



Horizon Hobby Distributors, Inc.  
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Phone: (217) 352-1913 Fax: (217) 355-0058

**FAX**

92487

February 18, 1999

Mr. Joe Dichoso  
Federal Communications Commission  
Equipment Authorization Division,  
Applications Processing Branch  
7435 Oakland Mills Road  
Columbia, MD 21046

RE: FCC ID: BRWF400EX  
Reference #: 5637

REC'D  
FEB 22 10 31 AM '99  
ULL

Dear Mr. Dichoso;

The requested information in response to your Fax dated January 20, 1999 is as follows:

**1) User's manual containing instructions and warnings per section 95.649**

Please refer to the actual production Instruction manual included in this parcel.

**2) Page 1 of the Technical Report indicates use of the transmitter for Airplane, Helicopters, Cars, Boats, ect. The 72-73 MHz band is only for Aircraft devices. See Section 95.207(a)2. Please correct/explain this discrepancy.**

Please refer to the correct page #1 included with this parcel. Please be advised that the above mentioned system will be sold for use only with R/C model Aircraft (Airplanes, Helicopters, ect).

The statement shown on the original page 1 document was written incorrectly by the testing facility (Kansai). I have reviewed our records on previous reports as far back as 1994 and have found this incorrect statement to be consistent. I will contact the Kansai labs to correct this problem for the future.

Please note that a channel sticker will be attached to the outside of the system box cover which states that this system is for use for "Aircraft Only".

**3) The maximum bandwidth is 8kHz. See Section 95.633(b). To show compliance, calculate the necessary bandwidth using  $2M+2D$  where M is the maximum modulating frequency and D is the maximum deviation.**

Please refer to the attachment included in this parcel for this information.

**4) Indicate compliance with section 95.647 by indicating the Antenna gain.**

Please refer to the attachment included in this parcel for this information.

**5) Section 95.645(b) states that Plug-in crystals must not be accessible to the user. Indicate whether or not the plug in crystals are accessible to the user.**

Although the Transmitter crystal is visible from the back of the Transmitter, each Crystal is glued in place prior to shipment making it a permanent installation. Consumer removal of the crystal will normally result in damage to the crystal. Therefore, frequency changes are done at the Service Center Only.

Thank you for bringing these questions to my attention. If you require additional information to complete the processing of these documents, please address correspondence to me directly at:

**Horizon Hobby Distributors  
ATTN: Len Sabato  
Fax: 217-355-0058  
Phone: 217-352-1958 Ext. 454**

Thank you for your time.

**Best Regards;**

A handwritten signature in black ink, appearing to be 'Len Sabato', written in a cursive style.

**Len Sabato**

CC: RS

**Technical Report  
Transmitter Model F400EX  
FCC ID# BRWF400EX**

**1.0 INTRODUCTION**

**1.1 Definition**

The Model F400EX is a transmitter for the Remote Control (R/C) of model Aircraft only (Airplane, Helicopter, ect.).

This Transmitter is for FM Systems, available for the PPM (Pulse Position Modulation).

This Transmitter is a part of the Horizon Hobbies PPM "Family" of Remote Control Transmitters which at this time consists of:

<b>Transmitter Model #</b>	<b>FCC ID #</b>
<b>Galaxy NET-72P</b>	<b>BRW8ZCNET72P</b>
<b>F400 NET-E104</b>	<b>BRWNET-104</b>

Separate Applications for each transmitter and for the receiver are submitted as required by the Commission.

The Manufacturer, Japan Remote Control Company (JR), manufactures all transmitters and receivers.

The PPM family of R/C Systems is exported by JR to the United States of America, and several European and Asian countries.

The Application for this Equipment Authorization, Horizon Hobbies, INC. will, following receipt of the Grant of Equipment Authorization, import only those versions of these R/C radios which are allowed for use in the USA under the Rules and Regulations of the Federal Communications Commission; specifically these are the 72-73 MHz frequency band.

The 72-73 MHz version of this transmitter is the subject of this Application; these are the units which will be offered for sale to the general public.

# KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER



HEAD OFFICE  
6-8-7, NISHITEMMA  
KITA-KU, OSAKA, 530-0047 JAPAN

*Corporate Juridical Person*

IKOMA  
TESTING LABORATORY  
10630, TAKAYAMA-CHO  
IKOMA-CITY, NARA, 630-0101 JAPAN

Federal Communications Commission  
Application Processing Branch  
7435 Oakland Mills Road  
Columbia, MD 21046

February 12, 1999  
KEC No. L-359

Mr. Joe Dichoso

SUBJECT : Additional Information on FCC ID: BRWF400EX[Corresponding ID: 5637]

Reference :

**Confirmation Number : 5637**  
FCC ID : BRWF400EX  
Applicant : JAPAN REMOTE CONTROL Co., Ltd..  
Device Name : Radio Control Transmitter  
Model No. : F400EX  
Applied Regulation : Part 95

Dir. Mr. Dichoso

I reply for your question of "Addition Information on FCC ID:BRWF400EX.

#### Test Items and Procedure

1. Measurement of the Necessary Band Width
2. Measurement of the Antenna Gain

Above tests were performed under : FCC Part 95 Subpart E Section 95.633(b), Section 95.647.

Test Place : KANSAI ELECTRIC INDUSTRY DEVELOPMENT CENTER.

Please put appended the report below in place of the engineering test report which was already submitted.

We are grateful if you would issue the grant at your earliest convenience

Very truly yours ;

Seiichi Izumi  
Manager  
IKOMA TESTING LABORATORY  
E-mail: izumi@kec.or.jp

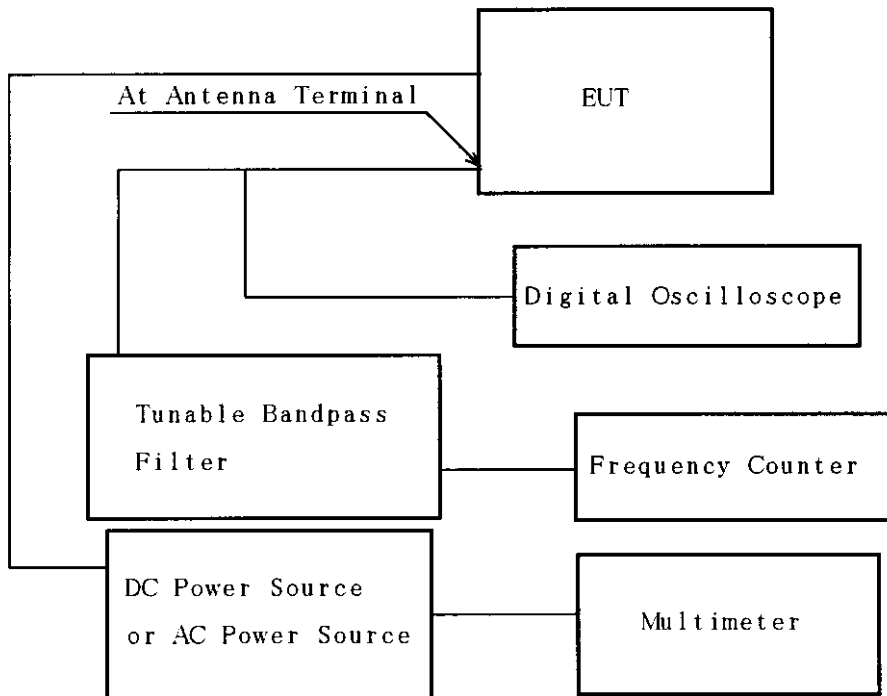
## ENGINEERING TEST REPORT

### 1. MEASUREMENT OF THE NECESSARY BANDWIDTH

#### 1.1 Reference Rule and Specification

FCC Rule Part 95 Subpart E [ § 95.633(b) ]

#### 1.2 Test Configuration



#### 1.3 Test Results

##### 1) Measurement of the Peak Frequency Deviation(D)

Flow (low frequency of carrier) : 72.58833 [ MHz ]  
Fhigh (high frequency of carrier) : 72.59148 [ MHz ]

[ Environment ]

Temperature : 20 °C      Humidity : 59 %

[ Calculation of the Peak Frequency Deviation ]

