IARU REGION 1 VHF/UHF/Microwaves BANDPLANS

On the following pages the official IARU Region 1 bandplans currently valid for the 50 MHz, the 70 MHz ,the 145 MHz, the 435 MHz and the microwave bands are set out. In accordance with the policy outlined in section IIa, point 2, only carefully considered modifications and/or additions have been made during the tri-annual IARU Region 1 Conferences.

At the IARU Region 1 Conference in Cefalu (1984) a 50 MHz bandplan was adopted for use in countries within the European part of Region 1 where amateurs had obtained a frequency allocation or assignment in the 50 MHz band. As an appreciable number of countries within the European part of Region 1 had obtained or expected to obtain such an allocation by the end of 1989, at the IARU Region 1 Conference in Torremolinos (1990) the first version of an official IARU Region 1 bandplan for use in that part of Region 1 where the 50 MHz allocation does not exceed 52.000 MHz was adopted.
At the IARU Region 1 Conference in Tel Aviv (1996) the bandplan has been slightly amended in order to reflect practical experiences.
At the IARU Region 1 Conference in San Marino (2002) it appeared that a not negligible number of DXCC countries (e.g. EI, G, GD, GI, GJ, GM, GU, GW, S5, ZB, ZS, 5B4, ZC4) had got access to the 70 MHz band and it was decided to add the bandplan for that band (based upon the RSGB planning) to the Region 1 bandplan.

Regarding amateur-satellite bandplans, the following was decided at the IARU Region 1 Conference in Warsaw (1975):

> That IARU Region 1 adopts the bandplans recommended by the sponsors of each satellite system, e.g. by AMSAT for OSCAR-7, but also informs sponsors that such bandplans must be kept simple and that in the opinion of IARU Region 1 in each case provisions should be made to segregate Telegraphy from telephony.

The currently valid satellite bandplan(s), together with some data on amateur satellites, can be found in section VII.

The appearance of manned space stations with an amateur station on board has led to the allocation of NBFM channel frequencies. In Vienna 1995 the former 145.200/145.800 MHz frequency pair was allocated.

The following general recommendations regarding the promotion of bandplans have been adopted/re-affirmed at various IARU Region 1 Conferences:

a. VHF Managers should give maximum publicity to the adopted bandplans. In view of the many newcomers, regular repetition of the publication of the bandplans is advisable.

b. Member Societies, and particularly their VHF Managers or VHF Committees, should strongly promote adherence to the adopted bandplans by all VHF/UHF/Microwaves amateurs in their country.

It will be noted in the following bandplans that the accommodation of the narrow-band modes in several bands is quite similar and is modelled after the plans for the 145 MHz band which existed before the 1996 Tel Aviv conference. The narrow-band modes parts of the higher bands are respectively:

432	-	434	MHz	
1296	-	1298	MHz	
2320	-	2322	MHz	alternative 2304 - 2306 or 2308- 2310 MHz
3400	-	3402	MHz	
5668	-	5670	MHz	
5760	-	5762	MHz	
10368	-	10370	MHz	alternative 10450 - 10452 MHz
24048	-	24050	MHz	
24192	-	24194	MHz	till 31-12-2003 (San Marino 2002)
47.000	-	47.002	GHz	
77.500	-	77.501	GHz	from 1-1-2004 (San Marino 2002)
122.250	-	122.251	GHz	from 1-1-2004 (San Marino 2002)
134.000	-	134.001	GHz	from 1-1-2004 (San Marino 2002)
248.000	-	248.001	GHz	from 1-1-2004 (San Marino 2002)

note : As it cannot be expected that NBFM repeater systems will become operational at the microwave bands above 77 GHz the NB segment in those bands is currently limited to 1 MHz

At the Conference in San Marino it was decided to change the basic set-up of the bandplan.

Till then the bandplans show two columns(plus a column for the frequency segments):

IARU Region 1 bandplan	Usage

The left column designation is self-explanatory. The right column contains meeting/calling frequencies, agreed upon for the convenience of the VHF/UHF/Microwaves amateurs practising specific modes of communication. These frequencies are not part of the adopted IARU Region 1 bandplan and, though in the normal amateur spirit other operators should take notice of these agreements, no right on reserved frequencies can be derived from a mention in the right-hand column.

The San Marino conference started to change this, beginning with the 50 MHz and 145 MHz bands. The other bands to follow at a later moment.

In this new planning there are three columns.

maximum bandwidth	Mode	Usage

The maximum bandwidth determines the maximum spectral width (-6 dB points) of all emissions allowed in a segment. The mode indicates the modulation methods (e.g. telegraphy, telephony, MGM, etc) allowed in a segment. M(achine) G(enerated() M(ode) indicates those transmission modes relying fully on computer processing such as RTTY, AMTOR, PSK31, FSK441 and the like. The usage column indicates the main usage (sometimes country dependant) of a segment. In case only one application is allowed, the word “exclusive” is added.

