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Cellular phone channel construction

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Here is a method of determining which frequencies are used in a cellular system, and which ones are in what cells. If the system uses OMNICELLS, as most do, you can readily find all the channels in a cell if you know just one of them, using tables constructed with the instructions below.

Cellular frequencies are assigned by channel number, and for all channel numbers, in both wireline and non-wireline systems, the formula is:

$$\begin{aligned} \text{Transmit Frequency} &= (\text{channel number} \times .030 \text{ MHz}) + 870 \text{ MHz} \\ \text{Receive Frequency} &= (\text{channel number} \times .030 \text{ Mhz}) + 825 \text{ Mhz} \end{aligned}$$

"Band A" (one of the two blocks) uses channels 1 - 333. To construct a table showing frequency by cells, use channel 333 as the top left corner of a table. The next entry to the right of channel 333 is 332, the next is 331, etc., down to channel 313. Enter channel 312 underneath 333, 311 under 332,

etc. Each channel across the top row is the first channel in each CELL of the system; each channel DOWN from the column from the the first channel is the next frequency assigned to that cell. You may have noted that each channel down is 21 channels lower in number. Usually the data channel used is the highest numbered channel in a cell.

"Band B" uses channels from 334 to 666. Construct your table in a similar way, with channel 334 in the upper left corner, 335 the next entry to the right. The data channel should be the lowest numbered channel in each cell this time.

Cellular Phone Band A (Channel 1 is Data)

Cell # 1

Channel 1	(333)	Tx 879.990	Rx 834.990
Channel 2	(312)	Tx 879.360	Rx 834.360
Channel 3	(291)	Tx 878.730	Rx 833.730
Channel 4	(270)	Tx 878.100	Rx 833.100
Channel 5	(249)	Tx 877.470	Rx 832.470
Channel 6	(228)	Tx 876.840	Rx 831.840
Channel 7	(207)	Tx 876.210	Rx 831.210
Channel 8	(186)	Tx 875.580	Rx 830.580
Channel 9	(165)	Tx 874.950	Rx 829.950
Channel 10	(144)	Tx 874.320	Rx 829.320
Channel 11	(123)	Tx 873.690	Rx 828.690
Channel 12	(102)	Tx 873.060	Rx 828.060
Channel 13	(81)	Tx 872.430	Rx 827.430
Channel 14	(60)	Tx 871.800	Rx 826.800
Channel 15	(39)	Tx 871.170	Rx 826.170
Channel 16	(18)	Tx 870.540	Rx 825.540

Cell # 2

Channel 1	(332)	Tx 879.960	Rx 834.960
Channel 2	(311)	Tx 879.330	Rx 834.330
Channel 3	(290)	Tx 878.700	Rx 833.700
Channel 4	(269)	Tx 878.070	Rx 833.070
Channel 5	(248)	Tx 877.440	Rx 832.440
Channel 6	(227)	Tx 876.810	Rx 831.810
Channel 7	(206)	Tx 876.180	Rx 831.180
Channel 8	(185)	Tx 875.550	Rx 830.550
Channel 9	(164)	Tx 874.920	Rx 829.920
Channel 10	(143)	Tx 874.290	Rx 829.290
Channel 11	(122)	Tx 873.660	Rx 828.660
Channel 12	(101)	Tx 873.030	Rx 828.030
Channel 13	(80)	Tx 872.400	Rx 827.400
Channel 14	(59)	Tx 871.770	Rx 826.770

Channel 15	(38)	Tx 871.140	Rx 826.140
Channel 16	(17)	Tx 870.510	Rx 825.510

Cell # 3

Channel 1	(331)	Tx 879.930	Rx 834.930
Channel 2	(310)	Tx 879.300	Rx 834.300
Channel 3	(289)	Tx 878.670	Rx 833.670
Channel 4	(268)	Tx 878.040	Rx 833.040
Channel 5	(247)	Tx 877.410	Rx 832.410
Channel 6	(226)	Tx 876.780	Rx 831.780
Channel 7	(205)	Tx 876.150	Rx 831.150
Channel 8	(184)	Tx 875.520	Rx 830.520
Channel 9	(163)	Tx 874.890	Rx 829.890
Channel 10	(142)	Tx 874.260	Rx 829.260
Channel 11	(121)	Tx 873.630	Rx 828.630
Channel 12	(100)	Tx 873.000	Rx 828.000
Channel 13	(79)	Tx 872.370	Rx 827.370
Channel 14	(58)	Tx 871.740	Rx 826.740
Channel 15	(37)	Tx 871.110	Rx 826.110
Channel 16	(16)	Tx 870.480	Rx 825.480

Cell # 4

Channel 1	(330)	Tx 879.900	Rx 834.900
Channel 2	(309)	Tx 879.270	Rx 834.270
Channel 3	(288)	Tx 878.640	Rx 833.640
Channel 4	(267)	Tx 878.010	Rx 833.010
Channel 5	(246)	Tx 877.380	Rx 832.380
Channel 6	(225)	Tx 876.750	Rx 831.750
Channel 7	(204)	Tx 876.120	Rx 831.120
Channel 8	(183)	Tx 875.490	Rx 830.490
Channel 9	(162)	Tx 874.860	Rx 829.860
Channel 10	(141)	Tx 874.230	Rx 829.230
Channel 11	(120)	Tx 873.600	Rx 828.600
Channel 12	(99)	Tx 872.970	Rx 827.970
Channel 13	(78)	Tx 872.340	Rx 827.340
Channel 14	(57)	Tx 871.710	Rx 826.710
Channel 15	(36)	Tx 871.080	Rx 826.080
Channel 16	(15)	Tx 870.450	Rx 825.450

Cell # 5

Channel 1	(329)	Tx 879.870	Rx 834.870
Channel 2	(308)	Tx 879.240	Rx 834.240
Channel 3	(287)	Tx 878.610	Rx 833.610
Channel 4	(266)	Tx 877.980	Rx 832.980
Channel 5	(245)	Tx 877.350	Rx 832.350

Channel 6	(224)	Tx 876.720	Rx 831.720
Channel 7	(203)	Tx 876.090	Rx 831.090
Channel 8	(182)	Tx 875.460	Rx 830.460
Channel 9	(161)	Tx 874.830	Rx 829.830
Channel 10	(140)	Tx 874.200	Rx 829.200
Channel 11	(119)	Tx 873.570	Rx 828.570
Channel 12	(98)	Tx 872.940	Rx 827.940
Channel 13	(77)	Tx 872.310	Rx 827.310
Channel 14	(56)	Tx 871.680	Rx 826.680
Channel 15	(35)	Tx 871.050	Rx 826.050
Channel 16	(14)	Tx 870.420	Rx 825.420

Cell # 6

Channel 1	(328)	Tx 879.840	Rx 834.840
Channel 2	(307)	Tx 879.210	Rx 834.210
Channel 3	(286)	Tx 878.580	Rx 833.580
Channel 4	(265)	Tx 877.950	Rx 832.950
Channel 5	(244)	Tx 877.320	Rx 832.320
Channel 6	(223)	Tx 876.690	Rx 831.690
Channel 7	(202)	Tx 876.060	Rx 831.060
Channel 8	(181)	Tx 875.430	Rx 830.430
Channel 9	(160)	Tx 874.800	Rx 829.800
Channel 10	(139)	Tx 874.170	Rx 829.170
Channel 11	(118)	Tx 873.540	Rx 828.540
Channel 12	(97)	Tx 872.910	Rx 827.910
Channel 13	(76)	Tx 872.280	Rx 827.280
Channel 14	(55)	Tx 871.650	Rx 826.650
Channel 15	(34)	Tx 871.020	Rx 826.020
Channel 16	(13)	Tx 870.390	Rx 825.390

Cell # 7

Channel 1	(327)	Tx 879.810	Rx 834.810
Channel 2	(306)	Tx 879.180	Rx 834.180
Channel 3	(285)	Tx 878.550	Rx 833.550
Channel 4	(264)	Tx 877.920	Rx 832.920
Channel 5	(243)	Tx 877.290	Rx 832.290
Channel 6	(222)	Tx 876.660	Rx 831.660
Channel 7	(201)	Tx 876.030	Rx 831.030
Channel 8	(180)	Tx 875.400	Rx 830.400
Channel 9	(159)	Tx 874.770	Rx 829.770
Channel 10	(138)	Tx 874.140	Rx 829.140
Channel 11	(117)	Tx 873.510	Rx 828.510
Channel 12	(96)	Tx 872.880	Rx 827.880
Channel 13	(75)	Tx 872.250	Rx 827.250
Channel 14	(54)	Tx 871.620	Rx 826.620
Channel 15	(33)	Tx 870.990	Rx 825.990

Channel 16 (12) Tx 870.360 Rx 825.360

Cell # 8

Channel 1 (326) Tx 879.780 Rx 834.780
Channel 2 (305) Tx 879.150 Rx 834.150
Channel 3 (284) Tx 878.520 Rx 833.520
Channel 4 (263) Tx 877.890 Rx 832.890
Channel 5 (242) Tx 877.260 Rx 832.260
Channel 6 (221) Tx 876.630 Rx 831.630
Channel 7 (200) Tx 876.000 Rx 831.000
Channel 8 (179) Tx 875.370 Rx 830.370
Channel 9 (158) Tx 874.740 Rx 829.740
Channel 10 (137) Tx 874.110 Rx 829.110
Channel 11 (116) Tx 873.480 Rx 828.480
Channel 12 (95) Tx 872.850 Rx 827.850
Channel 13 (74) Tx 872.220 Rx 827.220
Channel 14 (53) Tx 871.590 Rx 826.590
Channel 15 (32) Tx 870.960 Rx 825.960
Channel 16 (11) Tx 870.330 Rx 825.330

Cell # 9

Channel 1 (325) Tx 879.750 Rx 834.750
Channel 2 (304) Tx 879.120 Rx 834.120
Channel 3 (283) Tx 878.490 Rx 833.490
Channel 4 (262) Tx 877.860 Rx 832.860
Channel 5 (241) Tx 877.230 Rx 832.230
Channel 6 (220) Tx 876.600 Rx 831.600
Channel 7 (199) Tx 875.970 Rx 830.970
Channel 8 (178) Tx 875.340 Rx 830.340
Channel 9 (157) Tx 874.710 Rx 829.710
Channel 10 (136) Tx 874.080 Rx 829.080
Channel 11 (115) Tx 873.450 Rx 828.450
Channel 12 (94) Tx 872.820 Rx 827.820
Channel 13 (73) Tx 872.190 Rx 827.190
Channel 14 (52) Tx 871.560 Rx 826.560
Channel 15 (31) Tx 870.930 Rx 825.930
Channel 16 (10) Tx 870.300 Rx 825.300

Cell # 10

Channel 1 (324) Tx 879.720 Rx 834.720
Channel 2 (303) Tx 879.090 Rx 834.090
Channel 3 (282) Tx 878.460 Rx 833.460
Channel 4 (261) Tx 877.830 Rx 832.830
Channel 5 (240) Tx 877.200 Rx 832.200
Channel 6 (219) Tx 876.570 Rx 831.570

Channel 7	(198)	Tx 875.940	Rx 830.940
Channel 8	(177)	Tx 875.310	Rx 830.310
Channel 9	(156)	Tx 874.680	Rx 829.680
Channel 10	(135)	Tx 874.050	Rx 829.050
Channel 11	(114)	Tx 873.420	Rx 828.420
Channel 12	(93)	Tx 872.790	Rx 827.790
Channel 13	(72)	Tx 872.160	Rx 827.160
Channel 14	(51)	Tx 871.530	Rx 826.530
Channel 15	(30)	Tx 870.900	Rx 825.900
Channel 16	(9)	Tx 870.270	Rx 825.270

Cell # 11

Channel 1	(323)	Tx 879.690	Rx 834.690
Channel 2	(302)	Tx 879.060	Rx 834.060
Channel 3	(281)	Tx 878.430	Rx 833.430
Channel 4	(260)	Tx 877.800	Rx 832.800
Channel 5	(239)	Tx 877.170	Rx 832.170
Channel 6	(218)	Tx 876.540	Rx 831.540
Channel 7	(197)	Tx 875.910	Rx 830.910
Channel 8	(176)	Tx 875.280	Rx 830.280
Channel 9	(155)	Tx 874.650	Rx 829.650
Channel 10	(134)	Tx 874.020	Rx 829.020
Channel 11	(113)	Tx 873.390	Rx 828.390
Channel 12	(92)	Tx 872.760	Rx 827.760
Channel 13	(71)	Tx 872.130	Rx 827.130
Channel 14	(50)	Tx 871.500	Rx 826.500
Channel 15	(29)	Tx 870.870	Rx 825.870
Channel 16	(8)	Tx 870.240	Rx 825.240

Cell # 12

Channel 1	(322)	Tx 879.660	Rx 834.660
Channel 2	(301)	Tx 879.030	Rx 834.030
Channel 3	(280)	Tx 878.400	Rx 833.400
Channel 4	(259)	Tx 877.770	Rx 832.770
Channel 5	(238)	Tx 877.140	Rx 832.140
Channel 6	(217)	Tx 876.510	Rx 831.510
Channel 7	(196)	Tx 875.880	Rx 830.880
Channel 8	(175)	Tx 875.250	Rx 830.250
Channel 9	(154)	Tx 874.620	Rx 829.620
Channel 10	(133)	Tx 873.990	Rx 828.990
Channel 11	(112)	Tx 873.360	Rx 828.360
Channel 12	(91)	Tx 872.730	Rx 827.730
Channel 13	(70)	Tx 872.100	Rx 827.100
Channel 14	(49)	Tx 871.470	Rx 826.470
Channel 15	(28)	Tx 870.840	Rx 825.840
Channel 16	(7)	Tx 870.210	Rx 825.210

Cell # 13

Channel 1	(321)	Tx 879.630	Rx 834.630
Channel 2	(300)	Tx 879.000	Rx 834.000
Channel 3	(279)	Tx 878.370	Rx 833.370
Channel 4	(258)	Tx 877.740	Rx 832.740
Channel 5	(237)	Tx 877.110	Rx 832.110
Channel 6	(216)	Tx 876.480	Rx 831.480
Channel 7	(195)	Tx 875.850	Rx 830.850
Channel 8	(174)	Tx 875.220	Rx 830.220
Channel 9	(153)	Tx 874.590	Rx 829.590
Channel 10	(132)	Tx 873.960	Rx 828.960
Channel 11	(111)	Tx 873.330	Rx 828.330
Channel 12	(90)	Tx 872.700	Rx 827.700
Channel 13	(69)	Tx 872.070	Rx 827.070
Channel 14	(48)	Tx 871.440	Rx 826.440
Channel 15	(27)	Tx 870.810	Rx 825.810
Channel 16	(6)	Tx 870.180	Rx 825.180

Cell # 14

Channel 1	(320)	Tx 879.600	Rx 834.600
Channel 2	(299)	Tx 878.970	Rx 833.970
Channel 3	(278)	Tx 878.340	Rx 833.340
Channel 4	(257)	Tx 877.710	Rx 832.710
Channel 5	(236)	Tx 877.080	Rx 832.080
Channel 6	(215)	Tx 876.450	Rx 831.450
Channel 7	(194)	Tx 875.820	Rx 830.820
Channel 8	(173)	Tx 875.190	Rx 830.190
Channel 9	(152)	Tx 874.560	Rx 829.560
Channel 10	(131)	Tx 873.930	Rx 828.930
Channel 11	(110)	Tx 873.300	Rx 828.300
Channel 12	(89)	Tx 872.670	Rx 827.670
Channel 13	(68)	Tx 872.040	Rx 827.040
Channel 14	(47)	Tx 871.410	Rx 826.410
Channel 15	(26)	Tx 870.780	Rx 825.780
Channel 16	(5)	Tx 870.150	Rx 825.150

Cell # 15

Channel 1	(319)	Tx 879.570	Rx 834.570
Channel 2	(298)	Tx 878.940	Rx 833.940
Channel 3	(277)	Tx 878.310	Rx 833.310
Channel 4	(256)	Tx 877.680	Rx 832.680
Channel 5	(235)	Tx 877.050	Rx 832.050
Channel 6	(214)	Tx 876.420	Rx 831.420
Channel 7	(193)	Tx 875.790	Rx 830.790

Channel 8	(172)	Tx 875.160	Rx 830.160
Channel 9	(151)	Tx 874.530	Rx 829.530
Channel 10	(130)	Tx 873.900	Rx 828.900
Channel 11	(109)	Tx 873.270	Rx 828.270
Channel 12	(88)	Tx 872.640	Rx 827.640
Channel 13	(67)	Tx 872.010	Rx 827.010
Channel 14	(46)	Tx 871.380	Rx 826.380
Channel 15	(25)	Tx 870.750	Rx 825.750
Channel 16	(4)	Tx 870.120	Rx 825.120

Cell # 16

Channel 1	(318)	Tx 879.540	Rx 834.540
Channel 2	(297)	Tx 878.910	Rx 833.910
Channel 3	(276)	Tx 878.280	Rx 833.280
Channel 4	(255)	Tx 877.650	Rx 832.650
Channel 5	(234)	Tx 877.020	Rx 832.020
Channel 6	(213)	Tx 876.390	Rx 831.390
Channel 7	(192)	Tx 875.760	Rx 830.760
Channel 8	(171)	Tx 875.130	Rx 830.130
Channel 9	(150)	Tx 874.500	Rx 829.500
Channel 10	(129)	Tx 873.870	Rx 828.870
Channel 11	(108)	Tx 873.240	Rx 828.240
Channel 12	(87)	Tx 872.610	Rx 827.610
Channel 13	(66)	Tx 871.980	Rx 826.980
Channel 14	(45)	Tx 871.350	Rx 826.350
Channel 15	(24)	Tx 870.720	Rx 825.720
Channel 16	(3)	Tx 870.090	Rx 825.090

Cell # 17

Channel 1	(317)	Tx 879.510	Rx 834.510
Channel 2	(296)	Tx 878.880	Rx 833.880
Channel 3	(275)	Tx 878.250	Rx 833.250
Channel 4	(254)	Tx 877.620	Rx 832.620
Channel 5	(233)	Tx 876.990	Rx 831.990
Channel 6	(212)	Tx 876.360	Rx 831.360
Channel 7	(191)	Tx 875.730	Rx 830.730
Channel 8	(170)	Tx 875.100	Rx 830.100
Channel 9	(149)	Tx 874.470	Rx 829.470
Channel 10	(128)	Tx 873.840	Rx 828.840
Channel 11	(107)	Tx 873.210	Rx 828.210
Channel 12	(86)	Tx 872.580	Rx 827.580
Channel 13	(65)	Tx 871.950	Rx 826.950
Channel 14	(44)	Tx 871.320	Rx 826.320
Channel 15	(23)	Tx 870.690	Rx 825.690
Channel 16	(2)	Tx 870.060	Rx 825.060

