

Honeywell International Inc.
P.O. Box 97001
Redmond, Washington 98073-9701
U.S.A
CAGE 97896
Telephone: (800) 601-3099 (U.S.A.)
Telephone: (602) 365-3099 (International)
Web site: <http://portal.honeywell.com/wps/portal/aero>

TO HOLDERS OF MAINTENANCE MANUAL, PUB NO. 1137-1, DMA-37B DME SYSTEM

REVISION NO. 003 DATED 10 OCT 2007

HIGHLIGHTS

This revision is a full replacement. All changed pages have a new date, as identified in the List of Effective Pages. Revision bars are not used because the structure has changed.

Remove and discard all pages of the manual and replace them with the attached pages. The Record of Revisions page has been brought up-to-date for you.

Remove Page	Insert Page	Description of Change
---	---	Revised the header and footer on all pages.
T-1, PN-1	T-1 thru T-4	Revised to show the revision date of this manual. Added the ECCN number. Replaced the proprietary notice with the new Honeywell confidentiality notice, Materials License Agreement, and Copyright Notice.
RH-1/RH-2	---	Deleted REVISION HIGHLIGHTS.
RR-1, RR-2	RR-1, RR-2	Revised and issued this section.
---	RTR-1, RTR-2	Added RECORD OF TEMPORARY REVISIONS.
LEP-1, LEP-2	LEP-1, LEP-2	Revised to show where changes are made in this manual.
TC-1/TC-2	TC-1 thru TC-4	Revised to show the location of the data in this manual.
INTRO-1	INTRO-1 thru INTRO-6	Revised format. Added proprietary, export, precautionary, and content data.
0 thru 21/22	1 thru 20	Revised and issued this section.
101 thru 116	1001 thru 1016	Revised and issued this section.
201 thru 226	2001 thru 2024	Revised and issued this section.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Blank Page

34-51-02

Page HL-2
10 Oct 2007

Honeywell

Honeywell International Inc.
P.O. Box 97001
Redmond, Washington 98073
U.S.A.
CAGE: 97896
Telephone: (800) 601-3099 (U.S.A.)
Telephone: (602) 365-3099 (International)
Web site: <http://portal.honeywell.com/wps/portal/aero>

Maintenance Manual

DMA-37B DME System

This document contains technical data and is subject to U.S. export regulations. These commodities, technology, or software were exported from the United States in accordance with the export administration regulations. Diversion contrary to U.S. law is prohibited.
ECCN: 7E994, no license required.

34-51-02

Page T-1

Publication Number 1137-1, Revision 003

Revised 10 Oct 2007
Oct 1995

© Honeywell International Inc. Do not copy without express permission of Honeywell.

Honeywell – Confidential

THIS COPYRIGHTED WORK AND ALL INFORMATION ARE THE PROPERTY OF HONEYWELL INTERNATIONAL INC., CONTAIN TRADE SECRETS AND MAY NOT, IN WHOLE OR IN PART, BE USED, DUPLICATED, OR DISCLOSED FOR ANY PURPOSE WITHOUT PRIOR WRITTEN PERMISSION OF HONEYWELL INTERNATIONAL INC. ALL RIGHTS RESERVED.

Honeywell Materials License Agreement

The documents and information contained herein (“the Materials”) are the proprietary data of Honeywell International Inc. and Honeywell Intellectual Properties Inc (collectively “Honeywell”). These Materials are provided for the exclusive use of Honeywell Service Centers; Honeywell-authorized repair facilities; operators of Honeywell aerospace products subject to an applicable product support agreement, their wholly owned-sub-subsidiaries or a formally designated third party service provider; and direct recipients of Materials from Honeywell’s Aerospace Technical Publication Distribution. The terms and conditions of this License Agreement govern your use of these Materials, except to the extent that any terms and conditions of another applicable agreement with Honeywell regarding the operation, maintenance, or repair of Honeywell aerospace products conflict with the terms and conditions of this License Agreement, in which case the terms and conditions of the other agreement will govern. However, this License Agreement will govern in the event of a conflict between its terms and conditions and those of a purchase order or acknowledgement.

1. License Grant - If you are a party to an applicable product support agreement, a Honeywell Service Center agreement, or an authorized repair facility agreement, Honeywell hereby grants you a limited, non-exclusive license to use these Materials to operate, maintain, or repair Honeywell aerospace products only in accordance with that agreement.

If you are a direct recipient of these Materials from Honeywell’s Aerospace Technical Publication Distribution and are not a party to an agreement related to the operation, maintenance or repair of Honeywell aerospace products, Honeywell hereby grants you a limited, non-exclusive license to use these Materials to maintain or repair the subject Honeywell aerospace products only at the facility to which these Materials have been shipped (“the Licensed Facility”). Transfer of the Materials to another facility owned by you is permitted only if the original Licensed Facility retains no copies of the Materials and you provide prior written notice to Honeywell.

2. Rights In Materials - Honeywell retains all rights in these Materials and in any copies thereof that are not expressly granted to you, including all rights in patents, copyrights, trademarks, and trade secrets. No license to use any Honeywell trademarks or patents is granted under this License Agreement.

3. Confidentiality - You acknowledge that these Materials contain information that is confidential and proprietary to Honeywell. You agree to take all reasonable efforts to maintain the confidentiality of these Materials.

4. Assignment And Transfer - This License Agreement may be assigned to a formally designated service designee or transferred to a subsequent owner or operator of an aircraft containing the subject Honeywell aerospace products. However, the recipient of any such assignment or transfer must assume all of your obligations under this License Agreement. No assignment or transfer shall relieve any party of any obligation that such party then has hereunder.

5. Copies of Materials - Unless you have the express written permission of Honeywell, you may not make or permit making of copies of the Materials. Notwithstanding the foregoing, you may make copies of only portions of the Material for your internal use. You agree to return the Materials and any copies thereof to Honeywell upon the request of Honeywell.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

6. Term - This License Agreement is effective until terminated as set forth herein. This License Agreement will terminate immediately, without notice from Honeywell, if you fail to comply with any provision of this License Agreement or will terminate simultaneously with the termination or expiration of your applicable product support agreement, authorized repair facility agreement, or your formal designation as a third party service provider. Upon termination of this License Agreement, you will return these Materials to Honeywell without retaining any copies and will have one of your authorized officers certify that all Materials have been returned with no copies retained.

7. Remedies - Honeywell reserves the right to pursue all available remedies and damages resulting from a breach of this License Agreement.

8. Limitation of Liability - Honeywell does not make any representation regarding the use or sufficiency of the Materials. THERE ARE NO OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS, IMPLIED OR STATUTORY, INCLUDING, BUT NOT LIMITED TO, (i) WARRANTIES ARISING FROM COURSE OF PERFORMANCE, DEALING, USAGE, OR TRADE, WHICH ARE HEREBY EXPRESSLY DISCLAIMED, OR (ii) WARRANTIES AGAINST INFRINGEMENT OF INTELLECTUAL PROPERTY RIGHTS OF THIRD PARTIES, EVEN IF HONEYWELL HAS BEEN ADVISED OF ANY SUCH INFRINGEMENT. IN NO EVENT WILL HONEYWELL BE LIABLE FOR ANY INCIDENTAL DAMAGES, CONSEQUENTIAL DAMAGES, SPECIAL DAMAGES, INDIRECT DAMAGES, LOSS OF PROFITS, LOSS OF REVENUES, OR LOSS OF USE, EVEN IF INFORMED OF THE POSSIBILITY OF SUCH DAMAGES. TO THE EXTENT PERMITTED BY APPLICABLE LAW, THESE LIMITATIONS AND EXCLUSIONS WILL APPLY REGARDLESS OF WHETHER LIABILITY ARISES FROM BREACH OF CONTRACT, WARRANTY, TORT (INCLUDING BUT NOT LIMITED TO NEGLIGENCE), BY OPERATION OF LAW, OR OTHERWISE.

9. Controlling Law - This License shall be governed and construed in accordance with the laws of the State of New York without regard to the conflicts of laws provisions thereof. This license sets forth the entire agreement between you and Honeywell and may only be modified by a writing duly executed by the duly authorized representatives of the parties.

Copyright - Notice

Copyright 1995, 2007, Honeywell International Inc. All rights reserved.

Honeywell is a registered trademark of Honeywell International Inc.
All other marks are owned by their respective companies.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Blank Page

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

RECORD OF REVISIONS

For each revision, put the revised pages in your manual and discard the superseded pages. Write the revision number and date, date put in manual, and the incorporator's initials in the applicable columns on the Record of Revisions. The initial H shows Honeywell is the incorporator.

Revision Number	Revision Date	Date Put In Manual	By	Revision Number	Revision Date	Date Put In Manual	By
1	Not available	Not available	H				
2	13 Jul 1999	13 Jul 1999	H				
3	10 Oct 2007	10 Oct 2007	H				

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

RECORD OF TEMPORARY REVISIONS

Instructions on each page of a temporary revision tell you where to put the pages in your manual. Remove temporary revision pages only when discard instructions are given. For each temporary revision, put the applicable data in the record columns on this page.

Temporary Revision Number	Temporary Revision Date	Temporary Revision Status	Date Put in Manual	By	Date Removed From Manual	By

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Temporary Revision Number	Temporary Revision Date	Temporary Revision Status	Date Put in Manual	By	Date Removed From Manual	By

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

LIST OF EFFECTIVE PAGES

<u>Subheading and Page</u>	<u>Date</u>	<u>Subheading and Page</u>	<u>Date</u>
Title		4	■ 10 Oct 2007
		5	■ 10 Oct 2007
T-1	■ 10 Oct 2007	6	■ 10 Oct 2007
T-2	■ 10 Oct 2007	7	■ 10 Oct 2007
T-3	■ 10 Oct 2007	8	■ 10 Oct 2007
T-4	■ 10 Oct 2007	9	■ 10 Oct 2007
Record of Revisions		10	■ 10 Oct 2007
RR-1	■ 10 Oct 2007	11	■ 10 Oct 2007
RR-2	■ 10 Oct 2007	12	■ 10 Oct 2007
Record of Temporary Revisions		13	■ 10 Oct 2007
RTR-1	■ 10 Oct 2007	14	■ 10 Oct 2007
RTR-2	■ 10 Oct 2007	15	■ 10 Oct 2007
List of Effective Pages		16	■ 10 Oct 2007
LEP-1	■ 10 Oct 2007	17	■ 10 Oct 2007
LEP-2	■ 10 Oct 2007	18	■ 10 Oct 2007
Table of Contents		19	■ 10 Oct 2007
TC-1	■ 10 Oct 2007	20	■ 10 Oct 2007
TC-2	■ 10 Oct 2007		
TC-3	■ 10 Oct 2007		
TC-4	■ 10 Oct 2007		
Introduction		Fault Isolation	
INTRO-1	■ 10 Oct 2007	1001	■ 10 Oct 2007
INTRO-2	■ 10 Oct 2007	1002	■ 10 Oct 2007
INTRO-3	■ 10 Oct 2007	1003	■ 10 Oct 2007
INTRO-4	■ 10 Oct 2007	1004	■ 10 Oct 2007
INTRO-5	■ 10 Oct 2007	1005	■ 10 Oct 2007
INTRO-6	■ 10 Oct 2007	1006	■ 10 Oct 2007
Description and Operation		1007	■ 10 Oct 2007
1	■ 10 Oct 2007	1008	■ 10 Oct 2007
2	■ 10 Oct 2007	1009	■ 10 Oct 2007
3	■ 10 Oct 2007	1010	■ 10 Oct 2007
		1011	■ 10 Oct 2007
		1012	■ 10 Oct 2007
		1013	■ 10 Oct 2007
		1014	■ 10 Oct 2007
		1015	■ 10 Oct 2007
		1016	■ 10 Oct 2007

■ indicates a changed or added page
 F indicates a foldout page

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Subheading and Page

Date

Maintenance Practices

2001	■	10 Oct 2007
2002	■	10 Oct 2007
2003	■	10 Oct 2007
2004	■	10 Oct 2007
2005	■	10 Oct 2007
2006	■	10 Oct 2007
2007	■	10 Oct 2007
2008	■	10 Oct 2007
2009	■	10 Oct 2007
2010	■	10 Oct 2007
2011	■	10 Oct 2007
2012	■	10 Oct 2007
2013	■	10 Oct 2007
2014	■	10 Oct 2007
F 2015/2016	■	10 Oct 2007
F 2017/2018	■	10 Oct 2007
F 2019/2020	■	10 Oct 2007
F 2021/2022	■	10 Oct 2007
F 2023/2024	■	10 Oct 2007

-
- indicates a changed or added page
 - F indicates a foldout page

34-51-02

Page LEP-2
10 Oct 2007

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

TABLE OF CONTENTS

<u>Subject</u>	<u>Page</u>
INTRODUCTION	INTRO-1
1. How to Use This Manual	INTRO-1
A. General	INTRO-1
B. Symbols	INTRO-1
C. Weights and Measurements	INTRO-1
2. Customer Support	INTRO-2
A. Honeywell Aerospace Online Technical Publications Web Site	INTRO-2
B. Complete Customer Care Center	INTRO-2
3. Data Verification	INTRO-2
A. General	INTRO-2
4. References	INTRO-3
A. Honeywell Publications	INTRO-3
B. Other Publications	INTRO-3
5. Acronyms and Abbreviations	INTRO-4
A. General	INTRO-4
DESCRIPTION AND OPERATION	1
1. General	1
A. Description	1
B. Purpose of Equipment	3
C. Equipment Part Numbers	3
D. Equipment Required but Not Supplied	5
E. Configurations Available	5
2. System Leading Particulars	7
A. Unit Specifications	7
B. Environmental Certification (066-50013-0101, -0202, and -0303 only)	9
C. Environmental Certification (066-50013-1101 only)	10
D. Environmental Certification (066-50013-1212 only)	12
3. System Description	13
A. General	13
4. System Component Description	15
A. DMA-37B DME Interrogator	15
B. Other Components in the System	15

34-51-02

Page TC-1
Oct 8/07

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

5. Operation	17
A. General	17
B. Basic Theory	17
FAULT ISOLATION	1001
1. General	1001
A. Description for -0101, -0202, and -0303 Only	1001
B. Self-Test Mode for -0101, -0202, and -0303 Only	1003
C. Display-Failures Mode for -0101, -0202, and -0303 Only	1005
D. Maintenance Mode for -0101, -0202, and -0303 Only	1010
E. Flight Fault Memory Mode for -0101, -0202, and -0303 Only	1014
MAINTENANCE PRACTICES	2001
1. General	2001
A. Description	2001
B. Inspection After Unpacking	2001
C. Preinstallation Testing	2001
D. Equipment Changes and Marking	2001
E. Interchangeability	2001
2. Installation	2002
A. General	2002
B. Location of Equipment	2002
C. Interwiring and Cable Fabrication	2002
D. Installation of System	2007
3. Inspection and System Check Procedures	2008
A. Inspection	2008
B. System Checkout	2009
4. Removal and Replacement	2014
A. Removal	2014
B. Replacement	2014
5. Maintenance Procedures	2014
A. Adjustments and Alignments	2014
B. System Protection	2014
C. Lubrication Practices	2014
D. Cleaning	2014

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

List of Illustrations

Figure		Page
Figure Intro-1.	Symbols	INTRO-1
Figure 1.	DMA-37B DME Interrogator, 066-50013-0101, -0202, and -0303	1
Figure 2.	DMA-37B DME Interrogator, 066-50013-1101 and -1212	2
Figure 3.	DMA-37B DMA System	14
Figure 4.	DMA-37B DME Interrogator Simplified Block Diagram	16
Figure 1001.	Typical Normal Mode Screen.	1001
Figure 1002.	LCD Control Flow.	1002
Figure 1003.	Test in Progress Screen.	1003
Figure 1004.	Test Complete, No Failures Screen	1004
Figure 1005.	Test Complete, Failures Screen.	1004
Figure 1006.	DME Receiver OK, External Failures Present Screen.	1005
Figure 1007.	DME Receiver Failed, External Failures Also Present Screen	1005
Figure 1008.	DME Receiver Failed, External Failures Not Present Screen	1006
Figure 1009.	Tuning Port A Failure Screen.	1007
Figure 1010.	Tuning Port B Failure Screen.	1007
Figure 1011.	SDI 0 Program Pin Failure Screen.	1008
Figure 1012.	SDI 1 Program Pin Failure Screen.	1008
Figure 1013.	Antenna Monitor Program Pin Failure Screen	1009
Figure 1014.	CMC Port Failure Screen.	1009
Figure 1015.	DME Receiver Status (OK, FAILED) Screen	1010
Figure 1016.	Tuning Port Status (NML, TST, NCD, NODA) Screen	1011
Figure 1017.	Discrete Input Status Page 1 (OPEN, GRND) Screen.	1011
Figure 1018.	Discrete Input Status Page 2 (OPEN, GRND) Screen.	1012
Figure 1019.	SDI Program Pin Status Page (OPEN, COMM) Screen	1012
Figure 1020.	Antenna Monitor Program Pin Status Page (OPEN, COMM) Screen	1013
Figure 1021.	CMC Port Status (ACTIVE, INACTIVE) Screen.	1013
Figure 1022.	Old Failures Page Screen	1014
Figure 1023.	Previous Flight Legs Failures First Page Screen.	1015
Figure 1024.	Previous Flight Legs Failures Data Page Screen (Three Screens for Each Flight Leg).	1015
Figure 2001.	Typical Normal Mode Screen.	2010
Figure 2002.	Test in Progress Screen.	2011
Figure 2003.	Test Complete, No Failures Screen	2012
Figure 2004.	Test Complete, Failures Screen.	2012
Figure 2005.	DMA-37B DME Interrogator Dimensional Outline Drawing	2015
Figure 2006.	DMA-37B DME System Interwiring Diagram	2023

Honeywell

MAINTENANCE MANUAL
DMA-37B DME System

List of Tables

<u>Table</u>		<u>Page</u>
Table Intro-1.	Data Verification.	INTRO-2
Table 1.	DMA-37B DME System Components (Honeywell Supplied).	4
Table 2.	Equipment Required but Not Supplied	5
Table 3.	DMA-37B DME Interrogator Available Configurations.	5
Table 4.	DMA-37B DME Interrogator Features	6
Table 5.	Leading Particulars	7
Table 6.	Environmental Certification (066-50013-0101, -0202, and -0303 only).	9
Table 7.	Environmental Certification (066-50013-1101 only).	10
Table 8.	Environmental Certification (066-50013-1212 only)	12
Table 2001.	DMA-37B Interrogator Connector Determinants	2003
Table 2002.	Inspection/Check Procedures	2009
Table 2003.	Table of Test Equipment	2009

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

INTRODUCTION

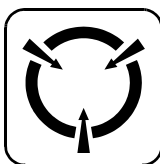
1. How to Use This Manual

A. General

- (1) The instructions in this manual give the data necessary to do all recommended maintenance functions to put the DMA-37B DME System in serviceable condition. The instructions in this manual do not give standard maintenance procedures that technicians must know.
- (2) Honeywell recommends that you do the tests in TESTING AND FAULT ISOLATION before you disassemble the unit. These tests can show the condition of the DMA-37B DME System or most possible cause of a malfunction. If a malfunction occurs, repair as necessary.
- (3) Warnings, cautions, and notes in this manual give the data that follows:
 - A WARNING gives a condition that, if you do not obey, can cause injury or death.
 - A CAUTION gives a condition that, if you do not obey, can cause damage to the equipment.
 - A NOTE gives data to make the work easier or gives direction to go to a procedure.
- (4) Warnings and cautions go before the applicable paragraph or step. Notes follow the applicable paragraph or step.
- (5) All personnel who operate equipment and do the specified maintenance must know and obey the safety precautions.

B. Symbols

- (1) The symbols in Figure Intro-1 identify ESDS and moisture sensitive devices in this manual, if applicable.



ESDS



Moisture Sensitive

Figure Intro-1. Symbols

C. Weights and Measurements

- (1) All weights and measurements are in U.S. values and S.I. (metric) values.

2. Customer Support

A. Honeywell Aerospace Online Technical Publications Web Site

- (1) If you have access to the Internet, go to the Honeywell Online Technical Publications web site at <http://portal.honeywell.com/wps/portal/aero/> to:
- Download or see publications online
 - Make an order for a publication
 - Tell Honeywell of a possible data error in a publication.

B. Complete Customer Care Center

- (1) If you do not have access to the the Honeywell Online Technical Publications web site, send an e-mail message or a fax, or speak to a person at the Complete Customer Care Center:
- E-mail: cas-publications-distribution@honeywell.com
 - Fax: 602-822-7272
 - Phone: 1-800-601-3099 (U.S.A.)
 - Phone: 1-602-365-3099 (International).
- (2) Also, the Complete Customer Care Center is available if you need to:
- Identify a change of address, telephone number, or e-mail address
 - Make sure that you get the next revision of this manual.

