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RSF/Report
(Dickler)

8 March 1976

MEMO TO: Cliff Murino
FROM : Dave Bargaen *JB*
SUBJECT: RSF Status Report - February 1976

HIGHLIGHTS

Checkout of the 15 PAM remote stations is underway. We expect to start the intercomparison test at Marshall by mid-March.

In the recent Washington meeting with NOAA/FGGE staff, we appear to have reached understanding on most aspects of the proposed Dropwindsonde Improvement Program.

Three buoys with our prototype pressure sensors were launched by the South Africans in late February, but we do not yet have data. Tests of the new FGGE Buoy Barometer are very promising. We are confident that we will meet our goal of delivering units which meet FGGE requirements by 1 May.

DISCUSSION

PAM - Fred Brock (022)

Magnetek has delivered a prototype power supply for the PAM remote stations that is 75% efficient. The new supply will reduce power consumption of the remote stations from 4.5 watts to 3.2 watts. An order has been placed for 15 supplies to be delivered by 1 April.

Checkout of the remote station equipment is underway. Almost all parts are in hand, and most subassemblies are complete. All remote transceivers are tuned and tested. We should begin the intercomparison test at Marshall between 9 March and 16 March.

Construction of a second tower-mounted rf package for the base station was begun. This will be delivered to FOF as a spare, to minimize down-time if the first unit is disabled by lightning or other problems.

Mark has designed a preamplifier/power amplifier for the remote station which looks very promising. Current plans call for testing this year and then building deliverable units in FY'77.

Good progress has been made in finalizing the plans for the Grover installation. Ed Elsberry, Mike Howard and Steve Semmer poured the base station tower pads at Grover and moved some PAM supplies into storage at the Chappel ranch. Ed also located some space at the Kimball airport for battery charging.

RDSS Video Recorder (029) - George Saum

The preliminary Operation & Maintenance Manual (actually a system proposal) was written, reviewed, and is ready for delivery to FOF for comments.

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Two 1 MHz phase lock loops have been built. One has a crystal oscillator with a lock range of 85 Hz and the other is an L-C oscillator with a lock range of approx. 450 Hz. The latter will probably be used, since it allows more variation in the radar local oscillator frequencies.

The allowable bit rate for housekeeping data has been measured. A rate of 8 kHz has been chosen as this is fast enough and provides ample safety factor for the tape machines. The housekeeping data format, resolution and channel assignments were made. We have ample capability for expanding the number of low data rate channels.

RDSS Computer System (029) - Vic Borgogno

The general purpose interface PC boards were received, and components have been ordered. The card reader from Documentation was received and operation was hindered because of an option which wasn't put into their interface. The NSF approval on the hardware multiply and divide boards along with the Hazeltine 1200 were obtained and we expect delivery on all items in 60 days. The front panel of the Cassette Reader/Recorder was reconfigured and installation made. The new version of the SOS was finally made operable after many problems with DG's software. The disk from DG was supposedly sent 1 March.

RDSS Processor/Display (029) - Vic Borgogno

The display circuitry of Grant's was reduced to a block diagram and investigations of what he has versus what we need will be undertaken. A decision to not buy the rather expensive paging system that Grant used was made when we found out the company increased the price by about \$1,000. We will probably order similar chassis in which the Intel memories are housed.

Viking - Hal Cole (030)

February was another very busy month. The following items were accomplished:

1. Developed the Meteorology Sequence Generating Program on the PRIME computer for use in the February training exercise.
2. Participated in the February DT-4 training exercise at JPL from 2/17/76 to 2/27/76.

Lyman Alpha Hygrometer - Arden Buck (032)

Arden delivered supplies to John Trembly of Glass Technologists, looked over his setup, and gave him a training session for fabricating UH₃ sources. The purpose of this effort is to transfer the source technology to a commercial supplier.

Arden has received requests for fabrication details for fixed path hygrometers from Sashi Verma, University of Nebraska and Gordon Little, NOAA, for use on the JMOF tower. He will prepare a note describing the various alternatives and tradeoffs.

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FGGE Buoy Barometer - Julian Pike (043)

The South Africans launched three buoys late in February with our Hamilton Standard pressure sensors aboard. Data are expected shortly.

Testing of the 10 pressure sensors came to some fruition with analysis of the first batch of data. Reference 19 Feb. Pike memo and 20 Feb. Bergen memo to RSF, Masterson and Murino.

We now plan to build 10 additional complete packaged sensors with versatile internal digital electronics. The units will be completed by 1 May, and then will be tested in buoy applications and ground field environment, as well as in the laboratory.

Laser TAS - Arden Buck (046)

In a discussion between Don Lenschow and Arden, design guidelines for the Laser TAS indicator were reviewed. The accuracy goal of 0.1% may be difficult to achieve. No altitude spec was defined.

Past experience by NASA et al have been successful at low altitudes. Altitude performance probably can be extended with the help of a more powerful laser and better signal processing. The limits and tradeoffs are not yet clear, however. It may be possible to borrow and rent some equipment to conduct a feasibility test.

