
 <p>EMERGENCY MEASURES RADIO GROUP</p>	<p>EMERGENCY MEASURES RADIO GROUP</p>
 <p>AMATEUR RADIO EMERGENCY SERVICE</p>	<p>OTTAWA ARES</p>

Two Names - One Group - One Purpose

Auxiliary Frequency Information EMRG-206

Version: 1.1

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Written by: D. Harris, M. Kelly for the EMRG Management Team

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1.0 REVISION SUMMARY

Date of Change	Revision Number	Summary of Changes (Section #, type of change)
2007 Feb 3	0.1	Initial document -DRAFT based on rev summary in EMRG 207. Still needs to be filled out, needs work on page breaks. Many columns could be doubled up to save space.
2007 Feb 21	1.0	Suggested changes compiled. VHF band plans and aviation frequencies could still use an update.
2007 Mar 25	1.1	Fixed spelling, moved CKTF from 104.7 to 99.7

2.0 PURPOSE OF THIS DOCUMENT

This document lists frequencies that are secondary to EMRG operation in an emergency, to facilitate decisions about frequency use and for reference, where we must communicate with other users of the spectrum, or must avoid interference with them. The document focuses on frequencies that many hams would not use in their day to day operating.

Current repeater listings can be obtained from the Saint Lawrence Valley Repeater Council (SLVRC) web site (<http://db.slvrc.org/>). EMRG saves the SLVRC database report as a PDF file and posts it as document;
EMRG-211 SLVRC Frequency List (this Para. retained from EMRG 207)

As other lists and data are found to be relevant, they will be included here. Space is included for EMRG members to note frequencies that they have found to be useful to keep handy.

3.0 FREQUENCY LISTS

3.1 FRS / GMRS FREQUENCIES

- FRS/GMRS operation does not require a licence, but users may only use equipment type approved **for this service**.
- Both services use 2.5KHz deviation (narrower than normal amateur use)
- FRS has only channels 1-14, and uses 0.5W max, GMRS uses CH 1-22 and has a 20W power limit.

FRS & GMRS CHAN	FREQUENCY	SUGGESTED CTCSS #	GMRS CHAN	FREQUENCY	SUGGESTED CTCSS #
1	462.5625	97.4 (11)	15	462.5500	156.7 (25)
2	462.5875	100.0 (12)	16	462.5750	162.2 (26)
3	462.6125	103.5 (13)	17	462.6000	1167.9 (27)
4	462.6375	107.2 (14)	18	462.6250	173.8 (28)
5	462.6625	110.9 (15)	19	462.6500	179.9 (29)
6	462.6875	114.8 (16)	20	462.6750	186.2 (30)
7	462.7125	118.8 (17)	21	462.7000	192.8 (31)
8	467.5625	123.0 (18)	22	462.7250	203.5 (32)
9	467.5825	127.3 (19)	See table 3.7 for CTCSS number to frequency conversion chart		
10	467.6125	131.8 (20)			
11	467.6375	136.5 (21)			
12	467.6625	141.3 (22)			
13	467.6875	146.2 (23)			
14	467.7125	151.4 (24)			

3.2 CB / GRS FREQUENCIES

- This service does not require a licence. It uses 5 watts AM or 12W PEP SSB maximum. Some radios operate AM only, and some only operate on CH 1-23. CH9 is reserved for EMERGENCY use. CH 19 is used by 18 wheel truckers.

Chan	FREQ (MHz)	Chan	FREQ (MHz)	Chan	FREQ (MHz)	Chan	FREQ (MHz)	Chan	FREQ (MHz)
1	26.965	9	27.065	17	27.165	25	27.245	33	27.335
2	26.975	10	27.075	18	27.175	26	27.265	34	27.345
3	26.985	11	27.085	19	27.185	27	27.275	35	27.355
4	27.005	12	27.105	20	27.205	28	27.285	36	27.365
5	27.015	13	27.115	21	27.215	28	27.295	37	27.375
6	27.025	14	27.125	22	27.225	30	27.305	38	27.385
7	27.035	15	27.135	23	27.255	31	27.315	39	27.395
8	27.055	16	27.155	24	27.235	32	27.325	40	27.405

3.3 VHF MARINE FREQUENCIES

- This table needs some expert help. Any experts out there? Mode is FM.
- "A" means simplex on ship freq. "B" means ship stations receive only.
- **BOLD** indicates frequencies likely to be used in this area.

