

**Response to the
"Consultation on a Policy, Technical
and Licensing Framework for Use
of the Bands 2000-2020 MHz and
2180-2200 MHz"**

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Background

In 1997 the US Federal Communications Commission ("FCC") reallocated 70 megahertz of spectrum in the 2 GHz band from a terrestrial Fixed and Mobile allocation to a Mobile Satellite allocation ("MSS"). MSS is a radio-communication service involving transmission between mobile earth stations and one or more space stations. The FCC intended for MSS to provide handheld wireless communications in areas where it is difficult or impossible to provide communications coverage via terrestrial base stations and at times when coverage may be unavailable from terrestrial-based networks. The FCC adopted MSS rules for the 2 GHz band in 2000, and in 2001 the International Bureau of the FCC authorized eight satellite operators to provide MSS in this band. By February 2003, the International Bureau cancelled three MSS authorizations for failure to meet their system implementation milestones

Three additional MSS operators surrendered their licenses in 2005. This left only two MSS operators in the 2 GHz band, DBSD (then known as ICO) and TerreStar, each of which had the right to use 20 megahertz of 2 GHz band spectrum to provide mobile satellite services.

The FCC also established rules for Auxiliary Terrestrial Component use ("ATC"), which allowed authorized MSS operators to augment their satellite services with terrestrial facilities. ATC consists of terrestrial base stations and mobile terminals that re-use frequencies assigned for MSS operations. To ensure that ATC would be ancillary to the provision of MSS, the FCC determined that ATC authority would be limited to MSS operators who met specific build out criteria.



Figure 1 TerreStar GENUS Phone

The FCC authorized ICO Services Limited (a predecessor to DBSD) and an indirect wholly owned subsidiary of ICO Global Communications (Holdings) Limited ("ICO Global"), to provide MSS using non-geostationary orbit satellites.

In May 2005, the FCC modified the authorization to allow DBSD to provide MSS using a geostationary-orbit satellite. DBSD later selected the 2010-2020 MHz and 2180-2190 MHz bands for its operation. In January 2009, DBSD received FCC approval to operate dual-mode mobile earth terminals and ATC facilities on a non-common-carrier basis.

DBSD and TerreStar launched their satellites in April 2008 and July 2009, respectively, and met their operational milestones in May 2008 and August 2009, respectively. DBSD and TerreStar received ATC authority in 2009 and 2010, respectively. Despite having MSS and ATC authority and an orbiting satellite, DBSD never offered either commercial satellite or terrestrial service and TerreStar offered only minimal satellite service (partnering with AT&T to offer a short-lived non-ATC satellite/terrestrial service using AT&T terrestrial spectrum and TerreStar satellite spectrum). The mobile device was the GENUS shown in Figure 1.

Overall, there remains little commercial use of this spectrum for MSS and none for terrestrial (ATC) service despite licenses that are over a decade old.

By 2010 TerreStar had filed for Chapter 11 bankruptcy to protect itself from liabilities in the range of \$1.6 billion. As expected, a restructuring was in order, with Blackstone Group LP providing financial advice for such a move. One of Terrestars creditors, EchoStar, offered \$75 million in financing to help keep the company operate while it went through the bankruptcy.

The reasons behind this failure to execute were not lack of spectrum or technical expertise, but rather that fact that satellite/terrestrial dual mode phones likely appeal to a very small percentage of the population, and operators cannot offer a full and varied portfolio of models - to put it bluntly no Apple iPhone or Samsung devices.

Such handheld devices are a "niche" product offering, and do not reach the scale needed to drive the ecosystem, for the following reasons:

- Power limitations and the inefficiencies of omni-directional antennas make handheld satellite broadband infeasible.
- Potential users will not accept outdoor only coverage and the need to point the antenna at the satellite unless they are truly "desperate".
- Uptake will only occur with certain vertical segments (military, government , broadcasters etc)
- Dual-mode phones are unable to match terrestrial offerings for features (such as Android and iPhone), and users prefer to carry a single mode satellite phone only when needed.

The lack of commercial success ensured that Bell Canada Enterprises sold Telesat, Telesat Mobile Inc and its shares in Terrestar well before Terrestar filed for Chapter 11. Subsequently DISH Network spent \$2.9 billion acquiring the MSS/ATC licenses and the spectrum that is the subject of this consultation by buying both TerreStar and DBSD North America satellite companies out of bankruptcy in 2011.

DISH has since worked with the 3GPP standards body to ensure that this spectrum (now known as AWS-4) fits within the 3GPP Band Class Definitions as Band Class 23.

