

# DERA

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Report on Spurious Emissions  
Testing to 47CFR of  
**Jotron 40S 406 MHz EPIRB**

DERA/SS/PSD/TT21/00-1.0

Cover + vi + 10 pages

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*Commissioned by;*

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Issue	Date	Details of Change
1.0	Oct 2000	First issue

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**1 Introduction**

- 1.1 The JOTRON 40S was tested for Spurious Emissions to the requirements of the code of Federal Regulations 47CFR. The relevant sections are 2.1053, 2.1057, 80.205 & 80.211.
- 1.2 The JOTRON 40S EPIRB transmits on both 121.5 MHz and 406.025 MHz. The spurious emissions were measured for both of these transmissions.

**2 Equipment under Test**

- 2.1 Jotron Ltd supplied the following items on 21/9/00 for the duration of type testing.

ITEM	Type	Serial Number
406 MHz EPIRB	TRON 40S	0GT 07202

- 2.2 A Photograph of the EPIRB can be seen in Figure 6.

**3 Test Location**

- 3.1 The tests were executed at DERA Fraser, Fort Cumberland Road, Portsmouth, Hants.

**4 Configuration of the EPIRB sample**

- 4.1 The beacon supplied was a standard model. However for the measurement of the spurious emissions due to the 121 MHz transmitter the 406 MHz transmitter was inhibited. Similarly for the measurement of the spurious emissions due to the 406 MHz transmitter the 121 MHz transmitter was inhibited.

**5 Tests**

- 5.1 The measurement of the spurious emissions were performed in a screened room lined with anechoic material.
- 5.2 The emissions were measured using calibrated antennas and spectrum analyser corrected for the antenna factors.
- 5.3 A plot of the emissions close to the 121.5 MHz carrier is shown in figure 1. All emissions pass the requirement of 47CFR80.211(e).
- 5.4 A summary of the spurious emissions for the 121 MHz transmitter are show in table 1. All emissions pass the requirement of 47CFR80.211(e) of being at least 30dB below the mean power. A plot of the emissions from 100 MHz to 1.3 GHz is shown in figure 2.

Spurious Emissions due to 121.5 MHz Transmitter		
Harmonic	Frequency (MHz)	Level (dBc)
Second	243.0	-30.9
Third	364.5	-34.2
Fourth	486.0	-50.8
Fifth	607.5	-48.0
Sixth	729.0	-47.1
Seventh	850.5	-48.3
Eighth	972.0	-48.6
Ninth	1093.5	<-56
Tenth	1215.0	-49.8

**Table 1**

- 5.5 A plot of the emissions close to the 406.025 MHz carrier is shown in figure 3. All emissions pass the requirement of 47CFR80.211(e).
- 5.6 A summary of the spurious emissions for the 406.025 MHz transmitter are show in table 2. All emissions pass the requirement of 47CFR80.211(e) of being at least 30dB below the mean power. A plot of the emissions from 400 MHz to 1 GHz is shown in figure 4 and the plot of 1 GHz to 4.1 GHz in figure 5.

Spurious Emissions due to 406.025 MHz Transmitter		
Harmonic	Frequency (MHz)	Level (dBc)
Second	812.050	-53.4
Third	1218.075	-58.8
Fourth	1624.100	-69.8
Fifth	2030.125	<-69
Sixth	2436.150	-54.09
Seventh	2842.175	-54.9
Eighth	3248.200	-52.25
Ninth	3654.225	-54.68
Tenth	4060.250	<-59

