



Federal Systems Division,
Space Systems Center,
Huntsville, Alabama

MODIFICATION INSTRUCTIONS

AUTHORIZATION

UCN	PCN	ECP / ECR	CCBD	MOD
13684		2586	305-71-0164	M-2027

SCHEDULE IMPACT

WORK LOCATION	IBM-HVL
SUB KITS REQUIRED FOR MOD	None
ESTIMATED MANHOURS REQUIRED	16
SCHEDULED CHANGE PERIODS	Prior to KSC Shipment

MODIFICATION DESCRIPTION

	N/A	SHEET	FILE
PURPOSE		2	1
MOD KIT PROOFED (HARDWARE INSTALLATION) ☐ YES ☒ NO	X		
INSTALLATION SEQUENCE	X		
RELATED ICD CHANGE (INTERFACE CONTROL DOCUMENT)	X		
SPARES AFFECTED ☒ YES ☐ NO		2	2
MANUALS AFFECTED ☐ YES ☒ NO			
SAFETY CONSIDERATION (SPECIAL)	X		
EFFECTIVITY 514			
PARTS/MATERIALS		2	3
DOCUMENTATION REQUIRED		2	1
VALIDATION REQUIREMENTS To be accomplished at IBM-CKF			
INSTRUCTIONS FOR ACCOMPLISHING MODIFICATION See Routing			
NAMEPLATE DATA See Routing			
DISPOSITION OF REMOVED PARTS	X		
MISCELLANEOUS	X		

REVISIONS

SYM.	DESCRIPTION	APPROVED/DATE	N/A	SHEET	FILE

PREPARED BY

DATE

TITLE

Rework and install Flight Control Computer
S/N 112V, 50Z35300-017

M.E. APPROVAL

DATE

D.E. APPROVAL

DATE

CONTRACT

NAS 8-14000

MI NO.

514-13684-F

SHEET 1 OF 2

MODIFICATION INSTRUCTIONS CONTINUATION

1. PURPOSE

This mod kit will rework FCC S/N 112V from P/N 50Z35300-005 to P/N 50Z35300-017 per documentation listed in para 4 and will satisfy the intent of ECP 2176R2, Mod 2031, UCN 11915.

2. SPARES AFFECTED

A spare FCC, 50Z35300-017 will be supplied to IBM-CKF, Dept. 922.

3. PARTS/MATERIALS

<u>Part Number</u>	<u>Description</u>	<u>Quantity</u>
50Z35300-017	Flight Control Computer	01*
7911581-001	Nameplate	01*

4. DOCUMENTATION REQUIREMENTS

EN 66301JP
 EN 66169SH (Ref)
 EO 1435-10Z22501-1
 *IP 1-4-100
 *IP 1-4-478
 Routing for 514-11915-F1/514-13684-F
 Statement of Work 70011R1
 INC Part I for M/K 514-11915-F1
 INC Part I for M/K 514-13684-F
 DWG 50Z35300-017
 Mod 2031 and 2027

*To be supplied by department performing rework.

CONTRACTOR NAME IBM		INSTALLATION NOTICE CARD		PROGRAM CONTROL NO. IU-06043	
PART I - MOD. KIT INSTALLATION					
CEI NO. SIU500A		CEI S/N 514		ECP NO. 2176R2	
NEW CEI PART NO. (IF CHANGED) N/A			MOD. KIT NO. 514-11915-F1		
WORK LOCATION IBM-HVL			WORK ORDER NO.		
			VALIDATION ACCOMPLISHED ☐ YES ☒ NO (IF NO - USING SITE MUST COMPLETE PART II)		
REMARKS: Rework FCC, S/N 112V EN 66169SH (SOW 70011R1) ORIGINATOR: H. R. Wynn, 22-965 837-4000, Ext. 2293 (M-2031)					
INSTALLED BY-ORGANIZATION & DATE			INSPECTED BY-ORGANIZATION & DATE		
RECORDED BY-ORGANIZATION & DATE			GOVERNMENT INSPECTION-ORGANIZATION & DATE		
DISTRIBUTION	WHITE	GREEN	YELLOW	PINK	BUFF
	EQUIP. HISTORICAL RECORD	CEI PROVISIONING CONTRACTOR	INSTALLING CONTRACTOR	MSFC PROGRAM CMB	NASA SITE REP.