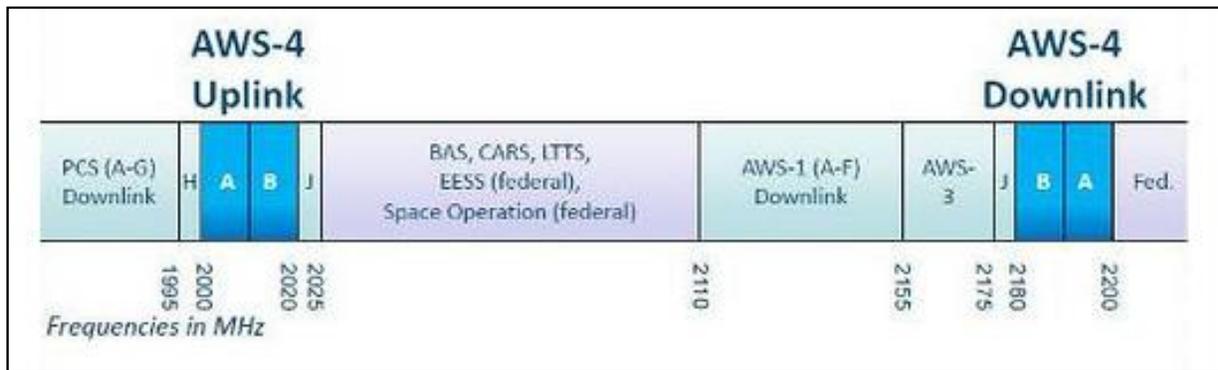


Figure 2 AWS 4 Band

With the current plan for AWS 4, please note that the "H" block acts as a guard band between the North American Band Class 25 (PCS blocks A through G) and the new Band Class 23 (AWS 4) assuming the AWS-4 uplink direction remains as shown in Figure 2.

In order to overcome any objections from other American carriers (notably Sprint) with regard to interference and out of band emissions with the "H" block, DISH purchased all 173 licenses for the "H" block in the most recent FCC auction (2014) for \$1.6Bn. The money will be used to help fund the 700 MHz Public Safety Broadband Network ("PSBN") to be operated by FirstNet in the USA.

Note that there is no Band Class Definition from 3GPP that includes the "H" Block, and in Canada the "H" block is unassigned at present and is available for auction in 2015, since the FCC has already auctioned this block in the USA.

However, all of this activity from DISH does not mean that the AWS-4 Band Plan is final!

In 2012, the FCC authorized full terrestrial use for AWS-4, and gave DISH full flexibility to alter the uplink/downlink assignments for AWS-4 as they see fit. DISH also owns some of the lower 700 MHz "E" block spectrum in the USA, and of course the "H" block, but since DISH does not operate any terrestrial wireless services at present the DISH spectrum assignments are not currently included in any of the four North American handset ecosystems (AT&T, Verizon, T-Mobile or Sprint).

Likely DISH has several options to further its ambition to become a mobile operator:

- To make an offer to buy T-Mobile USA from Deutsch Telekom (which owns 66.75% of the shares and wants to sell) if the Sprint/T-Mobile merger is rejected.
- To work out a deal with Sprint (SoftBank) if the T-Mobile merger gets approved
- To do a deal with AT&T or Verizon for the DISH spectrum if the first two choices do not work

Only once the results of the DISH strategy are known will the AWS-4 band plan and the device ecosystem be determined for North America.

The result may allow efficient use of this spectrum for mobile broadband for American consumers, but may take another two or three years - perhaps until 2017 before any services to consumers are provided.

Once the device ecosystem is established, the same handsets will become available for Canadian wireless operators since critical mass will have been achieved in the USA.

Therefore there is no need for urgency on the part of Industry Canada to make immediate decisions regarding AWS-4, but Industry Canada should consider adding the "H" block to the 2015 spectrum auction to raise some money (as did the FCC) in order to provide funding for the proposed Canadian 700MHz Public Safety Broadband Network.

For completeness Figure 3 shows the current 3GPP Band Class Definitions.

