



ONETECH Corp.

2F. KUNHAN BD, 1557-11 SEOCHO-DONG, SEOCHO-KU, SEOUL 137-070 KOREA
TEL: +82-2-587-9037 FAX: +82-2-587-9039 / Head office & Safety Dept.
TEL: +82-347-765-8289 FAX: +82-347-766-2904 / EMC Dept.

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

REMOTE CONTROL SECURITY TRANSCEIVER
CERTIFICATION TO FCC PART 15 REQUIREMENT

| | | | |
|---------------------|--|------------|-----|
| PRODUCT | VEHICLE SECURITY ARARM SYSTEM | | |
| FCC ID | OARR447675 | | |
| MODEL NO. | R447675 | SERIAL NO. | N/A |
| APPLICANT & ADDRESS | PRECISION ENGINEERING IND., INC. 11627 CANTARA STREET NORTH HOLLYHOOD, CA 91605 U.S.A. | | |

| | | | |
|--|-----------|------------|-----------------|
| REPORT NO. | E991R-010 | ISSUE DATE | January 6, 1999 |
| PREPARED BY : ONETECH CORPORATION 2 F. KUNHAN B/D, 1557-11, SEOCHO-DONG, SEOCHO-KU, SEOUL 137-070 KOREA (TEL)02-587-9037, (FAX)02-587-9039 | | | |

LIST OF EXHIBITS

FCC ID : OARR447675
MODEL : R447675

EXHIBIT 1. IDENTIFICATION LABEL

2. AGENT AUTHORIZATION

3. MODIFICATION LIST

4. TECHNICAL INFORMATION:

ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT

5. PHOTO REPORT

6. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

PREPARED BY: ONETECH CORPORATION

2 F. KUNHAN B/D, 1557-11, SEOCHO-DONG, SEOCHO-KU,
SEOUL 137-070 KOREA (TEL)02-587-9037(FAX)02-587-9039

EXHIBIT 1. IDENTIFICATION LABEL:**PROPOSED FCC LABEL (Part15 sec. 15.19)**

The label included following statement will be attached on bottom side of product.

FCC ID : OARR447675

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operations.

Made in Korea

“Please find an ID Label for EUT at ID Label/Location Info in Exhibit Type”

EXHIBIT 2. AGENT AUTHORIZATION:

“Please find an Agent Authorization Letter at Attestation Statements in Exhibit Type”

EXHIBIT 3. MODIFICATION LIST:

“There was no modified items during EMI test”

EXHIBIT 4. TECHNICAL INFORMATION:**ELECTROMAGNETIC EMISSIONS COMPLIANCE REPORT**

| |
|---|
| REMOTE CONTROL SECURITY TRANSCEIVER CERTIFICATION TO FCC PART 15 REQUIREMENT |
|---|

| | | | |
|---------------------|--|------------|-----|
| PRODUCT | VEHICLE SECURITY ARARM SYSTEM | | |
| FCC ID | OARR447675 | | |
| MODEL NO. | R447675 | SERIAL NO. | N/A |
| APPLICANT & ADDRESS | PRECISION ENGINEERING IND., INC. 11627 CANTARA STREET NORTH HOLLYHOOD, CA 91605 U.S.A. | | |

| | | | |
|--|-----------|------------|-----------------|
| REPORT NO. | E991R-010 | ISSUE DATE | January 6, 1999 |
| PREPARED BY : ONETECH CORPORATION 2 F. KUNHAN B/D, 1557-11, SEOCHO-DONG, SEOCHO-KU, SEOUL 137-070 KOREA (TEL)02-587-9037, (FAX)02-587-9039 | | | |

