


**M. Flom Associates, Inc. - Global Compliance Center**

3356 North San Marcos Place, Suite 107, Chandler, Arizona 85225-7176

www.mflom.com general@mflom.com (480) 926-3100, FAX: 926-3598

Date of Report: June 14, 2002

Date of Submission: June 25, 2002

Applicant: Honeywell International Inc.  
 Commercial Electronic Systems Inc. - Phoenix  
 2111 North 19<sup>th</sup> Avenue  
 Phoenix, AZ 85027

Attention of: Greg Shauder, Director RF Systems

Mailing: Honeywell Inc.  
 Business, Regional & General Aviation  
 5353 W. Bell Road, MS 2DD80  
 Glendale, AZ 85308

Attention of: Robert H. Fuller, Technical Mgr, EPIC Eng'g  
 (602) 436-4715; FAX: -4040  
 bob.fuller@honeywell.com  
 and/or Charles Dosdall, Manager  
 (602) 436-4653

Equipment: MODEL NC-861A consisting of COM Transmitter  
 and VOR/LOC Receiver, Glide Slope Receiver,  
 Marker Beacon Receiver and COM Receiver

FCC ID: GB8NC861A

P.O. Number: x302677L-06B

FCC Rules: Radiofrequency Radiation Exposure Limits  
 47 CFR 1.1310

MPE - Mobiles x Fixed Based Station       

Gentlemen:

Enclosed please find your copy of the Supplemental Test Data Report,  
 the whole for Environmental Assessment (MPE) of the referenced  
 equipment as shown.

Please allow from 8-12 weeks to hear from the Commission, who may  
 request additional data or information, and even a sample for  
 pre-grant audit testing.

Should you need any clarification, just fax or phone. Thank you  
 again for this order - it has been a pleasure to be of service.

Sincerely yours,

Morton Flom, P. Eng.

enclosure(s)

MF/cvr

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Federal Communications Commission  
Via: Electronic Filing

Attention: Authorization &amp; Evaluation Division

Applicant: Honeywell International Inc.

Equipment: MODEL NC-861A consisting of COM Transmitter  
and VOR/LOC Receiver, Glide Slope Receiver,  
Marker Beacon Receiver and COM Receiver

FCC ID: GB8NC861A

FCC Rules: Radiofrequency Radiation Exposure Limits  
47 CFR 1.1310MPE - Mobiles   x   Fixed Based Station       

Gentlemen:

On behalf of the Applicant, enclosed please find the Supplemental  
Test Data Report, the whole for Environmental Assessment (MPE) of  
the referenced equipment as shown.We trust the same is in order. Should you need any further  
information, kindly contact the writer who is authorized to act as  
agent.

Sincerely yours,

Morton Flom, P. Eng.

enclosure(s)

cc: Applicant

MF/cvr



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ENVIRONMENTAL ASSESSMENT

for

MOBILES/FIXED BASE STATION

for

FCC ID: FCC ID: GB8NC861A

MODEL NC-861A consisting of COM Transmitter, VOR/LOC Receiver,  
Glide Slope Receiver, Marker Beacon Receiver and COM Receiver

to

FEDERAL COMMUNICATIONS COMMISSION

47 CFR 1.1310 (MPE)  
Radiofrequency Radiation Exposure Limits

DATE OF REPORT: June 14, 2002

ON THE BEHALF OF THE APPLICANT:

Honeywell International Inc.

AT THE REQUEST OF:

P.O. x302677L-06B

Honeywell Inc.  
Business, Regional & General Aviation  
5353 W. Bell Road, MS 2DD80  
Glendale, AZ 85308

Attention of:

Robert H. Fuller, Technical Mgr, EPIC Eng'g  
(602) 436-4715; FAX: -4040  
bob.fuller@honeywell.com  
and/or Charles Dosdall, Manager  
(602) 436-4653

Morton Flom, P. Eng.

SUPERVISED BY:

TABLE OF CONTENTS

| <u>RULE</u> | <u>DESCRIPTION</u>                                 | <u>PAGE</u> |
|-------------|--|-------------|
|             | Test Report  | 1           |
|             | Identification of the Equipment Under Test         | 2           |
|             | Standard Test Conditions and Engineering Practices | 4           |
| 1.1310      | Environmental Assessment                           | 5           |

PAGE NO.

1 of 9.

