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220 Lenox Avenue
Albany NY 12208-1408
March 12, 2002

Ms. Magalie Roman Salas, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Room TW-B204
Washington, DC 20554

Dear Ms Salas

I am enclosing a signed original and 15 copies of reply comments on proceeding 01-278. These comments were submitted electronically on March 12, 2002.

The break down on the copies is as follows:

Signed original	1
Copies:	
Four copies	4
Copies for FCC Commissioners	5
Copies for multiple dockets/rulemakings	6
	15

Since this paper filing confirms an electronic filing, and since it is post-marked on March 12, 2002, I would like to request that these comments be accepted as timely filed.

Thank you for your assistance.

(Signed)

Mr. Gerald W. Murray (WA2IWW)
wa2iww@arrl.net

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Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of	)
Review of Part 15 and other	) ET Docket 01-278
Parts of the Commission's Rules.	) RM-9375
	) RM-10051

February 12, 2002

REPLY COMMENTS OF MR. GERALD W.MURRAY (WA2IWW) IN RESPONSE TO NOTICE OF PROPOSED RULEMAKING (RM-10051)

I am writing in opposition to Savi's petition to amend various sections of Part 15 of the FCC Rules to permit the proposed Savi RFID system.

I. BACKGROUND

My Name is Gerald W. Murray. I have held Amateur Radio license WA2IWW since 1976, and have held the Amateur Extra class license since 1992.

I also hold the following FCC commercial radio operator licenses:

General Radiotelephone Operator License (GROL) with Ship Radar Endorsement

Second Class Radiotelegraph Operator's Certificate with Ship Radar Endorsement

GMDSS Radio Operator/Maintainer License with Ship Radar Endorsement

I am currently employed as a Data Communications Specialist II by the New York State Workers' Compensation Board (NYSWCB). I had previously been employed as a broadcast operator by AM and FM broadcast stations in Upstate New York's Capital District Area.

II. THE SAVI PEITION

Savi requests changes to Part 15 to allow the use of its proposed new RFID system using higher average transmit levels, longer duty cycles, and near continuous operation. The proposed rule changes in the NPRM are actually broader than those that would be required to support the Savi system.

These proposed rules changes would also allow the introduction other systems from other vendors for other applications. If the FCC adopts the proposed rules and accepts the Savi

system, the FCC would have to approve any and all of the possible new systems, as long as they are operating within the limits of the proposed new rules.

Before granting a change in the proposed rules, the FCC would have to determine that the proposed Savi system, other future systems, and the rules themselves would not cause harmful interference to licensed users on the band.

III. CURRENT USAGE OF THE 70cm BAND

The 70 cm band is used by the following services:

> PRIMARY LICENSED USER - radiolocation service (including Space-Object-Tracking and airborne radars, and destruct frequencies)
>
> SECONDARY LICENSED USER – Amateur Radio Service – This band is used world-wide for SSB, CW, Amateur Television (ATV), satellite communications, and other weak signal work.
>
> UNLICENSED USERS – Part 15 Devices

IV. DISCUSSION

Unlicensed Part 15 devices may not cause harmful interference to primary or secondary users of the band. Commission rules require that Part 15 devices be marked with the following information:

> This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:
>
> (1) This device may not cause harmful interference, and
>
> (2) This device must accept any interference received, including interference that may cause undesired operation.

In practice, this requires that any user of Part 15 devices must resolve all cases of interference to licensed services, even if it means discontinuing the use of the Part 15 device. Many users of the proposed Savi system may actually become dependent on it for their business, and would resist any suggestion that they modify or discontinue their usage to protect a licensed service.

The proposed new system (and other new systems permissible under the proposed rule changes) would greatly increase the number, power levels, and duty cycles for Part 15 devices. This would create a new RF-rich environment with numerous opportunities to interfere with the operation of licensed services. Since many of these new sources would be mobile, they would be almost impossible for licensed users to locate and identify.

Even if the affected licensed services were able to decode the received information, it would still not provide the name or location of the user of the Part 15 device.

