

QRZ NEWS

A MONTHLY PUBLICATION OF
SOUTHERN PENNSYLVANIA AMATEUR RADIO CLUB, INC
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(Founded June 1960)

AN AFFILIATED SPECIAL SERVICE CLUB OF THE ARRL, INC.

"Public Service through Communication"

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Repeaters: 145.230 - 449.975 - Packet 145.030 - ATV 923.250, FN10se

November 2009

President's Message

Well, 2009 is almost over. It's hard to believe but it is true. It seems like just yesterday we were waiting for warm weather so we could get some antenna work done. Here it is November and we still didn't get it done.

Things are looking good along Breneman Road. We have cleared a lot of junk off the site, the grass has been cut and all the inoperative HF antennas removed. The technical committee is working on a plan for installing new HF antennas. We still have the 40 through 10 meter beam and a double bazooka cut for 80 meters so if you want to come out and use the site feel free. If you are a SPARC member, and you don't have a key, see a board member and we will get you one.

SPARC is the only Amateur Radio Club in Lancaster County who owns (well us and the bank) our own site. A lot of past and present members have expended a lot of time and energy to get us to where we are today. The greatest appreciation we could show those HAMS is to use the facility that they have worked so hard to acquire and equip.

A long time member of the Board of Directors and currently serving as Vice

President, Rick Watson, has informed me that he will be resigning as VP effective December 31. Rick is resigning due to an extremely busy schedule outside of HAM radio. He will remain a member of SPARC and will remain active in RACES. I will be actively seeking someone to fill that office. Also, Ross Kauffman has moved to center city Philadelphia. While Ross intends to maintain his membership he may not be able to continue as technical session coordinator. If you are interested in either of these positions don't be afraid to speak up.

Harry, WA3FFK

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Highlights of the October 2009 Meeting of the Southern Pennsylvania Amateur Radio Club

Wednesday, October 21 2009 at 7 PM at the Rapho Township Municipal Bidg.

The meeting was called to order at 7:00 PM by Harry Bauder and began with a round robin introduction.

The September membership meeting minutes were read. On a motion by Rick Watson and a second by Jim Silvius they were approved as read. There were no BOD minutes available to read. Highlights were discussed, including closing the fuel tank to avoid the expense of inspection and selling the truck to avoid an approximate \$1000 per year cost of ownership.

Ted Freedman read the Treasurer's Report. As of October 1, all bills were paid. The report was approved as read, pending review by the audit committee, on a motion by Mike Warner and a second by George Gadbois. It was noted that the mortgage has been renegotiated. The new terms are a rate of 7.25% and a payment of \$129.49 per month. There will be a balloon payment due on 2/13/2013. On a motion by Gerry Wagner and a second by Jon Rudy the membership present approved terms of the new loan.

Discussion

The change to the constitution was read a second time. On a motion by Jim Silvius and a second by George Gadbois it was approved with no objections noted.

Harry noted that a letter was sent to Randy Gockley regarding the county's truck. It has been parked at the site waiting for pickup ever since the van was turned over to the county. Harry requested that Randy have it towed or we will have it taken to a scrapyard and sold.

JOTA was held the weekend of October 18th at the club site. The event went very well. Two scouts from Troop 51 attended. Harry Bauder, Ted Freedman and Jon Rudy all helped operate. The scouts were able to spend many hours on the radio and made contacts over much of the US and Germany. They also heard from Eastern Europe and the World Scouting Headquarters in Geneva. The equipment and building also worked well. Dave Sarraf noted that the work over the years to maintain the building and antennas has resulted in a very pleasant and useful facility.

New Business

New Member - Dan Milligan KA3KHR submitted a new member application at the last meeting. On a motion by Gerry and a second by Jon his application was approved with no objections noted. Ted asked for Milligan's street address for the records.

Mike Warner, through Air Products, is making available several 45' utility poles. Delivery may be available. After some discussion it was agreed that we could use them.

Insurance was discussed in the context of the mortgage. We have liability insurance on the site but may not have fire. This may be required. See if we can get a rider for this added to the existing liability policy.

It was questioned if we are still helping Rapho Township with paper recycling.

Currently we are not, as a farmer takes all of the available paper for bedding in the winter.

We need to do another Adopt-A-Highway cleanup. Tentative dates discussed included November 1st and November 7th, from 9:00-11:00 am.

The next RACES meeting is November 12th at 7:00 PM. They are planning a ham-only drill for next October.

Ted asked for new net control operators to fill in.

