EA3461-01396 Revision A

737 FMC OPC SOFTWARE UPDATE VNAV ALT ENABLE

Priority

3 - Management Directive

Author

Lang, Andrew

Approver

Wong, Kai Chung

Published date

EA classification

Major Alteration

Fleet effectivity

737-700
737-8
737-800
737-9
737-900
737-900ER

Impacts

Capital Project	No
CAT II/III	No
Configuration Change	No
Crew Sensitive	Yes
Electrical Load Change	No
ETOPS	No
FAA Mandatory (AD/CFR/FAR)	No
Induction Sensitive	No
Major Alteration	Yes
Mx Program Change	No
Publications Affected	No
Re-accomplishments	No
RVSM	No
Sensitive Security	No
SSI (Safety Sensitive)	No
Spares	No
Time Controlled	No
Warranty	No

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Source documents and references

The following documents are used in the creation of the EA

Origin	Document number	Revision	DCN	Date	Description
Boeing	737-34-4328	01		April 04, 2025	Boeing Service Bulletin that authorizes update to FMC OPC that enables the VNAV ALT feature on NG Aircraft.
Boeing	737-34-4333	ORIG		July 11, 2025	Boeing Service Bulletin that authorizes update to FMC OPC that enables the VNAV ALT feature on MAX Aircraft.

Task cards

The following Task Cards are used for accomplishment of this EA

Task card number	Title
3461-01396-001	737 MAX FMC OPC Software Update OP 1
3461-01396-002	737 NG FMC OPC Software Update OP 2 (SB Group 5 aircraft)
3461-01396-003	737 NG FMC OPC Software Update OP 3 (SB Group 1 aircraft)
3461-01396-004	737 NG FMC OPC Software Update OP 4 (SB Group 2 aircraft)
3461-01396-005	737 NG FMC OPC Software Update OP 5 (SB Group 3 aircraft)
3461-01396-006	737 NG FMC OPC Software Update OP 6 (SB Group 4 aircraft)
3461-01396-007	Verify or update SCEPTRE software component files.

Revision Information

Revision	Publish Date	Author	Approver
A		Lang, Andrew	Wong, Kai Chung

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Reason for Revision

OP 2 RRTOA section listed wrong forecast M&E number. Changed to correct number: 61-0534-8-0068

OPS 1 - 6: Fixed typo; "Spply" to "Supply"

OP1 Split step 11 into two steps. One verifies VNAV ALT installed on left FMC the other verifies VNAV ALT installed on right FMC.

OPS 2 - 6: Split step XXX into two steps. One verifies VNAV ALT installed on left FMC the other verifies VNAV ALT installed on right FMC.

OP 7 Left out of Effectivity list on previous rev. Adding OP 7 Effectivity back in.

Revision	Publish Date	Author	Approver
ORIG	October 16, 2025	Lang, Andrew	Wong, Kai Chung

Reason for Revision

Original

Background

This EA installs a new version of the FMC OPC software on 737 NG and MAX Aircraft. This new OPC software enables the VNAV ALT feature as requested by flight ops. This change allows the aircraft to stay in VNAV mode when a conflict occurs between the VNAV profile and the MCP altitude, which decreases workload for pilots.

Please Note:

RSAT enablement (SB 737-34-4280 and EA 3449-01009) is a pre-requisite for VNAV ALT activation on the following tails: 7251-7272, 7274-7296, 7307, 7312, 7501-7555. FMC OPC PN BCG-02C-13 supports only RSAT capabilities. However, since FMC OPC BCG-02C-L7 supports both RSAT and VNAV ALT operation, this will be the appropriate end-stage software installed as part of these concurrent procedures.

Action

OPs 1 - 6

In the flight deck do the following

737 FMC OPC SOFTWARE UPDATE VNAV ALT ENABLE

-Install FMC OPC Software

- System operational Check

OP 7

Complete Sceptre transactions

Effectivity

TC #	Fleet/ MFG	M&E #	Aircraft / Serial No / Station	QTY
001	737-9	42-2000-9-0001	7401,7402,7403,7556,7557,7558,7559, 7560,7561,7562,7563,7564,7565,7566, 7567,7568,7569,7570,7571,7572,7573, 7574,7575,7576,7577,7578,7579,7580, 7581,7582,7583,7584,7585,7586,7587, 7588,7589,7590,7591,7592,7593,7594, 7595,7596,7597,7598,7599	47
001	737-8	41-2000-9-0001	7273,7297,7298,7299,7300,7301,7302, 7303,7304,7305,7306,7308,7309,7310, 7311,7313,7314,7315,7316,7317,7318, 7319,7320,7321,7322,7323,7324,7325, 7326,7327,7328,7329,7330,7331,7332, 7333,7334,7335,7336,7337,7338,7339, 7340,7341,7342,7343,7344,7345,7346, 7347,7348,7349,7350,7351,7352,7353, 7354,7355,7356,7357,7358,7359,7360, 7361,7362,7363,7364,7365,7366,7367, 7368,7369,7370	73
002	737-800	68-2000-9-0001	0201,0227,0232,0235,0236,0240,0246, 0249	8
002	737-800	58-2000-9-0001	0228	1
003	737-900ER	60-2000-9-0001	0436,0437,0438,0439,0440,0441,0442, 0443,0444,0445,0446,0447,0448,0449, 0450,0451,0452,0453,0454,0455,0456, 0457,0458,0459,0460,0461,0462,0463, 0464,0465,0466,0467,0468,0469,0470, 0471,0472,0473,0474,0475,0476,0477, 0478,0479,0801,0802,0803,0804,0805,	113

