

ANNEX 6: EXAMINATION SYLLABUS AND REQUIREMENTS FOR A H														
Edition 4 October 2011														
RECOMMENDATION T/R 61-02 – Page 13														
EXAMINATION SYLLABUS FOR A HARMONISED AMATEUR RADIO E														
Edition 4 October 2011														
RECOMMENDATION T/R 61-02 – Page 14														
9. 9.1 9.2 9.3 10. b) 1. 2. 3. 4. 5. 6. 7. c) 1. 2. 3.														
INTERFERENCE AND IMMUNITY Interference in electronic equipment; C														
DETAILED EXAMINATION SYLLABUS														
a) TECHNICAL CONTENT CHAPTER 1	SSA:s prov	"Saknas i Bli Sändaramatör"	Bli sändaramatör	Koncept	"Saknas i Koncept"	HAREC 61-02 antal områden	ERC Report 32 Novice	ECC Report 89 Entry	Bli sändaramatör antal områden	ERC Report 32 Novice antal områden	Tyska frågor för Klass A	Ämne	Alternativ	AIB
1. ELECTRICAL, ELECTRO-MAGNETIC AND RADIO THEORY														
1.1 Conductivity														
- Conductor, semiconductor and insulator;			x	x		1	x			1	1			
- Current, voltage and resistance;			x	x		1	x			1	1			
- The units ampere, volt and ohm;	x		x	x		1	x			1	1			
- Ohm's Law E I R	x		x	x		1	x			1	1			
- Kirchhoff's Laws;		1			1	1								
- Electric power P E I	x		x	x		1	x			1	1			
- The unit watt;			x	x		1	x			1	1			
- Electric energy W P t		1		x		1								
- The capacity of a battery [ampere-hour].		1			1	1	X 1.2				1			
1.2 Sources of electricity														
- Voltage source, source voltage [EMF], short circuit current, internal resistance		1		x		1								
- Series and parallel connection of voltage sources.		1		x		1								
1.3 Electric field														
- Electric field strength;		1		x		1	X 1.3				1			
- The unit volt/meter;		1		x		1								
- Shielding of electric fields.		1		x		1								
1.4 Magnetic field														
- Magnetic field surrounding live conductor;		1		x		1								
- Shielding of magnetic fields.		1		x		1								
1.5 Electromagnetic field														
- Radio waves as electromagnetic waves;		1		x		1	X 1.3				1			
- Propagation velocity and its relation with frequency and wavelength			x	x		1	X 1.3			1	1			
- Polarisation.			x	x		1	X 1.3			1	1			
1.6 Sinusoidal signals														
- The graphic representation in time;		1		x		1								
- Instantaneous value, amplitude [Emax], effective [RMS] value		1		x		1	X 1.3				1			
- Period and duration of period;	x					1								
- Frequency;	x		x	x		1	X 1.3			1	1			
-The unit hertz;	x		x	x		1	X 1.3			1	1			
- Phase difference.		1		x		1								
1.7 Non-sinusoidal signals														
- Audio signals;			x	x		1	X 1.4			1	1			
- Square wave;		1		x		1	X 1.4				1			
- The graphic representation in time;		1		x		1								
- D.C. voltage component, fundamental wave and higher harmonics;		1		x		1								
- Noise PN kTB (receiver thermal noise, band noise, noise density, noise power)		1			1	1								
1.8 Modulated signals														
- CW;			x	x		1	X 1.5			1	1			

