MOUNTAIN SPARK GAPS

NPARC—The Radio Club for the Watchung Mountain Area

Website: http://www.nparc.org
Club Calls: N2XJ, W2FMI
Facebook: New Providence Amateur Radio Club ((NPARC)

VOLUME 51 NO. 11 November 2016

UPCOMING EVENTS

Holiday Luncheon
12/9
Chimney Rock Inn, Gillette, NJ

Kids Day
1/8/17 2:00—5:00 PM
DeCorso Community Center

Regular Meetings

12/12 & 12/26?
Monday 7:30
DeCorso Community Center

Meeting Schedule

Regular Meeting: 7:30—9:00 PM
2nd Monday of each month at the
NP Senior & Adult Center
15 East Forth Street
New Providence

Informal Project Meeting: 7:30—9:00 PM
4th Monday of each month
Same location
Everyone is Welcome
If a normal meeting night is a holiday, we usually meet the following night.
Call one of the contacts below or check the web site

Club Officers for 2016

President: KC2WUF David Bean
973-747-6116
Vice President:K2UI Jim Stekas
973-377-4180
Secretary: KD2EKN Tim Farrell
973-921-1175
Treasurer: K2YG Dave Barr
908-277-4283
Activities: W2PTP Paul Wolfmeyer
201-404-6914

On the Air Activities

Club Operating Frequency
145.750 MHz FM Simplex

Sunday Night Phone Net
Murray Hill Repeater (W2LI) at 9:00 PM
Transmit on 147.855 MHz
With PL tone of 141.3 Hz
Receive on 147.255 MHz
Net Control K2AL

Digital Net
First & Third Mondays 9 PM
Details as announced.

Club Internet Address

Website:http://www.nparc.org
Webmaster K2MUN David Berkley
Reflector: nparc@mailman.qth.net
Contact K2UI, Jim

MOUNTAIN SPARK GAPS

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Contributing Editors:
WB2QOQ Rick Anderson
WB2EDO Jim Brown
K2UI Jim Stekas

Climatological Data for New Providence for October 2016

The following information is provided by Rick, WB2QOQ, who has been recording daily weather events at his station for the past 35 years.

TEMPERATURE -
Maximum temperature this October, 81 deg. F (October 19)
Last October(2015) maximum was 76 deg. F.
Average Maximum temperature this October, 64.5 deg. F
Minimum temperature this October, 31 deg. F (October 26)
Last October(2015) minimum was 28 deg. F.
Average Minimum temperature this October, 47.2 deg. F
Minimum diurnal temperature range, 7 deg.(61 -54 deg.) 10/1
Maximum diurnal temperature range, 27 deg. (70-43 deg.)10/16;(62-35 deg.)10/29.

Average temperature this October, 55.9 deg. F
Average temperature last October, 53.6 deg. F

PRECIPITATION -
Total precipitation this October - 2.49" rain.
Total precipitation last October - 4.87" rain.

Maximum one day precip. event this October - October 27, 0.73" rain
Measurable rain fell on 11 days this October, 7 days last October.
YTD Precipitation - 33.65" (included rain + melted snow, as of 11/8/16)

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Rick Anderson
11/8/16
243 Mountain Ave.
New Providence, NJ
(908)464-8912
rick243@comcast.net

Lat = 40 degrees, 41.7 minutes North
Long = 74 degrees, 23.4 minutes West
Elevation: 380 ft.
CoCoRaHS Network Station #NJ-UN-10

Pictures from the New York City Marathon
Taken at Mile 11,
3rd St. and Bedford Ave. in Williamsburg, Brooklyn

Pictures compliments of Kevin, N2TO. Thanks to him and all the other who helped who the Marathon.

Stocking Stuffers for Hams

Jim Stekas - K2UI

Egg nog is back on the shelves, a sure sign that the holiday season is upon us. Soon we will be spend long hours at the Short Hills mall finding appropriate gifts for my family, only to be followed by equally long hours on their part returning and exchanging those gifts. To save them time and money I'm giving them a list of suggested radio-centric stocking stuffers for their dad. Having gone through the effort to come up with a list, I figured I might as well share it in Spark Gaps. Then I can just have my wife e-mail them the article. So here goes…

At any hamfest worth going to you will find countless bins of miscellaneous parts. If all you were looking for was ¼ watt resistors you could bring your free Harbor Freight DVM along (or buy one at the hamfest for $5) to check them out. But how would you check out caps, diodes, transistors, and toroidal inductors?

.

