

# Modular Analog



Mumbai Workshop Series: Beginner

## The Agenda

Version 1.1

# 1. Introductions

- **Getting to know each other:** Icebreaker session to connect with fellow participants.
  - **Modular Analog - Who, Why, and What:** Exploring the motivations and story behind ModularAnalog
  - **Introduction to Make India Synth (MAMIS):**
    - Overview of MAMIS: Its mission to promote DIY synth-building culture in India.
    - The importance of hands-on learning and community-driven innovation.
  - **Brief history of modular synthesis:**
    - From the Moog modular systems of the 1960s to the resurgence of Eurorack in the 2000s.
    - The philosophy of modular synthesis: Flexibility, creativity, and the endless possibilities of patching.
  - **Workshop Goals:**
    - What participants will learn: From basic electronics to building functional Eurorack modules.
    - The end goal: Empowering participants to design and build their own modular systems.
  - **Q&A:** Open floor for questions about the workshop, modular synthesis, or Eurorack.
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## 2. Modular Synthesis & Eurorack Fundamentals

- **Modular Synthesis Basics:**
  - What is modular synthesis?

- Breaking down a synthesizer into individual components (modules) that interact via patch cables.
- Key concepts:
  - Oscillators (VCOs): Generating sound waves (sine, square, sawtooth, etc.).
  - Filters (VCFs): Shaping the timbre by removing or emphasizing frequencies.
  - Envelopes (ADSR): Controlling how a sound evolves over time.
  - Low-Frequency Oscillators (LFOs): Modulating parameters for movement and texture.
  - Voltage-Controlled Amplifiers (VCAs): Controlling signal levels dynamically.
- Signal flow in a modular system:
  - Audio signals vs. control voltages (CV).
  - How modulation creates complexity and expressiveness.
- **Live Demonstration:** Building a simple patch to demonstrate these concepts.
- **Introduction to Eurorack:**
  - What is Eurorack: A standardized format for modular synthesizers (3U height, 1/8" jacks).
  - Understanding power supplies:
    - +12V, -12V, and +5V rails.
    - Importance of proper power management to avoid damage.
  - Case design and rails: Choosing the right case for your needs (portable vs. studio).

- Module sizes (HP) and power requirements: How to plan a system based on available space and power.
  - **Q&A:** Open floor for questions about modular synthesis and Eurorack.
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### 3. Introduction to Building Electronic Circuits

- **Electricity Basics:**
  - What is electricity?
  - Current, voltage, and resistance (Ohm's Law).
  - Polarity: Why it matters in circuits.
- **Basic Electronic Circuits:**
  - What is a circuit? A closed loop that allows electricity to flow.
  - Common components:
    - Resistors: Limiting current flow.
    - Capacitors: Storing and releasing energy.
    - ICs (Integrated Circuits): Pre-built circuits for specific functions.
    - Potentiometers: Variable resistors for control.
- **Essential Tools:**
  - Multimeter: Measuring voltage, current, and resistance.
  - Wire cutters, strippers, and soldering irons.
- **Introduction to Breadboards:**
  - What is a breadboard? A tool for prototyping circuits without soldering.
  - How to use a breadboard: Connecting components and testing ideas.
- **Introduction to Schematics:**

- Reading and interpreting circuit diagrams.
  - Symbols for common components.
  - **Q&A:** Open floor for questions about modular synthesis and electronics.
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## 4. Let's Build Synths

- **Assembling a Eurorack Skiff**
- **A dual-rail Eurorack power supply.**
- **Crimping Eurorack power cables.**
- **Building Modules:**
  - Buffered-Mult.
  - CV Mixer.
  - Attenuverter
  - Decay Envelope Generator
  - 4 Step Sequencer ARP.
  - Noise.
  - Simple] VCA.
  - TRIANGLE VCO/VCLFO (*not V/oct*)
- **Homemade Eurorack Module Panel:**
- **Solder a DIY kit.**

