November 10, 1966

Mr. Robert H. Rines
Rines and Rines
No. Ten Post Office Square
Boston, Massachusetts 02109

RE: UIF v. BT v. JFD

Dear Bob:

* I enclose copies of some material which has been produced by JFD, including the current agreement with Prof. Mayes and progress reports of the lab from January 18 through March 9, 1963. In the progress reports there are several mentions of double boom antennas. However, in the final document, a technical report by Prof. Mayes, it appears that the antenna may have been constructed for the Foundation in 1961.

* I also enclose the transcript of Prof. Mayes' deposition.

We have checked with Judge Hoffman's clerk. There are between 30 and 40 cases on Judge Hoffman's docket ahead of this one. It is unlikely the case will be placed on trial call before the first of the year and the clerk's best estimate is that it will not be reached for trial before the latter part of January or February. It may not be reached until later in the spring.

Mike Cass has inquired when they might expect the information and materials they have requested.

Very truly yours,

Richard S. Phillips

RSP:iag

* Enclosures

November 10, 1966

Mr. Myron C. Cass
Silverman & Cass
105 West Adams Street
Chicago, Illinois 60603

Dear Mike:

Thanks for the copy of the Mayes-JFD agreements and the progress reports for the period from January 18 through March 9, 1963.

I have asked Bob Rines when the material you have requested will be available. I will let you know as soon as I have a reply.

Our docket clerk checked with Judge Hoffman's clerk and found that there are 30-40 cases ahead of this one. We will probably go on the trial call after the first of the year but won't be reached before the latter part of January or February. Possibly it will be later than that.

Very truly yours,

Richard S. Phillips

RSP:lag

cc: Mr. Basil P. Mann
Mr. Robert H. Rines

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RECEIVED
NOV 9 1966
HOFGREN, WEGNER, ALLEN, STELLMAN & McCORD

November 8, 1966

Our Ref. 6-418

Richard S. Phillips, Esq.
Hofgren, Wegner, Allen, Stellman & McCord
20 North Wacker Drive
Chicago, Illinois 60606

Re: U. of I. Foundation v. Blonder-Tongue v. JFD

Dear Dick:

I enclose Xerox copies of Progress Reports from the JFD Research and Development Laboratories with respect to the Log Periodic Dipole Antenna for UHF. I have excised portions of these Progress Reports relating to antennas not involved in this litigation.

I enclose copies of the current Employment Contract between Mayes and JFD and Letter Agreement of September 24, 1964 extending the original contract.

Portions of the current contract have been blanked out at pages 2 and 3. Exhibit A referred to in Paragraph 2(B) has not been provided. Do you need this Exhibit A?

The other items which you requested are in the pipe line. When can I expect production of the items that I requested?

Cordially yours,

SILVERMAN & CASS

Myron C. Cass

MCC/gm
Encl.

cc: Basil P. Mann, Esq.

R&D LAB, ILLINOIS
JAN 25, 1963

To. Ed Finkel

00250

Mono- Progress Report to Date.

Work week of 54 hours for technicians. Exams are now over and will have 4 technicians full time next week. We have plenty for them to do.

All of Rhode & Schwarz equipment arrived today. Chief Eng. will check it out Monday; seems to be in good condition. It was well packed and there doesn't seem to be any damage due to shipping.

Antennas in progress to date:

No 1, Ready for testing.

No 2, 1 model ready for testing, 2nd model designed, but have not started construction.

No 3, Construction time 3 hours -- cutting elements to length.
Materials used -- 40', 3/8 Alum ButtSeam tubing.

No 4, Log-Periodic Dipole Array (Sheet Metal) Antenna for UHF.
Construction time 20 hours-- sheet metal layout, cutout, filing, bending, V-ing elements for strength, and epoxy to booms.
Materials used-- 1/32 Alum Sheet 36x36', ½ oz. epoxy.
Feed in line has been designed and tested on resistance card. Plastic spacers for two booms have been designed and tested on resistance card.

The remaining time in lab was spent in construction of additional work benches, building frame storage, secur ing power equipment to floor, and wiring work benches.

Antennas Nos 3&4 will be completed by next week. Paul has designs for a 5th antenna to begin construction next week.

Best regards

R&D LAB ILLINOIS

FEB 1, 65

00251

To Ed Finkel
Memo Progress Report to Date

Technicians worked a total of 182 hours this week.

