

GRIFFTECH

SYSTEMS

BEACON (TARGET TRANSMITTER) CONTROL SYSTEMS



M7601

M7704

M7045

M7114

M7706

The Beacon Control System is designed to operate with the Vehicle Tracking System. It employs a radio link to remotely control a number of functions associated with beacons (target transmitters) in a target tracking system.

BEACON (TARGET TRANSMITTER) CONTROL SYSTEMS

A commandable beacon can be conveniently installed prior to commencement of surveillance and then remotely controlled into its various modes of operation as conditions require. In this way, optimum target tracking performance can be achieved and the beacon battery lifetime can be extended. Each commandable beacon comprises a target transmitter and a remote control receiver which responds to digitally encoded, FM radio messages from a command unit. The control is performed by a well-proved system which allows a considerable command range with high reliability of operation. An additional unit, Beacon Status Display, indicates the status of the commandable beacon currently being monitored by the tracking receiver.

FEATURES

- Beacons (Target Transmitters) can be switched on/off remotely.
- Remote switching from pulsed to continuous transmission.
- Relay outputs allow control on target vehicle, ie rear lights on/off, ignition on/off, etc.
- Remote control of movement sensor on/off.

COMMAND UNIT – MODEL M7601

This hand-held unit controls four functions in up to four beacons independently.

Features

- Four Beacons independently controllable.
- Four functions controllable for each Beacon.
- Portable battery operated.
- Can operate on same radio frequency as beacon transmitter.

Control Functions

- Beacon transmitter on/off.
- Continuous or pulse transmission.
- Movement trigger on/off.
- Relay contacts closed/open.

Specifications

- RF Power Output. Approx. 7 Watts into 50 Ohms.
- Antenna. 50 Ohm external (Helical whip supplied).
- Crystal Controlled in range 27-175MHz (as required).
- FM Deviation approx. 1kHz.
- Digitally encoded channel and command addressing. Up to 4 Beacons (Slaves) addressable. Can operate on same frequency as Beacon transmitter if required.
- Size: 230 x 145 x 60mm.

BEACON STATUS DISPLAY – MODEL M7114

The Beacon Status Display is a small unit which plugs into the "Auxiliary" socket of the Tracking Receiver Unit (M7111) to indicate the status of the commandable beacon currently being monitored by the Tracking Receiver. The Display is particularly for use with the Commandable Beacons, information indicated depends on beacon type but can include:

M7114



- (a) Beacon identity
- (b) Mode of operation
 - (1) Target transmitter on/off
 - (2) Pulsing on/off
 - (3) Movement trigger on/off
 - (4) Relay closed/open
- (c) Moving/stationary
- (d) Beacon Battery Low (not for M7704A)

The main function of the display is to confirm responses to commands, especially those which might not otherwise be confirmed, such as relay operation. The unit also indicates beacon movement status which is particularly useful during pulsed transmissions when the information is not available on the Tracking Receiver audio output. Additionally, a switchable buzzer gives a warning when the beacon commences moving after being set in the movement trigger mode, so obviating the need to constantly monitor the Tracking Receiver audio output. A low battery warning (not for M7704A) allows the operator to replace the Beacon batteries before the unit ceases to function.

NOTE

The status of the beacon can only be conveyed to the Display when the Slave Unit is transmitting. When used with Slave Unit M7704A the Display does not confirm the "Target Transmitter Off" command. However, the Commandable Beacon M7706A transmits a special signal to confirm this command. The 7045 is non-commandable but transmits data on status to the display.

SPECIFICATIONS

Power Source	External 10V (via "Auxiliary" socket on M7111).
Input	Binary data (via "Auxiliary" socket on M7111).
Size	120mm x 120mm x 38mm approx.
Controls	Buzzer on/off.
Indicators	(a) Slave 1 to 4 (b) Responses to command <ul style="list-style-type: none">(1) Target transmitter on/off(2) Pulsing on/off(3) Movement trigger on/off(4) Relay on/off (closed/open) (c) Moving (d) Stationary The Slave indicators give a unique response for a Slave low battery state (not M7704A).
Buzzer	Internal buzzer giving unique responses for slave low battery state (not M7704A) and for movement in the movement trigger mode.
Earphone Output	Responds as for buzzer above. Automatically disables the internal buzzer.

COMMANDABLE BEACON – MODEL M7704A (1 Watt)

The 7704A Commandable Beacon is a small unit which can be controlled by Command Unit (M7601) into the following modes:

- (a) Transmitter on/off.
- (b) Pulsing/non-pulsing transmitter operation.
- (c) Movement trigger on/off.
- (d) Independent relay contacts closed/open.

The unit requires an external 12 volt power source. An internal Antenna Matching Unit is used for both the Control Receiver and the Beacon Transmitter, and connections are supplied to allow fine adjustment of the antenna wire for maximum range.

