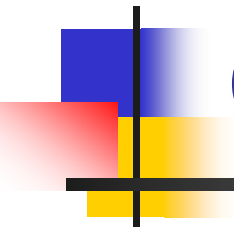


OFF-AIR MONITORING

Areas where monitoring required

- Live Events and Concerts
- Recording, Mixing and Mastering
- Radio and TV Broadcasting

Why Monitoring in Radio Broadcasting ?

- Critical Monitoring of Broadcast Audio Quality as well as Continuous Monitoring for Transmission Faults very important to Radio Stations

- For Live Broadcasts the Announcer or Presenter or Duty Officer is normally person responsible for monitoring the station Off-Air by listening to the transmitted program through high quality Loudspeakers and Headphones in the Studio

- At Night and at other times when the station operates on Automation, or Networked from Satellite, it is also important for someone to be delegated to monitor the station-maybe from home

How is Off-Air Monitoring done?

- The transmitted program is picked up Off-Air by a Monitor Receiver, ideally installed in the Station control/duty Room, and fed from a suitable Outdoor Antenna System to ensure a Constant Signal Level and reception-free from Interference and multipath problems

- A Transistor Radio, fed from it's own Telescopic Antenna, or a piece of wire hung at the back of it is simply not good enough to ensure satisfactory reception for critical monitoring or to give constant RF levels

Requirements of Hardware

Likewise in the On-Air Studio itself, cheap loudspeakers of unknown performance such as small cheap Surround Speakers or Computer Multimedia Speakers, often fed from a Power Amplifier of Questionable Quality are completely unsatisfactory, and will not allow critical monitoring of the Station Transmission Quality

Speaker Requirements

- Good quality Stereo Hi-Fi Speakers and Amplifiers costing little or maybe nothing, may be perfectly suitable for Off-Air Monitoring in a Radio Station having only one On-Air Studio
- This may not be practical for stations having two or more On-Air Studios, as the monitoring system in each studio should ideally, for consistency, have identical Monitor Amplifiers and Speakers
- Many Hi-Fi Speakers have similar characteristics to Monitor speakers, and are quite suitable for Off-Air Monitoring, while other so-called Hi-Fi Speakers are designed to sound pleasant and impressive but not necessarily accurate enough for serious monitoring

Speaker Requirements
-contd.

- In general, ordinary domestic Hi-Fi Speakers are designed to have peaks in both the Bass and Mid Treble, and a somewhat subdued Mid Range making them sound fairly pleasant, but does tend to hide minor audio quality problems.

- The better Hi-Fi and Genuine Monitor Grade Speakers have a much flatter frequency response and are designed to reveal audio quality problems rather than hiding them

Off-air monitoring in Studio

- Announcer or Presenter is the person responsible for monitoring the broadcast programme Off-Air through the Monitor Receiver, a good quality Studio Monitor Amplifier and suitable Monitor Loudspeakers and Headphones when the Microphone is switched on
- The Audio Quality of the Off-Air signal must be very good and pleasant to listen to, otherwise as is fairly common, the presenter will switch to the Mixer Output for monitoring leaving the transmitted program unmonitored

Off-air monitoring in Studio
-contd.

- Several cases involving Community Radio Stations where the Transmitter had failed, or was transmitting Emergency programs for several hours, the presenter did not know because he was monitoring the output of the Mixer and not Off-Air have been reported.

- This is understandable if the Off-Air Monitoring is of low quality, but it is not excusable.

What to Monitor for

- Is the Station On-Air? -This is the first responsibility of the presenter or the person monitoring the station
- Program Material Quality- As most of the Program Material, apart from Live Microphone and Phone Calls is Pre-Recorded, in the form of CD's, LP's, Music Items or "Spots" etc from a PC Based Announcer Assist System, there is not much the presenter can do apart from keeping audio levels correct. If a CD or other recording sounds Bad, somehow play it to the end, and then "Don't Play it Again" If a PC Based Music Item or Spot sounds bad, report it to the Program Director and demand it be removed from the Play List or Re-Done.
- Technical Problems and Faults If you cannot hear your station through the "Off-Air" Monitor System, you are probably "Off the Air", so instigate immediate Emergency Action as directed in the Station Technical Manual. Also listen Off-Air for Hum, Hiss, Clicks, Pops, Distortion, Inverted Phase in One Channel, Channel Balance, Missing Channel etc, and if possible, investigate and isolate the cause and report the problem to the Technical Director.

Tips to investigate and isolate transmission faults and problems

- Very Important to investigate the fault noticed in the monitoring.

- Correct investigation leads to :
  - less outage period
  - Better technical quality
  - Pleasing to the listener
  - More popular station

Major Faults and investigation thro’ off-air monitoring

Station Off-Air

- Switch to monitoring of Mixer Output
- A: If you then hear Normal Program
  - Programme Switcher, Audio Processor, Studio to Transmitter Link or Path, Transmitter, or Off-Air Monitor System has failed
- B: If you get silence
  - The problem is in the Mixer or Source Equipment, try operating from the other studio
- In either case, report immediately to the Technical Director.

Hum, Hiss, Clicks or Pops

- In case of finding hum, hiss, click in programme:

Stop sending programme from the mixer for a few seconds. Off-Air Monitor should be almost completely silent with no Hum, Hiss, Clicks etc.

