

Space Science Radio Spectrum Allocations and Usage

Version 8.0a, September 2, 2016

NOTE: Only current missions are listed

(Updated to reflect the Final Acts of WRC-15)

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Preface

These tables date back over a decade and a half and reflect my efforts to understand the role of spectrum management as related to Earth science missions. They constantly evolve.

This “edition” includes changes resulting from WRC-20012. However, beware that the list of instruments or spacecraft using a particular band is limited in this version to only currently operating missions and is chronically out-of-date.

Errors should be brought to my attention and will, hopefully, be corrected in subsequent editions.

C.D.Wende, April 2015

Definitions of Columns

Column	Definition
Band	The letter used to identify a particular frequency band.
Low	The lower limit of the band, in GHz.
High	The upper limit of the band, in GHz.
Instruments/ Spacecraft	All are current missions as of March, 2015; italicized are non-NASA missions. For communications bands, indicates user (service) and direction.
(EESS) Allocation	Primary allocations are BOLDED UPPER CASE (* added protection by RR 5.340, also Res 750 (WRC-97)); secondary allocations are in lower case; allocations by footnote are in parentheses, (...).
Primary Services In the Band	If we are primary, these other services are equal users; If we are secondary or otherwise limited, we are at the mercy And good will of these primary users.
Notes	Contains comments and other information, such as: usage and objects of observational interest; relevant spectral lines (listed as frequency-species pairs); {A at WRC-07} indicates allocated at WRC-07, {R at WRC 97} indicates realigned at WRC-97, {U at WRC-00} indicates upgraded at WRC-00, etc.
WC-15 Agenda	Bold-faced Agenda Items are desired by space science, other items may pose a threat.