Cell # 18

Channel 1	(316)	Tx 879.480	Rx 834.480
Channel 2	(295)	Tx 878.850	Rx 833.850
Channel 3	(274)	Tx 878.220	Rx 833.220
Channel 4	(253)	Tx 877.590	Rx 832.590
Channel 5	(232)	Tx 876.960	Rx 831.960
Channel 6	(211)	Tx 876.330	Rx 831.330
Channel 7	(190)	Tx 875.700	Rx 830.700
Channel 8	(169)	Tx 875.070	Rx 830.070
Channel 9	(148)	Tx 874.440	Rx 829.440
Channel 10	(127)	Tx 873.810	Rx 828.810
Channel 11	(106)	Tx 873.180	Rx 828.180
Channel 12	(85)	Tx 872.550	Rx 827.550
Channel 13	(64)	Tx 871.920	Rx 826.920
Channel 14	(43)	Tx 871.290	Rx 826.290
Channel 15	(22)	Tx 870.660	Rx 825.660
Channel 16	(1)	Tx 870.030	Rx 825.030

Cell # 19

Channel 1	(315)	Tx 879.450	Rx 834.450
Channel 2	(294)	Tx 878.820	Rx 833.820
Channel 3	(273)	Tx 878.190	Rx 833.190
Channel 4	(252)	Tx 877.560	Rx 832.560
Channel 5	(231)	Tx 876.930	Rx 831.930
Channel 6	(210)	Tx 876.300	Rx 831.300
Channel 7	(189)	Tx 875.670	Rx 830.670
Channel 8	(168)	Tx 875.040	Rx 830.040
Channel 9	(147)	Tx 874.410	Rx 829.410
Channel 10	(126)	Tx 873.780	Rx 828.780
Channel 11	(105)	Tx 873.150	Rx 828.150
Channel 12	(84)	Tx 872.520	Rx 827.520
Channel 13	(63)	Tx 871.890	Rx 826.890
Channel 14	(42)	Tx 871.260	Rx 826.260
Channel 15	(21)	Tx 870.630	Rx 825.630

Cell # 20

Channel 1	(314)	Tx 879.420	Rx 834.420
Channel 2	(293)	Tx 878.790	Rx 833.790
Channel 3	(272)	Tx 878.160	Rx 833.160
Channel 4	(251)	Tx 877.530	Rx 832.530
Channel 5	(230)	Tx 876.900	Rx 831.900
Channel 6	(209)	Tx 876.270	Rx 831.270
Channel 7	(188)	Tx 875.640	Rx 830.640
Channel 8	(167)	Tx 875.010	Rx 830.010
Channel 9	(146)	Tx 874.380	Rx 829.380

Channel 10	(125)	Tx 873.750	Rx 828.750
Channel 11	(104)	Tx 873.120	Rx 828.120
Channel 12	(83)	Tx 872.490	Rx 827.490
Channel 13	(62)	Tx 871.860	Rx 826.860
Channel 14	(41)	Tx 871.230	Rx 826.230
Channel 15	(20)	Tx 870.600	Rx 825.600

Cell # 21

Channel 1	(313)	Tx 879.390	Rx 834.390
Channel 2	(292)	Tx 878.760	Rx 833.760
Channel 3	(271)	Tx 878.130	Rx 833.130
Channel 4	(250)	Tx 877.500	Rx 832.500
Channel 5	(229)	Tx 876.870	Rx 831.870
Channel 6	(208)	Tx 876.240	Rx 831.240
Channel 7	(187)	Tx 875.610	Rx 830.610
Channel 8	(166)	Tx 874.980	Rx 829.980
Channel 9	(145)	Tx 874.350	Rx 829.350
Channel 10	(124)	Tx 873.720	Rx 828.720
Channel 11	(103)	Tx 873.090	Rx 828.090
Channel 12	(82)	Tx 872.460	Rx 827.460
Channel 13	(61)	Tx 871.830	Rx 826.830
Channel 14	(40)	Tx 871.200	Rx 826.200
Channel 15	(19)	Tx 870.570	Rx 825.570

Cellular Phone Band B (Channel 1 is Data)

Cell # 1

Channel 1	(334)	Tx 880.020	Rx 835.020
Channel 2	(355)	Tx 880.650	Rx 835.650
Channel 3	(376)	Tx 881.280	Rx 836.280
Channel 4	(397)	Tx 881.910	Rx 836.910
Channel 5	(418)	Tx 882.540	Rx 837.540
Channel 6	(439)	Tx 883.170	Rx 838.170
Channel 7	(460)	Tx 883.800	Rx 838.800
Channel 8	(481)	Tx 884.430	Rx 839.430
Channel 9	(502)	Tx 885.060	Rx 840.060
Channel 10	(523)	Tx 885.690	Rx 840.690
Channel 11	(544)	Tx 886.320	Rx 841.320
Channel 12	(565)	Tx 886.950	Rx 841.950
Channel 13	(586)	Tx 887.580	Rx 842.580
Channel 14	(607)	Tx 888.210	Rx 843.210
Channel 15	(628)	Tx 888.840	Rx 843.840
Channel 16	(649)	Tx 889.470	Rx 844.470

Cell # 2

Channel 1	(335)	Tx 880.050	Rx 835.050
Channel 2	(356)	Tx 880.680	Rx 835.680
Channel 3	(377)	Tx 881.310	Rx 836.310
Channel 4	(398)	Tx 881.940	Rx 836.940
Channel 5	(419)	Tx 882.570	Rx 837.570
Channel 6	(440)	Tx 883.200	Rx 838.200
Channel 7	(461)	Tx 883.830	Rx 838.830
Channel 8	(482)	Tx 884.460	Rx 839.460
Channel 9	(503)	Tx 885.090	Rx 840.090
Channel 10	(524)	Tx 885.720	Rx 840.720
Channel 11	(545)	Tx 886.350	Rx 841.350
Channel 12	(566)	Tx 886.980	Rx 841.980
Channel 13	(587)	Tx 887.610	Rx 842.610
Channel 14	(608)	Tx 888.240	Rx 843.240
Channel 15	(629)	Tx 888.870	Rx 843.870
Channel 16	(650)	Tx 889.500	Rx 844.500

Cell # 3

Channel 1	(336)	Tx 880.080	Rx 835.080
Channel 2	(357)	Tx 880.710	Rx 835.710
Channel 3	(378)	Tx 881.340	Rx 836.340
Channel 4	(399)	Tx 881.970	Rx 836.970
Channel 5	(420)	Tx 882.600	Rx 837.600
Channel 6	(441)	Tx 883.230	Rx 838.230
Channel 7	(462)	Tx 883.860	Rx 838.860
Channel 8	(483)	Tx 884.490	Rx 839.490
Channel 9	(504)	Tx 885.120	Rx 840.120
Channel 10	(525)	Tx 885.750	Rx 840.750
Channel 11	(546)	Tx 886.380	Rx 841.380
Channel 12	(567)	Tx 887.010	Rx 842.010
Channel 13	(588)	Tx 887.640	Rx 842.640
Channel 14	(609)	Tx 888.270	Rx 843.270
Channel 15	(630)	Tx 888.900	Rx 843.900
Channel 16	(651)	Tx 889.530	Rx 844.530

Cell # 4

Channel 1	(337)	Tx 880.110	Rx 835.110
Channel 2	(358)	Tx 880.740	Rx 835.740
Channel 3	(379)	Tx 881.370	Rx 836.370
Channel 4	(400)	Tx 882.000	Rx 837.000
Channel 5	(421)	Tx 882.630	Rx 837.630
Channel 6	(442)	Tx 883.260	Rx 838.260
Channel 7	(463)	Tx 883.890	Rx 838.890
Channel 8	(484)	Tx 884.520	Rx 839.520

Channel 9	(505)	Tx 885.150	Rx 840.150
Channel 10	(526)	Tx 885.780	Rx 840.780
Channel 11	(547)	Tx 886.410	Rx 841.410
Channel 12	(568)	Tx 887.040	Rx 842.040
Channel 13	(589)	Tx 887.670	Rx 842.670
Channel 14	(610)	Tx 888.300	Rx 843.300
Channel 15	(631)	Tx 888.930	Rx 843.930
Channel 16	(652)	Tx 889.560	Rx 844.560

Cell # 5

Channel 1	(338)	Tx 880.140	Rx 835.140
Channel 2	(359)	Tx 880.770	Rx 835.770
Channel 3	(380)	Tx 881.400	Rx 836.400
Channel 4	(401)	Tx 882.030	Rx 837.030
Channel 5	(422)	Tx 882.660	Rx 837.660
Channel 6	(443)	Tx 883.290	Rx 838.290
Channel 7	(464)	Tx 883.920	Rx 838.920
Channel 8	(485)	Tx 884.550	Rx 839.550
Channel 9	(506)	Tx 885.180	Rx 840.180
Channel 10	(527)	Tx 885.810	Rx 840.810
Channel 11	(548)	Tx 886.440	Rx 841.440
Channel 12	(569)	Tx 887.070	Rx 842.070
Channel 13	(590)	Tx 887.700	Rx 842.700
Channel 14	(611)	Tx 888.330	Rx 843.330
Channel 15	(632)	Tx 888.960	Rx 843.960
Channel 16	(653)	Tx 889.590	Rx 844.590

Cell # 6

Channel 1	(339)	Tx 880.170	Rx 835.170
Channel 2	(360)	Tx 880.800	Rx 835.800
Channel 3	(381)	Tx 881.430	Rx 836.430
Channel 4	(402)	Tx 882.060	Rx 837.060
Channel 5	(423)	Tx 882.690	Rx 837.690
Channel 6	(444)	Tx 883.320	Rx 838.320
Channel 7	(465)	Tx 883.950	Rx 838.950
Channel 8	(486)	Tx 884.580	Rx 839.580
Channel 9	(507)	Tx 885.210	Rx 840.210
Channel 10	(528)	Tx 885.840	Rx 840.840
Channel 11	(549)	Tx 886.470	Rx 841.470
Channel 12	(570)	Tx 887.100	Rx 842.100
Channel 13	(591)	Tx 887.730	Rx 842.730
Channel 14	(612)	Tx 888.360	Rx 843.360
Channel 15	(633)	Tx 888.990	Rx 843.990
Channel 16	(654)	Tx 889.620	Rx 844.620

Cell # 7

Channel 1	(340)	Tx 880.200	Rx 835.200
Channel 2	(361)	Tx 880.830	Rx 835.830
Channel 3	(382)	Tx 881.460	Rx 836.460
Channel 4	(403)	Tx 882.090	Rx 837.090
Channel 5	(424)	Tx 882.720	Rx 837.720
Channel 6	(445)	Tx 883.350	Rx 838.350
Channel 7	(466)	Tx 883.980	Rx 838.980
Channel 8	(487)	Tx 884.610	Rx 839.610
Channel 9	(508)	Tx 885.240	Rx 840.240
Channel 10	(529)	Tx 885.870	Rx 840.870
Channel 11	(550)	Tx 886.500	Rx 841.500
Channel 12	(571)	Tx 887.130	Rx 842.130
Channel 13	(592)	Tx 887.760	Rx 842.760
Channel 14	(613)	Tx 888.390	Rx 843.390
Channel 15	(634)	Tx 889.020	Rx 844.020
Channel 16	(655)	Tx 889.650	Rx 844.650

Cell # 8

Channel 1	(341)	Tx 880.230	Rx 835.230
Channel 2	(362)	Tx 880.860	Rx 835.860
Channel 3	(383)	Tx 881.490	Rx 836.490
Channel 4	(404)	Tx 882.120	Rx 837.120
Channel 5	(425)	Tx 882.750	Rx 837.750
Channel 6	(446)	Tx 883.380	Rx 838.380
Channel 7	(467)	Tx 884.010	Rx 839.010
Channel 8	(488)	Tx 884.640	Rx 839.640
Channel 9	(509)	Tx 885.270	Rx 840.270
Channel 10	(530)	Tx 885.900	Rx 840.900
Channel 11	(551)	Tx 886.530	Rx 841.530
Channel 12	(572)	Tx 887.160	Rx 842.160
Channel 13	(593)	Tx 887.790	Rx 842.790
Channel 14	(614)	Tx 888.420	Rx 843.420
Channel 15	(635)	Tx 889.050	Rx 844.050
Channel 16	(656)	Tx 889.680	Rx 844.680

Cell # 9

Channel 1	(342)	Tx 880.260	Rx 835.260
Channel 2	(363)	Tx 880.890	Rx 835.890
Channel 3	(384)	Tx 881.520	Rx 836.520
Channel 4	(405)	Tx 882.150	Rx 837.150
Channel 5	(426)	Tx 882.780	Rx 837.780
Channel 6	(447)	Tx 883.410	Rx 838.410
Channel 7	(468)	Tx 884.040	Rx 839.040
Channel 8	(489)	Tx 884.670	Rx 839.670
Channel 9	(510)	Tx 885.300	Rx 840.300

Channel 10	(531)	Tx 885.930	Rx 840.930
Channel 11	(552)	Tx 886.560	Rx 841.560
Channel 12	(573)	Tx 887.190	Rx 842.190
Channel 13	(594)	Tx 887.820	Rx 842.820
Channel 14	(615)	Tx 888.450	Rx 843.450
Channel 15	(636)	Tx 889.080	Rx 844.080
Channel 16	(657)	Tx 889.710	Rx 844.710

Cell # 10

Channel 1	(343)	Tx 880.290	Rx 835.290
Channel 2	(364)	Tx 880.920	Rx 835.920
Channel 3	(385)	Tx 881.550	Rx 836.550
Channel 4	(406)	Tx 882.180	Rx 837.180
Channel 5	(427)	Tx 882.810	Rx 837.810
Channel 6	(448)	Tx 883.440	Rx 838.440
Channel 7	(469)	Tx 884.070	Rx 839.070
Channel 8	(490)	Tx 884.700	Rx 839.700
Channel 9	(511)	Tx 885.330	Rx 840.330
Channel 10	(532)	Tx 885.960	Rx 840.960
Channel 11	(553)	Tx 886.590	Rx 841.590
Channel 12	(574)	Tx 887.220	Rx 842.220
Channel 13	(595)	Tx 887.850	Rx 842.850
Channel 14	(616)	Tx 888.480	Rx 843.480
Channel 15	(637)	Tx 889.110	Rx 844.110
Channel 16	(658)	Tx 889.740	Rx 844.740

Cell # 11

Channel 1	(344)	Tx 880.320	Rx 835.320
Channel 2	(365)	Tx 880.950	Rx 835.950
Channel 3	(386)	Tx 881.580	Rx 836.580
Channel 4	(407)	Tx 882.210	Rx 837.210
Channel 5	(428)	Tx 882.840	Rx 837.840
Channel 6	(449)	Tx 883.470	Rx 838.470
Channel 7	(470)	Tx 884.100	Rx 839.100
Channel 8	(491)	Tx 884.730	Rx 839.730
Channel 9	(512)	Tx 885.360	Rx 840.360
Channel 10	(533)	Tx 885.990	Rx 840.990
Channel 11	(554)	Tx 886.620	Rx 841.620
Channel 12	(575)	Tx 887.250	Rx 842.250
Channel 13	(596)	Tx 887.880	Rx 842.880
Channel 14	(617)	Tx 888.510	Rx 843.510
Channel 15	(638)	Tx 889.140	Rx 844.140
Channel 16	(659)	Tx 889.770	Rx 844.770

Cell # 12

Channel 1	(345)	Tx 880.350	Rx 835.350
Channel 2	(366)	Tx 880.980	Rx 835.980
Channel 3	(387)	Tx 881.610	Rx 836.610
Channel 4	(408)	Tx 882.240	Rx 837.240
Channel 5	(429)	Tx 882.870	Rx 837.870
Channel 6	(450)	Tx 883.500	Rx 838.500
Channel 7	(471)	Tx 884.130	Rx 839.130
Channel 8	(492)	Tx 884.760	Rx 839.760
Channel 9	(513)	Tx 885.390	Rx 840.390
Channel 10	(534)	Tx 886.020	Rx 841.020
Channel 11	(555)	Tx 886.650	Rx 841.650
Channel 12	(576)	Tx 887.280	Rx 842.280
Channel 13	(597)	Tx 887.910	Rx 842.910
Channel 14	(618)	Tx 888.540	Rx 843.540
Channel 15	(639)	Tx 889.170	Rx 844.170
Channel 16	(660)	Tx 889.800	Rx 844.800

Cell # 13

Channel 1	(346)	Tx 880.380	Rx 835.380
Channel 2	(367)	Tx 881.010	Rx 836.010
Channel 3	(388)	Tx 881.640	Rx 836.640
Channel 4	(409)	Tx 882.270	Rx 837.270
Channel 5	(430)	Tx 882.900	Rx 837.900
Channel 6	(451)	Tx 883.530	Rx 838.530
Channel 7	(472)	Tx 884.160	Rx 839.160
Channel 8	(493)	Tx 884.790	Rx 839.790
Channel 9	(514)	Tx 885.420	Rx 840.420
Channel 10	(535)	Tx 886.050	Rx 841.050
Channel 11	(556)	Tx 886.680	Rx 841.680
Channel 12	(577)	Tx 887.310	Rx 842.310
Channel 13	(598)	Tx 887.940	Rx 842.940
Channel 14	(619)	Tx 888.570	Rx 843.570
Channel 15	(640)	Tx 889.200	Rx 844.200
Channel 16	(661)	Tx 889.830	Rx 844.830

Cell # 14

Channel 1	(347)	Tx 880.410	Rx 835.410
Channel 2	(368)	Tx 881.040	Rx 836.040
Channel 3	(389)	Tx 881.670	Rx 836.670
Channel 4	(410)	Tx 882.300	Rx 837.300
Channel 5	(431)	Tx 882.930	Rx 837.930
Channel 6	(452)	Tx 883.560	Rx 838.560
Channel 7	(473)	Tx 884.190	Rx 839.190
Channel 8	(494)	Tx 884.820	Rx 839.820
Channel 9	(515)	Tx 885.450	Rx 840.450
Channel 10	(536)	Tx 886.080	Rx 841.080

Channel 11	(557)	Tx 886.710	Rx 841.710
Channel 12	(578)	Tx 887.340	Rx 842.340
Channel 13	(599)	Tx 887.970	Rx 842.970
Channel 14	(620)	Tx 888.600	Rx 843.600
Channel 15	(641)	Tx 889.230	Rx 844.230
Channel 16	(662)	Tx 889.860	Rx 844.860