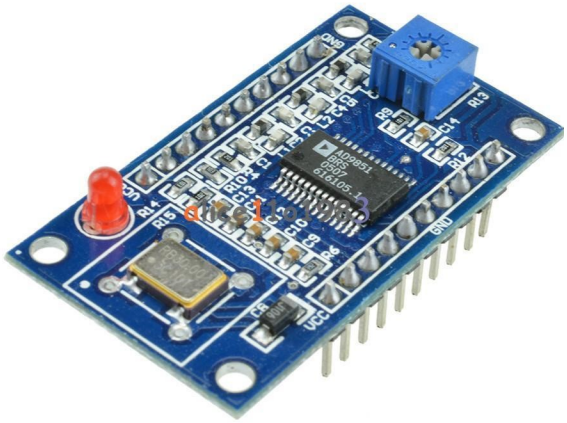
The little board shown here can test all of those things at a cost of less than $10. For $5 more you can get it in a Lucite case. It not only measures capacitance it measures the leakage as well (ESR=effective series resistance).). If you insert a transistor in the ZIF socket it will automatically identify the transistor type, map the pinout, and measure key parameters. It handles induc-

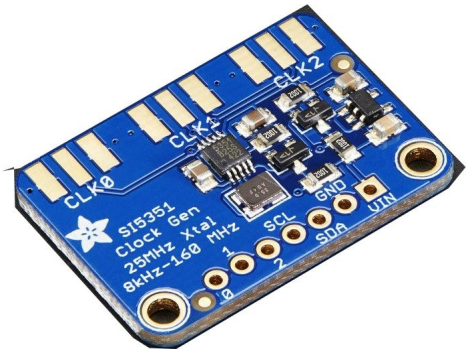
inductors as well, but won't go much below 100uh or so.

Look for “LCR-T4 Mega328” on eBay. If you google LCR-T4 you can find the original German host page for the project with schematics, software, and manuals in multiple languages.

If you build a QRP transmitter with a VFO, it is always handy to have a digital readout. In fact, cheap frequency counter boards make it easier to provide a digital readout these days than a dial. The frequency counter shown here can be had for $10.50. Digital meters for voltage, current, temperature, etc. are also available for less than $10.

The AD9850 DDS board covers 0-40MHz with 1Hz resolution and crystal stability and is used as a VFO in many ham projects. This board is widely available on eBay and elsewhere for about $10, but you'll need a PIC or Arduino controller to make it work.



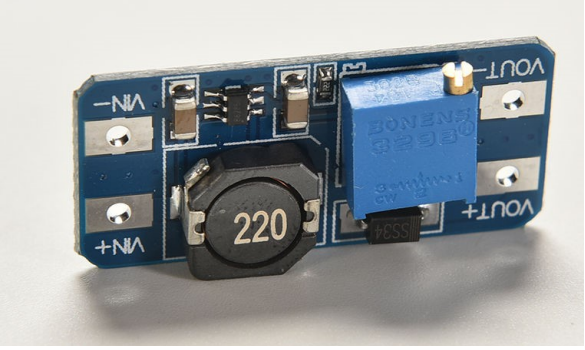


If $10 is a little rich for you blood, you can pick up an SI5351 board (right) from Adafruit for only $8. The SI5331 is a clock generator that can go up to 160MHz! It generates square wave output, not sine waves, but for mixer applications square waves are actually an advantage. The board can generate 3 different clocks at the same time, so you can use it to build a triple conversion receiver.

Below is a complete VFO kit based on the SI570 from Kees at www.qsl.net/k5bcq/Kits/Kits.html available for less than $50. Phase noise and spur specs are insanely good.

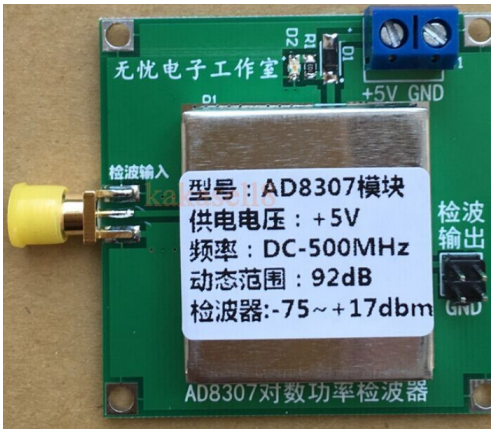
(See www.cliftonlaboratories.com/si570_kit_from_k5bcq.htm)

Something that's needed for practically every project is DC power. A cheap DC-DC converter board can not only simplify your design but also allow your project to run with a wide range of power supply input voltages. Cheap DC-DC boards are available from eBay to step up or down between just about any two voltages.



