



# Nemko

**Test Report:** 3W06286

**Applicant:** Mark IV Industries  
6020 Ambler Drive  
Mississauga, Ontario  
L4W 2P1

**Equipment Under Test:  
(EUT)** Mark IV IVHS Division, 801210 Transponder  
915.75MHz

**FCC ID:** JQU801210

**In Accordance With:** **FCC Part 90**  
902-928MHz, LMS Systems

**Tested By:** Nemko Canada Inc.  
303 River Road, R.R. 5  
Ottawa, Ontario K1V 1H2

**Authorized By:**   
Russell Grant, Senior Technical Assessor

**Date:** 8 May 2003

**Total Number of Pages:** 14

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Mark IV 801210 Transponder

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## Section 1. Summary of Test Results

### General

All measurements are traceable to national standards.

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 90, Sub part M.



New Submission



Production Unit



Class II Permissive Change



Pre-Production Unit



Equipment Code

THIS TEST REPORT RELATES ONLY TO THE ITEM(S) TESTED.

THE FOLLOWING DEVIATIONS FROM, ADDITIONS TO, OR EXCLUSIONS FROM THE TEST SPECIFICATIONS HAVE BEEN MADE.

See " Summary of Test Data".



TESTED BY: \_\_\_\_\_  
Glen Westwell, Wireless Technologist

DATE: 7 May 2003

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This report applies only to the items tested.

*Mark IV 801210 Transponder*

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**Summary Of Test Data**

<b>Name Of Test</b>	<b>Para. No.</b>	<b>Result</b>
RF Power Output	2.1046	Complies
Occupied Bandwidth	2.1049	Complies
Spurious Emissions at Antenna Terminals	2.1051	N/A
Field Strength of Spurious Emissions	2.1053	Complies
Frequency Stability	2.1055	N/A

**Notes:**

This mobile transponder is used in the 909.75-921.75MHz (12MHz) band for non-multilateration LMS operations. This mobile transponder is not subject to frequency stability restrictions. This device incorporates an integral antenna.

**Indoor**                      Temperature: 22°C  
   Humidity: 45%

**Outdoor**                    Temperature: 12°C  
   Humidity: 70%



*Mark IV 801210 Transponder*

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**Section 3. RF Power Output**

**Para. No.: 2.1046**

<b>Test Performed By: Glen Westwell</b>	<b>Date of Test: 5 May 2003</b>
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**Minimum Standard:** 90.205 (30W, ERP)

**Test Results:** Complies.

The RF power output is 7.0dBm (0.005)W.

**Measurement Data:**

Note: The field strength was measured using a 2MHz RBW.

Fundamental	Field Strength (maximum)	E.R.P. (signal substitution)
915MHz	102.6dBuV	7.0dBm

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**Section 4. Occupied Bandwidth**

**Para. No.: 2.1049**

<b>Test Performed By: Glen Westwell</b>	<b>Date of Test: 5 May 2003</b>
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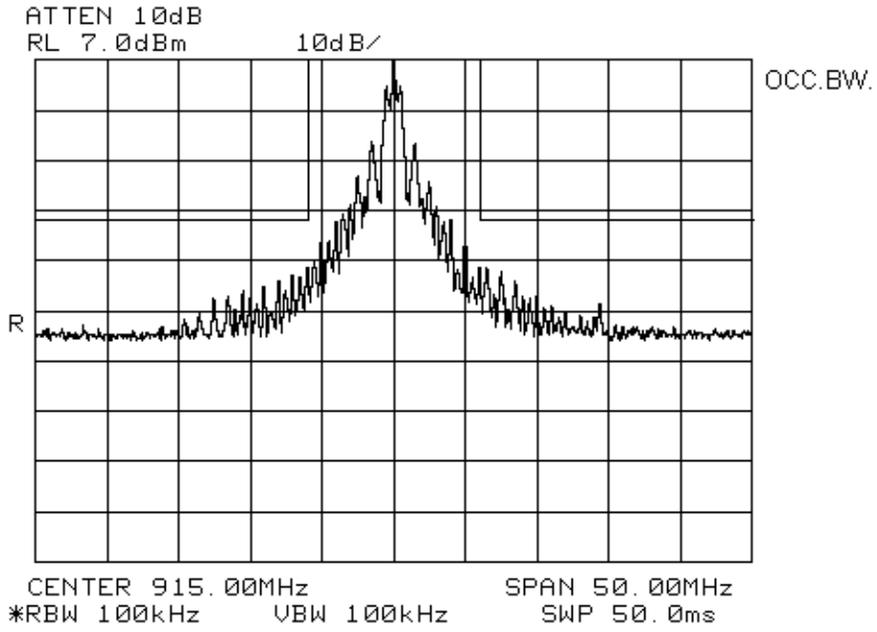
**Minimum Standard:** 90.210 (k)(3)