Cell # 15

Channel 1	(348)	Tx 880.440	Rx 835.440
Channel 2	(369)	Tx 881.070	Rx 836.070
Channel 3	(390)	Tx 881.700	Rx 836.700
Channel 4	(411)	Tx 882.330	Rx 837.330
Channel 5	(432)	Tx 882.960	Rx 837.960
Channel 6	(453)	Tx 883.590	Rx 838.590
Channel 7	(474)	Tx 884.220	Rx 839.220
Channel 8	(495)	Tx 884.850	Rx 839.850
Channel 9	(516)	Tx 885.480	Rx 840.480
Channel 10	(537)	Tx 886.110	Rx 841.110
Channel 11	(558)	Tx 886.740	Rx 841.740
Channel 12	(579)	Tx 887.370	Rx 842.370
Channel 13	(600)	Tx 888.000	Rx 843.000
Channel 14	(621)	Tx 888.630	Rx 843.630
Channel 15	(642)	Tx 889.260	Rx 844.260
Channel 16	(663)	Tx 889.890	Rx 844.890

Cell # 16

Channel 1	(349)	Tx 880.470	Rx 835.470
Channel 2	(370)	Tx 881.100	Rx 836.100
Channel 3	(391)	Tx 881.730	Rx 836.730
Channel 4	(412)	Tx 882.360	Rx 837.360
Channel 5	(433)	Tx 882.990	Rx 837.990
Channel 6	(454)	Tx 883.620	Rx 838.620
Channel 7	(475)	Tx 884.250	Rx 839.250
Channel 8	(496)	Tx 884.880	Rx 839.880
Channel 9	(517)	Tx 885.510	Rx 840.510
Channel 10	(538)	Tx 886.140	Rx 841.140
Channel 11	(559)	Tx 886.770	Rx 841.770
Channel 12	(580)	Tx 887.400	Rx 842.400
Channel 13	(601)	Tx 888.030	Rx 843.030
Channel 14	(622)	Tx 888.660	Rx 843.660
Channel 15	(643)	Tx 889.290	Rx 844.290
Channel 16	(664)	Tx 889.920	Rx 844.920

Cell # 17

Channel 1	(350)	Tx 880.500	Rx 835.500
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Channel 2	(371)	Tx 881.130	Rx 836.130
Channel 3	(392)	Tx 881.760	Rx 836.760
Channel 4	(413)	Tx 882.390	Rx 837.390
Channel 5	(434)	Tx 883.020	Rx 838.020
Channel 6	(455)	Tx 883.650	Rx 838.650
Channel 7	(476)	Tx 884.280	Rx 839.280
Channel 8	(497)	Tx 884.910	Rx 839.910
Channel 9	(518)	Tx 885.540	Rx 840.540
Channel 10	(539)	Tx 886.170	Rx 841.170
Channel 11	(560)	Tx 886.800	Rx 841.800
Channel 12	(581)	Tx 887.430	Rx 842.430
Channel 13	(602)	Tx 888.060	Rx 843.060
Channel 14	(623)	Tx 888.690	Rx 843.690
Channel 15	(644)	Tx 889.320	Rx 844.320
Channel 16	(665)	Tx 889.950	Rx 844.950

Cell # 18

Channel 1	(351)	Tx 880.530	Rx 835.530
Channel 2	(372)	Tx 881.160	Rx 836.160
Channel 3	(393)	Tx 881.790	Rx 836.790
Channel 4	(414)	Tx 882.420	Rx 837.420
Channel 5	(435)	Tx 883.050	Rx 838.050
Channel 6	(456)	Tx 883.680	Rx 838.680
Channel 7	(477)	Tx 884.310	Rx 839.310
Channel 8	(498)	Tx 884.940	Rx 839.940
Channel 9	(519)	Tx 885.570	Rx 840.570
Channel 10	(540)	Tx 886.200	Rx 841.200
Channel 11	(561)	Tx 886.830	Rx 841.830
Channel 12	(582)	Tx 887.460	Rx 842.460
Channel 13	(603)	Tx 888.090	Rx 843.090
Channel 14	(624)	Tx 888.720	Rx 843.720
Channel 15	(645)	Tx 889.350	Rx 844.350
Channel 16	(666)	Tx 889.980	Rx 844.980

Cell # 19

Channel 1	(352)	Tx 880.560	Rx 835.560
Channel 2	(373)	Tx 881.190	Rx 836.190
Channel 3	(394)	Tx 881.820	Rx 836.820
Channel 4	(415)	Tx 882.450	Rx 837.450
Channel 5	(436)	Tx 883.080	Rx 838.080
Channel 6	(457)	Tx 883.710	Rx 838.710
Channel 7	(478)	Tx 884.340	Rx 839.340
Channel 8	(499)	Tx 884.970	Rx 839.970
Channel 9	(520)	Tx 885.600	Rx 840.600
Channel 10	(541)	Tx 886.230	Rx 841.230
Channel 11	(562)	Tx 886.860	Rx 841.860

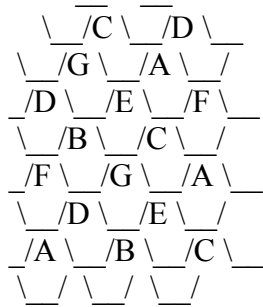
Channel 12	(583)	Tx 887.490	Rx 842.490
Channel 13	(604)	Tx 888.120	Rx 843.120
Channel 14	(625)	Tx 888.750	Rx 843.750
Channel 15	(646)	Tx 889.380	Rx 844.380

Cell # 20

Channel 1	(353)	Tx 880.590	Rx 835.590
Channel 2	(374)	Tx 881.220	Rx 836.220
Channel 3	(395)	Tx 881.850	Rx 836.850
Channel 4	(416)	Tx 882.480	Rx 837.480
Channel 5	(437)	Tx 883.110	Rx 838.110
Channel 6	(458)	Tx 883.740	Rx 838.740
Channel 7	(479)	Tx 884.370	Rx 839.370
Channel 8	(500)	Tx 885.000	Rx 840.000
Channel 9	(521)	Tx 885.630	Rx 840.630
Channel 10	(542)	Tx 886.260	Rx 841.260
Channel 11	(563)	Tx 886.890	Rx 841.890
Channel 12	(584)	Tx 887.520	Rx 842.520
Channel 13	(605)	Tx 888.150	Rx 843.150
Channel 14	(626)	Tx 888.780	Rx 843.780
Channel 15	(647)	Tx 889.410	Rx 844.410

Cell # 21

Channel 1	(354)	Tx 880.620	Rx 835.620
Channel 2	(375)	Tx 881.250	Rx 836.250
Channel 3	(396)	Tx 881.880	Rx 836.880
Channel 4	(417)	Tx 882.510	Rx 837.510
Channel 5	(438)	Tx 883.140	Rx 838.140
Channel 6	(459)	Tx 883.770	Rx 838.770
Channel 7	(480)	Tx 884.400	Rx 839.400
Channel 8	(501)	Tx 885.030	Rx 840.030
Channel 9	(522)	Tx 885.660	Rx 840.660
Channel 10	(543)	Tx 886.290	Rx 841.290
Channel 11	(564)	Tx 886.920	Rx 841.920
Channel 12	(585)	Tx 887.550	Rx 842.550
Channel 13	(606)	Tx 888.180	Rx 843.180
Channel 14	(627)	Tx 888.810	Rx 843.810
Channel 15	(648)	Tx 889.440	Rx 844.440



This represents how a cellular system might be laid out. Cells A and B never share a common border. Neither do B and C, A and G, etc. Cells that are next to each other are never assigned adjacent frequencies. They always differ by at least 60 kiloHertz. To track a mobile phone as it changes cells, let's put the mobile in a B cell. When the mobile switches frequencies, you know that he could only go to an D, E, F or G cell because A and C have adjacent frequencies. The two tables below will help you determine which channel cells can go next to each other. You can contact your local cellular phone company and see if they have any maps of the cells available. This is not a sure thing, but it couldn't hurt to try.

Cells that can go next to each other:

Cell	Compatible cells
A	C, D, E, F
B	D, E, F, G
C	E, F, G, A
D	F, G, A, B
E	G, A, B, C
F	A, B, C, D
G	B, C, D, E

Here is a frequency/cell layout chart. The cell frequencies are used by the cell site towers, and the mobile frequencies are the input frequencies used by the cars.

Wireline company cell frequencies (BAND B)

CELL A	CELL B	CELL C	CELL D	CELL E	CELL F	CELL G
889.890	889.920	889.950	889.980		<i>f₀</i>	
889.680	889.710	889.740	889.770	889.800	889.830	889.860 ≥
889.470	889.500	889.530	889.560	889.590	889.620	889.650 ≥
889.260	889.290	889.320	889.350	889.380	889.410	889.440 ≥
889.050	889.080	889.110	889.140	889.170	889.200	889.230 ≥
888.840	888.870	888.900	888.930	888.960	888.990	889.020 ≥
888.630	888.660	888.690	888.720	888.750	888.780	888.810 ≥
888.420	888.450	888.480	888.510	888.540	888.570	888.600 ≥

888.210	888.240	888.270	888.300	888.330	888.360	888.390	≥
888.000	888.030	888.060	888.090	888.120	888.150	888.180	≥
887.790	887.820	887.850	887.880	887.910	887.940	887.970	≥
887.580	887.610	887.640	887.670	887.700	887.730	887.760	≥
887.370	887.400	887.430	887.460	887.490	887.520	887.550	≥
887.160	887.190	887.220	887.250	887.280	887.310	887.340	≥
886.950	886.980	887.010	887.040	887.070	887.100	887.130	≥
886.740	886.770	886.800	886.830	886.860	886.890	886.920	≥
886.530	886.560	886.590	886.620	886.650	886.680	886.710	≥
886.320	886.350	886.380	886.410	886.440	886.470	886.500	≥Voice
886.110	886.140	886.170	886.200	886.230	886.260	886.290	≥
885.900	885.930	885.960	885.990	886.020	886.050	886.080	≥
885.690	885.720	885.750	885.780	885.810	885.840	885.870	≥
885.480	885.510	885.540	885.570	885.600	885.630	885.660	≥
885.270	885.300	885.330	885.360	885.390	885.420	885.450	≥
885.060	885.090	885.120	885.150	885.180	885.210	885.240	≥
884.850	884.880	884.910	884.940	884.970	885.000	885.030	≥
884.640	884.670	884.700	884.730	884.760	884.790	884.820	≥
884.430	884.460	884.490	884.520	884.550	884.580	884.610	≥
884.220	884.250	884.280	884.310	884.340	884.370	884.400	≥
884.010	884.040	884.070	884.100	884.130	884.160	884.190	≥Channels
883.800	883.830	883.860	883.890	883.920	883.950	883.980	≥
883.590	883.620	883.650	883.680	883.710	883.740	883.770	≥
883.380	883.410	883.440	883.470	883.500	883.530	883.560	≥
883.170	883.200	883.230	883.260	883.290	883.320	883.350	≥
882.960	882.990	883.020	883.050	883.080	883.110	883.140	≥
882.750	882.780	882.810	882.840	882.870	882.900	882.930	≥
882.540	882.570	882.600	882.630	882.660	882.690	882.720	≥
882.330	882.360	882.390	882.420	882.450	882.480	882.510	≥
882.120	882.150	882.180	882.210	882.240	882.270	882.300	≥
881.910	881.940	881.970	882.000	882.030	882.060	882.090	≥
881.700	881.730	881.760	881.790	881.820	881.850	881.880	≥
881.490	881.520	881.550	881.580	881.610	881.640	881.670	≥
881.280	881.310	881.340	881.370	881.400	881.430	881.460	≥
881.070	881.100	881.130	881.160	881.190	881.220	881.250	≥
880.860	880.890	880.920	880.950	880.980	881.010	881.040	≥
880.650	880.680	880.710	880.740	880.770	880.800	880.830	fY

880.440	880.470	880.500	880.530	880.560	880.590	880.620	føDigital
880.230	880.260	880.290	880.320	880.350	880.380	880.410	≥Control
880.020	880.050	880.080	880.110	880.140	880.170	880.200	fYChannels

Wireline company mobile frequencies (BAND B)

CELL A	CELL B	CELL C	CELL D	CELL E	CELL F	CELL G
=====	=====	=====	=====	=====	=====	=====
844.890	844.920	844.950	844.980		fø	
844.680	844.710	844.740	844.770	844.800	844.830	844.860 ≥

844.470	844.500	844.530	844.560	844.590	844.620	844.650	≥
844.260	844.290	844.320	844.350	844.380	844.410	844.440	≥
844.050	844.080	844.110	844.140	844.170	844.200	844.230	≥
843.840	843.870	843.900	843.930	843.960	843.990	844.020	≥
843.630	843.660	843.690	843.720	843.750	843.780	843.810	≥
843.420	843.450	843.480	843.510	843.540	843.570	843.600	≥
843.210	843.240	843.270	843.300	843.330	843.360	843.390	≥
843.000	843.030	843.060	843.090	843.120	843.150	843.180	≥
842.790	842.820	842.850	842.880	842.910	842.940	842.970	≥
842.580	842.610	842.640	842.670	842.700	842.730	842.760	≥
842.370	842.400	842.430	842.460	842.490	842.520	842.550	≥
842.160	842.190	842.220	842.250	842.280	842.310	842.340	≥
841.950	841.980	842.010	842.040	842.070	842.100	842.130	≥
841.740	841.770	841.800	841.830	841.860	841.890	841.920	≥
841.530	841.560	841.590	841.620	841.650	841.680	841.710	≥
841.320	841.350	841.380	841.410	841.440	841.470	841.500	≥Voice
841.110	841.140	841.170	841.200	841.230	841.260	841.290	≥
840.900	840.930	840.960	840.990	841.020	841.050	841.080	≥
840.690	840.720	840.750	840.780	840.810	840.840	840.870	≥
840.480	840.510	840.540	840.570	840.600	840.630	840.660	≥
840.270	840.300	840.330	840.360	840.390	840.420	840.450	≥
840.060	840.090	840.120	840.150	840.180	840.210	840.240	≥
839.850	839.880	839.910	839.940	839.970	840.000	840.030	≥
839.640	839.670	839.700	839.730	839.760	839.790	839.820	≥
839.430	839.460	839.490	839.520	839.550	839.580	839.610	≥
839.220	839.250	839.280	839.310	839.340	839.370	839.400	≥
839.010	839.040	839.070	839.100	839.130	839.160	839.190	≥Channels
838.800	838.830	838.860	838.890	838.920	838.950	838.980	≥
838.590	838.620	838.650	838.680	838.710	838.740	838.770	≥
838.380	838.410	838.440	838.470	838.500	838.530	838.560	≥
838.170	838.200	838.230	838.260	838.290	838.320	838.350	≥
837.960	837.990	838.020	838.050	838.080	838.110	838.140	≥
837.750	837.780	837.810	837.840	837.870	837.900	837.930	≥
837.540	837.570	837.600	837.630	837.660	837.690	837.720	≥
837.330	837.360	837.390	837.420	837.450	837.480	837.510	≥
837.120	837.150	837.180	837.210	837.240	837.270	837.300	≥
836.910	836.940	836.970	837.000	837.030	837.060	837.090	≥
836.700	836.730	836.760	836.790	836.820	836.850	836.880	≥
836.490	836.520	836.550	836.580	836.610	836.640	836.670	≥
836.280	836.310	836.340	836.370	836.400	836.430	836.460	≥
836.070	836.100	836.130	836.160	836.190	836.220	836.250	≥
835.860	835.890	835.920	835.950	835.980	836.010	836.040	≥
835.650	835.680	835.710	835.740	835.770	835.800	835.830	fY

835.440	835.470	835.500	835.530	835.560	835.590	835.620	føDigital
835.230	835.260	835.290	835.320	835.350	835.380	835.410	≥Control
835.020	835.050	835.080	835.110	835.140	835.170	835.200	fYChannels

Non-wireline company cell frequencies (BAND A)

CELL A	CELL B	CELL C	CELL D	CELL E	CELL F	CELL G
879.900	879.930	879.960	879.990			<i>f</i> øDigital
879.690	879.720	879.750	879.780	879.810	879.840	879.870 ≥Control
879.480	879.510	879.540	879.570	879.600	879.630	879.660 ≥Channels
			879.390	879.420	879.450	<i>f</i> Ÿ
879.270	879.300	879.330	879.360			<i>f</i> ø
879.060	879.090	879.120	879.150	879.180	879.210	879.240 ≥
878.850	878.880	878.910	878.940	878.970	879.000	879.030 ≥
878.640	878.670	878.700	878.730	878.760	878.790	878.820 ≥
878.430	878.460	878.490	878.520	878.550	878.580	878.610 ≥
878.220	878.250	878.280	878.310	878.340	878.370	878.400 ≥
878.010	878.040	878.070	878.100	878.130	878.160	878.190 ≥
877.800	877.830	877.860	877.890	877.920	877.950	877.980 ≥
877.590	877.620	877.650	877.680	877.710	877.740	877.770 ≥
877.380	877.410	877.440	877.470	877.500	877.530	877.560 ≥
877.170	877.200	877.230	877.260	877.290	877.320	877.350 ≥
876.960	876.990	877.020	877.050	877.080	877.110	877.140 ≥
876.750	876.780	876.810	876.840	876.870	876.900	876.930 ≥
876.540	876.570	876.600	876.630	876.660	876.690	876.720 ≥
876.330	876.360	876.390	876.420	876.450	876.480	876.510 ≥
876.120	876.150	876.180	876.210	876.240	876.270	876.300 ≥
875.910	875.940	875.970	876.000	876.030	876.060	876.090 ≥
875.700	875.730	875.760	875.790	875.820	875.850	875.880 ≥ Voice
875.490	875.520	875.550	875.580	875.610	875.640	875.670 ≥
875.280	875.310	875.340	875.370	875.400	875.430	875.460 ≥
875.070	875.100	875.130	875.160	875.190	875.220	875.250 ≥
874.860	874.890	874.920	874.950	874.980	875.010	875.040 ≥
874.650	874.680	874.710	874.740	874.770	874.800	874.830 ≥
874.440	874.470	874.500	874.530	874.560	874.590	874.620 ≥
874.230	874.260	874.290	874.320	874.350	874.380	874.410 ≥
874.020	874.050	874.080	874.110	874.140	874.170	874.200 ≥
873.810	873.840	873.870	873.900	873.930	873.960	873.990 ≥
873.600	873.630	873.660	873.690	873.720	873.750	873.780 ≥
873.390	873.420	873.450	873.480	873.510	873.540	873.570 ≥ Channels
873.180	873.210	873.240	873.270	873.300	873.330	873.360 ≥
872.970	873.000	873.030	873.060	873.090	873.120	873.150 ≥
872.760	872.790	872.820	872.850	872.880	872.910	872.940 ≥
872.550	872.580	872.610	872.640	872.670	872.700	872.730 ≥
872.340	872.370	872.400	872.430	872.460	872.490	872.520 ≥
872.130	872.160	872.190	872.220	872.250	872.280	872.310 ≥
871.920	871.950	871.980	872.010	872.040	872.070	872.100 ≥
871.710	871.740	871.770	871.800	871.830	871.860	871.890 ≥