Channel	Ship	Coast	Description
5A	156.2500		Ship Movement
65A	156.2750		Search & Rescue, anti pollution
6	156.3000	-----	Intership Safety
66A	156.3250		Port Operations
7A	156.3500		Intership, ship/shore
67	156.3750		Intership, ship/shore, safety
8	156.400	-----	Intership Safety 2nd choice
68	156.4250		Intership, ship/shore, marinas
69	156.4750		Intership, ship/shore
10	156.5000		Intership, ship/shore, safety
70	156.5250		Distress, safety, calling
11	156.5500		SEAWAY TRAFFIC CONTROL - IROQUOIS
12	156.6000		Port Operations, Pilot Information
13	156.6500		Intership, ship movement
73	156.6750		Intership, ship/shore, safety
14	156.7000		Port Operations, Pilot Information
15	156.7500		Intership, ship/shore, ship movement
75	-----	-----	Not Used -Guard band for channel 16
16	156.8000		International Distress, Safety, Calling
76	-----	-----	Not Used -Guard band for channel 16
17	156.8500		Intership, ship/shore, ship movement
77	156.8750		Port operations
18A	156.9000		Intership, ship/shore - Commercial
19A	156.9500		Canadian Coast Guard
20	157.0000	161.6000	Port Operations
21A	157.0500		Canadian Coast Guard
21B	-----	161.6500	Continuous Marine Broadcast -Cardinal
81A	157.0750		Canadian Coast Guard
22A	157.1000		International Coast Guard Liaison
82A	157.1250		Canadian Coast Guard
83B	-----	161.7750	Continuous Marine WX Kingston, Cornwall
24	157.2000	161.8000	Public correspondence -Kingston
25B	-----	161.8500	Continuous Marine Broadcast (Weather)
85	157.2750	161.8750	Public correspondence Cornwall
26	157.3000	161.9000	Public correspondence Cardinal, Kingston
27	157.3500	161.9500	Public correspondence Cardinal
87	157.3750	161.9750	Public correspondence
88	157.4250	162.0250	Public correspondence

3.4 LOCAL VHF AVIATION VOICE FREQUENCIES

- This section needs expert help, maybe from CASARA? Mode is AM.

FREQ (MHz)	DESCRIPTION	FREQ (MHz)	DESCRIPTION
118.8	Ottawa Tower	123.2	Picton, Westport, Carleton Place, Alexandria, Haliburton traffic
120.1	Ottawa Tower	123.3	Mountain View, Hawksbury traffic
121.15	ATIS (Weather) Ottawa English	123.5	Rockliffe
121.9	Ottawa Ground, Trenton Ground	126.4	Petawawa advisory
122.1	Maniwaki(remote)	126.7	Gatineau Quebec remote
122.3	Gatineau ,Pendleton radio	127.7	Ottawa Terminal
122.5	Kingston	128.7	Trenton Tower
122.7	Smiths Falls unicom	135.45	ATIS (Weather) Trenton
122.8	Rockliffe ,Carp, Winchester, Pembroke, Bancroft, unicom	173.34	Dwyer Hill "Watchdog" (FM Mode?)
123.0	Brockville, Lachute unicom		

3.5 COMMON CALLING AND DISTRESS FREQUENCIES

- These need to be checked. Is there info from any other service?

FREQ (MHz)	DESCRIPTION
2.182	Marine Calling and Distress (USB)
27.065	CB/GRS Emergency channel 9 (AM)
121.5	Aircraft Emergency / ELT (AM)
156.8	Marine calling and emergency CH 16 (FM)
243.0	Military aircraft emergency (AM)
	AMATEUR FM CALLING FREQUENCIES
29.60	10m FM Calling frequency
52.525	6m FM Calling frequency
146.520	2m FM Calling frequency
223.500	1.2m FM Calling frequency
446.000	70cm FM Calling frequency

3.6 BROADCAST FREQUENCIES

Local English language broadcast stations with significant local news coverage

FREQ (MHz)	Channel/ Callsign/ slogan	LOCATION / DESCRIPTION
0.58	CFRA	Ottawa News, talk
71.75	CH 4 CBOT	CBC ENGLISH TV
215.75	CH 13 CJOH TV	CTV AFFILIATE
649.75	CH 43 CHRO "A CHANNEL"	(TV freq's for audio subcarrier)
91.5	CBO	CBC RADIO ONE
99.7	Ottawa Information Radio	10 min INFO LOOP - WX but no news