Received partial shipment of General Radio and Scientific Atlanta equipment. Note of packing slip from Scientific Atlanta states Model RJ-2 Rotary Joint being shiped Jan 28, and Azimuth Positioner to be shiped Feb 12.

Equip. to be received as yet:
Nardo Freq Motor
Emerson-Cummings CVB9 Ecocoorb
Gen Radio Admittance Meter
Sci Atl Positioner and Rotary Joint.

Antennas in Progress:

No 3 Log-Periodic Resonent-V. Construction time this week- 48 hrs.

No 4 Log-Periodic Dipole Array (Sheet Metal). Construction time this week- 7 hrs. Testing time- 3 hrs. Time spent in sanding excess epoxy from boom and construction of transmission line. Three hours for impedence measurment. This model is completed and ready for further testing.

No 5 Log-Periodic Dipole Array (Indoor Model) for UHF. Four dummy models constructed in the range of Alpha equals 25 to 45 degrees. Performance for all four should be the same, dummy models built to check appearance. Alpha equals 40 degrees model choosen for tests. Bases built for dummy models can be used for working model.

We have experimented with the 7/8'' square tubing and 12 gage wire for transmissions lines on the Rhode and Schwarz and found it to give characteristic impedence of 150 ohms; which will be used as transmission lines for all projects.

All equipment received so far has been checked out. Construction of transmitting antenna has been started. Antenna mount for test range goes up tomorrow (Sat). Testing shack on roof was wired and shelves built this week.

C0252

For the first time with the arrival of testing equipment we begin to look like a testing lab. Absorbing material should arrive Sat or Monday, it was shiped 1/20, and construction of dark room will be underway next week.

Ed, I am suggesting a pay increase for technician Ury Priel. Priel was hired at a starting pay of $1.35 an hour. So far he has been given most of the more difficult assignments, and has carried them all out with ease. He is a very capable technician and has displayed responsible initiative. He has turned out to be one of the most capable technicians hired so far. I believe him capable of more than $1.35 an hour.

Best regards, and hope to report results of testing next week.

00253

February 8, 1963

To: Ed Finkel
Memo: Progress Report to Date.

Technicians worked a total of 170½ hours this week.

Received Emmerson & Cummings absorbing material 2/06 and General Radio admittance meter 2/08.

Equipment to be received as yet:
Scientific Atlanta's Positioner and Rotary Joint.
Poly Technique's Frequency Meter.

Antennaes in Progress:

No 3 Log-Periodic Resonent-V. Construction time this week 15 hours. Elements epoxied and cured required 9 hours. Construction and placing of plastic spacer bars between booms and plastic connectors for feed line required another 5 hours. This antenna is now complete and ready for testing.

Recap— Projects No 1,2,3 & 4 completed and ready for complete testing process. Nothing further on No 5 this week.

Remaining hours spent in lab this week were in readying testing equipment. Impedance measuring bench was set up with equipment, placed on casters, and provided with a mount for antennaes to be rolled into dark room.

Microwave dark room was started Thursday and completed today, Friday. Measures 7½ W, 10 D, 6 H.

Testing Range receiving tower was constructed and ready for mounting. Antenna Mount for transmitting antenna required additional work, before it can be placed in position. A spring stop mechanism was added for controling heigth positioning. It hasn't been placed on test range as yet as anticipated.

Two transmitting antennaes have been constructed. Asbestos jig has been built for soldering elements. Elements have been cut for two more antennaes.

Two technicians have been trained for handling impedance bench. Andi UHF antenna was used for training model. Results on record from Andi tests, however can not verify accuracy of these results since they were results of training session.

Best Regards,

February 16, 1963 00254

To: Edward Finkel
Memo: Progress Report for Week 2/9-15

Technicians worked a total of 114½ hours this week, includes 41 hours for engineer.

All equipment has been received. Mast is ready to mount on azimuth positioner. Azimuth positioner, pattern recorder, and indicator unit are being wired; and should be ready to move up to roof late this afternoon. Final construction for transmitting antenna are planned for this afternoon. Test range should be operational next week.

It takes more time to string cable and wire instruments than one would expect.

Polystyrene mounts have been made for all antennas under progress, and antennas Nos 1-4 are ready for testing. One model of project no 1 has been tested for impedance and standing xxxxx wave ratio. Would rather not send results of these tests at this time. There is some doubt as to the reliability due to set up of testing equipment. Will send testing results as soon as it can be predicted that they are accurate and reliable. Indications are that this antenna has hopeful prospects.

