

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, DC 20554**

In the matter of )  
)  
Review of Part 15 and other Parts ) ET Docket No. 01-278  
of the Commissions Rules ) RM-9375  
) RM-10051

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To: The Commission

### **Comment of Bruce Perens**

The proposed rule-making is really the first step in creating a worldwide coordination for a new ISM band. As is made clear by the comments of Mattel and others, there would be significant pressure after this rule-making to expand the allocation beyond the parameters specified by SAVI. For example, Mattel proposes a narrow-band FM application with continuous transmission.

The sole reason for consideration of spectrum around 433 MHz is the use of that frequency for ISM applications outside of the United States. SAVI cites the need for RF tags to operate internationally. Mattel cites the cost of producing multiple designs of baby-monitor, because U.S. frequency allocations are not the same as those elsewhere. Sufficient ISM and Part 15 spectrum currently exists for all of these applications, as is demonstrated by the existing widespread deployment of RF tags and baby monitors within our borders. But none of that spectrum is internationally coordinated as an ISM band such that it can be used the same way everywhere.

The allocation of a worldwide ISM band *with uniform parameters* across all international borders may be a worthwhile goal, but this proceeding

is *not* the proper venue for such a project. Such a project should be pursued via ITU, with all member administrations *committing to authorize the same set of technical parameters within their borders*. Otherwise, use of this spectrum will be constrained by the minimum technical parameters supported by all nations, and those parameters will be *uncoordinated*. This will lead to continuing problems in deployment from nation to nation, and continuing pressure on FCC to broaden the authorization for devices in this band to match whatever is authorized in another nation.

If this matter were to be undertaken in a coordinated fashion via ITU, it would be likely that a more appropriate frequency band would be selected. Perhaps that band would be one that is already allocated for ISM use within the United States.

The 420 to 450 MHz frequency band is heavily used by the Amateur Radio Service and the Amateur Satellite Service. The word *Amateur* belies the importance of the applications Radio Amateurs support in this spectrum. A primary application in the Amateur service is **education** in radio and electronic technology. Another important application is emergency communications, especially when a disaster has caused a communications infrastructure collapse or when the temporary need for emergency communications overwhelms the existing infrastructure.

Radio Amateurs are unique in that they are the only existing corps with sufficient size, skill, resources, and geographic distribution to be able to improvise emergency communications for any situation, no matter how large, remote, or specialized. An incursion into the 420 to 450 MHz band will reduce the ability of Amateurs to provide emergency services, in a time when our nation seeks to improve, not reduce, its homeland defense and disaster-recovery capabilities.

The interference studies submitted by SAVI depend on several specious propositions: that Amateur communications are carried out using FM, using strong signals with sufficient system fade margin to accommodate a significant increase in the noise floor, and that the interfering SAVI

equipment will be at a different frequency from that used by the Amateur operation. In reality, there is nothing preventing the proposed SAVI equipment from being used on the same frequencies as on-going Amateur communications. Those communications may well be weak-signal, and may use SSB or other modulation schemes that are more efficient than FM but are also more vulnerable to the SAVI signal. The SAVI interference studies posit that the use of the proposed allocation would remain within SAVI's proposed parameters: in reality, there would be significant pressure, as demonstrated by Mattel's comment, to broaden those parameters to include other applications, modulation modes, bandwidths, and duty cycles.

SAVI asserts that their users would be geographically separated from Radio Amateur operations, but that is simply not the case. The proposed RF tags would eventually be used by retail merchants. Retail operations are located in every community, in close proximity to housing where Amateur operations are located. In addition, Amateurs are often called on to provide emergency services in areas that are convenient to emergency victims, such as a town center, and that is exactly where retail merchants are most concentrated. Other proposed users of RF tags are delivery service operators such as United Parcel Service and Federal Express. Those are mobile operations, and would operate at the residential locations housing Amateur operations.

RF tag implementors propose to reduce the cost of the tags to just a few cents, so that RF tags can replace UPC stickers on retail items. To achieve low cost, tags will be constructed entirely from printed components, and will derive their power from the RF of the interrogator transmitter, as current passive anti-shoplifting tags do. Such devices can not be selective, and are extremely likely to create inter-modulation and parasitic radiation. Many RF tags will be embedded in consumer products that reach the Amateur's residence. Often the tags will be placed *inside* of the product, where the consumer can not remove them, in order to prevent their removal by shop-lifters. RF-powered tags will remain operational for decades after the sale. It is likely that they will be

activated by strong signals from nearby Amateur equipment, since they will operate on the same frequencies as that equipment. There will be many such tags in the Amateur's home, near and even *on* the Amateur equipment. This will create a mess of parasitic radiation, intermodulation, and interference for every Amateur. The interference may have its worst effect on Amateur communication using digital modes, because of the very short transmit-to-receive interval, and also when using full-duplex modes, because these involve simultaneous transmission and reception. It is also likely that parasitic radiation and intermodulation from the RF tags will increase the interference experienced by an Amateur's neighbors. Thus, it is essential that RF tags operate in a properly-authorized ISM band, with sufficiently wide guard-bands to protect band-sharing partners from their effects.