The allocation of frequency segments to the various modes of operation in the IARU Region 1 bandplans is subject to the following condition:

> The allocation of sub-bands in the IARU Region 1 bandplans allows the indicated category of users to employ any frequency within that sub-band, provided that no appreciable energy falls outside that sub-band. Users must therefore take into account the bandwidth of their sidebands when selecting an operating frequency.
>
> (de Haan, 1993)

Attention is drawn to the "Principles of Bandplanning", which are set out in section IIa, pages 2 - 4

50 - 52 MHz BANDPLAN (San Marino 2002)

Frequency (MHz)	Maximum Bandwidth (– 6 dB)	Mode	Usage	
50000 **50100**	**500 Hz**	**Telegraphy (a)**	50.000 - 50.080 50.090	Beacons Telegraphy center of activity
50100 **50500**	**2700 Hz**	**All narrow band modes (Telegraphy, SSB, MGM, etc.)**	50.100 - 50.130 50.110 50.150 50.185 50.200 50.250 50.255 50.260 - 50.280 50.270	Intercontinental Telegraphy/SSB DX Calling (**c**) SSB Center of activity Crossband activity center MS center of activity PSK31 center of activity JT44 FSK441 FSK441 Calling freq
50.500 **52.000**	**12 kHz**	**All modes**	50.510 50.550 50.600 50.620 - 50.750 51.210 - 51.390 51.410 - 51.590 51.510 51.810 - 51.990	SSTV (FSK) FAX working frequency RTTY (FSK) Digital communications FM repeaters input channels, 20 kHz spacing (**e**) FM FM calling frequency FM repeaters output channels, 20 kHz spacing (**e**)

NOTES ON THE 50 - 52 MHz BANDPLAN

1. IARU REGION 1 BANDPLAN

This bandplan, first adopted at the IARU Region 1 Conference in Torremolinos (1990) and revised at the 1996 Tel Aviv conference and the 2002 San Marino Conference, is recommended for use in those countries in the European part of Region 1 which allow amateurs to operate in this part of the radio spectrum. In many countries in the African part of Region 1 (see footnotes accompanying the ITU frequency allocation table) the 50 - 54 MHz band is allocated to the Amateur Service on a primary basis, and in some cases, like for instance in South Africa, an adaptation of the Region 2 bandplan is used.

1.1. Footnotes

a. Telegraphy is permitted over the whole band; Telegraphy exclusive between 50.000 - 50.100 MHz.

2. USAGE

The following notes are referring to the Usage column in the bandplan. As already set out in the introduction to section IIc, in the right amateur spirit operators should take notice of these agreements which are made for operating convenience, but no right to reserved frequencies can be derived from a mention in the Usage column or from the following notes.

2.1. Footnotes

c. The intercontinental DX calling frequency 50.110 MHz should not be used for calling within the European part of Region 1 at any time.

d. Channelized equipment: On this band the NBFM channel spacing is 20/10 kHz.

e. For the specification of NBFM telephony see section VIb

For the numbering of NBFM telephony channels see appendix 2 to this section

In those countries within the European part of IARU Region 1 where it is allowed to set up NBFM repeaters on 50 MHz, the indicated channels are recommended in order to establish a commonality.

In those countries where the National Authorities do not permit repeaters to operate with output frequencies above 51 MHz, repeater output frequencies may be 500 kHz below the repeater input frequencies.(Tel Aviv 1996)

70.0 - 70.5 MHz BANDPLAN (San Marino 2002)

Frequency (MHz)	MODE	Usage	
70.000 **70.050**	BEACONS	70.030	Personal beacons
70.050 **70.250**	TELEGRAPHY/SSB	70.150 70.185 70.200	MS calling Crossband center of activity Telegraphy/SSB calling
70.250 **70.294**	ALL MODES	70.260	AM/FM calling
70.294 **70.500**	NBFM CHANNELS, 12.5 kHz spacing	70.3000 70.3125 70.3250 | | 70.4500 70.4625 70.4750 70.4875	RTTY/FAX Packet radio Packet radio FM calling Packet radio

144 - 146 MHz BANDPLAN (San Marino 2002)

