

# Embedded Design Challenge

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## INTRODUCTION:

We all have in one way or another some kind of attachment with music. Some like to play, some like to sing while others just like to listen. Whichever kind you may be, Electronics Club provides you the opportunity to do these activities with your own built music synthesizer which you can configure in whichever way you want.

## PROBLEM STATEMENT:

To design and build a music synthesizer with a visualiser.



The participants will have to design the following features of the device:

### Compulsory Features:

**Music Keys:** The device must have at least 8 keys that can generate 8 basic notes of an octave namely sa re ga ma pa dha ni sa' in Indian Classical music or C D E F G A B C' in Western Music.

**Graphical Visualizer:** The device must have a graphical visualiser attached to it in the form of a glcd which should give a visual representation of the notes played.

**Pre-Amplifier:** The output from the synthesizer must be amplified to such extent that it can be heard from a speaker.

### Additional Features:

Apart from the compulsory features, various additional features can be added to the circuit like

1. Control knob to control volume , pitch etc.
2. Implementation of Chords (multi key press)

3. Representation of volume level , pitch level etc. on GLCD.
4. Touch Input instead of key input

These are just some of the additional features. Apart from these, any other innovative additional features can be implemented.

## RULES AND REGULATIONS

### Eligibility & Team structure

- Students belonging to any batch or program are eligible.
- Team strength should not exceed 3.
- There are no restrictions on number of teams from a pool. Though all members of a single team should belong to the same pool.
- Teams willing to participate in the event must submit an abstract to [eclub.iitk@gmail.com](mailto:eclub.iitk@gmail.com) before 20<sup>th</sup> August, 11:59 pm.
- Based on the abstract top 16 teams would be selected, to participate in the event.

### General Rules

- Use of pre-built modules is **strictly** prohibited. All the modules should be self-made. You can however use Arduino boards.
- Only basic ICs (4xxx and 7xxx) and 8-bit microcontrollers are allowed. Use of any other IC should be intimated to us.
- **The final circuit must be soldered on a General Purpose Board or on a PCB. Circuits on breadboard will automatically lead to disqualification.**
- The software written should be original and not copied from any other source. You can however use libraries.
- Judges decision shall be final and binding on all.
- Judging shall be subjective.
- All of the above rules may be subject to change as they deem fit. Change in rules, if any will be highlighted on the following links:

Electronics Club Website: <http://students.iitk.ac.in/eclub/>

Takneek Website: <http://students.iitk.ac.in/takneek/2012/>

## JUDGING CRITERIA

Judging shall be done on basis of:

- User friendliness of the gadget.
- Robustness and innovation in design of the gadget. (logic used and its implementation)
- Layout on PCB/GPB and Soldering
- Extra features implemented.

- Power point Presentation

Judges would be faculty of Department of Electrical Engineering, IIT Kanpur and/or senior members of the Electronics Club.

## POINTS DISTRIBUTION

Parameter	Weightage (%)
Compulsory Tasks Achieved	20 (5+10+5)
Logic used and software implementation	20
User Friendliness of the device	15
Additional Features Implemented	25
PCB/GPB layout and soldering	10
Presentation	10

## CONTACTS

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