**Test Results:** Complies

**Measurement Data:** See Attached Plot.

Mark IV 801210 Transponder

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**Section 9. Field Strength of Spurious Emissions**

**Para. No.: 2.1053**

<b>Test Performed By: Glen Westwell</b>	<b>Date of Test: 2 May 2003</b>
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**Minimum Standard:** 90.210, -25dBm

**Test Results:** Complies.

**Measurement Data:** See Attached Table.

This EUT was searched on 3 orthogonal axis for maximum emissions from 30MHz to 10GHz. Only those emissions detected with in 20dB of the limit were reported.

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**Test Data - Radiated Emissions**

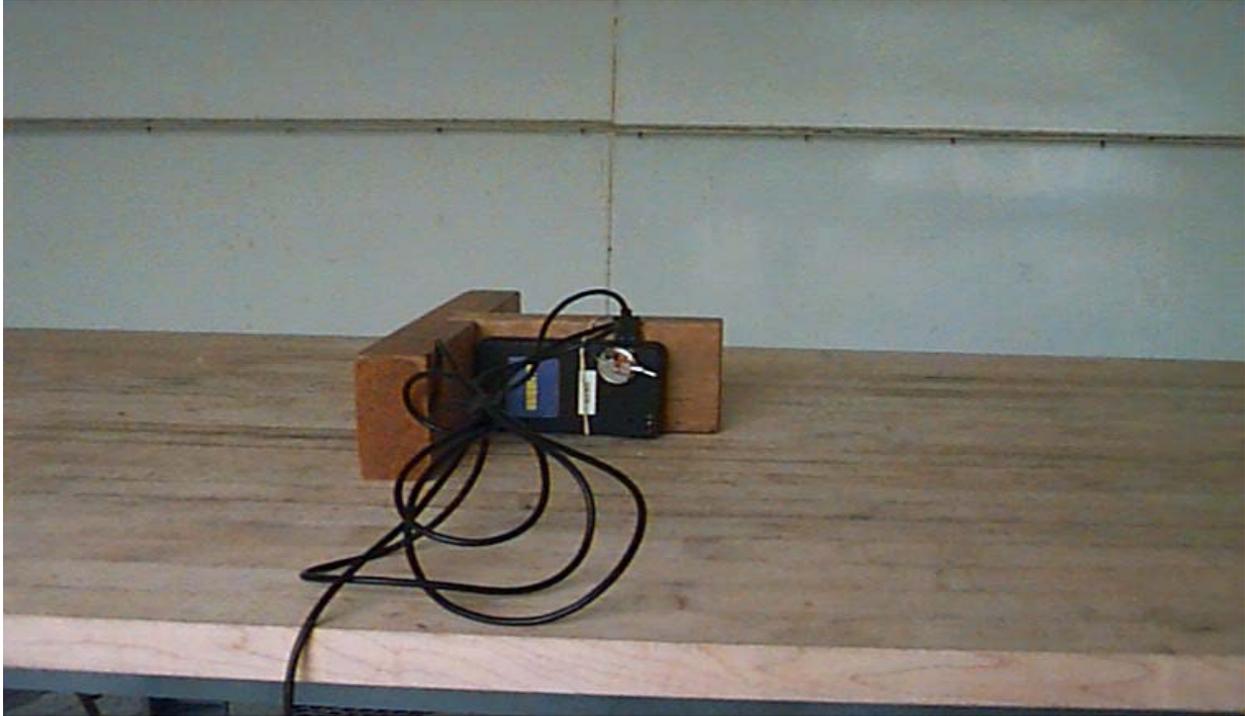
Test Distance (meters) : 3		Range: A		Receiver: 8565E		RBW(kHz): 1000	Detector: Peak	
Freq. (MHz)	Ant. *	Pol. (V/H)	RCVD Signal (dBµV/m)	Conversion Factor (dB)**	Cable Loss (dB)	Emission Level (dBm)	Limit (dBm)	Margin (dB)
1830.00	Hrn2	V	81.5	-119.1	3.9	-33.7	-25	8.7
1830.00	Hrn2	H	68.7	-119.7	3.9	-47.1	-25	22.1
2745.00	Hrn2	V	67.2	-127.5	3.9	-54.6	-25	29.6
2745.00	Hrn2	H	72.5	-129.1	3.9	-50.8	-25	25.8