Ross Kauffman is moving to Philadelphia and will be unlikely to be able to help with JOTA.

On a motion by Gerry Wagner and a second by Mike Warner, the business portion of the meeting was closed at 8:12 PM.

The technical portion was a presentation by Harry Bauder about the air traffic control system and its history, and some collision-avoidance avionics and its operation.

Respectfully submitted,
Dave Sarraf, N3NDJ
SPARC Secretary

Coming Events

The SPARC business meeting will be held Wednesday, 18 November 2009 at the Rapho Township Municipal Building, 971 N. Colebrook Rd, in Rapho Twp. Meeting time is 7:00PM. Everyone interested in Amateur Radio is invited to attend.

Recycle Update

There has been a small improvement in the price for recycled paper to about \$25/ton.

This doesn't support transportation costs, but if you can deliver clean recycled paper to Dave Payne's mini recycling center at 1373 Malleable Rd, Columbia, PA or bring it to a club meeting, the club will profit from the recycling. Remember the no, nos of recycled paper, No plastic, No glue.

SPARC also recycles scrap metal. As with all recycling, clean, meaning little or no foreign material, brings the highest prices at the recycler. For example, insulated copper wire can be recycled at a much reduced price.

The SPARC heavy duty pickup used for transporting recycled paper is now for sale. If you know anyone who might be interested, contact Dave Payne, [N3LOM](#).

Editor's Notes

There is good news on sunspot cycle 24. The average daily sunspot number for October was 7, the highest in the past 19 months. A few more fleeting sunspots showed up in early November. The Sun is still mostly blank, but there is hope for a real start of cycle 24 soon.

Six meters is showing a bit of Es activity with several moderate openings over the past few weeks. The winter Es season peaks late December to early January. Don't expect the intense multihop openings of last Summer, but you can still have fun.

I did some online research to learn more about the subsidies available for solar photovoltaic installations. The Federal tax credit expires in 2016. Pennsylvania now has a generous grant program that adds to the Federal subsidy. Subsidies will cover about 45% of the installation cost. If you are thinking about solar, this is a good time to act. It is not cheap even with the subsidies.

I also looked up AECs (Alternate Energy Credits) which are saleable items similar to the carbon cap and trade proposal. For solar photovoltaic installations, the AECs are especially valuable. One AEC is created for each megawatt hour of electricity generated. You don't have to be connected to the grid or sell any energy to your power company to claim AECs. You will have to provide proof that you really are generating the electricity.

For 2008, a solar AEC sold for about \$230. There is an auction of AECs scheduled for this month. Phil Theis, K3TUF, expects the price to rise above \$500.

Johnson & Johnson/Merck plans to install a \$3.3million, 620Kw, solar system in the Greenfield Corporate Center. The Pennsylvania grant will be \$876K.

Solar systems are rated for their peak output under ideal conditions when the sun's rays arrive normal to the surface of the solar cells. With fixed arrays, this almost never happens. Some installations slope the solar panels parallel to the Earth's axis as a best compromise.

Pennsylvania law requires utilities to increase the percentage of energy generated by solar photovoltaic systems each year else pay an SACP (Solar Alternative Compliance Payment). This requirement drives the price of AECs. The percentage of electricity generated by solar photovoltaic cells in Pennsylvania is very small.

"The calculated SACP for the 2008 Compliance Year was \$528.17." See <http://paaeps.com/credit/pricing.do> for more information.

I am always looking for material to publish in QRZ News. Material covering the full range of beginner to highly advanced is welcome. There are several requests for a General and/or Extra licensing class. People want to upgrade and I want to help with a range of articles in QRZ News. I can't write them all.

73,
George, W3FEY

ARES/RACES



As part of the SPARC commitment to emergency communications, the SPARC repeater system is maintained as available for linking with other area repeaters.

Lancaster County RACES VHF Net is held on the first Tuesday of the month at 2030 hours local time. Presently being held on the 145.310 MHz repeater.

The Lancaster County primary ARES/RACES repeater is on 145.310 MHz with minus offset and 118.8 PL.

Combined York County Amateur and ARES/RACES NET convenes at 8:30 PM (2030) Mondays on 146.97.

Pennsylvania RACES HF Nets are held at 3993.5 kHz LSB on all Sundays except holidays.

The statewide net is on the first Sunday of the month at 0800 hours local time.

The Central Area (including Lancaster County) net is at 08:30 local time.

