



Digital Switchover Transmitter Details

Border Region

Issue 7.0

Issued: 5 January 2011

Digital Switchover Transmitter Details: Border Region

This document contains details of the transmission characteristics which the television transmitter network in the Border Region adopted at digital switchover.

A key to column headings is provided in the Glossary.

If you would like to be kept informed of any changes or update to these details, please join our digital transmitter mailing list by sending an email to broadcast.technical@ofcom.org.uk, with the word 'subscribe' as the message subject.

Disclaimer: While every reasonable effort is made to ensure that the information provided in this document is accurate, no guarantees for the currency or accuracy of information are or can be made. The information contained in this document is provided without any representation or endorsement made and without warranty of any kind, whether express or implied.

Caldbeck transmitter group - Public Service Broadcaster (PSB) Multiplexes

Site Name	NGR	BBCA		D3&4		BBC B		Aerial Group
		Channel	ERP	Channel	ERP	Channel	ERP	
Caldbeck	NY299425	25-	100kW	28-	100kW	30-	100kW	AH
Ainstable	NY539466	49	20W	45	20W	42	20W	BV
Bassenthwaite	NY206305	49	32W	45	32W	42	32W	BV
Bleach Green HP	NX984199	60	2W	53	2W	57	2W	C/DH
Bleach Green VP	NX984199	60	2.5W	53	2.5W	57	2.5W	C/DV
Coniston	SD327966	27	16W	24	16W	21+	16W	AV
Crosby Ravensworth	NY618152	60	2W	53	2W	57	2W	C/DV
Crosthwaite	SD437900	48	4W	52	4W	56	4W	C/DV
Dentdale	SD727854	60	10.4W	53	10.4W	57	10.4W	C/DV
Eskdale Green	SD135997	25	2W	28	2W	22	2W	AV
Glenridding	NY395172	57	2W	53	2W	60	2W	C/DV
Glenridding Link	NY386184	24	2W	27	2W	21+	2W	AV
Gosforth	NY069012	61	100W	54	100W	58	100W	C/DV
Grasmere	NY339056	55	4W	62-	4W	59	4W	C/DV
Greystoke	NY450299	60	2.3W	53	2.3W	57	2.3W	C/DV
Haltwhistle	NY674627	59	400W	62-	400W	55	400W	C/DV
Hawkshead	SD342959	26	12.2W	23	12.2W	29	12.2W	AV
Kendal	SD540912	60	400W	53	400W	57	400W	C/DV
Kendal Fell	SD509930	46	3.2W	50	3.2W	43	3.2W	BH
Keswick	NY278224	24	24W	27	24W	21+	24W	AV
Kirkby Stephen	NY777082	60	2.4W	53	2.4W	57	2.4W	C/DV
Lorton	NY155278	60	10W	53	10W	57	10W	C/DV
Lowther Valley	NY520199	46	5.2W	50	5.2W	43	5.2W	BV
Millthrop	SD658926	52	3W	48	3W	56	3W	C/DV
Orton	NY618071	43	6.2W	50	6.2W	46	6.2W	BV
Pooley Bridge	NY477234	46	2.6W	50	2.6W	43	2.6W	BV
Ravenstonedale	NY733048	60	2.2W	53	2.2W	57	2.2W	C/DV
Sedburgh	SD607879	46	100W	50	100W	43	100W	BV
St Bees	NX967115	61	50W	54	50W	58	50W	C/DV
Threlkeld	NY313256	60	2.2W	53	2.2W	57	2.2W	C/DV
Whitehaven	NX992123	43	2kW	50	2kW	46	2kW	BV
Windermere	SD383980	44	100W	47	100W	41+	100W	BV
Workington	NY001277	61	10W	54	10W	58	10W	C/DV

Site Name	NGR	BBCA		D3&4		BBC B		Aerial Group
		Channel	ERP	Channel	ERP	Channel	ERP	
Caldbeck (Scottish)	NY299425	27-	50kW	24-	50kW	22-	100kW	AH
Ballantrae	NX089827	58	2W	61	2W	54	2W	C/DV
Barskeoch Hill	NX810616	55	400W	59	400W	62-	400W	C/DV
Cambret Hill	NX524578	44	2.8kW	41+	2.8kW	47	2.8kW	BH
Creetown	NX432559	59	6.4W	62-	6.4W	55	6.4W	C/DV
Dumfries South	NX970741	43	20W	46	20W	50	20W	BV
Glenluce	NX203569	57	3W	60	3W	53	3W	C/DV
Kirkudbright	NX686506	21+	2W	24	2W	27	2W	AV
Langholm	NY358831	57	4W	60	4W	53	4W	C/DV
Minnigaff	NX406661	26	2W	29	2W	23	2W	AV
Moffat	NT078050	45	2W	42	2W	49	2W	BV
New Galloway	NX615788	26	20W	23	20W	29	20W	AV
Pinwherry	NX183876	22	11.2W	25	11.2W	28	11.2W	AV
Portpatrick	NX007545	58	60W	61	60W	54	60W	C/DV
Stanraer	NX111632	57	50W	60	50W	53	50W	C/DV
Thornhill	NX855891	57	100W	60	100W	53	100W	C/DV

