



Date: 2014-07-01

TEST REPORT

Report No.: 68.760.14.182.01

Applicant:

Jian Feng Toys Factory
Hua Dong Road, Dong Lin Tou Village, Shanhua
Town, Chenghai District, Shantou City,
Guangdong Province, China

Description of Samples:

Model name: Remote control plane (Transmitter)
Brand name: N/A
Model no.: 970911, RJH-4/6046
Test Model: 970911
FCCID: 2ACOM970911

Date Samples Received:

2014-06-24

Date Tested:

2014-06-24 to 2014-06-30

Investigation Requested:

FCC Part 15 Subpart C, Section 15.227

Conclusions:

The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks:

Checked by:

Approved by:-

Alan Xiong
Project Engineer

John Zhi
Project Manager

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1.0 **General Details**

1.1 **Test Laboratory**

Attestation of Global Compliance (Shenzhen) Co., Ltd. 12/F.,
Building 2, No.1-No.4, Chaxi Sanwei Technical Industrial Park,
Gushu, Xixiang, Bao'an District, Shenzhen, Guangdong, China
Registration Number: 259865

1.2 **Applicant Details** **Applicant**

Jian Feng Toys Factory
Hua Dong Road, Dong Lin Tou Village, Shanhua Town, Chenghai
District, Shantou City, Guangdong Province, China

Manufacturer

Jian Feng Toys Factory
Hua Dong Road, Dong Lin Tou Village, Shanhua Town, Chenghai
District, Shantou City, Guangdong Province, China

1.3 Equipment Under Test [EUT]

Description of EUT

Model Name:	Remote control plane (Transmitter)
Brand Name:	N/A
Model Number:	970911
FCCID:	2ACOM970911
Rating:	9.0Vd.c. (6 x “ AA” size batteries)
Antenna Type:	Permanent External Antenna
Operated Frequency:	27.145MHz
No. of Channel:	1
Accessories and Auxiliary Equipment:	None
EUT Exercising Software:	None

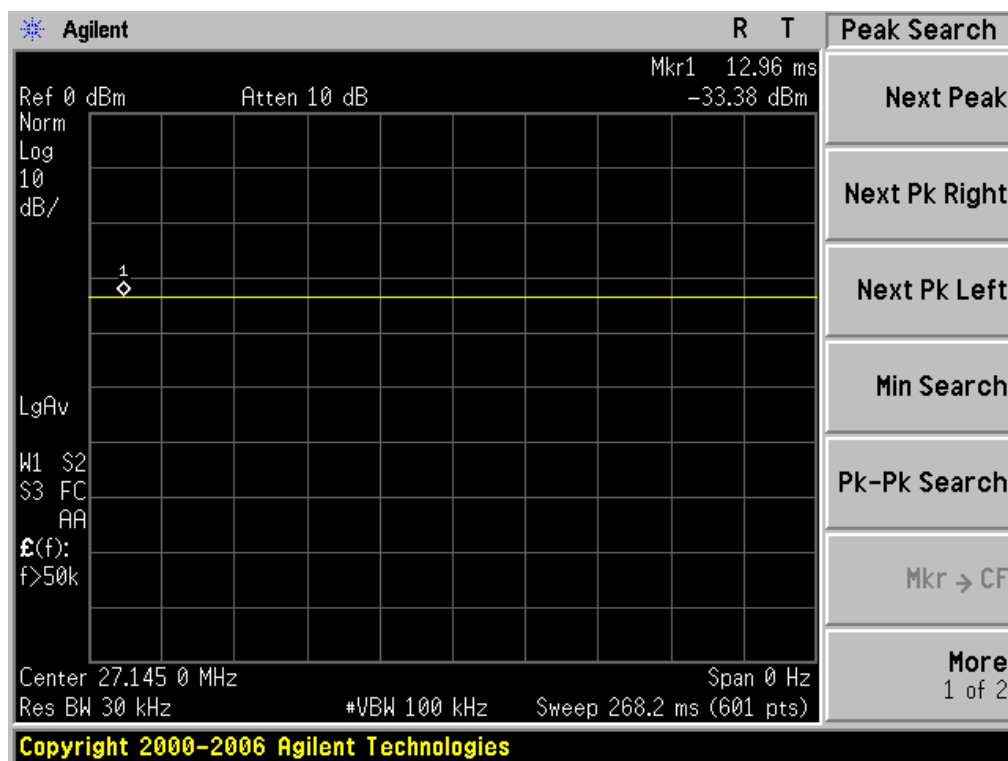
Model description: Utilize the identical circuit design, PCB layout in models 970911,RJH-4/6046.

