

# A review of the fm radio



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FM has proved itself to be the most innovative and extremely popular medium across the world. This medium enjoys a unique history. It has evolved like any other regular medium but proved itself when other media failed to do so.

## **INVENTOR:**

It was Major Edwin Armstrong, who is the original inventor of the Frequency Modulation (FM) radio broadcasting system. Major Edwin is not only the inventor on FM but has also contributed greatly many enchantments to the Amplitude Modulation. Since the inventor was one of the developers of AM so he always knew what the AM lacked and its problems. Keeping his experience in his hand, Major Edwin devised a new type of radio transmission that eliminated these problems. He named the new type “ Frequency Modulation “ later on popularised as FM.

The inventor had to face problems in launching hi FM. He took his idea to his friend who was the head of Radio Corporation of America (RCA). Major Edwin noticed the professional jealousy in the head of RCA so therefore sold the manufacturing rights to several other radio manufacturing companies. This resulted in Armstrong being plagued by RCA’s determination to undermine his invention. The legal battle started between RCA and Armstrong and as a result of it the inventor jumped from his 30th floor apartment, ending his life.

## **Working of FM:**

According to record of Westinghouse and KDKA On December 26, 1933, Edwin Howard Armstrong was issued five basic patents on his FM system. At the same time, it is important to remember that many stations in the “ VHF”

band were still amplitude modulated. Actual "official" FM operations began in 1940/41.

Major Armstrong (U. S. Signal Corps, WWI) conducted the first regular transmissions of the FM techniques used today beginning in 1935 on a frequency of 42.1 MHz from a transmitter loaned him by RCA atop the Empire State Building in New York. On April 10, 1938, Armstrong began the experimental station W2XMN on 43.7 MHz at 600 Watts. "Full Power of 35,000 Watts and regular programming was report begun on July 18, 1939. The station lasted until 1954.

Several more stations began regular "program service" in 1940 as GE and other manufacturers started making quantities of FM receivers. All were still considered "experimental" and were operated without commercial content.

According to online process there are two ways in which FM stations work. Either they are Digital or Ana-log.

"In Ana-log FM, the frequency of the AC signal wave, also called the carrier, varies in a continuous manner. Thus, there are infinitely many possible carrier frequencies. In narrowband FM, commonly used in two-way wireless communications, the instantaneous carrier frequency varies by up to 5 kilohertz (kHz, where 1 kHz = 1000 hertz or alternating cycles per second) above and below the frequency of the carrier with no modulation. In wideband FM, used in wireless broadcasting, the instantaneous frequency varies by up to several megahertz (MHz, where 1 MHz = 1,000,000 Hz). When the instantaneous input wave has positive polarity, the carrier frequency shifts in one direction; when the instantaneous input wave has

negative polarity, the carrier frequency shifts in the opposite direction. At every instant in time, the extent of carrier-frequency shift (the deviation) is directly proportional to the extent to which the signal amplitude is positive or negative.

In digital FM, the carrier frequency shifts abruptly, rather than varying continuously. The number of possible carrier frequency states is usually a power of 2. If there are only two possible frequency states, the mode is called frequency-shift keying (FSK). In more complex modes, there can be four, eight, or more different frequency states. Each specific carrier frequency represents a specific digital input data state.

Frequency modulation is similar in practice to phase modulation (PM). When the instantaneous frequency of a carrier is varied, the instantaneous phase changes as well. The converse also holds: When the instantaneous phase is varied, the instantaneous frequency changes. But FM and PM are not exactly equivalent, especially in analog applications. When an FM receiver is used to demodulate a PM signal, or when an FM signal is intercepted by a receiver designed for PM, the audio is distorted. This is because the relationship between frequency and phase variations is not linear; that is, frequency and phase do not vary in direct proportion.”

### **Federal Communication Commission (FCC):**

The FCC permitted regular “ commercial operation” of FM stations in 1941, and the first commercial FM station, W47NV (now WSM-FM) in Nashville, signed on during New Year’s Day of 1941.

