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COLLECTOR SYSTEM INTERFACE

PREOPERATIONAL TEST

PROCEDURE 360

REVISION: 0

SEPTEMBER, 1981

UNITED STATES DEPARTMENT OF ENERGY/
SOUTHERN CALIFORNIA EDISON COMPANY

10 MWe SOLAR PILOT PLANT

DAGGETT, CALIFORNIA

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY

HUNTINGTON BEACH, CALIFORNIA

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COLLECTOR SYSTEM INTERFACE
TEST PROCEDURE 360, REV. 0

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NOTE

This test addresses startup of the heliostat array controller (HAC) as it interfaces with other plant equipment external to the Collector System (CS), including the Operation Control System (OCS), the Data Acquisition System (DAS), the Receiver System (RS) and the Collector Field Power Supply. Figure 1 illustrates the essence of this test. This test is structured to test interfaces only. The systems are tested in other tests as follows: 100-CS, 000-RS, 305-DAS, 340-OCS and 820-Collector Field Power Supply. Test 360 is organized into four subtests one for each CS interface.

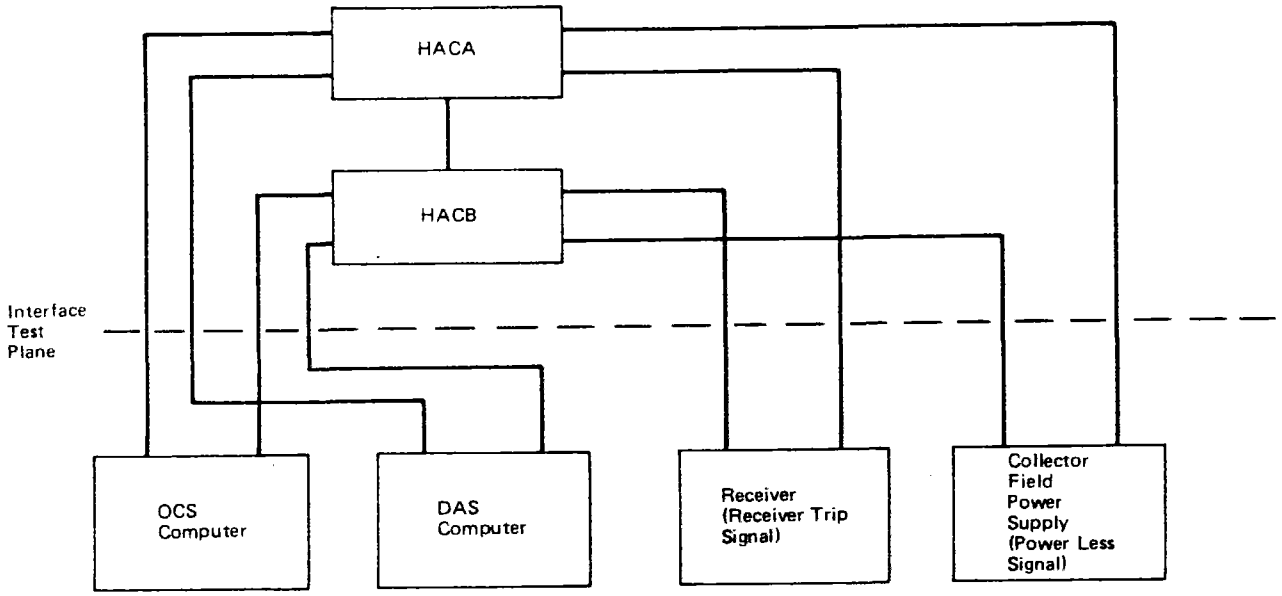

Figure 1. Test 360

1.0 OBJECTIVES

1.1 OCS-CS Interface

1.1.1 Legal Commands and Responses

Demonstrate that the legal commands associated with the matrix in Table 1.1.1 when entered at the OCS terminal are accepted by the HAC and processed properly by the CS. Demonstrate the HAC can (1) process commands in parallel, (2) maintain single blob during wire walk, and (3) process emergency commands as required.

1.1.2 Illegal Commands and Responses

Demonstrate that illegal commands associated with the matrix in Tables 1.1.2-1, -2 and -3 when entered at the OCS terminal are responded to properly, but are not executed.

1.1.3 CS Alarms and OCS Processing

Demonstrate that CS alarms are processed adequately by OCS.

1.1.4 HAC Failover Effect

Demonstrate that the CS responses to OCS commands is not affected by HAC failover.

1.1.5 OCS Failure Effect

Demonstrate that the failure of the OCS to communicate with the CS does not interfere with CS functions.

1.2 DAS-CS Interface

1.2.1 Status Commands and Responses

Demonstrate the DAS receives CS status data and logs it.

1.2.2 Illegal Commands and Responses

Demonstrate the commands entered at the DAS console are responded to properly and not executed.

1.2.3 HAC Failover Effect

Demonstrate that the DAS logging of CS status data is not affected by HAC failover.

TABLE 1.1.1

OCS-CS LEGAL COMMANDS AND RESPONSES TEST MATRIX

		MODE GOING TO																		
		STOW													STANDBY					
	COMMAND	STOW				STHIWIND	ESTOW								UNSTOW					
	ADDRESSING	H	S	A	ALL	ALL	H	F	S	W	R	A	ALL		H	F	S	W	R	A	ALL
FROM MODE	STOW														X	X	X	X	X	X	X
	STOW ALT1	X	X	X	X	X									X	X	X	X	X	X	X
	STOW ALT2														X	X	X	X	X	X	X
	TRACK	X	X	X	X	X															
	STANDBY	X	X	X	X	X															
	BCS					X															
	DIR POS	X	X	X	X	X															
	INITIAL	X	X	X	X	X	X	X	X	X	X	X	X								
	MARK	X	X	X	X	X															
	TRANSIT*					X															

H - HELIOSTAT
F - FIELD CONTROLLER
S - SEGMENT
W - WEDGE
R - RING
A - ARC
ALL - ENTIRE FIELD

*TO AND FROM TRACK MC

TABLE 1.1.1 (CONTINUED)

OCS-CS LEGAL COMMANDS AND RESPONSES TEST MATRIX

		MODE GOING TO								
		TRACK								
ADDRESSING		TRACK						INCREASE		
COMMAND		H	F	S	W	R	A	S	W	R
FROM MODE	STOW									
	STOW ALT1									
	STOW ALT2									
	TRACK									
	STANDBY	X	X	X	X	X	X	X	X	X
	BCS									
	DIR. POS									
	INITIAL									
	MARK									

TABLE 1.1.1 (CONTINUED)

OCS-CS LEGAL COMMANDS AND RESPONSES TEST MATRIX

		MODE GOING TO																		
		STANDBY																		
	COMMAND	STANDBY						DECREASE			DEFOCUS	ESTANDBY								
	ADDRESSING	H	F	S	W	R	A	S	W	R	ALL	H	F	S	W	R	A	ALL		
FROM MODE	STOW																			
	STOW ALT1																			
	STOW ALT2																			
	TRACK	X	X	X	X	X	X	X	X	X	X									
	STANDBY																			
	BCS																			
	DIR. POS																			
	INITIAL											X	X	X	X	X	X	X		
	MARK																			
	TRANSIT*										X									

*TO AND FROM TRACK MODE

Table 1.1.2-1

OCS-CS ILLEGAL COMMANDS-CS CONTROL CONSOLE ONLY TEST MATRIX

Command	Command
ALT1STOW	LOAD
ALT2STOW	UPBIAS
WASH	HELP
BCSTRACK	CFABORT
RETURN	CFWAIT
POSITION	REFRESH
SAVE	BCSSTART
RESTORE	BCSTAPE
OFFLINE	BCSFILE
ONLINE	BCSDISP
HOLD	BCSRANGE
RLHIWIND	BCSMEAS
DEFRLSE	BCSINPUT
RELWASH	BCSOFFS
MARK	BCSCALC
UPAIM	BCSUPD
	BCSEND

Table 1.1.2-2

OCS-CS ILLEGAL COMMANDS-WRONG MODE TEST MATRIX

	Command	STOW	STHIWIND	ESTOW	UNSTOW	TRACK	INCREASE	STANDBY	DECREASE	DEFOCUS	ESTANDBY
	Addressing	H	ALL	H	H	H	S	H	S	ALL	H
Current Mode	STOW					X	X	X	X	X	X
	STOW ALT1			X		X	X	X	X	X	X
	STOW ALT2	X	X	X		X	X	X	X	X	X
	TRACK			X	X						X
	STANDBY			X							
	BCS	X		X	X	X		X		X	X
	DIR POS			X	X	X	X	X	X	X	X
	INITIAL				X	X	X	X	X	X	
	MARK			X	X	X	X	X	X	X	X
	TRANSIT	X		X	X	X	X	X	X		X

Table 1.1.2-3

OCS-CS ILLEGAL COMMANDS-ADDRESSING ERRORS TEST MATRIX

	COMMAND	STOW		UNSTOW		STANDBY	DECREASE				TRACK	INCREASE			
	ADDRESSING	W	R	S	W	ALL	H	F	A	ALL	ALL	H	F	A	ALL
Current Mode	STOW			X	X										
				(numerical errors)											
	TRACK					X	X	X	X	X					
	STANDBY	X	X								X	X	X	X	X

1.2.4 DAS Failure Effect

Demonstrate that the failure of the DAS to communicate with the CS does not interfere with CS functions.

1.3 RS-OCS Interface

1.3.1 Simulated RS Trip

1.3.1.1 Heliostats in STOW Mode

Demonstrate that a simulated RS trip and cleared trip are reported to the operator by the CS.

1.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

Demonstrate in addition to the above objectives that a simulated RS trip and cleared trip are processed properly by the CS.

1.3.1.3 HAC Failure Before RS Trip

Demonstrate the above objectives are met when a RS trip is preceded by a HAC failure.

1.3.2 Actual RS Trip

1.3.2.1 Heliostats in STOW Mode

Demonstrate that an actual RS trip and a cleared trip are reported to the operator by the CS.

1.3.2.2 Heliostate in TRACK Mode

Demonstrate in addition to the above objectives that an actual RS trip and cleared trip are processed properly by the CS.

1.3.2.3 HAC Failover Before RS Trip

Demonstrate the above objectives are met when a RS trip is preceded by a HAC failure.

1.4 Collector Field Power Supply - CS Interface

1.4.1 Simulated Power Loss and Regain

1.4.1.1 Heliostats in STOW Mode

Demonstrate that a simulated power loss and regain are reported to the operator by the CS and the HAC does not failover.

1.4.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

Demonstrate in addition to the above objectives that receiver trips, emergency commands and field initialization are processed properly by the CS.

1.4.1.3 HAC Failover Before Power Loss

Demonstrate the above objectives are met when the power loss is proceded by a HAC failover.

1.4.2 Actual Power Loss and Regain

1.4.2.1 Heliostats in STOW Mode

Demonstrate actual collector field power loss and regain are reported to the operator by the CS and the HAC does not failover.

1.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

Demonstrate in addition to the above objectives that receiver trips, emergency commands and field initialization are processed properly by the CS.

1.4.2.3 Heliostats Walking Wires

Demonstrate the above objectives for the case of heliostats walking wires.

1.4.2.4 HAC Failover Before Power Loss

Demonstrate that the above objectives are met when power loss is proceded by a HAC failover.

2.0 ACCEPTANCE CRITERIA

2.1 OCS-CS Interface

	Verification Paragraph	Objective Paragraph
2.1.1 Legal Commands and Responses		
The graphics and loggers of both the OCS and the CS report that the CS responds to legal commands from the OCS with appropriate heliostat mode transitions and status response data as required in Reference 3.1b.	8.1.1	1.1.1
2.1.2 Illegal Commands and Responses		
The graphics and loggers of both the OCS and the CS report that the CS responds to illegal commands from the OCS with appropriate error messages and the CS does not implement commands which are illegal.	8.1.2	1.1.2
2.1.3 CS Alarms and OCS Processing		
The graphics and logger of the OCS report CS alarms in an appropriate manner.	8.1.3	1.1.3
2.1.4 HAC Failover Effect		
The graphics and loggers of both the OCS and the CS report that the CS continues to respond to OCS commands in an appropriate manner following a HAC failover.	8.1.4	1.1.4
2.1.5 OCS Failure Effect		
The graphics and loggers of the CS report that the CS continues to function properly when the OCS does not communicate with the CS.	8.1.5	1.1.5

2.2 DAS-CS Interface

2.2.1 Status Commands and Responses		
The CS status data logged by the DAS concurs with that logged by the CS; and these data	8.2.1	1.2.1

	Verification Paragraph	Objective Paragraph
2.2.1 Status Commands and Responses (Continued)		
are logged by the DAS every 64 seconds or more frequently.		
2.2.2 Illegal Commands and Responses		
All DAS-CS interface commands entered at the DAS console are responded to by error messages. In addition, collector field commands entered at the DAS console are not responded to be the CS.	8.2.2	1.2.2
2.2.3 HAC Failover Effect		
The logging by the DAS of valid CS status data continues through and following a HAC failover.	8.2.3	1.2.3
2.2.4 DAS Failure		
The graphics and logger of the CS report that the CS continues to function properly when the DAS does not communicate with the CS.	8.2.4	1.2.4
2.3 RS-CS Interface		
2.3.1 Simulated RS Trip		
2.3.1.1 Heliostats in STOW Mode	8.3.1.1	1.3.1.1
The CS control console displays RS trip and cleared trip messages		
2.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes	8.3.1.2	1.3.1.2
The CS control console displays appropriate messages, and the CS implements commands in the proper manner.		

	Verification Paragraph	Objective Paragraph
2.3.1.3 HAC Failure Before RS Trip	8.3.1.3	1.3.1.3
The CS console displays appropriate messages and the CS implements commands in the proper manner.		
2.3.2 Actual RS Trip		
2.3.2.1 Heliostats in STOW Mode	8.3.2.1	1.3.2.1
The CS control console displays RS trip and cleared trip messages.		
2.3.2.2 Heliostats in TRACK Mode	8.3.2.2	1.3.2.2
The CS control console displays appropriate messages, the CS moves 97% of heliostats in TRACK mode to the STANDBY mode within 30 seconds and the CS implements commands in the proper manner.		
2.3.2.3 HAC Failover Before RS Trip	8.3.2.3	1.3.2.3
The CS control console displays appropriate messages, the CS moves 97% of heliostats in TRACK mode to the STANDBY mode within 30 seconds and the CS implements commands in the proper manner.		
2.4 Collector Field Power Supply - CS Interface		
2.4.1 Simulated Power Loss and CS Responses		
2.4.1.1 Heliostats in STOW Mode	8.4.1.1	1.4.1.1
The CS control console displays power loss and regain alarm messages and it does not display a HAC failover message.		

	Verification Paragraph	Objective Paragraph
2.4.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes	8.4.1.2	1.4.1.2
The CS control console displays appropriate messages and the CS implements commands in the proper manner.		
2.4.1.3 HAC Failover Before Power Loss	8.4.1.3	1.4.1.3
The CS control console displays appropriate messages and the CS implements commands in the proper manner.		
2.4.2 Actual Power Loss and Regain		
2.4.2.1 Heliostats in STOW Mode	8.4.2.1	1.4.2.1
The CS control console displays power loss and regain alarm messages and it does not display a HAC failover alarm message.		
2.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes	8.4.2.2	1.4.2.2
The CS control console displays appropriate messages, the CS reinitializes the collector field within 60 seconds, and the CS implements commands in the proper manner.		
2.4.2.3 Heliostats Walking Wires	8.4.2.3	1.4.2.3
The CS control console displays appropriate messages, the CS reinitializes the field within 60 seconds and the CS implements commands in the proper manner.		
2.4.2.4 HAC Failover Before Power Loss	8.4.2.4	1.4.2.4
The CS control console displays appropriate messages, the CS reinitializes the field within 60 seconds and the CS implements commands in the proper manner.		

3.0 REFERENCES

3.1

a. Pilot Plant System Description, RADL 2-1, December 1980

b. CS-MCS and CS-Plant Interface Requirements, RADL 2-30-1, May 1981

c. Master Control Subsystem Hardware and Software Specification, TBI

d. Operations Instructions, Heliostat Field Subsystem, MCR-81-1708, April 1981

3.2 Logic Diagrams

N/A

3.3 Line Schedules

N/A

3.4 Single Line Diagrams

"Main One Line Diagram", SCE Drawing No. 5133351-F

3.5 Piping And Instrumentation Diagrams

N/A

3.6 Electrical Elementary Diagrams

a. "Elementary Diagram 4160 Volt Switchgear, "A01-7" Cubicle 6 and "A01-9" Cubicle 8, SCE Drawing Nos. 5133380-0 and 5133382-0.

b. "Wiring and Connections, Heliostat Array Controller Auxiliary Relay Box", S-R Drawing No. E8-114.

3.7 Instrument Index

N/A

3.8 Material Requisition And/Or Specification

N/A

3.9 Vendor Data

N/A

3.10 Test Plans

CS Pre-operational Test Procedure 100, Rev 0

OCS Pre-operational Test Procedure 340, Rev 0

RS Pre-operational Test Procedure 000, Rev 0

Collector Power Pre-operational Test Procedure 820, Rev 0.

4.0 PREREQUISITES

4.1 OCS-CS Interface

4.1.1 Turnover of the OCS and the CS to SCE are both complete and in accordance with Section 5.4 of the SCE Start-up Manual.

_____ /_____
INITIAL DATE

4.1.2 Referenced material has been reviewed and later revisions (if any) will not affect this test.

_____ /_____
INITIAL DATE

4.1.3 The Master Tracking System has been reviewed and outstanding items (if any) will not affect this test. A summary list of outstanding items is attached on Appendix 10A.

_____ /_____
INITIAL DATE

4.1.4 The Abnormal Equipment and Circuitry Log has been reviewed, is current, and is satisfactory for this test. A summary list is attached on Appendix 10B.

_____ /_____
INITIAL DATE

4.1.5 The system has been walked through and verified complete to the extent required to conduct this test.

_____ /_____
INITIAL DATE

4.1.5.1 The maxnet system has been tested and demonstrated functional for the OCS-HAC A and OCS-HAC B communication lines in Test 340.

_____/ _____
INITIAL DATE

4.1.5.2 Both the physical communication interfaces between the operating control system (OCS) and HAC's (A and B) are properly established through the two MODCOMP 4811 Asynchronous Communications Interface Units.

_____/ _____
INITIAL DATE

4.1.5.3 The CS displays illustrate the field and heliostat status as verified in Test 100.

_____/ _____
INITIAL DATE

4.1.6 A pretest coordination meeting has been held to familiarize test and operations personnel with the requirements of this test and the proper safety criteria to be exercised.

_____/ _____
INITIAL DATE

4.1.7 If required, special standby coordinates are entered in the HAC software in order that heliostat beam off receiver timing is more accurate.

_____/ _____
INITIAL DATE

4.2 DAS-CS Interface

4.2.1 Turnover of the DAS and the CS to SCE are both complete and in accordance with Section 5.4 of the SCE Start-up Manual.

_____/ _____
INITIAL DATE

4.2.2 Referenced material has been reviewed and later revisions (if any) will not affect this test.

_____/ _____
INITIAL DATE

4.2.3 The Master Tracking System has been reviewed and outstanding items (if any) will not affect this test. A summary list of outstanding items is attached on Appendix 10A.

_____/ _____
INITIAL DATE

4.2.4 The Abnormal Equipment and Circuitry Log has been reviewed, is current, and is satisfactory for this test. A summary list is attached on Appendix 10B.

