Exercises for Innovation, Invention & Entrepreneurship

Excerpts and exercises collected from;

A Whack on the Side of the Head
The Founders at Work
The Universal Traveler &
The Art of the Start

NYU-Polytechnic Computer Science Department

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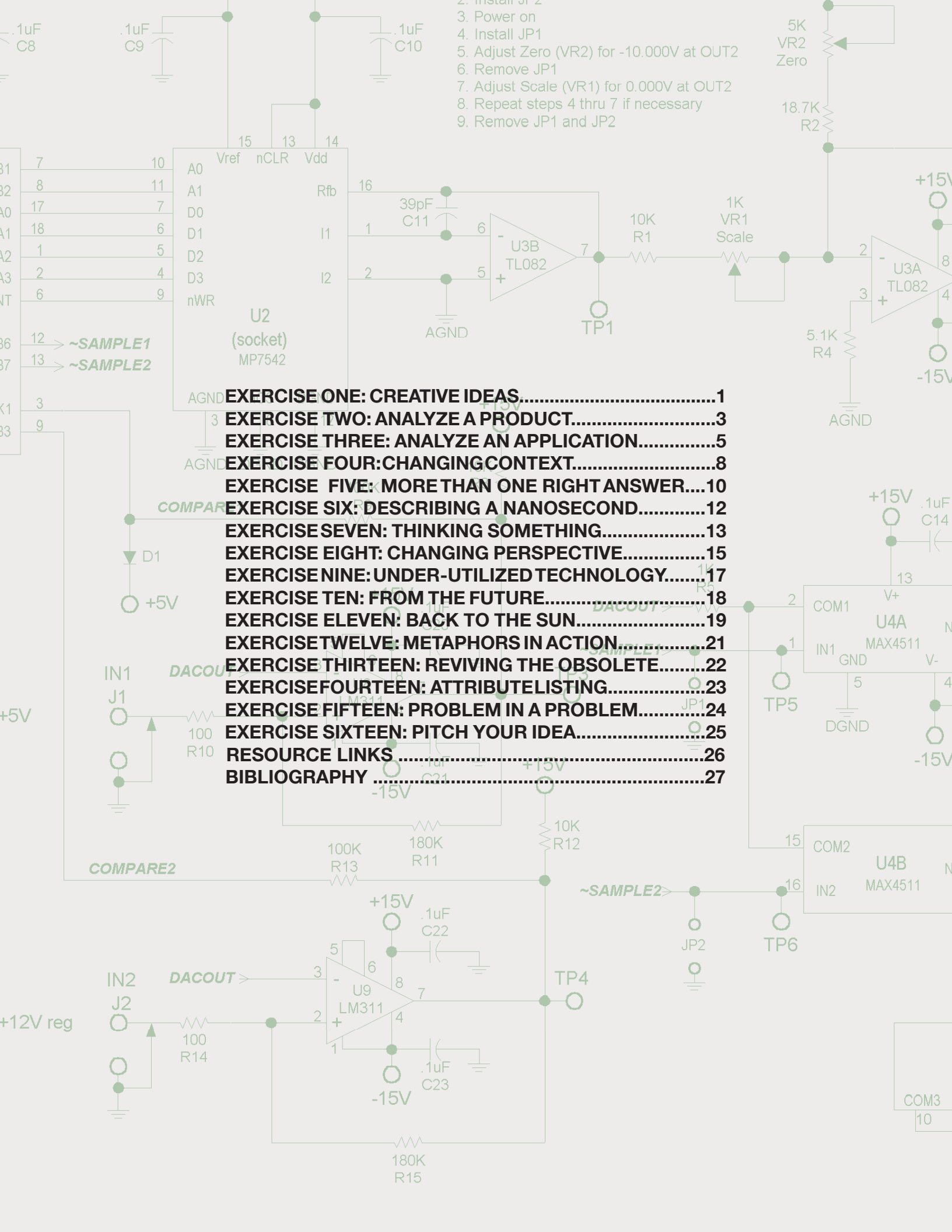

EXERCISE ONE: CREATIVE IDEA

Homework
From *Whack on the Side of the Head* page 12 which is the following:

- When was the last time you had a creative idea?
- What was it?
- What motivates you to be creative?

Please bring a hard copy of your answer to our next class, to be collected. In addition, please make sure you keep your electronic copy to post on an internal blog or other class material sharing application.

NOTES:

EXERCISE TWO: ANALYZE A PRODUCT

Exercise two: Part I
Below is a link to a .pdf about the Brita Water pitcher. This is a fairly popular consumer device. The goal is for the students to understand it and critique it.