The Commission should also consider the impact of the proposed new Part 15 transmission levels and duty cycles on existing Part 15 devices which were accepted under the current rules. Mr. William R. Hildebrand of Operator Specialty Company, Inc. of Casnovia, MI, expresses concerns about jamming effects and states that "the proposed changes would allow new devices of unproven utility to overpower the transmission signals of millions of existing devices and render them unreliable". Mr. Hildebrand also states that his industry serves 25 million home and business customers.

V. SAVI COMMENTS - FEBRUARY 12, 2002

In Savi's comments of February 12, 2002, Savi makes the following points

II. Authorization of Advanced RFID Products Will Provide Obvious Public Benefits

It is a given that properly designed and deployed RFID systems can be of enormous benefit. However, the FCC does not have the authority to permit an unlicensed system which may cause harmful interference to licensed radio services. In addition, the system proposed by Savi would not even come close to enjoying world-wide acceptance, even if the FCC were to adopt the NPRM.

III. The Amateur Radio Service Still Misunderstands SAVI's Request

Whether or not some of the commenters misunderstand some or all of the Savi request, there are other issues to be considered. The rule changes proposed in the NPRM would allow for new applications which could operate beyond the scope of the changes which Savi is requesting.

A. Part 15 Permits Power Levels Utilized By Savi

Although the current Part 15 rules allow short transmission bursts of 110,000 uV/meter, the effect of near-continuous operations of up to two minutes is quite another matter. Short interruptions during voice or CW modes would result in a manual re-transmit by the amateur operators. Digital modes would retry on error, but the two-minute transmission period would cause the stations in the data connection to time out. Either of these results renders the service useless. Savi keeps restating that the Peak Power levels will not change, but downplays the fact that the duty cycles and the average power transmitted over time would substantially increase.

B. SAVI Operations Are limited to Commercial/Industrial Environments That Severely Restrict Propagation

This statement overlooks two significant facts:

a. Adoption of the proposed rules would pave the way for other applications from other vendors. The FCC would have to accept these new systems as long as they did not exceed the limits in the proposed rules. These new systems might be designed for home, office or business use, and would not be restricted to "industrial areas" as stated by Savi. These multiple new systems would act in concert to increase the noise level in the 70 cm band.

b. The proposed Savi system itself would not necessarily be restricted to industrial areas. The proposed rule changes do not allow for the possibility that some of Savi's customers might choose to deploy interrogators at locations other than those envisioned by Savi. This could be done without the knowledge of Savi, and nothing in the proposed rules would prevent it. The FCC must consider the possibility that the Savi interrogators might be used in situations and locations other than those envisioned by Savi.

C. The 433 MHz Band is Appropriate and Necessary for Savi's Operations

Due to the present deployment of stations utilizing SSB, CW, ATV and weak signal applications, this band is among the worst possible choices for the proposed system. A check of the International Telecommunications Union (ITU) allocations shows that the band between 430 and 440 MHz is allocated to the amateur radio service *world-wide.* The band between 420 and 450 MHz is allocated to the amateur radio service in ITU Region 2 and ITU Region 3.

Wavelength Band	ITU Region 1	ITU Region 2	ITU Region 3
UHF	MHz	MHz	MHz
70 cm	430-440	420-250	420-250

In a comment submitted on behalf of UPS, Mr. Philip Hunter states that "we clearly see a global network, enriched data transfer capabilities, and RFID technology as key elements in providing this visibility". However, the usage proposed by Savi is presently allowed in a small number of countries, which are primarily in Eastern Europe. In fact, five of these countries were formed out of the former Yugoslavia. Even if the FCC were to grant the NPRM, additional changes would have to be made in numerous countries around the world before Savi could advertise and market their system as having "global" capabilities. The proposed system would not enjoy wide acceptance in large parts of Western Europe or Asia.

In order to implement a 'global" system, it would be more appropriate for Savi to use allocations which are more favorably tailored for their proposed usage around the world.

Several other vendors are already active in RFID technologies, and are using other bands which are more appropriate. It is more likely that world-wide RFID applications would standardize on bands which are already allocated for the purpose, and in which multiple vendors are operating.