*Required information per ISO/IEC Guide 25-1990, paragraph 13.2:*

a) TEST REPORT (SUPPLEMENTAL)

b) Laboratory: M. Flom Associates, Inc.  
(FCC: 31040/SIT) 3356 N. San Marcos Place, Suite 107  
(Canada: IC 2044) Chandler, AZ 85225

c) Report Number: d0260028

d) Client: Honeywell International Inc.  
Commercial Electronic Systems Inc. - Phoenix  
2111 North 19<sup>th</sup> Avenue  
Phoenix, AZ 85027

e) Identification: NC-861A  
Description: FCC ID: GB8NC861A  
VHF FM Mobile Transceiver

f) EUT Condition: Not required unless specified in individual tests.

g) Report Date: June 14, 2002  
EUT Received: April 15, 2002

h, j, k): As indicated in individual tests.

i) Sampling method: No sampling procedure used.

l) Uncertainty: In accordance with MFA internal quality manual.

m) Supervised by:

  
Morton Flom, P. Eng.

n) Results: The results presented in this report relate only to the item tested.

o) Reproduction: This report must not be reproduced, except in full, without written permission from this laboratory.

PAGE NO.

2 of 9.

IDENTIFICATION OF THE EQUIPMENT UNDER TEST (EUT)NAME AND ADDRESS OF APPLICANT:

Honeywell International Inc.  
Commercial Electronic Systems Inc. - Phoenix  
2111 North 19<sup>th</sup> Avenue  
Phoenix, AZ 85027

MANUFACTURER:

Honeywell Inc.  
Business, Regional & General Aviation  
5353 W. Bell Road, MS 2DD80  
Glendale, AZ 85308

FCC ID: GB8NC861A

MODEL NO: NC-861A consisting of COM  
Transmitter VOR/LOC Receiver,  
Glide Slope Receiver, Marker  
Beacon Receiver and COM Receiver

DESCRIPTION: VHF FM Mobile Transceiver

TYPE OF EMISSION: 16K00A3E

FREQUENCY RANGE, MHz: 117.975 to 152.0

POWER RATING, Watts: 22  
 Switchable  Variable  N/A

MODULATION:  
 AMPS  
 TDMA  
 CDMA  
 OTHER

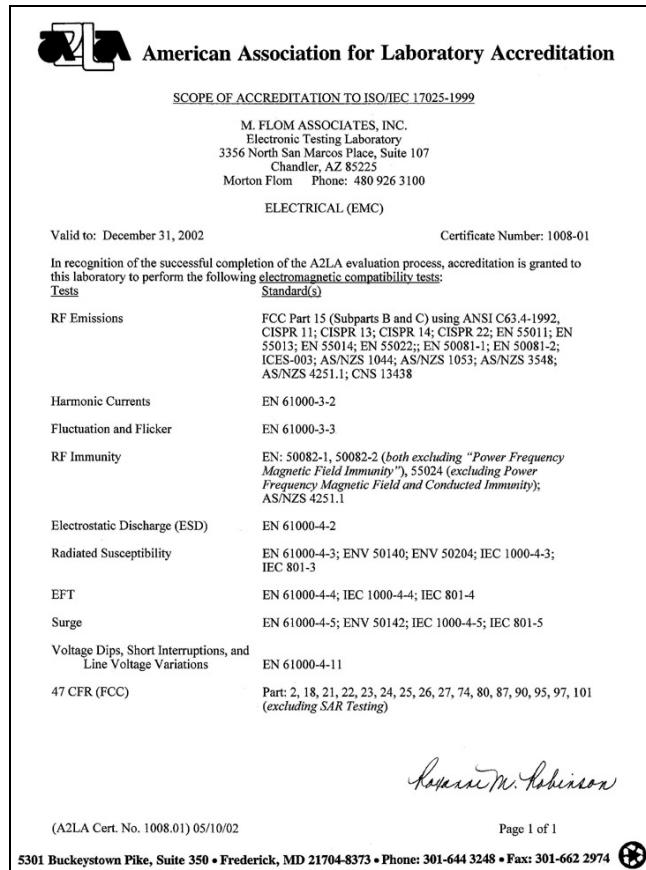
ANTENNA:  
 HELICAL  
 MONOPOLE  
 WHIP  
 OTHER

**NOTE: For RF Safety test antenna gain taken at the upper range of expected gain (i.e. 0 dBd) and RF Power set to highest nominal power across all channels.**

PAGE NO.

3 of 9.

M. Flom Associates, Inc. is accredited by the American Association for Laboratory Association (A2LA) as shown in the scope below.



"This laboratory is accredited by the American Association for Laboratory Accreditation (A2LA) and the results shown in this report have been determined in accordance with the laboratory's terms of accreditation unless stated otherwise in the report."

Should this report contain any data for tests for which we are not accredited, or which have been undertaken by a subcontractor that is not A2LA accredited, such data would not be covered by this laboratory's A2LA accreditation.

PAGE NO.