Exercise two: Part II
Now the students should start looking to answering the questions from above with the Users Guide and anything else in detail. The goal of answering the questions should be; what is good about it? What is bad about it?

http://www.brita.com/pdf/BritaUsersGuide.pdf

Exercise two: Part III
Get into groups of three and take ten minutes to write a description of WHAT THE IDEAL PRODUCT WOULD BE. NO MATTER THAT THEY HAVE NO IDEA HOW TO BUILD IT.

NOTES:

EXERCISE THREE:
ANALYZING A DIGITAL MEDIA APPLICATION

PART I

Divide the class into NEW groupings of three. Give each group one of the following Digital-Media Applications; youtube/facebook/google/gmail/twitter.

PART II

The students should start to look into answering the questions from above by looking at the application documentation and anything else in detail. The goal of answering the question; What is good about it? What is bad about it?

PART III

Get back into your groups and take ten minutes to write a description of WHAT THE IDEAL PRODUCT WOULD BE. NO MATTER THAT THEY HAVE NO IDEA HOW TO BUILD IT.

Exercise three (continued) for the Class Leader

NOTES:

EXERCISE FOUR: CHANGING CONTEXT

From *Whack on the Side of the Head* page 21 which is the following:

Shown below is the Roman numeral seven. By adding a single line, turn it into the number eight.

VII

This is pretty easy all you have to do is add a vertical line to the right of VII to create VIII. Now for something a little more challenging; Shown below is a roman numeral nine. By adding only a single line, turn it into a six.

IX

Exercise four (continued) for Class Leader to interactively review with the students:

One solution is to put a single line through the center turn it upside down and cover the bottom half. This gives you a roman numeral VI. But if you were “thinking something different” you could put an S in front of IX to create SIX. This solution takes the IX out of context and put it into the context of Arabic numerals spelled out in English. What prevents some people from doing this is that even with only three examples of roman numerals – VII, VIII, and IX – they get locked into the context of Roman numerals. Let’s look for another answer. Can you think of other ways to add a single line to IX and turn it into a 6?

IX

Another solution would be to add the single line that makes a 6 after the IX. Then you get IX6, or one times six. Here the “X” no longer represents “10” or the English letter “X” but rather the multiplication sign. Everybody has a lot of knowledge; by shifting the contexts in which we think about it, we’ll discover new ideas.

NOTES:

EXERCISE FIVE: IDENTIFYING SHAPES, MORE THAN ONE RIGHT ANSWER

From *Whack on the Side of the Head* page 34 which is the following:

Five figures are shown, which one is different from all the others? Choose one and have a sentence to answer why it is different from the four other shapes listed on the page.

IMAGES SHOULD BE HERE:

EXERCISE SIX: DESCRIBING A NANOSECOND

From *A Whack on the Side of the Head* p. 16 which is the following:

Navy Commander Grace Hopper had the task of explaining the meaning of a “nanosecond” to some non-technical computer users. (A nanosecond is a billionth of a second and it’s the basic time interval of a supercomputer’s internal clock.) She wondered: “How can I get them to understand the brevity of a nanosecond? Why not look at it as a space problem rather than a time problem? I’ll just use the distance light travels in one billionth of a second.” She pulled out a piece of string 30 centimeters long (11.8 inches) and told her visitors. “Here is one nanosecond.”

Choose an abstract concept from the way a computer works (like the super-computer’s basic time interval) and choose a way to describe it that utilizes something you have near-by, at hand. Something from your desk, kitchen or home.

Describe the abstract idea and the object you choose to illustrate the way it works.

Write one paragraph of the abstract idea and why you chose it. (This will serve to describe the situation and it’s potential for purpose and meaning also known as a reason for its importance)

Write a second paragraph to describe the object you found that you chose to describe the abstract idea’s function.

Then write a third paragraph that will describe any new or unexpected ideas you had about the starting abstract idea OR the object that describes the idea.

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EXERCISE SEVEN: THINKING SOMETHING DIFFERENT

From *Whack on the Side of the Head* page 136 which is the following:

"…television people could learn a lot from elementary school teachers…research and development could pick up a few ideas from advertising. Every culture, industry, discipline, department, and organization has its own metaphors, models, methodologies, and short cuts for dealing with problems. But often the best ideas come from cutting across disciplinary boundaries and looking into other fields for new ideas. Many significant advances in art, business, education, entertainment, politics, and science have come about through a cross-fertilization of ideas. And to give a corollary, Nothing will make a field stagnate more quickly than keeping out foreign ideas..."

