TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 7

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
6016.102												
6016.502							528A		6016.502			
6016.902				411A	1	6016.902						
6017.302							529A		6017.302			
6017.702	13		See Above									
6018.102							530A		6018.102			
6018.502				412A	1	6018.502						
6018.902							531A		6018.902			
6019.302												
6019.328												
	Existing "T" Plan 29.652 MHz			Prop. 9.884 MHz			Prop. 4.942 MHz					
6019.328												
6021.799							301A		6021.799			
6024.270				201A	1	6024.270						
6026.741							302A		6026.741			
6029.212												
6031.683							303A		6031.683			
6034.154	14		6034.154	202A	1	6034.154						
6036.625		1					304A		6036.625			
6039.096												
6041.567							305A		6041.567			
6044.038				203A	1	6044.038						
6046.509							306A		6046.509			
6048.980												
6051.451							307A	1	6051.451			
6053.922				204A		6053.922						
6056.393							308A	1	6056.393			
6058.864												
6061.335							309A	1	6061.335			
6063.806	15		6063.806	205A		6063.806						
6066.277		1					310A	1	6066.277			
6068.748												
6071.219							311A	1	6071.219			
6073.690				206A		6073.690						
6076.161							312A	1	6076.161			
6078.632												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 8

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz											
6078.632												
6093.458	16		6093.458									
6108.284												
6123.110	17		6123.110									
6137.936												
6152.762	18	1	6152.762	FUTURE TECHNOLOGIES PAIRED (29.652 MHz)								
6167.588												
	GUARD/AUX			FUTURE TECHNOLOGIES SUCH AS PCS PAIRED & UNPAIRED (14.824 MHz)								
6175.000												
	GUARD/AUX											
6182.412												
6197.238	21	1	6197.238	FUTURE TECHNOLOGIES PAIRED (29.652 MHz)								
6212.064												
6226.890	22		6226.890									
6241.716												
	Existing "T" Plan 29.652 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
6241.742												
6242.142							501B	1	6242.142			
6242.542				401B		6242.542						
6242.942							502B	1	6242.942			
6243.342												
6243.742							503B	1	6243.742			
6244.142				402B		6244.142						
6244.542							504B	1	6244.542			
6244.942												
6245.342							505B	1	6245.342			
	23		See Below									
6245.742				403B		6245.742						
6246.142							506B	1	6246.142			
6246.542												
6246.942							507B	1	6246.942			
6247.342				404B		6247.342						
6247.742							508B	1	6247.742			
6248.142												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 9

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
6248.142												
6248.542							509B	1	6248.542			
6248.942				405B		6248.942						
6249.342							510B	1	6249.342			
6249.742												
6250.142							511B	1	6250.142			
6250.542				406B		6250.542						
6250.942							512B	1	6250.942			
6251.342												
6251.542										601B		6251.542
6251.742							513B	1	6251.742			
6251.942										602B		6251.942
6252.142												
6252.342										603B		6252.342
6252.542							514B	1	6252.542			
6252.742										604B		6252.742
6252.942												
6253.142										605B		6253.142
6253.342							515B	1	6253.342			
6253.542										606B		6253.542
6253.742												
6253.942										607B		6253.942
6254.142							516B	1	6254.142			
6254.342										608B		6254.342
6254.542												
6254.742										609B		6254.742
6254.942							517B	1	6254.942			
6255.142										610B		6255.142
6255.342												
6255.542										611B		6255.542
6255.742							518B	1	6255.742			
6255.942										612B		6255.942
6256.142												
6256.342										613B		6256.342
6256.542							519B	1	6256.542			
6256.742										614B		6256.742
6256.542	23		6256.542									
6256.942		1										
6257.142										615B		6257.142
6257.342							520B	1	6257.342			
6257.542										616B		6257.542
6257.742												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 10

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
6257.742												
6257.942										617B		6257.942
6258.142							521B	1	6258.142			
6258.342										618B		6258.342
6258.542												
6258.742										619B		6258.742
6258.942							522B	1	6258.942			
6259.142										620B		6259.142
6259.342												
6259.542										621B		6259.542
6259.742							523B	1	6259.742			
6259.942										622B		6259.942
6260.142												
6260.342										623B		6260.342
6260.542							524B	1	6260.542			
6260.742										624B		6260.742
6260.942												
6261.142										625B		6261.142
6261.342							525B	1	6261.342			
6261.542										626B		6261.542
6261.742	23		See Above									
6261.942										627B	1	6261.942
6262.142												
6262.342										628B	1	6262.342
6262.542				407B		6262.542						
6262.742										629B	1	6262.742
6262.942												
6263.142										630B	1	6263.142
6263.342												
6263.542										631B	1	6263.542
6263.742												
6263.942										632B	1	6263.942
6264.142				408B		6264.142						
6264.342										633B	1	6264.342
6264.542												
6264.742										634B	1	6264.742
6264.942												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 11