FDD LTE BANDS & FREQUENCIES					
LTE BAND NUMBER	UPLINK (MHZ)	DOWNLINK (MHZ)	WIDTH OF BAND (MHZ)	DUPLEX SPACING (MHZ)	BAND GAP (MHZ)
1	1920 - 1980	2110 - 2170	60	190	130
2	1850 - 1910	1930 - 1990	60	80	20
3	1710 - 1785	1805 - 1880	75	95	20
4	1710 - 1755	2110 - 2155	45	400	355
5	824 - 849	869 - 894	25	45	20
6	830 - 840	875 - 885	10	35	25
7	2500 - 2570	2620 - 2690	70	120	50
8	880 - 915	925 - 960	35	45	10
9	1749.9 - 1784.9	1844.9 - 1879.9	35	95	60
10	1710 - 1770	2110 - 2170	60	400	340
11	1427.9 - 1452.9	1475.9 - 1500.9	20	48	28
12	698 - 716	728 - 746	18	30	12
13	777 - 787	746 - 756	10	-31	41
14	788 - 798	758 - 768	10	-30	40
15	1900 - 1920	2600 - 2620	20	700	680
16	2010 - 2025	2585 - 2600	15	575	560
17	704 - 716	734 - 746	12	30	18
18	815 - 830	860 - 875	15	45	30
19	830 - 845	875 - 890	15	45	30
20	832 - 862	791 - 821	30	-41	71
21	1447.9 - 1462.9	1495.5 - 1510.9	15	48	33
22	3410 - 3500	3510 - 3600	90	100	10
23	2000 - 2020	2180 - 2200	20	180	160
24	1625.5 - 1660.5	1525 - 1559	34	-101.5	135.5
25	1850 - 1915	1930 - 1995	65	80	15
26	814 - 849	859 - 894	30 / 40		10
27	807 - 824	852 - 869	17	45	28
28	703 - 748	758 - 803	45	55	10
29	n/a	717 - 728	11		
30	2305 - 2315	2350 - 2360	10	45	35
31	452.5 - 457.5	462.5 - 467.5	5	10	5

Figure 3 3GPP Band Class Definitions

Discussion and Response to Questions

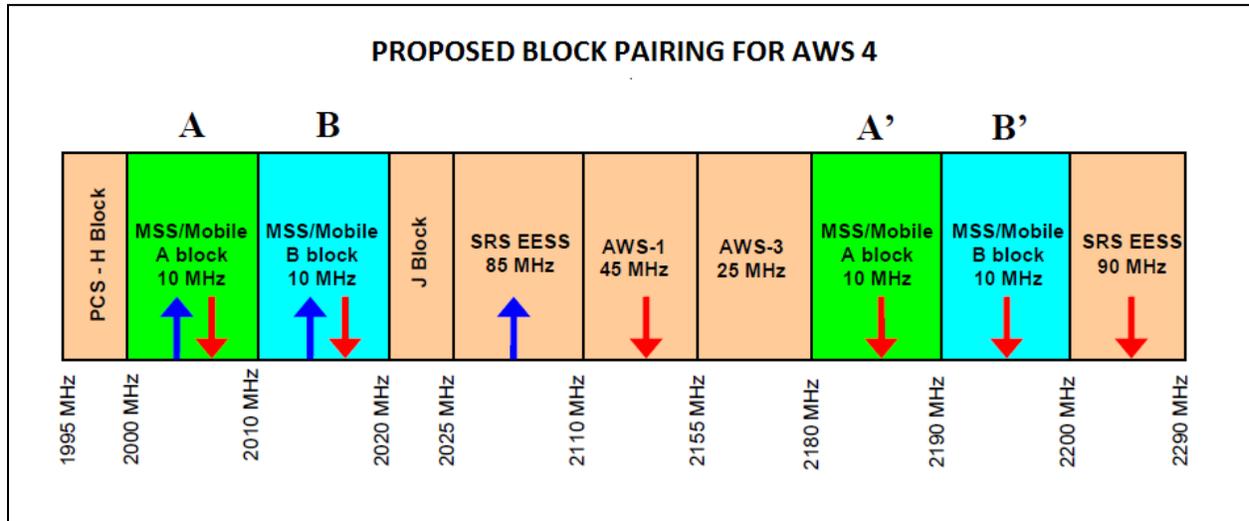


Figure 4 Industry Canada's proposal for the revised 2 GHz band plan

Question A-1

Industry Canada proposes to adopt the 2 GHz band plan and the block pairing shown above.

Comments are being sought on these proposals. In providing responses, include supporting arguments for or against these proposals.

Recommendation

AGREED.

Industry Canada should follow the 3GPP Band Class Definition for Band 23 for AWS 4, thus the lower spectrum blocks should be uplink channels for LTE, and the upper blocks the FDD downlink channels.