SPARC Nets

SPARC holds nets on the 2nd, 3rd, 4th, and 5th Tuesday (every Tuesday except the first) at 2030 local time on 145.230 MHz minus offset and a PL of 118.8.

Club Officers

President Harry Bauder – [WA3FFK](#)
Vice-President: Rick Watson - [N3SWJ](#)
Secretary - Dave Sarraf. - [N3NDJ](#)
Treasurer - Ted Freedman - [K3KSA](#)
Repeater Trustee - Dave Payne - [N3LOM](#)
Past President - Mike Warner – [N3XPD](#)
Board of Directors - Jim Silvius – [KW3E](#)

Nearby Nets of Local Interest

Delaware Co. Mobile Sixers Net Schedule
Sunday 2000 50.550 MHz USB

Packrats 1296.100 MHz USB net Mondays at 2130 local time Bob, W2SJ, Pennsauken, NJ, FM291w, is net control. Bob has a good signal into Lancaster County. He looks west ~ 2135-40.

Combined York County Amateur and
ARES/RACES NET convenes at 8:30 PM (2030)
Monday on 146.97.

Technical/Elmer NET -- following Monday
Combined York NET

For discussion or questions in reference to Amateur radio, the club, equipment, operating procedures, etc, have them ready to ask. If you just want to talk about something particular to Amateur radio, we can do that too. The net will start at 9 PM on the York 146.97 repeater. If the regular net runs longer than this, it will start when the normal Monday night net ends.

If you would like to volunteer to discuss a topic, for 5 to 10 minutes, please send your name and topic to the NET Manager, Richard Reese at "kr3ee@frontiernet.net". Rich will schedule you.

Sandy Goodman, N3ECF

QRZ News Publication

QRZ News is published monthly on the second Wednesday of each month, one week before the monthly meeting. Deadline for article submission is the second Tuesday of each month.

We operate on an exchange basis with other non-commercial publications. Articles printed in QRZ News may be reprinted in a not for profit publication provided proper credit is given. Reprinted articles require permission from the original source.

QRZ News is archived at http://www.k3ir.org/QRZ_News.html. Documents are in PDF format.

Dave Payne, N3LOM, recently found a paper copy of the first quarter 1999 issue of QRZ News. This is the oldest copy of QRZ News in the archive. The next oldest copies are from 2001.

Meter Fundamentals

We all need to measure voltage or current to support our hobby. Buying new meters for each application is expensive. Surplus meters are available for reasonable prices and they can be used for many jobs. Rarely will the surplus meter you find at a hamfest be exactly what you need. Here are some tips on adapting what you find to what you need.

When you make a measurement, there is some affect on the quantity measured. The magnitude of this affect depends on the circuit being measured and the sensitivity of the meter.

For this article, the discussion will be limited to measuring DC voltage and/or current. In general, you want the meter movement to be as sensitive as possible to minimize circuit loading by the measuring device. A microammeter with a full scale sensitivity of 100µa or lower is a good choice. For circuits with plenty of current

available, a 1ma full scale meter can be used.

This column will describe using a 100 μ a FS meter to display 0-3 volts DC for a power output monitor.



This meter is labeled for milliamps-volts DC. Directly under that label is the meter basic sensitivity, FS= 100 microamperes.

The intended application is to monitor power output from a Kuhne Electronic MKU PA 13500 A 23cm amplifier. The amplifier is built with a directional coupler in the output circuit calibrated to output 2.9V at rated output of 550 watts on 1296MHz.

The meter is hermetically sealed so there is no way to change the existing scale. Measurements don't have to be exact so we will add a 30K Ω precision resistor in series with the meter to make it read full scale at 3V. Use Ohms Law ($R = E/I$) to calculate the resistance required to deliver 100 μ a with 3V applied. You'll note that the factor is 10K Ω /volt.

The meter internal resistance is unknown, but we can assume it is low because of the

basic sensitivity of the meter movement. The calibration was checked with a Bird wattmeter to ensure that the readings are close.

I used a metal film precision resistor here to keep the tolerance close and minimize temperature caused resistance changes. For high accuracy measurements, temperature coefficient of the resistors becomes very important.

For operational use, close is good enough in this application. Just assume that full scale is 600W and multiply the scale reading by 200 to get approximate watt output. The meter is showing ~300W output on 1296 MHz.

Analog meters as shown here are inexpensive on the surplus market. The advantage of analog meters is that it is easy to perceive that a value is high or low and in which direction it may be changing.