4 of 9.

STANDARD TEST CONDITIONS  
and  
ENGINEERING PRACTICES

Except as noted herein, the following conditions and procedures were observed during the testing:

In accordance with ANSI C63.4-1992/2000, section 6.1.9, and unless otherwise indicated in the specific measurement results, the ambient temperature of the actual EUT was maintained within the range of 10° to 40°C (50° to 104 °F) unless the particular equipment requirements specify testing over a different temperature range. Also, unless otherwise indicated, the humidity levels were in the range of 10% to 90% relative humidity.

Prior to testing, the EUT was tuned up in accordance with the manufacturer's alignment procedures. All external gain controls were maintained at the position of maximum and/or optimum gain throughout the testing.

Measurement results, unless otherwise noted, are worst case measurements.

PAGE NO. 5 of 9.

Name of test: Environmental Assessment

Specification: FCC: 47 CFR 1.1310

Measurement Guide: ANSI/IEEE C95.1 1992

Test Equipment: Maximum Permissible Exposure (MPE) measurement system, consisting of:  
Narda 8717-1174R, Radiation meter  
Narda 8761D, E-field probe (300 kHz - 3 GHz)  
(Calibrated Nov-98)

Measurement Procedure:

1. The following measurements were performed with a Narda probe using ANSI/IEEE C95.1 as a guide.
2. Prior to making any measurements, the measurements system was calibrated in accordance with the manufacturer's procedures.
3. The EUT's radiating element (antenna) was placed on a 1 m tall table for ease of testing. For equipment normally operated on a metal surface, a ground plane was used.
4. The remaining equipment necessary to operate the EUT was maintained at a distance from the measurement arrangement suitable to minimize interference with the measurements.
5. The minimum safe distance was calculated from the formula  $\text{Power Density} = \text{EIRP} / 4\pi R^2$  (Peak Watts/m<sup>2</sup>). The calculation is shown with the measurement data.
6. With the EUT operating at maximum power, a search was initiated for worst case emissions with the probe raised and lowered over a range of 0.2 to 2 meters in height and over a horizontal plane of 0° to 360°.
7. Average values were calculated for the whole body (0.2-2.0m), lower body (0.2-0.8m) and upper body (1.0-2.0m).

Results: Attached.

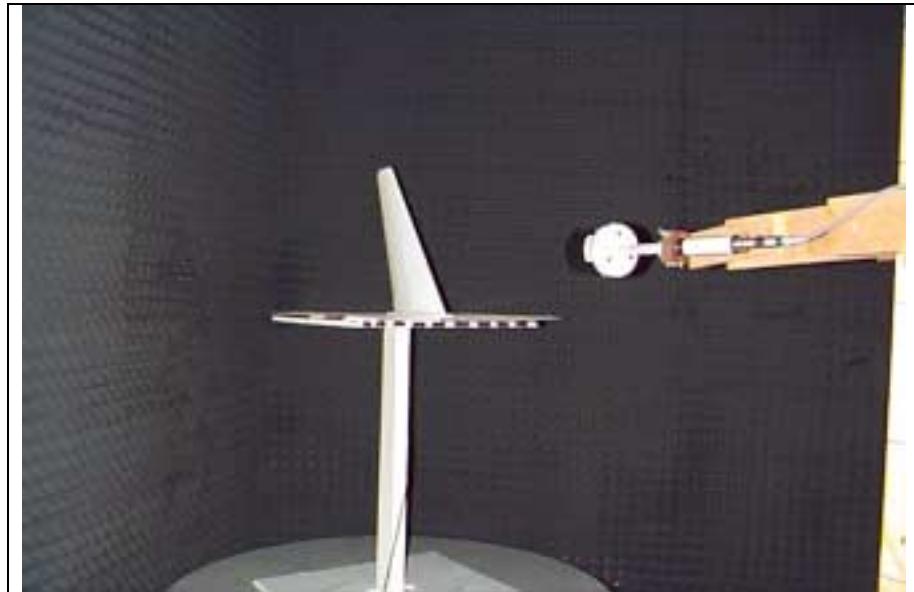
PAGE NO.

6 of 9.

TEST SETUP: Maximum Permissible Exposure (MPE)

g0240013: 2002-Apr-19 Fri 08:50:49

STATE: 0:General



PAGE NO.

7 of 9.

