(c) Stations located between 16 km (10 miles) and 128 km (80 miles) of a TV transmitter operating on either Channel 4 or 5, or from the post office of a community in which either channel is assigned but not in operation, are secondary to TV operations within the Grade B service contour.[1]

Subpart Q—Stations in the Radiodetermination Service

§ 87.471 Scope of service.

Stations in the aeronautical radiodetermination service provide radionavigation and radiolocation services.

(a) Transmission by radionavigation land stations must be limited to aeronautical navigation, including obstruction warning.

(b) Radionavigation land test stations are used for the testing and calibration of aircraft navigational aids and associated equipment. When used as radionavigation land test stations (MTF) signal generators must be licensed as radionavigation land test stations (MTF). Transmission must be limited to cases when radiation is necessary and there is no alternative.

(c) Transmissions by emergency locator transmitter (ELT) test stations must be limited to necessary testing of ELTs and to training operations related to the use of such transmitters.

[53 FR 28940, Aug. 1, 1988, as amended at 58 FR 67696, Dec. 22, 1993]

§ 87.473 Supplemental eligibility.

(a) Licenses for radionavigation land test stations (MTF) will be granted only to applicants engaged in the development, manufacture or maintenance of aircraft radionavigation equipment. Licenses for radionavigation land test stations (OTF) will be granted only to applicants who agree to establish the facility at an airport for the use of the public.

(b) Licenses for ELT test stations will be granted only to applicants to train personnel in the operation and location of ELTs, or for testing related to the manufacture or design of ELTs.

[53 FR 28940, Aug. 1, 1988, as amended at 63 FR 68958, Dec. 14, 1998]

§ 87.475 Frequencies.

(a) *Frequency coordination.* The Commission will assign frequencies to radionavigation land stations and radionavigation land test stations after coordination with the FAA. The applicant must notify the appropriate Regional Office of the FAA prior to submission to the Commission of an application for a new station or for modification of an existing station to change frequency, power, location or emission. Each application must include the FAA Regional Office notified and date of notification.

(b) *Frequencies available for radionavigation land stations.* (1) LORAN-C is a long range navigation system which operates in the 90–110 kHz band.

(2) Radiobeacon stations enable an aircraft station to determine bearing or direction in relation to the radiobeacon station. Radiobeacons operate in the bands 190–285 kHz; 325–435 kHz; 510–525 kHz; and 525–535 kHz. Radiobeacons may be authorized, primarily for off-shore use, in the band 525–535 kHz on a non-interference basis to travelers information stations.

(3) Aeronautical marker beacon stations radiate a vertical distinctive pattern on 75 MHz which provides position information to aircraft.

(4) The following table lists the specific frequencies in the 108.100–111.950 MHz band which are assignable to localizer stations with simultaneous radiotelephone channels and their associated glide path station frequency from the 328.600–335.400 MHz band.

Localizer (MHz)	Glide path (MHz)
108.100	334.700
108.150	334.550
108.300	334.100
108.350	333.950
108.500	329.900
108.550	329.750

[1] OET Bulletin No. 67, March 1988, entitled ''Potential Interference from Operational Fixed Stations in the 72–76 MHz Band to Television Channels 4 and 5'' describes an analytical model that can be used to calculate the potential interference that might result from a given fixed station operation. Copies of the bulletin may be obtained from the Commission's current duplication contractor. Information concerning the current duplication contractor may be obtained from the Office of Public Affairs, Consumer Assistance and Small Business Division, Telephone (202) 632–5050.

