

4-11-2016 DSES Technical Planning Meeting Minutes Rev. C Web Version

Location and Time: The 17th DSES Engineering and Planning meeting was held on Monday, April 11th.

Attendance: Myron Babcock, Ed Corn, Floyd Glick. Michael Lowe, Bill Miller, David Molter, Steve Plock, Dr. Richard Russel, Bob Sayers, Ray Uberecken

Attending Remote: Don Fraser and Mike Hoffet via Team Viewer.

Agenda:

1. CSVHF conference in Rochester MN, July 28-31 and Microwave Update in St. Louis, Oct. 13-15. [Ray]
Richard Russel has volunteered to write the presentation for Central States VHF.
2. Certification of Operators for generator and antenna [Ed Corn, Ray, Rich Russel]
 - a. Bill, Rich, Dave and Steve have all been certified by Ed Corn for the Startup/Shutdown procedures for the generator. Please see Ed for training and certification sign off on your next trip to the site or you won't be able to startup the site.
 - b. The same will be the case for the 60ft dish movement. Each participant will need certification to control the dish. We only have one dish so let's protect it with best practices. Ed and Ray will provide a certification procedure for dish movement.
3. Position readout progress and timeline. Ra/Dec into Az/EI [Dave Molter]
 - a. Dave and Glenn Davis bread boarded the interface electronics for the decoders. They made a trip to Plishner on the 9th with Steve and Ed and with Steve's expertise of the dish control and help attached the breadboard with a laptop to the dish encoders at the control deck in the pedestal.
 - b. A calibration procedure was run setting the dish at 0 deg (vertical), 45 deg and 90deg (Horizontal or Stow) Elevations.
 - c. They also sighted three points on the horizon in azimuth with the dish and measured the encoder outputs.
 - d. Conclusions were that the encoders are working properly with no missing bits as was the case with the spare sample encoder that Dave was working with. The results were very good with the encoder data only slightly different by a few counts from the calculated expectation. Data collected shown:

Elevation	0	45	90
Calculated	3587	3075	2563
Observed	3587	3075	2568

Azimuth	0	45	54.21	90	135	180	225	270	315
Calculated	1975	1463	1358.210	951	439	4023	3511	2999	2487
Observed	1975	?	1366	?	?	?	?	?	2453

- e. The readout was on a laptop via RS232 at the control deck and the next step will be to transfer this with by coding the Raspberry Pie Microcontroller in the pedestal and sending the output via CAT5 to the laptop in the comm. trailer.
- f. A conversion from Az/EI to Ra/Dec will need to be done in the laptop to match with a star atlas program for manual tracking and later converted to automatic but that is not necessary for near term objectives such as VHF contesting and moon bounce.
- g. There are a number of cleanup items needed in the control box and the interface to the

dish like removing the ceramic slip ring and adding strain relief and sealed conduit from the control box to the interface box and reversing the plug on one end of the Cat5 cable.

4. Pedestal Electrical [Ed Corn]
 - a. Ed has all of the electrical items cleaned up in the comm. trailer including a 240VAC outlets in both trailer and bunker. The pedestal is the next area of focus for Ed.
 - b. There is already inverter power from the 1800 Watt inverter Ed installed in the battery shack running in the comm. trailer and in the pedestal on red colored fixtures. Ed will install a light switch near the pedestal door that will power lights at all levels of the pedestal running from inverter power so work can be done without generator power. An outside light would also be handy to be sure the switch is off when locking up the pedestal and leaving the site.
 - c. Ed will add a sub mains panel in the control deck on the right side of the control box. Certification of operators for the dish will include the light switch and turning on AC breaker from the generator. Ed will draft a process for the certification.
5. Trailer Cleanup and Operational Position [Ray]
 - a. The trailer cleanup is underway as Steve and Ed did a lot in that regard on the last trip.
 - b. More is needed to have a good operational state. The batteries need to be moved to the battery shack and the tables need to be rearranged for operational efficiency and access to the equipment rack.
 - c. Rays 446Mz - 8 relay remote control link is installed and was checked on site but was not reachable from Ray's house probably due to insufficient gain from his 432Mhz antenna. Another antenna will be tried.
 - d. The onsite experiment laptop went offline again last week. It must be reconfigured without battery and with boot sequence and startup file to be remotely powered off and rebooted from this link. Rich will work on this on his next trip.
 - e. The GMRS to Wifi Hot Spot is currently powered from the small solar controller USB port which can drop if battery voltage is too low. This should be moved to the laptop USB port so the laptop and hotspot are rebootable together from the remote link.
6. Ham Station [Ray and Myron Babcock]
 - a. Rays ICOM 706 is installed in the comm. trailer as a site station. The new fan dipole Ray installed was used on 40 meters with good results. Ray did a full frequency scan of the multi-band fan dipole and needs to crunch the data to determine if tuning is need on any of the elements.
7. Contest Weekends are:
 - i. June 11th-13th VHF and the first Moon Bounce contest and we want the site ready for it. The next one is in Oct. or Nov.
 - ii. UHF August 6-7
 - iii. VHF September 10-12
 - b. Steve has applied for a club call requesting K0PRT, Kilo-Zero-Plishner-Radio-Telescope.
8. Radio Astronomy Certifications[Richard Russel]
 - a. If Rich certifies two additional people the organization can become the national certification body.
 - b. The Lyrid meteor shower will come up this week from April 19th to the 25 reaching its maximum activity on April 23rd, next Saturday. Use a dipole at 55.25Mhz, and Radio Sky Pipe program attached to a receiver to log the "dings" heard from the reflections from the ionization trails. Sky Pipe can be set up to log these and correlate to meteor count. This is one of the elements for certification so get your ears on for meteor scatter.
 - c. The data from this and previous meteor scatter events is logged on the computer at Rich's place. (Contact Rich for access to the data)
 - d. Paid members and bonified students can get access to this and other data for experimental research.
 - e. Student projects and science fair projects may use the data and we can make a DSES

