

## 2017-02-13 DSES Technical Planning Meeting Minutes

**Location and Time:** The DSES Annual Members Meeting will be held on **Monday February 13<sup>th</sup> at 5:30PM MST** at the Cumulus Media conference room at 6805 Corporate Dr. # 130, Colorado Springs, CO 80919.

**Attendance:** Bob Sayers, Drew Gary Agranat, Dr. Richard Russel, Laura Russel, Ed Corn, Steve Plock, Dave Molter, Bill Miller, Glenn Martin, Ray Uberecken, Floyd Glick

**Attending Remote:** Roger Henson joined by Team Viewer remotely.

**As usual if I have omitted anyone or miss represented anyone or anything here please feel free to correct me.**

### Agenda:

- Next Trip
- Board Election
- Officers
- Change of Address
- Call for Dues
- Last trip report
- Rich's experimental data
- Ray's Calculation for minimum capable flux density
- Ray's Multiband Feed modification presentation

**Next Trip:** Planned this Saturday February 18<sup>th</sup> and should be good weather, partly cloudy and 63 degrees with only a 2% chance of precept. Coordinate with Ray, Ed and Steve to meet at the Ellicot Fire Station at 7:30. There is also a Ham Swap fest at Adams County Fairgrounds in Brighton on Sunday.

**Changes to Last Meeting Minutes:** Michael caught my error, Thanks Michael.

"Power for the site:

Utility wants 34,650-\$36,616 for wire connection ~~3-phase~~ single phase 240V, 200 Amp service and \$30 per month minimum. This is up about 10K from the estimate of 5 years ago. (Correcting 3Phase to single phase. I believe that this is actually single split phase rural 240V.)"

**Board Member Election:** from last member meeting Dave Molter, Floyd Glick and Bill Miller were voted in as new board members.

**Nominations and Election of Officers:** Board Members convened an online meeting and appointed the following officer positions.

President

Dr. Rich Russel

Vice President	Steve Plock
Treasure	Myron Babcock
Secretary	Bill Miller

**Change of Address:** It was expressed in last meeting that we would like to change the official DSES Address to a more local one serving the majority of members more conveniently. To change the official address it needs to be done with a form submitted to the Secretary of State of Colorado for the official nonprofit incorporated address. We would like to change the address from Wayne Green's Longmont address to a more local one. It is considered that the address may need to be a permanent residence of a member or board member and not a PO Box. Will determine the requirement and submit the required paperwork.

Michael Lowe checked into this and has the following report.

"Today I went by a UPS store to send a package and looked into their mailboxes. 24 hr access, takes packages, will sign for postal notice mail, a real street address that will be accepted by almost every govt need, they will text when mail or packages arrive. Some of this was not available when I got my PakMail acct in 2003 - who were the only outfit then that worked that way. Cost is \$156 year, \$20 setup fee, for box key and cost of 24 hr front door key- Kinda pricey but keeps a full time address for the group. PakMail is more money and not as available. Some U-Haul places have the service, but they have some problems.

Take care,

Michael"

### **Call for Member Dues:**



Call for Member  
Dues.pdf

### **SARA Conference:**

The 2017 SARA Western Regional Conference will be held at the Pete V. Domenici Science Operations Center in Socorro, New Mexico on March 17 to 19, 2017. <http://radio-astronomy.org/> The abstracts are due on the 1<sup>st</sup> of February and the papers are due February 28. We have three abstracts submitted. Formatted paper deadline to the editor is Feb 25<sup>th</sup>.

**Last trip Report:** Trip was made, Saturday Feb. 4<sup>th</sup>. This was a general maintenance trip and orientation for new members.

The stair assembly was started and 6 stairs were installed on the spiral staircase in the bunker.

More wiring was completed in the comm. trailer

Two new members came onboard the site. Ray gave an orientation to Drew Bodker from Springs and Ed Johnson from Limon.

Worked on the feed point mechanical for the Multi-Band Feed mounting. This should greatly improve the remounting of the multiband antenna.

### Rich's Prototype Data:

Measuring deep sky emissions.

Rich's TS2000 transceiver was causing drop outs periodically when the cooling fan came on, modifying the gain of the receiver outside the normal signal standard deviation range.

Adding a fan on the top of the radio prevented the internal fan from coming on and eliminated the drop outs.