General Operation of EUT

The equipment under test (EUT) is a transmitter for a RC toy aircraft operating at 27.145MHz. The EUT has 2 control rods to command rise, drop, forward, backward, left and right movement of the associated receiver.

Periodic Operation of EUT

The transmitter transmits signal for continue to launch. For further information refer to User Manual.



1.4 Equipment Modification

No modification was made to the tested unit by TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch

1.5 Related Submittal(s) Grants

This is a single application for certification of the transmitter.

2.0 Technical Details

2.1 Investigations Requested

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2008 and ANSI C63.4: 2003 for FCC Verification.

2.2 Test Standards and Results Summary Tables

EMISSION Results Summary				
Test Condition	Test Requirement	Test Result		
		Pass	Failed	N/A
Radiated Emission of Carrier Frequency	Part 15.227(a)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Radiated Emission,	Part 15.227(b)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Conducted Emission on AC, 0.15MHz to 30MHz	Part 15.207	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Bandwidth Measurement	Part 15.215	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Note: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 259865.

3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$FS = R + \text{System Factor}$$
$$\text{System Factor} = AF + CF + FA - PA$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

The EUT was placed on a non-metallic table 0.8m above the horizontal metal reference plane and 0.4m from a vertical ground plane which is connected to the horizontal metal ground plane. Meanwhile, the AC main of EUT was connected to the distance of 0.8m line impedance stabilization network (LISN) during measurement.

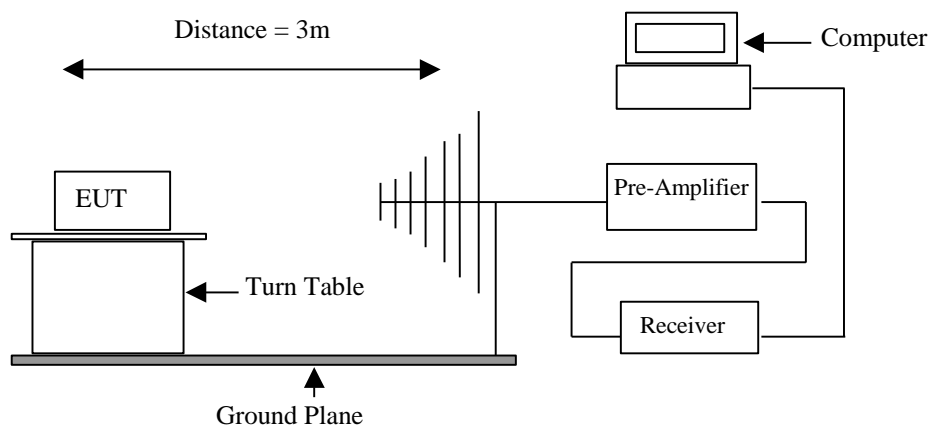
Initial measurements were performed in quasi-peak and average detection modes by the test receiver, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Radiated Emission of Fundamental Frequency

Test Requirement:	FCC part 15 section 15.227(a)
Test Method:	ANSI C63.4:2003
Test Date:	2014-06-30
Mode of Operation:	Transmitting mode.
Detector Function	Peak and Average
Measurement BW	120 kHz

Test Setup:



Results: PASS

Radiated Emissions									
Value	Emissions Frequency MHz	E-Field Polarity	Reading dB μ V/m	System Factor dB	Field Strength at 3m dB μ V/m	Average Factor dB	Net Field Strength at 3m dB μ V/m	Limit dB μ V/m	Delta to Limit dB μ V/m
PK	27.145	V	38.8	15.4	54.20	0.00	54.20	80	-25.8
AV	27.145	V	36.7	15.4	52.10	-4.26	47.84	60	-12.16
PK	27.145	H	34.5	15.4	49.90	0.00	49.90	80	-30.1
AV	27.145	H	33.8	15.4	49.20	-4.26	44.94	60	-15.06

Note:

Remark:

-Calculated measurement uncertainty: ± 5.0 dB

-Refer to section 4.5 for average factor calculation.

