

# **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 53 NO. 9 September 2020**

**Regular Meetings**  
Second & Fourth Mondays  
“ZOOM” until we can all  
get together again

## **Upcoming Events**

Digital Net Mondays at 9:00 PM  
PSK on 80 or 10 meters  
CW training Net, Thursday at 9:00 PM  
Watch for Email announcements.

## Meeting Schedule

**Regular Meeting:** 7:30—9:00 PM  
**2nd & 4th Monday  
of each month** at the  
New Providence Hall  
Elkwood Ave. NP

**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 2018

President: W2PTP Paul Wolfmeyer  
201-406-6914  
Vice President: K2GLS Bob Willis  
973-543-2454  
Secretary: K2AL: Al Hanzl  
908-872-5021  
Treasurer: K2YG Dave Barr  
908-277-4283  
Activities: KC2OSR Sam Sealy  
973-635-8966

## —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  
28,084 — 28,086  
Will be using PSK and RTTY  
Net control K2YG

## Club Internet Address

Website: <http://www.nparc.org>  
Webmaster KC2WUF David Bean  
Reflector: [nparc@mailman.qth.net](mailto:nparc@mailman.qth.net)  
Contact K2JV, Barry

## MOUNTAIN SPARK GAPS

Published Monthly by NPARC, Inc.  
The Watchung Mountain Area Radio Club  
P.O. Box 813

New Providence, NJ 07974  
©NPARC 2010 All Rights Reserved  
Editor: K2EZR Frank McAneny  
Contributing Editors:  
WB2OOO Rick Anderson  
W2PTP Paul Wolfmeyer  
K2UI Jim Stekas

## Climatological Data for New Providence for August 2020

The following information is provided by  
Rick, WB2OOO, who has been recording daily  
weather events at his station for the past  
38 years.

### TEMPERATURE -

Maximum temperature this August, 90 deg. F  
(August 2)  
Last August (2019) maximum was 88 deg. F.  
Average Maximum temperature this August,  
81.7 deg. F  
Minimum temperature this August, 59 deg. F  
(August 20)  
Last August (2019) minimum was 61 deg. F.  
Average Minimum temperature this August,  
67.8 deg. F  
Minimum diurnal temperature range, 7 deg.  
(77-70 deg.) 8/4  
Maximum diurnal temperature range, 22 deg.  
(88-66 deg.) 8/1

Average temperature this August, 74.8 deg. F  
Average temperature last August, 75.0 deg. F

### PRECIPITATION -

Total precipitation this August- 4.62" rain.  
Total precipitation last August- 4.09" rain.

Maximum one day precip. event this August-

August 4, 1.42" rain

Measurable rain fell on 15 days this Au-  
gust, 10 days last August.

YTD Precipitation - 30.07"

=====  
Rick Anderson

9/27/2020

243 Mountain Ave.

New Providence, NJ

(908) 464-8911

[rick243@comcast.net](mailto: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

## President's Column September 2020

Three things are on my “NPARC mind” this month:

Programs

Taking advantage of “abnormal times” to operate/grow,

And “how we should be operating as a club” in these times.

First, we are grateful for Carver Washburn’s (W2TFM) presentation on MARS COMEX at our ZOOM #11 Monday night meeting. I was glad to get “caught up” on MARS, see the relationship with amateur radio, and understand the value in possible crisis situations.

As you know Sam works diligently in seeking and securing programs. Give him your ideas, programs, and support. Thanks.

Second, I like to emphasize taking advantage of these times to operate and/or grow (although, I’ve been a “slackard” the last month.) But others are being active: Bob K2GLS now has his 5B DXDCC Award in hand, and Dave KC2WUF is now at **seven-band** DXCC. And Al K2AL and Ken W2IOC are very active in the State QSO Party Challenge. And there are our NPARC nets to try out and grow that CW and digital operations (Thanks K2YG, K2AL and KC2WUF). And there are license upgrades—congrats to Craig WB2BOI on his upgrade to Extra!!

