVE ROOM and a CONTROL ROOM. The live room consists of only two to four microphones. It is equipped with a telephone connection which is a user friendly attribute for recording Phone-in programs. The control room consists of an additional Phone-in console for conducting Phone-in programs. The acoustics of the talk studio is entirely different from a music studio. It is constructed in such a way that the reverberation time is minimised and no echo is experienced. The recording produced and processed at the talk studio is then forwarded to the playback studio for transmission. Talk studio can be also used to produce live chat programs.

❖ PLAYBACK STUDIO

A **PLAYBACK STUDIO** is entirely different from all other studios. It consists of transmission console, microphones, two workstations/computers (Master & Standby). Its main function is co-ordinating the programs, announcements and advertisements. All the recorded programs will be available in the workstations used and the programs are sent to the control room for broadcasting as per the schedule. Before transmission of the first program a tone of 1 kHz and signature tone will be aired. A GPS clock is used both in the studio complex and transmitting section, to avoid time delays.

BLOCK DIAGRAM OF STUDIO

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CONTROL                                    TALK STUDIO
 ROOM

                    ↘        ↗

PLAYBACK STUDIO  ⟷  SWITCHER  ⟷  DUBBING/EDITTING
                                      STUDIO

                    ↗        ↘

   MUSIC STUDIO                        CONTROL ROOM
                                         SERVER
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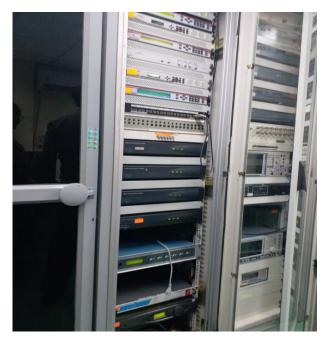
CONTROL ROOM STUDIO CONSOLE:

The Studio console is the major equipment used in the STUDIO CONTROL ROOM. It is with the help of this device the different programs that are produced and those that are received from other stations routed to air. The various inputs to the console are the programs from various studios, the programs that are received using a C BAND receiver which is broadcasted from Delhi and the programs that are received via an ISDN link. The Outputs from the console is taken through two master amplifiers among which one is active at a time. This output is directed to the STUDIO TRANSMITTER LINK (STL).

STUDIO TRANSMITTER LINK:

The programs produced at the Studios are not transmitted from the same complex with intention of preventing the problems due to interference and radiation. Instead, the programs are transmitted from the transmission complex which is situated at Malad (Mumbai). The high quality sound programs from AIR studio centre are normally transported to the AIR transmitting centre with the help of a transmission link named as the STUDIO TRANSMITTER LINK (STL).AIR is having three types of STL called STL-01, STL-02 and STL-05. The numbers 01, 02 and 05 describe the number of base band (50Hz – 15 kHz) channels that could be transported. For quality transmission of the programs, STL is realized using four methods.
They are:

1. A microwave link.
2. FM transmitter link.
3. ISDN link.
4. Optical fibre cables.

1. MICROWAVE

Radio and television broadcast companies originate their signals in studios, but must get them to the transmitter site. In many cities, a nearby hill or mountain holds most of the transmitters. A microwave studio transmitter link (STL) delivers the signal without wires. Positioned at a fixed location and using radio waves, a microwave transmitter sends those waves across space to be received by a microwave receiver at another fixed location. Microwave is broadband, so it can transmit a substantial amount of information from point to point, for use in cell phone and wireless Internet service, with no need for any other equipment between the two fixed locations.

2. Integrated Services Digital Network (ISDN)

Integrated Services Digital Network (ISDN) is a set of communication standards for simultaneous digital transmission of voice, video, data, and other network services over the traditional circuits of the public switched telephone network. It was first defined in 1988 in the CCITT red book. Prior to ISDN, the telephone system was viewed as a way to transport voice, with some special services available for data. The key feature of ISDN is that it integrates speech and data on the same lines, adding features that were not available in the classic telephone system. For AIR, The ISDN link is facilitated by the BSNL. Air is making use of BROADBAND ISDN. In addition to an STL system ISDN acts as a channel for live broadcasting of AIR programs.

SALIENT FEATURES OF ISDN:

- ISDN is a fast network
- ISDN is a telephone network/digital network.
- Integrated services

ANTENNAS

Antenna is usually a metallic device (a rod or a wire) used for radiating or receiving electromagnetic waves. The radio frequency power developed in the final stage of a transmitter is delivered through cables/feeders, without themselves consuming any power to the transmitting antenna. The RF energy gets converted into electromagnetic waves and travels in the free space at the speed of light. The receiving antenna picks up the radio waves and delivers useful signal at the input of a receiver for reception of signals. The transmitting and receiving antennae are reciprocal in the sense, any characteristics of the antenna in general applies equally to both.

Antennas play a vital role in AIR also since these are the communication links between the various stations and the transmitter complex as well. As the purpose differ the shape, size and specifications varies in case of Antennas. In an AIR station we can see a wide variety of Antenna systems. These include:

1. A C-band receiver antenna with a dish whose diameter is about 5m. This antenna receives signals from other stations like Delhi.
2. A DTH receiver antenna with a dish whose diameter is about 1m. This antenna receives signals from stations like Calicut and Thiruvananthapuram
3. Yagi antennas are mounted on the top of a mast of height around 45 m. This is the transmitter antenna for the microwave studio transmitter link. And a similar receiver antenna is mounted on a mast of
4. height about 50m. This enables the line of sight communication between the studio and the transmitter.

CONCLUSION

Broadcasting, in its significance, reach and impact, constitutes the most powerful medium of mass communication. In India, All India Radio operates this service, over a network of broadcasting stations located over the country. Starting with 6 broadcasting stations in 1947, the AIR today has a network of 82 broadcasting stations. AIR's programs pattern combines three main elements: a national channel providing programs of countrywide interest and significance, a zonal service from each of the four metropolitan centers (Delhi, Bombay, Calcutta and Madras); and regional services from individual stations each catering to the needs and interests of its respective area. Currently there are two complexes in AIR Churchgate, **Studio cum office complex** and the **earth station**. In studio complex, there are three studios, MUSIC, TALK and the PLAYBACK. The first two together called to be the recording studio facilitates sound recording and mixing whereas the latter helps in coordinating the programs, Announcements and advertisements.

Reflector antenna

Microwave link

The Studio console is the major equipment used in the STUDIO CONTROL ROOM. The various inputs to the console are the programs from various studios, the programs that are received using a C BAND receiver which is broadcasted from Delhi and the programs that are received via an ISDN link. The Outputs from the console is taken through two master amplifiers among which one is active at a time. This output is directed to the STUDIO TRANSMITTER LINK (STL). This further route the programs to TRANSMITTER at Malad. The source to the transmitter complex is also realized using Microwave, FM Transmitter, ISDN or Optical Fiber Cables.