Digital panel meters have come down a lot in price so they are practical for applications where knowing the actual value of a quantity is needed. You can read the value and write it down with few errors. Shunts and multipliers can be used with digital meters if you want to change the range of a surplus buy or you want to add ranges to an existing meter. The specifications will provide the internal impedance of the meter. Luminous bar graphs are the digital worlds nod to the need for an analog presentation.

George, W3FEY

EME Dish Aiming System

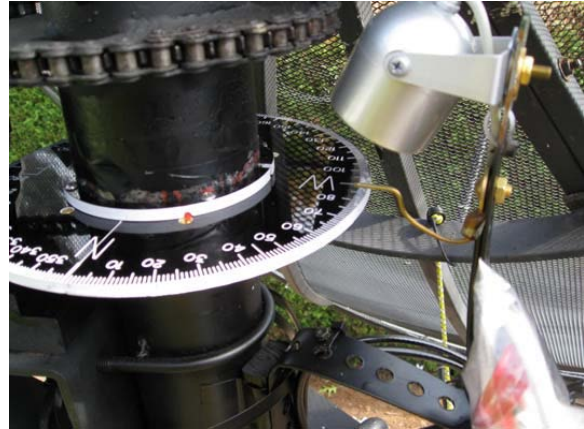
By John, W3HMS Rev. 8 Nov 09

I am now using TV cameras for position readout of my 23 cm 3 m dish. I have one camera on an AZ disk and another camera on an EL inclinometer, and both are easily seen on TV monitors in the station. It is great to have them when the moon camera shows only clouds, HI!

I wanted a large compass rose for the AZ readout. I found exactly what I needed at UBR-LLC in Dillsburg, PA. They were able to supply compass roses with considerable flexibility in dimensions.

The one I use is under 10 inches but they can be made as large as 24". The center hole size can be reduced or enlarged. It comes in two pieces for easy addition to an existing dish installation. The AZ graduations can be clockwise or counterclockwise per user needs, i.e. if you move the support pole and use a fixed pointer you will need counterclockwise. If the pointer moves then clockwise is right.

The material is ¼ inch "Phenolic xxx". I have an all-weather version that can also be made in aluminum. The required vertical space is about ¾ inch and I have found the calibration to be linear and the image very crisp. I see the image on my remote TV camera monitor day or night and even in rain. For more info, price and terms contact Frank Ulrich, CEO at Frank.Ulrich@UBR-LLC.com or call 717-432-0398.



W3HMS' TV camera dish readout system



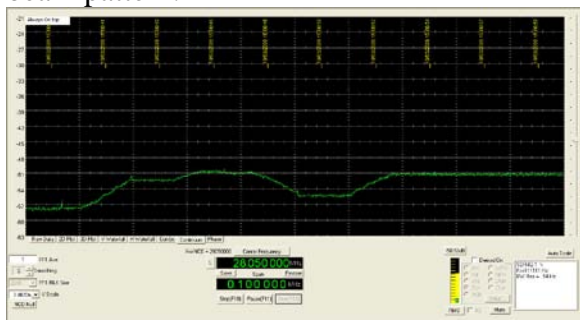
W3HMS' Azimuth readout as seen on monitor in his shack

I received a number of responses on the JT's echo mode in the last NL confirming its' usefulness. DL2FCN in particular wanted to remind everyone that VK3UM's EME calculator software works well with the Echo mode program to predict performance.

This month we have F5SE's Moon Chart for 2010 by band. From Franck's chart you can predict Moon conditions for the coming year. With his calendar, you can see the good conditions once or twice per month in 2010 and plan your EME activity. Next month I hope to have the 2010 Moon Calendar now produced by DL7APV.

For related Sun noise testing N2UO points out that K5SO at http://www.k5so.com/Using_sun_noise.html

has some interesting plots of sun noise vs. dish diameter. You can get the sun noise from the day before at <http://www.solen.info/solar/>. Sun noise does varies a lot over time, so you can't take the numbers too seriously. The web site shows the average at a particular location. For those with SDR-IQ receivers, moving your antenna across the Sun while running in the continuous display mode produces a nice display of your beam pattern.



This article first appeared in the 432 AND ABOVE EME NEWS for November 2009. See <http://www.nitehawk.com/rasmit/em70cm.html> for more information.

SDR-IQ Receiver



Those not active on VHF/UHF or VLF DXing may not know what an SDR-IQ receiver is. What is the connection between VLF and microwave DXing? Let's explore that topic just a bit.

