HOTLINE

PRINCETON PLASMA PHYSICS LABORATORY

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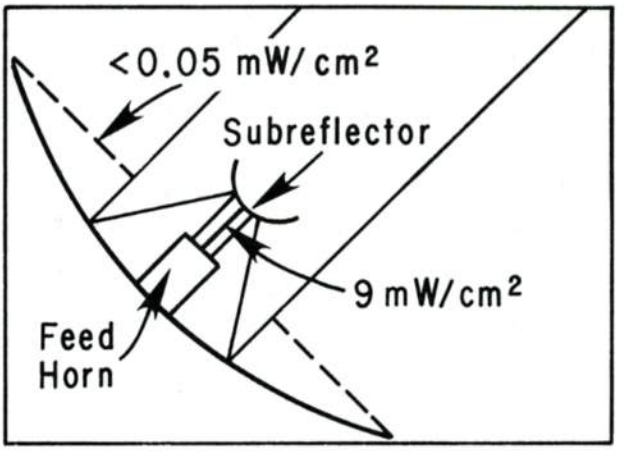
Antenna Survey



An initial microwave radiation survey of the two new antennas for the laboratory's satellite data link was conducted by Health and Safety on the evening of April 10. The system was operating at its expected power output of one watt.

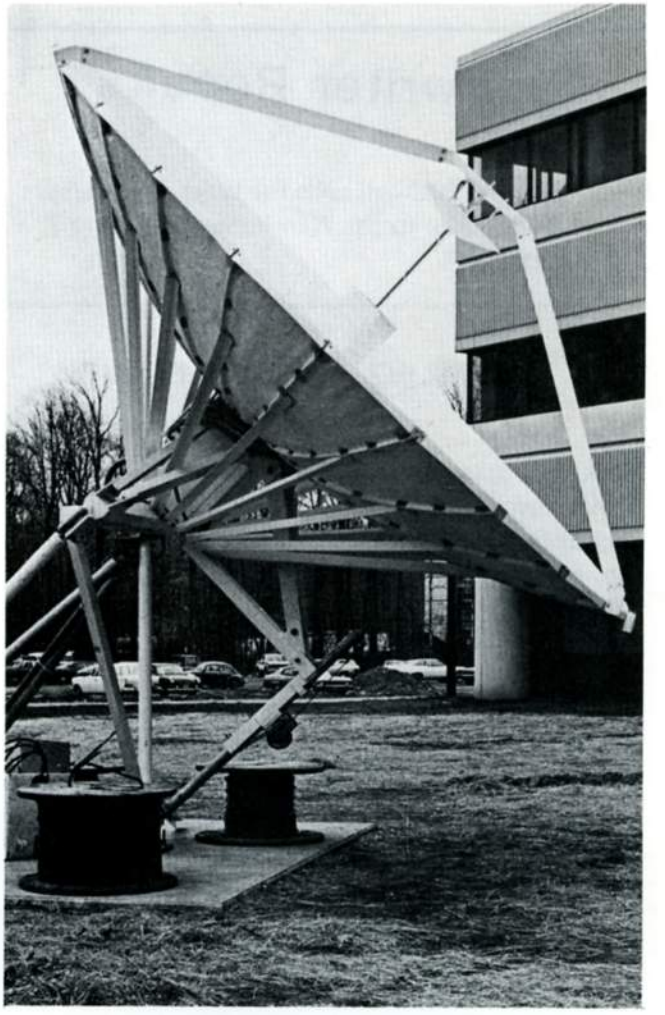
A measurement was made between the output of the feedhorn and the subreflector (see diagram), an area not normally surveyed. The maximum power density in this region was 9 mW/cm^2.

At the plane of the dish (see diagram), the levels were below the detection levels of the measurement instruments (less than 0.05 mW/cm^2). Since the maximum predicted level in this near field was 0.02 mW/cm^2, Health and Safety is confident that any area accessible to PPL employees will be far below 0.01 mW/cm^2, the most conservative standard for continuous exposure.