3.7 CTCSS DATA

These are the standard CTCSS tone frequencies. SLVRC has assigned different tones to different parts of its jurisdiction as indicated below:

FREQ (Hz) [SLVRC]	PL	MT	C4	RS	MS	FREQ (Hz) [SLVRC]	PL	MT	C4	RS	MS
67.0	XZ	1	1	1		[A,C]151.4	5Z	24	25	25	
69.3	WZ		2			156.7	5A	25	26	26	
69.4				2		159.8			27	27	
71.9	XA	2	3	3		162.2	5B	26	28	28	
74.4	WA	3	4	4		165.5				29	
77.0	XB	4	5	5	A	167.9	6Z	27	29	30	
79.7	WB	5	6	6		171.3				31	
82.5	YZ	6	7	7		173.8	6A	28	30	32	
85.4	YA	7	8	8		177.3				33	
88.5	YB	8	9	9	B	179.9	6B	29	31	34	
[D]91.5	ZZ	9	10	10		183.5			32	35	
94.8	ZA	10	11	11		186.2	7Z	30	33	36	
97.4	ZB	11	12	12	C	189.9			34	37	
[B,C]100.0	1Z	12	13	13		192.8	7A	31	35	38	
103.5	1A	13	14	14		196.6			36		
107.2	1B	14	15	15	D	199.5			37		
[A]110.9	2Z	15	16	16		203.5	M1	32	38		
[E]114.8	2A	16	17	17		206.5	8Z		39		
[D]118.8	2B	17	18	18	E	210.7	M2	33	40		
[B]123.0	3Z	18	19	19		218.1	M3	34	41		
127.3	3A	19	20	20	F	225.7	M4	35	42		
131.8	3B	20	21	21		229.1	9Z		43		
[B]136.5	4Z	21	22	22	G	233.6	M5	36	44		
141.3	4A	22	23	23		241.8	M6	37	45		
[E]146.2	4B	23	24	24		250.3	M7	38	46		
						254.1	DZ		47		

- [A] Counties of: Prescott & Russell, Stormont, Dundas & Glengarry, Ontario Franklin, N.Y. Plus the SLVRC portion of Quebec north of Prescott & Russell.
- [B] National Capital Area Plus SLVRC portion of Quebec north of Ottawa
- [C] Counties of: Lanark, Leeds & Grenville, Frontenac, On., St. Lawrence, N.Y.
- [D] Counties of: Lennox & Addington, Hastings, Prince Edward, Ontario
- [E] County of Renfrew, Plus SLVRC portion of Nipissing County and Quebec north of the County of Renfrew ...Continued next page

3.7 CTCSS DATA (continued)

FRS/GMRS : CTCSS tone frequencies and numbers may not be the same, even among radios of the same brand with different model numbers.

PL+ is the Motorola Letter number code for the frequency

MT is the CTCSS number for Motorola Talkabout, Kenwood Freetalk, Midland Speak Easy and Cobra 250/350 Radios

C4 is the CTCSS number for Cherokee 465 radios

RS is the CTCSS number for Radio Shack 106 radios

MS is the CTCSS number for Motorola "Sport" radios

3.8 VHF WEATHER FREQUENCIES (FM Mode)

FREQ (MHz)	CHAN	LOCATION	FREQ (MHz)	CHAN	LOCATION
162.400	2		162.500	6	
162.425	4		162.525	7	
162.450	5		162.550	1	Ottawa, Lavant, Sandringham
162.475	3	Pembroke / Laurentians			

3.9 MISC. FREQUENCIES

Items that didn't fit well anywhere else, but might be useful to know.