			0806,0807,0808,0809,0810,0811,0812, 0813,0814,0815,0816,0817,0818,0819, 0820,0821,0822,0823,0824,0825,0826, 0827,0828,0829,0830,0831,0832,0833, 0834,0835,0836,0837,0838,0839,0840, 0841,0842,0843,0844,0845,0846,0847, 0848,0849,0880,0881,0882,0883,0884, 0885,0886,0887,0888,0889,0890,0891, 0892,0893,0894,0895,0896,0897,0898, 0899	
003	737-800	58-2000-9-0001	0519,0520,0521,0522,0523,0524,0525, 0526,0527,0528,0529,0530,0531,0532, 0533,0534,0535,0536,0537,0538,0539, 0540,0541,0542	24
004	737-800	58-2000-9-0001	0507,0508,0509,0510,0511,0512,0513, 0514,0515,0516,0517,0518	12
004	737-900ER	60-2000-9-0001	0413,0414,0415,0416,0417,0418,0419, 0420,0421,0422,0423,0424,0425,0426, 0427,0428,0429,0430,0431,0432,0433, 0434,0435	23
005	737-800	58-2000-9-0001	0202,0203,0204,0205,0206,0207,0208, 0209,0210,0211,0212,0213,0214,0215, 0216,0217,0218,0219,0220,0221,0222, 0223,0224,0225,0226,0229,0230,0231, 0233,0234,0237,0238,0239,0241,0242, 0243,0244,0245,0247,0248,0250,0251, 0252,0253,0254,0255,0256,0257,0258, 0259,0263,0265,0266,0267,0268,0269, 0271,0272,0273,0274,0275,0276,0277,	63
005	737-700	57-2000-9-0001	0701,0702,0703,0704,0705,0706,0707, 0708,0709,0710,0711,0714,0715,0716, 0717,0718,0719,0721,0722,0724,0728, 0729,0730,0731,0732,0733,0750,0751, 0752,0753,0754	31

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005	737-900	59-2000-9-0001	0401,0402,0403,0404,0405,0406,0407, 0408,0409,0410,0411,0412	12
006	737-800	58-2000-9-0001	0260,0261,0262,0264,0270,0278,0279, 0280,0281,0282,0283,0284,0285,0286, 0287,0288,0289,0290,0291,0292,0293, 0294,0295,0296,0297,0298,0299,0501, 0502,0503,0504,0505,0506	33
006	737-700	57-2000-9-0001	0712,0713,0723,0726,0727	5
006	737-700	65-2000-9-0001	0720,0734,0735,0736	4
007	737-900ER	60-2000-9-0001	0413,0414,0415,0416,0417,0418,0419, 0420,0421,0422,0423,0424,0425,0426, 0427,0428,0429,0430,0431,0432,0433, 0434,0435,0436,0437,0438,0439,0440, 0441,0442,0443,0444,0445,0446,0447, 0448,0449,0450,0451,0452,0453,0454, 0455,0456,0457,0458,0459,0460,0461, 0462,0463,0464,0465,0466,0467,0468, 0469,0470,0471,0472,0473,0474,0475, 0476,0477,0478,0479,0801,0802,0803, 0804,0805,0806,0807,0808,0809,0810, 0811,0812,0813,0814,0815,0816,0817, 0818,0819,0820,0821,0822,0823,0824, 0825,0826,0827,0828,0829,0830,0831, 0832,0833,0834,0835,0836,0837,0838, 0839,0840,0841,0842,0843,0844,0845, 0846,0847,0848,0849,0880,0881,0882, 0883,0884,0885,0886,0887,0888,0889, 0890,0891,0892,0893,0894,0895,0896, 0897,0898,0899	136
007	737-8	41-2000-9-0001	7273,7297,7298,7299,7300,7301,7302, 7303,7304,7305,7306,7308,7309,7310, 7311,7313,7314,7315,7316,7317,7318, 7319,7320,7321,7322,7323,7324,7325, 7326,7327,7328,7329,7330,7331,7332, 7333,7334,7335,7336,7337,7338,7339, 7340,7341,7342,7343,7344,7345,7346, 7347,7348,7349,7350,7351,7352,7353,	73

			7354,7355,7356,7357,7358,7359,7360, 7361,7362,7363,7364,7365,7366,7367, 7368,7369,7370	
007	737-9	42-2000-9-0001	7401,7402,7403,7556,7557,7558,7559, 7560,7561,7562,7563,7564,7565,7566, 7567,7568,7569,7570,7571,7572,7573, 7574,7575,7576,7577,7578,7579,7580, 7581,7582,7583,7584,7585,7586,7587, 7588,7589,7590,7591,7592,7593,7594, 7595,7596,7597,7598,7599	47
007	737-800	58-2000-9-0001	0202,0203,0204,0205,0206,0207,0208, 0209,0210,0211,0212,0213,0214,0215, 0216,0217,0218,0219,0220,0221,0222, 0223,0224,0225,0226,0228,0229,0230, 0231,0233,0234,0237,0238,0239,0241, 0242,0243,0244,0245,0247,0248,0250, 0251,0252,0253,0254,0255,0256,0257, 0258,0259,0260,0261,0262,0263,0264, 0265,0266,0267,0268,0269,0270,0271, 0272,0273,0274,0275,0276,0277,0278, 0279,0280,0281,0282,0283,0284,0285, 0286,0287,0288,0289,0290,0291,0292, 0293,0294,0295,0296,0297,0298,0299, 0501,0502,0503,0504,0505,0506,0507, 0508,0509,0510,0511,0512,0513,0514, 0515,0516,0517,0518,0519,0520,0521, 0522,0523,0524,0525,0526,0527,0528, 0529,0530,0531,0532,0533,0534,0535, 0536,0537,0538,0539,0540,0541,0542,	133
007	737-800	68-2000-9-0001	0201,0227,0232,0235,0236,0240,0246, 0249	8
007	737-700	57-2000-9-0001	0701,0702,0703,0704,0705,0706,0707, 0708,0709,0710,0711,0712,0713,0714, 0715,0716,0717,0718,0719,0721,0722, 0723,0724,0726,0727,0728,0729,0730, 0731,0732,0733,0750,0751,0752,0753, 0754	36