The first Non-Commercial FM station was KALW, San Francisco. Owned by the SF Unified School District, this station was licensed in March of 1941, and apparently signed on officially sometime between then and September. (This station was equipped with a converted RCA unit, given to the District, after 1939-40 Golden Gate International Exposition.

Armstrong also operated a subcarrier on that transmitter and demonstrated transmission of facsimile, to show that newspapers might also be delivered by radio broadcast stations. His facsimile demonstrations were carried on later by a number of FM stations, most notably those of the Cox broadcast and newspaper group, including WIOD-FM in Miami.

### **Difference between AM and FM:**

AM radio stations broadcast at much lower frequency when compared with FM. According to Porter (2010) Commercial AM stations broadcast at 550 kilohertz to 1600 kilohertz, while FM stations broadcast at 88 megahertz to 108 megahertz. The prefix “ kilo” stands for thousand, and the prefix “ mega” stands for million. She further says that the radio waves travelling in the air remain more vulnerable to amplitude changes rather than frequency.

AM and FM are different in their working. They transmit in different ways. AM transmits through power and the ionosphere interferences with these radio waves while FM is through high antennas in the air to broaden the range of broadcast.

### **FM Media in Pakistan:**

Naz (2008) writes that Pakistan Broadcast Corporation (PBC) took the first step in setting up an FM station back in 1994 as FM Gold. PBC has used its

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own studios and staff for FM Gold. The initial transmission was limited to the big cities only. The transmission slots were from 7: 00 AM till 1: 00 PM as experimental. In 1996 PBC started FM 101 as an independent FM channel.

Fm 100 is considered the pioneer FM station, established in 1994 and started its transmission on March 23 1995 according to their webpage history.

After an immense response to FM 100 in listenership and commercialization and technological boom, the debate of privatization hit the Pakistan Media field. Soon afterward Musharraf liberated the Media and so new and private channels entered the media entrepreneurship. This proved to be a very positive step for FM stations' development.

Radio has been an integral part of any nation's communication. It has the power to make or break the society when it comes to the impact of radio. The radio in Pakistan has also seen downfalls in history and at times it has also seen upsurges. The nation when had only one media of communication, radio, the nation utilized the media vastly and vitally. Radio Pakistan has witness its glory days when whole families use to sit around it for news or infotainment. With advent of TV radio's usage graph dropped little down. But the usage of TV was limited to cities only. Even today at many far flung areas in Pakistan, TV is not the media in use but still its radio.

Introduction of FM in the country was the revival of radio medium in the country. The broadcast quality of FM is vastly superior to that of AM.

The FM stations in Pakistan can be categorized in three:

Affiliated channels

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The affiliated broadcasters are the legal broadcasts that come under PEMRA in Pakistan. These channels are properly licensed and they operate under the laws of Pakistan. These are geographically registered.

#### Right winged FM broadcast

There are FM channels that are designed for the right winged society keeping in view the fact that religion is the base to everything in our society. Currently Pakistan does not have such channel operating.

#### Sustained Illegal FM broadcasters

These are un-authorized channels that have been used by many non-state elements. The biggest example of this category is the illegal FM stations in Swat and FATA. This type or category is mostly used by negative elements in a society or revolutionist.

For many areas in NWFP and FATA, since there were number of illegal stations working, therefore, government has introduced alternative radio stations controlled by government itself. Mostly these alternative radio stations are available in the urban centres along with international radio stations like BBC and VOA.

### **Pakistan Electronic Media Regulatory Authority (PEMRA):**

To regulate the public and private media Musharraf made a regulatory body Pakistan Electronic Media Regulatory Authority (PEMRA).

PEMRA according to their official website has been established under PEMRA Ordinance 2002 to facilitate and regulate the private electronic media. It has

mandate to improve the standards of information, education and entertainment and to enlarge the choice available to the people of Pakistan Including news, current affairs, religious knowledge, art and culture as well as science and technology.

According to Wikipedia (2010), Pakistan Electronic Media Regulatory Authority (formerly named RAMBO - Regulatory Authority for Media and Broadcast Organizations) was formed to gradually liberate the broadcasting sector in Pakistan. PEMRA has issued a number of licenses to Cable TV operations, FM Radio stations and Satellite TV Channels.