Frequency (MHz)	Maximum Bandwidth (-6dB)	MODE	USAGE
144.000 144.035	500Hz	Telegraphy (a)	EME exclusive
144.035 144.135	500Hz	Telegraphy(a)	144.050 Telegraphy calling 144.100 Random MS(**m**)
144.135 144.150	500Hz	Telegraphy, MGM	144.138 PSK31 center of activity 144.140-144.150 FAI & EME activity telegraphy
144.150 144.165	2700Hz	Telegraphy, SSB, MGM	144.150-144.160 FAI & EME activity SSB
144.165 144.360	2700Hz	Telegraphy & SSB	144.195-144.205 Random MS SSB (**m**) 144.300 SSB calling
144.360 144.399	2700Hz	Telegraphy, SSB, MGM	144.370 FSK441 Random calling(**m**)
144.400 144.490	500Hz	Telegraphy, MGM	Beacons exclusive(**b**)
144.500 144.794	20kHz	All mode (f)	144.500 SSTV calling 144.525 ATV SSB talk back 144.600 RTTY calling(**n**) 144.630-144.660 Linear Transponder OUT 144.660-144.690 Linear Transponder IN 144.700 FAX calling 144.750 ATV talk back
144.794 144.990	12kHz	MGM (h)	144.800 APRS
144.994 145.194	12kHz	FM	Repeater Input exclusive (**c**)
145194145.206	12kHz	FM	Space communication (**p**)
145.206 145.5935	12kHz	FM	145.300 RTTY local 145.500 (mobile) calling
145.594 145.7935	12kHz	FM	Repeater Output exclusive (**c,d**)
145.794 145.806	12kHz	FM	Space communication (**p**)
145.806 146.000	12kHz	ALL MODE (e)	Satellite exclusive

NOTES ON THE 144 - 146 MHz BANDPLAN

1. IARU REGION 1 BANDPLAN

The following notes are part of the officially adopted IARU Region 1 bandplan, and all member societies should strongly promote adherence to the recommendations made in these notes.

1.1. General

i. In Europe no input or output channels of telephony repeaters shall be allowed to operate between 144.000 and 144.794 MHz.

ii. Except in the part of the band allocated to the Amateur Satellite Service and the linear transponders it is not allowed to use input- or output frequencies in the 145 MHz band for repeaters with in- or output in other amateur bands (Miskolc-Tapolca 1978, San Marino 2002).

iii. No packet-radio networks will be set up in the 145 MHz band (revised Lillehammer 1999)
It is recognised that in some parts of Region 1 the introduction of packet-radio may require the use of access frequencies in the 144 - 146 MHz band for a limited time (Düsseldorf 1989).

Note. The parts of Region 1 meant are those parts with low amateur population and/or those at the periphery of the Region, where exceptions can be tolerated as these do not harm the orderly use of the band in the parts of Region 1 where there is a greater pressure on the available spectrum space. In the latter part of the Region the second paragraph of the footnote should never be used to justify ignoring the first part for a considerable time.

iv. Beacons, irrespective of their ERP, will have to be situated in the beacon part of the band.

1.2. Footnotes

a. Telegraphy is permitted over the whole band, but preferably not in the beacon band; Telegraphy exclusive between 144.000 - 144.135 MHz.

b. Within IARU Region 1 the frequencies for beacons with an ERP of more than 50 Watts are coordinated by the IARU Region 1 Beacon Coordinator; the frequencies for beacons with and ERP of 10 Watts or more shall be communicated to the Beacon Coordinator. (see section IX).

c. For technical standards on NBFM and repeaters see section VIb

If there is a real need for more repeater channels (see section VIIIa !), it is recommended that Societies or Repeater Groups consider setting up a repeater system on the higher frequency band(s).

Further to this subject the following recommendation was adopted in De Haan, 1993:

> For FM repeater and simplex operation in the 144 to 146 MHz band IARU Region 1 will change to a genuine 12.5 kHz channel spacing system.
> Furthermore in Tel Aviv, 1996 it was decided that societies shall promote the use of the 12.5 kHz channel spacing standard for NBFM channels in order to effectively implement the 12.5 kHz system .

For the numbering of NBFM telephony channels, see annex 2 to this section.

d. Established simplex frequencies on repeater output channels may be retained.

e. In view of the important public relations aspect of amateur satellite activities, it was decided at the IARU Region 1 Conference in Miskolc-Tapolca (1978) that:

i) AMSAT will be allowed to use the band 145.8 - 146.0 MHz for amateur satellite activity.

This decision was re-confirmed at the IARU Region 1 Conference in Brighton (1981).

iii) see also footnote p

f. No unmanned stations shall use the all-mode segment, except for linear transponders (Tel Aviv 1996, San Marino 2002)

g. Attention is drawn to section 1.1. point iii of these Bandplan notes!

h. Network stations shall only operate in the part of the 145 MHz band allocated to Digital Communications and will be permitted only for a limited time. Such network stations should also have access ports on other VHF/UHF or Microwave bands and should not use the 145 MHz band to forward traffic to other network stations. In view of the time limitation the set-up of new network stations is not encouraged (De Haan, 1993).

Unmanned packet radio stations are only allowed in the segment 144.800 - 144.990 MHz. Outside of this segment the signal level produced by those stations shall be not larger than 60 dB below the carrier level (measured in a 12 kHz bandwidth). Any other unmanned packet radio and digital access points must cease operation not later than 31 December 1997.(Tel Aviv 1996).

2. USAGE

The following notes are referring to the Usage column in the bandplan. As already set out in the introduction to section IIc, in the right amateur spirit operators should take notice of these agreements which are made for operating convenience, but no right to reserved frequencies can be derived from a mention in the Usage column or from the following notes.

