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July 28, 1999

Magalie Roman Salas
Office of the Secretary
TW-A306
Federal Communications Commission
445 12th Street, S.W.
Washington, DC 20554

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Dear Madam Secretary:

Enclosed please find an Original and four copies of Comments to be filed by V-Soft Communications/Doug Vernier Telecommunications Consultants regarding MM Docket No. 99-25, Creation of a Low Power Radio Service.

Should there be any questions or concerns, please contact us at 319-266-8402.

Sincerely,

Kate Michler

Kate Michler, Business Associate

Enc.

No. of Copies rec'd 0+4
List ABCDE

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Before the
Federal Communications Commission
Washington, DC 20554

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JUL 29 1999

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In the Matter of	)	
	)	
Creation of a Low Power	)	MM Docket No. 99-25
Radio Service	)	RM-9208
	)	RM-9242

Comments Filed by:

V-Soft Communications/ Doug Vernier
Telecommunications Consultants
1600 Picturesque Dr.
Cedar Falls, IA 50613

V-Soft Communications designs broadcast engineering software tools including propagation prediction computer programs. The company contains a broadcast technical consulting unit that provides consultative assistance for solving broadcasting engineering problems.

With regard to the "Creation of a Low Power Radio Service" proposal, Docket 99-25, the Federal Communications Commission proposes a new radio service that would assign low power FM channels on the basis of a table of minimum separations. The FCC's table drops the 2nd and 3rd adjacent protections between

low power stations and the Commission asks whether the 2nd and 3rd adjacent channels should be dropped between LPFM and other stations. The Commission states a belief that, over the years, FM receivers have improved to the extent 2nd and 3rd adjacent protections may not be necessary and that the exiting demand for LPFM frequencies requires more channels than the present allocation system can deliver. The Commission also asks whether the minimum spacings table it has devised should protect LPFM stations from interference or allow such stations to receive interference.

V-Soft Communication opposes the establishment of an LPFM system unless the Commission can assure the American public that no new interference will result. The Commission has reiterated its position that considering the volume of applications for LPFM stations that it expects, it does not have the technical resources to administer an LPFM program that requires a more sophisticated interference analysis procedure. We consider this approach to be an abrogation of the Commission's responsibility to assure U.S. citizens will have the highest quality broadcasting available absent interference. Regardless of the social and political demands on the Commission, we believe its first responsibility is to maintain the integrity of the existing system and any future system. This is particularly important as we enter the age of digital broadcasting where any changes we make in the allocation system today could have a major impact on our ability to implement the next generation broadcasting system.

An allocation method to avoid interference:

From an interference standpoint, our preference would be no LPFM at all. However, if an LPFM service is adopted, we feel that the Commission should use the conservative approach with regard to protecting existing and new stations from interference. The Commission requests comments on what system of allocation should be adopted including which of two sets of minimum spacings tables should be employed for LPFM. With regard to the separation tables, the

first set would derive its spacing distances from the addition of the average distance to the standard protected signal contour of a fully classed (maximum antenna height and power) station and the ten percent interference signal contour of a fully classed LPFM station. These two distances, added together, should not be greater than the distance between the station's transmitters. The set of minimum spacings would also consider the average reverse contours, therefore preventing the ten percent interference signal contour of the standard station from crossing over the LPFM station's average protected contour distance. The second set would allow the LPFM stations to be closer to other stations because the Commission would ignore the ten percent interference contour of the station having a relationship with the LPFM station, therefore allowing the LPFM station to receive interference.

Of the two separation distances provided in the proposed table, we believe the one which protects the LPFM station from interference is better. First, these separations, on the average, will maintain a greater distance between new LPFM facilities and existing stations, therefore insuring less interference to existing stations. Secondly, we believe that if LPFM stations are allowed to receive interference, that a good portion of the LPFM service would be worthless because the interference free coverage areas would be so reduced as to make the station's coverage impractical. LPFM stations will already be second class in terms of power and antenna heights. To add substantial interference to the coverage of these minimally powered stations courts disaster.