FREQ (MHz)	DESCRIPTION
162.150	Red Cross Ottawa (FM) CTCSS 141.3Hz
6.998	Red Cross, National, listed in TAFL as CW
13.9150	Red Cross, National, listed in TAFL as CW
13.9650	Red Cross, National, listed in TAFL as CW
13.9730	Red Cross, National, listed in TAFL as CW
13.9980	Red Cross, National, listed in TAFL as CW
14.3750	Red Cross, National, listed in TAFL as CW
20.7530	Red Cross, National, listed in TAFL as CW
20.8000	Red Cross, National, listed in TAFL as CW
20.9420	Red Cross, National, listed in TAFL as CW
20.9980	Red Cross, National, listed in TAFL as CW
27.9980	Red Cross, National, listed in TAFL as CW
29.7020	Red Cross, National, listed in TAFL as CW
129.275	MOH air ambulance (AM)

4.0 BAND PLANS

4.1 RAC 2M BAND PLAN

- Current as of 2004

144-148 MHz **Amateur Primary Exclusive**

144.000 - 144.100 MOONBOUNCE AND TERRESTRIAL CW

144.100 CW CALLING FREQUENCY

144.100 - 144.200 CW/SSB WEAK SIGNAL

144.200 - 144.275 AM NARROW BAND MODES EXCLUSIVE SSB (ACSSB, SSB, CW, RTTY, FAX, SSTV, etc.), bandwidth < 3 kHz

144.275 - 144.300 PROPAGATION BEACON NETWORK EXCLUSIVE

144.300 - 144.500 DIGITAL (2)

144.340 NATIONAL ATV COORDINATION FREQUENCY (1)

144.390 NATIONAL APRS FREQUENCY (9)

144.500 - 144.600 REPEATER INPUTS PRIMARY, LINEAR TRANSLATOR INPUTS SECONDARY(10)

144.600 - 144.900 REPEATER INPUTS(10)

144.900 - 145.100 DIGITAL (3)

145.100 - 145.200 REPEATER OUTPUTS PRIMARY, LINEAR TRANSLATOR OUTPUTS SECONDARY (10)

145.200 - 145.500 REPEATER OUTPUTS(10)

145.500 - 145.590 SAREX/ARISS LINKS

145.590 - 145.790 DIGITAL (4)

145.800 - 146.000 EXCLUSIVE AMATEUR SATELLITE SERVICE, ARISS

146.010 - 146.370 REPEATER INPUTS(10)

146.400 - 146.580 FM SIMPLEX (5)(6)

146.520 NATIONAL FM CALLING FREQUENCY (1)

146.610 - 147.390 REPEATER OUTPUTS (10)

147.420 - 147.570 FM SIMPLEX (30 kHz raster)(7)

147.435 - 147.585 DIGITAL (30 kHz raster)(8)

147.600 - 147.990 REPEATER INPUTS (10)

Footnotes:

(1) Once communications are established QSY off the frequency.

(2) Seven (7) frequencies on a 20 kHz channel raster 144.37, 144.39, 144.41, 144.43, 144.45, 144.47, 144.49. Occupancy to occur ONLY when available Digital frequencies within the sub bands 144.9 - 145.1 MHz and 145.59 - 145.79 MHz are exhausted. Consult with your local digital coordination body regarding maximum ERP, Bandwidth and coverage area within this sub band. Operation may occur on 144.31 MHz provided operating bandwidth, ERP do NOT cause harmful interference within the propagation beacon network sub band.

(3) Ten (10) frequencies on a 20 kHz channel raster. 144.91, 144.93, 144.95, 144.97, 144.99, 145.01, 145.03, 145.05, 145.07, 145.09. Consult with local coordination body.

(4) Eleven (11) frequencies on a 20 kHz channel raster 145.59, 145.61, 145.63, 145.65, 145.67, 145.69, 145.71, 145.73, 145.75, 145.77, 145.79 MHz. Consult with your local coordination body.

(5) The frequencies 146.40, 146.43, 146.46 MHz continue to be used as repeater inputs in some areas. Consult with your local coordination body.

(6) Thirteen (13) Channels on a 15 kHz channel raster 146.415, 146.430, 146.445, 146.460, 146.475, 146.490, 146.505, 146.520, 146.535, 146.550, 146.565, 146.580, 146.595 MHz.

(7) Six (6) Channels on a 30 kHz channel raster, 147.420, 147.450, 147.480, 147.510, 147.540, 147.570 MHz.

(8) Six (6) Channels on a 30 kHz channel raster 147.435, 147.465, 147.495, 147.525, 147.555, 147.585 MHz. Consult your local coordination body for available frequencies, ERP and bandwidth.

(9) Consult with your local coordination body.

(10) Repeaters may include FM, ACSSB or digital modes of modulation. Consult with your local coordination body for frequency and modulation scheme allocations.

4.2 RAC 70 CM BAND PLAN

Current as of 2004

STATUS: Radiolocation primary, Amateur secondary.