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All Bands Allocated to EESS

Band	Low	High	Instruments/Usage	Allocation	PRIMARY Services in the Band	Notes	WRC-19 Agenda
	0.03001	0.03001	SOS and SRS, no EESS	COMM	SOS(s-e)	30.005-30.01 MHz	1.7
	0.04000	0.04020	srs, no eess	comm	FS, MS	39.986 – 40.02 MHz	1.7
	0.04098	0.04102	srs, no eess	comm	FS, MS	40.98-41.015 MHz	1.7
P	0.1370	0.1380	NOAA, S-E; no EESS	COMM	METSAT(s-E), SOS(s-E), SRS(s-E)	Obsolete, sub-bands have MSS(s-E), no EESS	1.7
P	0.1380	0.1440	SRS, no EESS or SOS	COMM	SRS(s-E),FS,MS,RLS	Only regions 2 and 3; secondary below 143.6	1.7
P	0.1480	0.1499	SOS, no EESS or SRS	(COMM)	SOS(E-S) footnote 5.218		1.7
P	0.1530	0.1540	Metaids, no EESS or SRS	comm	FS, MS, metaids		1.7
P	0.2670	0.2720	sos, no eess or srs	comm	sos(s-E), FS, MS		1.7
P	0.272	0.273	SOS, no EESS or SRS	COMM	SOS(s-E), FS, MS		1.7
P	0.40015	0.401	NOAA, S-E; no EESS	COMM	SRS(s-E), METSAT(s-E), METAID, MSS(S-E), sos(s-E)	NOAA usage, no EESS allocation	1.2, 1.7
P	0.401	0.402	DORIS, E-S	COMM	EESS(E-s),SOS(s-E), METAIDS, METSAT(E-s)		1.2, 1.7
P	0.402	0.403	TT&C, old, E-S	COMM	METAIDS, EESS(E-S), MetSat(E-S)	{U at WRC-97}	1.2, 1.7
P	0.403	0.406	NOAA, radiosonde; no EESS	comm	METAIDS	NOAA{U at WRC-97}, no EESS	1.7
P	0.410	0.420	Manned Program, EVA; no EESS	comm	SRS(S-S), FS, MS, no EESS	{U at WRC-97}, footnote 5.268	1.7
P	0.432	0.438	Proposed SAR	active	RLS, eess	Geology under vegetation. {A at WRC-03 via footnote 5.279A}	1.7
P	0.44975	0.45025	sos(e-s), srs(e-s), no EESS	(COMM)	sos & srs(e-s) footnote 5.286		1.7
P	0.460	0.470	NOAA s-E	comm	metsat(s-E), FS, MS	EESS via 5.289 (NIB)	1.3, 1.7
L	1.164	1.215	[GPS L3(s-s, s-E)], Blackjack, IGOR, ROSA, APOD, GNOS, GRAS, IGOR, ROSA	COMM	ARNS, RNSS, (footnote 5.378A,B)	GPS civil L3 at 1176 MHz, no EESS	
L	1.215	1.300	[GPS L2: Blackjack, IGOR, ROSA, APOD, GNOS, GRAS, IGOR, ROSA], ALScat, PALSAR-2	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RLS, RNSS (s-E,s-s)	Wave structure, geology; GPS temp. civil L2 at 1.227, perm. civil CA in future. {U at WRC-97}	
L	1.370	1.400		(passive)	FS, MS, RLS, eess, srs Footnote 5.339	Ocean salinity, soil moisture, sea surface temp., vegetation index	
L	1.400	1.427	SMAP, SMOS(MIRAS)	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS, note Resolution 750 (WRC-97)	Hydrogen line, Ocean salinity, soil moisture, sea surface temp., vegetation index.	
L	1.427	1.429	SOS, no EESS	COMM	SOS(E-s), FS, MS	No EESS	
L	1.525	1.535	eess	comm	SOS(s-E), MSS (s-E), FS(regions 1,3), eess		
L	1.559	1.610	[GPS L1(s-s, s-E)], Blackjack, IGOR, ROSA, APOD, GNOS, GRAS, IGOR, ROSA,	COMM	A	GPS civil L1 at 1.575; {S-S U at WRC-00}, no EESS or SRS or SOS	
L	1.6605	1.668	SRS, no EESS	PASSIVE	SRS(PASSIVE), RAS	No EESS of SOS	
L	1.6680	1.6684	SRS, no EESS	PASSIVE	SRS(PASSIVE), RAS, MS(E-s)	No EESS or SOS	
L	1.6684	1.670	NOAA, radiosonde; no EESS	COMM	METAIDS, FS, MS, MSS(E-s), RAS	NOAA – radiosondes, no EESS or SRS of SOS	
L	1.670	1.690	NOAA, s-E;	COMM	METAIDS, METSAT(s-E), MS, FS	NOAA, no EESS, SRS, or SOS; MSS(E-s) 1.670-1.675	
L	1.690	1.700	NOAA, S-E (eess nib)	COMM	METAIDS, METSAT(s-E)	EESS (s-E) via 5.289 (nib)	
L	1.700	1.710	NOAA, S-E (eess nib)	COMM	METSAT(s-E), FS, MS	EESS (s-E) via 5.289 (nib)	
L	1.750	1.850	SOS and SRS, no EESS	(COMM)	SRS(E-s) & SOS(E-s),FS, MS,	Footnote 5.386 – region 2 + 4 countries	