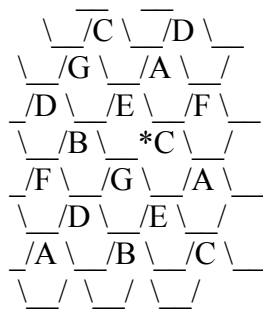
871.500	871.530	871.560	871.590	871.620	871.650	871.680	≥
871.290	871.320	871.350	871.380	871.410	871.440	871.470	≥
871.080	871.110	871.140	871.170	871.200	871.230	871.260	≥
870.870	870.900	870.930	870.960	870.990	871.020	871.050	≥
870.660	870.690	870.720	870.750	870.780	870.810	870.840	≥
870.450	870.480	870.510	870.540	870.570	870.600	870.630	≥
870.240	870.270	870.300	870.330	870.360	870.390	870.420	≥
870.030	870.060	870.090	870.120	870.150	870.180	870.210	fY

Non-wireline company mobile frequencies (BAND A)

CELL A	CELL B	CELL C	CELL D	CELL E	CELL F	CELL G	
834.900	834.930	834.960	834.990				føDigital
834.690	834.720	834.750	834.780	834.810	834.840	834.870	≥Control
834.480	834.510	834.540	834.570	834.600	834.630	834.660	≥Channels
			834.390	834.420	834.450		fY
834.270	834.300	834.330	834.360				fø
834.060	834.090	834.120	834.150	834.180	834.210	834.240	≥
833.850	833.880	833.910	833.940	833.970	834.000	834.030	≥
833.640	833.670	833.700	833.730	833.760	833.790	833.820	≥
833.430	833.460	833.490	833.520	833.550	833.580	833.610	≥
833.220	833.250	833.280	833.310	833.340	833.370	833.400	≥
833.010	833.040	833.070	833.100	833.130	833.160	833.190	≥
832.800	832.830	832.860	832.890	832.920	832.950	832.980	≥
832.590	832.620	832.650	832.680	832.710	832.740	832.770	≥
832.380	832.410	832.440	832.470	832.500	832.530	832.560	≥
832.170	832.200	832.230	832.260	832.290	832.320	832.350	≥
831.960	831.990	832.020	832.050	832.080	832.110	832.140	≥
831.750	831.780	831.810	831.840	831.870	831.900	831.930	≥
831.540	831.570	831.600	831.630	831.660	831.690	831.720	≥
831.330	831.360	831.390	831.420	831.450	831.480	831.510	≥
831.120	831.150	831.180	831.210	831.240	831.270	831.300	≥
830.910	830.940	830.970	831.000	831.030	831.060	831.090	≥
830.700	830.730	830.760	830.790	830.820	830.850	830.880	≥ Voice
830.490	830.520	830.550	830.580	830.610	830.640	830.670	≥
830.280	830.310	830.340	830.370	830.400	830.430	830.460	≥
830.070	830.100	830.130	830.160	830.190	830.220	830.250	≥
829.860	829.890	829.920	829.950	829.980	830.010	830.040	≥
829.650	829.680	829.710	829.740	829.770	829.800	829.830	≥
829.440	829.470	829.500	829.530	829.560	829.590	829.620	≥
829.230	829.260	829.290	829.320	829.350	829.380	829.410	≥
829.020	829.050	829.080	829.110	829.140	829.170	829.200	≥
828.810	828.840	828.870	828.900	828.930	828.960	828.990	≥
828.600	828.630	828.660	828.690	828.720	828.750	828.780	≥
828.390	828.420	828.450	828.480	828.510	828.540	828.570	≥ Channels
828.180	828.210	828.240	828.270	828.300	828.330	828.360	≥
827.970	828.000	828.030	828.060	828.090	828.120	828.150	≥

827.760	827.790	827.820	827.850	827.880	827.910	827.940	≥
827.550	827.580	827.610	827.640	827.670	827.700	827.730	≥
827.340	827.370	827.400	827.430	827.460	827.490	827.520	≥
827.130	827.160	827.190	827.220	827.250	827.280	827.310	≥
826.920	826.950	826.980	827.010	827.040	827.070	827.100	≥
826.710	826.740	826.770	826.800	826.830	826.860	826.890	≥
826.500	826.530	826.560	826.590	826.620	826.650	826.680	≥
826.290	826.320	826.350	826.380	826.410	826.440	826.470	≥
826.080	826.110	826.140	826.170	826.200	826.230	826.260	≥
825.870	825.900	825.930	825.960	825.990	826.020	826.050	≥
825.660	825.690	825.720	825.750	825.780	825.810	825.840	≥
825.450	825.480	825.510	825.540	825.570	825.600	825.630	≥
825.240	825.270	825.300	825.330	825.360	825.390	825.420	≥
825.030	825.060	825.090	825.120	825.150	825.180	825.210	fY

Monitoring of the base sites is obviously going to be easier than monitoring the mobiles. The cell base sites are towers (usually blue) with a triangle shaped "head" on top, and sporting a couple of what appear to be vertical antennas. These base sites have a range of 3-5 miles. If you take a look at the honeycomb diagram, you can see how they are laid out. The cell transmitter is in the middle of the cell. It is possible to hear many, most, or all of the cells in your city, depending on your location. The closer you live to a boundary, the greater the chances of your being able to receive more cells. Due to the nature of radio signals, the actual cell shape is more or less round. However, the hexagon shape lends itself better to show how the system is laid out. With a circular coverage area, there will be some overlapping between adjacent cells.



If, for example, you live near the asterisk (*) in the above diagram, you will be able go easily hear the G, C, E, and A cells you're near. Since the maximum practical range of a cell is 3-5 miles, you'll be able to hear them a bit farther away. However, due to the nature of the FM transceivers at the cell sites (they capture only the strongest signal), you should be able to hear all seven cells. Which one of each cell you hear will depend on your location and the strength of the received signal. In the above diagram, you'll most likely hear the F cell in the upper right, rather than the one on the left.

Mobile reception is almost a waste of time unless you have an outdoor antenna. And, since the mobile will be repeated on the cell site, it's better to listen to the cell frequencies. You may not be able to hear both sides of the conversation if you listen only to the mobile frequencies!!! It is useful, however, for determining which channel cell you're in. If you use the antenna that came with the scanner, mobile range will be decreased down to 1 or 2 miles. By checking the scanner readout against the cell list above (825.030-844.980 MHz), you can tell what cell the mobile is in. This is also useful on the cell site frequencies. If you hear someone say, "I'm at the corner of highway FF and 37," and you know where the cell site antenna is in that area, you can check the frequency listing above and determine what cell that antenna belongs to.

The Electronic Communications Privacy Act of 1986 and CMT

The ECPA, passed in 1986, is partly responsible for the extreme interest in CMT monitoring. After all, if you tell someone they can't listen to these phone calls, they'll immediately want to do so. "There must be something going on there that's either interesting or important. Why else would they want to keep us from listening?" seems to be the predominant reaction.

Be assured that it is illegal under the ECPA to listen to cellular phone calls. This law was passed mainly to satisfy the CMT manufacturers. They can now tell their customers that their conversations are 'protected by federal law.' However, when this law was drawn up, it was obviously felt to be too narrow in its views, since it protected only one service. So it was amended to include various services, such as microwaves, some satellites, broadcast STL links (studio-transmitter links), and the descrambling of scrambled signals.

However, from the very beginning, the government has shown an extremely bored attitude when it comes to the ECPA. There is virtually no attempt at enforcement, unless it's a case involving blackmail, or an overt attempt is being made to provide radios with CMT-specific frequencies. In the latter case, a dealer was modifying the radios he was selling. After a government visit, he agreed not to modify the radios, but he was allowed to include instructions on how to make the modification. With the Pro-2005 and Pro-2005, this consists of opening the radio and clipping one diode, an operation that takes all of 15 minutes, including disassembly.

What does all this mean? You can receive any frequency you wish. There is literally no way to tell what you're listening to in the privacy of your

home. Your scanner (as well as EVERY radio) does transmit an extremely small amount of RF energy from the local oscillator, but unless the radio is in very bad shape, that energy won't go past 40 or 50 feet. The "gummint" would have to drive around in detection vans with beam antennas, and with 100,000 scanner owners, it's an extremely good bet that they're not even going to consider thinking about the merest possibility that someone might put this idea forward to be contemplated. They've got more important stuff to worry about. What it comes down to is this: listen to whatever you want to, but don't divulge it or use the information for personal or illegal gain. That will get you into deep doo-doo in double-quick time.

Most people have the opinion that if it's unscrambled, and it's passing freely through their home and body, that they have the right to receive it. This sounds like good solid thinking. The laws of this land provide for just compensation to individuals. Perhaps a few bills to CMT companies for transmission rights would help to remove this silly law from the books.

The Electronic Communications Privacy Act of 1986

February 2, 1987

TITLE 18 - CRIMES AND CRIMINAL PROCEDURE

PART I. CRIMES

Chapter			Sec.
	*	*	*
General provisions.....			1
	*	*	*
119. Wire and electronic communications interception and interception of oral communications.....			2510
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121. Stored Wire and Electronic Communications and Transactional Records Access.....			2701
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PART II. CRIMINAL PROCEDURE

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* * *

CHAPTER 65 - MALICIOUS MISCHIEF

Sec.

* * *
1367. Interference with the operation of a satellite.
* * *

{ 1367. Interference with the operation of a satellite

(a) Whoever, without the authority of the satellite operator, intentionally or maliciously interferes with the authorized operation of a communications or weather satellite or obstructs or hinders any satellite transmission shall be fined in accordance with this title or imprisoned not more than ten years of both.

(b) This section does not prohibit any lawfully authorized investigative, protective, or intelligence activity of a law enforcement agency or of an intelligence agency of the United States.

* * *
CHAPTER 109 - SEARCHES AND SEIZURES
* * *

{ 2232. Destruction or removal of property to prevent seizure

(a) Physical Interference With Search. -- Whoever, before, during, or after seizure of any property by any person authorized to make searches and seizures, in order to prevent the seizure or securing of any goods, wares, or merchandise by such person, staves, breaks, throws overboard, destroys, or removes the same, shall be fined not more than \$10,000 or imprisoned more than five years, or both.

(b) Notice of Search. -- Whoever, having knowledge that any person authorized to make searches and seizures has been authorized or is otherwise likely to make a search or seizure, in order to prevent the authorized seizing or securing of any person, goods, wares, merchandise or other property, gives notice or attempts to give notice of the possible search or seizure to any person shall be fined not more than \$100,000 or imprisoned not more than five years, or both.

(c) Notice of Certain Electronic Surveillance. -- Whoever, having knowledge that a Federal investigative or law enforcement officer has been authorized or has applied for authorization under chapter 119 to intercept a wire, oral, or electronic communication, in order to obstruct, impede, or

prevent such interception, gives notice or attempts to give notice of the possible interception to any person shall be fined under this title or imprisoned not more than five years, or both.

Whoever, having knowledge that a Federal officer has been authorized or has applied for authorization to conduct electronic surveillance under the Foreign Intelligence Surveillance Act (50 U.S.C. 1801, et seq.), in order to obstruct, impede, or prevent such activity, gives notice or attempts to give notice of the possible activity to any person shall be fined under this title or imprisoned not more than five years, or both.

* * *

CHAPTER 119 -- WIRE AND ELECTRONIC COMMUNICATIONS INTERCEPTION AND INTERCEPTION OF ORAL COMMUNICATIONS

Sec.

2510. Definitions.

2511. Interception and disclosure of wire or oral communications prohibited.

2512. Manufacture, distribution, possession, and advertising of wire or oral communication intercepting devices prohibited.

2513. Confiscation of wire, oral, or electronic communication intercepting devices.

2514. Immunity of witnesses.

2515. Prohibition of use as evidence of intercepted wire, oral, or electronic communications.

2516. Authorization for interception of wire, oral, or electronic communications.

2517. Authorization for disclosure and use of intercepted wire, oral, or electronic communications.

2518. Procedure for interception of wire, oral, or electronic communications.

2519. Reports concerning intercepted wire, oral or electronic communications.

2520. Recovery of civil damages authorized.

2521. Injunction against illegal interception.

{ 2510. Definitions

As used in this chapter --

(1) "wire communication" means any aural transfer made in whole or in part through the use of facilities for the transmission of communications by the aid of wire, cable, or other like connection between the point of origin and the point of reception (including the use of such connection in a switching station) furnished or operated by any person engaged in providing or operating such facilities for the transmission of interstate or foreign communications or communications affecting interstate or foreign commerce and such term includes any electronic storage of such communication, but such term does not include the radio portion of a cordless telephone communication that is transmitted between the cordless telephone handset and the base unit;

(2) "oral communication" means any oral communication uttered by a person exhibiting an expectation that such communication is not subject to interception under circumstances justifying such expectation, but such term does not include any electronic communication;

* * *

(4) "intercept" means the aural or other acquisition of the contents of any wire, electronic, or oral communication through the use of any electronic, mechanical, or other device.

(5) "electronic mechanical, or other device" means any device or apparatus which can be used to intercept a wire, oral, or electronic communication other than --

(a) any telephone or telegraph instrument, equipment or facility, or any component thereof, (i) furnished to the subscriber or user by a provider of wire or electronic communication service in the ordinary course of its business and being used by the subscriber or user in the ordinary course of its business or furnished by such subscriber or user for connection to the facilities of such service and used in the ordinary course of its business; or (ii) being used by a communications common carrier in the ordinary course of its business, or by an investigative or law enforcement officer in the ordinary course of his duties;

* * *

(8) "contents", when used with respect to any wire, oral, or electronic communication, includes any information concerning the substance, purport, or meaning of that communication;

(9) "Judge of competent jurisdiction" means --

(a) a judge of a United States district court or a United States court of appeals; and

(b) a judge of any court of general criminal jurisdiction of a State who is authorized by a statute of that State to enter orders authorizing interceptions of wire, oral, or electronic communications;

(10) "communication common carrier" shall have the same meaning which is given the term "common carrier" by section 153(h) of title 47 of the United States Code;

(11) "aggrieved person" means a person who was a party to any intercepted wire, oral, or electronic communication or a person against whom the interception was directed;

(12) "electronic communication" means any transfer of signs, signals, writing, images, sounds, data, or intelligence of any nature transmitted in whole or in part by a wire, radio, electromagnetic, photoelectronic or photo optical system that affects interstate or foreign commerce, but does not include --

(A) the radio portion of a cordless telephone communication that is transmitted between the cordless telephone handset and the base unit;

(B) any wire or oral communication;

(C) any communication made through a tone-only paging device; or

(D) any communication from a tracking device (as defined in section 3117 of this title);

(13) "user" means any person or entity who --

(A) uses an electronic communication service; and

(B) is duly authorized by the provider of such service to

engage in such use;

(14) "electronic communications system" means any wire, radio, electromagnetic, photooptical or photoelectronic facilities for the transmission of electronic communications, and any computer facilities or related electronic equipment for the electronic storage of such communications;

(15) "electronic communication service" means any service which provides to users thereof the ability to send or receive wire or electronic communications;

(16) "readily accessible to the general public" means, with respect to a radio communication, that such communication is not --

(A) scrambled or encrypted;

(B) transmitted using modulation techniques whose essential parameters have been withheld from the public with the intention of preserving the privacy of such communication;

(C) carried on a subcarrier or other signal subsidiary to a radio transmission;

(D) transmitted over a communication system provided by a common carrier, unless the communication is a tone only paging system communication; or

(E) transmitted on frequencies allocated under part 25, subpart D, E, or F of part 74, or part 94 of the Rules of the Federal Communications Commission, unless, in the case of a communication transmitted on a frequency allocated under part 74 that is not exclusively allocated to broadcast auxiliary services, the communication is a two-way voice communication by radio;

(17) "electronic storage" means --

(A) any temporary, intermediate storage of a wire or electronic communication incidental to the electronic transmission thereof; and

(B) any storage of such communication by an electronic communication service for purposes of backup protection of such communication; and

(18) "aural transfer" means a transfer containing the human voice at any point between and including the point of origin and the point of

reception.

{ 2511. Interception and disclosure of wire or oral communications prohibited

(1) Except as otherwise specifically provided in this chapter any person who--

(a) intentionally intercepts, endeavors to intercept, or procures any other person to intercept or endeavor to intercept, any wire, oral, or electronic communication;

(b) intentionally uses, endeavors to use, or procures any other person to use or endeavor to use any electronic, mechanical, or other device to intercept any oral communication when --

(i) such device is affixed to, or otherwise transmits a signal through, a wire, cable, or other like connection used in wire communication; or

(ii) such device transmits communications by radio, or interferes with the transmission of such communication; or

(iii) such person knows, or has reason to know, that such device or any component thereof has been sent through the mail or transported in interstate or foreign commerce; or

(iv) such use or endeavor to use (A) takes place on the premises of any business or other commercial establishment the operations of which affect interstate or foreign commerce; or (B) obtains or is for the purpose of obtaining information relating to the operations of any business or other commercial establishment the operations of which affect interstate or foreign commerce; or

(v) such person acts in the District of Columbia, the Commonwealth of Puerto Rico, or any territory or possession of the United States;

(c) intentionally discloses, or endeavors to disclose, to any other person the contents of any wire, oral, or electronic communication, knowing or have reason to know that the information was obtained through the interception of a wire oral, or electronic communication in violation of this subsection; or

(d) intentionally uses, or endeavors to use, the contents of any wire, oral, or electronic communication, knowing or having reason to know that the information was obtained through the interception of a

wire, oral, or electronic communication in violation of this subsection; shall be punished as provided in subsection (4) or shall be subject to suit as provided in subsection (5).

(2)(a)(i) It shall not be unlawful under this chapter for an operator of a switchboard, or an officer, employee, or agent of a provider of wire or electronic communication service, whose facilities are used in the transmission of a wire communication, to intercept, disclose, or use that communication in the normal course of his employment while engaged in any activity which is a necessary incident to the rendition of his service or to the protection of the rights or property of the provider of that service, except that a provider of wire communication service to the public shall not utilize service observing or random monitoring except for mechanical or service quality control checks.

(ii) Notwithstanding any other law, providers of wire or electronic communication service, their officers, employees, and agents, landlords, custodians, or other persons, are authorized to provide information facilities, or technical assistance to persons authorized by law to intercept wire, oral, or electronic communications or to conduct electronic surveillance, as defined in section 101 of the Foreign Intelligence Surveillance Act of 1978, if such provider its officers, employees, or agents, land- lord, custodian, or other specified person has been provided with --

(A) a court order directing such assistance signed by the authorizing judge, or

(B) a certification in writing by a person specified in section 2518(7) of this title or the Attorney General of the United States that no warrant or court order is required by law, that all statutory requirements have been met, and that the specified assistance is required.

setting forth the period of time during which the provision of the information, facilities, or technical assistance is authorized and specifying the information, facilities, or technical assistance required. No provider of wire or electronic communication service officer, employee, or agent thereof, or landlord, custodian, or other specified person shall disclose the existence of any interception or surveillance of the device used to accomplish the interception or surveillance with respect to which the person has been furnished an order or certification under this subparagraph, except as may otherwise be required by legal process and then only after prior notification to the Attorney General or to the principal prosecuting attorney of a State or any political subdivision of a State, as may be appropriate. Any such disclosure, shall render such person liable for the civil damages provided for in section 2520. No cause of action shall lie in any court against any provider of wire or electronic

communication service its officers, employees, or agents, landlord, custodian, or other specified person for providing information, facilities, or assistance in accordance with the terms of a court order or certification under this chapter.