Localizer (MHz)	Glide path (MHz)
108.700	330.500
108.750	330.350
108.900	329.300
108.950	329.150
109.100	331.400
109.150	331.250
109.300	332.000
109.350	331.850
109.500	332.600
109.550	332.450
109.700	333.200
109.750	333.050
109.900	333.800
109.950	333.650
110.100	334.400
110.150	334.250
110.300	335.000
110.350	334.850
110.500	329.600
110.550	329.450
110.700	330.200
110.750	330.050
110.900	330.800
110.950	330.650
111.100	331.700
111.150	331.550
111.300	332.300
111.350	332.150
111.500	332.900
111.550	332.750
111.700	333.500
111.750	333.350
111.900	331.100
111.950	330.950

(5) VHF omni-range (VOR) stations are to be assigned frequencies in the 112.050–117.950 MHz band (50 kHz channel spacing) and the following frequencies in the 108–112 MHz band:

108.200	110.200
108.250	110.250
108.400	110.400
108.450	110.450
108.600	110.600
108.650	110.650
108.800	110.800
108.850	110.850
109.000	111.000
109.050	111.050
109.200	111.200
109.250	111.250
109.400	111.400
109.450	111.450
109.600	111.600
109.650	111.650
109.800	111.800
109.850	111.850
110.000	112.000
110.050	

(6) The band 960–1215 MHz is available for the use of land stations and associated airborne electronic aids to air navigation. When distance measuring equipment (DME) is intended to operate with a single VHF navigation station in the 108–117.975 MHz band, the DME operating channel must be paired with the VHF channel as shown in the following table:

DME CHANNELING AND PAIRING

[MHz]

VHF channel	Airborne interrogating frequency	Ground reply frequency
108.000	1041.000	978.000
108.050	1041.000	1104.000
108.100	1042.000	979.000
108.150	1042.000	1105.000
108.200	1043.000	980.000
108.250	1043.000	1106.000
108.300	1044.000	981.000
108.350	1044.000	1107.000
108.400	1045.000	982.000
108.450	1045.000	1108.000
108.500	1046.000	983.000
108.550	1046.000	1109.000
108.600	1047.000	984.000
108.650	1047.000	1110.000
108.700	1048.000	985.000
108.750	1048.000	1111.000
108.800	1049.000	986.000
108.850	1049.000	1112.000
108.900	1050.000	987.000
108.950	1050.000	1113.000
109.000	1051.000	988.000
109.050	1051.000	1114.000
109.100	1052.000	989.000
109.150	1052.000	1115.000
109.200	1053.000	990.000
109.250	1053.000	1116.000
109.300	1054.000	991.000
109.350	1054.000	1117.000
109.400	1055.000	992.000
109.450	1055.000	1118.000
109.500	1056.000	993.000
109.550	1056.000	1119.000
109.600	1057.000	994.000
109.650	1057.000	1120.000
109.700	1058.000	995.000
109.750	1058.000	1121.000
109.800	1059.000	996.000
109.850	1059.000	1122.000
109.900	1060.000	997.000
109.950	1060.000	1123.000
110.000	1061.000	998.000
110.050	1061.000	1124.000
110.100	1062.000	999.000
110.150	1062.000	1125.000
110.200	1063.000	1000.000
110.250	1063.000	1126.000
110.300	1064.000	1001.000
110.350	1064.000	1127.000
110.400	1065.000	1002.000
110.450	1065.000	1128.000
110.500	1066.000	1003.000
110.550	1066.000	1129.000
110.600	1067.000	1004.000
110.650	1067.000	1130.000
110.700	1068.000	1005.000
110.750	1068.000	1131.000
110.800	1069.000	1006.000
110.850	1069.000	1132.000
110.900	1070.000	1007.000
110.950	1070.000	1133.000
111.000	1071.000	1008.000
111.050	1071.000	1134.000
111.100	1072.000	1009.000
111.150	1072.000	1135.000
111.200	1073.000	1010.000

DME CHANNELING AND PAIRING—Continued

[MHz]

