

USKA Input Paper #3 to IARU R1 Interim Meeting 2022

Subject: Bring the “Full License” Syllabus of Amateur Radio to the 21st Century

Society: USKA

Country: Switzerland

Committee:

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Author: Willi Vollenweider HB9AMC

1. Proposal

We propose that the partly outdated CEPT/HAREC-2018 recommendation (“Full” License) be quickly adapted to the requirements of the 21st century.

(this proposal does not affect the entry level licenses issued by numerous national administrations)

2. Motivation

In his opening address to the IARU October 2021 Workshop, president Don Beattie said: “*In short, I think we need a **relevant product** to offer to **today’s generation**”.*

This is uncomfortable for all of us, but true.

As we all know, Communication Technologies have arrived in the 21st century, but our license exams including associated training activities have not.

Aforementioned CEPT/HAREC T/R 61-02 recommendation keeps producing an outdated and false image of what Amateur Radio really is today, in stark contrast to what young STEM talents expect!

We have to ask ourselves the question: “*Why should a 17 year old want to become a radio amateur?*” To be honest, we answer him/her that it makes no sense whatsoever to learn last century’s technologies as required by regulators, but rather recommend him/her to join more innovative communities which instead focus on 21st century technologies which contribute real value to his/her education, career and life.

Even if the 2018 HAREC improvements (DS+DSP) were included into the national exam syllabuses (e.g. not yet the case in Switzerland), most current exams lag at least twenty years behind “state of the art”. This neglect and denial of new technologies in exam syllabuses are one of the major reasons why our hobby is NOT MARKETABLE anymore to young STEM talent. (Who are by the way not afraid at all to meet intellectual challenges!) This can very easily be proven by studying the age histograms of Member Societies, and is not subject to speculation. Not surprisingly, many Member Societies refrain from publishing these age histograms.

3. Objectives

For many, if not all of the Strategic Objectives (SO) defined in the October 2021 STF workshop, the need to fix this problem is prerequisite. Should we refrain from meeting this challenge quickly, we will not be taken serious in pursuing most of the goals as defined in our “Shaping the Future” process.

For good reason, governmental “Digital Transformation” initiatives are in the hands of ministries responsible for Industry, Economy, Research, Science and Education, not “Communication”. We must understand and accept that youth education and technological competitiveness are in most countries not the task of purely administrative and law enforcing communication regulators. For this reason, ministries with economic objectives must be involved with priority.

Young STEM talents want to technically understand 21st century technologies, not how communication used to function in the last century.

In addition, young STEM talents are not at all “stupid” consumers. But rather experimenters, creators, makers, researchers, innovators and curious discoverers!

We may not hesitate to throw outdated “material” over board in order to get our boat afloat again.

Recommendation: Modern Amateur Radio exam syllabuses and curricula should take into account:

- Motivation: How can I learn “Digital Transformation”? How can I profit from it? How can I avoid to become a victim of it? What’s in for me, for my education, for my career, for my life? How can I learn to understand how today’s high tech world functions, enabling me to take the right decisions?
- Adding new ICT Content (thereby substituting outdated content to avoid “overloading”):
 - Digital Fundamentals (Digital Logic, DAC/ADC, Digital Signals, Digital Signal Processing, Digital Filters, digital Modulation/Demodulation, SDR, ...)
 - Microcomputer Technology (architecture, interfacing, system software, languages, tools, integrated development environments etc)
 - Fundamentals of Methods of digital transmission of text, voice, image, video and data (Sampling, quantisation, coding, error correction, data compression, channels, lossy/lossless, real time communication, ...)
 - Networking Fundamentals (Ethernet, IP, Addressing, Ports, Switch, Routing, Gateways, Firewalls, Protocols, Services, Security... (IEEE 802), Web technologies (W3C.org)
 - Experimentation/Applications (VoIP, DATV, LoRa, LoRaWAN/IoT, HAMNET, FreeDV, M17, Vara, Winlink, Pactor, FT8, Webservers, Satellite Telemetry, API’s, Tools etc)
- Goal:
Radio Amateurs shall be proud to be recognized in society and by employers as “Ambassadors of modern Communication Technologies”. Thus contributing to make Amateur Radio relevant again.

Details to be discussed.

4. Remark

It is very important to take into account that young STEM talents nowadays already know how to write computer programs in at least one programming language.

Most school children learn how to program robots early. Writing computer code has become a widely recognized part of basic skills, similar to reading and writing, speaking English, fundamental math skills.

This is a very fortunate starting position for us. Hence, Amateur Radio courses do not have to teach programming to our students. In rare cases, any missing prior knowledge such as mathematics or programming essentials can be taught in additional preparatory course units.

5. Legal Basis

International Telecommunication Union: Recommendation ITU-R M.1544-1 (09/2015). (ITU is the United Nations specialized agency for information and communication technologies - ICTs.)