TABLE OF CONTENTS

| | page |
|---|-----------|
| 1. VERIFICATION OF COMPLIANCE | 1 |
| 2. GENERAL INFORMATION..... | 2 |
| 2.1 Product Description | 2 |
| 2.2 Related Submittal(s) / Grant(s) | 2 |
| 2.3 Test System Details..... | 2 |
| 2.4 Test Methodology | 3 |
| 2.5 Test Facility..... | 3 |
| 3. SYSTEM TEST CONFIGURATION..... | 3 |
| 3.1 Justification..... | 3 |
| 3.2 Equipment Modifications | 3 |
| 4. REFERENCED RULES SECTIONS AND TEST PROCEDURE | 3 |
| 4.1 Section 15.203: Antenna Requirement | 3 |
| 4.2 Section 15.231(a)(1): Regarding Release Transmission within 5 seconds..... | 3 |
| 4.3 Measurement of Tested EUT..... | 3 |
| 5. PRELIMINARY TESTS..... | 4 |
| 5.1 AC Power line Conducted Emissions Tests..... | 4 |
| 5.2 Radiated Emissions Tests..... | 4 |
| 6. CONDUCTED AND RADIATED MEASUREMENT PHOTOS | 5 |
| 6.1 Conducted Measurement Photos | 5 |
| 6.2 Radiated Measurement Photos> | 6 |
| 7. FINAL RESULT OF MEASUREMENT..... | 7 |
| 7.1 Conducted Emissions Tests..... | 7 |
| 7.2 Field Strength of the Carrier Test..... | 8 |
| 7.3 Spurious Emission Test..... | 9 |
| 7.4 Bandwidth of the operating frequency | 10 |
| 7.5 Plotting Data for bandwidth of the operating frequency | 11 |
| 7.6 Radiated Emission Test..... | 12 |
| 8. FIELD STRENGTH CALCULATION | 13 |
| 9. LIST OF TEST EQUIPMENT | 14 |

1. VERIFICATION OF COMPLIANCE

APPLICANT : PRECISION ENGINEERING IND., INC.
11627 CANTARA STREET NORTH HOLLYWOOD, CA 91605.

CONTACT PERSON : JOHN JOUNGHOON KIM / MANAGER

TELEPHONE NO : (818) 767-8593

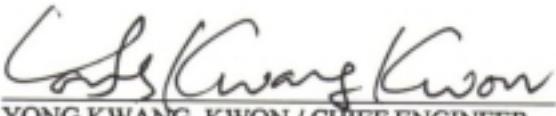
FCC ID : OARR447675 MODEL NO/NAME: R447675

SERIAL NUMBER : N/A

DATE : January 6, 1999

| | |
|---|--|
| DEVICE TYPE | INTENTIONAL RADIATOR (SECURITY/REMOTE CONTROL TRANSCIVER) |
| E.U.T. DESCRIPTION | VEHICLE SECURITY ARARM SYSTEM |
| THIS REPORT CONCERNS | ORIGINAL GRANT |
| MEASUREMENT PROCEDURES | ANSI C63.4/1992 |
| TYPE OF EQUIPMENT TESTED | PRE-PRODUCTION |
| KIND OF EQUIPMENT AUTHORIZATION REQUESTED | CERTIFICATION |
| EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S) | PART 15 SUBPART C §15.231 |
| MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE | NO |
| FINAL TESTS WERE CONDUCTED ON | 3 METER OPEN TEST SITE |

The above equipment was tested by ONETECH CORPORATION for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.


YONG KWANG KWON / CHIEF ENGINEER
EMC TESTING DEPARTMENT
ONETECH Testing & Eval. Lab.
SEOUL KOREA

2. GENERAL INFORMATION

2.1 Product Description

The PRECISION ENGINEERING IND., INC Model R447675 (referred to as the EUT in this report) is a Remote Control Security Transceiver for using vehicle security alarm system. The product specification information described herein was obtained from product data sheet or user's manual.

| | |
|---|---|
| CHASSIS TYPE | Plastic |
| TX/RX FREQUENCY RANGE | 447.675 MHz |
| MODULATION | FM |
| RECEIVER TYPE | SUPERHETERODYNE RECEIVER |
| ANTENNA TYPE | ROD ANTENNA(Permanently Attached) |
| LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1MHz) | 447.675 X 2, 10.245 MHz |
| POWER REQUIREMENTS | 1.5V AAA Battery |
| NUMBER OF LAYERS | 2 LAYER |
| FUNCTION OF BUTTON | Arm & Lock Doors, Disarm & Unlock Doors Channel 2&3 Activation and Pager Reset when Alarm Triggered |

Model Differences:

No other model differences have been mentioned.