**Table 2**

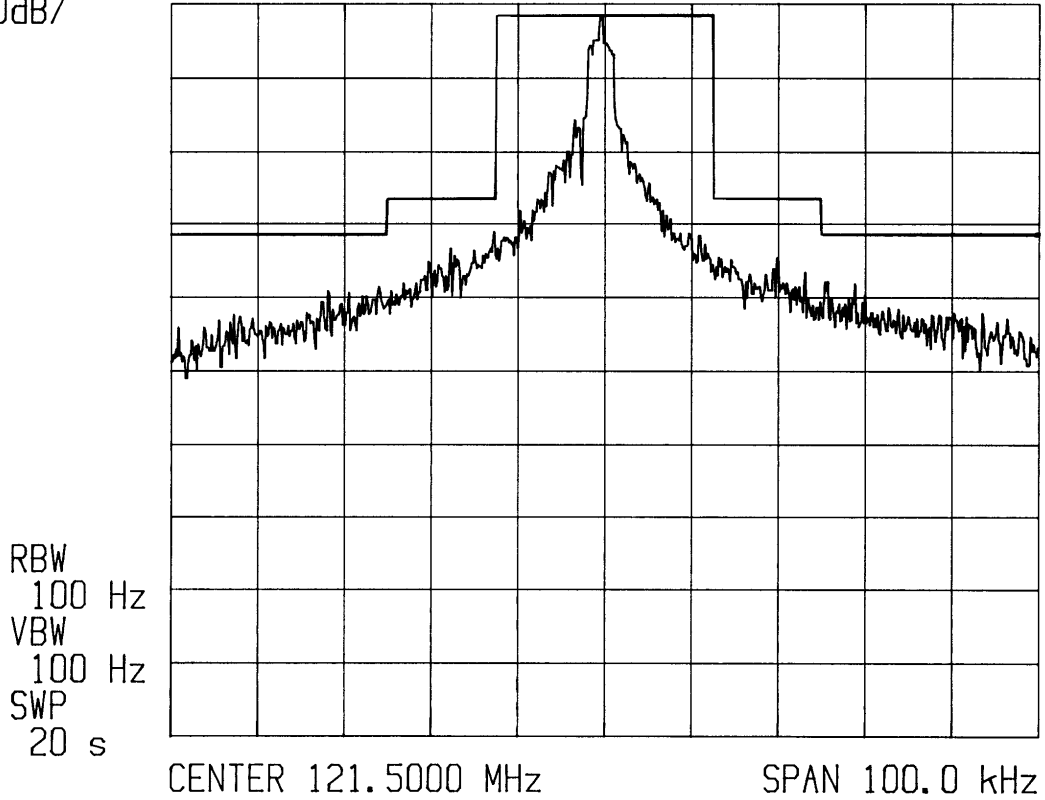
## 6 Conclusion

The Jotron 40S 406 MHz EPIRB meets the requirement for spurious emissions of FCC 47CFR Oct 1988.