Non-pulsing transmissions are modulated with an identification and a movement signal which can be monitored on the audio output of the Tracking Receiver. Both pulsing and non-pulsing transmissions include digitally encoded data which can be used at the Tracking Receiver to indicate the operating mode and movement status of the Beacon. This is particularly useful to show whether the Beacon is moving or stationary during pulsed transmissions which would not otherwise convey this information. The digital data is encoded and displayed by the Beacon Status Display (M7114) which plugs into the "Auxiliary" socket of the Tracking Receiver Unit (M7111).

The "movement trigger" mode provides a power-saving facility in which the transmitter is energised only when the movement takes place. When movement ceases, the transmitter continues to be energised for an over-run period of approximately 15 minutes, after which it is energised in a low duty ratio mode to conserve power. In this mode, short "confidence" pulses are transmitted periodically to confirm that the transmitter is still functional.

The relay provides a pair of independent voltage-free contacts. A magnetic base (M7080) can be fitted if required.

SPECIFICATIONS

General Features	All remotely controllable:
	(a) Transmitter on/off. Power output 1 Watt.
	(b) Pulsing/non-pulsing transmitter. Pulse rate: ¼ second every 2 seconds (Alarm contacts closed). ¼ second every ½ second (Alarm contacts open).
	(c) Movement trigger on/off. With trigger on: (i) Movement turn-on of internal transmitter with approx. 15 minute overrun. (ii) Confidence pulse every minute Pulse length: 2 second (non-pulsing selected) ½ second (pulsing selected).
	(d) Independent voltage-free contacts closed/open.

For further details see Transmitter data sheet.

COMMANDABLE BEACON – MODEL M7706A

The Commandable Beacon is a small self-contained dual-function unit which may be used as a stand alone beacon or as a slave under the control of the Command Unit (M7601). A magnetic base (M7080) can be fitted if required.

(1) STAND ALONE MODE

When initially powered-up, the unit is automatically set into the movement trigger mode permitting it to be operated as an independent movement-triggerable beacon, without the need of a command unit. The transmitting mode (pulsing or non-pulsing) is operator selectable by use of a wire link connected to the unit's external terminals.

(2) SLAVE MODE

When used as a Slave the following modes are controlled by the Remote Control Command Unit:

- (a) Transmitter on/off.
- (b) Pulsing/non-pulsing transmitter operation.
- (c) Movement trigger on/off.
- (d) Independent relay contacts closed/open.

(3) COMMON FEATURES

The unit can be powered externally, or internally from three readily obtainable alkaline manganese batteries. An internal Antenna Matching Unit is used for both the Control Receiver and the Beacon Transmitter, and connections are supplied to allow fine adjustment of the antenna wire for maximum range.

Non-pulsing transmissions are modulated with an identification pulse and a movement signal which can be monitored on the audio output of the Tracking Receiver. Both pulsing and non-pulsing transmissions include digitally encoded data which can be used at the Tracking Receiver to indicate the operating mode, movement status and battery state of the Beacon. This is particularly useful to show whether the Beacon is moving or stationary during pulsed transmissions which would not otherwise convey this information. The digital data is decoded and displayed by the Beacon Status Display (M7114) which plugs into the "Auxiliary" socket of the Tracking Receiver Unit (M7111).

The "movement trigger" mode provides a power-saving facility in which the transmitter is energised only when movement takes place. When movement ceases, the transmitter continues to be energised for an over-run period of approximately 15 minutes, after which it is energised in a low duty ratio mode to conserve power. In this mode, short "confidence" pulses are transmitted periodically to confirm that the transmitter is still functional.

SPECIFICATIONS

General Power Source	Internal – 3 off 9V alkaline manganese (eg Mallory MN1604) or External +9 to +15V Supply current (approx.) at 9V 1mA transmitter off 80mA transmitter on	
Endurance	With fresh batteries: Mode	Lifetime
	Transmitter off (receiver operating)	60 days
	Transmitter on – pulsing	5 days
	Transmitter on – non-pulsing	8 hours
Size	118mm x 93mm x 32mm approx.	
Weight	500g approx. (including batteries).	

Control Slave Section

Frequency	Crystal controlled single frequency in 30-175MHz band.
Receiver Sensitivity	– 160dBm (approx. 5km command range in open terrain with helical whip on the command unit).
Antenna	Shares Antenna Matching Unit with transmitter.
Relay	Max. switching power 35W. Max. switching voltage 150V d.c. Max. switching current 2A.