Limits for Fundamental Frequency: [Section 15.227 (a)]:

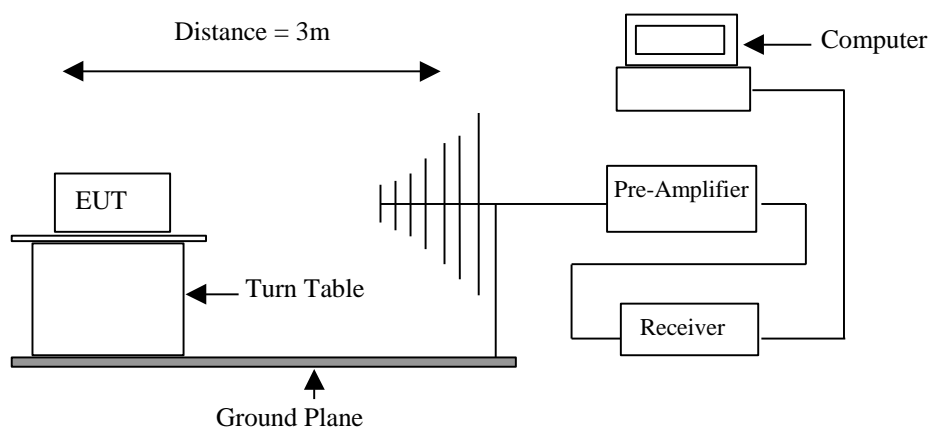
Fundamental Frequency [MHz]	Field Strength of Fundamental [μ V/m]	Field Strength of Fundamental [dB μ V/m]
26.96–27.28	10000	80

Compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR peak detector.

4.2 Spurious Radiated Emission

Test Requirement:	FCC part 15 section 15.227(b)
Test Method:	ANSI C63.4:2003
Test Date:	2014-06-30
Mode of Operation:	Transmitting mode.
Detector Function	Quasi Peak
Measurement BW	120 kHz

Test Setup:



Results: PASS

Radiated Emissions									
Value	Emissions Frequency MHz	E-Field Polarity	Reading dB μ V/m	System Factor dB	Field strength at 3m dB μ V/m	Average Factor dB	Net Field Strength at 3m dB μ V/m	Limit dB μ V/m	Delta to Limit dB μ V/m
AV	36.95	V	20.40	15.10	35.50	-4.26	31.24	40.00	-8.76
AV	54.38	V	22.68	11.53	34.21	-4.26	29.95	40.00	-10.05
AV	217.73	V	28.13	17.14	45.27	-4.26	41.01	46.00	-4.99
AV	36.60	H	24.49	15.10	39.59	-4.26	35.33	46.00	-10.67
AV	54.84	H	35.83	11.53	47.36	-4.26	43.10	54.00	-10.90
AV	217.75	H	32.73	17.14	49.87	-4.26	45.61	54.00	-8.39

Note: No further spurious emissions found between 30 MHz and lowest internal used/generated frequency.

Remark:

- (*) Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).
- Calculated measurement uncertainty: ± 5.0 dB.
- Refer to section 4.5 for average factor calculation.
- Result data graph is attached at the next pages for reference.

Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in section 15.209, whichever permits a higher field strength.