3. Data Verification

A. General

- (1) Verification of these technical instructions is done by performance or by simulation of the necessary procedures. Checks of the manual by the engineering staff make sure that the instructions and description data agree with the applicable engineering specifications and drawings and are accurate and sufficient. The dates of verification for this manual are as follows:

Table Intro-1. Data Verification

Number	Type	Date
Testing	By performance	09 Oct 2007
Fault Isolation	By performance	09 Oct 2007
Maintenance Practices	By performance	09 Oct 2007

- (2) Honeywell will revise this manual as necessary to give current data. The sources for data supplied in this manual include engineering drawings and change orders released as of 28 Sep 2007.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

4. References

A. Honeywell Publications

(1) The list that follows identifies Honeywell publications that are related to this manual:

- ATA No. 34-51-35 (Pub. No. 1137A-3), CMM, DMA-37B DME Interrogator
- ATA No. 34-51-36 (Pub. No. 1137A-4), CMM, DMA-37B DME Interrogator
- ATA No. 34-51-37 (Pub. No. 012-0824-001), CMM, DMA-37B DME
- ATA No. 34-51-38 (Pub. No. 012-0828-001), CMM, DMA-37B DME Interrogator
- JcAIR Pub. No. TR-0762-05, DMA-37B DME Interrogator Test Procedure.

NOTE: Order the DMA-37B DME Interrogator Test Procedure from JcAIR, Documentation Control Department, 400 New Century Parkway, New Century, KS 66031.

B. Other Publications

(1) These publications are standard references:

- The United States Government Printing Office (GPO) Style Manual 2000 (available at <http://www.gpoaccess.gov/stylemanual/browse.html>)
- ANSI/IEEE Std 260 (1978), Standard Letter Symbols for Units of Measurement (available from the American National Standards Institute, New York, NY)
- ASME Y14.38-1999 (Formerly ASME Y1.1-1989), Abbreviations for Use on Drawings and in Text (available from the American National Standards Institute, New York, NY)
- ANSI/IEEE Std 315-1975 (Replaces ANSI Y32.2-1975), Graphic Symbols for Electrical and Electronics Diagrams (available from the American National Standards Institute, New York, NY)
- ANSI/IEEE Std 91 (1984), Graphic Symbols for Logic Functions (available from the American National Standards Institute, New York, NY)
- H4/H8 Commercial and Government Entity (CAGE) Codes (available at http://www.dlis.dla.mil/cage_welcome.asp).

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

5. Acronyms and Abbreviations

A. General

(1) Refer to the list that follows for acronyms and abbreviations in this manual.

List of Acronyms and Abbreviations

Term	Full Term
AF	audio frequency
ANSI	American National Standards Institute
ARINC	Aeronautical Radio, Incorporated
ASME	American Society of Mechanical Engineers
ATC	air traffic control
BCD	binary coded decimal
BITE	built-in test equipment
CAGE	Commercial and Government Entity
CFDIU	centralized fault display interface unit
CFDS	central fault display system
CMC	central maintenance computer
CPU	central processor unit
CW	continuous wave
DITS	digital information transfer system
DME	data measuring equipment
DSP	digital signal processor
ECCN	export control classification number
EUROCAE	European Organisation for Civil Aviation Equipment
ESD	electrostatic discharge
ESDS	electrostatic discharge sensitive
FPGA	field-programmable gate array
FPLA	field-programmable logic array
GPO	Government Printing Office
HIRF	high intensity radiation fields
HPN	Honeywell part number

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

List of Acronyms and Abbreviations (cont)

Term	Full Term
I/O	input/output
IEEE	Institute of Electrical and Electronics Engineers
LCD	liquid crystal display
LRU	line replaceable unit
MOPS	minimum operational performance standards
NCD	no-computed-data
No.	number
PCMCIA	Personal Computer Memory Card International Association
RF	radio frequency
RTCA	Radio Technical Commission for Aeronautics
SDI	source/destination identifier
SSM	sign status matrix
Std	standard
TACAN	tactical air navigation
TCAS	traffic alert and collision avoidance system
TSO	technical standard order
VFR	visual flight rules
VHF	very high frequency
VOR	VHF omnirange
VORTAC	VHF omnirange tactical air navigation
U.S.A.	United States of America

Honeywell

MAINTENANCE MANUAL
DMA-37B DME System

Blank Page

34-51-02

Page INTRO-6
10 Oct 2007

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

DESCRIPTION AND OPERATION

1. General

A. Description

- (1) This section contains descriptive information covering the DMA-37B DME System and lists other components required for system operation. The DMA-37B DME Interrogator is illustrated in Figure 1 and Figure 2.

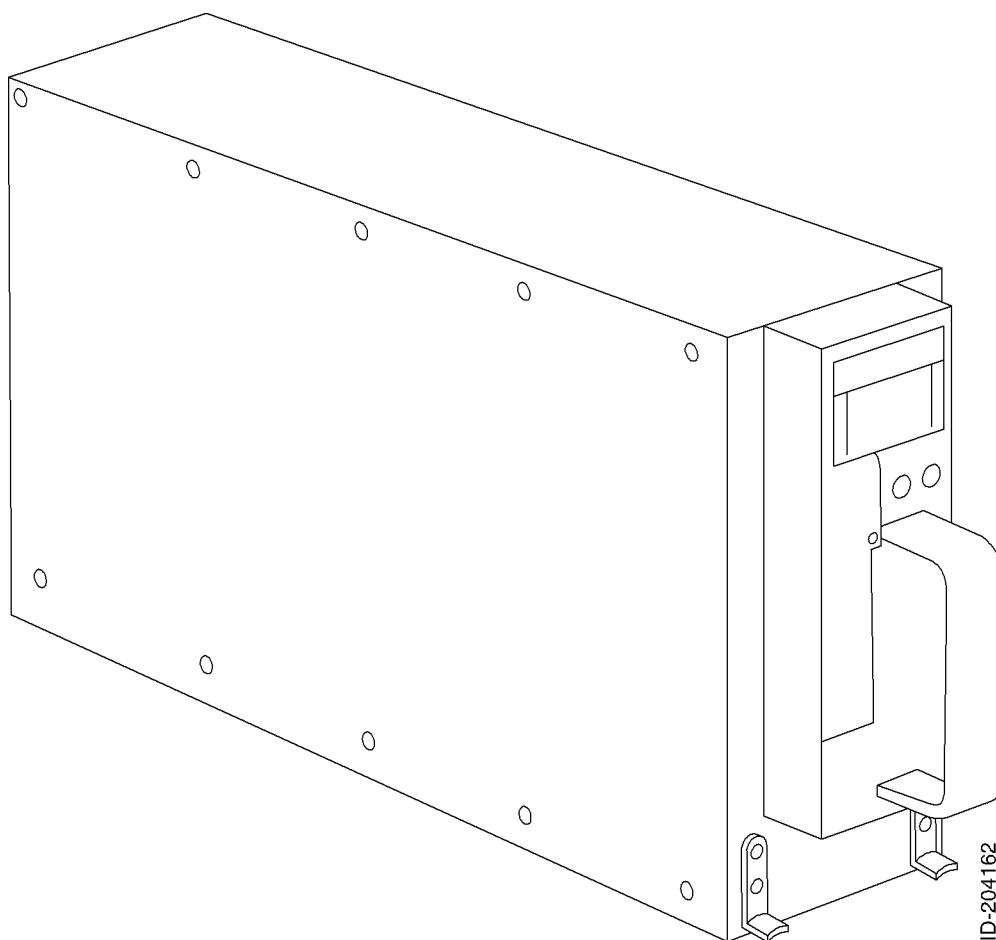


Figure 1. DMA-37B DME Interrogator, 066-50013-0101, -0202, and -0303

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

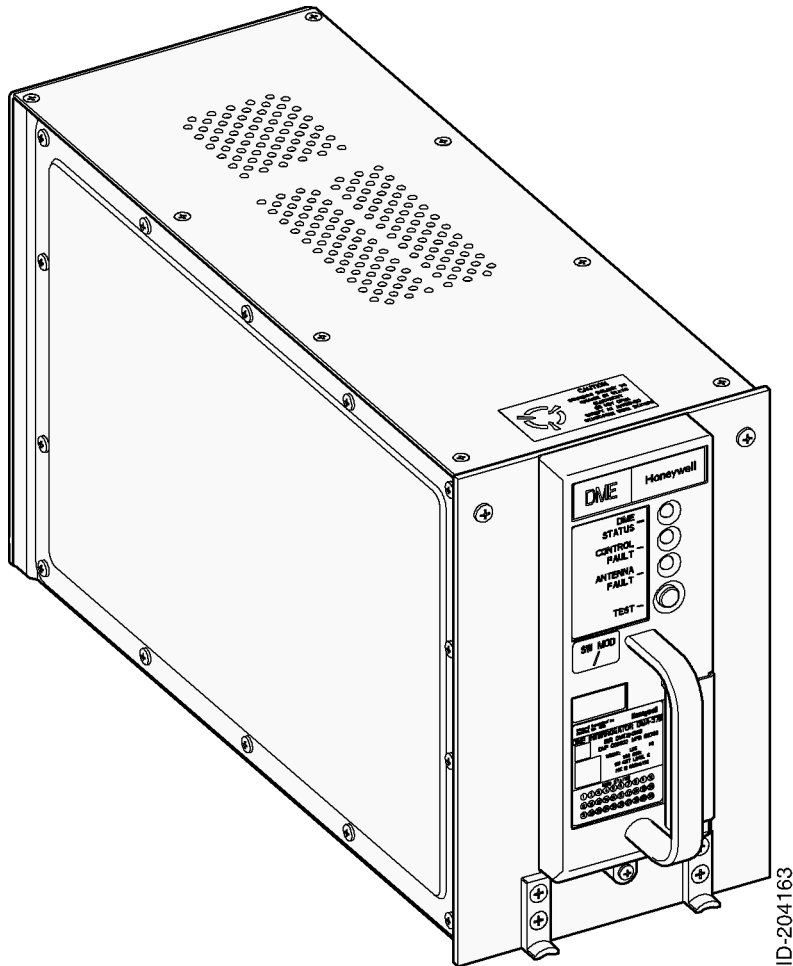


Figure 2. DMA-37B DME Interrogator, 066-50013-1101 and -1212

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

B. Purpose of Equipment

- (1) The DMA-37B DME System is designed to provide the flight crew with accurate slant-range distance information in digital format as measured from the aircraft to a selected ground-based DME transponder. Depending upon the DME display, DMA-37B adds ground speed and time for the aircraft to reach the selected ground-base station at the current velocity can be derived from the slant-range.
- (2) A DME is co-located at ground-based VHF Omnidirectional Distance Measuring Equipment (VOR-DME) and VHF Omnidirectional Tactical Air Navigation (VORTAC) stations. The DMA-37B is capable of receiving the distance measurement from military Tactical Air Navigation (TACAN) stations. A few DMEs are co-located with ILS systems presenting distance and aircraft speed to the runway as the aircraft approaches for landing.
- (3) DME is used in conjunction with a primary navigation source, like VOR, to measure distance along a route of flight toward the VORTAC station. For some instrument approaches, it is used with VOR to fly where a DME arc or VOR-DME equipment is required for approach.
- (4) The DMA-37B DME Interrogator is a very powerful scanning DME. In addition to stations selected by the crew, it searches automatically for up to five stations within a 300-nautical mile range.
- (5) The operating range of the DMA-37B DME System is zero to 300 nautical miles. The DMA-37B DME System consists of an airborne DMA-37B DME Interrogator, a mount, a DME indicator, and an antenna.
- (6) The DMA-37B DME Interrogator design conforms to industry standards Aeronautical Radio Incorporated (ARINC) 709-8 Airborne Distance Measuring Equipment, Radio Technical Commission for Aeronautics (RTCA) document number DO-189 Minimum Operational Performance Standards (MOPS) for Airborne Distance Measuring Equipment (DME), and European Organisation for Civil Aviation Equipment (EUROCAE) ED-54 Minimum Operational Performance Requirements for Distance Measuring Equipment Interrogator, and digital guidance data conforms to ARINC 429-14 Mark 33 Digital Information Transfer System (DITS) format.
- (7) The DMA-37B DME Interrogator is fully interchangeable with the earlier ARINC 709 DMA-37A DME Interrogator for backward compatibility.
- (8) In addition, the DMA-37B provides fast scan and digital Morse Code decoding outputs, fault memory, and built-in test equipment (BITE) interfaces for use in a Central Maintenance Computer (CMC) in accordance with ARINC 604 to transfer maintenance data or in a Central Fault Display System (CFDS) in accordance with ARINC 604, and Airbus Industrie ABDO048C or McDonnell Douglas software requirements.

C. Equipment Part Numbers

- (1) Components of the DMA-37B DME System supplied by Honeywell are listed in Table 1. Table 1 lists the currently available components of the system, along with part numbers and equipment type numbers.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 1. DMA-37B DME System Components (Honeywell Supplied)

Equipment Type Number	Equipment Description	Part Number
DMA-37B DME Interrogator	<p>A microprocessor-based distance measuring equipment used to determine the slant-range distance as measured from the aircraft to a selected ground-based DME transponder. Derived distance information is made available for visual display to the pilot, and for use by an automatic flight control system.</p> <p>Design conforms to ARINC 809-8 and EUROCAE ED-54; digital guidance data output ports (binary digital distance, BCD digital distance, station identification and BCD channel selected) conforms to ARINC 429 format; two digital input ports for frequency/function select data input and source select capability operate in accordance with ARINC 429.</p> <p>In addition to the automatic self-test feature, the unit contains an operator-initiated self-test feature, located on the DMA-37B front panel, that provides a comprehensive test of all sections of the unit and operation of its outputs.</p> <p>Complies with DO-178B software requirements and enhanced BITE requirements of Airbus, Boeing, and McDonnell Douglas.</p> <p>Capable of interfacing CMC in accordance with ARINC 604.</p> <p>Capable of data recording and loading through the front of the unit.</p> <p>Meets D0-160C lightning protection and 200 ms power interrupt transparency requirements.</p> <p>Meets HIRF requirements and ICAO Annex 10 requirements.</p> <p>Valid station identification is output for the Ident channel only, BCD distance is output for all foreground channels (only the Display Channel is valid) and output label 035 has its sign status matrix (SSM) set to NORMAL in the standby mode.</p>	066-50013-0101
	<p>Same as -0101, except valid station identification is output for all foreground channels simultaneously (multichannel Ident), BCD distance is output only for the Display Channel (unless no Display Channel is selected) and output label 035 has its SSM set to no-computed-data (NCD) in the standby mode.</p> <p>Capable of interfacing CFDS in accordance with ARINC 604 and Airbus Industrie ABDO048C.</p>	066-50013-0202
	<p>Same as -0202 except capable of interfacing CFDS in accordance to McDonnell Douglas software requirements (replaces ABDO048C implementation).</p>	066-50013-0303
	<p>Same as the -0101 except upgraded to DO-160E configuration. Unit also upgraded with variable frequency capability with harmonic correction for input power. Front panel consists of easy to use LED fault and status indicators in place of LCD display.</p>	066-50013-1101
	<p>Same as the -0202 except upgraded to DO-160E configuration. Unit also upgraded with variable frequency capability with harmonic correction for input power. Front panel consists of easy-to-use LED fault and status indicators in place of LCD display. In addition, the ARINC 429 capability has been upgraded to have a burst mode capability.</p>	066-50013-1212

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

D. Equipment Required but Not Supplied

- (1) Table 2 lists equipment required for the RVA-36B VOR/Marker System, but not supplied by Honeywell.

Table 2. Equipment Required but Not Supplied

Equipment	Description
Power Source	AC power supply of 115 V, 400 Hz as defined by Radio Technical Commission for Aeronautics, Inc. (RTCA) D0-160C. The -1101 and 1212 are rated for DO-160E variable frequency operation with harmonic content correction.
NAV Control Panel	DME frequency automatically paired with NAV frequency. Must provide remote control of frequency selection in serial digital ARINC 429 format, power on-off, and self-test in ARINC 429 format.
Distance Indicator	A display which indicates distance to the selected DME ground station. Communication with DMA-37B is on an ARINC 429 data bus.
Audio Distribution System	Audio system with an input impedance of 200 to 10,000 ohms.
DME Antenna	L-Band, vertically polarized antenna capable of receiving DME signals over a frequency range of 962.00 MHz to 1213.00 MHz, and capable of transmitting DME signals over a frequency range of 1025 MHz to 1150 MHz.
4 MCU Unit Mount	Interrogator in the aircraft. Designed in accordance with ARINC 600. Mount connector will allow mating of DMA-37B low-insertion force, size 2, ARINC 600 connector with three inserts. The middle insert will be used for aircraft interconnections. The bottom insert will be used for input power. The middle insert is also used for coaxial antenna connections. Keying pins will be indexed to pin code 03.
Cooling Source	Aircraft supplied ARINC 600 forced-air cooling is required for the DMA-37B.
Cable and Connectors	Necessary connectors, power cables, RF cables, and aircraft interwiring are shown in DMA-37B DME System Interwiring Diagram, Figure 2006.

E. Configurations Available

- (1) Table 3 lists the available configurations of the DMA-37B and the features contained in each configuration. Table 4 contains a brief description of each feature.

Table 3. DMA-37B DME Interrogator Available Configurations

HPN	Features				
	Basic Unit	Fault Memory	Interface		
			Boeing CMC	Airbus CFDS	McDonnell Douglas CFDS
066-50013-0101	X	X	X		
066-50013-0202	X	X		X	
066-50013-0303	X	X			X
066-50013-1101	X	X	X		
066-50013-1212	X	X		X	

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 4. DMA-37B DME Interrogator Features

Feature	Description
Basic Unit	<p>A microprocessor-based distance measuring equipment used to determine the slant-range distance as measured from the aircraft to a selected ground-based DME transponder. Derived distance information is made available for visual display to the pilot, and for use by an automatic flight control system.</p> <p>Design conforms to ARINC 709-8 and EUROCAE ED-54; digital guidance data output ports (binary digital distance, BCD digital distance and BCD channel selected) conforms to ARINC 429 format; two digital input ports for frequency/function select data input and source select capability operate in accordance with ARINC 429.</p> <p>In addition to the automatic self-test feature, the unit contains an operator-initiated self-test feature, located on the DMA-37B front panel, that provides a comprehensive test of all sections of the unit and operation of its outputs.</p> <p>The -1101 and -1212 units feature LEDs. The other dash numbers have an LCD display.</p> <p>Complies with DO-178B software requirements and enhanced BITE requirements of Airbus, Boeing, and McDonnell Douglas.</p> <p>With the exclusion of -1101 and -1212 the remaining dash numbers are capable of data recording and loading through the front of the unit.</p> <p>Meets D0-160C lightning protection and 200 ms power interrupt transparency requirements. The -1101 and -1212 units are also rated for DO-160E operation.</p> <p>Meets HIRF requirements and ICAO Annex 10 requirements.</p>
Fault Memory	<p>A nonvolatile, single-chip fault memory that allows the recording of faults associated with a particular flight leg. Sixty-four flight legs are available with each flight leg made up of a flight-leg information header containing a fault record section for recording ten airborne faults and three ground faults. When all flight legs have been used, the oldest flight leg is reused.</p>
CMC Interface	<p>The DMA-37B interfaces fault memory and BITE data between DME Interrogator and line maintenance Centralized Maintenance Computer (CMC) for the purpose of extracting maintenance information and initiating tests. Designed to conform with ARINC 429 interfaces and ARINC 604.</p>
CFDS Interface	<p>The DMA-37B interfaces fault memory and BITE data between DME Interrogator and line maintenance Centralized Fault Display Interface Unit (CFDIU) for the purpose of extracting maintenance information and initiating tests. Designed to conform with ARINC 429 interfaces, ARINC 604 and Airbus Industrie ABDO048C or McDonnell Douglas software requirements</p>
Digital Morse Code	<p>Provides capability of receiving ground-facility digital Morse Code Ident signals and decoding them to ARINC 429 data word format for use on the DME Interrogator system ARINC 429 data output bus.</p>
Multichannel Ident	<p>Valid station identification is output for all foreground channels simultaneously, BCD distance is output only for the display channel (unless no display channel is selected), and output label 035 has its SSM set to NCD in standby mode; otherwise, without multichannel ident, valid station identification is output for the Ident channel only, BCD distance is output for all foreground channels (only the display channel is valid), and output label 035 has its SSM set to NORMAL in standby mode.</p>

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

2. System Leading Particulars

A. Unit Specifications

(1) Table 5 lists the leading particulars for the DMA-37B DME System.