ARIS IV - Mike Duncan (047)

Progress on ARIS IV has been slower than desired, primarily due to Mike's heavy involvement with PAM. Mike is working on a revised schedule. We still hope to have the first system operational by next spring.

Vic and Jacques are making steady progress with the quad async interface for ARIS IV-RDSS communication. The core memory has been returned; no semi-conductor memory has yet been purchased. A floppy disk will not be required on the aircraft to run programs coded in FORTRAN or BASIC.

Air Motion Sensing Development - Karl Danninger (056)

Karl machined two new beams for the fixed-vane assembly. After review of the designs, and preparation of a gaging spec, they were sent to Kulite for gage installation. A new rotary vane for the Electra also was completed during Feb.

DME Development - Phil Benedict (057)

In a brief design review, it was decided that a new DME system should not involve extensive displays nor wind calculations, etc., since those can be handled by ARIS IV. On the other hand, it would be desirable to make the station selection as automatic as possible.

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FGGE Dropsonde - Justin Smalley (058)

Murino, Bargaen and Smalley went to Washington the last week in February to discuss a draft plan for the FGGE Dropsonde Project with Sargent, Scribner, and others in the FGGE Program Office. In general there seemed to be good agreement on the scope, schedule and budget of the project. One area of possible concern is the early availability of the NOAA/ERL man who will have responsibility for the production contract management.

Colorado State University

Julian spent two days at CSU, relative to his Affiliate Professor appointment. He has been named NOWCAST Program Scientist; others include Bill Marlatt, Principle investigator, and Donald Hill, Project Engineer.

Mechanical Design Group - Paul Johnson

CP-3 Radar Pedestal - The system is back from Washington and the only mechanical problems we have heard of are an oil leak from the azimuth gear box (we will replace a seal) and a continued deterioration of the plywood sheathing on the radome wings. The plan for the wing repair is to replace the plywood with 0.1 inch aluminum sheet before the system goes to Grover for the Hail program.

C130 Pod (Hinkelman) - Guenther has finished the drawings and delivered prints to Hinkelman. We are now charging Guenther's time to Hinkelman's account until the charges are recovered.

Aerosol Pressurizer (Langer/NHRE) - Shop work is complete including lapping of the sealing surfaces and the device has been delivered to Langer for testing.

Cassette Chassis (Brun/RSF) - Howard handled the design. Project complete and delivered.

AgI2 Collectors (Langer/NHRE) - This project is a rework of the older versions but designed for different sampling speeds and easier filter changing in flight.

Launch Spool II (Kubara/SBF) - This is a new launch spool and release system designed to handle 20,000 pounds balloon lift with a 1.5 safety factor. Paul made a quick trip to Palestine to review the changes made in the old system (which we designed and built) and, in general, define the new system. The design of the system has proceeded very well and is almost complete. The large diameter tube for the spool itself was the most troublesome item and we finally had to accept a 16 inch o.d. tube although the machining on the spool itself will now have to be done outside our shop.

Cooling Tower Fan Bearings (Mankin) - Gunderson in Plant Maintenance has requested our assistance in solving a problem with the fan bearings on the building cooling tower. Some urgency is present since one set of blowers is now out of service with a ruined bearing and chewed-up shaft and they hope to have all six sets of blowers converted to the new design before warm weather.

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Filter Sequence (Gandrud/AQM) - Gandrud has requested a preliminary design and cost estimate for a filter sequencer for aircraft sampling which would sequence, on command, a series of 16 filters in and out of a sample duct.

Machine Shop - Bud Hewett

February, normally the month during which the heavy spring work requirements begin, was rather quiet. By the third week in the month, however, three major jobs and another smaller production job were written up as work orders. No. 1 of those was the heavy payload launch spool for Palestine. The work for February was as follows:

SSAP (Deardorff)	24 shop hours
Atmos. Aerosols	24
Radon Daughters	24
Far Infrared	3
RAF ATD	21
RAF	37
RSF Univ. Md.	27
RSF RDSS	70
RSF LAH (Buck)	4
RSF PAM (Brock)	158
AQM (Knight)	16
AQM (Langer)	138
AQM (Murphy)	9
GAMP (Stenlund)	115
Palestine (Kubara)	320

Instrument Shop - Dale McKay

Thirty-four calibrations and seven repairs were completed on RSF equipment during Feb. Six repairs and two calibrations were completed on equipment from other groups.

We have submitted our annual usage report to NSF/IRAC as required for VHF operations.

Documentation - Lynn Post

C-Band Radar - Final, printed copies of the CP-4 Antenna Controller Manual have been delivered to FOF. The CP-4 Antenna and Pedestal Manual is in the print shop. The CP-4 Drawing Package will go to printing next week.

PAM - The documentation for PAM will include 7 manuals: Remote Station Manual, System Test Set, Mechanical Drawing Package, Operating Manual, Base Station, System Overview and Software.

The plan is to have the first two manuals completed in a clean draft form before the start of the NHRE experiment, so that they can be used to operate and maintain the system. We do not plan to have them printed until after NHRE experiment is completed, however, so that the final manuals can reflect any changes resulting from field experience.

- END OF MEMO -

DWB/cen