

## Essential Patents Listed on April 1, 2008 Attachment 1 for ATSC Standard

This chart shows *illustrative* essential claims of each patent. (Other claims may also be essential.)

Patent	Description	Claim	A/53	A/54A	A/65C	A/69	A/74A
US 5,684,541	modulation_mode & service_type	2	Secs.: 6 (Pt. 2)   5 (Pt. 3) Figs.: 6.1 (Pt. 2)   5.1 (Pt. 3) Pages: 8-9 (Pt. 2)   7-8 (Pt. 3)		Secs.: 5.1, 6.3, 6.3.1 Tables: 6.4, 6.5, 6.7 Pages: 21, 27-28	Secs.: 5, 5.1, 6.3.1, 6.3.4.2  Pages: 19-20, 28-29, 33	
US Re. 36,919	data de-randomizer	53	Secs.: 6.3, 6.4.1.1, 6.5.1, 6.5.2, 6.5.2.1, 6.5.2.2, 6.5.2.3 (Pt. 2) Figs.: 6.1, 6.3, 6.5, 6.14, 6.15 (Pt. 2) Pages: 9-13, 26-28 (Pt. 2)	Secs.: 9.2.3, 9.2.5, 9.2.12  Figs.: 9.5, 9.6 Pages: 90-93, 102			
US 6,175,718	content advisory descriptor: DCCT	9	Sec.: 5 (Pt. 3) Fig.: 5.1 (Pt. 3)  Page: 8 (Pt. 3)		Secs.: 3.3, 6.5, 6.7, 6.9.3 Fig.: D5 Table: 6.11 Pages: 14, 41, 43, 44, 64, 72, 119, 120	Secs.: 6.7, 6.9, 6.9.1  Table: 6.5 Pages: 38-40	
US 7,051,359	virtual channel table	1		Secs.: 4.1, 4.1.4, 9.2 Fig.: 4.1 Pages: 19, 20, 85	Secs.: 1.1.1, 5, 6.3.1  Pages: 9, 10, 20, 30, 33-35	Secs.: 6.3, 6.3.1  Pages: 26, 28, 29	
US 7,051,361	virtual channel table	19		Secs.: 4.1, 4.1.4, 9.2 Fig.: 4.1 Pages: 20, 21, 85	Secs.: 1, 1.1.1, 5, 6.3.1, 6.9, 6.9.5 Table: 6.4 Pages: 9, 10, 20, 30, 33-35, 69, 74	Secs.: 6.3, 6.3.1  Pages: 26, 28, 29	
US 7,080,401	virtual channel table	1		Secs.: 4.1, 4.1.4, 9.2 Fig.: 4.1 Pages: 19, 20, 21, 85	Secs.: 1.1.1, 5, 6.3.1, 6.9, 6.9.5 Table: 6.4 Pages: 9, 10, 20, 30, 34, 35, 69, 74	Secs.: 6.3.1  Pages: 28, 29	
US 7,100,189	virtual channel table	1		Fig.: 4.1 Pages: 20, 21, 85	Table: 6.4 Pages: 9, 10, 20, 30, 34, 35, 69, 74	Table: 6.2 Pages: 28, 29	
KR 348,249	inactive channel information	1			Secs.: 1.1.1, 6.3.1, 6.9.6 Table: 6.4 Pages: 9-10, 29, 32-34, 72		
US Re. 38,483	trellis code: VSB	8	Secs.: 6, 6.3, 6.4.1.4, 6.5.1, 6.5.2, 6.9.1, 6.9.3 (Pt. 2) Figs.: 6.1, 6.3, 6.4, 6.8, 6.14, 6.15, 6.17 (Pt. 2) Pages: 8-12, 15, 16, 26, 27, 40, 41 (Pt. 2)	Secs.: 9.9.2, 9.2.1, 9.2.2, 9.2.3, 9.2.5  Figs.: 9.1, 9.2 Pages: 82, 85-88, 90, 92, 99, 100			
