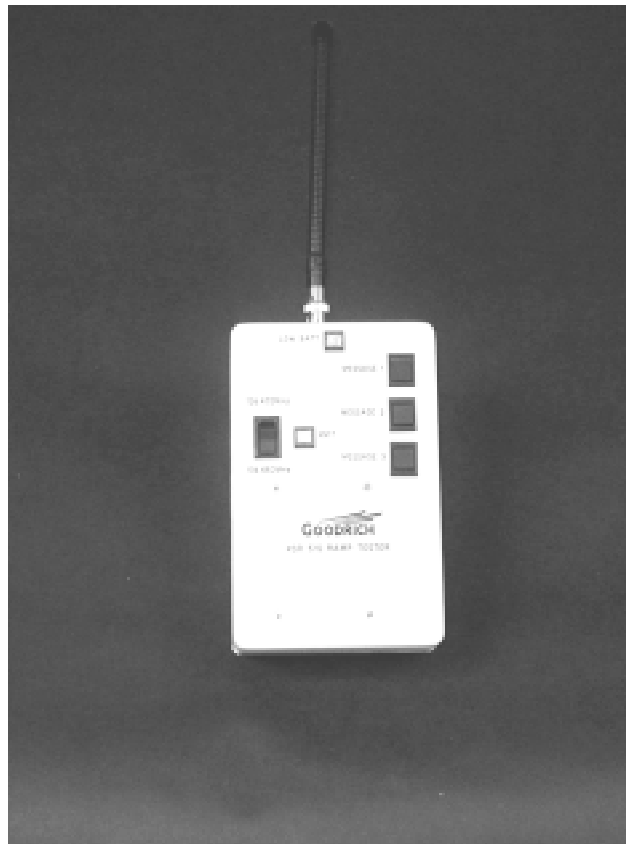

Operator Manual
FIS-B Ramp Tester
For The KMD 540/KDR 510
FIS-B Avionics Display System



FIS-B Ramp Tester

Author: Robert M. Groh, Honeywell International Inc., Olathe, KS. 66061

File: C:\RMG_Documents\RampTester\Ramp Tester Operators Manual.doc

Word Processor: Microsoft Office 97

This document and all information contained herein are the property of Honeywell International Inc, are provided in confidence, and may not be used, duplicated or disclosed to a third party, in whole or in part, without prior written permission from Honeywell International Inc, Copyright 2002 Honeywell International Inc, All rights reserved.

Revision Table			
Rev	Date	Author	Comment
1.0	January 22, 2002	RMG	Original Draft
2.0	January 24, 2002	RMG	Added more photographs and information on changing frequency, etc.
2.1	January 25, 2002	RMG	Added 'Range Check' section

Table Of Contents

1 CONTENTS AND SETUP	3
1.1 ASSEMBLING THE RAMP TESTER	3
1.2 FRONT PANEL CONTROLS.....	3
2 USING THE RAMP TESTER.....	4
2.1 SHORT COURSE IN OPERATING THE KMD 540	4
2.1.1 Accessing The Weather Display Page	4
2.1.2 Accessing the FIS DATA page.....	5
2.2 CONFIGURE THE KMD 540/KDR 510 SYSTEM	5
2.3 TRANSMIT A TEST MESSAGE	6
2.4 INTERPRET THE RESULTS	6
2.4.1 'Lightning Bolt' on Tower Symbol	6
2.4.2 APDU Counter on FIS DATA page	6
2.4.3 Date and Time on FIS DATA page	6
2.4.4 APDU Type on FIS DATA page	6
2.5 GROUND RANGE CHECK.....	6
3 MESSAGE 1: METAR.....	7
4 MESSAGE 2: <TBD>.....	14
5 MESSAGE 3: <TBD>.....	14
6 ROUTINE MAINTENANCE	15
6.1 BATTERY REPLACEMENT	15

List of Figures

Figure 1 Controls and Connectors	3
Figure 2 FIS DATA Page	5
Figure 3 Interior View Showing Battery Locations.....	15

1 Contents And Setup

The Ramp Tester system includes the following items:

1. Ramp Tester Electronics Assembly
2. Plug In antenna assembly (BNC connector)
3. External Power Supply <Not provided with prototype units>
4. This Operators Manual

1.1 Assembling The Ramp Tester

Remove the Ramp Test Electronics Assembly from the shipping package and plug in the supplied antenna. The Ramp Tester (RT) is now ready to use. Note: the prototype unit(s) are shipped with the alkaline batteries already connected.

