

Interoffice

ADDITIONAL BASELINE TO INTERFEROMETER

National Radio Astronomy Observatory

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Green Bank, West Virginia

To: Monterville Project Group

March 22, 1982

From: R. Fleming

Subject: (1) Progress Reports, January and February  
(2) TIW Proposed Servo Drive Control

The progress reports for January and February concerning the 14.2 meter antenna are attached. The January report is unremarkable since items were covered in memo 161 and 164. The high interest/action items (circled) in the February report will be addressed during a visit by Buck Peery and John Ralston to the TIW Plant in Toronto on April 2, 1982.

If anyone has any comments or questions concerning these items contact Buck Peery before March 31.

RLF/baw  
Attachments

TIW SYS SUWL  
MARCH 18, 1982  
OUR REF MSG NO. 3413

ATTN: MR. RICHARD FLEMING

SUBJ: NRAD ANTENNA PROGRAM, MONTHLY REPORT, JANUARY, 1982

1.0 GENERAL

THIS REPORT SUMMARIZES THE PROGRESS BY TIW SYSTEMS DURING THE MONTH OF JANUARY, 1982, ON SUPPLYING ONE NEW 14.2 METER ANTENNA STRUCTURE.

2.0 SCHEDULE

A DETAILED SCHEDULE WAS PRESENTED AT THE DESIGN REVIEW MEETING IN GREENBANK ON JANUARY 26. THIS SCHEDULE CALLS FOR THE ANTENNA TO BE COMPLETED AND READY FOR DELIVERY BY JUNE 30, 1982, AND ERECTION COMPLETED BY AUGUST 31, 1982.

3.0 PROGRESS

PROGRESS FOR THE MONTH OF JANUARY WAS AS FOLLOWS:

3.1 DRAWINGS

COMPLETED THE FOLLOWING DRAWINGS

- ANTENNA ASSEMBLY
- CONCRETE TOWER AND FOUNDATION
- ALIDADE
- HANDRAILS AND LADDERS

3.2 PROCUREMENTS

ORDERED FOLLOWING MATERIAL

- PANELS
- QUADRAPOD
- REFLECTOR STRUCTURE
- PEDESTAL STEEL

ORDERED FOLLOWING COMPONENTS

- ELEVATION AND AZIMUTH BRAKES
- ELEVATION AND AZIMUTH REDUCERS
- ELEVATION STOP ACTUATOR
- ELEVATION AND AZIMUTH DC MOTORS

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4.0 PROBLEM AREAS

DELIVERY OF AZIMUTH BEARING MAY EXTEND FROM EARLY MAY TO LATE JUNE DUE TO DIFFICULTY OF SUPPLIER IN OBTAINING FORGINGS.  
POSSIBLE DELAY IN SHOP PROOF ASSEMBLY COMPLETION FROM LATE JUNE TO LATE JULY.

5.0 ACTION

THE FOLLOWING ACTION ITEMS BY TIW RESULTED FROM THE DESIGN REVIEW MEETING

- TIW SYSTEMS TO PROVIDE THE FOLLOWING INFORMATION:
  - MOTOR BLOWER HORSEPOWER
  - ACTUATOR MOTOR HORSEPOWER
  - DATA SHEETS ON LIMIT SWITCHES
  - MAXIMUM ELEVATION TRANSDUCER SHAFT DEFLECTION
  - MAXIMUM HORIZONTAL REFLECTOR VERTEX SHIFT

\*\*\*\*\* END OF MONTHLY REPORT \*\*\*\*\*

REGARDS,

J.K. ADAMSON  
TIW SYS SUPL

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TIW SYS SUWL

MARCH 18, 1982

OUR REF MSG NO. 3420

ATTN: MR. RICHARD FLEMING

SUBJ: NRAO ANTENNA PROGRAM, MONTHLY REPORT, FEBRUARY, 1982

1.0 GENERAL

THIS REPORT SUMMARIZES THE PROGRESS BY TIW SYSTEMS DURING THE MONTH OF FEBRUARY, 1982 ON SUPPLYING ONE NEW 14.2 METER ANTENNA STRUCTURE.

2.0 SCHEDULE

THE ORIGINAL SCHEDULE CALLED FOR COMPLETION OF REFLECTOR PANELS IN EARLY JUNE, 1982. HOWEVER, DUE TO FABRICATION SCHEDULING, REFLECTOR PANEL COMPLETION HAS BEEN ACCELERATED TO APRIL 30, 1982.

ALSO, THE ORIGINAL SCHEDULE CALLED FOR ANTENNA PROOF ASSEMBLY TO BE COMPLETED JUNE 30 AND ANTENNA ERECTION TO BE COMPLETED BY AUGUST 31, 1982. HOWEVER, AS REPORTED IN THE JANUARY MONTHLY REPORT, DELIVERY OF THE AZIMUTH BEARING MAY BE DELAYED TO LATE JUNE.

✓ TO AVOID SCHEDULE DELAY AND TO PROVIDE A TIMELY PROOF ASSEMBLY, TIW SYSTEMS RECOMMENDS THE USE OF A STEEL SPACER, FABRICATED TO THE HEIGHT AND DIAMETER DIMENSIONS OF THE AZIMUTH BEARING, FOR PROOF ASSEMBLY. THIS SPACER HAS BEEN USED SUCCESSFULLY FOR PROOF ASSEMBLY ON A PREVIOUS ANTENNA WHICH USED THE SAME BEARING

✓ IF USE OF THE SPACER IS APPROVED BY NRAO, PROOF ASSEMBLY CAN BE RESCHEDULED FOR LATE MAY, 1982.

*ok* THE AZIMUTH BEARING WILL THEN BE SENT DIRECTLY TO THE SITE FOR INSTALLATION.

