REMOVE THIS COPY SINGLE COPY ONLY 0110 GUIDANCE COMPUTER AND ASSOCIATED GROUND [U] SUPPORT EQUIPMENT (NASA-CR-117718) APOLLO GUIDANCE COMPUTER N79-76239 AND ASSOCIATED GROUND SUPPORT EQUIPMENT 1. MONTHLY TECHNICAL REPORT, 1-31 MAY 1964 (Raytheon Co.) 62 p Unclas 00/14 11571 INX MONTHLY TECHNICAL REPORT NO.23 DUP FR-4-306 RAYTHEON COMPANY RAYTHEON SPACE AND INFORMATION SYSTEMS DIVISION REMOVE THIS COPY TCIONAL

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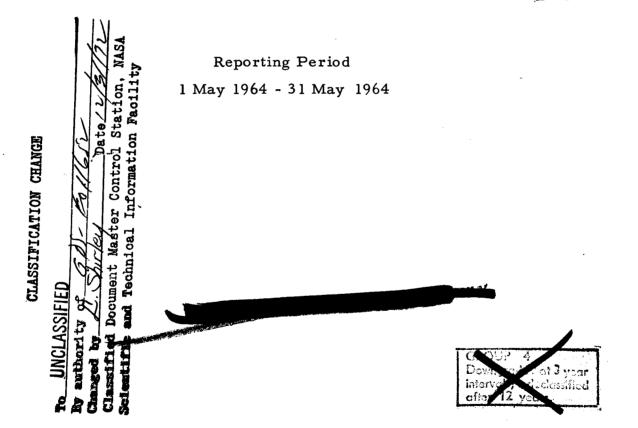
RAYTHEON

065-8622

MONTHLY TECHNICAL REPORT NO. 23

FR-4-306

APOLLO GUIDANCE COMPUTER AND ASSOCIATED GROUND SUPPORT EQUIPMENT



Prepared for

National Aeronautics and Space Administration

Contract NAS 9-498

Sudbury, Massachusetts SPACE AND INFORMATION SYSTEMS DIVISION.

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GROUE Downgraded at year intervals; declassified after Ta vears.



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TABLE OF CONTENTS

Section	Title	Page
1	PROGRAM MANAGEMENT	1-1
2	COMPUTER SUBSYSTEM	2-1
	 2.1 Apollo Guidance Computers. 2.2 Display and Keyboard Units. 2.3 Program Support. 2.4 Special Tooling. 	2-1 2-2 2-3 2-4
3	GROUND SUPPORT EQUIPMENT	3-1
	3.1Simulation Computer3.2Core Rope Simulator3.3Computer Test Set3.4AGC/CTS Operation Console3.5Computer Simulator3.6AGC Calibration System	3-2 3-2 3-2
4	FACTORY TEST EQUIPMENT	4-1
5	RELIABILITY	5-1
	 5.1 Reliability Engineering. 5.2 Components Engineering 5.3 Reliability Statistics and Analysis 5.4 Reliability Analysis Laboratory 	5 - 1 5 - 1 5 - 2 5 - 2
6	DOCUMENTATION	6-1
7	SYSTEMS SUPPORT	7 - 1
	7.1 Support Engineering	

iii

LIST OF ILLUSTRATIONS

Number	Title	Page
1 - 1	Raytheon Apollo Milestone Chart	1-2
1-2	Raytheon Apollo Hardware Deliveries	1-3
5 - 1	Transistor Analysis Results (3 Sheets)	5-4
	LIST OF TABLES	

4-1	Apollo Factory Test Equipment	•	•	٠	•	•	•	•	•	•	•	•	4-1
6-1	Specification Control Drawings	•	•	•	•	•	•	•	•	•	•	•	6-1

SECTION 1 PROGRAM MANAGEMENT

This is Monthly Technical Report No. 23 issued in accordance with Work Statement for Industrial Support E-1097. Information contained in this report relates to the period 1 May through 31 May 1964.

One hundred ninety-four TD's have been received to date; 135 have been formally accepted, 81 have been completed, superseded, or incorporated into other TD's, 54 are active. Man Hour Status Charts and Active Resident Status Charts are grouped at the end of this section of the report. The Raytheon Apollo Milestone Chart has been updated and included as figure 1-1. The Raytheon Apollo Hardware Delivery Schedule is shown in figure 1-2.

The progress of active TD effort is normally reflected in the following sections of the report as indicated:

Section 1: R-1, R-9, R-123, R-129, R-145.

- Section 2: R-49, R-95, R-108, R-122, R-132, R-134, R-139.
- Section 3: R-55, R-67, R-79, R-82, R-86, R-102, R-148.

Section 4: R-8, R-58, R-89, R-90, R-136, R-143.

- <u>Section 5</u>: R-10, R-16, R-18, R-63, R-75, R-83, R-125, R-163, R-164, R-165.
- <u>Section 6</u>: R-11, R-21, R-26, R-33, R-39, R-43, R-66, R-91, R-112, R-131.
- <u>Section 7:</u> R-107, R-109, R-110, R-111, R-113, R-114, R-116, R-141, R-152

APOLLO PROJECT PLAN MILESTONES Begin Industrial Support Residents at MIT Submit Reliability Plan Begin PERT Reporting GSE Design Release GSE Design Release GSE Design Release GSE Pabrication AGC "A" Release GSE Fabrication AGC Breadboard Complete Submit Field Support Proposal	Pace and information systems division SUBGURY OPERATION SUDGURY OPERATION SUDGURY OPERATION SUDGURY OPERATION SUDGURY OPERATION SUDGURY OPERATION SUDGURY OPERATION DAFE: CY 1962 CY 196 CY 196 CY 196 CY 196 CY 1962 CY 1962	:: 5/31/64 isea
Begin Field Training Program All GSE Breadboards Complete All GSE Breadboards Complete AGC Fabrication Subassy Qual. Testing First Field Eng. on Station AGC Learning Model Sub Assy's del. to MIT/IL AGC Qual. Testing NOTES		

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Figure 1-1. Raytheon Apollo Milestone Chart

																	DATE 5/31/64
						1961									1965		
3JVMQLVH	MBCH	APRIL	MAY	JUNE	JULY			SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER		JANUARY	FEBRUARY	MARCH	APRIL	MAY
	6 13 20 27 3	10 17 24 1	1 8 15 22	29 5 12 19	26 3 10 17	24 31 7 14	-	11 18 25	2 9 16 23 30	٩	4	25 1 8	5 53	12 19 26 5	12 19 26 2	6	-
AGC 5					A A								1				
AGC 6 (LESS MAIN DORY)				4													
AGC 7 (LESS MAIN DOILY)																	
AGC B(INCLUDES MARY DEKY)						ব											
AGC 20, 10, 11, 17, 12, 9						4		\$ \$									
MAV DSKY				ৰ ব			1		+								
MAIN DSKY		· ·	4														
SIMULATION COMPUTER						₹ 											
COMPUTER TEST SET			V														
ABC/CTS OPERATION CONSOLE					$\overline{\diamond}$	$\Phi \Phi$											
NAV PANEL DOKY HOLDING FIXTURES			¥<\ ↓	<u> </u>													
MANN PANEL DSKY HOLDWOG FUXTURES																	
AGC HOLDING FIXTURES				Ŵ													
SHIPPING CONTAINERS				$\phi \phi \phi \phi$													
SPARES KIT - AGC						\triangleleft	4	\triangleleft	4								
SPARES KIT - 6SE						7		4									
CTS CABLES INECOVERY SCHEDULE)					-												
2) NG. 1020115			7	AN AN													
						•											
				·													
												.Figure 1-2.		Apollo Han	Raytheon Apollo Hardware Deliveries	ies .	

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R-9

COMPLETED FEBRUARY 1963. FOLLOW ON COVERED ON OTHER TD'S COMPLETED SEPT 1962, FOLLOW DN EFFORT ON TO 16 COMPLETED SEPT 1962. FOLLOW ON Effort on To 16 PROJECTED TO DECEMBER 1964 PROJECTED TO DECEMBER 1964 EFFORT COMPLETED MAY 1964 COMPLETED SEPTEMBER 1962 PROJECTED TO 30 JUNE 1964 COMMENTS COMPLETED JANUARY 1963 COMPLETED JANUARY 1963 AS OF 31 MAY 1964 PROJECTED TO JUNE 1964 PROJECTED TO JUNE 1964 COMPLETED JUNE 1962 ONDJFMAM 1964 J J A S O N D J F M A M J J A S 963 TECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE 1962 EXP DATE 36,124 12.742 13, 291 13,052 2615 Se 8 7412 2 1226 832 2558 Ē MAN HOURS TOTAL 36,540 18,210 14,851 10,000 12.912 ĵ 1506 4 1 jt: a, ¥ EXP. THIS MONTH 1451 ៊ុ 1144 1108 13 1918 i ŧ Зř 244 ŧ t ACCEPTED 5/24/62 6/1/62 5 24 62 6/1/62 5 29 62 ISSUED 5, 29 62 , 5/29/62 6 5 62 5/29/62 6/5/62 6/1/62 6/11/62 6/1/62 6/20/62 6/11/62 £/5/62 6/20/62 6/13/62 7/5/62 7/19/62 6//20//62 6/5 62 6.5 62 6/5/62 MIT ENG'R RAY ENG'R J. LEVY/E. HALL POUNDSTONE J. POUNDSTONE V. FARNSWORTH J. POUNDSTONE R. FRONCILLO **R. FRONCILLO** G. WAYO L. HAWORTH L. HAWORTH L. HAWORTH N SEARS F NESLINE L. HAWORTH T. LAWTON F. NESLINE **Y**. KUPFER J. LEW W. KUPFER . HALZEL G. MAYO G. NAYO E MALL E. HALL G. MAYO DOCUMENTATION CONTROL PROCEDURES DOCUMENTATION FACTORY TEST PLANS INSULATION EVALUATION MAGNET WIRE ENGINEERING SUPPORT - RENDEZVOUS RELIABILITY INPLEMENTATION PLAN QUALITY ASSURANCE PROGRAM SUBJECT **WELDING SPECIFICATIONS** AGC PROGRAM DESIGN RESIDENT ENGINEERS DEVELOPMENT PLAN CORE ROPE TESTER PROJECT OFFICE CONTRACT NAS 9-498 PERT TEAM W.S. 4.3.1 4.4.2 4.6.3 4.1.1 4.1.3 4.4.2 17 4.6.2 1.2 4 14 4.7