007	737-700	65-2000-9-0001	0720,0734,0735,0736	4
007	737-900	59-2000-9-0001	0401,0402,0403,0404,0405,0406,0407, 0408,0409,0410,0411,0412	12

Recommended/required time of accomplishment (RRTOA)

Planning is instructed to schedule this EA for accomplishment within the following constraints.

Forecast M&E #	Constraint	Constraint value	Task card #
61-0534-8-0064	As scheduled by Planning	-	3461-01396-001

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
61-0534-8-0068	As scheduled by Planning	-	3461-01396-002

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
29-0534-8-0450	As scheduled by Planning	-	3461-01396-003

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
29-0534-8-0454	As scheduled by Planning	-	3461-01396-004

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
29-0534-8-0458	As scheduled by Planning	-	3461-01396-005

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
29-0534-8-0462	As scheduled by Planning	-	3461-01396-006

Comments

Forecast M&E #	Constraint	Constraint value	Task card #
99-0534-8-0226	As scheduled by Planning	-	3461-01396-007

Comments

As scheduled by Planning. This operation contains the SCEPTRE transactions for software signoff. It should be scheduled concurrently with other ops on this EA.

Labor

Planning is instructed to ensure that the labor necessary to accomplish this EA is allocated at the scheduled visits.

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Task card number	Elapsed hours	Labor hours	Technician quantity	Skill required	Constraint
3461-01396-001	1.50	1.50		AVIONICS	
3461-01396-002	1.50	1.50		AVIONICS	
3461-01396-003	1.50	1.50		AVIONICS	
3461-01396-004	1.50	1.50		AVIONICS	
3461-01396-005	1.50	1.50		AVIONICS	
3461-01396-006	1.50	1.50		AVIONICS	
3461-01396-007	2.00	0.50		AVIONICS	

Cost information

AFE number	Job number	Account number	Cost center
		0915248	

Comments

Weight and balance

Flight Ops Engineering is instructed to update the aircraft weight and balance manuals to reflect the changes made in this EA.

Does the EA make changes to weight and balance? **No**

Does the EA make changes to the aircraft weight limits or performance? **No**

Software changes

Avionics Engineering is instructed to update the software tracking system to reflect the changes made in this EA.

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Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-001	176200-01-01	M01175		BCG-02C-13	BCG-02C-L7

Comments and instructions

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-001	176200-01-01	M01632		BCG-02C-13	BCG-02C-L7

Comments and instructions

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-002	176200-01-01	M01175		BCG-01T-J8	BCG-02C-S5

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-002	176200-01-01	M01632		BCG-01T-J8	BCG-02C-S5

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N

3461-01396-003	176200-01-01	M01175		BCG-01P-G9	BCG-02C-S1

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-003	176200-01-01	M01632		BCG-01P-G9	BCG-02C-S1

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-004	176200-01-01	M01175		BCG-01T-14	BCG-02C-S2

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-004	176200-01-01	M01632		BCG-01T-14	BCG-02C-S2

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N

3461-01396-005	176200-01-01	M01175		BCG-01T-J6	BCG-02C-S3

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-005	176200-01-01	M01632		BCG-01T-J6	BCG-02C-S3

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-006	176200-01-01	M01175		BCG-01T-J7	BCG-02C-S4

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Task card number	Destination HW P/N	ERD, FIN, equipment number	Location address (SLID)	Old SW P/N	New SW P/N
3461-01396-006	176200-01-01	M01632		BCG-01T-J7	BCG-02C-S4

Comments and instructions

Note some aircraft are equipped with FMC HW P/N 171497-05-01 which is interchangeable in ship sets only with the 176200-01-01 PN via IPC.

Related documents

737 FMC OPC SOFTWARE UPDATE VNAV ALT ENABLE

The following documents were used in the development of this EA but are not required for accomplishment.

Origin	Document number	Revision	Date	Description
Boeing	737-34-4328	ORIG	2025-04-04	Boeing Service Bulletin that authorizes update to FMC OPC that enables the VNAV ALT feature on NG Aircraft.
Boeing	737-34-4333	01	2025-07-11	Boeing Service Bulletin that authorizes update to FMC OPC that enables the VNAV ALT feature on MAX Aircraft.

Service bulletin incorporation

Methods and Standards is instructed to incorporate the following Service Bulletins in their entirety.

Service bulletin number	Revision	Date	Or later revision?
737-34-4328	ORIG	April 04, 2025	Yes

Comments and instructions

Service bulletin number	Revision	Date	Or later revision?
737-34-4333	01	July 11, 2025	Yes

Comments and instructions

Manual change ECRA

Methods and Standards is instructed to incorporate the following Manual Change ECRA's.

Custom manual changes

Methods and Standards is instructed to make the following custom manual changes

Interior furnishings manual changes

Methods and Standards is instructed to incorporate the following documents into the Interiors Furnishings Manual (IFM).