_____/ _____
INITIAL DATE

4.2.5 The system has been walked through and verified complete to the extent required to conduct this test.

_____/ _____
INITIAL DATE

4.2.5.1 The maxnet system has been tested and demonstrated functional for the DAS-HAC A and DAS-HAC B communications lines in Test 340

_____/ _____
INITIAL DATE

4.2.5.2 Both the physical communications interfaces between DAS and HAC's (A and B) are properly established through the two MODCOMP 4811 Asynchronous Communications Interface Units.

_____/ _____
INITIAL DATE

4.2.5.3 The CS displays illustrate the field and heliostat status as verified in Test 100.

_____/ _____
INITIAL DATE

4.2.6 A pretest coordination meeting has been held to familiarize test and operations personnel with the requirements of this test and the proper safety criteria to be exercised.

_____/ _____
INITIAL DATE

4.3 RS-CS Interface

4.3.1 Turnover of the RS and the CS to SCE are both complete and in accordance with Section 5.4 of the SCE Start-up Manual.

_____/ _____
INITIAL DATE

4.3.2 Referenced material has been reviewed and later revisions (if any) will not affect this test.

_____/ _____
INITIAL DATE

4.3.3 The Master Tracking System has been reviewed and outstanding items (if any) will not affect this test. A summary list of outstanding items is attached on Appendix 10A.

_____/ _____
INITIAL DATE

4.3.4 The Abnormal Equipment and Circuitry Log has been reviewed, is current, and is satisfactory for this test. A summary list is attached on Appendix 10B.

_____/ _____
INITIAL DATE

4.3.5 The system has been walked through and verified complete to the extent required to conduct this test.

_____/ _____
INITIAL DATE

4.3.5.1 The hardwire receiver trip/clear signal has been tested up to the Auxiliary Relay Box - HAC interface and it has been found operational in Test 000.

_____/ _____
INITIAL DATE

4.3.5.2 The CS displays illustrate the field and heliostat status as verified in Test 100.

_____/ _____
INITIAL DATE

4.3.6 All test equipment as per Section 6.3, is available, calibrated and in working order.

_____/ _____
INITIAL DATE

4.3.7 A pretest coordination meeting has been held to familiarize test and operations personnel with the requirements of this test and the proper safety criteria to be exercised.

_____/ _____
INITIAL DATE

4.3.8 If required, special standby coordinates are entered in the HAC software in order that heliostat beam off receiver timing is more accurate.

_____/ _____
INITIAL DATE

4.4 Collector Field Power Supply-CS Interface

4.4.1 Turnover of the Collector Field Power Supply, Main/Auxiliary Power Transformer, and the CS to SCE are both complete and in accordance with Section 5.4 of the SCE Start-up Manual.

_____/ _____
INITIAL DATE

4.4.2 Referenced material has been reviewed and later revisions (if any) will not affect this test.

_____/ _____
INITIAL DATE

4.4.3 The Master Tracking System has been reviewed and outstanding items (if any) will not affect this test. A summary list of outstanding items is attached on Appendix 10A.

_____/ _____
INITIAL DATE

4.4.4 The Abnormal Equipment and Circuitry Log has been reviewed, is current, and is satisfactory for this test. A summary list is attached on Appendix 10B.

_____/ _____
INITIAL DATE

4.4.5 The system has been walked through and verified complete to the extent required to conduct this test.

_____/ _____
INITIAL DATE

4.4.5.1 The hardwire power loss/regain signal capability has been tested up to the Auxiliary Relay Box - HAC interface and it has been found acceptable in Test 820.

_____/ _____
INITIAL DATE

4.4.5.2 The CS displays illustrate the field and heliostat status as verified in Test 100.

_____/ _____
INITIAL DATE

4.4.6 All test equipment as per Section 6.4, is available, calibrated and in working order.

_____/ _____
INITIAL DATE

4.4.7 A pretest coordination meeting has been held to familiarize test and operations personnel with the requirements of this test and the proper safety criteria to be exercised.

_____/ _____
INITIAL DATE

5.0 LIMITS AND PRECAUTIONS

5.1 Prior to the start of this test, the Test Conductor shall ensure all personnel and equipment are out of the arc to be swung by the heliostats under test.

5.2 Prior to the start of this test, the operator must read and understand the complete procedure, noting those actions required to terminate any critical condition.

This procedure must be performed in sequence, unless otherwise indicated.

Field personnel must be alerted before this test is performed because heliostats should or can be slewing and tracking.

Wash crews must not be working on heliostats during this test.

5.3 Observe vendor operating and maintenance instructions.

5.4 Beam safety considerations require that test 360 procedures which involve multiple heliostat movements with uncovered mirrors should be performed preferably at night or if necessary on heavily overcast days. During night tests, simulated time of day shall be incorporated to provide realistic gimbal angles.

6.0 TEST EQUIPMENT

NOTE: Test equipment equivalent to that specified may be used. Equipment serial number will be recorded prior to start of test and calibration shall be verified for expected test time period.

6.1 OCS-CS Interface

(None identified)

6.2 DAS-CS Interface

(None identified)

6.3 RS-CS Interface

6.3.1 A Simpson Volt-Ohm-Milliammeter or equivalent

6.3.2 Two 24 volt sources.

6.3.3 A pair walkie-talkies for communications between test personnel in control room and equipment room, as required.

6.4 Collector Field Power Supply-CS Interface

6.4.1 A Simpson Volt-Ohm-Milliammeter or equivalent.

6.4.2 A pair walkie-talkies for communications between test personnel in control room and equipment room, as required.

7.0 INITIAL CONDITIONS

7.1 Environmental Conditions

7.1.1 Ambient conditions are acceptable to the CS, OCS, DAS, RS and Collector Field Power Supply.

_____/_____
INITIAL DATE

7.1.2 Wind conditions are acceptable to the CS.

_____/_____
INITIAL DATE

7.2 System Status

7.2.1 Collector System

7.2.1.1 The Collector Control System has the following components on-line and in an operational status: 1) both HAC's, 2) dual redundant communications, 3) at least 70% of heliostat field under control of HAC, and 4) the control room control console and graphics.

_____/_____
INITIAL DATE

7.2.1.2 At least 70% of the heliostats are in the STOW mode and the other heliostats in the OFFLINE mode. (Testing in Section 8 must "MARK" these HC's as required.)

_____/_____
INITIAL DATE

7.2.2 Operations Control System

7.2.2.1 The OCS console, logger, and computer are operational.

_____/_____
INITIAL DATE

7.2.2.2 The dual redundant communications with the CS is operational.

_____/_____
INITIAL DATE

7.2.3 Data Acquisition System

7.2.3.1 The DAS console, logger and computer are operational.

_____/_____
INITIAL DATE

7.2.3.2 The dual redundant communications with the CS is operational.

_____/_____
INITIAL DATE

7.2.4 Receiver System

7.2.4.1 The hardwire interface from the Auxiliary Relay Box to the HACs is installed.

_____/_____
INITIAL DATE

7.2.4.2 For the testing in Section 8.3.2, the RLU is operational and the receiver trip/clear signal is operational and has been tested up to the interface between the Auxiliary Relay Box and the HACs (Auxiliary Relay Box terminals RETTI, $\overline{\text{RTRIP1}}$, RTRIP1, $\overline{\text{RTRIP2}}$, RTRIP2, and RETT2).

_____/_____
INITIAL DATE

7.2.5 Collector Field Power Supply System

7.2.5.1 The hardwire interface from the Auxiliary Relay Box to the HACs is installed.

_____/_____
INITIAL DATE

7.2.5.2 For the testing in Section 8.4.2, the power loss/regain signal is operational and has been tested up to the interface between the Auxiliary Relay Box and the HACs (Auxiliary Relay Box terminals RET1, PWR1, $\overline{\text{PWR1}}$, $\overline{\text{PWR2}}$, PWR2, and RET2).

_____/_____
INITIAL DATE

7.2.6 Plant Power System

Plant power is available to the CS, OCS, DAS, and RS. Circuit breakers are in position and status required in Appendix 10F.

_____/_____
INITIAL DATE

8.0 PROCEDURE AND DATA COLLECTION

8.1 OCS-CS Interface

8.1.1 Legal Commands and Responses

NOTE

The testing of the command matrix in Table 1.1.1 is organized as follows:

8.1.1.1 Normal Commands

8.1.1.1.1 Single Addressee Commands

8.1.1.1.2 Multiple Addressee Commands

8.1.1.1.3 Full Field Commands

8.1.1.1.4 Multiple Wire Walk Commands-Single Blob

8.1.1.1.5 Miscellaneous Commands

8.1.1.2 Emergency Commands

8.1.1.2.1 Collector Field Power Loss/Track-Standby Modes

8.1.1.2.2 Collector Field Power Loss/Walking Wires

8.1.1.2.3 Receiver Defocus and High Winds

CAUTION

THIS SECTION REQUIRES HELIOSTATS TO BE IN MODES WHICH REQUIRE BEAM SAFETY CONSIDERATIONS. THEREFORE, THE TESTING IN THIS SECTION IS REQUIRED PREFERABLY AT NIGHT AND IF NECESSARY ON HEAVILY OVERCAST DAYS.

8.1.1.1 Normal Commands

8.1.1.1.1 Single Addressee Commands

8.1.1.1.1.1 Single HC, Segment And Arc Addressing

a. Verify the initial conditions have been established.

INITIAL _____ / _____ DATE

b. Enter the commands addressed to a single HC, a single segment and a single Arc as listed below and verify the response. The command sequences have been established in a manner which attempts to reduce the test time by performing wire walks in parallel on 3 different wires. If any of the addresses are offline an alternate addressee type may be selected provided each addressee type is assigned to a different wire.

8.1.1.1.1.1 Single HC, Segment And Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
CS	LOAD ALL	CS	Trans. to Init.	_____/_____
OCS	STOW H 0133	CS and OCS	Init. to Stow	_____/_____
CS	MARK H 0133	" " "	Stow to Mark	_____/_____
OCS	STOW H 0133	" " "	Mark to Stow	_____/_____
CS	ALT1 H 0133	" " "	Stow to Alt 1	_____/_____
OCS	STOW H 0133	" " "	Alt 1 to Stow	_____/_____
CS	ALT2 H 0133	" " "	Stow to Alt 2	_____/_____
OCS	STOW S 209	CS and OCS	Init. to Stow	_____/_____
CS	MARK S 209	" " "	Stow to Mark	_____/_____
OCS	STOW S 209	" " "	Mark to Stow	_____/_____
CS	ALT1 S 209	" " "	Stow to Alt 1	_____/_____
OCS	STOW S 209	" " "	Alt 1 to Stow	_____/_____
CS	ALT2 S 209	" " "	Stow to Alt 2	_____/_____
OCS	STOW A 0402 0420	CS and OCS	Init. to Stow	_____/_____
CS	MARK A 0402 0420	" " "	Stow to Mark	_____/_____
OCS	STOW A 0402 0420	" " "	Mark to Stow	_____/_____
CS	ALT1 A 0402 0420	" " "	Stow to Alt 1	_____/_____
OCS	STOW A 0402 0420	" " "	Alt 1 to Stow	_____/_____
CS	ALT2 A 0402 0420	" " "	Stow to Alt 2	_____/_____

8.1.1.1.1.1 Single HC, Segment And Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS*	UNSTOW S 209	CS and OCS	Alt 2 to Standby	____/____
OCS*	UNSTOW A 402,420	" " "	Alt 2 to Standby	____/____
OCS*	UNSTOW H 0133	" " "	Alt 2 to Standby	____/____
OCS	TRACK H 0133	CS and OCS	Standby to Track	____/____
OCS	STANDBY H 0133	" " "	Track to Standby	____/____
OCS	TRACK S 209	CS and OCS	Standby to Track	____/____
OCS	STANDBY S 209	" " "	Track to Standby	____/____
OCS	INCREASE S 209	" " "	Standby to Track	____/____
OCS	DECREASE S 209	" " "	Track to Standby	____/____
OCS	TRACK A 0402,0420	CS and OCS	Standby to Track	____/____
OCS	STANDBY A 0402, 0420	" " "	Track to Standby	____/____
CS	ALT1 S 209	CS and OCS	Standby to Alt 1	____/____
CS	ALT1 A 0402,0420	" " "	Standby to Alt 1	____/____
CS	ALT1 H 0133	" " "	Standby to Alt 1	____/____

*Enter commands one immediately after another to minimize test time during wire walk.

8.1.1.1.1.1 Single HC, Segment And Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS*1	UNSTOW S 209	CS and OCS	Alt 1 to Standby	____/____
OCS*1	UNSTOW A 0402, 0420	" " "	Alt 1 to Standby	____/____
OCS*1	UNSTOW H 0133	" " "	Alt 1 to Standby	____/____
OCS*2	STOW S 209	CS and OCS	Standby to Stow	____/____
OCS*2	STOW A 0402, 0420	" " "	Standby to Stow	____/____
OCS*2	STOW H 0133	" " "	Standby to Stow	____/____
OCS*3	UNSTOW S 209	CS and OCS	Stow to Standby	____/____
OCS*3	UNSTOW A 0402, 0420	" " "	Stow to Standby	____/____
OCS*3	UNSTOW H 0133	" " "	Stow to Standby	____/____
OCS	TRACK S 209	CS and OCS	Standby to Track	____/____
OCS	TRACK A 0402, 0420	" " "	Standby to Track	____/____
OCS	TRACK H 0133	" " "	Standby to Track	____/____

*n Enter commands with same n value one immediately after another to minimize test time during wire walk.

8.1.1.1.1.1 Single HC, Segment And Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS*	STOW S 209	CS and OCS	Track to Stow	____/____
OCS*	STOW A 0402, 0420	" " "	Track to Stow	____/____
OCS*	STOW H 0133	" " "	Track to Stow	____/____
CS	POSI S 209 10. -75.	CS and OCS	Stow to Dir. Pos. 10.^{o} AZ, -75.^{o} EL	____/____
CS	POSI A 0402,0402, 10.,-75.	" " "	Stow to Dir. Pos. 10.^{o} AZ, -75.^{o} EL	____/____
CS	POSI H 0133 10., -75.	" " "	Stow to Dir. Pos. 10.^{o} AZ, -75.^{o} EL	____/____
OCS	STOW S 209	CS and OCS	Dir. Pos. to Stow	____/____
OCS	STOW A 0402,0420	" " "	Dir. Pos. to Stow	____/____
OCS	STOW H 0133	" " "	Dir. Pos. to Stow	____/____

*Enter commands one immediately after another to minimize test time during wire walk.

8.1.1.1.1.2 Single HFC, Ring and Wedge Addressing

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

c. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

d. Enter the commands addressed to a single HFC, ring and wedge as listed below and verify the response. The command sequences have been established in a manner which attempts to reduce the test time by performing wire walks in parallel on 3 different wires. If any of the addressees are offline an alternate addressee type may be selected provided each addressee type is assigned to a different wire.

8.1.1.1.1.2 Single HFC, Ring and Wedge Addressing (Continued)

NOTE

Ring 5 includes segments 504, 505, 506, 507, 508 and 509.

Wedge 10 includes segments 110, 210, 310 and 410.

HFC 34 controls HCS 2022-2084.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS*	UNSTOW R/5	CS and OCS	Stow to Standby	____/____
OCS*	UNSTOW W/10	" " "	Stow to Standby	____/____
OCS*	UNSTOW F/34	" " "	Stow to Standby	____/____
OCS	TRACK R/5	CS and OCS	Standby to Track	____/____
OCS	STANDBY R/5	" " "	Track to Standby	____/____
OCS	INCREASE R/5	" " "	Standby to Track	____/____
OCS	DECREASE R/5	" " "	Track to Standby	____/____
OCS	TRACK W/10	CS and OCS	Standby to Track	____/____
OCS	STANDBY W/10	" " "	Track to Standby	____/____
OCS	INCREASE W/10	" " "	Standby to Track	____/____
OCS	DECREASE W/10	" " "	Track to Standby	____/____
OCS	INCREASE 15/R/5	CS and OCS	Standby to Track	____/____
OCS	DECREASE 15/R/5	" " "	Track to Standby	____/____
OCS	INCREASE 15/W/10	CS and OCS	Standby to Track	____/____
OCS	DECREASE 15/W/10	" " "	Track to Standby	____/____

*Enter commands one immediately after another to minimize test time during wire walk.

8.1.1.1.1.2 Single HFC, Ring and Wedge Addressing (Continued)

NOTE

Ring 5 includes segments 504, 505, 506, 507, 508 and 509.

Wedge 10 includes segments 110, 210, 310 and 410.

HF 34 controls HCS 2022-2084.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS	TRACK F/34	CS and OCS	Standby to Track	____/____
OCS	STANDBY F/34	" " "	Track to Standby	____/____
CS*1	ALT1 R/5	CS and OCS	Standby to Alt 1	____/____
CS*1	ALT1 W/10	" " "	Standby to Alt 1	____/____
CS*1	ALT1 F/34	" " "	Standby to Alt 1	____/____
OCS*2	UNSTOW R/5	CS and OCS	Alt 1 to Standby	____/____
OCS*2	UNSTOW W/10	" " "	Alt 1 to Standby	____/____
OCS*2	UNSTOW F/34	" " "	Alt 1 to Standby	____/____
OCS	ALT2 R/5	CS and OCS	Standby to Alt 2	____/____
OCS	ALT2 W/10	" " "	Standby to Alt 2	____/____
OCS	ALT2 F/34	" " "	Standby to Alt 2	____/____
OCS	UNSTOW R/5	CS and OCS	Alt 2 to Standby	____/____
OCS	UNSTOW W/10	" " "	Alt 2 to Standby	____/____
OCS	UNSTOW F/34	" " "	Alt 2 to Standby	____/____
OCS	STOW ALL	" " "	Standby to Stow	/

*n Enter commands with same n value one immediately after another to minimize test time during wire walk.

8.1.1.1.2 Multiple Addressee Commands

8.1.1.1.2.1 Five HCs and Segments and Three Arc Addressing

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. Enter the commands addressed to five HCs and segments and three Arcs as listed below and verify the response. The command sequences have been established in a manner which attempts to reduce the test time by performing wire walks in parallel on three different wires. If any of the addressees are offline an alternate addressee type may be selected provided each addressee type is assigned to a different wire.

Console Where Command Is Entered	Command	Display	Addressees Mode Change Verification or Other Messages	Sign-off Initial/ Date
CS	LOAD ALL	CS	Trans. to Init.	____/____
OCS	STOW H/0133,0235, 0335,0437,0547	CS and OCS	Init. to Stow	____/____
CS	MARK H/0133,0235, 0335,0437,0547	CS and OCS	Stow to Mark	____/____
OCS	STOW H/0133,0235, 0335,0437,0547	CS and OCS	Mark to Stow	____/____
CS	ALT1 H/0133,0235, 0335,0437,0547	CS and OCS	Stow to Alt 1	____/____
OCS	STOW H/0133,0235, 0335,0437,0547	CS and OCS	Alt 1 to Stow	____/____
CS	ALT2 H/0133,0235, 0335,0437,0547	CS and OCS	Stow to Alt 2	____/____

8.1.1.1.2.1 Five HCs and Segments and Three Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressees Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS	STOW S/209,309, 409,108,208	CS and OCS	Init. to Stow	____/____
CS	MARK S/209,309, 409,108,208	CS and OCS	Stow to Mark	____/____
OCS	STOW S/209,309, 409,108,208	CS and OCS	Mark to Stow	____/____
CS	ALT1 S/209,309, 409,108,208	CS and OCS	Stow to Alt 1	____/____
OCS	STOW S/209,309, 409,108,208	CS and OCS	Alt 1 to Stow	____/____
CS	ALT2 S/209,309, 409,108,208	CS and OCS	Stow to Alt 2	____/____
OCS	STOW A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Init. to Stow	____/____
CS	MARK A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Stow to Mark	____/____
OCS	STOW A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Mark to Stow	____/____
CS	ALT1 A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Stow to Alt 1	____/____
OCS	STOW A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Alt 1 to Stow	____/____
CS	ALT2 A/0402,420/ 0502,0510/0702,0710/	CS and OCS	Stow to Alt 2	____/____
OCS*	UNSTOW S/209,309, 409,108,208	CS and OCS	Alt 2 to Standby	____/____
OCS*	UNSTOW A/402,420/ 0502,0510/0702,0710/	CS and OCS	Alt 2 to Standby	____/____
OCS*	UNSTOW H/0133,0235, 0335,0437,0547	CS and OCS	Alt 2 to Standby	____/

*Enter commands one immediately after another to minimize test time during wire walk.