FREQUENCY (MHz)

430.025 - 431.500 - DIGITAL MODES (1) (6) (7)

431.500 - 433.000 - CW, SSB, MOONBOUNCE (Global Exclusive Allocation),

Amplitude Modulation narrow band modes.

432.000 - Centre frequency for EME, globally coordinated frequency allocations exist above and below 432.0 MHz

432.100 - National CW Calling Frequency (2)

432.200 - National SSB Calling Frequency (2)

432.300 - 432.400 - Propagation Beacon Network Exclusive (10)

432.400 - 433.000 - Experimental Narrow bandwidth modes

433.000 - 434.800 - DIGITAL MODES (1) (7)

434.800 - 434.900 - Analog Repeater Links (4)

434.900 - 435.000 - Guard Band

435.000 - 438.000 - SATELLITE (Global Exclusive Allocation)

438.000 - 444.000 - Amateur Television (NTSC, Vestigial Sideband, Digitally Enhanced Video) (3) (6) (8)

439.250 - Video Carrier Frequency

442.000 - 445.000 - Repeater Outputs (5) (4) (11)

444.000 - Spread Spectrum (9)

445.000 - 445.775 - Analog and Digital Links (4) (1)

445.800 - 445.975 - DIGITAL (1)

446.000 - 446.175 - FM Simplex

446.000 - National FM Calling Frequency (2)

446.200 - 446.375 - FM Remote Base (Uncoordinated)

446.400 - 446.775 - Analog and Digital Links (4) (1)

446.800 - 446.975 - DIGITAL MODES (1)

447.000 - 450.000 - Repeater Inputs (5) (4) (11)

Footnotes:

(1) Digital Channelling 25 kHz "minimum" raster, contiguous multiples of 25 kHz should be released based on required Digital System Bandwidth. (Data Rate and Modulation scheme will govern bandwidth). Consult with your local coordinating body, or RAC where no coordination exists.

(2) Once communication has been established, QSY off frequency to allow others to call.

(3) ATV operations may be for point to point, or repeater input operations. Note that any non ATV activity below 444.0 MHz must be coordinated with ATV users to minimize or

eliminate interference to the video signal. Consult with RAC for advice on administrative and technical means to achieve this. Note that Double Sideband Video is NOT sanctioned from a technical, spectrum, interference and power conservation viewpoint. Note that non video Digital operations in this sub-band should only occur if other frequencies allocated are full, consult with your local coordination body. RAC supports development of spectrally efficient video transmission techniques in this band.

(4) Local Option - consult with your local coordinating body.

(5) Repeaters - includes Narrowband FM, Digital(Voice, video and data) modes.

Frequencies must be coordinated with your local coordinating body, or RAC VHF UHF Advisory where no coordination body exists.

(6) Non conforming analog links on 70 cm are grandfathered provided that their existence does not cause harmful interference with amateur operations designated for that sub-band. In the case of interference, coordination discussions must be held to resolve the problem. Note grandfathering ceases once that link goes out of service, consult with your local coordinating body.

(7) Digital operations may include repeater operation, crossband duplex operation, links or simplex. Consult with your local coordination body.

(8) RAC encourages development of Digital compression techniques to reduce video bandwidth within this sub-band.

(9) Spread Spectrum centre frequency, secondary, operations per IC bandwidth limit of 12 MHz (max. spreading), may occur within these sub-bands, but must not cause interference to primary Amateur systems.

(10) Propagation Beacon frequencies are to be coordinated through the RAC VHF UHF Advisory Committee.

(11) RAC encourages the use of CTCSS encoding where spectral congestion occurs.

4.3 RAC 1.25 CM (220 MHZ) BAND PLAN

- Current as of 1998 **needs updating**

STATUS: **EXCLUSIVE** BAND: 220 225 MHz

FREQUENCY (MHz) UTILIZATION

220.00 - 221.00 HIGH DATA RATE DIGITAL (≥ 4800 B)

** MAX BW 100 kHz, raster starting at 220.15.

220.55 to 220.95 MHz is DUPLEXED TO 430.05 430.45 MHz (2)

221.01 - 221.09 PACKET (≤ 2400 B), 20 kHz CHANNELLING

221.10 - 221.95 DIGITAL

222.00 - 222.30 CW, SSB

222.00 - 222.05 EME Exclusive

222.05 - 222.10 CW

222.1 National CW Calling Frequency

222.10 - 222.275 SSB

222.2 National SSB Calling Frequency

222.275 - 222.30 Propagation Beacons

222.31 - 223.37 Repeater Inputs

223.390 - 223.490 High Speed Data (Local option cross band duplexed to 430 MHz, or 1300 MHz.)