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
6264.942												
6265.142										635B	1	6265.142
6265.342												
6265.542										636B	1	6265.542
6265.742				409B		6265.742						
6265.942										637B	1	6265.942
6266.142												
6266.342										638B	1	6266.342
6266.542												
6266.942							526B		6266.942			
6267.342	23		See Above	410B	1	6267.342						
6267.742							527B		6267.742			
6268.142												
6268.542							528B		6268.542			
6268.942				411B	1	6268.942						
6269.342							529B		6269.342			
6269.742												
6270.142							530B		6270.142			
6270.542				412B	1	6270.542						
6270.942							531B		6270.942			
6271.342												
6271.368												

	Existing "T" Plan 29.652 MHz			Prop. 9.884 MHz			Prop. 4.942 MHz		
6271.368									
6273.839							301B		6273.839
6276.310				201B	1	6276.310			
6278.781							302B		6278.781
6281.252									
6283.723							303B		6283.723
6286.194	24		6286.194	202B	1	6286.194			
6288.665		1					304B		6288.665
6291.136									
6293.607							305B		6293.607
6296.078				203B	1	6296.078			
6298.549							306B		6298.549
6301.020									

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 PROPOSED LOWER 6 GHz FREQUENCY PLAN - APPENDIX B - PAGE 12

REF FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)	CH NO.	NOTE	CENTER FREQ (MHz)
	Existing "T" Plan 29.652 MHz			Prop. 9.884 MHz			Prop. 4.942 MHz					
6301.020												
6303.491							307B	1	6303.491			
6305.962				204B		6305.962						
6308.433							308B	1	6308.433			
6310.904												
6313.375							309B	1	6313.375			
6315.846	25		6315.846	205B		6315.846						
6318.317		1					310B	1	6318.317			
6320.788												
6323.259							311B	1	6323.259			
6325.730				206B		6325.730						
6328.201							312B	1	6328.201			
6330.672												
6345.498	26		6345.498									
6360.324												
6375.150	27		6375.150									
6389.976												
6404.802	28	1	6404.802	FUTURE TECHNOLOGIES PAIRED (29.652 MHz)								
6419.628												
	GUARD/AUX			FUTURE TECHNOLOGIES SUCH AS PCS PAIRED (5.372 MHz)								
6425.000												

SUMMARY

	EXISTING 29.652 MHz	PROPOSED 9.884 MHz	4.942 MHz
TOT CHAN (Pr.)	8	6	12
1ST CHOICE	3	3	6
LAST CHOICE	5	3	6

	1.6 MHz	800 KHz	400 KHz
TOT CHAN (Pr.)	12	31	38
1ST CHOICE	9	6	26
LAST CHOICE	3	25	12

Note 1 - Alternate Channel - Use if all other channels are full.

1. 11 GHz FREQUENCY PLAN

1.1 COMMENTS ON THE NOTICE The Notice suggests a frequency plan for 10700 to 11700 MHz starting on page 40 of Appendix A. Although this plan would likely prove adequate if the band were free of incumbent users, it is seriously flawed for the current environment. The following summarizes these concerns:

1. The plan uses a transmit/receive separation that is different than the embedded systems. It proposes the use of a 500 MHz separation. The existing systems were planned on a 530 MHz separation. The introduction of this plan would result in spectrum inefficiencies due to the need to clear multiple channels to accommodate a small capacity need.

For example to clear the spectrum for a single 10 KHz application at 10775 MHz, it would be necessary to insure non-interference with channels 1P (10755 MHz), 10P (10795) and channel 10E (10775 MHz) of the existing frequency plan. The mate 10 MHz channel at 11275 MHz could interfere with existing channels 12J (11285 MHz) and 12d (11265 MHz), thus destroying spectrum efficiency.

2. The Notice plan does not include any 20 or 40 MHz channels. Since the embedded systems were built with these bandwidths, the plan makes all existing applications obsolete, and difficult to grow.

3. The Notice plan does not include any allocation for channels narrower than 10 MHz. The 10 GHz spectrum is an ideal spot for relocating shorter hops from 2 GHz. However, the plan excludes all but the 10 MHz users from consideration.

4. The plan proposed in the Notice does not reserve any spectrum for future technologies.

1.2 EXISTING 11 GHz FREQUENCY PLAN In nearly all[1] cases, the 11 GHz spectrum is populated with channels that were assigned using a frequency plan that evolved from the original applications of 11 GHz. The plan uses two sets of frequencies separated by 530 MHz for transmit and receive. The plan is arranged with the P and E channels in the lower half of the band which is used for one direction of transmission. The other direction uses J and D channels. For 40 MHz channels, only P or J channels are used. For 20 MHz operation P, E, J, and D channels are used. The following table describes this plan:

---

1. Seven two way paths nationwide are coordinated using the 16 channel plan which uses 30 MHz spacing between channels. These are the only known exceptions to the existing plan described above.

