

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.8 August 2016

UPCOMING EVENTS

Regular Meetings

**9/12 & 9/26
Monday 7:30
NP 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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WB2QOO Rick Anderson

WB2EDO Jim Brown

K2UI Jim Stekas

Climatological Data for New Providence for
July 2016

The following information is provided by
Rick, WB2QOO, who has been recording
daily weather events at his station for the
past 34 years.

TEMPERATURE -

Maximum temperature this July, 96 deg. F
(July 25)

Last July (2015) maximum was 97 deg. F.

Average Maximum temperature this July, 87.7
deg. F

Minimum temperature this July, 59 deg. F
(July 3)

Last July (2015) minimum was 59 deg. F.

Average Minimum temperature this July, 67.1
deg. F

Minimum diurnal temperature range, 5 deg. (70
-65 deg.) 7/9

Maximum diurnal temperature range, 28 deg.
(90-62 deg.) 7/8

Average temperature this July, 77.4 deg. F

Average temperature last July, 76.4 deg. F

PRECIPITATION -

Total precipitation this July - 7.17" rain.

Total precipitation last July - 2.10" rain.

Maximum one day precip. event this July -
July 25, 1.90" rain

Measurable rain fell on 13 days this July,
11 days last July.

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Rick Anderson

8/3/16

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

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SWR Meter Expander

Jim Stekas - K2UI

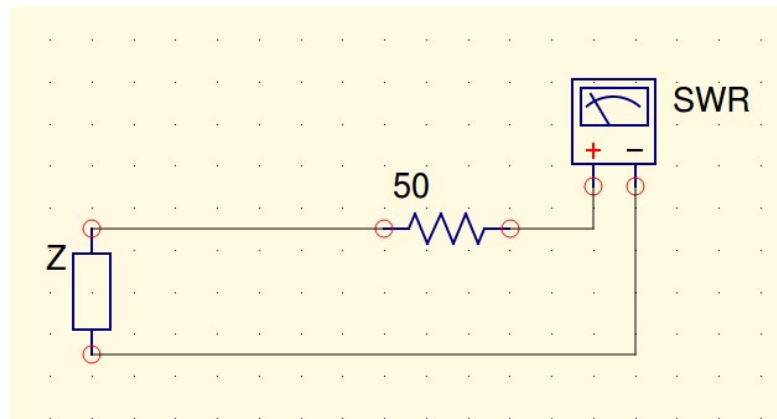
I have an MFJ-207 hand-held SWR analyzer that comes in handy for checking antennas. It isn't a laboratory grade instrument (MFJ ain't exactly HP) but it is accurate enough to be useful with a fresh 9v battery inside. The meter readout devotes about 75% of the scale for the a range of SWR 1 to 3 which is very convenient when the antenna is close to a match. This makes it easy to distinguish between SWRs of 1.2 and 1.5 or 2.5 and 3, which covers a range of input resistance from 17 to 150 ohms. For resistances outside this range, the reading falls into a red patch at the top of the scale labeled 3 to infinity.

To use this instrument for measuring impedances we need to:

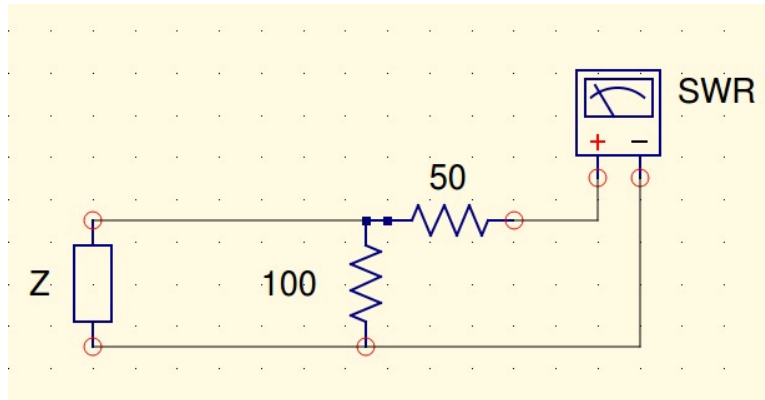
Break the ambiguity between $Z = \text{SWR}/50$ and $Z = 50/\text{SWR}$.

Keep the SWR to be in the 1-3 range.

We can fix the ambiguity problem by adding a 50 ohm resistor in series with the load as shown below. Now when the $\text{SWR}=2$ we know that the meter is seeing 100 and not 25 ohms, and $Z=50$ (not -25!!). The range of SWR 1 to 3 now corresponds to Z of 0 to 100 without any ambiguity.

