

HF-APRS Frequency Calculation

update 2018-04-13 09:00z SA7SKY

HF-APRS Dial Frequency Calculation RPR ↔ FSK						
Tone Frequencies 1600/1800						
Region		RPR	USB=300 Hz lower than FSK LSB=300 Hz higher than FSK	FSK	USB=300 Hz higher than RPR LSB=300 Hz lower than RPR	side band
20 m	Europe		14.103,30 kHz		14.103,00 kHz	LSB
20 m	VK /ZL		14.096,30 kHz		14.096,60 kHz	USB
30 m	worldwide		10.147,30 kHz		10.147,60 kHz	USB
40 m	Europe		7.047,30 kHz		7.047,60 kHz	USB
40 m	PY / VK / ZL		7.036,30 kHz		7.036,00 kHz	LSB
80 m	DL		3.610,00 kHz		3.610,30 kHz	USB
= no usage						BOLD = active usage

The following 2 tables have been adopted from <http://aprs.net.au/hf/hf-aprs-frequencies> and extended with European frequency pairs accordingly.

FSK Dial Frequency LSB ↔ USB					
Tone Frequencies splitted into groups					
Band	Tone Frequencies	FSK Dial Frequency		FSK Dial Frequency	
		LSB	USB	LSB	USB
20 m	1070/1270 (Group A)	14.099,470	14.097,130	14.102,470	14.100,130
	1100/1300 (Group B)	14.099,500	14.097,100	14.102,500	14.100,100
	1600/1800 (Group C)	14.100,000	14.096,60	14.103,00	14.099,600
	2025/2225 (Group D)	14.100,425	14.096,175	14.103,425	14.099,750
	2100/2300 (Group E)	14.100,500	14.096,100	14.130,500	14.099,100
	2110/2310 (Group F)	14.100,510	14.096,090	14.103,510	14.099,090
	2125/2325 (Group G)	14.100,525	14.096,075	14.103,525	14.099,750
30 m	1070/1270 (Group A)	10.150,470	10.148,130	same	
	1100/1300 (Group B)	10.150,500	10.148,100		
	1600/1800 (Group C)	10.151,00	10.147,60		
	2025/2225 (Group D)	10.151,425	10.147,175		
	2100/2300 (Group E)	10.151,500	10.147,100		
	2110/2310 (Group F)	10.151,510	10.147,090		
	2125/2325 (Group G)	10.151,525	10.147,075		
40 m	1070/1270 (Group A)	7.035,470	7.033,130	7.050,470	7.048,130
	1100/1300 (Group B)	7.035,500	7.033,100	7.050,500	7.048,100
	1600/1800 (Group C)	7.036,00	7.032,600	7.051,000	7.047,60
	2025/2225 (Group D)	7.036,425	7.032,175	7.051,425	7.047,175
	2100/2300 (Group E)	7.036,500	7.032,100	7.051,500	7.047,100
	2110/2310 (Group F)	7.036,510	7.032,090	7.051,510	7.047,090
	2125/2325 (Group G)	7.036,525	7.032,075	7.051,525	7.047,075
RPR Dial Frequencies not critical					

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Popular Modem Offsets

The table below lists the common HF modem/TNC equipment in use, and their tones. These have been categorised into "Groups" for the purpose of carrier frequency selection.

Modem / TNC	Tone Frequencies	
Group "A"		
Bell 103 Originate	1070	1270
Group "B"		
Tigertronics TM1	1100	1300
Group "C"		
AGWPE Pro (Soundcard)	1600	1800
MFJ-1270 & MFJ-1270b	1600	1800
TinyTrack 3 & 4	1600	1800
Kam Plus	1600	1800
PacComm TNC320	1600	1800
OpenTracker	1600	1800
Group "D"		
Bell 103 Answer	2025	2225
Group "E"		
AGWPE freeware version (Soundcard)	2100	2300
MixW (Soundcard)	2100	2300
Group "F"		
PK-232	2110	2310
MFJ-1270c & MFJ-1274c	2125	2295
MFJ-1276 & MFJ-1278	2125	2295
Group "G"		
DSP-12	2125	2325

Comments from the HF-APRS community

WA8LMF

A: The freeware AGWpe is limited to the 2100/2300 Hz tone pair. The pay-for "AGWpe Pro" also allows you to select the classic KAM pair of 1600/1800 Hz.

B: MixW can be tuned to ANY arbitrary tone pair -- not just 2100/2300. [I have long used it set to 1100/1300 to receive along-side transmitted beacons from my TigerTrack TM-1 in my HF mobile setup.]

C: The latest arrival to the HF soundcard "soft TNC" world, the UZ7HO "Soundmodem" is also fully tunable to any tone pair desired.

D: MFJ/TNC2 clones: The RC-controlled VCO-based modem chips tuned by a 10-turn helipot (and also the TX tone generators) are so unstable that specifying their tones as exactly 2125 and 2975 (which are the classic 170-hz-shift RTTY tones rather than the 200-Hz-shift packet tones in any case) is meaningless. Just refer to them as 2100/2300.

E: Same thing applies to the PK-232. Actually, it's op-amp hardware-based linear FM discriminator receives 2100/2300 or 2125/2975 equally well. Again, the TX side is just an RC-network-controlled oscillator tuned by a trimpot. It's send tones could actually be anywhere from 160 to 220 Hz shift depending on temperature and age.