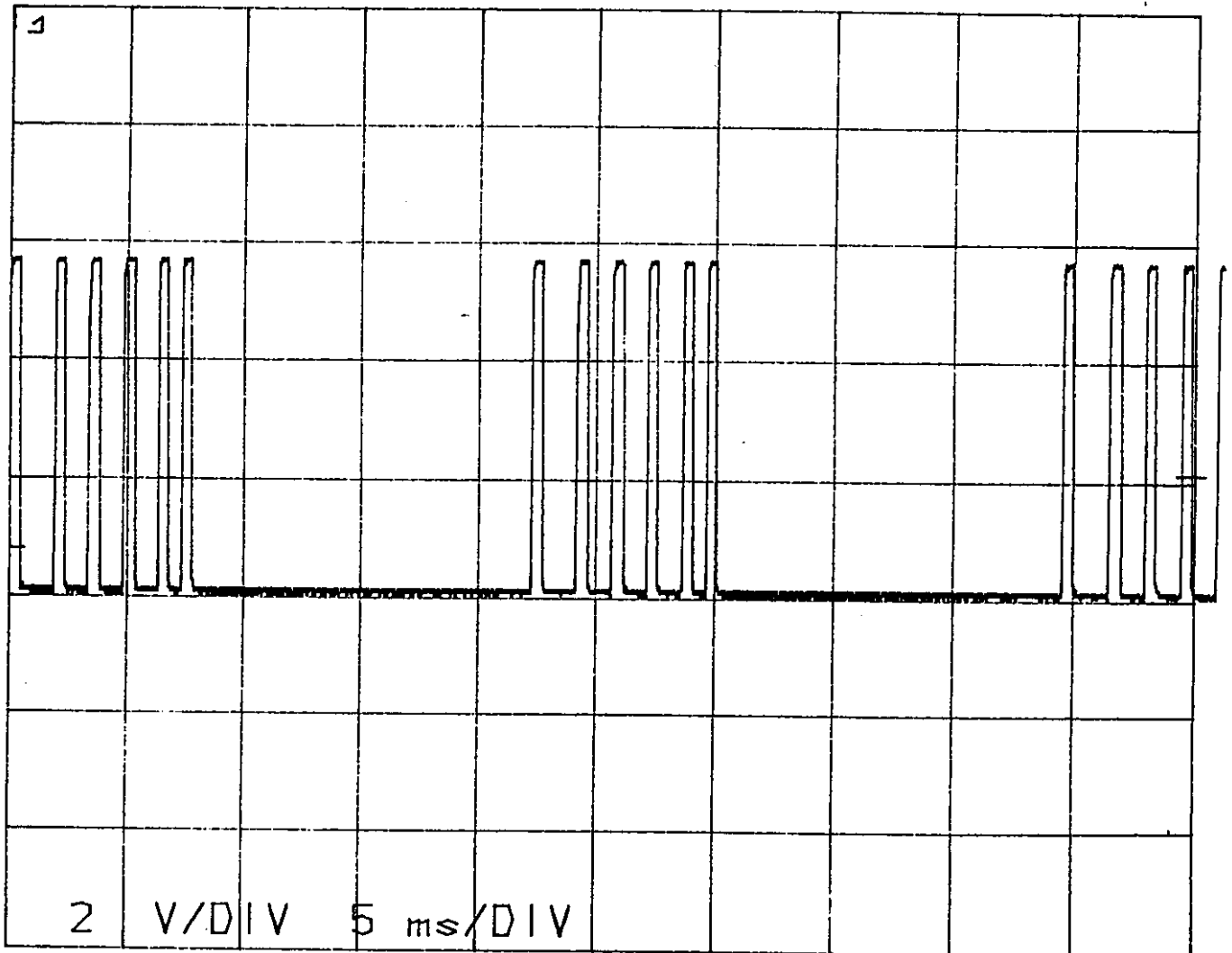
$$D = ( F_{high} - F_{low} ) / 2 = 1.575 [ \text{kHz} ]$$

D [ kHz ] : the Peak Frequency Deviation

## ENGINEERING TEST REPORT

2) Measurement of the Maximum Moduration Frequency(M)

Encoded Waveform



**ENGINEERING TEST REPORT****[ Environment ]**

Temperature : 20 °C Humidity : 59 %

**[ Calculation of the Maximum Moduration Frequency ]**

From Encoded Waveform, the Modulation Pulse Width (most minimum) was readed on the plotted graph.

$$T = 3.4 \text{ [ mm ]} / 17.2 \text{ [ mm / DIV ]} \times 5 \text{ [ ms / DIV ]}$$

$$= 0.99 \text{ [ ms ]}$$

$$M = 1 / T$$

$$= 1.01 \text{ [ kHz ]}$$

T [ ms ] : the Modulation Pulse Width (most minimum)  
M [ kHz ] : the Maximum Moduration Frequency