Caldbeck transmitter group - Commercial (COM) Multiplexes

Site Name	NGR	SDN		Arqiva A		Arqiva B		Aerial Group
		Channel	ERP	Channel	ERP	Channel	ERP	
Caldbeck^a	NY299425	23-	50kW	26-	50kW	29-	50kW	AH

^a Caldbeck COM multiplexes will broadcast at 15kW ERP until 2012

Selkirk transmitter group - Public Service Broadcaster (PSB) Multiplexes

Site Name	NGR	BBCA		D3&4		BBC B		Aerial Group
		Channel	ERP	Channel	ERP	Channel	ERP	
Selkirk	NT500294	62-	10kW	59-	10kW	55	10kW	C/DH
Bonchester Bridge	NT589114	45	2W	49	2W	42	2W	BV
Clovenfords	NT444351	27	2W	24	2W	21+	2W	AV
Eyemouth	NT947599	21+	400W	24	400W	27	400W	AV
Galashiels	NT507360	44	20W	41+	20W	47	20W	BV
Hawick	NT509147	26	10W	23	10W	29	10W	AV
Innerleithen	NT325368	61	16W	54	16W	58	16W	C/DV
Jedburgh	NT661224	44	32W	41+	32W	47	32W	BV
Lauder	NT506502	28	2.2W	25	2.2W	22	2.2W	AV
Peebles	NT228416	28	20W	25	20W	22	20W	AV
Stow	NT448445	26	2W	23	2W	29	2W	AV
Yetholm	NT836283	44	2W	41+	2W	47	2W	BV

Selkirk transmitter group - Commercial (COM) Multiplexes

Site Name	NGR	SDN		Arqiva A		Arqiva B		Aerial Group
		Channel	ERP	Channel	ERP	Channel	ERP	
Selkirk	NT500294	57	5kW	53	5kW	60+	5kW	C/DH

Glossary

Site Name:	The name of the transmitter site. Primary transmitters in each transmitter group are highlighted in bold , with their dependent relays listed alphabetically below them. Public Service Broadcaster (PSB) and Commercial (COM) multiplexes are shown in separate tables.
NGR:	The location of the transmitter site, in Ordnance Survey National Grid Reference format.
Multiplex names:	The post-switchover name of the multiplex. See below for more details
Channel	The UHF channel number of the multiplex. The centre frequency, F_c (in Megahertz) of the multiplex can be calculated using $F_c=8n+306$, where n is the UHF channel number. A + or - following the channel number indicates that the frequency is offset by +0.167MHz or -0.167MHz with respect to the channel centre. Channel numbers highlighted in red are likely to be affected in future by the clearance of channels 61 and 62: see the '800 MHz Clearance' section below.
ERP	The Effective Radiated Power of the multiplex, in watts (W) or kilowatts (kW)
Aerial Group:	Suggested aerial group for reception of the 3 PSB multiplexes (and the 3 COM multiplexes, where broadcast) from this transmitter. See below for more information on aerial groups. The final character in this column indicates whether signals are horizontally (H) or vertically (V) polarised.
Aerial Group Colour codes:	All frequencies at this transmitter were formerly used by analogue channels.
	One or more digital frequencies at this transmitter were formerly unused at this transmitter by analogue TV, but all digital channels fall within the former analogue aerial group.
	One or more digital frequencies at this transmitter were formerly unused at this transmitter by analogue TV, and at least one of these frequencies also falls outside the former analogue aerial group.
DSO	Digital Switchover
Single Frequency networks (SFNs)	In order to maximise digital coverage, some transmitter sites will operate as Single Frequency Networks (SFNs) at switchover. In an SFN, neighbouring transmitters use the same frequencies as each other.

