Practical Assessment Information

Prepared by Paul Hoffmann VK5PH Specialist Assessor

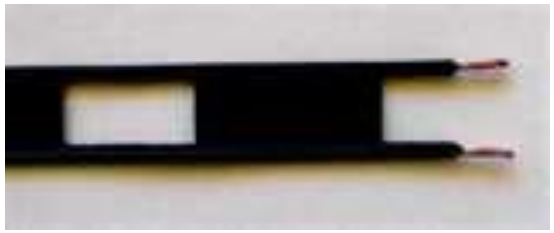
1. Identify common transmission lines types.

Parallel

Coaxial

Coax cable codes like RG58 are not required.

2. Identify balanced and unbalanced transmission lines.



Balanced

Unbalanced

3. Identification of common coaxial connectors.

BNC

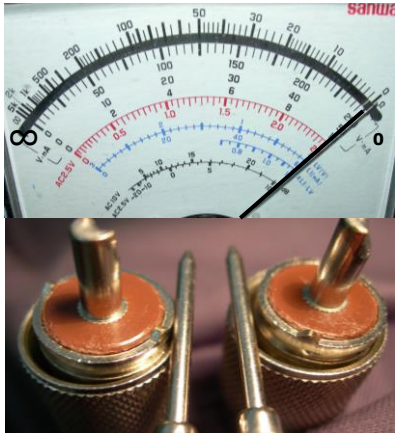
N

PL259 or UHF

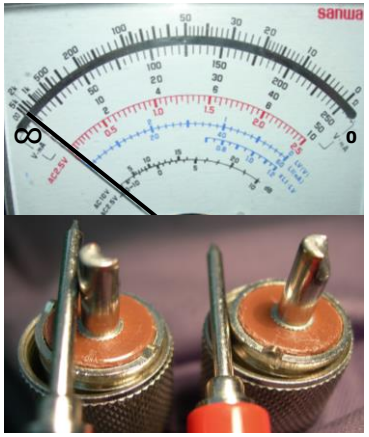
You must identify at least two of these connectors.

4. Conduct a continuity check on a coaxial cable terminated with RF connectors.

Inner to inner
Low resistance



Outer to outer
Low resistance



Inner to outer
High resistance

You indicate what resistance is expected in each case.

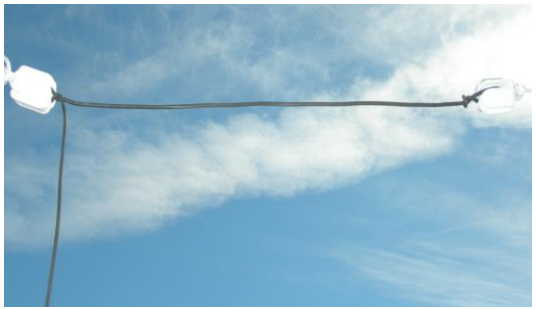
5. Identify Antennas.

Dipole

Yagi or Beam

Vertical

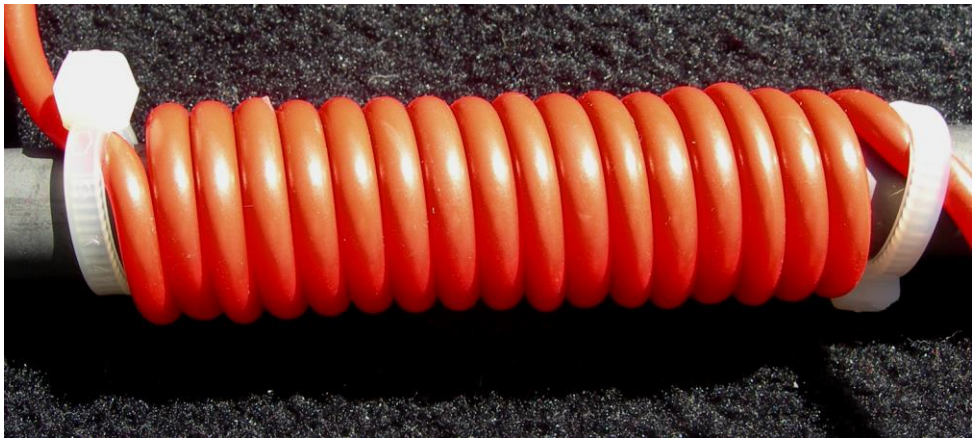
Folded Dipole



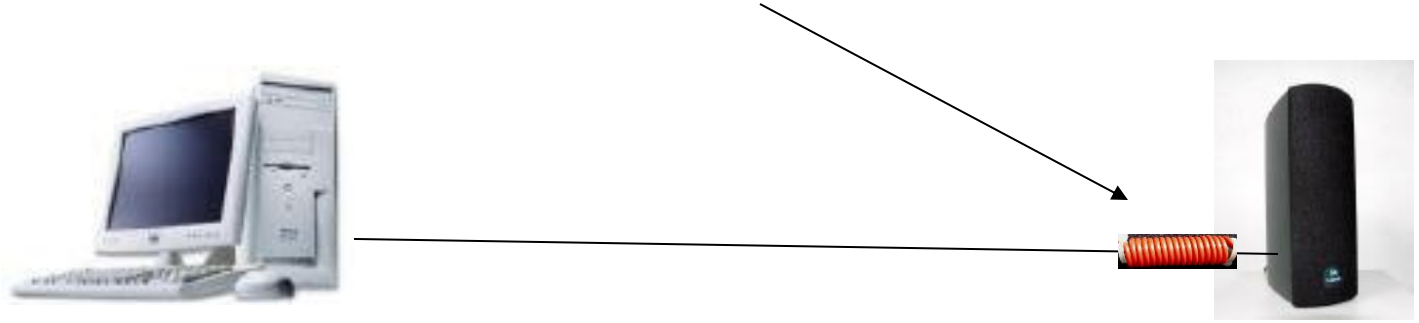
End Fed

You must identify at least four types of antenna.

6. Construct an RF choke.



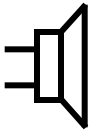
Explain why the choke is placed as close as possible to the affected device.



7. Symbol identification.

Antenna

Earth



Speaker

Microphone

Resistor

Lamp

Switch

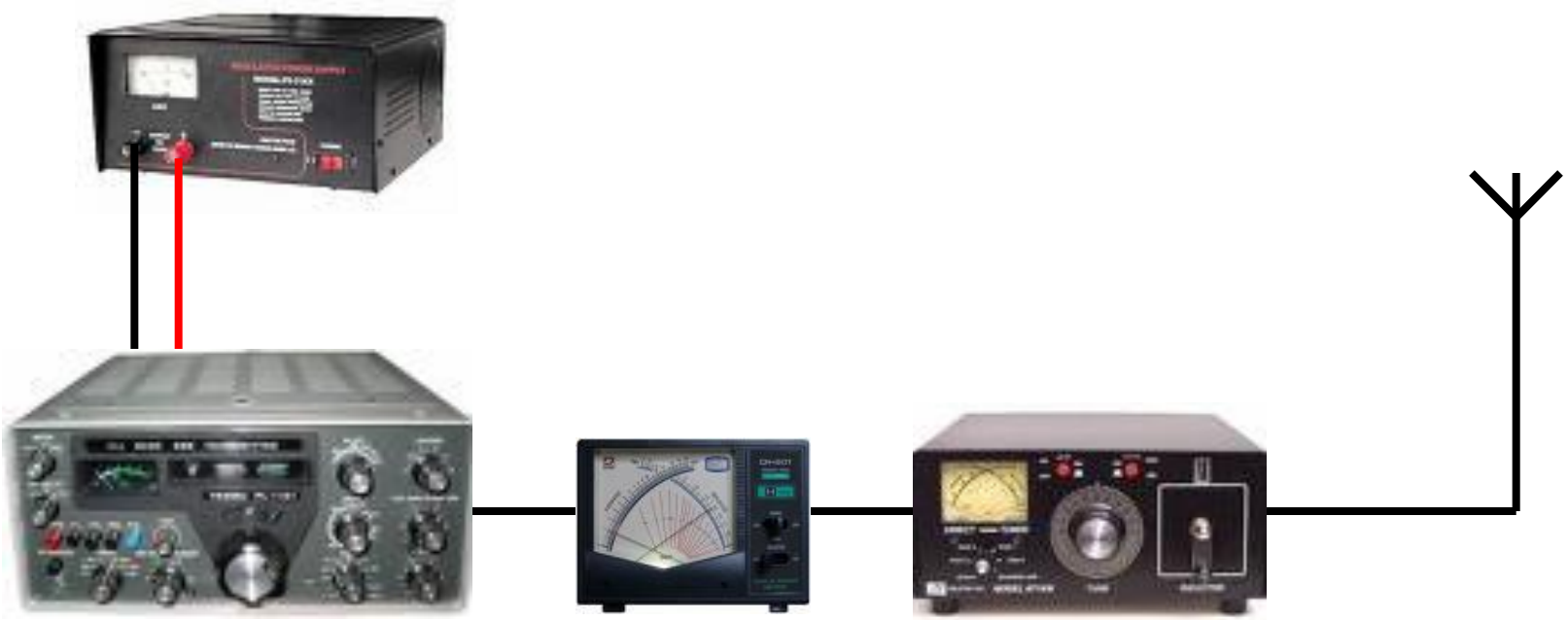
Cell

Battery

Fuse

You must identify five symbols correctly and these must include the antenna & earth symbols.

8. Demonstrate safely the connection of a transmitter/receiver.



The SWR meter is located between the transceiver and the ATU
Ask Assessor to check the setup before you power up the radio.

9. Identify amateur radio bands using LCD.

Band	Frequency
80m	3.50-3.70MHz
40m	7.00-7.30MHz
15m	21.00-21.45MHz
10m	28.00-29.70MHz
2m	144.00-148.00MHz
70cm	430.00-450.00MHz

Identify 4 bands correctly from the permitted frequency tables in the LCD

10. Demonstrate the protocol(s) required prior to commencing transmitting.

- Increase volume and adjust squelch to a minimum – this will improve your chances of hearing a weak signal
- Listen – nothing heard
- See if the frequency is busy

  "This is VK5PH - Is this frequency in use?"
- Listen – nothing heard
- Put out a call to the required station

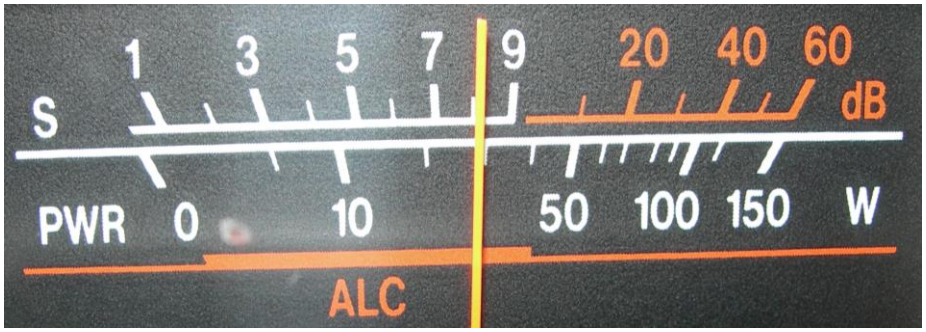
11. Demonstrate on-air calling procedures for HF and VHF or UHF.

- After checking that the frequency is free.
- For **HF** say ***"VK5BP VK5BP VK5BP this is VK5PH VK5PH VK5PH calling and listening"***
- For **VHF/UHF** say ***"VK5BP this is VK5PH calling and listening"***
- For a general call you might just say ***"This is VK5PH listening on the Crafers repeater"***

12. Demonstrate how the signal strength meter is used in conjunction with a signal report.

- The signal's readability is rated from 1 (poor) to 5 (perfectly readable).
- The signal strength can be read from the power meter. Generally from 1-9.

You will be required to give a signal report during the assessment.



12. Demonstrate how the signal strength meter is used in conjunction with a signal report.

- Scale S1-S9 with each S-point defined as a 6dB change in signal strength. If we drop an S-point the voltage is halved (-6dB)
- S9 (50uV) is strong however for stronger signals we use 10dB steps. So S9+20 means 20dB above S9

13. Explain the correct use of voice repeaters with and without CTCSS & DTMF.

Continuous Tone Coded Squelch System					
67.0 Hz	79.7 Hz	94.8 Hz	114.8 Hz	141.3 Hz	167.9 Hz
69.0 Hz	82.5 Hz	100.0 Hz	118.8 Hz	146.2 Hz	173.8 Hz
71.9 Hz	85.4 Hz	103.5 Hz	123.0 Hz	151.2 Hz	179.9 Hz
74.4 Hz	88.5 Hz	107.2 Hz	131.8 Hz	156.7 Hz	186.2 Hz
77.0 Hz	91.5 Hz	110.9 Hz	136.5 Hz	162.2 Hz	192.8 Hz

CTCSS tones are sub-audible.
These tones are only used with FM mode.

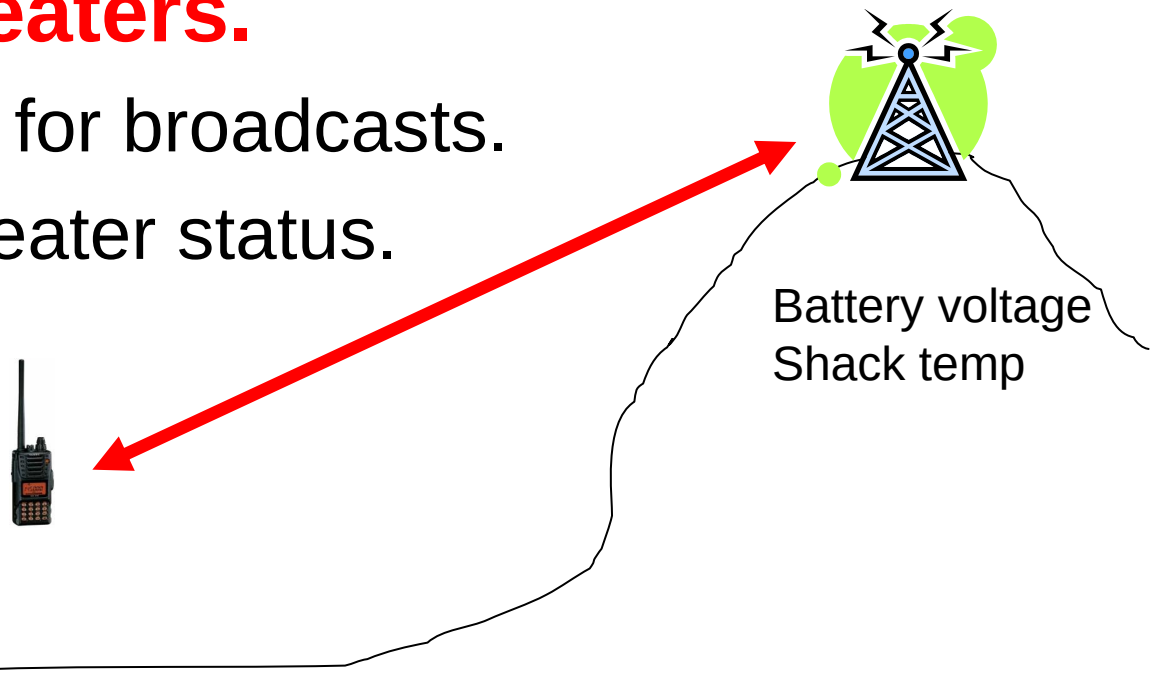
13. With the material provided demonstrate the correct use of voice repeaters with and without CTCSS & DTMF.

Dual Tone Multi Frequency				
		Digit		
Low Tone (Hz)	697	1	2	3
	770	4	5	6
	852	7	8	9
	942	*	0	#
High Tone (Hz)		1209	1336	1477

DTMF tones are audible.
These tones are only used with FM mode.

13. With the material provided demonstrate the correct use of voice repeaters with and without CTCSS & DTMF.

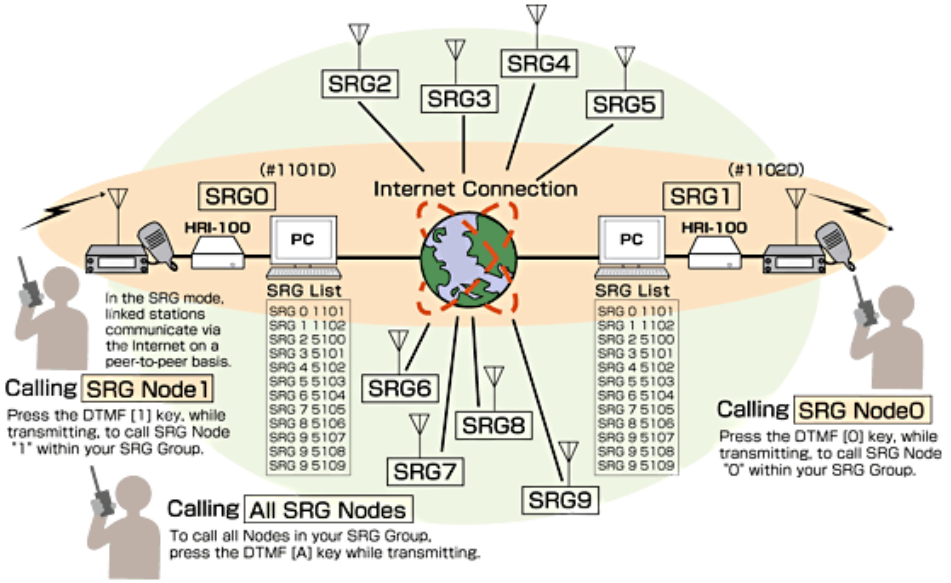
- **To control repeaters.**
  - Extend timeout for broadcasts.
  - Interrogate repeater status.



CTCSS is sometimes called Private Line (PL).

13.With the material provided demonstrate the correct use of voice repeaters with and without CTCSS & DTMF.

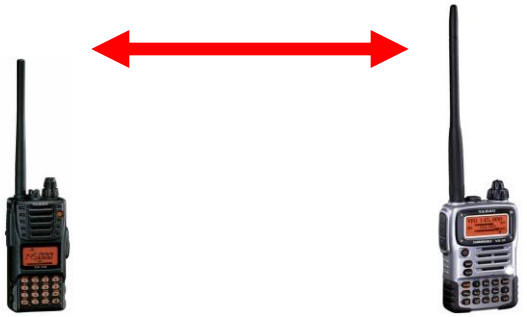
- To allow the interconnection of repeaters via IRLP.



IRLP Node list on the Internet – IRLP is permitted for Foundation Licensees.

13.With the material provided demonstrate the correct use of voice repeaters with and without CTCSS & DTMF.

- To limit the receipt of signals to those with the correct code.



147.0MHz
CTCSS 151.4

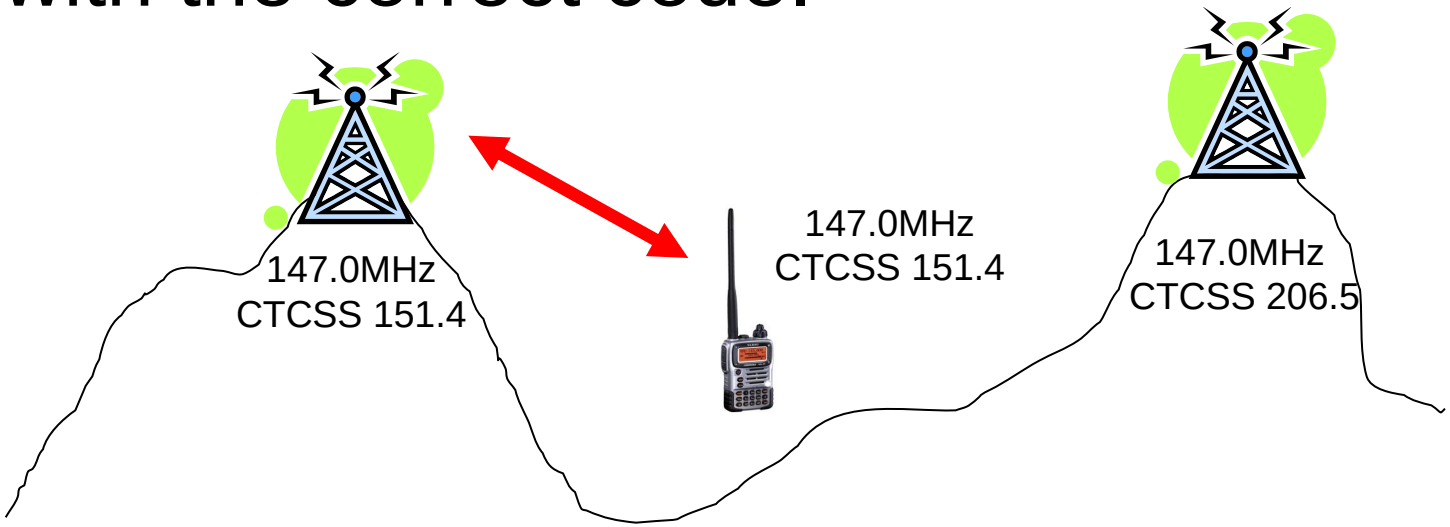
147.0MHz
CTCSS 151.4

147.0MHz
CTCSS 206.5

All radios on the same frequency but 2 have the same CTCSS tone

13.With the material provided demonstrate the correct use of voice repeaters with and without CTCSS & DTMF.

- To limit the receipt of signals to particular devices with the correct code.



The repeater will only hear radios transmitting the correct CTCSS tone and may transmit a tone so only that radios with the correct tone CTCSS receive.

14. Explain the purpose of breaks in transmissions.

- Allow the repeater to reset to prevent time out – wait for the kerchunk – count to 5 after the last over concludes.
- Provides an opportunity for others to join the conversation.
- Allows someone to put a call out for another person.

15. Change to another frequency (QSY).

- Find a nearby frequency that doesn't appear to be in use.
- Check that the frequency is clear.
- Go back to the original frequency and tell them the proposed frequency.
- Get the other party to confirm the new frequency – repeat the frequency back to you.
- Change to the new frequency.
- Put out a call for the other party or say something like ***"VK5PH on frequency"***

16. Q-Code and the Phonetic Alphabet.

- List some phonetic codes or spell your name phonetically.
- List some Q codes and their meanings.
  - QTH – location
  - QSY – change frequency
  - QRP – low power
- Q codes can be used both as a question or an answer.

17. Transmitter power measurement and adjustment.

- Switch transmitter to SSB.
- Ensure that the power meter is set to forward power measurement on the correct scale. Generally start off at the meter's highest power range first and work down through the ranges.
- Make a sound with constant tone and volume.

  " Haaaaaaaaaaaaaaallo" for example
- Adjust the power level so that the meter reads 10 Watts.

18. Measurement of SWR (single-needle)

- Set transmitter to low power and switch mode to FM, CW or AM.
- Set SWR meter to Calibrate and rotate calibration knob fully counter-clock-wise (so you don't bounce needle).
- Transmit and slowly bring the needle up to the Calibration Point ▼ by turning knob clock-wise.

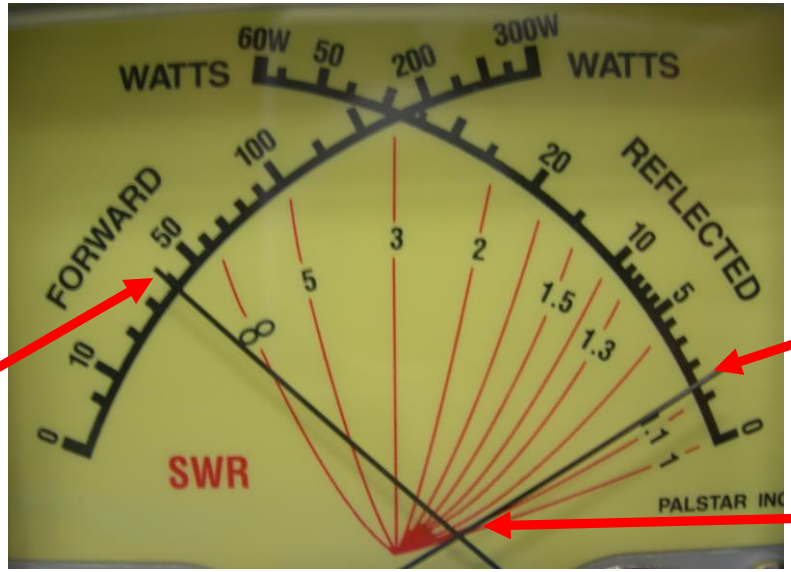
- Switch meter to SWR, then transmit and measure SWR.

SWR of 1.5:1 shown.

The SWR should be rechecked if you change frequency significantly.

18. Measurement of SWR (cross-needle)

- Set transmitter to low power and switch mode to FM, CW or AM.
- Transmit and read the SWR measurement where the two needles cross.



Forward Power

Reflected Power

SWR reading taken where needles cross. Read from the red SWR scale.

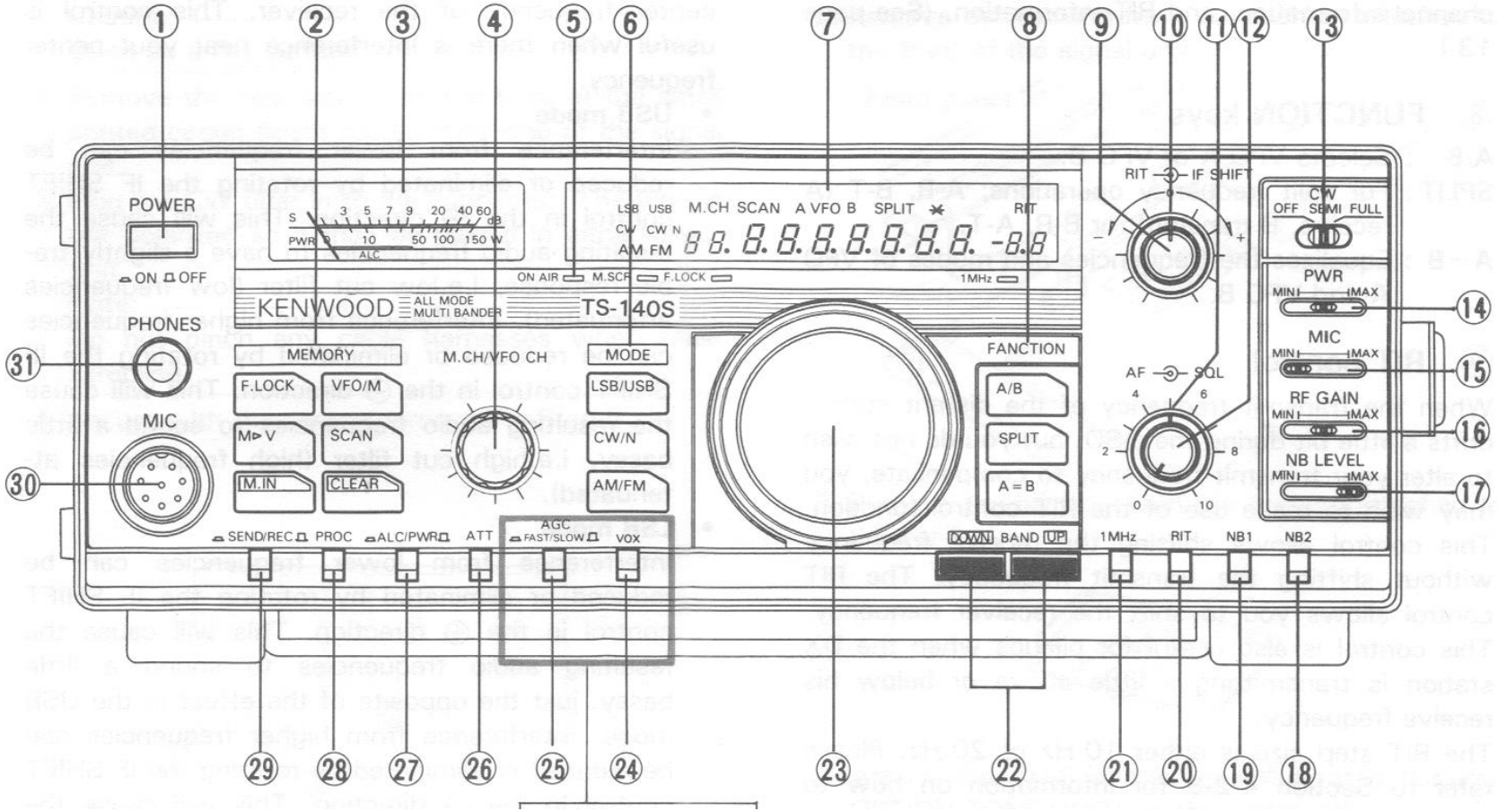
19. Correcting high SWR.

- Shorten or lengthen the antenna elements until the SWR is acceptable at the desired frequency.
- Insert an ATU antenna tuning unit sometimes called antenna matching unit or transmatch into the circuit between the SWR meter and the antenna.

20. Safety with RF, high voltages and currents.

- 13.8V from batteries and power supplies is considered safe.
- High currents can cause fires.
- 240V is dangerous.
- Do not go near antennas when someone is transmitting.

Radio controls



Radio controls

Power	Can be a soft switch on some radios.
F.Lock	Lock the frequency & mode.
M.In	Enter data into memory.
VFO/M	Switch between VFO & Memory.
Scan	In VFO mode will start program scan or in Mem mode will scan memory.
Meter	S-meter on receive or ALC or power meter on transmit.
M.CH/VFO	Change frequency in 10kHz steps or selects memory channel.
On Air	Lights during transmit.

Radio controls

Mode	Select LSB, USB, CW, AM or FM
A/B	Selects VFO A or VFO B
Split	A-Rx B-Tx or A-Tx B-Rx
A=B	Equalises frequencies and modes.
RIT (Receiver Incremental Tuning)	When operational allows you to change the receive frequency without changing the transmit frequency.
IF Shift control	Shift the IF passband of the receiver without changing the centre frequency.
Squelch	Eliminate atmospheric and static noise during no signal periods. Slowly rotate control until the ambient noise just disappears.

Radio controls

AF Gain control	Alters the volume.
C/W Off/Semi/Full	Affects the transmission of morse code.
Power control	Power level can be controlled in the FM, LSB and USB modes. Adjust so that the needle sits in the ALC section.
Mic Gain control	Microphone gain can be adjusted in USB, LSB and AM.
RF Gain control	Controls the gain of the receivers HF amplifier. Normally set fully CW.
NB (Noise Blanker)	Noise blankers for pulse noise of various durations.
Tuning knob (VFO)	Rotate to select the desired frequency.

Radio controls

RF Amp	Assists when receiving weak signals.
AGC Switch	Selects the response time of the Auto Gain Control. Normally set to slow so that he receiver gain and S-meter change slowly to large input changes. Set to fast when tuning, receiving weak signals or for high speed CW. Disabled for FM operations.
ATT (Attenuator) Switch	The incoming signal can be attenuated by 20dB for very strong signals that are in the order of 20dB over S-9.
Proc (Processor) Switch	Effective transmit power output will increase when the PROC switch is turned on during USB, LSB or AM operation.