Table 5. Leading Particulars

Characteristics	Description
General	
Power Requirements	115 V ac, 380 to 420 Hz, 22 W (-0101, -0202, and -0303 only) 115 V ac, 360 to 800 Hz, 25 W (-1101 and -1212 only)
Weight	9.8 lb (4,45 kg)
Dimensions	See Figure 2005.
Form Factor	ARINC 600 4 MCU
Cooling	ARINC 600 forced air
Temperature	
• Operating	-67 to +158 °F (-55 to +70 °C) for -0101, -0202, and -0303 only +5 to +158 °F (-15 to +70 °C) for -1101 and -1212 only
• Storage	-85 to +158 °F (-65 to +85 °C)
Humidity	Zero to 95% Relative Humidity
Warm-up period	Stable operation within one minute after application of power
Frequency Selection	Serial digital in accordance with ARINC 429
Range	Zero to 300 Nautical Miles
Altitude	50,000 feet above mean sea level
Velocity	Zero to 1000 Knots
Self Test	Continuous, automatic; Manual from discrete ARINC 429, CMC, or Front Panel
Integrity Monitoring	Continuous self-monitoring
Fault Reporting	ARINC 429 and ABD 0048B Centralized Maintenance Interfaces
Data Outputs	ARINC 429 Distance and CMC Interface
Certification	
• -0101, -0202, and -0303	TSO C66c DO-160C Environmental Category /A2D2/ZCA/MNB/XXXXXXAEAEZUZ/XXE2/XX ICAO Annex 10 FM Immunity DO-189, DO-178B
• -1101	TSO C66c DO-160E Environmental Category [(A2)(B2)V]BAB[SB]XXXXXXAA(WF)XA[R(WF)][ZW]RRRL[ZZZZ]XXAC ICAO Annex 10 FM Immunity DO-189, DO-178B

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 5. Leading Particulars (cont)

Characteristics	Description						
• -1212	TSO C66c DO-160E Environmental Category [(A2)(D2)Z]BAB[SB]XXXXXXAA(WF)HA[R(WF)][ZW]R[RR]L[ZZZZ]XXAC ICAO Annex 10 FM Immunity DO-189, DO-178B						
Transmitter							
Frequency Range	1025.00 MHz to 1150.00 MHz, 1MHz channel spacing						
Frequency Stability	± 80 kHz						
Power Output	700 Watts, Typical						
Pulse Code Spacing							
• X-Channel	12.0 ± 0.4 microseconds						
• Y-Channel	36.0 ± 0.4 microseconds						
Frequency Spectrum	90% of total pulse energy within ± 0.25 MHz of channel frequency						
Rise Time (maximum)	2.8 Microseconds (consistent with pulse spectrum)						
CW Leakage at Antenna Connector	-79 dBm maximum						
Antenna Mismatch	No damage to transmitter with antenna open or short circuit						
Receiver							
Frequency	962.00 MHz to 1213 MHz (252 Channels)						
Sensitivity	-90 dBm minimum lock-on level						
Selectivity	<table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: center;">Attenuation</th> <th style="text-align: center;">Bandwidth</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">Less than 6 dB</td> <td style="text-align: center;">95 kHz</td> </tr> <tr> <td style="text-align: center;">More than 50 dB</td> <td style="text-align: center;">±800 kHz</td> </tr> </tbody> </table>	Attenuation	Bandwidth	Less than 6 dB	95 kHz	More than 50 dB	±800 kHz
Attenuation	Bandwidth						
Less than 6 dB	95 kHz						
More than 50 dB	±800 kHz						
Dynamic Range	80 dB minimum						
Image Rejection	60 dB minimum						
CW Rejection	60 dB minimum						
Audio Output	Capable of 40 milliwatts minimum into a 200-ohm to 10,000 ohm resistive load with -87 dBm input signal level.						
Harmonic Distortion	Less than 15% with 1000 microvolts modulated 30% at 1000 Hz and less than 20% with 90% modulation for rated audio output into a 200-ohm to 600-ohm resistive load						
Audio Output Regulation	Less than 6-dB voltage change from a 25-milliwatt reference level into 200 ohms for resistive load variations of 200 ohms to 10,000 ohms Less than 0.31-dB voltage change from a 40-milliwatt level into 600-ohm reference for resistive load variations of 453 ohms to 2400 ohms.						

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 5. Leading Particulars (cont)

Characteristics	Description						
Audio Noise Level	Greater than 30 dB below audio reference level.						
Digital Range Output	Distance available in fractional binary format and BCD format in accordance with ARINC 709 and ARINC 429 standards.						
Warning Signals	Digital warning signals provided in accordance with ARINC 709 and ARINC 429 standards						
Distance Accuracy	<table border="0"> <tr> <td>Signal Level</td> <td>Accuracy</td> </tr> <tr> <td>Lock-on to -80 dBm</td> <td>0.2 NM</td> </tr> <tr> <td>Lock-on from -80 to -10 dB</td> <td>0.1 NM</td> </tr> </table>	Signal Level	Accuracy	Lock-on to -80 dBm	0.2 NM	Lock-on from -80 to -10 dB	0.1 NM
Signal Level	Accuracy						
Lock-on to -80 dBm	0.2 NM						
Lock-on from -80 to -10 dB	0.1 NM						

B. Environmental Certification (066-50013-0101, -0202, and -0303 only)

- (1) The DMA-37B DME Interrogator meets the environmental conditions of the Radio Technical Commission for Aeronautics (RTCA) document number D0-160C, Environmental Conditions and Test Procedures for Airline Electronic/Electrical Equipment and Instruments (refer to Table 6). The environmental certification categories of the DMA-37B are /A2D2/ZCA/MNB/XXXXXXAEAEZUZ/XXE2/XX (refer to Table 6).

Table 6. Environmental Certification (066-50013-0101, -0202, and -0303 only)

Test	Category
Temperature and Altitude	A2D2
In-Flight Loss of Cooling	Z
Temperature Variation	C
Humidity	A
Operational Shocks and Crash Safety	Operational Shock
Vibration	MNB
Explosion Proofness	X
Waterproofness	X
Fluids Susceptibility	X
Sand and Dust	X
Fungus Resistance	X
Salt Spray	X
Magnetic Effect	A
Power Input	E
Voltage Spike	A

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 6. Environmental Certification (066-50013-0101, -0202, and -0303 only) (cont)

Test	Category
Audio Frequency Conducted Susceptibility - Power Inputs	E
Induced Signal Susceptibility	Z
Radio Frequency Susceptibility (Radiated and Conducted)	U
Emission of Radio Frequency Energy	Z
Lightning-Induced Transient Susceptibility	XXE2
Lightning-Direct Effects	X
Icing	X

C. Environmental Certification (066-50013-1101 only)

- (1) The DMA-37B DME Interrogator meets environmental conditions of RTCA document number DO-160E In addition to several Boeing Specific requirements (refer to Table 7). The environmental certification categories for the -1101 DMA-37B DME Interrogator are [(A2)(B2)V]BAB[SB]XXXXXXAA(WF)XA[R(WF)][ZW]RRRL[ZZZZ]XXAC (refer to Table 7).

Table 7. Environmental Certification (066-50013-1101 only)

Test	Category
Ground Survival Low Temperature	A2
Short Term Operating Low Temperature	A2
Operating Low Temperature	A2
Ground Survival High Temperature	A2
Short Term Operating High Temperature	A2
Operating High Temperature	A2
In-Flight Loss of Cooling	V
Altitude	B2
Decompression	A2
Overpressure	A2
Temperature Variation	B
Humidity	A
Acceleration	X
Vibration Due to Fan Blade Loss (Windmilling)	X
Bench Handling Shock	X
Shipping Container	X
Operational Shock (Emergency Landing and Bird Strike)	B

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 7. Environmental Certification (066-50013-1101 only) (cont)

Test	Category
Vibration	S
Explosive Atmosphere	N/A
Waterproofness	N/A
Fluids Susceptibility	N/A
Sand and Dust	N/A
Fungus Resistance	N/A
Salt Fog	N/A
Magnetic Effect	A
Power Input	A(WF)
Voltage Spikes	A
Voltage Waveform - Individual Harmonic Content (AF Conducted Susceptibility)	R(WF)
AF Magnetic Field Susceptibility – Equipment	ZW
AF Magnetic Field Susceptibility – Wiring	ZW
AF Electric Field Susceptibility – Wiring	ZW
Spikes Induced into Interconnecting Cables	ZW
Radio Frequency Conducted Susceptibility	R
Radio Frequency Radiated Susceptibility	R
Certification HIRF Environment I by Direct Injection Method	X
AF Conducted Emissions, AF Capacitive Coupling	X
AF Conducted Emissions, AF Inductive Coupling	X
RF Conducted Emissions (Narrowband)	M
RF Conducted Emissions (Broadband)	X
RF Radiated Emissions (Narrowband)	M
RF Radiated Emissions (Broadband)	X
Lightning-Induced Transient Susceptibility, Pin Injected	ZZZZZ
Lightning-Induced Transient Susceptibility, Cable Injected	ZZZZZ
Lightning-Induced Transient Susceptibility, Ground Injected	ZZZZZ
Lightning-Induced Transient Susceptibility, Multiple Burst	X
Lightning Direct Effects	N/A
Icing	N/A
Electrostatic Discharge (ESD)	A
Fire, Flammability	C

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

D. Environmental Certification (066-50013-1212 only)

- (1) The DMA-37B DME Interrogator meets environmental conditions of RTCA document number DO-160E In addition to several Boeing Specific requirements (refer to Table 8). The environmental certification categories for the -1212 DMA-37B DME Interrogator are [(A2)(D2)Z]BAB[SB]XXXXXXAA(WF)HA[R(WF)][ZW]R[RR]L[ZZZZ]XXAC (refer to Table 8).

Table 8. Environmental Certification (066-50013-1212 only)

Test	Category
Temperature Test	A2
In-Flight Loss of Cooling	Z
Temperature Variation	B
Altitude Test	D2
Decompression Test	A2
Overpressure Test	A2
Humidity	A
Operational Shock And Crash Safety	B
Vibration	S
Vibration Due to Fan Blade Loss (Windmilling)	X
Vibration: Due to Landing Gear Tyre Burst	X
Explosive Atmosphere	X
Waterproofness	X
Fluids Susceptibility	X
Sand and Dust	X
Fungus Resistance	X
Salt Fog	X
Magnetic Effect	A
Power Input	A (WF)
Voltage Spike	A
Audio Frequency Conducted Susceptibility	R(WF)
AF Electric Field Susceptibility – Wiring	ZW
AF Magnetic Field Susceptibility – Wiring	ZW
AF Magnetic Field Susceptibility – Equipment	ZW
Spikes Induced into Interconnecting Cables	ZW
Radio Frequency Conducted Susceptibility	R
Radio Frequency Radiated Susceptibility	R

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 8. Environmental Certification (066-50013-1212 only) (cont)

Test	Category
RF Conducted Emissions (Narrowband)	L
RF Radiated Emissions (Narrowband)	L
Lightning-Induced Transient Susceptibility, Pin Injected	ZZZZZ
Lightning-Induced Transient Susceptibility, Multiple Pulse (Burst)	ZZZZZ
Lightning-Induced Transient Susceptibility, Multiple Stroke	ZZZZZ
Lightning Direct Effects	X
Icing	X
ESD Susceptibility	A
Fire, Flammability	C

3. System Description

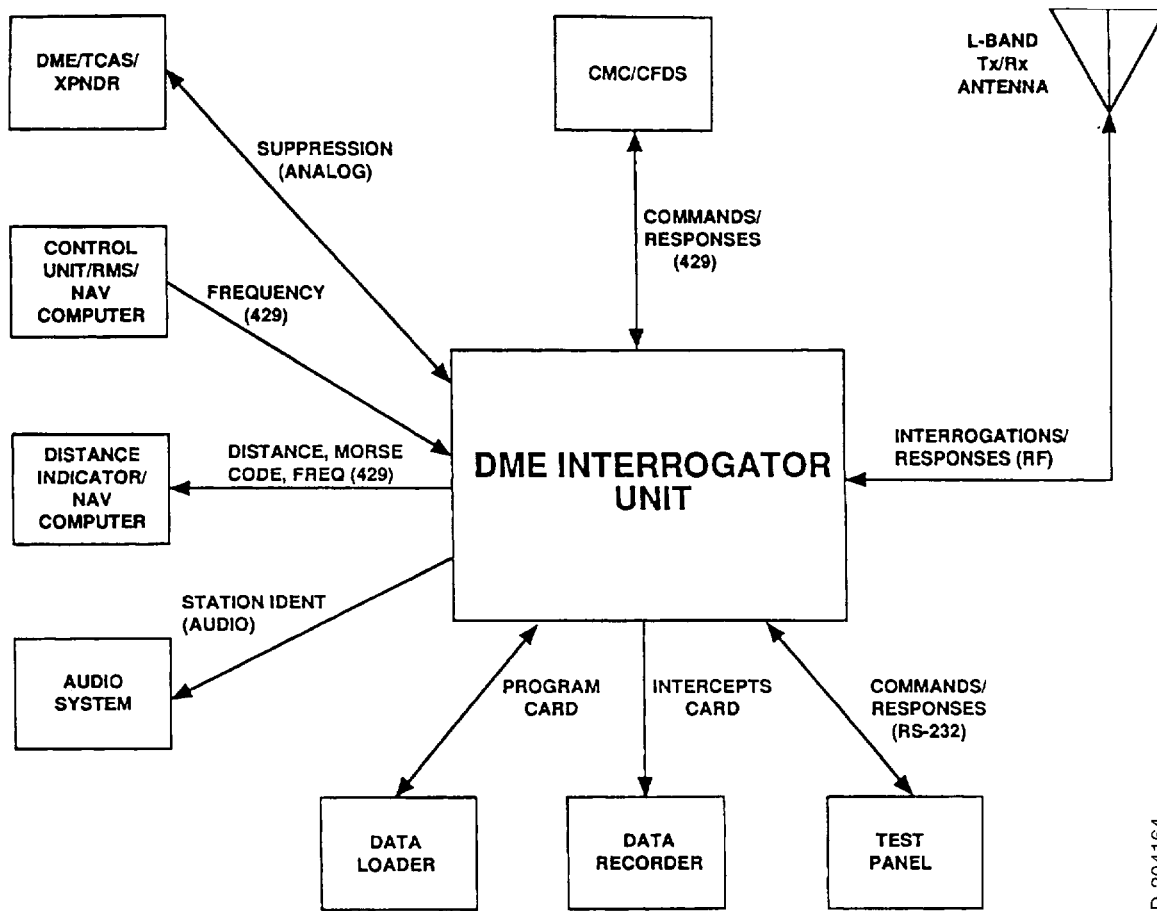
A. General

- (1) The DMA-37B DME System is an airborne distance measuring system which determines the slant-range distance from an aircraft to a selected ground based DME transponder (see Figure 3). The DMA-37B DME Interrogator transmits a pulse-pair signal on any one of 126 frequencies within the range of 1025 MHz to 1150 MHz. One hundred of the DMA-37B transmit frequencies are automatically selected by tuning the NAV control to a frequency between 108.00 and 117.95 MHz. The other 26 frequencies can be selected by tuning the NAV control to frequencies between 133.30 and 135.95 MHz, these channels are normally used for military TACAN stations. The data loader and data recorder capability in Figure 3 are used in the -0101, -0202, -0303 only
- (2) The signals transmitted by the airborne DMA-37B are received by the ground station assigned to the selected channel frequency. After a built-in delay of 50 microseconds, a reply pulse-pair is automatically transmitted on the channel frequency assigned to the ground station. There are 252 channels within the frequency band of 962 to 1213 MHz set aside for DME ground stations.
- (3) The DMA-37B receives the response to the interrogations and processes these signals to determine the precise amount of time that has elapsed between transmission of a pulse pair and reception of the response. The DMA-37B computes the slant-range distance by subtracting the 50 microsecond delay and dividing the result by 12.359 microseconds (time required for DME signal to travel to and return from a DME ground station that is one mile away). The distance is computed every time a pulse pair response is received from the ground station.
- (4) An operator initiated self-test feature is also included in the DMA-37B. The self-test is initiated by pressing the TEST pushbutton on the front panel of the DMA-37B. There are one or more additional means of initiating the self test; these switches can be located on the DME tuning source, DME indicator, or an EFIS (electronic flight instrument system) indicator.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System



ID-204164

Figure 3. DMA-37B DME System

- (5) An automatic self-test feature is also built into the DMA-37B. This test is controlled by the microprocessor program. Approximately once every 1.5 seconds the program automatically instructs the unit to go into self test. The results of the test are monitored and compared against information stored in memory. If any results of the test indicate a malfunction, a DME invalid flag is generated and routed to DME distance users through the ARINC 429 output.
- (6) The DME ground station transmits a station-identification signal along with the other data. The DMA-37B detects the station-identification signal and applies it to the aircraft audio system.
- (7) The DMA-37B generates a suppression pulse for internal use and also makes the pulse available at the rear connector of the unit. The pulse can be used to suppress other receivers when DME interrogation pulses are being transmitted. The DMA-37B can also receive suppression pulses from external equipment on the mutual suppression line.

4. System Component Description

A. DMA-37B DME Interrogator

- (1) The DMA-37B DME Interrogator is packaged in an ARINC 600 Characteristic, 4 MCU standard form factor case. It contains the electronics required to transmit and receive the pulse modulated L-band signal required by the ground station transponder and to interface with the aircraft systems.
- (2) The basic -0101, -0202, and -0303 DMA-37B consists of a RF module, a synthesizer/modulator module, a video processor module, CPU-I/O module, power supply assembly, HIRF/rear interconnect assembly, front panel assembly, and memory card interface module (see Figure 4).
- (3) The basic -1101 and -1212 DMA-37B consists of a RF assembly, an integrated video main processor assembly, a variable frequency power factor corrected power supply assembly, a rear interconnect assembly containing lightning protection, and a front panel assembly (see Figure 4).
- (4) The DMA-37B uses a low insertion force, size two shell, ARINC 600 rear panel connector with three inserts. The top insert is not used. The middle insert is used for aircraft interconnections and coaxial antenna connector, and the bottom insert is used for input power and suppression coaxial connectors. The keying pins are set to index pin code 03.
- (5) Forced air cooling, in accordance with ARINC specification 600, is required for cooling the DMA-37B.
- (6) Data interfaces to the aircraft systems are through slow-speed ARINC 429 ports.
- (7) A variety of discrete and strap pins provide additional information to and from the DME.
- (8) The -0101, -0202, and -0303 front panel display provides an interface to an operator with a liquid crystal display (LCD) that is visible from the front of the DMA-37B to display messages in simple language in one of four modes: normal operation, BITE display, maintenance, and software loading.
- (9) Software loading and data recording to/from the CPU is through the front panel Personal Computer Memory Card International Association (PCMCIA) slot. Intel Series 2 Flash Cards with capabilities ranging from 1, 2, or 4 megabytes are supported.
- (10) Intel Series 2 Flash Cards with capabilities ranging from 4, 10, and 20 megabytes (up to 64 megabytes, when available) are also supported.
- (11) Two pushbutton switches allow operator interface with the DMA-37B LCD.
- (12) In normal operation, the front panel LCD displays the unit's characteristics: unit identification, part number, and serial number (-0101, -0202, and -0303 only). The BITE display mode is activated after manual self-test has been exercised either from the front panel test pushbutton or remotely. In the BITE mode, BITE status is reported and, in the event of a detected failure, additional help screens are provided to locate the detected failure to a module. BITE help pages are provided. In the maintenance mode, a set of maintenance words are displayed and decoded showing the names of data fields and the value of the data. Maintenance help pages are provided. For loading software, a series of screens direct the operator during the data loading process. Software version and loading status are provided during the update process.
- (13) The -1101 and -1212 front panel assembly consists of three easy to see LED indicators that display the status of the unit.

