

# **DATONG** ELECTRONICS LIMITED

## **MODEL VLF**

Adds Very Low Frequency (VLF) Coverage to Existing Communications Receivers.



## CONVERTS INCOMING VLF SIGNALS TO FREQUENCIES 28MHz HIGHER, FOR EASY TUNING ON NORMAL COMMUNICATIONS RECEIVERS.

### SIMPLY CONNECTS IN SERIES WITH THE ANTENNA.

#### FEATURES

- Covers 0 to 500kHz plus up to 1MHz at lower sensitivity.
- No receiver modifications are required.
- High sensitivity – only a short antenna is required.
- Crystal controlled for high stability.
- Rugged diecast aluminium case.
- SO239 coaxial connectors for input and output.
- Powered by internal 9 volt battery (PP3) or external supply. Long battery life.
- Circuitry completely bypassed and antenna connected directly to receiver when Model VLF is switched off.
- LED "power on" indicator.

#### MANY RECEIVERS NEGLECT VLF

Many current communications receivers have limited coverage or poor sensitivity below 500kHz, a region which includes time signal transmissions, beacons, long wave broadcasting, and certain communications and navigational services.

By connecting Model VLF in series with a receiver's antenna, incoming VLF signals are converted to a frequency 28MHz higher and can be received at high sensitivity with no modifications being required to the receiver.

For example, to receive signals at 19kHz the receiver would be tuned to 28.019MHz. Similarly tuning the receiver to 28.200MHz would give reception of signals at 200kHz.

#### ALSO USABLE FOR LW AND MW RECEPTION

Although the main application of Model VLF is to signals below 500kHz, it can also be used to give reception of long and medium wave signals on normal amateur-bands-only receivers. An internal low-pass filter progressively attenuates signals above 600kHz, but the sensitivity is still adequate to allow good reception of medium and long wave broadcast stations for time checks, news bulletins, etc.

#### INSTALLATION AND OPERATION

Model VLF connects in series with the receiver's antenna. When the unit is switched off the unit is bypassed and the receiver is connected directly to the antenna.

A light emitting diode indicates when the unit is switched on.

Only a short antenna, a few metres of wire, is required due to the high sensitivity of Model VLF.

#### TECHNICAL INFORMATION

Power requirements: External supply of 5 to 16 volts DC at 5mA, or internal 9 volt battery (PP3, 6F22, 006P or equivalent). Internal battery disconnects when jack inserted. Jack tip is positive.

Sensitivity: When used with typical communications receivers having 0.5  $\mu$ V sensitivity, Model VLF needs 1.2  $\mu$ V for 10db signal-plus-noise to noise ratio (SSB, 2.1kHz bandwidth) over the frequency range 10kHz to 600kHz.

The response reduces by 5db at 700kHz, 20db at 1000kHz, 32db at 1400kHz.

Overall gain: 6db typical.

Output impedance: 50 ohms nominal.

Input characteristics: Unbalanced input, suitable for both short high impedance antennas and low impedance matched feeders.

Dimensions: 113mm x 62mm x 31mm (4.5 x 2.4 x 1.2 inches).

Weight: 250gms (8.8 ounces).

#### OPTIONAL ACCESSORIES

Model MPU: mains power unit.

Lead D: coaxial jumper lead, length 1 metre, fitted PL259 coaxial plug at each end.



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## MODEL VLF - INSTALLATION AND OPERATING INSTRUCTIONS

### Power source

Model VLF requires a DC supply of between 5 and 14 volts at 5 milliamps.

It is designed to operate from either an internal battery or an external supply fed via the jack socket. When a jack plug is inserted the internal battery is disconnected. To use an external power supply connect the jack plug supplied so that positive goes to the "tip", and negative to the "sleeve". The negative supply line is connected to the case of Model VLF internally.

NOTE: as the jack plug is inserted the external supply will be momentarily short circuited. Therefore switch the supply off before inserting or withdrawing the plug.

Good life can be expected from an internal 9 volt battery since the current drain is so low. Use type PP3, 6F22, 006P or equivalent.

To install or replace the battery, remove the case lid via the four fixing screws.

When the unit is used with no battery installed the battery clip should be taped to the case to stop it shorting to the circuitry.

If the unit is to be left unused for a long period or if the battery is exhausted, the battery should be removed to eliminate the possibility of corrosion due to battery leakage.

### Operation

1. Use a coaxial jumper lead to connect Model VLF to the coaxial input connector of the communications receiver. If the receiver does not have a coaxial input connector connect the outer shield of the jumper lead to the "EARTH" connection and the centre conductor to the "ANTENNA" connection.
2. Connect an antenna to the input of Model VLF. The input is designed to work effectively with short antennas. In most cases a piece of wire three or four metres long fed to the centre of the coaxial input connector will be quite adequate.

Beware of using very large antennas. Unless their output is attenuated Model VLF will overload and give inferior performance.

3. With Model VLF switched off (button out) the input and output terminals are connected together and the receiver should work normally.
4. With Model VLF switched on (button depressed, LED illuminated) tune the range from 28 MHz upwards to cover the VLF range from zero upwards.  
Example: to receive Droitwich at 200 kHz set the receiver to 28.200 MHz.

### IMPORTANT NOTE:

When using Model VLF with a transceiver take care not to transmit through the unit otherwise it may be damaged. This applies whether it is switched in or out.



### Internal adjustments

Two trimmer capacitors are mounted on the printed circuit board. The larger one (nearest to the antenna socket) can be used to trim the crystal frequency slightly. The smaller one tunes the output of the mixer to 28 MHz. The overall gain of the converter can be reduced by detuning the small trimmer. This may be useful if the main receiver has very high sensitivity and tends to overload when Model VLF is used at full gain.

# Datong VLF Converter