Name of test:

R.F. Radiation Exposure

FCC Rules:

1.1307, 1.1310, 1.1311, 2.1091

Description, EUT:

See page 2 of Test Report

Test Frequency, MHz

= 118.00

Antenna Gain

= 3 dB

Antenna Model

Aircraft Fin

Rated Probe:

Narda 8761D Probe = 10  $\mu\text{W}/\text{cm}^2$  to 20  $\text{mW}/\text{cm}^2$ 

LIMITS: Controlled

|               |                   |   |
|---------------|-------------------|---|
| Exposure      | 0.3-3.0 MHz:      | Limit $[\text{mW}/\text{cm}^2]$ = 100         |
| 47 CFR 1.1310 | 3.0-30 MHz:       | Limit $[\text{mW}/\text{cm}^2]$ = $(900/f^2)$ |
| Table 1, (A)  | 30-300 MHz:       | Limit $[\text{mW}/\text{cm}^2]$ = 1.0         |
|               | 300-1500 MHz      | Limit $[\text{mW}/\text{cm}^2]$ = $f/300$     |
|               | 1500-100,000 MHz: | Limit $[\text{mW}/\text{cm}^2]$ = 5.0         |

Power, Conducted, W = 43.5 dBm = 22 Watts

Power + Ant. Gain, W = 43.5 + 3 = 46.5 dBm = 44.6 Watts

Limit: Controlled Exposure: 30 - 300 MHz Limit = 1.0

Tested Distance: 110 cm

Results:  
at tested distance

| Probe | Height, m | Power Density, $\text{mW}/\text{cm}^2$ |
|-------|-----------|--|
|       | 2.0       | 0.19                                   |
|       | 1.8       | 0.19                                   |
|       | 1.6       | 0.19                                   |
|       | 1.4       | 0.19                                   |
|       | 1.2       | 0.19                                   |
|       | 1.0       | 0.18                                   |
|       | 0.8       | 0.16                                   |
|       | 0.6       | 0.15                                   |
|       | 0.4       | 0.11                                   |
|       | 0.2       | 0.03                                   |

Power Density  
Calculations:The measured power density readings were summed  
and the results divided by the number of  
readings to calculate the average.

For whole body:

Average of 0.2 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.188

For lower body:

Average of 0.2 to 0.8 m,  $\text{mW}/\text{cm}^2$  = 0.113

For upper body:

Average of 1.0 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.158

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PAGE NO. 8 of 9.

Name of test: R.F. Radiation Exposure

FCC Rules: 1.1307, 1.1310, 1.1311, 2.1091

Description, EUT: See page 2 of Test Report

Test Frequency, MHz = 134.875

Antenna Gain = 3 dB

Antenna Model Aircraft Fin

Rated Probe: Narda 8761D Probe = 10  $\mu\text{W}/\text{cm}^2$  to 20  $\text{mW}/\text{cm}^2$ 

|                             |                   |   |
|-----------------------------|-------------------|---|
| LIMITS: Controlled Exposure | 0.3-3.0 MHz:      | Limit [ $\text{mW}/\text{cm}^2$ ] = 100         |
| 47 CFR 1.1310               | 3.0-30 MHz:       | Limit [ $\text{mW}/\text{cm}^2$ ] = $(900/f^2)$ |
| Table 1, (A)                | 30-300 MHz:       | Limit [ $\text{mW}/\text{cm}^2$ ] = 1.0         |
|                             | 300-1500 MHz      | Limit [ $\text{mW}/\text{cm}^2$ ] = $f/300$     |
|                             | 1500-100,000 MHz: | Limit [ $\text{mW}/\text{cm}^2$ ] = 5.0         |

Power, Conducted, W = 43.5 dBm = 22 Watts

Power + Ant. Gain, W = 43.5 + 3 = 46.5 dBm = 44.6 Watts

Limit: Controlled Exposure: 30 - 300 MHz Limit = 1.0

Tested Distance: 47 cm

| Results:<br>at tested distance | Probe Height, m | Power Density, $\text{mW}/\text{cm}^2$ |
|--------------------------------|-----------------|--|
|                                | 2.0             | 0.09                                   |
|                                | 1.8             | 0.15                                   |
|                                | 1.6             | 0.17                                   |
|                                | 1.4             | 0.13                                   |
|                                | 1.2             | 0.15                                   |
|                                | 1.0             | 0.19                                   |
|                                | 0.8             | 0.12                                   |
|                                | 0.6             | 0.05                                   |
|                                | 0.4             | 0.02                                   |
|                                | 0.2             | 0.08                                   |

Power Density Calculations: The measured power density readings were summed and the results divided by the number of readings to calculate the average.

For whole body: Average of 0.2 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.115For lower body: Average of 0.2 to 0.8 m,  $\text{mW}/\text{cm}^2$  = 0.068For upper body: Average of 1.0 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.147

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PAGE NO. 9 of 9.