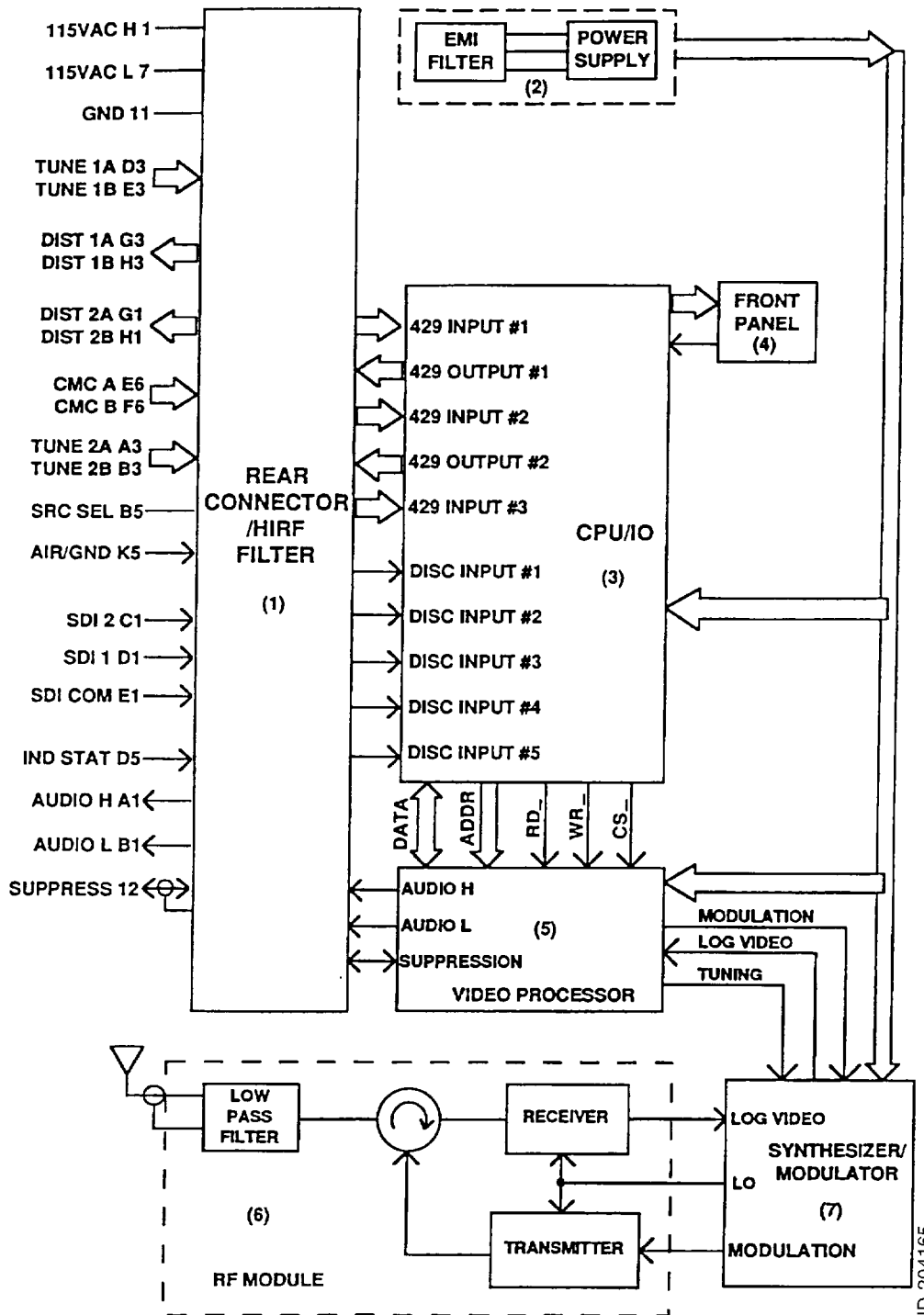
B. Other Components in the System

- (1) Other DMA-37B DME System components are not supplied by Honeywell. Information on these units must be obtained from their respective manufacturers.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System



NOTE: In the -1101 and -1212 units, the synthesizer modulator is included in the RF module. In addition, the video processor module is included in the CPU/IO module.

Figure 4. DMA-37B DME Interrogator Simplified Block Diagram

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

5. Operation

A. General

- (1) The DMA-37B DME Interrogator transmits a pair of pulses through the antenna on one frequency and waits for a ground station reply on a frequency offset by 63 MHz. The ground station replies to this interrogation 50 microseconds later, somewhat like a delayed radar reflection.
- (2) The 50-microsecond delay allows completion of the interrogation. If not delayed at close ranges, the returned signal would come back to the receiver before the transmitted pulses have left the aircraft antenna. When a DME unit measures 50 microseconds from transmit time until the beginning of the received pulse, the aircraft is at 0.0 mile range.
- (3) Like radar, the unit calculates the distance from the station based on speed of the transmitted pulses through the air, divided by time. Speed of signal propagation equals one nautical mile per 12.369 microseconds.
- (4) Each DME unit must distinguish its own pulse return from other DME returns or squitters (unsolicited replies emitted by the ground station). To do this, reply/squitter distances from multiple interrogations are saved and compared to determine actual reply distance to the ground station. The DME is capable of simultaneously maintaining track of up to five different ground stations that are tuned by a Flight Management System.

B. Basic Theory

- (1) RF Module
 - (a) This module consists of a single PC board that is mounted in a closed aluminum chassis. It contains the transmitter, receiver, circulator and a low-pass filter.
 - (b) The solid-state transmitter contains a six-stage amplifier followed by a 700 W (typical) final amplifier. The pulse modulation is applied to the first six stages of amplification. It is tuned to frequencies in the range 1025 to 1150 MHz.
 - (c) The single-conversion superheterodyne receiver consists of a varactor tuned preselector, 1-GHz preamplifier, mixer, SAW band-pass filters, and a 63-MHz logarithmic IF amplifier. The preselector is tuned to frequencies in the 962 to 1213 MHz range.
 - (d) The circulator routes the transmitter output to the antenna and the antenna received signal to the receiver. It provides isolation to protect the transmitter output amplifier devices from reflected signals due to high VSWR conditions.
 - (e) The low-pass filter prevents internal transmitter harmonics from being passed to the antenna.
- (2) Synthesizer/Modulator Assembly

NOTE: On the -1101 and -1212 units, the synthesizer/modulator assembly has been combined into the RF assembly.

 - (a) This module contains the digital frequency synthesizer and transmitter modulator circuits.
 - (b) The digital frequency synthesizer supplies an RF signal used both as the local oscillator input to the receiver mixer and as the low-level CW signal into the transmitter. This circuit consists of a phase-locked loop and VCO which is tuned to the desired channel frequency by a serial tuning word supplied by the video processor module.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

(c) The modulator supplies the on/off signal that corresponds to the X or Y pulse pairs associated with the channel frequency. An interrogation is transmitted by triggering the series of on/off modulation to control the transmitter amplifier stages that drive the final amplifier.

(3) Main Processor (CPU and I/O) Assembly

NOTE: On the -1101 and -1212, units the the main processor function and video processor function have been combined on one module.

- (a) This module contains the CPU that executes the signal processing using an 80486SX microprocessor.
- (b) It also contains the I/O section consisting of ARINC 429 transmitters and receivers, and discrete I/O logic to provide the interfaces with other aircraft systems, including the Central Maintenance Computer (CMC) and displays.
- (c) ARINC 429 inputs and outputs are processed by a specially designed ARINC 429 LSI transceiver device. External level converters are used to satisfy the ARINC 429 characteristics for the transmitters and convert input ARINC 429 signals to logic levels.
- (d) All discrete inputs and outputs external to the DME are processed by discrete components to provide level shifting and latching.
- (e) The following types of devices are employed:
 - Digital-to-analog converter devices to generate control and test signals
 - Field Programmable Logic Array (FPLA) devices to accept, decode and generate discrete signals
 - Memory devices (bootstrap, program, nonvolatile, and data)
 - Data recorder interface
 - Front panel display driver
 - RS-232 interface
 - Clock generators.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

(4) Video Processor

- (a) This module contains a field programmable gate array (FPGA) which is the control center for the video processor. The video processor provides the following operations:
- Converts tuning commands from CPU to serial data to tune the transmit/receive frequency synthesizer
 - Generates the corresponding receiver preselector tuning voltage
 - Generates the corresponding X or Y pulse modulation for the interrogation
 - Generates the output mutual suppression pulse for an interrogation
 - Detects the input mutual suppression pulse and inhibits reception and video processing
 - Determines the log IF noise threshold setting
 - Starts the range (distance) counter when an interrogation is transmitted
 - Digitizes the video signals from the receiver log IF amplifier
 - Validates the amplitude, spacing, and width of the digitized video pulse pairs
 - Stores the range counter value in a FIFO when each valid pulse pair is decoded
 - Analog-to-digital converter devices to process the received signals and BITE test point voltages
 - Generates the audio tone for the Morse code station identity aural output
 - Provides for integrity testing.

(5) Power Supply Assembly

- (a) This module is a self-contained, high-efficiency power supply that converts the 115 V ac, 400 Hz AC power into the required DC operating voltages. It includes an EMI filter to reduce electromagnetic interference from being radiated from the power lines.
- (b) The power supply for the -1101 and -1212 units can operate in accordance with the DO-160E VF 360 Hz to 800 Hz mode and has harmonic content (power factor) correction.

(6) HIRF/Rear Interconnect

- (a) The rear connector assembly provides the interwiring from the aircraft interface to the internal modules. A combination of series resistors, transorb devices, and ferrite pin filters provide HIRF and lightning protection.
- (b) For the -0101, -0202, and -0303 units only, to prevent High Intensity Radiation Fields (HIRF) or lightning from affecting operation by entering through rear connector cables, an HIRF compartment is formed in the rear of the DMA-37B. The signal and power cables are filtered by using discrete and distributed filter elements and limiting devices on the rear interconnect module located inside this HIRF compartment. The filtered lines are then fed to the appropriate points in the DMA-37B. The DMA-37B is packaged in an aluminum casting. This seamless main frame ensures HIRF cannot enter the unit through structural seams. The slots formed by the removable side covers are sealed against HIRF with protective gaskets and metal covers.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

- (7) Front Panel Display Module, -0101, -0202, and -0303 Only
- (a) The front panel display module is mounted behind the front panel and provides an interface to an operator through a low-power liquid crystal display (LCD) that is visible from the front of the DMA-37B. In addition to the LCD, the module contains Light Pipe back lighting, temperature compensation circuitry, and a PC board containing an associated LCD driver, two pushbutton switches used to enter functional test and to control the display menus, and a D-sub, nine-pin, RS-232 serial type connector.
 - (b) The RS-232 front panel connector is used for testing the DMA-37B through a compatible test set or test panel.
 - (c) The LCD is a bit-mapped display capable of displaying alphanumeric and graphical symbols. Simple messages written in plain language minimize the potential for misunderstanding or incorrect interpretation. The LCD displays the following:
 - Part Number/Software Identification
 - Status
 - Results of Level i BITE Tests
 - Maintenance Help Pages
 - Shop Maintenance Data
 - Flight Fault Memory Contents
 - Software Loading Status
 - Capable of Customizing for Airline Unique Maintenance Messages.
 - (d) The memory card interface module is used to load software program data into the CPU or record data from the CPU. The memory card interface module supports Series 2 FLASH cards through the front panel Personal Computer Memory Card International Association (PCMCIA) slot. Intel Series 2 cards with capabilities ranging from 4, 10, and 20 megabytes (up to 64 megabytes, when available) are all supported. The FLASH card is inserted through the front panel. In one mode, data stored on the flash card memory module is used to update program or data memory in the DME Interrogator. In another mode, the flash card memory module functions as a data recorder for the software program stored in the CPU.
- (8) Front Panel Display Module, -1101 and -1212 Only
- (a) The front panel display module for the -1101 and -1212 units contain LEDs to indicate unit operational status and a push button to initiate self test. In addition there is a 25 pin D connector for a sperate tester interface.
- (9) Memory Card Interface Module, -0101, -0202, and -0303 Only
- (a) The memory card interface module is used to load software program data into the CPU or record data from the CPU. The memory card interface module supports Series 2 FLASH cards through the front panel Personal Computer Memory Card International Association (PCMCIA) slot. Intel Series 2 cards with capabilities ranging from 4, 10, and 20 megabytes (up to 64 megabytes, when available) are all supported. The FLASH card is inserted through the front panel. In one mode, data stored on the flash card memory module is used to update program or data memory in the DME Interrogator. In another mode, the flash card memory module functions as a data recorder for the software program stored in the CPU.

Honeywell

MAINTENANCE MANUAL

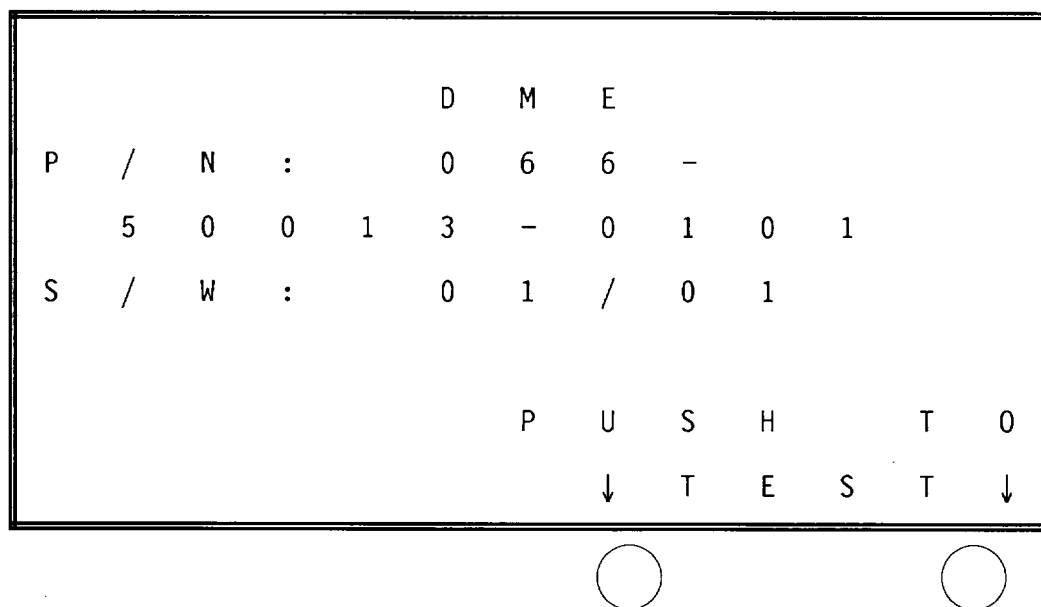
DMA-37B DME System

FAULT ISOLATION

1. General

A. Description for -0101, -0202, and -0303 Only

- (1) Fault isolation is the process of isolating the source of a system failure to an LRU (line replaceable unit) or to the aircraft wiring.
- (2) For the -1101 and -1212 units, the front panel display indicates the status of the unit. The top LED shows the internal status and shows RED with an internal fault. The center LED is normally off and when displaying RED indicates an external failure with either the ARINC 429 inputs or unit strapping. The bottom LED shows RED if there is a problem with the antenna connection. A separate connector on the units can be used with an adapter to show the indications and functionality described below with the LCD functions. The LEDs show amber during the self test function described in the following procedure.
- (3) Fault isolation in the DMA-37B DME System includes a continuity check of the interwiring, and the assurance that proper installation techniques and procedures have been followed.
- (4) A functional self test of the LRU can be initiated by pressing the test key pushbutton switch as designated on the front panel LCD, see Figure 1001. Although the normal-mode screen indicates that this actuated from the right key, the left key has the same function if pressed while the DMA-37B is in its normal mode.
- (5) A complete functional test of the system can be performed as described in the MAINTENANCE PRACTICES section of this manual.
- (6) Figure 1002 illustrates the control flow of the LCD screens (except for the data loading and data recording screens).



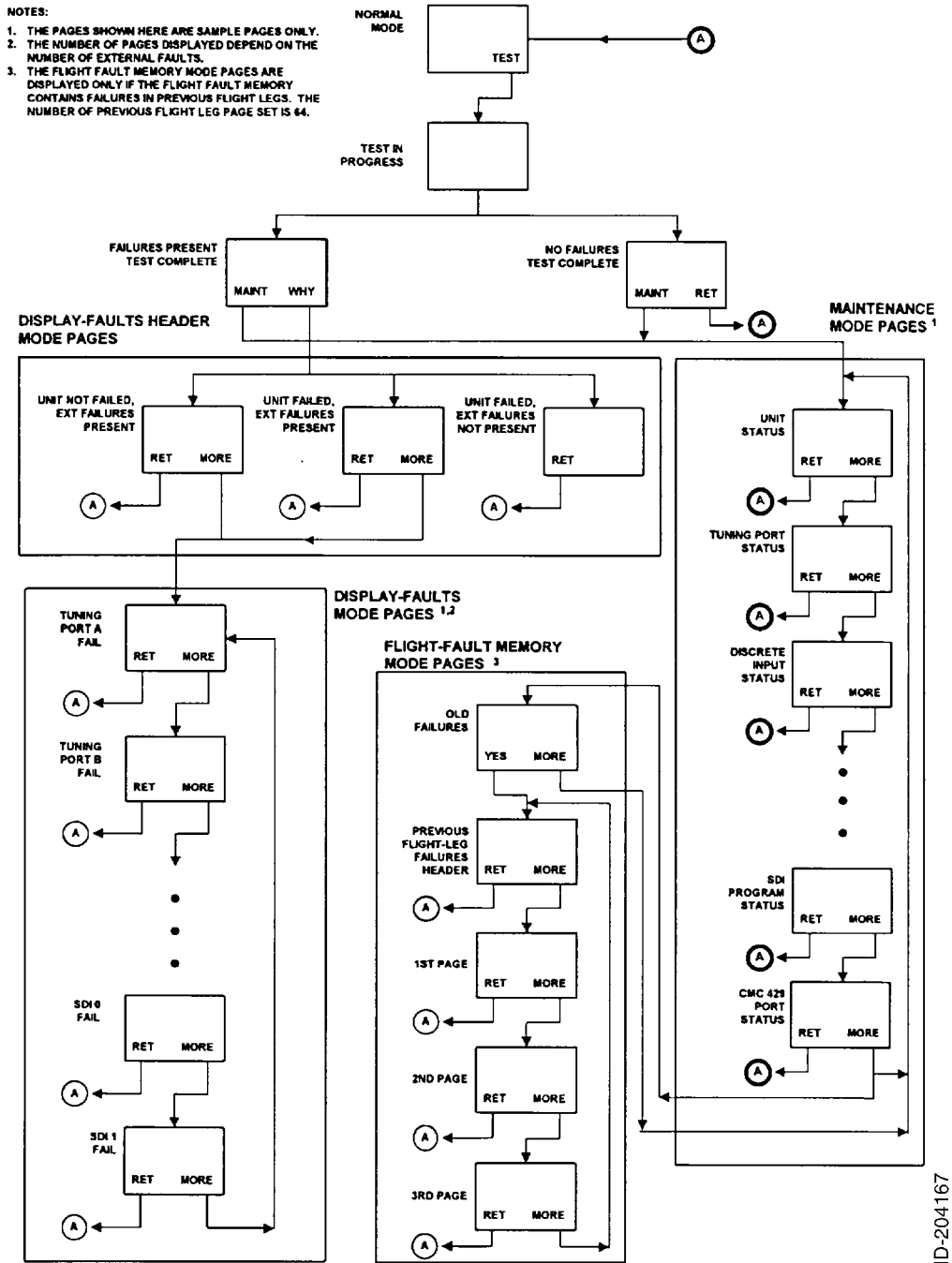
ID-204166

Figure 1001. Typical Normal Mode Screen

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System



ID-204167

Figure 1002. LCD Control Flow

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

B. Self-Test Mode for -0101, -0202, and -0303 Only

- (1) The self-test mode starts by displaying the Test in Progress screen, see Figure 1003, one second after pressing the test key. This is displayed for four seconds with a moving thermometer along the bottom of the LCD indicating the progress of the test from one to five seconds.

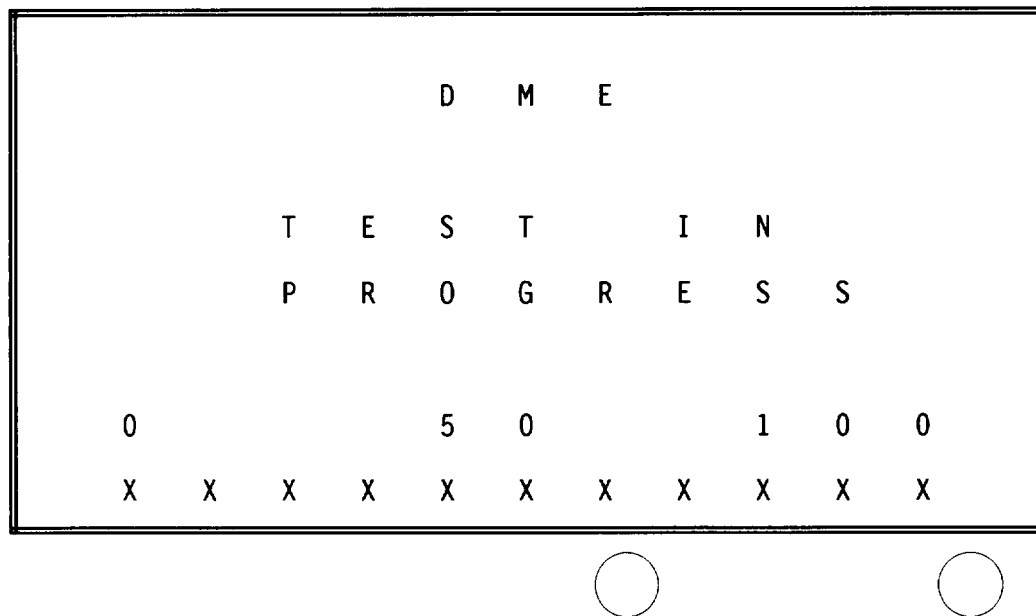


Figure 1003. Test in Progress Screen

- (2) The Normal Mode screen (Figure 1001) is displayed for the first second of the test sequence.
- (3) Once complete, the Test Complete, No Failures screen is displayed (Figure 1004), or the Test Complete, Failures screen is displayed (Figure 1005). Both screens contain two key selections each: MAINT and RETURN or MAINT and WHY?, respectively.
 - **MAINT** For both screens, MAINT is located on the left key. This allows the initiation of the extended maintenance pages of the system for troubleshooting. Refer to Paragraph D.
 - **RETURN** In the Test Complete, No Failures screen, the RETURN key to the right returns the system to its normal mode screen (Figure 1001).
 - **WHY?** In the Test Complete, Failures screen, the WHY? key to the right puts the system into the display-failures mode where individual system failures are displayed one on each page. Refer to Paragraph C.
- (4) While in the self-test mode, not pressing either key for five minutes causes the system to return to the Normal Mode screen (Figure 1001).