8.1.1.1.2.1 Five HCs and Segments and Three Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressees Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS	TRACK H/0133,0235, 0335,0437,0547	CS and OCS	Standby to Track	____/____
OCS	STANDBY H/0133,0235, 0335,0437,0547	CS and OCS	Track to Standby	____/____
OCS	TRACK S/209,309, 409,108,208	CS and OCS	Standby to Track	____/____
OCS	STANDBY S/209,309, 409,108,208	CS and OCS	Track to Standby	____/____
OCS	INCREASE S/209,309, 409,108,208	CS and OCS	Standby to Track	____/____
OCS	DECREASE S/209,309, 409,108,208	CS and OCS	Track to Standby	____/____
OCS	TRACK A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Standby to Track	____/____
OCS	STANDBY A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Track to Standby	____/____
CS*1	ALT1 S/209,309, 409,108,208	CS and OCS	Standby to Alt 1	____/____
CS*1	ALT1 A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Standby to Alt 1	____/____
CS*1	ALT1 H/0133,0235, 0335,0437,0547	CS and OCS	Standby to Alt 1	____/____
OCS*2	UNSTOW S/209,309, 409,108,208	CS and OCS	Alt 1 to Standby	____/____
OCS*2	UNSTOW A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Alt 1 to Standby	____/____
OCS*2	UNSTOW H/0133,0235, 0335,0437,0547	CS and OCS	Alt 1 to Standby	____/____

xn Enter commands with same n value one immediately after another to minimize test time during wire walk.

8.1.1.1.2.1 Five HCs and Segments and Three Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressees Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS*1	STOW S/209,309, 409,108,208	CS and OCS	Standby to Stow	____/____
OCS*1	STOW A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Standby to Stow	____/____
OCS*1	STOW H/0133,0235, 0335,0437,0547	CS and OCS	Standby to Stow	____/____
OCS*2	UNSTOW S/209,309, 409,108,208	CS and OCS	Stow to Standby	____/____
OCS*2	UNSTOW A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Stow to Standby	____/____
OCS*2	UNSTOW H/0133,0235, 0335,0437,0547	CS and OCS	Stow to Standby	____/____
OCS	TRACK S/209,309, 409,108,208	CS and OCS	Standby to Track	____/____
OCS	TRACK A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Standby to Track	____/____
OCS	TRACK H/0133,0235, 0335,0437,0547	CS and OCS	Standby to Track	____/____
OCS*3	STOW S/209,309, 409,108,208	CS and OCS	Track to Stow	____/____
OCS*3	STOW A/0402,0420/ 0502,0510/0702,0710	CS and OCS	Track to Stow	____/____
OCS*3	STOW H/0133,0235 0335,0437,0547	CS and OCS	Track to Stow	____/____
CS	POSI S/209,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI S/309,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI S/409,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____

*n Enter commands with the same n value one immediately after another to minimize test time during wire walk.

8.1.1.1.2.1 Five HCs and Segments and Three Arc Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressees Mode Change Verification or Other Messages	Sign-off Initial/ Date
CS	POSI S/108,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI S/208,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI A/0402,0420/ 10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI A/0502,0510/ 10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI A/0702,0710/ 10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI H/0133,10.-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI H/0235,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI H/0335,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI H/0437,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
CS	POSI H/0547,10.,-75.	CS and OCS	Stow to Dir. Pos. 10.° AZ, -75.° EL	____/____
OCS	STOW S/209,309, 409,108,208	CS and OCS	Dir. Pos. to Stow	____/____
OCS	STOW A/0402,0420/ 0502,0510/0702,0710/	CS and OCS	Dir. Pos. to Stow	____/____
OCS	STOW H/0133,0235, 0335,0437,0547	CS and OCS	Dir. Pos. to Stow	____/____

8.1.1.1.2.2 Five HFCs, Rings and Wedges Addressing

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

c. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

d. Enter the commands addressed to five HFCs, rings and wedges as listed below and verify the response. The command sequences have been established in a manner which attempts to reduce the test time by performing wire walks in parallel on 3 different wires for the HFC and wedge tests. If any of the addressees are off-line an alternate addressee type may be selected provided each addressee is assigned to a different wire. The 5 ring tests are done after the HFC and wedge tests are completed.

8.1.1.1.2.2 Five HFCs, Rings and Wedges Addressing (Continued)

NOTE

HFC 34 controls HCS 2022-2084.
HFC 45 controls HCS 2716-2767.
HFC 47 controls HCS 2849-2859.
HFC 61 controls HCS 2701-2715 and 2801-2847.
HFC 63 controls HCS 2901-2945.
Wedge 04 includes segments 104, 204, 304, 404, and 504.
Wedge 05 includes segments 105, 205, 305, 405 and 505.
Wedge 06 includes segments 106, 206, 306, 406 and 506.
Wedge 10 includes segments 110, 210, 310 and 410.
Wedge 11 includes segments 111, 211, 311, and 411.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS*	UNSTOW W/04,05,06, 10,11	CS and OCS	Stow to Standby	____/____
OCS*	UNSTOW F/34,45,47, 61,63	CS and OCS	Stow to Standby	____/____
OCS	TRACK W/04,05,06, 10,11	CS and OCS	Standby to Track	____/____
OCS	STANDBY W/04,05,06, 10,11	CS and OCS	Track to Standby	____/____
OCS	INCREASE W/04,05, 06,10,11	CS and OCS	Standby to Track	____/____
OCS	DECREASE W/04,05, 06,10,11	CS and OCS	Track to Standby	____/____
OCS	INCREASE 15/W/04,05, 06,10,11	CS and OCS	Standby to Track	____/____
OCS	DECREASE 15/W/04,05, 06,10,11	CS and OCS	Track to Standby	____/____
OCS	TRACK F/34,45,47,61, 63	CS and OCS	Standby to Track	____/____

*Enter commands one immediately after another to minimize test time during wire walks.

8.1.1.1.2.2 Five HFCs, Rings and Wedges Addressing (Continued)

NOTE

HFC 34 controls HCS 2022-2084.
HFC 45 controls HCS 2716-2767.
HFC 47 controls HCS 2849-2859.
HFC 61 controls HCS 2701-2715 and 2801-2847.
HFC 63 controls HCS 2901-2945.
Wedge 04 includes segments 104, 204, 304, 404, and 504.
Wedge 05 includes segments 105, 205, 305, 405 and 505.
Wedge 06 includes segments 106, 206, 306, 406 and 506.
Wedge 10 includes segments 110, 210, 310 and 410.
Wedge 11 includes segments 111, 211, 311, and 411.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS	STANDBY F/34,45,47, 61,63	CS and OCS	Track to Stadnby	____/____
CS*1	ALT1 W/04,05,06,10, 11	CS and OCS	Standby to Alt 1	____/____
CS*1	ALT1 F/34,45,47,61, 63	CS and OCS	Standby to Alt 1	____/____
OCS*2	UNSTOW W/04,05,06, 10,11	CS and OCS	Alt 1 to Standby	____/____
OCS*2	UNSTOW F/34,45,47, 61,63	CS and OCS	Alt 1 to Standby	____/____
CS	ALT2 W/04,05, 06,10,11	CS and OCS	Standby to Alt 2	____/____
CS	ALT2 F/34,45,47, 61,63	CS and OCS	Standby to Alt 2	____/____
OCS*3	UNSTOW W/04,05,06, 10,11	CS and OCS	Alt 2 to Standby	____/____
OCS*3	UNSTOW F/34,45,47, 61,63	CS and OCS	Alt 2 to Standby	____/____

*n Enter commands with the same n value one immediately after another to minimize test time during wire walk.

8.1.1.1.2.2 Five HFCs, Rings and Wedges Addressing (Continued)

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS*	STOW W/04,05,06, 10,11	CS and OCS	Standby to Stow	____/____
OCS*	STOW F/34,45,47, 61,63	CS and OCS	Standby to Stow	____/____
OCS	UNSTOW R/1,2,3,4,5	CS and OCS	Stow to Standby	____/____
OCS	TRACK R/1,2,3,4,5	CS and OCS	Standby to Track	____/____
OCS	STANDBY R/1,2,3,4,5	CS and OCS	Track to Standby	____/____
OCS	INCREASE R/1,2,3,4,5	CS and OCS	Standby to Track	____/____
OCS	DECREASE R/1,2,3,4,5	CS and OCS	Track to Standby	____/____
OCS	INCREASE 15/R/1,2, 3,4,5	CS and OCS	Standby to Track	____/____
OCS	DECREASE 15/R/1,2, 3,4,5	CS and OCS	Track to Standby	____/____
CS	ALT1 R/1,2,3,4,5	CS and OCS	Standby to Alt 1	____/____
OCS	UNSTOW R/1,2,3,4,5	CS and OCS	Alt 1 to Standby	____/____
CS	ALT2 R/1,2,3,4,5	CS and OCS	Standby to Alt 2	____/____
OCS	UNSTOW R/1,2,3,4,5	CS and OCS	Alt 2 to Standby	____/____
OCS	STOW ALL	CS and OCS	Standby to Stow	____/____

*Enter commands one immediately after another to minimize test time during wire walk.

8.1.1.1.3 Full Field Commands

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

c. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

d. Enter the commands addressed to the collector field as listed below and verify the response.

_____/_____
INITIAL DATE

8.1.1.1.3 Full Field Commands (Continued)

Console Command Where Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/Date
OCS	UNSTOW ALL	CS and OCS	Stow to Standby	____/____
OCS	STOW ALL	" " "	Standby to Stow	____/____
CS	ALT1 ALL	" " "	Stow to Alt 1	____/____
OCS	STOW ALL	" " "	Alt 1 to Stow	____/____
CS	ALT1 ALL	" " "	Stow to Alt 1	____/____
OCS	UNSTOW ALL	" " "	Alt 1 to Standby	____/____
OCS	INCREASE R/1,2,3, 4,5	" " "	Standby to Track	____/____
OCS	STOW ALL	" " "	Track to Stow	____/____
CS	MARK ALL	" " "	Stow to Mark	____/____
OCS	STOW ALL	" " "	Mark to Stow	____/____
CS	LOAD ALL	" " "	Stow to Initial	____/____
OCS	STOW ALL	" " "	Initial to Stow	____/____
CS	POSI ALL/10.,-75.	" " "	Stow to Dir. Pos. 10^{o} AZ, -75^{o} EL	____/____
OCS	STOW ALL	" " "	Dir. Pos. to Stow	____/____
CS	ALT2 ALL	" " "	Stow to Alt 2	____/____
OCS	UNSTOW ALL	" " "	Alt 2 to Standby	____/____
OCS	STOW ALL	" " "	Standby to Stow	____/____

8.1.1.1.4 Multiple Wire Walk Commands - Single Blob

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

c. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command.

UNSTOW R/1

Verify from the CS and OCS displays that ring 1 transitions from the STOW mode to the TRANSIT mode.

_____/_____
INITIAL DATE

8.1.1.1.4 Multiple Wire Walk Commands - Single Blob (Continued)

e. At the OCS console enter the command

STATUS H/0101

as required. As soon as the status reported to the OCS display is such that the elevation angle of heliostat 101 is greater than zero (ring 1 is walking the wires), at the OCS console enter the following commands to ring 2 one at a time to test the 16 parallel command and "single blob" capabilities of the CS:

UNSTOW S/201
UNSTOW S/202
UNSTOW S/203
UNSTOW S/204
UNSTOW S/205
UNSTOW S/206
UNSTOW S/207
UNSTOW S/208
UNSTOW S/209
UNSTOW S/210
UNSTOW A/0835,0851/0937,0943
UNSTOW A/1047,1057/1147,1157
UNSTOW A/1247,1257
UNSTOW A/0643,0651
UNSTOW A/0743,0749

Verify from the CS and OCS displays that the heliostats in ring 2 (segments 201-212) transition from the STOW mode to the TRANSIT mode and then track the lower end points of the wires (not starting up the wires) until ring 1 attains the STANDBY mode.

_____ / _____
INITIAL DATE

f. At the OCS console enter the command

STATUS H/1201

as required. As soon as the status reported to the OCS display is such that the elevation angle of heliostat 1201 is greater than zero (ring 2 is walking the wires), at the OCS console enter the command.

STOW S/101,102,103,104,105,106,107,108,109,110,111,112

Verify from the CS and OCS displays that ring 1 does not change mode from the STANDBY mode to the TRANSIT mode until ring 2 attains the STANDBY mode.

_____ / _____
INITIAL DATE

8.1.1.1.4 Multiple Wire Walk Commands - Single Blob (Continued)

g. When ring 2 is in the STANDBY mode and ring 1 is in the STOW mode, at the OCS console enter the command

STOW S/201,202,203,204,205,206,207,208,209,210,211,212

Verify from the OCS and CS displays that ring 2 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

UNSTOW W/07,08

Verify from the CS and OCS displays that wedges 7 and 8 transition from the STOW mode to the TRANSIT mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

STATUS H/0101

as required. As soon as the status reported to the OCS display is such that the elevation angle of heliostat 101 is greater than zero (wedges 7 and 8 are walking the wires), at the OCS console enter the command

8.1.1.1.4 Multiple Wire Walk Commands - Single Blob (Continued)

UNSTOW W/09

Verify from the CS and OCS displays that wedge 9 transitions from the STOW mode to the TRANSIT mode and tracks the lower end point of its wire until wedges 7 and 8 attain the STANDBY mode.

_____/_____
INITIAL DATE

j. At the OCS console enter the command

STATUS H/1233

as required. As soon as the status reported to the OCS display is such that the elevation angle of heliostat 1233 is greater than zero (wedge 9 is walking the wires), at the OCS console enter the command.

STOW S/107,207,307,407,507,108,208,308,408,508

Verify from the CS and OCS displays that wedges 7 and 8 do not change mode from the STANDBY mode to the TRANSIT mode until wedge 9 attains the STANDBY mode.

_____/_____
INITIAL DATE

8.1.1.1.4 Multiple Wire Walk Commands - Single Blob (Continued)

k. When wedge 9 is in the STANDBY mode and wedges 7 and 8 are in the STOW mode, at the OCS console enter the command.

STOW S/109,209,309,409,509

Verify from the OCS and CS displays that wedge 9 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.1.5 Miscellaneous Commands

NOTE

This section is devised to check out the commands AIMPOINT, CFSTART and STATUS. The CFSTART command uses a command file designated here as 360. This file is prepared in a batch environment before this test. The commands of this file are as follows:

STOW S/411
OFFLINE S/411
ONLINE R/1,2,3,4,5
STOW ALL

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

NOTE

Segment 411 includes heliostats 1763-1775, 1865-1875, 1963-1973, 2087-2095 and 2185-2189.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
CS	LOAD S/411	CS and OCS	Seg 411 Stow to Initial	____/____
OCS	STATUS M/INT	CS and OCS	Seg 411 in Initial	____/____
OCS	STOW S/411	CS and OCS	Initial to Stow	____/____
OCS	AIMPOINT ALL/05	CS and OCS	Field AP is 05	____/____
CS	OFFLINE R/1.2,3,4,5	CS and OCS	Stow to Offline	____/____
CS	ONLINE S/411	CS and OCS	Seg 411 Offline to D.P.	____/____
OCS	STATUS M/DPO	CS and OCS	Seg 411 in D.P.	____/____

8.1.1.1.5 Miscellaneous Commands (Continued)

NOTE

Segment 411 includes heliostats 1763-1775, 1865-1875, 1963-1973, 2087-2095 and 2185-2189.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
CS	ALT2STOW S/411	CS and OCS	D.P. to Alt 2 Stow	____/____
OCS	STATUS M/AL2	CS and OCS	Seg 411 in Alt 2 Stow	____/____
CS	OFFLINE S/411	CS and OCS	Alt 2 Stow to Offline	____/____
CS	ONLINE S/411	CS and OCS	Offline to D.P.	____/____
CS	ALT1STOW S/411	CS and OCS	D.P. to Alt 1 Stow	____/____
OCS	STATUS M/AL1	CS and OCS	Seg 411 in Alt 1 Stow	____/____
CS	STOW S/411	CS and OCS	Alt 1 Stow to Stow	____/____
OCS	STATUS M/STO	CS and OCS	Seg 411 in Stow	____/____
CS	WASH A/1763,1775	CS and OCS	Stow to Wash	____/____
OCS	STATUS M/WSH	CS and OCS	HCS 1763-75 in Wash	____/____
CS	RELWASH A/1763,1775	CS and OCS	Wash to D.P.	____/____
OCS	STOW A/1763,1775	CS and OCS	D.P. to Stow	____/____
OCS	STATUS H/1763	CS and OCS	HC 1763 in Stow	____/____
OCS	UNSTOW S/411	CS and OCS	Stow to Transit	____/____
OCS	STATUS M/TRN	CS and OCS	Seg 411 in Transit	____/____
OCS	INCREASE 5/S/411	CS and OCS	Standby to Track	____/____
OCS	AIMPOINT S/411/20	CS and OCS	Seg 411 at AP 20	____/____
OCS	STATUS M/TRK	CS and OCS	5 HCs in Seg 411 in Track	____/____
OCS	STATUS R/4	CS and OCS	Seg 411, 5 HCs in Trk Rest in Stb.	____/____

8.1.1.1.5 Miscellaneous Commands (Continued)

NOTE

Segment 411 includes heliostats 1763-1775, 1865-1875, 1963-1973, 2087-2095 and 2185-2189.

Console Where Command Is Entered	Command	Display	Addressee Mode Change Verification or Other Messages	Sign-off Initial/ Date
OCS	STATUS ALL	CS and OCS	5 HC in TRK, Rest Seg 411 in Stb. Rest field Offline	____/____
OCS	DECREASE 5/S/411	CS and OCS	Track to Standby	____/____
CS	BCSTRACK H/1763	CS and OCS	Standby to BCS	____/____
OCS	STATUS M/BCS	CS and OCS	HC 1763 in BCS	____/____
CS	RETURN H/1763	CS and OCS	BCS to Standby	____/____
OCS	STATUS M/STB	CS and OCS	Seg 411 in Standby	____/____
OCS	CFSTART 360	CS and OCS	Seg 411 Standby to Stow to Offline	____/____
			All Offline to D.P. to Stow	____/____
CS	OFFLINE S/411	CS and OCS	Stow to Offline	____/____
OCS	STATUS M/OFF	CS and OCS	Seg 411 in Offline	____/____
CS	ONLINE S/411	CS and OCS	Offline to D.P.	____/____
CS	STOW S/411	CS and OCS	D.P. to Stow	____/____

8.1.1.2 Emergency Commands

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes

The ESTANDBY command is tested for the OCS-CS interface. Section 8.4.2.2 should be finished before testing in this section is begun.

