

AMSD07 PREAMPLIFIERS AND AMPLIFIERS

UNIT-1 PREAMPLIFIERS AND INPUT SIGNALS

- 1.1 Requirements, Signal Voltage And Impedance Levels, Gramophone Pick-Up Inputs, Input Circuitry, Moving Coil Pu Head Amplifier Design, Circuit Arrangements, Input Connections, Input Switching
- 1.2 Voltage Amplifiers And Controls, Preamplifier Stages, Linearity, Noise Levels, Output Voltage Characteristics, Voltage Amplifier Design, Constant-Current Sources And 'Current Mirrors', Performance Standards, Audibility Of Distortion, General Design Considerations, Controls

UNIT-2 INTERFACING AND PROCESSING

- 2.1 The Input, RF filtration, The balanced input, Sub-sonic protection and high-pass filtering, Damageprotection, What are process functions?, Computer control

UNIT-3 AUDIO AMPLIFIERS

- 3.1 Junction Transistors, Control of Operating Bias, Stage Gain, Basic Junction Transistor Circuit Configurations, Emitter-follower Systems, Thermal Dissipation Limits
- 3.2 Junction Field Effect Transistors (JFETs), Insulated Gate FETs (MOSFETs), Power BJTs vs. Power MOSFETs as Amplifier Output Devices, U and D MOSFETs, Useful Circuit
- 3.3 Components, Circuit Oddments, Slew Rate Limiting

UNIT-4 AUDIO AMPLIFIER PERFORMANCE

- 4.1 A brief history of amplifiers, Amplifier architectures, The three-stage architecture,
- 4.2 Power amplifier classes, AC- and DC-coupled amplifiers, Negative feedback in power amplifiers

UNIT-5 VALVE (TUBE-BASED) AMPLIFIERS

- 5.1 Valves or Vacuum Tubes, Solid State Devices, VALVE AUDIO AMPLIFIER LAYOUTS, Single-ended vs. Push-pull Operation, Phase Splitters, Output Stages,
- 5.2 Output (Load-matching) Transformer, Effect of Output Load Impedance, Available Output Power

UNIT-6 NEGATIVE FEEDBACK

- 6.1 Amplifier stability and NFB, Maximising the NFB, Maximising linearity before feedback, References

UNIT-7 NOISE AND GROUNDING

- 7.1 Audio amplifier PCB design, Amplifier grounding, Ground loops: how they work and how to deal with them, Class I and Class II, Mechanical layout and design considerations

UNIT-8 DIGITAL AUDIO FUNDAMENTALS

- 8.1 Audio as data, what is an audio signal? Why binary? Why digital?

- 8.2 Some digital audio processes outlined, Time compression and expansion, Error correction and concealment, Channel coding, Audio compression,
8.3 Disk-based recording, Rotary-head digital recorders, Digital audio broadcasting, Networks

UNIT-9 REPRESENTATION OF AUDIO SIGNALS

- 9.1 Introduction- Analogue and Digital- Elementary Logical Processes- The Significance of Bits and Bobs- Transmitting Digital Signals- The Analogue Audio Waveform- Arithmetic
9.2 Digital Filtering- Other Binary Operations- Sampling and Quantising- Transform and Masking Coders- Bibliography- Other titles of interest

UNIT-10 COMPACT DISC

- 10.1 Problems With Digital Encoding- The Record-Replay System- The Replay System- Error Correction

UNIT-11 DIGITAL AUDIO RECORDING BASICS

- 11.1 Types of Media- Recording Media Compared- Some Digital Audio Processes Outlined- Hard Disc Recorders- The PCM Adaptor- An Open Reel Digital Recorder-
11.2 Rotary Head Digital Recorders- Digital Compact Cassette- Editing Digital Audio Tape

UNIT-12 DIGITAL AUDIO INTERFACES

- 12.1 Digital audio interfaces- MADI (AES10–1991) serial multi-channel audio digital interface

UNIT-13 DATA COMPRESSION

- 13.1 Lossless compression- Intermediate compression systems- Psychoacoustic masking systems
13.2 MPEG layer 1 compression (PASC)- MPEG layer 2 audio coding (MUSICAM)- MPEG layer 3- MPEG-4- Digital audio production

UNIT-14 DIGITAL AUDIO PRODUCTION

- 14.1 Digital audio workstations (DAWs)- Audio data files- Sound cards- PCI bus versus ISA bus-
14.2 Disks and other peripheral hardware- Hard drive interface standards- Digital noise generation – chain-code generators- Notes

UNIT-15 OTHER DIGITAL AUDIO DEVICES

- 15.1 Video Recorders- HDCD- CD Writers- MPEG Systems- MP3- Transcribing a Recording by Computer- WAV Onwards- DAM CD- DVD and Audio

UNIT-16 MICROPHONE TECHNOLOGY

- 16.1 Microphone Sensitivity- Microphone Selection- Nature of Response and Directional Characteristics- Wireless Microphones-
16.2 Microphone Connectors, Cables, and Phantom Power- Measurement Microphones

UNIT-17 LOUDSPEAKERS

- 17.1 Radiation of Sound- Characteristic Impedance- Radiation Impedance- Radiation from a Piston- Directivity- Sound Pressure Produced at Distance r- Electrical Analogue-
- 17.2 Diaphragm/Suspension Assembly- Diaphragm Size- Diaphragm Profile- Straight-Sided Cones- Material- Soft Domes- Suspensions- Voice Coil
- 17.3 Moving Coil Loudspeaker- Motional Impedance

UNIT-18 LOUDSPEAKER ENCLOSURES

- 18.1 Loudspeakers- The interrelation of components

UNIT-19 HEADPHONES

- 19.1 A Brief History- Pros and Cons of Headphone Listening- Headphone Types- Basic Headphone Types- Measuring Headphones- The Future

Reference Book:

1. Design with Operational Amplifiers and Analog Integrated Circuits Paperback – 1 July 2017 by Sergio Franco (Author)