At the meeting of the VHF/UHF/Microwaves Committee in Vienna, March 1992, the following recommendation was adopted:

Societies should publish the use of 144.140 - 144.160 MHz as an alternative for EME operation. The results of this test should be monitored with the aim of incorporating this segment as EME alternative into the Usage part of the bandplan if successful.

2.1. Footnotes

m. See procedures set out in section Vb.

n. Publicity should be given to the usage of frequencies around 144.600 MHz by RTTY stations , in order to keep these frequencies clear from other traffic and to avoid interference with those RTTY stations.

p. For NBFM voice communications with special stations like manned spacecraft it is recommended to use 145.200 MHz for simplex operation or 145.200/145.800 MHz for split-channel operation (Vienna 1995/Tel Aviv 1996).

430 - 440 MHz BANDPLAN(till 31-12-2003)

IARU Region 1 bandplan		Usage	
430.000		430.025 - 430.375	NBFM repeater output-channnel freqs (F/PA), 25 kHz spacing, 1.6 MHz shift (**f**)
		430.400 - 430.575	Digital communication link channels (**g**) (**j**)
		430.600 - 430.925	Digital communications repeater channels (**g**) (**j**) (**l**)
	SUB-REGIONAL (national bandplanning) (**d**)	430.925 - 431.025	Multi mode channels (**j**) (**k**) (**l**)
		431.050 - 431.825	Repeater input channel freqs (HB/DL/OE), 25 kHz spacing, 7.6 MHz shift (**f**)
		431.625-431.975	Repeater input channel freqs (F/PA), 25 kHz spacing, 1.6 MHz shift
431.981			
432.000		432.000 - 432.025	Moonbounce
	TELEGRAPHY **(a)**	432.050	Telegraphy centre of activity
432.150		432.088	PSK31
432.150		432.200	SSB centre of activity
	SSB/TELEGRAPHY	432.350	Microwave talkback centre of activity
432.500		432.370	FSK441 random calling
		432.500	Narrow-band SSTV
432.500		432.600	RTTY (FSK/PSK)
	LINEAR TRANSPONDER INPUT **(e)**		
432.600			
432.600		432.700	FAX (FSK)
	LINEAR TRANSPONDER OUTPUT **(e)**		
432.800			
432.800			
	BEACONS **(b)**		
432.990			
432.994		In the UK those channels are used for repeater output	
	REPEATER INPUT REGION 1 STANDARD, 25 kHz spacing, 1.6 MHz shift (Channel freq 433.000--433.375 MHz)		
433.381			
433.394		433.400	SSTV (FM/AFSK)
	NBFM SIMPLEX CHANNELS, 25 kHz spacing, (Channel freq 433.400 -- 433.575 MHz)	433.500	(Mobile) NBFM calling
433.581			

IARU Region 1 bandplan	Usage	
433.600 ALL MODES **434.000**	433.600 433.625 - 433.775 433.700 434.000	RTTY (AFSK/FM) Digital communications channels (g) (h) (i) FAX channel (FM/AFSK) Centre frequency of digital experiments as defined in note m
434.000 ATV (**c**) **434.594**	434.450 - 434.475	Digital communications channels (by exception !!) (**i**)
434.594 ATV (**c**) & REPEATER OUTPUT (region 1 system), 25 kHz spacing, 1.6 MHz shift, (Channel freq 434.600) -- 434.975 MHz) **434.981**	In the UK those channels are used for repeater input	
434.981 ATV (**c**) & SATELLITE SERVICE **438.000**		
438.000 ATV (**c**) & SUB-REGIONAL (national bandplanning) (**d**) **440.000**	438.025 - 438.175 438.200 - 438.525 438.550 - 438.625 438.650 - 439.425 439.800 -- 439.975 439,9875	Digital communications channel freqs (**g**) Digital communications repeater channels (**g**) (**j**) (**l**) Multi-mode (**j**) (**k**) (**l**) Repeater output channels (HB/DL/OE), 25 kHz spacing, 7.6 MHz shift, (**f**) Digital communications link channels (**g**) (**j**) POCSAG centre

430 - 440 MHz BANDPLAN (San Marino 2002, Vienna 2004)