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from OCS displays that the heliostats in rings 1 through 5 transition to the Mark mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

f. At the OCS console enter the command

UNSTOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

INCREASE R/1, 2, 3, 4

Verify from the OCS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step i below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

i. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the OCS console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

j. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

k. Verify the OCS console displays the message for a receiver trip.

_____/_____
INITIAL DATE

l. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS console displays the message for field power regain.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

m. At the CS control console enter the command

LOAD ALL

Verify from the OCS displays that the heliostats transition to the INITIALIZED MODE.

_____/_____
INITIAL DATE

n. At the OCS console enter the command

ESTANDBY R/1

Verify from the OCS displays that ring 1 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

o. At the OCS console enter the command

ESTANDBY R/2

Verify from the OCS displays that ring 2 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

p. At the OCS console enter the command

ESTANDBY R/3

Verify from the OCS displays that ring 3 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

q. At the OCS console enter the command

ESTANDBY R/4

Verify from the OCS displays that ring 4 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

r. At the OCS console enter the command

ESTANDBY R/5

Verify from the OCS that ring 5 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

s. At the OCS console enter the command

INCREASE R/1

Verify from the OCS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

t. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

u. Verify the OCS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

v. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

w. At the OCS console enter the command

INCREASE R/1

Verify from the OCS displays that ring 1 transitions from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

x. At the OCS console enter the command

STOW S/101,102,103,104,105,106,107,108,
109,110,111,112

Verify from the OCS displays that ring 1 transitions from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

y. At the OCS console enter the command

STOW S/201,202,203,204,205,206,207,208,
209,210,211,212

Verify from the OCS displays that ring 2 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

z. At the OCS console enter the command

STOW S/301,302,303,304,305,306,307,308,
309,310,311,312

Verify from the OCS displays that ring 3 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

aa. At the OCS console enter the command

STOW S/401,402,403,404,405,406,407,408,
409,410,411,412

Verify from the OCS displays that ring 4 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

bb. At the OCS console enter the command

STOW S/504,505,506,507,508,509

Verify from the OCS displays that ring 5 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

NOTE

The following steps are used to test the remaining ESTANDBY addressing.

cc. At the CS control console enter the command

MARK ALL

Verify from OCS displays that the heliostats in rings 1 through 5 transition to the Mark mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

dd. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

ee. At the OCS console enter the command

UNSTOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

ff. At the OCS console enter the command

INCREASE R/1, 2, 3, 4

Verify from the OCS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

gg. At the OCS console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step hh below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

hh. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the OCS console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

ii. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

jj. Verify the OCS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

kk. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS console displays the message for field power regain.

_____/_____
INITIAL DATE

ll. At the CS control console enter the command

LOAD ALL

Verify from the OCS displays that the heliostats transition to the INITIALIZED mode.

_____/_____
INITIAL DATE

mm. At the OCS console enter the command

ESTANDBY W/12

Verify from the OCS displays that wedge 12 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

nn. At the OCS console enter the command

ESTANDBY H/2189

Verify from the OCS displays that heliostat 2189 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

oo At the OCS console enter the command

ESTANDBY F/45

Verify from the OCS displays that HFC 45 heliostats (HC2717-2767) transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

pp. At the OCS console enter the command

ESTANDBY S/110

Verify from the OCS displays that egment 110 heliostats transition from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

qq. At the OCS console enter the command

ESTANDBY A/1749, 1775

Verify from the OCS displays that the arc of heliostats from 1749 to 1775 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

rr. At the OCS control console enter the command

ESTANDBY ALL

Verify from the OCS displays that the remaining heliostats in the INITIALIZED mode transition to the STANDBY mode.

_____/_____
INITIAL DATE

ss. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

tt. Verify the OCS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

8.1.1.2.1 Collector Field Power Loss/TRACK - STANDBY Modes (Continued)

uu. At the CS control console enter the command

DEFRLSE

Verify the CS console displays a defocus release message.

_____/_____
INITIAL DATE

vv. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostat field transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

ww. At the CS control console enter the command

MARK ALL

Verify from the OCS and CS displays that the heliostat field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

xx. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostat field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires

The ESTOW command is tested for the OCS-CS interface. Section 8.4.2.3 should be finished before the testing in this section is begun.

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

INITIAL _____ / DATE _____

ii. A receiver trip will not interfere with other testing that is planned or in progress.

INITIAL _____ / DATE _____

iii. The receiver operator agrees to allow a receiver trip.

INITIAL _____ / DATE _____

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command.

MARK ALL

Verify from OCS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command.

STOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

f. At the OCS console enter the command

UNSTOW W/1,2,3,4,5,6

Verify from the OCS displays that the heliostats in wedges 1 through 6 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the OCS control console enter the commands

UNSTOW W/7,8,9,10,11,12
STOW W/1,2,3,4,5,6

Proceed immediately to step h below while the heliostats in wedges 1 through 12 are in transition between the STANDBY and STOW modes.

h. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the OCS console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

i. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

j. Verify the OCS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

k. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS console displays the message for field power regain.

_____/_____
INITIAL DATE

l. At the CS control console enter the command

LOAD ALL

Verify from the OCS displays that the heliostats transition to the INITIALIZED mode.

_____/_____
INITIAL DATE

m. At the OCS console enter the command

ESTOW R/1

Verify from the OCS displays that ring 1 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

n. At the OCS console enter the command.

ESTOW R/2

Verify from the OCS displays that ring 2 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

o. At the OCS console enter the command

ESTOW R/3

Verify from the OCS displays that ring 3 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

p. At the OCS console enter the command.

ESTOW R/4

Verify from the OCS displays that ring 4 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

q. At the OCS console enter the command.

ESTOW R/5

Verify from the OCS displays that ring 5 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

NOTE

The following steps are used to test the remaining ESTOW addressing.

r. At the CS control console enter the command

MARK ALL

Verify from OCS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

s. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

t. At the OCS console enter the command.

UNSTOW W/1,2,3,4,5,6

Verify from the OCS displays that the heliostats in wedges 1 through 6 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

u. At the OCS console enter the commands

UNSTOW W/7,8,9,10,12
STOW W/1,2,3,4,5,6

Proceed immediately to step v below while the heliostats are in transition between the STOW and STANDBY modes.

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

v. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the OCS console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

w. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

x. Verify the OCS console displays the message for a receiver trip.

_____/_____
INITIAL DATE

y. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the OCS console displays the message for field power regain.

_____/_____
INITIAL DATE

z. This step has been deleted.

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

aa. At the CS control console enter the command

LOAD ALL

Verify from the OCS displays that the heliostats transit to the INITIALIZED mode.

_____/_____
INITIAL DATE

bb. At the OCS console enter the command

ESTOW R/1

Verify from the OCS displays that ring 1 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

cc. At the OCS console enter the command

ESTOW H/2189

Verify from the OCS displays that heliostat 2189 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

dd. At the OCS console enter the command

ESTOW F/45

Verify from the OCS displays that HFC 45 heliostats (HC2717-2767) transition from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

ee. At the OCS console enter the command

ESTOW S/110

Verify from the OCS displays that segment 110 heliostats transition from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

ff. At the OCS console enter the command

ESTOW A/1749,1775

Verify from the OCS displays that the arc of heliostats from 1749 to 1775 transition from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

gg. At the OCS console enter the command

ESTOW ALL

Verify from the OCS displays that the remaining heliostats in the INITIALIZED mode transition to the STOW mode.

_____/_____
INITIAL DATE

hh. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

ii. Verify the OCS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

jj. At the CS control console enter the command

DEFRLSE

Verify the CS console displays a defocus release message.

_____/_____
INITIAL DATE

8.1.1.2.2 Collector Field Power Loss/Walking Wires (Continued)

kk. At the CS control console enter the command

MARK ALL

Verify from the OCS displays that the heliostat field transitions from the STOW mode to the MARK mode.

_____ / _____
INITIAL DATE

ll. At the OCS console enter the command

STOW ALL

Verify from the OCS displays that the heliostat field transitions from the MARK mode to the STOW mode.

_____ / _____
INITIAL DATE

8.1.1.2.3 Receiver Defocus and High Winds

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section uses a command file designated 361. This file should be generated in the batch job mode. Command file 361 is composed of the commands listed below:

Command File 361

Execution Time	Command
10.0	POSI H/0107,10.,-75.
10.1	LOAD H/109
10.2	MARK H/111
10.3	WASH H/113
10.4	OFFLINE H/0207
10.5	UNSTOW R/1,2,3,4,5
1500.0	BCSTRACK H/0114
1500.1	BCSTRACK H/0102
1500.2	BCSTRACK H/209
1560.0	TRACK R/1,2,3,4,5

NOTE

This section may require the use of special wires to make the measurement of "off the receiver time" more meaningful. If these wires are to be used, verify that they have been loaded into the HAC'S.

_____ / _____
INITIAL DATE

a. Verify the initial conditions have been established.

_____ / _____
INITIAL DATE

b. At the OCS console enter the command

CFSTART 361

Verify that the addressees in this command file transition to the appropriate modes.

_____ / _____
INITIAL DATE

8.1.1.2.3 Receiver Defocus and High Winds (Continued)

c. Compute and record 97 percent of the heliostats in the TRACK mode.

NSTB = 0.97 X number in Track Mode = _____

d. At the OCS console enter the command

STANDBY S/101

record the plant time

_____:_____:_____

and while this segment is in the TRANSIT mode, at the OCS console enter the command

DEFOCUS

e. Record the plant time when NSTB heliostats have transitioned to the STANDBY mode as displayed on the CS control console.

_____:_____:_____

f. From the above times determine and record the approximate time required to defocus the heliostat field.

Approximate Time Required = _____ seconds.

This "Approximate Time Required" should be less than 38 seconds. (The sum of the maximum time allowed, 30 seconds, and the 8 second delay inherent in the status polling design in the CS.)

g. Verify that the OCS console displays a defocus alarm message.

_____/_____
INITIAL DATE

h. At the OCS control console enter the command

STOW W/01,02,03,04,09,10,11,12
INCREASE W/05

(See the note following step j). Verify that wedge 5 does not transition to the TRACK mode but remains in the standby mode.

_____/_____
INITIAL DATE

i. At the CS control console enter the commands

DEFRLSE
INCREASE W/08

Verify that the CS console displays a defocus release message and a transition of wedge 8 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

j. Verify from the CS console that wedges 1,2,3,4,9,10,11,12 are in the STOW mode.

_____/_____
INITIAL DATE

NOTE

The high wind stow command is tested now. Wedges 5 through 8 are chosen for the STHIWIND test to avoid potential singularity problems that are more likely for wedges 1-4 and 9-12, during wire walk.

8.1.1.2.3 Receiver Defocus and High Winds (Continued)

k. At the OCS console enter the command

STANDBY W/08

When this wedge is in the TRANSIT mode, at the OCS console record the plant time.

_____:_____:_____

and enter the command

STHIWIND

l. Verify from the CS control console that the field transitions to the STOW mode and record time when the field (except for those HC's in the WASH and OFFLINE modes) attain the STOW mode.

_____:_____:_____

m. From the above times determine and record the approximate time required to stow the heliostat field.

Approximate Time Required = _____ seconds.

This "Approximate Time Required" should be less than 1448 seconds. (The sum of the maximum time allowed, 1440 seconds, and the 8 second delay inherent in the status polling design in the CS.)

n. Verify that the OCS console displays an alarm message indicating that the heliostat 0113 is in the WASH mode and heliostat 0207 is in the OFFLINE mode.

_____/_____
INITIAL DATE

8.1.1.2.3 Receiver Defocus and High Winds (Continued)

o. At the CS control console enter the commands

RELWASH H/0113
ONLINE H/0207
STOW H/0113,0207

Verify from the CS display that these heliostats transition to the STOW mode.

_____/_____
INITIAL DATE

p. At the CS control console enter the command

ALT1 H/0115

Verify from the CS displays that heliostat 0115 transitions from the STOW mode to the ALT1STOW mode.

_____/_____
INITIAL DATE

q. At the OCS console enter the command

STHIWIND

Verify from the OCS displays that heliostat 0115 transitions from the ALT1 STOW mode.

_____/_____
INITIAL DATE

8.1.2 Illegal Commands

NOTE

The testing of this section is organized as follows:

8.1.2.1 CS Control Console Only Commands

8.1.2.2 Commands In Wrong Mode

8.1.2.3 Commands With Addressing Errors

CAUTION

THIS SECTION REQUIRES THAT COMMANDS ARE ISSUED THAT REQUIRE BEAM SAFETY CONSIDERATIONS IF THE CS RESPONSES TO THESE COMMANDS WITH HELIOSTAT MOVEMENTS. THEREFORE, THE TESTING IN THIS SECTION IS REQUIRED PREFERABLY AT NIGHT AND IF NECESSARY ON HEAVILY OVERCAST DAYS.

8.1.2.1 CS Control Console Only Commands

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

ALT1STOW H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change modes.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

ALT2STOW H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change modes.

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

d. At the OCS console enter the command

WASH H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

BCSTRACK H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

_____/_____
INITIAL DATE

f. At the OCS console enter the command

RETURN H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

POSITION H/0116,10.,-75.

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

SAVE

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

i. At the OCS console enter the command

RESTORE

Verify the response message displayed by the OCS shows "OK 0".

INITIAL _____ / DATE _____

j. At the OCS console enter the command

OFFLINE H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

INITIAL _____ / DATE _____

k. At the OCS console enter the command

ONLINE H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

INITIAL _____ / DATE _____

l. At the OCS console enter the command

HOLD H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change mode.

INITIAL _____ / DATE _____

8.1.2.1 CS Control Console Only Commands

m. At the OCS console enter the command

STHIWIND
RLHIWIND

Verify the response message displayed by the OCS for the RLHIWIND command shows "OK 0".

_____/_____
INITIAL DATE

n. At the CS control console enter the command

RLHIWIND

Verify that the CS display shows that the high wind stow is released.

_____/_____
INITIAL DATE

o. At the OCS console enter the command

DEFOCUS
DEFRLSE

Verify the response message displayed by the OCS for the DEFRLSE command shows "OK 0".

_____/_____
INITIAL DATE

p. At the CS control console enter the command

DEFRLSE

Verify the response message displayed by the CS shows "OK≠0" and a defocus release message is shown at the CS display.

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

q. At the CS control console enter the command

WASH H/0116

Verify the response message displayed by the CS shows "OK 1" and the mode for heliostat 116 is shown to transition from the STOW mode to the WASH mode by the CS display.

_____/_____
INITIAL DATE

r. At the OCS console enter the command

RELWASH H/0116

Verify the response message displayed by the OCS shows "OK 0" and the mode of heliostat 0116 does not change.

_____/_____
INITIAL DATE

s. At the CS console enter the commands

RELWASH H/0116
STOW H/0116

Verify the response message displayed by the CS shows "OK 1" for both commands and heliostat 116 is shown to transition from the WASH mode to the STOW mode by the CS display.

_____/_____
INITIAL DATE

t. At the OCS console enter the command

MARK H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change modes.

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

u. At the OCS console enter the command

UPAIM 02

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

v. At the OCS console enter the command

LOAD H/0116

Verify the response message displayed by the OCS shows "OK 0" and heliostat 116 does not change modes.

_____/_____
INITIAL DATE

w. At the OCS console enter the command

UPBIAS H/0116, 1234, 5678

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

x. At the OCS console enter the command

HELP

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

y. At the OCS console enter the command

CFABORT

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

z. At the OCS console enter the command

CFWAIT

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

aa. At the OCS console enter the command

REFRESH

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

bb. At the OCS console enter the command

BCSSTART

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

cc. At the OCS console enter the command

BCSTAPE

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

dd. At the OCS console enter the command

BCSFILE 1

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

ee. At the OCS console enter the command

BCSDISP ON

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

ff. At the OCS console enter the command

BCSRANGE 0116,0118

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

gg. At the OCS console enter the command

BCSMEAS

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

hh. At the OCS console enter the command

BCSINPUT

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

ii. At the OCS console enter the command

BCSOFFS 111281,104553,+12.01,-11.02

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.1 CS Control Console Only Commands

jj. At the OCS console enter the command

BCSCALC

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

kk. At the OCS console enter the command

BCSUPD Y

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

ll. At the OCS console enter the command

BCSEND

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.2 Commands In Wrong Mode And With Addressing Errors

8.1.2.2.1 STOW Mode

a. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and the heliostats in segment 107 do not change mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and the heliostats in segment 107 do not change mode.

_____/_____
INITIAL DATE

8.1.2.2.1 STOW Mode

e. At the OCS console enter the command

DEFOCUS ALL

Verify the response message displayed by the OCS shows "OK 0" and the heliostats do not change mode.

_____/_____
INITIAL DATE

f. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.2 STOWALT1 Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

ALTISTOW S/107

Verify the response message displayed by the CS shows "OK 1" and segment 107 transitions to the STOWALT1 mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.2 STOWALT1 Mode

f. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and the heliostats do not change mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.2 STOWALT1 Mode

j. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK 1" and segment 107 transitions from the STOWALT1 mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.3 STOWALT2 Mode

a. Verify that the initial conditions are established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

ALT2STOW S/107

Verify the response message displayed by the CS shows "OK 1" and segment 107 transitions from the STOW mode to the STOWALT2 mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

STOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

STHIWIND

Verify the response message displayed by the OCS shows "OK 0" and the heliostats do not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.3 STOWALT2 Mode

f. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.3 STOWALT2 Mode

j. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and the heliostats do not change mode.

_____/_____
INITIAL DATE

k. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

l. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK 1" and segment 107 transitions from the STOWALT2 mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.4 TRACK Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

UNSTOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and the segment 107 transitions from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

TRACK S/107

Verify the response message displayed by the OCS shows "OK≠0" and the segment 107 transitions from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.4 Track Mode

e. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

f. At the console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

STANDBY R/1,2,3,4,5

Verify the response message displayed by the OCS shows "OK≠0" and rings 1, 2, 3, 4 and 5 transition from the TRACK mode to the STANDBY mode.

_____/_____
INITIAL DATE

h. If testing in Sections 8.1.2.2.5 STANDBY Mode, Section 8.1.2.2.6 BCS Mode, or 8.1.2.2.7 TRANSIT Mode is to be done next proceed to step d of those sections; otherwise, proceed to step j below.

i. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.5 STANDBY Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

UNSTOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions from the STOW mode to the TRACK mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

ESTOW H/101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. If testing in Sections 8.1.2.2.4 TRACK Mode, Section 8.1.2.2.6 BCS Mode, or 8.1.2.2.7 TRANSIT Mode is to be done next proceed to step c of those sections; otherwise proceed to step e below.

e. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.6 BCS Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

UNSTOW S/107

Verify the response message displayed by the OCS shows "OK 1" and segment 107 transitions from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

c. At the CS control console enter the command

BCSTRACK H/0101

Verify the response message displayed by the CS shows "OK 1" and heliostat 101 transitions from the STANDBY mode to the BCS mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

STOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.6 BCS Mode

f. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.6 BCS Mode

i. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

j. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

k. At the CS control console enter the command

RETURN H/0101

Verify the response message displayed by the CS console shows "OK 1" and heliostat 101 transitions from the BCS mode to the STANDBY mode.