Multiplex Names

The naming convention for the six multiplexes changed at switchover, and the table below compares their pre-switchover and post-switchover designations:

Pre-Switchover Name	Post-Switchover Name	Operator
Multiplex 1	BBC A	BBC
Multiplex 2	D3&4	Digital 3 & 4
Multiplex A	SDN	SDN
Multiplex B	BBC B	BBC
Multiplex C	Arqiva A	Arqiva
Multiplex D	Arqiva B	Arqiva

Aerial Groups

Television aerials are designed to operate most efficiently over a specific range of frequencies, as shown in the table below. For guidance, this document suggests a suitable aerial group for reception of the digital services from each transmitter. Where a transmitter uses a semi-wideband channel grouping (E or K), a wideband (W) aerial is also suggested as an alternative. The colour codes in the table below are often used by aerial manufacturers to aid identification of the aerial's group.

Aerial Group	Channels	Colour Code
A	21-37	Red
B	35-53	Yellow
C/D	48-68	Green
E	35-68	Brown
K	21-48	Grey
W	21-68	Black

Transmission Modes

The post-switchover transmission mode for all multiplexes except BBC B is 64QAM modulation, coding rate 2/3, & 8K FFT.

The BBC B multiplex uses the DVB-T2 standard: 256QAM modulation, coding rate 2/3, & 32K FFT.

Transitional Transmission Characteristics

Transmission frequencies are intensively used in many parts of the UK. To avoid unnecessary interference being caused to viewers, a certain number of multiplexes will need to operate with 'transitional' transmission characteristics for a limited period following switchover at particular transmitters. These transitional characteristics are only likely to affect a small proportion of sites. For example, some channels may need to operate at slightly reduced power levels compared to the final post-switchover allocations shown in this booklet. This is primarily in order to prevent interference being caused to neighbouring transmitters which may not switch over until later in the regional sequence. Full power operation will be adopted when these interference constraints are removed, generally when the neighbouring transmitter or region switches over. Details of known transitional arrangements affecting individual transmitters are provided in footnotes.

800 MHz clearance

In order to align the frequencies released by digital switchover for alternative uses with those released by other European countries, UHF channels 61 and 62 will be 'cleared' of digital TV services over the coming years. UHF channels 39 and 40 (which were previously among the channels due to be released for other uses after switchover) will instead now be retained for TV broadcasting.

In order to minimise changes to domestic aerial groups, the general approach for adopting these changes is that multiplexes using channels 61 or 62 will move to channels 49 or 50, and multiplexes using channels 49 or 50 will move to channels 39 or 40. Other channels may also be affected in some cases. The changes will either be carried out at digital switchover, or sometime after switchover completes (e.g. during 2013). If the changes are to be carried out at digital switchover, an updated version of this guide will be issued.

Multiplexes using channels 61, 62, 49, or 50 are highlighted in red in this guide to indicate that these allocations are likely to change in the future.

Transmitter Locations

Maps showing the location of TV transmitters within individual regions are available on Ofcom's website at:

<http://stakeholders.ofcom.org.uk/broadcasting/guidance/tech-guidance/>

Document History

Version	Date	Details
1.0	5/4/2007	Document Issued
2.0	24/10/2007	Additional explanatory text and revised document format. Revisions to multiplex naming conventions. Minor correction to analogue data. Glenmoye frequencies moved in-group. Kendal, Port St. Mary, and Whitehaven transitional arrangements added.
3.0	4/11/2008	Com mux names revised. Map removed and replaced with link to online version. Transmission mode section revised to include DVB-T2.
4.0	5/3/2009	Douglas transmitter group separated from Caldbeck. Offsets added. Windermere, Coniston, Hawkshead, Kendal Fell, Sedburgh, Crosthwaite, Millthrop, channel allocations changed. Minor editorial amendments. Relay attributions finalised.
5.0	15/6/2009	Channel order at Caldbeck / Caldbeck Scottish revised. Some offsets modified. SFN information added for Douglas transmitter group.
6.0	10/9/2009	Douglas transmitter group removed and added to Granada regional guide (Douglas now carries Granada regional services). Other minor editorial changes.
7.0	5/1/2011	Format and text changed for post-switchover situation, and analogue details removed. Initial 800Mhz clearance information added. Transitional arrangements footnotes updated.

© Ofcom copyright 2011. All material provided by Ofcom is owned by Ofcom or is licensed to Ofcom and is protected by copyright, trade marks, service marks, patents or other proprietary rights and laws. The Ofcom logo is a registered trademark.