PROJECTED TO DECEMBER 1964

8319

11,609

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7/24/62 7/24/62

-. HAWORTH

RELIABILITY PROGRAM IMPLEMENTATION

4.4.2

R-16

G. MAYO

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7/19/62

L MLLER F. NESLINE

ENGINEERING SUPPORT - SMULATION

£.1.4

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R-10

R-11

8-13

R-13

PSA RESIDENT ENGINEER

4.1.3

8-12

64 48

1161

526

7/17/62 7/23/62

POUNDSTONE

E. DUGGAN

1155

4

1

7/19/62 7/21/62

E DUGGAN J. POUNDSTONE

WATRIX FEASIBILITY STUDY

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11-¥

COMPLETED MAY 1963

EFFORT COMPLETED MAY 1964

CANCELLED MARCH 1963

		CONT	CONTRACT NAS 9-498		TECHNICAL		DIRE(MMAND	- DIRECTIVE MAN HOUR SI FOR COMMAND MODULE	STATUS				AS OF <u>31 MAY 1964</u>
With Biologenetic Accessing Acces					ISSUED	MAI	NOH N	l si	1962	_	963		1964	
4.23 6.600 #ELMBILTY GUATING 5.78.16 EMBGR 7.8.16 EMBGR 7.8.16 EM	Ū.	W.S.	SUBJECT	RAY ENG'R	ACCEPTED		TOTAL EST	7		MAM	A L	2 0	FMA	
422 60000000 5 000000000 5 0000000000 5 00000000000000000 5 000000000000000000000000000000000000	R-18	4.4.2		G.MAYO E.DRISCOLL L.HAWORTH	7 24 62 7 24 62	(36)	22.301	14.311						PROJECTED TO 31 DECEMBER 1964
4212 Endinetisands support E Mult. 73 kg. 640 1	61-8	422		E DLSSON	. 7 20.62 7:20.62	2158		142.635						EFFORT COMPLETED MAY 1964. FOLLOW ON EFFORT UNDER OTHER TD'S.
4:3 PODRES REPORTS E MALL 7.3.42 54 19.36 11.36	R-20	4212	ENGINEERING SUPPORT	E. HALL J. POUNDSTONE	7 - 24 - 62 7 - 24 - 62	6802		204.474						EFFORT COMPLETED MAY 1964. FOLLOW ON EFFORT UNDER OTHER ID'S.
421 CLOKA SKALER RELADEOLAD E. MALL 7.452 7.452 7.8	R-21	4.6.3	PROGRESS REPORTS	E. HALL J. POUNDSTONE	7 24 62 7 24 62	664	13.556	10.585						PROJECTED TO DECEMBER 1964
4.11 BEEABBOARD COMPUTER E-MALL 7.3 62 44 - 9'3.9 -	R-22	1 23	CLOCK & SCALER BREADBOARD Construction	E HALL J POUNDSTONE	1.24.62 7.24.62	l de la compañía de l La compañía de la comp		324						COMPLETED AUGUST 1962
(13) Reiner Support REENTER 0. LCMLFT 7.27 62 -	873	4231	BREADBOARD COMPUTER	E. HALL J. POUNDSTONE	7: 24: 62 7: 24: 62	434	,	37.550						EFFORT COMPLETED MAY 1964
4.1 RESIDENT FROMERER E. DUGGAM 1.27 62 160 - 278 1 1.000000000000000000000000000000000000	9-24	Ę	ENCINEERING SUPPORT - RE ENTRY	D. LICKLEY F. NESLINE	7 27 62 7 27 62		1	53						COMPLETED JANUARY 1963
4£2 DOCUMENTATION ADMINISTRATION J. LEV 8.3 05 1/2 5/80 2/85 1/2 5/80 2/85 1/2<	8-25	Ę	RESIDENT ENGINEER	E. DUGGAN J. POUNDSTONE	1/27 62 1/27 62	160	i	2678						EFFORT COMPLETED
4.3 DOCUMENTATION CD.ONDINATION J. LEVY 8.24.62 - 733 1 <td>R-26</td> <td>4.6.2</td> <td>DOCUMENTATION ADMINISTRATION</td> <td>J. LEVY J. AVTGES</td> <td>8 30 62 9 19 62</td> <td>172</td> <td>5180</td> <td>3785</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>EFFORT PROJECTED TO DECEMBER 1964</td>	R-26	4.6.2	DOCUMENTATION ADMINISTRATION	J. LEVY J. AVTGES	8 30 62 9 19 62	172	5180	3785						EFFORT PROJECTED TO DECEMBER 1964
4.1 RESIDENT ENCINEN E. DUGGAM 8.21 %2 14 - 1077 1	R-27	3		J. LEVY J. AVTGES	8 · 23 · 62 8 · 24 · 62	- - 4	I	193						EFFORT COMPLETED APRIL 1963. FOLLOW DN EFFORT COVERED ON OTHER TD'S.
462 DOCUMENTATION FOR TECHNICAL 1 LEVV 93.452 - - 1438 1<	8-28	Ŧ	RESIDENT	E. DUGGAN R. FRONCILLO	8 21 62 8 22 62	М	1	1077						EFFORT COMPLETED APRIL 1963
46.3 Distribution of accinformation TO E. Hall 9:19:62 10.5 10.505 <td>8-29</td> <td>46.2</td> <td></td> <td>J. LEVY J. AVTGES</td> <td>9,4/62 9/19/62</td> <td>r</td> <td>ŗ</td> <td>1438</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>EFFORT COMPLETED OCTOBER 1963. FOLLOW ON COVERED ON OTHER TO'S.</td>	8-29	46.2		J. LEVY J. AVTGES	9,4/62 9/19/62	r	ŗ	1438						EFFORT COMPLETED OCTOBER 1963. FOLLOW ON COVERED ON OTHER TO'S.
412 APOLLO FAILURE REPORTING SYSTEM G. MAYO 9:8 62 - 55 - 56 - 10 16 1 1 1 1 412 DESIGN REVIEW L. HAWORTH 10:16 62 - 9:18 62 - 9:14 1 <td>R-30</td> <td>4.6.3</td> <td>DISTRIBUTION OF AGC INFORMATION TO MIT AND RAYTHEON</td> <td>E. HALL J. POUNDSTONE</td> <td>9 19 62 10 16 62</td> <td>102</td> <td>ł</td> <td>15.045</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>EFFORT COMPLETED MAY 1964</td>	R-30	4.6.3	DISTRIBUTION OF AGC INFORMATION TO MIT AND RAYTHEON	E. HALL J. POUNDSTONE	9 19 62 10 16 62	1 02	ł	15.045						EFFORT COMPLETED MAY 1964
4.42 bESIGN REVIEW G. MAYO 9 I8 62 - - 614 10 10 10 10 4.63 DETING SPECIFICATIONS L. HAWORTH 10 : 16 : 62 - 209 163 163 10	R-31	442	APOLLO FAILURE REPORTING SYSTEM	G. MAYO L. HAWORTH	9/18.62 10/16.62	ig" ∎ b	id na nig ∎							COMPLETED MARCH 1983. FOLLOW ON EFFORT COVERED ON TD 16
4.63 POTTING SPECIFICATIONS S. COPPS 10 2 62 - 209 163 1	R-32	442		G. MAYO L. HAWORTH	9/18/62 10/16/62	1	ŧ.	814						EFFORT COMPLETED DECEMBER 1963 FOLLOW ON COVERED ON OTHER TD'S
LAZ EVALUATION OF EFFECT OF RESISTANCE G. MAYO 9.26 62 LAZ WELDING ON SEMI-CONDUCTOR DEVICES V. WHITE 10.16 62	-33	4.6.3		S. COPPS V. WHITE	10 2 62 10 16 62	1	209	163						PROJECTED TO JUNE 1964
	16	442	ω	G.MAYO V.White	9:26.62 10:16:62	3		307						EFFORT COMPLETED 14 FEBRUARY 1964

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	CONT	CONTRACT NAS 9-498		TECHN	ICAL D FOF	IRECTIV	TECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE	AS, OF 31 MAY 1964
			MIT ENG'R	ISSUED	MAN	MAN HOURS	1962 1963	
T.D.	w.S.	SUBJECT		Δ	EXP. TC THIS TC MONTH E	TOTAL EXP EST DATE	JJASONDJFMAMJJASONDJFMAM	COMMENTS
R-35	413	MID COURSE GUIDANCE AMALYSIS	R. SCHOLTEN F. NESLINE	10 3 62 10 16 62		- 1606		EFFORT COMPLETED APRIL 1963
R-36	4 13	RESIDENT ENCINEERS	F. DUGGAN J. POUNDSTONE	10 3 62 10 16 62	91	- 3010		EFFORT COMPLETED MAY 1964
R-37	2	LAYOUT DRAFTSMAN	E. DUGGAN D. GRASSI	10-2-62 10-16-62	157	- 59,607		EFFORT COMPLETED MAY 1964
8-38	3	PSA PLANNING SUPPORT	E. DUGGAN R. FRONCILLO	10 2 62 10 15 62		1		COMPLETED MARCH 1963. Necessary Effort Will Not Be Charged Directly
R-39	4.6.3	SPECIAL PROCESSES AND MATERIAL SPECIFICATIONS	J. LEVY R. FRONCILLO	10 2 62 10 2 62	40 27	2784 1753		PROJECTED THRU DECEMBER 1964
R-40	£23	ROPE ŠTUDY	S COPPS J. POUNDSTONE	10-9-62 10-9-62	1	- 4558		EFFORT COMPLETED JANUARY 1954. FOLLOW ON EFFORT COVERED BY OTHER TO'S
R-41	IJ	DPERATOR WELDING TRAINING	G.MAYO R.GOULART	10-15-62 10-15-62	+	- 55		EFFORT COMPLETED NOV. 1962
R-42	463	PROCESS SPECIFICATIONS	E MAYO R SPARACINO V WHITE	11-8-62 11-28-62		t I		COMPLETED DECEMBER 1962 EFFORT CHARGED TO TO 20
R-43	4.6.3	PROGRAM PROGRESS AND STATUS REPORTING	J. LEVY J. AVTGES	11 21 62 11 28 62	7,5 35	3915 3370		EFFORT PROJECTED TO DECEMBER 1964
R-44	46	SPECIFICATION CONTROL DRAWINGS	J. LEVY J. AVTGES	11 28 62 11 28 62		- 3456		COMPLETED APRIL 1964. FULLOW ON EFFORT COVERED ON OTHER TD'S
R-45	1222	GSE DESIGN: BREADBOARD COMPUTER Simulator	J. GILMORE D. SCOLAMIERO	11 28 62 11 30 62	+	106		EFFORT COMPLETED APRIL 1963. FOLLOW ON EFFORT Covered Under TD 19
R-47	541	AGC FABRICATION	E. HALL J. POUNOSTONE	11 28 62 11 30 62	: 	1		ALL EFFORT TRANSFERRED TO TD 139
R-48	412	SPACE STUDY TEAM	E. OLSSON J. POUNDSTONE	12 31 62 1 7 63		864		COMPLETED MARCH 1963
R-49	4213	THERMAL INTERFACE COMMITTEE	E.HAŁL J. POUNDSTONE	11 28 62 11 28 62	551 62	6211 8063		PROJECTED TO AUG 1964
Ŗ-50	4221	DC - DC CONVERTER DESIGN	E. HAL L J. POUNDSTONE	11 - 28 - 62 11 - 28 - 62	,	- 1766		COMPLETED SEPTEMBER 1963
R-51	6 63	PROCESS SPECIFICATIONS	G. MAYO R. FRONCILLO	12 18 62 12 26 62	- u	3		EFFORT COMPLETED UNDER TD'S 20 AND 39
R-52	(I) ND	SUPPORT ENGINEER FOR FIELD Maintenance Procedures & Planning	R. BOYD . R. WILSON	12: 20: 62 1:7:63	ł	1 		CANCELLED 14 FEBRUARY 1963

TECHNICAL DIRECTIVE MAN HOUR STATUS

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	CONT	CONTRACT NAS 9-498		TECHNICAL DIRECTIVE MAN HOUR FOR COMMAND MODULE	ICAL - FC	DIRE(R CO	CTIVE MMAN	- DIRECTIVE MAN HOUI FOR COMMAND MODULE	HOUR	STATUS	SU				A	AS OF 31 MAY 1964
			MIT ENG'R	ISSUED	MAN	MAN HOURS	ŝ	1962	N		1963	6		1964		
T.D.	w.S.	SUBJECT	ENG'R	ACCEPTED	EXP. THIS MONTH	TOTAL EST.	EXP TO DATE	J J A S	O N D	л Ч Ч	ΓWA	J A S	0 N O	J F M A	Σ	COMMENTS
R-54	432 542	AGC CALIBRATION EQUIPMENT	J. CILMORE D. SCOLAMIERO J. SCHRMACK	1.4 63 2.15 63	1	1	ш								Ē	EFFORT COMPLETED APRIL 1963
R-55	54.2 4.32	SPECIAL TOOLING AND TEST EQUIPMENT	J. GILMORE D. SCOLAMIERO J. SCHRMACK	1 4 63 1 9 63	1062	23.494 2	20.251								PRO	PROJECTED TO 30 JULY 1964
95-8	42.1.2	AGC OSCILLATOR DOCUMENTATION	L HALL J POUNOSTONE	1.7.63 1/9/63	(23)		8155								θ.	EFFORT COMPLETED MAY 1964. FOLLOW ON EFFORT COVERED BY OTHER TD'S.
8-5 <i>1</i>	5	ERASABLE NEMORY TESTER	E HALL J POJINDSTONE	1 14 63 3 18 63	65		6150								<u>.</u>	EFFORT COMPLETED APRIL 1964
R-58	5.4	APOLLO MODULE TESTER	E. HALL J. POUNDSTONE	1 14 63 2 28 63	1414	4959	4745								PRC	PROJECTED TO JUNE 1964
R-59	11 3	ENGNEERING SUPPORT	R. ALUNSO J. POUNDSTONE	1. 14 63 1 21 63	ł	ł	2272								5	EFFORT COMPLETED MARCH 1964
8-60	3	LOGISTICS SUPPORT FOR FIELD OPERATIONS	R. BOYD, JR. R. WILSON	1 24 63 2 6 63	1 1 1		7126								0000	COMPLETED JULY 1963 FOLLOW ON EFFORT COVERED ON OTHER TD'S
R-62	1 27	TRAJECTORY CHECKS AND EVALUATION	N. SEARS F. NESLINE	1 18 63 2 6 63	1	,	ł -								55	COMPLETED JUNE 1963 COMPUTER TIME ONLY *
R-63	4.4	MICROLOGIC EVALUATION AND QUALIFICATION PROGRAM	E. HALL J. POUNDSTONE	1 22 63 1 26 63	109	6223	5288								PRO	PROJECTED TO AUGUST 1964
R-64	412	AGC/GSE RESIDENT	D. SCOLANIERO J. POUNDSTONE	1.21.63 1.28.63	1	1	200								i i	EFFORT COMPLETED FEB 1963
R-65	412	EVALUATION OF MIT'S MICROLOGIC	L. HANLEY L. HANORTH	1 24 63 2 15 63	ł	I	1539								CO	COMPLETED SEPTEMBER 1963
R-66	4.6.3	AGC INTERFACE SPECIFICATION	E. HALL J. POUNDSTONE	1 24 63 2 27 63	100	1649	1289								PRO	PROJECTED TO DECEMBER 1964
R-67	5.3	GSE MODULE AND DRAWER FABRICATION	D. SCOLAMIERO J. GILMORE J. SCHRMACK	1 30 63 2 1 63	2003	37.774	31.695								PRO	PROJECTED TO AUGUST 1964
R-68	53b	COMPUTER SIMULATOR, PROTOTYPE	D. SCOLAMIERO J. GILMORE J. SCHRMACK	1:30:63 3:14/63	(61 ţ)	,	2943								EFF	EFFORT COMPLETED AUGUST 1963
R-69	53 b	BREADBOARD COMPUTER TEST SETS	D. SCOLAMIERO J. SCHRMACK	1/30/63 2/1/63		1	10,321								8	COMPLETED SEPTEMBER 1963
R-70	4.3.1 5.4.1	AGC WIRE WRAP TOOLING	E. DUGGAN V. WHITE	2 26 63 2 27 63	274	I	3154								E E	EFFORT COMPLETED MAY 1964
R-71	4.1.2	RESIDENTS FOR SYSTEM TEST PREPARATION	J. FLEMING J. POUNDSTONE	2 21 63 2 28 63	16	,	3829								EFF	EFFORT COMPLETED MAY 1964
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< > INDICATES ACCOUNTING CHANGE FROM PREVIOUS REPORT