Here is a description of the SDR-IQ from the RF Space web site:

The SDR-IQ™ is a 14-bit software defined radio receiver. It offers a broad range of spectrum analyzer and demodulation capabilities. The hardware samples the whole 0.0001-30 MHz band using a high performance, 14 bit analog to digital converter (ADC) running at 66.6 MHz. The digital data from the ADC is processed into I and Q format using a direct digital converter (DDC). The I and Q data is then sent to the PC for processing using a USB 2.0 interface. All of the demodulation and spectral functions are done on the PC side.

The SDR-IQ™ comes with a High Frequency (HF) amplified front-end with switched attenuators, switched filters and 1Hz tuning. The SDR-IQ™ comes with the latest version of SpectraVue™ software. It supports AM, WFM, USB, LSB, N-FM, DSB and CW with fully adjustable DSP Filter bandwidths and FFT sizes of 2048 to 262144 points. The resolution bandwidth is as low as 0.031 Hz.

If you don't understand all that technology, don't worry about it. The important thing to understand is what it will do for you. As a software defined receiver, most of the functionality is in the software which you install on your computer. All the controls for the receiver come from your computer and the computer presents the received information to you. If you want to explore the VLF spectrum, the SDR-IQ is a good choice. There are some very interesting phenomena at the very low end of the range of the SDR-IQ. See <http://www.rfspace.com/SDR-IQ.html> for more information. Our current topic is VHF and microwaves so I'll skip to how you use the SDR-IQ to support communications on those bands.

Serious VHF/UHF DXing requires top of the line HF transceiver performance with very high dynamic range. You need top of the line dynamic range, but not all the functions required for HF DX contesting. You don't get this in a single box. A typical set up is to use transverters that interface

between an HF transceiver and whatever VHF to microwave band you want to use. Almost universally, the 10 meter band on the HF transceiver is used as the IF because of the wide tuning range available without band switching.

One of the problems is finding signals on the higher bands if the signals are very weak or Doppler shifted as they are for EME and satellite work. The SDR-IQ coverage includes 28MHz so that is just what you need. You can watch a bandwidth up to 196KHz wide and display all the activity in that bandwidth. For most VHF through microwave bands, that is most of the spectrum used by DXers. You will have to shift the center frequency between major modes such as SSB/CW and EME. Six meters spreads out more than 196KHz when there are major openings. You could operate on the high end of 6m and watch the DX portion on the SDR-IQ.

By the time you convert from a higher band to 28MHz, there is more than adequate signal available at 28MHz to split off some signal to the SDR-IQ and keep the HF transceiver as your main operating tool. All your operating functions stay the same and you can observe up to 196KHz of activity at the same time on your computer.

You can control your transceiver and rotator from your computer if you wish, but that is a topic for another time and author.

This is just a beginning discussion of software defined radios. I hope this will get everybody thinking about how they can benefit from this new technology.

George, W3FEY

Low Frequency Receiving is interesting

The active antenna made by LF Engineering is very good from 10-500 KHz. Last night I heard both France Inter on 162 KHz and France 183 KHz better than ever before with this antenna feeding my Kenwood R-2000. I also heard VE beacons in Montreal, QC and in ONT. I found a neat way to check out the beacon QTH....just type NDB _____ where the dash is the beacon call in Google and you will have the QTH ASAP....test with NDB CX....works well.

73, John, W3HMS, 9 Nov 09

First Test: CFLs Compared to LEDs

Two GVO LED candelabra lamps rated at 1.7W were purchased for comparison to 7W CFLs in a wall lighting installation. See the specification below. Note that no specification is given for luminous output. LEDs are typically more efficient than CFLs, but here we don't have any data for the test LED lamps.

I didn't really expect a 1.7W LED to have light output equal to a 7W CFL, but it seemed close enough for a meaningful evaluation and it was.

The comparison bulb was a 7W, (25W tungsten equivalent), CFL made by Overdrive. See the photo and specifications below.

The CFLs performed as expected providing a diffuse illumination and cool operation with only 7W dissipated. In the actual lamps, you can't really resolve the coiled structure of the fluorescent tube.

The LEDs were slightly frosted but not nearly enough to make it comfortable to look at the bulbs which were installed near eye level.

The heating of the LED base and socket was noticeably greater than for the CFLs. I don't have any instruments to measure real power at 60HZ but the heating strongly indicates that the LEDs dissipate more energy than the 7W rated CFLs.