(b) It shall not be unlawful under this chapter for an officer, employee, or agent of the Federal Communications Commission, in the normal course of his employment and in discharge of the monitoring responsibilities exercised by the Commission in the enforcement of chapter 5 of title 57 of the United States Code, to intercept a wire or electronic communication, or oral communication transmitted by radio, or to disclose or use the information thereby obtained.

(c) It shall not be unlawful under this chapter for a person acting under color of law to intercept a wire, oral, or electronic communication, where such person is a party to the communication or one of the parties to the communication has given prior consent to such interception.

(d) It shall not be unlawful under this chapter for a person not acting under color of law to intercept a wire, oral, or electronic communication where such person is a party to the communication or where one of the parties to the communication has given prior consent to such interception unless such communication is intercepted for the purpose of committing any criminal or tortious act in violation of the Constitution or laws of the United States or of any State.

(e) Notwithstanding any other provision of this title or section 705 or 706 of the Communications Act of 1934, it shall not be unlawful for an office, employee, or agent of the United States in the normal course of his official duty to conduct electronic surveillance, as defined in section 101 of the Foreign Intelligence Surveillance Act of 1978, as authorized by that Act.

(f) Nothing contained in this chapter or chapter 121, or section 705 of the Communications Act of 1934, shall be deemed to affect the acquisition by the United States Government of foreign intelligence information from international or foreign communication, or foreign intelligence activities conducted in accordance with otherwise applicable Federal law involving a foreign electronic communications system, utilizing a means other than electronic surveillance as defined in section 101 of the Foreign Intelligence Surveillance Act of 1978, and procedures in this chapter and the Foreign Intelligence Surveillance Act of 1978 shall be the exclusive means by which electronic surveillance, as defined in section 101 of such Act, and the interception of domestic wire and oral communications may be conducted.

(g) It shall not be unlawful under this chapter or chapter 121 of this

title for any person --

(i) to intercept or access an electronic communication made through an electronic communication system that is configured so that such electronic communication is readily accessible to the general public;

(ii) to intercept any radio communication which is transmitted --

(I) by any station for the use of the general public, or that relates to ships, aircraft, vehicles, or persons in distress;

(II) by any governmental, law enforcement, civil defense private land mobile, or public safety communications system, including police and fire, readily accessible to the general public;

(III) by a station operating on an authorized frequency within the bands allocated to the amateur, citizens band, or general mobile radio services; or

(IV) by any marine or aeronautical communications system;

(iii) to engage in any conduct which --

(I) is prohibited by section 633 of the Communications Act of 1934; or

(II) is excepted from the application of section 705(a) of the Communications Act of 1934 by section 705(b) of that Act;

(iv) to intercept any wire or electronic communication the transmission of which is causing harmful interference to any lawfully operating station or consumer electronic equipment, to the extent necessary to identify the source of such interference; or

(v) for other users of the same frequency to intercept any radio communication made through a system that utilizes frequencies monitored by individuals engaged in the provision or the use of such system, if such communication is not scrambled or encrypted.

(h) It shall not be unlawful under this chapter --

(i) to use a pen register or a trap and trace device (as those terms are defined for the purposes of chapter 206 (relating to pen registers and trap and trace devices) of this title); or

(ii) for a provider of electronic communication service to record

the fact that a wire or electronic communication was initiated or completed in order to protect such provider, another provider furnishing service toward the completion of the wire or electronic communication, or a user of that service, from fraudulent, unlawful or abusive use of such service.

(3)(a) Except as provided in paragraph (b) of this subsection a person or entity providing an electronic communication service to the public shall not intentionally divulge the contents of any communication (other than one to such person or entity, or an agent thereof) while in transmission on that service to any person or entity other than an addressee or intended recipient of such communication or an agent of such addressee or intended recipient.

(b) A person or entity providing electronic communication service to the public may divulge the contents of any such communication --

(i) as otherwise authorized in section 2511(2)(a) or 2517 of this title;

(ii) with the lawful consent of the originator or any addressee or intended recipient of such communication;

(iii) to a person employed or authorized, or whose facilities are used, to forward such communication to its destination; or

(iv) which were inadvertently obtained by the service provider and which appear to pertain to the commission of a crime, if such divulgence is made to a law enforcement agency.

(4)(a) Except as provided in paragraph (b) of this subsection or in subsection (5), whoever violates subsection (1) of this section shall be fined under this title or imprisoned not more than five years, or both.

(b) If the offense is a first offense under paragraph (a) of this subsection and is not for a tortious or illegal purpose or for purposes of direct or indirect commercial advantage or private commercial gain, and the wire or electronic communication with respect to which the offense under paragraph (a) is a radio communication that is not scrambled or encrypted, then --

(i) If the communication is not the radio portion of a cellular telephone communication, a public land mobile radio service communication or a paging service communication, and the conduct is not that described in subsection (5), the offender shall be fined under this title or imprisoned not more than one year, or both, and

(ii) if the communication is the radio portion of a cellular

telephone communication, a public land mobile radio service communication or a paging service communication, the offender shall be fined not more than \$500.

(c) Conduct otherwise an offense under this subsection that consists of or relates to the interception of a satellite transmission that is not encrypted or scrambled and that is transmitted --

(i) to a broadcasting station for purposes of retransmission to the general public; or

(ii) as an audio subcarrier intended for redistribution to facilities open to the public, but not including data transmissions or telephone calls,

is not an offense under this subsection unless the conduct is for the purposes of direct or indirect commercial advantage or private financial gain.

(5)(a)(i) If the communication is --

(A) a private satellite video communication that is not scrambled or encrypted and the conduct in violation of this chapter is the private viewing of that communication and is not for a tortious or illegal purpose or for purposes of direct or indirect commercial advantage or private commercial gain; or

(B) a radio communication that is transmitted on frequencies allocated under subpart D of part 74 of the rules of the Federal Communications Commission that is not scrambled or encrypted and the conduct in violation of this chapter is not for a tortious or illegal purpose or for purposes of direct or indirect commercial advantage or private commercial gain.

then the person who engages in such conduct shall be subject to suit by the Federal Government in a court of competent jurisdiction.

(ii) In an action under this subsection --

(A) if the violation of this chapter is a first offense for the person under paragraph (a) of subsection (4) and such person has not been found liable in a civil action under section 2520 of this title, the Federal Government shall be entitled to appropriate injunctive relief; and

(B) if the violation of this chapter is a second or subsequent offense under paragraph (a) of subsection (4) or such person has been found liable in any prior civil action under section 2520, the person

shall be subject to a mandatory \$500 civil fine.

(b) The court may use any means within its authority to enforce an injunction issued under paragraph (ii)(A), and shall impose a civil fine of not less than \$500 for each violation of such an injunction,

{ 2512. Manufacture, distribution, possession, and advertising of wire or oral communication intercepting devices prohibited

(1) Except as otherwise specifically provided in this chapter, any person who intentionally --

(a) sends through the mail, or sends or carriers in interstate or foreign commerce, any electronic, mechanical, or other device, knowing or having reason to know that the design of such device renders it primarily useful for the purpose of the surreptitious interception of wire, oral, or electronic communications;

(b) manufactures, assembles, possesses, or sells any electronic, mechanical, or other device, knowing or having reason to know that the design of such device renders it primarily useful for the purpose of the surreptitious interception of wire, oral, or electronic communications, and that such device or any component thereof has been or will be sent through the mail or transported in interstate or foreign commerce; or

(c) places in any newspaper, magazine, handbill, or other publication any advertisement of--

(i) any electronic, mechanical, or other device knowing or having reason to know that the design of such device renders it primarily useful for the purpose of the surreptitious interception of wire, oral, or electronic communications; or

(ii) any other electronic, mechanical, or other device, where such advertisement promotes the use of such device for the purpose of the surreptitious interception of wire, oral, or electronic communications,

knowing or having reason to know that such advertisement will be sent through the mail or transported in interstate or foreign commerce,

shall be fined not more than \$10,000 or imprisoned not more than five years, or both.

(2) It shall not be unlawful under this section for-

(a) a provider of wire or electronic communication service or an officer, agent, or employee of, or a person under contract with, such a provider, in the normal course of the business of providing that wire or electronic communication service, or

(b) an officer, agent, or employee of, or a person under contract with, the United States, a State, or a political subdivision thereof, in the normal course of the activities of the United States, a State, or a political subdivision thereof, to send through the mail, send or carry in interstate or foreign commerce, or manufacture, assemble, possess, or sell any electronic, mechanical, or other device knowing or having reason to know that the design of such device renders it primarily useful for the purpose of the surreptitious interception of wire, oral, or electronic communications.

{ 2513. Confiscation of wire, oral, or electronic communication intercepting devices

Any electronic, mechanical, or other device used, sent, carried, manufactured, assembled, possessed, sold, or advertised in violation of section 2511 or section+ 2512 of this chapter may be seized and forfeited to the United States. All provisions of law relating to (1) the seizure, summary and judicial forfeiture, and condemnation of vessels, vehicles, merchandise, and baggage for violations of the customs laws contained in title 19 of the United States Code, (2) the disposition of such vessels, - vehicles, merchandise, and baggage or the proceeds from the sale thereof, (3) the remission or mitigation of such forfeiture, (4) the compromise of claims, and (5) the award of compensation to informers in respect of such forfeitures, shall apply to seizures and forfeitures incurred, or alleged to have been incurred, under the provisions of this section, insofar as applicable and not inconsistent with the provisions of this section; except that such duties as are imposed upon the collector of customs or any other person with respect to the seizure and forfeiture of vessels, vehicles, merchandise, and baggage under the provisions of the customs laws contained in title 19 of the United States Code shall be performed with respect to seizure and forfeiture of electronic, mechanical, or other intercepting devices under this section by such officers, agents, or other persons as may be authorized or designated for that purpose of the Attorney General.

{ 2515. Prohibition of use as evidence of intercepted wire, oral, or electronic communications

Whenever any wire, oral, or electronic communications has been intercepted, no part of the contents of such communication and no evidence derived therefrom may be received in evidence in any trial, hearing, or other proceeding in or before any court, grand jury, department, officer, agency, regulatory body, legislative committee, or other authority of the United States, a State, or a political subdivision thereof if the disclosure

of that information would be in violation of this chapter.

{ 2516. Authorization for interception of wire, oral, or electronic communications

(1) The Attorney General, Deputy Attorney General, Associate Attorney General, any Assistant Attorney General, any acting Assistant Attorney General, or any Deputy Assistant Attorney General in the Criminal Division specially designated by the Attorney General, may authorize an application to a Federal judge of competent jurisdiction for, and such judge may grant in conformity with section 2518 of this chapter an order authorizing or approving the interception of wire or oral communications by the Federal Bureau of Investigation, or a Federal agency having responsibility for the investigation of the offense as to which the application is made, when such interception may provide or has provided evidence of-

(a) any offense punishable by death or by imprisonment for more than one year under sections 2274 through 2277 of title 42 of the United States Code (relating to the enforcement of the Atomic Energy Act of 1954), section 2284 of title 42 of the United States Code (relating to sabotage of nuclear facilities or fuel), or under the following chapters of this title: chapter 37 (relating to espionage), chapter 105 (relating to sabotage), chapter 115 (relating to treason), chapter 192 (relating to riots), chapter 65 (relating to malicious matter mischief), chapter 111 (relating to destruction of vessels), or chapter 81 (relating to piracy);

(b) a violation of section 186 or section 501(c) of title 29, United States Code (dealing with restrictions on payments and loans to labor organizations), or any offense which involves murders, kidnapping, robbery, or extortion, and which is punishable under this title;

(c) any offense which is punishable under the following section of this title: section 201 (bribery of public officials and witnesses), section 224 (bribery in sporting contests), subsection (d), (e), (f), (g), (h), or (i) of section 844 (unlawful use of explosives), section 1084 (transmission of wagering information), section 751 (relating to escape), sections 1503, 1512, and 1513 (influencing or injuring an officer, juror, or witness generally), section 1510 (obstruction of criminal investigations), section 1511 (obstruction of State or local law enforcement), section 1751 (Presidential and Presidential staff assassination, kidnapping, and assault), section 1951 (interference with commerce by threats or violence), section 1952 (interstate and foreign travel or transportation in aid of racketeering enterprises), section 1952A (relating to use of interstate commerce facilities in the commission of murder for hire), section 1952B

(relating to violent crimes in aid of racketeering activity), section 1954 (offer acceptance, or solicitation to influence operations of employee benefit plan), section 1955 (prohibition of business enterprises of gambling), section 659 (theft from interstate shipment), section 664 (embezzlement from pension and welfare funds), section 1343 (fraud by wire, radio, or television), section 2252 or 2253 (sexual exploitation of children), Section 2251 and 2252 (sexual exploitation of children), section 2312, 2313, 2314, and 2315 (interstate transportation of stolen property), the second section 2320 (relating to trafficking in certain motor vehicles or motor vehicle parts), section 1203 (relating to hostage taking), section 1029 (relating to fraud and related activity in connection with access devices), section 3146 (relating to penalty for failure to appear), section 3521(b)(3) (relating to witness relocation and assistance), section 32 (relating to destruction of aircraft or aircraft facilities), section 1963 (violations with respect to racketeer influenced and corrupt organizations), section 115 (relating to threatening or retaliating against a Federal official), the section in chapter 65 relating to destruction of an energy facility, and section 1341 (relating to mail fraud), section 351 (violations with respect to congressional, Cabinet, or Supreme Court assassination, kidnapping, and assault), section 831 (relating to prohibited transaction involving nuclear materials), section 33 (relating to destruction of motor vehicles or motor vehicle facilities), or section 1992 (relating to wrecking trains);

(d) any offense involving counterfeiting punishable under section 471, 472, or 473 of this title;

(e) any offense involving fraud connected with a case under title 11 or the manufacture, importation, receiving, concealment, buying, selling, or otherwise dealing in narcotic drugs, marijuana, or other dangerous drugs, punishable under any law of the United States;

(f) any offense including extortionate credit transactions under sections 892, 893, or 894 of this title;

(g) a violation of section 5322 of title 31, United States Code (dealing with the reporting of currency transactions);

(h) any felony violation of sections 511 and 2512 (relating to interception and disclosure of certain communications and to certain intercepting devices) of this title;

(i) any violation of section 1679(c)(2) (relating to destruction of a natural gas pipeline) or subsection (i) or (n) of the United States Code;

(j) any criminal violation of section 2778 of title 22 (relating

to the Arms Export Control Act); or

(k) the location of any fugitive from justice from an offense described in this section; or

(l) any conspiracy to commit any of the foregoing offenses.

(2) The principal prosecuting attorney of any State, or the principal prosecuting attorney of any political subdivision thereof, if such attorney is authorized by a statute of that State to make application to a State court judge of competent jurisdiction for an order authorizing or approving the interception of wire, oral, or electronic communications, may apply to such judge for, and such judge may grant in conformity with section 2518 of this chapter and with the applicable State statute an order authorizing, or approving the interception of wire, oral, or electronic communications by investigative or law enforcement officers having responsibility for the investigation of the offense as to which the application is made, when such interception may provide or has provided evidence of the commission of the offense of murder, kidnapping, gambling, robbery, bribery, extortion, or dealing in narcotic drugs, marijuana or other dangerous drugs, or other crime dangerous to life, limb, or property, and punishable by imprisonment for more than one year, designated in any applicable State statute authorizing such interception, or any conspiracy to commit any of the foregoing offenses.

(3) Any attorney for the Government (as such term is defined for the purposes of the Federal Rules of Criminal Procedure) may authorize an application to a Federal judge of competent jurisdiction for, and such judge may grant, in conformity with section 2518 of this title, an order authorizing or approving the interception of electronic communications by an investigative or law enforcement officer having responsibility for the investigation of the offense s to which the application is made, when such interception may provide or has provided evidence of any Federal felony.

{ 2517. Authorization for disclosure and use of intercepted wire, oral, or electronic communication

(1) Any investigative or law enforcement officer who, by any means authorized by this chapter, has obtained knowledge of the contents of any wire, oral, or electronic communication, or evidence derived therefrom may disclose such contents to another investigative or law enforcement officer to the extent that such disclosure is appropriate to the proper performance of the official duties of the officer making or receiving the disclosure.

(2) Any investigative or law enforcement officer who, by an means authorized by this chapter, has obtained knowledge of the contents of any wire, oral, or electronic communication or evidence derived therefrom any use such contents to the extent such use is appropriate to the proper

performance of his official duties.

(3) Any person who has received, by any means authorized by this chapter, any information concerning a wire, oral, or electronic communication, or evidence derived therefrom intercepted in accordance with the provisions of this chapter may disclose the contents of that communication or such derivative evidence while giving testimony under oath or affirmation in any proceeding held under the authority of the United States of of any State or political subdivision thereof.

(4) No otherwise privileged wire, oral, or electronic communication intercepted in accordance with, or in violation of, the provisions of this chapter shall lose its privileged character.

(5) When an investigative or law enforcement officer, while engaged in intercepting wire or oral communications in the manner authorized herein, intercepts wire, oral, or electronic communications relating to offenses other than those specified in the order of authorization or approval, the contents thereof, and evidence derived therefrom, may be disclosed or used as provided in subsections (1) and (2) of this section. Such contents and any evidence derived therefrom may be used under subsection (3) of this section when authorized or approved by a judge of competent jurisdiction where such judge finds on subsequent application that the contents were otherwise intercepted in accordance with the provisions of this chapter. Such application shall be made as soon as practicable.