_____/_____
INITIAL DATE

l. If testing in Section 8.1.2.2.4 TRACK Mode, Section 8.1.2.2.5 STANDBY Mode, or 8.1.2.2.7 TRANSIT Mode is to be done next proceed to step c of those sections; otherwise proceed to step m below.

m. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.7 TRANSIT Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

UNSTOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transition from the STOW to the STANDBY mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions to the TRANSIT mode. Go on immediately to the next step below.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

e. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.2.7 TRANSIT Mode

f. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0"

_____/_____
INITIAL DATE

g. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

h. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

i. At the OCS console enter the command

STOW H/0101

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

j. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

8.1.2.2.7 TRANSIT Mode

k. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0".

_____/_____
INITIAL DATE

l. This test section is complete when segment 107 has transitioned to the STOW mode.

8.1.2.2.8 DIRECTED POSITION Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

POSITION S/107,10.,-75.

Verify the response message displayed by the CS shows "OK 1" and segment 107 transitions to the DIRECTED POSITION mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.8 DIRECTED POSITION Mode

f. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.8 DIRECTED POSITION Mode

j. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

k. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK 1" and segment 107 transitions from the DIRECTED POSITION mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.9 INITIAL Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

LOAD ALL

Verify the response message displayed by the CS shows "OK≠0" and the heliostat field transitions to the INITIAL mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.9 INITIAL Mode

f. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

STOW ALL

Verify the response message displayed by the OCS shows "OK≠0" and the heliostat field transitions from the INITIAL mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.2.10 MARK Mode

a. Verify the initial conditions are established.

_____/_____
INITIAL DATE

b. At the CS control console enter the command

MARK S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment 107 transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

c. At the OCS console enter the command

STANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

d. At the OCS console enter the command

DECREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

DEFOCUS

Verify the response message displayed by the OCS shows "OK 0" and the heliostat field does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.10 MARK Mode

f. At the OCS console enter the command

ESTANDBY H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

ESTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

UNSTOW H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

TRACK H/0101

Verify the response message displayed by the OCS shows "OK 0" and heliostat 101 does not change mode.

_____/_____
INITIAL DATE

8.1.2.2.10 MARK Mode

j. At the OCS console enter the command

INCREASE S/107

Verify the response message displayed by the OCS shows "OK 0" and segment 107 does not change mode.

_____/_____
INITIAL DATE

k. At the OCS console enter the command

STOW S/107

Verify the response message displayed by the OCS shows "OK≠0" and segment transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

8.1.2.3 Commands With Addressing Errors

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

UNSTOW S/503

Verify that the response message displayed by the OCS shows "503 invalid address".

_____/_____
INITIAL DATE

c. At the OCS console enter the command

UNSTOW W/1

Verify that the response message displayed by the OCS shows "1 invalid address".

_____/_____
INITIAL DATE

d. At the OCS console enter the command

UNSTOW ALL

Verify that the response message displayed by the OCS shows "OK≠0" and the heliostat field transitions from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

e. At the OCS console enter the command

TRACK ALL

Verify that the response message displayed by the OCS shows "ALL address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

8.1.2.3 Commands With Addressing Errors

f. At the OCS console enter the command

INCREASE H/0101

Verify that the response message displayed by the OCS shows "H address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

g. At the OCS console enter the command

INCREASE F/10

Verify that the response message displayed by the OCS shows "F address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

h. At the OCS console enter the command

INCREASE A/1059, 1069

Verify that the response message displayed by the OCS shows "A address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

i. At the OCS console enter the command

INCREASE ALL

Verify that the response message displayed by the OCS shows "ALL address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

8.1.2.3 Commands With Addressing Errors

j. At the OCS console enter the command

TRACK R/1,2,3,4,5

Verify that the response message displayed by the OCS shows "OK‡0" and rings 1, 2, 3, 4 and 5 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

k. At the OCS console enter the command

STANDBY ALL

Verify that the response message displayed by the OCS shows "ALL address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

l. At the OCS console enter the command

DECREASE H/0101

Verify that the response message displayed by the OCS shows "H address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

m. At the OCS console enter the command

DECREASE F/10

Verify that the response message displayed by the OCS shows "F address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

8.1.2.3 Commands With Addressing Errors

n. At the OCS console enter the command

DECREASE A/1059, 1069

Verify that the response message displayed by the OCS shows "A address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

o. At the OCS console enter the command

DECREASE ALL

Verify that the response message displayed by the OCS shows "ALL address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

p. At the OCS console enter the command

STANDBY R/1,2,3,4,5

Verify that the response message displayed by the OCS shows "OK≠0" and rings 1, 2, 3, 4, and 5 transition from the TRACK mode to the STANDBY mode.

_____/_____
INITIAL DATE

q. At the OCS console enter the command

STOW W/01

Verify that the response message displayed by the OCS shows "W address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

8.1.2.3 Commands With Addressing Errors

r. At the OCS console enter the command

STOW R/1

Verify that the response message displayed by the OCS shows "R address not allowed" and no mode transition for the addressee.

_____/_____
INITIAL DATE

s. At the OCS console enter the command

STOW ALL

Verify that the response message displayed by the OCS shows "OK≠0" and the heliostat field transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

t. At the OCS console enter the command

STATUS S/312

Verify that the response message displayed by the OCS shows "S invalid address".

_____/_____
INITIAL DATE

8. .3 CS Alarms and OCS Processing

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. Remove the power at the primary HAC interface electronics box, simulating total communications loss with the field.

_____/_____
INITIAL DATE

c. Verify CS displays and logs the alarm for communication loss with the field.

_____/_____
INITIAL DATE

d. Verify the CS displays and logs the alarm for HAC failover.

_____/_____
INITIAL DATE

e. Verify the OCS logs the alarms recorded in steps c and d above.

_____/_____
INITIAL DATE

f. Restore the power removed in step b above.

_____/_____
INITIAL DATE

g. Reboot both HACs (A and B) and recycle HFC power by recycling the main breakers in each of the 14 feeder panels in the field prior next step of procedure.

_____/_____
INITIAL DATE

8.1.4 HAC Failover Effect

a. Verify the initial conditions have been established.

_____/ _____
INITIAL DATE

b. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the field transitions from the STOW mode to the MARK mode.

_____/ _____
INITIAL DATE

c. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS and OCS consoles display and/or log the HAC failover alarm.

_____/ _____
INITIAL DATE

d. At the OCS console enter the command

STOW ALL

Verify from the OCS and CS displays that the field transitions from the MARK mode to the STOW mode.

_____/ _____
INITIAL DATE

e. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/ _____
INITIAL DATE

8.1.5 OCS Failure Effect

a. Verify the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the OCS console enter the command

STATUS ALL

Verify the OCS displays the status in agreement with that displayed by the CS displays.

_____/_____
INITIAL DATE

c. Detach the communications cables (OCS-HAC A) and (OCS-HAC B) at the OCS I/F port. At the CS control console enter the commands

STATUS ALL
LOAD ALL
STOW ALL

Verify from the CS control console that the CS does not get hung up waiting for OCS requests.

_____/_____
INITIAL DATE

d. Reattach the communications cables that were detached in step c above. At the OCS console enter the command

STATUS ALL

Verify the OCS displays the status in agreement with that displayed by the CS displays.

_____/_____
INITIAL DATE

8.2 DAS-CS Interface

8.2.1 Status Commands and Responses

NOTE

The status commands do not require heliostat motion, therefore, this section of the test can be done during the day or night.

a. Initialize the DAS so that the scan list for HAC data has individual status requested for heliostats 0116, 0128, 1052, 1638, 2050, 2350, 2650, 2766, 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112.

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. Verify that the DAS logger prints the field status, the ring status for rings 1 through 5, and individual heliostat status for the heliostats specified in the HAC scan list (see step a. above) every 64 seconds or more frequently.

_____/_____
INITIAL DATE

d. Verify that the CS logger has printed status data that agrees with that described in Step c. above.

_____/_____
INITIAL DATE

8.2.2 Illegal Commands and Responses

NOTE

The commands in this section are illegal and should not be implemented by the CS. However, if these commands are implemented due to a software error, they are addressed so they have no beam safety implications.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. At the DAS keyboard enter the commands listed below and verify that they are not implemented by the CS and that the DAS console displays an illegal command message.

1. STATUS ALL

_____/_____
INITIAL DATE

2. STATUS M/TRK

_____/_____
INITIAL DATE

3. STATUS H/0102

_____/_____
INITIAL DATE

4. STATUS R/1

_____/_____
INITIAL DATE

5. STOW H/0102

_____/_____
INITIAL DATE

8.2.2 Illegal Commands and Responses

6. ALT1STOW H/0102

_____/_____
INITIAL DATE

7. ALT2STOW H/0102

_____/_____
INITIAL DATE

8. UNSTOW H/0102

_____/_____
INITIAL DATE

9. WASH H/0102

_____/_____
INITIAL DATE

10. STHIWIND

_____/_____
INITIAL DATE

8.2.3 HAC Failover Effect

NOTE

The status commands do not require heliostat motion; therefore, this section of the test can be done during the day or night.

a. Initialize the DAS so that the scan list for HAC data has individual status requested for heliostats 0116, 0128, 1052, 1638, 2050, 2350, 2650, 2766, 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112.

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.2.3 HAC Failover Effect

c. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

d. Verify that the DAS logger prints the field status, ring status for rings 1 through 5 and individual heliostat status for the heliostats specified in the HAC scan list (see a. above) at least every 64 seconds or more frequently.

_____/_____
INITIAL DATE

e. Verify that the CS logger prints status data that agrees with that described in Step c. above.

_____/_____
INITIAL DATE

f. Verify the logged data in Steps d. and e. above are similar to that in Section 8.2.1 above.

g. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/_____
INITIAL DATE

8.2.4 DAS Failure Effect

NOTE

Heliostat motion is not required, therefore, this section of the test can be done during the day or night.

a. Initialize the DAS so that the scan list for HAC data has individual status requested for heliostats 0116, 0128, 1052, 1638, 2050, 2350, 2650, 2766, 0101, 0102, 0103, 0104, 0105, 0106, 0107, 0108, 0109, 0110, 0111, 0112.

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. Verify that the DAS logger prints the field status, ring status for rings 1 through 5 and individual heliostat status for the heliostats specified in the HAC scan list (see step a. above) every 64 seconds or more frequently.

_____/_____
INITIAL DATE

d. Verify that the CS logger has printed status data that agrees with that described in Step c. above.

_____/_____
INITIAL DATE

e. Detach the communications cables (DAS-HAC A) and (DAS-HAC B) at the DAS I/F port. At the CS control console enter the commands

STATUS ALL
LOAD ALL
STOW ALL

Verify from the CS control console that the CS does not get hung up waiting for DAS requests.

_____/_____
INITIAL DATE

8.2.4 DAS Failure Effect (Continued)

f. Reattach the communications cables that were detached in step e above. Verify that the DAS resumes logging CS status data in the manner observed above in step c.

_____/ _____
INITIAL DATE

8.3 RS - CS Interface

NOTE

This section is divided into two major parts: (1) 8.4.1 Simulated Receiver Trip and (2) Actual Receiver Trip. If receiver trip can be scheduled, Section 8.3.1 can be omitted and only Section 8.3.2 is required. However, if actual receiver trip is not desired because of receiver operations or other reasons, the procedure in Section 8.3.1 can be used as a preliminary test to that of Section 8.3.2.

CAUTION

SECTIONS 8.3.1.2, 8.3.1.3, 8.3.2.2, and 8.3.2.3 REQUIRE A LARGE NUMBER OF HELIOSTATS TO BE IN MODES WHICH REQUIRE BEAM SAFETY CONSIDERATIONS. THEREFORE, THE TESTING IN THESE SECTIONS IS REQUIRED PREFERABLY AT NIGHT AND IF NECESSARY ON HEAVILY OVERCAST DAYS.

8.3.1 Simulated Receiver Trip

NOTE

The signals for receiver trip are created by manipulating the electrical interface between two cables (M1950 and M1950A) and the HAC Auxiliary Relay Box. (See Drawing S-R 40E7005133094, "Wiring and Connections, Heliostat Array Controller Auxiliary Relay Box", Electrical E8-114.)

8.3.1.1 Heliostats in STOW Mode

NOTE

This test section may be performed during day or night. There are no beam safety considerations.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.3.1.1 Heliostats in STOW Mode (Continued)

b. If necessary remove the cover of the HAC Auxiliary Relay Box. Using a 24 volt source, simulate a receiver trip by attacking the 24 volt source across the terminal pair 1RLU10-1RLU11. Verify that the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

c. Detach the 24 volt source attached above. Verify that the CS control console displays the message for a removed receiver trip.

_____/_____
INITIAL DATE

d. Using a 24 volt source, simulate a receiver trip by attacking the 24 volt source across the terminal pair 1RLU16-1RLU17. Verify that the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

e. Detach the 24 volt source attached above. Verify that the CS control console displays the message for a removed receiver trip.

_____/_____
INITIAL DATE

f. Using two (2) 24 volt sources, simulate a receiver trip by attacking a 24 volt source across each of the terminal pairs (1RLU10-1RLU11) and (1RLU16-1RLU17). Verify that the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

8.3.1.1 Heliostats in STOW Mode (Continued)

g. Detach the 24 volt sources attacked above. Verify that the CS control console displays the message for a removed receiver trip.

_____/_____
INITIAL DATE

h. If the tests in 8.3.1 or 8.4.1 are to continue, proceed to those tests; otherwise, replace the HAC Auxiliary Relay Box cover.

8.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

The following procedure designates heliostat rings 1, 2 and 3 to be commanded to the TRACK mode. If these rings are not available, other rings which are available may be substituted.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

c. At the CS control console enter the command

MARK R/1, 2, 3

Verify from CS displays that the heliostats in rings 1, 2 and 3 transition to the Mark mode.

_____/_____
INITIAL DATE

d. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition to the STOW mode.

_____/_____
INITIAL DATE

8.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

e. At the CS control console enter the command

UNSTOW R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the heliostats in rings 1 and 2 transition from the STANDBY mode to the TRACK mode.

g. If necessary remove the cover of the HAC Auxiliary Relay Box. At the CS control console enter the commands

INCREASE R/3
DECREASE R/2

Proceed immediately to step h below while the heliostats in rings 2 and 3 are in transition between the TRACK and STANDBY modes.

h. Using two (2) 24 volt sources, simulate a receiver trip by attaching a 24 volt source across each of the terminal pairs (1RLU10 - 1 RLU11) and (1RLU16 - 1RLU17). Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

i. Verify from the CS displays that the CS transitions the heliostats in rings 1, 2 and 3 to the STANDBY mode.

_____/_____
INITIAL DATE

8.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

j. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode, but that the heliostats in rings 1 and 2 remain in the STANDBY mode.

_____/_____
INITIAL DATE

(continued on next page)

8.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

k. At the CS control console enter the commands

DEFRLSE
INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

l. At the HAC Auxiliary Relay Box detach the 24 volt sources from terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify that the CS console displays the message for a removed receiver trip.

_____/_____
INITIAL DATE

m. At the CS control console enter the commands

DEFRLSE
INCREASE R/1, 2, 3

Verify from the CS displays that the CS transitions the heliostats in rings 1, 2 and 3 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

n. If testing in Section 8.3.1.3 is to be done next, proceed to the steps in that section; otherwise, proceed to step r below.

o. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2 and 3 transition from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.3.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

p. If the test procedure in Section 8.4.1 are to continue, proceed to those tests; otherwise, replace the cover of the HAC Auxiliary Relay Box.

8.3.1.3 HAC Failover Before RS Trip

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

a. If this test is performed following Section 8.3.1.2, the heliostats in rings 1, 2 and 3 are in the TRACK mode and this procedure continues at Step h below; otherwise this procedure continues at Step b below.

NOTE

The following procedure designates heliostat rings 1, 2 and 3 to be commanded to the TRACK mode. If these rings are not available, other rings which are available may be substituted.

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 are in the MARK mode.

_____/_____
INITIAL DATE

8.3.1.3 HAC Failover Before RS Trip (Continued)

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1, 2 and 3 are in the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the heliostats in rings 1 and 2 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

8.3.1.3 HAC Failover Before RS Trip (Continued)

i. If necessary remove the cover of the HAC Auxiliary Relay Box. At the CS control console enter the commands

INCREASE R/3
DECREASE R/2

Proceed immediately to step j below while the heliostats in rings 2 and 3 are in transition between the TRACK and STANDBY modes.

j. Using two (2) 24 volt sources, simulate a receiver trip by attaching a 24 volt source across each of the terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

k. Verify from the CS displays that the CS transitions the heliostats in rings 1, 2 and 3 to the STANDBY mode.

_____/_____
INITIAL DATE

l. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode, but that the heliostats in rings 1 and 2 remain in the STANDBY mode.

_____/_____
INITIAL DATE

8.3.1.3 HAC Failover Before RS Trip (Continued)

m. At the CS control console enter the commands

DEFRLSE

INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

n. At the HAC Auxiliary Relay Box detach the 24 volt sources from terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify that the CS console displays the message for a removed receiver trip.

_____/_____
INITIAL DATE

(continued on next page)

o. At the CS control console enter the commands

DEFRLSE

INCREASE R/1, 2, 3

Verify from the CS displays that the CS transitions the heliostats in rings 1, 2 and 3 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

p. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2 and 3 transition from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

q. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/_____
INITIAL DATE

r. If the test procedures in Section 8.4.1 are to continue, proceed to those tests; otherwise, replace the cover of the HAC Auxiliary Relay Box.

8.3.2 Actual Receiver Trip

NOTE

The buttons for a receiver trip and receiver trip removal are manipulated at the RS console to cause receiver trips. This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

8.3.2.1 Heliostats in STOW Mode

NOTE

This test section may be performed during day or night. There are no beam safety considerations.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.3.2.1 Heliostats in STOW Mode (Continued)

b. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

c. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

d. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

e. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

8.3.2.2 Heliostats in TRACK MODE

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

The following procedure designates heliostat rings 1, 2, 3, 4 and 5 to be commanded to the TRACK mode. Approximately 70 percent of the field should be available to make this section of testing most meaningful.

NOTE

This section may require the use of special wires to make the measurement of "off the receiver time" more meaningful. If these special wires are to be used, verify that they have been loaded into the HACs.

_____/_____
INITIAL DATE

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

   i. The RLU is on.

_____/_____
INITIAL DATE

8.3.2.2 Heliostats in TRACK Mode (Continued)

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the Mark mode.

_____/_____
INITIAL DATE

8.3.2.2 Heliostats in TRACK Mode
(Continued)

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the CS control console enter the command

INCREASE R/1, 2, 3, 4, 5

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. Calculate and record the number of heliostats that are required to be off the receiver in 30 seconds.

NSTB = 0.97 x Number in Track = _____

This number is used below.

8.3.2.2 Heliostats in TRACK Mode (Continued)

i. At the RS console keyboard record the plant time

_____:_____:_____

and depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

j. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

k. Record the plant time when NSTB (see step h above) heliostats have transitioned to the STANDBY mode as displayed on the CS control console.

_____:_____:_____

(continued on next page)

8.3.2.2 Heliostats in TRACK Mode (Continued)

l. From the above times determine and record the approximate time required to move NSTB heliostats off the receiver.

Approximate Time Required = _____seconds

This "Approximate Time Required" should be less than 38 seconds. (The sum of the maximum time allowed, 30 seconds, and the 8 second delay inherent in the status polling design in the CS.)

m. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

n. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

o. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

8.3.2.2 Heliostats in TRACK Mode (Continued)

p. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

q. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

r. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

s. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

8.3.2.2 Heliostats in TRACK Mode (Continued)

t. At the CS control console enter the command

INCREASE R/1, 2, 3, 4

Verify from the CS displays that rings 1, 2, 3 and 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

u. If testing in Section 8.3.2.3 is to be done next, proceed to the step h in that section; otherwise, proceed to step v below.

v. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2, 3, 4 and 5 transition to the STOW mode.