	CONT	CONTRACT NAS 9-498		TECHNICAL	ICAL F(DIRE(DR CO	CTIVE	- DIRECTIVE MAN HOUR FOR COMMAND MODULE	STATUS		AS OF 31 MAY 1964
			MIT ENG'R	ISSUED	MA	MAN HOURS	۶۶	1962	1963	1964	
Ö. H	N.S.	SUBJECT		ACCEPTED	EXP THIS MONTH	TOTAL EST	EXP TO DATE	J J A S O N D	JFMAMJJJASO	NDJFM	AMCOMMENTS
R-90	5.4.1	SCREENING & BURN-IN EQUIPMENT	E. HALL J. POUNDSTONE	4 · 25 63 5 3 63	2344	11.925	11,179				PROJECTED TO JULY 1964
R-91	46.2 b 46.3 c	PREPARATION OF INTERFACE Specifications	J. GILMORE J. AVTGES	4 30 63 5 6.63	203	ı	1663				PROJECTED TO DECEMBER 1954
R-92	53	ENGINEERING SERVICES	E. HALL J. POUNDSTONE	5 (] -63 5 6 63	267	45,261	41.066				EFFORT COMPLETED MAY 1964 FOLLOW ONCOVERED BY OTHER TD'S
R-93	3	RESIDENT DETAILER	E DUGGAN J POUNDSTONE	5/1/63 5/1/63	1 1	1	674				EFFORT COMPLETED SEPT 1963
88	93 3	SUPPLEMENTAL MICROLOGIC Procurement	E. HALL J. POUNDSTONE	5/1/63 5/15/63							SUPERSEDED BY TO 99 JUNE 1963
R-95	5.4.1	AGC TOOLING	E.HALL V.WHITE	5, 9 ·63 5 22 63	2397	19,096	17,008				PROJECTED TO SEPT 1964
R-36	ΓIÐ	ORAFTING SQUAD LEADER	E. DUGGAN D. GRASSI	5 21/63 5 23 63	11	2088	1876				EFFORT COMPLETED MAY 1964
8-97	1#X 777	FABRICATION OF QNE Computer Simulator	E HALL R FRONCHLD	5/31/63 6.12/63	1	1	1				I TD INCORPORATED INTO 1 TD 82 PER AG 61-64 1 completed 28 january 1964
\$6 -2	22.5	SUPPLEMENTAL MICROLOGIC PROCUREMENT	E. HALL J. POUNDSTONE	5/28/63 6 ^5, 63	•		4				EFFORT COMPLETED DECEMBER 1963 (MATERIAL ONLY)
101-W	1. 3	ANALYTICAL SUPPORT FOR SPACE Guidance Analysis division Powered Flight group	R. BATTIN J. POUNDSTONE	6/5/63 6/13/63	160	3088	1696				EFFORT COMPLETED MAY 1964
R-102	5.3 b	COMPUTER TEST SET PRODUCTION	J. GILMORE J. POUNDSTONE	6/17/63 6 28 63	17.366	616,72	81.581				PROJECTED TO SEPTEMBER 1964
R-103	1	EXTRA COMPUTER TEST SET	J. GILMORE J. POUNDSTONE	6/17/63 6/28/63	1 1 1	1	ł				I INCORPORATED INTO TD 102 12 March 1964
8:38	5.1.3	AGC POWER SUPPLY AND OSCILLATOR	E HALL J. POUNDSTONE	6/17/63 6/28/63		1	729				COMPLETED OCTOBER 1963
8-118 8-1	42.1.2	YUL SYSTEM DESCRIPTIVE WRITING	T. LAWSON J. POUNDSTONE	6/18/63 6:25:63	ŧ	ા	392				COMPLETED DECEMBER 1963
R-107	4.3.3*	FIELD OPERATIONS TRAINING	R.BOYD R.WILSON	6/25 63 7/17 63	790	17,226	10,781	•			EFFORT PROJECTED TO DEC. 1964
R-108	4.2.1.2	AGC FIXTURE AND SHIPPING CONTAINER	Lehall J.Pouncstöne	10 8 63 10 15 63	182	1073	122				PROJECTED TO SEPTEMBER 1964
8-109	4.2.1	FIELD OPERATIONS MANAGEMENT	R.BOYD R.WILSON	6 25 63 7 17 63	750	16, 530	6041				EFFORT PROJECTED TO DEC. 1964
-NASA L	ETTER DA	-NASA LETTER DATED 13 JUNE 1963. SUBJECT: SPECIFICATIONS OF FIELD OPERATION PROGRAM	OF FIELD OPERATIO	IN PROGRAM	NAS	V, TWX SGC	4-233 (ITEN	**NASA, T#X SGC 4-233 (ITEM 2.C.2.H) DATED 10 APRIL 63	63		

TECHNICAL DIDECTIVE MAN HOUD STATUS

CONT	CONTRACT	NAS 9-498	-	TECHNICAL DIRECTIVE MAN HOUR FOR COMMAND MODULE			IVE M	- DIRECTIVE MAN HOUI		STATUS	S				AS OF	31 MAY 1964
			MIT ENG'R	ISSUED	MAI	MAN HOURS	ss	1962	N		51	1963		1964		0+11
T.D.	W.S.	SUBJECT		ACCEPTED	EXP THIS MONTH	TOTAL EST	EXP TO DATE J	JAS	0 N D	JFM	ר M M	٩ ٢	s o n d	J F M A	٤	COMMENIS
R-110	4.3.2*	MATERIAL & SPARES INTEGRATION	R.BOYD R.WILSON	6 25 63 7 17.63	540	6612	3128								I PROJECTED THRU DECEMBER 1964	DECEMBER 1964
R-111	4.1*	RESIDENT EFFORT, FIELD OPERATIONS	R.BOYD R.WILSON	6/28 63 7/17 63	133	5220	902								PROJECTED THRU DECEMBER 1964	DECEMBER 1964
R112	4.3.4*	PROCUREMENT SPECIFICATIONS	R.BOYD R.WILSON	6. 28 63 7 17 63	849	7482	5006								PROJECTED THRU DECEMBER 1964	DECEMBER 1964
R-113	4.3.1*	MAINTENANCE ANALYSIS SUPPORT	R.BOYD R.WILSON	6/25/63 7 17 63	329	0609	2039								PROJECTED THRU DECEMBER 1964	DECEMBER 1964
R-114	3.2* 4.4.2	SPECIAL TEST EQUIPMENT	R.BOYD R.WILSON	6/25.63 7.17/63	ı	3308	1								PROJECTED THRU DECEMBER 1964	DECEMBER 1964
R-115	4.1.3 6	RESIDENT EFFORT-GUIDANCE ANALYSIS	N SEARS J. POUNDSTONE	6.28.63 7/16/63	160	ı	1696								EFFORT COMPLETED MAY 1954	0 MY 196
R-116	3.1 SEC.5	SPARES PROCUREMENT	R.BOYD R.WILSON	7/12~63 7°18′63	9	10,000	8								EFFORT PRESENTLY CHARGED TO RESPECTIVE HARDWARE TO'S	Y CHARGED Rdware td's
R-117		AGC IN-FLIGHT MAINTEMANCE STUDY	E. HALL J. POUNDSTONE	6/28/63	1	1	1								CANCELLED BY TD 9L	æ
R-120		SUBASSEMBLY QUALIFICATION TEST PROGRAM	G.MAYO L.HAWORTH	3 26 64	ŝ	1	16								NOT FORMALLY ACCEPTED	CEPTED
R-121		AGC - SA FABRICATION	E. HALL J. POURDSTONE	8/23/63 9/5/63		n	5 <u>5</u>						•		COMPLETED OCTOBER 1963	868 1963
R-122	5.1 5.2 5.3	FABRICATION OF BLOCK 1 AGC'S	E. HALL J. POUNDSTONE	8 19 63 9/5/63	29,525	187,146	147,121								PROJECTED TO AUGUST 1964	GUST 1964
R-123	9	RESIDENT EFFORT - APOLLO SYSTEM TEST GROUP	J. FLEMING J. POUNDSTONE	8/20/63 <u>9</u> /3/63	9	1827	1340								EFFORT COMPLETED MAY 1964	ED MAY 1964
R-125		COMPONENT QUALIFICATION TEST PROGRAM	G. MAYO L. HAWORTH	3 18 64 3 25 64	554	17,194	2162								PROJECTED TO DECEMBER 1964	CEMBER 1964
R.136	412	ENGINE ERING SUPPORT	R ALONSO J POUNDSTONE	8/9Z/8	(15)		1059								EFFORT COMPLETED WARCH 1964	ED WARCH 1964
R-125	13	HALF ROPE STICKS	A HOPKINS J. POUNDSTONE	8/26/63 9/10/63	4		1461			-					EFFORT COMPLET	EFFORT COMPLETED DECEMBER 1963
R-129	TWX 227	IMPLEMENTATION OF PACE AND Stu system test activity	J.FLEMING J.POUNDSTONE	9 9 63 9 23 63	1242	21,924	6254								PROJECTED TO FEBRUARY 1965	BRUARY 1965
R-131	4.6.2	MAINTENANCE AND REPAIR MANUALS	L.LARSON J. POUNDSTONE	9 '9 63 2 '26 '64	1572	27,345	21,536								PROJECTED TO DECEMBER 1964	CEMBER 1964

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TECHNICAL DIRECTIVE MAN HOUR STATUS

CON	CONTRACT -	NAS 9-498		TECHNICAL DIRECTIVE MAN HOUR FOR COMMAND MODULE	L DII FOR		IVE M.	DIRECTIVE MAN HOU		STATUS					AS OF 31 MAY 1964	
			MIT ENG'R	ISSUED	IVW	MAN HOURS	RS	1962			6	1963		1964		
T.D.	w.S.	SUBJECT		ACCEPTED	EXP. THIS MONTH	TOTAL EST.	EXP TO DATE J	J A S	0 2 0	N N N	ν Μ Μ	۲ ۲	N O S	JFMA	COMMENTS	T
R-132	5.2	AGC BLOCK I ROPES	E.HALL J.POUNDSTONE	6, 63 9 /16/63	6685	37,020	18,592								PROJECTED THRU DECEMBER 1964	4
R-133																
R-134	•	AGC SIMULATION COMPUTERS	E.HALL J.POUNDSTONE	9/23/63 9/30/63	8217	67,210	36,696								EFFORT PROJECTED THRU JULY 1964	1964
R-135		AGC SIMULATION COMPUTERS CORE ROPES	E.HALL J.POUNDSTONE	9/23/63 9/30/63	1	11,106	ł								ALL EFFORT CURRENTLY CHARGED TO TD 132. PROJECTED TO JULY 1964	1964 1964
R-136	1.4.2	AGC COMPUTER POWER SUPPLY TESTER	E.HALL J.POUNDSTONE	9.′27/63 10/4/63	214	1349	1854								PROJECTED THRU JUNE 1964	
R-137		FAILURE EFFECTS ANALYSIS	C.MAYO J.POUNDSTONE	3/18/64	-	ł	,								NOT FORMALLY ACCEPTED	
R-138					1	1	i	· · · · · · · · · · · ·								
R-139	5.1	AGC 4B FABRICATION	E.HALL J.POUNDSTONE	10/15/63 10/22/63	1074	33,069	32,025								PROJECTED TO JUNE 1964	
R-140	5.1	AGC 4B CORE ROPES	E.HALL J.POUNDSTONE	10/15/63 10/22/63	1	7404	ı								ALL EFFORT CURRENTLY CHARGED TO TD 132 PROJECTED TO JULY 1964	1964 1964
R-141	4.2.2 (FD, SOW)	DEPLOYMENT OF FIELD TEST AND OPERATIONS PERSONNEL	R.T. BOYD R.D. WILSON	10/17/63 10/24/63	4163	69,235	11,755								PROJECTED TO DECEMBER 1964	
R-142					I	1	1									
R-143	5.4.1	AGC DISPLAY AND KEYBOARD TEST STATION	E.HALL J.POUNDSTONE	10/18/63 10/23/63	239	2068	1499								PROJECTED THRU JUNE 1964	
R-144					I	1	ı									
R-145	NA	GROUND TEST DATA REDUCTION And Analysis planning	J. FLEMING J. POUNDSTONE	2/7/64 2/21/64	1155	10,218	4299				_				PROJECTED THRU DECEMBER 1964	4
R 146	VB	KENDENT EFFORT CDU & GSE	J MILLER R FRONCILLO	12/2/63 12/9/63	8	ı	£								EFFORT COMPLETED MAY 1964	
R-147	NA	SPECIFICATION CONTROL DWGS	G. MAYO R. FRONCILLO	11/27/63	1309	10,440	3004				_				NOT FORMALLY ACCEPTED	- 1
R-148	NA	AGC ROPE SIMULATORS	E. HALL J. POUNDSTONE	2/3/64 2.10/64	2613	14,787	4273								PROJECTED THRU JULY 1964	
•NASA LET	TER APCAN	WASA LETTER APCAN (FDN.:mmp) 30 AUGUST 63			+ CORREC	CTION TO I	· CORRECTION TO MARCH ENTRY	ž								

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AS OF 31 MAY 1964		COMMENTS		NOT FORMALLY ACCEPTED		PROJECTED TO DECEMBER 1964		NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED			NOT FORMALLY ACCEPTED		NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	PROJECTED TO DECEMBER 1964	PROJECTED TO DECEMBER 1964	PROJECTED TO DECEMBER 1964
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REC CO	MAN HOURS	TOTAL		275.007		1548		13.226	3952			4856		3534			5493	2130	
AL D	S	EXP THIS MONTH		5440		224		667				306		1279		308	629	236	137
FECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE	ISSUED	ACCEPTED		3/5/64		2/17/64 2/24/64		3/5/64	4/8/64		•	5/8/64		5/8/64	3/26/64	4/1/64	4/7/64 4/14/64	4/3/64 4/10/64	4/3/64 4/10/64
·	MIT ENG'R	RAY ENG'R		L. LARSON R. FRONCILLO		R. J. BOYD R. D. WILSON		E. HALL R. VOLPI	C. SPERLING J. POUNDSTONE			E. HALL J. POUNDSTONE		E. HALL R. FRONCILLO	G. MAYO L. HAWORTH	G. MAYO R. Froncillo	G. MAYO R. FRONCILLO/ L. HAWORTH	G. MAYO R. FRONCILLO/ L. HAWORTH	G. MAYO R. FRONCILLO/ L. HAWORTH
9 - 498		SUBJECT		BLOCK I DRAWINGS – MAINTENANCE		GSE INSTALLATION TEAM		AGC PROGRAM DOCUMENTATION	STU MAIN DSKY			POWER SUPPLY REDESIGN		AGC OSCILLATOR REDESIGN	RELIABILITY PROGRAM PLAN	RELIABILITY DESIGN SUPPORT – CM BLOCK II	FAILURE ANALYSIS	FAILURE REPORTING AND CORRECTIVE ACTION	RELIABILITY ANALYSIS
CONTRACT NAS		W.S.		BLOC		GSE II		AGC	STUA			3m0d		AGC	KELL	RELL	FAIL	FAIL	RELI
NTF											~				-	2			
S		T.D.	R-149	R-150	R-151	R-152	R-153	R-154	R-155	R-156	R-157	R-158	R-159	R-160	R-161	R-162	R-163	R-164	R-165