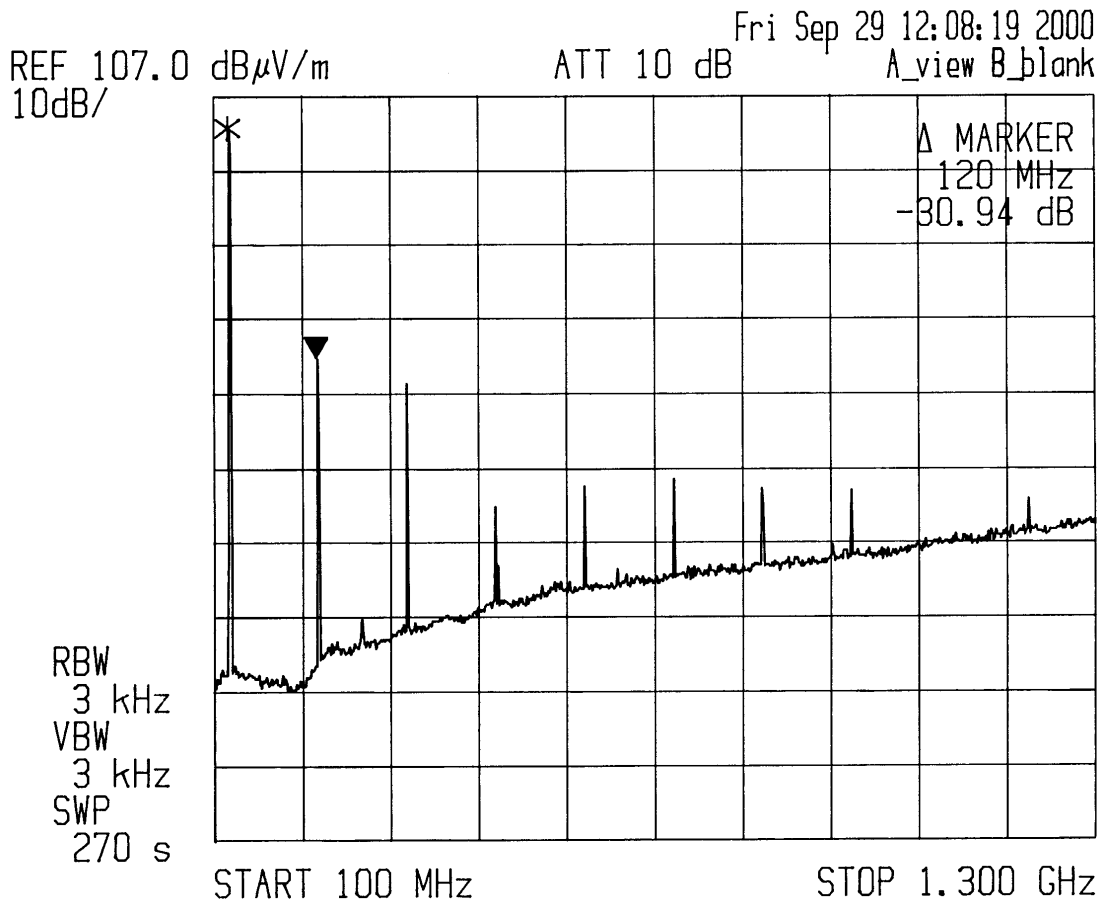
7 **Figures**

Bilog CBL6112A & lead sn M2064 Thu Oct 5 10:15:48 2000  
REF 107.0 dB $\mu$ V/m ATT 10 dB A\_write&max B\_blank  
10dB/



