

BYE-110552-82
As of 31 March 1982
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MEMORANDUM FOR THE DIRECTOR, NATIONAL RECONNAISSANCE
OFFICE

SUBJECT: Quarterly Program Report

Attached is the Program A Quarterly Program Report for
the period 1 January 1982 through 31 March 1982.

Ralph H. Jacobson

for

JOHN E. KULPA, JR.
Major General, USAF
Director

1 Atch
Quarterly Program Report

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QUARTERLY PROGRAM REPORT

989 PROGRAM

Program Manager: Colonel Paul F. Foley

1. Summary:

Three 989 satellites were operational during this reporting period. The average combined tasking level for the period was 338 minutes per day. Throughout the period, operation of the on-orbit vehicles was nominal with no new anomalies occurring. On 20 Feb 82, real time transpond operations of URSALA III and RAQUEL IA, which had been suspended since 8 Jan 82, resumed at Indian Ocean Station. During this reporting period, FARRAH I completed post acoustic functional tests, two cycles of thermal vacuum, an orbital insertion/deployment test, and an end-to-end RF test to verify proper antenna final installation. On 16 Mar 82, an Orbital Sequence Demonstration involving the spacecraft, command generation, telemetry and mission data processing systems and the SCF interfaces was conducted. The purpose of this demonstration was to verify all critical interfaces associated with commanding the satellite and with receiving and processing vehicle data. With the completion of the end-to-end test, final mate preparation commenced with actual mate operations scheduled to begin on 6 Apr 82. The launch is currently planned for early May 82. FARRAH II spacecraft subsystems and antennas continue to be assembled and tested. The silver ribbon problem rework is progressing satisfactorily. The majority of the payload system modules have been completed and the remaining downconverter modules are scheduled to be complete in mid-April 82. The pulse and CW receivers are presently undergoing acceptance testing. The manufacturing and assembly of all antennas have been completed and all but three antennas have completed RF testing. During this period, the acquisition of LORRI II commenced with the issuance of a letter contract for the critical long lead material and preliminary design of key subsystem. LORRI II is a dual mission pallet to be flown on HV 20. It includes the Extremely High Frequency (EHF) (26-426Hz) general search capabilities of LORRI I plus a

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special purpose VHF MBTI collection system (130-180MHZ). Release of the FARRAH III RFP occurred during January. The preparation and review of pertinent program documentation and plans are continuing.

2. Specific Status:

a. On-Orbit Spacecraft

(1) Mission 7343/URSALA III. URSALA III, in its 68th month of operation, continues to support limited operational ELINT and general search requirements across the 2-12 GHz spectrum. Because of the failure of recorder number three, all tasking operations, except a very limited number of omni video collections (2/week) are being completed in the transpond mode. At present, URSALA III is supporting approximately 60 minutes per day of collection. No further degradation in payload pulse amplitude sensitivity beyond the 10 to 18 dbm range has occurred during this period.

(2) Mission 7345/RAQUEL IA. RAQUEL IA, in its 48th month of operation, continues to provide technical intelligence collection in the 4-18 GHz region. This vehicle has continued to operate satisfactorily, but because only one recorder remains operational, the number of tape recorder cycles per day continues to be limited. The average number of tape recorder readouts per day has been four. At present, 90 minutes per day of tasking are being supported by RAQUEL IA. No new anomalies have occurred.

(3) Mission 7344/URSALA IV. The mission of URSALA IV consists of general search, operational ELINT, and technical intelligence in the 2-12 GHz region. URSALA IV is in its 36th month of operation and is supporting 200 minutes of tasking per day. No new anomalies have occurred.

b. Vehicles Under Development and Test

(1) Mission 7346/FARRAH I. At the end of the last reporting period, the spacecraft had just completed acoustic vibration. During this reporting period, the post acoustic functional, thermal vacuum, and flight readiness tests were completed. During the