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CON	CONTRACT -	NAS 9-498	F	FECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE	L DIF	RECTI	VE M		L L L L L L L L	rs s	ATU	S							AS OF 31 MAY 1964
			MIT ENG'R	ISSUED	MAN	MAN HOURS	ŝ	-	1962				1963				1964		
T.D.	w.s.	SUBJECT		ACCEPTED	EXP. THIS MONTH	TOTAL EST	EXP TO DATE J	A L	s 0	o z	L L L	MAM	~ ~	A S	2 0		F M A	Σ	COMMENTS
R-166		MAIN DSKY TEST STAND	C. SPERLING K. BROWN	5/13/64	289		289												NOT FORMALLY ACCEPTED
R-167		AGC PRODUCTION EFFORT ENGINEERING	E. HALL D. GRASSI	5.8 64	17.047		17,047												NOT FORMALLY ACCEPTED
372		BLOCK II AGC PACKAGING	E DUGGAN D GRASS	4 10 G	21	3460	512												EFFORT COMPLETED MAY 1964
R-169		BLOCK I GSE PRODUCTION SUPPORT ENGINEERING	E. OLSSON W. KURTZ/ J. POUNDSTONE	5/8·64	2429		2429												NOT FORMALLY ACCEPTED
R-170		BLOCK II PROGRAM MANAGEMENT	L. LARSON W. KURTZ	5/8/64	941		941									-			NOT FORMALLY ACCEPTED
R-171		BLOCK II DESIGN ENGINEERING SUPPORT (MFG. TECHNIQUE/TOOLING)	E. HALL W. Kurtz/ J. Poundstone	5/8/64	24		24											Z	NOT FORMALLY ACCEPTED
R-172		BLOCK II DOCUMENTATION/ (Engineering Services)	L. LARSON W. KURTZ/ J. POUNDSTONE	5/8/64	I	3306	1											Z	NOT FORMALLY ACCEPTED
R-173		BLOCK II DESIGN ENGIMEERING SUPPORT (Information series)	E.HALL W.KURTZ/ G.ROLT	5/8/64	I		ı											2 	NOT FORMALLY ACCEPTED
R-174		BLOCK II DESIGN ENGINEERING SUPPORT (PROGRAM REQUIREMENTS)	E. HALL W. KURTZ/ J. POUNDSTONE	5/8/64	1		,												NOT FORMALLY ACCEPTED
R-175		BLOCK II DESIGN ENGINEERING SUPPORT (agg electrical/mechanical design)	E. HALL W. KURTZ/ J. POUNDSTONE	5/8/64			I											Z	NOT FORMALLY ACCEPTED
R-176		BLOCK II DESIGN ENGINEERING SUPPORT (AGC/GSE)	E. HALL W. KURTZ/ J. POUNDSTONE	5/8/64			,												NOT FORMALLY ACCEPTED
R-177		BLOCK II DESIGN ENGINEERING SUPPORT (DISPLAY AND KEYBOARDS)	E. HALL W. KURTZ/ J. POUNDSTONE	5/8/64	i	1	-												NOT FORMALLY ACCEPTED
R-178		BLOCK II FABRICATION (DSKY'S)	E. HALL W. KURTZ/ J. POUNDSTONE	5/8/64	1		,												NOT FORMALLY ACCEPTED
R-179																			
R-180																			
R-181		BLOCK II FABRICATION (AGC PROTOTYPES)	E. DUGGAN W. KURTZ J. POUNDSTONE	5.8.64	1	-													NOT FORMALLY ACCEPTED
R-182		BLOCK II FABRICATION (BITS AND PIECES)	e. Duggan W. Kurtz/ I. Poundstone	5.8 64			,												NOT FORMALLY ACCEPTED

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AS OF 31 MAY 1964		COMMENTS	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED
	1964	F M A M																	
ECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE	1962 1963	EXP J J A S O N D J F M A M J J A S O N D J B	4433																
	MAN HOURS	TOTAL EI	25.056 44:																
AL DIR FOR	MAN	EXP T THIS MONTH	4433 2																
TECHNIC/	ISSUED	ACCEPTED	5.8.64	5/8/64		5 8/64	5,′8,64	5/21.64	5/21/64	5/8/64	5/8/64		5/14/64	5/14/64	5/12/64	5/11/64	5/26/64	5/26/64	5.26/64
	MIT ENG'R		E. HALL W. Kurtz/ J. Poundstone	E. HAŁL W. KURTZ/ J. POUNDSTONE		J. MILLER W. Kurtz/ J. Poundstone	D. TEST/J. MILLER W. KURTZ/ J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. OLSSON J. POUNDSTONE	D. TEST/ J. MILLER J. POUNDSTONE		E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE	E. HALL J. POUNDSTONE
NAS 9-498		SUBJECT	BLOCK II RESIDENT EFFORT	BLOCK II FABRICATION (AGC FIXED MEMORY CORE ROPE MODULES)		BLOCK II CDU DESIGN ENGINEERING SUPPORT	BLOCK II CDU MANUFACTURING PROCESS DEVELOPMENT	DESIGN ENGINEERING SUPPORT (DART Input/output equipment, (10E))	DART IOE FABRICATION	BLOCK II FABRICATION (BLOCK II AGC/GSE RETROFIT KITS)	FABRICATION OF PROTOTYPES BLOCK II CDU DIGITAL MODULES		BLOCK I (F) DESIGN ENGINEERING SUPPORT (DSKY'S)	BLOCK II FABRICATION (TEST EQUIPMENT AND TOOLING AGC)	BLOCK II FABRICATION (TEST EQUIPMENT AND TOOLING GSE)	BLOCK II FABRICATION (OSKY TEST Equipment and tooling	BLOCK I (100 SERIES) FABRICATION (AGC TEST EQUIPMENT AND TOOLING)	BLOCK 1 (100 SERIES) AGC FABRICATION	BLOCK I (100 SERIES) FABRICATION (FIXED MEMORY CORE ROPE MODULES)
CONTRACT _		w.S.																	
CON		Ŭ F	R-183	R-184	R-185	R-186	R-187	R-188	R-189	R-190	R-191	R-192	R-193	R-194	R-195	R-196	R-197	R-198	R-199

AS OF 31 MAY 1964		COMMENTS	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED	NOT FORMALLY ACCEPTED								
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	1963	ר צ					PREPARED BY D. WHALEN		 		 	 	 	
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M M M M		7							 	 	 			
IVE MAN	JRS	EXP TO DATE					1,399.01							
REC T COM	MAN HOURS	TOTAL EST					1,441,821							
	ΦW	EXP THIS MONTH					1,399,019 1,441,821 1,399.019							
TECHNICAL DIRECTIVE MAN HOUR STATUS FOR COMMAND MODULE	ISSUED		5 '26 64	5 26 64	5 26 64	5 26 64								
	MIT ENG'R	RAY ENG'R	E. HALL J. POUNDSTONE	E. HALL	E. HALL J. Poundstone	E. HALL J. POUNDSTONE								
		SUBJECT		L.			TOTALS							
CONTRACT NAS 9-498			BLOCK I (100 SERIE	BLOCK I (100 SERIE SUPPORT (AGC ELE DESIGN)	BLOCK I (100 SERIE SUPPORT (AGC TES TOOLING)	BLOCK I AGC/BLOCK I (100 SERIES) AGC RETROFIT	-	,						
TRACT		W.S.												
CON		Ϊ.D.	R-200	R-201	R-202	R-203								

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1 Note: No	CO	CONTRACT NAS	NAS 9-498	P	TECHNICAL DIRECTIVE MAN HOUR STATUS FOR LEM GAN CONCEPT DESIGN	LEM (ECTIV SBN C	E MA	NICAL DIRECTIVE MAN HOUR ST. FOR LEM G&N CONCEPT DESIGN	STATI	SU				AS	AS OF 31 MAY 1964
WG SUBACT Ray Encit					ISSUED	MAN	HOURS		1962			1963		1964		THIT
Bill Landacterin F. Merriniti Color Col Mathematical Mathematical R Restart sever J. Pounstine Color S	T.D.	w.s.	SUBJECT		ACCEPTED				A S	r a v	M A	, J	s o	JFM		COMMENIS
Mat Eutodent Econt Evention	R-IL	20 EE	LEM PROJECT MANAGEMENT	P. K. BRYANT J. POUNDSTONE	6/19/63 6/24/63			2444							COMP	LETED MARCH 1964
46 000000000000000000000000000000000000	8-21	R	AESIDEAT EFFORT	P. K. BRYANT J. POUNDSTONE	872/8 672/8		in the second	176							COMPI	LETED MARCH 1964
Settle functione F. N. BOTTONE F. N.	컱	*	BOCUMENTATION	P. K. BRYANT J. POUNDSTONE	6/19/63 6/24/63	1	1	254							COM	LETED MARCH 1964
121 CERTANATORATE FABRICATION JOUNDETION JOUNDETION <th< td=""><td>#</td><td>38</td><td>SCHEDULING AND REPORTING</td><td>P. K. BRYAMT J. POUNDSTONE</td><td>6/19/63 6/26/63</td><td>1</td><td></td><td>210</td><td></td><td></td><td></td><td></td><td></td><td></td><td>8</td><td>LETED 28 FEBRUARY 1954</td></th<>	#	38	SCHEDULING AND REPORTING	P. K. BRYAMT J. POUNDSTONE	6/19/63 6/26/63	1		210							8	LETED 28 FEBRUARY 1954
xi Ld6 systems ferr Procedures 1 - 100 - - <	15-8	362	LEW HARDWARE FABRICATION	L GILMORE L POUNDSTONE	6/19/63		1								CANC AG 89	ELLED PER 5-63 16 OCTOBER 1963
A. LGE SYSTEMS TEST PROCEDURES J. FLEMIOL C/24/43 <	R-6L		•			1	ŀ									
ALGE VARYELING TEST PROCEDURES J. FLEMIG C/24/53	R-7L					1	1	-								-
14 AGC IN FLIGHT MANTERANCE STURF M.M.S3 1	R-8L	a	LGE SYSTEMS TEST PROCEDURES	L FLEMMC	69/38/63 1/16/63	1									EFFO	RT COVERED ON TO 21.
1.3 LEN GAN GSE RESIDENT 0.5001.MIRENO 8/1/53 - <td>1</td> <td>1</td> <td>AGC IN FLIGHT MAINTENANCE STUDY</td> <td>E HALL J POUNDSTONE</td> <td>8/€/63 8/13/63</td> <td>-</td> <td></td> <td>8</td> <td></td> <td></td> <td>•</td> <td></td> <td></td> <td></td> <td>EFFO</td> <td>RT COMPLETED FEBRUARY 1964</td>	1	1	AGC IN FLIGHT MAINTENANCE STUDY	E HALL J POUNDSTONE	8/€/63 8/13/63	-		8			•				EFFO	RT COMPLETED FEBRUARY 1964
3AJ GET REQUIREMENTS FOR LGC USCOLAMIERIA ISCREMANCK UN	R		LEGISTA 359 KPD NOT.	D. SCOLANIENO J. SHRWACK	8/7/63 8/7/63	•	1								EFFO	RT COVERED ON TD 2L
JAII THEMMAL AND TITRUCTURAL AMALYSS E.OUGGANG 8/5/63 - - 1315 - <td>E E</td> <td>ā</td> <td>GSE REQUIREMENTS FOR LGC</td> <td>D SCOLANIERO J SCHRINACK</td> <td>E9/E1/8</td> <td>1</td> <td></td> <td>107</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td>EFF0</td> <td>RT COMPLETED FEBRUARY 1964</td>	E E	ā	GSE REQUIREMENTS FOR LGC	D SCOLANIERO J SCHRINACK	E9/E1/8	1		107							EFF0	RT COMPLETED FEBRUARY 1964
JAJ CORE ROPE WANUFACTIONNE EDUGGAM Br/643 - b27 -	8-13F	341	THERMAL AND STRUCTURAL ANALYSIS OF LOC DESIGN	E.DUGGAN R.FRONCILLO	8/6/63 8/13/63-	1		315							EFFO	EFFORT COMPLETED 7 FEBRUARY 1964
3 A/21. (c) LEWCHINTERCHANGCABLE MARDWARE E.MALL 10/15/58 -	R-13L		CORE ROPE MANUFACTURING STUDY Fon Ligo	E DUGGAN R FRONCILLO	8/6/63 8/13/63	4		527							EFFO	RT COMPLETED JANUARY 1964
3.6/21, (a) Lec credit and Logic design E.M.L. 10/17/53 - - 391 - - 10 3.10,17,63 Lec credit and Logic design R.Francisci (10/27/53) - - 282 - - 10 3.10,17,63 Lec credit and Logic design R.Francisci (10/27/53) - - 282 - - - - 3.10,17,63 Lec credit (10) 10/27/53 - - 282 - - - - 10/27/53 - - 18,596 - 18,596 - - - - - TOTALS - - - 18,596 - - 18,596 - - -	R.R.	3 h (2), (c)		E HALL R FROMGILLO	10/15/63 10/22/63	1									EFFOI	RT COVERED ON TD 2L
J.D.(7), (b) Leccneconnical design E. Mali 10/17/65 - - 2892 P P TOTALS - - 18,596 0 0 0 0 0	R.B.	3 6 (3)		E NALL R FRONGLLO	10/17/63 10/24/63	l.	t	162							EFFO	TT COMPLETED FEBRUARY 1964
19,596	R-IGL	3 P (2) (9)		E HALL R FRONCILLO	10/1/63 10/24/63	1		832							EFFOI	RT COUPLETED FEBRIJARY 1954
			TOTALS			1		3,596			 Repared B 	HN - []				

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CORRECTIONS MADE TO FEBRUARY REPORT