S	2.025	2.110	Most TT&C, fwd links, + via TDRSS; DORIS; S-S, E-S	COMM	EESS(E-s,s-s), SOS(E-s,s-s), SRS(E-s,s-s); FS, MS	See RR 5.392, High density MS excluded at WRC-97	
S	2.110	2.120	Deep Space; TT&C; E-s	COMM	SRS(DEEP SPACE, E-s), FS, MS	Beware IMT-2000 via RR 5.388	
S	2.200	2.290	Most TT&C, return links, incl. via TDRSS; S-E, S-E	COMM	EESS(s-E,s-s), SOS(s-E,s-s), SRS(s-E,s-s); FS, MS	US government only in USA, except for some s-s; (High density MS excluded at WRC-97); See RR 5.392	
S	2.290	2.300	Deep Space, TT&C, S-E; no EESS	COMM	SRS(deep space, s-E), FS, MS		
S	2.640	2.655	eess & srs are secondary, passive	(passive)	FS, FSS(s-E), MS, BSS; eess & srs (passive) via RR 5.339	Ocean salinity, soil moisture, vegetation index	
S	2.655	2.670	eess, srs, and ras all secondary	passive	FS, FSS, MS, BSS; eess, srs, ras (all passive)	Ocean salinity, soil moisture, vegetation index	
S	2.670	2.690	eess, srs, and ras all secondary	passive	FS, FSS, MS, MSS; eess, srs, ras (all passive)	Ocean salinity, soil moisture, vegetation index	
S	2.690	2.700		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	Ocean salinity, soil moisture, vegetation index	
S	3.100	3.300	SAR on HJ-1C, SAR-10	active	RLS, eess(active) & srs (active)	Geology {U at WRC-97}	
C	4.200	4.400		(passive)	ARNS, eess & srs(passive) via RR 5.438	Sea surface temperature	
C	4.950	4.990		(passive)	FS, MS, ras; eess&srs(passive) via RR 5.339	Estuarine temperature	
C	4.990	5.000	srs(passive) no EESS	passive	RAS, MS, FS, srs		
C	5.250	5.350	ASCAT, RA, RISAT-SAR, SSALT(POSEIDON)	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RLS, MS	Soil Moisture, topology, geology, oil slicks {U at WRC-97}	1.16
C	5.350	5.460	RISAT-SAR, SAR on RADARSAT-2, SAR on Sentinel-1A	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), ARNS, RLS; see RR 5.448	Soil Moisture, topology, geology, oil slicks{A at WRC-97}	1.16
C	5.460	5.470		ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RNS, RLS;	Soil Moisture, topology, geology, oil slicks{A at WRC-03}	1.16
C	5.470	5.570		ACTIVE	EESS(ACTIVE), SRS(ACTIVE), Maritime RN, MS, RLS; see RR 5.448	Soil Moisture, topology, geology, oil slicks{A at WRC-03}	
C	5.650	5.725	srs, no eess	deep space	RLS, MS; srs(deep space)	???	
C	6.425	7.075	Windsat, AMSR-2, MWRI	((passive))	FS, FSS(E-s), MS; RR 5.458 – over oceans, eess & srs not even secondary	Sea surface temperature; ocean observations noted.	
C	7.075	7.250	AMSR-2	((passive))	FS, MS; RR 5.458 – over oceans, eess & srs not even secondary	Sea surface temperature	
C	7.145	7.190	SRS (no EESS), E-S	COMM	SRS (deep space E-s) via 5.460; FS, MS	Possibly add E-s EES uplink	
C	7.190	7.235	EESS(E-s) TT&C only, SRS (E-s)	COMM	SRS (E-s) GSO via RR 5.460; FS, MS	See RR 5.460A & B	
C	7.235	7.250	EESS(E-s) TT&C only	COMM	FS, MS see RR 5.458	See RR 5.460A & B	
C	7.450	7.550	GSO MetSAT (s-E)	COMM	METSAT, FS, FSS(s-E), MS;RR 5.461A	GSO only via 5.461A, {A at WRC-97}; no EESS	
C	7.750	7.900	NGSO MetSAT (s-E)	COMM	METSAT(s-E), FS, MS, RR 5.461B	NGSO only via 5.461B, {A @ WRC-97,U @ WRC12}	
X	8.025	8.175	EESS (s-E)	COMM	EESS(s-E),FS, FSS(E-s), MS.	{U at WRC-97}	
X	8.175	8.215	EESS (s-E)	COMM	EESS(s-E), METSAT(E-s) FS, FSS(E-s), MS	{U at WRC-97}	
X	8.215	8.400	EESS (s-E)	COMM	EESS(s-E), FS, FSS(E-s), MS	{U at WRC-97}	
X	8.400	8.450	Deep space, s-E; no EESS	COMM	SRS(DEEP SPACE s-E) via 5.465, FS, MS	Difficult out-of-band emission limits for adjacent band; also used by radio astronomers	
X	8.450	8.500	SRS (s-E)	COMM	SRS (s-E), FS, MS		