{ 2518. Procedure for interception of wire, oral, or electronic communications

(1) Each application for an order authorizing or approving the interception of a wire, oral, or electronic communication under this chapter shall be made in writing upon oath or affirmation to a judge of competent jurisdiction and shall state the applicant's authority to make such application. Each application shall include the following information:

(a) the identity of the investigative or law enforcement officer making the application, and the officer authorizing the application;

(b) a full and complete statement of the facts and circumstances relied upon by the applicant, to justify his belief that an order should be issued, including (i) details as to the particular offense that has been, is being, or is about to be committed, (ii) except as provided in subsection (11), a particular description of the nature and location of the facilities from which or the place where the communication is to be intercepted, (iii) a particular description of the type of communications sought to be intercepted, (iv) the identity of the person, if known, committing the offense and whose

communications are to be intercepted;

(c) a full and complete statement as to whether or not other investigative procedures have been tried and failed or why they reasonably appear to be unlikely to succeed if tried or to be too dangerous;

(d) a statement of the period of time for which the interception is required to be maintained. If the nature of the investigation is such that the authorization for interception should not automatically terminate when the described type of communication has been first obtained, a particular description of facts establishing probable cause to believe that additional communications of the same type will occur thereafter;

(e) a full and complete statement of the facts concerning all previous applications known to the individual authorizing and making the application, made to any judge for authorization to intercept, or for approval of interceptions of, wire, oral, or electronic communications involving any of the same persons, facilities or places specified in the application; and

(f) where the application is for the extension of an order, a statement setting forth the results thus far obtained from the interception, or a reasonable explanation of the failure to obtain such results.

(2) The judge may require the applicant to furnish additional testimony or documentary evidence in support of the application.

(3) Upon such application the judge may enter an ex parte order, as requested or as modified, authorizing or approving interception of wire, oral or electronic communications within the territorial jurisdiction of the court in which the judge is sitting (and outside that jurisdiction but within the United States in the case of a mobile interception device authorized by a Federal court within such jurisdiction) if the judge determines on the basis of the facts submitted by the applicant that-

(a) there is probable cause for belief that an individual is committing, has committed, or is about to commit a particular offense enumerated in section 2516 of this chapter;

(b) there is probable cause for belief that particular communications concerning that offense will be obtained through such interception;

(c) normal investigative procedures have been tried and have failed or reasonably appear to be unlikely to succeed if tried or to be

too dangerous;

(d) except as provided in subsection (11), there is probable cause for belief that the facilities from which, or the place where the wire, oral, or electronic communications are to be intercepted are being used, or are about to be used, in connection with the commission of such offense, or are leased to, listed in the name of, or commonly used by such person.

(4) Each order authorizing or approving the interception of any wire, oral, or electronic communication under this chapter shall specify-

(a) the identity of the person, if known, whose communications are to be intercepted;

(b) the nature and location of the communications facilities as to which, or the place where, authority to intercept is granted;

(c) a particular description of the type of communication sought to be intercepted, and a statement of the particular offense to which it relates;

(d) the identity of the agency authorized to intercept the communications, and of the person authorizing the application; and

(e) the period of time during which such interception is authorized, including a statement as to whether or not the interception shall automatically terminate when the described communication has been first obtained.

An order authorizing the interception of a wire, oral, or electronic communication under this chapter shall, upon request of the applicant, direct that a provider of wire or electronic communication service, landlord, custodian or other person shall furnish the applicant forthwith all information, facilities, and technical assistance necessary to accomplish the interception unobtrusively and with a minimum of interference with the services that such service provider, landlord, custodian, or person is according the person whose communications are to be intercepted. Any provider of wire or electronic communication service, landlord, custodian or other person furnishing such facilities or technical assistance shall be compensated therefor by the applicant for reasonable express incurred in providing such facilities or assistance.

(5) No order entered under this section may authorize or approve the interception of any wire, oral, or electronic communication for any period longer than is necessary to achieve the objective of the authorization nor in any event longer than thirty days. Such thirty-day period begins on the earlier of the day on which the investigative or law enforcement officer

first begins to conduct an interception under the order or ten days after the order is entered. Extensions of an order may be granted, but only upon application for an extension made in accordance with subsection (1) of this section and the court making the findings required by subsection (3) of this section. The period of extension shall be no longer than the authorizing judge deems necessary to achieve the purposes for which it was granted and in no event for longer than thirty days. Every order and extension thereof shall contain a provision that the authorization to intercept shall be executed as soon as practicable, shall be conducted in such a way as to minimize the interception of communications not otherwise, subject to interception under this chapter, and must terminate upon attainment of the authorized objective, or in any event in thirty days. In the event the intercepted communications is in a code or foreign language, and an expert in that foreign language or code is not reasonably available during the interception period, minimization may be accomplished as soon as practicable after such interception. An interception under this chapter may be conducted in whole or in part by Government personnel, or by an individual operating under a contract with the Government, acting under the supervision of an investigative or law enforcement officer authorized to conduct the interception.

(6) Whenever an order authorizing interception is entered pursuant to this chapter, the order may require reports to be made to the judge who issued the order showing what progress has been made toward achievement of the authorized objective and the need for continued interception. Such reports shall be made at such intervals as the judge may require.

(7) Notwithstanding any other provision of this chapter, any investigative or law enforcement officer, specially designated by the Attorney General, the Deputy Attorney General, the Associate Attorney General, or by the principal prosecuting attorney of any State or subdivision thereof acting pursuant of that State, who reasonably determines that-

- (a) an emergency situation exists that involves-
 - (i) immediate danger of death or serious physical injury to any person;
 - (ii) conspiratorial activities threatening the national security interest; or
 - (iii) conspiratorial activities characteristic of organized crime,

that requires a wire, oral, or electronic communication to be intercepted before an order authorizing such interception can, with due diligence, be obtained, and

(b) there are grounds upon which an order could be entered under this chapter to authorize such interception.

may intercept such wire, oral, or electronic communication if an application for an order approving the interception is made in accordance with this section within forty-eight hours after the interception has occurred, or begins to occur. In the absence of an order, such interception shall immediately terminate when the communication sought is obtained or when the application for the order is denied, whichever is earlier. In the event such application for approval is denied, or in any other case where the interception is terminated without an order having been issued, the contents of any wire, oral, or electronic communication intercepted shall be treated as having been obtained in violation of this chapter, and an inventory shall be served as provided for in subsection (d) of this section on the person named in the application.

(8)(a) The contents of any wire, oral, or electronic communication intercepted by any means authorized by this chapter shall, if possible, be recorded on tape or wire or other comparable device. The recording of the contents of any wire, oral, or electronic communication under this subsection shall be done in such a way as will protect the recording from editing or other alterations. Immediately upon the expiration of the period of the order, or extensions thereof, such recordings shall be made available to the judge issuing such order and sealed under this directions. Custody of the recordings shall be wherever the judge orders. They shall not be destroyed except upon an order of the issuing or denying judge and in any event shall be kept for ten years. Duplicate recordings may be made for use or disclosure pursuant to the provisions of subsections (2) and (2) of section 2517 of this chapter for investigations. The presence of the seal provided for by this section, or a satisfactory explanation for the absence thereof, shall be a prerequisite for the use or disclosure of the contents of any wire, oral, or electronic communication or evidence derived therefrom under subsection (3) of section 2517.

(b) Applications made and orders granted under this chapter shall be sealed by the judge. Custody of the applications and orders shall be wherever the judge directs. Such applications and orders shall be disclosed only upon a showing of good cause before a judge of competent jurisdiction and shall not be destroyed except on order of the issuing or denying judge, and in any event shall be kept for ten years.

(c) Any violation of the provisions of this subsection may be punished as contempt of the issuing or denying judge.

(d) Within a reasonable time but not later than ninety days after the filing of an application for an order of approval under section 2518(7)(b) which is denied or the termination of the period of an order or extensions

thereof, the issuing or denying judge shall cause to be served, on the persons named in the order or the application, and such other parties to intercepted communications as the judge may determine in his discretion that is in the interest of justice, and inventory which shall include notice of-

- (1) the fact of the entry of the order or the application;
- (2) the date of the entry and the period of authorized, approved or disapproved interception, or the denial of the application, and
- (3) the fact that during the period wire, oral, or electronic communications were or were not intercepted.

The judge, upon the filing of a motion, may in his discretion make available to such person or his counsel for inspection such portions of the intercepted communications, applications and orders as the judge determines to be in the interest of justice. On an ex parte showing of good cause to a judge of competent jurisdiction the serving of the inventory required by this subsection may be postponed.

(9) The contents of any wire, oral, or electronic communication intercepted pursuant to this chapter or evidence derived therefrom shall not be received in evidence or otherwise disclosed in any trial, hearing, or other proceeding in a Federal or State court unless each party, not less than ten days before the trial, hearing, or proceeding, has been furnished with a copy of the court order, and accompanying application, under which the interception was authorized or approved. This ten-day period may be waived by the judge if he finds that it was not possible to furnish the party with the above information ten days before the trial, hearing, or proceeding and that the party will not be prejudiced by the delay in receiving such information.

(10)(a) Any aggrieved person in any trial, hearing, or proceeding in or before the any court, department, officer, agency, regulatory body, or other authority of the United States, a State, or a political subdivision thereof, may move to suppress the contents of any wire or oral communication intercepted pursuant to this chapter, or evidence derived therefrom, on the grounds that-

- (i) the communication was unlawfully intercepted;
- (ii) the order of authorization or approval under which it was intercepted is insufficient on its face; or
- (iii) the interception was not made in conformity with the order of authorization or approval.

Such motion shall be made before the trial, hearing, or proceeding unless

there was no opportunity to make such motion or the person was not aware of the grounds of the motion. If the motion is granted, the contents of the intercepted wire or oral communication, or evidence derived therefrom, shall be treated as having been obtained in violation of this chapter. The judge, upon the filing of such motion by the aggrieved person, may in his discretion make available to the aggrieved person or his counsel for inspection such portions of the intercepted communication or evidence derived therefrom as the judge determines to be in the interests of justice.

(b) In addition to any other right to appeal, the United States shall have the right to appeal from an order granting a motion to suppress made under paragraph (a) of this subsection, or the denial of an application for an order of approval, if the United States attorney shall certify to the judge or other official granting such motion or denying such application the appeal is not taken for purposes of delay. Such appeal shall be taken within thirty days after the date the order was entered and shall be diligently prosecuted.

(c) The remedies and sanctions described in this chapter with respect to the interception of electronic communications are the only judicial remedies and sanctions for nonconstitutional violations of this chapter involving such communications.

(11) The requirements of subsections (1)(b)(ii) and (3)(d) of the section relating to the specification of the facilities from which, or the place where, the communication is to be intercepted do not apply if-

(a) in the case of an application with respect to the interception of an oral communication-

(i) the application is by a federal investigative or law enforcement officer and is approved by the Attorney General, the Deputy Attorney General, the Associate Attorney General, an Assistant Attorney General, or an acting Assistant Attorney General;

(ii) the application contains a full and complete statement as to why such specification is not practical and identifies the person committing the offense and whose communications are to be intercepted; and

(iii) the judge finds that such specification is not practical; and

(b) in the case of an application with respect to a wire or electronic communication-

(i) the application is by a Federal investigative or law

enforcement officer and is approved by the Attorney General, the Deputy Attorney General, the Associate Attorney General, and Assistant Attorney General, or an acting Assistant Attorney General;

(ii) the application identifies the person believed to be committing the offense and whose communications are to be intercepted and the applicant makes a showing of a purpose, on the part of that person, to thwart interception by changing facilities; and

(iii) the judge finds that such purpose has been adequately shown.

(12) An interception of a communication under an order with respect to which the requirements of subsections (1)(b)(ii) and (3)(d) of this section do not apply by reason of subsection (11) shall not begin until the facilities from which, or the place where, the communication is to be intercepted is ascertained by the person implementing the interception order. A provider of wire or electronic communications service that has received an order as provided for in subsection (11)(b) may move the court to modify or quash the order on the ground that its assistance with respect to the interception cannot be performed in a timely or reasonable fashion. The court, upon notice to the government, shall decide such a motion expeditiously.

{ 2519. Reports concerning intercepted wire, oral, or electronic communications

(1) Within thirty days after the expiration of an order (or each extension thereof) entered under section 2518, or the denial of an order approving an interception, the issuing or denying judge shall report to the Administrative Office of the United States Courts-

(a) the fact that an order or extension was applied for;

(b) the kind of order or extension was applied for (including whether or not the order was an order with respect to which the requirements of sections 2518(1)(b)(ii) and 2581(3)(d) of this title did not apply by reason of section 2518(11) of title);

(c) the fact that the order or extension was granted as applied for, was modified, or was denied;

(d) the period of interceptions authorized by the order, and the number and duration of any extensions of the order;

(e) the offense specified in the order or application, or

extension or an order;

(f) the identity of the applying investigative or law enforcement officer and agency making the application and the person authorizing the application; and

(g) the nature of the facilities from which or the place where communications were to be intercepted.

(2) In January of each year the Attorney General, an Assistant Attorney General specially designated by the Attorney General, or the principal prosecuting attorney of a State, or the principal prosecuting attorney for any political subdivision of a State, shall report to the Administrative Office of the United States Courts-

(a) the information required by paragraphs (a) through (g) of subsection (1) of this section with respect to each application for an order or extension made during the preceding calendar year;

(b) a general description of the interceptions made under such order or extension, including (i) the approximate nature and frequency of incriminating communications intercepted, (ii) the approximate nature and frequency of other communications intercepted, (iii) the approximate number of persons whose communications were intercepted, and (iv) the approximate nature, amount, and cost of the manpower and other resources used in the interceptions;

(c) the number of arrests resulting from interceptions made under such order or extension, and the offenses for which arrests were made;

(d) the number of trials resulting from such interceptions;

(e) the number of motions to suppress made with respect to such interceptions, and the number granted or denied;

(f) the number of convictions resulting from such interceptions and the offenses for which the convictions were obtained and a general assessment of the importance of the interceptions; and

(g) the information required by paragraphs (b) through (f) of this subsection with respect to orders or extensions obtained in a preceding calendar year.

(3) In April of each year the Director of the Administrative Office of the United States Courts shall transmit to the Congress a full and complete report concerning the number of applications for orders authorizing or approving the interception of wire, oral, or electronic communications pursuant to this chapter and the number of orders and extensions granted or

denied pursuant to this chapter during the preceding calendar year. Such report shall include a summary and analysis of the data required to be filed with the Administrative Office by subsections (1) and (2) of this section. The Director of the Administrative Office of the United States Courts is authorized to issue binding regulations dealing with the content and form of the reports required to be filed by subsections (1) and (2) of this section.

{ 2520. Recovery of civil damages authorized

(a) IN GENERAL.--Except as provided in section 2511(2)(a)(ii), any person whose wire, oral, or electronic communication is intercepted, disclosed, or intentionally used in violation of this chapter may in a civil action recover from the person or entity which engaged in that violation such relief as may be appropriate.

(b) RELIEF.--In an action under this section, appropriate relief includes-

(1) such preliminary and other equitable or declaratory relief as may be appropriate;

(2) damages under subsection (c) and punitive damages in appropriate cases; and

(3) a reasonable attorney's fee and other litigation costs reasonably incurred.

(c) COMPUTATION OF DAMAGES.--(1) In an action under this section, if the conduct is in violation of this chapter is the private viewing of a private satellite video communication that is not scrambled or encrypted or if the communication is a radio communication that is transmitted on frequencies allocated under subpart D of part 74 of the rules of the Federal Communications Commission that is not scrambled or encrypted and the conduct is not for a tortious or illegal purpose or for purposes of direct or indirect commercial advantage or private commercial gain, then the court shall assess damages as follows:

(A) If the person who engaged in that conduct has not previously been enjoined under section 2511(5) and has not been found liable in a prior civil action under this section, the court shall assess the greater of the sum of actual damages suffered by the plaintiff, or statutory damages of not less than \$50 and not more than \$500.

(B) If, on one prior occasion, the person who engaged in that conduct has been enjoined under section 2511(5) or has been found liable in a civil action under this section, the court shall assess the greater of the sum of actual damages suffered by the plaintiff, or

statutory damages of not less than \$100 and not more than \$1,000.

(2) In any other action under this section, the court may assess as damages whichever is the greater of-

(A) the sum of the actual damages suffered by the plaintiff and any profits made by the violator as a result of the violation; or

(B) statutory damages of whichever is the greater of \$100 a day for each day of violation or \$10,000.

(d) DEFENSE.--A good faith reliance on-

(1) a court warrant or order, a grand jury subpoena, a legislative authorization, or a statutory authorization;

(2) a request of an investigative or law enforcement officer under section 2518(7) of this title; or

(3) a good faith determination that section 2511(3) of this title permitted the conduct complained of;

is a complete defense against any civil or criminal action brought under this chapter or any other law.

(e) LIMITATION.--A civil action under this section may not be commenced later than two years after the date upon which the claimant first has a reasonable opportunity to discover the violation.

{ 2521. Injunction against illegal interception

Whenever it shall appear that any person is engaged or is about to engage in any act which constitutes or will constitute a felony violation of this chapter, the Attorney General may initiate a civil action in a district court of the United States to enjoin such violation. The court shall proceed as soon as practicable to the hearing and determination of such an action, and may, at any time before final determination, enter such a restraining order or prohibition, or take such other action, as is warranted to prevent a continuing and substantial injury to the United States or to any person or class of persons for whose protection the action is brought. A proceeding under this section is governed by the Federal Rules of Civil Procedure, except that, if an indictment has been returned against the respondent, discovery is governed by the federal Rules of Criminal Procedure.

CHAPTER 121- STORED WIRE AND ELECTRONIC COMMUNICATIONS AND
TRANSACTIONAL
RECORDS ACCESS

Sec.

- 2701. Unlawful access to stored communications.
- 2702. Disclosure of contents.
- 2703. Requirements for governmental access.
- 2704. Backup preservation.
- 2705. Delayed notice.
- 2706. Cost reimbursement.
- 2707. Civil action.
- 2708. Exclusivity of remedies.
- 2709. Counterintelligence access to telephone toll and transactional records.
- 2710. Definitions

2701. Unlawful access to stored communications

(a) OFFENSE.- Except as provided in subsection (c) of this section whoever-

(1) intentionally accesses without authorization a facility through which an electronic communication service is provided; or

(2) intentionally exceeds an authorization to access that facility;

and thereby obtains, alters, or prevents authorized access to a wire or electronic communication while it is in electronic storage in such system shall be punished as provided in subsection (b) of this section.

(b) PUNISHMENT.- The punishment for an offense under subsection (a) of this section is-

(1) if the offense is committed for purposes of commercial advantage, malicious destruction or damage, or private commercial gain-

(A) a fine of not more than \$250,000 or imprisonment for not more than one year, or both, in the case of a first offense under this subparagraph; and

(B) a fine under this title or imprisonment for not more than two years, or both, for any subsequent offense under this subparagraph; and

(2) a fine of not more than \$5,000 or imprisonment for not more than six months, or both, in any case.

(c) EXCEPTIONS.- Subsection (a) of this section does not apply with

respect to conduct authorized-

(1) by the person or entity providing a wire or electronic communications service;

(2) by a user of that service with respect to a communication of or intended for that user; or

(3) in section 2703, 2704 or 2518 of this title.