1.2 Front Panel Controls

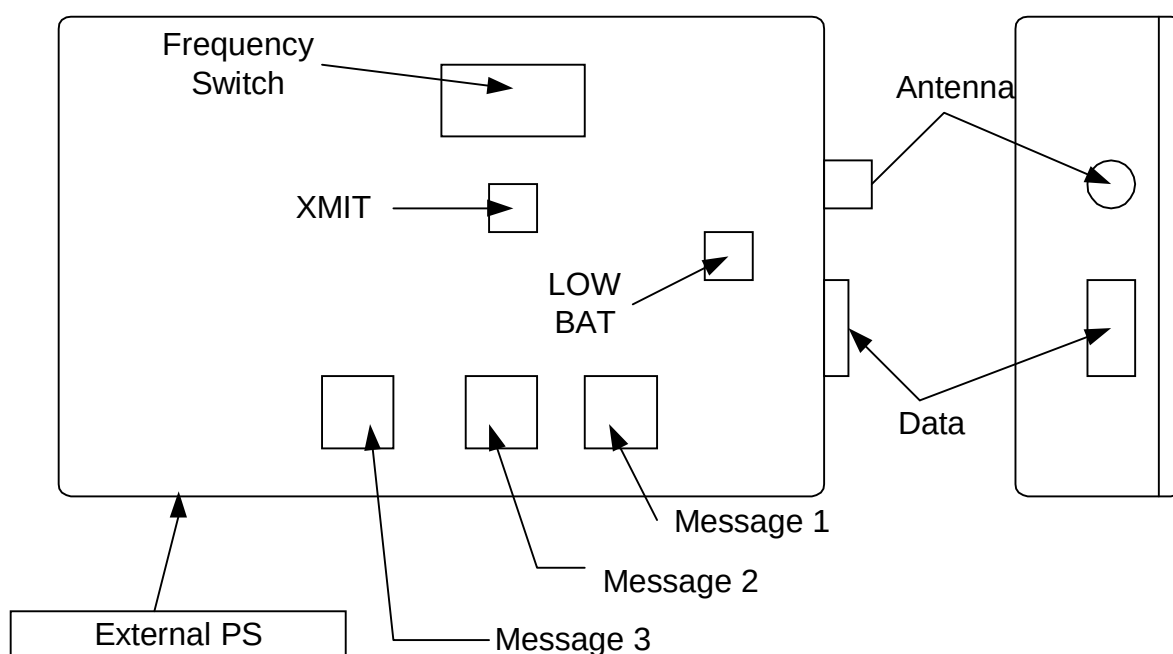


Figure 1 Controls and Connectors

2 Using The Ramp Tester

Using the Ramp Tester to ground test a FIS-B installation typically consists of several steps:

1. Power on the KMD 540/KDR 510 system and configure the KMD 540 display
2. While watching the KMD 540 display, transmit a message from the Ramp Tester by pressing one of the 'Message' buttons.
3. Interpret the results.

During the test process, please refer to the KDR 510 and KMD 540 manuals (Install and Operations) for additional details which are not covered here.

2.1 Short Course in Operating the KMD 540

The following is a quick summary on accessing some of the pertinent pages on the KMD 540. Please refer to the KMD 540 manual for more detail.

2.1.1 Accessing The Weather Display Page

The 'Weather Display Page' displays the graphical weather as well as the text based weather products. To access the 'Weather Display Page, press the [WX] key on the front of the KMD 540. Each time you press the [WX] key, you will bring up, alternately, a different weather product.

The actual weather products will depend on what options you have installed in your KMD 540. For our examples, the system has a StormScope attached as well as the FIS-B system. The first page is the 'StormScope' page, the next page is the 'NEXRAD Base Reflectivity' page and the third page is the 'Graphical METARS' page. You can also cycle between the 'NEXRAD Base Reflectivity' page and the 'Graphical METARS' page by pushing the [MODE] button. While on the 'Graphical METARS' page moving the joystick will activate each METAR site as the pointer head passes over the site on the map. When a site is highlighted, then pressing the [MORE INFO] key will bring up the text display page(s). While in the text display mode, pressing the [MODE] key will now bring up (alternately) the different text pages, i.e. METAR, PIREP, TAF, etc. Refer to the following pictures for examples:



FIS-B Ramp Tester

2.1.2 Accessing the FIS DATA page

The FIS DATA page allows us to observe and change the receiver RF receive frequency, observe the weather data packet count, etc. Pressing the following keys in sequence accesses this page: [AUX] → [WX SETUP] → [FIS] → [FIS DIAG] → [Enter password] → [FIS DATA].



Figure 2 FIS DATA Page

In the FIS DATA page shown in Figure 2, for example, the screen indicates:

FIS Data	Data	Interpretation
System Time	01/23/02 20:54:14	System Time is 20:54:14 Zulu on January 23, 2002
APDU frame count	5,914	There have been 5,914 APDU frames received since the last power on OR the last time the [CLEAR DATA] button was used
Last Product ID	402 Metar	The last weather product received was a METAR (weather product ID was '402')
Last Image Time	01/23/02 20:51:00	The last image product was time stamped 20:51:00 Zulu on January 23, 2002

When a system is first turned on or after the [CLEAR DATA] button has been pressed, all of the data on this screen will be 'zero'ed out except for the 'HDLC frame count' and the 'Frequency'. The 'HDLC frame count' will indicate some number which is incrementing by 1 every second (this is the display talking with the radio). The 'Frequency' will be set to whatever the default frequency is or whatever the frequency was the last time the system was powered down or whatever the user has last set it to. For the screen in Figure 2, the frequency is 136.450 MHz.

