# **MPE TEST RESULT**

Equipment Under Test: Mobile Radio

Model No.: TM-800U

Date of Test(s): 2006-10-04

Standards: FCC 47CFR 2.1091(b)

Tested by : Army 2006-05-19

The details of the testing results carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

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# 1. Description

HYT'S TM800U mobile radio are Compatible, Conventional radio system operation. The operation and functions for the TM-800U Series radios are described in this manual. TM-800U has a compact size with a various features in range of 400 MHz ~ 470 MHz. TM-800 U has a various features shown as below.

- Wideband frequency separation, Programmable output power

- Programmable 12.5 / 25 kHz channel spacing

- Programmable On / Off hook function, Talk Around
- Scanning, Priority Scanning
- Look Back, Scan list editing
- CTCSS / CDDCS (Conventional operation), Busy channel lockout
- Time-out timer

# 2. Antenna Information

Whip Antenna for vehicle :  $400 \sim 450$  MHz, 1/4 wave 3 dBi Whip Antenna for vehicle :  $450 \sim 470$  MHz, 1/4 wave 3 dBi

## 3. Test site

Accurate Technology Co. Ltd. F1, Bldg, A, Changyuan New Meterial Port, Keyuan Rd. Science & Industry Park, Nanshan District, 518057, Shenzhen P.R. China.

### 4. Measurement System

- Automobile: Hyundai Verna(2000)
- E-Field Survey Meter & Probe NARDA Model EMC 20 (100kHz~3GHz)
- Calibration due date: 2007-5-4
- Antennas (1/4 wave 3 dBi)

# 5. Measurement Uncertainty

The information below presents an estimate of the possible errors that are associated with the measurement system.

Description	Error
NARDA Survey Meter:	$\pm 4\%$
Repeatability Accuracy:	$\pm 7\%$

#### 6. Method of measurement

#### 6.1 EME measurements made on trunk mounted antennas

#### 6.1.1 External vehicle EME measurement

(Antenna mounted in trunk center)

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 60 cm to the antenna, from the back of the vehicle in a vertical line and then average theresults. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters.

#### 6.1.2 Internal vehicle EME measurement

(Antenna mounted in trunk center)

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

a) Head area

b) Chest area

c) Lower Trunk area

#### 6.2 EME measurements made on center roof mounted antennas

#### 6.2.1 External vehicle EME measurement

With the survey meter and probe, take ten (10) measurements, at the standard test distance of 110 cm from the vehicle-mounted antenna, in a vertical line and then average the results. These measurements are taken and recorded at every twenty (20) centimeters over a range starting at twenty (20) centimeters above ground and ending at 2.0 meters; this would be representative of a person standing next to a vehicle during a mobile radio transmission.

#### 6.2.2 Internal vehicle EME measurement

While rotating survey meter probe through 180 degrees to ensure that the highest level is found, scan the inside of the vehicle, both front and back seating areas, for the highest level in each location. After the highest level is found, scan vertically making two (2) additional measurements within an area approximately 40 cm wide (representing the width of a person) so as to have a total of three (3) measured points as indicated below that will be averaged.

- a) Head area
- b) Chest area
- c) Lower Trunk area

# 7. Test result

Measurement Information										
Measurement Freq.(MHz)	400.00	435.00	470.00							
Raw Data Power(W)	46.59	46.62	46.56							
Controlled Limit	1.33	1.45	1.56							
Uncontrolled Limit	0.26	0.29	0.31							
Cal. Factor	1	1	1							
Antenna / gain(dBi)	Whip / 3	Whip / 3	Whip / 3							
External Vehicle Power Density (50% Duty)	Average over body/2									
Internal Vehicle Power Density(50% Duty)	Averag	e over (head/che	st/leg)/2							

External Vehicle MPE Assessment At 400.00 MHz											
Antenna Location	A1 /	ntenna Gain	Me Dista (cr	Meas. Distance (cm)			Calibration Factor		Average Over Body	Power. Density (mW/cm^2)	
Trunk	W	Vhip/3	6	0	Е		1		0.3144	0.1572	
Measurement Grid											
Test Position		Height		% of controlled Limit			Test Position	Height (cm)		% of controlled limit	
1		20	0		18		6	120		25	
2		4	0		23		7	140		40	
3		6	60		31		8	160		37	
4		8	80		34		9	180		42	
5		10	0		35		10		200	39	