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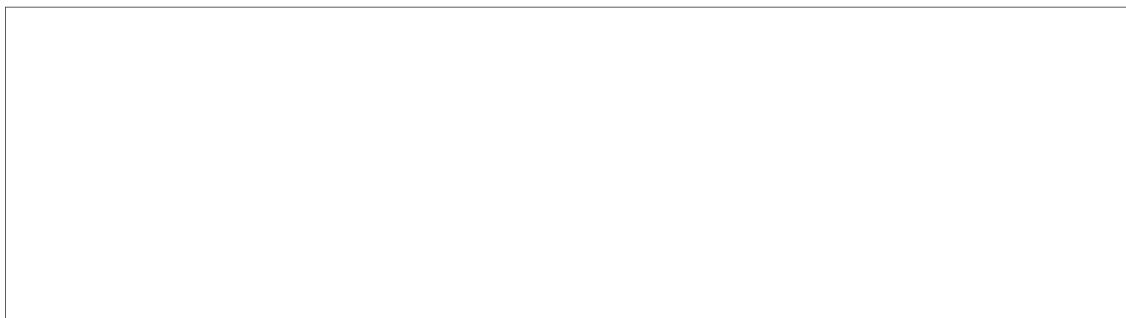
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latter test, a special test, designated the Orbital Sequence Demonstration, was performed. Its purpose was to provide interface verification of the total FARRAH I intercept system, including both space and ground segments prior to launch. The spacecraft was tasked using commands generated by the mission planning subsystem. The tasking was accomplished by the STC via Vandenberg tracking station and the DSIS. The entire network and spacecraft systems were verified and performed properly. The out-put product against simulated targets was processed satisfactorily by the ground processing system. Following electrical disconnect on 26 Mar 82, the pyrotechnic deployment devices, spin motors, and orbit boost motors were installed. The only remaining effort before mate is the mounting of the spacecraft on the support panel launcher assembly. The spacecraft is progressing satisfactorily toward mate with the host vehicle in early April 1982, and launch in early May 1982.

(2) Mission 73XX/FARRAH II. Fabrication, assembly, and acceptance testing of the various spacecraft subsystems, antennas, and payload subsystems continued during the reporting period. The antennas are undergoing final acceptance tests and final pattern tests. All spacecraft components have completed acceptance tests with the exception of the Type 28 Transmitter which is being prepared for acceptance testing during the first week of April. The payload module rework to replace silver ribbons is approximately 75 percent complete. Unit acceptance testing of the DF receivers and pulse frequency measurement units is in progress. Subsystem integration of the data handler system, omni pulse receiver, and omni pulse frequency measurement unit has also been initiated. In general the FARRAH II system is proceeding on schedule.



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MEMORANDUM FOR THE DIRECTOR, NATIONAL RECONNAISSANCE
OFFICE

SUBJECT: Quarterly Program Report

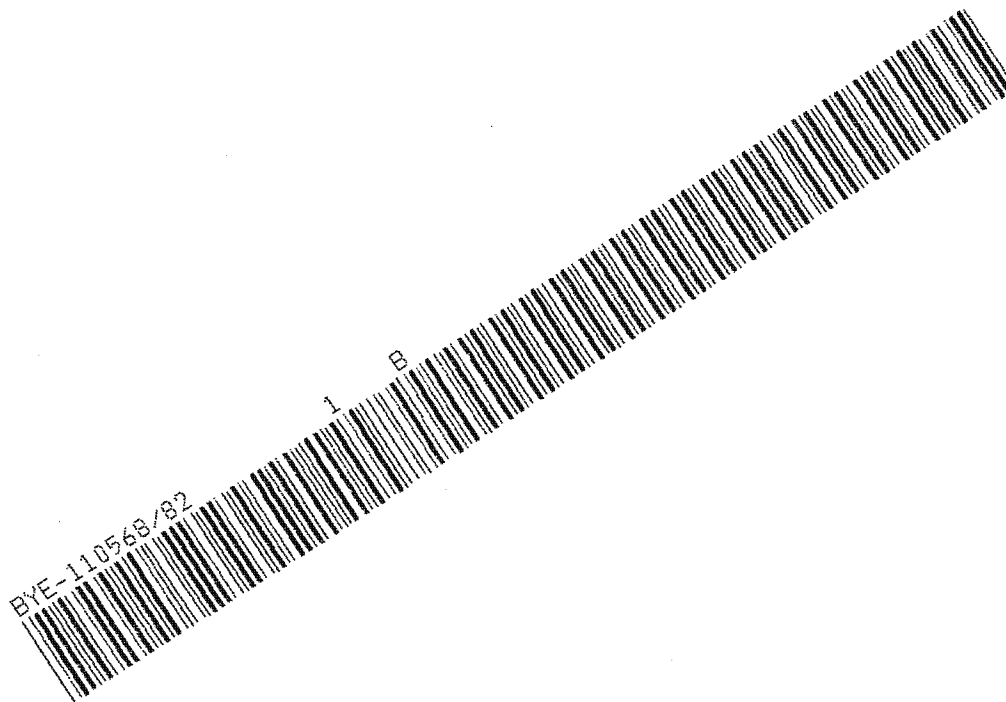
Attached is the Program A Quarterly Program Report for
the period 1 April 1982 through 30 June 1982.