2.2 Related Submittal(s) / Grant(s)

ORIGINAL SUBMITTAL ONLY

This application is simultaneously filed with Precision Engineering Ind., Inc Remote Control Security Transceiver

FCC ID: OARM447675.

2.3 Test System Details

The EUT was tested with the following all equipment used in the tested system are:

| Model No | Manufacturer | FCC ID | Description | Connected to |
|----------|---------------------------------|------------|----------------|--------------|
| B447675 | Precision Engineering Ind., Inc | OARM447675 | Transceiver | CM447675 |
| CM447675 | Precision Engineering Ind., Inc | N/A | Control Module | N/A |

2.4 Test Methodology

Both Radiated emission testing and Bandwidth of operating frequency were performed according to the procedures in ANSI C63.4/1992. Radiated testing was performed at an antenna to EUT distance of 3 meters.

2.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located on at 426-1 Daessangryung-Ri, Chowol-Myun, Kwangju-Kun, Kyunggi-Do 464-080 Korea. Detailed description of test facility was submitted to the Commission on January 24, 1996(31040/SIT, 1200F2).

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). During the tests, the following components inside the EUT were installed.

| DEVICE TYPE | MANUFACTURER | MODEL/PART NUMBER | FCC ID |
|---------------|----------------------------------|-------------------|--------|
| MAIN BOARD | PRECISION ENGINEERING IND., INC. | DKRT-H | N/A |
| DIGITAL BOARD | PRECISION ENGINEERING IND., INC. | DKRT-D | N/A |

3.2 Equipment Modifications

To achieve compliance to FCC part 15 rule, the following change(s) were made by PRECISION ENGINEERING IND., INC. during compliance testing: **“There was no Modified items during EMI test”**

4. REFERENCED RULES SECTIONS AND TEST PROCEDURE

4.1 Section 15.203: Antenna Requirement

The PRECISION ENGINEERING IND., INC transceiver complies with the requirement of section 15.203, because the antenna is permanently secured and made of Rod Antenna.

4.2 Section 15.231(a)(1): Regarding Release Transmission within 5 seconds

The PRECISION ENGINEERING IND., INC transceiver complies with the requirement of section 15.231(a)(1), because the EUT employs a push button switch that automatically deactivates the transmitter within 0.2ms of being released.

4.3 Measurement of Tested EUT.

Line Conducted Emission Test:

It is not need to test this requirement, because the EUT supplies from a DC battery.

Radiated Emission Test

Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4/1992 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3meter open area test site.

Field Strength of the Carrier Test:

The field strength of the carrier frequency shall be tested at open field test site with normal supply voltage. In addition, the variation of the fundamental transmitted by the device is shown for variation in supply voltage to 80% and 115% of the normal supply voltage. For battery operated equipment, tests shall be performed using a new battery.

Spurious Emission Test:

Preliminary radiated emissions tests were conducted using the procedure in ANSI C63.4/1992, 8.3.1.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meters open area test site.

Occupied Bandwidth Measurement:

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer. The plot is taken at 50 kHz/division frequency span, 10kHz-resolution bandwidth and 5dB/division logarithmic display from an 8568B spectrum analyzer. The Occupied Bandwidth is determined at the point 20dB down from the modulated carrier.

5. PRELIMINARY TESTS

5.1 AC Power line Conducted Emissions Tests

During Preliminary Tests, the following operating mode was investigated

| Operation Mode | The Worse operating condition (Please check one only) |
|----------------|---|
| N/A | N/A |

5.2 Radiated Emissions Tests

During Preliminary Tests, the following operating modes were investigated.