Reasoning

Economies of scale do not exist for dual-mode (satellite/terrestrial) phones, so for this spectrum to be useful it should be allocated to terrestrial purposes and comply with the Band Class 23 specifications. Past attempts to provide MSS/ATC systems have all failed, leaving this spectrum unused for more than a decade. Furthermore the FCC has removed the need for DISH to actually provide MSS services, since the recent FCC Report and Order authorizes MSS and/or ATC services. This means that while terrestrial use for LTE is viable, there will be a much smaller ecosystem for any dual mode (MSS and ATC) handset development. In the USA the spectrum will in all likelihood be solely used for terrestrial services by DISH and its eventual wireless carrier partner.

Question B-1

Industry Canada proposes to maintain the provision of MSS in this band.

Recommendation

NOT AGREED.

Industry Canada should abandon any requirement for MSS in this Band, and auction the AWS 4 band (and the H-block) as terrestrial spectrum when the ultimate band plan is determined.

Reasoning

Economies of scale do not exist for dual-mode (satellite/terrestrial) phones, so for this spectrum to be useful it should be allocated to terrestrial purposes and comply with the Band Class 23 specifications. Past attempts to provide MSS/ATC systems have all failed, leaving this spectrum unused for more than a decade.

The FCC has removed the need for MSS and ATC services, simply allowing MSS and/or ATC services to be provided.

A new auction in 2016 or 2017 is the preferred way to ensure that Canada receives the best value for spectrum resources, rather than leaving the deployment of this spectrum to MSS/ATC license holders who have already held the licenses for over a decade without providing services.

Question B-2

Industry Canada proposes to remove the dual-mode requirement in the 2 GHz band, and to modify RP-023 and RSS-170 accordingly.

Recommendation

AGREED

Dual mode phones do not scale and have no viable ecosystem for devices, any devices will need to support current band plans for mobile terrestrial use, but include the new band plan(s).

Reasoning

Economies of scale do not exist for dual-mode (satellite/terrestrial) phones, so for this spectrum to be useful it should be allocated to terrestrial purposes and comply with the Band Class 23 specifications. Past attempts to provide MSS/ATC systems have all failed to provide a viable business case, leaving this spectrum unused for more than a decade.

Question B-3

Industry Canada proposes to modify the spectrum and licensing policy principles on the implementation of ATC mobile services in RP-023 with regard to the 2 GHz band.

Recommendation

AGREED

Dual mode phones do not scale, the phones should be for terrestrial use, and include AWS 4. The recommended use is terrestrial Broadband Radio Service ("BRS") not "ATC".

Reasoning

Economies of scale do not exist for dual-mode (satellite/terrestrial) mobile systems, so for this spectrum to be useful it should be allocated to terrestrial purposes and comply with the Band Class 23 specifications. Past attempts to provide MSS/ATC systems have all failed, leaving this spectrum unused for more than a decade.

Industry Canada should not approve an operating license for the "G1" satellite to commence operations, and should not extend the license for the "T1" satellite.

Question B-4

Industry Canada proposes that the deployment of ATC service not constrain the deployment of MSS.

Recommendation

NOT AGREED

MSS/ATC use of this spectrum has yet to provide any benefits to Canadians for over a decade and should be abandoned.

Reasoning

There is no proven business case for MSS/ATC systems in this band, so for this spectrum to be useful it should be re-allocated to terrestrial purposes for BRS applications.

Question C-1

Industry Canada proposes to extend the spectrum assigned in existing 2 GHz MSS licences and ATC authorization to 2000-2020 MHz and 2180-2200 MHz.

Recommendation

NOT AGREED

Existing license holders for the "T1" satellite have provided no benefit for Canada, and the satellite owners for "G1" have never had an operating license. The entire S-band should be re-designated AWS 4 and auctioned along with the "H" block.

Reasoning

There is no proven business case for MSS/ATC systems in this band, so for this spectrum to be useful it should be re-allocated to terrestrial purposes for BRS applications. Revenue raised in this manner could be used to provide seed capital for the 700 MHz Canadian Public Safety Broadband Network.

Question C-2

Industry Canada proposes to issue new spectrum licences to incumbent 2 GHz licensees, with terms commencing on April 1, 2015, that reflect the proposed revisions to the band plan and new conditions of licence if a letter indicating interest is received from both incumbents.

Recommendation

NOT AGREED.

Existing licensees have not provided any meaningful services. The band should be re-designated AWS 4 and auctioned along with the "H" block.

Reasoning

There is no proven business case for MSS/ATC systems in this band, so for this spectrum to be useful it should be re-allocated to terrestrial purposes for BRS applications, and there is no operating license for the "G1" satellite currently. Industry Canada should re-examine the proposed approach.