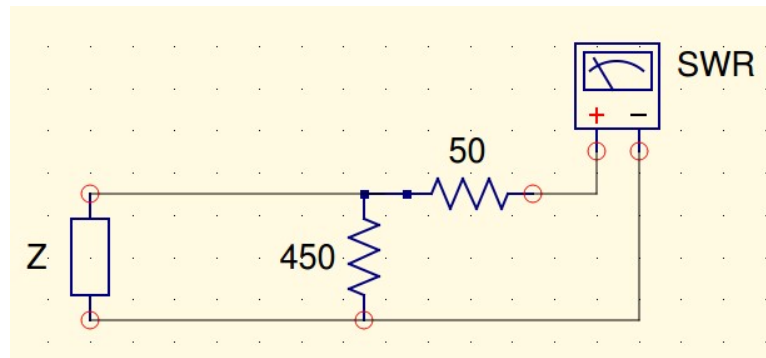


Next we extend the range of Z by adding another resistor as shown below.



Now, when Z is infinity the SWR meter sees 150 ohms and the SWR reading is 3. So with two resistors we have extended the range of the meter to measure Z from 0 to infinity (SWR from 1 to 3). Not only that, but $Z=0$ and $Z=\text{infinity}$ are now at opposite ends of our range scale and no longer give the same SWR reading (infinity). Note that when $Z=50$ the SWR bridge will read 1.67 with the configuration above. So if you were using the meter to adjust an antenna tuner, you would tune for a reading of 1.67.

I also have a digital antenna analyzer that plots SWR over a range of 1 to 10. For this device we want $Z=\text{infinity}$ to give an SWR of 10, which means the meter should see 500 ohms. This is easily accomplished by changing the parallel resistor to 450 ohms, as shown below.



With the above arrangement $Z = 0$ to infinity maps to $\text{SWR} = 1$ to 10.

This expander trick isn't a magic cure-all. While the Z range is expanded, the resolution is reduced because a larger range of Z is compressed into a smaller range of SWR readings. Note too, that we have treated Z as if it was a pure resistance, which will generally not be the case for antenna and feedline.

SCIENTIFIC TIDBITS

Exercise has Limited Weight-loss Benefits

Running that extra mile on the treadmill may not make you any thinner because exercise alone can burn only a limited number of calories. Instead, the body actually adapts to greater levels of activity, which may help explain why people who are trying to lose weight often hit a frustration plateau. The recent study followed more than 300 men and women from five different countries over the course of one week, measuring their daily activity levels and energy expenditure. As expected, people who were moderately active, walking a couple of miles daily or working out for a half hour two or three times a week, burned about 200 more calories than the ones who remained sedentary. But intense activity did not necessarily reap more benefits. Participants who logged the highest levels of physical exertion expended about the same amount of energy as those who were only moderately active. The researchers suggest that the bodies of extremely active people learn to use energy more efficiently during exercise and to burn fewer calories while at rest. It seems this is a really common evolutionary adaptation that all animals use to keep from outstripping their resources and to keep from starving. Exercise can provide many health benefits, including weight loss, but to shed a lot of pounds one should probably focus on changing one's diet and watching how much you eat. Ain't that the truth!

While We are on the Subject of Exercise

Regular exercise may shrink waistlines, but a long-term study suggests it increases brain volume and lowers the risk of age-related cognitive decline. Researchers followed 1,583 middle-aged men and women with no personal history of dementia or heart disease over the course of two decades. At the start of the study, participants underwent an MRI and took a physical fitness test on a treadmill, during which their heartrate and blood pressure were also monitored. The procedures were repeated 20 years later, and after factoring out people who had developed heart disease and high blood pressure, the researchers found that the ones who kept in shape were more likely to have larger brains. On the other hand, poorly conditioned participants had lost gray matter. It is normal that our brains shrink as we age, and this atrophy is related to cognitive decline and increased risk for dementia. The moral here is for us old codgers to get off the couch and move around daily.

Printing Body Parts

In a medical first, researchers have successfully printed living human body parts that are large and strong enough to replace human tissues. Previous attempts to engineer lifelike body parts had failed because the structures were too flimsy or lacked the complexity to remain viable. But a Wake Forest University research team has circumvented those issues using a new device called an integrated tissue-organ printer, which has manufactured ears, muscles, and jawbones using precise 3-D models. The printer mixes live cells with a special gel that hardens to the consistency of living tissues. Oxygen and nutrients are delivered to the new cells through layers of tiny tunnels until blood vessels grow and perform this vital function naturally.

The engineered structures were stable enough to be successfully implanted in rodents. More study is needed to determine whether these tissues are safe for humans, but researchers hope the technology can one day enable patients to get customized vital-organ transplants using their own cells. What a blessing this would be for the thousands waiting for transplants. Let us hope its development will not get bogged down in the bureaucratic marsh.

Jim WB2EDO