CONTRACTOR NAME IBM		INSTALLATION NOTICE CARD MASTER		PROGRAM CONTROL NO. N/A	
PART II-MOD. KIT VALIDATION					
CEI NO. SIU500A		CEI S/N 514		ECP NO. 2586	
NEW CEI PART NO. (IF CHANGED) N/A			MOD. KIT NO. 514-13684-F		
TEST LOCATION IBM-KSC			TEST IDENTIFICATION		
REMARKS: SAT V FCC Common Mode ORIGINATOR: H. R. Wynn, 22-965 837-4000, Ext. 2293 (M-2027)					
TESTED BY - ORGANIZATION & DATE			INSPECTED BY - ORGANIZATION & DATE		
RECORDED BY - ORGANIZATION & DATE			GOVERNMENT INSPECTION - ORGANIZATION & DATE		
DISTRIBUTION	WHITE	GREEN	YELLOW	PINK	BUFF
	EQUIP. HISTORICAL RECORD	CEI PROVISIONING CONTRACTOR	TESTING CONTRACTOR	MSFC PROGRAM CMB	NASA SITE REP.

CONTRACTOR NAME IBM		INSTALLATION NOTICE CARD MASTER		PROGRAM CONTROL NO.	
PART I - MOD. KIT INSTALLATION					
CEI NO. SIU500A		CEI S/N 514		ECP NO. 2586	
NEW CEI PART NO. (IF CHANGED) N/A			MOD. KIT NO. 514-13684-F		
WORK LOCATION IBM-HVL			WORK ORDER NO.		
			VALIDATION ACCOMPLISHED ☐ YES ☒ NO (IF NO - USING SITE MUST COMPLETE PART II)		
REMARKS: Rework and Install FCC (FCC Common Mode) P/N 50Z35300-017 EO 1435-10Z22501-1 Ref EN 66301JP (M-2027) ORIGINATOR: H. R. Wynn, 22-965 837-4000, Ext. 2293					
INSTALLED BY - ORGANIZATION & DATE			INSPECTED BY - ORGANIZATION & DATE		
RECORDED BY - ORGANIZATION & DATE			GOVERNMENT INSPECTION - ORGANIZATION & DATE		
DISTRIBUTION	WHITE	GREEN	YELLOW	PINK	BUFF
	EQUIP. HISTORICAL RECORD	CEI PROVISIONING CONTRACTOR	INSTALLING CONTRACTOR	MSFC PROGRAM CMB	NASA SITE REP.

TRAN CODE	LOC	TE	CD	SEQ
		46		01

REFERENCE ROUTING OR MANUFACTURING ORDER

TYPE OF ROUTING - CHECK ONE ONLY			
RELEASE: ☐	EC CHANGE: ☐	MC CHANGE: ☐	REWRITE: ☐

TEMP. MFG.
ORDER

DATE 02-27-74

PAGE 1 OF 2

ORDER NO.	SA NO.	SER. FROM	SER. TO	QUANTITY	ZONE	ANAL	DWG CODE ID	DRAWING NUMBER/WORK PACKAGE	LEVEL REV.	EO	CEI	EFF.
PART CODE ID	PART NUMBER	USE	LEVEL REV.	EO	MC NO.	TYPE	SYSTEM	MASTER OR POOL NO.	USE	QE REVIEW DATE		
	50235300-017	80					IV-FCC					

OP CD	OPER. NO.	SER NO.	RCD TYP	CODE ID OR UM	TOOL-MATL-CONTR-EN/EO NAME	TOOL-MATL-CONTR-EN/EO NO.	WT/QTY PER 100
				DEPT.	GROUP	SET-UP	HOURS PER 100
	0000	05	09		FCC, S/N 112-V, J. GORDON, X-2054		
	↓	10	↓		REF: MOD KIT 514-11915-F		
	↓	15	↓		S.O.W. 700 LIR, VCN 11915, EN 66301 JP # 304/74		
	↓	20	↓		MOD KIT 514-13684-F		
	0001	00	05	680	6800 FROM STOCK:		
	↓	05	09	↓	(1) FCC 50235300-005, S/N 112-V		
	↓	10	↓	↓	(1) 7911581-001 NAMEPLATE		
	0010	00	03	388	6820 INSPECT		
	0020	00	03	184	6820 PERFORM NO-LOAD TEST		
	↓	05	09	↓	AS FOLLOWS:		
	↓	10	↓	↓	1- APPLY ± 27 VOLTS TO THE		
	↓	15	↓	↓	SIMULATE INPUTS WITH THE		
	↓	20	↓	↓	SERVO AMPLIFIER UNLOADED.		

