SHACKNEWS

HIGHVELD AMATEUR RADIO CLUB

July 2013

We're on

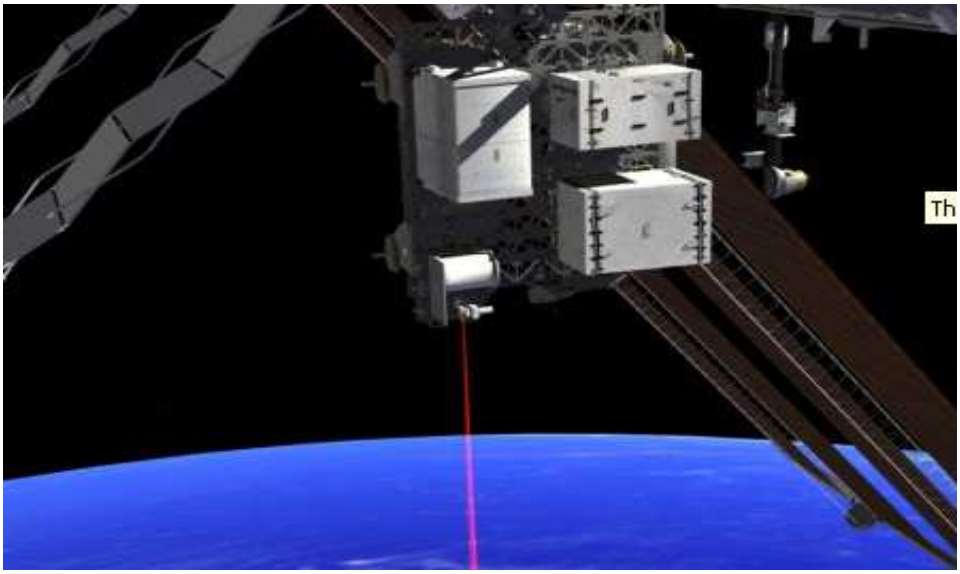
COMMUNICATION IS THE NAME OF THE GAME

Apologies for the long delay in publishing an issue of this newsletter.
Much has happened since January. The club chairman, Ton ZS6ANA, passed away and has left a gap in the club-he will be missed by all. A long standing friend of mine and many time visitor to the club, Andre ZS6ABZ has also passed away. And recently, Ingrid, the wife of Rex, ZS6REX and mother of Giezela, ZR6FXY passed away.

The last meeting of the club held on the 20th July did not see a large turn out of members. This is bit of a concern as the next meeting in August is the AGM and a quorum is needed to move forward. Notices to the effect are attached.

NASA's OPALS will use lasers to improve comms with the ISS

Thanks Selwyn



In internet engineering, there's a problem called the "last half mile," which looks at how to connect users to high-speed fiber optic networks without going through old-fashioned copper wires that can slow data down to a crawl. NASA has more of a "last 250 miles" problem in making data connections with the International Space Station (ISS). The upcoming Optical Payload for Lasercomm Science (OPALS) project is an optical technology demonstration for using lasers to improve communications with the ISS and other spacecraft in hopes of boosting connection speeds by a factor of 10 to 100.
You'd think that lasers and space travel would go together like Captain Kirk and phasers, but aside from zapping rocks on Mars, they don't get much of a look in – at least, in terms of shooting them across thousands of miles. True, scientists bounced a laser off the Moon in 1962 and they've been aiming them at reflectors set up on the lunar surface by the Apollo astronauts, or in geodetic satellites, but otherwise all the long distance stuff has been pretty much left to the radio bands.

Space travel is currently undergoing something of a renaissance, however, as commercial companies take a greater interest in the final frontier. The problem is that as technology becomes more sophisticated and the missions more ambitious, the communications systems need to keep up with an ever increasing flow of information. Conventional radio links are like hooking an old telephone line to a fiber optic cable, so

something better is needed. In the case of OPALS, it's lasers.