Then the temperature effects of the receiver and the preamp were seen, modifying the signal level fairly dramatically over the days run. The Sun heating of the preamp seems to be the problem. The Preamp gain varies greatly with temperature. Need to find a way to either stabilize the preamp gain and or temperature or mathematically subtract it out.

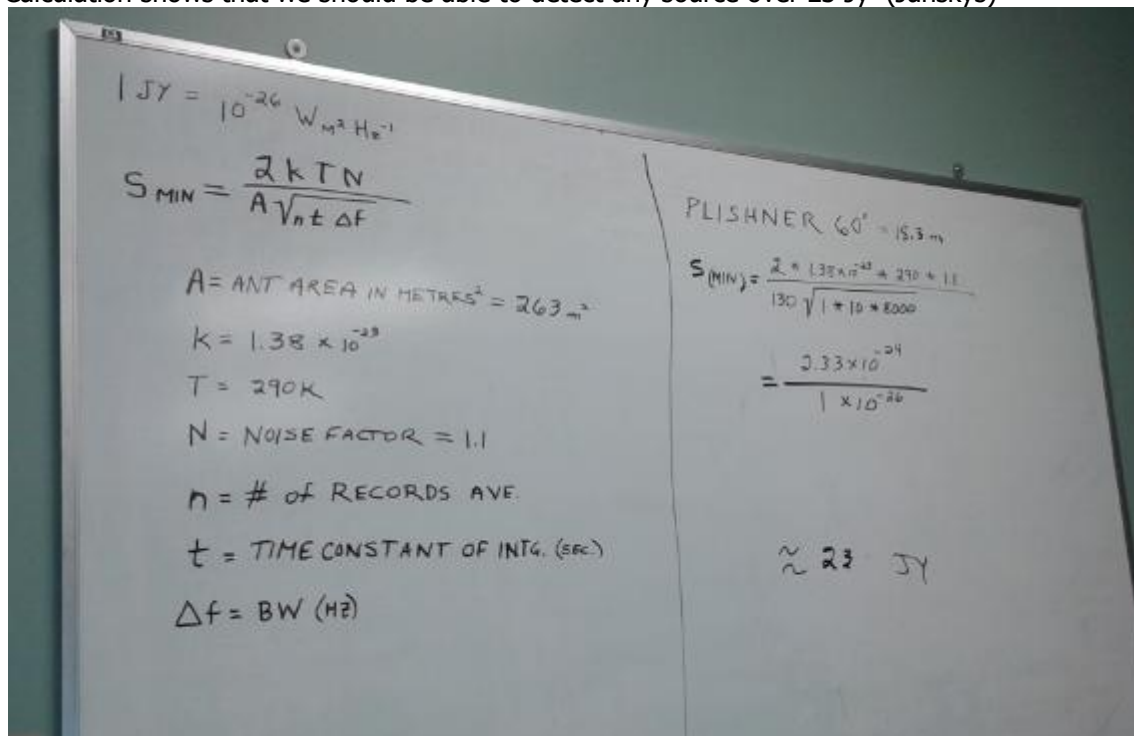
Rich is developing methods for capturing the data, modifying and filtering to reduce errors and false positives and determining the event validity and presenting the data in accurate and meaningful format. We will need to these techniques at the site to calibrate the receiver and preamps and make measurements of the background radiation and radio emitting objects.

### Rays Discussion of the Dish spectral flux density capability or minimum Janskys

"From Wikipedia, the free encyclopedia

The **jansky** (symbol **Jy**) is a non-SI unit of spectral [flux density](#),<sup>[1]</sup> or [spectral irradiance](#), used especially in [radio astronomy](#). It is equivalent to  $10^{-26}$  [watts](#) per [square meter](#) per [hertz](#). The unit is named after pioneering US radio astronomer [Karl Guthe Jansky](#) "

Calculation shows that we should be able to detect any source over 23 Jy (Janskys)



**Technical Discussion of Multiband Feed:**

Ray took the multiband feed to the PPRA meeting for Feb 8<sup>th</sup> at the IHop at Stetson Hills and Powers and was well received ;?)

Ray repaired the multiband feed, correcting the lead-in line short and made several other modifications and enhancements.

Any time we are doing ham radio the power switch on the Multiband Feed controller is on. When doing radio astronomy the switch is off.

Ray also modified the relay connection in the feed so that relays are in the right position to switch in the 50 ohm noise resistors when the radio astronomy switch is on.

The controller has a sequencer to prevent loading the transmitter into the backend of the preamps.