**Close to carrier Emissions of 121.5 MHz Transmitter of Tron 40S EPIRB**

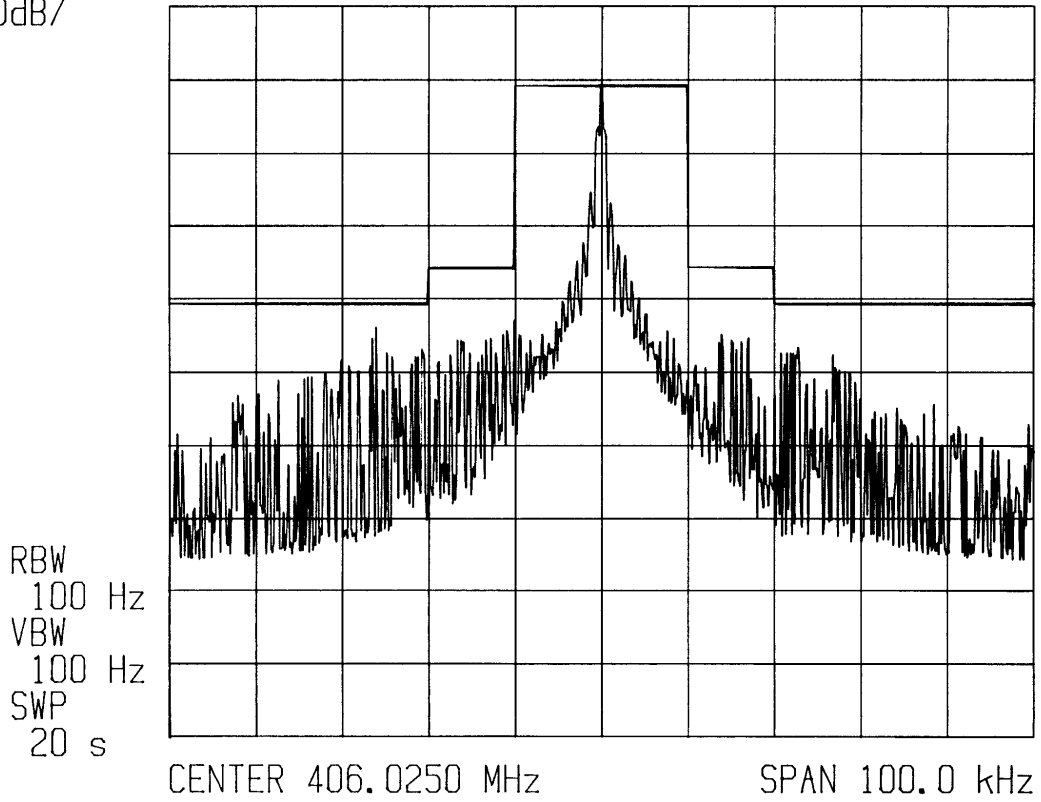
**Figure 1**



**Emissions of 121.5 MHz Transmitter of Tron 40S EPIRB**

**Figure 2**

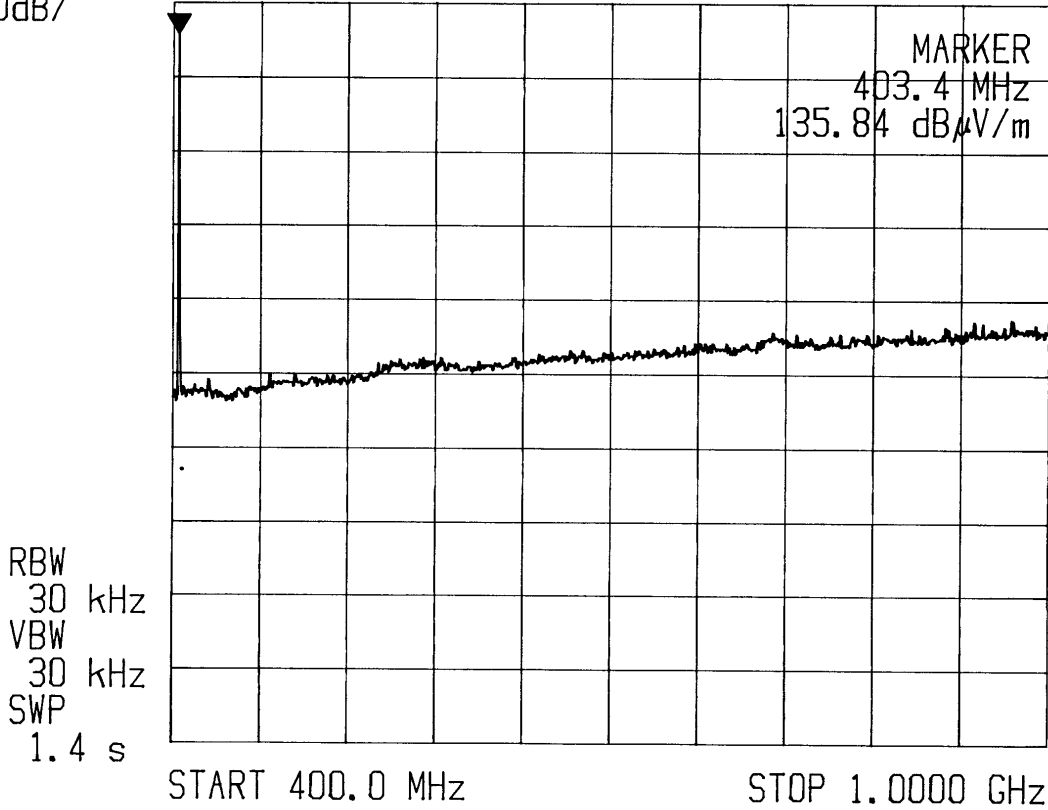
Bilog CBL6112A & lead sn M2064 Thu Oct. 5 09:41:24 2000  
REF 147.0 dB $\mu$ V/m ATT 50 dB A\_write&max B\_blank  
10dB/