How is the human genome chemistry like information to analyze and find patterns within? What would you build if the data that comprise the human genome were easy to read? What kind of system or device would/could you make for reading the genome that was as engaging as a portrait or a well-written biography?

NOTES:

EXERCISE EIGHT: CHANGING PERSPECTIVE

From *Whack on the Side of the Head* p. 18 which is the following:

"…By changing perspective and playing with knowledge, we can make the ordinary extraordinary. In this way, wine presses squeeze out information, string is transformed into nanoseconds, labor grievances become symphonies, and bicycle seats turn into bulls heads. The Nobel-Prize winning physician Albert Szent-Gyorgyi put it well when he said: …

Discovery consists of looking at the same thing as everyone else and thinking something different…"

1. So did the first person to look at a ship's sail and think "windmill"

2. As did the first person to look at sheep intestines and think "guitar strings."

3. And the first person to look at a perfume vaporizer and think "gasoline carburetor."

4. And the first person to look at baby's urea and think "skin moisturizer"

5. And the first person to look at bacterial mold and think "antibiotics."

6. And the first person to look at Internet search queries and think "advertising medium."

For all students, individually; make three of your own examples to follow the ones listed above. It is best to start with something you are interested in understanding the history or inner workings of.

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EXERCISE NINE: UNDER-UTILIZED TECHNOLOGY

From *Founders at Work* p.161, Chapter 12 which contains the following:

Gmail founder Paul Buchheit chose to expand the features of the email program that he was developing on Javascript. At the time he was developing this, Javascript wasn't taken seriously as a scripting language that was robust enough for an application like gmail. Some of the features he was able to expand and include in his email program made email management more user centric with; threaded conversations, minimizing previous threads in the automated 'quoted text' feature, auto-completing of addresses, and the robustness of search that google is known for, applied to your email.

First, choose an application that you would like to revise to include some features that you think would make it more user-friendly. Second, choose a method of developing or type of technology that you think would serve solving the problem of making the application. Be prepared to write a paragraph to explain each of your choices.

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EXERCISE TEN: BACK FROM THE FUTURE

From *Founders at Work* Interview with Mike Ramsay one of the co-founders of Tivo, p.191, Chapter 14 which contains the following:

Real-world Example: Mike Ramsay Co-Founder of Tivo discusses a few features created by Tivo engineers/designers that didn't yet exist on the consumer market, as he and his team knew it. As a result, they had to come up with a metaphorical term like "Time Warp" to describe their patent for simultaneously recording and playing back, pausing and fast-forwarding through live, broadcast, video and television data.

Choose a Science Fiction film that has a device or system that you would like to bring back from the future. Describe the movie and scene and the immediate purpose of the device or system as it is defined or used in the film. Expand the device or system to operate with existing, consumer grade electronics, computer hardware and software.

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EXERCISE TWELVE: METAPHORS IN ACTION

From *Whack on the Side of the Head*, p.62, p. 79-81

"The metaphor is probably the most fertile power possessed by man." –Jose Ortega Gasset, Philosopher

Make a metaphor for a current problem. Simply compare your concept to something else and then see what similarities you can find between the two ideas.

Then take your metaphor, from the above exercise, and expand it with actions taking place. Here is a starter listing of some actions to try applying to your metaphor;

Running for political office
Disciplining a ten year old
Cooking a fancy meal
Fighting the government
Starting a revolution
Negotiating a contract
Going fishing
Putting out a fire
Fighting a disease
Doing Stand-up comedy
Making a sales call
Courting a mate
Going on a diet
Performing a magic trick
Colonizing a territory
Building a house
Spreading propaganda
Prospecting for gold
Planting a garden
Having a baby
Arranging flowers

NOTES:

EXERCISE THIRTEEN: REVIVING THE OBSOLETE

From *Whack on the Side of the Head* p.62 which is the following:

"…The qwerty keyboard was designed by engineers in 1870 to make typing a bit more difficult and forcing the typist to type slower by the positioning of often used keys in place of a relatively weak fingers. This kept typists from jamming up the keys in the keyboard when the typist was moving too quickly…"

Choose an obsolete device or system, look-up the reasoning behind it's design and then extract a list of ten reasons the design has become obsolete to an existing consumer. Then list three possible solutions with existing consumer grade hardware, software, or electronics that will address whatever was lacking in a preexisting; design, invention, solution.