CONTRACT NAS 9-498

ACTIVE RESIDENT STATUS

AS OF 31 MAY 1964

				ACTIVE REGIL	RESIDENT STALUS	
		MIT ENG'R	ISSUED	1963	1964 1965	
	SUBJECT	RAY ENG'R	ACCEPTED	JASONDJI	FMAMJJASONDJFMAM	COMMEN - 0
111	RESIDENT FIELD OPERATIONS	R. BOYD R. WILSON	6/28/63 7/17/63		4 T 64 R HENNESSEY	
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9/9:63 9.23/63	10/1 63	3 4. <i>B</i> /B BQ	
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9 '9/63 9 '23/63	10 63	63 J. HAARISDN	
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9.′9.63 9.′23.63		17.163 R. HELMNSON	PROJECTED TO I JANUARY 1965
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9/9 63 9/23 63		14 5 43 A. OCOMMEL	PROJECTED TO 5 APRIL 1965
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9.⁄9.⁄63 9.⁄23.⁄63		1 6 64 R WIGOINS	PROJECTED TO 5 APRIL 1965
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9/9/63 9/23/63		11 64 E. GR4CE	PROJECTED TO 15 SEPTEMBER 1965
129	RESIDENT PACE AND STU SYSTEMS TEST	J. FLEMING J. POUNDSTONE	9/9/63 9/23/63		473/64 J. AOPDLD	PROJECTED TO 1 JULY 1965
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		511 °64 PL CGRBETT	
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5 (8/64 5/15/64		511/64 H. THALER	
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64		5/1/6/ R, CRENJER	
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		5/1/64 J. WOCEL	
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		5/1/4 1. DEUTICH	
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64		S/1/Sed. REEVES	
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		SATOR P NICHOLAS	
183	BLOCK 11 RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64		5// /64 R. VIBRANTIS	
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		S/1/de A addimity	

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CONTR,	CONTRACT NAS 9-498			ACTIVE RESIDENT STATUS	DENT STATUS		AS OF 31 MAY 1964
		MIT ENG'R	ISSUED	1963	1964	1965	0 L 7 L WINC C
Ü.	SUBJECT		ACCEPTED	J J A S O N D J F	FMAMJASOND	J F M A M	COMMENTS
183	BLOCK II RESIDENT EFFORT	E.HALL W.Kurtz	5 8 64 5 15 64		S 1 64 D. WILLARD		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5 8-64 5-15 64		1 64 D. SPRAGUE		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5.8.64 5.15.64		5 64 J. FUSCO		
183	BLOCK 11 RESIDENT EFFORT	E.HALL W.KURTZ	5/8 64 5 15 64		5 8 64 D. LINDELL		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5 8.64 5 15 64		5 7 64 R. BAKER		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5 /8 /64 5 /15/64		5 1 (64 A. \$E1FLE		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64		5 1 54 R TRYBER		
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5,8/64 5/15/64		5 1 64 B. #APPIA		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8.64 5/15/64		5 7 64 R Di GLORIA		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64		5 1 34 E. RDGFRS		
183	BLOCK II RESIDENT EFFORT	E.HALL W.KURTZ	5/8/64 5/15/64	,	5 64 C. RICE		
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5.'8./64 5.'15./64		5 11 (64 R. HOMC		
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		5/1 64 A. DILEO		
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		5-1 54 P. MILLEON		
183	BLOCK II RESIDENT EFFORT	E. HALL W. KURTZ	5/8/64 5/15/64		SVI 64 C. PRESTIA		
183	BLOCK II RESIDENT EFFORT	E.HALL W. KURTZ	5/8/64 5/15/64		5/1/64 E. POWERS		
183	BLOCK II RESIDENT EFFORT	E. HALL W. Kurtz	5/8/64 5/15/64		5/1/64 R. KINDSBURY		

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AS OF 31 MAY 1964	COMMENTS	A M													
	<u>5961</u>	0 N D J F M													
ACTIVE RESIDENT STATUS	1964	JFMAMJJAS	5 1/64 E. JOHANNSEN	5-7 64 T. DUVAL	571 64 R. GOGUEN	5.1 64 1. BRICHAM	5 1 /54 W. PAICE	57764 M. SACK	5 64 B. KRECIMAN	5 1 44 E. MJILLER	5/1/64 A MARTO				
ACTIVE RE	1963	JJASOND													
	ISSUED	ACCEPTED	5 /8 /64 5/15/64	5/8-64 5/15/64	5/8/64 5/15/64	5/8/64 5/15/64	5/8/64 5/15/64	5.8/64 5/15/64	5-8/64 5/15/64	5./8.64 5/15/64	5/8/64 5/15/64				
	MIT ENG'R	RAY ENG'R	E.HALL W.KUPTZ	E.HALL W.KURTZ	E.HALL W.KURTZ	E.HALL W.KURTZ	E.HALL W.KURTZ	E. HALL W. KURTZ	E.HALL W.KURTZ	E, HALL W. KURTZ	E.HALL W.KURTZ				
CONTRACT NAS 9-498	SUBJECT		BLOCK II RESIDENT EFFORT												
CONTRA	Ū.T	<u></u>	183	183	183	183	183	183	183	183	183				

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CONTIDENTIAL

SECTION 2

COMPUTER SUBSYSTEM

2.1 APOLLO GUIDANCE COMPUTERS

AGC 4A was updated during the reporting period to reflect the revised wirelist which was issued on 18 March, 1964. This modification had been delayed because AGC 4A was being used to test core ropes. Tapes are now available for the Core Rope Tester (CRT), however, and the AGC 4A is no longer performing this testing function. Ropes tested during May are as follows:

<u>Serial No.</u>	Type	<u>Times</u> Tested
06	Eclipse	3
33	Eclipse	2
09	Artemis	2
10	Artemis	3
11	Warning	1
12	Artemis	4
18	Artemis	2
19	Artemis	2
25	Artemis	5

The G & N harness (tray C) for AGC 5 was completed on 11 May. All AGC 5 items except for replacement trays A and B were delivered to MIT/IL during the reporting period. Vendor delays have slipped the anticipated completion dates for AGC 5 replacement trays A and B to 14 July and 28 June, respectively.

System testing of AGC 6 continued this month using the Computer Test Set, (CTS) as well as a Main and Navigation Panel DSKY. Most of the problems encountered during the test were due to errors in the temporary interface cables or noise in the test connector cable. The final revision of the Final Test Method (FTM) was used and several changes were made to the



Interface Signal Measurement and DSKY checkout parts. The FTM portion dealing with core program checkout was not attempted because the necessary ropes were not available. Considerable time was expended in attempting to get the Core Rope Simulator (CRS) running properly with AGC 6, however, the CRS was consistently dropping or picking up particular bits. Effort using the CRS was temporarily stopped to enable checkout in other computer areas. Following computer checkout with the CTS and all available erasable memory test programs, the computer was sent for potting and test, except for tray A which required additional wiring. Units which are gating delivery of AGC 6 are system integration of the AGC/CTS Operation Console, Rl and R2 FTM ropes, and tray A. The anticipated delivery date for AGC 6 is now 26 June, 1964.

The testing of A trays for AGC 7 has been initiated using the AGC 4A monitor. The memory timing, micrologic registers, and basic instructions have been checked out. The end connector and coldplate are being subjected to environmental test to evaluate the vibration fixture prior to complete environmental testing of the AGC. The anticipated completion date for AGC 7 is 13 July, 1964.

Fully potted DSKY's for AGC 8 will be available during the next reporting period. AGC 8 will be the first system to undergo environmental testing. The gating items for completion of the system are tray B modules, as well as the availability of CTS 7 and AGC/CTS Operation Console 2. The anticipated completion date for this system is 6 August, 1964.

2.2 DISPLAY AND KEYBOARD UNITS (DSKY's)

Navigation and Main Panel DSKY's were completed and made available for system testing during the reporting period. A problem evolved in the DSKY harness lead dress which required the addition of two brackets onto the cable. As a result of the addition of minor cable lead dress modifications, and cable tie down points, the DSKY configurations proved to be satisfactory. Plans have also been made for improved DSKY moisture resistance. Addi-

tional potted areas have been added to the backs of the electroluminescent lights, as well as to the keyboard, brightness potentiometer, and UPTL switch terminals for system 8 DSKY's and subsequent.

A gasket for sealing has been designed and the tooling order is in process. These gaskets will be retrofitted into system 8 and subsequent DSKY's when available. A mechanical stop for the brightness potentiometer has been designed which will also be incorporated into system 8 and subsequent DSKY's. This stop will prevent failure of the potentiometer internal stop under conditions of mishandling.

2.3 PROGRAM SUPPORT

Artemis procedures and test implementation methods have been incorporated into the initially published FTM document for use during AGC factory sell-off. Minor revisions to these procedures were also made during the reporting period.

The Artemis, EXTEST and AGC Factory Diagnostic programs were used extensively during May for verification of AGC operational and functional capabilities, as well as for diagnostic assistance in the isolation of malfunctions.

A program which exercises the 24 hour clock in word IN 1 of the AGC erasable memory has been programmed and checked out. This program will be submitted as an integral part of the first FTM sell-off of the AGC.

Wiring maps have been prepared for all Artemis ropes. These maps designate the route that each wire follows during the manufacture of core ropes.

A series of IBM 1401 programs have been prepared to produce punched paper tapes for the CRS, CRT, and CTS phases of core rope manufacture. An IBM 1012 paper tape punch will be used for the tape preparation procedure.



A series of programs have been produced for the MH-800 computer to verify each punched paper tape produced during the core rope manufacturing procedure. These programs will correct hardware mispunching which has been prevalent in the past.

DIT-MCO revision C control tapes were produced for the machine, handwrap, and end connector phases. Revisions have been made to automatically provide parameters through paper tape rather than the use of manual procedures at the console. The DIT-MCO flexowriter is now being used to provide parameter identification printouts.

2.4 SPECIAL TOOLING

To date, over 5, 200 matrices have been produced and processed. Minor difficulties have arisen in the Eubanks Wire Stripper being used in conjunction with the Semi-Autowrap System. The wire has a tendency to get caught in the supply tube. Investigations are being made to determine whether the fault lies in the equipment or with the wire. Preliminary results indicate that the use of wire which does not conform to specification may be the determining cause. Special equipment for the insertion of .125 center Malco pins has been completed and is operational. The Equipment Development Notification will be signed as soon as heavier magazine springs are available. Fabrication of the equipment to be used for the insertion of .200 center Malco pins is on schedule with an anticipated completion date of 30 June, 1964. The service manual for the core rope weaving machines is being updated to reflect latest equipment modifications. In addition, an equipment set-up procedure will be included in the updated manual.

-CONFIDENTIA

COMPRESSION

SECTION 3

GROUND SUPPORT EQUIPMENT

3.1 SIMULATION COMPUTER

All modules for Tray A, System 1, are complete and have been successfully tested. All modules for Tray B, System 1 with the exception of B8 have been completed and are being tested. The gating items for completion of B8 are the K cores which are undergoing unit test. One set of four trays sent to RCA in Ohio for wirewrapping has been completed and is in transit back to Raytheon. The end connector for System 1 has been wirewrapped by machine to the modified card deck which eliminates one level of wiring.

The cabinet for System 1 was delivered on 13 May, 1964. The cabinets for Systems 2 and 3 will be delivered during the next reporting period. The frame has been completed and is awaiting the return of trays prior to continuation of assembly effort. The junction box wiring began on 19 May; the unit is now undergoing electrical testing. Because of flyable signal and connector requirement changes, cables nos. 3, 4, 8, 9, 10, and 11 were redesigned and new drawings issued.

Changes and additions to the Simulation Computer which are being studied for integration into the present configuration are as follows:

- 1. Use of 28V output from PSA or internal power
- Modification of J box to channel all non-common DSKY signals to the Main DSKY connector
- 3. Allowance for operation with the Core Rope Simulator

Changes to flyable modules are still being picked up in the modules for the Simulation Computer. A drawing updating program to document these production changes in in process.

CONTRACTOR

3.2 CORE ROPE SIMULATOR

Forty Core Rope Simulator (CRS) drawings were released between 8 and 12 May, 1964. These releases constitute approximately 90% of all drawings required for this task. The drawings which have not yet been released are: 1) The five connector drawings; 2) The signal interconnection diagram; 3) The logic diagram; 4) The module plate assembly. These drawings all require information which is obtained by programming the logic diagram. The one shot module for the CRS was completed and released on 22 May, 1964.

3.3 COMPUTER TEST SET

The updating of Computer Test Set (CTS) 2 for Block I AGC testing is in process. The anticipated completion date for the updating is 15 June, 1964. The retrofits for CTS 7 and 8 have been completed. The electrical changes effected by the retrofit were completed on CTS 4. These changes will correct two discrepancies, double punching in the tape prepare mode and generating a false stop condition (Pinc problem). The fabrication of CTS 7 and 8 has been completed and the final sale of CTS 7 is in process.

3.4 AGC/CTS OPERATION CONSOLE

Operation Console 1 is being integrated with CTS 4 and AGC 6. Final test and sale of this console has been completed.

3.5 COMPUTER SIMULATOR

The marked drawings for the Computer Simulator retrofit were completed and are being processed.





3.6 AGC CALIBRATION SYSTEM

Engineering effort is currently being expended to design the modification for the AGC Calibration System.

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SECTION 4 FACTORY TEST EQUIPMENT

Apollo factory test equipment is divided into four categories: AGC inprocess, GSE in-process, AGC/GSE in-process, and AGC/GSE incoming inspection test stations. The status of Apollo factory test equipment is shown in table 4-1.

TABLE 4-1

APOLLO FACTORY TEST EQUIPMENT

	Test Station	D
Number	Name	Remarks
	AGC/GSE Incoming I	nspection
1 201 1 202 1 203 1 204 1 205 1 206 1 207 1 208 1 209 1 210 1 212 1 212	Pulse Transformer Semiconductor Leakage Gross Leak Oscillator (GSE) Helium Leak Automatic Semiconductor (TACT) Lead Visual High-Temperature Storage Constant Acceleration Micrologic	 * Checkout complete
1 21 3 1 21 4 1 21 5 1 21 6 1 21 7	Relay Power Supply Resistor Micrologic Burn-in Transistor Burn-in	 * Checkout complete
1 21 8	Diode Burn-in	* Checkout complete

* Indicates test station in use.