### **PEMRA and FM:**

FM radio broadcasting is used for the high quality sound. The band according to PEMRA is 880109 MHz. The area of coverage is 40-50kms.

The main clauses of PEMRA dealing FM stations are

13. Media ownership concentration and exclusion of monopolies. -

“ To ensure that fair competition is facilitated, media diversity and plurality are promoted in the society and undue concentration of media ownership is not created. Maximum number of licences that may be issued to a person or any of its directors or partners where such person is a company or firm, who is directly or indirectly, controlling, owning or operating more than one media enterprise, shall not exceed a total of four satellite TV, four FM Radio licences and two landing rights permissions.”

Area of operation-



“ A licensee to whom a licence has been issued for a particular area shall not extend or shift its operations beyond the territorial limits of that area without prior permission of the Authority and up-gradation of its existing licence or issuance of a new licence shall also be subject to permission in writing by the Authority:

Provided that an FM radio licensee shall not be allowed to shift its station from the city for which it has been licensed.”

The body has a set code of conduct about the content. The code of conduct is same for both the audio and audio visual media. It is a 2 page code of conduct which includes the basic ethical restrictions.

### **FM today:**

Like the rest of the world, Pakistan also saw the boom in the radio industry and so after allowing from government to set up private radio stations, more than 200 FM stations have been licensed. Presently there are number of FM stations working in big and small cities.

MA Research Foundation (2009) writes that majority of the current radio stations are entertainment focused while some also broadcast news.

The FM station is an active media and an important source of contacting with people. Local FM stations can be very helpful for communicating with people at a local level plus it could narrow down the gap between administration and public.

Initially the FM media lacked trained people. Since there were not many trained radio workers. But then in the following years many universities

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offered degrees in media which to some extent met the deficiency of trained people. Still the media is said to be growing and at initial stage of learning since trained people are not substitutes of experienced ones.

### **Problems and Solutions of FM Stations:**

The biggest and foremost problem that FM stations face is in the selection of broadcasters. FM broadcasters are commonly known as RJs i. e. radio jockeys or MJs i. e. Music Jockeys. Since the media lacks experienced people therefore selection and hiring has been an issue in the industry. In case of an RJ, only the quality of voice has been considered benchmark. As far as the criteria of selection is considered, command over language, pronunciation, general knowledge in social political and ethical issues must be stressed.

An RJ must not be just put in front of the mike without his/her training in various fields. He/she should first be trained according to the policy of the parent company. Before sitting in front of the mike the RJ should at least have knowledge about the psychology of people of the broadcast area or the target audience.

These days the FM is only a revenue generation firm. "Revenue at any cost" not only damages the standard of the station but also the reputation plus it is contrary to the ethical values practiced in Pakistan.

To attract more listenership and through huge listenership attracting more and more advertisers has been an issue. Since all radio stations except few follow this policy therefore the FM media faces monotone in its programming. For this reason mostly the programs are entertainment based and musical.

## **FM in Pakistani Society:**

The FM media has the ability to mobilize the society and impart information to the society. Therefore it could be an important tool for the societal development. The FM stations are the best way to involve people in the society development projects.

For this purpose more and more community radios should be set up. Setting up community radios might be risky because if not set properly. These can be used for negative propagandas. Properly set means to be like a proper radio station registered with PEMRA and under the law of the country.

Radio and specially FM stations that are now even available in mobiles as well are a cheap source of entertainment, education and information. Especially in big cities where one has access to number of different radio stations.

This is not only a cheap media in terms of price but also a portable media which was easy to carry with you. A common use of the FM is seen during any other work since it is a portable media. It can be listened while doing some other routine work. People enjoy listening to it while driving, ploughing in villages, and workers in factories or shops. FM in Pakistan gained more popularity in electricity crisis. When people have no access to any media, FM stations proved to be the only source of information.