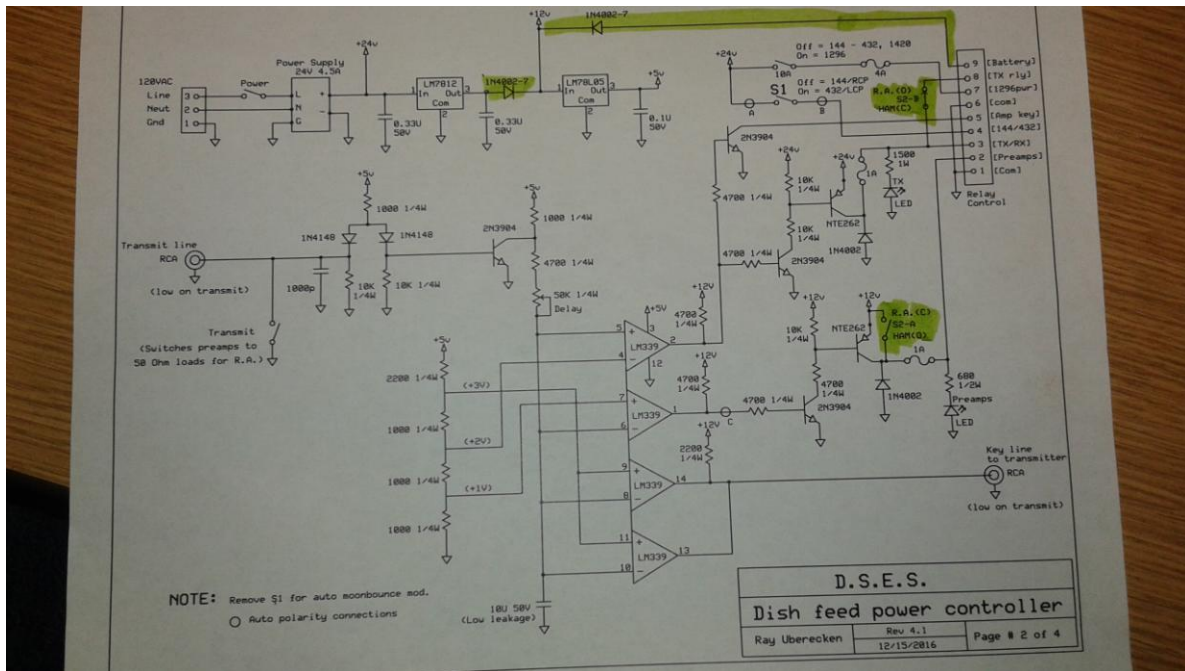
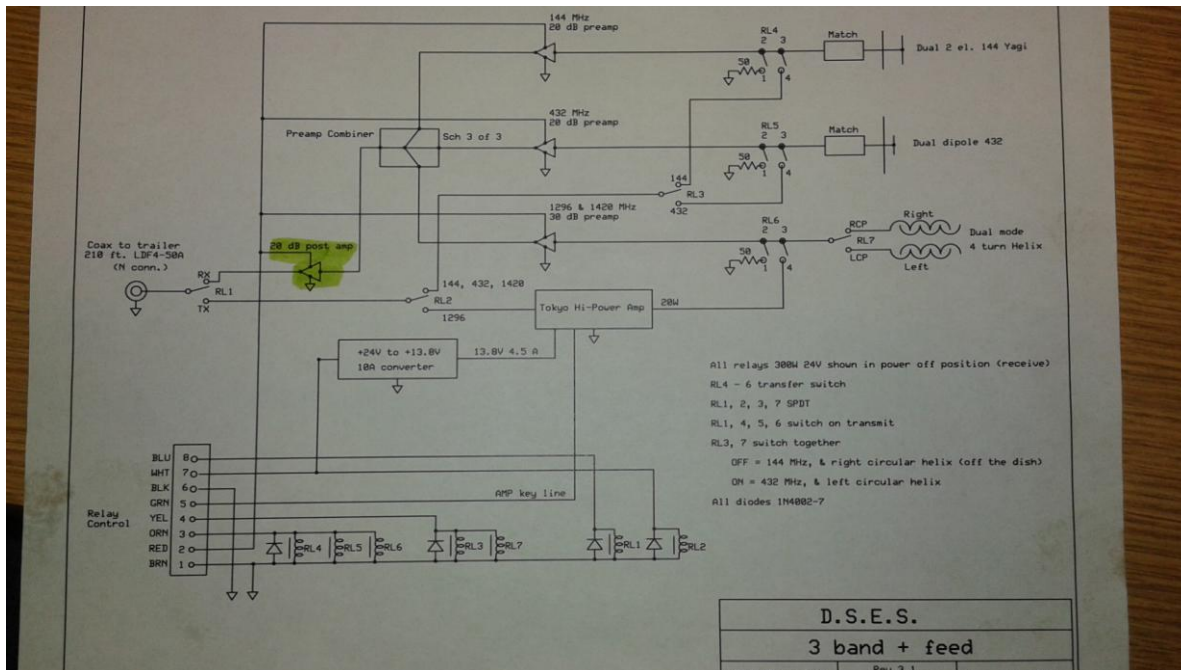
When leaving the site and reverting to radio astronomy all the switches on the controller are set to off or down.