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TABLE 4-1

APOLLO FACTORY TEST EQUIPMENT (continued)

	Cest Station	Remarks
Number	Name	
	AGC/GSE Incoming	Inspection
1 2 2 0	Tape Wound Rope Core	Electrical design complete; semi-automatic mechanical handler in development
1 2 2 1	Capacitor	* Checkout complete
1222	Indicator Light	* Checkout complete
1224	Transformer and Inductor	* Checkout complete
1 2 2 5	Power Semiconductor	* Checkout complete
1 2 2 6	Power Semiconductor	In fabrication
1 2 2 7	Relay (for AGC)	* Checkout complete
1 2 2 8	Thermal Shock	* Checkout complete
1 2 2 9	Marking	* Checkout complete
1 2 3 0	Propagation Delay	* Checkout complete
1 231	Integrated Sense Amp-	-
	lifier	* Checkout complete
1 233	Varicap	* Checkout complete
	AGC In-Pro	cess
1002	Micrologic Stick	* Checkout complete
1003	Erasable Memory	* Checkout complete
1004	Core Rope	* Checkout complete
1006	DSKY	* Checkout complete
1008	Power Supply	* Checkout complete
1009	AGC Oscillator	Being fabricated
	GSE In-Proc	cess
1101 1102 1103 1104	Control Panels Computer Simulator Computer Test Set Module	Checkout complete
1102 1103	Computer Simulator Computer Test Set	Checkout complete

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*Indicates test station in use.

4-2



TABLE 4-1

APOLLO FACTORY TEST EQUIPMENT (continued)

	Test Station	Remarks
Number	Name	Remarks
	GSE In-Process (c	ontinued)
1105 1106	Operation Console Coldplate	*Checkout complete
	AGC/GSE In-Pr	ocess
1 301 1 302	Module Interconnection Assemblies	* Checkout complete

*Indicates test station in use.

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SECTION 5

RELIABILITY

5.1 RELIABILITY ENGINEERING

Five types of pulse transformers manufactured by four different vendors to SCD 1006762 were chemically depotted during the reporting period to analyze the reliability of their mechanical design and construction. This examination indicated the following potential failure mechanisms in two of the five devices:

- Inadequate anchorage of the transformer leads to insure against leads being pulled out.
- No anti-rotation mechanism to keep the leads from twisting internally, thereby, breaking their connections from the fine wire winding on the core.

3) Inadequate sleeving to prevent leads from shorting together. The evaluation showed that three different types of devices were mechanically sound. These devices will be subjected to complete electrical and environmental stresses in qualification tests.

The noise level requirements on the output of the core ropes (fixed memory) required a re-evaluation of current matching techniques. Studies of the problem revealed that the diodes can be matched to meet system requirements. However, tight controls must be maintained during the process. A special test circuit with a resolution of 0.1 mv has been designed and put into operation. The diodes are being matched within 2 mv. The possibility of integrating eight of these diodes on a single chip is also being investigated.

5.2 COMPONENTS ENGINEERING

Various insulated wire samples have been sent to the analysis laboratory

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for testing. No completion date has been established at this time. Ninety five percent of the qualification test plans have been submitted on this program. Effort is also being expended in setting up and calibrating the electroluminescent panel test set. The present schedule calls for delivery of these parts during the next reporting period.

5.3 RELIABILITY STATISTICS AND ANALYSIS

Recommendations for a new Apollo Field Failure Report form were made to AC Spark Plug and MIT/IL during the reporting period. The new form should be available for comment soon. A generation breakdown of GSE has also been submitted for use with the failure report form. A package for an Apollo Block I maintainability program was prepared in May in a joint effort with Field Operations.

5.4 RELIABILITY ANALYSIS LABORATORY

A routine inspection of transistors which conform to SCD 1006752 was conducted during the reporting period. Four units were received in each lot except for ID 8486 from which three were received. All of these devices proved to be electrically sound.

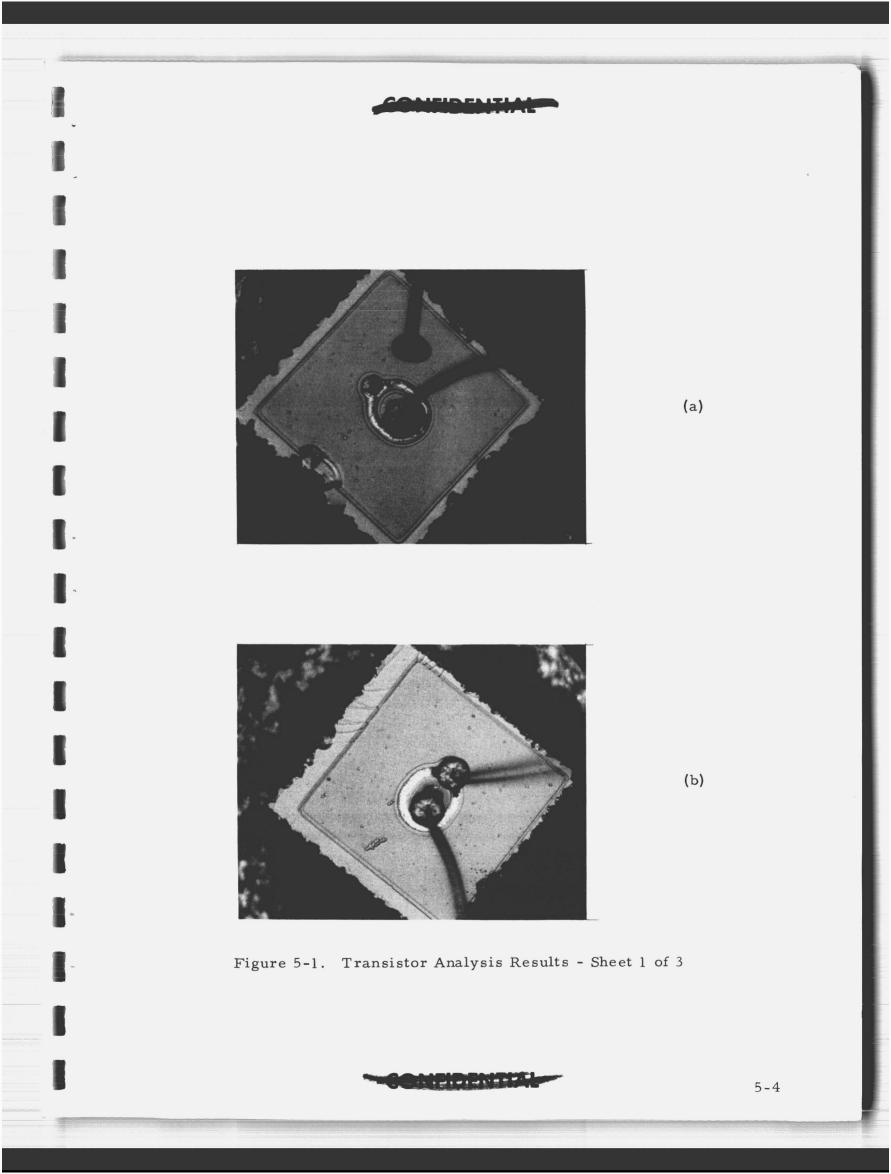
All of these units showed signs of purple plague, some quite pronounced. One of the base bonds was found open when the cap was removed (figure 5-la) indicating that the contact had been tenuous. On another unit, base and emitter bonds were removed with only a slight pull on the lead unit (figure 5-lb and c).

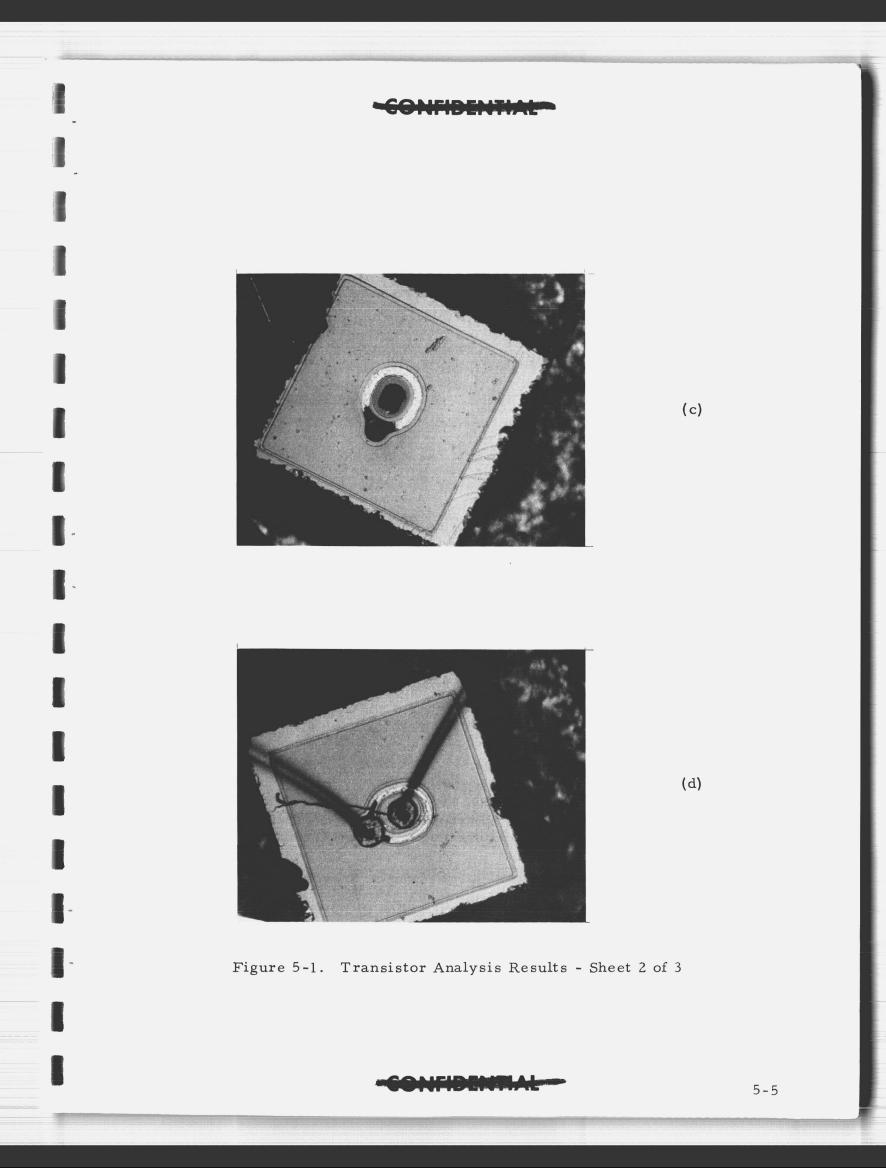
Several other interesting points were noted. One unit (figure 5-ld) had a long string of black material extending from under the emitter bond to near the edge of the chip. This material was very brittle. It crumbled and fell away from the chip when probed. It appeared to be carbonized material,

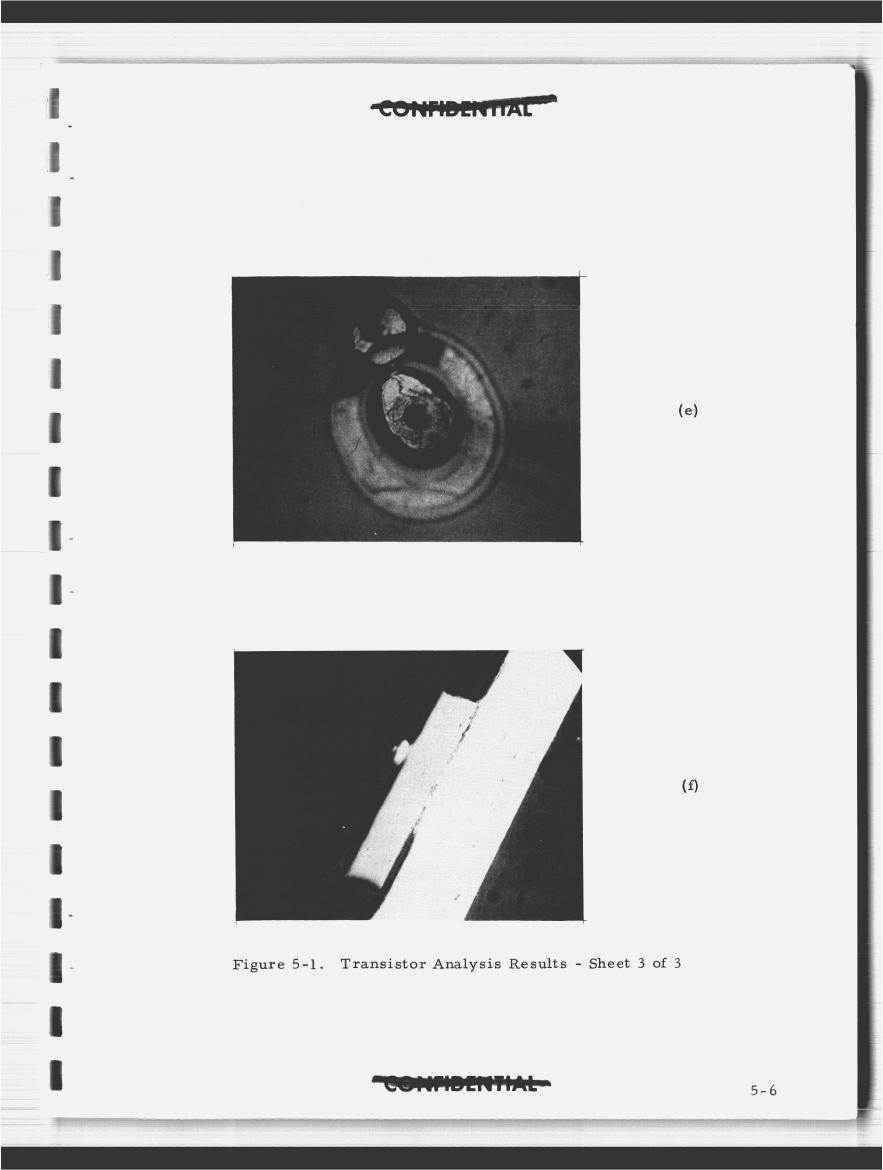




however, it did not cause a device failure. Another unit (figure 5-le) had the base and emitter gold bonds very close to each other. In the photo, they appear to be touching although they are not actually in contact. There is some vertical displacement. A cross section of another unit (figure 5-lf) revealed a rather poor chip to header bonding. While this condition may not have led to failure in this case, it has been the cause in others.







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SECTION 6

DOCUMENTATION

Apollo Documentation Milestone Charts are presented in this section. It should be noted that the specification control drawing section lists only SCD's in process. Table 6-1 is a summary of the SCD effort.