US Re. 38,513	trellis code: VSB	8	Secs.: 1, 6, 6.4.1.4, 6.9.3 (Pt. 2) Figs.: 6.1, 6.4, 6.8 (Pt. 2)  Pages: 6, 8, 9, 12, 15-16 (Pt. 2)				
US Re. 39,111	trellis code: VSB	4	Secs.: 6.3, 6.4.1.4, 6.5.1, 6.5.2, 6.9.1 (Pt. 2)  Pages: 10-12, 15, 16, 26, 27, 40 (Pt. 2)	Secs.: 9.9.2, 9.2.1, 9.2.3, 9.2.5, 9.2.9 Figs.: 9.1, 9.2, 9.3 Pages: 82, 85, 86, 88, 90, 92, 99-101			
US 5,999,569	trellis code: VSB	5	Secs.: 6.3, 6.4.1.4, 6.5.1, 6.5.2, 6.9.1 (Pt. 2) Figs.: 6.3, 6.8, 6.14, 6.15 (Pt. 2) Pages: 10-12, 15, 16, 26, 27, 40 (Pt. 2)	Secs.: 9.9.2, 9.2.1, 9.2.2, 9.2.3, 9.2.5, 9.2.9 Figs.: 9.1, 9.2, 9.3 Pages: 82, 85, 86, 88, 90, 92, 99-101			
US 6,549,716	trellis code: VSB	2	Secs.: 6.3, 6.4.1.4, 6.5.1, 6.5.2, 6.9.1 (Pt. 2) Figs.: 6.3, 6.8, 6.14, 6.15 (Pt. 2) Pages: 10 to 12, 15, 16, 26, 27, 40 (Pt. 2)	Secs.: 9.9.2, 9.2.3, 9.2.5 Figs.: 9.1, 9.4 Pages: 82, 85, 90 to 93			
KR 161,051	trellis code; VSB; Reed Solomon error correction	6	Sec.: 6.1 (Pt. 2)  Fig.: 6.1 (Pt. 2) Pages: 8, 9 (Pt. 2)	Secs.: 4.1, 4.1.1, 4.1.3, 4.1.4, 5.1.3, 9.2, 9.2.1, 9.2.9, 9.2.10, 9.2.11 Figs.: 4.1, 5.1, 9.1 Pages: 19-21, 23, 85, 86, 99-102			

Patent	Description	Claim	A/53	A/54A	A/65C	A/69	A/74A
US 5,488,418	Reed Solomon error correction	4	Secs.: 6, 6.1, 6.4.1.2 (Pt. 2)   5 (Pt. 3)   6, 6.1 (Pt. 4) Figs.: 6.1 (Pt. 2)   5.1 (Pt. 3) Pages: 8, 9, 13, 14 (Pt. 2)   7.8, (Pt. 3)   9 (Pt. 4)	Secs.: 5.4, 9.2, 9.2.11 Fig.: 9.1 Pages: 28, 85, 102			
US 5,734,430	Reed Solomon error correction	4	Secs.: 6, 6.1, 6.4.1.2 (Pt. 2) Pages: 8, 9, 13, 14 (Pt. 2)	Secs.: 9.2, 9.2.11, 9.5.2 Fig.: 9.1 Pages: 85, 102, 105			
US 5,793,432	Reed Solomon error correction	3		Secs.: 7.4.4, 7.4.4.2, 9.2, 9.2.11 Fig.: 9.1 Pages: 55, 85, 102			
US 6,016,172	service location descriptor	1			Secs.: 6.3, 6.3.1 Pages: 28, 29	Secs.: 6.3, 6.3.3, 6.3.4.2, 7.4.1 Fig.: 7.4, 7.5, 7.6 Pages: 26, 32, 33, 46 to 48	
KR 182,004	service location descriptor	1			Secs.: 1, 6.3.1, 6.9, 6.9.5 Tables: 6.4, 6.25a, 6.29 Pages: 9, 29, 30, 69, 70, 74 to 76	Secs.: 4, 6.3.3, 6.3.4.2, 7.4.1 Fig.: A.4 Pages: 17, 32 to 34, 47, 48, 56	