- Amplitude modulation;			x	x		1	X 1.5		1	1				
											TE101	jfr bandbredd m SSB	alla rimliga	a
											TE102	nyckelknäppar	alla rimliga	a
											TE103	CW-BFO	en för hög	a
											TE104	def av modulation		a
											TE105	bild på AM		a
											TE106	övermodulation	alla rimliga	a
											TE107	korsmodulation	2 övermod	a
											TE108	splatter		a
											TE109	störmöjlighet		a
											TE110	bild på AM		a
											TE111	bild på AM		a
											TE112	bild på AM		a
											TE113	bild på AM		c
- Phase modulation, frequency modulation and single-sideband modulation	x		x	x		1	X 1.5		1	1				
- Frequency deviation and modulation index m F f mod x		1		x		1	X 1.5							
											TE201	störkänslighet	1 underlig	a
											TE202	bandbredd	verkar 2x2 men c och	a
											TE203	bandbredd	verkar 2x2 men c och	a
											TE204	definition		a
											TE205	definition		a
											TE206	fördel		a
											TE207	sving		a
											TE208	modulator		a
											TE209	beräkna sving	en underlig	a
											TE210	för stort sving		a
											TE211	fördel med stort sving		c
											TE212	konsekvens av stort sving		a
											TE213	preemfas deemfas		a
											TE214	sving för ingen bärvåg	Bessell	a
											TE215	modulationsindex för ingen bä		a
											TE216	känslighet		a
											TE217	bandbredd	1 för stort	a
- Carrier, sidebands and bandwidth;	x		x	x		1	X 1.5		1	1				
- Waveforms of CW, AM, SSB and FM signals (graphical presentation);			x	x		1								
- Spectrum of CW, AM and SSB signals (graphical presentation);			x	x		1								
- Digital modulations: FSK, 2-PSK, 4-PSK, QAM;		1			1	1								
- Digital modulation: bit rate, symbol rate (Baud rate) and bandwidth;		1			1	1								
- CRC and retransmissions (e.g. packet radio), forward error correction (e		1			1	1								
											TE301	modulator för Packet		a
												bandbredd för Packet	varför inte 1200 Hz?	a
												toner för Packet		d
												dataöverföring för Packet		b
												synkron dataöverföring		a
												bandbredd för Packet		d
												TNC för Packet		a
												TX-Delay		a
												TX-Delay		a
												krav på radion för Packet		a
												krav på radion för Packet		d
												DAMA		?
												bandbredd för Packet		c
												Packetmailbox		a
												TNC för Packet		a
											TE316	flera stn samtidigt med Packe		d
												TX-Delay		a
												hastighetsanpassning		a
												modulator		d
												Baudotkod		a
												skillnad RTTY och Pactor		a
												utrustning för RTTY		a
												minsta bandbredd		a
												Pactor		a
												PSK31-bandbredd		a
												vattenfallsdiagram		a
												skillnad SSTV och ATV		a
												halv duplex, full duplex, simpli		a

CHAPTER 4									
4. RECEIVERS									
4.1 Types									
- Single and double superheterodyne receiver;	enkel		?	x		1	x	?	
- Direct conversion receivers.			x	x		1	x	1	1
4.2 Block diagrams									
- CW receiver [A1A];	x		x	x		1	x	1	1
- AM receiver [A3E]	x		x	x		1	x	1	1
- SSB receiver for suppressed carrier telephony [J3E];	x		x	x		1	x	1	1
- FM receiver [F3E].	x		x	x		1	x	1	1
4.3 Operation and function of the following stages (Block diagram treatment)									
- HF amplifier [with tuned or fixed band pass];	x		x	x		1	x	1	1
- Oscillator [fixed and variable];	x		x	x		1	x	1	1
- Mixer;	x		x	x		1	x	1	1
- Intermediate frequency amplifier;	x		x	x		1	x	1	1
- Limiter;		1			1	1	x		1
- Detector, including product detector;	x		x	x		1	x	1	1
- Audio amplifier;	x		x	x		1	x	1	1
- Automatic gain control;			x	x		1	x	1	1
- S meter;		1		x		1			
- Squelch.		1		x		1	x		1
4.4 Receiver characteristics (simple description treatment)									
- Adjacent-channel;			x	x		1		1	1
- Selectivity;			x	x		1		1	1
- Sensitivity, receiver noise, noise figure;			x	x		1		1	1
- Stability;		1		x		1			
- Image frequency;	x	1		x		1			
- Desensitization / Blocking;		1		x		1			
- Intermodulation; cross modulation;		1		x		1			
- Reciprocal mixing [phase noise].		1		x		1			
CHAPTER 5									
5. TRANSMITTERS									
5.1 Types									
- Transmitter with or without frequency translation.			x	x		1		1	1
5.2 Block diagrams									
- CW transmitter [A1A];	x		x	x		1	X 5.1	1	1
- SSB transmitter with suppressed carrier telephony [J3E];	x		x	x		1	X 5.1	1	1
- FM transmitter with the audio signal modulating the VCO of the PLL [F3E];	x		x	x		1	X 5.1	1	1
5.3 Operation and functions of the following stages (Block diagram treatment)									
- Mixer;	x		x	x		1	X 5.2	1	1
- Oscillator;	x		x	x		1	X 5.2	1	1
- Buffer;	x		x	x		1	X 5.2	1	1
- Driver;		1			1	1	X 5.2		1
- Frequency multiplier;	x		x	x		1	X 5.2	1	1
- Power amplifier;	x		x	x		1	X 5.2	1	1
- Output matching;			x	x		1	X 5.2	1	1
- Output filter;	x		x	x		1	X 5.2	1	1
- Frequency modulator;	x		x	x		1	X 5.2	1	1
- SSB modulator;	x		x	x		1	X 5.2	1	1
- Phase modulator;		1		x		1			
- Crystal filter.	x		x	x		1			
5.4 Transmitter characteristics (simple description)									
- Frequency stability;			x	x		1	X 5.3	1	1
- RF-bandwidth;	x		x	x		1	X 5.3	1	1
- Sidebands;	x		x	x		1	X 5.3	1	1
- Audio-frequency range;			x	x		1		x	
- Non-linearity [harmonic and intermodulation distortion];		1		x		1			
- Output impedance;			x	x		1		x	
- Output power;			x	x		1	X 5.3	1	1