2.2 Configure the KMD 540/KDR 510 system

Generally you will want to change the operating frequency so it does not interfere with whatever Honeywell FIS-B ground station is active in your area. The frequency should also be one selectable on the Ramp Tester. <the prototype Ramp Tester can tune 136.450 MHz and 136.475 MHz>.

To change the RF frequency, access the 'FIS DATA' page as discussed in 2.1.2. Use the joystick control in the upper right hand corner of the KMD 540 front panel to either increase (press UP) or decrease (press DOWN) the

FIS-B Ramp Tester

operating frequency. The displayed frequency will change in 25 kHz increments. Release the joystick when the desired frequency is reached.

You may also want to press the [CLEAR DATA] key to clear the 'FIS DATA' page. This will make it easier to detect changes when a message is received from the Ramp Tester.

2.3 Transmit A Test Message

Transmitting a test message is a simple 2-step process:

1. Set the Ramp Tester frequency to the selected KMD 540/KDR 510 frequency by setting the 'Frequency' switch to the desired setting – up for 136.475 MHz and down for 136.450 MHz.
2. Press the desired 'Message' button. The 'XMIT' button will light during the duration of the transmission. The Ramp Tester will turn itself off when the message is finished. The Ramp Tester will remain OFF until the next time a 'Message' button is pressed.

2.4 Interpret The Results

There are several interesting observations that can be made when a message from the Ramp Tester has been received:

- 2.4.1 'Lightning Bolt' on Tower Symbol
If you have the FIS-B 'Weather Display Page' active (either the 'NEXRAD Base Reflectivity' page or the 'Graphical METARS' page), you will observe lightning bolts next to the tower symbol in the bottom left hand corner of the display screen. These lightning bolts indicate that a message is being received by KMD 540 display.
- 2.4.2 APDU Counter on FIS DATA page
Each time a valid message is received the APDU counter will increment by some number 'n'. The exact value of n will depend on the type of message being received. Each Mode 2 VDL RF transmission can contain up to eight(8) APDUs. The METAR message in the Ramp Tester will increment the APDU counter by 5.
- 2.4.3 Date and Time on FIS DATA page
Each test message used in the Ramp Tester includes a system information message (or SIM) which is used to force the KMD 540's internal date and time to a set value – specifically December 8, 2001 at 20:05Z for Message 1. Every time you transmit Message 1, the 'System Time' on the FIS DATA page will jump to the December 8, 2001 at 20:05Z.
- 2.4.4 APDU Type on FIS DATA page
Message 1 on the Ramp Tester is a METAR type message (type 402). After reception of Message 1, the 'Last Product ID' on the FIS DATA page will indicate '402 METAR'.

2.5 Ground Range Check

The Ramp Tester can also be used to check for system sensitivity. However the results are relatively imprecise due to the many unpredictable factors involved principally due to the RF path between the output of the Ramp Tester and the RF input on the KDR 510. These factors include:

- The RF radiation efficiency of the antenna on the output of the Ramp Tester
- The RF radiation efficiency of the antenna on the aircraft
- The many disturbances due to the physical environment, e.g. the close proximity of the aircraft to the ground, adjacent physical structures, detuning of the Ramp Tester antenna due to the physical proximity of the person operating the Ramp Tester, etc.

Despite these unknowns, it should be possible to obtain some idea of how well the FIS-B system is performing overall. This can be done by gradually walking away from the aircraft with the Ramp Tester while transmitting a test message at intervals (e.g. every 10 feet). Another person monitors the KMD 540 display (we suggest watching the FIS DATA page) to determine if the signal has been received. For example if the person in the plane sees the APDU count (on the FIS DATA page) increment when a Ramp Tester Message is sent then the transmission was successful. Generally you should be able to go between 50 and 100 feet from the aircraft before reception is lost.

3 Message 1: METAR

Message 1 is a set of METAR/SPECI data. This is actual data taken on December 8, 2001 with time stamps between 1952Z and 2035Z. The data is about 1/6 of the total data set for that time frame and includes a selection of data for the continental USA. The actual data is included below so the user can verify the received data if he or she so desires.

