



Amateur Radio - Safety

Presented to

LARC Basic Ham License Course
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by:

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with a little help from my friends

SAFETY - Overview

- Housekeeping
- Structures Climbing Safety - Study Guide 16.7
- Lightning - Study Guide 16.8
- Station Grounding - Study Guide 16.2
- Household Power, & Hazards - S. Guide 16.1
- Antenna Safety - Study Guide 16.6

2

If you don't pay attention, you may...

- ANNOY YOUR FRIENDS AND NEIGHBORS
- ANNOY YOUR FELLOW HAMS
- ATTRACT GOVERNMENT ATTENTION
and/or FINES
- **INJURE YOURSELF**
- **>> INJURE OTHERS <<**
- **>>>> KILL YOURSELF <<<<**

3

Housekeeping

- Introduction of Mike Watts VE3ACW, ...
- Only one person speaks at a time
- Questions when instructor invites them
- 5 minute break every hour

4

AMATEUR RADIO IS A LIFETIME TECHNICAL HOBBY...

- A LIFETIME OF **LEARNING**.
- IT HAS **RISKS** THAT HAVE TO BE MANAGED.
- SOME CAN BE MINIMISED BY **PRACTICES** (SOP's).
- ALL MUST AND CAN BE MANAGED BY SOUND **SKILL** AND BALANCED **JUDGEMENT**.

5

Structures Climbing Safety

- Safety considerations:
 - structure **security**,
 - needed **equipment**: correct attire, safety footwear, hard hat, gloves, safety glasses, belt or harness
 - **Buddy** system,
 - **3 point** contact
- Best way to climb - full **belaying**, "SLT"

6

Self Belay Rigging

DEMO

flip chart diagram

7

Lightning

- Direct or indirect strikes
- Totally unpredictable
- Induced voltages can be anywhere
- Rise time is in microseconds = several MHz
- Therefore grounds must have low inductance to provide low impedance to ground
- Grounding minimal #6 braid or strap

8

Station Grounding = Guide 16.2

- Separate ground from electrical ground
- Ground rods are copper clad steel
- Minimum ground rod length 8 feet, 10 better
- Alternate to rod is ground plate

9

Household Power - Guide 16.1

- Must follow standard electrical code wiring
- Modern 3 wire, service capacity = 100 Amp
- Separate circuits for power and light
- **Key lock switch** to disable station power
- Correct plug wiring - L.B.G.R.
- Fire extinguisher & CO2 monitor desirable
- Safety interlocks
- Isolation transformers
- Power bars, UPS
- Spike arresters

10

SHOCK HAZARD

- LETHAL VOLTAGE = 30 Volts
- CURRENT:
 - 1-2 mA FEEL IT
 - 10 mA PAIN
 - 10-100 mA SEVERE PAIN
 - 100 mA DEATH

MOST SUSCEPTABLE ORGAN = HEART

11

FIRST RESPONDER ACTIONS FOR ELECTRIC SHOCK

KILL POWER

INSULATE YOURSELF

REMOVE VICTIM FROM SOURCE

CALL 911

START CPR IF NEEDED.

KIR9 KIR9 KIR9

12

RADIATION EFFECTS

- MOST SUSCEPTABLE ORGAN = **EYES**
- FED **SAFETY CODE 6**
- 30-300 MHz is most susceptible
- TISSUE HEATING
- R.F. BURNS DON'T HEAL

13

ANTENNA SAFETY

- Position
- Aiming
- Proximity
- VHF / UHF considerations
- NVIS antennas: special considerations

14

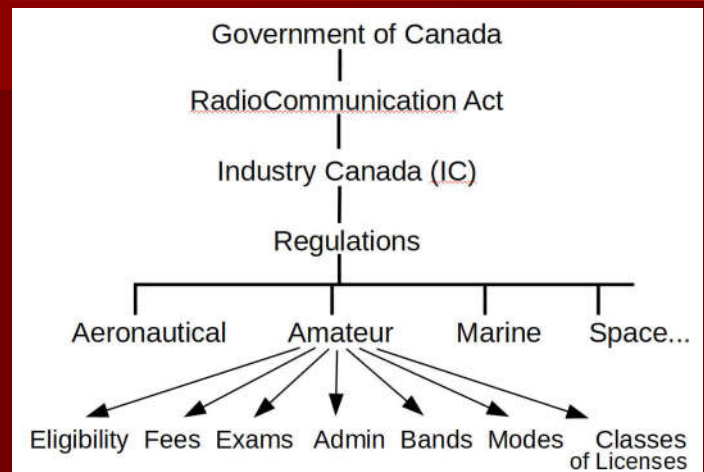
Safety -/- Rules & Regs

---- End OF SAFETY -----

---- Start of RULES and REGULATIONS ----

15

The Rule Makers



SECURITY OF INFORMATION ACT

NO PERSON SHALL MAKE USE OF, DIVULGE THE CONTENT OF OR EXISTENCE A RADIO BASED COMMUNICATION, UNLESS IT ORIGINATES FROM A BROADCAST ENTITY OR AN AMATEUR RADIO STATION

THIS ACT, LIKE THE WEIGHTS AND MEASURES AND FIREARMS ACTS, HAS REAL TEETH !!!