Ralph H. Jacobson

for

JOHN E. KULPA, JR.
Major General, USAF
Director

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Quarterly Program Report



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QUARTERLY PROGRAM REPORT

PROJECT 989

Program Manager: Colonel Paul F. Foley

1. Summary:

Four 989 satellites were operational during this reporting period. The average combined tasking level for the period was 559 minutes per day. Operation of URSALA III, RAQUEL IA, and URSALA IV continued with no new anomalies occurring during the reporting period. URSALA III tasking was reduced to approximately 25 minutes per day following the launch of FARRAH I on 11 May 1982. Following a 21-day preliminary engineering evaluation phase, FARRAH I was turned over for operational use on 2 Jun 82. First data from the FARRAH I system was shipped on 3 Jun 82. The FARRAH I vehicle is in a nominal 383 nmi orbit and was maneuvered between 14-17 Jun to an interim orientation to provide priority coverage of the South Atlantic. Engineering testing of the spacecraft has progressed on schedule. Currently, FARRAH I is averaging approximately 266 minutes of collection per day. FARRAH II spacecraft subsystem and antennas continue to be assembled and tested. The silver ribbon problem rework has been completed and the majority of the payload subsystems have completed their acceptance level testing and are being integrated into the payload A and B boxes. The early development and design activities associated with LORRI II are progressing on schedule. Seventy percent of the purchase orders for critical long lead materials for both the EHF and VHF payload boxes have been placed. The proposal for the FARRAH III

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2. Specific Status:

a. On-Orbit Spacecraft

(1) Mission 7343/URSALA III: URSALA III, in its 70th month of operation, continues to support limited operational ELINT and general search requirements across the 2-12 GHz spectrum. All tasking operations, except a very limited number of omni video collections (0-1/week) are being completed in the transpond mode. At present, URSALA III is being constrained to only 24 minutes per day to give higher priority to FARRAH I processing.

(2) Mission 7345/RAQUEL IA: RAQUEL IA, in its 50th month of operation, continues to provide technical intelligence collection in the 4-18 GHz region. This vehicle has continued to operate satisfactorily, but because only one recorder remains operational, the number of recorder cycles per day continues to be limited. The average number of readouts per day has increased to eight. At present, 200 minutes per day of tasking are being supported by RAQUEL IA. On 24 April a maneuver was initiated to reorient the vehicle's attitude to provide better southern hemisphere coverage. No new anomalies have occurred.

(3) Mission 7344/URSALA IV: The mission of URSALA IV consists of general search, operational ELINT, and technical intelligence in the 2-12 GHz region. URSALA IV is in its 39th month of operation and is supporting approximately 195 minutes of tasking per day. On 10 April 82, a maneuver was successfully completed to reorient the vehicle's spin axis orientation to provide improved southern hemisphere coverage. No new anomalies have occurred during the reporting period.

b. Vehicles Under Development and Test

(1) Mission 7346/FARRAH I: During this reporting period, the spacecraft was mated to the support launcher assembly (SPLA) and the interface verified. The host vehicle/FARRAH I interface was verified and the host shroud installed on 11 May 82. FARRAH I was launched on 11 May 82. Subsequent to the launch and