{ 2702. Disclosure of contents

(a) PROHIBITIONS.- Except as provided in subsection (b)-

(1) a person or entity operating an electronic communication service to the public shall not knowingly divulge to any person or entity the contents of a communication while in electronic storage by that service; and

(2) a person or entity providing remote computing service to the public shall not knowingly divulge to any person or entity the contents of any communication which is carried or maintained on that service-

(A) on behalf of, and received by means of electronic transmission from (or created by means of computer processing of communications received by means of electronic transmission from), a subscriber or customer of such service; and

(B) solely for the purpose of providing storage or computer processing services to such subscriber or customer, if the provider is not authorized to access the contents of any such communications for purposes of providing any services other than storage or computer processing.

(b) EXCEPTIONS.- A person or entity may divulge the contents of a communication-

(1) to an addressee or intended recipient of such communication or an agent of such addressee or intended recipient;

(2) as otherwise authorized in section 2516, 2511(2)(a), or 2703 of this title;

(3) with the lawful consent of the originator or an addressee or intended recipient of such communication, or the subscriber in the case of remote computing service;

(4) to a person employed or authorized or whose facilities are used to forward such communication to its destination;

(5) as may be necessarily incident to the rendition of the service or to the protection of the rights or property of the provider of that service; or

(6) to a law enforcement agency, if such contents-

(A) were inadvertently obtained by the service provider; and

(B) appear to pertain to the commission of a crime.

{ 2703. Requirements for governmental access

(a) CONTENTS OF ELECTRONIC COMMUNICATIONS IN ELECTRONIC STORAGE.- A governmental entity may require the disclosure by a provider of electronic communication service of the contents of an electronic communication, that is in electronic storage in an electronic communications system for one hundred and eighty days or less, only pursuant to a warrant issued under the Federal Rules of Criminal Procedure or equivalent State warrant. A governmental entity may require the disclosure by a provider of electronic communications services of the contents of an electronic communication that has been in storage in an electronic communications system for more than one hundred and eighty days by the means available under subsection (b) of this section.

(b) CONTENTS OF ELECTRONIC COMMUNICATIONS IN A REMOTE COMPUTING SERVICE.- (1) A governmental entity may require a provider of remote computing service to disclose the contents of any electronic communication to which this paragraph is made applicable by paragraph (2) of this subsection-

(A) without required notice to the subscriber or customer, if the governmental entity obtains a warrant issued under the Federal Rules of Criminal Procedure or equivalent State warrant; or

(B) with prior notice from the governmental entity to the subscriber or customer if the governmental entity-

(i) uses an administrative subpoena authorized by a Federal or State statute or a Federal or State grand jury subpoena; or

(ii) obtains a court order for such disclosure under subsection (d) of this section; except that delayed notice may be given pursuant to section 2705 of this title.

(2) Paragraph (1) is applicable with respect to any electronic communication that is held or maintained on that service-

(A) on behalf of, and received by means of electronic transmission from

(or created by means of computer processing of communications received by means of electronic transmission from), a subscriber or customer of such remote computing service; and

(B) solely for the purpose of providing storage or computer processing services to such subscriber or customer, if the provider is not authorized to access the contents of any such communications for purposes of providing any services other than storage or computer processing.

(c) RECORDS CONCERNING ELECTRONIC COMMUNICATION SERVICE OR REMOTE COMPUTING SERVICE.- (1)(A) Except as provided in subparagraph (B), a provider of electronic communication service or remote computing service may disclose a record or other information pertaining to a subscriber to or customer of such service (not including the contents of communications covered by subsection (a) or (b) of this section) to any person other than a governmental entity.

(B) A provider of electronic communication service or remote computing service shall disclose a record or other information pertaining to a subscriber to or customer of such service (not including the contents of communications covered by subsection (a) or (b) of this section) to a governmental entity only when the governmental entity-

(i) uses an administrative subpoena authorized by a Federal or State statute, or a Federal or State grand jury subpoena;

(ii) obtains a warrant issued under the Federal Rules of Criminal Procedure or equivalent State warrant;

(iii) obtains a court order for such disclosure under subsection (d) of this section; or

(iv) has the consent of the subscriber or customer to such disclosure.

(2) A governmental entity receiving records or information under this subsection is not required to provide notice to a subscriber or customer.

(d) REQUIREMENTS FOR COURT ORDER.- A court order for disclosure under subsection (b) or (c) of this section shall issue only if the governmental entity shows that there is reason to believe the contents of a wire or electronic communication, or the records or other information sought, are relevant to a legitimate law enforcement inquiry. In the case of a State governmental authority, such a court order shall not issue if prohibited by the law of such State. A court issuing an order pursuant to this section, on a motion made promptly by the service provider, may quash or modify such order, if the information or records requested are unusually voluminous in nature or compliance with such order otherwise would cause an undue burden on such provider.

(e) NO CAUSE OF ACTION AGAINST A PROVIDER DISCLOSING INFORMATION UNDER THIS CHAPTER.- No cause of action shall lie in any court against any provider of wire or electronic communication service, its officers, employees, agents, or other specified persons for providing information, facilities, or assistance in accordance with the terms of a court order, warrant, subpoena or certification under this chapter.

{ 2704. Backup preservation

(a) BACKUP PRESERVATION.- (1) A governmental entity acting under section 2703(b)(2) may include in its subpoena or court order a requirement that the service provider to whom the request is directed create a backup copy of the contents of the electronic communications sought in order to preserve those communications. Without notifying the subscriber or customer of such subpoena or court order, such service provider shall create such backup copy as soon as practicable consistent with its regular business practices and shall confirm to the governmental entity that such backup copy has been made. Such backup copy shall be created within two business days after receipt by the service provider of the subpoena or court order.

(2) Notice to the subscriber or customer shall be made by the governmental entity within three days after receipt of such confirmation, unless such notice is delayed pursuant to section 2705(a).

(3) The service provider shall not destroy such backup copy until the later of --

(A) the delivery of the information; or

(B) the resolution of any proceedings (including appeals of any proceeding) concerning the government's subpoena or court order.

(4) The service provider shall release such backup copy to the requesting governmental entity no sooner than fourteen days after the governmental entity's notice to the subscriber or customer if such service provider --

(A) has not received notice from the subscriber or customer that the subscriber or customer has challenged the governmental entity's request; and

(B) has not initiated proceedings to challenge the request of the governmental entity.

(5) A governmental entity may seek to require the creation of a backup copy under subsection (a)(1) of this section if in its sole discretion such entity determines that there is reason to believe that notification under section 2703 of this title of the existence of the subpoena or court order

may result in destruction of or tampering with evidence. This determination is not subject to challenge by the subscriber or customer or service provider.

(b) CUSTOMER CHALLENGES -- (1) Within fourteen days after notice by the governmental entity to the subscriber or customer under subsection (a)(2) of this section, such subscriber or customer may file a motion to quash such subpoena or vacate such court order, with copies served upon the governmental entity and with written notice of such challenge to the service provider. A motion to vacate a court order shall be filed in the court which issued such order. A motion to quash a subpoena shall be filed in the appropriate United States district court or State court. Such motion or application shall contain an affidavit or sworn statement --

(A) stating that the applicant is a customer or subscriber to the service from which the contents of electronic communications maintained for him have been sought; and

(B) stating the applicant's reasons for believing that the records sought are not relevant to a legitimate law enforcement inquiry or that there has not been substantial inquiry or that there has not been substantial compliance with the provisions of this chapter in some other respect.

(2) Service shall be made under this section upon a governmental entity by delivering or mailing by registered or certified mail a copy of the papers to the person, office, or department specified in the notice which the customer has received pursuant to this chapter. For the purposes of this section, the term "delivery" has the meaning given that term in the Federal Rules of Civil Procedure.

(3) If the court finds that the customer has complied with paragraphs (1) and (2) of this subsection, the court shall order the governmental entity to file a sworn response, which may be filed in camera if the governmental entity includes in its response the reasons which make in camera review appropriate. If the court is unable to determine the motion or application on the basis of the parties' initial allegations and response, the court may conduct such additional proceedings as it deems appropriate. All such proceedings shall be completed and the motion or application decided as soon as practicable after the filing of the governmental entity's response.

(4) If the court finds that the applicant is not the subscriber or customer for whom the communications sought by the governmental entity are maintained, or that there is a reason to believe that the law enforcement inquiry is legitimate and that the communications sought are relevant to that inquiry, it shall deny the motion or application and order such process enforced. If the court finds that the applicant is the subscriber or customer for whom the communications sought by the governmental entity are

maintained, and that there is not a reason to believe that the communications sought are relevant to a legitimate law enforcement inquiry, or that there has not been substantial compliance with the provisions of this chapter, it shall order the process quashed.

(5) A court order denying a motion or application under this section shall not be deemed a final order and no interlocutory appeal may be taken therefrom by the customer.

{ 2705. Delayed notice

(a) DELAY OF NOTIFICATION --(1) A governmental entity acting under section 2703(b) of this title may --

(A) where a court order is sought, include in the application a request, which the court shall grant, for an order delaying the notification required under section 2703(b) of this title for a period not to exceed ninety days, if the court determines that there is reason to believe that notification of the existence of the court order may have an adverse result described in paragraph (2) of this subsection; or

(B) where an administrative subpoena authorized by a Federal or State statute or a Federal or State grand jury subpoena is obtained, delay the notification required under section 2703(b) of this title for a period not to exceed ninety days upon the execution of a written certification of a supervisory official that there is reason to believe that notification of the existence of the subpoena may have an adverse result described in paragraph (2) of this subsection.

(2) An adverse result for the purposes of paragraph (1) of this subsection is --

(A) endangering the life or physical safety of an individual;

(B) flight from prosecution;

(C) destruction of or tampering with evidence;

(D) intimidation of potential witnesses; or

(E) otherwise seriously jeopardizing an investigation or unduly delaying a trial.

(3) The governmental entity shall maintain a true copy of certification under paragraph (1)(B).

(4) Extensions of the delay of notification provided in section 2703 of up to ninety days each may be granted by the court upon application, or by

certification by a governmental entity, but only in accordance with subsection (b) of this section.

(5) Upon expiration of the period of delay of notification under paragraph (1) or (4) of this subsection, the governmental entity shall serve upon, or deliver by registered or first-class mail to, the customer or subscriber a copy of the process or request together with notice that --

(A) states with reasonable specificity the nature of the law enforcement inquiry; and

(B) informs such customer or subscriber --

(i) that information maintained for such customer or subscriber by the service provider named in such process or request was supplied to or requested by that governmental authority and the date on which the supplying or request took place.

(ii) that notification of such customer or subscriber was delayed;

(iii) what governmental entity or court made the certification or determination pursuant to which that delay was made; and

(iv) which provision of this chapter allowed such delay.

(6) As used in this subsection, the term "supervisory official" means the investigative agent in charge or assistant investigative agent in charge or an equivalent of an investigating agency's headquarters or regional office, or the chief prosecuting attorney or the first assistant prosecuting attorney or an equivalent of a prosecuting attorney's headquarters or regional office.

(b) PRECLUSION OF NOTICE TO SUBJECT OF GOVERNMENTAL ACCESS. -- A governmental entity acting under section 2703, when it is not required to notify the subscriber or customer under section 2703(b)(1), or to the extent that it may delay such notice pursuant to subsection (a) of this section, may apply to a court for an order commanding a provider of electronic communications service or remote computing service to whom a warrant, subpoena, or court order is directed, for such period as the court deems appropriate, not to notify any other person of the existence of the warrant, subpoena, or court order. The court shall enter such an order if it determines that there is reason to believe that notification of the existence of the warrant, subpoena, or court order will result in --

(1) endangering the life or physical safety of an individual;

(2) flight from prosecution;

(3) destruction of or tampering with evidence;

(4) intimidation of potential witnesses; or

(5) otherwise seriously jeopardizing an investigation or unduly delaying a trial.

{ 2706. Cost reimbursement

(a) PAYMENT -- Except as otherwise provided in subsection (c), a governmental entity obtaining the contents of communications, records, or other information under section 2702, 2703, or 2704 of this title shall pay to the person or entity assembling or providing such information a fee for reimbursement for such costs as are reasonably necessary and which have been directly incurred in searching for, assembling, reproducing, or otherwise providing such information. Such reimbursable costs shall include any costs due to necessary disruption of normal operations of any electronic communication service or remote computing service in which such information may be stored.

(b) AMOUNT -- The amount of the fee provided by subsection (a) shall be as mutually agreed by the governmental entity and the person or entity providing the information, or in the absence of agreement, shall be as determined by the court which issued the order for production of such information (or the court before which a criminal prosecution relating to such information would be brought, if no court order was issued for production of the information).

(c) The requirement of subsection (a) of this section does not apply with respect to records or other information maintained by a communications common carrier that relate to telephone toll records and telephone listings obtained under section 2703 of this title. The court may, however, order a payment as described in subsection (a) if the court determines the information required is unusually voluminous in nature or otherwise caused an undue burden on the provider.

{ 2707. Civil action

(a) CAUSE OF ACTION. -- Except as provided in section 2703(e), any provider of electronic communication service, subscriber, or customer aggrieved by any violation of this chapter in which the conduct constituting the violation is engaged in with a knowing or intentional state of mind may, in a civil action, recover from the person or entity which engaged in that violation such relief as may be appropriate.

(b) RELIEF. -- IN a civil action under this section, appropriate relief includes --

(1) such preliminary and other equitable or declaratory relief as may be appropriate;

(2) damages under subsection (c); and

1/2 of (b), all of (c) & (d) omitted see p. 514,447

(e) LIMITATION. -- A civil action under this section may not be commenced later than two years after the date upon which the claimant first discovered or had a reasonable opportunity to discover the violation.

{ 2708. Exclusivity of remedies

The remedies and sanctions described in this chapter are the only judicial remedies and sanctions for nonconstitutional violations of this chapter.

{ 2709. Counterintelligence access to telephone toll and transactional records

(a) DUTY TO PROVIDE. -- A wire or electronic communication service provider shall comply with a request for subscriber information and toll billing records information, or electronic communication transactional records in its custody or possession made by the Director of the Federal Bureau of Investigation under subsection (b) of this section.

(b) REQUIRED CERTIFICATION. -- The Director of the Federal Bureau of Investigation (or an individual within the Federal Bureau of Investigation designated for this purpose by the Director) may request any such information and records if the Director (or the Director's designee) certifies in writing to the wire or electronic communication service provider to which the request is made that --

(1) the information sought is relevant to an authorized foreign counterintelligence investigation; and

(2) there are specific and articulable facts giving reason to believe that the person or entity to whom the information sought pertains is a foreign power or an agent of a foreign power as defined in section 101 of the Foreign Intelligence Surveillance Act of 1978 (50 U.S.C. 1801).

(c) PROHIBITION OF CERTAIN DISCLOSURE. -- No wire or electronic communication service provider, or officer, employee, or agent thereof, shall disclose to any person that the Federal Bureau of Investigation has sought or obtained access to information or records under this section.

(d) DISSEMINATION BY BUREAU. -- The Federal Bureau of Investigation may disseminate information and records obtained under this section only as

provided in guidelines approved by the Attorney General for foreign intelligence collection and foreign counterintelligence investigations conducted by the Federal Bureau of Investigation, and, with respect to dissemination to an agency of the United States, only if such information is clearly relevant to the authorized responsibilities of such agency.

(e) REQUIREMENT THAT CERTAIN CONGRESSIONAL BODIES BE INFORMED. -- On a semi-annual basis the Director of the Federal Bureau of Investigation shall fully inform the Permanent Select Committee on Intelligence of the House of Representatives and the Select Committee on Intelligence of the Senate concerning all requests made under subsection (b) of this section.

{ 2710. Definitions for chapter

As used in this chapter -

(1) the terms defined in section 2510 of this title have, respectively, the definitions given such terms in that section; and

(2) the term "remote computing service" means the provision to the public of computer storage or processing services by means of an electronic communications system.

CHAPTER 205-SEARCHES AND SEIZURES

Sec. 3101. Effect of rules of court--Rules

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3117. Mobile tracking devices.

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{ 3117. Mobile tracking devices

(a). IN GENERAL.--If a court is empowered to issue a warrant or other order for the installation of a mobile tracking device, such order may authorize the use of that device within the jurisdiction of the court, and outside that jurisdiction if the device is installed in that jurisdiction.

(b). DEFINITION.--As used in this section, the term "tracking device" means an electronic or mechanical device which permits the tracking of the movement of a person or object.

CHAPTER 206-PEN REGISTERS AND TRAP TRACE DEVICES

Sec.

3121. General prohibition on pen register on trap and trace device use; exception.

3122. Application for an order for a pen register or a trap and trace device.

3123. Issuance of an order for a pen register or a trap or trace device.

3124. Assistance in installation and use of a pen register or a trap and trace device.

3125. Reports concerning pen registers and trap and trace devices.

3126. Definitions for chapter.

{ 3121. General prohibition on pen register and trap and trace device use; exception

(a) In General.-Except as provided in this section, no person may install or use a pen register or a trap and trace device without first obtaining a court order under section 3123 of this title or under the Foreign Intelligence Surveillance Act of 1978 (50 U.S.C. 1801 et seq.).

(b) Exception.-The prohibition of subsection (a) does not apply with respect to the use of a pen register or a trap and trace device by a provider of electronic or wire communication service-

(1) relating to the operation, maintenance, and testing of a wire or electronic communication service or to the protection of the rights or property of such provider, or to the protection of users of that service from abuse of service or unlawful use of service; or

(2) to record the fact that a wire or electronic communication was initiated or completed in order to protect such provider, another provider furnishing service toward the completion of the wire communication, or a user of that service, from fraudulent, unlawful or abusive use of service; or with the consent of the user of that service.

(c) Penalty.-Whoever knowingly violates subsection (a) shall be fined under this title or imprisoned not more than one year, or both.

{ 3122. Application for an order for a pen register or a trap and trace device

(a) Application.- (1) An attorney for the Government may make application for an order or an extension of an order under section 3123 of this title authorizing or approving the installation and use of a pen

register or a trap and trace device under this chapter, in writing under oath or equivalent affirmation, to a court of competent jurisdiction.

(2) Unless prohibited by State law, a State investigative law enforcement officer may make application for an order or an extension of an order under section 3123 of this title authorizing or approving the installation and use of a pen register or a trap and trace device under this chapter, in writing under oath or equivalent affirmation, to a court of competent jurisdiction of such State.

(b) Contents Of Application.-An application under subsection (a) of this section shall include-

(1) the identity of the attorney for the Government or the State law enforcement or investigative officer making the application and the identity of the law enforcement agency conducting the investigation; and

(2) a certification by the applicant that the information likely to be obtained is relevant to an ongoing criminal investigation being conducted by that agency.

{ 3123. Issuance of an order for a pen register or a trap and trace device

(a) In General.-Upon an application made under section 3122 of this title, the court shall enter an ex parte order authorizing the installation and use of a pen register or a trap and trace device within the jurisdiction of the court if the court finds that the attorney for the Government or the State law enforcement or investigative officer has certified to the court that the information likely to be obtained by such installation and use is relevant to an ongoing criminal investigation.