Existing 11 GHz FREQUENCY PLAN

40 MHz Channel Plan

TYPICAL GROWTH SEQUENCE

Growth Sequence	Frequency (MHz)		Frequency (MHz)	
1	11035	(12P)	11485	(11J)
2	10875	(6P)	11325	(5J)
3	10715	(4P)	11645	(3J)
4	10795	(10P)	11245	(9J)
5	11115	(8P)	11565	(7J)
6	10955	(2P)	11405	(1J)
7	10835	(11P)	11285	(12J)
8	11155	(5P)	11605	(6J)
9	10995	(3P)	11445	(4J)
10	11075	(9P)	11525	(10J)
11	10915	(7P)	11365	(8J)
12	10755	(1P)	11685	(2J)

20 MHz Channel Plan

TYPICAL GROWTH SEQUENCE

Growth Sequence	Frequency (MHz)		Frequency (MHz)	
1	11035	(12P)	11485	(11J)
2	10875	(6P)	11325	(5J)
3	10715	(4P)	11645	(3J)
4	10795	(10P)	11245	(9J)
5	11115	(8P)	11565	(7J)
6	10955	(2P)	11405	(1J)
7	11055	(12E)	11265	(12D)
8	10895	(6E)	11585	(6D)
9	10735	(4E)	11425	(4D)
10	10815	(10E)	11505	(10D)
11	11135	(8E)	11345	(8D)
12	10975	(2E)	11665	(2D)
13	10835	(11P)	11285	(12J)
14	11155	(5P)	11605	(6J)
15	10995	(3P)	11445	(4J)
16	11075	(9P)	11525	(10J)
17	10915	(7P)	11365	(8J)
18	10755	(1P)	11685	(2J)
19	10855	(11E)	11465	(11D)
20	11015	(3E)	11625	(3D)
21	11095	(9E)	11305	(5D)
22	10935	(7E)	11545	(7D)
23	10775	(1E)	11385	(1D)

One half of the channels are assigned to each polarity. The growth sequence is established to allow use of a single polarity initially. In many cases, the paths are coordinated on a single polarity, leaving the other polarity to another user. The 20 MHz plan is often divided into 4 groups of channels with 6 channels in each.

Although the original plan was intended for low stability single antenna FM systems, the plan was carried forward into digital radio systems. This was done to allow the orderly introduction of digital systems.

The 40 MHz plan is generally used for 135 Mb systems. The 20 MHz plan is used for 90 Mb systems. Some FM systems still exist.

1.3 PROPOSED 11 GHz FREQUENCY PLAN An alternative proposal for 11 GHz is shown in Tables 1 and 2 starting on page 5 of this appendix. In this plan compatibility is maintained with the existing 11 GHz frequency plans. For ease in understanding the plan, all frequency assignments are sequential starting on page 5 with 10700 MHz. Table 1 (pages 5-9) covers channel assignments for bandwidths equal or greater than 10 MHz. Table 2 (pages 10-18) expands the spectrum for channels less than 10 MHz in bandwidth. The following channel number scheme was used to designate the different bandwidths in the plan:

Proposed 11 GHz Channel Numbers

Channel Number Range	Bandwidth (MHz)
1-99 (P or J)	40.0 or 20.0
1-99 (D or E)	20.0
101-199	30.0
201-299	10.0
301-399	5.0
401-499	1.6
501-599	0.8
601-699	0.4

The proposed plan provides a better balance between the needs for narrow channels and wide channels. The following table compares the proposed plan channel capacity with the Notice plan:

Channel Number Range	Bandwidth (MHz)	AT&T Plan Channel Pairs	Notice Plan Channel Pairs
0-99	40.0	7 1st Choice[2] 5 Last Choice	None Planned
0-99	20.0	9.5 1st Choice[2] 14.5 Last Choice	None Planned
101-199	30.0	7 1st Choice[2] 5 Last Choice	16 Shared
201-299	10.0	20 1st Choice 15 Last Choice	50 Shared
301-399	5.0	4 1st Choice 8 Last Choice	None Planned
401-499	1.6	12 1st Choice 24 Last Choice	None Planned

Channel Number Range	Bandwidth (MHz)	AT&T Plan Channel Pairs	Notice Plan Channel Pairs
501-599	0.8	6 1st Choice 18 Last Choice	None Planned
601-699	0.4	15 1st Choice 41 Last Choice	None Planned

In the table above, "Shared" channels share the spectrum with other bandwidth applications; "1st Choice" channels only need to share with applications of the same bandwidth and the grandfathered incumbents; "Last Choice" channels are only assigned to that application upon a showing that all other channel options are not available.