Supplemental instructions

Department	Revision
Aircraft Records	Orginal

Special Instructions

Create -8 M&E for Operations 001, 002, 003, 004, 005, 006, and 007 of this EA.

Department	Revision
EA Planning	Orginal

Special Instructions

Schedule EA using Planning section of this EA front matter.

Department	Revision
Flight Operations	Orginal

Special Instructions

Review for Operational and Flight Manual Updates.

Department	Revision
Loadable Software Group	Orginal

Special Instructions

This EA updates the FMC OPS software to enable the VNAV ALT feature as requested by flight standards. On EA completion MX will update component files in SCEPTRE per Op 007. Make sure the listed software is available in the loader.

Safety risk management

Please complete the assessment below. If you answered "YES" to any of the questions, complete the System Analysis Worksheet (SAW). Based on the results of the SAW and SMS CAPA may be required. Reference GMM 02- 30-50 for further details.

Trigger event

Revision to existing system/procedures (Including EA/ECRA/FCD revisions)

System analysis

Did you identify any hazards by considering the function and purpose of the system? No

Did you identify any hazards by considering the systems operating environment? No

Did you identify any hazards by considering an outline of the systems and processes and procedures? No

Did you identify any hazards by considering the personnel, equipment, and facilities necessary for the operation of the system? No

Technical substantiation

1. Data Validation

This is a major alteration using FAA accepted data found in Boeing Service Bulletin 737-34-4333 and 737-34-4328.

4. Risk Assessment

This project as has been determined to be a (1B) Limited Risk per SMS Risk Assessment Procedures as indicated below

-Severity Indication

a. (0) Regulatory Compliance - No effect on regulatory compliance.

b. (0) Safety of Flight - Performance Factors Database has no safety impact to aircraft.

c. (0) Operational Reliability - No delays or reliability impact.

d. (0) Physical Injury - No Effect.

e. (0) Damage to Assets - No Damage.

f. (0) Increase in Cost or Revenue Loss - No.

- Likelihood Identification:

a. (B) Improbable

- Risk Classification: (1B) Limited Risk

5. 14 CFR Compliance Review

-Reviewed Title 14 Aeronautics and Space Code of Federal Regulations Parts 25, 91 and 121 with no affect/impact of this minor alteration.

Parts & Materials

Tools & Software

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-L7	1		Ensure on hand
FMC OPC	BCG-02C-S1	1		Ensure on hand
FMC OPC	BCG-02C-S2	1		Ensure on hand
FMC OPC	BCG-02C-S3	1		Ensure on hand
FMC OPC	BCG-02C-S4	1		Ensure on hand

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FMC OPC	BCG-02C-S5	1		Ensure on hand

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737 MAX FMC OPC Software Update OP 1

Operation 001 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-801				Supply Electrical Power
AMM	34-61-00-470-801				FMC Software Installation with Onboard Network System
AMM	34-61-00-470-802				FMC Software Crossload
AMM	34-61-00-750-803				FMCS Performance Factors - Adjustment
AMM	45-00-00-910-801				UMD Global Account and UMDTech Account Access and Use
AMM	46-13-00-070-801				Mass Stoarge Device Software Part Removal
AMM	46-13-00-470-803				Download Files Using the Software Management Tool (SMT)
AMM	46-13-00-470-804				Stage Software on a Mass Storage Device - Software Installation
AMM	46-13-00-860-804				Mass Storage Device Software Parts Check

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-L7	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 046 through 048 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737MAX

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) CHECK AIRCRAFT'S UNIVERSAL MAINTENANCE DEVICE (UMD) FOR OLD FMC SOFTWARE

(a) Access the UMD that is installed on the aircraft and log in. Refer to AMM 45-00-00-910-801, UMD Global Account and UMDTech Account Access and Use.

Mechanic
_____

(b) Start the LSAPL-SMT application and select "View Parts on SMT"

Mechanic
_____

(c) Examine for the below old FMC OPC software part number. If the below part number (P/N BCG-02C-13) is found, delete it from the UMD.

Description	OLD FMC OPC Software P/N
FMC OPC	BCG-02C-13

Select "Exit SMT" to exit the SMT application.

Note: If P/N BCG-02C-13 is NOT found on the UMD, N/A this step.

Mechanic
_____

(5) CHECK AIRCRAFT'S MASS STORAGE DEVICE (MSD) FOR OLD FMC SOFTWARE

(a) Use the UMD to determine the FMC OPC software installed on the aircraft's MSD. Refer to AMM 46-13-00-860-804, Mass Storage Device Software Parts Check.

Mechanic
_____

(b) If the below old FMC OPC part number (P/N BCG-02C-13) is found on the MSD, refer to AMM 46-13-00-070-801, Mass Storage Device Software Part Removal, to remove the old FMC software parts number from the MSD.

Description	OLD FMC OPC Software P/N
FMC OPC	BCG-02C-13

Note: If P/N BCG-02C-13 is NOT found on the MSD, N/A this step.

Mechanic
_____

(6) CHECK AIRCRAFT'S MSD FOR SOFTWARE THAT WILL BE LOADED IN THIS OPERATION

Use the UMD to verify that the following P/Ns are installed on the aircraft's MSD. Refer to AMM 46-13-00-860-804, Mass Storage Device Software Parts Check.

- FMC OPC: BCG-02C-L7

If ALL software P/Ns were found on the MSD, sign off this step, and mark Step 7 and Step 8 as "N/A," then proceed to Step 9.