D. Use of the 433 MHZ Band Will Not Introduce Harmful Interference to Amateur Operations

The on-air tests conducted by Savi to support this statement are not sufficiently rigorous to prove that the proposed rule changes would not cause harmful interference to licensed services:

a. The Savi test procedures do not clearly state whether the interrogators used are from the current Savi system, or the proposed new Savi system.

b. Since the average power levels and duty cycles in the NPRM are higher than those requested by Savi, the Savi tests do not address the impact of future systems from other vendors which are operating higher than the Savi levels, but within the levels allowed by the NPRM. The Commission must evaluate the combined effects of the Savi system *AND* of other new systems running at or near the limits of the NPRM.

c. In various Savi presentations, Savi claims that the inability to break FM receiver squelch during Savi-conducted tests is proof that harmful interference to the Amateur Radio Service would not occur. The frequencies from 425 – 435 MHz are used for SSB, CW, Amateur Television (ATV), and weak-signal work. The receiver squelch is generally not used in these applications. Also, the typical receive levels for these services are generally below the squelch threshold, and are well below the levels which are considered as minimally acceptable in other radio services.

d. In the Savi comments of February 12, 2002, (the last day of the comment filing period) Savi states that "the only new issue raised is about the "weak signal" service and the effect that Savi's system would have on this service". If Savi considers this to be a new issue, then it suggests that Savi was not aware of, did not consider, or chose not to discuss the "weak signal" question before it came up during the comment period.

VI. SAVI EX-PARTE PRESENTATION OF FEBRUARY 7, 2002

a. In Savi's ex-parte presentation of February 7,2002 Savi claims that some of the ARRL curves are off by 30 dB. In the ARRL ex-parte presentation of February 26, 2002, the ARRL shows that Savi is in error on their claim that the free space curves are in error by 30 dB.

b. I have run my own calculations to try to independently verify the figures and resolve the differences between the two positions:

1. Using an Excel spreadsheet with the same formula as the ARRL;'s basic program, the tabulated values and graphs compare very closely with those of the ARRL.

2. Using an Excel spreadsheet with the same formula as that contained in the Savi presentation, the tabulated values and graphs compare very closely with those of the ARRL.

c. I have no explanation as to why the values listed by Savi for distances of 100 meters and 1000 meters vary so widely from those computed by the ARRL or WA2IWW. However, the figure listed by Savi for the reference distance of 3 meters is "in the ballpark".

Distance From Source	**ARRL calculation for power**	**Savi calculation for power (interrogator)**	**WA2IWW calculation using ARRL formula**	**WA2IWW calculation using Savi formula**	**Notes**
3 meters (reference)	-58.92 dBW (-28.92 dBm)	-58.17 dBW (-28.17 dBm)	-59.13 dBW (-29.13 dBm)	-58.92 dBW (-28.92 dBm)	ARRL, Savi, and WA2IWW in agreement
100 meters	-89.38 dBW (-59.38 dBm)	**-122.75 dBW** **(-92.75 dBm)**	-89.59 dBW (-59.59 dBm)	-89.38 dBW (-59.38 dBm)	-20log (100/3) = -30.46 dB from the field present at 3 meters. Savi data would require that the field vary as -43log (100/3)
1000 meters	-109.38 dBW (-79.38 dBm)	**-142.57 dBW** **(-112.57 dBm)**	-109.59 dBW (-79.59 dBm)	-109.38 dBW (-79.38 dBm)	

VII. CONCLUSION

In conclusion:

The proposed new system is not suitable for sharing spectrum with the current licensed users of the 70cm band.
Savi has not proven that their proposed system (or other systems which would be permissible under the proposed rule changes) will not cause harmful interference to licensed users.

Testing conducted by Savi is not sufficiently rigorous to prove that harmful interference will not occur from the proposed Savi system, or from other new systems which would be permissible under the proposed new rules.

Allocations in other parts of the world work against Savi's intention of implementing a global system.

World-wide standardization of RFID systems is more likely to occur in other bands which have greater acceptance around the world, and where other vendors are already operating.

Mathematical data supplied in support of the Savi petition is seriously flawed (the 30 dB claim).

For these reasons, the Savi petition is not in the public interest, convenience, and necessity, and should be denied.

Respectfully submitted

Gerald W. Murray, WA2IWW
wa2iww@arrl.net