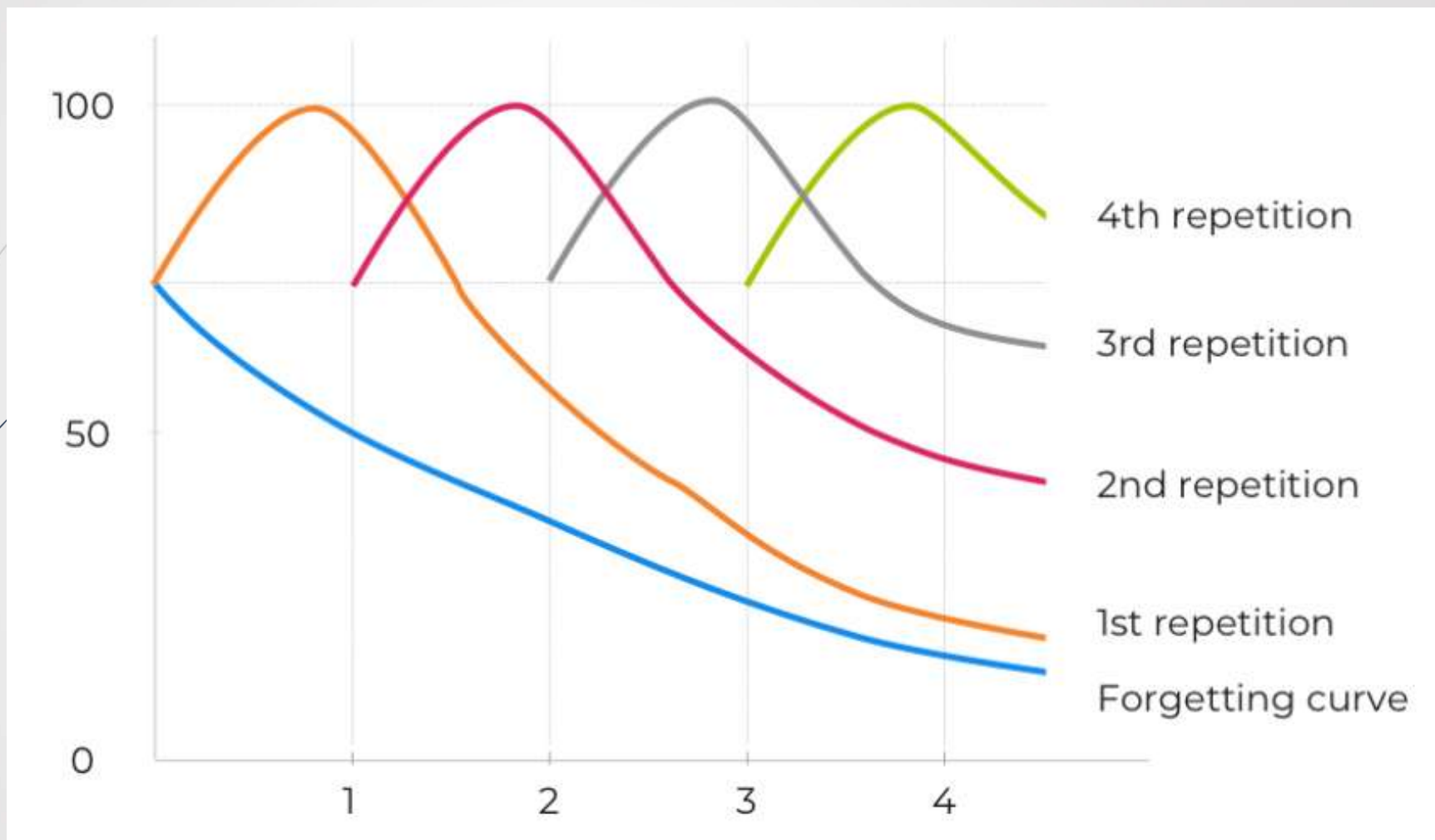




How to Study and Prepare for a Ham Test

Bob Ross





Study pattern

- Read book
- Take notes
- Create a single page reference sheet
- Review questions and correct answers for the chapter
- Watch videos for the chapter
- Do a practice test for each chapter and keep a list of missed questions with correct answers
- Use a calculator