At the edge of the antennas, as pointed out in a recent Safety session, the power densities are calculated to be less than 0.0002 mW/cm^2 for a one watt transmission.

Health and Safety will continue to do periodic surveys of the antennas as part of its inspection and monitoring programs. Special surveys will be conducted if operating parameters change. A fence will also be installed around the area to eliminate the attractive nuisance hazard (the temptation for anyone to climb on the antennas).

Employees requiring further explanation of these antennas from a safety standpoint are encouraged to contact the Health and Safety office at ext. 2526.



Dance Class Begins

All PPL women employees are invited to join their co-workers in toning their muscles to music in the lab's new jazzercise/aerobics dance class.

Classes, which will run for at least six weeks, began April 21 and will continue every Tuesday and Thursday in the LOB Commons. Classes are held from 5 to 6 p.m.

The sessions will cost less than $20, depending on the number of registrants. Participants should bring comfortable clothing and a mat to class.

For further information, contact Helen Pesce at ext. 2462 or Shirley Owens at ext. 3711.

Typewriter Repairs

Effective April 20th, all calls for typewriter repairs should be directed to the Warehouse Receiving 3 Office, ext. 3396.

Award Winners

Mark and Brian Brown, the sons of PPL's Mary Ann Brown, won a number of awards in the 29th annual Greater Trenton Science Fair. The event, sponsored by the Trenton Engineers' Club and The Trentonian, was recently held in the War Memorial Building in Trenton.

Mark, a junior at Notre Dame High School, entered a project entitled "Measuring Molecules Using the Langmuir Molecular Film Balance." The project received first place awards from the Junior Engineering Technical Society, the New Jersey National Bank, and the National Council of Mathematics. It also took second place in the Senior Physical category, and won additional awards from NASA, the Air Force and the Navy.

Mark Brown, who recently received a number of awards in the Greater Trenton Science Fair, poses with his mom, Mary Ann Brown (right) and his science teacher, Richard Gusciora (left).

Mark, 17, plans to major in engineering when he enters college. His hobbies include science, jogging, bike hikes, golf, flying model airplanes, fishing and water skiing.

Brian, a 12-year-old sixth grader at St. Paul's School, entered a project called "Surface Tension Experiments" in the science fair. The project received a first place award in the Elementary "A" Division, a third place award from the Junior Engineering Technical Society, and the Pitman-Moore Award.

Brian, who also plans to attend college, shares most of his brother's interests. Both boys are also accomplished organists, according to their proud mom.

Thank You

Employee Relations Supervisor Len Thomas expressed special thanks to George Clark, Jack Haggerty, Gerry Hart and Ed Gilsenan for their assistance in preparing the garden areas for use this year. "The speedy manner in which they performed their tasks has given our growers an early planting season," Thomas added.

Seminar Slated

Roberta Gernhardt from the main campus Personnel Office and Don Betterton, director of undergraduate financial aid, will present a seminar on "Financing Children's Education" in the M.B. Gottlieb auditorium.

The seminar, which will cover University-provided benefits and other financial sources available, will be presented May 19 for employees whose last names begin with A through M. Employees whose last names begin with N through Z should attend the May 21 session.

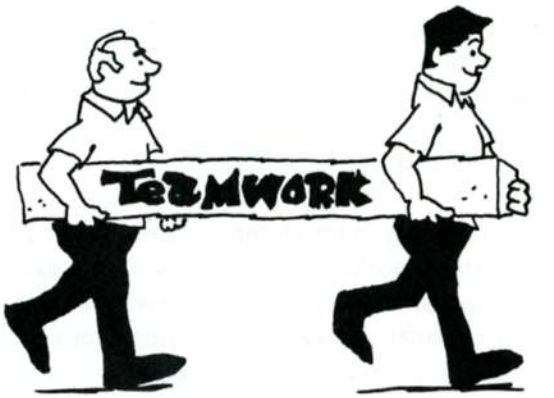
Both sessions will be held from 3 to 4 p.m. in the auditorium.