Andi-UHF Antenna Tests. Slotted line impedance and standing wave ratiox measurements taken and plotted on Smith Charts. Same question as to reliability of results as was to project 1 test results.

Checks on testing apparatus set up and methods used are to be made next week. From this the one best method can be discerned using the equipment we have.

Item in question from Spracklens covering polystyrene plastic for $184.39.... 6 sheets; 2- ½x24x24, 2- 3/8x24x24, 2- 3/16x24x24. This is a supply that will last for a year or more. Realize that it is more expensive than plexaglass, however since it has a better dielectric constant for insulators on booms it was decided to go ahead and substitute for other inferior plastics.

No further projects scheduled since all out effort is being made for VHF testing of LPV series. Construction of 1/10 scale model of LPV-11 to be started next week.

Will be able to report technical data for Project No 1 as well as Andi antennas next week.

Best regards.

3/9/63

00255

To: Ed Finkel
Progress Report for week of 3/2-8

Worked a total of 128 hours this week, including 44 for Engineer.

Antenna Tests:

Project No 1, Radiation Patterns for Model A 4 hours.
Project No 4, Impedance measuremnts and Smith Chart Plotting 6 hours.
Admittance measurements and Smith Chart Plotting, 21 hours.
(21 hours included trouble shooting General Radio admittance meter)

Antenna Construction:

Project No 6, 18 hours total time spent on construction. We have really had difficulty with this project; epoxy not sticking, plastic mounts breaking, etc. Should be completed this week. Minature rivits for feeder line were put on today.

Paul discusses trouble with SLRD in his report. Hope to have it in operation next week. Weather had caused delay in the construction of tower we had ordered for VHF pattern range. Vendor promised delivery this week.

Making changes and additions to outside impedance measuring bench this week.

Looking forward to your visit.

Tom Reeder

00256

3/9
Technical Report

Pattern range was put into operation this week and a few patterns were taken on the ZZ-1A. Copies are enclosed. The patterns look very good up to 800 Mc where the beam starts to broaden. This is a front-end truncation effects and should be corrected by adding a few cells to the front end of the antenna. Adding additional small cells should also improve the VSWR at the higher frequencies (curve was included in last weeks report). Operation of the range has been hampered by a defect in the Rhode and Swartz SLRD signal generator. We have had to use the General Radio oscillator as a source on the range which makes it impossible to get pattern and impedance data at the same time. After telephone contact with Rhode & Swartz rep-engineer, our engineer is trouble-shooting the SLRD and hope to have it in service soon.

The termination of the LPDA (Project No 4) has been changed and a new impedance run was made. A VSWR plot is enclosed. This shows improvement over the curve previously sent, but doesn't yet measure up to expectations. Another modification of the rear termination has been made and new impedance measurements will be made.

The 1/10 scale model of LPV-8 is nearly completed. Pending repair of the SLRD should be possible to get patterns on this next week. A rooftop platform for measuring impedance on VHF antennas is under construction. Check out of General Radio admittance meter isunderway.

Also enclosed are copies of patterns on the VHF antenna using twin-boom construction which we constructed for the U of I Foundation in 1961. This is the antenna which I used at my home for several months, and was the basis of the statements about TV reception in the Microwave Journal article. These are sent for comparison with the LPV-8 patterns measured by Wingard (sent last week). A principal difference is to be noted in sidelobe level in the high band.

P. E. Mayes.

ROCKFORD LAB, ILLINOIS
MAY 18, 1963

00257

To. Ed Finkol

Mono- Progress report to date.

Slow week here. Technicians worked only 32 hours. Previously weekly average 70 hours. Reason, waiting for testing equip. & shipment of alum and brass from Brooklyn. Alum & brass arrived Wed. 16th.

Test Equip arrived to date;
1) Broadband Coaxial Crystal Mount, Microlab
2) Solid State Modulator, American Elec Lab
3) Standing Wave Indicator, H & P

Antennas in progress to date;

No 1, Log-Periodic ZigZag Antenna for UHF, 3-Models

No 2, Log-Periodic Dipole Antenna for UHF
Difficult to est. materials used for Paul brought much of the materials from the University Lab.
Total labor in construction to date- 21 hrs @ 28.35
One model with high impedance feeder has been completed, and is ready for testing. Second model with low impedance feeder and 4:1 transformer has been designed.