The AT&T proposed plan provides more orderly migration to the new environment. Every potential user, new and old, has a location where bandwidth needs can be met without unnecessarily requiring the negotiated displacement of the incumbent user. If later the mix of channel bandwidths changes, it can easily be modified to allow more or less users of a given bandwidth.

The Commission should also consider the potential for 30 MHz for future 11 GHz technologies. This spectrum is in the middle of the band as shown on page 7 of this appendix. As can be seen from the Table, the 30 MHz is vacant in all of the more common plans. In the 16 channel - 30 MHz separation plan described in footnote 1 on page 1, the plan uses 5 MHz on each side of this spectrum leaving 20 MHz totally clear of any existing use. However, since only 7 two way paths presently are coordinated for the 16 channel plan, the entire 30 MHz could easily be cleared.

The following tables describe the proposed frequency plan in more detail:

---

2. Digital radio systems operating at either 90 Mb 16 QAM or 135 Mb 64 QAM modulation are assumed to compete for the same spectrum. In these systems, the actual occupied bandwidth is usually within 30 MHz bandwidth. However, since previously 30 MHz channels were not available, they generally were coordinated and licensed to operate within a 40 MHz channel.

Based on the new frequency plan which includes 30 MHz channels, it may be possible to re-coordinate and license these channels with an occupied bandwidth of 30 MHz, thus freeing unoccupied spectrum. Since the center frequency of both the 40 MHz and 30 MHz channels is coincident, this relicensing could be accommodated by a paper change, thus avoiding any need to change operating equipment.

TABLE 1 - PROPOSED 11 GHz FREQUENCY PLAN - APPENDIX C - PAGE 5

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Existing 40 MHz			Existing 20 MHz			Prop. 30 MHz			Prop. 10 MHz		
10700												
10705										201 A	1	10705
10710												
10715	4 P		10715	4 P		10715	101 A		10715	202 A	1	10715
10720												
10725										203 A	1	10725
10730												
10735				4 E	1	10735	VACANT			204 A		10735
10740												
10745										205 A		10745
10750												
10755	1 P	1	10755	1 P	1	10755	102 A	1	10755	206 A		10755
10760												
10765										207 A		10765
10770												
10775				1 E	1	10775	VACANT			208 A		10775
10780												
10785										209 A	1	10785
10790												
10795	10 P		10795	10 P		10795	103 A		10795	210 A	1	10795
10800												
10805										211 A	1	10805
10810												
10815				10 E	1	10815	VACANT			212 A		10815
10820												
10825										213 A		10825
10830												
10835	11 P	1	10835	11 P	1	10835	104 A	1	10835	214 A		10835
10840												
10845										215 A		10845
10850												
10855				11 E	1	10855	VACANT			216 A		10855
10860												
10865										217 A	1	10865
10870												
10875	6 P		10875	6 P		10875	105 A		10875	218 A	1	10875
10880												
10885										219 A	1	10885
10890												
10895				6 E	1	10895	VACANT			220 A		10895
10900												
10905										221 A		10905
10910												
10915	7 P	1	10915	7 P	1	10915	106 A	1	10915	222 A		10915
10920												
10925										223 A		10925
10930				7 E See Below						224 A See Below		
10935												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 - PROPOSED 11 GHz FREQUENCY PLAN - APPENDIX C - PAGE 6

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Existing 40 MHz			Existing 20 MHz			Prop. 30 MHz			Prop. 10 MHz		
10925							106 A See Above			223 A See Above		
10930	7 P See Above											
10935				7 E	1	10935	VACANT			224 A		10935
10940												
10945										225 A	1	10945
10950												
10955	2 P		10955	2 P		10955	107 A		10955	226 A	1	10955
10960												
10965										227 A	1	10965
10970												
10975				2 E	1	10975	VACANT			228 A		10975
10980												
10985										229 A		10985
10990												
10995	3 P	1	10995	3 P	1	10995	108 A	1	10995	230 A		10995
11000												
11005										231 A		11005
11010												
11015				3 E	1	11015	VACANT			232 A		11015
11020												
11025										233 A	1	11025
11030												
11035	12 P		11035	12 P		11035	109 A		11035	234 A	1	11035
11040												
11045										235 A	1	11045
11050												
11055				12 E	1	11055	VACANT					
11060												
11065												
11070												
11075	9 P	1	11075	9 P	1	11075	110 A	1	11075	NARROW CHANNELS SEE TABLE 2		
11080												
11085												
11090												
11095				9 E	1	11095	VACANT					
11100												
11105												
11110												
11115	8 P		11115	8 P		11115	111 A		11115			
11120												
11125												
11130												
11135				8 E		11135	VACANT					
11140	5 P See Below											
11145							112 A See Below					

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 - PROPOSED 11 GHz FREQUENCY PLAN - APPENDIX C - PAGE 7