- minimum signal to noise ratio;		1			1	1								
- minimum received signal power;		1			1	1								
- path loss;		1			1	1								
- antenna gains, transmission line losses;		1			1	1								
- minimum transmitter power.		1			1	1								
CHAPTER 8														
8. MEASUREMENTS														
8.1 Making measurements														
- Measurement of:														
- DC and AC voltages and currents;			x	x		1	x			1	1			
- Measuring errors:	1				1	1								
- Influence of frequency;			x	x		1				x				
- Influence of waveform;	1			x		1								
- Influence of internal resistance of meters.			x	x		1				x				
- Resistance;			x	x		1	x			1	1			
- DC and RF power [average power, Peak Envelope Power];			x	x		1	x			1	1			
- Voltage standing-wave ratio;			x	x		1				x				
- Waveform of the envelope of an RF signal;	1			x		1								
- Frequency;			x	x		1	x			1	1			
- Resonant frequency.			x	x		1				x				
8.2 Measuring instruments														
- Making measurements using:	1				1	1								
- Multi range meter (digital and analog);			x	x		1	x			1	1			
- Rf-power meter;	1			x		1	x							
- Reflectometer bridge (SWR meter);			x	x		1	x			1	1			
- Signal generator;	1			x		1								
- Frequency counter;			x	x		1				x				
- Oscilloscope;	1			x		1								
- Spectrum Analyzer.						1								
CHAPTER 9														
9. INTERFERENCE AND IMMUNITY														
9.1 Interference in electronic equipment														
- Blocking			x	x		1				x				
- Interference with the desired signal	1			x		1	x				1			
- Intermodulation	1			x		1								
- Detection in audio circuits			x	x		1	x			1	1			
9.2 Cause of interference in electronic equipment														
- Field strength of the transmitter	x		x	x		1				x				
- Spurious radiation of the transmitter [parasitic radiation, harmonics]	x		x	x		1	x			1	1			
- Undesired influence on the equipment:	x	1			1	1	x				1			
- via the antenna input [aerial voltage, input selectivity]	x		x	x		1	x			1	1			
- via other connected lines	x		x	x		1	x			1	1			
- by direct radiation	x	1		x		1	x				1			
9.3 Measures against interference														
- Measures to prevent and eliminate interference effects:						1								
- Filtering			x	x		1	x			1	1			
- Decoupling			x	x		1	x			1	1			
- Shielding		1		x		1	x				1			
CHAPTER 10 10. SAFETY														
- The human body	x		x	x		1	x			1	1			
- Mains power supply	x		x	x		1	x			1	1			
- High voltages	x		x	x		1	x			1	1			
- Lightning	x		x	x		1	x			1	1			
Number of missing items in each course book in row C and F and number														
		127			26	269				99	123			

Edition 4 October 2011														
RECOMMENDATION T/R 61-02 – Page 22														
b) NATIONAL AND INTERNATIONAL OPERATING RULES AND PROC														
CHAPTER 1. PHONETIC ALPHABET A = Alpha B = Bravo C = Charlie D	x (ej helt kollat)													
CHAPTER 2. Code QRK QRM QRN QRO QRP QRT QRZ QRV QSB QS	QRK QRX troligen (kollat)													
CHAPTER 3 BK CQ CW DE K MSG PSE RST R RX TX UR Signal used	x (ej helt kollat)													
CHAPTER 4. INTERNATIONAL DISTRESS SIGNS, EMERGENCY TRAFFIC AND NATURAL DISASTER COMMUNICATION Distress signs: - radiotelegraph [SOS] - radiotelephone "MAYDAY" - International use of the amateur station in the event of national disasters; - Frequency bands allocated to the amateur service and amateur satellite service.	x													
CHAPTER 5. CALL SIGNS Identification of the amateur station; Use of the call signs; Composition of call signs; National prefixes.	x													
CHAPTER 6. IARU BAND PLANS IARU band plans; Purposes.	x													
CHAPTER 7														
7.1 SOCIAL RESPONSIBILITY OF RADIO AMATEUR OPERATION														
7.2 OPERATING PROCEDURES	anrop													
c) NATIONAL AND INTERNATIONAL REGULATIONS RELEVANT TO TI														
1. ITU RADIO REGULATIONS														
Definition Amateur Service and Amateur Satellite Service;														
Definition Amateur station;														
Article 25 Radio Regulations;														
Status Amateur Service and Amateur Satellite Service;														
ITU Radio Regions.														
2. CEPT REGULATIONS Recommendation T/R 61-01; Temporary use of x														
3. NATIONAL LAWS, REGULATIONS AND LICENCE CONDITIONS .														
National laws	x													
Regulations and licence conditions														
Demonstrate knowledge of maintaining a log: - log keeping; - purpose; - recorded data	x													
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