VHF channel	Airborne interrogating frequency	Ground reply frequency
111.250	1073.000	1136.000
111.300	1074.000	1011.000
111.350	1074.000	1137.000
111.400	1075.000	1012.000
111.450	1075.000	1138.000
111.500	1076.000	1013.000
111.550	1076.000	1139.000
111.600	1077.000	1014.000
111.650	1077.000	1140.000
111.700	1078.000	1015.000
111.750	1078.000	1141.000
111.800	1079.000	1016.000
111.850	1079.000	1142.000
111.900	1080.000	1017.000
111.950	1080.000	1143.000
112.000	1081.000	1018.000
112.050	1081.000	1144.000
112.100	1082.000	1019.000
112.150	1082.000	1145.000
112.200	1083.000	1020.000
112.250	1083.000	1146.000
112.300	1094.000	1157.000
112.350	1094.000	1031.000
112.400	1095.000	1158.000
112.450	1095.000	1032.000
112.500	1096.000	1159.000
112.550	1096.000	1033.000
112.600	1097.000	1160.000
112.650	1097.000	1034.000
112.700	1098.000	1161.000
112.750	1098.000	1035.000
112.800	1099.000	1162.000
112.850	1099.000	1036.000
112.900	1100.000	1163.000
112.950	1100.000	1037.000
113.000	1101.000	1164.000
113.050	1101.000	1038.000
113.100	1102.000	1165.000
113.150	1102.000	1039.000
113.200	1103.000	1166.000
113.250	1103.000	1040.000
113.300	1104.000	1167.000
113.350	1104.000	1041.000
113.400	1105.000	1168.000
113.450	1105.000	1042.000
113.500	1106.000	1169.000
113.550	1106.000	1043.000
113.600	1107.000	1170.000
113.650	1107.000	1044.000
113.700	1108.000	1171.000
113.750	1108.000	1045.000
113.800	1109.000	1172.000
113.850	1109.000	1046.000
113.900	1110.000	1173.000
113.950	1110.000	1047.000
114.000	1111.000	1174.000
114.050	1111.000	1048.000
114.100	1112.000	1175.000
114.150	1112.000	1049.000
114.200	1113.000	1176.000
114.250	1113.000	1050.000
114.300	1114.000	1177.000
114.350	1114.000	1051.000
114.400	1115.000	1178.000
114.450	1115.000	1052.000
114.500	1116.000	1179.000
114.550	1116.000	1053.000
114.600	1117.000	1180.000
114.650	1117.000	1054.000
114.700	1118.000	1181.000

DME CHANNELING AND PAIRING—Continued

[MHz]

VHF channel	Airborne interrogating frequency	Ground reply frequency
114.750	1118.000	1055.000
114.800	1119.000	1182.000
114.850	1119.000	1056.000
114.900	1120.000	1183.000
114.950	1120.000	1057.000
115.000	1121.000	1184.000
115.050	1121.000	1058.000
115.100	1122.000	1185.000
115.150	1122.000	1059.000
115.200	1123.000	1186.000
115.250	1123.000	1060.000
115.300	1124.000	1187.000
115.350	1124.000	1061.000
115.400	1125.000	1188.000
115.450	1125.000	1062.000
115.500	1126.000	1189.000
115.550	1126.000	1063.000
115.600	1127.000	1190.000
115.650	1127.000	1064.000
115.700	1128.000	1191.000
115.750	1128.000	1065.000
115.800	1129.000	1192.000
115.850	1129.000	1066.000
115.900	1130.000	1193.000
115.950	1130.000	1067.000
116.000	1131.000	1194.000
116.050	1131.000	1068.000
116.100	1132.000	1195.000
116.150	1132.000	1069.000
116.200	1133.000	1196.000
116.250	1133.000	1070.000
116.300	1134.000	1197.000
116.350	1134.000	1071.000
116.400	1135.000	1198.000
116.450	1135.000	1072.000
116.500	1136.000	1199.000
116.550	1136.000	1073.000
116.600	1137.000	1200.000
116.650	1137.000	1074.000
116.700	1138.000	1201.000
116.750	1138.000	1075.000
116.800	1139.000	1202.000
116.850	1139.000	1076.000
116.900	1140.000	1203.000
116.950	1140.000	1077.000
117.000	1141.000	1204.000
117.050	1141.000	1078.000
117.100	1142.000	1205.000
117.150	1142.000	1079.000
117.200	1143.000	1206.000
117.250	1143.000	1080.000
117.300	1144.000	1207.000
117.350	1144.000	1081.000
117.400	1145.000	1208.000
117.450	1145.000	1082.000
117.500	1146.000	1209.000
117.550	1146.000	1083.000
117.600	1147.000	1210.000
117.650	1147.000	1084.000
117.700	1148.000	1211.000
117.750	1148.000	1085.000
117.800	1149.000	1212.000
117.850	1149.000	1086.000
117.900	1150.000	1213.000
117.950	1150.000	1087.000