IARU Region 1 Bandplan	Usage	
430.000 SUB-REGIONAL (national bandplanning) (**d**) **431.981**	430.025 - 430.375	NBFM repeater output-channel freqs (F/PA/ON),12,5 kHz spacing, 1.6 MHz shift (**f**)
	430.400 - 430.575	Digital communication link channels (**g**) (**j**)
	430.600 - 430.925	Digital communications repeater channels (**g**) (**j**) (**l**)
	430.925 - 431.025	Multi mode channels (**j**) (**k**) (**l**)
	431.050 - 431.825	Repeater input channel freqs (HB/DL/OE), 25 kHz spacing, 7.6 MHz shift (**f**)
	431.625 - 431.975	Repeater input channel freqs (F/PA/ON), 12.5 kHz spacing, 1.6 MHz shift
432.000 Telegraphy (**a**) **432.100**	432.000 - 432.025	EME
	432.050	Telegraphy centre of activity
	432.088	PSK31 centre of activity
432.100 SSB/Telegraphy **432.399**	432.200	SSB centre of activity
	432.350	Microwave talkback centre of activity
	432.370	FSK441 random calling
432.400 Beacons (**b**) **432.490**		
432.500 ALL MODES **432.594**	432.500	Narrow-band SSTV
	432.500-432.600	LINEAR TRANSPONDER IN(**e**)
432.594 FM/Linear **432.994**	432.600 432.700 432.600-432.800	RTTY (ASK/PSK) FAX (ASK) LINEAR TRANSPONDER OUT (e)
	NBFM REPEATER INPUT; 25/12.5 kHz spacing, 2.0 MHz shift, (Channel freq 432.6000--433.9875 MHz)	

IARU Region 1 Bandplan	Usage	
432.994 ALL MODE **433.394**	In the UK repeater OUTPUT channels. (Channel frequencies 433.000- 433.375 MHz)	
433.394 NBFM **433.581**	433.400 433.500	SSTV(FM/AFSK) (Mobile) NBFM calling SIMPLEX CHANNELS, 25 kHz spacing, (Channel freq 433.400 -- 433.575 MHz)
433.600 All modes **434.000**	433.600 433.625 - 433.775 433.700 434.000	RTTY (AFSK/FM) Digital communications channels (**g**) (**h**) (**i**) FAX channel (FM/AFSK) Centre frequency of digital experiments as defined on note **m**
434.000 All modes & ATV (**c**) **434.594**	434.450 - 434.575	Digital communications channels (by exception !!) (**i**)
434.594 ATV (**c**) & FM **434.981**	REPEATER OUTPUT (in the UK INPUT), 25/12.5 kHz spacing, 2.0 MHz shift (in the UK 1.6 MHz shift), (Channel freq 434.600 -- 434.9875 MHz) 433.800 may be also used by APRS systems but only in the case where 144.800 really is not available for APRS	
435.000 Satellite service & ATV (**c**) **438.000**		
438.000 ATV (**c**) & SUB-REGIONAL (national bandplanning) (**d**) **440.000**	438.025 - 438.175 438.200 - 438.525 438.550 - 438.625 438.650 - 439.425 439.800 -- 439.975 439,9875	Digital communications channel freqs (**g**) Digital communications repeater channels (**g**) (**j**) (**l**) Multi-mode (**j**) (**k**) (**l**) Repeater output channels (HB/DL/OE), 25 kHz spacing, 7.6 MHz shift, (**f**) Digital communications link channels (**g**) (**j**) POCSAG centre

NOTES ON THE 430 - 440 MHz BANDPLAN

1.IARU REGION 1 BANDPLAN

The following notes are part of the officially adopted IARU Region 1 bandplan, and all member societies should strongly promote adherence to the recommendations made in these notes.

1.1. General

i. In Europe no input or output channels of telephony repeaters shall be allowed to operate between 432 and 433 MHz.(From 1-1-2004 those frequencies are ....between 432.000 and 432.600 MHz .....)

ii. Beacons, irrespective of their ERP, will have to be located in the exclusive beacon part of the band.

iii. NBFM telephony channels and Repeaters are specified in section VIb

1.2. Footnotes

a. Telegraphy is permitted over the whole narrow-band DX part of the band; Telegraphy exclusive between 432.000 - 432.150 MHz(After 1-1-2004 432.100 MHz). PSK31, however, can be used as well in this segment

b. Within IARU Region 1 the frequencies for beacons with an ERP of more than 50 Watts are coordinated by the IARU Region 1 Beacon Coordinator (see section IX).

c. i. ATV operators should be encouraged to use the microwave allocations where available, but may continue to use the 430 MHz band where permitted by the licensing authority. In case of interference between ATV and the Amateur Satellite Service the Satellite Service should have priority.

ii. ATV transmissions in the 435 MHz band should take place in the segment 434.000 - 440.000 MHz. The video carrier should be below 434.500 MHz or above 438.500 MHz. National societies should provide guidance to their members on the exact frequencies to be used, with due consideration of the interests of other users.
(Noordwijkerhout 1987)

d) The words "Sub-regional (national) bandplanning" appearing in IARU Region 1 VHF/UHF/Microwave bandplans mean the following:

In bands and sub-bands not available throughout Region 1, band-planning should be coordinated on a sub-regional basis between the countries where those bands and sub-bands are allocated to the Amateur Service. The words "national bandplanning" refer to bands/segments which are available only in a single country (such as the 70 MHz band allocation), or only in a few widely separated countries.(Torremolinos 1990)

e) At the IARU Region 1 Conference in Torremolinos (1990) the output band for linear transponders was extended from 432.700 to 432.800 MHz under the following condition:

The established use of 432.600 MHz for RTTY (ASK/PSK) and 432.700 MHz for FAX should be respected when installing linear transponders which use this allocation.