US 6,104,436	EPG	11		Secs.: 4, 4.1.3, 7.1 Fig.: 4.1 Pages: 18, 20, 21, 49	Secs.: 6.3, 6.3.1, 6.5 Table: 6.4 Pages: 28 to 32, 41	Secs.: 5.3, 5.3.1, 6.3, 6.3.1, 6.3.4.2, 6.3.4.3, 6.4, 5.2, 5.3, 7.4.1 Figs.: 5.2, 5.3, 6.2 Pages: 22, 23, 26 to 29, 33 to 35, 46 to 48	
US 6,184,938	GCR: VSB	17	Secs.: 6.3, 6.5.2.2 (Pt. 2) Figs.: 6.3, 6.15, 6.16 (Pt. 2) Pages: 10, 12, 27-28 (Pt. 2)	Secs.: 9.2, 9.2.3, 9.2.5, 9.2.7 Figs.: 9.1, 9.5, 9.6, 9.9 Pages: 85, 90-93, 96, 97			Secs.: B2.1, B2.2 Fig.: B.1 Pages: 36, 37
US 6,480,239	GCR: VSB	13	Secs.: 1, 6, 6.3, 6.5.2, 6.5.2.2 (Pt. 2) Figs.: 6.3, 6.15, 6.16 (Pt. 2) Pages: 6, 8-10, 12, 26-28 (Pt. 2)				Secs.: B2.1, B2.2 Fig.: B.1 Pages: 36, 37
US 6,937,292	GCR: VSB	7	Secs.: 6.3, 6.5.2, 6.5.2.2 (Pt. 2) Figs.: 6.1, 6.3, 6.15, 6.16 (Pt. 2) Pages: 9, 10, 12, 26-28 (Pt. 2)	Secs.: 9.2, 9.2.5, 9.2.7 Figs.: 9.1, 9.9 Pages: 85, 92, 96, 97			Secs.: B2.1, B2.2 Fig.: B.1 Pages: 36, 37
KR 100,718	STT	1			Secs.: 1.1.1, 6.1 Table: 6.1 Pages: 9, 10, 22, 23, 24	Sec.: 5.1 Tables: A.3, A.4 Pages: 20, 55, 56	
KR 134,327	trellis code; VSB	1	Secs.: 6, 6.1, 6.3, 6.4.1.4, 6.9.3 (Pt. 2) Figs.: 6.8, 6.17 (Pt. 2) Pages: 8-12, 15-16, 41 (Pt. 2)				
KR 138,289	EIT	1			Secs.: 1.1.1, 6.5 Table: 6.11 Pages: 9, 10, 41-43		
KR 156,496	mixing video and program information	1				Secs.: 5.3.1, 6.4 Figs.: A.3, A.4 Pages: 23, 34, 35, 55, 56	
KR 194,033	GCR: VSB	8	Secs.: 6.3, 6.5.2.2 (Pt. 2) Fig.: 6.15 (Pt. 2) Pages: 10, 26-27 (Pt. 2)	Secs.: 9.2.7 Pages: 96, 97			
KR 195,177	trellis code; VSB	3	Secs.: 6.4.1.4, 6.9.1, 6.9.3 (Pt. 2) Figs.: 6.8, 6.9 (Pt. 2) Pages: 15-17, 40-41 (Pt. 2)				
KR 246,792	time information display	1				Secs.: 5.3.1, 6.4, 6.6 Figs.: 5.3, A.3 Pages: 23, 34, 35, 37, 56	

Patent	Description	Claim	A/53	A/54A	A/65C	A/69	A/74A
KR 329,417	EPG	1			Secs.: 5, D.2 Pages: 20, 110	Secs.: 5.3, 7.2 Figs.: 5.2, A.4 Pages: 22, 23, 43, 56	
KR 369,579	EPG	5			Secs.: 1.1.1, 5 Pages: 9, 19	Secs.: 5.3, A1.2 Figs.: 5.2, A.4 Pages: 17, 22, 23, 55, 56	