EUT antenna was extended maximum length because EUT uses an adjustable antenna..

| Operation Mode | The Worse operating condition (Please check one only) |
|----------------|---|
| Tx mode | X |
| Rx Mode | |

6. CONDUCTED AND RADIATED MEASUREMENT PHOTOS

6.1 Conducted Measurement Photos

Not Applicable

Not Applicable

6.2 Radiated Measurement Photos>



7. FINAL RESULT OF MEASUREMENT

Per preliminary tests, the following TX mode of operations were selected which shown the maximum emissions level.

7.1 Conducted Emissions Tests

Humidity Level : % Temperature : □

Limits apply to : FCC CFR 47, PART 15, SUBPART C

Result : PASSED BY dB

Operating Condition : Date:

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

| Power Line Conducted Emissions | | | FCC Limit | |
|--|---------------------|-----------|-----------------|----------------|
| Frequency (MHz) | Amplitude (dBuV) | conductor | Limit (dBuV) | Margin (dB) |
| | | | | |
| | | | | |
| It is not need to test this requirement, because the EUT supplies from a DC battery. | | | | |
| | | | | |
| | | | | |
| | | | | |

Line Conducted Emissions Tabulated Data

7.2 Field Strength of the Carrier Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

To get the highest levels of above testing, the test was performed using a new battery.

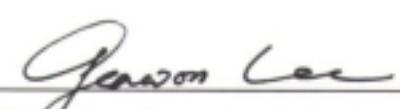
Humidity Level : 54 % Temperature : 12□
 Limits apply to : FCC CFR 47, PART 15, SUBPART C
 Result : PASSED BY -7.2 dB at Quasi-Peak mode
 Operating Condition : TX mode Date: December 12, 1998
 Distance : 3 Meter

| Radiated Emissions | | Detection Mode | Ant | Correction Factors | | Total | FCC Limit | |
|---------------------|--------------|----------------|------|--------------------|------------|---------------|----------------|-------------|
| Carrier Freq. (MHz) | Ampl. (dBuV) | | Pol. | Ant. (dB/m) | Cable (dB) | Ampl (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 447.7 | 51.5 | Quasi-Peak | H | 16.45 | 6.17 | 74.12 | 81.27 | -7.15 |

*Remark: FCC Limit: 3,750 ~ 12,500uV/m to 260 ~ 470 MHz (linear interpolations)

Limit calculation at 447.675 MHz = $(12,500 - 3,750)/(470 - 260) \times (447.675 - 260) + 3,750 = 11,569.8 \text{ uV/m}$

$20\log 11,569.8 = 81.266 \text{ dBuV/m}$


 Measuring by : Geon Won, Lee / Project Engineer

7.3 Spurious Emission Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

To get the highest levels of above testing, the test was performed using a new battery.

Humidity Level : 54 % Temperature : 12□
 Limits apply to : FCC CFR 47, PART 15, SUBPART C
 Result : PASSED BY -18.7 dB at Peak mode
 Operating Condition : TX mode Date: December 12, 1998
 Distance : 3 Meter

| Radiated Emissions | | Detection Mode | Ext. Pre-Amp. (dBuV) | Ant | Correction Factors | | Total | FCC Limit | |
|--------------------|--------------|----------------|----------------------|------|--------------------|------------|---------------|----------------|-------------|
| Freq. (MHz) | Ampl. (dBuV) | | | Pol. | Ant. (dB/m) | Cable (dB) | Ampl (dBuV/m) | Limit (dBuV/m) | Margin (dB) |
| 895.5 | 11.9 | Peak | 0 | H | 22.98 | 7.68 | 42.56 | 61.3 | -18.74 |
| 1343.0 | 30.6 | Average | 25.0 | H | 26.42 | 9.1 | 41.12 | 61.3 | -20.18 |
| 1791.0 | * | Average | 25.0 | H | - | - | - | 61.3 | - |

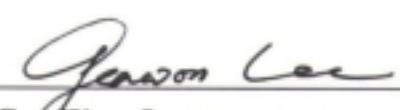
Other spurious frequencies were not found up to 5000 MHz.