SA NO.	OPER NO.	SA QUANTITY	DATE	BAL. QTY.	INITIAL	SA NO.	OPER NO.	SA QUANTITY	DATE	BAL. QTY.	INITIAL

TRAN CODE		INPUT CTL NO.				REFERENCE ROUTING OR MANUFACTURING ORDER										TEMP. MFG. ORDER		DATE 02-27-74					
LOC		TE		CD		SEQ		TYPE OF ROUTING - CHECK ONE ONLY										PAGE 2 OF 2					
		46				01		RELEASE: ☐ EC CHANGE: ☐ MC CHANGE: ☐ REWRITE: ☐															
ORDER NO.		SA NO.		SER. FROM		SER. TO		QUANTITY		ZONE		ANAL		DWG CODE ID		DRAWING NUMBER/WORK PACKAGE		LEVEL REV. EO		CEI		EFF.	
PART CODE ID		PART NUMBER		JUE		LEVEL REV. EO		MC NO.		TYPE		SHE NO.		SYSTEM		MASTER OR POOL NO.		USE		QE REVIEW DATE			
		50Z35300-017		80										46 IU-FCC									
OPERATION DETAIL DESCRIPTION																							
OP CD		OPER. NO.		SER NO.		RCD TYP		CODE ID OR UM		TOOL-MATL-CONTR-EN/EO NAME										TOOL-MATL-CONTR-EN/EO NO.		WT/QTY PER 100	
								DEPT. GROUP		OPERATION HEADER DESCRIPTION										SET-UP PROC		HOURS PER 100	
0020		25		09		144		6820		2- IF THE TELEMETRY OUTPUT VOLTAGE CHANGES WHEN THE SIGNAL INPUT IS TRANSFERRED FROM +27 VOLTS TO -27 VOLTS, THE Q12 TRANSISTOR SHALL BE REPLACED WITH A-005 PART													
		30																					
		35																					
		40																					
		45																					
		50																					
0030		00		01		195		5010		RE-IDENTIFY 50Z35300-005, S/N 112-V TO 50Z35300-017, S/N 112-V, PER DWG. 50Z35300-017.													
		05		09																			
		10																					
0040		00		03		388		6820		INSPECT													
0987		00		06		680		6800		STOCK													
SA NO.		OPER NO.		SA QUANTITY		DATE		BAL. QTY.		INITIAL		SA NO.		OPER NO.		SA QUANTITY		DATE		BAL. QTY.		INITIAL	

ORIGINATOR J. HARRIS		DATE WRITTEN 2-28-74	DEPT. NO. K82	PHONE 2004	CONTRACT NO. NA\$8-14000	CONTRACT CHANGE AUTH. M-2027	CLOSURE YES * NO	ECP/PCR NO. 2586	CLASS II
CHG IDENT SYM I	ASSY/PIECE PART NO. 10Z22501-1	MI CODE CD	EFFECTIVITY 514	USED ON ASSY NO.	STK DISP 4	REASONS - NOTES - REMARKS ADD (-17) FCC	ENGR ORDER NO. 237-1435		N-9

I. - CANCEL EO 237-1383/10Z22501-1 (IU-514).

I. - REVISE EPL AS SHOWN BELOW.

REF: EN66301JP (2-28-74).

CLOSURE: MOD WAS CLOSED BY MEMO DATED 8-17-72.
RE-OPEN FOR THIS CHANGE AND THEN RE-CLOSE.

