

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
WASHINGTON D.C.**

In the matter of	)	
	)	<b>MM Docket 99-25</b>
Creation of a Low Power Radio Service	)	RM-9208
	)	RM-9242
	)	

In this filing we submit the following:

- *An updated version of the Arizona Microradio Association's 99-25 LPFM Band-plan for Arizona.* In this revised version we demonstrate in more detail the availability of 87.5 through 87.9 (Channels 198 through 200) in areas well outside the Grade-B contours of full power and LPTV channel 6 stations. In this revised band-plan, we also demonstrate the wide availability of LPFM channels in rural areas and their compatibility with existing full power broadcast stations and translators. It will also reinforce our belief that we can equip almost every high school in the State with a 10 watt station.
- *Revised distance spacing charts.* These charts are revised to reflect some corrections in some of our numbers, mostly in IF protection. We also revise our comments to include boosters and Class-D secondary stations using the same "sub class" formulas that we propose for translators to determine interference protection.
- *Article on adjacent channel television testing.* We are submitting information on an article that appeared in TV TECHNOLOGY regarding television testing which is going on in Utah.

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**AMENDMENT**

*101. Inclusion of boosters and Class D secondary stations in our “translator sub-class” proposal.* In our previous comments at 44, REC Networks (“REC”) devised a simple method of determining the protected interference contours of translators by establishing three different “sub classes” and use a matrix based on the station’s power and antenna height. We are now asking that this scheme also be extended to other “Class D” stations such as boosters and secondary Class-D NCE-FM stations. This will assure that these stations are afforded the proper protection that they are entitled to.

*102. First adjacent channel LPTV testing in Utah.* REC requests the Commission to review an article that appeared in TV Technology, June 30, 1999 issue titled “Translators, LPTVs Find Stopgap Solution”. In the article written by Naina Narayana, there is testing going on in Utah where a full power NTSC station on Channel 35 operated from the same site as a LPTV station on Channel 36 with no reports of harmful interference. Some may say that comparing TV and FM is like apples and oranges but we feel that this article may have some merit in the LPFM proceedings since it shows some have taken the time to think out of the box and deviated away from a thirty-year-old interference theory to show that adjacent channeling in the TV service would work. This shows that receiver

technology has improved over time. The same types of improvements that went into TV technology is also going into FM receivers. Today's FM receivers are more sensitive and provide far superior stability, selectivity and unwanted signal rejection than the FM receivers from the past three decades. If the industry can prove that TV stations can operate on adjacent channels with no interference, we feel that LPFM can co-exist with full power FM stations on the *second* adjacent channel. We urge the Commission to think outside the box when it comes to second and third adjacent channel protections. The rules have been in effect since the early days of FM radios, before PLL technology and improved front-end technology. It's time to re-examine these archaic standards and update them by relaxing the second, third and IF restrictions. REC continues to support the removal of second & IF adjacent channel restrictions for 1-100 watt stations (A3, D1 & D2) as well as the removal of third adjacent channel restrictions for all classes of LPFM stations.

Respectfully Submitted,

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attachments

## APPENDIX AA. REVISED DISTANCE SEPERATION CHARTS FOR ALL LPFM CLASSES PROPOSED BY REC NETWORKS

### CLASS A1

Primary Service

This is similar to the FCC proposed "LP-1000" service.

Not available within 100km of the top-50 markets.

Not available within 100km of the second-50 markets.

Reported Internationally as Class A.

Will protect first adjacent, second adjacent channels and IF of full power stations.

Will protect first adjacent channels of LPFM stations.

1.0 kW ERP at 60m HAAT

Minimum: 0.3kW ERP with no minimum HAAT.