So, “how should we be operating as a club”? We’re all, at least to some extent, “restless”. We’re tired of being cooped up, uncertain how cautious is “sufficient caution”, and ....

We’d normally be thinking about elections, the banquet, awards at the banquet, meeting arrangements, planning for the auction, and Field Day location reservations. Well, we have initiated Election Nomination (get names and ideas to Tim Farrell KD2EKN). But banquet is pushed off to Spring, at least—we’ll just have to see what is permissible then. Auction looks “very doubtful” to me; our location this year worked very well, but it would be too tight under current assembly conditions (even if it would be available, as many places are not allowing “outside” groups in). Meeting locations for possible “in-person”—same thing. And it will soon be too cold for an outdoor assembly. I think ZOOM is working well, with good-attendance—but I miss seeing some of our regular in-person attendees!

Now I’m basically a “stay the course” kind of guy. (This means keep going as we are but stay attune to the environment.) But I want to know what you are thinking. I’ll be having an officers meeting in early October so **get your thoughts and ideas to me or any of the officers soon...**

So stay safe...the next ZOOM meetings are October 12 and 26--hope to see you...

73

Wolf W2PTP

201-404-6914 or W2PTP@arrl.net

## Vintage Linear PSU Repair

Jim Stekas - K2UI

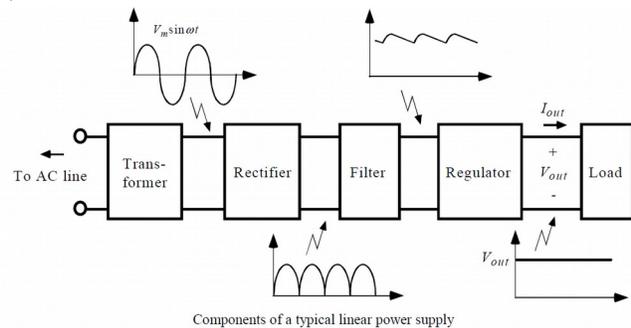
After a hiatus of 20-25 years I installed an OCF dipole, ran an RG8 feed-line into the basement, and was QRV once again from my traditional “shack”. I got on the air for the NPARC CW net using a vintage ICOM IC-720A transceiver and Western Electric straight key (circa 1920). Craig, WB2BOI, noticed that there was hum on my signal, so technically I was running MCW.

Once the net was over I hooked up the scope to the power supply and was shocked to find a 6v peak-to-peak AC signal superimposed on top of the 13.8V DC output voltage. Kudos to the IC-720A for surviving the insult and showing no trace of hum on the received signal.

The supply in question is a 30 amp model from North Electronics that I picked up surplus on Rt. 22. I brought it home, plugged it in, and pretty much left it alone for 30+ years. At some point in the 1990's it tripped a breaker, so I opened it up and immediately suspected that one of the three huge electrolytic capacitors had failed. Somehow, I isolated the faulty capacitor and effected a repair, in true ham tradition, by disconnecting it. Problem solved!!

I have come to take it for granted that manuals and schematics for every piece of equipment ever made are somewhere on the Internet just a few button clicks away. But all my attempts to find a schematic on-line failed.

Upon inspection, the internal circuitry seemed to share the architecture of linear PSUs of the same vintage, such as the ICOM PS-15, Astron RS-35A, etc.