All Bands Allocated to EESS

Band	Low	High	Instruments/Usage	Allocation	PRIMARY Services in the Band	Notes	WRC-19 Agenda
X	8.550	8.650	SAR-3, SLR-3	ACTIVE	EESS(active), SRS(active), RLS,	Rain, wave structure (U at WRC-97)	
X	9.200	9.300		(ACTIVE)	EESS(active), RLS, MRN	If bandwidth needed, {A at WRC-15} RR 5.474	
X	9.300	9.800	COSI, S-M OBRC, SAR on COSMO-SkyMed, TDX, TSX-SAR, X-SAR	ACTIVE	EESS(active), RLS, RNS , SRS(active)	Rain, wave structure (U at WRC-97; lower 200 MHz A at WRC-07)	
X	9.800	9.900		active	RLS, eess(active), srs(active)	If bandwidth needed {A at WRC-07}	
X	9.900	10.000		(ACTIVE)	EESS(active), RLS	If bandwidth needed, {A at WRC-15} RR 5.474	
X	9.975	10.025	NOAA MetSAT radar	active	RLS; metsat (active) via RR 5.479	Weather radars only	
X	10.000	10.400		(ACTIVE)	EESS(active), FS, MS, RLS	If bandwidth needed, {A at WRC-15} RR 5.474	
X	10.600	10.680	AMSR-2, MTVZA-GY, MWRI	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), RAS, FS, MS	Rain rate, snow water content, ice morphology, sea state, ocean wind speed	
X	10.680	10.700	GMI, Windsat	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	Rain rate, snow water content, ice morphology, sea state, ocean wind speed	
Ku	12.750	13.250	Deep space	dsn s-E	FS, FSS (E-S), MS, srs(deep space, s-e)		
Ku	13.250	13.400	KU-RFSCAT	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), ARNS	{A at WRC-97, Added to 13.4-13.75 GHz}	
Ku	13.400	13.650	DPR, RA, SIRAL, SSALT	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), FSS(s-E),	Wind, ice, geoid (U at WRC-97), RR 501B	
Ku	13.650	13.750		ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RLS		
Ku	13.750	14.000	RA, RA-2,	active	FSS, RLS (RR 5.498A), eess, srs	EXPIRING(?), Wind, ice, geoid	
Ku	13.750	14.000	TDRSS	comm	FSS(e-s), RLS, eess, srs(s-e) via 5.503	TDRSS; later missions secondary via RR 5.503	
Ku	14.000	14.250	TDRSS (s-E)	comm	FSS(E-s), RNS, srs		
Ku	14.250	14.300	srs	comm?	FSS(E-s), RNS, srs		
Ku	14.400	14.470	srs(s-e), no EESS	comm	FS, FSS(E-s), MS, srs		
Ku	14.500	14.800	srs	comm	FS, FSS(E-s), MS, srs		
Ku	14.800	15.350	srs	comm	FS, MS, srs	15.2-15.35 GHz eess & ses (passive) via RR 5.339	
Ku	15.200	15.350	none known	(passive)	FS, MS; eess & srs(passive) via RR 5.339	Water vapor, rain rate	-
Ku	15.350	15.400	none known	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	Water vapor, rain	
Ku	16.600	17.100	srs(deep space, e-s)	comm	srs, RLS, srs (deep space, E-s)		
Ku	17.200	17.300	SSAR-17	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RLS	Vegetation, snow	
K	18.000	18.100	METSAT(s-E), no EESS	(COMM)	METSAT (s-E, GSO only) via RR 5.519; FS	Region 2 only {A at WRC-07}	1.5
K	18.100	18.300	METSAT(s-E), no EESS	(COMM)	METSAT (s-E, GSO only) via RR 5.519; FS	All regions	1.5
K	18.300	18.400	METSAT(s-E), no EESS	(COMM)	METSAT (s-E, GSO only) via RR 5.519; FS	Regions 1 and 3 only {A at WRC-07}	1.5
K	18.600	18.800	AMR, GMI, Windsat, AMSR-2, MTVZA-GY, MWRI	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, FSS(s-E), MS	Rain rate, sea state, sea ice, water vapor, ocean wind speed, soil emissivity, and humidity {Deferred at WRC-97, U at WRC-00}	1.5
k	19.350	19.350	SSM/I, SSMIS, TMI	No Allocation		historically used by DMSP	1.5
K	21.200	21.400	TMI	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, MS	Water vapor, liquid water	
K	22.210	22.500	SSM/I, SSMIS	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), RAS, FS, MS	Water vapor, liquid water	