Message #1 contents:

METAR KAAF 081956Z AUTO 19007KT 10SM CLR 24/21 A2994 RMK A02 SLP138 T02440211
TSNO-

METAR KAAO 081954Z AUTO 36012KT 10SM CLR 09/M08 A3031 RMK A02 SLP270
T00941078-

METAR KAAO 081955Z AUTO 00000KT 10SM CLR 05/M02 A3015 RMK A02 SLP228
T00501017 TSNO-

METAR KABE 081951Z 09009KT 6SM RA BR BKN014 OVC021 03/02 A3007 RMK A02 SLP187
P0002 T00330022-

METAR KABI 081952Z 36012KT 10SM FEW100 11/M04 A3035 RMK A02 RAE1855 SLP271
P0000 T01061044-

METAR KABQ 081956Z 36008KT 10SM CLR 06/M13 A3041 RMK A02 SLP292 T00561133-

METAR KABR 081956Z 17011KT 10SM CLR M04/M08 A3012 RMK A02 SLP221 T10391078-

SPECI KABY 082023Z 18006KT 10SM FEW014 23/19 A2996 RMK A02 \$-

METAR KACB 082015Z AUTO 20003KT 2 1/2SM -SN SCT012 BKN019 OVC024 02/01 A2997
RMK A02-

METAR KACK 081953Z 02007KT 10SM OVC045 05/M03 A3016 RMK A02 SLP213 T00501033-

METAR KACT 081951Z 01016KT 10SM CLR 12/01 A3023 RMK A02 SLP233 T01170011-

METAR KACV 081953Z AUTO 27006KT 10SM FEW014 12/09 A3017 RMK A02 SLP223
T01170089-

SPECI KACY 082015Z AUTO 07013KT 10SM -RA OVC014 08/08 A3003 RMK A02 P0001
TSNO-

METAR KADC 082037Z AUTO 25004KT 10SM CLR M06/M09 A3012 RMK A02-

METAR KADG 081953Z AUTO 05006KT 10SM FEW055 07/03 A2995 RMK A02 SLP148
T00720028-

METAR KADH 082029Z AUTO 32013G21KT 10SM CLR 11/M09 A3027 RMK A02-

METAR KADM 081950Z 33020KT 25SM SCT120 10/M03 A3030-

METAR KADS 081947Z 01017G25KT 15SM OVC150 13/M03 A3025-

METAR KADU 082025Z AUTO 31009KT 10SM CLR 03/M06 A3024 RMK A01-

METAR KAEG 082030Z AUTO 35009KT CLR 06/M11 A3039 RMK A01 P000-

FIS-B Ramp Tester

METAR KAEI 082033Z AUTO 29012KT 10SM CLR M04/M08 A3016 RMK A02-

METAR KAEX 081953Z 30008KT 5SM BR BKN006 OVC012 15/15 A3001 RMK A02 RAE39
SLP166 P0000 T01500150-

METAR KAFJ 082035Z AUTO 08006KT BKN004 BKN029 OVC046 06/05 A2981 RMK A01
P0003-

METAR KAFN 081952Z AUTO 25004KT 10SM FEW085 01/M08 A3014 RMK A02 SLP223
T00061078-

METAR KAFW 081953Z 36014KT 10SM CLR 12/M05 A3027 RMK A02 SLP251 T01221050-

SPECI KAGC 082006Z 09006KT 1SM R28/P6000FT -RA BR BKN002 OVC005 05/05 A2985
RMK A02 P0002-

METAR KAGS 081953Z 19008KT 10SM CLR 26/17 A2992 RMK A02 SLP131 T02560167-

METAR KAHN 081953Z 23009G17KT 10SM FEW049 SCT065 BKN080 24/12 A2992 RMK A02
SLP129 T02390122-

METAR KAIA 081953Z AUTO 26012KT 10SM CLR 03/M04 A3017 RMK A02 SLP249
T00331039-

METAR KAID 081945Z 32007KT 4SM HZ OVC010 A2995 RMK A02-

METAR KAIG 082034Z AUTO 31011G22KT 10SM SCT025 SCT029 OVC039 M01/M04 A2996
RMK A02-

METAR KAI0 082025Z AUTO 30008KT 10SM CLR 04/M04 A3028 RMK A01-

METAR KAIT 082035Z AUTO 29004KT 10SM CLR M04/M11 A3011 RMK A02-

METAR KAIZ 082035Z AUTO 33008G18KT 290V350 10SM CLR 08/M03 A3020 RMK A01-

METAR KAKH 081954Z AUTO 22012G17KT 10SM CLR 23/13 A2990 RMK A02 SLP122
T02330128-

METAR KAKO 081953Z AUTO 27010KT 10SM CLR 07/M11 A3025 RMK A02 SLP262
T00671111-

METAR KAKQ 081954Z AUTO VRB03KT 8SM CLR 18/12 A2993 RMK A02 SLP137 T01830122
TSNO-

METAR KAKR 081954Z AUTO 01005KT 10SM OVC013 05/02 A2987 RMK A02 SLP163
T00500022-

METAR KALB 081951Z 01005KT 10SM SCT090 01/M07 A3016 RMK A02 SLP217 T00111072-

SPECI KALI 082016Z AUTO 34012G20KT 8SM -RA FEW014 BKN033 OVC085 11/10 A3019
RMK A02 P0002-

METAR KALM 082030Z AUTO 18006KT 10SM CLR 12/M03 A3033 RMK A02-

METAR KALN 081949Z 32012KT 7SM FEW015 BKN250 08/04 A3009-

METAR KALO 081954Z 33017KT 10SM CLR 03/M09 A3015 RMK A02 SLP218 T00331089-

FIS-B Ramp Tester

METAR KALS 081952Z AUTO 00000KT 10SM CLR M02/M16 A3038 RMK A02 SLP345
T10171156-

METAR KALW 081953Z 32011KT 10SM CLR 09/03 A2998 RMK A02 SLP156 T00940033-

METAR KAMA 081953Z 01012G18KT 10SM CLR 08/M10 A3036 RMK A02 SLP278 T00831100-

METAR KAMG 081953Z AUTO 26006KT 10SM FEW025 SCT038 BKN100 24/19 A2994 RMK A02
SLP137 T02440194-

METAR KAMN 082035Z AUTO 00000KT 7SM SCT006 OVC011 01/00 A2997 RMK A02-

METAR KAMW 081953Z AUTO 32016KT 10SM CLR 03/M07 A3022 RMK A02 SLP240
T00281067-

METAR KANB 081953Z 24009KT 10SM BKN035 BKN055 OVC080 21/14 A2996 RMK A02
SLP141 T02110139-

METAR KAND 081956Z 24015KT 10SM CLR 24/13 A2992 RMK A02 SLP124 T02390133-

METAR KANE 081955Z AUTO 29009KT 10SM CLR M03/M08 A3016 RMK A02-

SPECI KANJ 082017Z AUTO 20008KT 3/4SM -SN VV014 01/M02 A2993 RMK A02 SNB1957
P0000-

METAR KANW 082030Z AUTO 26010KT 10SM CLR 06/M05 A3015 RMK A01-

SPECI KAOH 082020Z AUTO 01005KT 9SM SCT018 07/02 A2993 RMK A02-SPECI KA00
082000Z 10007KT 3SM -RA BR OVC007 02/01 A2993 RMK A02 P0000-

