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June 20, 2002

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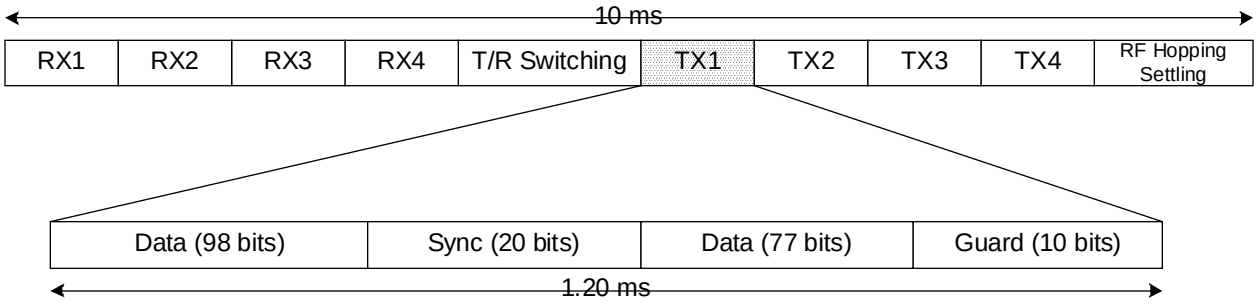
Dear Ms. Ellen:

I am writing to respond to your e-mail inquiry dated June 19, 2002, about SAR, average transmit power and transmit duty cycle in our products, EP-436, which are in the process of FCC Part 15 certification.

1. **Handset SAR:** According to the guidelines in Supplement C to OET-65, Section 3, Table 1, the limit for a 915 MHz handset transmitter is 0.3W. In addition, Footnote 19 states: "When applicable, a source-based time-averaging duty factor may be considered for determining compliance." EP-436 employs TDMA multiple access scheme and the handset has a duty cycle of 12% (see detailed explanation below). With a design peak power of 630 mW (28 dBm), the average power is only **76 mW**, thus meeting the SAR requirement.

2. **Average Power:** To accommodate 4 users per RF carrier (to handle 4 C.O. lines), EP-436 uses a 8-slot TDMA scheme with a frame length of 10 ms. The uplink (handset to base) frame and slot structures are shown as below:



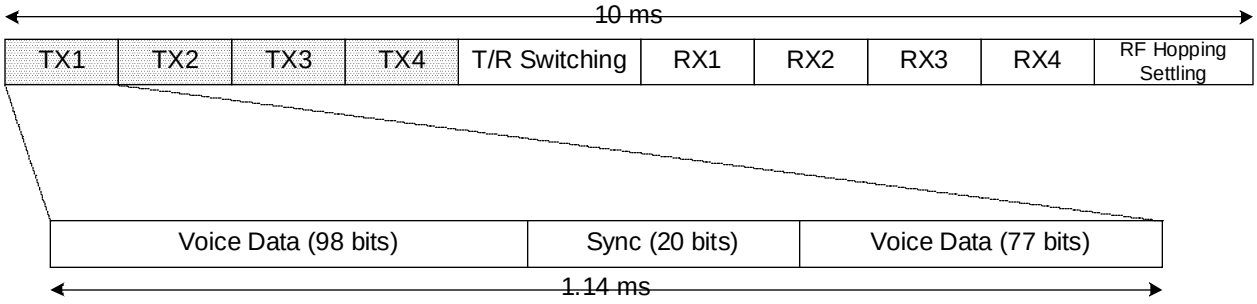
where

- Frame length is 10 ms, and the hopping rate is 100 hops/second, i.e., one frame per hop.
- TX1-TX4 time slot is 1201.17 μs each, for a duty cycle of **12 %**.
- RF switching time is 199.87 μs.
- RX1-RX4 time slot is 1142.58 μs.
- RF hopping settling time is 425.13 μ s.
- Speech codec is 8 kbps G.729A, FEC adds 8 kbps, there are 15 signaling bits per slot.
- System Clock Frequency, Clk = 16.384 MHz
- Internal DSP Clock Frequency, ClkDsp = Clk x 6 = 98.304 MHz
- Digital to Analog sample rate is 8.192 MHz (i.e. 12 DSP clock)

- Number of samples per transmitted bit = 48.
- Bit period, Tb = (1/ClkDsp) x 576 = 5.859 μs.
- Channel data rate is 170.667 kbps.

