

(19) World Intellectual Property Organization
International Bureau



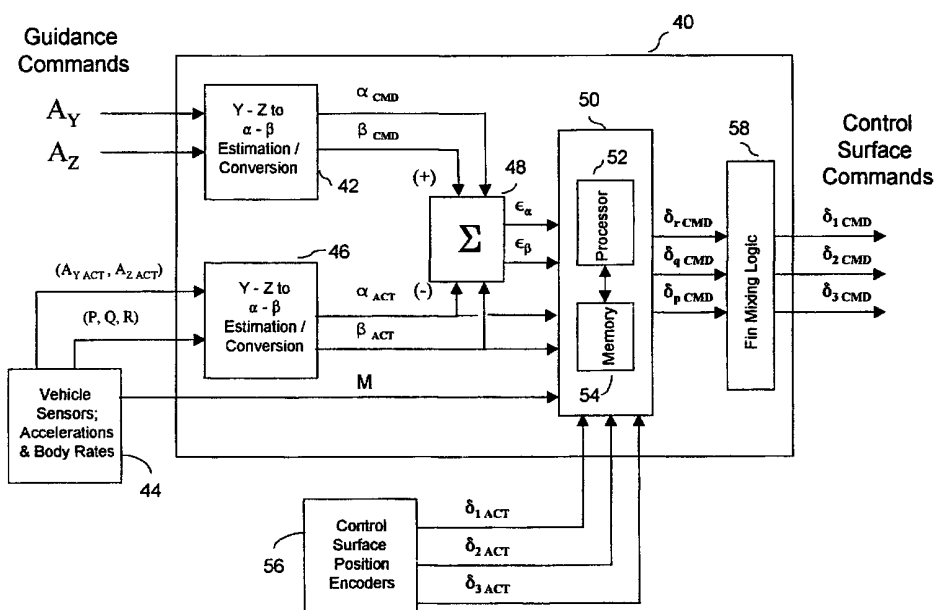
(43) International Publication Date
21 December 2000 (21.12.2000)

PCT

(10) International Publication Number
WO 00/77586 A3

- (51) International Patent Classification⁷: G05D 1/08 (74) Agents: COTROPIA, Charles, S. et al.; Sidley & Austin, Suite 3400, 717 N. Harwood, Dallas, TX 75201 (US).
- (21) International Application Number: PCT/US00/16815
- (22) International Filing Date: 16 June 2000 (16.06.2000) (81) Designated States (*national*): BR, CA, IL, JP, KR.
- (25) Filing Language: English (84) Designated States (*regional*): European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).
- (26) Publication Language: English
- (30) Priority Data:
60/139,412 16 June 1999 (16.06.1999) US
09/359,349 21 July 1999 (21.07.1999) US
09/376,104 17 August 1999 (17.08.1999) US
- (71) Applicant: LOCKHEED MARTIN CORPORATION [US/US]; 6801 Rockledge Drive, Bethesda, MD 20817 (US).
- (72) Inventor: KALOUST, Joseph, H.; 1161 Meadow Park Lane, Grand Prairie, TX 75052 (US).
- Published:
— With international search report.
- (88) Date of publication of the international search report:
12 July 2001
- For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: ENHANCED STALL AND RECOVERY CONTROL SYSTEM



(57) Abstract: An autopilot controller, for controlling a vehicle traveling in a fluid medium, designed for controlling the vehicle in any one of pre stall, stall and post stall regions. The autopilot controller provides an approach for one-to-one mapping between a target command which is received and control surface deflections for effecting the command based on vehicle normal force and vehicle moment response characteristics. In one embodiment, the autopilot controller determines linear functions representative of the vehicle dynamic response for the current operating conditions in order to determine a direction of change of fin deflection for effecting the command. In another embodiment, the autopilot controller controls transverse vehicle accelerations by controlling a body pitch moment generated by a control surface.

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 00/16815

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 G05D1/08

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 G05D B64C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data, INSPEC, COMPENDEX, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP 0 743 242 A (BOEING CO) 20 November 1996 (1996-11-20) the whole document ----	1-73
A	US 4 590 475 A (BROWN JERRY A) 20 May 1986 (1986-05-20) the whole document ----	1-73
A	EP 0 471 395 A (BOEING CO) 19 February 1992 (1992-02-19) the whole document -----	1-73

☐

Further documents are listed in the continuation of box C.

☒

Patent family members are listed in annex.

° Special categories of cited documents :

- *A* document defining the general state of the art which is not considered to be of particular relevance
- *E* earlier document but published on or after the international filing date
- *L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- *O* document referring to an oral disclosure, use, exhibition or other means
- *P* document published prior to the international filing date but later than the priority date claimed

- *T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- *X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- *Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.
- *&* document member of the same patent family

Date of the actual completion of the international search

18 January 2001

Date of mailing of the international search report

25/01/2001

Name and mailing address of the ISA

European Patent Office, P.B. 5818 Patentlaan 2
NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,
Fax: (+31-70) 340-3016

Authorized officer

Philippot, B

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 00/16815

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP 0743242 A	20-11-1996	US 5803408 A	08-09-1998
US 4590475 A	20-05-1986	NONE	
EP 0471395 A	19-02-1992	US 5096146 A	17-03-1992
		DE 69119325 D	13-06-1996
		DE 69119325 T	12-09-1996
		JP 4254294 A	09-09-1992