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

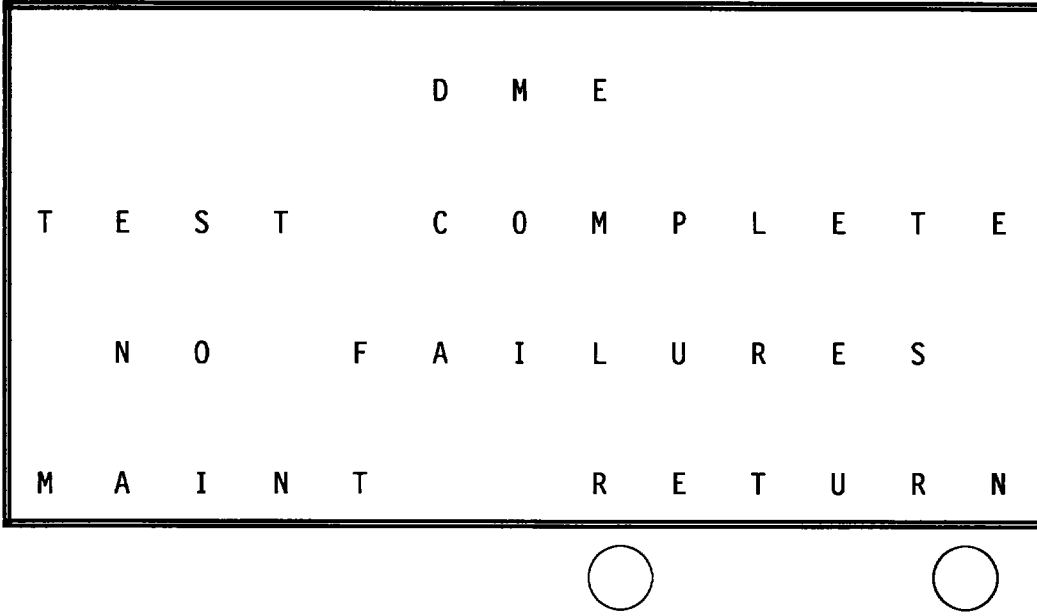


Figure 1004. Test Complete, No Failures Screen

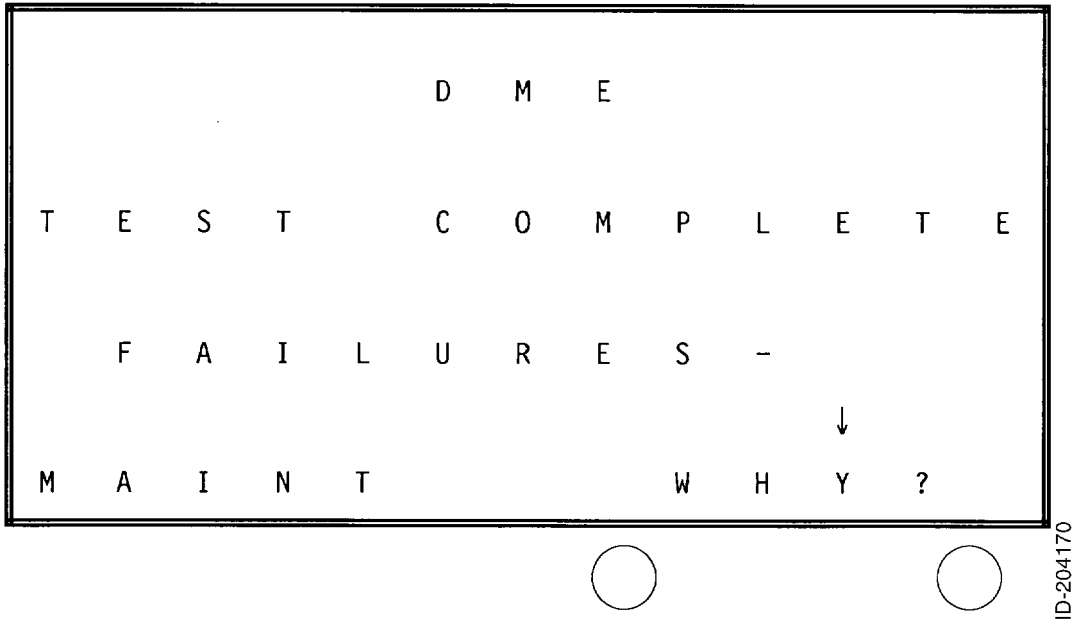


Figure 1005. Test Complete, Failures Screen

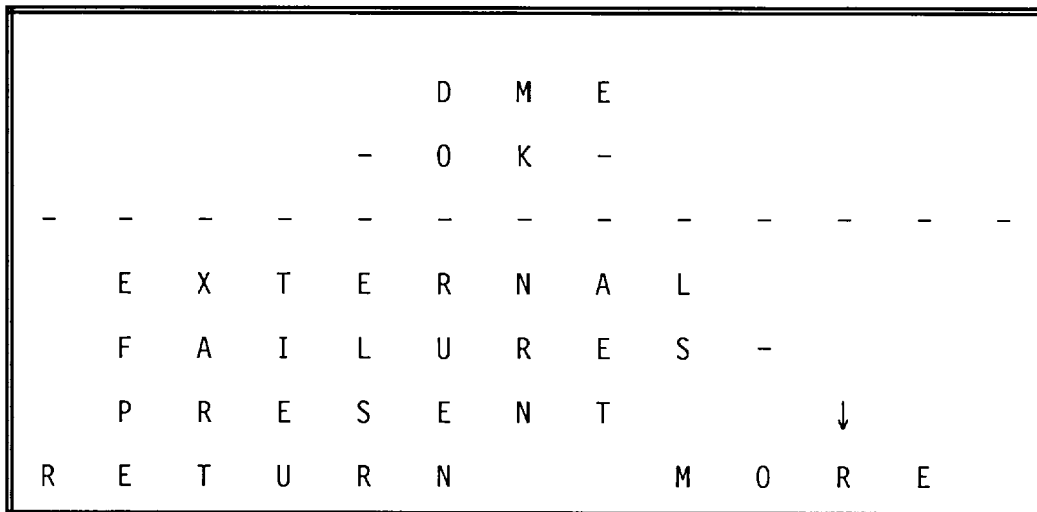
Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

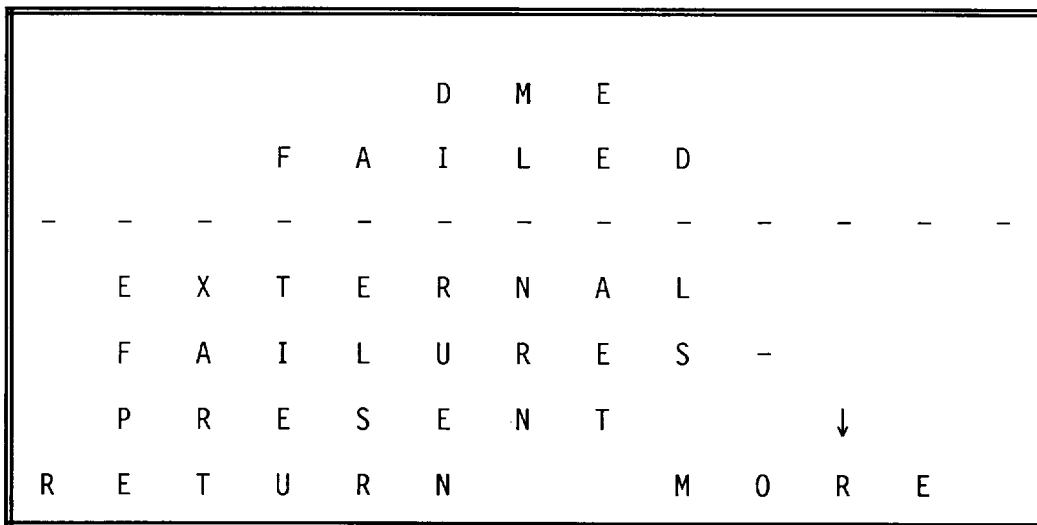
C. Display-Failures Mode for -0101, -0202, and -0303 Only

- (1) One of three failure possibilities exist: the DMA-37B is okay, but there are external failures (Figure 1006), the DMA-37B failed and there are external failures (Figure 1007), and the DMA-37B failed, but there are no external failures (Figure 1008).



ID-204171

Figure 1006. DME Receiver OK, External Failures Present Screen



ID-204172

Figure 1007. DME Receiver Failed, External Failures Also Present Screen

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

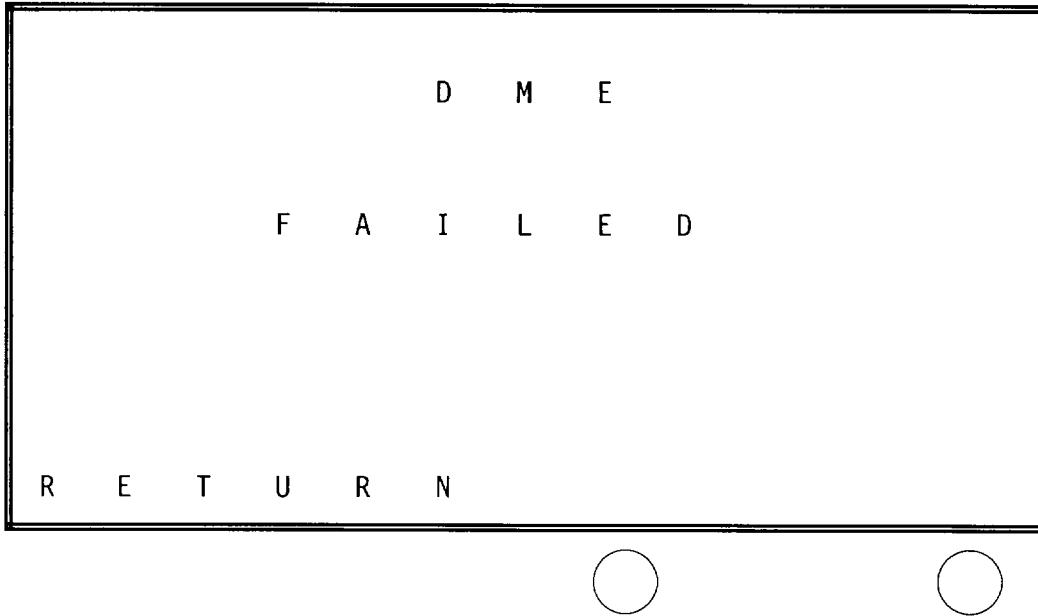


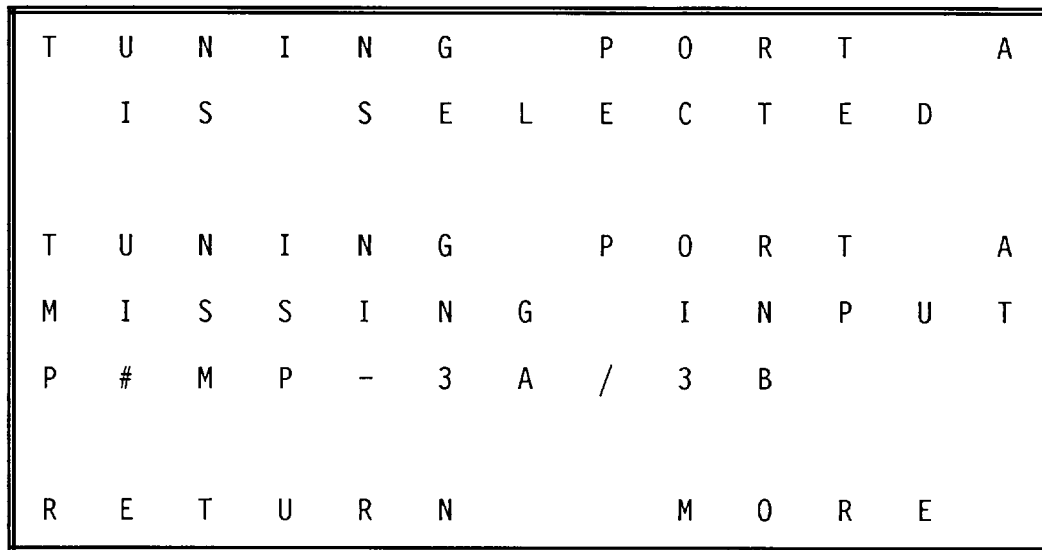
Figure 1008. DME Receiver Failed, External Failures Not Present Screen

- (2) All Display-Failures Mode screens have the MORE selection on the right key. The only exception is when there is only one failure page. This only happens when the DMA-37B itself has failed and no other external failure exists Figure 1008).
 - MORE Pressing this key cycles through all of the failures present. When on the last page, the MORE key causes a return to the first displayed failure page (Figure 1006 or Figure 1007).
- (3) All Display-Failures Mode screens have the RETURN selection on the left key.
 - RETURN Pressing this key causes the system to return to the Normal Mode screen (Figure 1001).
- (4) While in the display-failures mode, not pressing either key for five minutes causes the system to return to the Normal Mode screen (Figure 1001).
- (5) Figure 1009 thru Figure 1014 show typical display-failure modes that can be encountered.

Honeywell

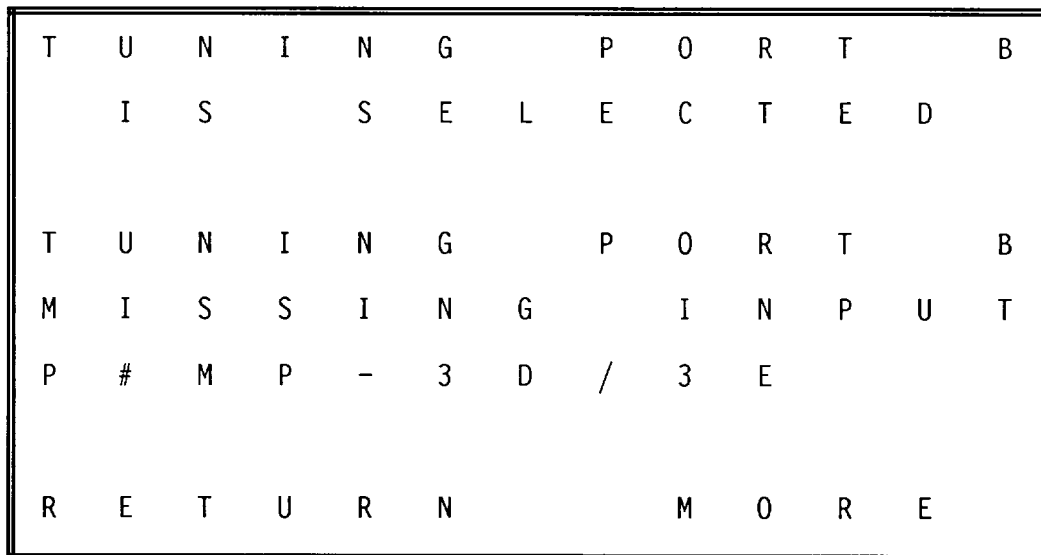
MAINTENANCE MANUAL

DMA-37B DME System



ID-204174

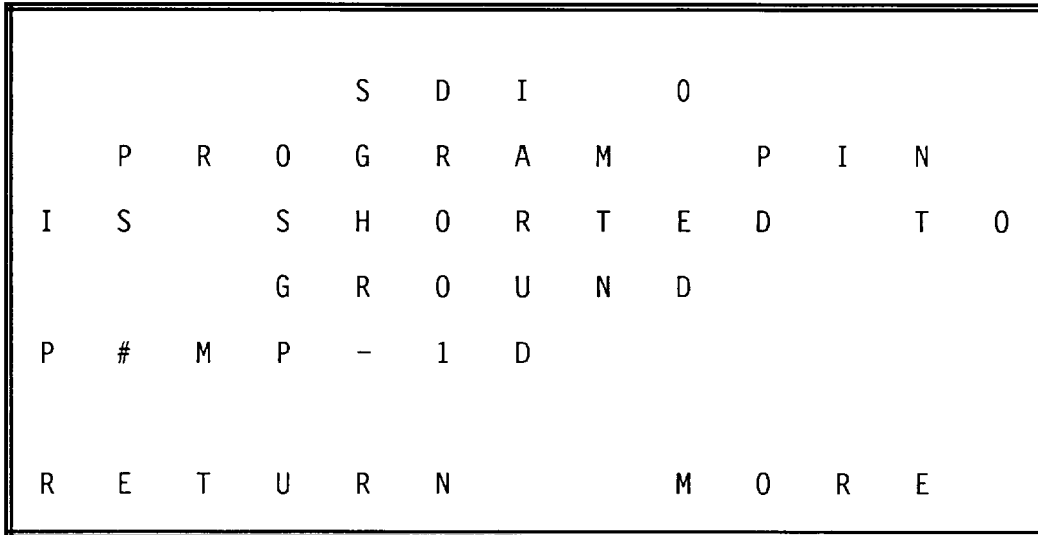
Figure 1009. Tuning Port A Failure Screen



ID-204175

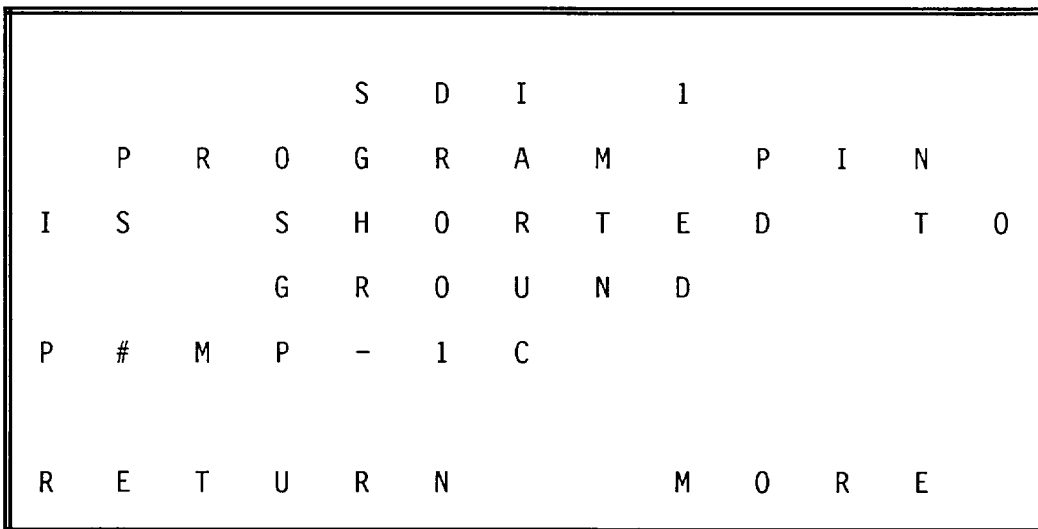
Figure 1010. Tuning Port B Failure Screen

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System



ID-204176

Figure 1011. SDI 0 Program Pin Failure Screen



ID-204177

Figure 1012. SDI 1 Program Pin Failure Screen

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

			A	N	T	E	N	N	A			
M	O	N	I	T	O	R		E	N	B	L	E
		P	R	O	G	R	A	M		P	I	N
I	S		S	H	O	R	T	E	D		T	O
			G	R	O	U	N	D				
P	#	M	P	-	6	H						
R	E	T	U	R	N				M	O	R	E



ID-204178

Figure 1013. Antenna Monitor Program Pin Failure Screen

		C	M	C		P	O	R	T			
M	I	S	S	I	N	G		I	N	P	U	T
P	#	M	P	-	6	E	/	6	F			
R	E	T	U	R	N				M	O	R	E

ID-204179

Figure 1014. CMC Port Failure Screen

Honeywell

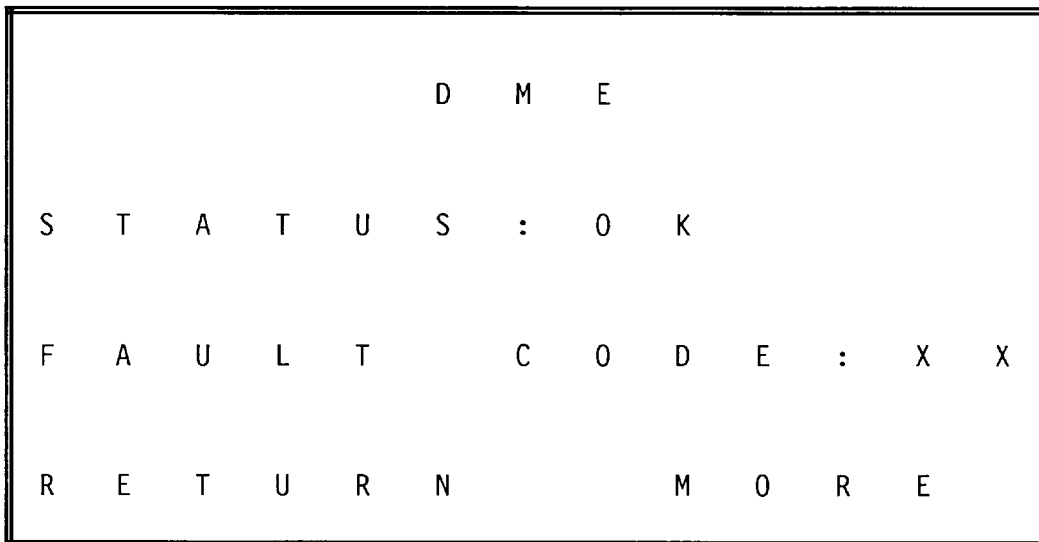
MAINTENANCE MANUAL

DMA-37B DME System

D. Maintenance Mode for -0101, -0202, and -0303 Only

- (1) The maintenance mode is entered from either one of the two Test Complete screens (Figure 1004 or Figure 1005). The maintenance mode allows troubleshooting of all components of the DMA-37B DME System, both internal and external.
- (2) All pages have the MORE selection on the right key.
 - MORE Pressing this key cycles through all of the maintenance pages. When on the last page, the MORE key causes a return to the first displayed maintenance screen.
- (3) All pages have the RETURN selection on the left key.
 - RETURN Pressing this key causes the system to return to the Normal Mode screen (Figure 1001).
- (4) There is no timeout in the maintenance mode when the aircraft is on the ground. But, while in the air, not pressing a key for five minutes causes the system to return to the Normal Mode screen (Figure 1001).
- (5) Figure 1015 thru Figure 1021 show typical maintenance-mode pages that can be encountered.
- (6) In Figure 1016, row one, PORT X will be either PORT A or PORT B. Lines 2 thru 7 display the status of up to six tuning words by showing the contents of their SSM, Mode, Ident, Display, and Frequency fields. Mode 0 thru 5 frequencies are displayed if a Mode 0 (standby) frequency is being received. If the DMA-37B is not in standby, then Mode 1 thru 6 frequencies will be displayed. Column six displays either I, D, or B, when the Ident bit is on, when the Display is on, and when both Ident and Display bits are on, respectively. If the selected port does not meet the minimum total update rate check for Default Mode then all fields display X.