METAR KAPA 081953Z 14008KT 10SM FEW180 09/M17 A3022 RMK A02 SLP258 T00891167-

METAR KAPC 081954Z 09014G18KT 4SM HZ BKN150 14/08 A3019 RMK A02 SLP214
T01390078-

METAR KAPF 082035Z 20009KT 10SM CLR 27/22 A2994 RMK A01-

SPECI KAPN 082024Z AUTO 24003KT 2 1/2SM -SN BR OVC014 01/00 A2999 RMK A02
P0000-

METAR KAQP 082038Z AUTO 00000KT 10SM CLR M08/M11 A3018 RMK A02-

METAR KARA 081953Z 34018KT 9SM FEW026 BKN060 OVC090 18/14 A2999 RMK A02 PK
WND 32026/1922 SLP156 T01830139-

METAR KARB 081953Z 09007KT 10SM SCT050 06/02 A2994 RMK A02 SLP143 T00560017-

METAR KARG 082035Z AUTO 32015KT 10SM CLR 11/05 A3009 RMK A01-

METAR KARR 081953Z 32009KT 10SM SCT029 BKN046 08/02 A3002 RMK A02 SLP170
T00780017-

METAR KART 081956Z AUTO 06007KT 10SM BKN110 01/M08 A3011 RMK A02 SLP200
T00061078-

METAR KARV 082035Z AUTO 30011G17KT 10SM OVC021 M03/M09 A2999 RMK A02-

FIS-B Ramp Tester

METAR KASD 081953Z AUTO 27006KT 10SM FEW026 24/16 A2995 RMK A02 SLP141
T02390161-

METAR KASE 081953Z 32003KT 10SM CLR M07/M16 A3041 RMK A02 SLP350 T10671156-

METAR KASG 081950Z 35014KT 10SM BKN250 09/M03 A3020-

METAR KASH 081945Z 31003KT 15SM OVC0890 03/M09 A3020-

METAR KASJ 082019Z AUTO 19006KT 10SM CLR 21/12 A2991 RMK A02-

SPECI KAST 082030Z AUTO 23006KT 3SM RA BR BKN026 OVC039 08/07 A2999 RMK A02
P0011-

METAR KASX 081953Z AUTO 29010G17KT 10SM OVC029 M04/M11 A3009 RMK A02 SLP203
T10441106-

METAR KATL 081953Z 24010KT 10SM SCT044 SCT070 BKN085 22/11 A2995 RMK A02
SLP137 T02220111-

METAR KATS 082030Z AUTO 02005KT 10SM CLR 10/M06 A3039 RMK A02-

METAR KATW 081945Z 27012KT 7SM BKN020 OVC025 04/M01 A2998-

METAR KATY 081953Z AUTO 17007KT 10SM CLR M02/M09 A3013 RMK A02 SLP229
T10221094-

METAR KAUG 081953Z AUTO 31004KT 10SM CLR 01/M09 A3015 RMK A02 SLP214
T00111094-

METAR KAUH 082030Z AUTO 31007KT 10SM CLR 07/M06 A3025 RMK A01-

METAR KAUM 082035Z AUTO 30015KT 10SM CLR M03/M11 A3015 RMK A02-

METAR KAUO 082035Z AUTO 29009KT 10SM FEW044 22/12 A2995 RMK A01-

METAR KAUS 081953Z 35011G18KT 10SM FEW050 BKN080 BKN100 OVC130 10/04 A3021
RMK A02 RAE51 SLP230 P0000 T01000039-

METAR KAUW 081954Z AUTO 32009KT 10SM BKN039 01/M06 A2998 RMK A02 SLP170
T00111061-

METAR KAVC 082019Z AUTO 00000KT 10SM SCT055 19/13 A2998 RMK A01-

METAR KAVK 082031Z AUTO 01014G17KT 10SM CLR 12/M12 A3033 RMK A02-

METAR KAVL 081954Z 20012KT 10SM OVC048 18/12 A2994 RMK A02 SLP126 T01830122-

SPECI KAVP 082027Z 04004KT 3/4SM -SN BR VV007 01/01 A3005 RMK A02 P0002-

METAR KAVX 081951Z AUTO 03007KT 10SM CLR 19/M08 A3018 RMK A02 SLP201