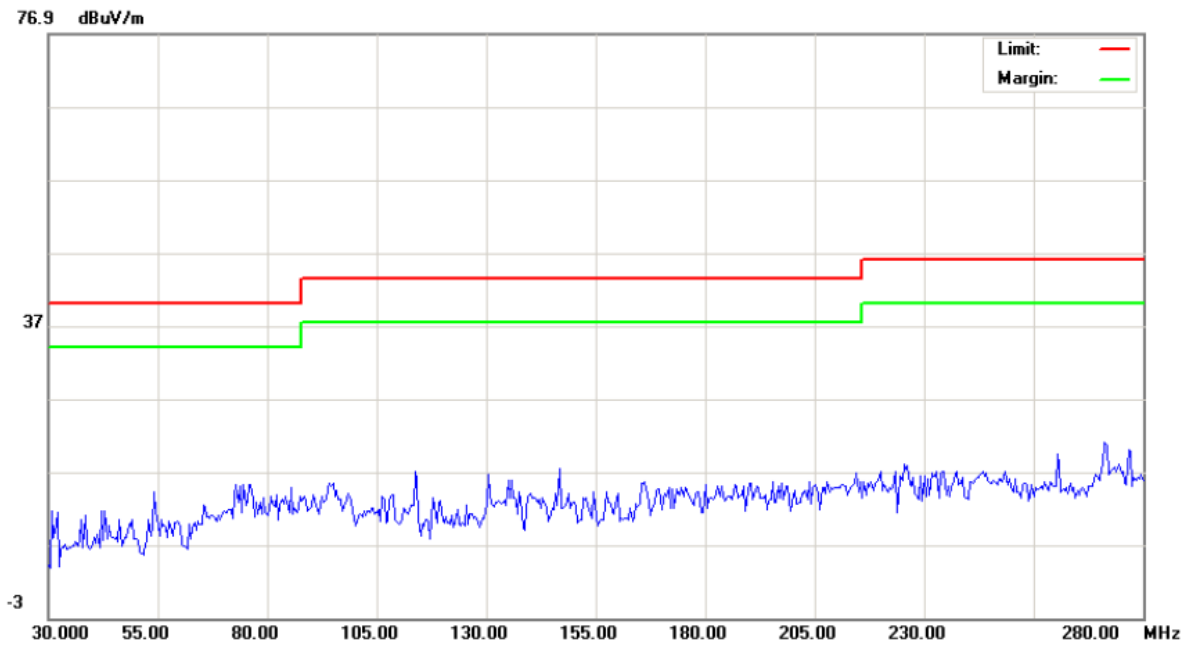
Limit for Radiated Emission Falling in Restricted Bands [Section 15.209]:

Frequency (MHz)	Field Strength [μ V/m]	Field Strength [dB μ V/m]
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

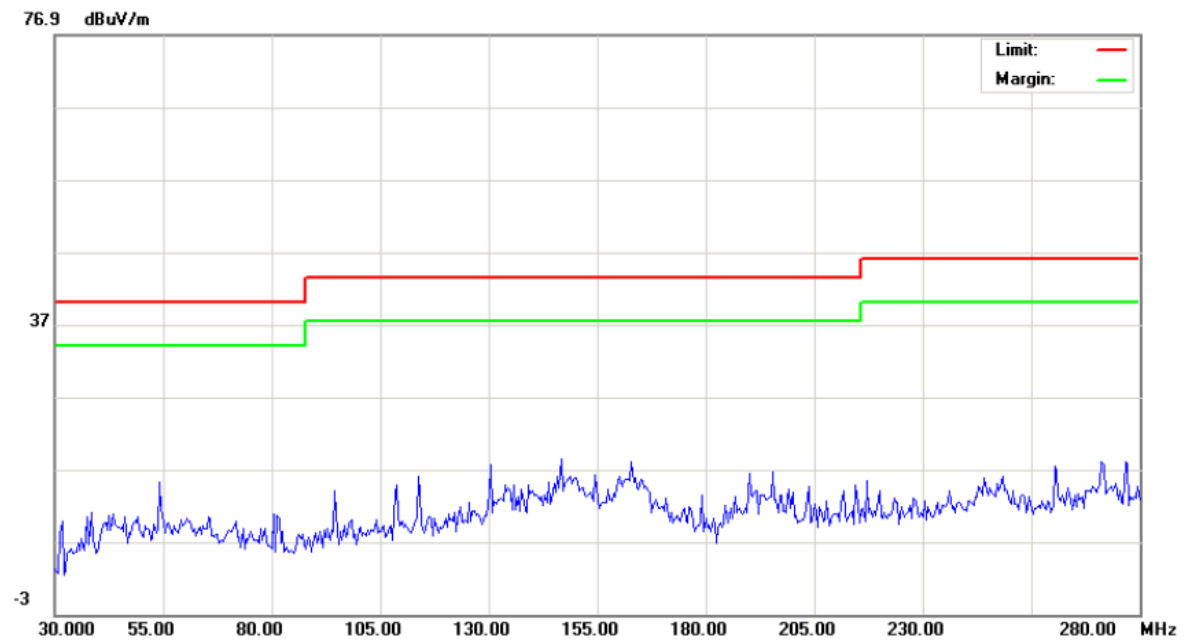
Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Vertical



Horizontal



4.3 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC part 15 Section 15.207 Class B
Test Method: ANSI C63.4:2003
Test Date: ---
Mode of Operation: ---

Results: N/A

Note : This testing is not applicable for the battery operated EUT.