Name of test: R.F. Radiation Exposure

FCC Rules: 1.1307, 1.1310, 1.1311, 2.1091

Description, EUT: See page 2 of Test Report

Test Frequency, MHz = 151.975

Antenna Gain = 3 dB

Antenna Model Aircraft Fin

Rated Probe: Narda 8761D Probe = 10  $\mu\text{W}/\text{cm}^2$  to 20  $\text{mW}/\text{cm}^2$ 

|                             |                   |   |
|-----------------------------|-------------------|---|
| LIMITS: Controlled Exposure | 0.3-3.0 MHz:      | Limit [ $\text{mW}/\text{cm}^2$ ] = 100         |
| 47 CFR 1.1310               | 3.0-30 MHz:       | Limit [ $\text{mW}/\text{cm}^2$ ] = $(900/f^2)$ |
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|                             | 300-1500 MHz      | Limit [ $\text{mW}/\text{cm}^2$ ] = $f/300$     |
|                             | 1500-100,000 MHz: | Limit [ $\text{mW}/\text{cm}^2$ ] = 5.0         |

Power, Conducted, W = 43.5 dBm = 22 Watts

Power + Ant. Gain, W = 43.5 + 3 = 46.5 dBm = 44.6 Watts

Limit: Controlled Exposure: 30 - 300 MHz Limit = 1.0

Tested Distance: 103 cm

| Results:<br>at tested distance | Probe Height, m | Power Density, $\text{mW}/\text{cm}^2$ |
|--------------------------------|-----------------|--|
|                                | 2.0             | 0.10                                   |
|                                | 1.8             | 0.11                                   |
|                                | 1.6             | 0.12                                   |
|                                | 1.4             | 0.16                                   |
|                                | 1.2             | 0.19                                   |
|                                | 1.0             | 0.19                                   |
|                                | 0.8             | 0.19                                   |
|                                | 0.6             | 0.19                                   |
|                                | 0.4             | 0.18                                   |
|                                | 0.2             | 0.16                                   |

Power Density Calculations: The measured power density readings were summed and the results divided by the number of readings to calculate the average.

For whole body: Average of 0.2 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.159For lower body: Average of 0.2 to 0.8 m,  $\text{mW}/\text{cm}^2$  = 0.180For upper body: Average of 1.0 to 2.0 m,  $\text{mW}/\text{cm}^2$  = 0.145

SUPERVISED BY:



Morton Flom, P. Eng.

**(The following will be placed in the Instruction Manual)**

**MANDATORY SAFETY INSTRUCTIONS TO INSTALLERS & USERS**

Use only manufacturer or dealer supplied antenna.

Antenna Minimum Safe Distance: 110 cm, 100% Duty Cycle.

Antenna Gain: 3.0 dbi.

The Federal Communications Commission has adopted a safety standard for human exposure to RF (Radio Frequency) energy which is below the OSHA (Occupational Safety and Health Act) limits.

Antenna Mounting: The antenna supplied by the manufacturer or radio dealer must not be mounted at a location such that during radio transmission, any person or persons can come closer than the above indicated minimum safe distance to the antenna i.e. 110 cm, 100% Duty Cycle.

To comply with current FCC RF Exposure limits, the antenna must be installed at or exceeding the minimum safe distance shown above, and in accordance with the requirements of the antenna manufacturer or supplier.

Base Station Installation: The antenna should be fixed-mounted on an outdoor permanent structure. RF Exposure compliance must be addressed at the time of installation.

Antenna Substitution: Do not substitute any antenna for the one supplied or recommended by the manufacturer or radio dealer. You may be exposing person or persons to excess radio frequency radiation. You may contact your radio dealer or the manufacturer for further instructions.

WARNING: Maintain a separation distance from the antenna to a person(s) of at least 110 cm, 100% Duty Cycle.

You, as the qualified end-user of this radio device must control the exposure conditions of bystanders to ensure the minimum separation distance (above) is maintained between the antenna and nearby persons for satisfying RF Exposure compliance. The operation of this transmitter must satisfy the requirements of Occupational/Controlled Exposure Environment, for work-related use. Transmit only when person(s) are at least the minimum distance from the properly installed, externally mounted antenna.

TESTIMONIAL  
AND  
STATEMENT OF CERTIFICATION

THIS IS TO CERTIFY THAT:

1. THAT the application was prepared either by, or under the direct supervision of, the undersigned.
2. THAT the technical data supplied with the application was taken under my direction and supervision.
3. THAT the data was obtained on representative units, randomly selected.
4. THAT, to the best of my knowledge and belief, the facts set forth in the application and accompanying technical data are true and correct.

CERTIFYING ENGINEER:



Morton Flom, P. Eng.