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deployment of the FARRAH I spacecraft, a two-phase evaluation/verification operation was initiated. The first phase, which verified the spacecraft's integrity (engineering evaluation phase), was successfully completed on 2 Jun 82. The second phase, consisting of refining the space segment/ground segment interface and ground processing based on on-orbit calibration data, is in progress. The expected completion date for the second phase is 12 July 82. At that time, the FARRAH I system (spacecraft and ground segment) will be considered fully operational. Results from the evaluation phase testing indicate that the spacecraft is performing exceptionally well. System performance discrepancies observed to date are as follows: There appears to be a slight degradation of sensitivity (approximately 3db) in the omni pulse frequency measurement system. The wideband omni receiver threshold is not affected and current mission impact appears to be minimal. The Band 8 (16-18 GHz) sensitivity degradation seen during system test has reappeared. The extent of the loss as a function of temperature is currently being characterized. During the next reporting period, all verification testing will be completed and a more comprehensive assessment of FARRAH I system performance will be made.

(2) Mission 73XX/FARRAH II: Assembly and acceptance testing of the various spacecraft subsystems, antennas, and payload subsystems continued during the reporting period. All antennas have completed final acceptance and pattern tests. Calibration data collection for two of the three direction finding antennas has been completed. The solar array panels have completed their final assembly and are awaiting environmental tests. The Type 28 transmitter qualification unit experienced an acceptance test failure during May. As a result, a new process for controlling the fabrication and assembly of the copper clad substrates used in the power amplifier section was developed, tested and implemented. To date, the qualification unit has successfully completed its acceptance tests and is now proceeding into qualification testing. The silver ribbon rework of all affected subsystems of the payload was completed during the reporting period. All payload subsystems (with the exception of the data control unit (C-Box) and the downconverters) have

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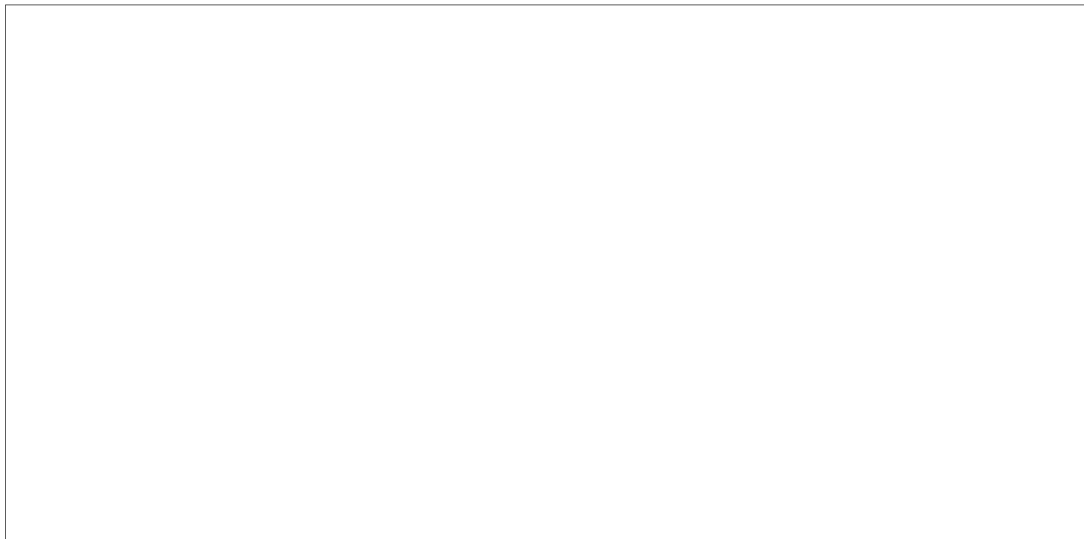
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completed their acceptance tests, have been integrated into their respective payload boxes and are presently being operated and tested at the system level. The downconverters have completed their acceptance test with three problems noted. Diagnostic testing of the downconverters in order to isolate the cause for each problem is in progress.



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(4) Mission 72XX/LORRI II: Preliminary development activities for LORRI commenced in earnest during this reporting period. A LORRI II System Requirements Review was held on 20 May 82. Results of that review are reflected in the LORRI II System Specification. In addition to completing program planning activities, purchase orders for 75% of the critical long lead payload components were placed.