Attached plot in Figure 1 illustrates the duty cycle of an EP-436 handset.

3. **Base SAR:** According to the guidelines in Supplement C to OET-65, Section 3, Table 1, the limit is 2.5W for a 915 MHz mobile transmitter using indoor antenna that operates at 20 cm or more from nearby persons. On the reverse link (base to handset) of EP-436, the base station's total transmit time is 1.14258 ms x 4 = 4.57032 ms, for a duty cycle of **45.7%**. Therefore, with a design peak power of 630 mW, the average power is **0.28W**, less than the 2.5 W limit for a mobile unit (or even the 0.3 W handset limit). The base station's frame and slot structures are:



Attached plot in Figure 2 illustrates the duty cycle of an EP-436 Base.

4. **Safety Statements:** The following statement will be added as Item 19 on Page 4 of the User's Manual: "This equipment is a transmitter which produces RF energy. The limits on human exposure to radio emission are set by FCC, this equipment complies with those limits. The use of any accessories that have not been approved is a violation of FCC rules."

5. **Belt Clip:** Attached in Figure 3 is a photo of the Belt Clip used in EP-436.

I appreciate your assistance in this application; please feel free to contact me if you have any question.

Best regards,

Jyun-cheng Chen

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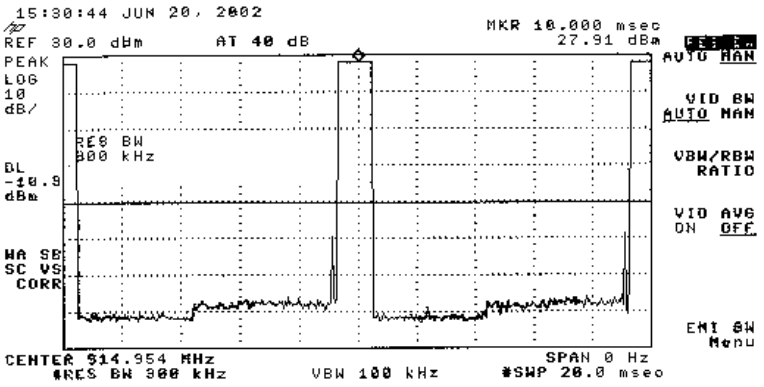
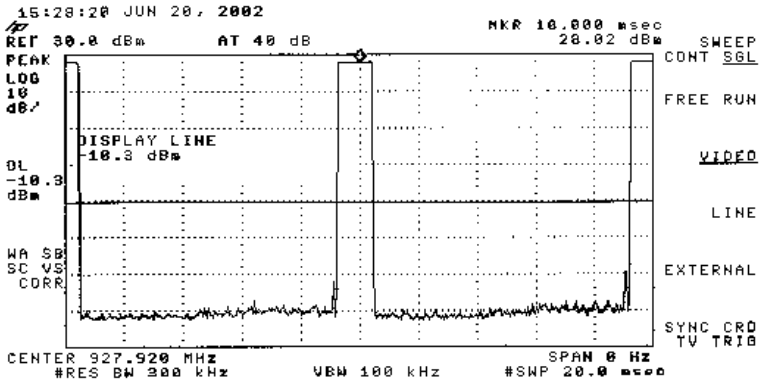