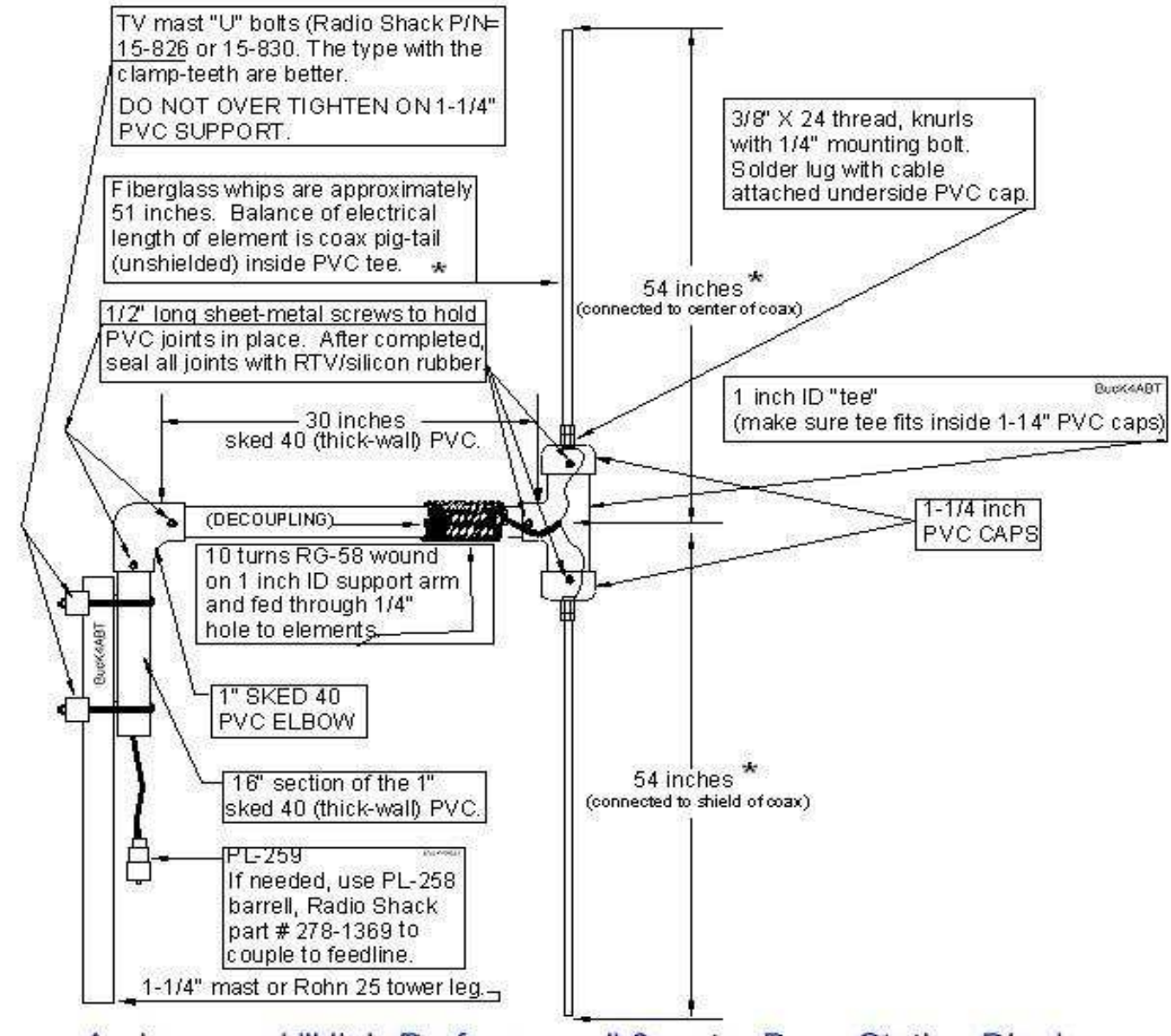
"OPALS represents a tangible stepping stone for laser communications, and the International Space Station is a great platform for an experiment like this," says Michael Kokorowski, OPALS project manager at the Jet Propulsion Laboratory (JPL) in Pasadena, California. "Future operational laser communication systems will have the ability to transmit more data from spacecraft down to the ground than they currently do, mitigating a significant bottleneck for scientific investigations and commercial ventures."

OPALS consists of a sealed container holding the avionics in a pressurized environment. This is connected to an optical gimbal transceiver, an uplink camera and a laser collimator. The package will be sent to the ISS in December aboard a Dragon supply ship and will be mounted outside the station where it will run for 90 days.

Back on Earth, JPL's Optical Communications Telescope Laboratory in Wrightwood, California will shoot out a laser beacon through its telescope in the direction of the ISS. The OPALS package will home in on this and lock on using a closed loop control system and a two-axis gimbal. When the line of sight is clear, the system will download a formatted video using a laser beam for 100 seconds.

"It's like aiming a laser pointer continuously for two minutes at a dot the diameter of a human hair from 30 feet away while you're walking," says OPALS systems engineer Bogdan Oaida of JPL.