Read book:

- Get the correct ARRL book for the test
- Take notes as you read it

Chapter 5

Bandwidths:

| | |
|-----------------|--------------|
| CW | 150 Hz |
| SSB voice | 2 to 3 kHz |
| FM voice | 10 to 15 kHz |
| AM fast-scan TV | 6 MHz |

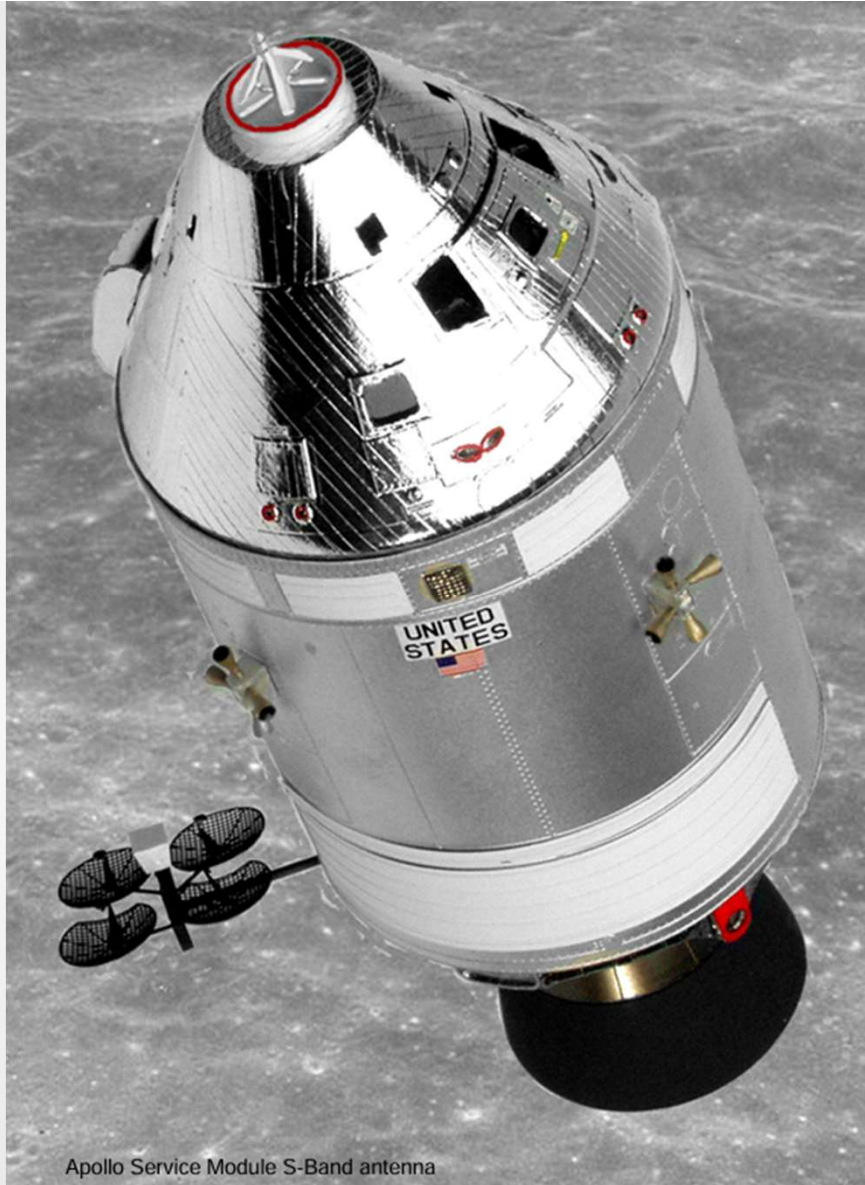
Filters:

| | |
|---------|-------------------------------|
| SSB | wide filter 2.4 kHz (2400 Hz) |
| CW/data | narrow filter 500 Hz |



Link new information to:

- 1) something you already know
- 2) some silly picture or story
- 3) a mnemonic



Apollo Service Module S-Band antenna



This Good Morning,

King Henry Died

by Drinking Chocolate Milk

Making Nothing Possible.