T01941083-

METAR KAWG 082025Z AUTO 31016G22KT 10SM CLR 07/M01 A3014 RMK A01-

METAR KAWO 082035Z AUTO 16013KT 9SM OVC035 06/04 A2983 RMK A01-

FIS-B Ramp Tester

METAR KAXA 082025Z AUTO 31012G15KT 10SM CLR 01/M05 A3022 RMK A01-

METAR KAXN 081953Z AUTO 28005KT 10SM CLR M06/M10 A3014 RMK A02 SLP233
T10561100-

METAR KAYS 082024Z AUTO 28005KT 10SM SCT021 BKN033 OVC095 25/21 A2994 RMK
A01-

SPECI KAZO 082009Z 34008KT 8SM SCT017 BKN037 OVC055 05/02 A2998 RMK A02-

METAR KBAF 081953Z 05006KT 10SM FEW110 03/M06 A3014 RMK A02 SLP213 T00331056-

METAR KBAK 081950Z 32008KT 1 1/2SM BR OVC015 08/ A2992-

METAR KBAX 082035Z AUTO 13004KT 10SM SCT012 SCT048 BKN055 03/02 A2996 RMK
A02-

METAR KBAZ 081951Z AUTO 34011KT 10SM -RA BKN035 BKN060 09/05 A3024 RMK A02
SLP236 P0000 T00940050-

METAR KBBB 082035Z AUTO 29005KT 10SM M07/M12 A3018 RMK A02-

METAR KBBW 081953Z AUTO 27011KT 10SM CLR 08/M07 A3020 RMK A02 SLP239
T00831067-

METAR KBCB 082022Z AUTO 13004KT M1/4SM OVC002 08/07 A2993 RMK A01-

METAR KBCE 081953Z AUTO 14006KT 10SM CLR 01/M13 A3040 RMK A02 SLP317
T00061128-

METAR KBCT 081950Z 15006KT 10SM FEW025 27/21 A2997-

METAR KBDE 081953Z AUTO VRB03KT 10SM CLR M09/M13 A3008 RMK A02 SLP209
T10891133-

METAR KBDL 081951Z 02005KT 10SM SCT100 OVC130 04/M04 A3014 RMK A02 SLP207
T00441039-

METAR KBDR 081954Z 10009KT 10SM BKN075 07/00 A3014 RMK A02 SLP205 T00720000-

METAR KBED 081956Z 03003KT 10SM FEW100 03/M09 A3017 RMK A02 SLP234 T00281089-

SPECI KBEH 082013Z AUTO 34006KT 10SM BKN012 06/01 A2998 RMK A02-

SPECI KBFD 082022Z AUTO 13007KT 3/4SM -SN BR BKN008 OVC020 00/M01 A2992 RMK
A02 P0002 \$-

METAR KBFF 081954Z AUTO 29011G21KT 10SM CLR 09/M08 A3020 RMK A02 SLP246
T00891078-

METAR KBFI 081953Z 19010KT 10SM SCT045 OVC055 11/04 A2989 RMK A02 SLP120
T01060039-

METAR KBFL 081954Z 31005KT 6SM HZ CLR 12/08 A3021 RMK A02 SLP228 T01220083-

METAR KBFM 081953Z 15007KT 10SM FEW030 23/18 A2996 RMK A02 SLP145 T02280178-

FIS-B Ramp Tester

METAR KBFW 082036Z AUTO 31005KT 10SM CLR M07/M13 A3005 RMK A02-

METAR KBGD 081951Z AUTO 01013G18KT 10SM CLR 09/M10 A3038 RMK A02 SLP288
T00891100-

METAR KBGM 081956Z 08006KT 10SM BKN055 00/M03 A3004 RMK A02 SLP188 T00001028-

METAR KBHB 082035Z AUTO 30003KT 10SM CLR 01/M10 A3016 RMK A01-

METAR KBHK 081953Z AUTO 24010KT 10SM CLR 03/M03 A2998 RMK A02 SLP180
T00331028 \$-

SPECI KBHM 082004Z 29010KT 10SM FEW022 SCT035 BKN080 20/15 A2998 RMK A02-

METAR KBID 082035Z AUTO 06005KT 10SM CLR 06/M02 A3015 RMK A01-