However, when forced to make a choice, we support the set of tables that results in greater separations. We do not support an allocation system based simply on minimum separations. The danger in using a minimum spacings table is that terrain is not considered. An LPFM station may have a site that provides it with a larger than average antenna height in one direction but a smaller than average height in another direction. In the direction of the larger antenna height, interference can be caused since the minimum spacings are blind to these

differences. Also, an LPFM station can cause significant interference within an existing station's protected signal contour. This can occur for many reasons, particularly in rolling or hilly terrain where a given listener may be shadowed from the existing station's coverage, but be in a direct line of sight in its relationship with the LPFM station. Our Longley-Rice studies in the San Francisco area confirm widespread interference within the FCC defined 60 dBu protected signal of an existing station from a co and 1st adjacent low power stations. In the example attached, based on the Commission's proposed minimum spacings table that is supposed to protect other stations from interference, we found a legitimate 1st adjacent LPFM 100 watt channel located outside the KALW standard FCC 60 dBu contour.[1] The study shows that, though the LPFM channel meets the proposed minimum spacing requirements, significant interference involving 16,866 people is caused to KALW. The same results were found in other markets when minimum separation distances were used and when the 2nd and 3rd adjacent protections were dropped.

A better choice than the terrain-blind minimum spacings method is the Longley-Rice or TIREM method using the USGS 03 arc-second terrain elevation database. Longley-Rice has already been implemented by the FCC for use with DTV and the Satellite Home Viewers Act. Under the DTV rules, any increase of interference to a given station by more than a certain percentage is not allowed.[2] The real advantage of this method is that it can spot areas of interference at various locations within a station's coverage area. While the FCC's method of overlapping contours can only identify likely interference where the contours overlap, Longley-Rice/TIREM can identify interference at other locations. The FCC's DTV model also integrates US population figures with interference locations, which is absent in the FCC's proposed LPFM method. We do not agree with Commission's reasoning that it does not have the resources to

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[1] 2nd and 3rd adjacent separations were dropped

[2] Under the DTV rules increasing the population-based interference to any given station beyond two percent is not allowed. Interference to a station already receiving ten percent interference is also not allowed.

implement such screening, nor with the rational that the LPFM applicant is not sophisticated enough to use such a model in advance of submission of an application. There are numerous commercial services that can provide Longley-Rice interference studies at reasonable costs including the Department of Commerce's Telecommunications Analysis Services at Bolder, Colorado. V-Soft Communications itself provides this service and as an alternative sells the software for the users to do it themselves. We feel the Commission has an obligation to the American public to insure quality reception by preventing interference and that the use of a Longley-Rice/TIREM method is the best method available.

LPFM, together with Streamlining the Rules is too much:

Under the1998 Biennial Regulatory Review - Streamlining of Radio Technical Rules in MM Docket No. 98-93, 98-1, the FCC has put forward a number of proposals which will raise the interference floor including allowing a station to "negotiate" interference by buying or selling interference rights. The Commission proposes to define all new construction permits as Section 73.215 proposals therefore allowing (even encouraging) further shortspacing. The Commission has proposed to allow all applicants to improve facilities by receiving second or third adjacent interference without negotiation as long as the, docket defined, negotiated interference criteria are met and no interference would be caused to the service contour of any other station. In the same docket, the Commission proposes to allow the use of the U/D method rather than contour overlap, which will result in defining a smaller interference area, even though the size of the actual interference area does not change. The Commission has proposed to reduce the minimum shortspacing distances defined under Section 73.215(e) by six kilometers. If this comes about, it will mean that many stations may be operating more highly directional (and, over a period of time, less stable) antennas. The Commission has proposed a C0 class of station which will reduce the spacing protection now given class C stations, therefore allowing

more new stations to go on the air or existing stations to move closer to a protected station. Finally, the FCC proposes a new point-to-point signal contour calculation method that is supposed to be more sophisticated in the way it considers the impact of terrain. In reality, however, the method, as proposed, produces anomalous results and is flawed. While, in a previous comment filing, we supported various Streamlining proposals, taken together, if the interference protections are relaxed as proposed in MM Docket 90-25 the deleterious effect of the addition of LPFM to this mix will be significant.

In-Band-On-Channel Digital Broadcasting Must Be Allowed to Establish:

Since the IBOC proponents propose a modulation system that results in a large amount of radio energy being placed at the edge a station's assigned bandwidth, interference from closely spaced LPFM stations to this signal is possible, particularly if the LPFM station were allowed to operate without 2nd and 3rd channel protections. Frankly, we are surprised at the Commission's desire to blithely proceed full-speed ahead at a time when a U.S. digital system is being designed and before anyone knows much about it. The Commission should, at least, wait until IBOC is up and running and tested before changing the environment in which it will operate. It is entirely possible that the Commission's decision today regarding LPFM will be a deciding factor on whether the U.S. will have a viable digital service in the future.