*Remark: FCC Limit: 375 ~ 1,250uV/m to 260 ~ 470MHz (linear interpolations)

Limit calculation at 447.675 MHz = $(1,250 - 375)/(470 - 260) \times (447.675 - 260) + 375 = 1,156.98 \text{ uV/m}$

$$20\log 1,156.98 = 61.3 \text{ dBuV/m}$$

The marked “*” means less than 5.0 dBuV.


 Measuring by : Gea Won, Lee / Project Engineer

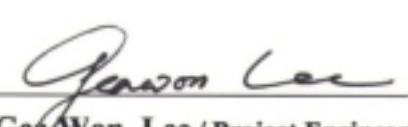
7.4 Bandwidth of the operating frequency

Humidity Level : 56 % Temperature : 25
Limits apply to : FCC CFR 47, PART 15, SUBPART C
Result : PASSED
Operating Condition : TX mode
Minimum Resolution Bandwidth : 10 kHz

Date: December 13, 1998

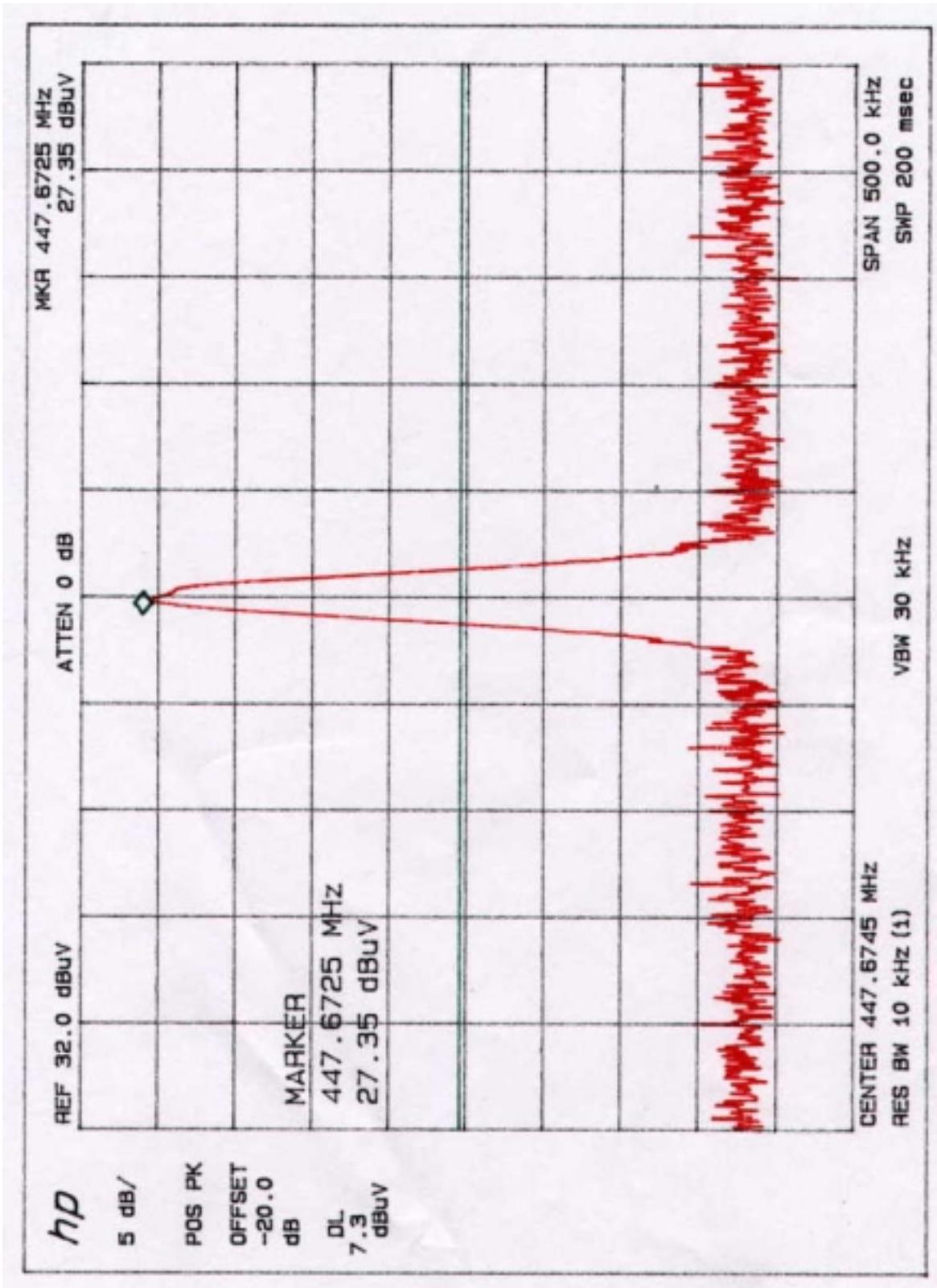
| Carrier Freq. (MHz) | Bandwidth of the emission. (MHz) | Limit (MHz) | Remark |
|------------------------|-------------------------------------|----------------|---|
| 447.675 | 0.028 | 1.119 | <u>The point 20dB down from</u> <u>the modulated carrier</u> |