60dBu protected service contour. (14.2 km)

Interference Contours:

Other Station	Class B	Class B1	All Others
Co-Channel	71.9km (34 dBu)	60.5km (37 dBu)	50.8km (40 dBu)
First-Adjacent	29.9km (48 dBu)	25.1km (51 dBu)	21.1km (54 dBu)
Second-Adjacent	6.3 km (74 dBu)	5.3 km (77 dBu)	4.6 km (80 dBu)

Proposed Distance Separation Requirements:

	Co-Channel	First Adjacent	Second Adjacent	IF
A (6kw/100m)	101	58	33	7
A1 (1kw/60m)	65	35	...	...
A2 (0.25kW/40m)	59	30	...	...
A3 (0.1kW/30m)	56	28	...	...
B1 (25kW/100m)	128	74	50	9
B (50kW/150m)	152	95	71	13
C3 (25kW/100m)	128	74	44	9
C2 (50kW/150m)	152	92	57	13
C1 (100kW/299m)	186	119	77	20
C (100kW/600m)	212	151	96	28
D1 (0.1kW/30m)	56	28	...	...
D2 (1W/30m)	52	23	...	...
D – subclass "A"	39	25	...	...
D – subclass "B"	60	35	...	...
D – subclass "C"	76	44	...	...

No Class A1 station will be assigned on Channel 253 (98.5) if it proposes a transmitter location within 10km of a full power NTSC Channel 6 station. This applies to both TV Zones I and II.

Class A1 stations would have primary status over all translators. REC recommends that Class A1 stations should pick a channel that will allow the LPFM and the translator station to co-exist. If no channels are available using that method, the LPFM can displace the translator.

"Class D" stations include translators, boosters and Class-D Non Commercial Educational (Secondary) stations.

## CLASS A2

Primary Service

Not available within 100km of the top-50 markets.

Reported to Mexico as Class A.

Reported to Canada as Class A1.

Will protect first and second adjacent channels of full power stations.

Will protect first adjacent channels of LPFM stations.

0.25kW at 40m HAAT.

Minimum 0.15kW with no minimum HAAT.

60dBu protected service contour. (8.2 km)

Interference Contours:

Other Station	Class B	Class B1	All Others
Co-Channel	41.5km (34 dBu)	33.3km (37 dBu)	27.2km (40 dBu)
First-Adjacent	16.7km (48 dBu)	13.6km (51 dBu)	11.6km (54 dBu)
Second-Adjacent	3.6km (74 dBu)	3.0km (77 dBu)	2.6km (80 dBu)

Proposed Distance Separation Requirements:

Since no study was done on this 250-watt level in the NPRM, we will do a similar study here. The first amount is the distance separation required for the LPFM to not cause interference to the other protected station. The second amount is the distance separation required for the other station to not cause interference to the LPFM. The amount in **bold** is the actual distance proposed.

	Co-Channel	First Adjacent	Second Adjacent	IF
A (6kw/100m)	56/ <b>95</b>	40/ <b>51</b>	<b>31</b> /18	6
A1 (1kw/60m)	42/ <b>59</b>	26/ <b>30</b>	...	...
A2 (0.25kW/40m)	36	20	...	...
A3 (0.1kW/30m)	<b>33</b> /27	<b>17</b> /17	...	...
B1 (25kW/100m)	78/ <b>122</b>	58/ <b>69</b>	<b>48</b> /21	8
B (50kW/150m)	107/ <b>146</b>	77/ <b>87</b>	<b>69</b> /28	12
C3 (25kW/100m)	67/ <b>122</b>	51/ <b>69</b>	<b>42</b> /21	8
C2 (50kW/150m)	80/ <b>146</b>	64/ <b>85</b>	<b>55</b> /28	12
C1 (100kW/299m)	100/ <b>180</b>	84/ <b>114</b>	<b>75</b> /42	19
C (100kW/600m)	119/ <b>206</b>	103/ <b>145</b>	<b>94</b> /59	26
D1 (0.1kW/30m)	<b>33</b> /27	<b>17</b> /17	...	...
D2 (1W/30m)	<b>29</b> /14	<b>14</b> /11	...	...
D – subclass “A”	35	21	...	...
D – subclass “B”	56	31	...	...
D – subclass “C”	72	40	...	...

No Class A2 station will be assigned on Channel 253 (98.5) if it proposes a transmitter location within 7km of a full power NTSC Channel 6 station. This applies to both TV Zones I and II.

“Class D” stations include translators, boosters and Class-D Non Commercial Educational (Secondary) stations.