2. USAGE

The following notes are referring to the Usage column in the bandplan. As already set out in the introduction to section IIc, in the right amateur spirit operators should take notice of these agreements which are made for operating convenience, but no right to reserved frequencies can be derived from a mention in the Usage column or from the following notes (except where “exclusive”is mentioned”).

2.1. General

During contests and bandopenings local traffic using narrow-band modes should operate between 432.500 - 432.800 MHz. (This note is only valid till 31-12-2003)

2.2. Footnotes

f. The HB/DL/OE wide-shift repeater system, already in use for a long time, is valuable with a view to a better utilisation of the whole band. Hence IARU Region 1 endorses the system.
This also applies for the French repeater channel system, also adopted by the Netherlands and Belgium, which IARU Region 1 supports as a useful measure to fill a hitherto unused part of the band.
For the numbering of NBFM telephony channels see appendix 2 to this section

g. In the Usage section of the 435 MHz bandplan the following frequency segments have been designated for digital communications:

i) 430.544 - 430.931 MHz Extension of the 7.6 MHz repeater system input for digital comm.
438.194 - 438.531 MHz Output channels for the above

ii) 433.619 - 433.781 MHz
438.019 - 438.181 MHz

iii) 430.394 - 430.581 MHz For digital communication links
439.794 - 439.981 MHz For digital communication links

With due regard to the band allocated to the Amateur Service by the national Administration, the interests of other users, possible interference from e.g. ISM, the specific digital technique or system to be accommodated etc., a sub-regional, or national choice may be made within the above segments.

h. In those countries where 433.619 - 433.781 MHz is the only segment of the 435 MHz band available for digital communications, modulation techniques requiring a channel separation exceeding 25 kHz should not be used. If different or incompatible use of this part of the frequency spectrum in contemplated in neighbouring countries, this use should be coordinated between the countries concerned with the aim of avoiding harmful interference.

i. On a temporary basis, in those countries where 433.619 - 433.781 MHz is the only segment of the 435 MHz band available for Digital Communications:

1. Channels with centre frequencies 432,500 - 432,525 – 432,550 – 432,575 MHz may be used for digital communications.

2. Use of these channels must nor interfere with linear transponders.

3. Modulation techniques requiring a channel separation exceeding 25 kHz must not be used on these channels.

(De Haan, 1993/ Vienna 2004)

j. At the IARU Region 1 Conference in Torremolinos (1990) the following recommendation was adopted regarding the segments for repeaters and links, shown in footnote g:

> For a repeater/link to be installed within 150 km of a national border, the member society should co-ordinate the frequency allocation and the technical (system) data with the member societies in neighbouring countries. Special attention should be paid to the common good practice of using directional antennas and the minimum power necessary.

As a matter of course this agreement is also valid for any link experiments carried out on the multi-mode channels in the segment 438.544--438.631 MHz. (De Haan, 1993).

k. These multi-mode channels are to be used for experimenting with new transmission technologies (De Haan, 1993)

l. In the United Kingdom the use of low-power speech repeaters on repeater channels in the segment 438.419--438.581 is allowed. Where necessary, frequencies will be coordinated with neighbouring countries (De Haan, 1993).

m. Experiments using wide band digital modes may take place in the 435 MHz band in those countries that have the full 10 MHz allocation. These experiments should be in the

all modes section around a frequency of 434 MHz, use horizontal polarisation and the minimum power required.(Tel Aviv 1996)

1240 - 1300 MHz BANDPLAN

IARU REGION 1 bandplan		Usage	
1240.000 **1243.250**	ALL MODES	1240.000-1241.000 1242.025-1242.250 1242.250-1242.700 1242.725-1243.250	Digital communications Repeater output, ch. RS1 – RS10 Repeater output, ch. RS11 – RS28 Packet radio duplex, ch. RS29 – RS50
1243.250 **1260.000**	ATV	1258.150-1259.350	Repeater output, ch. R20 – R68
1260.000 **1270.000**	SATELLITE SERVICE		
1270.000 **1272.000**	ALL MODES	1270.025-1270.700 1270.725-1271.250	Repeater input, ch. RS1 -- RS28 Packet Radio duplex, ch. RS29 -- RS50
1272.000 **1290.994**	ATV	For DATV the use of this segment is recommended (Vienna 2004)	
1290.994 **1291.481**	NBFM REPEATER INPUT, 25 kHz spacing, ch. RM0 (1291.000) -- RM19 (1291.475**)**		
1291.494 **1296.000**	ALL MODES	1293.150-1294.350	Repeater input, ch. R20 – R68
1296.000 **1296.150**	TELEGRAPHY (a)	1296.00-1296.025 1296.138	Moonbounce PSK31 centre of activity
1296.150 **1296.800**	TELEGRAPHY/SSB	1296.200 1296.400-1296.600 1296.500 1296.600 1296.700 1296.600-1296.800	Narrow-band centre of activity Linear transponder input SSTV RTTY FAX Linear transponder output
1296.800 **1296.994**	BEACONS EXCLUSIVE (b)		
1296.994 **1297.481**	NBFM REPEATER OUTPUT, ch. RM0 -- RM19		
1297.494 **1297.981**	NBFM SIMPLEX, ch. SM20 -- SM39 (c)	1297.500	NBFM center of activity