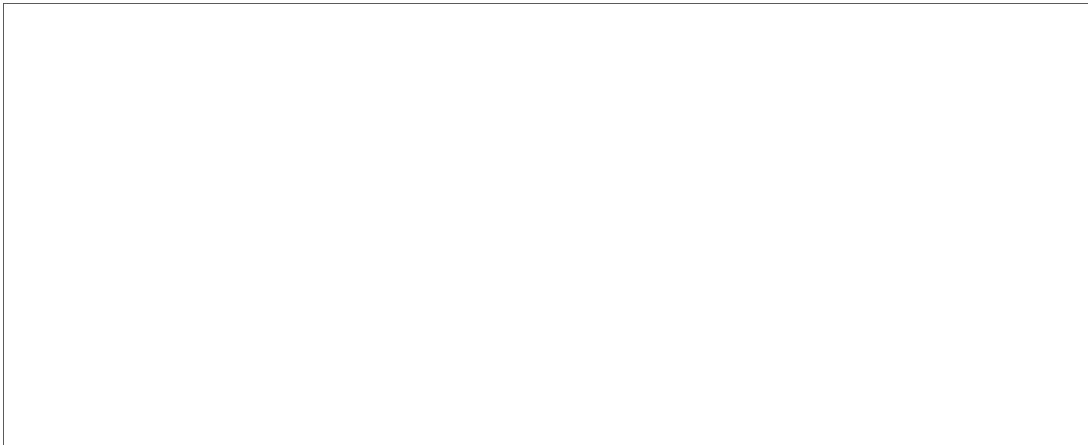
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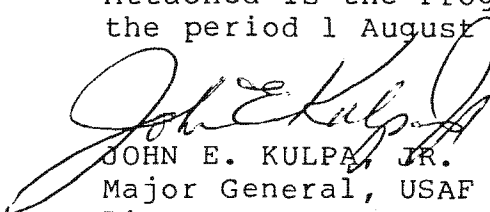
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BYE-110576-82 *42*
As of 30 September 1982
Page 01 of 131 PagesMEMORANDUM FOR THE DIRECTOR, NATIONAL RECONNAISSANCE
OFFICE

SUBJECT: Quarterly Program Report

Attached is the Program A Quarterly Program Report for
the period 1 August 1982 through 30 September 1982.
JOHN E. KULPA, JR.
Major General, USAF
Director1 Atch
Quarterly Program
Report, as of 31 Sep 82

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As of 30 September 1982

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QUARTERLY PROGRAM REPORT

PROJECT 989

Program Manager: Colonel Paul F. Foley

1. SUMMARY:

Four 989 satellites were operational during this reporting period. The average combined tasking level for the period was 575 minutes per day. Operation of URSALA III, RAQUEL IA, and URSALA IV continued with no new anomalies occurring during the reporting period. URSALA III tasking was terminated on 19 Aug 82 because its daily collect of less than 25 minutes did not warrant its continued operation. URSALA III has been inactivated. The FARRAH I vehicle is in a nominal 383 nmi orbit and was maneuvered back to its nominal polar attitude on 9 Aug 82. Engineering testing of FARRAH I was completed on 3 Aug 82 and operational status was attained. Currently FARRAH I is averaging 310 minutes of collection per day. The FARRAH II spacecraft subsystem and antennas continue to be tested. An intermittent ground problem resulted in a 15-16 week slip in the projected delivery date. The early development and design activities associated with LORRI II are progressing toward a series of preliminary design reviews on the major subsystems. All long lead material orders for the LORRI II system have been placed. Studies are continuing to refine the FARRAH III Satellite and Ground Segment System Designs and the Launch System Integration requirements. The detailed cost and technical proposals for the acquisition of

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requested.

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2. Specific Status:a. On-Orbit Spacecraft

(1) Mission 7343/URSALA III: URSALA III, in its 74th month on-orbit, had its tasking terminated on 19 Aug 82. The utility of the less than 25 minutes of collection provided by URSALA III did not warrant the

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expense of operating the vehicle.

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(2) Mission 7345/RAQUEL IA: RAQUEL IA, in its 54th month of operation, continues to provide technical intelligence collection in the 4-18 GHz region. This vehicle has continued to operate satisfactorily, but because only one recorder remains operational, the number of recorder cycles per day continues to be limited. At present, 82 minutes per day of tasking are being supported by RAQUEL IA. On 3 Jul 82, tasking of the South Atlantic was concluded and the vehicle was reoriented to its nominal attitude on 25 Aug 82. No new anomalies have occurred.