р п з э о а б а к м г т



Tera
Giga
Mega
kilo
hecto
deca
base
deci
centa
milli
micro
nano
pico



| | |
|-------|-----|
| Tera | 12 |
| Giga | 9 |
| Mega | 6 |
| kilo | 3 |
| hecto | 2 |
| deca | 1 |
| base | |
| deci | -1 |
| centa | -2 |
| milli | -3 |
| micro | -6 |
| nano | -9 |
| pico | -12 |



Read book:

- Create a single page reference sheet

Ham Technician Test Reference Sheet 3/6/24

ELF 3-30Hz

$$E=IR; I=E/R; R=E/I$$

SLF 30-300Hz

$$P=IE; I=P/E; E=P/I$$

ULF 300Hz-3kHz

VLF 3-30kHz

$$P=I^2R$$

LF 30-300kHz

$$P=E^2/R$$

MF 300kHz-3MHz

$$E=\text{SQR}(PR)$$

HF 3-30MHz

VHF 30-300MHz

$$\text{Wavelength Meters} = 300 / \text{Freq. MHz}$$

UHF 300MHz-3GHz

SHF 3-30GHz

$$\text{Length Feet} = 468 / \text{Freq. MHz dipole } \frac{1}{2} \text{ wave}$$

EHF 30-300GHz

$$\text{Length Feet} = 234 / \text{Freq. MHz ground plane } \frac{1}{4} \text{ wave}$$

300GHz-3THz

Tera 12

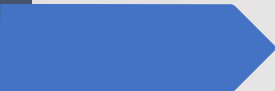
$$M = \text{feet} * 3.28$$

Giga 9

Mega 6

kilo 3

hecto 2

- 
- Review questions and correct answers for the chapter
 - Watch videos for the chapter
 - Do a practice test for each chapter and keep a list of missed questions with correct answers

Right Answers Study Guide (Fifth Edition)
Technician Class – Chapter Two

T3B04. What is the velocity of a radio wave traveling through free space?

Speed of light

T3B05. What is the relationship between wavelength and frequency?

Wavelength gets shorter as frequency increases

T3B06. What is the formula for converting frequency to approximate wavelength in meters?

Wavelength in meters equals 300 divided by frequency in megahertz

T3B07. In addition to frequency, which of the following is used to identify amateur radio bands?

The approximate wavelength in meters

T3B08. What frequency range is referred to as VHF?

30 MHz to 300 MHz



Watch Videos:

- Dave Castler (ARRL YouTube)
- W4EEY (YouTube)



Practice exams:

- ARRL.org Exam Practice
(<https://arrlexamreview.appspot.com/>)
- HamExam.org

Chapter 4

For antennas less than $\frac{1}{2}$ wavelength from the ground:

Estimate antenna length (in feet) = $468/\text{frequency in MHz}$ (dipole ($1/2$ wavelength))

= $234/\text{frequency in MHz}$ (ground-plane ($1/4$ wavelength))