IARU REGION 1 bandplan	Usage	
1298.000 ALL MODES **1300.000**	1298.025-1298.500 1298.500-1300.000 1298.725-1299.000	Repeater output channel freqs, ch. RS1 -- RS28 Digital communications Packet-Radio duplex channel freqs, ch. RS29 -- RS40

NOTES ON THE 1240 - 1300 MHz BANDPLAN

1. **IARU REGION 1 BANDPLAN**

The following notes are part of the IARU Region 1 bandplan for this band, originally adopted during the IARU Region 1 Conference at Noordwijkerhout (1987), and all member societies should strongly promote adherence to the recommendations made in these notes.
For the specification of NBFM see section VIb

1.1. Footnotes

a. Telegraphy is permitted over the whole narrow-band DX part of the band; Telegraphy exclusive between 1296.000 - 1296.150 MHz.

b. Within IARU Region 1 the frequencies for beacons with an ERP of more than 50 Watts are coordinated by the IARU Region 1 Beacon Coordinator (see section IX).

c. In countries where 1298 - 1300 MHz is not allocated to the Amateur Service (e.g. Italy) the FM simplex segment may also be used for digital communications.

2. **USAGE**

The following note refers to the Usage column in the bandplan. As already set out in the introduction to section IIc, in the right amateur spirit operators should take notice of these agreements which are made for operating convenience, but no right to reserved frequencies can be derived from a mention in the Usage column.

2.1. General

During contests and bandopenings local traffic using narrow-band modes should operate between 1296.500 - 1296.800 MHz.

2300 -2450 MHz BANDPLAN

IARU Region 1 bandplan		Usage	
2300.000 **2320.000**	SUB-REGIONAL (national) BANDPLANNING (a)	2304 - 2306 2308 - 2310	Narrow band segment in countries where the 2320-2322 segment is not available Narrow band segment in HB
2320.000 **2320.150**	TELEGRAPHY EXCLUSIVE (**c**)	2320.000-2320.025 2320.138	EME PSK31 centre of activity
2320.150 **2320.800**	TELEGRAPHY/ SSB (**c**)	2320.200	SSB centre of activity
2320.800 **2321.000**	BEACONS EXCLUSIVE (**c**)		
2321.000 **2322.000**	NBFM SIMPLEX & REPEATERS (**b**)		
2322.000 **2400.000**	ALL MODES (**b**)	2322.000-2355.000 2355.000-2365.000 2365.000-2370.000 2370.000-2392.000 2392.000-2400.000	ATV Digital communications Repeaters ATV Digital communications
2400.000 **2450.000**	AMATEUR SATELLITE SERVICE	2427.00 - 2443.00	ATV if no satellite uses this segment

NOTES ON THE 2300 - 2450 MHz BANDPLAN

a) The words "Sub-regional (national) bandplanning" appearing in IARU Region 1 VHF/UHF/Microwave bandplans mean the following:

In bands and sub-bands not available throughout Region 1, band-planning should be coordinated on a sub-regional basis between the countries where those bands and sub-bands are allocated to the Amateur Service. The words "national bandplanning" refer to bands which are available only in a single country (such as the 70 MHz band allocation), or only in a few widely separated countries.

(Torremolinos 1990)

b) In countries where the ALL MODES segment 2322 - 2400 MHz is not allocated to the Amateur Service, the FM SIMPLEX & REPEATER segment 2321 - 2322 MHz may be used for digital data transmissions.
For the specification of NBFM see section VIb

c) In countries where the narrow-band segment 2320 - 2322 MHz is not available, the following alternative narrow-band segments can be used:

2304 - 2306 MHz
2308 - 2310 MHz

3400 -3475 MHz BANDPLAN

IARU Region 1 bandplan		Usage	
3400.000 **3402.000**	NARROW-BAND MODES	3400.100	Center of activity
3402.000 **3475.000**	ALL MODES	3420.000-3430.000 3450.000-3455.000	Digital Communications Digital Communications

5650 - 5850 MHz BANDPLAN

IARU Region 1 bandplan		Usage	
5650.000 **5668.000**	AMATEUR SATELLITE SERVICE (up-link**)**		
5668.000 **5670.000**	AMATEUR SATELLITE SERVICE (up-link) & NARROW BAND MODES **(a)**	5668.200	Narrow band center of activity
5670.000 **5700.000**	DIGITAL		
5700.000 **5720.000**	ATV		
5720.000 **5760.000**	ALL MODES		
5760.000 **5762.000**	NARROW BAND MODES **(a)**	5760.200	Narrow band center of activity
5762.000 **5790.000**	ALL MODES		
5790.000 **5850.000**	AMATEUR SATELLITE SERVICE (down-link**)**		

NOTES ON THE 5650 - 5850 MHz BANDPLAN

1. Footnotes

a. Societies are urged to inform their members that stations should preferably be able to operate in both narrow-band segments.