Keep 2nd and 3rd adjacent protections:

The removal of 2nd and 3rd adjacent protections will have a different interference impact depending on the location of the interfering station with reference to the protected station. Based on the Commission's U/D ratios, a 2nd or 3rd adjacent interfering station will cause a much larger area of interference when the interfering station is on or near the periphery of a given station's protected contour. This condition is exacerbated in hilly terrain. Under certain

circumstances, as our example indicates, it is possible for the interference area of an LPFM station, spaced without regard to 2nd or 3rd channel protections, to be several miles across and spotted throughout a given station's coverage. Continuation of the FCC's current 2nd and 3rd adjacent and I.F. relationship protections is well advised since the system, as currently construed, provides the greatest protection over a wide variety of conditions.

Considering there is the potential of up to twenty (or more) new LPFM stations in many markets, the chances of a mix of the LPFM output frequency and an existing standard FM station is highly probable resulting in serious interference from the products. Assuming that the standard spacing between channels in most markets becomes .4 MHz, the intermodulation products will easily fall on the adjacent assignments. Also, although minimum I.F. taboo spacings are listed in the proposed tables, the Commission is unclear as to whether it favors applying such minimum spacings between LPFM and standard FM stations and between LPFM and LPFM stations. We believe that the IF spacings, based on protection to the 36 mV/m contour, should be applied at all times between LPFM and LPFM and LPFM and standard class FM stations. Without such protections the LPFM service will cause serious uncorrectable interference.

We have been informed that recent receiver tests indicate a significant rise in the noise floor when stations are allowed to operate in the same area with less than .8 MHz spacing. This is more reason to keep the existing 2nd and 3rd adjacent protections. Further, over the years, to combat interference on the standard broadcast band, many receiver manufacturers designed receivers with narrower I.F. bandwidths. This lessened the interference but created receivers having tighter bandwidths and larger distortion figures. It is very likely that receiver manufacturers will react in the same way again if an LPFM service is introduced. We believe that if LPFM comes about the quality of the average FM radio in the U.S. will drop. Also, purposeful reduction of bandwidth of LPFM stations is not the answer to limiting interference. Such an activity will result in a sub-standard

service with regard to audio quality.

We urge the Commission to take a "go slow" approach to adopting the proposed LPFM service, to give IBOC time to establish and to protect the American public from interference. If, ultimately, an LPFM service is adopted, we urge the Commission to use the Longley-Rice method to prevent other stations from receiving interference. This method may not be the cheapest nor the least labor intensive for the Commission and the applicant, but we believe the integrity of the American FM radio service is in question if the Commission fails to select the best method available to it.

These comments were written on July 28th, 1999 by Doug Vernier, President, V-Soft Communications.