The role of the media is also to unite people in case of any insurgency or problem in any country. These radio stations are also helpful in dealing with the natural calamities. This role was visible during the 2005 earthquake. The radio stations besides their regular transmission also aired the names and  
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information about the missing people and injured people so that they may be contacted by their relatives. Not only had this but the radio proved itself in Pakistan when it tried in bringing people out of that trauma that the nation had gone through.

## **FM media and Politics:**

### **The emergency in Pakistan:**

During emergency rule in Pakistan, when all media had to go through dark phase and when people had no access to any medium, before moving towards internet as media , people of Pakistan had tried FM stations.

H. Yousaf(2009) says that people had been using FM radio broadcasts and cell phones as a way to organize and disseminate information. She adds that “ the emergent, ad hoc, and hyper local networked public spheres thus created served the public well under emergency rule”.

According to the writer the medium did not emerge as a site for civic engagement or community building. This was due to the fact that the FM channels both private and public were banned to air news and current affairs even before the emergency rule. According to PEMRA regulations the FM stations were supposed to broadcast diversified mixture of programs specializing in education, information, entertainment, culture and other areas. Initially this clause was interpreted to mean that no form of news is allowed.

Community radios are thought to be daily life radio which guides you to make your day easier. This may be by telling you the right road to your office or keeping an umbrella in case of forecast rain. The city radio of Karachi  
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according to H. Yousaf, played the role of community radio during 2008 Karachi riots. It kept on alerting people with traffic updates.

### **FM stations:**

The common FM stations that are accessible in the federal capital are:

#### FM 101

This is the channel of Radio Pakistan. The channel was specially introduced for the youth of Pakistan. The content of the channels involve regular programming with strict ethical code of conduct. FM 101 does not enjoy a complete freedom of expression since it comes under a government body. FM 101 also airs its transmission on dish TV.

#### FM 100

FM 100 was the first and a leading channel. It has maintained its standard of content. All the content aired on FM100 is in respect to the culture and traditions of Pakistan.

#### FM 96. 4

FM 96. 4 is relatively new. The channel is a simple entertainment channel. The channel has RJs for whole day.

#### FM 94

It is an English channel. The channel is called Planet 94. This is an entertainment channel which airs the entertaining content in English.

#### FM 92. 4

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This is a specialized community radio station from Islamabad Traffic Police. The channel specialises in traffic management information and education. The channel is localized therefore it airs special content for traffic.

#### FM 89

This is an English based channel. The name of the channel is city FM 89. Its target audience is English speaking foreigners and overseas Pakistani who have returned to Pakistan. Many people call it a elite class or upper class radio station. It currently operates four stations across Pakistan: Karachi, Lahore, Islamabad and Faisalabad.

#### FM 91:

FM 91 is another English channel. It is owned by an advertising agency. Listening to 91 gives an impression of it set to be a top dog. This maintains the Pakistani culture and does not westernize the content at the value of Pakistani culture. The RJs at FM 91 seem to be more Pakistani speaking English. The channel also airs Urdu music at time. The channel enjoys the ratio of music and content at 70: 30 in terms of language Urdu and English. So the channel cannot be categorized complete English.

#### FM99

Targeting the lower middle and middle class of Pakistan 99 has gained popularity in masses. The channel also airs programs on current affairs and news. It also airs programs in other languages like dari and Pashtu.

#### FM 93

FM 93 is also a channel of Radio Pakistan. It specializes in sports. The channel airs live coverage of the cricket matches of Pakistan.

FM 106. 2

This is a musical special since it does not have any RJ. The channel only has music aired all the time. Besides that the channel airs BBC sports news 3 to 4 times a day. It is also a cricket specialized station because it also airs the coverage of the cricket matches but no other sports.

### **Content of FM stations:**

If the content of above mentioned fm channels is examined closely there would be clearly seen that these fm channels are purely entertainment based. The news content is not mainly focused by these channels if we see them collectively. But after examining them on individual level the findings are different from channel to channel.

The FM stations in Pakistan are mostly entertainment based. This entertainment mainly is through live shows that RJs conduct and play music on the whole. They have a link time defined by their company. The linked time refers to the time that they speak on air. In between this link time, music is played. Many radio stations are now running programs for women issue and even youth or children based as well. But the format of the programs is more or less the same. The special programs that focus on women issue or any other will have some experts in it talking on the issue and being contacted by local women through telephone in case of any query.