US 5,600,378	virtual channel table & program_number	1	Secs.: 6, 6.1 (Pt. 2)   5 (Pt. 3) Figs.: 6.1 (Pt. 2)   5.1 (Pt. 3) Pages: 8-9 (Pt. 2)   7-8 (Pt. 3)		Secs.: 3.3, 5.1, 6.3.1 Pages: 15, 22, 32, 35-36	Secs.: 1.1, 5, 5.3, 6.3, 6.3.1, 6.3.2, 6.3.4.2, A1.1, A1.1.1 Table: 6.3 Fig. A.4 Pages: 10, 11, 19, 22, 26-31, 33-34, 51, 52, 56	
US 6,215,530	virtual channel table & program_number	9	Secs.: 6.1 (Pt. 2)   5 (Pt. 3) Figs.: 6.1 (Pt. 2)   5.1 (Pt. 3) Pages: 8-9 (Pt. 2)   7-8 (Pt. 3)		Secs.: 4, 5.1, 6.3.1 Pages: 14-15, 21-22, 31, 34	Secs.: 6.3.1, 6.3.2, 6.3.4.2 Table: 6.3 Pages: 28, 30-31, 33-34	
US Re.36,992	symbol rate	67	Secs.: 6.3, 6.5.1 (Pt. 2) Figs.: 6.4, 6.14 (Pt. 2) Pages: 10, 12, 26 (Pt. 2)	Secs.: 4.1, 4.1.4, 9, 9.2 Figs.: 4.1, 9.1 Pages: 19-21, 82, 85			
KR 119,736	interference rejection filter	6	Secs.: 6.3, 6.9.3 (Pt. 2) Figs.: 6.3, 6.4, 6.17 (Pt. 2) Pages: 10-12, 41 (Pt. 2)	Secs.: 8.1, 9.2, 9.2.6 Figs.: 9.1, 9.7 Pages: 72, 85, 93, 94			
US 5,406,587	phase tracker	1		Secs.: 9.2.2, 9.2.8 Figs.: 9.3, 9.10 Pages: 88, 97, 98			
US 5,416,524	data segment sync	56	Secs.: 6.3, 6.5.1 (Pt. 2) Figs.: 6.3, 6.14 (Pt. 2) Pages: 10-12, 26 (Pt. 2)	Secs.: 9.2, 9.2.3, 9.2.4 Figs.: 9.1, 9.4, 9.5 Pages: 85, 90-92			
US 5,534,938	data segment sync; data field sync	6	Secs.: 6.3, 6.5.1, 6.5.2 (Pt. 2) Figs.: 6.3, 6.14, 6.15 (Pt. 2) Pages: 10-12, 26, 27 (Pt. 2)	Secs.: 9, 9.2, 9.2.3, 9.2.5, 9.2.6, 9.2.7 Figs.: 9.1, 9.4, 9.5, 9.6, 9.8 Pages: 82, 85, 90-93, 95, 96			
US 5,598,220	data field sync	54	Secs.: 6.3, 6.5.1, 6.5.2 (Pt. 2) Figs.: 6.3, 6.14, 6.15 (Pt. 2) Pages: 10-12, 26, 27 (Pt. 2)	Secs.: 9, 9.2, 9.2.5 Figs.: 9.1, 9.6 Pages: 82, 85, 92, 93			
US 5,600,677	trellis code	1	Secs.: 6.1, 6.4.1.4, 6.9.1 (Pt. 2) Figs.: 6.1, 6.8 (Pt. 2) Pages: 8, 9, 15, 16, 40 (Pt. 2)				
US 5,602,595	sync information	23	Secs.: 1, 6, 6.3, 6.5.1, 6.5.2, 6.9.3 (Pt. 2)   6.1 (Pt. 3)   6 (Pt. 4)   5.1 (Pt. 5) Figs.: 6.3, 6.14, 6.15 (Pt. 2) Pages: 6, 8, 10-12, 26, 27, 41 (Pt. 2)   9 (Pt. 3)   9 (Pt. 4)   8 (Pt. 5)	Secs.: 4, 4.1.4, 8.1, 9, 9.2, 9.2.1, 9.2.3 Figs.: 4.1, 9.1, 9.4, 9.5 Pages: 18, 20, 21, 71, 73, 82, 85, 87			
