

# General License Examination – Memorization Sheet

## General Class HF Frequency Privileges

10 meters	<b>28000 – 29700 kHz</b>
12 meters	<b>24890 – 24990 kHz</b>
15 meters	<b>21025</b> – 21200 kHz and 21275 – <b>21450 kHz</b>
17 meters	18068 – 18168 kHz
20 meters	14025 – 14150 kHz and <b>14225 – 14350 kHz</b> (the last digits are 25-50, 25-50)
30 meters	<b>10100 – 10150 kHz (CW and data only)</b>
40 meters	7025 – 7125 kHz and <b>7175 – 7300 kHz</b>
80 meters	<b>3525 – 3600 kHz and 3800 – 4000 kHz</b>
160 meters	1800 – 2000 kHz

**Bolded** items are in the question pool

Maximum 1500 watts PEP, **Except** 200 watts PEP on 30 meters, 100 watts for beacons

## 60 meter rules

5 authorized channels 2.8kHz wide with USB and 50 watts ERP maximum. No interference to adjacent services and records must be kept if gain antenna is used.

## RTTY/data near center of CW allocation (170Hz shift for amateur RTTY)

80m data 3570-3600                      20m RTTY 14.070-14.100 MHz                      20m PSK31 14.070

## Maximum Symbol Rate for Packet, RTTY, or Data

Below 10 meters (28 MHz)	300 baud	
10 Meter band	1200 baud	
6 and 2 meters	19.6 kilobaud	Maximum 20Khz bandwidth

General privileges can be used immediately with General CSCE by adding “/AG” to callsign on CW and “Temporary AG” on phone

## Minimum Channel Separation

CW 150 – 500Hz                      RTTY 250 – 500Hz                      SSB 3 kHz

## Power Multipliers

One S-Unit = 20dB = 100 fold power change  
6dB = 4 fold power change  
3dB = 2 fold power change  
1dB loss = -20.5%

## Data Modes

PSK31 uses varicode  
RTTY uses 5 bit Baudot with 170Hz shift

## Sideband Operation

Below 14 MHz use lower sideband (LSB)  
Above 14 MHz use upper sideband (USB)

## Propagation

A-index – Long term geomagnetic stability  
K-index – Short term geomagnetic stability  
Solar Flux – Radio energy at 10.7cm  
D layer absorbs  
E layer maximum single hop distance 1200 miles at altitude of 70 miles  
F2 layer maximum single hop distance 2500 miles  
X-rays take 8 minutes to arrive, coronal mass ejections (CMEs) take 20-40 hours to arrive

A two tone linearity test uses two **non-harmonically related** audio tones

Q-Signals and Prosigns

QRP – Low power operation, ~ 5 watts on HF      QRV – Ready to receive  
 QRS – Send more slowly      KN – Listening for specific station(s)  
 QRQ – Send faster      CL – Closing station  
 QSL – Acknowledge receipt      AR – End of message

Wire Sizes

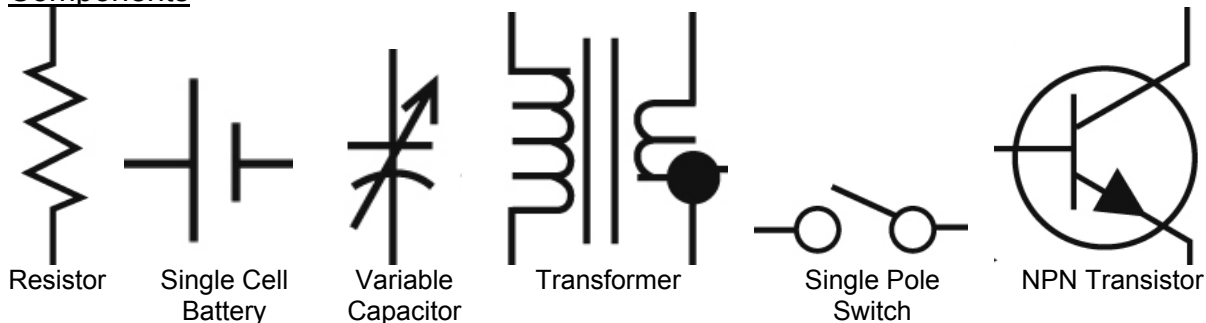
15 amp circuit requires 14 gauge wire - 20 amp circuit requires 12 gauge wire

Series/Parallel	Series	Parallel
Resistors/Inductors	Add (R <sub>1</sub> +R <sub>2</sub> +R <sub>3</sub> ...)	Divide (1/ R <sub>1</sub> +R <sub>2</sub> +R <sub>3</sub> ...)
Capacitors	Divide (1/ C <sub>1</sub> +C <sub>2</sub> +C <sub>3</sub> ...)	Add (C <sub>1</sub> +C <sub>2</sub> +C <sub>3</sub> ...)

Reactance

Increases with frequency in a coil, decreases with frequency in a capacitor

Components

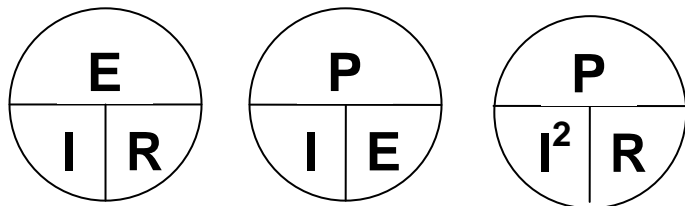


Peak Envelope Power

$$PEP = [(0.707PEV)(0.707PEV)]/RL$$

Where: PEV = Peak Voltage  
 RL = Resistive Load

Ohm's Law and Power Formulas



E = Voltage in Volts  
 I = Current in Amperes  
 R = Resistance in Ohms  
 P = Power in Watts

Cover the value you need and divide or multiply the remaining values as appropriate

Examples:

$E = I \times R$	$I = E / R$	$R = E / I$
$P = I \times E$	$I = P / E$	$E = P / I$
$P = I^2 \times R$	$R = P / I^2$	$E^2 = P \times R$

Antenna Lengths

Dipole Length       $L \text{ (Ft)} = \frac{468}{F \text{ (MHz)}}$

$\frac{1}{4}\lambda$  Vertical       $L \text{ (Ft)} = \frac{234}{F \text{ (MHz)}}$

L is Length in Feet and F is Frequency in MHz

Divide Full Wave Loop by 4 for one side of **Quad** Loop  
 Divide Full Wave Loop by 3 for one side of **Delta** Loop