Another benchmark that the radio station of Pakistan has set is to have a Ghazal program at the late hours of the day. The programs of the radio stations can be said to be monotonous. Any FM station will have a special music hour, a specialised program, a night time ghazal program and regular music based shows.

The radio station should keep in mind the program that it has to present. While planning a program, the length and utility of the program? How long the program will be, its frequency and also its consequences. Keep in view what will be the consequences of your programs and will it be anything utilizable for the society or not.

The news element on radio seems to lack some technicalities'. A good new bulletin on radio can become a cause of attraction for the listeners. The main function of news and current affairs on FM channel is to aware people and trains them. Easy access to information leads to educated society and once the society is educated it gains the confidence to play its role in nation building.

According to MA research publication (2009) " Presently, FM radio stations are working on big and small towns, and highways but many radio stations avoid broadcasting news due to strict and tough policies of PEMRA. In fact, in the beginning PEMRA had not allowed the private sector radio stations to present news and current affairs programs, but now after the PEMRA has relaxed its rules, some FM radio stations have began news and current affairs programs. However, the FM radios presenting news programs face shortage of trained and experienced staff, having a keen news sense and



command on technical aspects of news. Moreover, the listeners want immediate information about major happenings while the FM radios due to lack of proper staff fail to provide them correct and timely news". They further write that The FM stations do not have trained and experienced people. That is why the standard of the news and current affairs is not up to the mark and satisfactory. The stations should have a code of conduct for the people from news and current affairs.

There is a big way difference in the content of public and private channels. The public channels fm 101 and fm 93 have got different focus and preferences. They give hour to hour detailed news bulletin and they also broadcast news programs, news documentaries, dialogues, and promotional content for the state authorities.

If we examine the news content of these two channels they can considered being puppets in the hands of government. The activities and events of the authorities are also given a prominent coverage by these two channels. This is what we can take as a drawback of these channels but if we see the positive side it is found after analyzing their content that these channels are very patriotic and loyal. Every national day is celebrated by fm 101 and fm 93 with specially designed program line.

As far as the music collection is concerned, Indian songs are not allowed to air through fm 101 and fm 93. When the content of both the channels is compared with each other, it is found that fm 101 has a conventional and sober tone while fm 93 is designed according to the demand of today's

trends. It's more lively and dynamic in its program formats and content even fm 93 is given more freedom as compared to fm 101.

Another good aspect of these two channels is they give a significant importance to decency of the content and they are strictly monitored to maintain the civility in the programs. Radio junkies are not allowed to use bold topics or bold and indecent words in their conversation.

Very keen attention is given to the Urdu pronunciation and dialogue delivery of the presenters. You would find an excellent selection and delivery of words uttered by the presenters in the programs especially in the news bulletin.

When it comes to the private channels fm 100 is the one which comes at the top of this league in terms of decency, standard and quality content. The best thing about fm 100 is it keeps its decency and follow the moral values but also comes in the league of modern channels. It fulfils the demand of today's youth but doesn't adopt cheap methods to increase its popularity. The listenership of this channel is very high just because of this reason. It wouldn't be wrong if we call it a well balanced fm channel of Pakistan.

The news bulletin is aired after every hour and there are also some programs designed to discuss the social and political issues. This channel doesn't focus on news content that much as compared to the other channels. It focuses on the traditional and culture oriented program formats.

Fm 99 is considered to come under the popular channels. This channel gives a great focus to the news content as well. The channel is also known for its

over-entertainment content and program formats. It caters each and every strata of society. It doesn't pay much attention to the decency of the content and language used by the presenters most of the times cross the borders of civility. The channel hired presenters from every region and designed the programs in many regional languages as well. There is no restriction on the selection of songs.

Fm 106. 2 is a pure entertainment channel. It is owned by ARY, a reputed television channel of Pakistan. It airs nonstop music 24 hours a day. There wasn't any presenter in the channel when it was started but it was just focusing on airing the music all the time. Now they have started some programs but most of the time nonstop music is aired from the channel. News content is not given attention by this fm channel.