If the software P/Ns were NOT found on the MSD, sign-off this step and continue to the next step to load the missing software onto the UMD and MSD.

Mechanic
_____

(7) Load Software to UMD.

(a) Connect the UMD to the UA Ground Network and log in using the United global account. Load unscheduled parts onto te UMD; Refer to AMM 45-00-00-910-801, UMD Global Account and UMDTech Account Access and Use.

Note: If all P/Ns were found on the MSD in Step 6, mark this step as "N/A."

Mechanic
_____

(b) Start the Software Management Tool (SMT) on the UMD. Refer to AMM 46-13-00-470-803, Download Files Using the Software Management Tool (SMT).

- Double click the LSAP-SMT icon on the UMD desktop
- Select "Primary" as the Location
- Select the Finish button

Note: If all P/Ns were found on the MSD in Step 6, mark this step as "N/A."

Mechanic
_____

(c) Use "Get Parts Unscheduled" on the UMD to load the needed software part number(s) from Step 6 onto the UMD. Refer to AMM 46-13-00-470-804, Stage Software on a Mass Storage Device - Software Installation.

Note: Search for missing part numbers from Ground Network.

Note: If all P/Ns were found on the MSD in Step 6, mark this step as "N/A."

Mechanic
_____

(8) STAGE SOFTWARE ONTO AIRCRAFT'S MSD

(a) Send the new software part number(s) to the aircraft's MSD. Refer to AMM 46-13-00-470-804, Stage Software on a Mass Storage Device - Software Installation.

Note: If all P/Ns were found on the MSD in Step 6, mark this step as "N/A."

Mechanic
_____

(b) Close SMT by selecting "Exit SMT" on the SMT screen.

Note: Do NOT close SMT by selecting the 'X' in the upper right hand corner.

Note: If all P/Ns were found on the MSD in Step 6 , mark this step as "N/A."

Mechanic
_____

(9) NEW FMC SOFTWARE INSTALLATION

(a) Load FMC OPC software P/N BCG-02C-L7 into the Left FMC. Refer to AMM 34-61-00-470-801, FMC Software Installation with Onboard Network System.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-802, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-750-803, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-750-803, FMC Performance Factors - Adjustment.

Mechanic
_____

(10) SOFTWARE VERIFICATION

(a) Record FMC OPC part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) WasFMC OPC part number BCG-02C-L7 recorded in Step 10.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 10.b was marked "Yes" sign off this step and continue on the next step. If step 10.b was marked "No" return to step 9 and load the correct software in the applicable FMCs before continuing.

Mechanic
_____

(11) Confirm that VNAV ALT option is present on the Left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on Left FMC, re-accomplish step 9 until the VNAV ALT software is installed successfully.

Mechanic
_____

(12) Confrim that VNAV ALT option is present on the Right FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on Right FMC, re-accomplish step 9 until the VNAV ALT software is installed successfully.

Mechanic
_____

(13) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
_____

(14) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
_____

(15) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

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737 MAX FMC OPC Software Update OP 1

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
_____

EA3461-01396 Revision A

737 NG FMC OPC Software Update OP 2 (SB Group 5 aircraft)

Operation 002 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-811				Supply Electrical Power
AMM	34-61-00-470-805				FMC Software Installation with Portable Data Loader
AMM	34-61-00-470-806				FMC Software Crossload
AMM	34-61-00-800-801				FMC Performance Factors - Adjustment

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-S5	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 031 through 043 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737NG

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) NEW FMC SOFTWARE INSTALLATION

737 NG FMC OPC Software Update OP 2 (SB Group 5 aircraft)

(a) Load FMC OPC software P/N BCG-02C-S5 into the Left FMC. Refer to AMM 34-61-00-470-805, FMC Software Installation with Portable Data Loader.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-806, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(5) SOFTWARE VERIFICATION

(a) Record FMC OPC software part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) Was FMC OPC software part number BCG-02C-S5 recorded in Step 5.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 5.b was marked "Yes" sign off this step and continue on the next step. If step 5.b was marked "No" return to step 4 and load the correct software in the applicable FMCs before continuing.

Mechanic
_____

(6) Confirm that VNAV ALT option is present on the Left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Left FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(7) Confirm that VNAV ALT option is present on the Right FMCs.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Right FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(8) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
_____

(9) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
_____

(10) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
_____

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737 NG FMC OPC Software Update OP 3 (SB Group 1 aircraft)

Operation 003 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-811				Supply Electrical Power
AMM	34-61-00-470-805				FMC Software Installation with Portable Data Loader
AMM	34-61-00-470-806				FMC Software Crossload
AMM	34-61-00-800-801				FMC Performance Factors - Adjustment

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-S1	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 031 through 043 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737NG

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) NEW FMC SOFTWARE INSTALLATION

737 NG FMC OPC Software Update OP 3 (SB Group 1 aircraft)

(a) Load FMC OPC software P/N BCG-02C-S1 into the Left FMC. Refer to AMM 34-61-00-470-805, FMC Software Installation with Portable Data Loader.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-806, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(5) SOFTWARE VERIFICATION

(a) Record FMC OPC software part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) Was FMC OPC software part number BCG-02C-S1 recorded in Step 5.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 5.b was marked "Yes" sign off this step and continue on the next step. If step 5.b was marked "No" return to step 4 and load the correct software in the applicable FMCs before continuing.