Getting A "Lift"

To be sure lifting and carrying doesn't become a real pain, follow the simple safety guidelines listed below:

Before lifting, consider the load's weight, size and shape —— and your ability to handle it. Then step close to the load, placing your feet 8 to 12 inches apart for good balance. Bend at the knees, get a secure handhold on the load, and lift straight up using leg and back muscles. Keep the load close to your body as you lift it into carrying position. Reverse the procedure when setting the load down.

Be sure to turn by moving your feet while carrying the load, avoiding twisting motions that may cause back injuries. Strain can also be eliminated by storing heavy objects at least 12 inches above the floor, and by using a ladder rather than chairs or stacked boxes to reach overhead objects. And when stacking objects to be lifted, make sure your view will remain clear while you're carrying them.



Teamwork counts when two people are lifting and carrying, especially in the case of a long object. Make sure the load is evenly distributed, and coordinate lifting and turning motions. The load should be held on the same side of the body at the same level for both people carrying it.

Art Exhibit

An overview of contemporary North Carolina art is currently on display at The Squibb Gallery. The exhibition will continue until May 27.

Works represented in "The Art of North Carolina" were selected by a jury of North Carolina Museum of Art staff members. The works of 30 artists are displayed, including pieces by George Bireline, Peter Plagens, Robin Lehrer, Frank Faulkner, Maud Gatewood and McDonald Bane.

The Squibb Gallery is located in the world headquarters of E.R. Squibb & Sons, Inc. three miles south of Princeton on Route 206. Gallery hours are 9 a.m. to 5 p.m. Monday through Friday, with hours extended to 9 p.m. Thursday. Weekend hours are from 1 to 5 p.m.

Great Adventure Tickets

The Employee Relations section has recently acquired free family discount tickets from Great Adventure. If you are interested, stop by the Personnel building, B-Site, and pick up your ticket.

Obituary

Ridgeway L. Challiner, 73 of Trenton died April 23 in Mercer Medical Center. Born in Trenton, he was a lifelong area resident. Mr. Challiner worked in the PPL Vacuum Shop, and retired in 1970 after eight years of service.

To The Editor Of HOTLINE:

It was said recently that TFTR had better work, or the Federal government would want our heads on a serving tray. One might add that if such a general disaster were due to erroneous operation of a minor subsystem, the lead engineer would be keel-hauled and quartered besides.

The human body is much more complicated than TFTR, but it works surprisingly well —— except that we sometimes let it go to pieces through failure in a small subsystem. An obstruction of less than one gram in one of the coronary arteries can ruin a body weighing 100,000 times as much.

Sadly enough, this operational error occurs frequently. Some 120 of the present PPL staff may die from it prematurely (before retirement age) unless something is done. That 'something' requires no new research, simply an application of what has been known for a long time.

Figure 1 is a mechanical engineering view of the cardiac system. The two main arteries sit on top of the heart, and from a distance they look somewhat like a crown (hence the name coronary arteries). They are the first taps off the aorta and conduct blood to the heart muscle itself, taking about 5% of the total blood flow in the body. They are of fairly small bore but short, making the pressure drop minor and the blood flow adequate. If the owner of the heart is exerting himself, the heart will pump faster and the heart

