M003 MAINTENANCE NOTE 3 (for Electronics Technicians)
Engineering Division
W/0S0321:FLP

Profile Software

General

1. We lost the ability to run the ART system built-in simulator profile tests when we implemented the Micro-ART system. We have developed software for the M003 microcomputer that enables the electronics technician to run these profiles. This note provides operating instructions for the profile software.

2. Effect on Other Instructions: Make the following pen-and-ink changes:

   EHB-9, Section 4.4, Maintenance Schedule for the Automatic Radiotheodolite System (for Electronics Technicians), page 2, step 1 of monthly checks. Change reference under Precautions & Remarks heading to "Refer to EHB-9, Section 2.6, M003 Maintenance Note 3."

   Instruction Manuals 9-601, 9-602, 9-701 and 9-702. Change references in the manuals to setting up the Daconics minicomputer during the simulator profile tests to "Refer to EHB-9, Section 2.6, M003 Maintenance Note 3 for microcomputer profile software operation."

Procedure

The floppy diskette provided contains both the simulator profile and ARTIC board test software. It is a stand-alone, bootable diskette. You can run the test independent of the Micro-ART program software. The test does not use the M003 fixed disk drive and will not affect it.

The Micro-ART simulator profile software contains several options. Unlike the M001 minicomputer software, you can run both ART system simulator profiles 6 and 7. You can select the profile run length and enter it from the M003 keyboard.

To run the profile, proceed as follows:

1. Set up the R/ACU for Profile 6 or Profile 7. The use of met data is an operator option. If you do not use met data, bypass the met data test fixture by connecting the simulator output directly to the external AM input of the T405 (Hewlett-Packard 8614A) signal generator. Adjust the signal generator output attenuation so the ART system reads 35-40 on the signal strength meter with the system sensitivity turned off.

2. Place S1 on the Time Digitizer A board (3A3A1A3) in the MCU to the crystal position. Leave S1 in this position permanently. Leaving S1 in the line position will affect the profile test accuracy.

3. Set the M003 printer to ON-LINE and the paper to the top of page. Use of the printer is optional. At the end of the test, or if you press the STOP PRINT button during the test, the profile screen will pause. This allows you to read the average RMS values from the display.

4. Insert the floppy diskette in drive A and turn on AC power to the M003. If the M003 is powered, do a system reset by pressing Ctrl-Alt-Del.

5. The monitor will display a menu. Use the cursor keys to highlight Profile 6 or Profile 7. Select the same profile as set up on the R/ACU. Press ENTER.

6. The monitor will show the profile screen with "Enter station name:" at the bottom of the display. This is an optional entry. You can default with a carriage return.

7. After you enter the station name, the profile screen will display "Enter length of run in minutes (11-99)". Enter the number of minutes you want the test to run. You must make a correct response. The program will not accept a default carriage return, but you can terminate it with an Est. When you enter an acceptable time, the "Length of Run is -----" line at the bottom of the screen will display the minutes selected and the ARTIC Real Time Clock (RTC) will start.

8. The program is now ready for release. Check the pedestal angles on the MOC for the correct profile starting points. (Profile 6 - AZ = 179.88 EL = 2.40, Profile 7 - AZ = 180.84 EL = 90.00).

9. Press the RELEASE button. When the release is detected, the following events should occur:

   Rflag at the bottom left of the screen should show "RELEASE DETECTED";

   the ARTIC RTC should reset and start. The RTC display should update every 1/2 second;

   EL-ref, EL-act, AZ-ref, and AZ-act data should display and update every minute;

   the elapsed time should start and update every 1/2 second;

ART data should display and update every 1/2 second;

if the printer is on, it should print the station name entered in step 6, date, time, column labels, and minute 0 data. The system reads the date and time stamp automatically from the multifunction board. It will be in Universal Time Coordinated (UTC). The program initializes the multifunction board during bootup. The M003 system must have the AST SixPakPlus multifunction board installed per EHB-9, Section 3.6, M003 Modification Note 3 for the date and time stamp to be correct.

The program calculates and displays RMS error individually for the elevation and azimuth channels. You can use this as a maintenance aid to isolate a defective channel. RMS calculations begin at minute 10. The first calculated values are displayed at minute 11. RMS values of 0.000 will be displayed and printed for minutes 0 to 10. The RMS calculation uses the same procedure as the WS Form B-17, RAWIN Theodolite Comparison. The values shown for each successive minute are the average RMS.

The profile test will continue for the length specified. The actual antenna angles, angle error, and average calculated RMS values will print every minute.

The READ.ME file on the floppy diskette contains a condensed version of the software operating instructions.

An excessive RMS can have many causes; bad antenna drive train condition, incorrect system tracking alignment, or system timing errors. The ART system elapsed time originates from timing signals generated on the Time Digitizer A board (3A3A1A3) in the MCU. To increase timing accuracy, this oscillator is set to the crystal position in step 2 above. An oscillator on the ARTIC board generates the ARTIC RTC. Simulator timing originates from its own oscillator and is used for timing antenna positioning. The counters driven by these various clocks are synchronized at release, but each circuit then runs at its own rate. If any of the oscillators has an error, it can affect the RMS accuracy.

The RMS profile test does not verify system phasing. It tests only the antenna drive system response. The system could pass the profile test but still exhibit erratic tracking because of improper system phasing.

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