	External Vehicle MPE Assessment At 435.00 MHz											
Antenna Location	A1 /	ntenna Gain	na Meas. Distance (cm)		E/H Field		Calibration Factor		Average Over Body	Power. Density (mW/cm^2)		
Trunk	W	Vhip/3	6	0	E		1		0.3136	0.1568		
Measurement Grid												
Test Position	Test Position Height		ght	% of controlled Limit			Test Position	Height (cm)		% of controlled limit		
1		20	0		25		6	120		22		
2		4	0		22		7	140		26		
3		6	60		19		8		160	39		
4		8	80		32		9		180	40		
5		10	0		37		10		200	38		

	External Vehicle MPE Assessment At 470.00 MHz											
Antenna Location	a Antenna n / Gain Meas. Distance (cm)		as. ance n)	E/H Field		Calibration Factor		Average Over Body	Power. Density (mW/cm^2)			
Trunk	V	Vhip/3	6	0	E		1		0.3042	0.1521		
Measurement Grid												
Test Position		Height		% of controlled Limit			Test Position	ł	leight (cm)	% of controlled limit		
1		20	0	1			6		120	20		
2		4	0		24		7	140		23		
3		6	60		28		8		160	24		
4		8	0		25		9		180	24		
5		10	0		25		10		200	26		

External Vehicle MPE Assessment At 400.00 MHz											
Antenna Location	A1 /	ntenna Gain	na Meas. Distance (cm)		E/H Field	Calibration Factor		Calibration Factor Body		Power. Density (mW/cm^2)	
Roof	V	Vhip/3	11	0	E		1		0.1780	0.0890	
Measurement Grid											
Test Position	Height		ght	% of controlled Limit			Test Position	Height (cm)		% of controlled limit	
1		20	0		13		6		120	19	
2		40	0		14		7	140		23	
3		6	60		17		8		160	23	
4		8	80		10		9		180	15	
5		10	0		16		10		200	14	

Internal Vehicle MPE Assessment At 400.00 MHz										
Antenna Locatio n	A a	ntenn / Gain	Meas. Distance (cm)	E/H Field	Calibra tion Factor	Average Head, Cho Back / I Seats(mW	Power Density HigherLevel (mW/cm^2)			
Trunk	W	/hip/3	Highest Reading	E	1	0.24	0.12			
			]	Meas	urement (	Grid				
Test		% of c	controlled <b>L</b>	Limit	% of contr	olled Limit	% of co	% of controlled Limit		
Position	1		Head		Ch	est		Leg		
Front 14			1	2	10					
Back		38			2	7	15			

	Internal Vehicle MPE Assessment At 435.00 MHz										
Antenna Locatio n	Antenn a / Gain	Meas. Distance (cm)	E/H Field	Calibra tion Factor	Average Head, Che Back / I Seats(mW	Over est, Leg Front V/cm^2)	Power Density HigherLevel (mW/cm^2)				
Trunk	Whip/3	Highest Reading	E	1	0.22	0.11					
		]	Meas	urement (	Grid						
Test	% of (	controlled I	Limit	% of contr	olled Limit	% of co	% of controlled Limit				
Position	1	Head		Ch	est		Leg				
Front		13		1	2	11					
Back		36			8	13					

Internal Vehicle MPE Assessment At 470.00 MHz											
Antenna Locatio n	Antenn a / Gain	Meas. Distance (cm)	E/H Field	Calibra tion Factor	Average Head, Cho Back / I Seats(mW	Power Density HigherLevel (mW/cm^2)					
Trunk	Whip/3	Highest Reading	E	1	0.20	0.10					
		-	Meas	urement (	Grid						
Test	% of	controlled I	Limit	% of contr	olled Limit	% of co	% of controlled Limit				
Position	Position Head			Ch	est	Leg					
Front	Front 17		1	3	10						
Back		37		2	5	13					

Internal Vehicle MPE Assessment At 400.00 MHz										
Antenna Locatio n	Antenn a / Gain	Meas. Distance (cm)	E/H Field	Calibra tion Factor	Average Head, Cho Back / I Seats(mW	Power Density HigherLevel (mW/cm^2)				
Roof	Whip/3	Highest Reading	E	1	0.08	0.042				
		]	Meas	urement (	Grid					
Test	% of (	controlled I	Limit	% of contr	olled Limit	% of co	% of controlled Limit			
Position	1	Head		Ch	est		Leg			
Front		6		5	5	3				
Back	Back 14		3	3	6					

# 8. Conclusion

The measurement results complies with the FCC Limit Per 47 CFR 2.1091 (b) for the Uncontrolled RF Exposure.