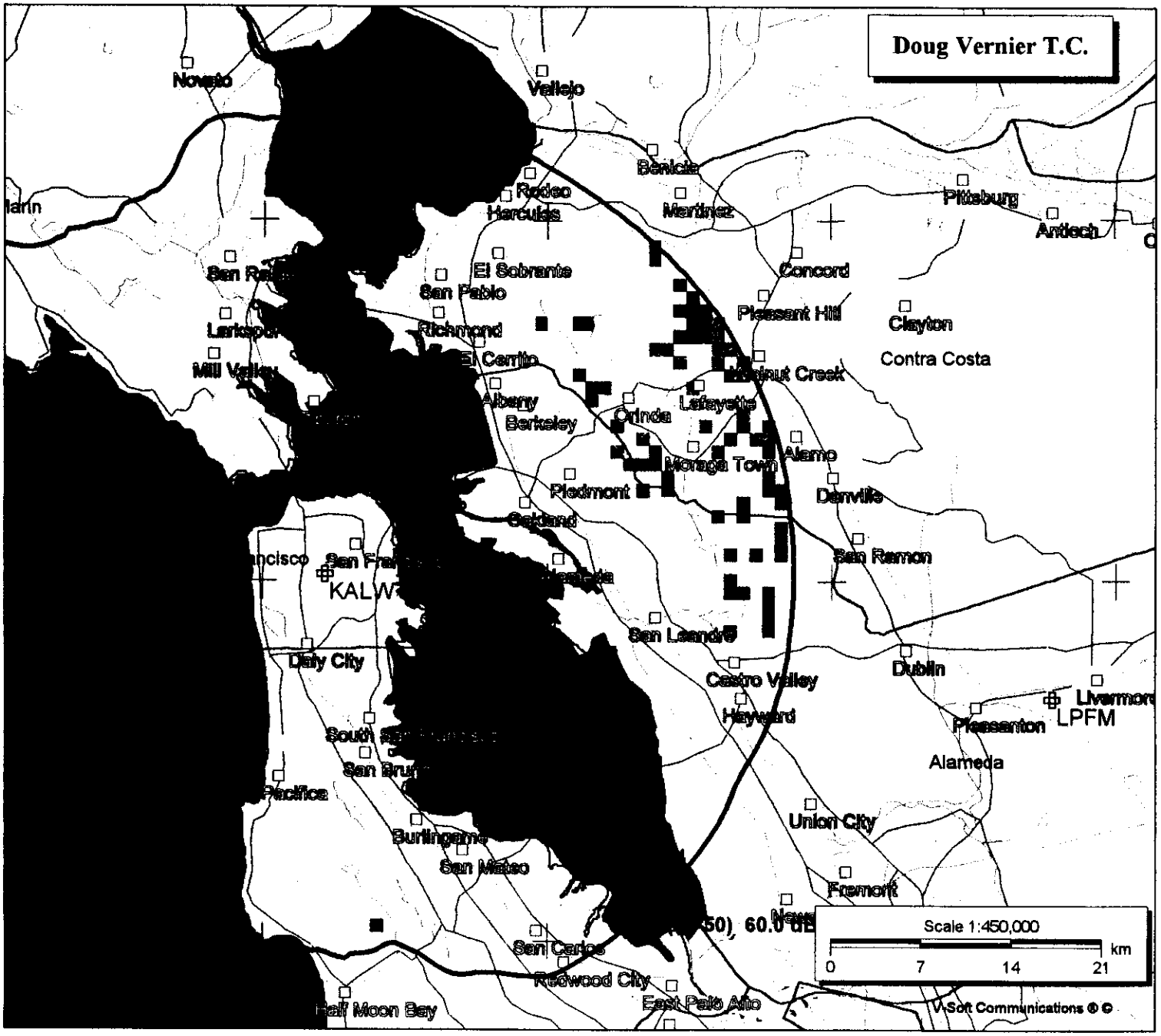
FM Interference Study
Interference within KALW 60.0 dBu contour shown as red blocks.

Signal Resolution: 1 km
EIRP was used for signal calculations.

Study Date: 7/27/99

KALW
Latitude: 37-45-17 N
Longitude: 122-26-44 W
Power: 1.90 kW
Frequency: 91.7 MHz
Channel: 219
AMSL Height: 310 m
Elevation: 223.25 m
Prop Model: Longley/Rice
Climate: Cont temperate
Conductivity: 0.0040
Dielec Const: 15.0
Refractivity: 310.0
Receiver Ht AG: 9.1 m
Time Variability: 50.0%
Sit. Variability: 50.0%
ITM Mode: Broadcast

LPFM
Latitude: 37-40-05 N
Longitude: 121-48-25 W
Power: 0.10 kW
Frequency: 91.9 MHz
Channel: 220
AMSL Height: 260 m
Elevation: 125.427 m



Doug Vernier Telecommunications Consultants
1600 Picturesque Dr. Cedar Falls IA 50613
LPFM 100 Watt channel
East of San Francisco

REFERENCE
37 40 05 N
121 48 25 W

CLASS = L2
Current Spacings

DISPLAY DATES
DATA 07-27-99
SEARCH 07-27-99

---------- Channel 220 - 91.9 MHz ----------

Call		Channel	Location		Dist	Azi	FCC	Margin
KFJO.A	AP	221A	Walnut Creek	CA	35.61	316.7	36.0	-0.39
KFJO	LI	221A	Walnut Creek	CA	36.07	315.7	36.0	0.07
KFJO.A	AP	221A	Walnut Creek	CA	36.62	342.2	36.0	0.62
KALW	LI	219B1	San Francisco	CA	57.13	279.9	54.0	3.13
KCSS	LI	220A	Turlock	CA	85.35	100.4	47.0	38.35
KLVR	LI	220B	Santa Rosa	CA	132.55	327.3	92.0	40.55
KXSR	LI	219B	Groveland	CA	144.16	71.7	77.0	67.16
KXSR.A	AP	219B	Groveland	CA	144.18	71.8	77.0	67.18
KSPB	LI	220A	Pebble Beach	CA	120.47	184.9	47.0	73.47