**3) Calculation of the Necessary Bandwidth(B)**

From the result 1) and 2) , the Necessary Bandwidth(B) was calculated as follows

$$B = 2M + 2D = 5.17 \text{ [ kHz ]}$$

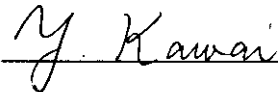
B [ kHz ] : the Necessary Bandwidth

**[ Summary of Test Result ]**

Above test results show that the Necessary Bandwidth is less than 8.0 kHz

Tested Date: February 2, 1999

Tester Signature



Yasunari Kawai

## ENGINEERING TEST REPORT

### 1.4 LIST OF TEST INSTRUMENTS

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	if used, checked by "X".	Last Cal.	Next Cal.
Regurated DC Power Supply	Kikusui	PAB18-3A	Output 0 ~ 18V, 3A	PD-32	<input checked="" type="checkbox"/>	—	—
Frequency Counter	Advantest	TR5823H	Freq. Range 1 mHz-1300 MHz	CU-17	<input checked="" type="checkbox"/>	1998/5	1999/5
Digital Plotterr	Hewlett Packard	7090A	Plot Area A3 size	RE-17	<input checked="" type="checkbox"/>	—	—
Multimeter	John Fluke	37	Volt Range 0.1mV - 1000 V Ampere Range 0.01 mA - 20 A	MM-91	<input checked="" type="checkbox"/>	1998/3	1999/3
Digital Oscilloscope	Matsushita Communication Ind.	VP-5740A	Frequency Range DC -10 MHz	OS-22	<input checked="" type="checkbox"/>	1998/5	1999/5



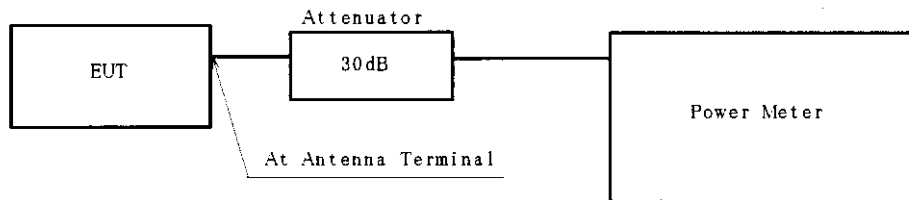
**ENGINEERING TEST REPORT**

## 2. MEASUREMENT OF THE ANTENNA GAIN

## 2.1 Reference Rule and Specification

FCC Rule Part 95 Subpart E [ § 95.647]

## 2.2 Test Configuration



## ENGINEERING TEST REPORT

### 2.3 Test Results

EMISSION FREQUENCY [MHz]	METER READING [dBm]	ATTENUATO LOSS [dB]	OUTPUT POWER [dBm]	ANTENNA GAIN *1) [dB]
72.59	-9.0	30.0	21.0	-3.8

[ Environment ]

Temperature : 18 °C    Humidity : 59 %

[ Calculation of the Antenna Gain ]

Meter Reading                         : -9.0 [ dBm ]  
 Attenuator Loss                        : 30.0 [ dB ]  
 Effective Radiated Power(ERP) \*2 : 17.2 [ dBm ]

\*1) Antenna Gain : Gain as compared to a half wave dipole.

\*2) Please refer to  
 the 6 of 20 page within ENGINEERING TEST REPORT (Report No. A-018-98-C) which  
 KANSAI ELECTRONIC INDUSTRY DEVELOPMENT CENTER have issued.

Then, the Output Power and the Antenna Gain is calculated as follows,

$$\text{the Output Power(PA)} = -9.0 + 30.0 = 21.0 \text{ [dBm]}$$

$$\begin{aligned} \text{the Antenna Gain} &= \text{ERP} - \text{PA} \\ &= 17.2 - 21.0 = -3.8 \text{ [dB]} \end{aligned}$$

[ Summary of Test Result ]

Above test results show that Antenna Gain have no gain as compared to a half wave dipole.

Tested Date: February 2, 1999

Tester Signature

*Y. Kawai*  
 \_\_\_\_\_  
 Yasunari Kawai

**ENGINEERING TEST REPORT**

## 2.4 LIST OF TEST INSTRUMENTS

Instrument	Manufacturer	Model No	Specifications	KEC Control No.	if used, checked by "X".	Last Cal.	Next Cal.
Attenuator	Anritsu	MP47A	Frequency Range 0.05 - 14 GHz -30 dB	AT-40-5	<input checked="" type="checkbox"/>	1999/1	2000/1
Power Meter	Anritsu	ML83A	Frequency Range 0.05 - 14 GHz	PM-15	<input checked="" type="checkbox"/>	1998/3	1999/3