A: If you hear Hum, Hiss, Clicks or Pops, you have a problem

- Temporarily Switch to Monitoring of the Mixer Output
- If you still hear Hum, Hiss, Clicks or Pops
- The problem is in the Mixer or Source Equipment

B: If Monitor is now silent, the problem is in the Programme Switcher, Audio Processor, Studio to Transmitter Link or the Transmitter itself

Report to the Technical Director

Distortion

- If you hear Distorted Sound Off-Air, a problem can be expected
- Immediately, Switch to Monitoring of the Mixer Output
  - A: If still Distorted, the problem is in the Mixer, Source Equipment or Source Material
  - B: If Distortion disappears, the problem is in the Switcher, Audio Processor, Studio to Transmitter Link or the Transmitter
- Report to the Technical Director.

Inverted Phase

- If program sounds “Strange or Peculiar” you probably have a Phase Inversion where One Channel is reversed in respect to the other channel
- Press ‘MONO CHECK’ Switch in Audio Mixer
- If the audio level drops or Bass disappears, Phase Inversion exists making the transmission useless on Mono Receivers. Centre Channel Audio such as Voice or Speech will completely disappear when listening on a Mono Radio Receiver
- Generally no remedy except not to play that item again
- In extreme cases where you may have a lengthy recorded piece such as a Lecture, Play or Music Compilation in Mono, it might be better to abort the transmission altogether
- If regularly presented with program material having Inverted Phase, use a Phase Reversal Switch, or Phase Reversal Plug to correct the problem
- WARNING: If Phase is corrected for a particular piece of program material, DO-NOT forget to restore the Phase Switch or Plug to normal, otherwise correct material will broadcast out of phase
- Inverted Phase in one channel, is a technical mistake made by a human person during production or duplication of recorded material and is not a Technical Equipment Fault
- It is not uncommon on program material prepared without taking the appropriate care in monitoring during preparation, usually on Reel to Reel Tape, but also known to exist on Amateur Produced CD’s

Channel Balance

- If you notice one channel is low relative to the other channel, there is some problem
- Temporarily Switch to Monitoring of the Mixer Output
  - A: If still low, the problem is in the Mixer, Source Equipment or Source Material
  - B: If now correct, the problem is in the Programme Switcher, Audio Processor, Studio to Transmitter Link or the Transmitter
- Report to the Technical Director.

Missing Channel

- If you notice one channel is missing, you have a problem
- Temporarily Switch to Monitoring of the Mixer Output
  - A: If still missing, the problem is in the Mixer, Source Equipment or Source Material
  - B: If now correct, the problem is in the Programme Switcher, Audio Processor, Studio to Transmitter Link or the Transmitter
- Report to the Technical Director

Requirements of a station for Monitoring

i. An Outdoor Receiving Antenna
ii. A High Quality Off-Air Receiver
iii. Distribution Amplifier sending Off-Air Audio to all Studios and other areas
iv. Program Fail Detection System (Optional) but nice to have monitoring System and Speakers in Control room
v. Quality Monitor Amplifier in each Studio
vi. Monitor Quality Speakers in each Studio
vii. Good Quality Headphones in each Studio for listening when Microphone is on

Outdoor Receiving Antenna

- For AM, Omnidirectional antenna available professionally recommended
- For FM, a Band II 3 or 4 Element Yagi suitable- should be correctly installed to produce a better signal

Off-Air Receiver

- High Quality
- A Portable Stereo Receiver, Integrated Tuner/Amplifier
- A good quality Hi-Fi AM/FM Radio Tuner
- Unfortunately, mechanically tuned units tend to drift off station, so units with digitally Pre-Set Tuning more suitable
- The best solution is a Professional Broadcast Off-Air Receiver
- Although first cost is high, a Professional Broadcast Off-Air Receiver is actually very good value by incorporating all the necessary Audio Distribution Amplifiers and Program Fail Detection facilities

Audio Distribution Amplifier

- Audio Distribution Amplifier, suitable for use in conjunction with a Hi-Fi AM/FM Tuner
- Distribution Amplifier sending Off-Air Audio to all Studios and other areas
- Program Fail Detection System (Optional) but nice to have

Monitoring System and Speakers in Control room

- Vital for Technical Monitoring in order to Troubleshoot and Identify Problems
- Sometimes a Switcher incorporates a complete monitoring Facility requiring external speakers

Monitoring Amplifier

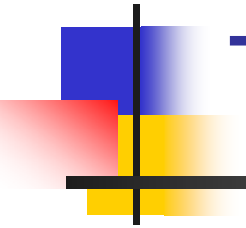
- Quality Monitor Amplifier a must in each Studio
- High Quality 25 to 30 Watt Per Channel Monitoring Amplifier for serious monitoring of Audio Quality in On-Air Studio, preferably a Professional Stereo Monitor Amplifier with Balanced Inputs as Professional Mixers generally have Balanced Line Level Monitor Outputs
- A High Quality Stereo Hi-Fi Amplifier with Unbalanced Inputs may be perfectly satisfactory if the Mixer can be modified for Unbalanced Monitor Outputs
- For large Studios such as Recording Studio, Control Rooms, and to drive very large or inefficient speakers, a larger Monitoring Amplifier will be needed

Speakers

- Monitor Quality Speakers in each Studio
- High Quality Speakers having similar characteristics to Professional Monitor Speakers rather than Hi-Fi
- Speakers are required for serious monitoring of Audio Quality

Headphones

- Good Quality Headphones should be used in the Studios
- The Presenter and Studio Guests require Headphones to allow them to listen to programmes when Microphones are turned on and the Loudspeaker Monitoring is Muted
- Generally, the Announcer or Presenter should use headphones of a type he likes and feels comfortable with
- Cost of suitable Headphones vary from about Rs. 1000 to in excess of Rs. 20000 with the actual choice left to the individual
- Very Cheap Headphones should be avoided, they generally do not sound very good, are uncomfortable and tend to fall apart rather quickly



THANKS