K	22.550	23.550	ISS	comm	SRS (E-s) & ISS		
K	23.600	24.000	AMR, AMSU, AMSU-A, ATMS, GMI, Windsat, AHIKA-RMU, AMSR-2, AMSU-A, DRMRM, MTVZA-GY, MWR, MWRI	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS, note Resolution 750 (WRC-97)	Water vapor, liquid water, associated channel for atmospheric sounding	
K	24.050	24.250	KBR	active	RLS, eess(active)	Water vapor, liquid	
K	25.250	25.500	EESS and SRS only S-S	(COMM)	EESS & SRS (s-s) via footnote 5.536; FS, ISS, MS	TDRSS, footnote 5.536	1.13, 1.14
Ka	25.500	27.000	Wideband downlink, S-E, S-S	COMM	EESS(s-E) & SRS(s-E); FS, ISS, MS	TDRSS, downlink {A at WRC-97}	1.13, 1.14
Ka	27.000	27.500	S-S	(COMM)	EESS(s-s) & SRS(s-s) via RR 5.536; FS, FSS, ISS, MS	TDRSS, footnote 5.537	1.13, 1.14
Ka	28.500	30.000	Possible future uplink, E-s	comm	FS, FSS(E-s), MS, MSS(E-s), eess(E-s)	eess via RR 5.541, 5.543	1.5
Ka	29.500	29.900	DRS only	comm	eess(E-s), FSS(E-s)	{A at WRC-15} RR 5.541	
Ka	29.900	30.000	DRS only	(comm)	FSS(E-s), MSS(E-s), eess(E-s)	eess via RR 5.543	
Ka	31.000	31.300	SRS	comm	FS, MS, srs		
Ka	31.300	31.500	AMSU, AMSU-A, ATMS, AMSU-A, MTVZA-GY	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS, note Resolution 750 (WRC-97)	Sea ice, water vapor, oil spills, clouds, liquid water, surface temp., ref. Window for 50-60 GHz range	
Ka	31.500	31.800		PASSIVE	EESS(PASSIVE), SRS(PASSIVE), RAS	Sea ice, water vapor, oil spills, clouds, liquid water, surface temp., ref. Window for 50-60 GHz range; Footnote 5.340 applies region 2 only	
Ka	31.800	32.000	SRS, Deep space, s-E (USA); KBR	COMM	SRS(deep space, s-E), FS, RNS	USA only, footnote 5.547B {WRC-97}	1.13
Ka	32.000	32.300	SRS, Deep space, s-E (USA)	COMM	SRS(deep space, s-E), FS, RNS	USA only, footnote 5.547C {WRC-03}	1.13
Ka	34.000	34.000	AMR	No Allocation		by design, RFI on S/C	
Ka	34.200	34.700	SRS, no EESS; Deep space, E-S	COMM	SRS(deep space, e-s), RLS	Footnote 5.549	
Ka	34.700	35.200	SRS, no EESS	comm	SRS(deep space, E-s), RLS		
Ka	35.200	35.500	Metalds, no EESS	COMM	METAIDS, RLS	Footnote 5.549	
Ka	35.500	36.000	AHIKA-AMU, DPR	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), METAIDS, RLS	Snow (U at WRC-97)	
Ka	36.000	37.000	GMI, SSM/I, SSMIS, TMI, Windsat, AHIKA-RMU, AMSR-2, DFMRM, MTVZA-GFY, MWR, MWRI	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, MS	Rain rates, snow, sea ice, clouds	
Ka	37.000	37.500	SRSS(S-E); no EESS	COMM	SRS (s-E), FS, MS		1.6, 1.13
Ka	37.500	38.000	RM-0,8; s-e	comm	SRS (s-E), FS, FSS(s-e), MS, eess(s-E)	EESS secondary, s-e	1.6, 1.13
	38.000	39.500	s-e	comm	FS, FSS(s-E), MS, eess(s-E)	EESS secondary, s-e	1.6, 1.13, 1.14
	39.500	40.000	s-e	comm	FS, FSS(s-E), MS, MSS(s-e), eess(s-E)	EESS secondary, s-e	1.6, 1.13
	40.000	40.500	E-S	COMM	EESS(E-s), SRS (E-s), FS, FSS(s-E), MS, MSS(s-E), eess(s-E)	EESS primary E-S, secondary s-e	1.6, 1.13
	41.900	42.100	MTVZA-GY	No Allocation			1.6, 1.13
	47.500	48.500	MTVZA-GY	No Allocation			1.6
	50.200	50.400	AMSU, AMSU-A, ATMS, SSM/T-1, SSMIS, AMSU-A, MWTS	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), note Resolution 750 (WRC-97)	Reference window for Temp. profile via O {R at WRC-97}	1.6, 1.13
	52.600	54.250	AMSU, AMSU-A, ATMS, SSM/T-1, SSMIS, AMSU-A, MTVZA-GY, MWTS	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), note Resolution 750 (WRC-97)	Temp. profile via O {R at WRC-97}	9.1.9