10.000 - 10.500 GHz BANDPLAN

IARU Region 1 bandplan		Usage	
10.000 **10.150**	DIGITAL		
10.150 **10.250**	ALL MODES		
10.250 **10.350**	DIGITAL		
10.350 **10.368**	ALL MODES		
10.368 **10.370**	NARROW BAND MODES	10.3682	Narrow band center of activity
10.370 **10.450**	ALL MODES		
10.450 **10.500**	AMATEUR SATELLITE SERVICE & ALL MODES	10.450-10.452	Narrow band modes in countries where 10.368-10.370 is not available

NOTES ON THE 10.0 - 10.5 GHz BANDPLAN

1. Footnotes

a. In those countries where the narrow-band segment 10368 - 10370 MHz is not available, the segment 10450 - 10452 MHz is suggested as an alternative narrow-bandwidth segment.

24.000 - 24.250 GHz BANDPLAN(San Marino 2002)

IARU Region 1 bandplan	Usage
24.000 ALL MODES **24.048**	
24.048 AMATEUR SATELLITE SERVICE & NARROW BAND MODES **24.050**	24.0482 Narrow band center of activity
24.050 ALL MODES (not preferred) (**a**) **24.250**	24.125 Preferred operating frequency for wide-band equipment

1. Footnotes

a. In the lower 50 MHz of the 24 GHz band the amateur and amateur satellite service have a primary/exclusive status, while the status is secondary in the upper 200 MHz .
The all mode section in the secondary segment should only be used in case the preferred segment cannot be used.

47.000 - 47.200 GHz BANDPLAN(Vienna 2004)

IARU Region 1 bandplan	Usage
47.000 ALL MODES **47.088**	
47.088 AMATEUR SATELLITE SERVICE & NARROW BAND MODES **47.090**	47.088200 Narrow band center of activity
47.090 ALL MODES **47.200**	

75.50-81.50 GHz BANDPLAN (San Marino 2002)

IARU Region 1 bandplan	Usage
75.500 ALL MODES(**b)** **76.000**	
76.000 ALL MODES (not preferred) (**a**) **77.500**	
77.500 AMATEUR SATELLITE SERVICE & NARROW BAND MODES **77.501**	77.5002 Narrow band center of activity
77.501 ALL MODES (Preferred segment) **78.000**	
78.000 ALL MODES (not preferred) (**a**) **81.500**	

1. Footnotes

a. Between 77.5 and 78 GHz the amateur and amateur satellite service have a primary/exclusive status, while the status is secondary in the remainder of the allocation.
The all mode section in the secondary segment should only be used in case the preferred segment cannot be used
b. Till 2006 the status in the 75,5-76 GHz segment is primary/shared; after that date this amateur allocation will deleted. CEPT has amended the in such a way that this segment will remain available in the CEPT countries after 2006. This in order to avoid interference [problems between Short Range Radar for cars using 77-81 Ghz and the amateur(satellite) activities in the 77,5-78 Ghz segment.
At a future conference the consequences for our bandplanning have to be discussed

122.25 - 123 GHz Bandplan (San Marino 2002)

IARU Region 1 bandplan	Usage
122.250 NARROW BAND MODES **122.251**	
122.251 ALL MODES **123.000**	

134 - 141 GHz BANDPLAN (San Marino 2002)

IARU Region 1 bandplan	Usage
134.000 AMATEUR SATELLITE SERVICE & NARROW BAND MODES **134.001**	
134.001 ALL MODES (Preferred segment) **136.000**	
136.000 ALL MODES (not preferred) (**a**) **141.000**	

1. Footnotes

a. Between 134 and 136 GHz the amateur and amateur satellite service have a primary/exclusive status, while the status is secondary in the remainder of the allocation.
The all mode section in the secondary segment should only be used in case the preferred segment cannot be used

241 - 250 GHz BANDPLAN (San Marino 2002)

Valid from 1-1-2004 onwards

IARU Region 1 bandplan	Usage
241.000 ALL MODES (not preferred) (a) **248.000**	
248.000 AMATEUR SATELLITE SERVICE & NARROW BAND MODES **248.001**	
248.001 ALL MODES (Preferred segment) **250.000**	

1. Footnotes

a. Between 248 and 250 GHz the amateur and amateur satellite service have a primary/exclusive status, while the status is secondary in the remainder of the allocation.
The all mode section in the secondary segment should only be used in case the preferred segment cannot be used

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