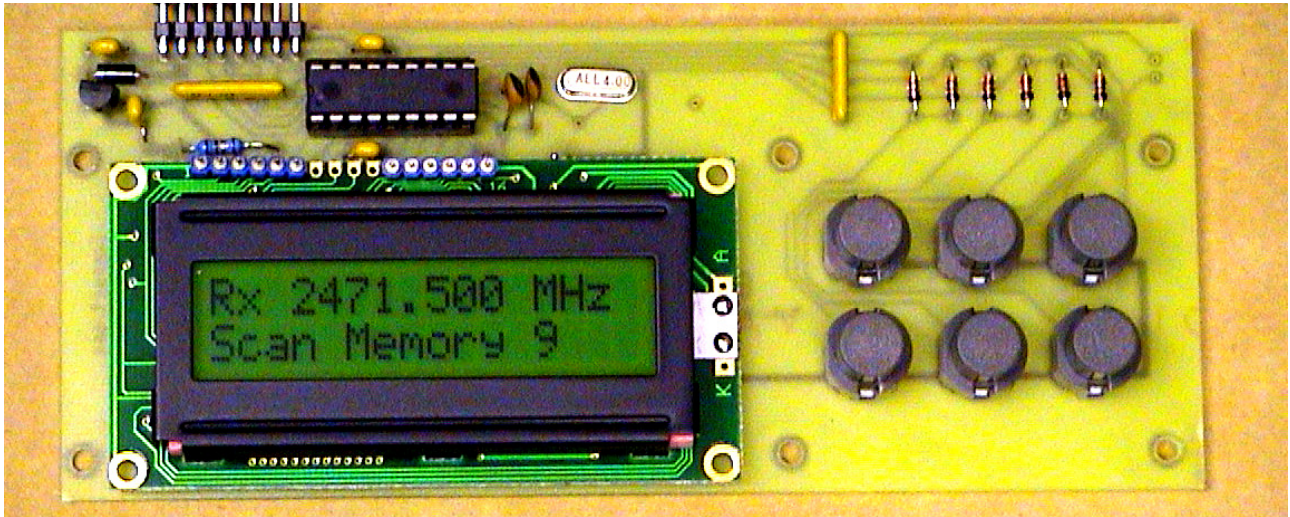# Archive document from G1MFG.com

*The best ATV gear in the world...*

## ENG Receiver controller

This document is provided as-is, without any warranty.



## Specification

| | |
|---|---|
| *Frequency range* | 2.200 - 2.700GHz (some receivers may not tune the entire range) |
| *Frequency Step size* | 125kHz      (250kHz in Band Scan mode) |
| *Frequency selection* | Pushbutton tuning or memory recall |
| *Number of memories* | 10      (plus special Scan Lo and Scan Hi memories) |
| *Scan modes* | Memory scan or frequency scan between any two frequencies |
| *Pause Scan function* | Yes, via external electrical connection |
| *Power requirements* | 10-18V DC, 10mA typical (standard), 50mA (backlit version) |
| *Compatible with* | G1MFG.com ENG receiver, 13cm Advanced (DIP switch versions), and standard 13cm receiver (4 LED version) |

## Principles of operation

The LCD controller contains a PIC microprocessor which provides control signals direct to the synthesiser within the receiver module, replacing the 18 pin PIC on the receiver printed circuit board.  Because the frequency selection is no longer constrained to whatever can be coded from 8 DIP switches or a single pushbutton and four LEDs, it has been possible to improve the finesse of frequency selection to 125kHz, and also to extend the receiver frequency range.

Frequency selection is now achieved by up/down tuning buttons, or by various scanning modes. The receive frequency and other operating information is shown on the LCD display.

**WARNING:** The LCD controller can be damaged if power is removed while a memory is being stored.  You should also avoid switching the controller on and off rapidly and repeatedly.

## Installation

Switch off the receiver. Remove the 18 pin PIC chip (if fitted) from its socket on the receiver PCB. The PIC is no longer required and may be used for your own experiments.

### *Identifying the connections*

This is the pinout of the LCD controller. Note that the metal pins are not fitted to all versions.
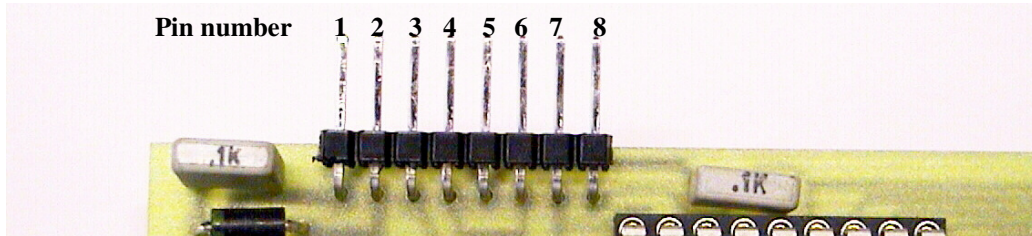


| Controller pin | **Function** (this differs slightly from the text on the PCB foil pattern) |
| --- | --- |
| 1 | 0V (ground) from power supply |
| 2 | +12V nominal from power supply |
| 3 | SDA (serial data) to receiver module |
| 4 | SCL (serial clock) to receiver module |
| 5 | 0V (ground) |
| 6 | SCL (serial clock) |
| 7 | Not used |
| 8 | Scan Pause input (ground to activate) |

Identify the SCL and SDA pins on the receiver module. The SCL pin is the bottom one, and the SDA pin is the next one up.