_____/_____
INITIAL DATE

8.3.2.3 HAC Failover Before Receiver Trip

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

The following procedure designates heliostat rings 1, 2, 3, 4 and 5 to be commanded to the TRACK mode. Approximately 70 percent of the field should be available to make this section of testing most meaningful.

NOTE

This section may require the use of special wires to make the measurement of "off the receiver time" more meaningful. If these wires are to be used, verify that they have been loaded into the HACs.

_____/_____
INITIAL DATE

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the Mark mode.

_____/_____
INITIAL DATE

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the CS control console enter the command

INCREASE R/1,2,3,4

Verify from the CS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. Calculate and record the number of heliostats that are required to be off the receiver in 30 seconds.

NSTB = 0.97 x Number in Track = _____

This number is used below.

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

i. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

j. At the CS control console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step k below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

k. At the RS console keyboard record the plant time

_____:_____:_____

and depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

l. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

m. Record the plant time when NSTB (see step h above) heliostats have transitioned to the STANDBY mode as displayed on the CS control console.

_____:_____:_____

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

n. From the above times determine and record the approximate time required to move NSTB heliostats off the receiver.

Approximate Time Required = _____seconds

This "Approximate Time Required" should be less than 38 seconds. (The sum of the maximum time allowed, 30 seconds, and the 8 second delay inherent in the status polling design in the CS.)

o. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

p. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

q. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

r. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

s. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

t. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

u. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

8.3.2.3 HAC Failover Before Receiver Trip (Continued)

v. At the CS control console enter the command

INCREASE R/1, 2, 3, 4, 5

Verify from the CS display that rings 1, 2, 3, 4, and 5 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

w. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2, 3, 4 and 5 transition to the STOW mode.

_____/_____
INITIAL DATE

x. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/_____
INITIAL DATE

8.4 Collector Field Power Supply-CS Interface

NOTE

This section is divided into two major parts: (1) 8.4.1 Simulated Power Loss and Regain and (2) Actual Power Loss and Regain. If actual power loss to the collector field can be scheduled, Section 8.4.1 can be omitted and only Section 8.4.2 is required. However, if actual power loss to the collector field is not desired because of field operations or other reasons, the procedure in Section 8.4.1 can be used as a preliminary test to that of Section 8.4.2.

CAUTION

SECTIONS 8.4.1.2, 8.4.1.3, 8.4.2.2, 8.4.2.3 and 8.4.2.4 REQUIRE A LARGE NUMBER OF HELIOSTATS TO BE IN MODES WHICH REQUIRE BEAM SAFETY CONSIDERATIONS. THEREFORE, THE TESTING IN THESE SECTIONS IS REQUIRED PREFERABLY AT NIGHT AND IF NECESSARY ON HEAVILY OVERCAST DAYS.

8.4.1 Simulated Power Loss and Regain

NOTE

The signals for power loss and regain are created by manipulating the electrical interface between two cables (M1950 and M1950A) and the HAC Auxiliary Relay Box. (See Drawing S-R 40E7005133094, "Wiring and Connections, Heliostat Array Controller Auxiliary Relay Box", Electrical E8-114).

8.4.1.1 Heliostats in STOW Mode

NOTE

This test section may be performed during day or night. There are no beam safety considerations.

a. Verify that the initial conditions have been established.

_____ / _____
INITIAL DATE

8.4.1.1 Heliostats in STOW Mode (Continued)

b. At an available SDPC console call up the graphics display of power flow, including the collector field power status for circuit breakers 152-A01-7 and 152-A01-9. Verify primary power is supplied to collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

c. Remove the cover of HAC Auxiliary Relay Box. Simulate circuit breaker 152-A01-7 to be open by detaching the black wire from terminal 27X1 and placing an insulating cover on the exposed wire. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

d. Attack the wire just removed to terminal 27X1. Verify that the CS control console displays the message for field power regained.

_____/_____
INITIAL DATE

e. Simulate circuit breaker 152-A01-9 to be open by detaching the black wire from terminal 27X2 and placing an insulating cover over the exposed wire. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

8.4.1.1 Heliostats in STOW Mode (Continued)

f. Attach the wire just removed to terminal 27X2. Verify that the CS control console displays the message for field power regained.

INITIAL / DATE

g. Simulate circuit breakers 152-A01-7 and 152-A01-9 both to be open by (1) detaching the black wire from terminal 27X1 and placing an insulating cover over the exposed wire and (2) detaching the black wire from terminal 27X2 and placing an insulating cover over the exposed wire. Verify the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

INITIAL / DATE

h. Attach the wires just removed by attaching the black wire from cable M1950 to terminal 27X1 and the black wire from cable M1950A to terminal 27X2. Verify that the CS control console displays the message for field power regain.

INITIAL / DATE

i. If the tests in 8.3.1 or 8.4.1 are to continue, proceed to those tests; otherwise, replace the cover of the HAC Auxiliary Relay Box.

8.4.1.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

8.4.1.2 Heliostats in TRACK Mode (Continued)

NOTE

The following procedure designates heliostat rings 1, 2 and 3 to be commanded to the TRACK mode. If these rings are not available, other rings which are available may be substituted.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

c. At the CS control console enter the command

MARK R/1, 2, 3

Verify from CS displays that the heliostats in rings 1, 2 and 3 transition to the Mark mode.

_____/_____
INITIAL DATE

d. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition to the STOW mode.

_____/_____
INITIAL DATE

8.4.1.2 Heliostats in TRACK Mode (Continued)

e. At the CS control console enter the command

UNSTOW R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the heliostats in rings 1 and 2 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

g. If necessary remove the cover of the HAC Auxiliary Relay Box. At the CS control console enter the commands

INCREASE R/3

DECREASE R/2

Proceed immediately to step h below while the heliostats in rings 2 and 3 are in transition between the TRACK and STANDBY modes.

h. Simulate circuit breaker 152-A01-7 to be open by detaching the black wire from terminal 27X1 and placing an insulating cover on the exposed wire. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

8.4.1.2 Heliostats in TRACK Mode (Continued)

i. Using two (2) 24 volt sources, simulate a receiver trip by attaching a 24 volt source across each of the terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify the CS control console displays the message for a receiver trip.

_____/ _____
INITIAL DATE

j. Verify from the CS displays that the CS does not transition the heliostats in rings 1, 2 and 3 to the STANDBY mode.

_____/ _____
INITIAL DATE

k. Attach the black wire (detached in step h. above) to terminal 27X1. Verify that the CS control console displays the message for field power regain.

_____/ _____
INITIAL DATE

l. At the CS control console enter the command

LOAD ALL

Verify from the CS displays that the field transitions to the INITIALIZED mode.

_____/ _____
INITIAL DATE

m. Verify from the CS control console that the CS does not transition the heliostats from the INITIALIZED mode to the STANDBY mode.

_____/ _____
INITIAL DATE

n. At the CS control console enter the command

ESTANDBY R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STANDBY mode.

_____/ _____
INITIAL DATE

8.4.1.2 Heliostats in TRACK Mode (Continued)

o. At the CS control console enter the command

ESTANDBY R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

p. At the CS console enter the command

ESTANDBY R/3

Verify from the CS displays that ring 3 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

q. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode, but that the heliostats in rings 1 and 2 remain in the STANDBY mode.

_____/_____
INITIAL DATE

r. At the HAC Auxiliary Relay Box detach the 24 volt sources from terminal pairs (1RLU10 and 1RLU11) and (1RLU16 and 1RLU17). At the CS control console enter the commands

DEFRLSE

INCREASE R/1, 2

Verify from the CS displays that the CS transitions the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.4.1.2 Heliostats in TRACK Mode (Continued)

s. If testing in Section 8.4.1.3 is to be done next, proceed to the steps in that section; otherwise, proceed to step t. below.

t. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2 and 3 transition to the STOW mode.

_____/_____
INITIAL DATE

u. If the test procedure in Section 8.3.1 are to continue, proceed to those tests; otherwise, replace the cover of the HAC Auxiliary Relay Box.

8.4.1.3 HAC Failover Before Power Loss

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

a. If this test is performed following Section 8.4.1.2, the heliostats in rings 1, 2 and 3 are in the proper modes and this procedure continues at Step h below; otherwise this procedure continues at Step b below.

NOTE

The following procedure designates heliostat rings 1, 2 and 3 to to be commanded to the TRACK mode. If these rings are not available,other rings which are available may be substituted.

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition to the MARK mode.

_____/_____
INITIAL DATE

8.4.1.3 HAC Failover Before Power Loss (Continued)

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition to the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW R/1, 2, 3

Verify from the CS displays that the heliostats in rings 1, 2 and 3 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the CS control console enter the command

INCREASE R/1,2

Verify from the CS displays that the heliostats in rings 1 and 2 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

8.4.1.3 HAC Failover Before Power Loss (Continued)

i. If necessary remove the cover of the HAC Auxiliary Relay Box. At the CS control console enter the commands

INCREASE R/3

DECREASE R/2

Proceed immediately to step j. below while heliostats in rings 2 and 3 are in transition between the TRACK and STANDBY modes.

_____/_____
INITIAL DATE

j. Simulate circuit breaker 152-A01-7 to be open by detaching the black wire from terminal 27X1 and placing an insulating cover on the exposed wire. Verify that the CS control console displays the alarm message for field power loss and it does not display an additional HAC failover message.

_____/_____
INITIAL DATE

k. Using two (2) 24 voltage sources, simulate a receiver trip by attaching a 24 volt source across each of the terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

l. Verify from the CS displays that the CS does not transition the heliostats in rings 1, and 3 to the STANDBY mode.

_____/_____
INITIAL DATE

m. Attach the black wire (detached in Step j above) to terminal 27X1. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

8.4.1.3 HAC Failover Before Power Loss (Continued)

n. At the CS control console enter the command

LOAD ALL

Verify from the CS displays that the field transitions to the INITIALIZED mode.

_____ / _____
INITIAL DATE

o. Verify from the CS control console that the CS does not transition the heliostats from the INITIALIZED mode to the STANDBY mode.

_____ / _____
INITIAL DATE

p. At the CS control console enter the command

ESTANDBY R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STANDBY mode.

_____ / _____
INITIAL DATE

q. At the CS control console enter the command

ESTANDBY R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STANDBY mode.

_____ / _____
INITIAL DATE

r. At the CS console enter the command

ESTANDBY R/3

Verify from the CS displays that ring 3 transitions from the INIALIZED mode to the STANDBY mode.

_____ / _____
INITIAL DATE

8.4.1.3 HAC Failover Before Power Loss (Continued)

s. At the CS control console enter the command

INCREASE R/1, 2

Verify from the CS displays that the CS does not transition the heliostats in rings 1 and 2 from the STANDBY mode to the TRACK mode, but that the heliostats in rings 1 and 2 remain in the STANDBY mode.

_____/_____
INITIAL DATE

t. At the HAC Auxiliary Relay Box detach the 24 volt sources from terminal pairs (1RLU10 - 1RLU11) and (1RLU16 - 1RLU17). Verify from the CS control console that the receiver trip is cleared. At the CS control console enter the commands

DEFRLSE

and

INCREASE R/1, 2, 3

Verify from the CS displays that the CS transitions the heliostats in rings 1, 2 and 3 from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

u. At the CS control console enter the command

STOW ALL

Verify from the CS control console that rings 1, 2 and 3 transition from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

v. Initialize the HAC A and HAC B by following the procedure given in the CS Operations Manual MCR-81-1708.

_____/_____
INITIAL DATE

w. If the test procedure in Section 8.3.1 are to be done next, proceed to those tests; otherwise, replace the cover of the HAC Auxiliary Relay Box.

8.4.2 Actual Power Loss and Power Regain

NOTE

The circuit breakers controlling power supply to the collector field are manipulated to cause a collector field power loss. (See Drawing SCE 5133351, "Main One Line Diagram".)

a. Verify that power loss to the collector field will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

8.4.2.1 Heliostats in STOW Mode

NOTE

This test section may be performed during day or night.

a. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

b. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

c. At this SDPC console keyboard command circuit breaker 152-A01-7 open. Verify that the CS control console displays the message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

8.4.2.1 Heliostats in STOW Mode (Continued)

d. At this SDPC console keyboard command circuit breaker 152-A01-7 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

e. At this SDPC console keyboard command circuit breaker 152-A01-9 open. Verify that the CS control console displays the message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

f. At this SDPC console keyboard command circuit breaker 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

g. At the SDPC console keyboard command circuit breakers 152-A01-7 and 152-A01-9 open. Verify that the CS control console displays the message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

h. At this SDPC console keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

8.4.2.1 Heliostats in STOW Mode (Continued)

i. At the CS control console enter the command

LOAD ALL

and verify from the CS control console that the heliostats are in the INITIALIZED mode.

_____/_____
INITIAL DATE

j. At the CS control console enter the command

STOW ALL

and verify from the CS control console that the heliostats are in the STOW mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfer with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 are in the Mark mode.

_____/_____
INITIAL DATE

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 are in the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

g. At the CS control console enter the command

INCREASE R/1, 2, 3, 4

Verify from the CS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

h. At the CS control console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step i below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

i. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____/_____
INITIAL DATE

j. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

k. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

l. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

m. At the CS control console enter the command

LOAD ALL

and record the plant time.

_____ : _____ : _____

n. Record the plant time when all heliostats have transitioned to the INITIALIZED mode as displayed on the CS control console.

_____ : _____ : _____

o. From the above times determine and record the approximate time required to initialize the heliostat field.

Approximate Time Required = _____seconds

This "Approximate Time Required" should be less than 68 seconds. (The sum of the maximum time allowed, 60 seconds, and the 8 second delay inherent in the status polling design in the CS.)

p. Verify from the CS displays that the CS does not transition the heliostats from the TRACK mode to the STANDBY mode.

_____/_____
INITIAL DATE

q. At the CS control console enter the command

ESTANDBY R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

r. At the CS control console enter the command

ESTANDBY R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

s. At the CS control console enter the command

ESTANDBY R/3

Verify from the CS displays that ring 3 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

t. At the CS control console enter the command

ESTANDBY R/4

Verify from the CS displays that ring 4 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

u. At the CS control console enter the command

ESTANDBY R/5

Verify from the CS displays that ring 5 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

v. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

w. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

x. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

y. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

z. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that ring 1 transitions from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

aa. At the CS control console enter the command

STOW S/101,102,103,104,105,106,107,108,109,110,111,112

Verify from the CS displays that ring 1 transitions from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

bb. At the CS control console enter the command

STOW S/201,202,203,204,205,206,207,208,209,210,211,212

Verify from the CS displays that ring 2 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

cc. At the CS control console enter the command

STOW S/301,302,303,304,305,306,307,308,309,310,311,312

Verify from the CS displays that ring 3 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

dd. At the CS control console enter the command

STOW S/401,402,403,404,405,406,407,408,409,410,411,412

Verify from the CS displays that ring 4 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

ee. At the CS control console enter the command

STOW S/504,505,506,507,508,509

Verify from the CS displays that ring 5 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

NOTE

The following steps are used to test the remaining ESTANDBY addressing from the CS control console.

ff. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

gg. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

hh. At the CS control console enter the command

UNSTOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

ii. At the CS control console enter the command

INCREASE R/1, 2, 3, 4

Verify from the CS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

jj. At the CS control console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step kk below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

kk. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

INITIAL _____ / DATE _____

ll. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

INITIAL _____ / DATE _____

mm. Verify the CS control console displays the message for a receiver trip.

INITIAL _____ / DATE _____

nn. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

INITIAL _____ / DATE _____

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

oo. At the CS control console enter the command.

LOAD ALL

and record the plant time.

_____ : _____ : _____

pp. Record the plant time when all heliostats have transitioned to the INITIALIZED mode as displayed on the CS control console.

_____ : _____ : _____

qq. From the above times determine and record the approximate time required to initialize the heliostat field.

Approximate Time Required = _____ seconds.

This "Approximate Time Required" should be less than 68 seconds. (The sum of the maximum time allowed, 60 seconds, and the 8 second delay inherent in the status polling design in the CS.)

rr. Verify from the CS displays that the CS does not transition the heliostats from the TRACK mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

ss. At the CS control console enter the command

ESTANDBY W/12

Verify from the CS displays that wedge 12 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

tt. At the CS control console enter the command

ESTANDBY H/2189

Verify from the CS displays that heliostat 2189 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

uu. At the CS control console enter the command

ESTANDBY F/45

Verify from the CS displays that HFC 45 heliostats (HC2717-2767) transition from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

vv. At the CS control console enter the command

ESTANDBY S/110

Verify from the CS displays that segment 110 heliostats transition from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

ww. At the CS control console enter the command

ESTANDBY A/1749, 1775

Verify from the CS displays that the arc of heliostats from 1749 to 1775 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

xx. At the CS control console enter the command

ESTANDBY ALL

Verify from the CS displays that the remaining heliostats in the INITIALIZED mode transition to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

yy. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

zz. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

aaa. At the CS control console enter the command.

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

bbb. At the CS control console enter the command.

STOW ALL

Verify from the CS displays that the heliostat field transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.2 Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

ccc. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the heliostat field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

ddd. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostat field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW W/1, 2, 3, 4, 5, 6

Verify from the CS displays that the heliostats in wedges 1 through 6 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

g. At the CS control console enter the commands

UNSTOW W/7,8,9,10,11,12

STOW S/101,201,301,401
STOW S/102,202,302,402
STOW S/103,203,303,403
STOW S/104,204,304,404,504
STOW S/105,205,305,405,505
STOW S/106,206,306,406,506

Proceed immediately to step h below while the heliostats in wedges 1 through 12 are in transition between the STANDBY and STOW modes.

_____ / _____
INITIAL DATE

h. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____ / _____
INITIAL DATE

i. At the RS console keyboard deparess the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____ / _____
INITIAL DATE

j. Verify the CS control console displays the message for a receiver trip.

_____ / _____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

k. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

l. At the CS control console enter the command

LOAD ALL

and record the plant time.

_____ : _____ : _____

m. Record the plant time when all heliostats have transitioned to the INITIALIZED mode as displayed on the CS control console.

_____ : _____ : _____

n. From the above times determine and record the approximate time required to initialize the heliostat field.

Approximate Time Required = _____ seconds.

This "Approximate Time Required" should be less than 68 seconds. (The sum of the maximum time allowed, 60 seconds, and the 8 second delay inherent in the status polling design in the CS.)

8.4.2.3 Heliostats Walking Wires (Continued)

o. At the CS control console enter the command

ESTOW R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

p. At the CS control console enter the command

ESTOW R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

q. At the CS control console enter the command

ESTOW R/3

Verify from the CS displays that ring 3 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

r. At the CS control console enter the command

ESTOW R/4

Verify from the CS displays that ring 4 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

s. At the CS control console enter the command

ESTOW R/5

Verify from the CS displays that ring 5 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

NOTE

The following steps are used to test the remaining ESTOW addressing.

t. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

u. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____ / _____
INITIAL DATE

v. At the CS control console enter the command

UNSTOW W/1,2,3,4,5,6

Verify from the CS displays that the heliostats in wedges 1 through 6 transition from the STOW mode to the STANDBY mode.