NOTE: The Status field displays FAILED if either an external or an internal failure is detected.



ID-204180

Figure 1015. DME Receiver Status (OK, FAILED) Screen

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

T	U	N	I	N	G	P	O	R	T	X	
T	S	T		0		1	1	7	.	4	0
N	M	L		5	I	1	1	5	.	6	5
N	M	L		1	D	1	1	0	.	1	0
N	C	D		3		1	3	3	.	3	0
N	C	D		4		1	1	7	.	9	0
N	M	L		6		1	3	4	.	0	5
R	E	T	U	R	N			M	O	R	E



ID-204181

Figure 1016. Tuning Port Status (NML, TST, NCD, NODA) Screen

	D	I	S	C	R	E	T	E	S		1	
S	C	A	N		I	N	H	:	O	P	E	N
P	#	M	P	-	5	A						
A	I	R	/	G	R	N	D	:	G	R	N	D
P	#	M	P	-	5	K						
P	O	R	T		S	E	L	:	O	P	E	N
P	#	M	P	-	5	B						
R	E	T	U	R	N			M	O	R	E	



ID-204182

Figure 1017. Discrete Input Status Page 1 (OPEN, GRND) Screen

Honeywell
MAINTENANCE MANUAL
 DMA-37B DME System

D	I	S	C	R	E	T	E	S		2		
F	C	T		T	E	S	T	:	O	P	E	N
P	#	M	P	-	5	C						
I	N	D		1		S	T	:	O	P	E	N
P	#	M	P	-	5	D						
I	N	D		2		S	T	:	O	P	E	N
P	#	M	P	-	5	E						
R	E	T	U	R	N				M	O	R	E



ID-204183

Figure 1018. Discrete Input Status Page 2 (OPEN, GRND) Screen

S	D	I		P	R	O	G		P	I	N	S
S	D	I		0				:	O	P	E	N
P	#	M	P	-	1	D						
S	D	I		1				:	C	O	M	M
P	#	M	P	-	1	C						
C	O	M	M	:	P	#	M	P	-	1	E	
R	E	T	U	R	N				M	O	R	E



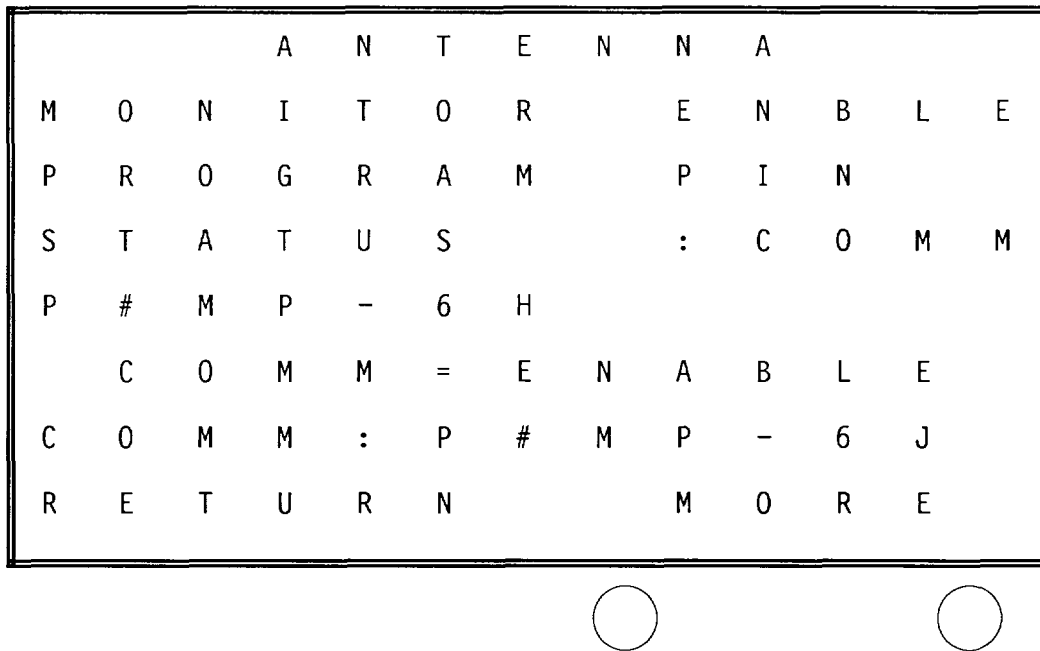
ID-204184

Figure 1019. SDI Program Pin Status Page (OPEN, COMM) Screen

Honeywell

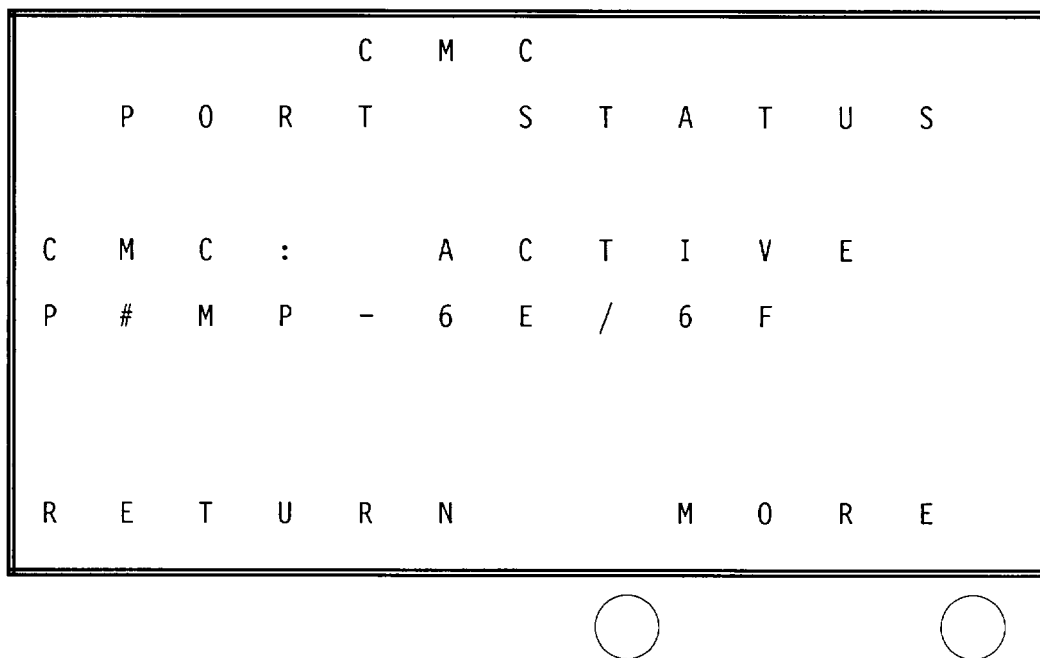
MAINTENANCE MANUAL

DMA-37B DME System



ID-204185

Figure 1020. Antenna Monitor Program Pin Status Page (OPEN, COMM) Screen



ID-204186

Figure 1021. CMC Port Status (ACTIVE, INACTIVE) Screen

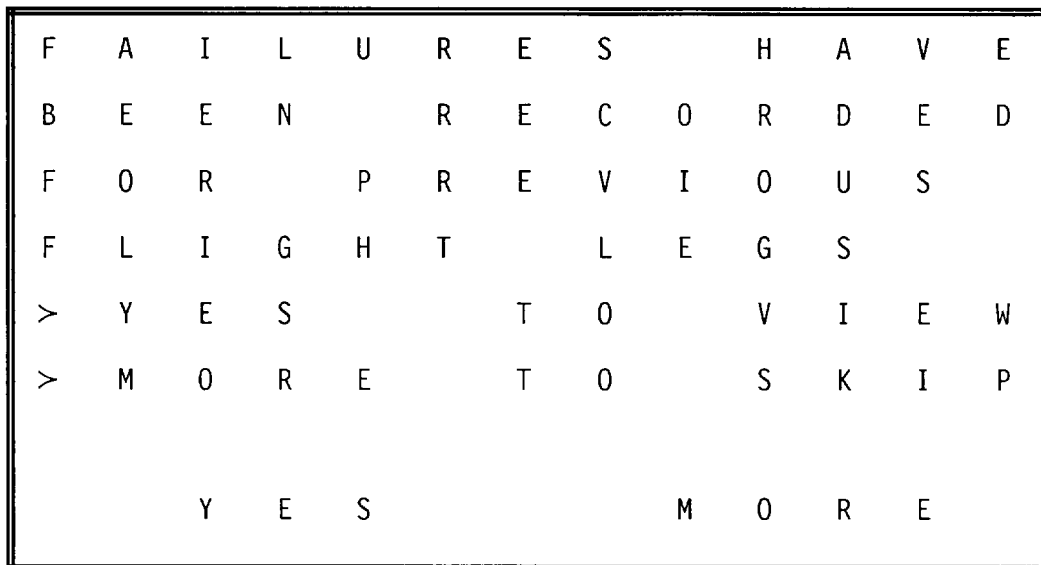
Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

E. Flight Fault Memory Mode for -0101, -0202, and -0303 Only

- (1) When the flight-fault memory contains failures from previous flight legs, an Old Failures screen (Figure 1022) is presented as the last page of the maintenance mode screens. This page allows the viewing of previous flight leg failures, one flight leg at a time by pressing the YES key. Pressing the MORE key from this page bypasses this function and returns the system back to the first page of the maintenance data.
- (2) Once in the flight fault memory mode, flight legs are displayed from the most recent, backwards. Four pages are required for each flight leg. The first page of each flight leg contains the date, flight number, aircraft number, and departure/destination stations (Figure 1023). Three pages follow for each flight leg to contain the 13 possible failures (Figure 1024).
- (3) All flight fault memory pages have the MORE selection on the right key.
 - MORE Pressing the key cycles through all of the flight fault memory pages. When on the last page, the MORE key causes a return to the first page.
- (4) All flight fault memory pages have the RETURN selection on the left key.
 - RETURN Pressing this key causes the system to return to normal mode (Figure 1001).
- (5) There is no timeout in this mode when the aircraft is on the ground. But, while in the air, not pressing a key for five minutes causes the system to return to the Normal Mode screen (Figure 1001).



ID-204187

Figure 1022. Old Failures Page Screen

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

F	L	I	G	H	T		L	E	G	:	X	X
D	A	T	E	:	M	M	M	D	D			
D	E	P	T	:	X	X	X	X				
D	E	S	T	:	X	X	X	X				
F	#	:	X	X	X	X	X	X	X	X	X	X
A	/	C	:	X	X	X	X	X	X			
R	E	T	U	R	N		M	O	R	E		



ID-204188

Figure 1023. Previous Flight Legs Failures First Page Screen

F	L	I	G	H	T		L	E	G	:	X	X
F	C		U	T	C		R	P	O			
0	0		0	0	0	0	0	0	0	0	0	
0	0		0	0	0	0	0	0	0	0	0	
0	0		0	0	0	0	0	0	0	0	0	
0	0		0	0	0	0	0	0	0	0	0	
0	0		0	0	0	0	0	0	0	0	0	
R	E	T	U	R	N		M	O	R	E		



ID-204189

NOTE: FC is fault code, UTC is time, R is repetition count, P is phase, O is origin.

**Figure 1024. Previous Flight Legs Failures Data Page Screen
(Three Screens for Each Flight Leg)**

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

Blank Page

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

MAINTENANCE PRACTICES

1. General

A. Description

- (1) This section of the manual provides service personnel with installation and maintenance information for the DMA-37B DME System. Installation instructions are supported by mechanical outline drawings and an electrical interconnection diagram. These drawings, located at the back of this section, must be reviewed by the installer, and requirements peculiar to the airframe must be established before starting the installation.

B. Inspection After Unpacking

CAUTION: THIS EQUIPMENT CONTAINS ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. EQUIPMENT, MODULES, AND ESDS DEVICES MUST BE HANDLED WITH APPROPRIATE PRECAUTIONS.

- (1) Visually inspect the DMA-37B DME System and all associated equipments for possible damage which can occur during shipment. Inspect for dents, deep abrasions, chipped paint, etc. If any equipment is damaged, notify the transportation carrier immediately.
- (2) A Honeywell test and inspection record and quality report tag is included with each shipped unit. This notifies the customer that the necessary production tests and inspection operations have been performed on that particular unit.
- (3) One copy of the quality report tag is affixed to each unit by the first assembly inspector. As the unit proceeds through production and stock to the shipping area, the appropriate blocks on the test and inspection record of the tag are stamped. This tag accompanies the unit when it is shipped to the customer. Customers are requested to complete the quality report portion of the tag and return it to the Honeywell Quality Assurance Department, Fort Lauderdale, Florida. This portion of the tag provides Honeywell with the necessary information required to evaluate shipping methods as well as test and inspection effectiveness.
- (4) Completed cards are accumulated to provide information for a periodic analysis.

C. Preinstallation Testing

- (1) The components in the DMA-37B DME System are adjusted and tested prior to shipment. Therefore, preinstallation testing is not required. However, if preinstallation testing of the units is desired, refer to the customer acceptance criteria given in the Component Maintenance Manual for the appropriate unit in the system. Refer to Paragraph 4 in the INTRODUCTION section of this manual for a list of related Component Maintenance Manuals.

D. Equipment Changes and Marking

- (1) Honeywell uses a standardized marking system to identify equipment and their subassemblies which have had changes incorporated. Refer to the front of the appropriate Component Maintenance Manual for a list of Service Bulletins affecting the unit.

E. Interchangeability

- (1) The DMA-37B DME System will operate in any installation that complies with ARINC characteristic 709-8; it also operates as an DME-37A DME System replacement in any installation that complies with ARINC 709. See Figure 2006 for particulars.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

2. Installation

A. General

- (1) The DMA-37B DME System must be installed in the aircraft in a manner consistent with acceptable workmanship and engineering practices, and in accordance with the instructions set forth in this publication. To make sure that the system has been properly and safely installed in the aircraft, the installer must make a thorough visual inspection and conduct an overall operational and functional check of the system on the ground prior to flight.

CAUTION: AFTER INSTALLATION OF THE CABLING AND BEFORE INSTALLATION OF THE EQUIPMENT, A CHECK MUST BE MADE WITH AIRCRAFT PRIMARY POWER BEING SUPPLIED TO THE MOUNT CONNECTORS TO MAKE SURE THAT POWER IS APPLIED ONLY TO THE PINS SPECIFIED IN FIGURE 2006.

B. Location of Equipment

- (1) Location of the DMA-37B DME System in the aircraft is not critical, as long as the environment is compatible with the equipment design. Refer to the Leading Particulars, Table 5, in the DESCRIPTION AND OPERATION section of this manual. Forced air cooling is required for cooling the DMA-37B DME Interrogator in accordance with ARINC Characteristic 600. The associated cooling equipment must be mounted in accordance with the manufacturer's instructions.
- (2) Antenna mounting must be in accordance with the manufacturer's instructions for the antenna being used. The coaxial cable connecting the antenna to the mount must be as short and direct as possible and any required bends must be gradual. When two or more DMA-37B DME Systems are installed in an aircraft, it is necessary to provide adequate space isolation between antennas of each system to make sure that the use of one unit does not interfere with reception from another system. A minimum of 35 dB of space isolation must be provided, and any steps which can be taken to provide further isolation must be considered.
- (3) Control unit location and mounting can be determined by mutual agreement between the user and airframe manufacturer.

C. Interwiring and Cable Fabrication

- (1) General
 - (a) Figure 2006 is a complete interwiring diagram for a single DMA-37B DME System and associated components. This diagram requires thorough study before the installer begins installation of the aircraft wiring.
 - (b) When two systems are being installed in the aircraft, the interconnecting wiring shown in Figure 2006, as well as all other installation instructions must be duplicated.
 - (c) Cabling must be fabricated by the installer in accordance with Figure 2006. Wires connected to parallel pins must be approximately the same length, so that the best distribution of current can be effected. Honeywell recommends that all wires, including spares, shown in Figure 2006, be included in the fabricated harness. However, if full ARINC wiring is not desired, the installer must make sure that the minimum wiring requirements for the features and functions to be used are incorporated.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

- (d) When the cables are installed in the aircraft, they must be supported firmly enough to prevent movement and must be carefully protected against chafing. Additional protection must also be provided in all locations where the cables can be subject to abuse. In wire bundles, the cabling must not be tied tightly together as this tends to increase the possibility of noise pick-up and similar interference. When routing cables through the airframe, try to avoid running cables or wire close to power sources (400-Hz generator, etc). If unavoidable, the cables must cross high-level lines at a right angle, or high-quality shielded conductors must be used.
- (e) If a cable must pass through a bulkhead between pressurized and unpressurized zones, this passage must conform to the aircraft manufacturer's specifications.
- (f) The assembler must be knowledgeable of any system variations peculiar to the installation, and must thoroughly understand the complexities associated with handling related problems of line lengths, capacitance, and of susceptibility to interference.
- (g) Table 2001 lists the determinants that are the responsibility of the installation agency for fabrication of the wiring harness. See Figure 2006 also.