Mechanic
_____

(6) Confirm that VNAV ALT option is present on the Left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Left FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(7) Confirm that VNAV ALT option is present on the Right FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Right FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(8) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
_____

(9) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
_____

(10) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
_____

EA3461-01396 Revision A

737 NG FMC OPC Software Update OP 4 (SB Group 2 aircraft)

Operation 004 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-811				Supply Electrical Power
AMM	34-61-00-470-805				FMC Software Installation with Portable Data Loader
AMM	34-61-00-470-806				FMC Software Crossload
AMM	34-61-00-800-801				FMC Performance Factors - Adjustment

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-S2	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 031 through 043 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737NG

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) NEW FMC SOFTWARE INSTALLATION

737 NG FMC OPC Software Update OP 4 (SB Group 2 aircraft)

(a) Load FMC OPC software P/N BCG-02C-S2 into the Left FMC. Refer to AMM 34-61-00-470-805, FMC Software Installation with Portable Data Loader.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-806, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(5) SOFTWARE VERIFICATION

(a) Record FMC OPC software part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) Was FMC OPC software part number BCG-02C-S2 recorded in Step 5.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 5.b was marked "Yes" sign off this step and continue on the next step. If step 5.b was marked "No" return to step 4 and load the correct software in the applicable FMCs before continuing.

Mechanic
_____

(6) Confirm that VNAV ALT option is present on the left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Left FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(7) Confirm that VNAV ALT option is present on the Right FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Right FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(8) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
_____

(9) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
_____

(10) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
_____

EA3461-01396 Revision A

737 NG FMC OPC Software Update OP 5 (SB Group 3 aircraft)

Operation 005 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-811				Supply Electrical Power
AMM	34-61-00-470-805				FMC Software Installation with Portable Data Loader
AMM	34-61-00-470-806				FMC Software Crossload
AMM	34-61-00-800-801				FMC Performance Factors - Adjustment

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-S3	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 031 through 043 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737NG

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) NEW FMC SOFTWARE INSTALLATION

737 NG FMC OPC Software Update OP 5 (SB Group 3 aircraft)

(a) Load FMC OPC software P/N BCG-02C-S3 into the Left FMC. Refer to AMM 34-61-00-470-805, FMC Software Installation with Portable Data Loader.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-806, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(5) SOFTWARE VERIFICATION

(a) Record FMC OPC software part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) Was FMC OPC software part number BCG-02C-S3 recorded in Step 5.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 5.b was marked "Yes" sign off this step and continue on the next step. If step 5.b was marked "No" return to step 4 and load the correct software in the applicable FMCs before continuing.

Mechanic
_____

(6) Confirm that VNAV ALT option is present on the Left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Left FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(7) Confirm that VNAV ALT option is present on the Right FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Right FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
_____

(8) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
_____

(9) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
_____

(10) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
_____

EA3461-01396 Revision A

737 NG FMC OPC Software Update OP 6 (SB Group 4 aircraft)

Operation 006 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description
AMM	24-22-00-860-811				Supply Electrical Power
AMM	34-61-00-470-805				FMC Software Installation with Portable Data Loader
AMM	34-61-00-470-806				FMC Software Crossload
AMM	34-61-00-800-801				FMC Performance Factors - Adjustment

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required
FMC OPC	BCG-02C-S4	1		Ensure on hand

A. GENERAL INSTRUCTIONS

CAUTIONS:

(a) KEEP THE WORK AREA, WIRES AND ELECTRICAL BUNDLES CLEAN OF METAL PARTICLES OR CONTAMINATION WHEN YOU USE TOOLS. UNWANTED MATERIAL, METAL PARTICLES OR CONTAMINATION CAUGHT IN WIRE BUNDLES CAN CAUSE DAMAGE TO THE BUNDLES. DAMAGED WIRE BUNDLES CAN CAUSE SPARKS OR OTHER ELECTRICAL DAMAGE.

(b) PROTECT/CLEAN ELECTRICAL WIRING INTERCONNECTION SYSTEM (EWIS) IN ACCORDANCE WITH SECTIONS 20-60-02 AND 20-60-07 OF THE 737 MAX AMM. EWIS IS DEFINED AS WIRES, POWER FEEDERS, WIRING DEVICES, AND TERMINATION DEVICES INSTALLED IN ANY AREA OF THE AIRPLANE. EWIS HAS THE PURPOSE OF TRANSMITTING ELECTRICAL ENERGY, DATA, AND SIGNALS BETWEEN TWO OR MORE INTENDED TERMINATION POINTS

GENERAL NOTES:

(a) Contact Engineering if the aircraft or component has been repaired or modified in such a manner that prevents the inspection/repair/modification from being accomplished in accordance with the instructions contained in this workcard.

(b) If open-up/access/close-up steps required by this workcard are accomplished by other routine workcards, it is permissible to (N/A) those steps on this workcard referencing the applicable routine workcard.

(c) Manuals included as reference material are identified by parentheses and the words Reference Only in the Technical Data Required list. Reference materials are not required to perform the task and are included for mechanics convenience only. Note: It is not necessary to print out reference materials to accompany each work package.

(d) Obey all of the warnings and cautions given in the specified manual sections.

(e) Unless shown differently, these dimensions and tolerances are used:

Linear dimensions are in inches.

Tolerance on linear dimensions, other than rivet and bolt edge margins, is plus or minus 0.03-inch.

Tolerance on rivet and bolt edge margin is plus or minus 0.05 inch.

Angular tolerance is plus or minus 2 degrees.

Hole dimensions for standard solid rivets and fasteners are in SRM Chapter 51.

(f) Torque Values:

Values for structural fasteners are given in 737 Structural Repair Manual, Chapter 51.