EXCEPTIONS: PROTECTING PROPERTY DAMAGE
PREVENTING HARM
COURT EVIDENCE
NATIONAL SECURITY

17

Privileges of a **Basic Ham License**

- Build commercial kits
- Operate cross band repeater
- Operate store and forward repeater
- Can use 250W input / 560 W PEP / 190W AM
- Can operate above 30 MHz

18

Privileges of an **Advanced** ham license

- Operate repeaters in general
- Trustee for a club station
- Design and build transmitters and amplifiers
- Can use 1000W input / 2250 W PEP / 750W AM
- Can operate above and below 30 MHz

19

General License Admin Info

- Exams can be in English or French
- Exams can be given orally on request
- Certificate is valid for life
- No fees for initial certificate
- No age restriction, any nationality
- Essential requirement: pass the exam
- No time limit on the exam
- Fee to a volunteer examiner to be negotiated
- Fee for Industry Canada administered exam: \$20

20

General License Admin Info - Continued

- \$60 to exchange an existing call sign, including 2 letter suffix call sign
- \$60 for a new club call sign
- \$60 for an additional call sign
- \$60 for a special event call sign or special prefix
- No fee for initial basic call sign, or for replacement certificate (move provinces)
- Only 2 additional qualifications: advanced, 5 WPM CW
- Silent key calls inactive for a year, unless family

21

Operating Parameters

- Bands available specified in RBR-4, schedule 1 for region 2
- Frequency in column 1, bandwidth in column 2
- Bandwidth measured 26dB down from carrier peak
- Should use the minimum power required to affect communications
- Hams are **secondary** status on 5 MHz, 430 MHz, 902 MHz and 2.4 GHz

22

IARU Regions and Prefixes

IARU: US / Canada = region 2

Australia, Japan, SE Asia = region 3

rest of world = region 1

Canadian Call sign prefixes: VO, VE, VA, VY

CY0 - CY9 is Sable and ST Paul's Islands

Special Events can be CJ, CY, CF, CG, etc.

Note: There are no 3 letter suffices in the QOA - QUZ block

23

Third Party Traffic

- 3rd party traffic definition
- In Canada, 3rd party traffic is expressly permitted except to countries where 3rd party traffic is prohibited by the foreign administration
- IC / RAC have lists of countries forbidding 3rd party traffic

24

Admin Rules

- You have 30 days to register an address change with Industry Canada (ISED)
- You have 48 hours to comply with a government inspector's demand
- A government inspector can only demand access to your station if he has a warrant

25

Prohibited

- Out of band transmissions
- Harmful interference (may interfere if your station is in distress)
- Music transmission
- Secret ciphers (PSK31, FT8, digital not secret)
- False emergency calls (\$25,000 dollar fine)
- Broadcast to general public (ARRL exception)
- Obscene or profane language
- Business communications
- Any compensation or payment or pecuniary interest

26

Emergency / Distress

- Ham can answer any **unanswered** distress call on **any** frequency using **any** mode, using **any** power
- Voice distress call prefixes:
PAN, **SECURITE**, **MAYDAY** (most severe)

27

Station Identification

- An amateur must transmit its own call sign in English or French at **beginning**, and **end** of every series of transmissions and **at intervals not less than 30 minutes**.
- Chat language can be anything
- There's no legal requirement for Canadian hams to add "mobile" or "portable"
- Canadian IDs vs American IDs
- ID requirement exception: controlling an RC model

28

Definitions

- **Licensee**: a person holding a valid certificate
- **Control Operator**: Must hold a certificate and have control of the emissions
- An **Operator**: any person using the equipment under direct supervision of a control operator

29

Towers / Antenna Support Structure

- There have been recent changes for antenna support structure regulation
- Industry Canada (ISED) trumps everything else, and allows a **maximum of 15 meters**
- Local Usage Authority can allow **more, but not less**
- "Antenna support structure" rather than tower
- immediate neighbour = those living within 3 times the height of the structure in a radius of the base
- London: personal use only, 1 meter from any property line, **up to 16.6 M high**, not in front yard

30

Rules & Regs

---- End of RULES and REGULATIONS ----