Overdrive™
ENERGY SAVING LAMPS

LIFE
1X10,000 hrs (LED) vs 10X1,000 hrs (CFL)

BRIGHTNESS
7W vs 25W

POWER CONSUMPTION
CFL 25% vs GLS 100%

Base E12

LIGHT OUTPUT: **340 LUMENS**

ENERGY USED: **7 WATTS**

AVERAGE LIFE: **10,000 HOURS**

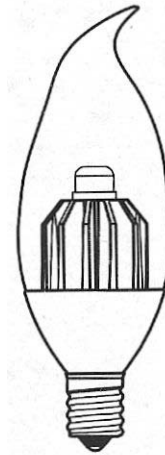
COLOR TEMPERATURE: **2700 K**

CRI = **>80**

UL US

To save energy costs, find the bulb with light output you need, then choose the one with lowest watts.

Application: [Icons for various lighting fixtures]



DYNASTY
LIGHT REDEFINED

PART#: 30022

Dynasty® Candelabra LED Lamp

UL LISTED
38TS
E300200
120VAC 88mA 1.7W 50/60HZ

Not for use with dimmers

Suitable for use in open luminaries

Caution – Risk of Electric Shock– Use In Dry Location only

Golden Valley Optoelectronics Co.,LTD.
www.gvopto.com
Made in China

Note the 88ma rating of the LED lamps. If we assume that the current is in phase with the voltage, the dissipation is 10.6W ($P=EI$). The 1.7W rating must be for the LED assembly alone.

LEDs require DC current to operate so there must be a rectifier circuit. The heat dissipation suggests a dropping resistor and bridge rectifier for the LEDs. I am not ready for a destructive test to find out, but this is consistent with the observed heating of the LEDs. The LEDs have been replaced with CFLs.

What could the LEDs be used for?

They could be used in a fixture with a diffusing globe. They are not rated for use with a dimmer, but they could be separated as a stand alone component and modulated for communications. I'll think about this.

If someone wants to experiment further, I will sell the two samples for \$20, less than half the original price.

C7 LED replacement Christmas bulbs are available rated for 0.6W each and the pricing is much lower than the lamps from GVO. I haven't tried any but from the small size and low price I suspect resistor ballasting. The 0.6W is probably for the LEDs alone. Life claimed is 50K hours so this is a consideration. When you buy LED strings, an adapter is required. This probably is a more efficient solution.

T8 LED fluorescent replacements with much better energy efficiency are available. See <http://www.1000bulbs.com/LED-T8-Fluorescent-Replacement-Tubes/> and http://www.ilumisys.com/template_page.aspx?top_nav_name=about for more information. The wide input voltage specification suggests an internal switching ballast supply. Old fixtures require rewiring.

A well known problem with standard fluorescents is that they don't start well at low temperatures. LED based fluorescent replacements should work as well or better under outdoor winter conditions. Very high summer temperatures would be a negative.

LEDs used for lighting purposes have the same problem as power transistors. The junctions are difficult to cool and high operating temperatures result in atoms migrating in the semiconductor junctions. This eventually results in failure of the device. When you operate above the maximum ratings, eventually turns out to be a very short time. LED life is specified in terms of the loss of light output over time. Infant failures usually result from manufacturing defects.

By the way, all fluorescents contain mercury and should be disposed of as hazardous waste. LEDs do not contain mercury.

George, W3FEY

How Santa Came to Watt & Shand

A long time tradition in Lancaster was the arrival of Santa Claus at the Watt & Shand department store on Penn Square in Lancaster. The site is now just a façade of the Watt & Shand store with the Marriot Hotel and convention center behind. The return of the Santa Claus tradition has been announced by the Marriot, but the mode of travel is top secret.

In the past, Santa Claus arrived by several clever means including the Strasburg Railroad.

Photo next page:



Photo by Lloyd Jury

Strasburg Railroad locomotive #1223 in downtown Lancaster 19 Nov. 1966

1223 was formerly used by the Pennsylvania Railroad on the Broadway Limited before it was loaned to the Strasburg Railroad. It is now in the Pennsylvania Railroad Museum in Strasburg.

The railroad tracks on Water Street are long gone. This was the rail line to Quarryville for many years. The Pennsylvania main line came to downtown Lancaster before the present railroad station was constructed. Remains of the tunnel under Prince Street can still be seen. The rails now end at Lancaster Crossings where the bridge on James Street still exists.

The Golden Star was the only Chinese restaurant in town when I came to Lancaster in 1955.

George, W3FEY