_____ / _____
INITIAL DATE

w. At the CS control console enter the commands

UNSTOW W/7,8,9,10,12

STOW S/101,201,301,401
STOW S/102,202,302,402
STOW S/103,203,303,403
STOW S/104,204,304,404,504
STOW S/105,205,305,405,505
STOW S/106,206,306,406,506

Proceed immediately to step x below while the heliostats are in transition between the STOW and STANDBY modes.

x. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display a HAC failover message.

_____ / _____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

y. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

z. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

aa. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

bb. At the CS control console enter the command

LOAD ALL

Verify from the CS control console displays that the heliostats transition to the INITIALIZED mode.

_____/_____
INITIAL DATE

cc. At the CS control console enter the command

ESTOW W/1

Verify from the CS displays that wedge 1 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

dd. At the CS control console enter the command

ESTOW H/2189

Verify from the CS displays that heliostat 2189 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

ee. At the CS control console enter the command

ESTOW F/45

Verify from the CS displays that HFC 45 heliostats (HC2717-2767) transition from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

ff. At the CS control console enter the command

ESTOW S/110

Verify from the CS displays that segment 110 heliostats transition from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

gg. At the CS control console enter the command

ESTOW A/1749, 1775

Verify from the CS displays that the arc of heliostats from 1749 to 1775 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

hh. At the CS control console enter the command

ESTOW ALL

Verify from the CS displays that the remaining heliostats in the INITIALIZED mode transition to the STOW mode.

_____/_____
INITIAL DATE

ii. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

jj. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

8.4.2.3 Heliostats Walking Wires (Continued)

kk. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

ll. At the CS control console enter the command

MARK ALL

Verify from the CS displays that the heliostat field transitions from the STOW mode to the MARK mode.

_____/_____
INITIAL DATE

mm. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostat field transitions from the MARK mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the Mark mode.

_____/_____
INITIAL DATE

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW MODE.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

g. At the CS control console enter the command

INCREASE R/1, 2, 3, 4

Verify from the CS displays that the heliostats in rings 1 through 4 transition from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

h. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

i. At the CS control console enter the commands

INCREASE R/5
DECREASE R/4

Proceed immediately to step j below while the heliostats in rings 4 and 5 are in transition between the TRACK and STANDBY modes.

j. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display an additional HAC failover message.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

k. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

l. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

m. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

n. At the CS control console enter the command

LOAD ALL

and record the plant time.

_____:_____:_____

o. Record the plant time when all heliostats have transitioned to the INITIALIZED mode as displayed on the CS control console.

_____:_____:_____

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

p. From the above times determine and record the approximate time required to initialize the heliostat field.

Approximate Time Required = _____seconds

This "Approximate Time Required" should be less than 68 seconds. (The sum of the maximum time allowed, 60 seconds, and the 8 second delay inherent in the status polling design in the CS.)

q. Verify from the CS displays that the CS does not transition the heliostats from the TRACK mode to the STANDBY mode.

_____/_____
INITIAL DATE

r. At the CS control console enter the command

ESTANDBY R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

s. At the CS control console enter the command

ESTANDBY R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

t. At the CS control console enter the command

ESTANDBY R/3

Verify from the CS displays that ring 3 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

u. At the CS control console enter the command

ESTANDBY R/4

Verify from the CS displays that ring 4 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

v. At the CS control console enter the command

ESTANDBY R/5

Verify from the CS displays that ring 5 transitions from the INITIALIZED mode to the STANDBY mode.

_____/_____
INITIAL DATE

w. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that the CS does not transition the heliostats in ring 1 from the STANDBY mode to the TRACK mode, but that the heliostats in ring 1 remain in the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

x. At the RS console keyboard depress the receiver trip remove button and verify the RS console displays a receiver trip removed message.

_____/_____
INITIAL DATE

y. Verify the CS control console displays a receiver trip removed message.

_____/_____
INITIAL DATE

z. At the CS control console enter the command

DEFRLSE

Verify the CS control console displays a defocus release message.

_____/_____
INITIAL DATE

aa. At the CS control console enter the command

INCREASE R/1

Verify from the CS displays that ring 1 transitions from the STANDBY mode to the TRACK mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

bb. At the CS control console enter the command

STOW S/101,102,103,104,105,106,107,108,109,110,111,112

Verify from the CS displays that ring 1 transitions from the TRACK mode to the STOW mode.

_____/_____
INITIAL DATE

cc. At the CS control console enter the command

STOW S/201,202,203,204,205,206,207,208,209,210,211,212

Verify from the CS displays that ring 2 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

dd. At the CS control console enter the command

STOW S/301,302,303,304,305,306,307,308,309,310,311,312

Verify from the CS displays that ring 3 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

ee. At the CS control console enter the command

STOW S/401,402,403,404,405,406,407,408,409,410,411,412

Verify from the CS displays that ring 4 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.4 HAC Failover Before Power Loss With Heliostats in TRACK Mode and Transitioning Between TRACK and STANDBY Modes (Continued)

ff. At the CS control console enter the command

STOW S/504,505,506,507,508,509

Verify from the CS displays that ring 5 transitions from the STANDBY mode to the STOW mode.

_____/_____
INITIAL DATE

gg. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/_____
INITIAL DATE

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires

CAUTION

PERFORM THIS SECTION OF THE TEST PROCEDURE PREFERABLY ONLY AT NIGHT OR IF NECESSARY ON A HEAVILY OVERCAST DAY.

NOTE

This section requires an actual receiver trip to occur. Therefore, the testing in this section should be done only when it has been determined that a receiver trip can be implemented.

a. Verify that a receiver trip can be implemented:

i. The RLU is on.

_____/_____
INITIAL DATE

ii. A receiver trip will not interfere with other testing that is planned or in progress.

_____/_____
INITIAL DATE

iii. The receiver operator agrees to allow a receiver trip.

_____/_____
INITIAL DATE

b. Verify that the initial conditions have been established.

_____/_____
INITIAL DATE

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires (Continued)

c. At an available SDPC console call up the graphics display of power flow, including the collector field power status. Verify primary power is supplied to the collector field (i.e., circuit breakers 152-A01-7 and 152-A01-9 are closed).

_____/_____
INITIAL DATE

d. At the CS control console enter the command

MARK ALL

Verify from CS displays that the heliostats in rings 1 through 5 transition to the MARK mode.

_____/_____
INITIAL DATE

e. At the CS control console enter the command

STOW ALL

Verify from the CS displays that the heliostats in rings 1 through 5 transition to the STOW mode.

_____/_____
INITIAL DATE

f. At the CS control console enter the command

UNSTOW W/1, 2, 3, 4, 5, 6

Verify from the CS displays that the heliostats in wedges 1 through 6 transition from the STOW mode to the STANDBY mode.

_____/_____
INITIAL DATE

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires (Continued)

g. Cause a HAC failover by halting the CPU in the prime HAC. Verify that the CS console displays the HAC failover alarm.

_____/_____
INITIAL DATE

h. At the CS control console enter the commands

UNSTOW W/7,8,9,10,11,12

STOW S/101,201,301,401
STOW S/102,202,302,402
STOW S/103,203,303,403
STOW S/104,204,304,404,504
STOW S/105,205,305,405,505
STOW S/106,206,306,406,506

Proceed immediately to step i below while the heliostats in wedges 1 through 12 are in transition between the STANDBY and STOW modes.

_____/_____
INITIAL DATE

i. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 to open. Verify that the CS control console displays the alarm message for field power loss and it does not display an additional HAC failover message.

_____/_____
INITIAL DATE

j. At the RS console keyboard depress the "receiver trip" button. Verify the RS console displays a receiver trip message.

_____/_____
INITIAL DATE

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires (Continued)

k. Verify the CS control console displays the message for a receiver trip.

_____/_____
INITIAL DATE

l. At an available SDPC console call up the graphics display of power flow, including the collector field power status. From the keyboard command circuit breakers 152-A01-7 and 152-A01-9 closed. Verify that the CS control console displays the message for field power regain.

_____/_____
INITIAL DATE

m. At the CS control console enter the command

LOAD ALL

and record the plant time.

_____:_____:_____

n. Record the plant time when all heliostats have transitioned to the INITIALIZED mode as displayed on the CS control console.

_____:_____:_____

o. From the above times determine and record the approximate time required to initialize the heliostat field.

Approximate Time Required = _____seconds

This "Approximate Time Required" should be less than 68 seconds. (The sum of the maximum time allowed, 60 seconds, and the 8 second delay inherent in the status polling design in the CS.)

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires (Continued)

p. At the CS control console enter the command

ESTOW R/1

Verify from the CS displays that ring 1 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

q. At the CS control console enter the command

ESTOW R/2

Verify from the CS displays that ring 2 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

r. At the CS control console enter the command

ESTOW R/3

Verify from the CS displays that ring 3 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

s. At the CS control console enter the command

ESTOW R/4

Verify from the CS displays that ring 4 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

8.4.2.5 HAC Failover Before Power Loss With Heliostats Walking Wires (Continued)

t. At the CS control console enter the command

ESTOW R/5

Verify from the CS dispalys that ring 5 transitions from the INITIALIZED mode to the STOW mode.

_____/_____
INITIAL DATE

u. Initialize the HAC A and HAC B by following the procedure given in the Collector System Operations Manual, MCR-81-1708.

_____/_____
INITIAL DATE

9.0 SYSTEM RESTORATION

9.1 OCS-CS Interface

9.1.1 When the testing in Section 8.1 is completed satisfactorily, inform the SCE Station Shift operating foreman that the Test 360 testing for the OCS-CS interface is completed.

_____/_____
INITIAL DATE

9.1.2 If desired, power down the OCS.

_____/_____
INITIAL DATE

NOTE

The on-line heliostats must be in the stow position before beginning CS power down.

NOTE

When removing power from the CS disk drives, be sure that the "LOAD" light is illuminated before turning off power on the front panel switch. Remove power via the front panel switch before switching off the "Peri Device" and "Controller" switches.

9.1.3 If desired, power down the CS.

a. Power down the HAC in accordance with operations manual MCR-81-1708

_____/_____
INITIAL DATE

b. Remove power from the heliostats by commanding circuit breakers 152-A01-7 and 152-A01-9 open via an available SDPC console.

_____/_____
INITIAL DATE

9.2 DAS-CS Interface

9.2.1 When the testing in Section 8.2 is completed satisfactorily, inform the SCE Station Shift operating foreman that the Test 360 testing for the DAC-CS interface is completed.

_____/_____
INITIAL DATE

9.2.2 If desired, power down the DAS.

_____/_____
INITIAL DATE

NOTE

The one-line heliostats must be in the stow position before beginning CS power down.

NOTE

When removing power from the CS disk drives, be sure that the "LOAD" light is illuminated before turning off power on the front panel switch. Remove power via the front panel switch before switching off the "Peri Device" and "Controller" switches.

9.2.3 If desired, power down the CS.

a. Power down the HAC in accordance with operations manual MCR-81-1708.

_____/_____
INITIAL DATE

b. Remove power from the heliostats by commanding circuit breakers 152-A01-7 and 152-A01-9 open via an available SDPC console.

_____/_____
INITIAL DATE

9.3 RS-CS Interface

9.3.1 When the testing in Section 8.3 is completed satisfactorily, inform the SCE Station Shift operating foreman that the Test 360 testing for the RS-CS interface is completed.

_____/_____
INITIAL DATE

9.3.2 If desired, power down the RS.

_____/_____
INITIAL DATE

NOTE

The on-line heliostats must be in the stow position before beginning CS power down.

NOTE

When removing power from the CS disk drives, be sure that the "LOAD" light is illuminated before turning off power on the front panel switch. Remove power via the front panel switch before switching off the "Peri Device" and "Controller switches.

9.3.3 If desired, power down the CS.

a. Power down the HAC in accordance with operations manual MCR-81-1708.

_____/_____
INITIAL DATE

b. Remove power from the heliostats by commanding circuit breakers 152-A01-7 and 152-A01-9 open via an available SDPC console.

_____/_____
INITIAL DATE

9.4 Collector Field Power Supply - CS Interface

9.4.1 When testing in Section 8.4 is completed satisfactorily, inform the SCE Station Shift operating foreman that the Test 360 testing for the collector field power supply-CS interface is completed.

_____/_____
INITIAL DATE

NOTE

The on-line heliostats must be in the stow position before beginning CS power down.

NOTE

When removing power from the CS disk drives, be sure that the "LOAD" light is illuminated before turning off power on the front panel switch. Remove power via the front panel switch before switching off the "Peri Device" and "Controller" switches.

9.4.2 If deisred, power down the CS.

a. Power down the HAC in accordance with operations manual MCR-81-1708.

_____/_____
INITIAL DATE

b. Remove power from the heliostats by commanding circuit breakers 152-A01-7 and 152-A01-9 open via an available SDPC console.

_____/_____
INITIAL DATE

10. ATTACHMENTS

Appendix 10A	Master Tracking System
Appendix 10B	Abnormal Equipment and Circuits
Appendix 10C	Electrical Prerequisite Tests
Appendix 10D	Instrumentation and Control Prerequisite Test and Calibrations
Appendix 10E	Mechanical Prerequisite Tests
Appendix 10F	Initial Status of Breakers for Test Procedure
Appendix 10G	Initial Status of Switches for Test Procedure
Appendix 10H	Initial Status - Valve Lineup for Test Procedure
Appendix 10J	Collector System Commands and Addressing Formats
Appendix 10K	Out of Service Heliostat List

APPENDIX 10A

MASTER TRACKING SYSTEM

ITEM NO.	DESCRIPTION	SECTION AFFECTED	INITIAL/DATE

APPENDIX 10B

ABNORMAL EQUIPMENT AND CIRCUITS

ITEM NO.	DESCRIPTION	SECTION AFFECTED	INITIAL/DATE

APPENDIX 10C

ELECTRICAL PREREQUISITE TESTS

Component		Generic Test Procedure No.	Test Complete Initial/Date
Number	Description		
	N/A		

APPENDIX 10D

INSTRUMENTATION & CONTROLS
PREREQUISITE TESTS AND CALIBRATIONS

Component				Generic Test Procedure No.	Test Complete Initial/Date
Number	Description	Set Point	Field Setting		
	N/A				

APPENDIX ICE

MECHANICAL PREREQUISITE TESTS

Component		Generic Test Procedure No.	Test Complete Initial/Date
Number	Description		
	N/A		

APPENDIX 10F

INITIAL STATUS OF BREAKERS FOR TEST PROCEDURE

BREAKERS		POSITION	STATUS	INITIAL/DATE
NUMBER	DESCRIPTION			
152-A01-7	No. 1 Feeder Circuit Breaker	Closed	Operational	
152-A01-9	No. 2 Feeder Circuit Breaker	Closed	Operational	

APPENDIX 10G

INITIAL STATUS OF SWITCHES FOR TEST PROCEDURE

SWITCH		STATUS	INITIAL/DATE
NUMBER	DESCRIPTION		
	N/A		

APPENDIX 10H

INITIAL STATUS - VALVE LINEUP LIST FOR TEST PROCEDURE

VALVE TAG NO.	INFO ONLY DRAWING NUMBER	INFO ONLY COORD	DESCRIPTION	POSITION	INITIAL	DATE
			N/A			

O = Open C - Closed T - Throttled LO - Locked Open LC - Locked Closed

*Number assigned by TBD - No existing Valve Tag Number.

APPENDIX 10J

COLLECTOR SYSTEM COMMANDS AND ADDRESSING FORMATS

Transition of a heliostat, segment, ring, wedge, arc, field controller group, or the entire field of heliostats from one mode to another is accomplished via commands input by the operator at OCS and CS consoles. Collector field status commands can be issued by the CS, OCS and DAS. The operator can issue status commands at the CS and OCS consoles. The operator can not issue status commands at the DAS console; they are generated by the DAS software.

The available commands are described below in alphabetical order. These commands are listed alphabetically in Table 10J-1 also where the command mode applicability and the available addressing are delineated further. Certain commands in this table are noted "must have beam safety constraints." These constraints are the operators responsibility. Each command can be implemented by entering the entire command word or the first four letters of the command word and the proper addressing. Addressing formats are delineated in Tables 10J-2a and 10J-2b for general commands and status commands, respectively.

AIMPOINT

This command is used to specify the tracking array to be used by a segment for any heliostat to be put in the track mode. The collector subsystem will store up to 20 tracking arrays, each of which will contain a target point for each and every heliostat in the field. The AIMPOINT command shall specify to the HAC which of these arrays is to be used for each segment in the field (there may be a different array for each segment). The purpose of this command is to provide for testing flexibility, to account for the possible need to have different target points based on insolation level or time or day, and for starting the receiver. If a segment is in the TRACK mode, the HAC will implement an AIMPOINT command to change the tracking array and move the heliostats to the new aim points. The HAC will have the capability of changing the data in aim point arrays be reading magnetic tape input through the use of the UPAIM command. This capability should be provided in real-time with the HAC controlling the field. The AIMPOINT command is available at both the OSC and the CS console.

Table 10J-1. Collector System Commands (Page 1 of 5)

Command	Mode going to	Mode coming from	Available Addressing	Notes
AIMPOINT	N/A	N/A	Segment Field NN (Array number)	
ALT1STOW	Stow – Alternate 1	Stow Track Standby Directed Position	Heliostat Segment Wedge Ring Field controller Arc Field	CS console command only. This command can have beam safety constraints for heliostats in the Directed Position mode.
ALT2STOW	Stow – Alternate 2	Standby Directed Position	Heliostat Segment Entire field Arc	CS console command only. This command has beam safety constraints.
BCSCALC	N/A	N/A	Blank, Heliostat, or ALL	CS console command only
BCSDISPL	N/A	N/A	ON/OFF	CS console command only
BCSEND	N/A	N/A	None	CS console command only
BCSFILE	N/A	N/A	File No. 1, 2, or 3	CS console command only
BCSINPUT	N/A	N/A	None	CS console command only
BCSMEAS	N/A	N/A	None	CS console command only
BCSOFFS	N/A	N/A	Date, Time, Offset values	CS console command only
BCSRANGE	N/A	N/A	Start Heliostat ID, End Heliostat ID	CS console command only
BCSSTART	N/A	N/A	None	CS console command only
BCSTAPE	N/A	N/A	None	CS console command only

Table 10J-1. Collector Command Structure (Page 2 of 5)

Command	Mode going to	Mode coming from	Available addressing	Notes
BCSTRACK	BCS	Standby	Heliostat	CS console command
BCSUPD	N/A	N/A	Y (yes)/N (no)	CS console command only
CFABORT	N/A	N/A	None	CS console command only
CFSTART	N/A	N/A	FFF (file name)	This command will cause the execution of a particular command file (FFF) to begin.
CFWAIT	N/A	N/A	SSSS (seconds)	CS console command only
DECREASE	Standby	Track	Number Segment Wedge Ring	
DEFOCUS	Standby	Track (in transition between modes)	Entire field	This command causes a mode change only to heliostats in the track mode or on the way to the track mode
DEFRLSE	Standby	Standby	Entire field	CS console command only
ESTANDBY	Standby	Initialization	Heliostat Field controller Segment Wedge Ring Field Arc	Used following power loss when heliostat(s) were in either the track or standby mode or transitioning to these modes before the power loss. Heliostat(s) in corridor walk at power loss are excluded. This command has beam safety constraints.
ESTOW	Stow	Initialization	Heliostat Field controller Segment Wedge Ring Field Arc	Used following power loss for heliostat(s) in wire walk at power loss. This command has beam safety constraints.