(3) Mission 7344/URSALA IV: The mission of URSALA IV consists of general search, operational ELINT, and technical intelligence in the 2-12 GHz region. URSALA IV is in its 42nd month of operation and is supporting approximately 174 minutes of collection per day. On 14 Sep 82, a maneuver was successfully completed to reorient the vehicle's spin axis to its nominal polar orientation. No new anomalies have occurred during the reporting period.

(4) Mission 7346/FARRAH I: The mission of FARRAH I consists of general and directed search, operational ELINT and technical intelligence over the 2-18 GHz spectrum. The vehicle is in its 4th month of operation and is supporting approximately 310 minutes of collection per day. On 3 Aug 82, FARRAH I was declared operational. On 9 Aug, after a 39 revolution attitude adjustment maneuver, the vehicle's orientation was changed to its nominal polar attitude. Results from on-orbit testing and subsequent calibrations indicate that the spacecraft is performing exceptionally well. No new system performance discrepancies were observed during the period. The Band 8 (16-18 GHz) sensitivity degradation reported last period has been characterized. Approximately 10-25 db of sensitivity loss occurs in the pulse and CW DF channels for Band 8 as the payload temperature increases above 7 degrees C. Tasking of Band 8 DF was suspended 15 Jul 82. Periodic test signal generator evaluations will be conducted when the payload temperature returns to 10 degrees C or less (spring - early summer of 1983). At that time the Band 8

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sensitivity should return to normal and routine tasking of Band 8 DF will be resumed.

b. Vehicles Under Development and Test

(1) Mission 73xx/FARRAH II: Acceptance testing of the various spacecraft subsystems, antennas, and payload subsystems continued during the reporting period. All direction finding antennas have completed final calibration and the omni antennas are now in calibration. On 26 Jul 82, the Type 28 transmitter qualification unit successfully completed its qualification test program. This was a major milestone which was necessary for the end item transmitters to begin their acceptance testing. At the end of the last reporting period, a problem developed during the temperature cycling of the payload A and B box downconverters. The sum channels for bands 3, 4 and 5 lost gain above 60 degrees C and the omni plus pulse and TI output channels exhibited an intermittent loss of gain in all bands. The cause for the failures was the loss of a D.C. return to a microwave solid state switch. This loss was caused by either inadequate concentration or size of conductive particles in a chromerics conductive adhesive, which is used to bond the switches to the module housing. To solve the problem, a redundant D.C. return from the switch cover to the housing was provided. As a protective measure, all switches within the downconverters were incorporated. This necessitated the disassembly, repair, and reacceptance test of the A and B box downconverters, test signal generator, and CW and omni pulse receivers. As a result, the payload delivery has been delayed from 1 Apr 83 to 13 Jul 83. As of 4 Oct, all module rework has been completed and each affected subsystem reacceptance tested. The downconverters are presently undergoing their acceptance test with an anticipated completion date of 22 Oct 82. A spur problem with the TI receiver was also identified during acceptance testing of the TI receiver and will be corrected prior to payload system level acceptance testing, which commences on 10 Dec 82.

(2) Mission 72xx/LORRI II: Development activities for LORRI continued during the reporting period in preparation for a series of payload and pallet subsystem preliminary design reviews in Oct and Nov 82.

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As of 31 December 1982
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MEMORANDUM FOR THE DIRECTOR, NATIONAL RECONNAISSANCE
OFFICE

SUBJECT: Quarterly Program Report

Attached is the Program A Quarterly Program Report for
the period 1 October 1982 through 31 December 1982.

Ralph H. Jacobson

RALPH H. JACOBSON
Brig General, USAF
Director

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Quarterly Program
Report, as of 31 Dec 82

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QUARTERLY PROGRAM REPORT

PROJECT 989

Program Manager: Colonel Paul F. Foley

1. Summary:

Three 989 satellites were operational during this reporting period. The average combined tasking level for the period was 378 minutes per day. Operations of RAQUEL 1A and URSALA IV continued with no new anomalies occurring during the reporting period. URSALA III remains stored on-orbit. The FARRAH I Vehicle sustained two on-orbit anomalies during the reporting period. Both these anomalies were corrected and the vehicle is now fully operational with the exception of the previously reported sensitivity loss in the 12-18 GHz DF Channel. The FARRAH II availability is continuing to be held for a possible launch in Mar 84. All subsystems that comprise the spacecraft bus are complete with the exception of the transmitters and orbital boost motors. The payload has completed final integration and is presently undergoing preacceptance testing. A series of subsystem preliminary design reviews were conducted for LORRI II. Preliminary design phase activities continued for FARRAH III.