Question C-3

Industry Canada proposes that the ATC licensee be allowed to decide if the use of the band 2000-2020 MHz will be for uplink or downlink operations and notify Industry Canada by May 20, 2016; and further proposes that the decision apply to all of Canada and for the rest of the licence term.

Recommendation

NOT AGREED.

Industry Canada should decide on the AWS-4 band plan and utilization, not an incumbent licensee that has not provided any services for over a decade.

Reasoning

The incumbent licensee has not made use of the spectrum for over a decade since there is no proven business case for MSS/ATC systems in this band, so for this spectrum to be useful it should be re-allocated to terrestrial purposes for BRS applications by Industry Canada.

Question C-4

Industry Canada proposes a Tier 1 Service Area for the MSS and ATC spectrum licences.

Recommendation

NOT AGREED.

While Tier 1 is appropriate for MSS applications (with ATC), no such services have been successfully deployed in the past decade. The license areas should be Tier 2 for terrestrial use.

Reasoning

Tier 1 licenses are not appropriate for terrestrial cellular or BRS applications.

Question C-5

Industry Canada proposes that spectrum licences in the 2 GHz band have a licence term of 20 years.

Recommendation

AGREED

Reasoning

Since BRS licenses at 2.5 GHz are for 20 years, it is appropriate for the AWS 4 band.

Question C-6

Industry Canada proposes that the licensees not be permitted to transfer any of the ATC spectrum to a large wireless service provider for the term of the licence. For any other transaction, the transferability and divisibility provisions outlined in Section 5.6.4 of CPC-2-1-23 will apply to any ATC spectrum transfers.

Recommendation

NOT AGREED.

Reasoning

A future auction of AWs 4 and the "H" block should be open to all bidders without prejudice in order to raised funds to stimulate the network build for the Canadian Public Safety Broadband Network (PSBN) 700 MHz urgently needed by our First Responders.

In addition, Industry Canada needs to confirm the allocation of the 700 MHz "D" block for the PSBN to maintain compatibility with FirstNet in the USA.

Question C-7

Industry Canada is proposing deployment obligations for MSS licensees, within 5 years, to ensure that MSS is available and being offered throughout Canada.

Recommendation

NOT AGREED.

Reasoning

There have been no meaningful MSS/ATC services deployed over the last 13 years despite two satellite launches - thus providing confirmation that there is no business case for such services.

Question C-8

In case of an emergency leading to the lack of availability of the satellite for the provision of the MSS, Industry Canada proposes to give the satellite operator 48 months to replace the satellite in order to continue MSS operations.

Recommendation

NOT AGREED.

Reasoning

MSS services should not be considered for this band.

Question C-9

Industry Canada proposes that the ATC licensee be required to demonstrate that, within 5 years, MSS is available and being offered in the Tier 1 area; this condition would apply for the term of the licence provided that the EchoStar T1 satellite or its replacement is operational.

Recommendation

NOT AGREED.

Reasoning

MSS services should not be considered for this band. They are not necessary. EchoStar T1 has been operational for some time, but no viable services have been delivered. Another 5 years is not required.

Question C-10

Industry Canada is proposing deployment obligations for ATC licensees, within 5 years and 10 years, as specified in Annex C.

Recommendation

NOT AGREED.

Reasoning

Start over with AWS 4 as a BRS terrestrial band with 20 year licenses.

Question C-11

Industry Canada proposes that an interim site licensing procedure be used for radio stations operated by the ATC licensees until a spectrum licence fee is finalized.

Recommendation

NOT AGREED.

Reasoning

Start over with an auction for AWS 4 as a BRS terrestrial band in 2016 with 20 year licenses.

Question D-1

Industry Canada proposes to develop technical rules for the 2 GHz band, harmonizing with the U.S. rules to the extent feasible and to issue the applicable SRSP and RSS.

Recommendation

AGREED, but not yet!

Reasoning

As discussed the AWS-4 band plan is not firm, and there is no device ecosystem for the DISH spectrum. Industry Canada should wait until the FCC and DISH have formulated final rules before considering any harmonization efforts.

CONCLUSIONS

Both the FCC and Industry Canada have spent over a decade trying to use this band to provide MSS/ATC services to North America with little or nothing to show for the effort.

There is no provable business case for MSS services.

It is recommended that Industry Canada auction the "H" block using Tier 2 licenses to the highest bidders in 2016, and uses the funds to start building the Canadian PSBN for First Responders.

Any decisions on the AWS-4 band plan need to wait until the restructuring in the US wireless carrier market is resolved over the next two or three years.

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