Table 2001. DMA-37B DME Interrogator Connector Determinants

Pin	Type	Signal Name	Function
MP1A	Output	Audio Output (HI)	An analog output of the demodulated ground station identification audio signal to the audio distribution system
MP1B	Output	Audio Output (LO)	
MP1C	Input	SDI Bit 1	Used for encoding the location (system number) of the DMA-37B in the aircraft; used with pins MP1D (SDI Bit 0) and MP1E (common)
MP1D	Input	SDI Bit 0	Used for encoding the location (system number) of the DMA-37B in the aircraft; used with pins MP1C (SDI Bit 1) and MP1E (common)
MP1E	---	SDI Common	Ground for the SDI code inputs from pins MP1C and/or MP1D
MP1F	---	Suggest ARINC 709 Spare No. 1	---
MP1G	Output	DME Distance Data Output No. 1 (A)	One of two low speed ARINC 429 data output ports to provide DME distance outputs to other equipment on the aircraft. Used to transmit the range words, the DME ground station identification words, and to repeat the selected frequency words if received over the frequency tuning interfaces. Maintenance data information will also be transmitted on these ports.
MP1H	Output	DME Distance Data Output No. 1 (B)	
MP1J	---	Spare	---
MP1K	Output	Suggest ARINC 709 Spare No. 2	---
MP2A	---	Spare	---
MP2B	---	Spare	---
MP2C	---	Spare	---
MP2D	---	Spare	---

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 2001. DMA-37B DME Interrogator Connector Determinants (cont)

Pin	Type	Signal Name	Function
MP2E	---	Spare	---
MP2F	---	Spare	---
MP2G	---	Spare	---
MP2H	---	Spare	---
MP2J	---	Spare	---
MP2K	---	Spare	---
MP3A	Input	Freq/Funct Select Data I/P Port A (A)	One of two low speed 429 data input ports to receive tuning information, Ident and Display channel selection, DME Mode and Source/Destination Identifier selection.
MP3B	Input	Freq/Funct Select Data I/P Port A (B)	
MP3C	---	Spare	---
MP3D	Input	Freq/Funct Select Data I/P Port A (A)	One of two low speed 429 data input ports to receive tuning information, Ident and Display channel selection, DME Mode and Source/Destination Identifier selection.
MP3E	Input	Freq/Funct Select Data I/P Port A (B)	
MP3F	---	Spare	---
MP3G	Output	DME Distance Data Output No. 2 (A)	One of two low speed ARINC 429 data output ports to provide DME distance outputs to other equipment on the aircraft. Used to transmit the range words, the DME ground station identification words, and to repeat the selected frequency words if received over the frequency tuning interfaces. Maintenance data information will also be transmitted on these ports.
MP3H	Output	DME Distance Data Output No. 2 (B)	
MP3J	---	Spare	---
MP3K	---	Spare	---
MP4A	---	Spare	---
MP4B	---	Spare	---
MP4C	---	Spare	---
MP4D	---	Spare	---
MP4E	---	Spare	---
MP4F	---	Spare	---
MP4G	---	Spare	---
MP4H	---	Spare	---
MP4J	---	Spare	---
MP4K	---	Spare	---

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 2001. DMA-37B DME Interrogator Connector Determinants (cont)

Pin	Type	Signal Name	Function
MP5A	Input	Default Scan Inhibit	Discrete input indicates default mode of operation. If this program pin is grounded when no tuning input is received and like-labelled words fall below five per second, DMA-37B automatically reverts to standby operation and invalidates its computed range measurement. If this program pin is open when no tuning input is received and like-labelled words fall below five per second, DMA-37B automatically reverts to free scan operation.
MP5B	Input	Freq/Funct Data Source Select Discrete	Discrete input determines which input tuning port will be selected. Port A (MP3A & MP3B) are used when the discrete is in the ground state. Port B (MP3D & MP3E) are used when the discrete is in the open state. When the DMA-37B is installed in an aircraft in which a dedicated control panel supplies the tuning information, Port B must be used. When the DMA-37B is installed in an aircraft in which a Centralized Radio Management system supplies the tuning information, Port A must be used as the primary control source, and Port B as the secondary or backup control source.
MP5C	Input	Functional Test Discrete	Discrete input that activates LRU functional test function. Gnd/Low = activate functional test.
MP5D	Input	Indicator No. 1 Status Input	Discrete input indicates the status of indicator No. 1. The input is open to indicate the indicator has failed.
MP5E	Input	Indicator No. 2 Status Input	Discrete input indicates the status of indicator No. 2. The input is open to indicate the indicator has failed.
MP5F	---	Spare	---
MP5G	---	Spare	---
MP5H	---	Spare	---
MP5J	Input	Reserved for Maintenance Display Reset	Resets failure reporting of DME System.
MP5K	Input	Air/Ground Logic	Discrete input is open when the aircraft is on the ground and grounded when the aircraft is airborne.
MP6A	---	Spare	---
MP6B	---	Spare	---
MP6C	---	Spare	---
MP6D	---	Spare	---

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 2001. DMA-37B DME Interrogator Connector Determinants (cont)

Pin	Type	Signal Name	Function
MP6E	Input	CFDS Data Bus Input A	Low speed ARINC 429 data input port receives maintenance data from the CFDS/CMC
MP6F	Input	CFDS Data Bus Input B	
MP6G	---	Spare	---
MP6H	Input	DC Antenna Monitor Enable	Discrete input indicates whether or not the antenna monitoring function is activated. Antenna monitoring is activated when this input is connected to the Antenna Monitor Common (MP6J).
MP6J	Output	DC Antenna Monitor Common	Discrete supplies the return (ground) for the Antenna Monitor Enable (MP6H) when antenna monitoring is active.
MP6K	---	Spare	---
MP7A	---	Spare	---
MP7B	Output	115V AC Indicator Panel Power Out (HOT)	115 V ac, 400Hz is available on these pins for routing to an indicator panel in those installations which use an individual indicator panel.
MP7C	Output	115V AC Indicator Panel Power Out (COLD)	
MP7D	---	Spare	---
MP7E	---	Spare	---
MP7F	---	Spare	---
MP7G	---	Spare	---
MP7H	Output	115V AC Control Panel Power Out (HOT)	115 V ac, 400Hz is available on these pins for routing to a control panel in those installations which use an individual control panel rather than an integrated frequency/function selection system supplied with aircraft power directly.
MP7J	Output	115V AC Control Panel Power Out (COLD)	
MP7K	---	Spare	---
BP1	Input	115VAC (HOT) (2A Circuit Breaker)	Primary input power to DMA-37B
BP2	---	---	---
BP3	---	---	---
BP4	---	---	---
BP5	---	---	---
BP6	---	---	---
BP7	Input	115VAC (COLD) (AC common)	Primary power return
BP8	---	---	---
BP9	---	---	---

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 2001. DMA-37B DME Interrogator Connector Determinants (cont)

Pin	Type	Signal Name	Function
BP10	---	---	---
BP11	Input	Chassis Ground	Chassis ground
BP12	Input/ Output	Suppressor	This analog port is both an input and an output. When the DMA-37B is receiving, this line will receive suppression pulses from other pulse equipment, and when the DMA-37B is transmitting, this line will transmit suppression pulses to other pulse equipment.
BP13	Output	Reserved for Video Output	Output for the video output signal from the DMA-37B receiver.

(2) Reserved and Spare Wires

- (a) If the installer does not wish to connect all wires, he can select wires reserved for optional functions which his system does not contain and delete these wires. He must also decide which future spare wires to include in the installation. Reserved and spare wires are identified in interwiring diagram Figure 2006.

(3) Source/Destination Identifier (SDI) Encoding

- (a) A connection is required from the common pin MP6C to the appropriate source/destination identifier (SDI) pin to identify each DMA-37B in multiple system installations. Installations having only one DMA-37B must include a connection identifying it as the No. 1 system. These connections must not be omitted from any installation. See Figure 2006 notes for the SDI encoding scheme for pins MP1C, MP1D, and MP1E.

D. Installation of System

(1) Mounting Base

- (a) The selected mounting base for the DMA-37B DME Interrogator must be wired according to the system interwiring diagram, Figure 2006, and installed according to the manufacturer's instructions. The mounts are designed to be removed without rewiring the connectors. Follow the equipment manufacturer's installation instructions to install the mount into the airframe.
- (b) To wire the mounts into the system, first remove the mount connector cover and connector plate assembly. Then crimp or solder (as applicable) the interconnecting wiring to the appropriate connector pins. Finally, return the connector plate assembly and cover to their original positions.

NOTE: To allow for inspection or repair of the connector, or the wiring to the connector, sufficient lead length must be left so that the rear connector assembly can be pulled forward several inches when the mounting hardware for the rear connector assembly is removed. A bend must be made in the harness near the connector to allow water droplets, that might form on the harness from condensation, to drip off at the bend and not collect at the connector.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

- (2) DMA-37B DME Interrogator
 - (a) The DMA-37B DME Interrogator is installed in the mount as follows:
 - 1 Slide the DMA-37B into the mount until the guide pins are aligned and the electrical connectors are firmly engaged.
 - 2 Secure the front of the DMA-37B to the mount by tightening the two knurled screw clamps (located on the front of the mount) until they are firmly seated over hold-down hooks located on the front of the unit.
 - 3 Safety-wire the two screw clamps.
- (3) NAV Control Panel
 - (a) The selected NAV control panel must be wired according to the system interwiring diagram, Figure 2006, and the manufacturer's instructions. For installation procedure and mounting dimensions, refer to the applicable manufacturer's instructions.
- (4) DME Display
 - (a) The selected DME display must be mounted in the aircraft instrument panel to provide easy visibility and to conform to customer requirements and the installation instructions of the manufacturer. Interwiring must be in accordance with Figure 2006, system interwiring diagram.
- (5) DME Antenna
 - (a) Install the DME antenna in accordance with the manufacturer's instructions. Maximum insertion loss of the coax run from the DMA-37B to the antenna is 3 dB.
- (6) Mutual Suppression
 - (a) In dual DMA-37B installations, mutual suppression pulse connections are required between units.
 - (b) Mutual suppression pulse connectors are also required between DMA-37B units, air traffic control (ATC) transponders, and Traffic Alert and Collision Avoidance System (TCAS).

3. Inspection and System Check Procedures

CAUTION: INSPECTION AND CHECK PROCEDURES FOR THE DMA-37B INCLUDES CHECKOUT OF ALL INTERFACING UNITS THAT CAN AFFECT PERFORMANCE OF THE DMA-37B.

A. Inspection

- (1) Table 2002 is a visual inspection check procedure and must be performed after system installation, prior to system checkout. In addition, the procedure must be used as a periodic inspection check.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

Table 2002. Inspection/Check Procedures

Equipment	Inspection/Check Procedure
4 MCU Unit Mount	As defined by manufacturer's instructions.
DMA-37B DME Interrogator	<ol style="list-style-type: none">1. Check that unit is fully inserted in mount and that Interrogator the knurled screw clamps which secure the unit in the mount are tight and safety wired.2. Inspect the case for deformation, dents, corrosion, and damage to finish; make sure that ventilation holes in the unit are not clogged.
NAV Control Panel	As defined by manufacturer's instructions.
DME Display	As defined by manufacturer's instructions.
DME Antenna	As defined by manufacturer's instructions.

B. System Checkout

(1) General

- (a) After installation of the DMA-37B DME System and inspection of the equipment in accordance with Table 2002, perform a continuity and visual check of the system interwiring in accordance with Paragraph 3.B.(2). A post-installation test in accordance with Paragraph 3.B.(3) must then be performed.

(2) System Interwiring Check

- (a) Visually check the system interwiring for abnormalities, such as cables rubbing unprotected metal edges or tightly stretched cables. Check continuity of all interwiring. In particular, check the following:
 - Check that the DMA-37B is properly installed and the hold-down screw clamps are tight.
 - Check the wiring harness connectors for security and connection to the DMA-37B.
 - Check that the antenna transmission line connectors are securely fastened.
 - Check that the control panel connectors are securely fastened.
 - Check that the DME display is securely fastened.
 - Check that the cables do not interfere with aircraft controls or other equipment.

(3) Post-Installation Check

(a) Test Equipment Required

- 1 Table 2003 lists a ramp test set that can be used to determine if the DMA-37B DME System is operating properly. Test sets other than that listed in Table 2003 can be used if their characteristics fulfill those listed under Characteristics Required.

Table 2003. Table of Test Equipment

Description	Characteristics Required	Representative Type
Transponder and DME Test Set	Must have an X-channel and a Y-channel output. Selected range must be variable from 0.1 to 400 nautical miles. Must transmit an ident tone.	Instrument Flight Research Corp. (IFR) Model ATC-600A or equivalent

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

(b) DMA-37B Initiated System Test, -0101, -0202, and -0303 Only

- 1 A functional self test of the DMA-37B DME System can be initiated by pressing the test key pushbutton switch as designated on the front panel LCD (Figure 2001). Although the normal-mode screen indicates that this is actuated from the right key, the left key has the same function if pressed while the DMA-37B LCD is in its normal mode.
- 2 The self-test mode starts by displaying the Test in Progress screen (Figure 2002) one second after pressing the test key. This is displayed for five seconds with a moving thermometer along the bottom of the LCD indicating the progress of the test from one to five seconds.
- 3 The Normal-Mode screen (Figure 2001) is displayed for the first second of the test sequence.

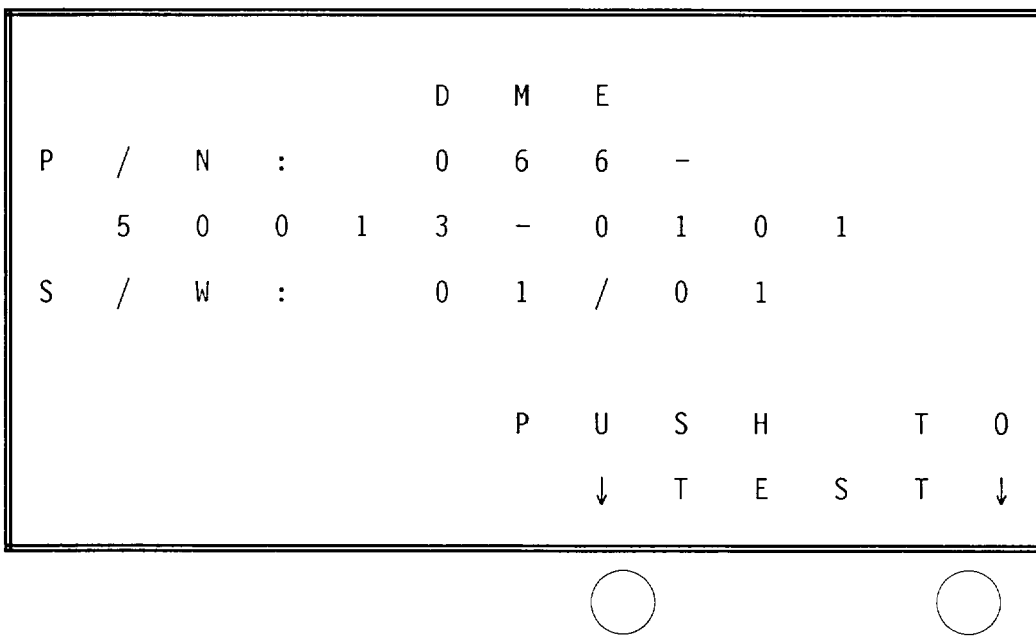


Figure 2001. Typical Normal Mode Screen

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

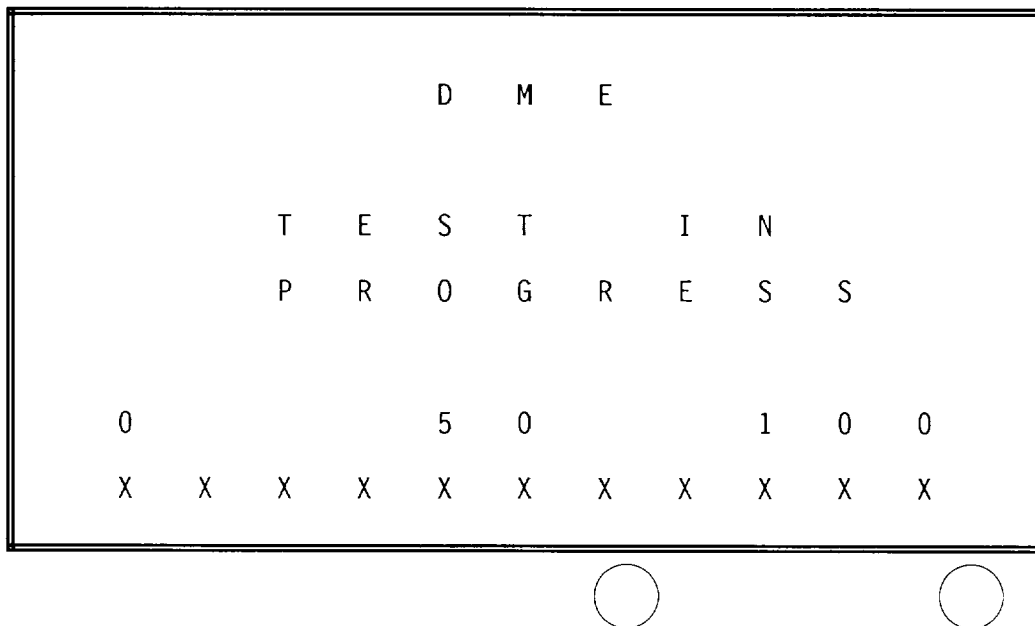
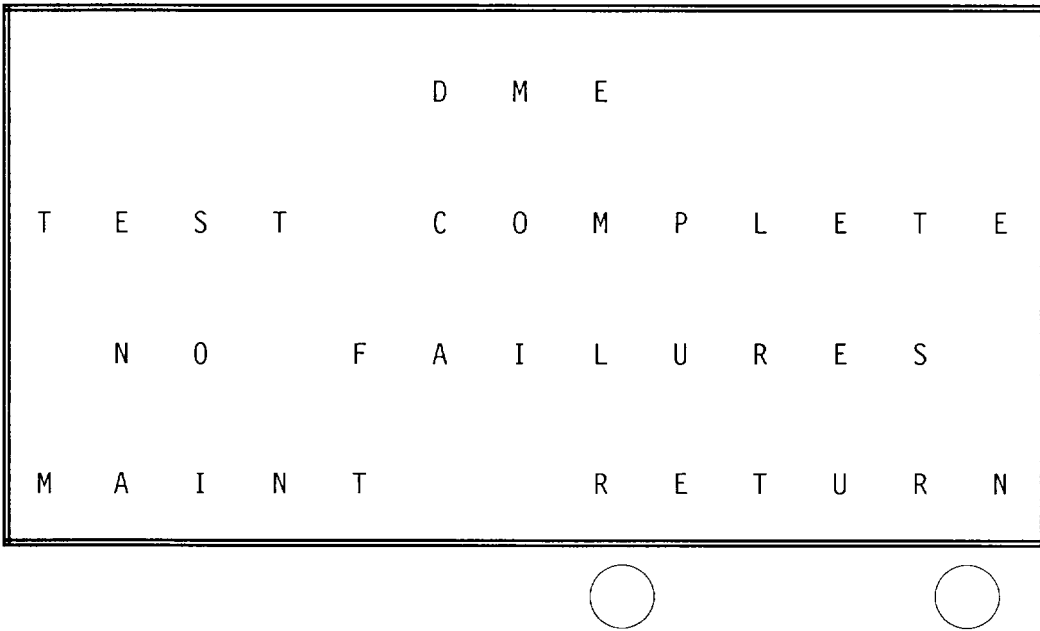


Figure 2002. Test in Progress Screen

- 4** Once complete, the Test Complete, No Failures screen is displayed (Figure 2003), or the Test Complete, Failures screen is displayed (Figure 2004). Both screens contain two key selections each: MAINT and RETURN or MAINT and WHY?, respectively.

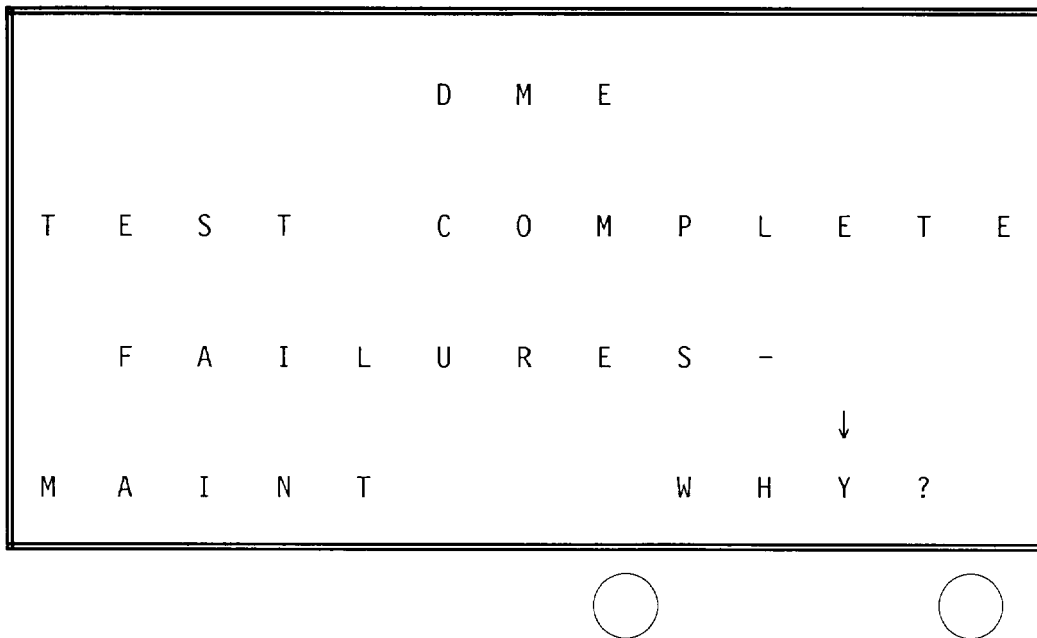
 - **MAINT** For both screens, MAINT is located on the left key. This allows the initiation of the extended maintenance pages of the system for troubleshooting. Refer to Paragraph D of the FAULT ISOLATION section of this manual.
 - **RETURN** In the Test Complete, No Failures screen, the RETURN key to the right returns the system to its normal mode screen (Figure 2001).
 - **WHY?** In the Test Complete, Failures screen, the WHY? key to the right puts the system into the display-failures mode where individual system failures are displayed one on each page. Refer to Paragraph C of the FAULT ISOLATION section of this manual.
- 5** While in the self-test mode, not pressing either key for five minutes causes the system to return to the Normal Mode screen (Figure 2001).

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System



ID-204192

Figure 2003. Test Complete, No Failures Screen



ID-204193

Figure 2004. Test Complete, Failures Screen

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

(c) Front Panel Test Initiation, -1101 and -1212 Only

- 1 On the front panel, observe that the green status LED is lit.
- 2 On the front panel, push the self test button.
- 3 Make sure that all LEDs turn amber and then turn green (indicating normal operation).

(d) Cockpit-Initiated System Test

- 1 If provisions have been made in the aircraft installation for cockpit initiated DMA-37B self-test procedure, that procedure must be verified. The results of the test can be indicated on the EFIS or DME displays depending upon the installation.

(e) Ramp test

NOTE: The following test instructions are written in general terms. Refer to the DME test set instruction manual for specific DME test set operating instructions.

- 1 Set up ramp test set as recommended in accordance with test set manufacturer's instruction manual. Position DME ramp test set in vicinity of aircraft.
- 2 Apply power to DMA-37B DME System.
- 3 If the Post-Installation Check System Test has not been accomplished, perform the System Test as described in Paragraph 3.B.(3) to verify self-test operation.
- 4 Set NAV control to select a DME frequency corresponding to that set in the DME ramp test set.
- 5 Verify that the DME distance readout is equal to that set in the DME ramp test set.
- 6 Set DME ramp test set for an audio Ident output.
- 7 Verify that the audio Ident is heard through the cockpit speaker.
- 8 Repeat steps 4 and 5 for one or more additional frequencies and distances.

(f) Flight Tests

1 Preflight Test

a General

- (1) The following test procedure gives instructions for a preflight test which make sure that the DMA-37B DME System is functioning in an acceptable manner prior to takeoff.

b Test Procedures

- (1) Perform the System Test, Cockpit Initiated procedure as described in Paragraph 3.B.(3)(d) of this section.

2 In-Flight Confidence Test

a General

- (1) Upon completion of the post-installation and preflight checks, a local flight can be made to verify system operation. Perform the following In-Flight Confidence Test procedures.

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

b Test Procedures

- (1) Apply power to DMA-37B DME System.
- (2) Set NAV control to frequency of a nearby DME station.
- (3) Note distance readout of DME display to the selected DME station and compare this to calculated distance on a visual flight rules (VFR) chart. Verify that the two distances agree within 0.1 nautical mile.

4. Removal and Replacement

A. Removal

- (1) Loosen the two knurled screw clamps (located on the front of mount) that secure the DMA-37B to the mount.
- (2) Gently pull the DMA-37B forward until it is disconnected from the rear connector and guide pins.

B. Replacement

- (1) Slide the DMA-37B onto the tray of the mount and then gently push the DMA-37B until the guide pins are aligned and the connectors make a firm connection.
- (2) Tighten the two knurled screw clamps located on the front of the mount until they are firmly seated over the hold-down hooks located on the front of the DMA-37B.
- (3) Safety wire the two knurled screw clamps.

5. Maintenance Procedures

A. Adjustments and Alignments

- (1) There are no adjustments or alignments required for the DMA-37B DME System. All alignment and adjustment procedures are accomplished during bench maintenance. The technician must remove the unit from the aircraft and reference must be made to the related maintenance manual when unit performance indicates an adjustment or an alignment is required.

B. System Protection

- (1) The system must be protected by a 2-ampere circuit breaker located at the circuit breaker panel in the aircraft.

C. Lubrication Practices

- (1) There are no requirements for periodic lubrication of any DMA-37B DME System components while mounted in the aircraft. Reference must be made to the applicable maintenance manual for lubrication procedures during routine maintenance of individual units. Refer to Paragraph 4 in the INTRODUCTION section of this manual for a list of related maintenance manual publications.

D. Cleaning

- (1) When deemed necessary, depending upon the environment to which the equipment is exposed and the intensity of use, periodic cleaning must be performed. Any dust on the DMA-37B DME System LRUs must be wiped off with a lint-free cloth.


NOTE: Any cleaning of equipment interiors must be limited to that required when performing overhaul (bench-type) work.

Honeywell

MAINTENANCE MANUAL DMA-37B DME System

IDENTIFYING NUMBER	APPLICABLE SHEET	MAX WEIGHT	EXTERNAL SURFACE FINISH
066-50013-0101	1-2	11.0 LBS [5,0 KG]	TEXTURED POLYURETHANE PAINT
066-50013-0202	1-2	11.0 LBS [5,0 KG]	TEXTURED POLYURETHANE PAINT
066-50013-0303	1-2	11.0 LBS [5,0 KG]	TEXTURED POLYURETHANE PAINT
066-50013-1101	3-4	9.8 LBS [4,4 KG]	FRONT: BLACK ANODIZED SIDES: TEXTURED POLYURETHANE PAINT BALANCE OF UNIT: CLEAR ALODINE
066-50013-1212	3-4	9.8 LBS [4,4 KG]	FRONT: BLACK ANODIZED SIDES: TEXTURED POLYURETHANE PAINT BALANCE OF UNIT: CLEAR ALODINE

NOTES:

1. Deleted.
2. Bottom surface of connector locator tab must be flush or extend no more than 0.010, 0, 25mm below datum -B-
3. Forced air colling, bulk air supply conditions:
 Temperature less than 40° C
 Density ratio 1
 Pressure drop through LRU is 5 ±3mm of water at flow rate 2.8 CFM
4. Deleted.
5. All screw or rivet heads shall be within this dimension.
6. Deleted.
7. Primary dimensions are in inches, millimeters are shown for reference only.
8.  symbol denotes unit center of gravity.
9. The 4.88 dimension applies across the connector plate only. The chassis, covers and attaching hardware shall not exceed 4.90, 124, 5mm.
10. Deleted.
11. **CAUTION: THIS ASSEMBLY EITHER CONTAINS OR IS ASSOCIATED WITH ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. HANDLE WITH CARE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE REPAIR SECTION OF THE SERVICE MANUAL.**
12. Deleted.
13. Or equivalent.

ID-204194 E066-50013-1-V

Figure 2005. (Sheet 1). DMA-37B DME Interrogator Dimensional Outline Drawing

34-51-02

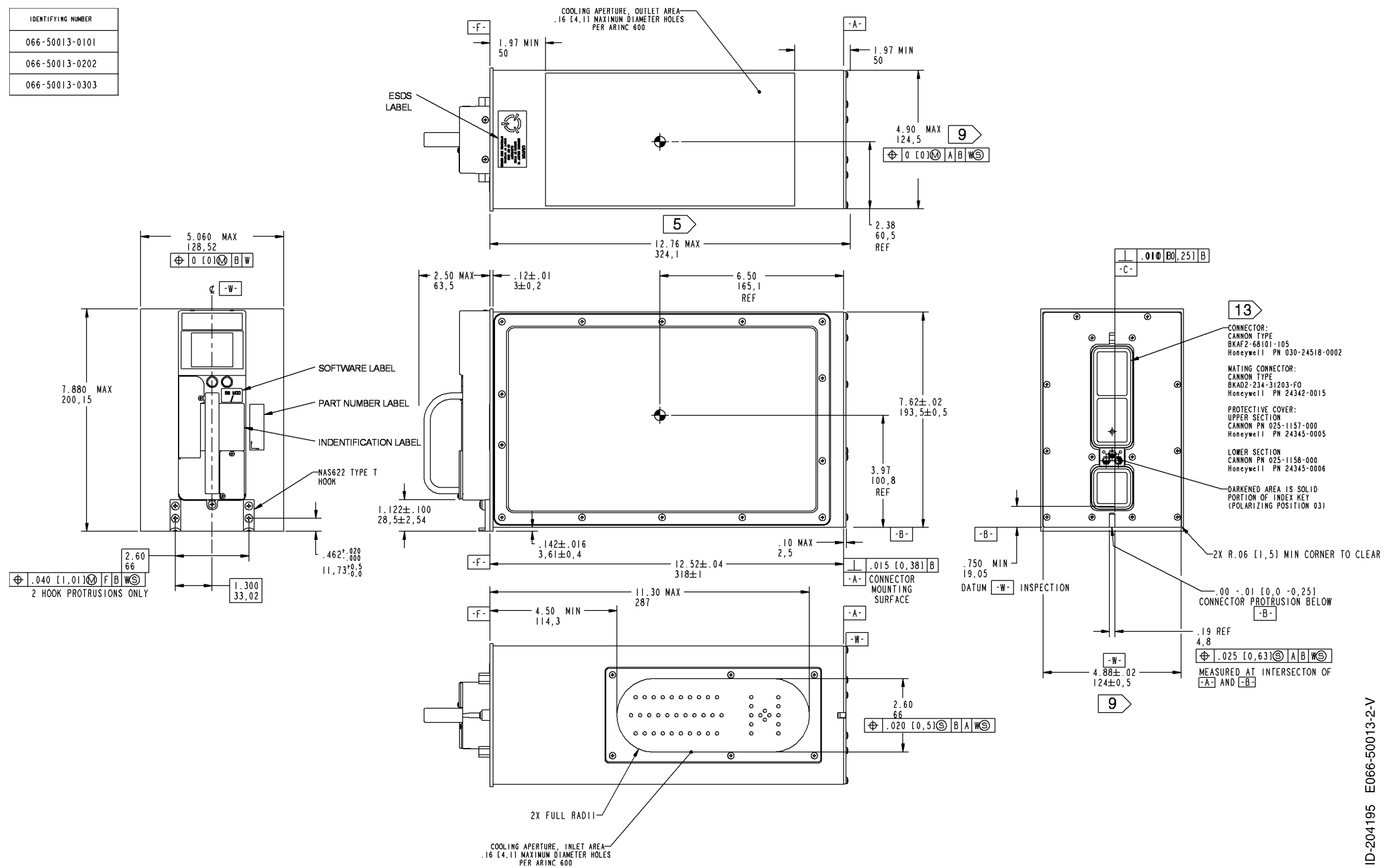
Page 2015/2016
10 Oct 2007

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

IDENTIFYING NUMBER
066-50013-0101
066-50013-0202
066-50013-0303



ID-204195 E066-50013-2-V

Figure 2005 (Sheet 2). DMA-37B DME Interrogator Dimensional Outline Drawing

34-51-02


Page 2017/2018
10 Oct 2007

Honeywell
MAINTENANCE MANUAL
DMA-37B DME System

IDENTIFYING NUMBER
066-50013-1101
066-50013-1212

NOTES:

DASHES -1101, -1212

1. Bottom surface of connector locator tab must be flush or extend no more than 0.010, 0, 25mm below datum -B-
2. Deleted.
3. Deleted.
4. All screw or rivet heads shall be within this dimension.
5. Primary dimensions are in inches, millimeters are shown for reference only.
6.  symbol denotes unit center of gravity.
7. The 4.88 dimension applies across the connector plate only. The chassis, covers and attaching hardware shall not exceed 4.90, 124, 5mm.
8. This drawing is not complete without the latest issue of the associated parts list.
9. **CAUTION:** THIS ASSEMBLY EITHER CONTAINS OR IS ASSOCIATED WITH ELECTROSTATIC DISCHARGE SENSITIVE (ESDS) DEVICES. HANDLE WITH CARE IN ACCORDANCE WITH THE PROCEDURES OUTLINED IN THE REPAIR SECTION OF THE SERVICE MANUAL.
Deleted.
10. Or equivalent.

ID-204196 E066-50013-3-V

Figure 2005 (Sheet 3). DMA-37B DME Interrogator Dimensional Outline Drawing

34-51-02

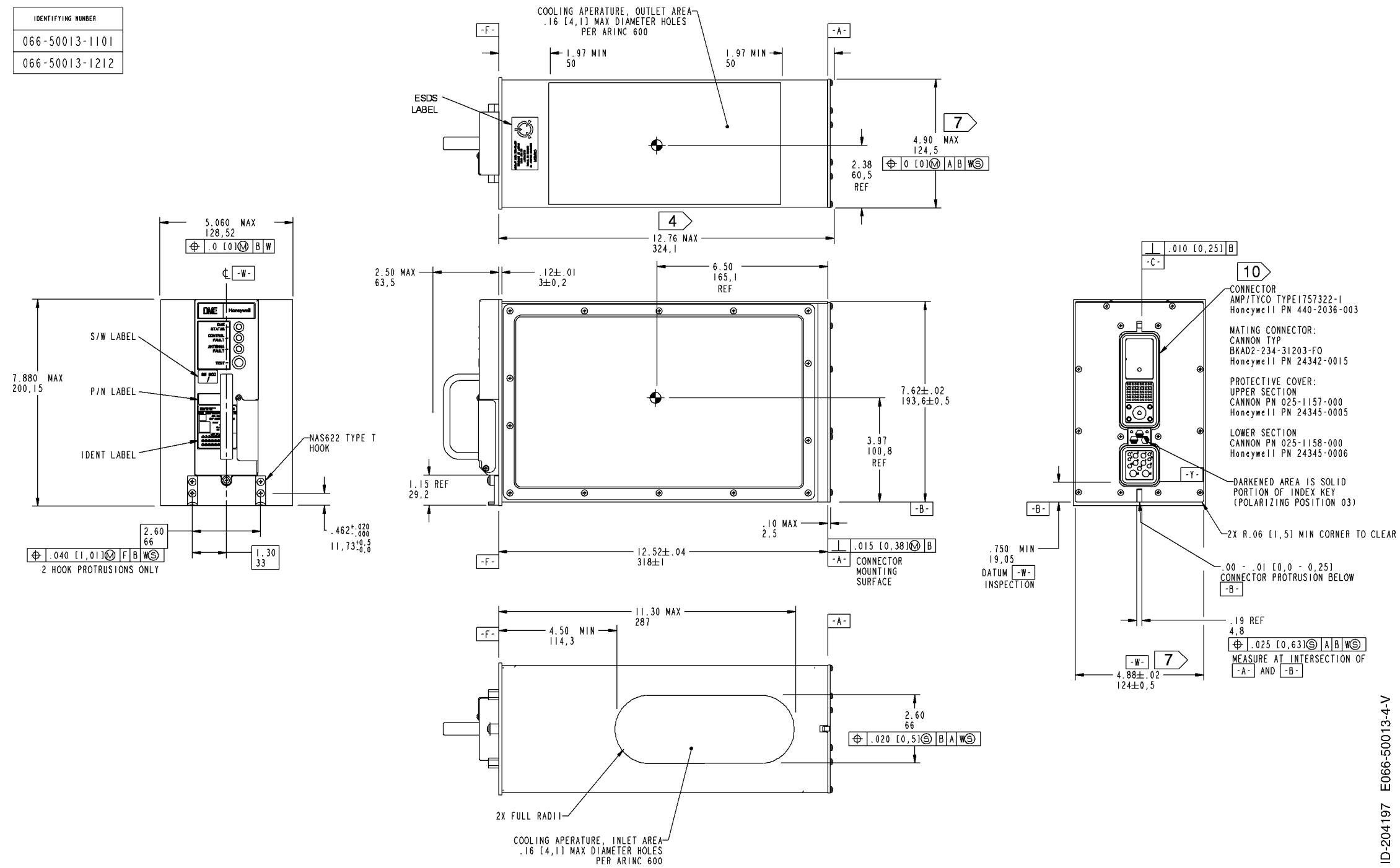
Page 2019/2020
10 Oct 2007

Honeywell

MAINTENANCE MANUAL

DMA-37B DME System

IDENTIFYING NUMBER
066-50013-1101
066-50013-1212



ID-204197 E066-50013-4-V

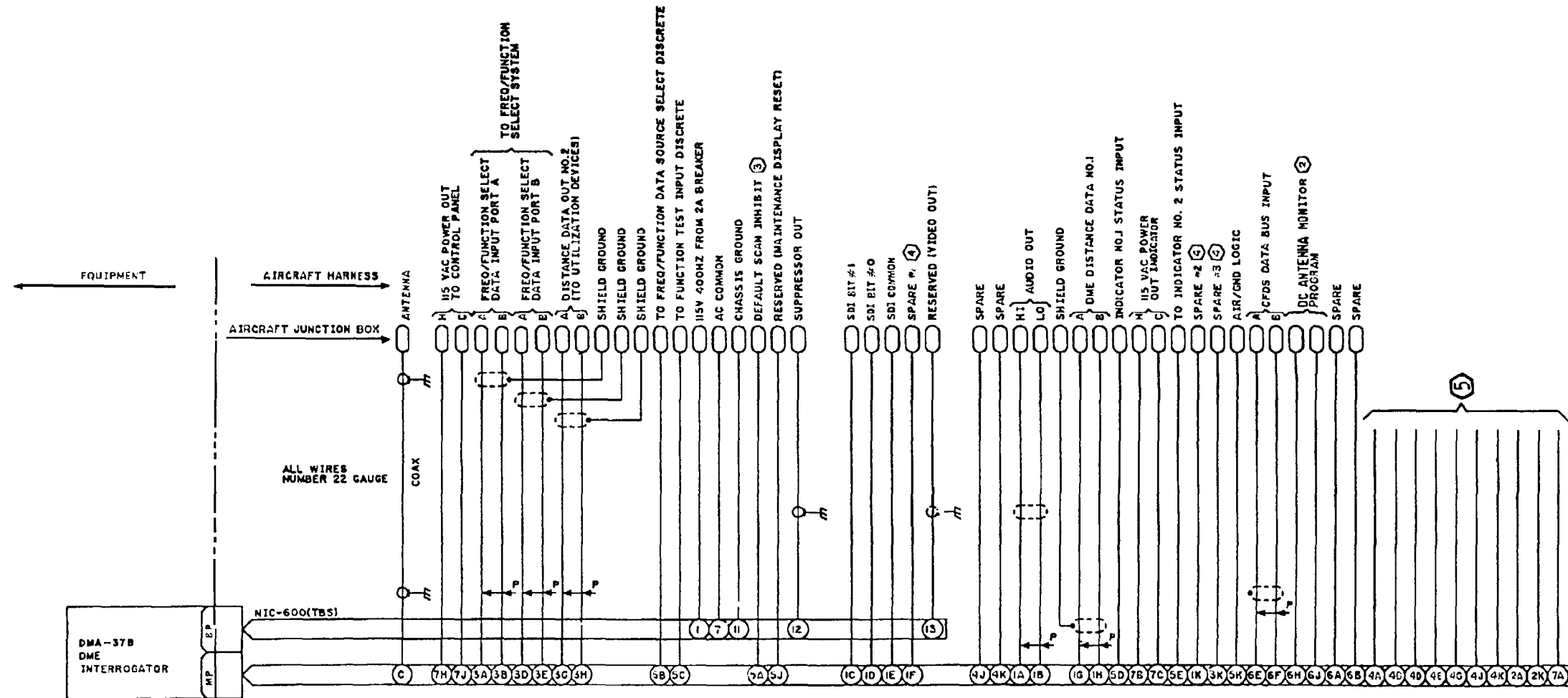
Figure 2005 (Sheet 4). DMA-37B DME Interrogator Dimensional Outline Drawing

34-51-02

Page 2021/2022
10 Oct 2007

Honeywell

MAINTENANCE MANUAL
DMA-37B DME System



NOTES

1. INDICATES TWISTED PAIR.

2. PROGRAM PINS MP6H AND MP6J HAVE BEEN ASSIGNED THE FUNCTION OF INDICATING WHETHER THE DME ANTENNA, AS INSTALLED ON THE AIRCRAFT, IS MONITORED FOR DC CONTINUITY. THE PINS SHOULD BE SHORTED BY A JUMPER ON THE AIRFRAME SIDE OF THE CONNECTOR WHEN ANTENNA MONITORING IS EMPLOYED, AND LEFT OPEN OTHERWISE.

3. THE DME SHOULD AUTOMATICALLY REVERT TO STANDBY OPERATION AND INVALIDATE ITS COMPUTED RANGE MEASUREMENT IF PROGRAM PIN MP5A IS GROUNDED (STANDARD GROUND LESS THAN 10 OHMS RESISTANCE FROM MP5A TO AIRFRAME DC GROUND) AND THE LIKE LABELLED WORDS FALL BELOW FIVE PER SECOND (INDICATING A TUNING SOURCE FAILURE).

THE DME SHOULD AUTOMATICALLY REVERT TO FREE SCAN OPERATION IF PROGRAM PIN MP5A IS OPEN CIRCUIT (STANDARD OPEN CIRCUIT 100,000 OHMS OR MORE RESISTANCE FROM PIN MP5A TO AIRFRAME DC GROUND) AND LIKE LABELLED WORDS FALL BELOW FIVE PER SECOND.

4. SUGGESTION PER ARINC CHARACTERISTIC 709A.

5. RESERVED

Figure 2006. DMA-37B DME System Interwiring Diagram

34-51-02

Page 2023/2024
10 Oct 2007