Remark: FCC Limit for above testing is: $310 \text{ MHz} \times 0.0025 = 780 \text{ kHz}$. Please refer to Plot #1 for test data in next page.



Measuring by : Geon Won, Lee / Project Engineer

7.5 Plotting Data for bandwidth of the operating frequency



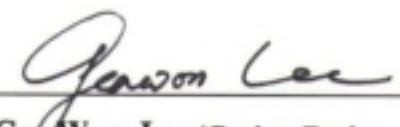
7.6 Radiated Emission Test

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

To get the highest levels of above testing, the test was performed using a new battery.

Humidity Level : 54 % Temperature : 12□
 Limits apply to : FCC CFR 47, PART 15, SUBPART C
 Result : PASSED BY -7.3 dB at Peak mode
 Operating Condition : TX mode, Date: December 12, 1998
 Distance : 3 Meter

| Radiated Emissions | | Detection Mode | Ant Pol. | Correction Factors | | Total | FCC Limit | |
|--------------------|-------------|----------------|----------|--------------------|------------|-------|----------------|-----------------|
| Freq. (MHz) | Amp. (dBuV) | | | Ant. (dBuV) | Cable (dB) | | Limit (dBuV/m) | Margin (dBuV/m) |
| 247.2 | 8.5 | Peak | V | 12.03 | 4.59 | 25.12 | 46.00 | -20.88 |
| 397.8 | 9.8 | Peak | H | 15.25 | 5.59 | 30.65 | 46.00 | -15.35 |
| 497.8 | 14.7 | Peak | H | 17.76 | 6.20 | 38.66 | 46.00 | -7.34 |
| 547.4 | 11.9 | Peak | H | 18.12 | 6.48 | 36.50 | 46.00 | -9.50 |