- 223.490 - 223.590 FM Voice Simplex
- 223.59 - 223.89 DATA
- 223.592 - 23.69 High Speed Data (Local Option 1 100 kHz channel, or three 30 kHz Channels, 223.605, 223.635, 223.665)
- 223.685 - 223.805 Narrow Band Packet (4 channels, Max BW of 30 kHz each centered at 223.7, 223.73, 223.76, 223.79)
- 223.790 - 223.890 High Speed Data (local option as 223.39 - 223.49)
- 223.91 - 225 Repeater Outputs
 1. See table of repeater pairs
 2. Links must be designed to limit emissions into the U.S. on a voluntary basis.
 3. RAC is proposing Secondary Status 218 - 220 MHz.

4.4 RAC 6M BAND PLAN

- Current as of 2004
- BAND: 50 - 54 MHz STATUS: Amateur Exclusive
- FREQUENCY (MHz) UTILIZATION
- 50.0 - 50.6 NARROW BAND MODES (SSB, AM)
- 50.0 - 50.050 CW / BEACONS / MOONBOUNCE
- 50.050 - 50.1 CW / BEACONS
- 50.1 - CW CALLING FREQUENCY
- 50.1-50.6 - SSB and AM MODES (BANDWIDTH less than or= 2.3 kHz)
- 50.105 - 50.115 DX WINDOW (LISTEN FOR DX HERE)(4)
- 50.110 DX WINDOW CALLING FREQUENCY (4)
- 50.125 NATIONAL SSB CALLING FREQUENCY
- 50.4 AM CALLING FREQUENCY
- 50.6 - 51.0 EXPERIMENTAL MODES (1)
- 50.7 RTTY, AMTOR CALLING FREQUENCY
- 50.8 - 50.98 RADIO CONTROL OF MODELS, TEN CHANNELS ON A 20 kHz RASTER

- 51 - 51.1 PACIFIC (ZL) DX WINDOW (SSB/CW ONLY) (3)
- 51.1 - 52 FM VOICE SIMPLEX, AND PACKET (1)
- 51.7 NATIONAL SIMPLEX PACKET CALLING FREQ
- 52 - 52.05 PACIFIC (VK) DX WINDOW (SSB/CW ONLY) (3)
- 52.525 NATIONAL FM CALLING FREQUENCY
- 52 - 53 FM VOICE REPEATER INPUTS (2)
- 53 - 54 FM VOICE REPEATER OUTPUTS