(7) 978.0 MHz is authorized for Universal Access Transceiver service.

(8) 1300–1350 MHz: The use of this band is restricted to surveillance radar

stations and associated airborne transponders.

(9) 1559–1626.5 MHz: The use of this band is limited to airborne electronic aids to air navigation and any associated land stations.

(10) 2700–2900 MHz: Non-Government land-based radars may be licensed. U.S. Government coordination is required. Applicants must demonstrate a need for the service which the Government is not prepared to render.

(11) 5000–5250 MHz: This band is to be used for the operation of the international standard system (microwave landing system).

(12) 9000–9200 MHz: This band is available to land-based radars. Stations operating in this band may receive interference from stations operating in the radiolocation service.

(13) 15,400–15,700 MHz: This band is available for use of land stations associated with airborne electronic aids to air navigation.

(14) 24,250–25,250, 32,300–33,400 MHz: In these bands, land-based radionavigation aids are permitted where they operate with airborne radionavigation devices.

(c) *Frequencies available for radionavigation land test stations.* (1) The frequencies set forth in §§ 87.187(c), (e) through (j), (r), (t), and (ff); and 87.475(b)(6) through (b)(11) may be assigned to radionavigation land test stations for the testing of aircraft transmitting equipment that normally operate on these frequencies and for the testing of land-based receiving equipment that operate with airborne radionavigation equipment.

(2) The frequencies available for assignment to radionavigation land test stations for the testing of airborne receiving equipment are 108.000 and 108.050 MHz for VHF omni-range; 108.100 and 108.150 MHz for localizer; 334.550 and 334.700 MHz for glide slope; 978 and 979 MHz (X channel)/1104 MHz (Y channel) for DME; 978 MHz for Universal Access Transceiver; 1030 MHz for air traffic control radar beacon transponders; 1090 MHz for Traffic Alert and Collision Avoidance Systems (TCAS); and 5031.0 MHz for microwave landing systems. Additionally, the frequencies in paragraph (b) of this section may be assigned to radionavigation land test stations after coordination with the FAA. The following conditions apply:after coordination with the FAA. The following conditions apply:

(i) The maximum power authorized on the frequencies 108.150 and 334.550 MHz is 1 milliwatt. The maximum power authorized on all other frequencies is one watt.

(ii) The pulse repetition rate (PRR) of the 1030 MHz ATC radar beacon test set will be 235 pulses per second (pps) ±5pps.

(iii) The assignment of 108.000 MHz is subject to the condition that no interference will be caused to the reception of FM broadcasting stations and stations using the frequency are not protected against interference from FM broadcasting stations.

(d) *Frequencies available for ELT test stations.* The frequencies available for assignment to ELT test stations are 121.600, 121.650, 121.700, 121.750, 121.800, 121.850, and 121.900 MHz. Licensees must:

(1) Not cause harmful interference to voice communications on these frequencies or any harmonically related frequency.

(2) Coordinate with the appropriate FAA Regional Spectrum Management Office prior to each activation of the transmitter.

(e) *Frequencies available for differential GPS stations.* Frequencies in the 112–118 MHz band may be assigned to Special Category I (SCAT-I) ground stations for differential GPS data links.