Values for airframe maintenance tasks are included in Chapter 20 of 737 Airplane Maintenance Manual (AMM).

Values for electrical maintenance tasks are included in Chapter 20 of Standard Wiring Practices Manual.

Values for engine maintenance tasks are included in Chapter 70 of 737Airplane Maintenance Manual (AMM).

Non-standard torque values for maintenance tasks are included in the applicable installation step.

(g) Use the approved fastener and process material substitutions in accordance with SRM Chapter 51.

(h) If the length of any fastener specified in this service bulletin does not meet the installation standards in SRM Chapter 51, then a fastener of the same specification, or an approved substitute, with a length which meets the installation standards in SRM Chapter 51 may be used. In addition, washers may be installed for fastener grip length in accordance with SRM Chapter 51.

(i) A General Visual Inspection is defined as: A visual examination of an interior or exterior area, installation or assembly to detect obvious damage, failure or irregularity. This level of inspection is made from within touching distance unless otherwise specified. A mirror may be necessary to ensure visual access to all surfaces in the inspection area. This level of inspection is made under normal available lighting conditions such as daylight, hangar lighting, flashlight or droplight and may require removal or opening of access panels or doors. Stands, ladders or platforms may be required to gain proximity to the area being checked.

(j) A Detailed Inspection is defined as: An intensive examination of a specific item, installation, or assembly to detect damage, failure, or irregularity. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors, magnifying lenses, etc. may be necessary. Surface cleaning and elaborate procedures may be required.

(k) The instructions in this operation may include operation of tools or test equipment. Boeing Engineering Tool Drawings, the Illustrated Tool and Equipment Manual, and the Special Tool and Ground Handling Drawing Index contain data on versions of the tools or test equipment that you can use. It is permitted to use replaced tools. It is not permitted to use superseded tools.

(l) The work instructions in this Engineering Authorization refer to procedures included in other Boeing documents. When the words "refer" to are used and United Airlines has an accepted alternative procedure, the accepted alternative procedure can be used. When the words "in accordance with" are included in the instruction, the procedure in the Boeing document must be used.

(m) If it is necessary to remove more parts for access, you can remove those parts. If you can get access without removing identified parts, it is not necessary to remove all of the identified parts. Jacking and shoring limitations must be observed.

B. ACCOMPLISHMENT INSTRUCTIONS

(1) Supply elctrical power to the airplane. Refer to AMM 24-22-00 as an accepted procedure. Remove DO-NOT-CLOSE tags from opened circuit breakers and DO-NOT-OPERATE labels from applicable switches.

Mechanic
_____

(2) Get access to the flight deck.

Mechanic
_____

(3) RECORD AUTHORIZED PERFORMANCE FACTORS

(a) FMC Performance Factors (Drag and Fuel Flow Factors)

Locate the drag and fuel flow factors, as indicated in SCEPTRE, for the specific tail number being worked. These values can be found in SCEPTRE via the following commands:

- /for scIJCc
- Enter CATEGORY CODE: 15 for ENGINEERING DEPARTMENT
- Enter PAGING = 031 through 043 for FLT.OPS. ENG. PERFORMANCE FACTORS for B737NG

Note: Applicable drag and fuel flow factors for this aircraft must be obtained in this step, as these values will be used later in the procedure.

Mechanic
_____

(b) Read and Record the drag and fuel factors found in Step 3.a.

Fuel Flow Factor: _____

Drag Factor: _____

Mechanic
_____

(4) NEW FMC SOFTWARE INSTALLATION

737 NG FMC OPC Software Update OP 6 (SB Group 4 aircraft)

(a) Load FMC OPC software P/N BCG-02C-S4 into the Left FMC. Refer to AMM 34-61-00-470-805, FMC Software Installation with Portable Data Loader.

Mechanic
_____

(b) Crossload the FMC OPC software from the Left FMC to the Right FMC. Refer to AMM 34-61-00-470-806, FMC Software Crossload.

Mechanic
_____

(c) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Left FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(d) Enter the Drag and Fuel Flow factors recorded in Step 3.b into the Right FMC. Refer to AMM 34-61-00-800-801, FMC Performance Factors - Adjustment.

Mechanic
_____

(5) SOFTWARE VERIFICATION

(a) Record FMC OPC software part number on both left and right FMC

Left FMC OPC PN: _____

Right FMC OPC PN: _____

Mechanic
_____

(b) Was FMC OPC software part number BCG-02C-S4 recorded in Step 5.a on both FMCs?

YES_____NO_____

Mechanic
_____

(c) If step 5.b was marked "Yes" sign off this step and continue on the next step. If step 5.b was marked "No" return to step 4 and load the correct software in the applicable FMCs before continuing.

Mechanic
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(6) Confirm that VNAV ALT option is present on the Left FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC LEFT prompt (1L).
- From the LT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Left FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
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(7) Confirm that VNAV ALT option is present on the Right FMC.

- Select the MAINT prompt in (6R) on the INIT/REF INDEX page.
- From the MAINT BITE INDEX page select FMCS in (1L).
- From the FMCS BITE page select FMC RIGHT prompt (2L).
- From the RT FMCS BITE page select SW OPTIONS prompt in (2R).
- From CDU SW OPTIONS pages verify that "VNAV ALT" option is listed.

Note: VNAV ALT may not be listed on the first CDU SW OPTIONS page. Make sure to check all pages.

Note: If VNAV ALT was not found on the Right FMC, re-accomplish step 4 until the VNAV ALT software is installed successfully.

Mechanic
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(8) Complete an operational test of both FMCs; Reference AMM 34-61-00.