For those into 6M-a simple dipole antenna **Submitted by Doug ZS6BXU**



The “S” meter found somewhere on the WWW

An "S" meter is fitted to some radio's (Communication Receivers) to allow the user to determine the signal strength of the transmission being heard. But What does this all mean?

As a guide; S9 on the S meter scale is reckoned to be equal to a potential of 50 uV signal voltage at the receivers aerial input. Also each "S" point is said to represent a 6 db change (up or down).
A 6 db change coincidentally represents a doubling (or halving) of a voltage before/after the aforesaid change. Recalling the well known textbook formula:

Therefore the relationship of “S" meter reading to input signal voltage obeys the law

$uV = k\ 2^{s}$ [k is a constant (derivation shown soon!)]

That is; because of the signal voltage doubling for each increase in "S~' point the signal voltage is directly proportional to the base 2 raised to an exponent being the "S" number. To bring this into some perspective:

If 50 uV represents S9, then substituting in the above formula

$50 = k \times 2^{9}$

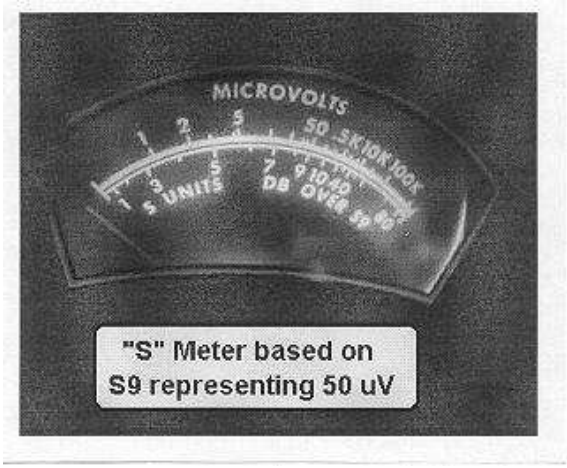
therefore $k = 50/512$

To obtain (say) the signal voltage corresponding to S4 we can substitute in the above formula

$uV = k\ 2^{s}$
$= 50/512 \times 2^{4}$
$= 50/32$
$= 1.5625$ uV

Constructing a table of values based on the above we get:

“S” reading	Voltage at RX input
9	50 uV
8	25 uV
7	12.5 uV
6	6.25 uV
5	3.125 uV
4	1.5625 uV
3	0.781 uV
2	0.39 uV
1	0.195 uV



Therefore: as you can see, each change in "S” point represents a doubling (or halving) of its immediate predecessor, all referenced to S9 being 50 uV (Some archaic texts suggest S9 as being 100uV), but the principle is still the same. Simple really !

Believe it or not

This story happened in a little town in Mexico, and even when it sounds like an Alfred Hitchcock tale it's real. This guy was on the side of the road hitch hiking on a very dark night and in the middle of a storm. The night was rolling and no car went by, the storm was so strong he could hardly see a few feet ahead of him.
Suddenly he saw a car coming towards him and stop. The guy without thinking about it got in the car and closes the door - just to realise there's nobody behind the wheel! The car starts moving forward slowly. The guy looks at the road and sees a curve coming his way, scared he starts to pray, begging for his life.
He hasn't come out of shock, when just before he hits the curve, a hand appears through the window and moves the wheel!
The guy, paralysed in terror, watched how the hand appears every time they are before a curve. The guy gathering strength gets out of the car and runs to the nearest town.
Wet and in shock goes to a cantina and asks for two shots of tequila, and starts telling everybody about the horrible experience he went through. A silence enveloped everybody when they realise the guy was crying and wasn't drunk. About half an hour later two guys walked in the same cantina and one says to the other: "Look Pepe, that's the *xyz* that got in the car when we were pushing it!!!"

CLUB INFORMATION

Postal address PO Box 19937 Sunward Park 1470

Website http://www.zs6hvb.za.net
Back Issues of Shacknews available on the club website
e-mail zs6hvb@zs6hvb.za.net
Repeater 145.1875 MHz input - 145.7875 MHZ output

Bulletins Sunday morning - 145.7875 MHz & 7062 KHz @ 08h45.
Relay - 80M - 3662Khz (Winter) 30M - 10.132Mhz (Sum)

Monthly meeting venue

Germiston Methodist Church
Room at back of the offices
Lady Duncan Rd
Germiston

3rd Saturday of the month at 14:30

Committee

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