(1) The frequencies available are on 25 kHz centers with the lowest assignable frequency being centered at 112.000 MHz and the highest assignable frequency being centered at 117.950 MHz.

(2) Applicants must coordinate a frequency, time slot assignment, and three-letter identifier with the FAA and provide this information to the Commission upon application.

[53 FR 28940, Aug. 1, 1988, as amended at 54 FR 11721, Mar. 22, 1989; 63 FR 68958, Dec. 14, 1998; 64 FR 27476, May 20, 1999; 69 FR 32886, June 14, 2004; 71 FR 70680, Dec. 6, 2006; 78 FR 61207, Oct. 3, 2013]

EDITORIAL NOTE: At 80 FR 38911, July 7, 2015, § 87.475 was amended by adding paragraphs (b)(11) and (14), however these paragraphs already exist and therefore, the new

ones could not be incorporated. For the convenience of the user of the added text is set forth as follows:

§ 87.475 Frequencies.

* * * * *

(b) * * *

(11) 5030–5150 MHz: This band is to be used for the operation of the international standard system (microwave landing system).

* * * * *

(14) 24,450–24,650 MHz and 32,300–33,400 MHz: In these bands, land-based radionavigation aids are permitted where they operate with airborne radionavigation devices.

* * * * *

§ 87.477 Condition of grant for radionavigation land stations.

Radionavigation land stations may be designated by the FAA as part of the National Airspace System. Stations so designated will be required to serve the public under IFT conditions. This condition of grant is applicable to all radionavigation land stations.

§ 87.479 Harmful interference to radionavigation land stations.

(a) Military or other Government stations have been authorized to establish wide-band systems using frequency-hopping spread spectrum techniques in the 960–1215 MHz band. Authorization for a Joint Tactical Information Distribution Systems (JTIDS) has been permitted on the basis of noninterference to the established aeronautical radionavigation service in this band. In order to accommodate the requirements for the system within the band, restrictions are imposed. Transmissions will be automatically prevented if:

(1) The frequency-hopping mode fails to distribute the JTIDS spectrum uniformly across the band;

(2) The radiated pulse varies from the specified width of 6.4 microseconds ±5%;

(3) The energy radiated within ±7 MHz of 1030 and 1090 MHz exceeds a level of 60 dB below the peak of the JTIDS spectrum as measured in a 300 kHz bandwidth. The JTIDS will be prohibited from transmitting if the time slot duty factor exceeds a 20 percent duty factor for any single user and a 40 percent composite duty factor for all JTIDS emitters in a geographic area.

(b) If radionavigation systems operating in the 960–1215 MHz band experience interference or unexplained loss of equipment performance, the situation must be reported immediately to the nearest office of the FAA, the National Telecommunications and Information Administration, Washington, DC 20504, or the nearest Federal Communications Commission field office. The following information must be provided to the extent available:

(1) Name, call sign and category of station experiencing the interference;

(2) Date and time of occurrence;

(3) Geographical location at time of occurrence;

(4) Frequency interfered with;

(5) Nature of interference; and

(6) Other particulars.

§ 87.481 Unattended operation of domestic radiobeacon stations.

(a) Radiobeacons may be licensed for unattended operation. An applicant must comply with the following:

(1) The transmitter is crystal controlled and specifically designed for radiobeacon service and capable of transmitting by self-actuating means;

(2) The emissions of the transmitter must be continuously monitored by a licensed operator, or by a direct positive automatic monitor, supplemented by aural monitoring at suitable intervals;

(3) If as a result of aural monitoring it is determined that a deviation from the terms of the station license has occurred, the transmitters must be disabled immediately by a properly authorized person. If automatic monitoring is used, the monitor must insure that the operation of the transmitter meets the license terms or is disabled;

(4) A properly authorized person must be able to reach the transmitter and disable it in a reasonable amount of time, so as not to adversely affect life or property in the air;

(5) The equipment must be inspected at least every 180 days. Results of inspections must be kept in the station maintenance records;