Transmitter Section

Power Output	¼W nom. into 50 ohms with 9V supply.
Frequency	Crystal controlled single frequency in 30-175MHz band.
Features	Identification signal (non-pulsing transmission). Movement monitor signal (non-pulsing transmission). Binary encoded data included in transmission to convey: (a) Slave Number (identity). (b) Mode of operation. (c) Status – moving or stationary. (d) Battery state.

Antenna Matching Unit

Impedance	50 ohms when wire length correctly adjusted.
Wire length	Approx. 160mm.
Wire type	24swg phosphor-bronze.

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BEACON – MODEL 7045 (¼ Watt)

The 7045 comprises a ¼W transmitter, with power saving, movement sensor, antenna matching, integral battery and magnetic base.

The power saving facility ensures that the Beacon is energised only when triggered by movement or activation of a pair of make/break contacts. When triggering ceases, the Beacon continues to be energised for an over-run period of approximately 15 minutes after which it is maintained in a low duty ratio mode to conserve power. In this mode, short "confidence" pulses are radiated periodically to confirm that the unit is still functional. Alternatively, the unit may be set during deployment to be energised in a continuously pulsing mode independent of trigger activations.

When energised, the Beacon transmits short pulses at either of two repetition rates selectable by the operator. The transmissions include digitally encoded data which can be decoded and displayed at the Tracking Receiver by the Beacon Status Display (M7114) which indicates the identity, operating mode, movement status and battery state of the Beacon. This is particularly useful to show whether the Beacon is moving or stationary for pulsed transmissions which do not convey this information by any other means.

The Beacon is powered from an internal, readily obtainable alkaline battery and requires only a simple wire antenna. These features together with the Beacon's small size and fitted magnets facilitate easy concealment and rapid deployment.

SUMMARY OF FEATURES

- ★ ¼W pulsed transmitter – 2 pulse rates selectable.
- ★ Power saving mode – movement or make/break triggerable.
- ★ Continuous pulsing mode selectable.
- ★ Internal, readily obtainable battery.
- ★ Fitted magnets.
- ★ Simple wire antenna.
- ★ Operating mode, movement status and battery state included in transmission.

NOTE

The Beacon is controlled by a microprocessor which permits factory modification of the operation of the unit to customer requirements. All of the parameters (eg pulse length, pulse repetition rate, over-run period etc) can be modified to any value within limits to satisfy most tracking requirements.

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Design & Manufacture:
MICROMILL ELECTRONICS
The Old Mill, Queen Street,
Emsworth, Hants. PO10 7BT
Tel: (0243) 376263

SPECIFICATIONS

Transmitter Power	¼W nominal.														
Frequency	Crystal controlled in range 27-175MHz.														
Modulation	Narrow band FM (deviation approx. 1kHz).														
Antenna	Thin wire approx. 250mm.														
Pulse duration	¼ second.														
Pulse rate	1 pulse every 1 or 8 seconds (selectable).														
Over-run period	15 minutes.														
Confidence pulse rate	1 pulse every 1 or 8 minutes (linked to pulse rate selection).														
Triggers	(a) Internal movement sensor (selectable). (b) External make/break contacts (between the M and E terminals).														
Controls	Switches: (a) ON/OFF (b) Pulse rate (¼ seconds) (c) Movement trigger enabled. Others: Continuous pulsing mode (External wire link between B and E terminals).														
Transmitted Data	Digitally encoded data included in the transmission to convey: (a) Beacon Identity (b) Operating Mode (1) Continuous pulsing selected (2) Pulse rate selected (3) Movement trigger selected (c) Status – moving or stationary (d) Battery state														
Power Source	Internal 9V alkaline manganese (eg Duracell MN1604). Circuits are protected against reverse polarity connection.														
Endurance	With fresh battery: <table><thead><tr><th>Mode</th><th>Lifetime</th></tr></thead><tbody><tr><td>"Confidence"</td><td></td></tr><tr><td>1 pulse/sec selected</td><td>25 days</td></tr><tr><td>1 pulse/8 sec selected</td><td>50 days</td></tr><tr><td>Transmitter pulsing</td><td></td></tr><tr><td>1 pulse/sec</td><td>20 hours</td></tr><tr><td>1 pulse/8 sec</td><td>7 days</td></tr></tbody></table>	Mode	Lifetime	"Confidence"		1 pulse/sec selected	25 days	1 pulse/8 sec selected	50 days	Transmitter pulsing		1 pulse/sec	20 hours	1 pulse/8 sec	7 days
Mode	Lifetime														
"Confidence"															
1 pulse/sec selected	25 days														
1 pulse/8 sec selected	50 days														
Transmitter pulsing															
1 pulse/sec	20 hours														
1 pulse/8 sec	7 days														
Magnetic base	Qty 6 Rare Earth magnets.														
Size	Approx. 84 x 64 x 30mm including magnets.														
Weight	Approx. 200g with battery.														

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