I	17 002	50Z35300-1	SUB	1	
I	17 003	50Z35300-3	SUB	1	
I	17	50Z35300-1	SUB	1	
I	17	50Z35300-17	ADD	1	

CHG IDENT SYM	FIND NO.	PART NO.	ACTION		ZONE	STOCK DISPOSITION	1 NO PARTS AFFECTED	NAME		DEPT		NAME		DEPT	
			FROM QTY	TO QTY				ADDITIONAL DISTRIBUTION							
						3 IF PAST AFFECTED OPERATION, USE AS IS, OTHERWISE WORK TO CHANGE	4 IF PAST AFFECTED OPERATION, REWORK TO CHANGE, OTHERWISE WORK TO CHANGE	5 IF PAST AFFECTED OPERATION, SCRAP, OTHERWISE WORK TO CHANGE	6 SCRAP	8 SEE NOTES	9 CALIBRATE				

APPROVALS	ENGINEERING	DATE	CHANGE CONTROL BOARD	DATE	RELEASE AND CHANGE ANALYST	DATE	ENGR RECORDS	DATE
	J. HARRIS 2/28/74		R.L. TARTER 2-28-74				2-28-74	
	SPECIFICATIONS & STANDARDS	DATE						
	D. HARRIS	2-28-74						



IBM
FED. GOVERNMENT, ALABAMA
FED IDENT CODE 20254

ENGINEERING NOTICE

ENGINEERING NOTICE NO 6630121

CONTRACT NO NH58-14000

MAJOR ITEM CD

EFFECTIVITIES 514

ORIGINATOR D.J. ANDREWS

DEPT D70

PHONE 2553

DATE 2-27-74

R/CA

TOOLS AFFECTED ☐ YES
☒ NO

SHEET 1 OF 2

PART NO.	DWG SIZE	REV	LVL	QUANTITY		ACTION	USED ON ASSEMBLY	REASON-NOTES-REMARKS	CLASS OF CHG	CONTRACT AUTHORITY	
				FROM	TO					ECR/ECP NO.	UCN
DESCRIPTION	NO OF SHEETS	DWG	EPL			STK DISP				MOD/X-DIRECTIVE	MSFC LTR. NO.
50235300-017	E/5	D		0	1	A/C		FOR CHANGE, SEE	I	2426	12174 B
FCC TOP ASSEMBLY, SAT V						8		SHT 2.	*	M-1872	
										2511 R3	13067
								*RE-OPEN ALL THREE		M-1925 S-2	
								MODS FOR INCORPORATION		2586	13684
								OF THIS CHANGE. CLOSE		M-2027	
50235300-013	E/5	-		1	0	B		ALL THREE WITH RELEASE	I	2586	13684
FCC TOP ASSY, SATV						8		OF THIS CHANGE.	*	M-2027	
								DELETE 514 EFF FOR-013			
								CHANGE REQ'D TO REMOVE TWO(2) CLASS I			
								CHANGES FROM DOC. FOR SIN 0112-V. THESE			
								CHANGES WERE NOT DIRECTED FOR 112 IN THE			
								MOD BUT WERE INCORPORATED IN THE DOC. THE			
								HARDWARE WAS NOT CHANGED AND IS CORRECT AS IS.			

ACTION CODE		STOCK DISPOSITION CODE	1	3	4	5	6	8	9
A RELEASE	D OBSOLETE	PARTS IN STOCK AND IN PROCESS	NO PARTS AFFECTED	IF PAST AFFECTED OPERATION, USE AS IS, OTHERWISE WORK TO CHANGE	IF PAST AFFECTED OPERATION, REWORK TO CHANGE, OTHERWISE WORK TO CHANGE	IF PAST AFFECTED OPERATION, SCRAP, OTHERWISE WORK TO CHANGE	SCRAP	SEE NOTES	CALIBRATE
B RE-RELEASE	E EO INCORP								
C CHANGE	F REDRAW W/O CHANGE								

MANAGER	QUALITY CONTROL	CHANGE CONTROL BOARD	ENG RECORDS	ADDITIONAL DISTRIBUTION
<u>V. H. Johnson</u> 2/27/74	<u>Prof. Richardson</u> 2/28/74	<u>R. J. Tate</u> 2-28-74	<u>2-28-74</u>	
<u>L. H. Gordon</u> 2-27-74	<u>L. H. Gordon</u> 2/28/74	<u>R. J. Tate</u>	<u>2-28-74</u>	
ENGINEERING	MFG ENGINEERING	SPECIFICATIONS AND STANDARDS	RELEASE DATE	