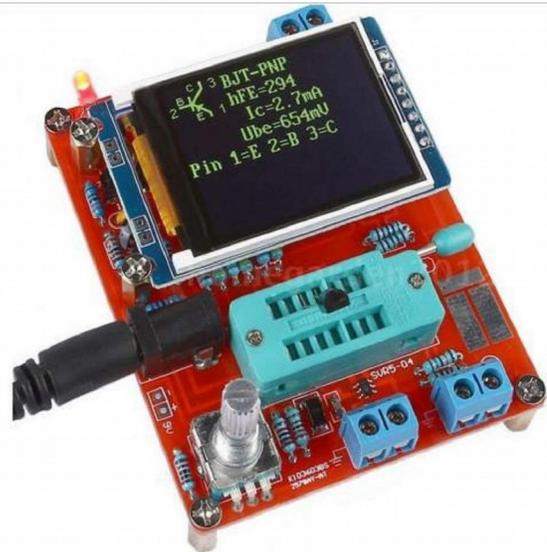
A big 5:1 power **transformer** (lower left) steps down the line voltage which feeds a full wave **rectifier** (little black square middle right). Three electrolytic capacitors in parallel **filter** the rectifier output producing a clean 24V DC. The voltage **regulator** (not visible) controls 8 pass transistors (mounted inside the cover) to drop the 24V to 13.8V.

The PSU started life with 3 capacitors of unknown value. A load that draws 25A from a 13.8v supply looks like a  $0.5\Omega$  load. To effectively shunt AC around that load we want a capacitor that has a reactance less than 1/10th of that, which is

–  $j \cdot 0.05\Omega$  at 120Hz, or about 26,000 $\mu\text{F}$ . The Astron RS-35A filter stage uses 50,000 $\mu\text{F}$  so my goal was to get at least that much capacitance into my PSU filter.

Testing a 20,000 $\mu\text{F}$  capacitor is not trivial. A typical LCR meter would use 1000Hz reference signal. At that frequency a 20,000 $\mu\text{F}$  capacitor looks like a dead short. A DC ohm meter applies a known voltage to a device and measures the current drawn. Large capacitors will draw huge “surge” DC currents while they charge up to the applied voltage, making them appear like dead shorts. The only good way to test a very large capacitor is to force a known current into it and measure how the voltage changes over time.

Thanks to Jon Pawlik, AE2JP, many of us built the GM328 all purpose tester kit as part of an NPARC project. Its spec sheet claims that it will measure capacitance from 25pF to 40,000 $\mu\text{F}$ . It also measures effective series resistance (ESR) which gives an indication of resistive loss. For large capacitors, accuracy isn't an issue. Typical parts have tolerances of -10/+25%. In this application the goal is to provide as much capacitance as possible. The GM328 confirmed what I suspected, all the caps in my PSU were bad.



The next step was to Google up replacement parts, which proved a bit more difficult than I thought. Finding parts with the right capacitance and voltage rating wasn't too hard, but size was an issue. I found some smaller caps that would fit but they cost \$25 a piece. Was it worth spending \$75 to fix a 40 year old power supply I could replace for \$50 at a hamfest? I decided to dig deeper into the junk box first.

Long ago I discovered a surplus Teletype CRT terminal and, for whatever stupid reason, I decided to buy it. It weighed about 40lbs and spoke to the world via a 25-pin RS232 port. It was a boat anchor with no redeeming functional capabilities or aesthetic merit. After taking up counter space for 10+ years I got rid of almost all of it except for the husky 5/12V power supply (which never found any use.) Inside I found two big caps, one a 75,000 $\mu\text{F}$  monster too big to squeeze into my PSU, and the other a 40,000 $\mu\text{F}$  perfect fit. Stored in the same cabinet was a 12V/10A supply built by Power/Mate Corp. (PMC) of Hacketstown, NJ which found some use long ago but had been doing little more than taking up space for the last 20 years. The PMC yielded a 30,000 $\mu\text{F}$  cap that was a perfect fit for my PSU.

I installed both replacement caps and left the disconnected cap right where it had been. With the bad caps replaced, the PSU filter totaled 70,000 $\mu\text{F}$  and whatever AC hum remains, it is undetectable on the scope<sup>1</sup>.

There is nothing more satisfying than:

1. fixing gear that's broken, without spending any money,
2. and relegating donor boat anchors to the trash heap.

---

1 A Tektronix 2445A from from AE2JP's estate that I am proud to own.