Mechanic
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(9) RETURN THE AIRCRAFT TO ITS NORMAL OPERATING CONDITION.

Ensure work area is free of all tooling and debris.

Mechanic
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(10) SIGN OFF

If accomplishing this Operation in ETASK, N/A this step. IOC sign-off is not required and will be accomplished automatically.

If accomplished on a Paper version of this Operation, sign-off accomplishment through SCEPTRE transaction scIOCc.

Mechanic
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UNITED

EA3461-01396 Revision A

Verify or update SCEPTRE software component files.

Operation 007 Overview

Technical documents

Maintenance must have the following documents to accomplish this operation

Origin	Document number	Revision	Date	DCN	Description

Parts & Materials

Maintenance must have the following parts to accomplish this operation.

Tools & Software

Maintenance must have the following tools to accomplish this operation.

Description	Tool/ Software Number	Quantity	Units	Required

UNITED

EA3461-01396 Revision A

Verify or update SCEPTRE software component files.

A. GENERAL NOTES

(1) Refer to GMM 05-40-05 for On Board Loadable Software (OBLS).

(2) If problems are encountered when entering data into SCEPTRE program scSWFc, this operation may be deferred. Deferral of this operation must be coordinated with supervision. Contact Engineering or the Engineering Service Center (ESC) if there are problems in completing SCEPTRE program scSWFc software updates.

B. Work Instructions

(1) This operation uses SCEPTRE program scSWFc to update software component files only if software was loaded in operations 001, 002, 003, 004, 005, or 006 of this EA The following table lists the effectivity by operation and software that was verified or loaded by this EA. The steps for SCEPTRE program scSWFc are only required if the software in the table below was loaded in Ops 001, 002, 003, 004, 005, or 006. If the required software was found previously installed then software updating with SCEPTRE program scSWFc is not required.

Was the FMC OPC loaded during the completion of this EA? YES_____NO_____

Software Installed	Software Number	Effective Operation	Effective Tails
FMC OPC	BCG-02C-L7	OP 1	7273, 7297-7306, 7308-7311, 7313-7327, 7328-7370, 7401-7403, 7556-7599
FMC OPC	BCG-02C-S5	OP 2	201, 227-228, 232, 235- 236, 240, 246, 249
FMC OPC	BCG-02C-S1	OP 3	436-479, 519-542, 801-810, 811-849, 880-899
FMC OPC	BCG-02C-S2	OP 4	413-435, 507-518
FMC OPC	BCG-02C-S3	OP 5	202-226, 229-231, 233-234, 237-239, 241-245, 247-259, 263, 265-269, 271-277, 401-412, 701-711, 714-719, 721-724, 728-733, 750-754
FMC OPC	BCG-02C-S4	OP 6	260-262, 264, 270, 278-299, 501-506, 712-713, 720, 723, 726-727, 734-736

Mechanic	Inspector
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Verify or update SCEPTRE software component files.

(2) Separately record all of the software that was loaded and identified above using SCEPTRE program scSWFc. Use the following procedure for both the left and right FMC's software. N/A this step if no software was loaded during the completion of this EA in the Op effective for this airplane.

Note: Separate entries will be required for each of the LRU softwares above that were loaded.

Note: If none of the software listed above was loaded then N/A this step.

Note: NOTE FOR 737 NGs Both of the following LRU M&E part numbers could be listed on the configuration file: 29-3461-9-0001 or 29-3461-9-0012 if both are present UPDATE BOTH on SCEPTRE.

Note: Make sure to update component file of BOTH left and Right FMC

(a) Start SCEPTRE program scSWFc and enter the following fields: Your EMPLOYEE NUMBER, 4 digit A/C nose number, component M/E PART NUMBER and component M/E SERIAL NUMBER.

(b) Click the INSTALL-SOFTWARE at the bottom of the screen.

Note: Newly inducted aircraft often have dummy component serial numbers listed in SCEPTRE. Using the actual serial number when the dummy is listed in SCEPTRE may prevent entry into the install screen. When this occurs, determine the SCEPTRE dummy serial number and use it to enter the install screen.

(c) The install screen will require you to enter all software loaded into a component, not just the software loaded by this EA. Enter all software M/E part numbers currently installed in the component. Enter a Y in the EA column for the software loaded by this EA. Select ENTER.

Note: The actual software order on the INSTALL-SOFTWARE page is important. Be sure to align the proper software type when entering the part numbers.

Note: It is recommended to use the Software "M/E" Number to avoid potential SCEPTRE problems.

(d) SCEPTRE will compare the entry to the aircraft's Software Configuration File. Software part numbers that do not match the Configuration File will be highlighted in red along with any errors. Correct any errors and select ENTER. Select ENTER again and the software should be accepted.

(e) Verify your entry was accepted by selecting COMPONENT FILE from SCEPTRE scSWFc main page. The newly installed software will be listed under the component M&E number with the current entry date.

Mechanic
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(3) Sign-Off Operation Accomplishment.

(a) If accomplishing this Operation in ETASK, N/A this step, as scIOCc signoff is not required and will be accomplished programatically.

(b) If accomplishing on a paper version of this operation, sign-off accomplishment through SCEPTRE transcation scIOCc.

Mechanic
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(4) If Op 002 cannot be compelted due to SCEPTRE SWF transaction errors and Op 001 is confirmed as completed, it is premissible to defer to Op 002

(a) Initate a DIP to accomplish Op 002 within 2 days without deviation.

Note: If The SCEPTRE SWF transaction was completed in it's entirety N/A this step.

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