Table 10J-1. Collector Command Structure (Page 3 of 5)

Command	Mode going to	Mode coming from	Available addressing	Notes
HELP	N/A	N/A	Blank, Command or Address	CS console command only
HOLD	Directed Position	(In transition between modes)	Heliostat	CS console command only
INCREASE	Track	Standby	Number Segment Wedge Ring	
LOAD	N/A	N/A	Heliostat Field Controller Field Arc	CS console command only Heliostat may be in any mode.
MARK	Mark	Stow	Heliostat Segment Wedge Ring Field controller Entire field Arc	CS console command only
OFFLINE	Offline	Stow Stow – Alternate 1 Stow – Alternate 2 Directed Position	Heliostat Segment Wedge Ring Field controller Arc	CS console command only
ONLINE	Directed Position	Offline	Heliostat Segment Wedge Ring Field controller Arc	CS console command only

Table 10J-1. Collector Command Structure (Page 4 of 5)

Command	Mode going to	Mode coming from	Available addressing	Notes
POSITION	Directed Position	Stow Stow - Alternate 1 Stow - Alternate 2 Standby Directed Position	Heliostat Segment Wedge Ring Field controller Arc	CS console command only. This command has beam safety constraints.
REFRESH	N/A	N/A	None	CS console command only
RELWASH	Directed Position	Wash	Heliostat Arc	CS console command only
RESTORE	N/A	N/A	Entire field	CS console command only
RETURN	Standby	BCS	Heliostat	CS console command
RLHIWIND	Stow Stow - Alternate 2	Stow Stow - Alternate 2	Entire field	CS console command only
SAVE	N/A	N/A	Entire field	CS console command only
STANDBY	Standby	Track	Heliostat Segment Wedge Ring Field controller Arc	
STATUS	N/A	N/A	Heliostat Mode Field Ring	
STHIWIND	Stow	Standby Track Stow - Alternate 1 BCS Directed Position (Cont)	Entire field	This command can have beam safety constraints for heliostats in the Directed Position or Initialization mode.

Table 10J-1. Collector Command Structure (Page 5 of 5)

Command	Mode going to	Mode coming from	Available addressing	Notes
STHIWIND (cont)		Mark (In transition between modes Initialization)		
STOW	Stow	Stow - Alternate 1 Track Standby Directed Position Initiailziation Mark	Heliostat Segment Entire field Arc	This command can have beam safety constraints for heliostats in the Directed Position or Initialization mode.
TRACK	Track	Standby	Heliostat Segment Wedge Ring Field controller Arc	
UNSTOW	Standby	Stow Stow - Alternate 1 Stow - Alternate 2	Heliostat Segment Wedge Ring Field controller Entire field Arc	This command has beam safety constraints for heliostats in the Stow - Alt 2 mode.
UPAIM	N/A	N/A	NN (Array number to be updated)	CS console command only
UPBIAS	N/A	N/A	H/NNNN,AZ,EL N=heliostat AZ=Azimuth bias in HEX EL=Elevation bias in HEX	CS console command only
WASH	Wash	All modes, except offline	Heliostat Arc	CS console command. This command has beam safety constraints and should only be used at night.

Table 10J-2a. General Command Addressing Format

Address	Format
Heliostat (H)	H/NNNN,NNNN,,,NNNN Where: NNNN is the heliostat number Example: STOW H/0421
Heliostat Field Controller (F)	F/NN,NN,,,NNN Where: NN is the field controller number Example: OFFLINE F/06
Segment (S)	[XX/]S/NNN,NNN,,,NNN Where: XX is the [optional] number of heliostats per segment. If not included the whole segment is assumed. NNN is the segment number Example: TRACK S/04,16,31
Wedge (W)	[XX/]W/NN,NN...NN Where: XX is the [optional] number of heliostats required out of each segment in the wedge. If not included the whole wedge is assumed. NN is the wedge number Example: DECREASE 4/W/1,3,11
Ring (R)	[XX/]R/N,N,,,N Where: XX is the [optional] number of heliostats required out of each segment in the ring. If not included the whole ring is assumed. N is the ring number Example: INCREASE 5/R/1,3
Arc (A)	A/NNNN,NNNN/NNNN,NNNN/.../NNNN,NNNN Where: First NNNN is the beginning heliostat number. The second NNNN is the ending heliostat number. Note: These numbers are either even inclusive or odd inclusive. The arc addressing can be used for any command that has individual heliostat addressing except for BCSTRACK. Example: WASH A/0201,0207
Field (ALL)	All The whole field. Example: UNSTOW ALL

Notes:

1. For fields designed as NNN or NNNN, ASCII zero fill must be used.
2. The command addressing can use /,b interchangeably.
3. Commands that can be addressed only as ALL need not be addressed.

Table 10J-2b. Status Command Addressing Format

Command	Addressing Format
STATUS X	1) If X is "ALL", the response is the field status. 2) If X is "M/NNN", NNN is the mode (see list below) and the response is mode status. 3) If X is "H/NNNN", NNNN is the heliostat number and the response is individual heliostat status. 4) If X is "R/N", N is the ring number and the response is the ring track status.

NOTE

Only one mode, heliostat, or ring per address in formats 2, 3, and 4, respectively are allowed.

The mode options NNN in format 2 above are as follows:

TRK - TRACK	TRN - TRANSITION
STB - STANDBY	WSH - WASH
BCS - BCS	DPO - DIRECTED POSITION
STO - STOW	OFF - OFFLINE
AL1 - ALT1STOW	MRK - MARK
AL2 - ALT2STOW	INI - INIT

EXAMPLE: STAT M/TRK

ALT1STOW

This command is used to move heliostats to the STOW ALTERNATE 1 mode, generally as an alternate to the stow mode to avoid wind effects. It will be available only at the CS console.

ALT2STOW

Th command is used to move heliostats to the STOW ALTERNATE 2 mode, generally for the purpose of reducing blocking and shadowing during BCS measurements or for using rain to clean the mirrors. It will be available only at the CS console.

BCSCALC

This command instructs the HAC to calculate beam pointing biases in each of the three methods. In method 1 this command is entered as BCSCALC INPUT. This command initiates method 2. An example for HC 1107 is BCSCALC 1107. This command initiates method 3 and is entered as BCSCALC ALL. This command is available only at the CS console.

BCSDISPL

This command instructs the HAC whether or not to display selected contents of the BCS Processing File on the CS control console. Examples of this command are BCSDISPL ON if the display is desired and BCSDISPL OFF if the display is not desired. This command is avialble only at the CS console.

BCSEND

This command instructs the HAC to terminate the BCS task in the HAC.

BCSFILE

This command instructs the HAC which BCS Processing File is selected by the operator for the BCS task. File number (1, 2, or 3) follows the command such as BCSFILE 2. This command is avialable only at the CS console.

BCSINPUT

This command instructs the HAC that the operator is initiating method 1 of the bias calculation/update procedure for a particular heliostat. An example for HC 1107 is BCSINPUT 1107. This command is available only at the CS console.

BCSMEAS

This command instructs the HAC that the operator is ready for the automatic beam measurements for the selected heliostats to begin. This command is available only at the CS console.

BCSOFFS

This command is used to input centroid offset points for method 1. An exmaple for coordinated universal date = 01/11/82, coordinated universal time = 14:48:03, horizontal centroid offset = 2.7 ft, and vertical centroid offset = -3.8 ft is BCSOFFS 011182,144803,2.7,-3.8. This command is available only at the CS console.

BCSRANGE

This command instructs the HAC the range of heliostats selected by the operator for the BCS task and to be shown on the CS control console. An example of this command is BCSRANGE R_1,R_2 where R_1 = start heliostat, R_2 = end heliostat and R_1 = R_2 limits the range to one heliostat. This command is available only at the CS console.

BCSSTART

This command activates the BCS task in the HAC computer. This command is available only at the CS console.

BCSTAPE

This command instructs the HAC to read the 3 BCS Processing Files to disk partitions from the SFDI provided magnetic tape. This command is available only at the CS console.

BCSTRACK

This command is used to direct a heliostat to track its assigned target. There are four BCS targets on the receiver tower and each heliostat will be assigned to one of them. This command is available only at the CS console.

BCSUPD

This command instructs the HAC whether or not the operator desires the calculated beam pointing biases used to update the biases used in the HC tracking algorithms. Examples are BCSUPD Y for yes update biases and BCSUPD N for no update of biases desired. This command is available only at the CS console.

CFABORT

This command terminates command file processing. No further commands will be executed from the command file. The CFABORT command is available only at the CS console.

CFSTART

This command is used by the operator to cause the execution of the addressed command file to begin. The file is prestored on CS disk. This command is available at both the OCS and the CS console.

CFWAIT

This command will cause an additional delay before the next command from the command file is to be executed. The time (in seconds) input will be added to the time remaining for the execution of the next command. The new time will be used to delay the execution of the next command. The CFWAIT command is available only at the CS console.

DECREASE

This command moves a specified number of heliostats in each of the designated segments, rings, or wedges from the TRACK mode to the STANDBY mode. This command will be available to both the OCS and the CS console. If a greater number is commanded than is in track in any segment, then the default will be all the tracking heliostats in that segment. Status messages at the CS console and back to the OCS will indicate how much of the command was implemented. The order in which heliostats are taken out of track is described under INCREASE.

DEFOCUS

This command is an emergency measure to move all heliostats in the track mode or in transition to the TRACK mode to the STANDBY mode. This command will be available at both the OCS and the CS control room consoles, as a function key on the CS Chromatics console and may also be triggered by a hardwire trip from the receiver subsystem. Following the issuance of a DEFOCUS command it will be impossible to put any heliostat into the TRACK mode until a DEFRLSE (defocus release) command has been issued from the CS console and (if applicable) the trip hardwire from the receiver subsystem has returned to its normal state.

DEFRLSE (Defocus Release)

This command is issued to allow return to tracking following a DEFOCUS command. It will be available only at the CS console. It will not be implemented by the HAC unless the receiver trip hardware has returned to normal.

ESTANDBY

This command is used following power loss and heliostat initialization for heliostats in the TRACK or STANDBY modes or in transition between these modes at the time of power loss. The heliostats are sent directly to the STANDBY mode. This command is available at both the OCS and the CS console.

ESTOW

This command is used following a power loss and heliostat initialization for heliostats in wire walk at the time of power loss. The heliostats are commanded directly to the STOW mode without safety considerations. This command is available at both the OCS and the CS console.

HELP

This command is an operator aid. When only HELP is input the operator will receive a list of valid commands. When HELP is input followed by a command mnemonic the operator will receive the format and valid addressing. This command is available only at the CS console.

HOLD

This is an emergency command which will immediately stop all movement of a heliostat and put it in the DIRECTED POSITION mode. It will be available only at the CS console. It might be noted that a HOLD command applies to heliostats in the TRANSIT mode.

INCREASE

This command moves a specified number of heliostats in each of the designated segments from the STANDBY to the TRACK mode. This command will be available to both the OCS and the CS console. Which heliostats to be put in the TRACK mode for an INCREASE command will be defined in the form of a "pecking order" in the CS subsystem data base. This pecking order can be updatable via an offline data base change.

There will be a specific pecking order for each segment in the field and it will be applied in reverse for the DECREASE command. The collector subsystem will account for the heliostats in unavailable modes (WASH, BCS, OFFLINE, etc) when implementing the INCREASE or TRACK command. If a greater number is commanded than can be obtained for a given segment, the default will be to bring on all that are available. Status messages at the CS console and back to the OCS will indicate how much of the command was implemented.

LOAD

This command is used to initiate the down-load of initialization data to the addressed group of installed heliostat controllers. These data, which are stored in the microcomputer's random access memory (RAM) consist of heliostat location in the field, current heliostat orientation, and encoder bias data. This command is available only at the CS console.

MARK

This command moves the heliostats from the face down STOW mode thru the nearby azimuth and elevation relative encoder reference marks to "mark limits". It is available only at the CS console.

OFFLINE

This command is used to take a heliostat offline, generally for maintenance purposes, by putting the heliostat in the OFFLINE mode. Following the

issuance of this command, only an ONLINE command will allow the heliostat to be used further. This command will be availble only at the CS console.

ONLINE

This is the only command allowed to change the mode of a heliostat in the OFFLINE mode. It will be available only at the CS console.

POSITION

This command is used to orient any addressed heliostat to a given gimbal position, by putting it in the DIRECTED POSITION mode. It will be used generally for maintenance or testing and will be available only at the CS console.

REFRESH

This command allows the CS control console to be completely refreshed. It is available only at the CS console.

RELWASH (Release Wash)

This command is issued to allow heliostats to return to some other mode following the completion of washing. It places the heliostats addressed in the DIRECTION POSITION mode and is the only command allowed for a heliostat in the WASH mode. This command is available only at the CS console.

RESTORE

This command is used to restore a complex tracking configuration when the field is being controlled from the CS console. When the RESTORE command is issued, the HAC will restore the last saved tracking configuration of all heliostats (including aim points) that are either in the TRACK or the STANDBY mode. Following completion of the RESTORE command, the HAC will provide the operator an indication of the success of the command by showing heliostats that were not available because they were in the BCS, WASH, etc., modes.

RETURN

This command is used to return to the STANDBY mode a heliostat that was directed to the BCS mode by the BCSTRACK command. It will be available only at the CS console.

RLHIWIND (High Wind Stow Release)

This command is issued to allow use of the field following STHIWIND command. It will be available only at the CS console.

SAVE

This command is used to save a complex tracking configuration when the field is being controlled from the CS console. When a SAVE command is issued, the HAC will store on disk the tracking configuration of the entire field. Capability for storing only one field configuration is required - each SAVE command will override the previous one.

STANDBY

This command is used to move heliostats from the TRACK mode to the STANDBY mode. It will be available to both the OCS and CS console.

STATUS

This command is used by the CS, OCS and DAS to obtain detailed status on selected portions of the field from the HAC. It is available at the CS and the OCS console.

STHIWIND (High Wind Stow)

This command is an emergency measure to move all heliostats, except those in the WASH, OFFLINE and STOW - ALTERNATE 2 modes to the STOW mode because of high winds in the field. Note that any heliostats in the STOW-ALT 2 mode should not respond to this command. This command will be available at both the OCS and the CS consoles and also as a function key on the CS Chromatics console. Following the issuance of a STHIWIND command, it will be impossible to move any heliostat from the STOW mode (or STOW-ALT 2 mode) until a RLHIWIND (High Wind Stow Release) command has been issued from the CS console. This command will be implemented in such a way that any heliostat in the TRACK, BCS, or STANDBY mode at the time of issuance will reach the bottom of the wire by wire walk within 24 minutes, unless a heliostat is at or near singularity.

The CS console (and OCS console if it issued command) will display as an alarm the heliostats in the WASH and OFFLINE modes all of which are unable to respond to the STHIWIND command.

STOW

This command is used to move heliostats to the STOW mode, generally for stowage at night. It is available at both the OCS and the CS console.

TRACK

This command is used to move heliostats from the STANDBY mode to the TRACK mode. It will be available to both the OCS and the CS console. The target points on the receiver to be used by the heliostats in a segment will be defined by a previously issued AIMPOINT command.

UNSTOW

This command is used to move heliostats from any of the three stow modes to the STANDBY mode. It will be available at both the OCS and the CS console.

UPAIM

This command will be used to update any one of the twenty target arrays. When this command is entered, the update data for an entire target array will be read from the magnetic tape unit. The target data will be screened before the array is updated to verify that the aim points pass inclusion area processing. This command is available only at the CS console.

UPBIAS

This command will update the heliostat BIAS disk file. This file is used as the input for heliostat bias data when the LOAD command causes the heliostat initialization message to be output. This bias azimuth and elevation input with this command are in hexidecimal. This command is available only at the CS console.

WASH

This command is used to move heliostats to the WASH mode from whatever mode they are in, except OFFLINE mode. It will generally be initiated by specifying the first and last heliostat on a radial arc to be washed. To avoid inadvertent movement of a heliostat while in the WASH mode, only a RELWASH command will allow a mode change. If a WASH command is given and some portion of the heliostats are not available, a warning message will appear at the CS console. This command is available only at the CS console.

APPENDIX 10K

OUT OF SERVICE HELIOSTAT LIST

Heliostat No.	Reason	Initial/Date

MCDONNELL DOUGLAS ASTRONAUTICS COMPANY
ENERGY PROGRAMS
5301 Bolsa Avenue, Huntington Beach, California 92647 (714) 896-3311 Telex: 678426

RAETZ

A3-202-EP-RGR-517
15 September 1981

Department of Energy
San Francisco Operations Office
1333 Broadway
Oakland, CA 94612

Attention: Mr. David J. Tenca, Contracting Officer

Subject: CONTRACT DE-AC03-79SF10499
SOLAR FACILITIES DESIGN INTEGRATION
FOURTH PARTIAL SUBMITTAL OF SUBSYSTEM STAND ALONE
(PREOPERATIONAL) TEST PROCEDURES (RADL ITEM 2-45)

References:
(a) MDAC Letter A3-130-DSB-138, dated 3 March 1981, "Revised Delivery Date for Subsystem Stand Alone Test Procedures" (RADL Item 2-45)

(b) MDAC Letter A3-202-EP-RGR-417, dated 17 July 1981, "Partial Submittal of Subsystem Stand Alone (Preoperational) Test Procedures" (RADL Item 2-45)

(c) MDAC Letter A3-202-EP-RGR-444, dated 28 July 1981, "Second Partial Submittal of Subsystem Stand Alone (Preoperational) Test Procedures" (RADL Item 2-45)

(d) MDAC Letter A3-202-EP-RGR-494, dated 1 September 1981, "Third Partial Submittal of Subsystem Stand Alone (Preoperational) Test Procedures" (RADL Item 2-45)

Dear Mr. Tenca:

One (1) copy of one of the Preoperational Test Procedures that comprise a portion of the subject RADL is being submitted in accordance with the requirements of the Phase II Reports and Deliverables List of the subject contract, as modified by the contents of the Reference (a) letter. Previous transmittals were accomplished per the Reference (b), (c), and (d) letters. This letter transmits the following preoperational test procedure:

- 360 Collector System Interface Revision 0

A copy of this letter also transmits the master copy of the procedure to Southern California Edison (L. H. Chillcott) at the Solar One Site for control and implementation. Any SFDI-originated revisions to this procedure will be coordinated informally with SCE and subsequently transmitted by letter in the same manner as the subject document.

Additional submittals will be made as other Preoperational Test Procedures become available in Revision 0 versions, and you will be notified when all of the Preoperational Test Procedures that comprise RADL Item 2-45 have been submitted.

Technical questions regarding this procedure should be directed to R. G. Riedesel at (714) 896-3357. For contractual questions, please call the undersigned at (714) 896-1340.

Very truly yours,

D S Butler

D. S. Butler
Contract Administrator
Solar Facilities Design Integration

RGR:bj

Enclosure (as noted)

Cy: L. H. Chillcott, SCE-Solar One (1)
J. M. Slaminski, DOE/Daggett (1)
C. W. Lopez, SCE-Solar One (1)
J. J. Bartel, Sandia-Livermore (1)
T. L. Neilsen, Rocketdyne-Daggett (1)
J. M. Friefeld, Rocketdyne (1)
W. R. Lang, Stearns-Roger (1)
J. R. Detweiler, Stearns-Roger-Daggett (1)
R. M. Weeks, MMC-Daggett (3)

(w/o enclosure)
R. N. Schweinberg, DOE/STMPO
J. C. Corcoran, DOE/STMPO
D. W. Christian, DOE/Daggett
A: Matino, T&B-Daggett
D. L. Williams, Stearns-Roger
H. D. Eden, Aerospace/STMPO
R. O. Rogers, Aerospace/STMPO
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