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Existing 40 MHz			Existing 20 MHz			Prop. 30 MHz					
11135							VACANT					
11140				8 E See Above								
11145												
11150												
11155	5 P		11155	5 P		11155	112 A		11155			
11160												
11165												
11170												
11175				5 E		11175						
11180												
11185												
11190												
11195										FUTURE TECHNOLOGIES UNPAIRED (30 MHz)		
11200	VACANT			VACANT			VACANT					
11205												
11210												
11215												
11220												
11225				9 D		11225				Prop. 10 MHz		
11230												
11235										201 B	1	11235
11240												
11245	9 J		11245	9 J		11245	101 B		11245	202 B	1	11245
11250												
11255										203 B	1	11255
11260												
11265				12 D	1	11265	VACANT			204 B		11265
11270												
11275										205 B		11275
11280												
11285	12 J	1	11285	12 J	1	11285	102 B	1	11285	206 B		11285
11290												
11295										207 B		11295
11300												
11305				5 D		11305	VACANT			208 B		11305
11310												
11315										209 B	1	11315
11320												
11325	5 J		11325	5 J		11325	103 B		11325	210 B	1	11325
11330												
11335										211 B	1	11335
11340												
11345				8 D	1	11345	VACANT			212 B		11345
11350												
11355										213 B		11355
11360	8 J See Below			8 J See Below			104 B See Below					

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 - PROPOSED 11 GHz FREQUENCY PLAN - APPENDIX C - PAGE 8

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Existing 40 MHz			Existing 20 MHz			Prop. 30 MHz			Prop. 10 MHz		
11345							VACANT			212 B	See Above	
11350				8 D	See Above							
11355										213 B	See Above	
11360												
11365	8 J	1	11365	8 J	1	11365	104 B	1	11365	214 B		11365
11370												
11375										215 B		11375
11380												
11385				1 D	1	11385	VACANT			216 B		11385
11390												
11395										217 B	1	11395
11400												
11405	1 J		11405	1 J		11405	105 B		11405	218 B	1	11405
11410												
11415										219 B	1	11415
11420												
11425				4 D	1	11425	VACANT			220 B		11425
11430												
11435										221 B		11435
11440												
11445	4 J	1	11445	4 J	1	11445	106 B	1	11445	222 B		11445
11450												
11455										223 B		11455
11460												
11465				11 D	1	11465	VACANT			224 B		11465
11470												
11475										225 B	1	11475
11480												
11485	11 J		11485	11 J		11485	107 B		11485	226 B	1	11485
11490												
11495										227 B	1	11495
11500												
11505				10 D	1	11505	VACANT			228 B		11505
11510												
11515										229 B		11515
11520												
11525	10 J	1	11525	10 J	1	11525	108 B	1	11525	230 B		11525
11530												
11535										231 B		11535
11540												
11545				7 D	1	11545	VACANT			232 B		11545
11550												
11555										233 B	1	11555
11560												
11565	7 J		11565	7 J		11565	109 B		11565	234 B	1	11565
11570												
11575										235 B	1	11575
11580												
11585				6 D	See Below		VACANT					

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 1 - PROPOSED 11 GHz FREQUENCY PLAN - APPENDIX C - PAGE 9

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Existing 40 MHz			Existing 20 MHz			Prop. 30 MHz			Prop. Narrow Ch.		
11575												
11580												
11585				6 D	1	11585	VACANT					
11590												
11595												
11600												
11605	6 J	1	11605	6 J	1	11605	110 B	1	11605	NARROW CHANNELS SEE TABLE 2		
11610												
11615												
11620												
11625				3 D	1	11625	VACANT					
11630												
11635												
11640												
11645	3 J		11645	3 J		11645	111'B		11645			
11650												
11655												
11660												
11665				2 D		11665	VACANT					
11670												
11675												
11680												
11685	2 J		11685	2 J		11685	112 B		11685			
11690												
11695												
11700												

SUMMARY

	Existing 40 MHz	Existing 20 MHz	Proposed 30 MHz	Proposed 10 MHz
TOT CH (Prs.)	12	24	12	35
1st Choice	7	9.5	7	20
Last Choice	5	14.5	5	15