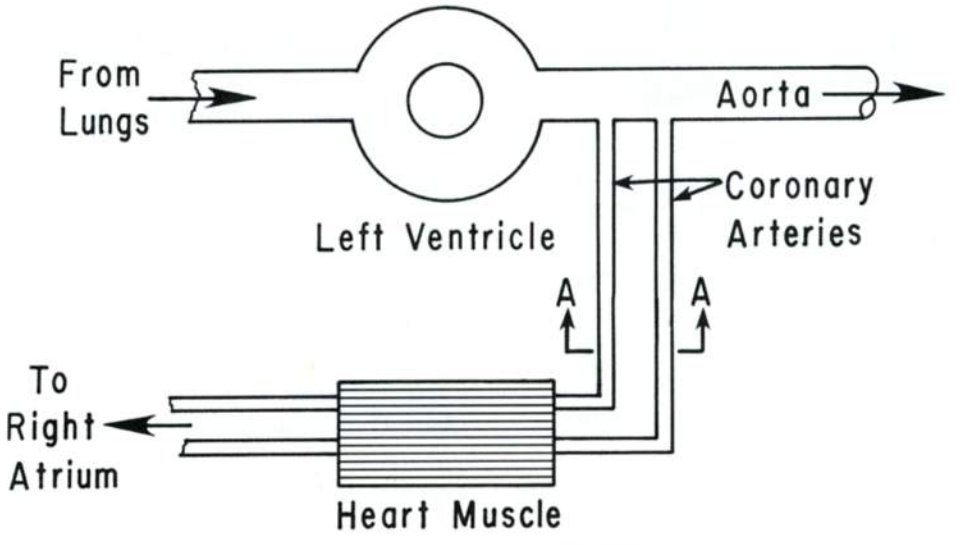


Fig.1 THE HEART AS A PUMP-PARTIAL AND SCHEMATIC

muscle will need more blood per unit of time. The system is designed so that normally there is always sufficient blood for the heart muscle's own use.

When the owner of the heart gets older (i.e., above 20), tiny deposits may form on the inside of numerous arteries, gradually obstructing the flow. This is particularly undesirable in the coronary arteries, because of their small bore and their important function in the body. But since they are located at the point of highest pressure in the system and the deposits are local, the pressure drop is manageable and the blood flow remains ample. The owner is seldom aware of the deposits, even if they get as extensive locally as shown in Figure 2B.

