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Specialists in Animal Radio Monitoring

## BIOTRACK PIP TRANSMITTERS

### Transmitters

Radio transmitters are small sealed units that contain the electronic circuitry needed to produce radio signals. To be built in to a radio tag, they must be fitted with a battery, antenna and mounting system (e.g. harness tubes for a backpack), and then encapsulated in resin ('potted').

### Description of circuit

The 'Pip' is a 'two-stage' transmitter circuit board with separate oscillator and amplifier/antenna matching circuits. It has an independent pulse-forming circuit (a stable multivibrator) and is built from some of the smallest surface mount components available, including a surface mount crystal. The inclusion of this small crystal is the main advance in the Pip, and enables 0.3g to be shaved off the weight of our small tags. For the very smallest tag, this represents a weight reduction of nearly 60%. The transmitter is named after Britain's smallest species of bat (Pipistrelle). The frequency bands that these Pip tags are currently available on are listed below.

### Electrical specification

Frequency bands (MHz):	138.186 - 138.450
	142.000 - 142.384
	148.000 - 148.973
	149.000 - 149.975
	150.000 - 150.500
	150.800 - 150.993
	151.000 - 151.500
	160.013 - 160.380
	164.030 - 164.200
	165.000 - 165.200
	173.200 - 173.350 UK frequency band
	173.700 - 173.999 UK frequency band

Country-specific frequency restrictions apply.

Channel spacing:	Nominally 10 kHz, 12.5 kHz or user-specified (country-specific restrictions apply)
Calibration error:	< ± 5 kHz (nominal), or < ± 1.5 kHz for channelized transmitters.

Temperature error: <  $\pm 10$  ppm (approx.  $\pm 1.5$  kHz) over temperature and voltage range.  
Ageing: <  $\pm 3$  ppm/year (approx.  $\pm 0.5$  kHz per year )  
Extreme temp: -10 to +55 C (for frequency error)  
Working temp: -40 to +60 C  
Extreme volts: 0.9 V to 1.6 V

For antenna type: whip or loop (depending on application)  
Power o/p: up to 0.1 mW on wanted frequency  
< 4 nW on spurious emissions between -  
41 - 68 MHz  
87.5 - 118 MHz  
162 - 230 MHz  
470 - 862 MHz  
< 250 nW on other frequencies

Suitable batteries: silver oxide (1.5 V)  
NB: Not all types of silver oxide cells are suitable  
Potting: Flexible acrylic  
Weight: 0.4 to 4g, depending on battery and mounting configuration  
Size (max.): 7mm x 7mm x 4mm

## Pulse parameters

Rate: 20 - 120 pulses/minute (variable in about 10 pulses/minute steps)  
Length: 5 - 50 ms (variable in about 5 ms steps)  
Current: approximately 1.8 mA  
(quiescent current is 2-3 uA)

## Approvals



Approved under EU Directive 1999/5/EC Radio and Telecommunications Equipment (RTTE).  
Restrictions apply to frequencies of transmitters according to the country in which they are to be used.



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