No 3, Log-Periodic Resonent-V Antenna for UHF
One model has been designed.

Final Exams at University next week. Anticipate slow week until exams are over. More testing equip should be in by then and Antenna No 3 is ready for construction. Antenna mount for testing range is nearly constructed and ready to be put in place.

Total initial opening costs for the lab were more than anticipated, however, I don't believe any unnecessary equipment or materials were purchased. Will furnish detail listing of purchases if not available from your accounting office.

Best regards

April 13, 1963

To: Edward Finkel
Re: Progress Report for week of 4/5-12/63

Work week of 198 hours this week, partly due to University vacation and partly due to Sears visit.

Voltage regulator arrived 4/11. Installation will begin Monday.

Antenna Construction.

Project No 1, Production Prototype of Zigzag. Elemnts have been cut and finished, as you say last Tuesday, and have been mounted to the booms. Adaptor for mounting on mast has not been completed, nor has the feed system been completed. Expect about 6-8 hours of construction remains before model is ready for testing. Total of 39 hours has been spent on construction of final production prototype model. Total of 39 hours includes final modification to earlier zigzag models in preparing them for final round of testing.

Project No 9, UVLPV Series, Combination UHF-VHF Antennas. 10 hours construction time for UVLPV-17. This was the antenna constructed and tested last Monday (4/8) for Sears Tuesday meeting. A UVLPV-6 has been constructed from parts of regular LPV-6 series model, only angle and length of elements has been changed. Construction time has been shortened considerably with the use of parts received from Brooklyn of regular LPV series. 14 hours has been spent so far on scale models of UVLPV series for VHF tests.

Antenna Testing.

Project No 1, LPZZ-1-I. Patterns from 430 to 530 Mc. Model I is the same as Model H only with ½ cell added back to the rear. Note the tail on patterns of ZZ1H at 470Mc; tail is absent at 470 Mc on Model I. Patterns enclosed, note comment in Bauls report concerning removal of ½ cell from rear on production prototype.

Project No 9, UVLPV Series. Pattern range test time 6 element- 23 hours, 8 element- 3 hours, 11 element- 4 hours, and 17 element 17 hours. Total hours includes time spent on modifications, mountings and re-runs of patterns. Some changes were made in the mounting arrangemtns in order to remove as much metal as possible from mast on test range. Re-runs were made on some antennas to determine if metal on mast was causing reflections. Patterns enclosed.

RgK
12-14-66

April 13, 1963

To: Edward Finkel
Re: Technical Report by Prof. Mayes for week of 4/5-12

Pattern measurements have continued on the combination UHF-VHF antennas. We have designated this Project No 9. The enclosed patterns on UVLPV-17 show the effect of various angles of Ψ (See January Microwave Journal for definition of Ψ) on the UHF pattern performance. The best patterns have been obtained by using Ψ equal to 55 degrees on the largest 9 elements and Ψ equal to 60 degrees on the smallest 8 elements, identified on patterns as UVLPV-17-55/60. The improvements in the UHF patterns is evident by comparing the patterns for this case with the patterns for Ψ equal to 55 degrees on all elements (UVLPV-17-60). The Ψ of 55/60 combination should also be better than Ψ of 60 degrees as far as VHF performance is concerned. Scale models of the UVLPV series are under construction.

Patterns on UVLPV-6-55 are also enclosed. The principle problem here lies in the coverage from 470-500 Mc where the patterns are not yet usable.

The production prototype of LPZZ1 has not yet been completed but both elements are mounted on booms. The mast mount and lead connections are yet to be finished. Patterns on the LPZZ-11 are enclosed which show improvement in the low frequency front-to-back ratio over LPZZ-10. Patterns of the latter antenna were sent with the report of March 30. The F/B at 470 Mc has been increased from 14.8 db to 18.2 db and at 500 Mc and above is greater than 20 db. We will therefore use the rear truncation point of this antenna in the production prototype presently under construction.

Projects for next week are:

1) Complete LPZZ-1 and test pattern and impedance.
2) Design and construct first models of new series of combination UHF-VHF antennas. These will be designated UVLPV-5-Ψ, UVLPV-7-Ψ, and UVLPV-18-Ψ.
3) Design and construct and begin tests on set of standard dipoles for gain measurements.

Signed, Paul Mayes
Technical Consultant