2. Specific Status:

a. On-Orbit Spacecraft

(1) Mission 7343/URSALA III: URSALA III, in its 77th month on-orbit, had its tasking terminated on 19 Aug 82. [redacted]

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(2) Mission 7345/RAQUEL IA: RAQUEL IA, in its 57th month of operation, continues to provide technical

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intelligence collection in the 4-18 GHz region. This vehicle has continued to operate satisfactorily, but because only one recorder remains operational, the number of recorder cycles per day continues to be limited. At present, approximately 51 minutes per day of tasking are being supported by RAQUEL IA.

(3) Mission 7344/URSALA IV: The mission of URSALA IV consists of general search, operational ELINT, and technical intelligence in the 2-12 GHz region. URSALA IV is in its 45th month of operation and is supporting approximately 136 minutes of collection per day. No new anomalies have occurred during this reporting period.

(4) Mission 7346/FARRAH I: The mission of FARRAH I consists of general and directed search, operational ELINT and technical intelligence over the 2-18 GHz spectrum. The vehicle is in its 7th month of operation and is supporting approximately 250 minutes of collection per day. During this report period, two major spacecraft anomalies occurred. On 28 Oct 82, the Data Handler power supply failed to turn on when commanded to do so by an on-board stored command. Subsequent testing and analysis traced the anomaly to a fault in either the command circuitry or the power supply internal circuitry. On 8 Nov 82 the power supply was successfully turned on. The vehicle was returned to full operational status on 2 Dec 82.

The power supply is now left on to prevent the recurrence of the failure. This increases the continuous power requirements and will impact tasking capability when the vehicle is in less than 100 percent sun conditions. Tasking may be reduced by 40-60 percent relative to the current 250 minutes per day average during these periods. The second failure occurred on 15 Dec 82 when the DCU failed to turn on by the on-board stored command. Subsequent analysis of data indicated that during the previous station contact, a fuse had blown in the supply line to the DCU primary power supply. Further investigation revealed that during assembly an improper size fuse had been

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installed (1/2 Amp versus the 2 Amp required). On 22 Dec 82 the redundant power supply (not fused) was selected and the DCU functioned normally. Tasking resumed on 24 Dec 82 and the vehicle was returned to full operational status on 29 Dec 82. The spacecraft is presently performing well and producing data as required except for the previously reported band 8 DF sensitivity degradation.

b. Vehicles Under Development and Test

(1) Mission 73XX/FARRAH II. The FARRAH II vehicle development and test is continuing satisfactorily to support a potential launch in Mar 84. On 6 Dec 82 the FARRAH II vehicle completed assembly and was transferred to systems test. The spacecraft bus is complete with the exception of the flight transmitters and orbital boost motors. The primary activities being pursued at this time are the preacceptance testing of the integrated payload which completed final top level integration assembly on 17 Dec 82 and the acceptance testing of the flight item transmitters. All antennas have completed final calibration with the exception of the C2 and C3 omni antennas which are scheduled for calibration in the Feb-Mar 83 timeframe. The flight transmitters are continuing to have problems due to late piece part delivery and various workmanship problems.

At present, the programmatic impact of this has not been fully assessed but it is not expected to impact vehicle availability. The payload is progressing on schedule for a 13 Jul 83 delivery. Acceptance testing of the downconverters was completed on 2 Nov 82 and box level integration was completed on 6 Dec 82. The problem with the TI receiver, which was reported in the last report, has been corrected. The payload final acceptance testing is scheduled to begin on 27 Jan 83 following final review of preacceptance data.