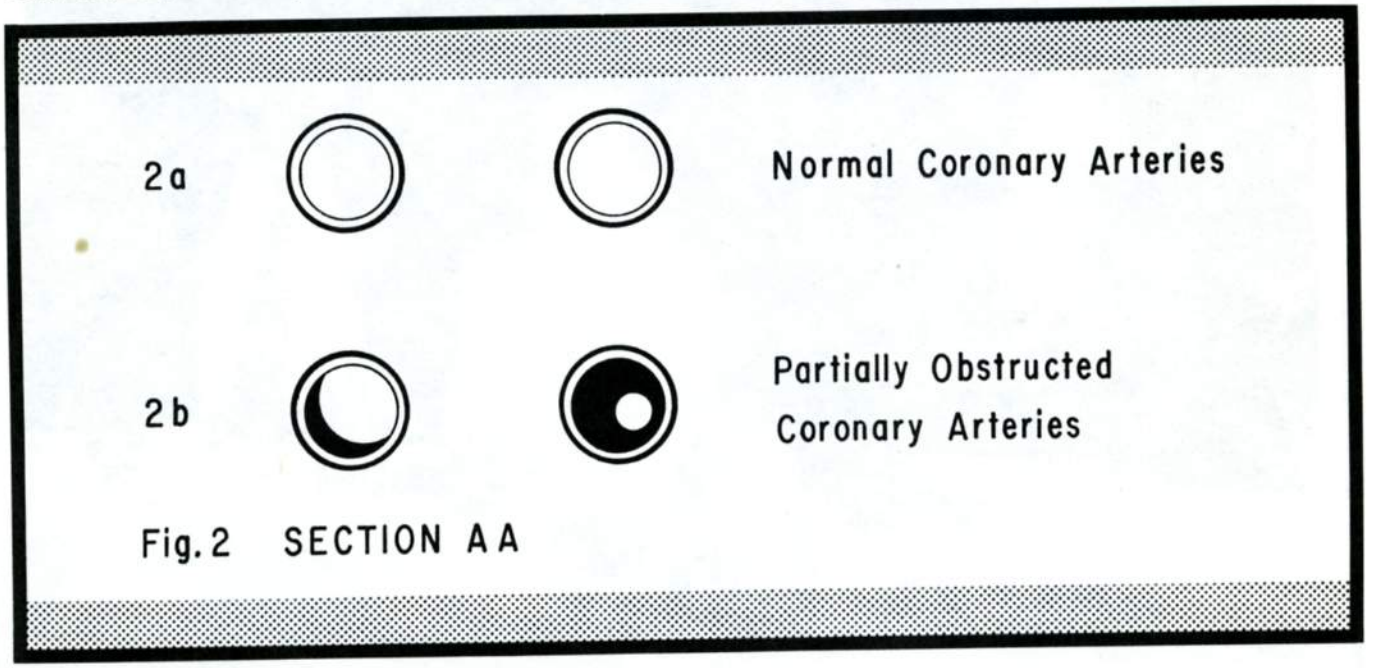


Fig. 2 SECTION AA

On a bad day, a small clot may become lodged in an obstruction and interrupt the flow completely. The technical term is *ischemic heart disease:* the common word is heart attack. It can be mild (meaning that the patient recovers) or of the other kind. The prognosis depends in part on the location of the blockage: the further downstream the better, because less of the heart muscle is affected.

A patient who has recovered from a heart attack can often go back to work, even very demanding work. LBJ had a heart attack in 1955 and was President of the USA from 1963 to 1968. But the underlying cause of the disease is not eliminated after recovery: the deposits, once formed, do not disappear. One may just hope that actual conditions for a blockage will be few and far between. A radical improvement can come from surgically cutting out the offending tube and replacing it by a healthy one at a cost of $10,000 and upwards.

Angina is an intermediate situation where the pressure drop across the narrow artery becomes too large and the blood flow becomes insufficient, although there is no complete blockage. Relief follows engineering rules: take a rest to reduce the demand on the system and take medicine to widen the arteries. Avoid smoking, because nicotine has the opposite effect: it causes the arteries of the body (including the coronaries) to constrict.

Since I started at PPL the year before last, I have noticed a sizeable number of skilled technical people (among them a number of highly respected colleagues) who have behaved as if the laws of physics, mechanical engineering and fluid flow apply to TFTR and everything else —— except to their own internal piping system. The human body is too complicated, they say, and besides, blood is not a Newtonian fluid, so why worry?

I hope to give some practical suggestions in rebuttal in another letter to the Editor.

E. de Haas

Graphic artist Jerry Motyka, his wife Lorraine, and laboratory director emeritus Melvin B. Gottlieb share a chuckle while reminiscing during Jerry's retirement dinner recently. Jerry, who retired after 23 years with PPL, received a hand-made card commemorating his artwork, and a gift certificate for art supplies.

Electrical Fire Rules

PPL Fire Chief Jack Anderson offers these guidelines for dealing with a minor electrical fire:

If an electrical appliance you are using emits a burning odor or begins to smoke, turn it off *immediately* and pull its plug from the electrical outlet. DO NOT attempt to use the appliance again until repairs are made.

An appliance on fire is also an electric shock hazard. DO NOT touch the appliance. Attempt to extinguish the flames with a dry chemical or carbon dioxide (CO_2) extinguisher; DO NOT ATTEMPT TO EXTINGUISH ELECTRICAL FIRES WITH WATER!

Remember to pull the appliance's plug from the electrical outlet. If this is not possible, turn off the electricity at the main power switch (the circuit breaker or fuse box).

If you receive a shock from an appliance, immediately remove the plug from the electrical outlet. If the appliance is small —— an iron, toaster or mixer, for example —— attach a tag saying "Don't Use – Shock Hazard" to the plug. Then store the appliance away so no one else will attempt to use it until it has been repaired.

For large appliances, contact your repairman promptly.