W. Tyler

NATIONAL RADIO ASTRONOMY OBSERVATORY

MEMORANDUM

March 14, 1967
IG 0367

To: Addressee

From: J. Coe

Subject: Three-Element Interferometer System Maintenance

General:

This memo defined the persons responsible for all of the interferometer electronics. It also includes details about the documentation, maintenance, and alteration of interferometer equipment. The maintenance schedule will be prepared from inputs received in response to this memo and published later.

Three general rules will be followed:

1. No adjustments or changes will be made by anyone unless authorized by the person responsible for the equipment. If adjustments will be required during operation of the instrument, they should be described in detail in the Operating Instructions for each system. However, if a malfunction occurs and the responsible person cannot be contacted during an eight-hour period, Bill Shank or George Grove are then authorized to attempt to repair the malfunction.

2. In general, temporary or "black tape" fixes will not be permitted. If a malfunction occurs which can be repaired correctly within eight-hours, the system will be shut down and fixed right. If the down time will be longer than eight hours due to lack of parts or bad weather conditions, a temporary fix may be installed but it must be replaced at the earliest opportunity.

3. After repair of a malfunction the interferometer operator on duty will be notified of the work performed so that he can enter it into the daily log. This log is the only record the observer receives of equipment changes.

Persons to Contact — When a malfunction occurs which affects system performance, contact either George Grove or Bill Shank. They will contact the responsible person and provide any assistance required in making the repairs.

Digital

Glenn Ertell will be responsible for the maintenance, documentation, and alteration or expansion of the following units or systems:

Unit 560 — Digital Interface Unit
Interferometer Computer System
60-Channel Data Transmission System
Antenna Position Encoder System

Front End

Mike Balister will be responsible for the maintenance, documentation, and alteration or expansion of the following units or systems:

Units 851, 852, 853 — Interferometer Receiver Front End
Units 801, 802, and 803 — Front End Equipment

Back End

Bill Shank will be responsible for maintenance, documentation, and alteration or expansion of the following units:

Unit 300 — Receiver Backend
Unit 330 — Analog Monitor
Unit 530 — Analog Buffer

He will also be familar with all components of the Interferometer System so as to be able to isolate malfunctions to a particular system and make repairs or contact the responsible party and insure that the required repairs are made. He will analyze the computer output of electronics test data to detect any trends which indicate system deterioration and see that the appropriate maintenance is performed.

Power System and Analog Display

George Grove will be responsible for maintenance, documentation, and alteration or expansion of the following unit and systems:

Unit 160 — Analog Display System
85-1, 85-2, 85-3 and Control Building Electronics Power System
Weather Station

He will also be familar with all of the components in the Interferometer System so as to be able to isolate malfunctions to a particular system and make repairs or contact the responsible party and insure that the required repairs are made.

In addition, he will have the computer programs developed which are required to produce the essential electronics data for a continuing analysis of system performance and assist in analyzing this data.

LO System, F and P System

Bob Ervine will be responsible for maintenance, documentation, and alteration or expansion of the following units and systems:

Unit 400 — LO Distribution System
LO Components in Antenna Control Buildings and Front End Boxes
Focus and Polarization Drive System
Focus and Polarization Encoder System

He will analyze outputs from the computer electronic test data pertaining to the LO system to detect significant changes in performance of this system.

Cable System

Jim Oliver will be responsible for maintenance, documentation, and alteration or expansion of the following units and systems:

Unit 500 — Computer Contacts Distribution
RF Cable System
Antenna Cable System
IF Cable Compensation System
Triax Cable System

Len Howell will be responsible for maintenance, documentation, and alteration or expansion of the:

Control and Data Cable System
Interferometer Time Cable System

Maintenance

Maintenance includes the repair of any malfunctions which develop and:

1. Preparing a periodic maintenance schedule listing the maintenance required by each system and also performing this maintenance.

2. Preparing a list of spare parts and any additional tools or test equipment required to maintain the system.

3. Set up a storage area for these spare parts and special tools, keep an up-to-date inventory of the parts available, and reorder parts as required.

The maintenance schedule and spare parts list should be submitted to me on or before June 1, 1967. All purchase requisitions will be submitted to me for approval before the purchase orders are typed.

Documentation

Documentation will include preparation of detailed schematics for each unit or system. These schematics will be issued drawings preferably on D-size paper with the scale large enough to permit 2 to 1 photo reductions or on A or B-size paper. These schematics should be issued on or before May 1, 1967. I will approve all schematics before they are issued.

Operating and Test Instructions will be prepared for all units and systems which require adjustments during or prior to observations. These instructions will be published as Interferometer Group memos.

Detailed parts lists will be prepared for each unit or system to aid in determining the spare parts which are required and to assist in expansion of the system.

A file system will be set up at the Interferometer Control Building and at each of the antenna control buildings. One copy of the schematics, parts lists, and operating instruction for all components of the system will be supplied by the responsible person and kept at the control building. Documentation of the system components located at each antenna will be kept in the antenna control building file.

One copy of the manufacturer's instruction manual for all commercial equipment will be supplied for the interferometer control building file.

Test reports must be prepared for all systems which contain active analog devices listing signal levels, bandwidths, noise levels, etc., to assist in evaluating system performance. Any additional test data which is available should be compliled and published as an Interferometer Group Memo.

Equipment Logs

An equipment log will be kept with each unit in which any malfunction, adjustment, or alteration will be noted along with the date and time. These entries should be signed by the person who makes the adjustment or detects the malfunction. The operator should also be notified of the action taken.

The documentation including schematics, operating and test instructions, and equipment logs must be completed or established on or before June 1, 1967.

Alterations

After engineering tests are completed and system operation is started, I will approve all changes in equipment before they become final. Temporary and "black tape" changes should not be made as they generally reduce system reliability.

JC/cjd

Addressees:
Glenn Ertell
M. Balister
Bill Shank
George Grove
Bob Ervine
Jim Oliver
Len Howell