KR 313,653	sync information	15	Secs.: 6, 6.3, 6.5.1, 6.9.3 (Pt. 2) Figs.: 6.3, 6.8, 6.14 (Pt. 2) Pages: 8, 10-12, 16, 26, 41 (Pt. 2)	Secs.: 7.3, 8.2, 9.2.3, Figs.: 4.1, 5.1, 6.1, 9.4, 9.5 Pages: 20, 23, 33, 50, 73, 90-92			
US 5,619,269	data field sync; equalizer	9	Secs.: 6.3, 6.5.1, 6.5.2, 6.5.2.1, 6.5.2.2 (Pt. 2) Figs.: 6.3, 6.14, 6.15 (Pt. 2) Pages: 10, 12, 26-28 (Pt. 2)	Secs.: 9, 9.2, 9.2.5, 9.2.7, 9.3 Figs.: 9.1, 9.9 Pages: 82, 85, 92, 96, 97, 103			
US 5,629,958	data field sync; trellis code	9	Secs.: 1, 6.3, 6.4.1.4, 6.5.2, 6.5.2.5 (Pt. 2) Figs.: 6.1, 6.3, 6.15 (Pt. 2) Pages: 6, 10-12, 15, 26, 27 (Pt. 2)	Secs.: 9.2, 9.2.9 Fig.: 9.11 Pages: 85, 99			
KR 274,288	data field sync; trellis code	7	Secs.: 6.3, 6.5.2.5 (Pt. 2) Figs.: 6.3, 6.15 (Pt. 2) Pages: 10-12, 27, 29 (Pt. 2)	Secs.: 9.2 Pages: 85, 86			

Patent	Description	Claim	A/53	A/54A	A/65C	A/69	A/74A
US 5,636,251	trellis code	1	Secs.: 6.4.1.4 (Pt. 2) Figs.: 6.8 (Pt. 2) Pages: 15, 16 (Pt. 2)	Secs.: 4.1, 4.1.4, 9, 9.2, 9.2.3, 9.2.7, 9.2.9 Figs.: 4.1, 9.1, 9.5, 9.9, 9.11 Pages: 19, 20, 21, 82, 85, 91, 96, 97, 99, 100			
US 5,677,911	data frame	21	Secs.: 6.3, 6.4, 6.4.1.2, 6.4.1.3, 6.5.1 (Pt. 2) Figs.: 6.3, 6.7, 6.14 (Pt. 2) Pages: 10-15, 26 (Pt. 2)	Secs.: 4.1, 4.1.1, 4.1.4, 9, 9.2, 9.2.3, 9.2.9, 9.2.10, 9.2.11 Figs.: 4.1, 9.1, 9.11, 9.14 Pages: 19-21, 82, 85, 91, 99-102			
KR 264,624	data frame	4	Secs.: 6.3, 6.4.1.2, 6.4.1.3, 6.5.1, 6.5.2, 6.5.2.3 (Pt. 2) Figs.: 6.3, 6.7, 6.14, 6.15 (Pt. 2) Pages: 10-15, 26-28 (Pt. 2)	Secs.: 4.1.1, 4.1.2, 9.2, 9.2.5 Fig.: 4.1 Pages: 20, 21, 85, 92			
US 5,802,107	trellis code	12	Secs.: 6.3, 6.4.1.4 (Pt. 2) Figs.: 6.3, 6.9 (Pt. 2) Table: 6.1 (Pt. 2) Pages: 10-12, 16, 17 (Pt. 2)	Secs.: 9, 9.2, 9.2.9 Figs.: 9.1, 9.12 Pages: 82, 85, 99, 100, 101			
KR 540,316	trellis code	8	Secs.: 6.3, 6.4.1.4 (Pt. 2) Figs.: 6.3, 6.9 (Pt. 2) Table: 6.1, 6.2 (Pt. 2) Pages: 10-12 (Pt. 2)	Secs.: 9.2, 9.2.9 Fig.: 9.11 Page: 85			
US 5,987,070	trellis code; VSB	1	Secs.: 6, 6.1, 6.3, 6.4.1.4, 6.5.1, 6.5.2, 6.5.2.1, 6.5.2.2, 6.5.2.3 (Pt. 2) Figs.: 6.1, 6.3, 6.8, 6.14, 6.15 (Pt. 2) Pages: 8 to 12, 15 to 17, 26 to 28 (Pt. 2)				