All Bands Allocated to EESS

Band	Low	High	Instruments/Usage	Allocation	PRIMARY Services in the Band	Notes	WRC-19 Agenda
	54.250	55.780	AMSU, AMSU-A, ATMS, SSM/T-1, SSMIS, AMSU-A, MTVZA-GY, MWTS	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), ISS(GSO only)	Temp. profile via O {R at WRC-97}	
	55.780	56.900	AMSU, AMSU-A, ATMS, AMSU-A	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, ISS (GSO only), MS	Temp. profile via O {R at WRC-97}	
	56.900	57.000	AMSU, AMSU-A, ATMS, AMSU-A	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, ISS, MS	Temp. profile via O {R at WRC-97}	
	57.000	58.200	AMSU, AMSU-A, ATMS, SSM/T-1, AMSU-A, MTVZA-GY, MWTS	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, ISS (GSO only), MS	Temp. profile via O {R at WRC-97}	
	58.200	59.000	SSM/T-1	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, MS	Temp. profile via O {R at WRC-97}	
	59.000	59.300	SSM/T-1, SSMIS	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, ISS(GSO), MS, RLS	Temp. profile via O {R at WRC-97}	
	61.000	61.000	SSMIS	No Allocation			
	63.000	63.000	SSMIS	No Allocation			
	65.000	66.000	?	COMM?	EESS, SRS, FS, ISS, MS	?	1.13
	74.000	76.000	srs secondary, no eess	comm	srs(s-E), FS, FSS, MS,BS, BSS	Downlink band	1.13
	76.000	77.500	srs secondary, no eess	comm	srs(s-E), RLS, RAS	Downlink band	
	77.500	78.000	srs secondary, no eess	comm	srs(s-E), AS, ASS	Downlink band	
	78.000	79.000	CLOUD RADAR	(ACTIVE)	EESS, SRS, RLS Footnote 5.560	Footnote 5.560 states primary from space vehicle	
	78.000	79.000	srs(s-e), no EESS	comm	srs(s-E), RLS	Downlink band	
	79.000	81.000	srs(s-e), no EESS	comm	srs(s-E), RAS, RLS	Downlink band	
	81.000	84.000	srs(s-E), no EESS	comm	srs(s-E), FS, FSS, MS, MSS, RAS	Downlink band	1.13
	86.000	92.000	AMSU, AMSU-A, AMSU-B, ATMS, GMI, MHS, SSM/I, SSM/T-2, SSMIS, TMI, AMSR-2, AMSU-A, MHS, MTVZA-GY, MWRI	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	Clouds, oil spills, ice, snow, rain, reference window for Temp. soundings near 118 GHz	1.13
	94.000	94.100	CPR	ACTIVE	EESS(ACTIVE), SRS(ACTIVE), RLS Spaceborne cloud radars only	{U at WRC-97}, footnote 5.562	
	100.000	102.000		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), SRS, RAS	100.49-NO ?- N ₂ O	
	105.000	109.500	SRS	PASSIVE	SRS(PASSIVE), RAS, FS, MS	Space-based radio astronomy, see 5.562B	
	109.500	111.800		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	110.8-O3 {WRC-00}	
	111.800	114.250	SRS, no EESS	PASSIVE	SRS(PASSIVE), FS, MS, RAS	Space-based radio astronomy, see 5.562B	
	114.250	116.000		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	115.27-CO	
	116.000	119.980	MLS, SMR	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), ISS(GSO)	118.8-O ₂ (Temp. profile) {WRC-00}	
	119.980	122.250		PASSIVE	EESS(PASSIVE), SRS(PASSIVE), ISS(GSO)		
	133.500	134.000		ACTIVE	EESS(ACTIVE), RAS, FS, ISS(GSO), MS	{A at WRC-00}, see footnote 5.562E	
	148.500	151.500	AMSU-B, SSM/T-2, SSMIS, MWHS	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	150.74-N ₂ O {WRC-00}, Earth surface temp., cloud parameters, reference window for temp. soundings.	
	155.500	158.500	MHS, MHS	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FS, MS, RAS	EESS & SRS expire 1/1/2018 via 5.562F {WRC-00}, Earth and cloud parameters, Space-based radio astronomy, see 5.562B	
	164.000	167.000	ATMS, GMI	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	164.38,167.2-CIO{WRC-00}, cloud water, ice, and rain, NO, and CO	
	174.800	182.000	AMSU-B, ATMS, GMI, SSMIS, MWHS, SAPHIR	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), ISS(GSO)	175.86-N2O {WRC-00}, water vapor profile, O ₃	
	182.000	185.000	AMSU-B, ATMS, GMI, MHS, SSM/T-2, SSMIS, MHS, MTVZA-GY, MWHS, SAPHIR	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	183.31-Water vapor profile, 184.75-O ₃ {WRC-00}	
	185.000	190.000	AMSU-B, ATMS, GMI, SSM/T-2, SSMIS, MTVZA-GY, MWHS, SAPHIR	PASSIVE	EESS(PASSIVE), SRS(PASSIVE), RAS, ISS(GSO)	Water vapor profile, O ₃ {WRC-00}	
	190.000	191.800	MHS, MLS, MHS, SAPHIR	PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	Water vapor profile, O ₃ {WRC-00}	
	200.000	202.000		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	200.98-N2O, {WRC-00} water vapor, O ₃ , CIO	
	202.000	209.000		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	203.4-7, 204.35-7, 206.13-7, 208.64-7 {WRC-00} water vapor, O ₃ , CIO	
	217.000	226.000	SRS, no EESS	PASSIVE	SRS(PASSIVE),RAS, FS, FSS(E-s), MS	Space-based radio astronomy, see 5.562B	
	226.000	231.500		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	226.09-N ₂ O, 230.54-CO, 231.28-O ₃ , reference window {WRC-00}	
	235.000	238.000		PASSIVE	EESS(PASSIVE), SRS(PASSIVE), FSS(s-E)	235.71,237.15-O ₃ {WRC-00}	
	237.900	238.000	Cloud radars only	(ACTIVE)	EESS(ACTIVE), SRS(ACTIVE), FSS(S-E)	Footnote 5.563B {WRC-00}	
	240.000	240.000	MLS	No Allocation		Primarily for Ozone and CO	
	250.000	252.000		PASSIVE *	EESS(PASSIVE), SRS(PASSIVE), RAS	251.21-N ₂ O {WRC-00}	
	275.000	277.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	NO, 276.33-N ₂ O	1.15
	294.000	306.000	MLS, MASTER	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	301.44-N2O, + NO, O ₂ , O ₃ , HN ₃ , HOCl	1.15
	316.000	334.000	MASTER	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	325.1-Water vapor, O ₃ , HOCl	1.15
	342.000	349.000	MASTER	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	345.8-CO, HNO ₃ , CH ₃ Cl, O ₃ , oxygen, HOCL	1.15
	363.000	365.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	364.32-O ₃	1.15
	371.000	389.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	380.2-Water vapor profile	1.15
	416.000	434.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	Temp sound, about 424.76	1.15
	442.000	444.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	442.99-O3 in Lower strato., tropopause water vapor, HNO ₃ , N ₂ O, CO, pressure, and temp.	1.15
	496.000	506.000	SMR	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	497.5, 499.5-BrO; ?-CIO, optimal for species: 504.6-CH3CL optimal >10 km, O3 optimal >10 km, N2O optimal > 8 Km	
	546.000	568.000	SMR	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	557-H ₂ O, Water vapor sounding, near nadir GEO	
	568.000	580.000	SMR	No Allocation			