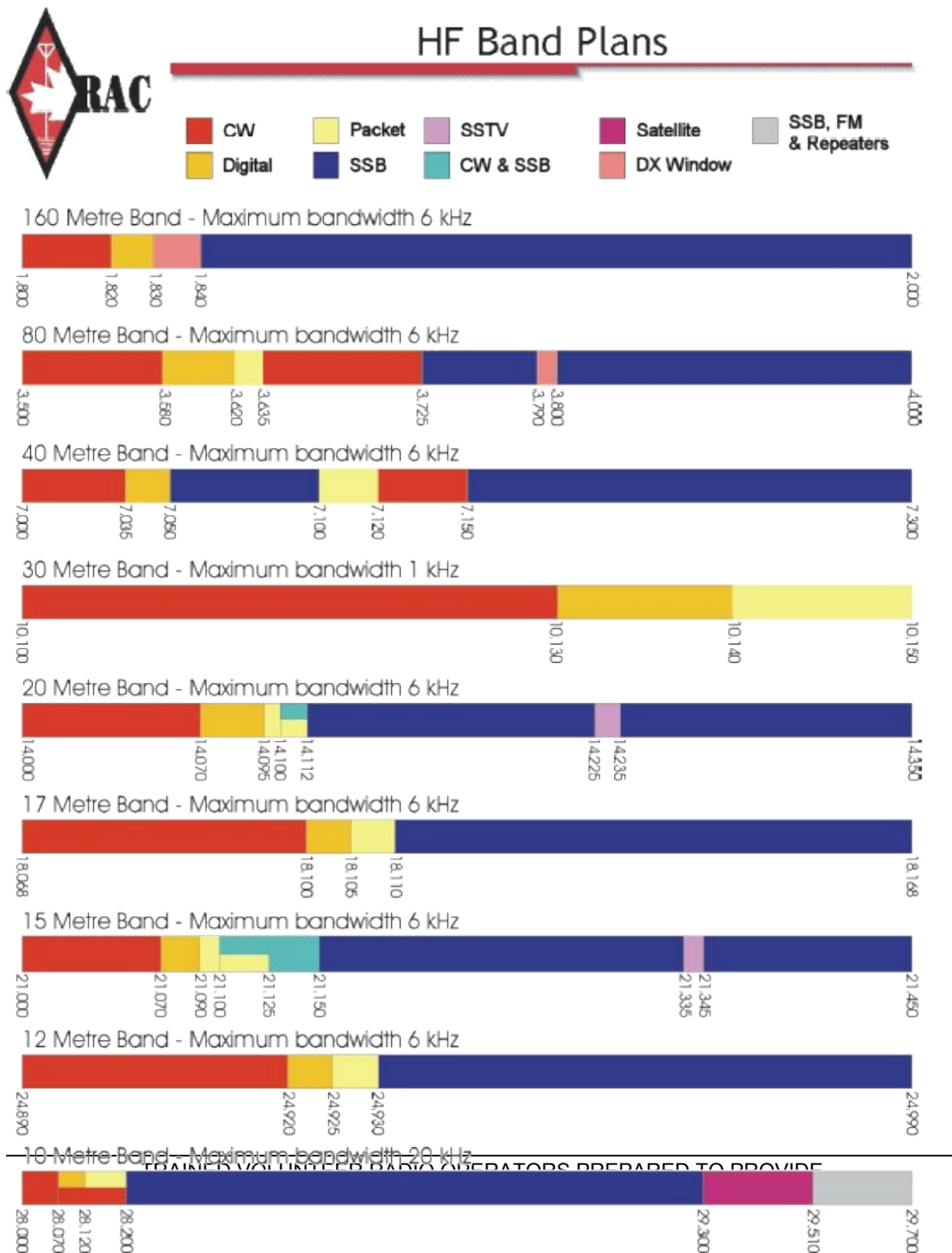
Footnotes:

- 1) In North America the following frequencies are suggested for Packet digipeater and packet scatter operation: 50.62/51.62 50.68/51.68 50.76/51.76 50.64/51.64 50.72/51.72 50.78/51.78 50.66/51.66 50.74/51.74
- For co-located voice and packet repeaters, use high (input) and low (output) to provide maximum mutual frequency isolation.

- 2) SEE TABLE OF REPEATER PAIRS
- 3) AMATEURS ARE REQUESTED TO AVOID USING FM OR OTHER WIDE BAND MODES ON THESE FREQUENCIES TO MINIMIZE INTERFERENCE TO AUSTRALIAN AND NEW ZEALAND AMATEURS WORKING INTO REGION 2 ON SSB/CW.
- 4) NORTH AMERICAN AMATEURS ARE REQUESTED TO AVOID CALLING "CQ DX" ON 50.110 MHz.