(2) Mission 72XX/LORRI II: Development activities for LORRI II have continued during the reporting period. A series of preliminary design reviews of the payload and pallet subsystems were

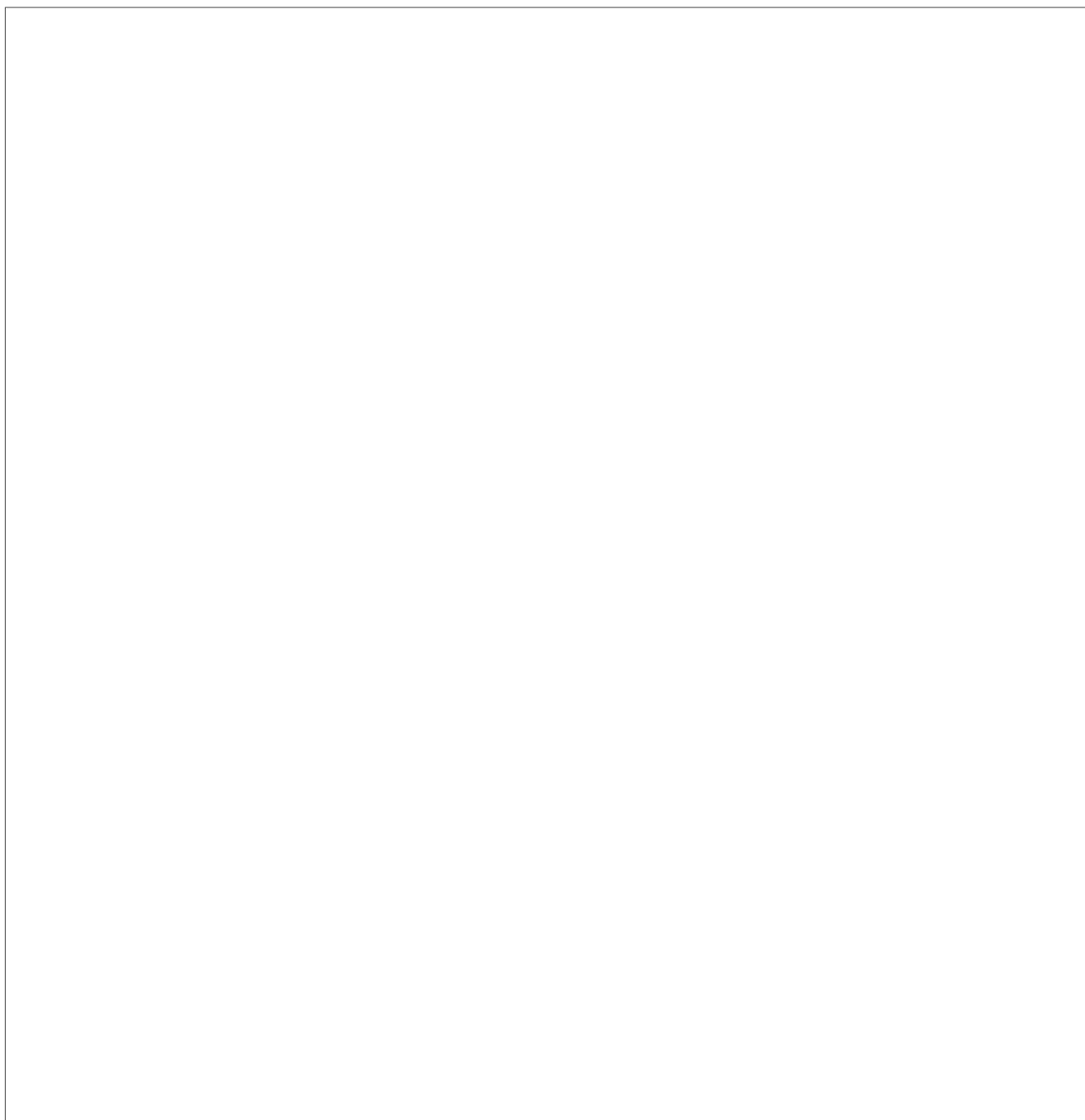
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completed during Oct 82. Detailed design activities are continuing in preparation for the system level Critical Design Review (CDR) in Mar 83. A VHF antenna mounting angle optimization study was completed in early Dec 82 and its results are being incorporated into the design. Preparations for a series of payload and pallet subsystem critical design reviews in Feb 83 are proceeding on schedule.



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Handle Via BYEMAN
Control System Only

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Handle Via BYEMAN
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