## CLASS A3

Primary Service

Available ONLY within 100km of the top-50 markets (where A1 & A2 are not available)

Reported to Canada as Class A1.

Reported to Mexico as Class D.

Will protect first adjacent channels on LPFM and full power stations.

0.1 kW at 30m HAAT.

Minimum 0.05kW with no minimum HAAT.

60dBu protected service contour. (5.2 km)

Interference Contours:

Other Station	Class B	Class B1	All Others
Co-Channel	26.9km (34 dBu)	22.4 km (37 dBu)	18.6 km (40 dBu)
First-Adjacent	11.4 km (48 dBu)	9.6 km (51 dBu)	8.0 km (54 dBu)

Proposed Distance Separation Requirements:

	Co-Channel	First Adjacent
A (6kw/100m)	92	49
A1 (1kw/60m)	32/56	23/28
A2 (0.25kW/40m)	33	17
A3 (0.1kW/30m)	24	14
B1 (25kw/100m)	119	66
B (50kW/150m)	143	84
C3 (25kW/100m)	119	66
C2 (50kw/150m)	143	84
C1 (100kW/299m)	178	111
C (100kW/600m)	203	142
D1 (0.1kW/30m)	24	14
D2 (1W/30m)	20	10
D – subclass “A”	30	16
D – subclass “B”	51	26
D – subclass “C”	67	35

## CLASS D1

Secondary Service

This is similar to the FCC proposed "LP-100" service.

Available ONLY outside 100km of the top-50 markets.

All other engineering parameters are the same as Class A3.

“Class D” stations include translators, boosters and Class-D Non Commercial Educational (Secondary) stations.

## CLASS D2

Secondary Service

This is similar to the FCC proposed "Micro Radio" class service.

Available in all areas.

Reported to Canada as Class A1.

Reported to Mexico as Class D.

Will protect first adjacent channels on LPFM and full power stations.

0.01 kW at 10m (approx. 40 feet) HAAT or 1 watt at 30m HAAT.

Minimum 1 watt with no minimum HAAT.

60dBu protected service contour. (1.8 km)

*In the NPRM, the Commission based it's study on 1 watt at 30m (90 feet). In reality, we do not project that most 10 watt stations will use an antenna height of 30m (we are going to figure that the average antenna height will be about 10 meters HAAT. Since the Commission and REC can not do calculations at 10m HAAT, we will agree with the Commission and use the 1w at 30m HAAT in our figures.*

Interference Contour:

Other Station	Class B	Class B1	All Others
Co-Channel	8.0 km (34 dBu)	6.7 km (37 dBu)	5.6 km (40 dBu)
First-Adjacent	3.5 km (48 dBu)	3.0 km (51 dBu)	2.5 km (54 dBu)

Proposed Distance Separation Requirements:

	Co-Channel	First Adjacent
A (6kw/100m)	89	46
A1 (1kw/60m)	20/52	17/23
A2 (0.25kW/40m)	14/29	11/14
A3 (0.1kW/30m)	11/20	8/10
B1 (25kw/100m)	115	62
B (50kW/150m)	140	80
C3 (25kW/100m)	115	62
C2 (50kW/150m)	140	80
C1 (100kW/299m)	174	107
C (100kW/600m)	200	138
D1 (0.1kW/30m)	11/20	8/10
D2 (1W/30m)	7	4
D – subclass "A"	26	12
D – subclass "B"	47	22
D – subclass "C"	63	31

Entries with two figures indicate the both the distance required for the D2 (LP-10) station to not interfere with the other station and the distance required for the other station to not interfere with the D2 (LP-10). The higher values will be the actual required distance separation.

"Class D" stations include translators, boosters and Class-D Non Commercial Educational (Secondary) stations.

In addition to the protections shown above, LPFM stations proposing to operate on Channels 198, 199 and 200 must also protect TV Channel 6 stations by using the following table:

	Channel 198 (87.5)	Channel 199 (87.7)	Channel 200 (87.9)
NTSC	138	200	138
DTV	300	300	300
LPTV	46	89	46

## APPENDIX AB. AzMA REVISED BANDPLAN FOR ARIZONA

See separate file in this electronic filing.