4.5 RAC HF BAND PLAN

Current as of 2006



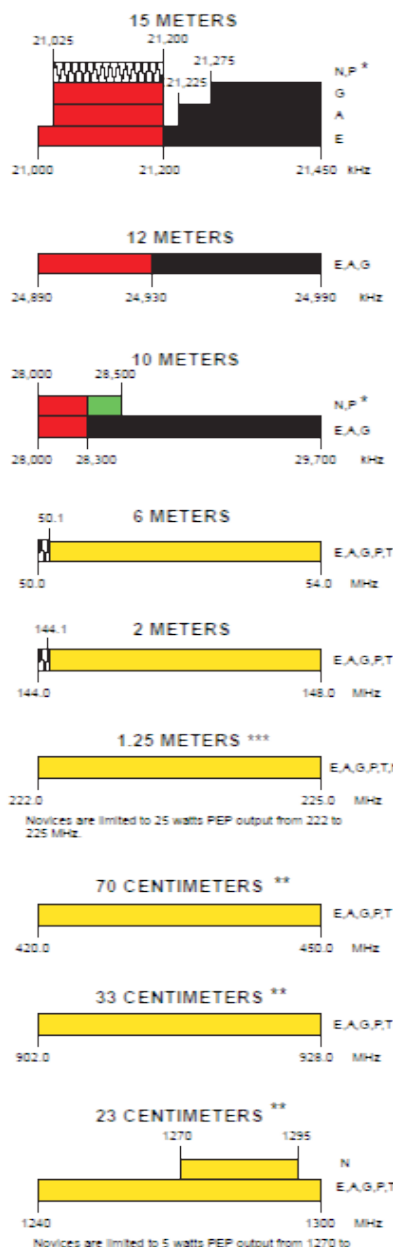
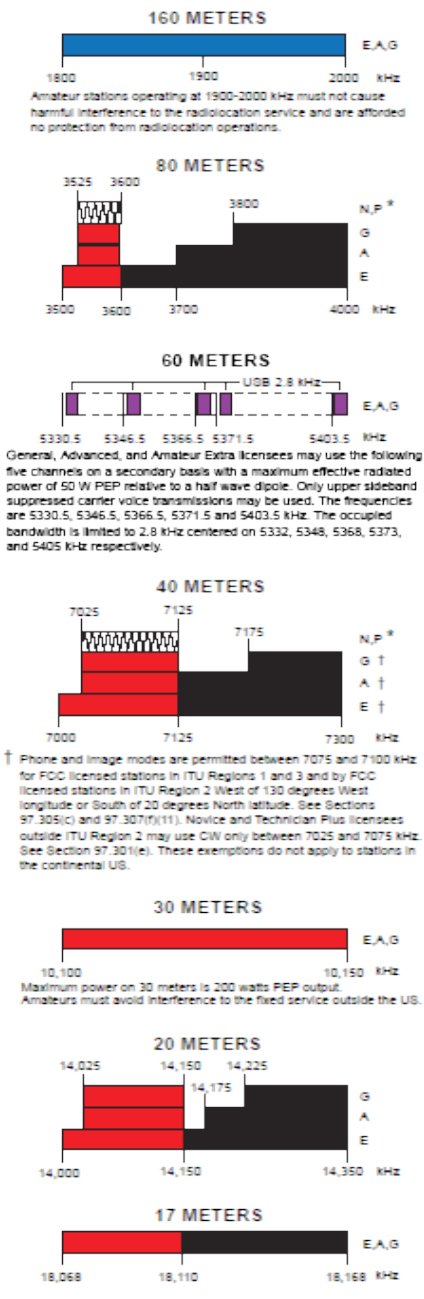
4.6 USA BAND PLAN

- Current as of Dec 15 2006

US Amateur Bands



Effective Date December 15, 2006



US AMATEUR POWER LIMITS

At all times, transmitter power should be kept down to that necessary to carry out the desired communications.

Power is rated in watts PEP output. Unless otherwise stated, the maximum power output is 1500 W.

Power for all license classes is limited to 200 W in the 10,100-10,150 kHz band. Novices and Technicians are restricted to 200 W below 28.5 MHz.

In addition, Novices are restricted to 25 W in the 222-225 MHz band and 5 W in the 1270-1295 MHz subband.

KEY

- █ - CW, RTTY and data
- █ - CW, RTTY, data, MCW, test, phone and image
- █ - CW, phone and image
- █ - CW and SSB phone
- █ - CW, RTTY, data, phone, and image
- █ - USB Phone only

E - AMATEUR EXTRA
A - ADVANCED
G - GENERAL
P - TECHNICIAN PLUS
T - TECHNICIAN
N - NOVICE

*Technicians who have passed the 5 wpm Morse code exam are indicated as "P".

**Geographical and power restrictions apply to all bands with frequencies above 420 MHz. See The ARRL FCC Rule Book for more information about your area.

***219-220 MHz allocated to amateurs on a secondary basis for fixed digital message forwarding systems only and can be operated by all licensees except Novices.

All licensees except Novices are authorized all modes on the following frequencies:

- 2300-2310 MHz
- 2390-2450 MHz
- 3300-3500 MHz
- 5650-5925 MHz
- 10.0-10.5 GHz
- 24.0-24.25 GHz
- 47.0-47.2 GHz
- 76.0-81.0 GHz
- 122.25-123.0 GHz
- 134-141 GHz
- 241-250 GHz
- All above 275 GHz