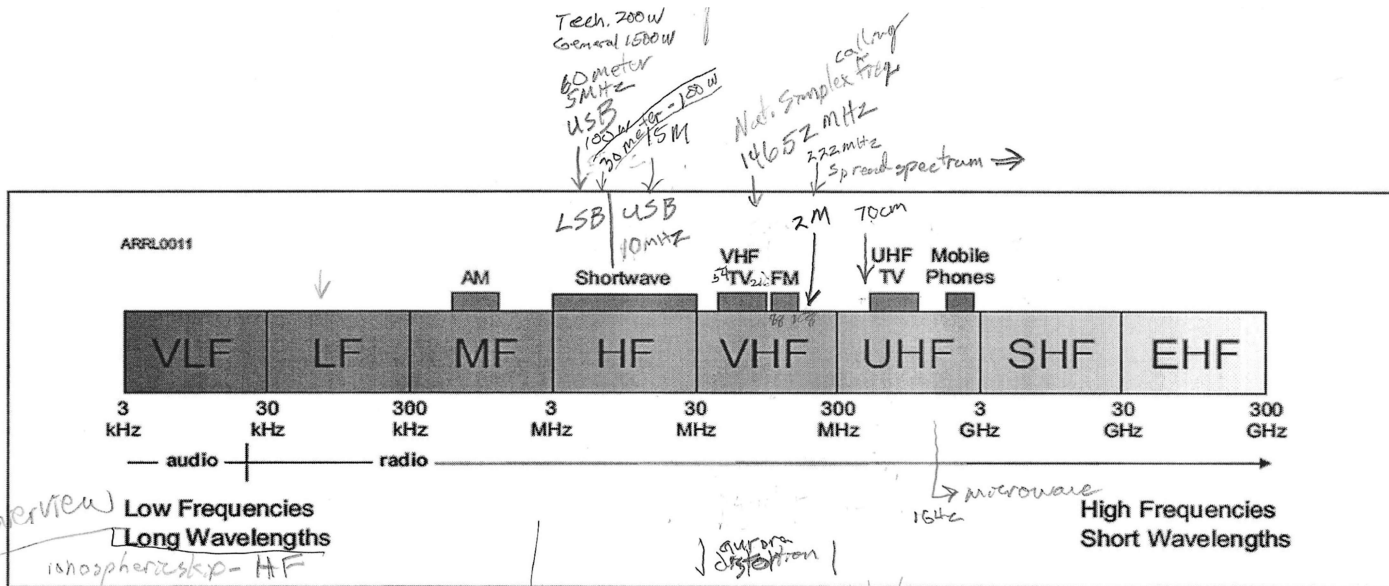
Connectors: PL-259 (plug) / SO-239 (socket) for HF

N connectors above 400 MHz

Meters * 3.28 = feet

Missed Questions:

1. CH4-1 T3A08 What is a likely cause of irregular fading of signals propagated by the ionosphere?
Random combining of signals arriving via different paths
2. CH4-1 T3A12 What is the effect of fog and rain on signals in the 10 meter and 6 meter bands?
There is little effect
3. CH4-1 T3C06 What type of propagation is responsible for allowing over-the-horizon VHF and UHF communications to ranges of approximately 300 miles on a regular basis?
Tropospheric ducting
4. CH4-3 T3C04 Which of the following types of propagation is most commonly associated with occasional strong signals on the 10, 6, and 2 meter bands from beyond the radio horizon?
Sporadic E



Overview
 Low Frequencies
 Long Wavelengths
 ionospheric skip - HF

aurora - VHF
 fog/freon - High VHF, microwave
 everything else VHF & UHF
 high sunspots/meteor scatter 6 meter (VHF)

aurora
 vegetation
 buildings, hills (shadowing)
 fog & rain
 ← little effect
 Refraction (gradual bending)
 multipath deadspots (picket-fencing)
 Higher digital error rate
 tropo ducts - 300mi
 ionosphere skip
 7 dummy signal peak
 10 meter (30MHz) during day
 6 meter (60MHz) high sunspots/meteor scatter
 sporadic E (skip) 10, 9, 2 meter early summer and winter



Use a calculator



Test pattern

1. Do not study on the day of the test – only review your reference sheet
2. Walk in but do not engage in any deep conversations
3. Keep going over the things you need to put on the reference sheet



Test pattern

4. Start test

5. Create reference page on scratch paper

6. Breathe deeply and stay relaxed – anxiety clogs your brain

Test pattern

7. If a question requires you to think deeply, write down the number and move on. Come back later to the list and answer them at the end.
8. How to analyze a question – A) what do they want and B) what do you have

Test pattern

9. If a question is giving you trouble – think of it backwards: Eliminate the incorrect answers and that leaves the correct answer.
10. Stay with your first answer – be very resistive to changing it (Don't talk yourself out of the correct answer)



Questions?