**Notes:**  
 B/C = Biconical, B/L = Biconilog, L/P = Log-Periodic, H = Horn, D/P = Dipole  
 \* Re-measured using dipole antenna.  
 \*\* Includes cable loss when amplifier is not used.  
 \*\*\* Includes cable loss.  
 ( ) Denotes failing emission level.  
 N.D. = Not Detected

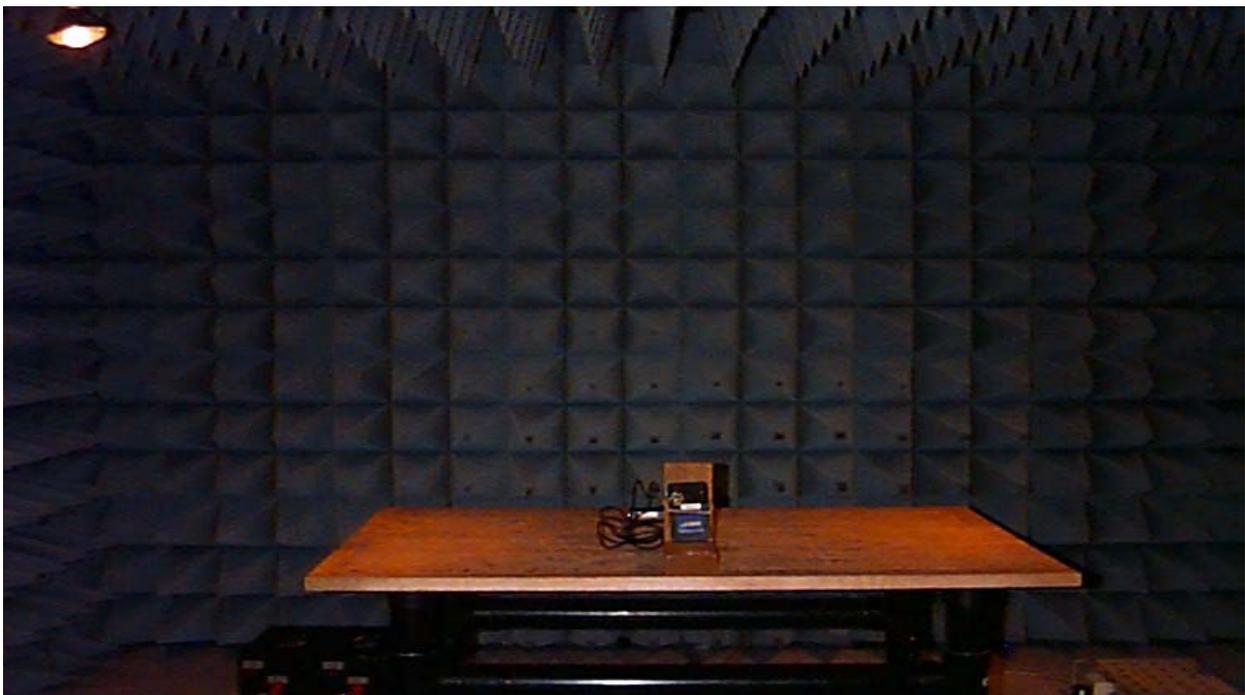
*Mark IV 801210 Transponder*

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**Radiated Emissions Set Up**



**Pre-Scan Photo**



Mark IV 801210 Transponder

**Section 12. Test Equipment List**

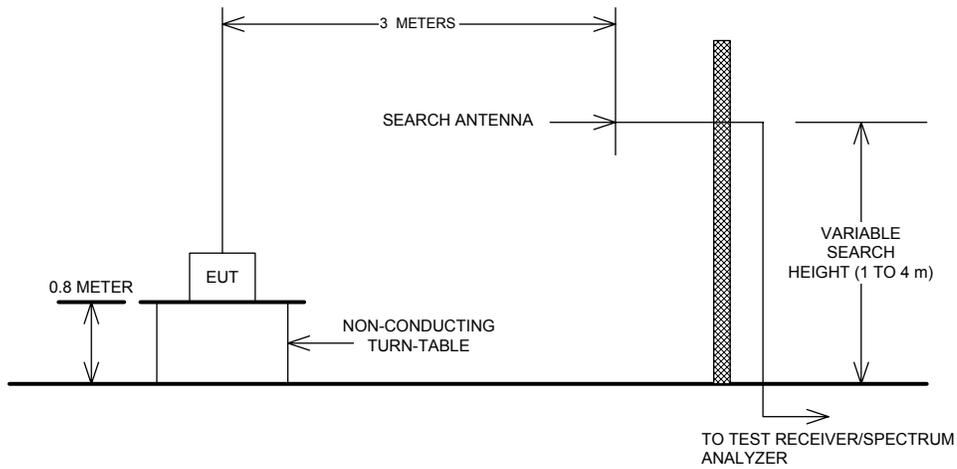
CAL CYCLE	EQUIPMENT	MANUFACTURER	MODEL	SERIAL	LAST CAL.	NEXT CAL.
1 Year	Spectrum Analyzer	Hewlett Packard	8565E	FA000981	15 Jul 02	15 Jul 03
1 Year	Power Meter	Hewlett Packard	E4418B	FA001678	01 Apr 03	01 Apr 04
1 Year	Biconical (1) Antenna	EMCO	3109	9204-2708	02 Jul 02	02 Jul 03
1 Year	Log Periodic Antenna #1	EMCO	LPA-25	FA000477	Aug. 23/02	Aug. 23/03
1 Year	Signal Generator	Rhode & Schwarz	SM1Q03E	FA001269	06 Dec 02	06 Dec 03
1 Year	Hrn. Antenna	EMCO	3115	FA000825	19 Dec 02	19 Dec 03
1 Year	Notch Filter (High Pass)	K&L	3DH1-2000	FA001434	COU	COU
1 Year	RF Amp	JCA	1-2GHz	FA001498	4 June 02	4 Jun 03
1 Year	RF Amp	JCA	2-4GHz	FA001496	4 June 02	4 Jun 03
1 Year	RF Amp	JCA	4-8GHz	FA001497	4 June 02	4 Jun 03

### Section 13. Test Diagrams

Para. No. 2.1046 - R.F. Power Output

Para. No. 2.1049 - Occupied Bandwidth

Para. No. 2.1053 - Field Strength of Spurious Radiation



Mark IV 801210 Transponder

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**Para. No. 2.1046 - R.F. Power Output**

**Para. No. 2.1053 - Field Strength of Spurious Radiation**

TIA/EIA 603

**Effective Radiated Power  
Spurious Emissions**