NOTES:

BIBLIOGRAPHY

a whack on the side of the head by Von Oech, Roger © 2008, Business Plus Hachette Book Group New York City.

the founders at work by Livingston, Jessica © 2008, Springer-Verlag New York Inc. New York City.

the universal traveler by Don Koberg and Jim Bagnall © 1973 Crisp Publications, Inc. Menlo Park, California

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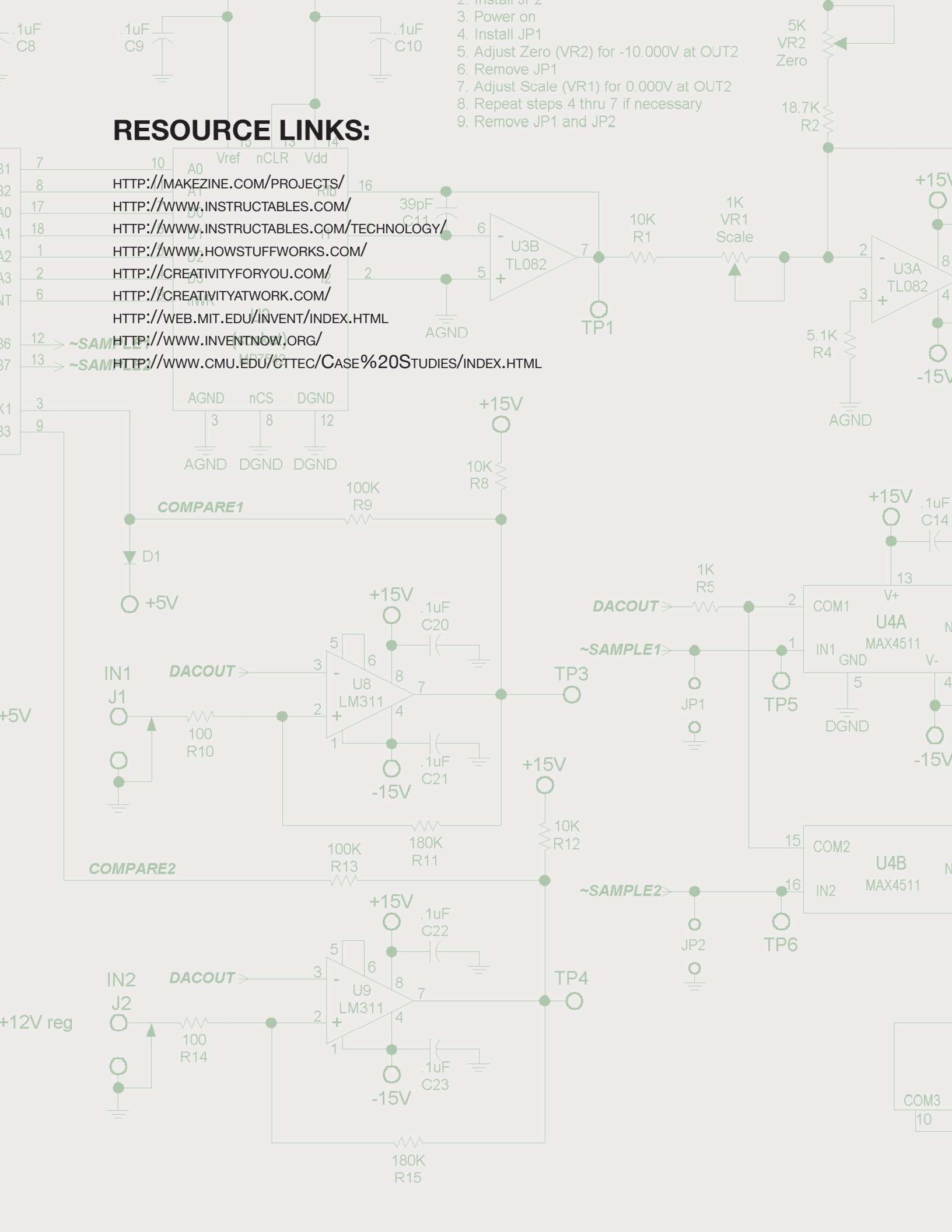

RESOURCE LINKS:

HTTP://MAKEZINE.COM/PROJECTS/
HTTP://WWW.INSTRUCTABLES.COM/
HTTP://WWW.INSTRUCTABLES.COM/TECHNOLOGY/
HTTP://WWW.HOWSTUFFWORKS.COM/
HTTP://CREATIVITYFORYOU.COM/
HTTP://CREATIVITYATWORK.COM/
HTTP://WEB.MIT.EDU/INVENT/INDEX.HTML
HTTP://WWW.INVENTNOW.ORG/
HTTP://WWW.CMU.EDU/CTTEC/CASE%20STUDIES/INDEX.HTML

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