IBM

IBM11

ENGINEERING NOTICE

(REVISION SKETCH SHEET)

ENGINEERING NOTICE NO. 66301 JPUNIFORM CONTROL NO. SEE SHT 1

FED. MFG. IDENT. CODE 20234

CONTRACT NO. NA58-14000CONTRACT CHANGE NO. SEE SHT 1SHEET 2 OF 2

PARTS LIST CHANGES

CHANGE NOTES 1 AND 3 AS FOLLOWS:

FROM "-013 OR -011" TO "-013, -011 OR -007"

CHANGE NOTE 10 TABULATION AS FOLLOWS
FROM:

FIND OR ITEM NO	DRAWING/PART NUMBER	USED ON COMPUTER SERIAL NUMBER
1	7911641-011	0112 & 0113
	7911641-013	0108

TO:

ITEM OR FIND NO	DRAWING/PART NUMBER	USED ON COMPUTER SERIAL NUMBER
1	7911641-007	0112
	7911641-011	0113
	7911641-013	0108

ENGINEERING RECORDS NOTE:
ATTACH A REPRODUCIBLE COPY OF THIS SHEET
TO THE MASTER DOCUMENT AFFECTED

TITLE

REVISIONS

SYM	ENGRG NOTICE	DESCRIPTION	DATE	CHECK	APPROVAL

SIZE	CODE IDENT NO.	DWG NO.
	20234	
SCALE	WEIGHT	SHEET

CONTRACT, SUBCONTRACT / P.O. NO. NAS8 - 14000	IBM UCN 11915	MSFC PCN	CCBD NUMBER 305-71-0170	EFFECTIVE DATE OF THIS DIRECTED CHANGE 8/12/71
SECTION NUMBER AND TITLE	CONTRACTS OFFICE ORIGINATOR <i>R. L. Wilcox</i> R. L. Wilcox			DATE 8/13/71
CONTRACT CHANGE NO. M-2031	MSFC LETTER AUTHORITY PM-CO-IU-131-8-4		CORRESPONDING IBM LOG NUMBER H 71-8-44	

SUBJECT: ECP 2176 R2, FCC Transistor Changes

Implement the subject ECP, as written, for effectivities AS-512 and subs.

NOTE: This modification supersedes change order modification no. 1996.
(The R2 ECP was submitted as the response to M-1996, showing a revised change implementation point).

ENG. RELEASES		EFFECTIVITY (BY IU, DATE, OR S/N)		☐ KSC ☒ HVL ☐ MOD KIT STORAGE	CHANGE PROPOSAL COORDINATOR R. L. Tarte	
DEPT.	DATE	PRODUCTION:	RETROFIT:		PROPOSAL SUBMITTAL PLAN	
D70	6/1/71		512-515		DATE	
67	6/15/71	CHANGE CATEGORY: H			Use M-1 SOW	
ENGINEERING DISTRIBUTION				ENG/OPS/PROG. TECHNICAL INPUTS TO CM BY	Budgets	
PRIME D70		INFO K18, D53, K27, D67, D63		ENG/OPS/PROG. BUDGETS TO CM BY		
ASSESS				CM TO PRICING & DCA BY	8/27/71	
				CONTRACTUAL DUE DATE TO MSFC	10/11/71	

STATEMENT OF WORK FOR ECI

Number 70011R1

ECI Statement of Work 70011 is hereby canceled and superceded by the following:

ECI is hereby directed to select the S2N2920 transistor used in the Q12 location of the 50 MA Servo Amplifier to have a base-emitter breakdown of 10.0 volts minimum.

The following groundrules shall be used:

Future Build Modules

The S2N2920 drawing (50Z32554) shall be revised to include a -005 part that has a minimum base-emitter breakdown of 10.0 volts. The breakdown shall be measured on a tester that utilizes a pulse testing technique and the reverse current shall be limited to 5.0 microamperes maximum.

The 50 MA Servo Amplifier drawing (50Z34855-003) shall be revised to require the use of the -005 S2N2920 part in the Q12 location on future build modules.