the "Best Radio Astronomy" science award and a reach out for science students. Ed's school science fair is a good example.

- f. There is an upcoming Satellite launch for Cornell on Oct. 4th and we could assist in verifying the track speed on 435-440Mhz if capable of 0.81 deg/sec. This is a controversial subject as many members don't want to use the dish for sat tracking as a risky proposition with too little angular velocity to do it well. Table this for now.
 - g. Radio Jove: Rich explained the operation of the phased array of the radio Jove antenna. Plans to increase the number of elements in the future for greater sensitivity and gain.
9. Web Page [Rich]
- a. Dan Martin looked for the DSES.org URL and had trouble finding it. If it can't be procured he may have to get another ISP to host it or a new one. (after the meeting Floyde and Bill did a WHOIS lookup on the site and sent the data to Rich to help with that) Some more research is needed before moving the site.
10. Bunker Staircase [Bob Sayers and Bill Miller]
- a. Bill brought back one of the stairs from his last trip and gave it to Bob.
 - b. Bob procured some 3" ID schedule 40 pipe for the stair collars from Western Steel.
 - c. Need a little more pipe and some 1.5" x 3/16" angle iron for the stairs as well as some 2x4 Trex or wood pieces for the stair surface.
 - d. Also need about 6 feet of additional 2.5" ID schedule 40 pipe, 3 feet of 2" pipe for the staircase support stand extension and about 7 count of 39"x1"x1" square tube stock for the banister and a banister pipe.
 - e. Bill has prices from Western Steel Colorado Springs and Martin Pipe and Steel in Rocky Ford. Still need to call Glazier Steel and Metal Mart in CS to find the cheapest used material.
 - f. Bobs metal worker neighbor has said he'll help with the fabrication of the stairs.
 - g. Steve Polk has a portable band saw he will lend to the fabrication and can help with the welding.
 - h. Bill will redraw the plans with more accurate dimensions.
 - i. Once material is procured the fabrication can begin.
 - j. Next step is to procure a metal door for the doghouse. Need the door and frame set with magnetic seal.
 - k. Should be able to finish this project by the early summer.
11. 10.7 cm solar telescope [<http://mscir.tripod.com/parabola/>] [Ray]
- a. The above site is an excellent calculator and method for determining the focal point of an offset feed dish. Check it out.
 - b. Have all of the electronics for the 10.7 CM solar experiment in a metal box and ready to transfer back to Rich
 - c. Also see very useful microwave site: <http://www.qsl.net/n1bwt/contents.htm> also see <http://www.qsl.net/w1ghz/> for Paul Wades microwave antenna projects and handbook.
12. Plishner data pipe or Internet Connectivity [Rich and Bill]
- a. As previously stated the link is down and a mystery
 - b. Next person at the site please reset the computer and check it.
 - c. As previously stated the 5 mile WiFi link to Haswell is probably not practical needing 100ft tower at the school to get line of site.
 - d. Best to continue to use the WIFI hot spot and conserve connect time as much as possible.
13. Next trip to Haswell/Plishner
- a. Trip will tentatively be April 23rd by Ed, Steve, Dave and Bill weather permitting.
14. Other business:
- a. Bob Sayers would like to donate a Suzuki ATV 250 to the org. for use at the site. Motion

and second to accept was passed unanimously.

- b. We need another outbuilding to store the ATV and other material. Any ideas?
 - c. Bob would also like to donate a set of Eaton Receivers. These have high sensitivity and value in EMI work.
 - d. Myron donated power pole connectors with leads attached to install radios easily at the site, Steve wired them into the 12 volt DC busses and Ed hooked in and verified their serviceability.
 - e. Discussion on power and solar. Bill will provide a solar model spreadsheet for load balancing and system sizing for next meeting.
15. Meeting closed:

73,
Bill Miller
DSES Secretary