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 10

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
A CHANNELS												
11050.0												
11050.8				401A	1	11050.8						
11051.6												
11052.4				402A	1	11052.4						
11052.5	301A		11052.5									
11053.2												
11054.0				403A	1	11054.0						
11054.8												
11055.0										601A	1	11055.0
11055.2												
11056.0				404A	1	11056.0						
11056.8												
11057.5	302A		11057.5									
11057.6				405A	1	11057.6						
11058.4												
11059.2				406A	1	11059.2						
11060.0												
11060.8				407A		11060.8						
11061.6												
11062.4				408A		11062.4						
11062.5	303A	1	11062.5									
11063.2												
11064.0				409A		11064.0						
11064.8												
11065.0										602A		11065.0
11065.2												
11066.0				410A		11066.0						
11066.8												
11067.5	304A	1	11067.5									
11067.6				411A		11067.6						
11068.4												
11069.2				412A		11069.2						
11070.0												
11070.2										603A	1	11070.2
11070.4							501A		11070.4			
11070.6										604A	1	11070.6
11070.8												
11071.0										605A	1	11071.0
11071.2							502A		11071.2			
11071.4										606A	1	11071.4
11071.6												
11071.8										607A	1	11071.8
11072.0							503A		11072.0			
11072.2										608A	1	11072.2
11072.4												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 11

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11072.4												
11072.6										609A	1	11072.6
11072.8							504A		11072.8			
11073.0										610A	1	11073.0
11073.2												
11073.4										611A	1	11073.4
11073.6							505A		11073.6			
11073.8										612A	1	11073.8
11074.0												
11074.2										613A	1	11074.2
11074.4							506A		11074.4			
11074.6										614A	1	11074.6
11074.8												
11075.0										615A		11075.0
11075.2							507A	1	11075.2			
11075.4										616A		11075.4
11075.6												
11075.8										617A		11075.8
11076.0							508A	1	11076.0			
11076.2										618A		11076.2
11076.4												
11076.6										619A		11076.6
11076.8							509A	1	11076.8			
11077.0										620A		11077.0
11077.2												
11077.4										621A		11077.4
11077.6							510A	1	11077.6			
11077.8										622A		11077.8
11078.0												
11078.2										623A		11078.2
11078.4							511A	1	11078.4			
11078.6										624A		11078.6
11078.8												
11079.0										625A		11079.0
11079.2							512A	1	11079.2			
11079.4										626A		11079.4
11079.6												
11079.8										627A		11079.8
11080.0												
11080.8				413A	1	11080.8						
11081.6												
11082.4				414A	1	11082.4						
11082.5	305A		11082.5									
11083.2												
11084.0				415A	1	11084.0						
11084.8												
11085.0										628A	1	11085.0
11085.2				416A	See Below							

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 12

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11085.0										628A	See Above	
11085.2												
11086.0				416A	1	11086.0						
11086.8												
11087.5	306A		11087.5									
11087.6				417A	1	11087.6						
11088.4												
11089.2				418A	1	11089.2						
11090.0												
11090.8				419A		11090.8						
11091.6												
11092.4				420A		11092.4						
11092.5	307A	1	11092.5									
11093.2												
11094.0				421A		11094.0						
11094.8												
11095.0										629A		11095.0
11095.2												
11096.0				422A		11096.0						
11096.8												
11097.5	308A	1	11097.5									
11097.6				423A		11097.6						
11098.4												
11099.2				424A		11099.2						
11100.0												
11100.8				425A	1	11100.8						
11101.6												
11102.4				426A	1	11102.4						
11102.5	309A	1	11102.5									
11103.2												
11104.0				427A	1	11104.0						
11104.8												
11105.0										630A	1	11105.0
11105.2												
11106.0				428A	1	11106.0						
11106.8												
11107.5	310A	1	11107.5									
11107.6				429A	1	11107.6						
11108.4												
11109.2				430A	1	11109.2						
11110.0												
11110.8				431A	1	11110.8						
11111.6												
11112.4				432A	1	11112.4						
11112.5	311A	1	11112.5									
11113.2												
11114.0				433A	1	11114.0						
11114.8												
11115.0										631A	See Below	

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 13

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11114.8												
11115.0										631A	1	11115.0
11115.2												
11116.0				434A	1	11116.0						
11116.8												
11117.5	312A	1	11117.5									
11117.6				435A	1	11117.6						
11118.4												
11119.2				436A	1	11119.2						
11120.0												
11120.2										632A	1	11120.2
11120.4							513A	1	11120.4			
11120.6										633A	1	11120.6
11120.8												
11121.0										634A	1	11121.0
11121.2							514A	1	11121.2			
11121.4										635A	1	11121.4
11121.6												
11121.8										636A	1	11121.8
11122.0							515A	1	11122.0			
11122.2										637A	1	11122.2
11122.4												
11122.6										638A	1	11122.6
11122.8							516A	1	11122.8			
11123.0										639A	1	11123.0
11123.2												
11123.4										640A	1	11123.4
11123.6							517A	1	11123.6			
11123.8										641A	1	11123.8
11124.0												
11124.2										642A	1	11124.2
11124.4							518A	1	11124.4			
11124.6										643A	1	11124.6
11124.8												
11125.0										644A	1	11125.0
11125.2							519A	1	11125.2			
11125.4										645A	1	11125.4
11125.6												
11125.8										646A	1	11125.8
11126.0							520A	1	11126.0			
11126.2										647A	1	11126.2
11126.4												
11126.6										648A	1	11126.6
11126.8							521A	1	11126.8			
11127.0										649A	1	11127.0
11127.2												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 14