Limits for Conducted Emission [Section 15.207]:

Frequency Range [MHz]	Quasi-Peak Limit [dB μ V]	Average Limit [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:

Calculated measurement uncertainty: ± 2.8 dB

4.4 Bandwidth Measurement

Test Requirement:	FCC part 15 section 15.215(c)
Test Method:	ANSI C63.4:2003
Test Date:	2014-06-30
Mode of Operation:	Transmitting mode.
Detector Function:	Peak

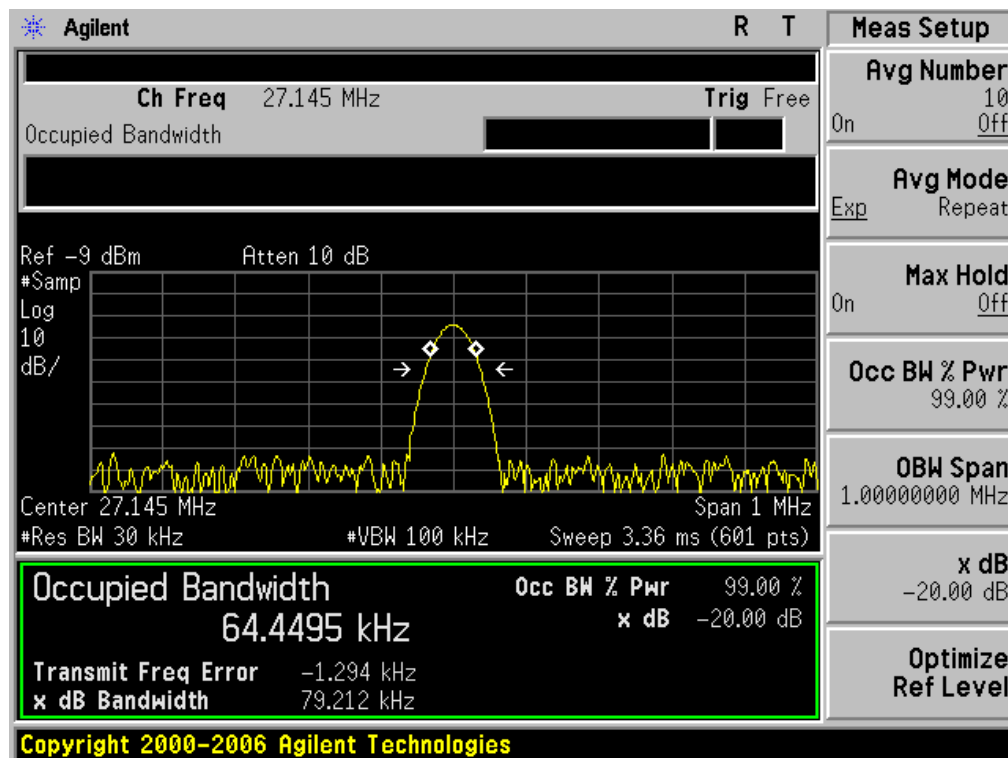
Results: PASS

Refer to the data graph.

Limit for Bandwidth [Section 15.215]

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage. If a frequency stability is not specified in the regulations, it is recommended that the fundamental emission be kept within at least the central 80% of the permitted band in order to minimize the possibility of out-of-band operation.

Test Result: Result data graph is shown at the next pages for reference.



5.0 List of Measurement Equipment

Radiated Emission and Bandwidth Measurement

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC209	Semi-anechoic Chamber	Frankonia	N/A	N/A	07- July -13	06-July -14
EMC017	Test Receiver	R & S	ESCI	100694	17-July-13	16-July-14
EMC040	Bi-conical Antenna	A.H. Systems Inc.	SAS-521-4	26	07-July-13	06-July-14
EMC045	Log Periodic Antenna	EMCO	3142C	N/A	07- July -13	06-July -14
EMC184	Horn Antenna	EM	EM-AH-10180	67	19-Apr-14	18-Apr-15
EMC138	Loop Antenna	A.H.	SAS-562B	SEL0097	17-July-13	16-July-14
EMC406	Coaxial Cable 50ohm	Rosenberger	RTK081-05S-10m	LA2-001-10M/002	17-July-13	16-July-14
60/2-74-05-042	Spectrum Analyser	Agilent	E4440A	US41421290	17-July-13	16-July-14

Remarks:

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined