4.2 FREQUENCY ALLOTMENTS

4.2.1 Allotment of 27575 and 27585 kHz for Short-Distance Low-Power Service

These allotments are to provide for intermittent miscellaneous U.S. Government short-distance low-power radio communications, radio signaling, and the control of remote objects or devices by means of radio (where the radiated power exceeds the limit established under Part 7.9).

The designated frequencies are allotted for use by U.S. Government agencies and may be authorized for use by agencies as required upon application. All stations operating on these frequencies shall meet the conditions and standards established for this service.

The designated frequencies are available on a shared basis only and will not be authorized for exclusive use of any one agency. No protection from interference can be assured to any station operating in this service. Services involving safety of life and property should not employ these frequencies in view of their unprotected status. All transmissions are to be restricted to official U.S. Government business that requires the use of radio.

Stations in this service shall utilize FCC type-accepted or type-approved Citizens Radio Band equipment or the equivalent. The maximum transmitter output power shall be five watts.

Stations shall be identified in accordance with the regulations of each agency.

The only class of station authorized is Mobile (including portable-type operation).

Frequencies 27575 and 27585 kHz with 6KA2A, 6KA2D and 6KA3E emission are designated for the U.S. Government short-distance low-power radio service.

All applications for the use of these frequencies must bear the note S159 which reads, "U.S. Government short-distance low-power service."

4.2.2 Allotments in the Band 1755-1850 MHz for Fixed Security Surveillance Systems

The frequencies 1760, 1780, and 1800 MHz are allotted for use in fixed security surveillance systems, on a secondary basis to other stations operating in accordance with the Federal Table of Frequency Allocations.

4.2.3 Allotments for Wide-Area, Common-Use Frequencies

1. Wide-Area, Common-Use frequencies are allotted for use by all Federal agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users.

a. The following paired frequencies are to be used for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that require the use of a repeater station. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies and on the repeater receive frequencies only if all other wide-area, common-use frequencies are in use, but only upon showing that none of the unpaired frequencies in subparagraph b., below, are available.

Frequencies (MHz)	
Repeater Transmit	**Repeater Receive**
163.100	168.350
409.050	418.050
409.3375	418.3375

The frequencies 409.05 and 409.3375 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies are to be used only for wide-area (e.g., county-wide, state-wide, USA or USP) operations of a transient nature that do not require the use of a repeater station, and shall be used in a simplex mode (use of a base station is allowed):

Frequencies (MHz)	
412.825	412.8375
412.850	412.8625

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended for, the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by Federal stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. the minimum ERP necessary to support the intended use shall be employed;

b. the maximum base or mobile station transmitter output power shall not exceed 30 watts;

c. the gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. the height of the base station (or repeater station) antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

e. all equipment shall conform to Part 5.3 of this Manual;

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be affixed with Record Note S355, “This assignment is for a wide-area, common-use frequency pursuant to Section 4.2.3 of the NTIA Manual.”

4.2.4 Allotments for Local-Area, Common-Use Frequencies

1. Local-Area, Common-Use frequencies are allotted for use by all Federal agencies and are to provide for radio communications that do not justify the assigning of a radio frequency exclusively to that use, i.e., the frequency can be shared with other users.

a. The following paired frequencies are to be used only for local area operations requiring the use of a repeater station at a fixed location. Unpaired, single frequency operations will be permitted on the repeater transmit frequencies, and on the repeater receive frequencies, only if all other local-area, common-use frequencies are in use, but only upon showing that none of the unpaired frequencies in subparagraph b., below, are available:

Frequencies (MHz)

Repeater Transmit	Repeater Receive
173.625	167.1375
407.525	416.525
409.075	418.075

The frequency 409.075 MHz shall not be used in the U.S./Canada Border Areas unless prior coordination has been effected with Canada under the provisions of paragraphs 3.9 and 3.10 of Section 3.4.7 of this Manual, or the output power is 5 watts or less and interference does not occur to Canadian operations.

b. The following frequencies shall be used only for local area operations that do not require the use of a repeater station, and shall be used only in a simplex mode (use of base stations is allowed):

Frequencies (MHz)

168.6125	163.7125
412.875	412.8875
412.9	412.9125

2. All operations shall be authorized in accordance with Chapter 9 of this Manual. The frequencies are available on a shared, non-priority basis only, and will not be authorized for, nor are they intended, for the exclusive use of any one agency. No protection from interference will be provided to any station operating on these frequencies from other stations operating on the same frequency. The use of equipment with coded squelch is strongly encouraged to reduce nuisance interference from other users.

3. These allotments are for use by Federal stations in the Land and Maritime Mobile Services (Table of Services, Station Classes, and Stations, Chapter 6, Section 6.1.4 of this Manual refers), and the following restrictions apply.

a. The minimum ERP necessary to support the intended use shall be employed;

b. the maximum base or mobile station transmitter output power shall not exceed 30 Watts;

c. the gain of the base station (or repeater station) antenna shall not exceed 6 dBi;

d. the height of the base station (or repeater station) antenna shall not exceed 6 meters above the height of the structure supporting the antenna;

e. all equipment shall conform to Part 5.3 of this Manual;

f. radius of operation for mobile stations is limited to 50 kilometers.

4. Applications for assignments on the frequencies listed in subparagraphs 1.a. and 1.b., above, shall be affixed with Record Note S356, “This assignment is for a local-area, common-use frequency pursuant to Section 4.2.4 of the NTIA Manual.”

4.3 FREQUENCY PLANS

4.3.1 CW Phase Comparison Radiolocation Plan

This plan provides for the use of frequencies for low power, medium and high frequency radiolocation systems employing harmonically related N0N emission phase comparison frequencies and associated 1KA2D emission data link frequencies. These systems normally operate to distances of approximately 400 kilometers offshore and to considerably lesser distances inland.

The following phase comparison frequencies with N0N emission are available for assignment in all areas. Frequency assignments for a band of frequencies shall not be made. Where equipment or other limitations make it impracticable to operate on these channels, applications for other suitable frequencies will be considered on a case-by-case basis.

1650.0-1655.0 kHz						**3300.4-3310.4 kHz**				
1650.0	1651.0	1652.0	1653.0	1654.0		3300.4	3302.4	3304.4	3306.4	3308.4
1650.1	1651.1	1652.1	1653.1	1654.1		3300.6	3302.6	3304.6	3306.6	3308.6
1650.2	1651.2	1652.2	1653.2	1654.2		3300.8	3302.8	3304.8	3306.8	3308.8
1650.3	1651.3	1652.3	1653.3	1654.3		3301.0	3303.0	3305.0	3307.0	3309.0
1650.4	1651.4	1652.4	1653.4	1654.4		3301.2	3303.2	3305.2	3307.2	3309.2
1650.5	1651.5	1652.5	1653.5	1654.5		3301.4	3303.4	3305.4	3307.4	3309.4
1650.6	1651.6	1652.6	1653.6	1654.6		3301.6	3303.6	3305.6	3307.6	3309.6
1650.7	1651.7	1652.7	1653.7	1654.7		3301.8	3303.8	3305.8	3307.8	3309.8
1650.8	1651.8	16528	1653.8	1654.8		3302.0	3304.0	3306.0	3308.0	3310.0
1650.9	1651.9	1652.9	1653.9	1654.9		3302.2	3304.2	3306.2	3308.2	3310.2
				1655.0						3310.4

The assignment of suitable frequencies for the associated data links with 1KA2D emission shall be considered on a case-by-case basis.

The mean antenna power shall be limited to 100 watts for both N0N and 1KA2D emissions. Only radiolocation land stations and radiolocation mobile stations shall be authorized.

The designated frequencies shall be authorized on a shared non-priority basis only and shall not be authorized for the exclusive use of any one agency. Any harmful interference that may develop between authorized radiolocation operations shall be resolved locally by coordination between the users involved.

Frequency assignments shall be for a temporary period not to exceed two years, and may be renewed.

4.3.2 Plan for Wireless Microphones in the Band 162-174 MHz

The following channels have been allotted for use by wireless microphone systems under the conditions listed in (a) through (e) below:

169.445 MHz	171.045 MHz
169.505 MHz	171.105 MHz
170.245 MHz	171.845 MHz
170.305 MHz	171.905 MHz

(a) The emission bandwidth shall not exceed 54 kHz.

(b) The output power shall not exceed 50 milliWatts.

(c) The frequency stability of wireless microphones shall limit the total emission to within 32.5 kHz of the assigned frequency.

(d) All wireless microphone use will be on an unprotected basis and further will be on a non-interference basis to authorized Federal and non-Federal users with the exception of other wireless microphone users.

(e) Assignment applications for wireless microphone use will be considered on a case-by-case basis by the Frequency Assignment Subcommittee (FAS); and, assignment applications do not need to be coordinated with the Hydrology Subcommittee.

4.3.3 Plan for Hydrologic and Meteorological Operations in the Bands 162-174 and 406.1-420 MHz

1. Hydrologic Channels. This plan identifies the center frequencies of channels used primarily for hydrologic operations.

MHz	MHz	MHz	MHz
169.425	170.2625	171.1000	406.1250
169.4375	170.2750	171.1125	406.1750
169.4500	170.2875	171.1250	412.6625
169.4625	170.3000	171.8250	412.675
169.4750	170.3125	171.8375	412.6875
169.4875	170.3250	171.8500	412.7125
169.5000	171.025	171.8625	412.7250
169.5125	171.0375	171.8750	412.7375
169.5250	171.0500	171.8875	412.7625
170.2250	171.0625	171.9000	412.775
170.2375	171.0750	171.9125	415.1250
170.2500	171.0875	171.9250	415.1750

a. Use by Federal Agencies.

Federal agencies may use the frequencies listed in the table above only for hydrologic operations, except as indicated in Section 8.3.6 of this Manual.

b. Use by Non-Federal Agencies. As provided in Allocation footnote US13, non-Federal fixed stations may use the frequencies listed in the table above for the specific purpose of transmitting hydrologic and meteorological data in cooperation with agencies of the Federal Government.

c. Coordination. Agencies must coordinate with the Hydrology Subcommittee of the Federal Interagency Advisory Committee on Water Data, as prescribed in Section 8.3.6 of this Manual, when applying for an assignment on one of the frequencies listed in the table above.

d. Narrowband Hydrologic Operations. All new hydrologic systems are required to operate with a necessary bandwidth of less than 12.5 kHz, and may use all the frequencies shown in the table above.

e. Wideband Hydrologic Operations.

Existing systems authorized in the 162-174 MHz band may continue using equipment operating with necessary bandwidths equal to, or greater than, 12.5 kHz, using the center frequencies listed in the table above that are spaced 25 kHz apart and in the columns beginning with 169.425, 170.2625, and 171.1000 MHz. New operations must have narrowband equipment operating with a necessary bandwidth of less than 12.5 kHz. All hydrologic systems in the 406.1-420 MHz band must comply with the center frequencies listed in the table above, and new operations must have equipment operating with necessary bandwidths of less than 12.5 kHz. New assignments on frequencies 406.1250 and 406.1750 MHz are to be primarily for paired operations with frequencies 415.1250 and 415.1750 MHz, respectively.

2. Meteorological and Quasi-Hydrologic Operations. The frequency 171.175 MHz is allotted for meteorological and quasi-hydrologic operations. Coordination with the Hydrology Subcommittee is not required.

4.3.4 Telemetering Plans

1. For the Band 1435-1535 MHz

a. Ninety-nine (99) one-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 1435.5 MHz, and will be authorized bandwidths of 1, 3, or 5 MHz. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band.

c. The frequencies 1444.5, 1453.5, 1501.5, 1515.5, 1524.5 and 1525.5 MHz will be shared with flight telemetering mobile stations (Station Classes MOEB, FLEB, MOD, FLD--see Chapter 6). Such uses will be limited to 1 MHz bandwidths except for frequencies 1524.5 and 1525.5 MHz where a bandwidth up to 2 MHz is permitted.

d. Included as permissible use of the 1435-1535 MHz band is telemetry associated with launching and reentry into the Earth's atmosphere, as well as any incidental orbiting prior to reentry, of manned or unmanned objects undergoing flight tests (Station Classes MOEA, FLEA, MOD, FLD apply).

e. Telecommand stations authorized operation in the 1435-1535 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

f. In the band 1435-1535 MHz, the channels designated for aeronautical telemetering are also available for space telemetering on a shared basis.

2. For the Band 2200-2300 MHz

a. In the band 2200-2290 MHz, 90 one-megahertz narrowband channels are designated, centered on 2200.5 MHz and each one-megahertz increment thereafter, through and including 2289.5 MHz. The use of emission bandwidths greater than 1 MHz is permitted, provided the assigned frequencies are centered on the center frequencies of narrowband channels. These channels are available for a) telemetering from space research space stations irrespective of their trajectories and b) aeronautical telemetering, including telemetry associated with launch vehicles, missiles, and upper atmosphere research rockets. Such use is on a coequal shared basis with fixed and mobile line-of-sight operations in the band conducted in accordance with the Federal Table of Frequency Allocations. No provision is made in this band for the flight testing of manned aircraft.

b. In the band 2290-2300 MHz, no specific channels have been established.

3. For the Band 2310-2390 MHz--The following applies to Mobile Telemetry and Associated Telecommand:

a. Seventy-three (73) one-megahertz channels are designated for use for telemetering and associated telecommand during the flight testing of manned or unmanned aircraft, missiles, or major components thereof (Station Classes MOEA, FLEA, MOD, FLD--see Chapter 6).

b. All assignments will be centered on frequencies at standard intervals of 1 MHz, beginning at 2310.5 MHz, and will normally be authorized bandwidths of 1, 3, or 5 MHz. Wider bandwidths may be authorized on a case-by-case basis to equipment capable of tuning the entire band. Assignments with bandwidths greater than 1 MHz will be centered so that they do not extend outside the allocated band. Telecommand assignments will be limited to 1 MHz bandwidths (see 3.d below)

c. The frequencies 2312.5, 2332.5, 2352.5, 2364.5, 2370.5, and 2382.5 MHz are also designated for use by both Federal and non-Federal stations on a co-equal basis for telemetering and associated telecommand operations of expendable and re-usable launch vehicles whether or not such operations involve flight testing. Such uses will be limited to 1 MHz bandwidths. (Station classes MOEA, MOEB, MOD, FLEA, FLEB, and FLD apply).

d. Telecommand stations, except as noted in 3c, above, authorized operation in the 2310-2390 MHz band will:

(1) Directly support flight test aeronautical telemetering functions;

(2) Be limited to 1 MHz bandwidth; and,

(3) Use antennas having a half power beamwidth of no more than 8 degrees and a front-to-back ratio of at least 20 dB.

4.3.5 VHF/UHF Plan for Aeronautical Radionavigation

TACAN-DME and VOR comprise the short-distance air navigational system in the common civil/military National Airspace System (NAS). TACAN is capable of providing range and azimuth information to aircraft. Normally range-only information is received by civil aircraft. DME provides range only and VOR provides azimuth only.

Frequencies at 1-MHz increments in the 960-1215 MHz band are used in airborne interrogating and ground transponder equipment as shown in the channel arrangement depicted below. This channel-pairing arrangement, which has been adopted by ICAO for facilities supporting operations in the international aeronautical service, also serves as a basis for all frequency planning and assignments for the NAS. TACAN and DME frequencies are designated on aeronautical charts by channel numbers 1-126. TACAN channels in the National Airspace System plan are paired with VOR or ILS localizer frequencies in the 108-118 MHz band and with glide slope frequencies in the 328.6-335.4 MHz band, as shown. This pairing arrangement facilitates the employment of a VOR in conjunction with a TACAN-DME beacon to form a VORTAC facility to provide simultaneous azimuth and range information to civil aircraft. Similarly TACAN-DME beacons may be paired with ILS facilities to provide both range and terminal guidance (azimuth and glide slope) information to properly equipped aircraft.

When a TACAN or DME transponder is intended to operate in association with a VHF navigational facility (VOR or ILS), the transponder is collocated with the VHF facility and frequency paired with it. If the system is to be used for terminal services such as for airport approach or landing, the facilities are considered to be collocated only if the transponder and VHF antennas are not more than 260 feet (80 meters) apart. For enroute procedures, collocation is considered to exist if the antenna separation does not exceed 2,000 feet (610 meters). Where the separation exceeds these figures, a VOR/ILS frequency from one pair and the TACAN-DME frequency from another pair must be assigned and suitable notations made on aeronautical charts to alert the user that he is not receiving azimuth and range information from the same point.

TACAN channels 17-59 and 70-126 are designated for use in the National Airspace System. Frequency assignments on these channels and for VOR and ILS operations are managed by the Aeronautical Assignment Group (AAG) of the FAS, under the provisions of Sections 1.3.2 and 9.14.1. Most of these TACAN channels are used by the FAA to provide air navigation services.

Channels 1-16 and 60-69 are designated for the military services for tactical uses and are not used in the NAS. The frequency subbands matching these channel designators are assigned to the military departments for use throughout the U. S. and Possessions. Assignments of specific frequencies to areas and locations are accomplished by individual military departments after appropriate coordination between departments. Land and shipborne beacons operating on these channels, as well as airborne beacons for air-to-air operations provide both azimuth and range information to military aircraft.

The FAA recognizes the need of the military services to use NAS frequencies for tactical purposes, including air-to-air operations, on a secondary basis. The military services recognize the need for frequency adjustments to provide protection for new or reclassified facilities of the NAS. Assignments and adjustments in support of these facilities shall be coordinated on a case-by-case basis through the AAG.

To minimize the possibility of harmful interference between the NAS and military operations, the FAA shall make every effort to avoid the use of TACAN Channels 17, 59, and 70 in areas of concentrated fleet activity. The military services shall coordinate in advance with the FAA relative to the use of TACAN Channels 16, 60, and 69 for land-based facilities.

Assignments of TACAN channels in the operational environment of ground radar facilities equipped with Selective Identification Features (SIF) of Secondary Surveillance Radars (SSR) must be considered carefully, in order to avoid interference. The ground SIF/SSR interrogator transmits on 1030 MHz (TACAN Channel 6 interrogator frequency) and the airborne SIF/SSR transponder transmits on 1090 MHz (TACAN Channel 66 interrogator frequency).

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
1X		1025	12	962	12		
1Y		1025	36	1088	30		
2X		1026	12	963	12		
2Y		1026	36	1089	30		
3X		1027	12	964	12		
3Y		1027	36	1090	30		
4X		1028	12	965	12		
4Y		1028	36	1091	30		
5X		1029	12	966	12		
5Y		1029	36	1092	30		
6X		1030	12	967	12		
6Y		1030	36	1093	30		
7X		1031	12	968	12		
7Y		1031	36	1094	30		
8X		1032	12	969	12		
8Y		1032	36	1095	30		
9X		1033	12	970	12		
9Y		1033	36	1096	30		
10X		1034	12	971	12		
10Y		1034	36	1097	30		
11X		1035	12	972	12		
11Y		1035	36	1098	30		
12X		1036	12	973	12		
12Y		1036	36	1099	30		
13X		1037	12	974	12		
13Y		1037	36	1100	30		
14X		1038	12	975	12		
14Y		1038	36	1101	30		
15X		1039	12	976	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
15Y		1039	36	1102	30		
16X		1040	12	977	12		
16Y		1040	36	1103	30		
17X	108.00	1041	12	978	12		
17Y	108.05	1041	36	1104	30		
18X		1042	12	979	12	108.10	334.70
18Y		1042	36	1105	30	108.15	334.55
19X	108.20	1043	12	980	12		
19Y	108.25	1043	36	1106	30		
20X		1044	12	981	12	108.3	334.1
20Y		1044	36	1107	30	108.35	333.95
21X	108.40	1045	12	982	12		
21Y	108.45	1045	36	1108	30		
22X		1046	12	983	12	108.5	329.9
22Y		1046	36	1109	30	108.55	329.75
23X	108.6	1047	12	984	12		
23Y	108.65	1047	36	1110	30		
24X		1048	12	985	12	108.70	330.50
24Y		1048	36	1111	30	108.75	330.35
25X	108.80	1049	12	986	12		
25Y	108.85	1049	36	1112	30		
26X		1050	12	987	12	108.90	329.30
26Y		1050	36	1113	30	108.95	329.15
27X	109.00	1051	12	988	12		
27Y	109.05	1051	36	1114	30		
28X		1052	12	989	12	109.10	331.40
28Y		1052	36	1115	30	109.15	331.25
29X	109.20	1053	12	990	12		
29Y	109.25	1053	36	1116	30		
30X		1054	12	991	12	109.30	332.00
30Y		1054	36	1117	30	109.35	331.85
31X	109.40	1055	12	992	12		
31Y	109.45	1055	36	1118	30		
32X		1056	12	993	12	109.50	332.60
32Y		1056	36	1119	30	109.55	332.45
33X	109.60	1057	12	994	12		
33Y	109.65	1057	36	1120	30		
34X		1058	12	995	12	109.70	333.20
34Y		1058	36	1121	30	109.75	333.05
35X	109.80	1059	12	996	12		
35Y	109.85	1059	36	1122	30		
36X		1060	12	997	12	109.90	333.80

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
36Y		1060	36	1123	30	109.95	333.65
37X	110.00	1061	12	998	12		
37Y	110.05	1061	36	1124	30		
38X		1062	12	999	12	110.10	334.40
38Y		1062	36	1125	30	110.15	334.25
39X	110.20	1063	12	1000	12		
39Y	110.25	1063	36	1126	30		
40X		1064	12	1001	12	110.3	335
40Y		1064	36	1127	30	110.35	334.85
41X	110.40	1065	12	1002	12		
41Y	110.45	1065	36	1128	30		
42X		1066	12	1003	12	110.50	329.60
42Y		1066	36	1129	30	110.55	329.45
43X	110.60	1067	12	1004	12		
43Y	110.65	1067	36	1130	30		
44X		1068	12	1005	12	110.70	330.20
44Y		1068	36	1131	30	110.75	330.05
45X	110.80	1069	12	1006	12		
45Y	110.85	1069	36	1132	30		
46X		1070	12	1007	12	110.90	330.80
46Y		1070	36	1133	30	110.95	330.65
47X	111.00	1071	12	1008	12		
47Y	111.05	1071	36	1134	30		
48X		1072	12	1009	12	111.10	331.70
48Y		1072	36	1135	30	111.15	331.55
49X	111.20	1073	12	1010	12		
49Y	111.25	1073	36	1136	30		
50X		1074	12	1011	12	111.30	332.30
50Y		1074	36	1137	30	111.35	332.15
51X	111.40	1075	12	1012	12		
51Y	111.45	1075	36	1138	30		
52X		1076	12	1013	12	111.50	332.90
52Y		1076	36	1139	30	111.55	332.75
53X	111.60	1077	12	1014	12		
53Y	111.65	1077	36	1140	30		
54X		1078	12	1015	12	111.70	333.50
54Y		1078	36	1141	30	111.75	333.35
55X	111.80	1079	12	1016	12		
55Y	111.85	1079	36	1142	30		
56X		1080	12	1017	12	111.90	331.10
56Y		1080	36	1143	30	111.95	330.95
57X	112.00	1081	12	1018	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
57Y	112.05	1081	36	1144	30		
58X	112.10	1082	12	1019	12		
58Y	112.15	1082	36	1145	30		
59X	112.20	1083	12	1020	12		
59Y	112.25	1083	36	1146	30		
60X		1084	12	1021	12		
60Y		1084	36	1147	30		
61X		1085	12	1022	12		
61Y		1085	36	1148	30		
62X		1086	12	1023	12		
62Y		1086	36	1149	30		
63X		1087	12	1024	12		
63Y		1087	36	1150	30		
64X		1088	12	1151	12		
64Y		1088	36	1025	30		
65X		1089	12	1152	12		
65Y		1089	36	1026	30		
66X		1090	12	1153	12		
66Y		1090	36	1027	30		
67X		1091	12	1154	12		
67Y		1091	36	1028	30		
68X		1092	12	1155	12		
68Y		1092	36	1029	30		
69X		1093	12	1156	12		
69Y		1093	36	1030	30		
70X	112.30	1094	12	1157	12		
70Y	112.35	1094	36	1031	30		
71X	112.40	1095	12	1158	12		
71Y	112.45	1095	36	1032	30		
72X	112.50	1096	12	1159	12		
72Y	112.55	1096	36	1033	30		
73X	112.60	1097	12	1160	12		
73Y	112.65	1097	36	1034	30		
74X	112.70	1098	12	1161	12		
74Y	112.75	1098	36	1035	30		
75X	112.80	1099	12	1162	12		
75Y	112.85	1099	36	1036	30		
76X	112.90	1100	12	1163	12		
76Y	112.95	1100	36	1037	30		
77X	113.00	1101	12	1164	12		
77Y	113.05	1101	36	1038	30		
78X	113.10	1102	12	1165	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
78Y	113.15	1102	36	1039	30		
79X	113.20	1103	12	1166	12		
79Y	113.25	1103	36	1040	30		
80X	113.30	1104	12	1167	12		
80Y	113.35	1104	36	1041	30		
81X	113.40	1105	12	1168	12		
81Y	113.45	1105	36	1042	30		
82X	113.50	1106	12	1169	12		
82Y	113.55	1106	36	1043	30		
83X	113.60	1107	12	1170	12		
83Y	113.65	1107	36	1044	30		
84X	113.70	1108	12	1171	12		
84Y	113.75	1108	36	1045	30		
85X	113.80	1109	12	1172	12		
85Y	113.85	1109	36	1046	30		
86X	113.90	1110	12	1173	12		
86Y	113.95	1110	36	1047	30		
87X	114.00	1111	12	1174	12		
87Y	114.05	1111	36	1048	30		
88X	114.10	1112	12	1175	12		
88Y	114.15	1112	36	1049	30		
89X	114.20	1113	12	1176	12		
89Y	114.25	1113	36	1050	30		
90X	114.30	1114	12	1177	12		
90Y	114.35	1114	36	1051	30		
91X	114.40	1115	12	1178	12		
91Y	114.45	1115	36	1052	30		
92X	114.50	1116	12	1179	12		
92Y	114.55	1116	36	1053	30		
93X	114.60	1117	12	1180	12		
93Y	114.65	1117	36	1054	30		
94X	114.70	1118	12	1181	12		
94Y	114.75	1118	36	1055	30		
95X	114.80	1119	12	1182	12		
95Y	114.85	1119	36	1056	30		
96X	114.90	1120	12	1183	12		
96Y	114.95	1120	36	1057	30		
97X	115.00	1121	12	1184	12		
97Y	115.05	1121	36	1058	30		
98X	115.10	1122	12	1185	12		
98Y	115.15	1122	36	1059	30		
99X	115.20	1123	12	1186	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
99Y	115.25	1123	36	1060	30		
100X	115.30	1124	12	1187	12		
100Y	115.35	1124	36	1061	30		
101X	115.40	1125	12	1188	12		
101Y	115.45	1125	36	1062	30		
102X	115.50	1126	12	1189	12		
102Y	115.55	1126	36	1063	30		
103X	115.60	1127	12	1190	12		
103Y	115.65	1127	36	1064	30		
104X	115.70	1128	12	1191	12		
104Y	115.75	1128	36	1065	30		
105X	115.80	1129	12	1192	12		
105Y	115.85	1129	36	1066	30		
106X	115.90	1130	12	1193	12		
106Y	115.95	1130	36	1067	30		
107X	116.00	1131	12	1194	12		
107Y	116.05	1131	36	1068	30		
108X	116.1	1132	12	1195	12		
108Y	116.15	1132	36	1069	30		
109X	116.20	1133	12	1196	12		
109Y	116.25	1133	36	1070	30		
110X	116.30	1134	12	1197	12		
110Y	116.35	1134	36	1071	30		
111X	116.40	1135	12	1198	12		
111Y	116.45	1135	36	1072	30		
112X	116.5	1136	12	1199	12		
112Y	116.55	1136	36	1073	30		
113X	116.6	1137	12	1200	12		
113Y	116.65	1137	36	1074	30		
114X	116.70	1138	12	1201	12		
114Y	116.75	1138	36	1075	30		
115X	116.80	1139	12	1202	12		
115Y	116.85	1139	36	1076	30		
116X	116.90	1140	12	1203	12		
116Y	116.95	1140	36	1077	30		
117X	117.00	1141	12	1204	12		
117Y	117.05	1141	36	1078	30		
118X	117.10	1142	12	1205	12		
118Y	117.15	1142	36	1079	30		
119X	117.20	1143	12	1206	12		
119Y	117.25	1143	36	1080	30		
120X	117.30	1144	12	1207	12		

Channel	VOR MHz	DME/TACAN				ILS	
		Airborne		Ground			
		Int. Freq. MHz	Pulse Code usec	Reply Freq. MHz	Pulse Code usec	Localizer MHz	Glide Slope MHz
120Y	117.35	1144	36	1081	30		
121X	117.40	1145	12	1208	12		
121Y	117.45	1145	36	1082	30		
122X	117.50	1146	12	1209	12		
122Y	117.55	1146	36	1083	30		
123X	117.60	1147	12	1210	12		
123Y	117.65	1147	36	1084	30		
124X	117.70	1148	12	1211	12		
124Y	117.75	1148	36	1085	30		
125X	117.80	1149	12	1212	12		
125Y	117.85	1149	36	1086	30		
126X	117.90	1150	12	1213	12		
126Y	117.95	1150	36	1087	30		

4.3.6 Channeling Plan for Assignments in the Band 29.89-50 MHz

This plan is a guide for identifying the center frequencies normally used for assignments with necessary bandwidths equal to or less than 16 kHz.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Assignments with necessary bandwidths equal to or less than 16 kHz (narrowband assignments) may be authorized on the center frequencies shown in this plan and on qualified interstitial channels. A “qualified interstitial channel” is one which:

a. Has a center frequency which falls exactly halfway between two adjacent center frequencies shown in this plan,

b. does not overlap an all-government-agencies (AGA) channel,

c. will result in more efficient use of the spectrum, and

d. has been properly coordinated with all affected agencies.

2. Wideband Operations. Assignments with necessary bandwidths greater than 16 kHz (wideband assignments) may also be authorized in this band, provided such assignments:

a. do not exceed 40 kHz of necessary bandwidth,

b. do not overlap an all-government-agencies (AGA) channel,

c. are positioned between the center frequencies shown in this plan when this will result in more efficient use of the spectrum,

d. have been properly coordinated with all affected agencies, and

e. are needed to satisfy requirements which cannot be accommodated with narrowband state-of-the-art equipment, or

f. are in direct support of military tactical and training operations which conform to the conditions and limitations of Section 7.15.4.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

29.9								
30.01	32.01	34.01	36.01		40.01	41.01		
30.03	32.03	34.03	36.03		40.03	41.03		
30.05	32.05	34.05	36.05		40.05	41.05		
30.07	32.07	34.07	36.07		40.07	41.07		
30.09	32.09	34.09	36.09		40.09	41.09		
30.11	32.11	34.11	36.11		40.11	41.11		
30.13	32.13	34.13	36.13		40.13	41.13		
30.15	32.15	34.15	36.15		40.15	41.15		
30.17	32.17	34.17	36.17		40.17	41.17		
30.19	32.19	34.19	36.19		40.19	41.19		
30.21	32.21	34.21	36.21		40.21	41.21		
30.23	32.23	34.23	36.23		40.23	41.23		
30.25	32.25	34.25	36.25		40.25	41.25		
30.27	32.27	34.27	36.27	38.27	40.27	41.27		
30.29	32.29	34.29	36.29	38.29	40.29	41.29		
30.31	32.31	34.31	36.31	38.31	40.31	41.31		
30.33	32.33	34.33	36.33	38.33	40.33	41.33		
30.35	32.35	34.35	36.35	38.35	40.35	41.35		
30.37	32.37	34.37	36.37	38.37	40.37	41.37		
30.39	32.39	34.39	36.39	38.39	40.39	41.39		
30.41	32.41	34.41	36.41	38.41	40.41	41.41		
30.43	32.43	34.43	36.43	38.43	40.43	41.43		
30.45	32.45	34.45	36.45	38.45	40.45	41.45		
30.47	32.47	34.47	36.47	38.47	40.47	41.47		
30.49	32.49	34.49	36.49	38.49	40.49	41.49		
30.51	32.51	34.51	36.51	38.51	40.51	41.51		
30.53	32.53	34.53	36.53	38.53	40.53	41.53		
30.55	32.55	34.55	36.55	38.55	40.55	41.55		
	32.57	34.57	36.57	38.57	40.57	41.57		
	32.59	34.59	36.59	38.59	40.59	41.59		
	32.61	34.61	36.61	38.61	40.61	41.61	46.61	49.61
	32.63	34.63	36.63	38.63	40.63	41.63	46.63	49.63
	32.65	34.65	36.65	38.65	40.65	41.65	46.65	49.65
	32.67	34.67	36.67	38.67	40.67	41.67	46.67	49.67
	32.69	34.69	36.69	38.69	40.69	41.69	46.69	49.69
	32.71	34.71	36.71	38.71	40.71	41.71	46.71	49.71
	32.73	34.73	36.73	38.73	40.73	41.73	46.73	49.73
	32.75	34.75	36.75	38.75	40.75	41.75	46.75	49.75
	32.77	34.77	36.77	38.77	40.77	41.77	46.77	49.77
	32.79	34.79	36.79	38.79	40.79	41.79	46.79	49.79
	32.81	34.81	36.81	38.81	40.81	41.81	46.81	49.81
	32.83	34.83	36.83	38.83	40.83	41.83	46.83	49.83
	32.85	34.85	36.85	38.85	40.85	41.85	46.85	49.85
	32.87	34.87	36.87	38.87	40.87	41.87	46.87	49.87
	32.89	34.89	36.89	38.89	40.89	41.89	46.89	49.89
	32.91	34.91	36.91	38.91	40.91	41.91	46.91	49.91
	32.93	34.93	36.93	38.93	40.93	41.93	46.93	49.93

32.95	34.95	36.95	38.95	40.95	41.95	46.95	49.95
32.97	34.97	36.97	38.97	40.97	41.97	46.97	49.97
32.99	34.99	36.99	38.99	40.99	41.99	46.99	49.99

4.3.7 Channeling Plan for Assignments in the Band 162-174 MHz (12.5 kHz Plan)

The channeling plan for the band 162-174 MHz is a guide for identifying the center frequencies used for assignments with necessary bandwidths less than 12.5 kHz. The channeling plan is composed of 942 channels beginning with the center frequency 162.0125 MHz with intervals of 12.5 kHz, excluding frequencies contained within the sub-band 173.2-173.4 MHz.

CONDITIONS AND LIMITATIONS

1. Narrowband Operations. Narrowband assignments (with a necessary bandwidth of less than 12.5 kHz) may be authorized on the center frequencies identified in this plan.

2. Wideband Operations. Wideband assignments (with necessary bandwidths equal to or greater than 12.5 kHz) for new systems are not authorized. Renewals for wideband assignments may be granted with the understanding that operations are subject to the provisions set forth in paragraph 2a below and Section 5.3.5 of this Manual. As an exception, NOAA Weather Radio operations on channels in the frequency range 162.3625-162.5875 MHz may continue to operate with necessary bandwidths equal to 16 kHz. The Automatic Identification System (AIS) (162.025 MHz) will also continue to operate with a 25 kHz bandwidth pursuant to the International Telecommunication Union (ITU) and International Maritime Organization (IMO).

a. Wideband operations may continue after December 31, 2006 with the understanding that an agency with wideband operations ultimately bears responsibility to mitigate harmful interference (e.g. change to narrowband operations, alter technical operating characteristics, change frequency, or assist the narrowband user to find another frequency) within 180[4] days of notification of an adjacent narrowband use requirement. Agencies requiring use of frequencies for narrowband operations, where wideband operations overlap the proposed narrowband operations shall submit a frequency proposal as formal notice through the FAS assignment process after concluding that they do not have other available options. Prior to formal notification the agency requesting narrowband operations shall inform the agency(ies) with wideband operations of the intended use of the adjacent narrowband frequency (Section 8.2.2). If at any time prior to or within 60 days of formal notification, either agency concludes that they cannot identify between them a resolution, the agency with wideband operations shall submit documentation to the FAS substantiating the requirement for continued wideband operations and describing the options considered in their discussions with the narrowband user. Agencies with wideband operations who do not submit substantiating documentation to the FAS shall be considered in concurrence with the proposed narrowband operation. The FAS will evaluate the documentation and identify any options not previously considered or possibly not available to the two agencies involved. If the subcommittee cannot identify a solution that can be agreed by the two parties, the issue will be referred in accordance with Section 8.1.1 paragraph 4. In cases where no solution can be found, the wideband operations may continue on a non-interference basis.

3. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum; e.g. use of fewer frequencies, sharing of frequencies, reduction or elimination of interference, etc.

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[4] For the purpose of this paragraph 180 days begins when the frequency proposal for the specific narrowband frequency first appears on an NTIA FAS Agenda.

4. Time Division Multiple Access (TDMA) Operations. TDMA systems, with at least 1 voice channel per 12.5 kHz, will be allowed and can be accommodated on adjacent 12.5 kHz channels listed in this channeling plan. The center frequency of the TDMA channel must be offset midway between the existing narrowband channels to avoid adjacent channel interference problems with existing or planned narrowband systems. Refer to Part 5.3.5 for technical standards.

5. Paired Frequency Operations. The channeling plan identifies 280 pairs of frequencies that are intended to be used for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5 kHz. The paired-use portion includes 359 channels, however 79 of these channels cannot be used for paired use due to existing limitations on the use of one of the frequencies that comprise these pairs (i.e., the 19 frequencies allotted for the NOAA weather radios, the 17 frequencies contained within the non-Federal sub-band 173.2-173.4 MHz, and 43 frequencies designated for other specified use by US footnote).

a. For paired frequency operations, the frequencies in the range 162.0500-166.4875 MHz will be used for land station receive (or mobile transmit), and frequencies in the range 169.5125-173.9875 MHz will be used for land station transmissions (or mobile receive).

b. Base stations with a power not greater than 125 Watts are permitted to transmit in the range 162.0500-166.4875 MHz for access to the repeater.

c. Mobile and base stations are permitted to use repeater transmit frequencies for talk-around communications.

d. Unpaired single frequency operations may be authorized using either of the paired frequencies, except pairs allotted AGA, if the requesting agency believes it to be a more effective use of the spectrum. All such assignments must bear the Record Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies designated for paired operations, that agency shall not be authorized paired frequency assignments on designated paired frequencies allotted AGA, unless justified otherwise.

e . An agency may use any of their allotted frequencies in the range 162.0500-166.4875 MHz and any of their allotted frequencies in the range 169.5125-173.9875 MHz to make up a single channel pair.

f. An agency may use any of their allotted frequencies in the range 166.5-169.5 MHz and any of their allotted frequencies in the ranges 162.0500-166.4875 MHz and 169.5125-173.9875 MHz to make up a single channel pair if the requesting agency believes it to be more effective use of the spectrum and if it complies, in part, to the provisions of paragraph 5.a.

g. Existing assignments that do not conform to the provisions of this paragraph and assignments that were converted or are converting to comply with the narrowband mandate are grand fathered until a replacement to those systems are necessary. Additionally, expansion of existing systems will continue to be authorized on the system's current operating frequencies. After January 1, 2019, all assignments must conform to the provisions of paragraph 5a through 5f. After April 1, 2004, assignments for new systems (i.e., those without the Record Note S391) will be approved only if they follow the provisions of paragraph 5a through 5f.

6. Single Frequency Operations. The channeling plan identifies 382 center frequencies that are intended to be used for single frequency operations with necessary bandwidths less than 12.5 kHz. The number of frequencies available for single frequency operations includes the 241 center frequencies contained in the frequency range 166.5-169.5 MHz plus those that cannot be used for paired operations in the remainder of the band.

7. Use of the Band by Military Agencies. Use of the band 162-174 MHz by the military agencies is limited to non-tactical or intra-base radio operations with the following provisions:

a. Frequency assignments may be authorized on the center frequencies designated AF/AR.

b. Frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P074 shall be applied to assignments on center frequencies allotted primarily for non-military agencies and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement. Applicant agencies obtaining waivers to the imposition of P074 on any assignment shall include in the assignment application the coordination note C095 (see Section 9.8.2, paragraph 18, and Annex A). If a waiver agreement contains any special arrangements, the terms or text of the arrangements must be submitted to the FAS Secretary, where an FAS administrative document number will be assigned. Reference to these arrangements (using the FAS administrative document number as a reference) also shall be included in the frequency assignment application as an *M002 note entry in the Circuit Remarks (see Section 9.8.2, paragraph 39k, Annex A).

c. Frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and coordination procedures have been followed, and provided the priority note P074 is applied to each such assignment.

8. Exceptions to the above conditions, limitations, and frequency selection/coordination procedures will be considered by the FAS on a case-by-case basis.

4.3.8 Splinter Channel Assignment Plan in the band 162-174 MHz (12.5 kHz plan)

The frequencies shown in this plan are available for assignment to all Federal agencies in accordance with allocation footnote G5 and as specified herein.

162.596875[2]	163.396875[2]	164.0[1]	165.796875[2]	166.421875[2]	167.196875[2]	171.221875[2]
.6[1]	.4[1]	164.003125[2]	.8[1]	.425000[1]	.2[1]	.225[1]
.603125[2]	.403125[2]	.009375[2]	.803125[2]	.428125[2]	.203125[2]	.228125[2]
.796875[2]	.596875[2]	.0125[1]	.809375[2]	.646875[2]	.796875[2]	.396875[2]
.8[1]	.6[1]	.015625[2]	.8125[1]	.650000[1]	.8[1]	.4[1]
.803125[2]	.603125[2]	.846875[2]	.815625[2]	.653125[2]	.803125[2]	171.403125[2]
.809375[2]	.609375[2]	.85[1]		.659375[2]	.809375[2]	.409375[2]
.81250[1]	.6125[1]	.853125[2]		.662500[1]	.8125[1]	.4125[1]
.815625[2]	.615625[2]			.665625[2]	.815625[2]	.415625[2]
	.796875[2]					
	.8[1]					
	.803125[2]					
	163.996875[2]					

[1] These frequencies are available for operations requiring a bandwidth up to 11 kHz.

[2] These frequencies are available for operations requiring a bandwidth up to 5 kHz.

CONDITIONS FOR USE

1. Use of voice or data with emissions less than 12.5 kHz on footnote one channels is authorized. New users shall ensure that they do not interfere with low power operations.
2. The technical standards applicable to the use of the channels listed above are shown in Section 5.3.6.
3. Directional antennas shall be used where practicable on point-to-point circuits.
4. Transmitter output power shall not exceed 5 watts.
5. Wherever practical, frequencies in the 406.1-420 MHz band, (Section 4.3.9) or the 932.5-935 and 941.5-944 MHz bands, (Section 4.3.14) should be used in lieu of the above frequencies.
6. Exceptions to these conditions will be considered on a case-by-case basis.

4.3.9 Channeling Plan for Assignments in the Band 406.1-420 MHz

This plan is a guide for identifying the center frequencies normally used for assignments with necessary bandwidths less than 12.5 kHz. Tables 1 and 2, below, list the center frequencies of the channels for assignments in the band 406.1-420 MHz. Table 1 contains 391 pairs of frequencies that are to be used primarily for two-frequency simplex operations. Table 2 contains 329 center frequencies that are to be used for single frequency operations.

CONDITIONS AND LIMITATIONS

1. Transition. To allow for an orderly transition from previous channel plans to this plan, the following apply:

a. Agencies having assignments on, or overlapping, frequencies allotted for primary use by other agencies, shall make every attempt to move their operations to frequencies allotted primarily for their own use, or to frequencies allotted for their shared use. All moves shall be done at the earliest possible date.

b. Any wideband assignment authorized prior to December 31, 2007, and continued in use after that date, that is on, or overlaps, a narrowband frequency allotted for primary use by another agency, shall be vacated by the using agency(ies) within 180 days of a formal notice of requirement from the agency to which the frequency is allotted, provided the notifying agency has demonstrated a valid requirement for the frequency and the FAS recommends the using agency vacate the assignment.

2. Narrowband Operations. Assignments for transmitters with necessary bandwidths less than 12.5 kHz (i.e., narrowband assignments) may be authorized on all of the center frequencies shown in Tables 1 and 2 of this plan. When making new narrowband assignments adjacent to wideband assignments (assignments with bandwidths of 12.5 kHz or greater), agencies should take into consideration that additional distance separation may be required due to the increased potential for adjacent channel interference, and then only after coordination/notification with affected agencies.

3. Wideband Operations. Renewal of assignments to existing stations with necessary bandwidths of 12.5 kHz or greater may be authorized. Assignments for expansion of stations within existing networks operating with bandwidths of 12.5 kHz or greater may also be authorized, but only on the center frequencies listed for the even numbered channels beginning with channel 2 in Table 1 and Channel 392 in Table 2. All such assignments must bear Record Note S391 (see Annex A). By January 1, 2008, all assignments and equipment must conform to the provisions set forth in paragraph 1, above, and Section 5.3.5 of this Manual. The Automated Surface Observing System (ASOS) operations centered on channels 318 and 388 may continue to operate with necessary bandwidths greater than 12.5 kHz, but less than 25 kHz. Exceptions to these rules may be authorized on a case-by-case basis, provided the assignment with bandwidth(s) of 12.5 kHz or greater is needed to satisfy requirements, has been properly coordinated with

all affected agencies, and has been recommended for approval by the FAS. However, the rule outlined in subparagraph 1.b, above, applies.

4. Use of Coded Squelch. Coded squelch (squelch control techniques) will be used whenever this technique will promote more efficient use of the spectrum (e.g., use of fewer frequencies, sharing frequencies, or reduction or elimination of interference).

5. Time Division Multiple Access (TDMA) Operations. TDMA systems with at least one voice channel per 12.5 kHz will be allowed and accommodated on adjacent 12.5 kHz center frequencies listed in this channeling plan. The center frequency of the TDMA emission must be offset midway between the center frequencies listed in this plan to limit adjacent channel interference problems with existing or planned narrowband operations. Refer to Part 5.3 of this Manual for technical details.

6. Paired Frequency Operations. Table 1 contains a list of 391 pairs of frequencies that are to be used primarily for two-frequency simplex operations using equipment operating with a necessary bandwidth less than 12.5 kHz.

a. For paired frequency operations, the frequencies in the range 406.1125-410.9875 MHz will be used for land station transmissions (or mobile receive), and frequencies in the range 415.1125-419.9875 MHz will be used for land station receive (or mobile transmit).

b. Base stations operating with a power not greater than 125 watts are permitted to transmit in the range 415.1125-419.9875 MHz for access to the repeater.

c. Mobile stations are permitted to use repeater transmit frequencies for talk-around communications.

d. Unpaired single frequency operations may be authorized using either of the paired frequencies, except those allotted AGA, if the requesting agency believes it to be a more effective use of the spectrum. All such assignments must bear Record Note S396 (see Annex A). However, as long as an agency has assignments for unpaired single frequency operations on frequencies listed in Table 1, that agency shall not be authorized paired frequency assignments on those frequencies in Table 1 allotted AGA, unless justified otherwise.

e. Agencies will first propose frequency pairs allotted primarily for their own use from the Table 1 structure.

f. If there are no agency allotted structured pairs available, agencies will then propose frequency pairs allotted primarily for AGA use from the Table 1 structure.

g. If there are no AGA allotted structured pairs available, an agency may use any of their allotted frequencies in the range 406.1125 – 410.9875 MHz and any of their allotted frequencies in the range 415.1125 – 419.9875 MHz to make up a single channel pair if the requesting agency believes it to be more effective use of the spectrum and if it complies, in part, to the provisions of paragraph 6.a.

h. If a pair cannot be found from the transmit and receive ranges, an agency may use any of their allotted frequencies in the range 406.1125 – 410.9875 MHz and any of their allotted frequencies in the ranges 411.000 – 415.1000 MHz or 415.1125 – 419.9875 MHz to make up a single channel pair if the requesting agency believes it to be more effective use of the spectrum.

i. Existing narrowband assignments that do not conform to the provisions of this paragraph are grand fathered until January 1, 2022. Additionally, expansion of existing narrowband systems will continue to be authorized within this period of time.

7. Single Frequency Operations. Table 2 contains a list of 329 center frequencies that are to be used for single frequency operations with necessary bandwidths less than 12.5 kHz.

8. Use of the Band by Military Agencies. Use of the band 406.1-420 MHz by the military agencies is limited to non-tactical or intrabase radio operations with the following provisions:

a. Frequency assignments may be authorized on center frequencies allotted primarily for DOD.

b. Frequency assignments for certified trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, subject to the conditions imposed on the NTIA certification of spectrum support and coordination between the affected agencies. The priority note P076 shall be applied to assignments on center frequencies allotted primarily for non-military agencies

and those allotted for shared use, unless the agency(ies) to which the frequency is primarily allotted agrees to waive this requirement. Applicant agencies obtaining waivers to the imposition of P076 on any assignment shall include in the assignment application the coordination note C095 (see Section 9.8.2, paragraph 18, and Annex A). If a waiver agreement contains any special arrangements, the terms or text of the arrangements must be submitted to the FAS Secretary, where an FAS administrative document number will be assigned. Reference to these arrangements (using the FAS administrative document number as a reference) also shall be included in the frequency assignment application as an *M002 note entry in the Circuit Remarks (see Section 9.8.2, paragraph 39k, Annex A).

c. Frequency assignments for purposes other than trunked systems may be authorized on the center frequencies allotted primarily for non-military agencies or AGA, provided the proper selection and coordination procedures have been followed, and provided the priority note P076 is applied to each such assignment.

d. The 406.1-420 MHz band channeling plans are contained in Tables 1 and Table 2. Table 1 contains the paired frequency channels, while Table 2 contains the single changes frequencies. In both tables the odd numbered channels are for 12.5 kHz bandwidth assignments, while the even numbered channels are for either 12.5 or old 25 kHz assignments. After December 31, 2007 all channels can be used for 12.5 kHz assignments.

Table 1: Paired Channels

Channel	Center Frequency	Center Frequency
1	406.1125	415.1125
2	406.1250	415.125
3	406.1375	415.1375
4	406.150	415.150
5	406.1625	415.1625
6	406.175	415.175
7	406.1875	415.1875
8	406.200	415.200
9	406.2125	415.2125
10	406.225	415.225
11	406.2375	415.2375
12	406.250	415.250
13	406.2625	415.2625
14	406.275	415.275
15	406.2875	415.2875
16	406.300	415.300
17	406.3125	415.3125
18	406.325	415.325
19	406.3375	415.3375
20	406.350	415.350
21	406.3625	415.3625
22	406.375	415.375
23	406.3875	415.3875

Table 1: Paired Channels

Channel	Center Frequency	Center Frequency
24	406.400	415.400
25	406.4125	415.4125
26	406.425	415.425
27	406.4375	415.4375
28	406.450	415.450
29	406.4625	415.4625
30	406.475	415.475
31	406.4875	415.4875
32	406.500	415.500
33	406.5125	415.5125
34	406.525	415.525
35	406.5375	415.5375
36	406.550	415.550
37	406.5625	415.5625
38	406.575	415.575
39	406.5875	415.5875
40	406.600	415.600
41	406.6125	415.6125
42	406.625	415.625
43	406.6375	415.6375
44	406.650	415.650
45	406.6625	415.6625
46	406.675	415.675

Table 1: Paired Channels

Channel	Center Frequency	Center Frequency
47	406.6875	415.6875
48	406.700	415.700
49	406.7125	415.7125
50	406.725	415.725
51	406.7375	415.7375
52	406.750	415.750
53	406.7625	415.7625
54	406.775	415.775
55	406.7875	415.7875
56	406.800	415.800
57	406.8125	415.8125
58	406.825	415.825
59	406.8375	415.8375
60	406.850	415.850
61	406.8625	415.8625
62	406.875	415.875
63	406.8875	415.8875
64	406.900	415.900
65	406.9125	415.9125
66	406.925	415.925
67	406.9375	415.9375
68	406.950	415.950
69	406.9625	415.9625

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
70	406.975	415.975
71	406.9875	415.9875
72	407.000	416.000
73	407.0125	416.0125
74	407.025	416.025
75	407.0375	416.0375
76	407.050	416.050
77	407.0625	416.0625
78	407.075	416.075
79	407.0875	416.0875
80	407.100	416.100
81	407.1125	416.1125
82	407.125	416.125
83	407.1375	416.1375
84	407.150	416.150
85	407.1625	416.1625
86	407.175	416.175
87	407.1875	416.1875
88	407.200	416.200
89	407.2125	416.2125
90	407.225	416.225
91	407.2375	416.2375
92	407.250	416.250
93	407.2625	416.2625
94	407.275	416.275
95	407.2875	416.2875
96	407.300	416.300
97	407.3125	416.3125
98	407.325	416.325
99	407.3375	416.3375
100	407.350	416.350
101	407.3625	416.3625
102	407.375	416.375
103	407.3875	416.3875
104	407.400	416.400
105	407.4125	416.4125
106	407.425	416.425
107	407.4375	416.4375

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
108	407.450	416.450
109	407.4625	416.4625
110	407.475	416.475
111	407.4875	416.4875
112	407.500	416.500
113	407.5125	416.5125
114	407.525	416.525
115	407.5375	416.5375
116	407.550	416.550
117	407.5625	416.5625
118	407.575	416.575
119	407.5875	416.5875
120	407.600	416.600
121	407.6125	416.6125
122	407.625	416.625
123	407.6375	416.6375
124	407.650	416.650
125	407.6625	416.6625
126	407.675	416.675
127	407.6875	416.6875
128	407.700	416.700
129	407.7125	416.7125
130	407.725	416.725
131	407.7375	416.7375
132	407.750	416.750
133	407.7625	416.7625
134	407.775	416.775
135	407.7875	416.7875
136	407.800	416.800
137	407.8125	416.8125
138	407.825	416.825
139	407.8375	416.8375
140	407.850	416.850
141	407.8625	416.8625
142	407.875	416.875
143	407.8875	416.8875
144	407.900	416.900
145	407.9125	416.9125

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
146	407.925	416.925
147	407.9375	416.9375
148	407.950	416.950
149	407.9625	416.9625
150	407.975	416.975
151	407.9875	416.9875
152	408.000	417.000
153	408.0125	417.0125
154	408.025	417.025
155	408.0375	417.0375
156	408.050	417.050
157	408.0625	417.0625
158	408.075	417.075
159	408.0875	417.0875
160	408.100	417.100
161	408.1125	417.1125
162	408.125	417.125
163	408.1375	417.1375
164	408.150	417.150
165	408.1625	417.1625
166	408.175	417.175
167	408.1875	417.1875
168	408.200	417.200
169	408.2125	417.2125
170	408.225	417.225
171	408.2375	417.2375
172	408.250	417.250
173	408.2625	417.2625
174	408.275	417.275
175	408.2875	417.2875
176	408.300	417.300
177	408.3125	417.3125
178	408.325	417.325
179	408.3375	417.3375
180	408.350	417.350
181	408.3625	417.3625
182	408.375	417.375
183	408.3875	417.3875

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
184	408.400	417.400
185	408.4125	417.4125
186	408.425	417.425
187	408.4375	417.4375
188	408.450	417.450
189	408.4625	417.4625
190	408.475	417.475
191	408.4875	417.4875
192	408.500	417.500
193	408.5125	417.5125
194	408.525	417.525
195	408.5375	417.5375
196	408.550	417.550
197	408.5625	417.5625
198	408.575	417.575
199	408.5875	417.5875
200	408.600	417.600
201	408.6125	417.6125
202	408.625	417.625
203	408.6375	417.6375
204	408.650	417.650
205	408.6625	417.6625
206	408.675	417.675
207	408.6875	417.6875
208	408.700	417.700
209	408.7125	417.7125
210	408.725	417.725
211	408.7375	417.7375
212	408.750	417.750
213	408.7625	417.7625
214	408.775	417.775
215	408.7875	417.7875
216	408.800	417.800
217	408.8125	417.8125
218	408.825	417.825
219	408.8375	417.8375
220	408.850	417.850
221	408.8625	417.8625

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
222	408.875	417.875
223	408.8875	417.8875
224	408.900	417.900
225	408.9125	417.9125
226	408.925	417.925
227	408.9375	417.9375
228	408.950	417.950
229	408.9625	417.9625
230	408.975	417.975
231	408.9875	417.9875
232	409.000	418.000
233	409.0125	418.0125
234	409.025	418.025
235	409.0375	418.0375
236	409.050	418.050
237	409.0625	418.0625
238	409.075	418.075
239	409.0875	418.0875
240	409.100	418.100
241	409.1125	418.1125
242	409.125	418.125
243	409.1375	418.1375
244	409.150	418.150
245	409.1625	418.1625
246	409.175	418.175
247	409.1875	418.1875
248	409.200	418.200
249	409.2125	418.2125
250	409.225	418.225
251	409.2375	418.2375
252	409.250	418.250
253	409.2625	418.2625
254	409.275	418.275
255	409.2875	418.2875
256	409.300	418.300
257	409.3125	418.3125
258	409.325	418.325
259	409.3375	418.3375

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
260	409.350	418.350
261	409.3625	418.3625
262	409.375	418.375
263	409.3875	418.3875
264	409.400	418.400
265	409.4125	418.4125
266	409.425	418.425
267	409.4375	418.4375
268	409.450	418.450
269	409.4625	418.4625
270	409.475	418.475
271	409.4875	418.4875
272	409.500	418.500
273	409.5125	418.5125
274	409.525	418.525
275	409.5375	418.5375
276	409.550	418.550
277	409.5625	418.5625
278	409.575	418.575
279	409.5875	418.5875
280	409.600	418.600
281	409.6125	418.6125
282	409.625	418.625
283	409.6375	418.6375
284	409.650	418.650
285	409.6625	418.6625
286	409.675	418.675
287	409.6875	418.6875
288	409.700	418.700
289	409.7125	418.7125
290	409.725	418.725
291	409.7375	418.7375
292	409.750	418.750
293	409.7625	418.7625
294	409.775	418.775
295	409.7875	418.7875
296	409.800	418.800
297	409.8125	418.8125

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
298	409.825	418.825
299	409.8375	418.8375
300	409.850	418.850
301	409.8625	418.8625
302	409.875	418.875
303	409.8875	418.8875
304	409.900	418.900
305	409.9125	418.9125
306	409.925	418.925
307	409.9375	418.9375
308	409.950	418.950
309	409.9625	418.9625
310	409.975	418.975
311	409.9875	418.9875
312	410.000	419.000
313	410.0125	419.0125
314	410.025	419.025
315	410.0375	419.0375
316	410.050	419.050
317	410.0625	419.0625
318	410.075	419.075
319	410.0875	419.0875
320	410.100	419.100
321	410.1125	419.1125
322	410.125	419.125
323	410.1375	419.1375
324	410.150	419.150
325	410.1625	419.1625
326	410.175	419.175
327	410.1875	419.1875
328	410.200	419.200
329	410.2125	419.2125
330	410.225	419.225
331	410.2375	419.2375
332	410.250	419.250
333	410.2625	419.2625
334	410.275	419.275
335	410.2875	419.2875

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
336	410.300	419.300
337	410.3125	419.3125
338	410.325	419.325
339	410.3375	419.3375
340	410.350	419.350
341	410.3625	419.3625
342	410.375	419.375
343	410.3875	419.3875
344	410.400	419.400
345	410.4125	419.4125
346	410.425	419.425
347	410.4375	419.4375
348	410.450	419.450
349	410.4625	419.4625
350	410.475	419.475
351	410.4875	419.4875
352	410.500	419.500
353	410.5125	419.5125
354	410.525	419.525
355	410.5375	419.5375
356	410.550	419.550
357	410.5625	419.5625
358	410.575	419.575
359	410.5875	419.5875
360	410.600	419.600
361	410.6125	419.6125
362	410.625	419.625
363	410.6375	419.6375
364	410.650	419.650
365	410.6625	419.6625
366	410.675	419.675
367	410.6875	419.6875
368	410.700	419.700
369	410.7125	419.7125
370	410.725	419.725
371	410.7375	419.7375
372	410.750	419.750
373	410.7625	419.7625

Table 1: Paired Channels		
Channel	**Center Frequency**	**Center Frequency**
374	410.775	419.775
375	410.7875	419.7875
376	410.800	419.800
377	410.8125	419.8125
378	410.825	419.825
379	410.8375	419.8375
380	410.850	419.850
381	410.8625	419.8625
382	410.875	419.875
383	410.8875	419.8875
384	410.900	419.900
385	410.9125	419.9125
386	410.925	419.925
387	410.9375	419.9375
388	410.950	419.950
389	410.9625	419.9625
390	410.975	419.975
391	410.9875	419.9875

Table 2: Single Channels	
Channel	**Center Frequency**
392	411.000
393	411.0125
394	411.025
395	411.0375
396	411.050
397	411.0625
398	411.075
399	411.0875
400	411.100
401	411.1125
402	411.125
403	411.1375
404	411.150
405	411.1625
406	411.175
407	411.1875
408	411.200
409	411.2125
410	411.225
411	411.2375
412	411.250
413	411.2625
414	411.275
415	411.2875
416	411.300
417	411.3125
418	411.325
419	411.3375
420	411.350
421	411.3625
422	411.375
423	411.3875
424	411.400
425	411.4125
426	411.425
427	411.4375
428	411.450
429	411.4625
430	411.475
431	411.4875
432	411.500
433	411.5125

Table 2: Single Channels	
Channel	**Center Frequency**
434	411.525
435	411.5375
436	411.550
437	411.5625
438	411.575
439	411.5875
440	411.600
441	411.6125
442	411.625
443	411.6375
444	411.650
445	411.6625
446	411.675
447	411.6875
448	411.700
449	411.7125
450	411.725
451	411.7375
452	411.750
453	411.7625
454	411.775
455	411.7875
456	411.800
457	411.8125
458	411.825
459	411.8375
460	411.850
461	411.8625
462	411.875
463	411.8875
464	411.900
465	411.9125
466	411.925
467	411.9375
468	411.950
469	411.9625
470	411.975
471	411.9875
472	412.000
473	412.0125
474	412.025
475	412.0375

Table 2: Single Channels	
Channel	**Center Frequency**
476	412.050
477	412.0625
478	412.075
479	412.0875
480	412.100
481	412.1125
482	412.125
483	412.1375
484	412.150
485	412.1625
486	412.175
487	412.1875
488	412.200
489	412.2125
490	412.225
491	412.2375
492	412.250
493	412.2625
494	412.275
495	412.2875
496	412.300
497	412.3125
498	412.325
499	412.3375
500	412.350
501	412.3625
502	412.375
503	412.3875
504	412.400
505	412.4125
506	412.425
507	412.4375
508	412.450
509	412.4625
510	412.475
511	412.4875
512	412.500
513	412.5125
514	412.525
515	412.5375
516	412.550
517	412.5625

Table 2: Single Channels	
Channel	**Center Frequency**
518	412.575
519	412.5875
520	412.600
521	412.6125
522	412.625
523	412.6375
524	412.650
525	412.6625
526	412.675
527	412.6875
528	412.700
529	412.7125
530	412.725
531	412.7375
532	412.750
533	412.7625
534	412.775
535	412.7875
536	412.800
537	412.8125
538	412.825
539	412.8375
540	412.850
541	412.8625
542	412.875
543	412.8875
544	412.900
545	412.9125
546	412.925
547	412.9375
548	412.950
549	412.9625
550	412.975
551	412.9875
552	413.000
553	413.0125
554	413.025
555	413.0375
556	413.050
557	413.0625
558	413.075
559	413.0875

Table 2: Single Channels	
Channel	**Center Frequency**
560	413.100
561	413.1125
562	413.125
563	413.1375
564	413.150
565	413.1625
566	413.175
567	413.1875
568	413.200
569	413.2125
570	413.225
571	413.2375
572	413.250
573	413.2625
574	413.275
575	413.2875
576	413.300
577	413.3125
578	413.325
579	413.3375
580	413.350
581	413.3625
582	413.375
583	413.3875
584	413.400
585	413.4125
586	413.425
587	413.4375
588	413.450
589	413.4625
590	413.475
591	413.4875
592	413.500
593	413.5125
594	413.525
595	413.5375
596	413.550
597	413.5625
598	413.575
599	413.5875
600	413.600
601	413.6125

Table 2: Single Channels	
Channel	**Center Frequency**
602	413.625
603	413.6375
604	413.650
605	413.6625
606	413.675
607	413.6875
608	413.700
609	413.7125
610	413.725
611	413.7375
612	413.750
613	413.7625
614	413.775
615	413.7875
616	413.800
617	413.8125
618	413.825
619	413.8375
620	413.850
621	413.8625
622	413.875
623	413.8875
624	413.900
625	413.9125
626	413.925
627	413.9375
628	413.950
629	413.9625
630	413.975
631	413.9875
632	414.000
633	414.0125
634	414.025
635	414.0375
636	414.050
637	414.0625
638	414.075
639	414.0875
640	414.100
641	414.1125
642	414.125
643	414.1375

Table 2: Single Channels	
Channel	**Center Frequency**
644	414.150
645	414.1625
646	414.175
647	414.1875
648	414.200
649	414.2125
650	414.225
651	414.2375
652	414.250
653	414.2625
654	414.275
655	414.2875
656	414.300
657	414.3125
658	414.325
659	414.3375
660	414.350
661	414.3625
662	414.375
663	414.3875
664	414.400
665	414.4125
666	414.425
667	414.4375
668	414.450
669	414.4625
670	414.475
671	414.4875
672	414.500
673	414.5125
674	414.525
675	414.5375
676	414.550
677	414.5625
678	414.575
679	414.5875
680	414.600
681	414.6125
682	414.625
683	414.6375
684	414.650
685	414.6625

Table 2: Single Channels	
Channel	**Center Frequency**
686	414.675
687	414.6875
688	414.700
689	414.7125
690	414.725
691	414.7375
692	414.750
693	414.7625
694	414.775
695	414.7875
696	414.800
697	414.8125
698	414.825
699	414.8375
700	414.850
701	414.8625
702	414.875
703	414.8875
704	414.900
705	414.9125
706	414.925
707	414.9375
708	414.950
709	414.9625
710	414.975
711	414.9875
712	415.000
713	415.0125
714	415.025
715	415.0375
716	415.050
717	415.0625
718	415.075
719	415.0875
720	415.100

4.3.10 Reserved

4.3.11 Plan for Bio-Medical Telemetry and Medical Radiocommunication

BIO-MEDICAL TELEMETRY ONLY

38-41 MHz	See Annex K
174-216 MHz	See Annex K
460.650-460.875 MHz	See US209 in Section 4.1.3
465.650-465.875 MHz	See US209 in Section 4.1.3

MEDICAL RADIOCOMMUNICATION

The following frequencies may be authorized for the purpose of conducting radio operations for the delivery or rendition of medical services to individuals, subject to the indicated limitations.

Frequency (MHz)	Class of Station(s)	Limitation
150.775	Base and Mobile	1
150.790	Base and Mobile	1
152.0075	Base	2
163.250	Base	2
462.950	Base and Mobile	3,5
462.975	Base and Mobile	3,5
463.000	Base and Mobile	3,4,6,7
463.025	Base and Mobile	3,4,6,7
463.050	Base and Mobile	3,4,6,7
463.075	Base and Mobile	3,4,7,8
463.100	Base and Mobile	3,4,7,8
463.125	Base and Mobile	3,4,7,8
463.150	Base and Mobile	3,4,7,8
463.175	Base and Mobile	3,4,7,8
467.950	Mobile Only	3,5,9
467.975	Mobile Only	3,5,9
468.000	Mobile Only	3,4,6,7,9
468.025	Mobile Only	3,4,6,7,9
468.050	Mobile Only	3,4,6,7,9
468.075	Mobile Only	3,4,6,7,9
468.100	Mobile Only	3,4,6,7,9
468.125	Mobile Only	3,4,6,7,9
468.150	Mobile Only	3,4,6,7,9
468.175	Mobile Only	3,4,6,7,9

1. This frequency may be authorized for base (FB or FC), mobile (ML or MS), mobile repeater (MLR), and for fixed (FX) operations to access a repeater which retransmits on a different frequency. This frequency shall be authorized for both federal and non-federal use with a maximum Effective Radiated Power (ERP) of 100 watts. Airborne operations on this frequency are prohibited. The fixed station classes included in this limitation are in addition to those mentioned in US216 (A).

2. This frequency may be authorized only for one-way paging communications to mobile receivers. Transmissions for the purpose of activating or controlling remote objects on this frequency will not be authorized.

3. For two-frequency systems, separation between base and mobile transmit frequencies is 5 MHz.

4. For applications for new radio systems received after August 15, 1974, the eight frequency pairs listed below will be assigned in a block for shared operations subject to the following:

a. For uniformity in usage, these frequency pairs may be referred to by channel name, as follows:

Base and Mobile MHz	**Mobile Only MHz**	**Channel Name**
463.000	468.000	MED-ONE
463.025	468.025	MED-TWO
463.050	468.050	MED-THREE
463.075	468.075	MED-FOUR
463.100	468.100	MED-FIVE
463.125	468.125	MED-SIX
463.150	468.150	MED-SEVEN
463.175	468.175	MED-EIGHT

b. Except as provided in subparagraphs e. and f. of this paragraph, mobile or portable stations must employ equipment which is both wired and equipped to transmit/receive, respectively, on each of these eight frequency pairs.

c. Except as provided in subparagraph f. of this paragraph, base and fixed stations[5] must employ equipment which is both wired and equipped to transmit/receive, respectively, on at least four (three, if bio-medical telemetry operation is not employed in the system) of these eight frequency pairs.

d. Multi-channel equipment requirements for use of these frequency pairs are intended to afford capability for alternating use of the individual frequencies, and ability to conduct simultaneous operations is not required. These requirements may be met in a single equipment unit or in any combination of equipment units suitable to the applicant's operations.

e. Portable (hand-held) units operated with a maximum output power of 2.5 watts are exempted from the multi-channel equipment requirements specified in subparagraph c. of this paragraph.

f. Stations located in the Canadian coordination zone (see Part 3.4), will be required to meet multi-channel equipment requirements only for those frequencies up to the number specified in subparagraphs b. and c. of this paragraph which have been assigned to the licensee after coordination with Canada in accordance with the applicable US-Canada agreement.

5. This frequency may be authorized for the dispatch of medical-care vehicles and personnel for the rendition or delivery of medical services. Central-dispatch operations serving multisystem requirements in an area-wide medical radio communications plan may be authorized and may include the designation of this frequency for intra-system and inter-system mutual assistance purposes.

6. This frequency may be authorized on a primary basis for operations in bio-medical telemetry systems. F1D, F2D, and F3E emissions may be authorized. On a secondary basis, subject to noninterference to bio-medical telemetry systems, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations.

7. The continuous carrier mode of operation may be authorized for use of telemetry emission on this frequency.

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[5] As indicated in Limitation 9, Section 4.3.11, transmissions by fixed stations are limited to the control of base station repeaters.

8. This frequency may be authorized on a primary basis for communications, between medical facilities, vehicles, and personnel, related to medical supervision and instruction for treatment and transport of patients in the rendition or delivery of medical services. F2D and F3E emissions may be authorized. On a secondary basis, subject to noninterference to the foregoing types of operations, this frequency may be authorized for the transmission of messages related to the efficient administration of organizations and facilities engaged in medical services operations and for bio-medical telemetry transmissions, including the use of F1D emission.

9. This frequency may be assigned to a fixed station for the control of a base station repeater (FBR) if it is also assigned to the associated mobile station. Fixed stations operating on this frequency shall comply with the following requirements if they are located within 120 kilometers of the center of urbanized areas of 200,000 or more population.

a. If the station is used to control one or more base station repeaters located within 45 degrees of azimuth, a directional antenna having a front-to-back ratio of at least 15 dB shall be used at the fixed station. For other situations, where a directional antenna cannot be used, a cardioid, bi-directional or omni-directional antenna may be employed. In each case, the antenna used must, consistent with reasonable design, produce a radiation pattern that provides only the coverage necessary to permit satisfactory control of each base station repeater and limit radiation in other directions to the extent feasible.

b. The strength of the signal of a fixed station, controlling a single base station repeater, may not exceed by more than 6 dB, at the antenna terminal of the base station repeater receiver, the signal strength produced there by a unit of the associated mobile station. When the station controls more than one base station repeater, the 6 dB control-to-mobile signal difference need be verified at only one of the base station repeater sites. The measurement of the signal strength of the mobile unit must be made when such unit is transmitting from the fixed station location or, if that is not practical, from a location within 400 meters of the fixed station site.

c. Each application for a fixed station to be authorized under the provisions of this paragraph shall be accompanied by a statement certifying that the output power of the proposed station transmitter will be adjusted to comply with the foregoing signal level limitation. Records of the measurements used to determine the signal ratio shall be kept with the station records and shall be made available for inspection upon request.

d. Urbanized areas of 200,000 or more population are defined in the U.S. Census Population, 1960, Vol. 1, Table 23, Page 50. The centers of urbanized areas are determined from the Appendix, page 226, of the U.S. Commerce publication "Air Line Distance Between Cities in the United States."

4.3.12 Channeling Plan for Assignments in the Fixed Service in the 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz

1. The following channeling plan became effective on January 1, 1982, for all assignments in the Fixed Service.

2. Existing assignments as of January 1, 1982 in the Fixed Service which are in the bands 14500.0 to 14714.5 MHz and 15136.5 to 15350.0 MHz that are not in compliance with the channeling plan may be retained until January 1, 1997. However, if existing equipment is replaced prior to January 1, 1997, assignments for the replaced equipment must be in accordance with the channeling plan.

3. This channeling plan is only applicable to assignments in the Fixed Service in the bands 14500.0 to 14714.5 and 15136.5 to 15350.0 MHz. The assigned frequency shall be chosen such that the frequency "2 of its necessary bandwidth shall not extend beyond the upper or lower limits of bands indicated herein. A general breakdown of these bands is:

a. For emission bandwidths equal to or greater than 3.5 MHz:
14500.0 to 14710.0 MHz
15140.0 to 15350.0 MHz

b. For emission bandwidths less than 3.5 MHz:
14710.0 to 14714.5 MHz
15136.5 to 15140.0 MHz

4. Criteria for assignments in the Fixed Service with emission bandwidths equal to or greater than 3.5 MHz:

a. The assigned frequency must center on one of the frequencies given in Table 1.

b. Multiple contiguous channels are to be used for emission bandwidths of 3.5 MHz or greater.

c. In order to promote uniformity and to establish a natural guard band, it is strongly urged that frequencies be selected in pairs from the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 on an equal basis.

5. Criteria for assignments in the Fixed Service with emission bandwidth of less than 3.5 MHz:

a. Assignments in the Fixed Service with emission bandwidths of less than 3.5 MHz are restricted to the bands:
14710.0 to 14714.5 MHz
and
15136.5 to 15140.0 MHz

b. Narrowband assignments, those with less than 3.5 MHz of necessary bandwidth, shall not be made in the bands 14500.0 to 14710.0 and 15140.0 to 15350.0 MHz.

Table 1. Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz

14500.0-14714.5 MHz	15136.5-15350.0 MHz
*14501.25	*15141.25
14503.75	15143.75
14506.25	15146.25
14508.75	15148.75
14511.25	15151.25
14513.75	15153.75
14516.25	15156.25
14518.75	15158.75
14521.25	15161.25
14523.75	15163.75
14526.25	15166.25
14528.75	15168.75
14531.25	15171.25
14533.75	15173.75
14536.25	15176.25
14538.75	15178.75
14541.25	15181.25
14543.75	15183.75
14546.25	15186.25
14548.75	15188.75
14551.25	15191.25
14553.75	15193.75
14556.25	15196.25

Table 1. Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz

14500.0-14714.5 MHz	15136.5-15350.0 MHz
14558.75	15198.75
14561.25	15201.25
14563.75	15203.75
14566.25	15206.25
14568.75	15208.75
14571.25	15211.25
14573.75	15213.75
14576.25	15216.25
14578.75	15218.75
14581.25	15221.25
14583.75	15223.75
14586.25	15226.25
14588.75	15228.75
14591.25	15231.25
14593.75	15233.75
14596.25	15236.25
14598.75	15238.75
14601.25	15241.25
14603.75	15243.75
14606.25	15246.25
14608.75	15248.75
14611.25	15251.25
14613.75	15253.75

Table 1. Center Frequencies (MHz) of 2.5 MHz Channels in the Bands 14500.0-14714.5 MHz and 15136.5-15350.0 MHz	
14500.0-14714.5 MHz	**15136.5-15350.0 MHz**
14616.25	15256.25
14618.75	15258.75
14621.25	15261.25
14623.75	15263.75
14626.25	15266.25
14628.75	15268.75
14631.25	15271.25
14633.75	15273.75
14636.25	15276.25
14638.75	15278.75
14641.25	15281.25
14643.75	15283.75
14646.25	15286.25
14648.75	15288.75
14651.25	15291.25
14653.75	15293.75
14656.25	15296.25
14658.75	15298.75
14661.25	15301.25
14663.75	15303.75
14666.25	15306.25
14668.75	15308.75
14671.25	15311.25
14673.75	15313.75
14676.25	15316.25
14678.75	15318.75
14681.25	15321.25
14683.75	15323.75
14686.25	15326.25
14688.75	15328.75
14691.25	15331.25
14693.75	15333.75
14696.25	15336.25
14698.75	15338.75
14701.25	15341.25
14703.75	15343.75
14706.25	15346.25
*14708.75	*15348.75
* These channels cannot be used for bandwidths greater than 2.5 MHz. Total number of channels available--168.	

4.3.13 Channeling Plan for Assignments in the Maritime Mobile Service in the Bands 4000-4063 and 8100-8195 kHz

1. For the band 4000-4063 kHz:

a. Frequency assignments for ship stations in the band 4000-4063 kHz must conform to the channeling plan shown below in accordance with Appendix **17** Part B Section I, Sub-Section C-1, of the International Radio Regulations.

b. Frequencies may be used by ship stations:

- or supplementing ship-to-shore channels for duplex operation with coast station channels listed in Table 1 of Annex H;
- for intership simplex (single-frequency) operation;
- for duplex operation with coast stations working in the band 4438-4650 kHz;
- for duplex operation with Channel Nos. 428 and 429 of Table 1, Annex H.

Table. Recommended Single-Sideband Transmitting Frequencies (in kHz) for Ship Stations in the Band 4000-4063 kHz

Channel No.	Carrier Frequency	Assigned Frequency
1	4000	4001.4
2	4003	4004.4
3	4006	4007.4
4	4009	4010.4
5	4012	4013.4
6	4015	4016.4
7	4018	4019.4
8	4021	4022.4
9	4024	4025.4
10	4027	4028.4
11	4030	4031.4
12	4033	4034.4
13	4036	4037.4
14	4039	4040.4
15	4042	4043.4
16	4045	4046.4
17	4048	4049.4
18	4051	4052.4
19	4054	4055.4
20	4057	4058.4
21	4060	4061.4*

* Effective 1 July 1991, in the maritime mobile service, this frequency is available exclusively for non-Federal use.

2. For the band 8100-8195 kHz:

a. Frequency assignments for maritime mobile stations in the band 8100-8195 kHz must conform to the channeling plan show below in accordance with Appendix 17 Part B Section I, Sub-Section C-2, of the International Radio Regulations.

b. Frequencies may be used by maritime mobile stations:

- for supplementing ship-to-shore channels for duplex operation with coast station channels listed in Table 1 of Annex H;
- for intership simplex (single-frequency) operations;
- for ship-to-shore or shore-to-ship simplex operations;
- for duplex operation with Channel Nos. 834, 835, 836 and 837 of Table 1, Annex H.

Table. Recommended Single-Sideband Transmitting Frequencies (in kHz) for Ship and Coast Stations in the Band 8100-8195 kHz

Channel No.	Carrier Frequency	Assigned Frequency
1	8101	8102.4
2	8104	8105.4
3	8107	8108.4
4	8110	8111.4
5	8113	8114.4*
6	8116	8117.4
7	8119	8120.4
8	8122	8123.4
9	8125	8126.4
10	8128	8129.4*
11	8131	8132.4
12	8134	8135.4
13	8137	8138.4
14	8140	8141.4
15	8143	8144.4
16	8146	8147.4
17	8149	8150.4
18	8152	8153.4
19	8155	8156.4
20	8158	8159.4
21	8161	8162.4
22	8164	8165.4
23	8167	8168.4
24	8170	8171.4
25	8173	8174.4
26	8176	8177.4
27	8179	8180.4
28	8182	8183.4
29	8185	8186.4
30	8188	8189.4
31	8191	8192.4

* Effective 1 July 1991, in the maritime mobile service, this frequency is available exclusively for non-Federal use.

4.3.14 Channeling Plan for Assignments in the Fixed Service in the Bands 932.4-935 MHz and 941.4-944 MHz

This plan is a guide for identifying the center frequencies of those paired frequencies that normally are used for assignments with a necessary bandwidth that can be accommodated within 12.5, 25, 50, 100 and 200 kHz. Transportable Operations are not permitted in the point-to-point bands 932.5-935.0 and 941.5-944.0 MHz. To permit flexibility, applicants for either point-to-point or point-to-multipoint channels will be permitted to combine channels upon a showing that there is a need and sufficient frequencies are available to permit this. Applicants may split channels if they choose to do so. The

frequencies listed in this plan are shared with non-Federal users, and applications for assignment from Federal users are subject to coordination with non-Federal users prior to NTIA approval.

CONDITIONS AND LIMITATIONS

1. Point-to-Multipoint Assignments:

Table 1 contains a list of five pairs of frequencies that are designated for use only in fixed point-to-multipoint assignments operating with a necessary bandwidth of 12.5 kHz or less.

a. For paired frequency operations the 941.4-941.5 MHz frequencies will be used to transmit to the multipoint receiving stations, and the 932.4-932.5 MHz frequencies will be used for reverse link communications.

b. Unpaired, single frequency, one-way point-to-multipoint operations are permitted, using either of the paired frequencies. However, when the multipoint receiving stations are located less than 48 kilometers (30 miles) from the transmitting station, frequencies from the 932-932.5 MHz band must be used.

c. Point-to-point use of the 932.4-932.5 MHz frequencies will be permitted but only when the transmission is relayed by a station transmitting in the 941.4-941.5 MHz band.

d. Frequencies will be used so as to facilitate communications on an interference-free basis in each operational/service area. In order to facilitate maximum reuse of frequencies, stations separated by 113 kilometers (70 miles) or more, and operating on the same frequency (co-channel), will be considered as interference free (see also Section 8.2.16). However, at distances of less than 113 km, reuse of a frequency (co-channel) will be permitted only upon providing evidence that the operation will not cause harmful interference to existing users.

e. Equivalent power and antenna-height restrictions:

Antenna Height in Meters	**Maximum Effective Radiated Power**	
	In Watts	**In dBm**
152.5 and below	1,000	60
Above 152.5 up to 182	630	58
Above 182 up to 213	500	57
Above 213 up to 244	400	56
Above 244 up to 274	315	55
Above 274 up to 305	250	54
Above 305	200	53

2. Point-to-Point Assignments:

Table 2 contains a list of thirty pairs of frequencies that are designated for two-way use in fixed point-to-point operations with a necessary bandwidth of 200 kHz or less. Frequencies shall be selected in pairs. However, unpaired frequency use, or single frequency one-way use, will be permitted, but only upon showing that spectrum is not available in other bands and that paired use will not be adversely affected.

EXCEPTIONS

Exceptions to the above conditions and limitations will be considered by the FAS on a case-by-case basis.

TABLE 1. Paired Frequencies for Point-to-Multipoint Assignments (12.5 kHz Bandwidth)	
MHz	**MHz**
932.44375	941.44375
932.45625	941.45625
932.46875	941.46875
932.48125	941.48125
932.49375	941.49375

TABLE 2. Paired Frequencies for Point-to-Point Assignments							
25 kHz Bandwidth Pairs		**50 kHz Bandwidth Pairs**		**100 kHz Bandwidth Pairs**		**200 kHz Bandwidth Pairs**	
MHz	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**	**MHz**
932.5125	941.5125	932.7000	941.7000	932.8250	941.8250	933.1750	942.1750
932.5375	941.5375	932.7500	941.7500	932.9250	941.9250	933.3750	942.3750
932.5625	941.5625	934.8000	943.8000	933.0250	942.0250	933.5750	942.5750
932.5875	941.5875			934.5250	943.5250	933.7750	942.7750
932.6125	941.6125			934.6250	943.6250	933.9750	942.9750
932.6375	941.6375			934.7250	943.7250	934.1750	943.1750
932.6625	941.6625					934.3750	943.3750
934.8375	943.8375						
934.8625	943.8625						
934.8875	943.8875						
934.9125	943.9125						
934.9375	943.9375						
934.9625	943.9625						
934.9875	943.9875						

4.3.15 Channeling Plan for Land Mobile Assignments in the Band 220-222 MHz

The following channeling plan is composed of 200 frequency pairs for shared Federal/non-Federal land-mobile operations with necessary bandwidths less than or equal to 4 kHz. Of these 200 channel pairs, 60 pairs are for nationwide use and 140 pairs are for shared local use. Of the 60 nationwide channel pairs, 10 are for exclusive Federal use and 50 are for exclusive non-Federal use. Of the 140 shared local-use channel pairs, 100 are available for trunked operations or other operations of equivalent or greater efficiency, 20 are set aside for data only operations until March 31, 2000, 10 are available for public safety/mutual aid, and the remaining 10 channel pairs have no restrictions on use.

The following table indicates the channel designations of frequencies (channel number, base station frequency and function) available for assignment under the following conditions:

1) Frequencies shall be assigned in pairs, with base station frequencies taken from the 220-221 MHz band, corresponding mobile frequencies being 1 MHz higher, taken from the 221-222 MHz band.

2) Only the lower half of the frequency pairs is listed in the table.

TABLE OF 220-222 MHz CHANNEL DESIGNATIONS
(Channel Number, Base Frequency in MHz and Function)

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
1	220.0025	11	.0525
2	.0075	12	.0575
3	.0125	13	.0625
4	.0175	14	.0675
5	.0225	15	.0725
6	.0275	16	.0775
7	.0325	17	.0825
8	.0375	18	.0875
9	.0425	19	.0925
10	.0475	20	.0975

Non-Federal Nationwide System			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
21	220.1025	26	220.1275
22	.1075	27	.1325
23	.1125	28	.1375
24	.1175	29	.1425
25	.1225	30	.1475

Trunked Systems (See next paragraph for Trunked Channel Groups)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
31	220.1525	41	220.2025
32	.1575	42	.2075
33	.1625	43	.2125
34	.1675	44	.2175
35	.1725	45	.2225
36	.1775	46	.2275
37	.1825	47	.2325
38	.1875	48	.2375
39	.1925	49	.2425
40	.1975	50	.2475

Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
51	220.2525	56	.2775
52	.2575	57	.2825
53	.2625	58	.2875
54	.2675	59	.2925
55	.2725	60	.2975

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
61	220.3025	71	.3525
62	.3075	72	.3575
63	.3125	75	.3625
64	.3175	74	.3675
65	.3225	75	.3725
66	.3275	76	.3775
67	.3325	77	.3825
68	.3375	78	.3875
69	.3425	79	.3925
70	.3475	80	.3975

Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
81	220.4025	86	.4275
82	.4075	87	.4325
83	.4125	88	.4375
84	.4175	89	.4425
85	.4225	90	.4475

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
91	220.4525	101	.5025
92	.4575	102	.5075
93	.4625	103	.5125
94	.4675	104	.5175
95	.4725	105	.5225
96	.4775	106	.5275
97	.4825	107	.5325
98	.4875	108	.5375
99	.4925	109	.5425
100	.4975	110	.5475

Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
111	220.5525	116	220.5775
112	.5575	117	.5825
113	.5625	118	.5875
114	.5675	119	.5925
115	.5725	120	.5975

Trunked Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
121	220.6025	131	220.6525
122	.6075	132	.6575
123	.6125	133	.6625
124	.6175	134	.6675
125	.6225	135	.6725
126	.6275	136	.6775
127	.6325	137	.6825
128	.6375	138	.6875
129	.6425	139	.6925
130	.6475	140	.6975

Non-Federal Nationwide Systems			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
141	220.7025	151	.7525
142	.7075	152	.7575
143	.7125	153	.7625
144	.7175	154	.7675
145	.7225	155	.7725
146	.7275	156	.7775
147	.7325	157	.7825
148	.7375	158	.7875
149	.7425	159	.7925
150	.7475	160	.7975

Public Safety/Mutual Air Operations			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
161	220.8025	166	220.8275
162	.8075	167	.8325
163	.8125	168	.8375
164	.8175	169	.8425
165	.8225	170	.8475

Available for any use			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
171	220.8525	176	220.8775
172	.8575	177	.8825
173	.8625	178	.8875
174	.8675	179	.8925
175	.8725	180	.8975

Data Operations (See Note *)			
Ch. #	**Base Frequency (in MHz)**	**Ch. #**	**Base Frequency (in MHz)**
181	220.9025	191	220.9525
182	.9075	192	.9575
183	.9125	193	.9625
184	.9175	194	.9675
185	.9225	195	.9725
186	.9275	196	.9775
187	.9325	197	.9825
188	.9375	198	.9875
189	.9425	199	.9925
190	.9475	200	.9975

Note: Channels 181-185 and 196-200 are indefinitely reserved until further FCC action and are not currently available for assignment or use.

Trunked Channel Groups

The channel groups listed in the following Table are available to both Federal and non-Federal applicants for trunked operations.

Table - Trunked Channel Groups			
Group #	**Channel #**	**Group #**	**Channel #**
1	1-31-61-91-121	11	11-41-71-101-131
2	2-32-62-92-122	12	12-42-72-102-132
3	3-33-63-93-123	14	14-44-74-104-134
4	4-34-64-94-124	15	15-45-75-105-135
5	5-35-65-95-125	16	16-46-76-106-136
6	6-36-66-96-126	11	11-41-71-101-131
7	7-37-67-97-127	17	17-47-77-107-137
8	8-38-68-98-128	18	18-48-78-108-138
9	9-39-69-99-129	19	19-49-79-109-139
10	10-40-70-100-130	20	20-50-80-110-140

4.3.16 Plans for Federal Interoperability Channels for Interagency Law Enforcement and Incident Response Operations in the Bands 162-174 MHz and 406.1-420 MHz

CONDITIONS FOR USE

1. The plans shown in Tables 1 and 2 show frequencies available for assignment to all federal agencies to satisfy law enforcement and public safety incident response interoperability requirements. These frequencies will be referred to hereinafter as “Federal Interoperability Channels”.

2. The Federal Interoperability Channels are available for use among federal agencies and between federal agencies and non-federal entities with which federal agencies have a requirement to operate. The channels are available to federal agencies on a shared basis and will not be authorized for the exclusive use of any one federal agency.

3. The channels are available to non-federal entities to enable joint federal/non-federal operations for law enforcement and incident response, subject to the condition that harmful interference will not be caused to federal stations. These channels are restricted to interoperability communications and are not authorized for routine or administrative uses.

4. Extended operations and congestion may lead to frequency conflicts. Coordination with NTIA is required to resolve these conflicts.

5. Only narrowband emissions are to be used on the Federal Interoperability Channels.

6. Federal agencies should have an assignment in the Government Master File (GMF) or be included in the Joint Applications (*JNT) circuit remarks in accordance with Chapter 9 of this Manual.

7. Exceptions to the above restrictions will be considered by the Interdepartment Radio Advisory Committee (IRAC)/Frequency Assignment Subcommittee (FAS) on a case-by-case basis.

LAW ENFORCEMENT PLANS

1. Frequencies 167.0875 MHz and 414.0375 MHz are designated as National Calling Channels for initial contact and will be identified in the radio as indicated in Table 1.

2. Initial contact communications will be established using analog FM emission (11KF3E).

3. The interoperability channels will be identified in mobile and portable radios as follows with Continuous Tone-Controlled Squelch Systems (CTCSS) frequency 167.9 Hz and/or Network Access Code (NAC) $68F:

Table 1

LE VHF PLAN			LE UHF PLAN		
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**
LEA	167.0875 (Simplex)	167.0875	LEB	414.0375 (Simplex)	414.0375
LE1	162.0875	167.0875	LE10	418.9875	409.9875
LE2	162.2625	167.2500	LE11	419.1875	410.1875
LE3	162.8375	167.7500	LE12	419.6125	410.6125
LE4	163.2875	168.1125	LE13	414.0625 (Simplex)	414.0625
LE5	163.4250	168.4625	LE14	414.3125 (Simplex)	414.3125
LE6	167.2500 (Simplex)	167.2500	LE15	414.3375 (Simplex)	414.3375
LE7	167.7500 (Simplex)	167.7500	LE16	409.9875 (Simplex)	409.9875
LE8	168. 1125 (Simplex)	168.1125	LE17	410. 1875 (Simplex)	410.1875
LE9	168.4625 (Simplex)	168.4625	LE18	410.6125 (Simplex)	410.6125

INCIDENT RESPONSE PLANS

1. Frequencies 169.5375 MHz, paired with 164.7125 MHz, and 410.2375 MHz, paired with 419.2375 MHz, are designated as the calling channels for initial contact and will be identified in the radio as indicated in Table 2.

2. Initial contact will be established using analog FM emission (11KF3E).

3. To ensure access by stations from outside the normal area of operation, CTCSS will not be used on the calling channels.

4. The interoperability channels will be identified in mobile and portable radios as follows:

Table 2							
IR VHF PLAN				**IR UHF PLAN**			
Identifier	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**	**Identifier**	**Mobile Transmit (MHz)**	**Mobile Receive (MHz)**	**CTCSS**
NC 1 Calling	164.7125	169.5375	None	NC 2 Calling	419.2375	410.2375	None
IR1	165.2500	170.0125	As required	IR10	419.4375	410.4375	As required
IR2	165.9625	170.4125	As required	IR11	419.6375	410.6375	As required
IR3	166.5750	170.6875	As required	IR12	419.8375	410.8375	As required
IR4	167.3250	173.0375	As required	IR13	413.1875 (Simplex)	413.1875	As required
IR5	169.5375 (Simplex)	169.5375	As required	IR14	413.2125 (Simplex)	413.2125	As required
IR6	170.0125 (Simplex)	170.0125	As required	IR15	410.2375 (Simplex)	410.2375	As required
IR7	170.4125 (Simplex)	170.4125	As required	IR16	410.4375 (Simplex)	410.4375	As required
IR8	170.6875 (Simplex)	170.6875	As required	IR17	410.6375 (Simplex)	410.6375	As required
IR9	173.0375 (Simplex)	173.0375	As required	IR18	410.8375 (Simplex)	410.8375	As required

4.3.17 Plan for JTIDS TDMA Waveform Systems

1. The Joint Tactical Information Distribution System/Multifunctional Information Distribution System (JTIDS/MIDS) Time Division Multiple Access (TDMA) Waveform is the designation for the tactical data link system used by the military services, which is critical to the "Command and Control" infrastructure of the Department of Defense (DOD). This waveform designation applies to the JTIDS family of terminals (Class 1, Class 2, Class 2M and Class 2H); MIDS Low Volume Terminal (LVT) variants (LVT-1, LVT-2, LVT-3/Fighter Data Link); and future approved systems incorporating the JTIDS/MIDS TDMA Waveform implementation. These TDMA systems provide the DOD with totally Integrated Communications, Navigation and Identification (ICNI) capabilities. The DOD refers to these terminals collectively as "Link 16".

2. JTIDS/MIDS TDMA Waveform operation is authorized in the 960-1215 MHz band and in addition, the DOD and the Department of Transportation (DOT) have made agreements to assure spectrum access and to maintain mutual compatibility between Air Traffic Control (ATC) systems and JTIDS/MIDS TDMA Waveform systems within the United States and its possessions (US&P). The following paragraphs are consistent with DOD - DOT agreements:

a. Uncoordinated JTIDS/MIDS TDMA Waveform operations are authorized in the 960-1215 MHz band in accordance with the coordinations outlined in Authorizing NTIA Spectrum Certification Document(s).

b. The DOD shall incorporate engineering features in the JTIDS/MIDS TDMA Waveform equipment in accordance with the NTIA guidance and requirements for JTIDS/MIDS EMC features. The engineering features when implemented shall minimize the possibility for harmful interference between ATC and JTIDS/MIDS TDMA Waveform systems operating in the US&P.

c. The DOT will support US&P frequency assignments for JTIDS/MIDS TDMA Waveform operations, with the conditions identified in the authorizing NTIA Spectrum Certification Documents and as set forth herein.

d. The DOD will ensure that by January 1, 2020, all fielded JTIDS/MIDS TDMA Waveform terminals are capable of remapping frequencies. MIDS LVT terminals will be retrofitted with the remapping capability and recertified between January 1, 2012 and December 31, 2018. These retrofits will occur during any scheduled system updates/modifications, when the terminals are brought in for maintenance. If necessary, special procedures will be established to ensure that all retrofits are completed no later than January 1, 2020. Any JTIDS/MIDS TDMA Waveform terminal produced after July 1, 2007 other than the MIDS LVT terminals will be capable of remapping. The remapping implementation will be flexible, but there will not be a requirement to remap more that 14 carrier frequencies. The remapping capability will be utilized as necessary to prevent harmful interference with ATC systems that have been approved by a NTIA Stage 4 Spectrum Certification.

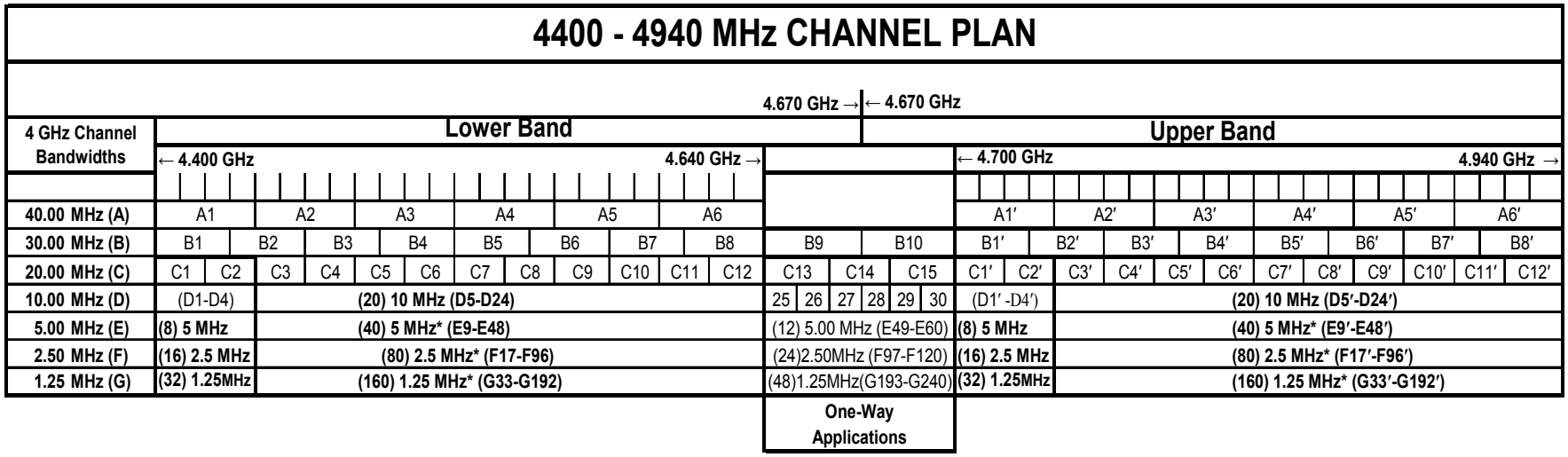
e. The DOT will ensure that planned and future systems/equipment subject to its jurisdiction that are to be implemented using spectrum not subject to remapping will be designed to satisfy their minimum performance standards in their intended electromagnetic environments. This environment includes JTIDS/MIDS TDMA Waveform systems operating in conformance with the remapping requirement. This will ensure that such new or modified systems shall incorporate features so as to not constrain JTIDS/MIDS TDMA Waveform Terminals operations in accordance with the approved NTIA Spectrum Certification.

f. Coordination procedures for JTIDS/MIDS TDMA Waveform operations involving all 51 frequencies, operations exceeding approved NTIA Spectrum Certification conditions and operations involving non-US and new terminals shall be cooperatively developed by DOD and DOT.

4.3.18 4400-4940 MHz Channel Plan

1. This section describes the 4400-4940 MHz Channel Plan for stations operating in the fixed service and provides guidance on its implementation. This channel plan will become effective on August 1, 2009 and all incumbent frequency assignments in the 4400-4940 MHz band and will be grandfathered until the equipment or frequency is changed.
2. Figure 1 provides an overview of the 4400-4940 MHz Channel Plan.

Figure 1: The 4400-4940 MHz Channel Plan



NOTE: Paired channels will be implemented for fixed service assignments using A1 with A1', A2 with A2', etc.

3. Applicable Guidance. In implementing the 4400-4940 MHz Channel Plan, the following guidance applies.

a. This channel plan only applies to fixed and/or transportable fixed assignments. For mobile or airborne assignments, this channel plan should be used to the extent possible.

b. Incumbent fixed and/or transportable fixed assignments will be grandfathered until the end of the life-cycle of the equipment[6] and all replacement equipment will utilize frequencies in accordance with this channel. Other assignments should use this channel plan to the extent possible.

c. Any request for changes or modifications to "grandfathered" fixed service and/or transportable fixed assignments, except for the frequency, will be governed by existing NTIA procedures. However, if the operating frequency is to be modified, the replacement frequency will be selected in accordance with this channel plan.

d. The First Priority Channels will be considered first before the other designated channels.

e. The Second Priority Channels will be considered if the First Priority Channels are not available..

f. The wide-band Third Priority Channels (i.e., A1/A1'; B1/B1'; B9 and B10; C13, C14, and C15) will be considered only if their respective First and Second Priority Channels are not available.

g. The narrow-band Third Priority Channels (i.e., E-, F-, and G-Channels) will be considered only if their respective First Priority Channels are not available. The following narrow-band channels: E9/E9' and E10/E10'; F17/E17' through F20/F20'; G33/G33' through G40/G40' will be considered first before the other respective narrow-band channels.

h. Fixed and/or transportable fixed assignments, may use either channel of a paired-channel if the one-way link First Priority Channels are not available.[7] or if multiple one-way links assignments are required.

i. Fixed and/or transportable fixed assignments for which the emission bandwidth exceeds the bandwidth of a channel will use the next available wider channel in the channel plan. For example, an assignment with an emission bandwidth of 24 MHz will use a 30 MHz channel *(e.g., Channel B6 centered at 4565 MHz and see also Channel D17 in Table 4).*

j. Fixed and/or transportable fixed assignments for which the emission bandwidth exceeds 40 MHz may use concatenated channels[8] commensurate with the emission bandwidth However, the center frequency of the concatenated channels should be one of the center frequencies listed in the channel plan. For example, an assignments with a emission bandwidth of 60 MHz would require two concatenated 30 MHz channels, such as channels B7 and B8 with the center frequency being 4610 MHz *(see Channel C11 in Table 3).*

4. The following tables list the center frequencies for narrowband, wideband and single or unpaired channels.

a. Tables 1 through 4 show the center frequencies of the wide-band paired channels (*i.e.*, *Channels A-40 MHz, B-30 MHz, C-20 MHz, and D-10 MHz*) in the 4400-4940 MHz Channel Plan and their respective channel status.

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[6] Transportable fixed assignments, include assignments employing one-way link applications; such as video target scoring, air-to-ground video downlink, ground-to-ground video and/or voice transmissions, etc.

[7.] Currently, land mobile radio assignments are not deployed in the 4400-4940 MHz band. In such time that land mobile radio assignments will be deployed in the band, the base stations will transmit at channels from the upper portion of the channel plan (*i.e.*, 4670-4940 MHz band segment) and mobile units will transmit from the lower portion of the channel plan (*i.e.*, 4400-4670 MHz band segment).

[8.] The term "concatenated channels" means any two or more adjacent channels in the 4400-4940 MHz band joined together for the purpose of accommodating a assignment having an emission bandwidth that exceeds the widest channel bandwidth in the channel plan.

CENTER FREQUENCIES FOR THE WIDE-BAND PAIRED CHANNELS

Table 1: The Center Frequencies for the 40 MHz Wide-Band Paired Channels (A-Channels)

Table 1		
Channel (Frequencyin MHz)	**Channel (Frequencyin MHz)**	**Channel (Frequencyin MHz)**
First Priority Channels		
A2/A2′ (4460/4760)	A3/A3′ (4500/4800)	A4/A4′ (4540/4840)
Second Priority Channels		
A5/A5′ (4580/4880)	A6/A6′ (4620/4920)	
Third Priority Channels		
A1/A1′ (4420/4720)		

Table 2: The Center Frequencies for the 30 MHz Wide-Band Paired Channels (B-Channels)

Table 2		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
B6/ B6′ (4565/4865)	B7/B7′ (4595/4895)	B8/B8′ (4625/4925)
Second Priority Channels		
B2/B2′ (4445/4745)	B4/B4′ (4505/4805)	B5/B5′ (4535/4835)
B3/B3′ (4475/4775)		
Third Priority Channels		
B1/B1′ (4415/4715)		

Table 3: The Center Frequencies for the 20 MHz Wide-Band Paired Channels (C-Channels)

Table 3		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
C1/C1′ (4410/4710)	C2/C2′ (4430/4730)	
Second Priority Channels		
C3/C3′ (4450/4750)	C7/C7′ (4530/4530)	C10/C10′ (4590/4890)
C4/C4′ (4470/4770)	C8/C8′ (4550/4850)	C11/C11′ (4610/4910)
C5/C5′ (4490/4790)	C9/C9′ (4570/4870)	C12/C12′ (4630/4930)
C6/C6′ (4510/4810)		

Table 4: The Center Frequencies for the 10 MHz Wide-Band Paired Channels (D-Channels)

Table 4		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
D1/D1′ (4405/4705)	D3/D3′ (4425/4725)	D4/D4′ (4435/4735)
D2/D2′ (4415/4715)		
Second Priority Channels		
D5/D5′ (4445/4745)	D12/D12′ (4515/4815)	D19/D19′ (4585/4885)
D6/D6′ (4455/4755)	D13/D13′ (4525/4825)	D20/D20′ (4595/4895)
D7/D7′ (4465/4765)	D14/D14′ (4535/4835)	D21D21′ (4605/4905)
D8/D8′ (4475/4775)	D15/D15′ (4545/4845)	D22/D22′ (4615/4915)
D9/D9′ (4485/4785)	D16/D16′ (4555/4855)	D23/D23′ (4625/4925)
D10/D10′ (4495/4795)	D17/D17′ (4565/4865)	D24/D24′ (4635/4935)
D11/D11′ (4505/4805)	D18/D18′ (4575/4875)	

b. Tables 5 through 7 show the center frequencies of the narrow-band paired channels (i.e., Channels E-5 MHz, F-2.5 MHz, and G-1.5 MHz) in the 4400-4940 MHz Channel Plan and their respective channel status.

CENTER FREQUENCIES FOR THE NARROW-BAND PAIRED CHANNELS

Table 5: The Center Frequencies for the 5 MHz Narrow-Band Paired Channels (E-Channels)[6]

Table 5		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
E1/E1′ (4402.5/4702.5)	E4/E4′ (4417.5/4717.5)	E7/E7′ (4432.5/4732.5)
E2/E2′ (4407.5/4707.5)	E5/E5′ (4422.5/4722.5	E8/E8′ (4437.5/4737.5
E3/E3′ (4412.5/4712.5	E6/E6′ (4427.5/4727.5	
Third Priority Channels		
E9/E9′ (4442.5/4742.5)	E23/E23′ (4512.5/4812.5)	E37/E37′ (4582.5/4882.5)
E10/E10′ (4447.5/4747.5)	E24/E24′ (4517.5/4817.5)	E38/E38′ (4587.5/4887.5)
E11/E11′ (4452.5/4752.5)	E25/E25′ (4522.5/4822.5)	E39/E39′ (4592.5/4892.5)
E12/E12′ (4457.5/4757.5)	E26/E26′ (4527.5/4827.5)	E40/E40′ (4597.5/4897.5)
E13/E13′ (4462.5/4762.5)	E27/E27′ (4532.5/4832.5)	E41/E41′ (4602.5/4902.5)
E14/E14′ (4467.5/4767.5)	E28/E28′ (4537.5/4837.5)	E42/E42′ (4607.5/4907.5)
E15/E15′ (4472.5/4772.5)	E29/E29′ (4542.5/4842.5)	E43/E43′ (4612.5/4912.5)
E16/E16′ (4477.5/4777.5)	E30/E30′ (4547.5/4847.5)	E44/E44′ (4617.5/4917.5)
E17/E17′ (4482.5/4782.5)	E31/E31′ (4552.5/4852.5)	E45/E45′ (4622.5/4922.5)
E18/E18′ (4487.5/4787.5)	E32/E32′ (4557.5/4857.5)	E46/E46′ (4627.5/4927.5)
E19/E19′ (4492.5/4792.5)	E33/E33′ (4562.5/4862.5)	E47/E47′ (4632.5/4932.5)

6. There are no secondary channels for the E-Channels (5 MHz channels).

Table 5		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
E20/E20′ (4497.5/4797.5)	E34/E34′ (4567.5/4867.5)	E48/E48′ (4637.5/4937.5)
E21/E21′ (4502.5/4802.5)	E35/E35′ (4572.5/4872.5)	
E22/E22′ (4507.5/4807.5)	E36/E36′ (4577.5/4877.5)	

Table 6: The Center Frequencies for the 2.5 MHz Narrow-Band Paired Channels (F-Channels)[7]

Table 6		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
F1/F1′ (4401.25/4701.25)	F7/F7′ (4416.25/4716.25)	F12/F12′ (4428.75/4728.75)
F2/F2′ (4403.75/4703.75)	F8/F8′ (4418.75/4718.25)	F13/F13′ (4413.25/4731.25)
F3/F3′ (4406.25/4706.25	F9/F9′ (4421.25/4721.25)	F14/F14′ (4433.75/4733.75)
F4/F4′ (4408.75/4708.25)	F10/F10′ (4423.75/4723.25)	F15/F15′ (4436.25/4736.25)
F5/E5′ (4411.25/4711.25)	F11/F11′ (4426.25/4726.25)	F16/F16′ (4438.75/4738.75)
F6/F6′ (4413.75/4713.25)		
Third Priority Channels		
F17/F17′ (4441.25/4741.25)	F44/F44′(4508.75/4808.75)	F71/F71′ (4576.25/4876.25)
F18/F18′ (4443.75/4743.75)	F45/F45′ (4511.25/4811.25)	F72/F72′ (4578.75/4878.75)
F19/F19′ (4446.25/4746.25)	F46/F46′ (4513.75/4813.75)	F73/F73′ (4581.25/4881.25)
F20/F20′ (4448.75/4748.75)	F47/F47′ (4516.25/4816.25)	F74/F74′ (4583.75/4883.75)
F21/F21′ (4451.25/4751.25)	F48/F48′ (4518.75/4818.75)	F75/F75′ (4586.25/4886.25)
F22/F22′ (4453.75/4753.75)	F49/F49′ (4521.25/4821.25)	F76/F76′ (4588.75/4888.75)
F23/F23′ (4456.25/4756.25)	F50/F50′ (4523.75/4823.75)	F77/F77′ (4591.25/4891.25)
F24/F24′ (4458.75/4758.75)	F51/F51′ (4526.25/4826.25)	F78/F78′ (4593.75/4893.75)
F25/F25′ (4461.25/4761.25)	F52/F52′ (4528.75/4828.75)	F79/F79′ (4596.25/4896.25)
F26/F26′ (4463.75/4763.75)	F53/F53′ (4531.25/4831.25)	F80/F80′ (4598.75/4898.75)
F27/F27′ (4466.25/4766.25)	F54/F54′ (4533.75/4833.75)	F81/F81′ (4601.25/4901.25)
F28/F28′ (4468.75/4768.75)	F55/F55′ (4536.25/4836.25)	F82/F82′ (4603.75/4903.75)
F29/F29′ (4571.25/4771.25)	F56/F56′ (4538.75/4838.75)	F83/F83′ (4606.25/4906.25)
F30/F30′ (4473.75/4773.75)	F57/F57′ (4541.25/4841.25)	F84/F84′ (4608.75/4908.75)
F31/F31′ (4476.25/4776.25)	F58/F58′ (4543.75/4843.75)	F85/F85′ (4611.75/4911.75)
F32/F32′ (4478.75/4778.75)	F59/F59′ (4546.25/4846.25)	F86/F86′ (4613.25/4913.25)
F33/F33′ (4481.25/4781.25)	F60/F60′ (4548.75/4848.75)	E87/F87′ (4616.25/4916.25)
F34/F34′ (4483.75/4783.75)	F61/F61′ (4551.25/4851.25)	F88/F88′ (4618.75/4918.75)
F35/F35′ (4486.25/4786.25)	F62/F62′ (4553.75/4853.75)	F89/F89′ (4621.25/4921.25)
F36/F36′ (4488.75/4788.75)	F63/F63′ (4556.25/4856.25)	F90/F90′ (4623.75/4923.75)
F37/F37′ (4491.25/4791.25)	F64/F64′ (4558.75/4858.75)	F91/F91′ (4626.25/4926.25)
F38/F38′ (4493.75/4793.75)	F65/F65′ (4561.25/4861.25)	F92/F92′ (4628.75/4928.75)
F39/F39′ (4496.25/4796.25)	F66/F66′ (4563.75/4863.75)	F93/F93′ (4631.25/4931.25)
F40/F40′ (4498.75/4798.75)	F67/F67′ (4566.25/4866.25)	F94/F94′ (4633.75/4933.75)

7. There are no secondary channels for the F-Channels (2.5 MHz channels).

Table 6		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
F41/F41′ (4501.25/4801.25)	F68/F68′ (4568.75/4868.75)	F95/F95′ (4636.25/4936.25)
F42/F42′ (4503.75/4803.75)	F69/F69′ (4571.25/4871.25)	F96/F96′ (4638.75/4938.75)
F43/F43′ (4506.25/4806.25)	F70/F70′ (4573.75/4873.75)	

Table 7: The Center Frequencies for the 1.25 MHz Narrow-Band Paired Channels (G-Channels)[8]

Table 7		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
First Priority Channels		
G1/G1′ (4400.625/4700.625)	G12/G12′ (4414.375/4714.375)	G23/G23′ (4428.125/4728.125)
G2/G2′ (4401.875/4701.875)	G13/G13′ (4415.625/4715.625)	G24/G24′ (4429.375/4729.375)
G3/G3′ (4403.125/4703.125)	G14/G14′ (4416.875/4716.875)	G25/G25′ (4430.625/4730.625)
G4/G4′ (4404.375/4704.325)	G15/G15′ (4418.125/4718.125)	G26/G26′ (4431.875/4731.875)
G5/G5′ (4405.625/4705.625)	G16/G16′ (4419.375/4719.375)	G27/G27′ (4433.125/4733.125)
G6/G6′ (4406.875/4706.825)	G17/G17′ (4420.625/4720.625)	G28/G28′ (4434.375/4734.375)
G7/G7′ (4408.125/4708.125)	G18/G18′ (4421.875/4721.875)	G29/G29′ (4435.625/4735.625)
G8/G8′ (4409.375/4708.375)	G19/G19′ (4423.125/4721.125)	G30/G30′ (4436.875/4736.875)
G9/G9′ (4410.625/4710.625)	G20/G20′ (4424.375/4724.375)	G31/G31′ (4438.125/4738.125)
G10/G10′ (4411.875/4711.875)	G21/G21′ (4425.625/4725.625)	G32/G32′ (4439.375/4789.375)
G11/G11′ (4413.125/4713.125)	G22/G22′ (4426.875/4726.875)	
Third Priority Channels		
G33/G33′ (4440.625/4740.625)	G87/G87′ (4508.125/4808.125)	G141/G141′ (4575.625/4875.625)
G34/G34′ (4441.875/4741.875)	G88/G88′ (4509.375/4809.375)	G142/G142′ (4576.875/4876.875)
G35/G35′ (4443.125/4743.125)	G89/G89′ (4510.675/4810.675)	G143/G143′ (4578.125/4878.125)
G36/G36′ (4444.375/4744.375)	G90/G90′ (4511.875/4811.875)	G144/G144′ (4579.375/4879.375)
G37/G37′ (4445.625/4745.625)	G91/G91′ (4513.125/4813.125)	G145/G145′ (4580.625/4880.625)
G38/G38′ (4446.875/4746.875)	G92/G92′ (4514.625/4814.625)	G146/G146′ (4581.875/4881.875)
G39/G39′ (4448.125/4748.125)	G93/G93′ (4515.625/4815.625)	G147/G147′ (4583.125/4883.125)
G40/G40′ (4449.375/4748.375)	G94/G94′ (4516.875/4816.875)	G148/G148′ (4584.375/4884.375)
G41/G41′ (4450.625/4750.625)	G95/G95′ (4518.125/4818.125)	G149/G149′ (4585.625/4885.625)
G42/G42′ (4451.875/4751.875)	G96/G96′ (4519.375/4819.375)	G150/G150′ (4586.875/4886.875)
G43/G43′ (4453.125/4753.125)	G97/G97′ (4520.625/4820.625)	G151/G151′ (4588.125/4888.125)
G44/G44′ (4454.375/4754.375)	G98/G98′ (4521.875/4821.875)	G152/G152′ (4589.375/4889.375)
G45/G45′ (4455.625/4755.625)	G99/G99′ (4523.125/4823.125)	G153/G153′ (4590.625/4890.625)
G46/G46′ (4456.875/4756.875)	G100/G100′ (4524.375/4824.375)	G154/G154′ (4591.875/4891.875)
G47/G47′ (4458.125/4758.125)	G101/G101 (4525.625/4825.625)	G155/G155′ (4593.125/4893.125)
G48/G48′ (4459.375/4759.375)	G102/G102 (4526.875/4826.875)	G156/G156′ (4594.375/4594.375)
G49/G49′ (4460.625/4760.625)	G103/G103′ (4528.125/4828.125)	G157/G157′ (4595.625/4895.625)
G50/G50′ (4461.875/4761.875)	G104/G104′ (4529.375/4829.375)	G158/G158′ (4596.875/4896.875)
G51/G51′ (4463.125/4763.125)	G105/G105′ (4530.625/4830.625)	G159/G159′ (4598.125/4898.125)
G52/G52′ (4464.375/4764.375)	G106/G106′ (4531.875/4831.875)	G160/G160′ (4599.375/4899.375)
G53/G53′ (4465.625/4765.625)	G107/G107′ (4533.125/4833.125)	G161/G161′ (4600.625/4900.625)
G54/G54′ (4466.875/4766.875)	G108/G108′ (4534.375/4834.375)	G162/G162′ (4601.875/4901.875)
G55/G55′ (4468.125/4768.125)	G109/G109′ (4535.625/4835.625)	G163/G163′ (4603.125/4903.125)
G57/G57′ (4470.625/4770.625)	G110/G110′ (4536.875/4836.875)	G164/G164′ (4604.375/4904.375)
G58/G58′ (4471.875/4771.875)	G111/G111′ (4538.125/4838.125)	G165/G165′ (4605.625/4905.625)

[8]. There are no secondary channels for the G-Channels (1.25 MHz channels).

Table 7		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
G59/G59′ (4473.125/4773.125)	G112/G112′ (4539.375/4889.375)	G166/G166′ (4606.875/4906.875)
G60/G60′ (4474.375/4774.375)	G113/G113′ (4540.625/4840.625)	G167/G167′ (4608.125/4908.125)
G61/G61′ (4475.625/4775.625)	G114/G114′ (4541.875/4841.875)	G168/G168′ (4609.375/4909.375)
G62/G62′ (4476.875/4776.875)	G115/G115′ (4543.125/4843.125)	G169/G169′ (4610.625/4910.625)
G63/G63′ (4478.125/4778.125)	G116/G116′ (4544.375/4844.375)	G170/G170′ (4611.875/4911.875)
G64/G64′ (4479.375/4779.375)	G117/G117′ (4545.625/4845.625)	G171/G171′ (4613.125/4913.125)
G65/G65′ (4480.625/4780.625)	G118/G118′ (4546.875/4846.875)	G172/G172′ (4614.375/4914.375)
G66/G66′ (4481.875/4781.875)	G119/G119′ (4548.125/4848.125)	G173/G173′ (4615.625/4915.625)
G67/G67′ (4483.125/4783.125)	G120/G120′ (4549.375/4849.375)	G174/G174′ (4616.875/4916.875)
G56/G56′ (4469.375/4768.375)	G121/G121′ (4550.625/4850.625)	G175/G175′ (4618.125/4918.125)
G68/G68′ (4484.375/4784.375)	G122/G122′ (4551.875/4851.875)	G176/G176′ (4619.375/4919.375)
G69/G69′ (4485.625/4785.625)	G123/G123′ (4553.125/4853.125)	G177/G177′ (4620.625/4920.625)
G70/G70′ (4486.875/4786.875)	G124/G124′ (4554.375/4854.375)	G178/G178′ (4621.875/4921.875)
G71/G71′ (4488.125/4788.125)	G125/G125′ (4555.625/4855.625)	G179/G179′ (4623.125/4923.125)
G72/G72′ (4489.375/4789.375)	G126/G126′ (4556.875/4856.875)	G180/G180′ (4624.375/4924.375)
G73/G73′ (4490.625/4790.625)	G127/G127′ (4858.125/4858.125)	G181/G181′ (4625.625/4925.625)
G74/G74′ (4491.875/4791.875)	G128/G128′ (4559.375/4559.375)	G182/G182′ (4626.875/4926.875)
G75/G75′ (4493.125/4793.125)	G129/G129′ (4560.625/4860.625)	G183/G183′ (4628.125/4928.125)
G76/G76′ (4494.375/4794.375)	G130/G130′ (4561.875/4861.875)	G184/G184′ (4629.375/4929.375)
G77/G77′ (4495.625/4795.625)	G131/G131′ (4563.125/4863.125)	G185/G185′ (4630.625/4930.625)
G78/G78′ (4496.875/4796.875)	G132/G132′ (4564.375/4864.375)	G186/G186′ (4631.875/4931.875)
G79/G79′ (4498.125/4798.125)	G133/G133′ (4565.625/4865.625)	G187/G187′ (4633.125/4933.125)
G80/G80′ (4499.375/4799.375)	G134/G134′ (4566.875/4866.875)	G188/G188′ (4634.375/4934.375)
G81/G81′ (4500.625/4800.625)	G135/G135′ (4568.125/4868.125)	G189/G189′ (4635.625/4935.625)
G82/G82′ (4501.875/4801.875)	G136/G136′ (4569.375/4869.375)	G190/G190′ (4636.875/4936.875)
G83/G83′ (4503.125/4803.125)	G137/G137′ (4570.625/4870.625)	G191/G191′ (4638.125/4938.125)
G84/G84′ (4504.375/4804.375)	G138/G138′ (4571.875/4871.825)	G192/G192′ (4639.375/4939.375)
G85/G85′ (4505.625/4805.625)	G139/G139′ (4573.125/4873.125)	
G86/G86′ (4506.875/4806.875)	G140/G140′ (4574.375/4874.375)	

c. Table 8 shows the center frequencies of the unpaired or single channels in the 4400-4940 MHz Channel Plan and their respective channel status.

CENTER FREQUENCIES OF THE UNPAIRED OR SINGLE CHANNELS

Table 8: The Center Frequencies for the Unpaired or Single Channels in the 4400-4940 MHz Channel Plan

Table 8		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
30 MHz Channels (Third Priority B-Channels)		
B9 (4655)	B10 (4685)	
20 MHz Channels (Third Priority C-Channels)		
C13 (4650)	C14 (4670)	C15 (4690)
10 MHz Channels (First Priority D-Channels)		
D25 (4645)	D27 (4665)	D29 (4685)
D26 (4655)	D28 (4675)	D30 (4695)
5 MHz Channels (First Priority E-Channels)		
E49 (4642.5)	E53 (4662.5)	E57 (4682.5)

Table 8		
Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
E50 (4647.5)	E54(4667.5)	E58 (4687.5)
E51 (4652.5)	E55 (4672.5)	E59 (4692.5)
E52 (4657.5)	E56 (4677.5)	E60 (4697.5)
2.5 MHz Channels (First Priority F-Channels)		
F97 (4641.25)	F105 (4661.25)	F113 (4681.25)
F98 (4643.75)	F106 (4663.75)	F114 (4683.75)
F99 (4646.25)	F107 (4666.25)	F115 (4686.25)
F100 (4648.75)	F108 (4668.75)	F116 (4688.75)
F101 (4651.25)	F109(4671.25)	F117 (4691.25)
F102 (4653.75)	F110 (4673.75)	F118 (4693.75)
F103 (4656.25)	F111 (4676.25)	F119 (4696.25)
F104 (4658.75)	F112 (4678.75)	F120 (4698.75)
1.25 MHz Channels (First Priority G-Channels)		
G193 (4640.625)	G209 (4660.625)	G225 (4680.625)
G194 (4641.875)	G210 (4661.875)	G226 (4681.875)
G195 (4643.125)	G211 (4663.125)	G227 (4683.125)
G196 (4644.375)	G212 (4664.375)	G228 (4684.375)
G197 (4645.625)	G213 (4665.625)	G229 (4685.625)
G198 (4646.875)	G214 (4666.875)	G230 (4686.875)
G199 (4648.125)	G215 (4668.125)	G231 (4688.125)
G200 (4649.375)	G216 (4669.375)	G232 (4689.375)
G201 (4650.625)	G217 (4670.625)	G233 (4690.625)
G202 (4651.875)	G218 (4671.875)	G234 (4691.875)
G203 (4653.125)	G219 (4673.125)	G235 (4693.125)
G204 (4654.375)	G220 (4674.375)	G236 (4694.375)
G205 (4655.625)	G221 (4675.625)	G237 (4695.625)
G206 (4656.875)	G222 (4676.875)	G238 (4696.875)
G207 (4658.125)	G223 (4678.125)	G239 (4698.125)
G208 (4659.375)	G224 (4679.375)	G240 (4699.375)

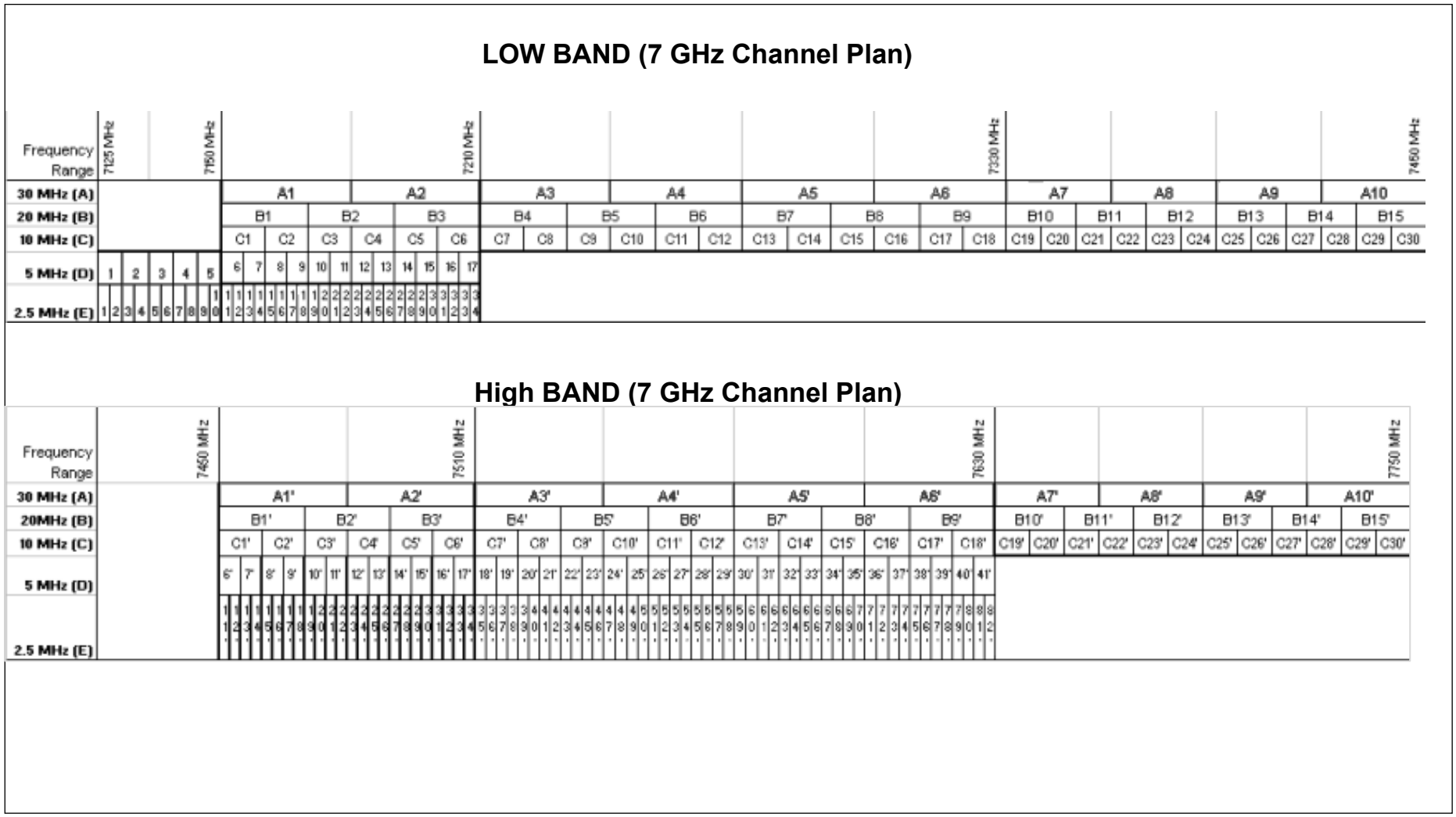
4.3.19 7125-8500 MHz Channel Plan

1. This section describes the 7125-8500 MHz Channel Plan for stations operating in the fixed service and provides guidance on its implementation. This plan will become effective December 1, 2009 and all incumbent frequency assignments in the 7125-8500 MHz band will be grandfathered until the equipment or frequency is changed.[9]

2. Figure 1 and 2 provide an overview of the 7125-8500 MHz Channel Plan. The plan consists of the 7125-7750 MHz (7GHz) Channel Plan (Figure 1) and the 7750-8500 MHz (8GHz) Channel Plan (Figure 2).

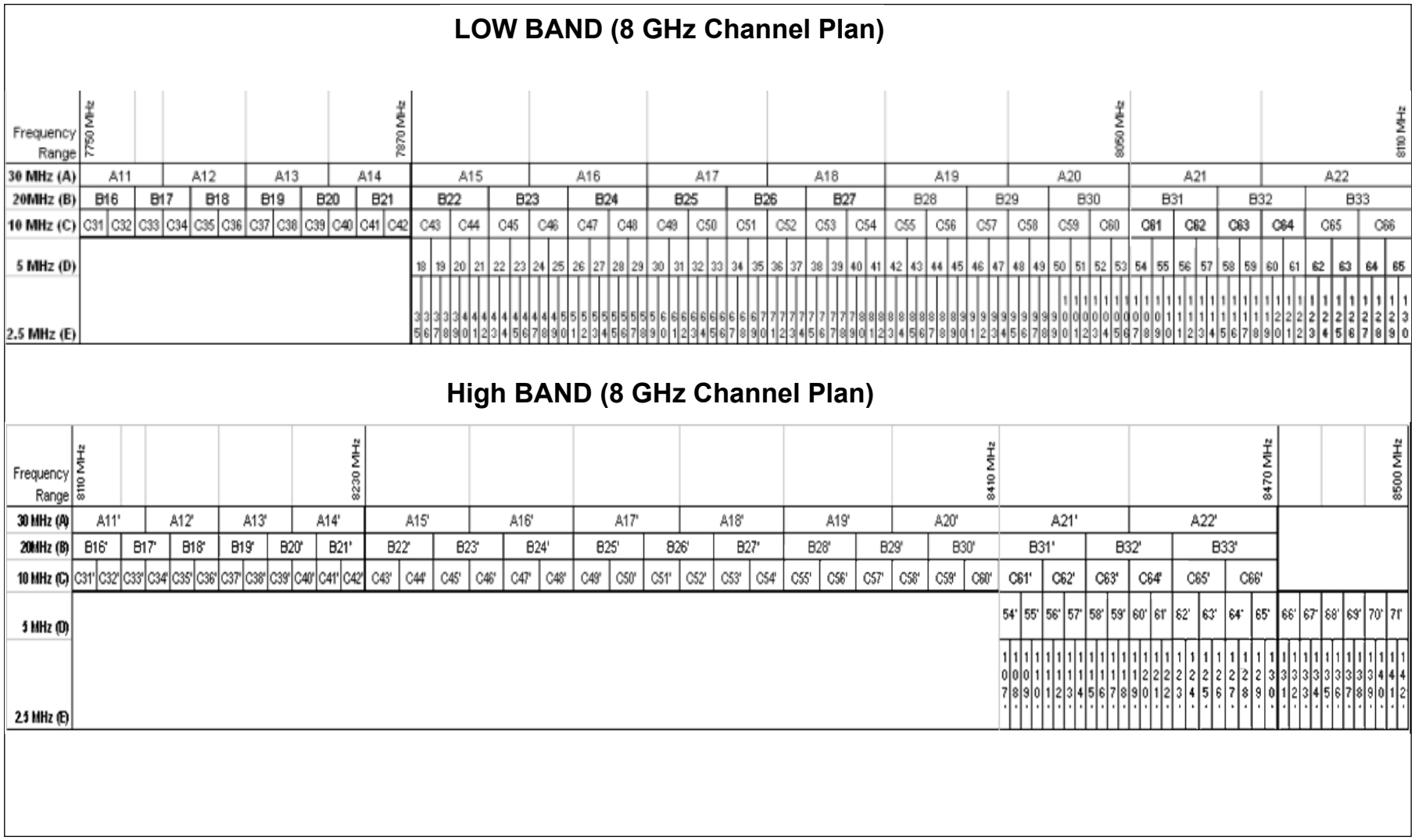
[9] Any system currently in the Government Master File or on the Frequency Assignment Subcommittee agenda before December 1, 2009 will be "grandfathered".

Figure 1: 7 GHz Channel Plan



Note: Paired channels will be implemented for fixed microwave operations using A1 with A1', A2 with A2', etc.

Figure 2: 8 GHz Channel Plan



Note: Paired channels will be implemented for fixed microwave operations using B16 with B16', B17 with B17', etc.

3. Procedure for Frequency Selection

a. The selection of frequencies for new fixed service systems (does not include transportable systems) will be performed by NTIA Spectrum Engineering and Analysis Division (SEAD) in conjunction with the NTIA Frequency Assignment Branch (FAB) within 9 workdays of receipt of complete data.

b. The federal agency submitting a frequency selection request must provide the following information in card format to SEADFASSupport@ntia.doc.gov.

(1) Transmitter and Receiver nomenclature and model (e.g. Alcatel MDR-8704S-155)

(2) Transmitter and Receiver coordinates of the proposed location(s) of deployment

(3) Transmitter power (in watts)

(4) Transmitter Equivalent Isotropically Radiated Power (in watts)

(5) Transmitter emission spectrum (i.e., -3dB, -20dB, and -60dB)

(6) Emission designator (modulation type and bandwidth) (e.g. 5M50D7W)

(7) Receiver radio frequency and intermediate frequency selectivity (i.e., -3dB, -20dB, and -60dB)

(8) Receiver noise figure (in dB)

(9) Transmitter and Receiver antenna model (e.g. Andrew HP6-44)

(10) Transmitter and Receiver antenna type

(11) Transmitter and Receiver mainbeam antenna gain (in dBi)

(12) Transmitter and Receiver antenna azimuth and elevation gain pattern (dB relative to mainbeam)

(13) Transmitter and Receiver antenna heights (in meters)

(14) Transmitter and Receiver antenna elevation (above mean sea level) (in meters)

(15) Transmitter and Receiver antenna polarization

c. SEAD will be provided to the requesting agency the selected frequencies for review. Upon agreeing to the frequencies identified, the agency will submit the selected frequencies to the FAS using the existing process. If the submitting agency disagrees with the selected frequencies, the agency will work with SEAD staff members to identify mutually agreeable frequencies.

4. Agency's shall enter the link ID number (seven digit number) and date at the bottom right hand corner of SEAD report in the GMF application remarks line.

5. Applicable Guidance. In implementing the 7125-8500 MHz Channel Plan, the following guidance applies.

a. This channel plan only applies to fixed and/or transportable assignments. This plan does not apply to mobile, airborne, air to ground (i.e. Space to Earth) or ground to air (i.e. Earth to space) operations, however, NTIA encourages that agencies use this channel plan whenever possible.

b. Incumbent fixed and/or transportable assignments will be grandfathered until the end of the life-cycle of the equipment and all replacement equipment will utilize frequencies in accordance with the channel plan. Other assignments should use this channel plan to the extent possible.

c. Any request for changes or modifications to "grandfathered" fixed and/or transportable assignments, except for the frequency, will be governed by existing NTIA procedures. However, if the operating frequency is to be modified, the replacement frequency will be selected in accordance with the channel plan.

d. The First Priority Channels will be considered first before the other designated channels.

e. The Second Priority Channels will be considered if the First Priority Channels are not available.

f. Fixed assignments may use either channel of a paired-channel if the one-way channels are not available and one-way channels may be used for paired assignments if paired channels are not available.

g. Fixed and/or transportable assignments for which the emission bandwidth of a channel will use the next available wider channel in the channel plan. For example, an assignment with an emission bandwidth of 24 MHz will use a 30 MHz channel.

h. Fixed and/or transportable assignments for which the emission bandwidth exceeds 40 MHz may use concatenated channels[10] commensurate with the emission bandwidth. However, the center frequency of the concatenated channels should be one of the center frequencies listed in the channel plan. For example, an assignment with an emission bandwidth of 60 MHz would require two concatenated 30 MHz channels.

i. Experimental stations may use any frequency in the 7125-8500 MHz under the condition that if the equipment/system becomes operational it must comply with the channel plan.

5. The following tables list the center frequencies of the paired-channels and single or unpaired channels.

a. Tables 1 through 5 shows the center frequencies of the paired-channels in the 7125-8500 MHz channel plan and their priority status.

Table 1: The Center Frequencies of the 30 MHz Paired Channels[11]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
A1/A1' (7165 / 7465)	A7/A7' (7345 / 7645)	A9/A9' (7405 / 7705)
A2/A2' (7195 / 7495)	A8/A8' (7375 / 7675)	A10/A10' (7435 / 7735)
SECOND PRIORITY CHANNELS		
A11/A11' (7765 / 8125)	A13/A13' (7825 / 8185)	A21/A21' (8065 / 8425)
A12/A12' (7795 / 8155)	A14/A14' (7855 / 8215)	A22/A22' (8095 / 8455)

Table 2: The Center Frequencies of the 20 MHz Paired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
B16/B16' (7760 / 8120)	B18/B18' (7800 / 8160)	B20/B20' (7840 / 8200)
B17/B17' (7780 / 8140)	B19/B19' (7820 / 8180)	B21/B21' (7860 / 8220)
SECOND PRIORITY CHANNELS		
B1/B1' (7160 / 7460)	B11/B11' (7360 / 7660)	B15/B15' (7440 / 7740)
B2/B2' (7180 / 7480)	B12/B12' (7380 / 7680)	B31/B31' (8060 / 8420)
B3/B3' (7200 / 7500)	B13/B13' (7400 / 7700)	B32/B32' (8080 / 8440)
B10/B10' (7340 / 7640)	B14/B14' (7420 / 7720)	B33/B33' (8100 / 8460)

[10] The term "concatenated channels" means any two or more adjacent channels in the 7125-8500 MHz band joined together for the purpose of accommodating a radio communication system or operation having an emission bandwidth that exceeds the widest channel bandwidth in the channel plan.

[11] In the situation wherein one site is transmitting and receiving multiple 30 MHz bandwidth (BW) channels, unless a site engineering study is performed, precautions should be taken to allow a minimum transmit-receive (T/R) separation of 60 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels A1/A1' and A10/A10' (T/R = 30 MHz between A1' and A10) or A11/A11' and A22/A22' (T/R = 30 MHz between A11' and A22) at a single site.

Table 3: The Center Frequencies of the 10 MHz Paired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
C61/C61' (8055 / 8415)	C63/C63' (8075 / 8435)	
C62/C62' (8065 / 8425)	C64/C64' (8085 / 8445)	
SECOND PRIORITY CHANNELS		
C1 /C1 ' (7155 / 7455)	C24/C24' (7385 / 7685)	C35/C35' (7795 / 8155)
C2 /C2 ' (7165 / 7465)	C25/C25' (7395 / 7695)	C36/C36' (7805 / 8165)
C3 /C3 ' (7175 / 7475)	C26/C26' (7405 / 7705)	C37/C37' (7815 / 8175)
C4 /C4 ' (7185 / 7485)	C27/C27' (7415 / 7715)	C38/C38' (7825 / 8185)
C5 /C5 ' (7195 / 7495)	C28/C28' (7425 / 7725)	C39/C39' (7835 / 8195)
C6 /C6 ' (7205 / 7505)	C29/C29' (7435 / 7735)	C40/C40' (7845 / 8205)
C19/C19' (7335 / 7635)	C30/C30' (7445 / 7745)	C41/C41' (7855 / 8215)
C20/C20' (7345 / 7645)	C31/C31' (7755 / 8115)	C42/C42' (7865 / 8225)
C21/C21' (7355 / 7655)	C32/C32' (7765 / 8125)	C65/C65' (8095 / 8455)
C22/C22' (7365 / 7665)	C33/C33' (7775 / 8135)	C66/C66' (8105 / 8465)
C23/C23' (7375 / 7675)	C34/C34' (7785 / 8145)	

Table 4: The Center Frequencies of the 5 MHz Paired Channels[12]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
D62/D62' (8092.5 / 8452.5)	D64/D64' (8102.5 / 8462.5)	
D63/D63' (8097.5 / 8457.5)	D65/D65' (8107.5 / 8467.5)	
SECOND PRIORITY CHANNELS		
D6 /D6 ' (7152.5 / 7452.5)	D13/D13' (7187.5 / 7487.5)	D56/D56' (8062.5 / 8422.5)
D7 /D7 ' (7157.5 / 7457.5)	D14/D14' (7192.5 / 7492.5)	D57/D57' (8067.5 / 8427.5)
D8 /D8 ' (7162.5 / 7462.5)	D15/D15' (7197.5 / 7497.5)	D58/D58' (8072.5 / 8432.5)
D9 /D9 ' (7167.5 / 7467.5)	D16/D16' (7202.5 / 7502.5)	D59/D59' (8077.5 / 8437.5)
D10/D10' (7172.5 / 7472.5)	D17/D17' (7207.5 / 7507.5)	D60/D60' (8082.5 / 8442.5)
D11/D11' (7177.5 / 7477.5)	D54/D54' (8052.5 / 8412.5)	D61/D61' (8087.5 / 8447.5)
D12/D12' (7182.5 / 7482.5)	D55/D55' (8057.5 / 8417.5)	

[12] In the situation wherein one site is transmitting and receiving multiple 20 MHz BW channels, unless a site engineering study is performed, precautions should be taken to allow a minimum T/R separation of 40 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels B1/B1' and B15/B15' (T/R = 20 MHz between B1' and B15) or B16/B16' and B33/B33' (T/R = 20 MHz between B16' and B33) at a single site.

Table 5: The Center Frequencies of the 2.5 MHz Paired Channels[13]

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
E123/E123' (8091.25/8451.25)	E126/E126' (8098.75 / 8458.75)	E129/E129' (8106.25 / 8466.25)
E124/E124' (8093.75/8453.75)	E127/E127' (8101.25 / 8461.25)	E130/E130' (8108.75 / 8468.75)
E125/E125' (8096.25/8456.25)	E128/E128' (8103.75 / 8463.75)	
SECOND PRIORITY CHANNELS		
E11 /E11 ' (7151.25 / 7451.25)	E25 /E25 ' (7186.25 / 7486.25)	E111/E111' (8061.25 / 8421.25)
E12 /E12 ' (7153.75 / 7453.75)	E26 /E26 ' (7188.75 / 7488.75)	E112/E112' (8063.75 / 8423.75)
E13 /E13 ' (7156.25 / 7456.25)	E27 /E27 ' (7191.25 / 7491.25)	E113/E113' (8066.25 / 8426.25)
E14 /E14 ' (7158.75 / 7458.75)	E28 /E28 ' (7193.75 / 7493.75)	E114/E114' (8068.75 / 8428.75)
E15 /E15 ' (7161.25 / 7461.25)	E29 /E29 ' (7196.25 / 7496.25)	E115/E115' (8071.25 / 8431.25)
E16 /E16 ' (7163.75 / 7463.75)	E30 /E30 ' (7198.75 / 7498.75)	E116/E116' (8073.75 / 8433.75)
E17 /E17 ' (7166.25 / 7466.25)	E31 /E31 ' (7201.25 / 7501.25)	E117/E117' (8076.25 / 8436.25)
E18 /E18 ' (7168.75 / 7468.75)	E32 /E32 ' (7203.75 / 7503.75)	E118/E118' (8078.75 / 8438.75)
E19 /E19 ' (7171.25 / 7471.25)	E33 /E33 ' (7206.25 / 7506.25)	E119/E119' (8081.25 / 8441.25)
E20 /E20 ' (7173.75 / 7473.75)	E34 /E34 ' (7208.75 / 7508.75)	E120/E120' (8083.75 / 8443.75)
E21 /E21 ' (7176.25 / 7476.25)	E107/E107' (8051.25 / 8411.25)	E121/E121' (8086.25 / 8446.25)
E22 /E22 ' (7178.75 / 7478.75)	E108/E108' (8053.75 / 8413.75)	E122/E122' (8088.75 / 8448.75)
E23 /E23 ' (7181.25 / 7481.25)	E109/E109' (8056.25 / 8416.25)	
E24 /E24 ' (7183.75 / 7483.75)	E110/E110' (8058.75 / 8418.75)	

b. Tables 6 through 10 shows the center frequencies of the unpaired-channels in the 7125-8500 MHz channel and their priority status.

Table 6: The Center Frequencies of the 30 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
[6]A3 (7225)	A6 (7315) [14]	A5' (7585)
[6]A4 (7255)	A3' (7525)	A6' (7615)
A5 (7285) [14]	A4' (7555)	
SECOND PRIORITY CHANNELS		

[13] In the situation wherein one site is transmitting and receiving multiple 10 MHz BW channels, unless a site engineering study is performed, precautions should be taken to allow a minimum T/R separation of 20 MHz between the transmit and receive frequencies to ensure sufficient isolation between the transmitter and the receiver. In this case, avoid assigning channels C1/C1' and C30/C30' (T/R = 10 MHz between C1' and C30) or C31/C31' and C66/C66' (T/R = 10 MHz between C31' and C66) at a single site.

[14] This channel may also be used for pairing with a narrower bandwidth channel in the Unpaired Channels pool (e.g. A3/D'18, or A3/E'35) for applications that have asymmetric radio capacity requirement (i.e. radio capacity requirement in one direction is greater than the other direction).

A15 (7885)	A19 (8005)	A17' (8305)
A16 (7915)	A20 (8035)	A18' (8335)
A17 (7945)	A15' (8245)	A19' (8365)
A18 (7975)	A16' (8275)	A20' (8395)

Table 7: The Center Frequencies of the 20 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
B22 (7880)	B26 (7960)	B24' (8280) [14]
B23 (7900)	B27 (7980)	B25' (8300) [14]
B24 (7920)	B22' (8240) [14]	B26' (8320) [14]
B25 (7940)	B23' (8260) [14]	B27' (8340) [14]
SECOND PRIORITY CHANNELS		
B4 (7220)	B4' (7520)	B28 (8000)
B5 (7240)	B5' (7540)	B29 (8020)
B6 (7260)	B6' (7560)	B30 (8040)
B7 (7280)	B7' (7580)	B28' (8360)
B8 (7300)	B8' (7600)	B29' (8380)
B9 (7320)	B9' (7620)	B30' (8400)

Table 8: The Center Frequencies of the 10 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
C55 (7995)	C59 (8035)	C57' (8375) [14]
C56 (8005)	C60 (8045)	C58' (8385) [14]
C57 (8015)	C55' (8355) [14]	C59' (8395) [14]
C58 (8025)	C56' (8365) [14]	C60' (8405) [14]
SECOND PRIORITY CHANNELS		
C7 (7215)	C11' (7555)	C51 (7955)
C8 (7225)	C12' (7565)	C52 (7965)
C9 (7235)	C13' (7575)	C53 (7975)
C10 (7245)	C14' (7585)	C54 (7985)
C11 (7255)	C15' (7595)	C43' (8235)
C12 (7265)	C16' (7605)	C44' (8245)
C13 (7275)	C17' (7615)	C45' (8255)
C14 (7285)	C18' (7625)	C46' (8265)
C15 (7295)	C43 (7875)	C47' (8275)
C16 (7305)	C44 (7885)	C48' (8285)
C17 (7315)	C45 (7895)	C49' (8295)

C18 (7325)	C46 (7905)	C50' (8305)
C7' (7515)	C47 (7915)	C51' (8315)
C8' (7525)	C48 (7925)	C52' (8325)
C9' (7535)	C49 (7935)	C53' (8335)
C10' (7545)	C50 (7945)	C54' (8345)

Table 9: The Center Frequencies of the 5 MHz Unpaired Channels

Channel (Frequency in MHz)	**Channel (Frequency in MHz)**	**Channel (Frequency in MHz)**
FIRST PRIORITY CHANNELS		
D1 (7127.5)	D5 (7147.5)	D69' (8487.5)
D2 (7132.5)	D66' (8472.5)	D70' (8492.5)
D3 (7137.5)	D67' (8477.5)	D71' (8497.5)
D4 (7142.5)	D68' (8482.5)	
SECOND PRIORITY CHANNELS		
D18 (7872.5)	D38 (7972.5)	D22' (7532.5)
D19 (7877.5)	D39 (7977.5)	D23' (7537.5)
D20 (7882.5)	D40 (7982.5)	D24' (7542.5)
D21 (7887.5)	D41 (7987.5)	D25' (7547.5)
D22 (7892.5)	D42 (7992.5)	D26' (7552.5)
D23 (7897.5)	D43 (7997.5)	D27' (7557.5)
D24 (7902.5)	D44 (8002.5)	D28' (7562.5)
D25 (7907.5)	D45 (8007.5)	D29' (7567.5)
D26 (7912.5)	D46 (8012.5)	D30' (7572.5)
D27 (7917.5)	D47 (8017.5)	D31' (7577.5)
D28 (7922.5)	D48 (8022.5)	D32' (7582.5)
D29 (7927.5)	D49 (8027.5)	D33' (7587.5)
D30 (7932.5)	D50 (8032.5)	D34' (7592.5)
D31 (7937.5)	D51 (8037.5)	D35' (7597.5)
D32 (7942.5)	D52 (8042.5)	D36' (7602.5)
D33 (7947.5)	D53 (8047.5)	D37' (7607.5)
D34 (7952.5)	D18' (7512.5)	D38' (7612.5)
D35 (7957.5)	D19' (7517.5)	D39' (7617.5)
D36 (7962.5)	D20' (7522.5)	D40' (7622.5)
D37 (7967.5)	D21' (7527.5)	D41' (7627.5)

Table 10: The Center Frequencies of the 2.5 MHz Unpaired Channels

Channel (Frequency in MHz)	Channel (Frequency in MHz)	Channel (Frequency in MHz)
FIRST PRIORITY CHANNELS		
E1 (7126.25)	E9 (7146.25)	E137' (8486.25)
E2 (7128.75)	E10 (7148.75)	E138' (8488.75)
E3 (7131.25)	E131' (8471.25)	E139' (8491.25)
E4 (7133.75)	E132' (8473.75)	E140' (8493.75)
E5 (7136.25)	E133' (8476.25)	E141' (8496.25)
E6 (7138.75)	E134' (8478.75)	E142' (8498.75)
E7 (7141.25)	E135' (8481.25)	
E8 (7143.75)	E136' (8483.75)	
SECOND PRIORITY CHANNELS		
E35 (7871.25)	E75 (7971.25)	E43' (7531.25)
E36 (7873.75)	E76 (7973.75)	E44' (7533.75)
E37 (7876.25)	E77 (7976.25)	E45' (7536.25)
E38 (7878.75)	E78 (7978.75)	E46' (7538.75)
E39 (7881.25)	E79 (7981.25)	E47' (7541.25)
E40 (7883.75)	E80 (7983.75)	E48' (7543.75)
E41 (7886.25)	E81 (7986.25)	E49' (7546.25)
E42 (7888.75)	E82 (7988.75)	E50' (7548.75)
E43 (7891.25)	E83 (7991.25)	E51' (7551.25)
E44 (7893.75)	E84 (7993.75)	E52' (7553.75)
E45 (7896.25)	E85 (7996.25)	E53' (7556.25)
E46 (7898.75)	E86 (7998.75)	E54' (7558.75)
E47 (7901.25)	E87 (8001.25)	E55' (7561.25)
E48 (7903.75)	E88 (8003.75)	E56' (7563.75)
E49 (7906.25)	E89 (8006.25)	E57' (7566.25)
E50 (7908.75)	E90 (8008.75)	E58' (7568.75)
E51 (7911.25)	E91 (8011.25)	E59' (7571.25)
E52 (7913.75)	E92 (8013.75)	E60' (7573.75)
E53 (7916.25)	E93 (8016.25)	E61' (7576.25)
E54 (7918.75)	E94 (8018.75)	E62' (7578.75)
E55 (7921.25)	E95 (8021.25)	E63' (7581.25)
E56 (7923.75)	E96 (8023.75)	E64' (7583.75)
E57 (7926.25)	E97 (8026.25)	E65' (7586.25)
E58 (7928.75)	E98 (8028.75)	E66' (7588.75)
E59 (7931.25)	E99 (8031.25)	E67' (7591.25)
E60 (7933.75)	E100 (8033.75)	E68' (7593.75)
E61 (7936.25)	E101 (8036.25)	E69' (7596.25)
E62 (7938.75)	E102 (8038.75)	E70' (7598.75)
E63 (7941.25)	E103 (8041.25)	E71' (7601.25)
E64 (7943.75)	E104 (8043.75)	E72' (7603.75)

E65 (7946.25)	E105 (8046.25)	E73' (7606.25)
E66 (7948.75)	E106 (8048.75)	E74' (7608.75)
E67 (7951.25)	E35' (7511.25)	E75' (7611.25)
E68 (7953.75)	E36' (7513.75)	E76' (7613.75)
E69 (7956.25)	E37' (7516.25)	E77' (7616.25)
E70 (7958.75)	E38' (7518.75)	E78' (7618.75)
E71 (7961.25)	E39' (7521.25)	E79' (7621.25)
E72 (7963.75)	E40' (7523.75)	E80' (7623.75)
E73 (7966.25)	E41' (7526.25)	E81' (7626.25)
E74 (7968.75)	E42' (7528.75)	E82' (7628.75)

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