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11127.2												
11127.4										650A	1	11127.4
11127.6							522A	1	11127.6			
11127.8										651A	1	11127.8
11128.0												
11128.2										652A	1	11128.2
11128.4							523A	1	11128.4			
11128.6										653A	1	11128.6
11128.8												
11129.0										654A	1	11129.0
11129.2							524A	1	11129.2			
11129.4										655A	1	11129.4
11129.6												
11129.8										656A	1	11129.8
11130.0												
B CHANNELS												
11580.0												
11580.8				401B	1	11580.8						
11581.6												
11582.4				402B	1	11582.4						
11582.5	301B		11582.5									
11583.2												
11584.0				403B	1	11584.0						
11584.8												
11585.0										601B	1	11585.0
11585.2												
11586.0				404B	1	11586.0						
11586.8												
11587.5	302B		11587.5									
11587.6				405B	1	11587.6						
11588.4												
11589.2				406A	1	11589.2						
11590.0												
11590.8				407B		11590.8						
11591.6												
11592.4				408B		11592.4						
11592.5	303B	1	11592.5									
11593.2												
11594.0				409B		11594.0						
11594.8												
11595.0										602B		11595.0
11595.2												
11596.0				410B		11596.0						
11596.8												
11597.5	304B	1	11597.5									
11597.6				411B		11597.6						
11598.4												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 15

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11599.2				412B		11599.2						
11600.0												
11600.2										603B	1	11600.2
11600.4							501B		11600.4			
11600.6										604B	1	11600.6
11600.8												
11601.0										605B	1	11601.0
11601.2							502B		11601.2			
11601.4										606B	1	11601.4
11601.6												
11601.6												
11601.8										607B	1	11601.8
11602.0							503B		11602.0			
11602.2										608B	1	11602.2
11602.4												
11602.6										609B	1	11602.6
11602.8							504B		11602.8			
11603.0										610B	1	11603.0
11603.2												
11603.4										611B	1	11603.4
11603.6							505B		11603.6			
11603.8										612B	1	11603.8
11604.0												
11604.2										613B	1	11604.2
11604.4							506B		11604.4			
11604.6										614B	1	11604.6
11604.8												
11605.0										615B		11605.0
11605.2							507B	1	11605.2			
11605.4										616B		11605.4
11605.6												
11605.8										617B		11605.8
11606.0							508B	1	11606.0			
11606.2										618B		11606.2
11606.4												
11606.6										619B		11606.6
11606.8							509B	1	11606.8			
11607.0										620B		11607.0
11607.2												
11607.4										621B		11607.4
11607.6							510B	1	11607.6			
11607.8										622B		11607.8
11608.0												
11608.2										623B		11608.2
11608.4							511B	1	11608.4			
11608.6										624B		11608.6
11608.8												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 16

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11608.8												
11609.0										625B		11609.0
11609.2							512B	1	11609.2			
11609.4										626B		11609.4
11609.6												
11609.8										627B		11609.8
11610.0												
11610.8				413B	1	11610.8						
11611.6												
11612.4				414B	1	11612.4						
11612.5	305B		11612.5									
11613.2												
11614.0				415B	1	11614.0						
11614.8												
11615.0										628B	1	11615.0
11615.2												
11616.0				416B	1	11616.0						
11616.8												
11617.5	306B		11617.5									
11617.6				417B	1	11617.6						
11618.4												
11619.2				418B	1	11619.2						
11620.0												
11620.8				419B		11620.8						
11621.6												
11622.4				420B		11622.4						
11622.5	307B	1	11622.5									
11623.2												
11624.0				421B		11624.0						
11624.8												
11625.0										629B		11625.0
11625.2												
11626.0				422B		11626.0						
11626.8												
11627.5	308B	1	11627.5									
11627.6				423B		11627.6						
11628.4												
11629.2				424B		11629.2						
11630.0												
11630.8				425B	1	11630.8						
11631.6												
11632.4				426B	1	11632.4						
11632.5	309B	1	11632.5									
11633.2												
11634.0				427B	1	11634.0						
11634.8												
11635.0										630B	See Below	

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 17

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11634.8	309B	See Above										
11635.0										630B	1	11635.0
11635.2												
11636.0				428B	1	11636.0						
11636.8												
11637.5	310B	1	11637.5									
11637.6				429B	1	11637.6						
11638.4												
11639.2				430B	1	11639.2						
11640.0												
11640.8				431B	1	11640.8						
11641.6												
11642.4				432B	1	11642.4						
11642.5	311B	1	11642.5									
11643.2												
11644.0				433B	1	11644.0						
11644.8												
11645.0										631B	1	11645.0
11645.2												
11646.0				434B	1	11646.0						
11646.8												
11647.5	312B	1	11647.5									
11647.6				435B	1	11647.6						
11648.4												
11649.2				436B	1	11649.2						
11650.0												
11650.2										632B	1	11650.2
11650.4							513B	1	11650.4			
11650.6										633B	1	11650.6
11650.8												
11651.0										634B	1	11651.0
11651.2							514B	1	11651.2			
11651.4										635B	1	11651.4
11651.6												
11651.8										636B	1	11651.8
11652.0							515B	1	11652.0			
11652.2										637B	1	11652.2
11652.4												
11652.6										638B	1	11652.6
11652.8							516B	1	11652.8			
11653.0										639B	1	11653.0
11653.2												
11653.4										640B	1	11653.4
11653.6							517B	1	11653.6			
11653.8										641B	1	11653.8
11654.0												

Note 1 - Alternate Channel - Use if all other channels are full.

TABLE 2 - PROPOSED 11 GHz NARROW CHAN FREQ PLAN - APPENDIX C - PAGE 18

REF FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)	CHAN NO.	NOTE	CENTER FREQ (MHz)
	Prop. 5 MHz			Prop. 1.6 MHz			Prop. 800 KHz			Prop. 400 KHz		
11654.0												
11654.2										642B	1	11654.2
11654.4							518B	1	11654.4			
11654.6										643B	1	11654.6
11654.8												
11655.0										644B	1	11655.0
11655.2							519B	1	11655.2			
11655.4										645B	1	11655.4
11655.6												
11655.8										646B	1	11655.8
11656.0							520B	1	11656.0			
11656.2										647B	1	11656.2
11656.4												
11656.6										648B	1	11656.6
11656.8							521B	1	11656.8			
11657.0										649B	1	11657.0
11657.2												
11657.4										650B	1	11657.4
11657.6							522B	1	11657.6			
11657.8										651B	1	11657.8
11658.0												
11658.2										652B	1	11658.2
11658.4							523B	1	11658.4			
11658.6										653B	1	11658.6
11658.8												
11659.0										654B	1	11659.0
11659.2							524B	1	11659.2			
11659.4										655B	1	11659.4
11659.6												
11659.8										656B	1	11659.8
11660.0												

SUMMARY

	PROPOSED CHANNEL PAIRS 5 MHz	1.6 MHz	800 KHz	400 KHz
TOTAL CHANNELS	12	36	24	56
FIRST CHOICE	4	12	6	15
LAST CHOICE	8	24	18	41

Note 1 - Alternate Channel - Use if all other channels are full.

1. UPPER 6 GHz FREQUENCY PLAN

1.1 COMMENTS ON THE NOTICE The Notice suggests a frequency plan for 6525 to 6875 MHz. (Notice, p. 34, App. A). Although this plan would likely prove adequate if the band were free of incumbent users, it is seriously flawed for the current environment. The following summarizes these concerns:

1. The Notice plan arbitrarily reassigns all existing 1.6 MHz and 800 KHz users to slightly different frequencies. To accommodate the plan, the existing users would need to change their center frequency by a few KHz. The cost for new crystals, and RF filters would need to be borne by the party requesting the spectrum. This is an unnecessary expense.

2. The Notice plan assigns the 5 MHz channels to frequencies which are at the band edge of the 10 MHz channels. Although this is an optimal assignment for FM systems, it is wasteful of spectrum for digital systems. In FM systems, this assignment places each of the carriers between channels, thus avoiding the high interference level from the carrier. In digital, single sideband, or spread spectrum systems the spectrum density is essentially flat over the channel. Thus the interference advantage of offset channels is lost.

1.2 EXISTING FREQUENCY PLAN The existing frequency plan is shown in 47 CFR 94.65. This plan should be retained as one of the optional plans in the new environment. However, the use of the existing 5 MHz channels should be limited to embedded applications, and FM analog channels. The rest of the existing plan is compatible with the proposed plan shown below.

1.3 PROPOSED 6 GHz FREQUENCY PLAN Proposed additions to the existing plan are shown in Table 1 starting on page 3 of this appendix. These additions include 400 KHz channels and 5 MHz digital channels. In this plan compatibility is maintained with the existing frequency plan. For ease in understanding the plan, all frequency assignments are sequential starting on page 3 with 6525 MHz. The following channel number scheme was used to designate the different bandwidths in the plan:

Proposed Upper 6 GHZ Channel Numbers

Channel Number Range	Bandwidth (MHz)	
201-299	10.0	
301-349	5.0	Digital
351-399	5.0	FM
401-499	1.6	
501-599	0.8	
601-699	0.4	

AT&T's plan provides a better balance between the needs for narrow channels and wide channels. The following table compares the proposed plan channel capacity with the Notice plan: