General License Examination – Memorization Sheet

General Class HF Frequency Privileges

10 meters **28000 – 29700 kHz**
12 meters **24890 – 24990 kHz**
15 meters **21025** – 21200 kHz and 21275 – **21450 kHz**
17 meters 18068 – 18168 kHz
20 meters 14025 – 14150 kHz and **14225 – 14350 kHz** (the last digits are 25-50, 25-50)
30 meters **10100 – 10150 kHz (CW and data only)**
40 meters 7025 – 7125 kHz and **7175 – 7300 kHz**
80 meters **3525 – 3600 kHz and 3800 – 4000 kHz**
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
QRS – Send more slowly
QRQ – Send faster
QSL – Acknowledge receipt
QRV – Ready to receive
KN – Listening for specific station(s)
CL – Closing station
AR – End of message

Wire Sizes

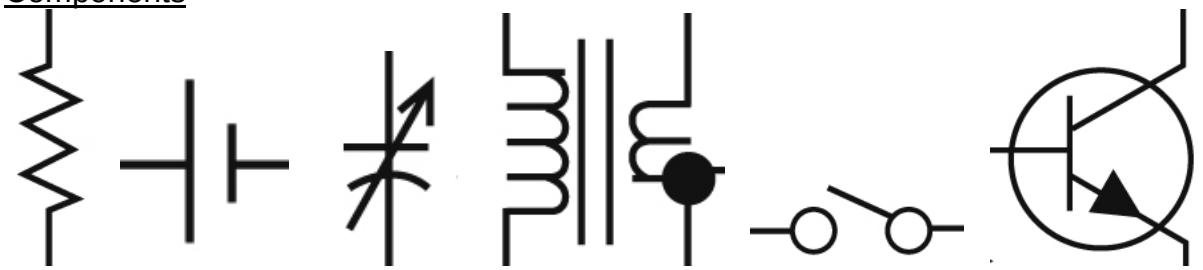
15 amp circuit requires 14 gauge wire - 20 amp circuit requires 12 gauge wire

Series/Parallel	Series	Parallel
Resistors/Inductors	Add (R_1+R_2+R_3…)	Divide (1/ R_1+R_2+R_3…)
Capacitors	Divide (1/ C_1+C_2+C_3…)	Add (C_1+C_2+C_3…)

Reactance

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

Components



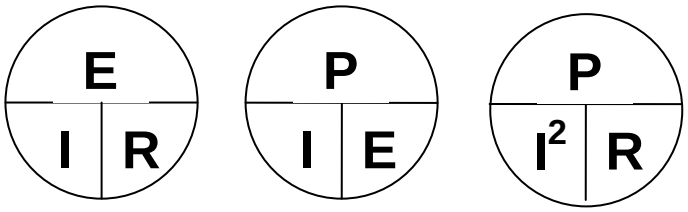
Resistor | Single Cell Battery | Variable Capacitor | Transformer | Single Pole Switch | NPN Transistor

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:

$E = I \times R$	$I = E / R$	$R = E / I$
$P = I \times E$	$I = P / E$	$E = P / I$
$P = I^2 \times R$	$R = P / I^2$	$\mathbf{E^2 = P * R}$

Antenna Lengths

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

¼λ Vertical L (Ft) = $\frac{234}{F\ (MHz)}$

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

Valid from July 1, 2007