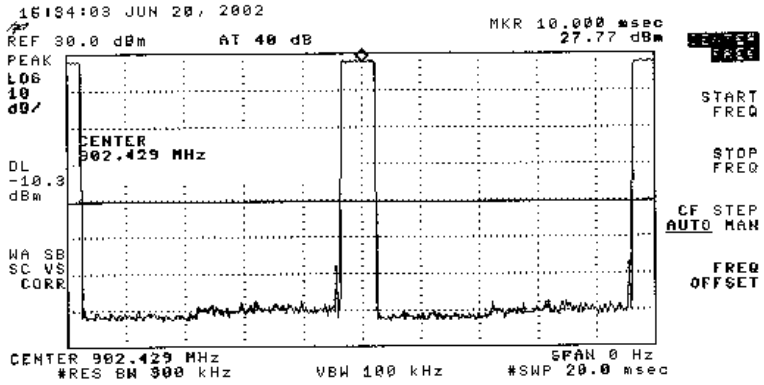
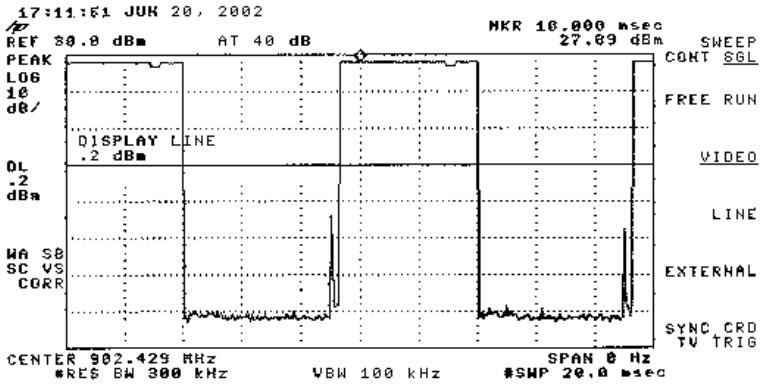
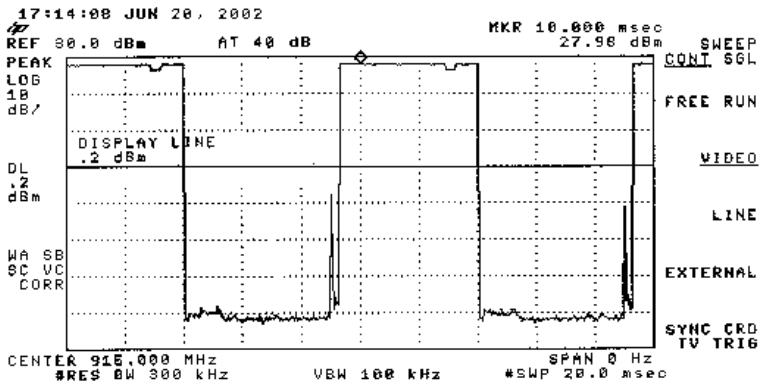


Figure 1: EP-436 Handset duty cycle illustration.





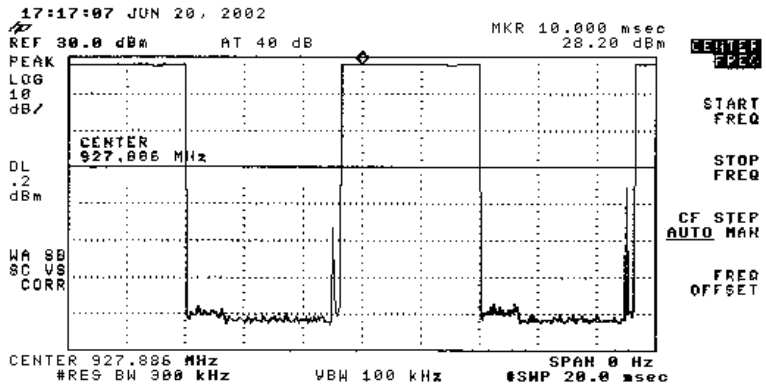


Figure 2: EP-436 Base Station duty cycle illustration.

Figure 3: EP-436 Belt Clip.