TABLE 6-1

· · · · · · · · · · · · · · · · · · ·		· · · · · · · · · · · · · · · · · · ·			
]	уре	Received	Completed	Cancelled	In-Process
AGC	Revisions Class B	25 162	25 1 20	0 33	0
GSE	Revisions Class B	143 218	143 180	0 34	0 4
PSA	Revisions Class B	41 181	41 155	0 26	0 0

SPECIFICATION CONTROL DRAWINGS



RAVTHEON	APOLLO DOCL	MEN	DOCUMENTATION	N MIL	LEST(ESTONES					DATE:	5/31/64
DOCUMENT SERIE	DOCUMENT SERIES: Special Process (ND)	TYPE CUMENT	T FIRST TAART		TRRIET TARGET	MMENTS MMENTS		COMMENTS	ЯРОЯАТЕ СТИЭММОС	CCB BMIT TO	RELEASED 37 CCB	REMARKS
NUMBER	דודנב	00	a]	00)))))		MIT C	ns	∃TAQ ∃	
1002009	Embedding and/or Staking with Silicone Rubber	н	х	X	×	X 2	X	x	Х	Х	8/14/63	Class "A"
1002017	Special Test Requests for Sense Amplifier	н	х	×	×	×	×	Х	×	Х	2/15/63	Class "B"
1002019	General Marking	н	×	×	×	×	×	×	×	×	6/26/63	Class "A"
1002025	Std-Weld Repair	н	×	×	×	x	×	×	×	х	9/20/63	
1002026	Inspection Criteria of Welds in Electrical Assemblies	н	X	×	×	×	Cance	elled	8/21	1/63		Refer to ND 1002005
1002027	Wire Stripping, Magnetic	н	х	x	×	x	Cance	elled	6/21	1/63		
1002028	Core Replacement	н	Х	x	x	x	Cance	elled	6/	21/63		
1002029	Fixed Memory Wiring	н	x							5/30/64		
1002030	Matrix Bonding	н	х	×	×	x	×	x	х	12/15/63	12/30/63	Class "A"
1002031	Wire Wrapping	ы	×	×	×	× ×	×	×	X	1/31/64	2/21/64	Class "A"
1.002032	Fabrication of Wiring Harness in Wired Assemblies	н	х	X	x	XX	x	X	х	X	9/10/63	Class "A"
1002107	Wire, PVC Insulated, Nylon Jacketed	н	Х	x	x	x x		х	х	1/31/64	2/21/64	Class "A"
1002117	Process for Encapsulating with Thermally Cond. Resin	н	х	X	x	x	×	Х	Х	х	9/5/63	Class "A"
					{		{					

DATE: 5/31/64	R CCB R CCB R F L E M 2 E D	ЭТАО 8	8/8/63 Class "A"	8/8/63 Class "A"	8/8/63 Class "A"	9/5/63 Class "A"		4/7/64 Class "B"		7 9,					•
	CCB BWIL 10 SOWWEN12	MITC	x x	X X	x x	X X		x		5/30/64					
	STN3MMO: STARDAR		x	×	×	x	/63	×					 		
S	MPLETE WPLETE	SIGNAT CO	x	X	×	×	8/81	×							
MILESTONES	RPORATE 8mments	CO INCO	х	Х	х	х	celled	×				ļ			
VILES.	IEW FIRST Draft	revi Bevi	х	х	×	х	Cane	X			х				
DOCUMENTATION M	T2AIT FTE FIRST RAFT		х	Х	х	х	Х	х			х				
	RT FIRST TAAR	AT2 D	x	×	×	х	×	×			Х				
	TYPE CUMENT	00	Г	H-1	н	н	н	н		н	н				
APOLLO DOC	DOCUMENT SERIES: Special Process (ND)	דודנב	Process Specification for Scotchcast No. 8	Installation of Keenserts	Process for Embedding with Epoxy Resin	Casting with 2850 FT Epoxy Resin	Insulating with Silicone Rubber	Filling Coldplate of CTS Han- dling Fixture With an Inhibit	ed Ethylene Glycol Coolant	Potting with low density Silicone Rubber	Application of Epoxy Gel-Coat				
RAVTHEON	DOCUMENT SERIE	NUMBER	1002119	1002121	1002126	1002183	1002186	1002212		1002217	1002221				

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RAVTHEON	APOLLO DOCU	DOCUMENTATION	ATION		MILESTONES	VES				DATE: _	5/31/64
DOCUMENT SERIES:	s: AGC - Final Test Method (F'TM)	TYPE CUMENT	72817 7486 72817 72917 72017 72017 72017 72017 72017 72017 72017 72017 72017 72017 72017 72017 72017 72007 700000000	ETE FIRST RAFT IEW FIRST	EW FIRST DRPORATE STRANGTE	MPLETE URE CYCLE MMENTS	STN3MM6	APORATE 2TN3MMO:	CCB BMIL TO	K CCB BFLEASED	REMARKS
NUMBER	עוערפ				INCO	TANDIS		MIT C INCO	NS	ЭТАО 8	
	Computer - AGC	I	х	x x	X				5/18/64	Required b statement	l by work it 11/23/62
	Tray A:										
1003074	Arithmetic	н	X	x x					5/15/64		
1003174-26	Parity	н	×	x x	X	×			5/15/64		
100317 ⁴ -2	GSA Service	н	×						5/15/64		
1003123	Interface (A19)	н	×	X · X					5/15/64		
1003115	Interface (A20)	г	×	x					5/5/64		
1003174-3	Control Pulse l	н	x	x					6/12/64		
1003174 - 4	Control Pulse 2	н	X 3	×					6/19/64		
1003174-6	Control Pulse 3		×	×					6/26/64		
100317 ¹ +-5	Instruction Decode	Г	X >	x					5/15/64		
100317 ¹ +-7	SQ Complex	н	x	X					6/19/64		

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RAVTHEON	APOLLO DOCU	MEN	DOCUMENTATION		MILESTONES	ONES					DATE: _	5/31/64
DOCUMENT SERIES:	s: AGC - Final Test Method (FTM) continued	TYPE CUMENT	RT FIRST TAAA TAAA	ETE FIRST RAFT	IEW FIRST TAART	MMENTS MMENTS	MPLETE URE CYCLE	COMMENTS	STN3MMO(BMIT TO	RELEASED	REMARKS
NUMBER	דודנב]	00.				ns	ЭТАО 9	
1003174-8	Time Pulse Counter	I	х	х						6/16/64		
1003174-9	Bank Register	н	×							6/21/64		
1003174-10	Ring Counter	T	Х							5/7/64		
1003174-11	Alarms	н	Х							5/14/64		
1003174-13	Counter Service	н	Х							5/21/64		
1003174-12	Counter Priority	н	x							5/28/64		
1003174-14	Scaler	н	X							6/4/64		
1003174-15	Ferrite Address	н	×							6/11/64		
1003174-16	Rate Circuits	н	×							6/18/64		
1003174-17	Rupt Service	н	×							6/25/64		
1003174-18	Down-link	н	×							6/25/64		
	Tray B:											
1003113	Power Switch	н	×							5/15/64		

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RAVIHEON	APOLLO DOCU	MENT	DOCUMENTATION		MILESTONES	DNES					DATE: _	5/31/64
DOCUMENT SERIES:	: <u>AGC - Final Test Method</u> (FTM) continued	TYPE CUMENT	RT FIRST ТЗАРТ 12912 ТЗАР	ETE FIRST	IEW FIRST DRPORTE	NRPORATE MMENTS URE CYCLE	MPLETE	COMMENTS	STNAMMOC 2000 2000 2000 2000 2000 2000 2000 20	IBMIT TO	RELEASED	REMARKS
NUMBER	TITLE]	00	00	· · · · · · · · · · · · · · · · · · ·		ns	ЭТАQ Э	
1003527	Oscillator	I								7/31/64		
1003165	Driver Service	н	х	×	×					7/31/64		
1003153	Current Switch	П								7/31/64		
1003069	Erasable Memory	г	х							7/31/64		
1003139	Erasable Driver	П	х	×	х					7/31/64		
1003138	Er asable Sense	г								7/31/64		
1003150	Power Supply Control	н	×							8/28/64		
1003133	Rope	н	×	×	×	×	×	×		8/28/64		
1003167	Strand Gate	н								8/28/64		
1003132	Rope Strand Select	н								8/28/64		
1003178	Rope Driver	ы	X							8/28/64		
1003154	Rope Sense Amplifier	н	×							8/28/64		

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RAVTHEON	APOLLO DOCL	MEN	DOCUMENTATION		MILESTONES	ONES					DATE:	5/31/64
DOCUMENT SERIES:	s: <u>GSE - Final Test Method</u> (FTM)	17РЕ СИМЕИТ	RT FIRST TAAR	ETE FIR2T RAFT	IEW FIRST DRAFT	MMENTS MMENTS	MPLETE URE CYCLE	DOMMENTS	A STARORATE	18MIT TO 18MIT TO	RELEASED	REMARKS
NUMBER	TITLE				3	00	1 ANDI8 00) TIM	MIT C	ns	∃TAQ ∃	
1014156	GSE - Test Set	н	×	×	×	×	×	×	×	3/19/64	3/20/64	
												ment II/23/62
1014061	GSE - Simulator	н	×	×	×	×	×	×	×	8/14/63	8/15/63	ired by state
							-					ment LL/23/62
1014217	GSE - Calibration Equipment	н	×	×	×	×	×	×	×	1/17/64	12/4/63	Required by work state-
1014465	GSE - Operational Console	H	X	Х	×	×	X			5/5/64		ment 11/23/62 Required by
	GSE - Modules											work state- ment
1014064	Diode	I	Х	Х	х	x	х	Х	Х	9/30/63	10/10/63	
1014209	Interface Coupling	н	Х	Х	х	×	×	X	х	1/3/64	3/10/64	
ī014096	Driver	T	х	х	х	×	x	х	×	1/3/64	1/24/64	
1014053	Transformer Driver	н	Х	Х	х	x	X	Х	Х	1/31/64	5/6/64	New Inputs
101 ⁴ 065 - 1	Resistor	н	Х	Х	×	×	×	×	×	11/15/63	1/24/64	
1014034	NOR	н	×	Х	×	×	×	×	×	1/3/64	5/6/64	New Inputs
1014079	Gated Flip-flop	н	×	×	X	×	×	×	×	3/2/64	5/6/64	

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64	REMARKS											
5/31/64	RE											
DATE:	Y CCB Y CCB	JTAD 8	1/24/64	3/10/64	3/10/64	3/10/64	3/31/64					
	BMIT TO	ns	11/15/63	2/26/64	1/6/64	1/6/64	3/16/64					
	ATAAOAA 2TNAMMO	MIT C INCO	х	х	х	х	×				 	
	OMMENTS	MITC	Х	х	Х	х	х					
S	MPLETE URE CYCLE	TANDI2 00	х	х	х	х	х	_			 	
TONE	RPORATE MMENTS	COI ODNI	х	х	х	х	х					
MILESTONES	EW FIRST RAFT	D BEAI	х	х	Х	х	х					
	T2817 <u>ETE</u> FIR2T RAFT	D COWET	Х	×	X	х	х					
VTAT	RT FIRST RAFT	ATZ	х	x	х	х	x		 			
DOCUMENTATION	TYPE CUMENT	oa	н	н	н	н	н					
APOLLO DOC	: <u>GSE - Final Test Method</u> (FTM) continued	TITLE	Resistor	Clock	DAC	Interface Receiver	Resistor (510)					
RAVIHEON	DOCUMENT SERIES: GSE (FT)	NUMBER	1014065-2	1014226	1014219	1014230	1014065-3					

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5/31/64	REMARKS				Class "A"								
DATE:	RELEASED IY CCB	ЭТАД 8			10/30/63	4/22/64							
	BMIT TO	ns	5/29/64	6/19/64		3/6/64				-			
	ATAROAR 2TN3MMO	MIT C INCO			Х	Х						-	
	OMMENTS	MIT C			Х	Х							
S	MPLETE	TANĐIZ 00			Х	Х							
TONE	RPORATE 8008ATE 8008	CO INCO			Х	Х							
MILESTONES	EW FIRST Carling to the test of test o	C BEAI			Х	Х							
	ETE FIRST RAFT	D COMPL			Х	х		<u></u>					
TATI	RT FIRST RAFT	AT2 D	Х	Х	Х	Х							
DOCUMENTATION	TYPE CUMENT	00	I	Ι	I	Τ							
APOLLO DOCI	DOCUMENT SERIES: Interface Specs (ND)	ЦТЕ	AGC & DSKY	GSE - Test Set	GSE - Simulator	GSE - Calibration Equipment	GSE - Operation Console						
RAVIHEON	DOCUMENT SERIES	NUMBER	1002076	1002192	1002193	1002194							

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RAVIHEON	APOLLO DOCI	MEN	DOCUMENTATION		MILESTONES	ONES					DATE:	5/31/64
DOCUMENT SERIE	DOCUMENT SERIES: GSE - Procurement Specs (PS)	TYPE CUMENT	RT FIRST RAFT	ETE FIRST RAFT	EW FIRST Farit	RPORATE MMENTS	МРLЕТЕ ИRE СҮСLЕ	OMMENTS	RPORATE STNAMMO:	BMIT TO	Y CCB Released	REMARKS
NUMBER	ПТСЕ	00	IAT2 Q	D COWLI	0	100	1 ANJIS 00	D TIM	MIT C	ns	JTAQ 8	
	GSE - Modules											
1014064	Diodes	н	Х	х	×	×	x	X	х	1/22/64	3/10/64	Class "B"
1014209	Interface Coupling	н	х	Х	х	x 3	x	х	х	3/13/64	3/31/64	
1014096	Driver	Н	х	X	x	x 3	×	X	Х	3/13/64	3/31/64	
1014053	Transformer Driver	I	х	×	X	x x	×	x	х	4/6/64	5/6/64	New Inputs
1014065	Resistor*	н	х	х	x	x >	×	×	x	1/22/64	3/10/64	Class "B"
1014034	NOR	г	х	Х	х	X X		х	х	1/22/64	3/10/64	Class "B"
1014079	Gat ed Flip-Flop	I	х	х	x	X X		×	×	4/18/64	5/19/64	
1014226	Clock	н	х	×	x	x x			х	3/17/64	4/22/64	
1014219	DAC	н	х	x	x	X X		x	х	2/26/64	3/31/64	
1014230	Interface Receiver	I	х	x	х	x		X	Х	2/26/64	3/31/64	
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*All resistor modules covered under (1) specification