METAR KBIE 082031Z AUTO 27006KT 10SM CLR 07/M08 A3027 RMK A01-

METAR KBIH 081956Z AUTO 00000KT 10SM CLR 08/M09 A3034 RMK A02 SLP273
T00831089 TSN0-

METAR KBIL 081956Z 24024G30KT 10SM FEW085 SCT120 08/M10 A3003 RMK A02 PK WND
24032/1858 SLP188 ACSL ALQDS T00831100-

METAR KBIS 081952Z 21007KT 10SM CLR 03/M04 A2998 RMK A02 SLP176 T00281044-

METAR KBIV 081953Z AUTO 32006KT 7SM SCT015 BKN021 OVC055 06/03 A3000 RMK A02
SLP163 T00560028-

METAR KBJC 081945Z VRB05KT 60SM FEW200 08/M16 A3024-

METAR KBJI 082035Z 28005KT 10SM CLR M07/M12 A3006 RMK A01-

METAR KBJJ 081953Z AUTO 34004KT 8SM FEW013 OVC024 05/02 A2991 RMK A02 SLP136
T00500017-

METAR KBKE 081953Z AUTO 11018KT 10SM CLR M02/M06 A3023 RMK A02 SLP271
T10171056-

METAR KBKL 081953Z 03003KT 10SM OVC025 07/02 A2990 RMK A02 SLP126 T00720022
\$-

METAR KBKV 081953Z AUTO 21006KT 10SM CLR 28/21 A2995 RMK A02 SLP139
T02780206-

SPECI KBKW 082011Z AUTO 21011KT 9SM -RA FEW009 BKN014 OVC027 13/13 A2987 RMK
A02 P0000-

METAR KBKX 082035Z AUTO 17007KT 10SM CLR M02/M09 A3015 RMK A01-

SPECI KBLF 082014Z AUTO 25007KT 210V280 5SM -RA BR FEW005 SCT009 OVC014 12/11
A2991 RMK A02 P0002-

METAR KBLH 081956Z AUTO 05007KT 10SM CLR 19/M02 A3030 RMK A02 SLP257
T01891022-

FIS-B Ramp Tester

SPECI KBLI 082015Z 17017G22KT 6SM RA BR BKN026 OVC036 07/05 A2983 RMK A02 P0003-

METAR KBLM 082035Z AUTO 08010KT 7SM FEW020 BKN036 OVC090 06/03 A3005 RMK A01 P0005-

METAR KBLU 081952Z AUTO 19009G15KT 170V240 10SM CLR 11/M09 A3028 RMK A02 SLP213 T01061094 TSN0-

METAR KBMG 081953Z 34008KT 3SM BR OVC010 08/06 A2995 RMK A02 SLP145 T00780056-

METAR KBMI 081945Z 34007KT 7SM BKN010 07/03 A3006-

METAR KBML 081952Z AUTO 29004KT 10SM CLR M02/M10 A3013 RMK A02 SLP219 T10171100-

METAR KBMQ 081953Z AUTO 35016G23KT 10SM CLR 11/M03 A3025 RMK A02 SLP239 T01111028-

METAR KBNA 081953Z 32007KT 3SM RA BR BKN011 OVC018 13/13 A2994 RMK A02 SLP134 P0005 T01330128-

METAR KBNO 081953Z AUTO 00000KT 10SM CLR M03/M07 A3016 RMK A02 SLP259 T10281067 TSN0-

METAR KBNW 082025Z AUTO 30012KT 10SM CLR 03/M07 A3021 RMK A01-

METAR KBOI 081956Z 15012KT 10SM CLR 02/M04 A3029 RMK A02 SLP273 T00221039-

METAR KBOS 081954Z 35008KT 10SM BKN100 OVC130 04/M09 A3019 RMK A02 SLP222 VIRGA ALQDS T00391089-

METAR KBOW 081951Z 21007KT 15SM SCT040 26/21 A2997-

METAR KBPI 081953Z AUTO 00000KT 10SM CLR M09/M14 A3035 RMK A02 SLP352 T10891139 FZРАН0-

METAR KBPK 081953Z AUTO 32007KT 290V360 10SM CLR 09/00 A3014 RMK A02 SLP206 T00890000-

SPECI KBPT 082037Z 35014KT 10SM -RA BKN014 BKN045 OVC060 14/12 A3006 RMK A02 RAB07 P0000-

