



# *An Effective Training Model*

**Field Application Engineers**

# *An Effective Training Model*

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■  
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Power Management



# *Needs Assessment*

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- **Field Applications Engineers were the target audience**
- **Determined by the Senior FAE's and the VP of marketing**
- **Training is already in place but is it effective**
- **If the training is not effective, what type of training needs to be done?**
- **20% of current FAE's do have baseline analog knowledge**
- **Optimal for 100% of current FAE's to have baseline knowledge**
- **Currently there is an 80% discrepancy factor**

# Project Plan

- Looked at the existing training model
- Developed a new training model based on the needs assessment
- Examined LCMS software
- Trained mentor on the LCMS system.

**Analog University**  
Advanced PLL Concepts

**Objective:** To review and test the advanced concepts of PLL circuit design.

**Length:** 90 minutes

**Step(s) to complete**

1. View online seminar
2. Complete the suggested assignments

**Online Seminar: Advantages and Pitfalls of Using Fractional N PLLs**

**About the Presenter:** Dean Banerjee, Deborah Brown, and Khang Nguyen

This seminar discusses various issues related to passive loop filter designs and presents new techniques using EasyPLL for optimizing passive loop filters for better performance. Also view Loop Filter Optimization online seminar.



**Take the Advanced Quizzes in the following topics:**

1. Non-PLL Radio Frequency (RF) Basics
2. PLL Building Blocks
3. PLL Performance
4. Fractional PLLs
5. National's PLL tools

**Suggested Assignments**

**Reading Assignment:**

1. Non-PLL Radio Frequency
2. PLL Building Blocks
3. PLL Performance
4. Fractional N PLLs
5. Loop Filter Optimization
6. WEBENCH EasyPLL Online Simulation Tools help
7. WIRELESS.NATIONAL.COM

**Additional Resources:**

- PLL Performance, Simulation and Design, by Dean Banerjee
- Single Integer PLL Parametric Selection Guide: Wireless.national.com

**Research Assignment:**

1. What are the three different types of fractional compensation methods? Briefly define them.
2. What performance parameters does the loop filter affect?
3. If I keep the same comparison frequency, but double the N counter value, what is the impact on phase noise inside the loop bandwidth?

**About the Professor: Dean Banerjee is a Senior**

**Analog University**  
Inductors for Switching Power

**Objective:** FAE's and DFAE's gain a baseline knowledge of power inductors for switching regulators.

**Length:** 120 minutes

**Step(s) to complete**

1. View online seminar
2. Complete the suggested assignments
3. Complete the required test for course certification

**Online Seminar: Magnetics: Filling the Gap**

**About the Presenter:** Sanjaya Maniktala has over 15 years industry experience, having worked professionally in India, Singapore, Germany and the US for several well-known power supply and semiconductor companies like Artesyn and Siemens. He received his Masters in Physics from the Indian Institute of Technology at Bombay, and from Northwestern University, Evanston in Illinois. He is currently Principal Applications Engineer with National's Power Management Group at Santa Clara.



The lesson will start at the very basics of inductors and their relationship with switching regulators. There are no pre-requisites for this course other than a desire to learn something about magnetics.

**Test Yourself!**

**Suggested Assignments**

**Task**

The task set out will enable you to understand inductor basics with the intent of allowing vendor flexibility choosing Power Magnetics.

**Use the following links to manufacturers:**

- Wilco
- Coilcraft
- Tyco Electronics
- Wurth Electronics

**Use the following link for Switching Regulators:**

- Switching Regulators

**Suggested Magnetics Scenarios**

**Scenario # 1:**



# *Training Model Proposal*

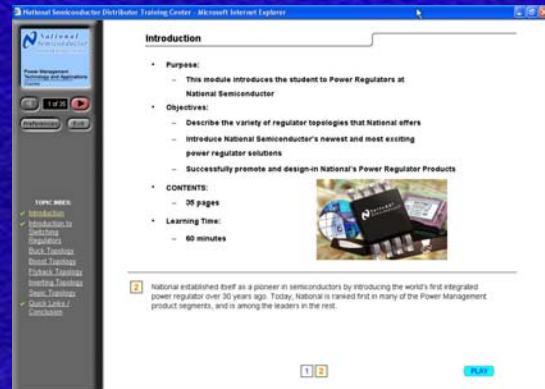
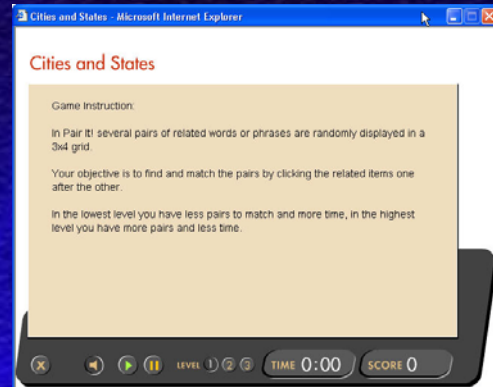
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- **Intro: (Replaces Online Seminar)**
- **Goal or Task: (Replaces Reading Assignment. This is directly related to the Objective)**
- **Scenario: (Replaces Research assignment)**
- **Assessment: (Evaluation)**
- **Extension: (Replaces Quiz)**



# Assessment and Extension Tools

- **Assessment**
  - **Blackboard**
  - **Rubrics**
- **Extensions**
  - **E-Games**
  - **Training Center**





## *Current Evaluation*

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- **This project is a continuous work in progress**
  - **Profits from incoming revenue drive budget**
  - **Tasks and scenarios are already in place**
  - **Assessment tools, Rubrics and E-games extensions have not been developed yet**



# Recommendations

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- Instructors need training within the following areas to maximize time usage:
  - Analog U Website, and Internal Engineering Site, locating Online Seminars and My Videos, Signal/Marketing/Distribution FAE Training
  - Analog University LCM'S (WEBEDITPRO) and it's integration with Online Seminars and assessment tools
  - Assessment tools including Blackboard Rubric software similar to Rubistar
  - Reporting tools for Assessment (To be determined with further inquiry)



# *Recommendations*

## *Continued (Train the Trainer)*

- **Web Based Training**
- **Why Web Based Training instead of Instructor Led Training?**
  - **Availability factors: Engineers will be working on developing instruction at various times during the year**
  - **Flexibility: Engineers can enter into the WBT Portal at any time**
  - **Cost saving benefit**
  - **You can address the learner (Trainer) at different ability levels**



# *Management Comments*

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- **It is very Important to have some form of criteria and measurement to examine knowledge of our FAE's. This training model does just that.** Ed Lam, VP Power Management
- **The bottom line is to get most of our FAE's to make the cut into level II. This is where the majority of our revenue is generated. This model which provides real assessment will be very helpful.** Paul Greenland, Director Marketing, Americas, Power Management



## *Mentor comments*

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- **This was designed specifically as an incentive model to encourage core level competencies of all existing FAE's at National for Power Products**
- **As long as management does not utilize this model for punitive measures it will be successful**
- **Having Level II and Level III FAE's be responsible for writing the lessons and taking responsibility for assessment will allow this to occur.**

**David Mishler, Senior Field Application Engineer, Power Management**



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