Completed Modules Not in FCC's

These modules shall be subjected to a base-emitter breakdown voltage test consisting of probing the junction of Q12B. If the breakdown exceeds 10.0 volts, the transistor shall remain on the board. If the breakdown is less than 10.0 volts, the transistor shall be replaced with a -005 part. The test technique used shall adhere to the requirements stated above.

Modules in Completed FCC's

These modules shall be subjected to a no-load test. The test shall consist of applying ± 27 volts to the simulate inputs with the Servo Amplifier unloaded. If the telemetry output voltage changes when the input signal is transferred from + 27 volts to - 27 volts, the Q12 transistor shall be replaced with a -005 part.

The effectivity of this change is FCC Serial Numbers 0108-V, 0110-V, 0111-V, 0112-V, 0113-V, 0115-V and the AS-510/511 Spare (presently S/N 0114-V).

The top assembly part number for the above serial numbered FCC's shall become 50Z35300-013.



Federal Systems Division
Space Systems
Huntsville, Alabama

(FOR INTERNAL USE ONLY)

CONTRACT SUMMARY

PAGE 1

CONTRACT, SUBCONTRACT / P.O. NO. ● NAS8 - 14000	IBM UCN 13684	MSFC PCN	CCBD NUMBER 305-71-0164	EFFECTIVE DATE OF THIS DIRECTED CHANGE 7/27/71
SECTION NUMBER AND TITLE	CONTRACTS OFFICE ORIGINATOR <i>R. L. Wilcox</i>			DATE 8/2/71
CONTRACT CHANGE NO. M-2027	MSFC LETTER AUTHORITY PM-CO-IU-41-7-30		CORRESPONDING IBM LOG NUMBER H 71-7-129	

SUBJECT: ECP 2586, Saturn V FCC Common Mode

Implement the subject ECP as written for effectivities AS-512 and subs.

ENG. RELEASES		EFFECTIVITY (BY IU, DATE, OR S/N)		☐ KSC ☐ HVL ☐ MOD KIT STORAGE	CHANGE PROPOSAL COORDINATOR R. L. Tarte	
DEPT.	DATE	PRODUCTION:	RETROFIT:		PROPOSAL SUBMITTAL PLAN	DATE
K99	9/2/71	513, 515	512, 514		Use ECP and Budgets	
		CHANGE CATEGORY: H			ENG/OPS/PROG. TECHNICAL INPUTS TO CM BY	
		ENGINEERING DISTRIBUTION			ENG/OPS/PROG. BUDGETS TO CM BY	
		PRIME K99	INFO		CM TO PRICING & DCA BY	8/20/71
		ASSESS F09, K18			CONTRACTUAL DUE DATE TO MSFC	9/24/71

11M11
 11M11
 11M11

REF

* *Exposition Universelle: 1889* E. N.

66162 5H

MAJIN ITEM CD

EFFECTIVITIES See Note 3

DEPT K99

PHONE 3410

DATE 10/13/71

TOOLS AFFECTED ☐ YES

☒ NO

NUMBER OF _____

ACTION CODE		STOCK DISPOSITION CODE	1	2	3	4	5	6	7	8	9
A RELEASE	D OBSOLETE			IF PAST	IF PAST	IF PAST	IF PAST				
B RE-RELEASE	E ED INCORP	PARTS IN STOCK	NO PARTS	AFFECTED OPERATION,	AFFECTED OPERATION,	AFFECTED OPERATION,	AFFECTED OPERATION,	SCRAP	SEE		CALIBRATE
CHANGE	F REPAIR W/O CHANGE	AND IN PROG	AFFECTED	USE AS IS, OTHERWISE	OPERATION, Rework TO	CHANGE, OTHERWISE	SCRAP, OTHERWISE		NOTES		
				WORK TO CHANGE	CHANGE	WORK TO CHANGE	WORK TO CHANGE				
MANAGER		QUALITY CONTROL	CHANGE CONTROL BOARD		ENG RECORDS		ADDITIONAL DISTRIBUTION				
ENGINEERING		MFG ENGINEERING	SPECIFICATIONS AND STANDARDS		RELEASE DATE						