The little board on the right will generate an adjustable output voltage up to 28v from an input from 2-24v at 2A max. The detailed specs are a bit murky, but one spec is perfectly understandable: $1 including free shipping! Look for “MT3608/2A” on eBay.

In the spring issues of Spark Gaps I wrote a about building an RF power meter around the ADI RF-Kit and an Arduino. Here are two little power meters that can do the same job as the RF-Kit. They are available on eBay for about $15 each with free shipping from China. For HF enthusiasts a board with an AD8307 covers the full range from audio to 440MHz with over 90dB dynamic range (left figure). If you need microwave coverage you can get coverage from the 160m band to 8GHz with 60dB dynamic range (right).



If you have a need for a power meter, you will probably find a programmable attenuator very useful. A decent 0-60 dB mechanical step attenuator controlled with 1dB resolution will cost you about $200 on eBay in certified working condition. For $16, shipping included, you can buy the PE4302 step attenuator which provides 0-31.5 dB attenuation from DC to 4GHz. The ergonomics of the dip-switch attenuator control isn't the best, but it couldn't be too hard to Arduino-ize it with an LCD display and rotary control.

PE4302

Digital RF attenuator
High attenuation accuracy
0.5dB step
High linearity

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I am sorry to report that this issue of Spark Gaps contains the next to last of Jim Brown, WB2EDO, contributions. The idea when these were started was to encourage others to contribute their talents. Unfortunately the response has been less than overwhelming. I encourage anyone who comes across anything they believe is of interest to the club membership to please send it along. The main requirement is to send only text, preferable in word format. Any pictures, illustrations, diagrams, etc. should be in separate jpeg files. PDFs are a nono. I can not include them using Publisher.

So, thank you Jim for your help. It has been deeply appreciated.
Frank, K2EZR

SCIENTIFIC TIDBITS

Bionic Leaf

Researchers at Harvard University have created a "bionic" leaf that vastly improves on a plant's ability to convert light energy into chemical fuel. In the process known as photosynthesis, plants use sunlight to split up water and carbon dioxide molecules and then reshape them as oxygen and, above all, as vital complex sugars.
The Harvard team developed a system that mimics natural photosynthesis in the lab, generating liquid fuel with solar power and bacteria called "Ralstonia eutropha." In truth, the technology looks nothing like a leaf. Rather, the researchers filled a jar with two electrodes, some Ralstonia, and water. The water gets broken down by solar electricity, releasing hydrogen; the bacteria, which can be genetically engineered to produce useful compounds like biofuel, gobble up the hydrogen and grow. Creators of the zero-carbon energy system say it's about 10 times better at turning sunlight into biomass than the fastest-growing plants. Photosynthesis is really unbelievable when one considers that it is just water, air, and sunlight, and plants can make biomass from that. Now with this system we can also.

Pluto's recurring face-lift

Pluto is more geologically active than astronomers ever imagined, constantly repaving its surface with a churning ocean of frozen nitrogen. High resolution images from NASA's New Horizons spacecraft have revealed strange, interlocking polygons on the frigid face of the dwarf planet. In two new studies, researchers found an explanation for this peculiar honeycomb pattern by honing in on Pluto's most prominent geological feature: a vast, oval-shaped basin dubbed "Sputnik Planum." The area, which spans Pluto's equator, is filled with frozen nitrogen broken up into elevated polygons between 10 and 25 miles across. The two research teams each concluded that the polygons form because heat from decaying radioactive elements in Pluto's core continually sends warm nitrogen ice to the surface, where it spreads. Every half-million years or so, this convection effectively erases craters and other signs of planetary age like rejuvenating face-lift. This little planet keeps coming up with surprises. It is truly amazing how much man has yet to learn.

Human Longevity

Here is a little tidbit that we all have an interest in. Human longevity likely evolved to its maximum limit in the 1990's, according to the Albert Einstein College of Medicine. The college's researchers' findings came after they analyzed years of mortality data. The longest time a person is capable of living is likely 125 years. Of course this is predicated on the level of man's medical capability at the present time. There is no telling how long man's life expectancy can be extended with new discoveries, especially in the field of immunology. The immunologists target is to return humans' life expectancy to those of biblical proportions. They seem to feel that this can be done while keeping humans productive over the extended life span. What immediately comes to mind, if they are successful, is the havoc that will be caused in pension plans and health insurance.

Jim WB2EDO