 Measuring by : Geon Won, Lee / Project Engineer

8. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

9. LIST OF TEST EQUIPMENT

| No. | EQUIPMENTS | MFR. | MODEL | SER. NO. | LAST CAL | DUE CAL | USE |
|-----|------------------------------------|-----------|-----------------|-------------------------------------|------------|------------|--------|
| 1. | Test Receiver | R/S | ESVS 30 | 826638/008 | AUG/98 | 12MONTH | ■ |
| 2. | Spectrum Analyzer | HP | 8568B | 3026A0226 | AUG/98 | 12MONTH | ■ |
| 3. | RF Pre-selector | HP | 85685A | 3107A01264 | AUG/98 | 12MONTH | ■ |
| 4. | Quasi-Peak Adapter | HP | 85650A | 3107A01542 | AUG/98 | 12MONTH | ■ |
| 5. | Spectrum Analyzer | HP | 8561E | 3350A00546 | JUN/98 | 12MONTH | ■ |
| 6. | Loop Antenna | EMCO | 6502 | 9108-2668 | FEB/98 | 12MONTH | |
| 7. | Dipole Antenna | EMCO | 3121C | 9107-745 | FEB/98 | 12MONTH | |
| 8. | Biconical Antenna | EMCO | 3104C | 9109-4441 9109-4443 9109-4444 | FEB/98 | 12MONTH | ■ |
| 9. | Log Periodic Antenna | EMCO | 3146 | 9109-3213 9109-3214 9109-3217 | FEB/98 | 12MONTH | ■ |
| 10. | Horn Antenna | EMCO | 3115 | 9509-4563 | MAR/98 | 12MONTH | ■ |
| 11. | LISN | EMCO | 3825/2 | 9109-1867 9109-1869 | AUG/98 | 12MONTH | ■ |
| 12. | RF Amplifier | HP | 8447F | 3113A04554 | N/A | N/A | ■ |
| 13. | Spectrum Analyzer | HP | 8591A | 3131A02312 | APR/98 | 12MONTH | |
| 14. | Spectrum Analyzer | ADVANTEST | R4131BN | 91520070 | FEB/98 | 12MONTH | |
| 15. | Computer System Hard disk drive | HP | 98581C 9153C | 98543A CMC762Z9153 | N/A N/A | N/A N/A | ■ ■ |
| 16. | Plotter | HP | 7475A | 30052 22986 | N/A | N/A | ■ |
| 17. | Position Controller | EMCO | 1090 | 9107-1038 | N/A | N/A | ■ |
| 18. | Turn Table | EMCO | 1080-1.21 | 9109-1576 | N/A | N/A | ■ |
| 19. | Antenna Master | EMCO | 1070-1 | 9109-1624 | N/A | N/A | ■ |

EXHIBIT 5. PHOTO REPORT**REMOTE CONTROL SECURITY TRANSCEIVER
CERTIFICATION TO FCC PART 15 REQUIREMENT**

| | | | |
|---------------------|--|------------|-----|
| PRODUCT | VEHICLE SECURITY ARARM SYSTEM | | |
| FCC ID | OARR447675 | | |
| MODEL NO. | R447675 | SERIAL NO. | N/A |
| APPLICANT & ADDRESS | PRECISION ENGINEERING IND., INC. 11627 CANTARA STREET NORTH HOLLYHOOD, CA 91605 U.S.A. | | |

| | | | |
|--|-----------|------------|-----------------|
| REPORT NO. | E991R-010 | ISSUE DATE | January 6, 1999 |
| PREPARED BY : ONETECH CORPORATION 2 F. KUNHAN B/D, 1557-11, SEOCHO-DONG, SEOCHO-KU, SEOUL 137-070 KOREA (TEL)02-587-9037, (FAX)02-587-9039 | | | |

REPORT NO.: E991R-010

FCC ID: OARR447675

DATE: January 6, 1999

“Please find in/outside photos of EUT at External Photos in Exhibit Type”

EXHIBIT 6. USER'S MANUAL & SCHEMATIC (BLOCK DIAGRAM)

| |
|---|
| REMOTE CONTROL SECURITY TRANSCEIVER CERTIFICATION TO FCC PART 15 REQUIREMENT |
|---|

| | | | |
|---------------------|--|------------|-----|
| PRODUCT | VEHICLE SECURITY ARARM SYSTEM | | |
| FCC ID | OARR447675 | | |
| MODEL NO. | R447675 | SERIAL NO. | N/A |
| APPLICANT & ADDRESS | PRECISION ENGINEERING IND., INC. 11627 CANTARA STREET NORTH HOLLYHOOD, CA 91605 U.S.A. | | |

| | | | |
|--|-----------|------------|-----------------|
| REPORT NO. | E991R-010 | ISSUE DATE | January 6, 1999 |
| PREPARED BY : ONETECH CORPORATION 2 F. KUNHAN B/D, 1557-11, SEOCHO-DONG, SEOCHO-KU, SEOUL 137-070 KOREA (TEL)02-587-9037, (FAX)02-587-9039 | | | |

REPORT NO.: E991R-010

FCC ID: OARR447675

DATE: January 6, 1999

“Please find a manual and block diagram for EUT at User Manual in Exhibit Type”