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			to -/64		4/ <u>16</u> /64 d 4/9/6	12/30/6 d 4/9/6	$[\neg]$									
5/31/64	REMARKS		Released t ACSP 2/21/	Preliminary Copy to Mary 15 May 1964	1. To MIT 4, 2. Returned	1. To MIT 1 2. Returned	1. To MIT 1 2. Returned	1	TD-R-138 Cancelled				Complete	Complete		
DATE:	IV CCB RELEASED	JTAQ 8	NA													
	CCB BWIT TO	ns	NA						-				NA	NA	NA	
	APORATE 2TN3MMO:		×										NA	NA	NA	
	OMMENTS		×		x	х	×		х				NA	NA	NA	
ES	MPLETE URE CYCLE	TANDIS	×	×	×	x	x		х			···	Х	х	х	
STON	RPORATE MMENTS		×	×	x	х	×		X	Х			х	×	Х	
APOLLO DOCUMENTATION MILESTONES	EW FIRST AAFT	BEVI	×	×	x	х	х		х	х			х	×	х	
	ETE FIRST RAFT		X	×	X	х	x		×	х			Х	х	Х	
	тгят тя Таяг Таая	· · · · ·	×	x	X	Х	х	Х	х	Х	×		×	×	х	
	TYPE CUMENT	00	H	н	H Fi	п	н		н	I		TII	III	III	III	
APOLLO DOC	s: AGC and GSE Manuals	דודנב	Familiarization Manual	Computer Subsystem Checkout, Maintenance and Repair Manual	AGC Test Set Checkout Maintenance and Re pair Manual	AGC Simulator Checkout Maintenance and Repair Manual	AGC Calibration System Check out Maintenance & Repair Man		AGC Simulator Field Test/ Procedure	AGC Test Set Connections Manual (3 Volumes)	Simulation Computer Operation and Maintenance Manual	Information Series	Issues 1 thru 13 and 15	Revisions - Issue 12	Issue - 2, 5, 15	
RAVTHEON	DOCUMENT SERIES.	NUMBER	1021037	1021001	1021000	1021003	1021002	FR –	1021004	1021005	FR-4-282		FR-2-100 Series			

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RAVTHEON	APOLLO DOCI	IMEN	DOCUMENTATION		MILESTONES	S				DATE:	5/31/64
DOCUMENT SERIES:	s: Reports and Plans	ТҮРЕ СИМЕИТ	RT FIRST RAFT T2R1	ETE FIRST RAFT EW FIRST T2R1 FIRST AART	MMENTE RPORATE STN3MM	MPLETE URE CYCLE	OMMENTS	RPORATE 2TN3MMO:	BMIT TO CCB	N CCB Released	REMARKS
NUMBER	TITLE			REVI	INCO	TANƏIZ Od	MITC	MIT C INCO	ns	ataq 8	
	Monthly Technical Progress	II	EACH	HLNOW							
	Quarterly Technical Progress	II	EACH	QUARTE	E						
	Still Photos (300)	II	AS RI	REQUIRED	D						
	Motion Pictures (20 min)	H	AS RI	REQUIRED	D						
	Emergency Action	II	AS RI	REQUIRED	D						
	Lesson Plan (Training)	III	AS RI	REQUIRED	D						
	Failure Data	IJ	AS RI	REQUIRED							
	Qualification Test	н									
	Documentation Plan	Ц	COMPLET	LETE							To be updated
	Development Plan	II	COMPLETE	EE							To be updated
	Factory Test Plan (GSE)	III									Update as re- quired
	Factory Test Plan (AGC)	III	×								
	Master Summary Schedule	III	COMPLETE	ELE						-	

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RAYTHEON	APOLLO DOCL	MEN	DOCUMENTATION		LEST	MILESTONES					DATE:	5/31/64
DOCUMENT SERIE	DOCUMENT SERIES: <u>Specification</u> Control Drawings	TYPE CUMENT	RAFT TARE TIRST	ETE FIRST RAFT	EW FIRST)RAFT	RPORATE MMENTS	MPLETE URE CYCLE	OMMENTS	RPORATE 2TN3MMO	BMIT TO BCB CCB	RELEASED	REMARKS
NUMBER	ШТЕ				0	00		MIT C	WILC INCO	ns	ЭТАД 8	
1006225	Back Shell, 2 ^{4,4} Pin Connector	н	х	х	x	x y	X	×	х		4/29/64	GSE
1006226	Back Shell, 88 Pin Connector	н	х	Х	x							GSE CANCELLED
1006227	Back Shell, 108 Pin Connector	н	Х	×	×	x		X	Х	5/27/64	5/28/64	GSE
1006228	Card	н	Х	X	x	x	x	x	х	2/20/64	4/15/64	GSE
1006229	Container, Shipping & Storage Main Display	I	х	X	x	x x	x	x	×	4/9/64	4/24/64	GSE
1006230	Container, Shipping & Storage, Computer	н	х	×	x	x x	×	х	х	4/9/64	サ/5サ/64	GSE
1006231	Container, Shipping & Storage Nav Display	н	×	×	×	× ×	×	х	х	4/9/61	4/24/64	GSE
1006232	Back Shell, Straight	H-4	Х	X	x	X X		X	Х	5/27/64	5/28/64	GSE
1006233	Back Shell, 90 ⁰ Bend	н	×	×	×	X X		×	х	5/27/64	5/28/64	GSE
100623	Relay	н	×	×	×	X X		×	×	3/19/64	4/15/64	GSE
1006235	Lamp, Incandescent	ы	X	×	×	x		×	×	3/19/64	4/13/64	GSE
1005236	Terminal, Lug	н	×	×	×	× ×		×	X	3/12/64	4/15/64	GSE
1006237	Plastic Sheet	н	Х	×	×	X X		×	×	3/20/64	4/15/64	GSE
1006266	Silicone Rubber Compound	<u>н</u>	×	X	×	x		×	×	4/14/64	4/22/64	AGC

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RAVTHEON	APOLLO DOCL	MENT	DOCUMENTATION	N MILE	.ESTC	STONES		1			DATE:	5/31/64
DOCUMENT SERIES:	s: <u>Specification Control</u> Drawings	TYPE CUMENT	T 2813 78 T 7817 T 817 T	IEW FIRST IRAFT TEW FIRST	TTARAC		MPLETE	COMMENTS	COMMENTE STN3MMOC	JEMIT TO 15MIT TO 15CB	RELEASED BY CCB	REMARKS
NUMBER	TITLE	00	0]	00			MIT (าร	ЭТАО I	
1006267	Curing Agent	щ	×	x y	x	x x		Х	х	4/14/64	4/22/64	AGC
1006268	Connector, Plug, Elec, 244 Pins	н	х	x x	x	x x		х	х	3/23/64	3/31/64	AGC
1006269	Connector, Recept, Elec, 244 Sockets	Н	Х	x x	×	× ×	×	х	×	3/23/64	3/31/64	AGC
1006270	Chromate Conversion Compound	г	×	x	×	X X		X	×	3/20/64	3/31/64	AGC
1006271	Ink, Epoxy Base	ы	Х	x	x	x x		х	х	3/20/64	4/14/64	AGC
1006693	Connector, Plug, Elec, 68 Pins	н	х	x	×	x		х	х	5/21/64		GSE
1006695	Terminal, Coaxial	н	х	x x	x	x x		×	×	3/12/64	4/15/64	GSE
1006696	Tubing	г	х	x	×	x x		X	×	2/7/64	3/6/64	GSE
1006697	Strap, Cable	н	х	×	×	× ×		×	×	2/7/64	3/6/64	GSE
1006698	Adapter, Connector	н	×	X X		×		×	×	3/20/64	4 /15/64	GSE
1006699	Cyclohexanone	г	Х	x	×	x		×	×	2/7/64	3/6/64	GSE
1006742	Plastic, Polyurethane	н	х	x	×	x		×	×	3/6/64	3/18/64	AGC
	Catalyst	н	х									AGC CANCELLED
1006744	Indicator	н	х	X		x		×	×	5/14/64	5/27/64	AGC

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RAVIHEON	APOLLO DOCL	MENT	DOCUMENTATION		MILESTONES	ONES					DATE: _	5/31/64
DOCUMENT SERIES:	: <u>Specification Control</u> Drawings	TYPE CUMENT	T FIRST TAAA TAAA	LETE FIRST	IEW FIRST	DI HORATE STN3MMENTS	MPLETE	STNEMMO	ЗТАЯОЯЯ СТИЭММОС	01 TIMBU 18MIT TO 800	BY CCB Released	REMARKS
NUMBER	דודנב			·			1 AND16 00		MIT (ns	∃TAO J	
1006745	Indicator	I	х	х	х	X	×	х	х	5/14/64	5/14/64	AGC
1006746	Indicator	н	×	X	X	×	×	×	X	5/14/64	5/14/64	AGC
1006748	Catalyst	н	Х									CANCELLED
1006945	Wire	н	х	×	x	x	x	х	Х	3/6/64	4/14/64	GSE
1006274	Thinner	г	х									AGC
1006272	Curing Agent	н	x	x	×	×	×	×	×	5/5/64	5/20/64	AGC
1006275	Magnet Wire	н	Х									AGC
1006273	Screw, Cap	н	х	×	X	×	X	Х	×	5/20/64	5/27/64	AGC
1006238	Fastener Ass'y, Captive	н	×	×	×	×	×	×	×	5/27/64	5/28/64	GSE
	K Core	Г	x									CANCELLED
	Epoxy Resin	н	х									AGC
	Epoxy Resin	П	Х									AGC
	Curing Agent	н	×									AGC
	Curing Agent	н	×									AGC

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RAYIHEON	APOLLO DOCL	DOCUMENTATION	ATIO		MILESTONES	ONES					DATE: .	5/31/64
DOCUMENT SERIES:	s: <u>Specification Control</u> Drawings	ТҮРЕ СИМЕИТ	RT FIRST TAART	T2817 JT3 RAFT	TAROAL	NRPORATE MMENTS URE CYCLE	ЭТЭЛЯМ	COMMENTS	STN3MMOC	IBMIT TO	BY CCB Released	REMARKS
NUMBER	ШТЕ]		00		MIT C	ns	ЭТАQ Э	
1006276	Pigment	н	Х	Х								AGC
1006277	Silica	н	х	x	x	x	×	х	Х	5/20/64	5/27/64	AGC
1006279	Nut, Hexagon	н	x	х	x	x	X	x	х	5/20/64	5/27/64	AGC
1006239	Lanyard Assembly	I	х	х	x	х	X	x	Х	5/20/64	6/2/64	GSE
1006240	Cap, Protective, Plastic	г	х	х								GSE
1006241	Plug, Protective, Plastic	н	×	Х								GSE
1006242	Channel, Rubber	н	х									GSE
1006280	Pigment	н	х									AGC
1006281	Resin, Urethane Foam	п	Х					·····				AGC

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SECTION 7 SYSTEMS SUPPORT

7.1 SUPPORT ENGINEERING

7.1.1 Personnel

The deployment of Raytheon field engineers remains unchanged.

7.1.2 Training

Progress for the third class consisting of thirteen field engineers is proceeding on schedule. The present teaching schedule has been updated to include uninterrupted continuation of training during the scheduled vacation period (3 July through 19 July). Instruction has been completed on the entire hardware portion of the AGC. The optical and inertial subsystems are now being presented to the class.

7.1.3 Equipment Status

One failure was reported at ACSP during the reporting period. The failure consisted of an erratic triggering level in the computer Measurement Corporation (CMC) Counter of the AGC Calibration System. A repair was made by the CMC representative in Milwaukee. In addition, a modification will be made to the input circuitry of the counter.

Three failures were reported at Raytheon on Computer Test Set 4. A transformer driver module was found to have no output and was replaced. The failed module is being analyzed to determine the cause of failure. A momentary contact switch was physically broken and replaced. The button for the contact switch was also replaced because a piece of the switch shaft





had lodged within its mounting hole.

7.1.4 GSE Deployment Status

The deployment status of Ground Support Equipment is as follows:

<u>Serial No.</u>	Computer Simulator	AGC Calibration System	CTS
2	MIT/IL	MIT/IL	
3	MIT/IL	ACSP	MIT/IL
4	ACSP	NAA	RAY
5	ACSP	RAY	ACSP
6	ACSP	MIT/IL	NAA
7	NAA		
8	ACSP		
9	ACSP		
10	ACSP		
11	ACSP		

7.2 LOGISTICS

7.2.1 Maintenance Engineering Analysis

During the reporting period, Raytheon responded to an MIT/IL request for data on the support requirements of the Apollo GSE (AGC/CTS Operation Console, Computer Test Set, AGC Calibration System, and Computer Simulator), as well as for listings of "Soft Consumable Items" and Bulk Item Requirements". This information was forwarded by Raytheon letter. An analysis of these requirements has continued as part of the Maintenance Engineering activity and, as a result, more comprehensive data has been gathered for the "Soft Consumable and Bulk Item Requirements". A letter will be sent to MIT/IL during June to notify them of the latest available information.



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7.2.2 Spares Documentation

Recommended Spare Parts List (RSPL) revision information was submitted on schedule. This transmittal was revision number 3 to master list number 3.

A review and analysis of the Core Rope Simulator configuration and design characteristics was begun. Spares recommendations for support of this equipment will be made following the spares analysis.

7.2.3 Spares Production and Status

The Apollo Field Site and Factory Inventory and Consumption Report for April was prepared and submitted. This submission superseded all previous submissions of this report and included Raytheon's recommended site allocations for approved spare parts.

The first submission of the Apollo Field Site and Factory Equipment Status and Location Report was made during the reporting period. Normally, a Description of Authorized Changes forms a part of this report, however, this portion of the report will not be prepared until Retrofit Change Program procedures have been established.