3.0 PROGRESS  
PROGRESS FOR THE MONTH OF FEBRUARY WAS AS FOLLOWS:

3.1 DRAWINGS

REVISED THE FOLLOWING DRAWINGS PER NRAO INTERFACE REQUIREMENTS:

- 64-13-01B FEED SUPPORT
- 64-00-01, SHEET 4A, EL ENCODER MOUNT
- 64-31-21, SHEET 1A, AZ ENCODER MOUNT
- 64-31-21, SHEET 3A, AZ ENCODER SHAFT
- 64-36-02, SHEET 2A, AZ ENCODER INSTALL.
- 64-36-21, SHEET 1A, EL ENCODER MOUNT

APPROVAL GIVEN TO TIW BY TWX  
ON 2/17/82 AND 2/23/82 ✓

3.2 PROCUREMENTS

ORDERED FOLLOWING COMPONENTS ✓  
AZIMUTH BEARING

3.3 FABRICATION

PANELS: TOOLING COMPLETED AND TEST PANELS FOR EACH PANEL TYPE  
SCHEDULED FOR COMPLETION MARCH 5.

REFLECTOR PACKUP STRUCTURE: MEMBERS IN CUTTING, CLUSTERS  
SCHEDULED FOR FITUP AND WELDING COMPLETION BY MARCH 12.

4.0 PROBLEM AREAS

DELIVERY OF AZIMUTH BEARING ESTIMATED TO BE LATE JUNE, 1982.  
SHOP PROOF ASSEMBLY WILL NOT BE DELAYED PROVIDED USE OF SPACER  
IS APPROVED IN PLACE OF AZIMUTH BEARING.

5.0 ACTION

THE FOLLOWING JANUARY DESIGN REVIEW ACTION ITEMS WERE COMPLETED  
IN FEBRUARY:

- PROVIDED MOTOR BLOWER HORSEPOWER ✓
- PROVIDED ACTUATOR MOTOR HORSEPOWER ✓
- PROVIDED DATA SHEETS ON LIMIT SWITCHES ✓
- PROVIDED MAXIMUM ELEVATION TRANSDUCER SHAFT DEFLECTION ✓
- PROVIDED MAXIMUM HORIZONTAL REFLECTOR VERTEX SHIFT ✓

" " " END OF MONTHLY REPORT " " "

REGARDS,

J.K. ADAMSON  
TIW SYS SUPL

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MARCH 18, 1982

OUR REF MSG NO. 3412

ATTN: MR. R. FLEMING

SUBJ: SERVO DRIVE CONTROL (14.2 M. ANTENNA)

FOR APPLICATION TO THE NRAO 14.2 METER RADIOTELESCOPE, TIW SYSTEMS RECOMMENDS ITS SERIES 1000 ANTENNA CONTROL SYSTEM. THIS CONTROL SYSTEM PROVIDES GREAT VERSATILITY AND NUMEROUS MANUAL MODES TOGETHER WITH AN RS232C INTERFACE FOR EXTERNAL COMPUTER CONTROL. THE PROPOSED SYSTEM IS THE SAME AS THE ONE BEING FURNISHED BY TIW SYSTEMS FOR THE 32 METER ITALIAN RADIOTELESCOPES. THE PROPOSED CONTROL SYSTEM PROVIDES THE FOLLOWING OPERATING MODES:

MANUAL RATE MODE:

ALLOWS THE CONTROL OF THE AXIS RATE ON EITHER AXIS FROM THE CONTROL PANEL.

MANUAL STEERING:

ALLOWS THE POSITIONING OF EITHER AXIS UNDER POSITION LOOP CONTROL VIA FRONT PANEL MOUNTED HANDCRANKS.

COMMAND POSITION:

ALLOWS ANY ANTENNA POSITION TO BE COMMANDED VIA FRONT PANEL MOUNTED ELECTRONIC THUMBWHEEL SWITCHES.

MEMORY TRACK:

ALLOWS UP TO FOUR HOURS OF EPHEMERIS TO BE LOADED INTO THE MICRO-PROCESSOR MEMORY FOR STAR TRACKING.

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PROGRAM TRACK:

ACCEPTS POSITION COMMANDS FROM AN EXTERNAL COMPUTER VIA THE RS232C PORT.

MAINTENANCE MODE:

ALLOWS THE ANTENNA AXIS RATE TO BE CONTROLLED FROM A PORTABLE CONTROL BOX AT THE ANTENNA.

THE ANTENNA DRIVE SYSTEM UTILIZES SCR CONTROLLED DC DRIVES WITH TWO DRIVES ON EACH AXIS OPERATING IN AN ANTI-BACKLASH TORQUE BIASED MODE.

OPTIONALLY, TIW SYSTEMS WILL PROVIDE THE ENCODER ELECTRONICS AND DISPLAY CHASSIS. THIS EQUIPMENT CONVERTS THE ANALOG OUTPUT FROM THE MRAD SUPPLIED ENCODERS TO BCD FORMAT AND DISPLAYS THE RESULTANT ANGLES TO 0.001 DEGREE RESOLUTION. ALL THE NECESSARY POWER SUPPLIES AND ELECTRONICS EXCEPT FOR THE ENCODER ITSELF ARE FURNISHED UNDER THIS OPTION.

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THE BUDGETARY PRICE FOR THE ABOVE OPTION IS AS FOLLOWS:

BASIC SERVO CONTROL AND DRIVE EQUIPMENT	\$ 118,500
ENCODER ELECTRONICS AND DISPLAY SYSTEM	\$ 28,500
INSTALLATION HARDWARE	\$ 9,900
INSTALLATION AND TEST SERVICES	\$ 42,600

REGARDS,  
LOUIS E. BECKER  
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