All Bands Allocated to EESS

Band	Low	High	Instruments/Usage	Allocation	PRIMARY Services in the Band	Notes	WRC-19 Agenda
	624.000	629.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	624.271-ClO ₂ , 624.344-SO ₂ , 624.770-BrO, 625.370-O ₃ , 625.920-HCl, 626.656-O ₃ , 627.087-H ₂ O ₂ , 627.1770-CH ₃ CL, 627.773-O ₂ , 628.460-HOCl	
	634.000	654.000	MLS	(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	Many lines-HCl, Many lines-HOCl, ?-CH ₃ Cl, 635.87-?, 642.85-?, 647.198-H ₂ O, 649.450-ClO, 649.701-HO ₂ , 650.180-BrO, 650.279-HNO ₃ , 650.733-O ₃ , 651.771-NO, 652.834-N ₂ O	
	659.000	661.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	660.49-BrO	
	684.000	692.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	ClO, CO, CH ₃ Cl	
	730.000	732.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	Oxygen, HNO ₃	
	851.000	853.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	NO	
	951.000	956.000		(PASSIVE)	EESS(PASSIVE), SRS(PASSIVE), RR 5.565 {WRC-00}	Multiple lines-O ₂ and NO	
	2500	2500	MLS	No Allocation		Primarily for OH	