FM 91 as caters elite class keeps the essence of parent culture in its programs. Most of RJs on the channel are with neutral accent. Their RJs do not Americanize their accents while speaking English. The channel is purely an entertainment channel. They have special designed programs for peace, patriotism and peace promotion. Another 24 hour entertainment channel plays mostly English, Hindi and Urdu music. The channel also has the privilege to be the first in playing its part for the community betterment. The program was specially designed for the youngsters to seek advice from experienced people to pursue their career.

As far as RJs of FM91 are concerned, well this channel has maintained a set standard in hiring its RJs. So you will find good RJs on this station who not

only are well groomed in their personalities but they add something to the society through this powerful medium that they have.

Another radio station launched by the Islamabad traffic police, is FM 92. 4. This can be categorized under a community radio since it performs some tasks of a community radio. But the tasks that it performs for community are limited to traffic and road problems only. In a way this can also be called a specialized radio which is dealing a single department. The content aired is not up to the mark since the RJs at the station seem to be amateur. They are not well trained or experienced. The station has stick policy to play only the national music and no other type.

The channel airs the traffic update of Rawalpindi and Islamabad from time to time. Along with that they keep on playing promos that comprise of traffic rules and road ethics.

FM94 and 96. 4 are comparatively new in line. FM 94 is still struggling with target audience since the channel has still not made it to favourites of any group. This is another English channel that airs all English content. It is also a creation of Radio Pakistan. Since it is a public owned station therefore it is faced with lot many restrictions when compared with other English stations. FM 94. 6 is Urdu channel. It is purely an entertainment channel. The channel faces the same issues of substandard content that other Urdu stations also suffer from.

## **FM stations' Network:**

The FM station like TV stations in Pakistan can find a common ground and produce a networking for the betterment of the field. For the betterment two declarations have already been conducted which are discussed below:

## **Murree Declaration:**

Pakistan Press Foundation (PPF) in collaboration with International Broadcasting Bureau of Voice of America (VOA) organized a five-day workshop at Shangrila Hotel, Murree from May 14 to May 18, 2006, which was attended by local and foreign FM broadcasters and university representatives. The workshop participants approved the following declaration:

1. A community radio forum should be established in Pakistan.
2. PEMRA should review and amend its rules and policies to help in development of community radio in Pakistan.
3. PEMRA should allow the community radios to present news and current affairs programs.
4. Strategy should be formed for booting freedom of expression, ensuring security and safety of people related to mass media, and further straightening of media organizations.
5. Network should be formed between participants of workshop.
6. Universities should set up training academies for broad casters of all communities in their mass communication/ journalism departments.

7. The radio stations set up in the earthquake affected areas should be allowed to continue their broadcasting, and they should also be given status of community radios.
8. A network of campus radios should be established in Pakistani universities.
9. Pakistan Press Foundation should be requested to continue its training workshops for the capacity building of community broadcasters.
10. The government should ensure peoples' access to information at every level

A six-member committee comprised Mr. Razi Rizvi of Voice of America Urdu Service, Mr. Owais Aslam Ali Secretary General Pakistan Press Foundation, Mr. Sajjad Paracha of Mass Communication Department University of Bahawalpur, Ms. Shazia Gul of Mass Communication Department University of Peshawar, Mr. Aijaz Ahmed of Mass Communication Department University of Baluchistan Quetta, and Mr. Muhammad Rafiq Bhatti, Deputy Controller Radio Pakistan Muzaffarabad drafted the declaration.

### **Rawalakot Declaration:**

Pakistan Press Foundation in collaboration with Friedrich-Ebert-Stiftung(FES) organized a workshop on Development of FM Radio in Pakistan at the Himalaya International Hotel Rawalakot, Azad Kashmir on August 9-10, 2008, which was attended by the station managers and broadcasters of 23 FM radio stations of Pakistan. They approved following declaration:

1. The government should make laws to ensure access of FM radio information at every level.

## 2. A guar