The Multiband feed preamps are wideband and running wide open gain at 20-40dB. So they are not frequency selective and can be used across the bands with multiple receivers. They are also hyper sensitive and any RF source at the site and its harmonics will be amplified so need to minimize all sources.

We will gain tropospheric communication confidence with several of the more local guys that operate on those modes and frequencies.

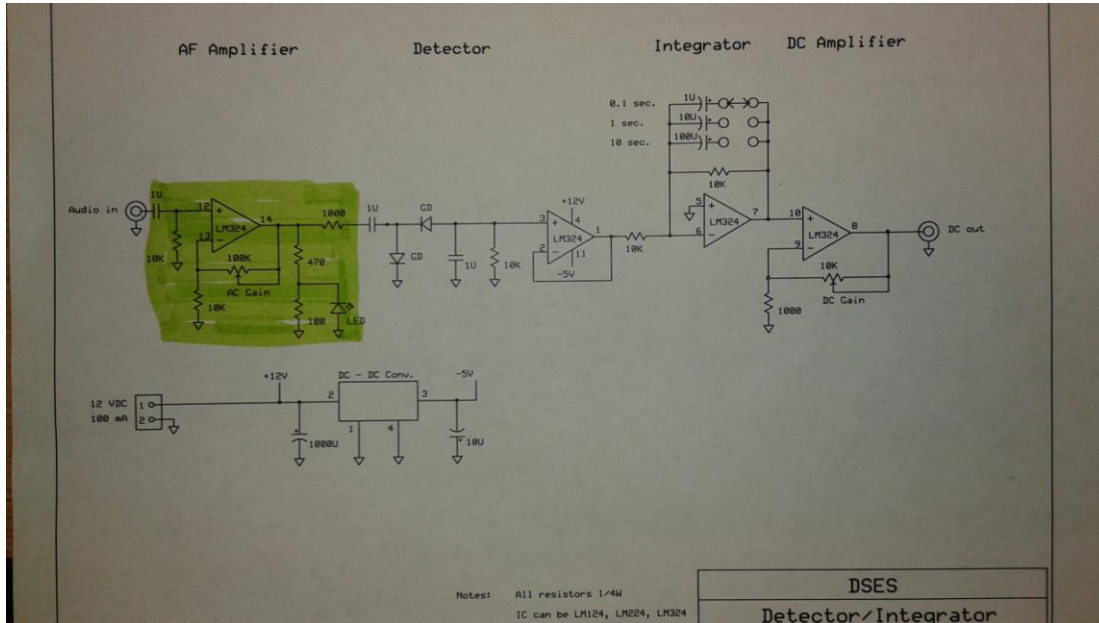
For tropospheric and moon bounce there is an automatic polarity reversal mechanism to correct the polarization between Transmit and Receive.

Should be able to do tropospheric, moon bounce and spectra cyber work as soon as the feed is reinstalled.



**Meteor Scatter:** Separate Meter Scatter receiver schematic presented. This is an add in to the standard FM receiver, picking off the 19KHz pilot signal of the receiver. The older the receiver to be modified the more likely that you can get to the discrete 19KHz pilot. Ray also had to kill the gain of the IF strip with a pot attenuator to make it work.

**Integrator Circuit:** Ray's separate circuit for the signal integrator can be used for many other signal purposes.



**Meeting Close:** Thanks for everyone's participation and great work!

73, and keep looking up!  
Bill Miller  
KCOFHN  
DSES Secretary