**Close to carrier Emissions of 406.025 MHz Transmitter of Tron 40S EPIRB**

**Figure 3**

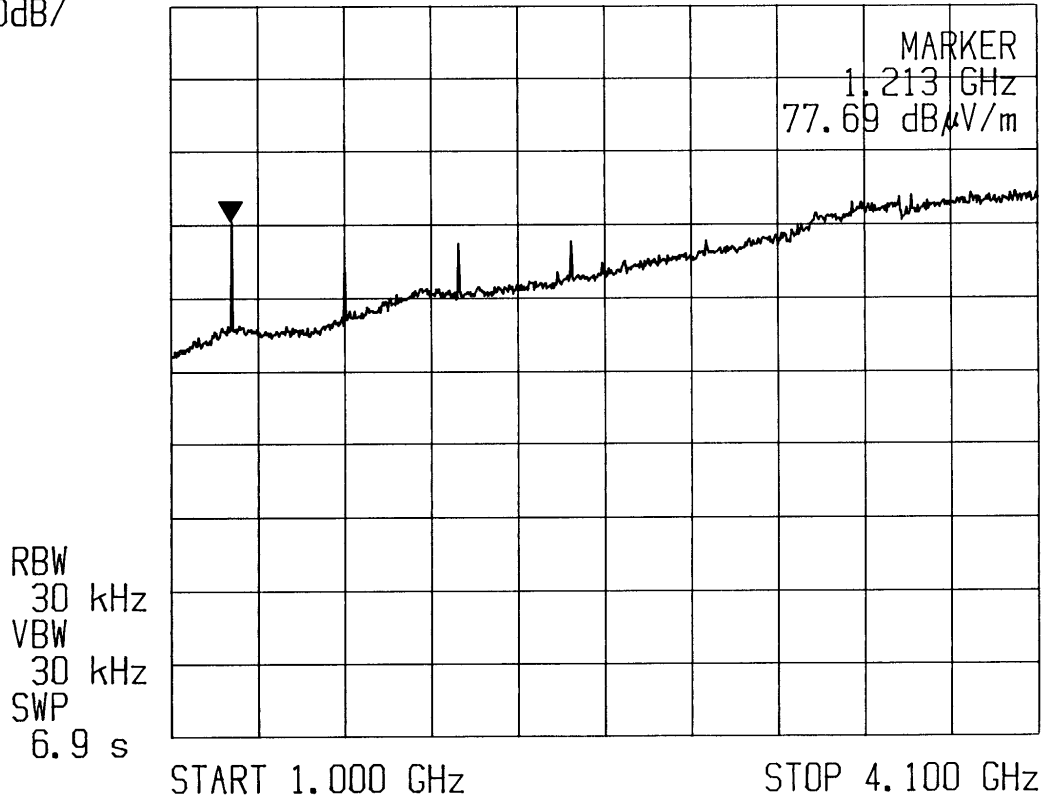
Bilog CBL6112A & lead sn M2064 Thu Oct 5 14:05:35 2000  
REF 140.0 dB $\mu$ V/m ATT 50 dB A\_write&max B\_blank  
10dB/



**Emissions of 406.025 MHz Transmitter of Tron 40S EPIRB (400 MHz to 1 GHz)**

**Figure 4**

EMC03115 Ant. & lead sn M2064      Fri Oct 6 12:30:05 2000  
REF 107.0 dB $\mu$ V/m      ATT 10 dB      A\_write&max B\_blank  
10dB/



**Emissions of 406.025 MHz Transmitter of Tron 40S EPIRB (1 GHz to 4.1 GHz)**

**Figure 5**



**Tron 40S EPIRB**

**Figure 6**

**8 List of Equipment Used**

<b>Description</b>	<b>Serial Number</b>	<b>Calibration Date</b>
Advantest Spectrum Analyser R3271A	45050075	19/1/00
Rhophase Test Lead	M2064	3/11/99
Chase Bilog Antenna CBL6112A	2138	28/2/00
EMCO Double Ridge Wave guide Horn Antenna 3115	9605-4679	3/6/98

**9 Distribution List**

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