METAR KBQK 082019Z AUTO 17003KT 3SM BKN022 BKN028 OVC037 22/22 A2996 RMK A02-

METAR KBRD 081953Z AUTO VRB06KT 10SM CLR M05/M12 A3015 RMK A02 SLP228 T10501117-

SPECI KBRL 082034Z AUTO 32011G18KT 8SM SCT019 05/00 A3013 RMK A02-

SPECI KBRO 082010Z 35019G27KT 2 1/2SM -RA BR OVC011 14/13 A3010 RMK A02 PK WND 34027/2004 RAB1958 P0000-

METAR KBTL 081953Z AUTO 34006KT 9SM OVC055 06/02 A2996 RMK A02 SLP153 T00610022-

FIS-B Ramp Tester

METAR KBTM 081953Z AUTO 31009KT 270V340 10SM CLR 06/M14 A3010 RMK A02 SLP219 T00561139-

METAR KBTP 082035Z AUTO 10007KT 5SM OVC005 04/03 A2985 RMK A01-

SPECI KBTR 082032Z 35012G18KT 10SM BKN025 OVC033 18/13 A2999 RMK A02 PK WND 31028/2000 P0001-

METAR KBTM 081954Z 04003KT 10SM FEW100 BKN140 M01/M09 A3017 RMK A02 SLP222 T10061089-

METAR KBUF 081954Z 07009KT 10SM SCT100 SCT130 BKN150 OVC180 03/M02 A2999 RMK A02 SLP164 T00281022-

METAR KBUR 081953Z 00000KT 10SM CLR 22/M04 A3016 RMK A02 SLP201 T02221044~

4 Message 2: <TBD>

At present, there is no defined message loaded into 'Message #2'

5 Message 3: <TBD>

At present, there is no defined message loaded into 'Message #3'

6 Routine Maintenance

6.1 Battery Replacement

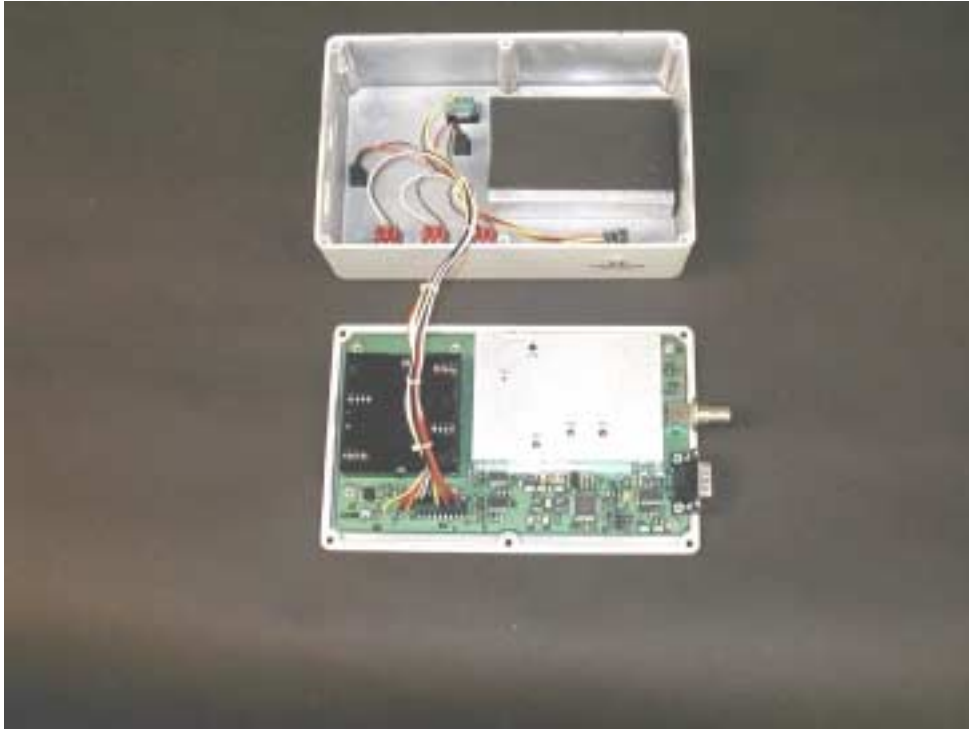


Figure 3 Interior View Showing Battery Locations

The Ramp Tester uses 4 standard AA sized alkaline dry cells. In continuous use, a set of fresh batteries should be good for several days of continuous use. In the very intermittent use anticipated in the field, the batteries should last for several years. As the batteries get low in capacity the 'LOW BATT' light will come on when a 'Message' key is depressed – this is an indication the batteries should be replaced.

To replace the batteries, first remove the antenna. Next remove the six screws on the bottom of the case. Then, on the top of the case, remove the two screws holding the DB-9 data connector and the large nut and lock washer securing the BNC connector. The bottom of the case can now be dropped down and the bottom, with the attached electronics, withdrawn backwards from the case. The batteries are now exposed. Refer to Figure 3 for a view of the inside of the case.

Remove the 4 batteries and replace them being careful of the polarity of the batteries. Carefully re-insert the board and connectors into the case (particularly insuring that the wiring harness is not pinched) and then reconnect the BNC hardware, the 2 screws anchoring the DB-9 data connector and the 6 screws connecting the bottom.