SDA (to LCD pin 3)

SCL (to LCD pin 4)
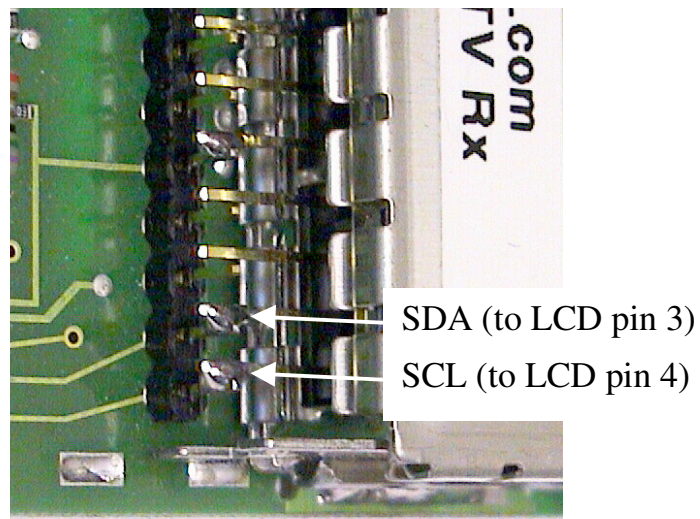
### *Connection instructions*

The controller must be used fairly close to the receiver module. We recommend that the connections are no more than about 300mm (12"). The fundamental limitation of interconnection length is the capacitance to ground and to each other of the SCL and SDA wires, which should not exceed about 200pF. You may be able to get away with longer interconnections by using low-capacitance cabling but we cannot guarantee success.

Wire up the LCD controller to the receiver as shown in the diagram overleaf.
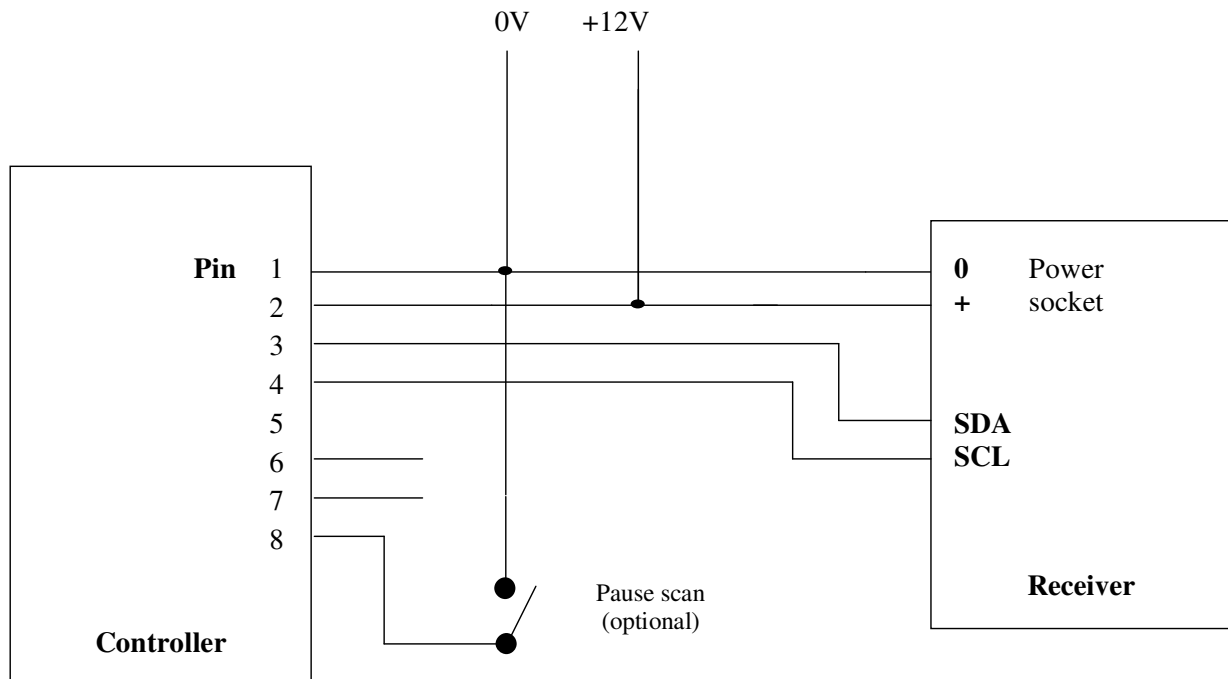
The Pause Scan switch is optional. Pin 8 can be driven by an external circuit (e.g. a sync detector). The pin must not go above +5V or below 0V. The input is pulled up to +5V via 10k.

If you want to mount the receiver a long way from the controller, you can use Philips $I^2C$ Bus Extender ICs type P82B715. You will need one at each end of the control cable. We have used these ICs to control a receiver via more than 50m of cable. P82B715 ICs are available from Farnell and other suppliers, and at the time of writing (April 2001) they cost about £5 each.

## Important notes about your receiver

### Power supply

The receiver requires a supply of supply of 12 to 15V DC, tip positive. Reverse polarity will cause very serious damage. Do NOT use less than 12V. If your receiver has two voltage regulators mounted on heatsinks then we recommend operating it from 12V. Supplies above 14V will make the regulators run very hot.

### Video and audio connections

Video and audio connections are as follows:

- Yellow phono socket - composite video
- White socket - audio demodulated from 6.0MHz sound subcarrier (if present on transmission)
- Red socket - audio demodulated from 6.5MHz sound subcarrier (if present on transmission)

### Video deviation (gain)

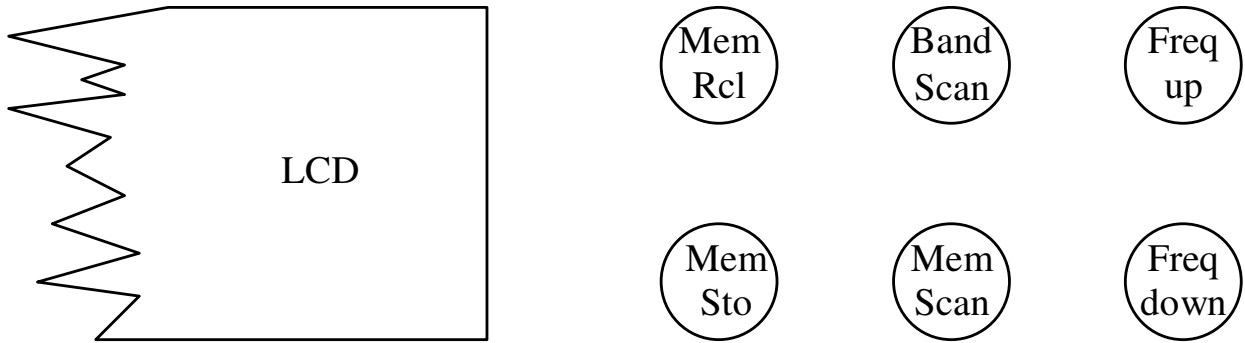Video gain is set using the pre-set pot on the main PCB.

### Video de-emphasis

The receiver does not include video de-emphasis. A suitable de-emphasis circuit is published on our web site at www.G1MFG.com/PCB/.

### Powering a mast-head pre-amp

If you need to power a preamp via the co-ax, DC insertion is done using the pin on the receiver module nearest the aerial socket. Do not exceed 18V or 250mA or you could kill the receiver.

# Operating instructions

## *Identifying the Controls*

```
        ┌─────────────────┐       ⎛ Mem ⎞      ⎛ Band ⎞      ⎛ Freq ⎞
        │                 │       ⎝ Rcl ⎠      ⎝ Scan ⎠      ⎝  up  ⎠
        │      LCD        │
        │                 │       ⎛ Mem ⎞      ⎛ Mem  ⎞      ⎛ Freq ⎞
        └─────────────────┘       ⎝ Sto ⎠      ⎝ Scan ⎠      ⎝ down ⎠
```

## *Basic operation*

Use the *Freq Up* and *Freq Down* buttons to select a frequency.  The buttons auto-repeat.

## *Band scan*

Press *Band Scan* to make the receiver scan between the lower and upper limits stored in the special memories *Scan Lo* and *Scan Hi* (see *Storing a frequency in a memory*, below).  Band Scan operates with 250kHz steps.  You can make the receiver pause on the current frequency by taking pin 8 low (see wiring diagram).

Press *Band Scan* again to stop scanning.

## *Recalling a memory frequency*

Press *Mem Rcl* to step through the memories.  The receiver will tune to each memory in turn.  The button does not auto-repeat.  You can use *Freq Up* and *Freq Down* to change the frequency once it has been recalled.  This does not affect the frequency stored in the memory.

## *Memory scan*

Press the *Mem Scan* button.  The receiver will step through the 10 memory channels (0-9), pausing for about 3 seconds on each channel.  Memory Scan always starts with Memory 0.  You can make the receiver pause on the current memory by taking pin 8 low (see wiring diagram).

Press *Mem Scan* again to stop scanning.

## *Storing a frequency in a memory*

Use the *Freq Up* and *Freq Down* buttons to select the frequency you want to store, then press *Mem Sto*.  Press *Mem Rcl* to select the memory in which you want to store the frequency, then press *Mem Sto* to write the frequency to the selected memory.  All memories are non-volatile.

Two special memories are provided - *Scan Lo* and *Scan Hi*, which set the lower and upper scan limits for the Band Scan function.  Please make sure that you store a higher frequency in *Scan Hi* than *Scan Lo* otherwise you'll get an error message when you press *Band Scan*.