(b) Contents Of Order.-An order issued under this section-

(1) shall specify-

(A) the identity, if known, of the person to whom is leased or in whose name is listed the telephone line to which the pen register or trap and trace device is to be attached;

(B) the identity, if known, of the person who is the subject of the criminal investigation;

(C) the number and, if known, physical location of the telephone line to which the pen register or trap and trace device is to be attached and, in the case of a trap and trace device, the geographic limits of the trap and trace order; and

(D) a statement of the offense to which the information likely to be

obtained by the pen register or trap and trace device relates; and

(2) shall direct, upon the request of the applicant, the furnishing of information, facilities, and technical assistance necessary to accomplish the installation of the pen register or trap and trace device under section 3124 of this title.

(c) Time Period And Extensions.- (1) An order issued under this section shall authorize the installation and use of a pen register or a trap and trace device for a period not to exceed sixty days.

(2) Extensions of such an order may be granted, but only upon an application for an order under section 3122 of this title and upon the judicial finding required by subsection (a) of this section. The period of extension shall be for a period not to exceed sixty days.

(d) Non-disclosure Of Existence Of Pen Register Or A Trap And Trace Device.- An order authorizing or approving the installation and use of a pen register or a trap and trace device shall direct that-

(1) the order be sealed until otherwise ordered by the court; and

(2) the person owning or leasing the line to which the pen register or a trap and trace device is attached, or who has been ordered by the court to provide assistance to the applicant, not disclose the existence of the pen register or trap and trace device or the existence of the investigation to the listed subscriber, or to any other person, unless or until otherwise ordered by the court.

{ 3124. Assistance in installation and use of a pen register or a trap and trace device

(a) Pen Registers.- Upon the request of an attorney for the Government or an officer of a law enforcement agency authorized to install and use a pen register under this chapter, a provider of wire or electronic communication service, landlord, custodian, or other person shall furnish such investigative or law enforcement officer forthwith all information, facilities, and technical assistance necessary to accomplish the installation of the pen register unobtrusively and with a minimum of interference with the services that the person so ordered by the court accords the party with respect to whom the installation and use is to take place, if such assistance is directed by a court order as provided in section 3123(b)(2) of this title.

(b) Trap And Trace Device.- Upon the request of an attorney for the Government or an officer of a law enforcement agency authorized to receive the results of a trap and trace device under this chapter, a provider of a wire or electronic communication service, landlord, custodian, or other

person shall install such device forthwith on the appropriate line and shall furnish such investigative or law enforcement officer all additional information, facilities and technical assistance including installation and operation of the device unobtrusively and with a minimum of interference with the services that the person so ordered by the court accords the party with respect to whom the installation and use is to take place, if such installation and assistance is directed by a court order as provided in section 3123(b)(2) of this title. Unless otherwise ordered by the court, the results of the trap and trace device shall be furnished to the officer of a law enforcement agency, designated in the court, at reasonable intervals during regular business hours for the duration of the order.

(c) Compensation.-A provider of a wire or electronic communication service, landlord, custodian, or other person who furnishes facilities or technical assistance pursuant to this section shall be reasonably compensated for such reasonable expenses incurred in providing such facilities and assistance.

(d) No Cause Of Action Against A Provider Disclosing Information Under This Chapter.-No cause of action shall lie in any court against any provider of a wire or electronic communication service, its officers, employees, agents, or other specified persons for providing information, facilities, or assistance in accordance with the terms of a court order under this chapter.

(e) Defense.-A good faith reliance on a court order, a legislative authorization, or a statutory authorization is a complete defense against any civil or criminal action brought under this chapter or any other law.

{ 3125. Reports concerning pen registers and trap and trace devices

The Attorney General shall annually report to Congress on the number of pen register orders and orders for trap and trace devices applied for by law enforcement agencies of the Department of Justice.

{ 3126. Definitions for chapter

As used in this chapter-

(1) the terms "wire communication", "electronic communication", and "electronic communication service" have the meanings set forth for such terms in section 2510 of this title;

(2) the term "court of competent jurisdiction" means-

(A) a district court of the United States (including a magistrate of such a court) or a United States Court of Appeals; or

(B) a court of general criminal jurisdiction of a State authorized by

the law of that State to enter orders authorizing the use of a pen register or a trap and trace device;

(3) the term "pen register" means a device which records or decodes electronic or other impulses which identify the numbers dialed or otherwise transmitted on the telephone line to which such device is attached, but such term does not include any device used by a provider or customer of a wire or electronic communication service for billing, or recording as an incident to billing, for communications services provided by such provider or any device used by a provider or customer of a wire communication service for cost accounting or other like purposes in the ordinary course of its business;

(4) the term "trap and trace" device means a device which captures the incoming electronic or other impulses which identify the originating number of an instrument or device from which a wire or electronic communication was transmitted;

(5) the term "attorney for the Government" has the meaning given such term for the purposes of the Federal Rules of Criminal Procedure; and

(6) the term "State" means a State, the District of Columbia, Puerto Rico, and any other possession or territory of the United States.

A lawyer's review and perspective of the ECPA

WHEN IS LISTENING TO THE RADIO A CRIME?

By FRANK TERRANELLA

The federal Electronic Communications Privacy Act has turned many radio listeners into criminals. The problem is, most of them don't know about it. I will attempt here to describe in very non-legalistic and general terms (extremely difficult for a lawyer), exactly what listening is legal and what is illegal.

Section 2511 of the Federal Criminal Statutes (18 U.S.C.) is where most of the action is in this field. The statute is primarily a wiretap and bug statute and only recently has been expanded to include radio listening. I will not be discussing the provisions dealing with oral communications or wiretaps and bugging devices here.

The statute starts out by saying that it is illegal to intentionally intercept, disclose or use the contents of any wire or electronic communication. The statute then goes on to carve out exceptions to this general rule.

It is important to understand what the law means by wire or electronic communication. A wire communication is any communication over a telephone or other wire. However, the definition specifically includes cellular telephones and excludes cordless telephones (even though both involve the use of radio and wire transmission). An electronic communication includes all radio transmissions, but excludes cordless telephones and pagers.

After making a blanket prohibition of intercepting all electronic (i.e. radio) transmissions, the statute lists the exceptions. The first exception is that it is legal to listen to all radio transmissions which are "readily accessible to the general public." This term is defined in the statute to mean radio signals which are (1) not encrypted, scrambled, carried on a subcarrier or other signal subsidiary to a radio transmission; (2) not transmitted over a common carrier communications system (such as the phone company); (3) not special transmissions such as point-to-point private relay transmissions for the broadcast services, not meant for reception by the general public.

The next exception to the general rule is that it is legal to listen to all radio broadcasts "relating to ships, aircraft, vehicles or persons in distress." The statute also says that it is legal to listen to a broadcast by any governmental, law enforcement, civil defense, private land mobile or public safety communications system, including police and fire, which are readily accessible to the general public. It is also legal to listen to transmissions on the amateur bands, citizens band or general mobile radio services as well as any marine or aeronautical communications system and cordless telephone transmission.

Finally, it is not illegal to intercept satellite transmissions of cable programming as long as the transmission is not encrypted, there is no monetary gain by the viewer, and there is no marketing system available (meaning no one is selling the rights to view the programming via satellite).

There is also an interesting section of the statute which may provide a loophole for lawyers defending clients charged with a violation of this law. The statute says that it is not illegal to intercept a radio transmission which is causing interference with any lawfully operating station (including ham radio operators), or is causing interference with any consumer electronic equipment, to the extent necessary to identify the source of the interference. I can see a lawyer arguing that his client was only listening to that cellular telephone transmission because it was interfering with his client's reception on the 23 centimeter band.

After all of the exceptions are carved out, the bottom line is that the only radio frequency transmissions which are off limits are those which are not readily accessible to the general public, as that term is defined in the statute. The definition of "readily accessible to the general public" is stated in the statute as follows:

- (a) not scrambled or encrypted;
- (b) not transmitted using modulation techniques whose essential parameters have been withheld from the public with the intention of preserving the privacy of such communication;
- (c) not carried on a subcarrier or other signal subsidiary to a radio transmission;
- (d) not transmitted over a communication system provided by a common carrier, unless the communication is a tone only paging system communication;
- (e) not transmitted on frequencies allocated under part 25; subpart D,E, or F of part 74; or part 94 of the Rules of the Federal Communications Commission, unless, in the case of a communication transmitted on a frequency allocated under part 74 that is not exclusively allocated to broadcast auxiliary services, the communication is a two-way voice communication by radio.

The first two of these are no problem. If the signal is scrambled, law-abiding DXers will leave it alone. Paragraph (c) begins the real restrictions on DXers. Under the statutory definition, signals on a subcarrier, such as the types being experimented with in television at the moment, are not readily accessible to the general public and are not permitted listening.

The next section poses the greatest problem for DXers. Under the definition, any signal, other than a tone, which is transmitted by a common carrier is off limits. The FCC defines a common carrier as "any person engaged in rendering communication service for hire to the public." (47 CFR 21.2) The statutory definition given in 47 U.S.C. 153(h) is a bit more specific in that it specifically excludes radio broadcasters who, through sale of commercials, do render a communication service for hire. But, even with the removal of broadcasters, this definition is very broad and will include, beyond obvious services such as cellular telephone, just about every utility station on the face of the earth.

The types of radio transmissions made off limits to DXers by paragraph (e) are certain satellite communications, certain microwave communications, and auxiliary stations to broadcasters used for such things as feeds from the mobile van back to the studio or from the studio to the transmitter. The

frequencies of these services are all above 1 Gigahertz except for the bands 928-929 MHz and 944-960 Mhz. The exception to this is the frequency assignment given to remote broadcast pickup stations under subpart D of part 74. This service, which is off-limits to DXers, is assigned bits and pieces of the radio spectrum from 1606 kHz through 455.925 Mhz. Twenty-six frequencies in the shortwave bands are allocated to this service. The allocations are scattered between 25.87 Mhz and 26.47 Mhz, but unless you have a copy of the FCC Rules and Regulations, there is no easy way for a DXer to know that listening to these transmissions is a federal offense.

This is precisely why I maintain that this law is unenforceable. In order for a prosecution under 18 U.S.C. 2511 to be successful, the government must prove beyond a reasonable doubt that the DXer intentionally intercepted a protected transmission. Since even attorneys are unsure what frequencies are off-limits, how can the government hope to prove that a DXer who happens upon one of these federally-legislated minefields in the radio spectrum, actually intended to do so?

It should be noted that the Communications Act of 1934 (47 U.S.C. 605) has not been repealed by the new law. It is still illegal, as it has been since at least 1934, to divulge the contents of any transmission except for general broadcast stations, amateur radio and CB transmissions, and transmissions relating to ships, aircraft, vehicles or persons in distress. A recent case (Edwards v. State Farm Insurance Co., 833 F.2d 535) concluded that in order to prove an offense under this statute, the speaker must have held a subjective expectation of privacy that was justifiable under the circumstances.

I hope that this brief trip through the legal maze of communications privacy has been useful. I can see the day coming when some industrious lawyer, defending a client of means, decides to challenge this unjust law. The basis is very simple. Just as there is no Fourth Amendment right of privacy where there is no reasonable expectation of privacy, so too there should not be a statutory right of privacy where anyone with a receiver can listen in. To use an analogy, the providers of cellular service want the right to parade down Main Street with no clothes on and then prosecute anyone who looks. This is simply unfair and unrealistic.

And beyond that, our First Amendment freedom of speech has a corollary freedom to be informed and to gather information. This freedom must extend to the spoken as well as the printed word, as long as no reasonable expectations of privacy are violated. Anyone with a receiver should be entitled to hear anything which is broadcast in the clear over the "public" airwaves for the simple reason that it is not reasonable for anyone to transmit in this manner and expect this transmission to be private. An expectation of privacy can only be achieved by scrambling the signal, not by governmental decree.

FRANK TERRANELLA is an attorney, ham radio operator and short wave listener

(not necessarily in that order).

Modifying two scanners for cellular reception

The word "modifying" in this case is wrong. That implies that there is a conversion process whereby you can cause your scanner to suddenly begin receiving cellular mobile telephone calls. This is wrong thinking. A scanner that is designed to receive those frequencies above 512 MHz can have those frequencies RESTORED (sometimes). A scanner that covers from 30-512 MHz can NEVER receive 800-900 MHz frequencies without the aid of an external RF converter. Many times you will see messages from people asking how to modify such-and-such a receiver to pick up CMT. The sad truth is, the answer is \$\$\$, as that's what it will take to get a new scanner that covers those frequencies.

Some older scanners (most of them in fact) have no modifications so that they will cover these frequencies. There may be cosmetic changes, such as the addition of an S-meter, or squelch or tone improvement, but there will never, ever be anything that can be done to most of them to make them cover CMT. The PRO-2004/2005/34 receivers originally had those frequencies, but had them blocked out. Restoring those frequencies was simply a matter of unblocking them. There was really no "modifying" taking place. If a scanner was never intended to cover 800 MHz, it never will. You can get RF converters that will convert 800-912 MHz down to 400-512 MHz, however, and these should work on all scanners.

MOST SCANNERS CANNOT BE MODIFIED OR CHANGED TO RECEIVE THE CMT FREQUENCIES.

There are a handful of exceptions to this. It started out with the Realistic PRO-2004 and the PRO-34, and went to the PRO-2005. To restore CMT for the 2004, open the radio and turn it upside down. You'll see a large metal box. Carefully remove the cover. Find diode D-513. It may be in the line of diodes, or it may be on the bottom of the PC board, in which case you'll have to VERY carefully remove the board. In either case, the cure is the same. Clip one leg of D-513 to restore CMT frequencies.

If you're careful, you can unsolder this diode and place it in the empty spot at D-510. That will give you 400 channels instead of 300.

For the PRO-2005, the procedure is the same, except you clip one leg of

D-502 to restore cellular reception. In the 2004, put a 1N914 diode in D-514 and you'll increase your scan/search speed by 25%. Watch your diode polarity! For the PRO-2005, it's D-501, which is on the display board behind the keyboard. Adding D-504 to the PRO-2005 will DELETE 66-88 MHz coverage -- TV channels, radio control, etc., so don't add D-504!!!! As far as is known, there is no channel expansion capability on the order of the PRO-2004 for the PRO-2005. 400 channels appears to be its limit.

The PRO-34 handheld can also have CMT restored, and all can be modified to receive 6,400 channels (3,200 on the PRO-34), but that's beyond the capability of this article. I could have typed in the directions for restoring CMT to the PRO-34, but you really need pictures to go with the modification. The original article was in "Popular Communications." All these are described in great detail in the "Scanner Modification Handbook" by Bill Cheek, available from CRB Research Books, Inc., PO Box 56, Commack, New York, 11725. It's \$17.95 + \$2.00 postage and handling, but is well worth the price due to the treasure trove of info that's in it.

How to discover other scanner modifications

HOW TO 'DISCOVER' THOSE NEAT RADIO MODIFICATIONS

by Bob Parnass, AJ9S

How do the people that discover modifications to radios go about finding them? Good question!

The first rule of thumb is to obtain service manuals, as they contain more than just troubleshooting information. For example, the alignment procedure outlined in the Regency K500 and M400 service manuals describes how to circumvent the frequency limit checking firmware, which allows out of band frequency programming. The Uniden 200/205XLT service manual describes a keyboard sequence that clears most of the 200 memory channels, and loads the others with bizarre test frequencies.

Service manuals often describe the circuit changes in models intended for export to other countries. This can reveal features disabled for some customers but enabled for others.

A good library of IC and semiconductor data books is very helpful, although radio service manuals can also include IC internal diagrams. Old TTL databooks are no longer enough. The transition to surface mount components in

radios like the Uniden/Bearcat 760XLT is motivation for acquiring data books for leadless components.

Although some modifications involve discovery of "hidden" features, many others involve designing new circuitry or applying old circuitry from another radio. I can't claim credit for many "add/delete a diode" modifications, but here are the factors that accounted for a few other modifications.

***** Recognize Common Radio Circuits *****

Modification: Improve the squelch on the PRO-24, PRO-2004, 800XLT, etc.
Motivation: Unsatisfied with stock performance.

Almost all modern scanners use MC3357, MC3359, or Japanese pin equivalent chips, which contain the IF, squelch, limiter & discriminator circuitry. Older Bearcat and Regency scanners, like the BC300 and M400, often hid the identity of their IC with "house numbers" painted over them. I compared these ICs pin for pin with the MC3357 and other known radio ICs to unmask their true identity. Having the Motorola IC data sheet and scanner service manuals made learning the chip internals easy, so I found the way to decrease hysteresis involved changing one resistor.

***** Be Curious *****

Modification: Trick the Icom R-71A to tune below 100 kHz.
Motivation: Curiosity.

Tried manipulating several front panel controls at the same time to see if I could confuse the microprocessor into doing something neat. I did.

***** Study the Schematic, Look for Unused Pins *****

Modification: Double the memory in the R-7000 (also published by another radio hobbyist).
Motivation: curiosity.

I studied the schematic of the R-7000, and looked up the memory IC in a data book. Icom grounded an address lead, so only 1/2 the chip capacity was used. Not having enough time to try the idea on my own radio, I suggested the idea Jack Albert, who writes the RTTY column in "Monitoring Times", who used his R-7000 as a guinea pig.

***** Borrow Circuits from Other Radio Models *****

Modification: S-meter circuit for Bearcat scanners (unpublished).
Motivation: wanted to use scanners for transmitter hunting.

I looked for other radios that used the same IF/squelch chip and already

featured S-meters (like the Kenwood TR- 2600A, IC-28A, IC228H, etc.) I grafted their S-meter circuitry to my scanners.

***** Vary Parameters and Measure the Impact *****

Modification: Speed up the R-7000 scan rate.
Motivation: dissatisfied with stock performance.

I studied the radio schematic, found the components that determined scan rate, and substituted various values of resistance, measuring the affect of each change.

***** Apply Simple Theory *****

Modification: COR light for the PRO-2004.
Motivation: make scanner easier to use in a roomful of other active radios.

Having studied the schematics of many scanners, I was familiar with FM receiver and scanner circuitry. I used service manual and found the proper point in the circuit where a logic level signal was produced depending on whether a signal was absent or present. Again, the PRO-2004 used a popular IF/squelch chip. I used the simplest transistor switching principles to design a COR light circuit.

***** Fashion a Test Harness *****

Marvin Moss used an interesting approach to explore his portable scanner. He wired the diodes in the diode matrix of his Radio Shack PRO-34 to separate DIP switches so he could experiment with switching in and out different combinations of diodes.

***** All That Glitters is Not Gold *****

I always find other peoples' modifications very interesting, although not all are meritorious. For instance, avoid changing the crystal or RC time constant circuitry used as a clock for the microprocessor controller in your receiver. The controller performs many functions, so this alteration can produce undesirable side effects which outweigh any small increase in scan rate.