

Crawley Amateur Radio Club

ATV on 23cm - Current Status

The ATV Relay Station is not yet in service as it is awaiting final set-up and testing.

Introduction

CARC's ATV license application for a repeater operating on 23cm has been turned down. It is believed NATS objected to the application due to our close proximity to the Primary Radar site at Pease Pottage. CARC has therefore decided to operate a manned 23cm ATV Relay Station G3WSC.

The necessary changes to convert the resident equipment into a Relay Station has meant that the equipment has had to be split into separate Receive and Transmit units. This arrangement has the advantage that it will be easier to test, set-up, fault-find and upgrade. The original RX, TX, PA and Controller modules built by Jack Darby G4TVC and Phil Fuller G0PVQ have been incorporated within the new arrangement.

The modifications include: -

Reconfiguring the original ATV repeater modules into an ATV Relay Station.

Implementing insertion of "Relay Station" identification onto relayed video.

Making improvements to the G1MFG receiver video circuit to improve HF performance and colour burst performance.

Implementing improved video distribution within the set-up.

Incorporating the ability to switch to simplex operation from the shack.

Enabling front panel selection of operating frequencies (all the common frequencies + simplex).

Enabling the switching in of a high gain Yagi aerial for simplex operation.

Make as many as possible of the interconnections plug in or screw terminal.

The new ATV Relay Station G3WSC -

The Relay Station is based on G1MFG receiver and transmitter

modules with a GH Engineering 18W PA.

A schematic of the Relay Station and the Aerial Relay configuration in PDF format is available here.

[Repeater Schematic](#)

[ATV Aerial](#)

Overleaf is an illustration of the Relay Station mounted in a rack that now resides in the club shack.

The two close up shots show the frequency selection available at the front panels.

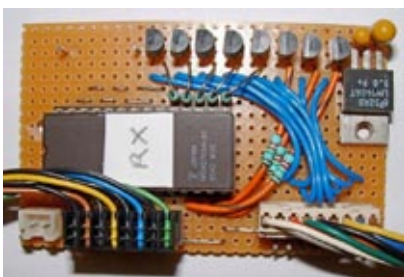
Frequency selection has been achieved by disabling the G1MFG unit dipswitches and connecting the (inverted) data outputs of an EPROM in their place. The unit is shown here with the TX and RX EPROM listings.



The text inserter you will see inside the RX box is based on a modified Panasonic CL350 camera. The camera is locked to the incoming received signal via some sync processing to cope with small incoming signals. The peak white produced by the camera's programmed video text insertion (G3WSC) is gated onto the video going out to the transmitter. Crude, but it works reasonably well. I have now got hold of a professional text inserter card and will upgrade to this in the near future.

The Club ATV Station G6RC

A separate unit has been built to act as a Club Station. This can be used to 'break into' the Relay Station and act as if it were operating through it. This will happen when the microphone TX button is pressed. When the Relay Station is switched to Simplex Mode the separate RX and TX boxes become the slave of the Club Station and become its own RX and TX. The Club Station is shown here.



Encoder



Controller

[Click here to view a PDF of the EPROM listing](#)

To enable simple front panel control of the switching between Relay and Simplex operation an additional control board is required. This is to operate the two coaxial relays, enable/disable the frequency selection in both RX

and TX and enable/disable the text insertion.

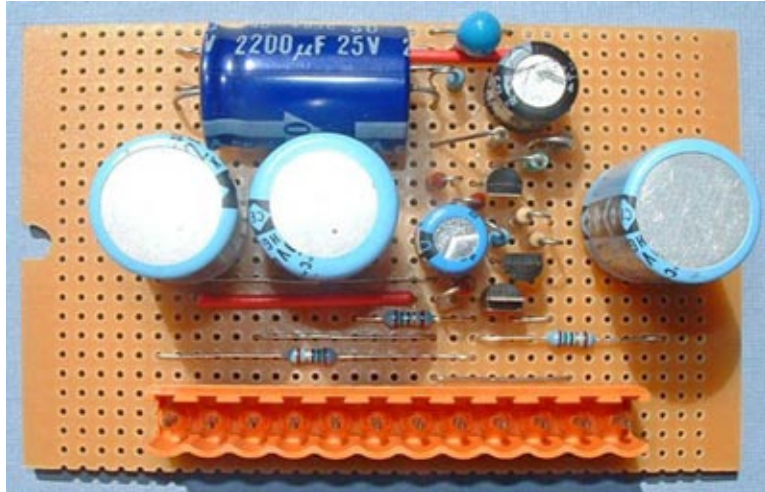
Improvements in video distribution have been achieved by using additional video buffer circuitry as shown.

The internals of both RX and TX units are shown in detail here.

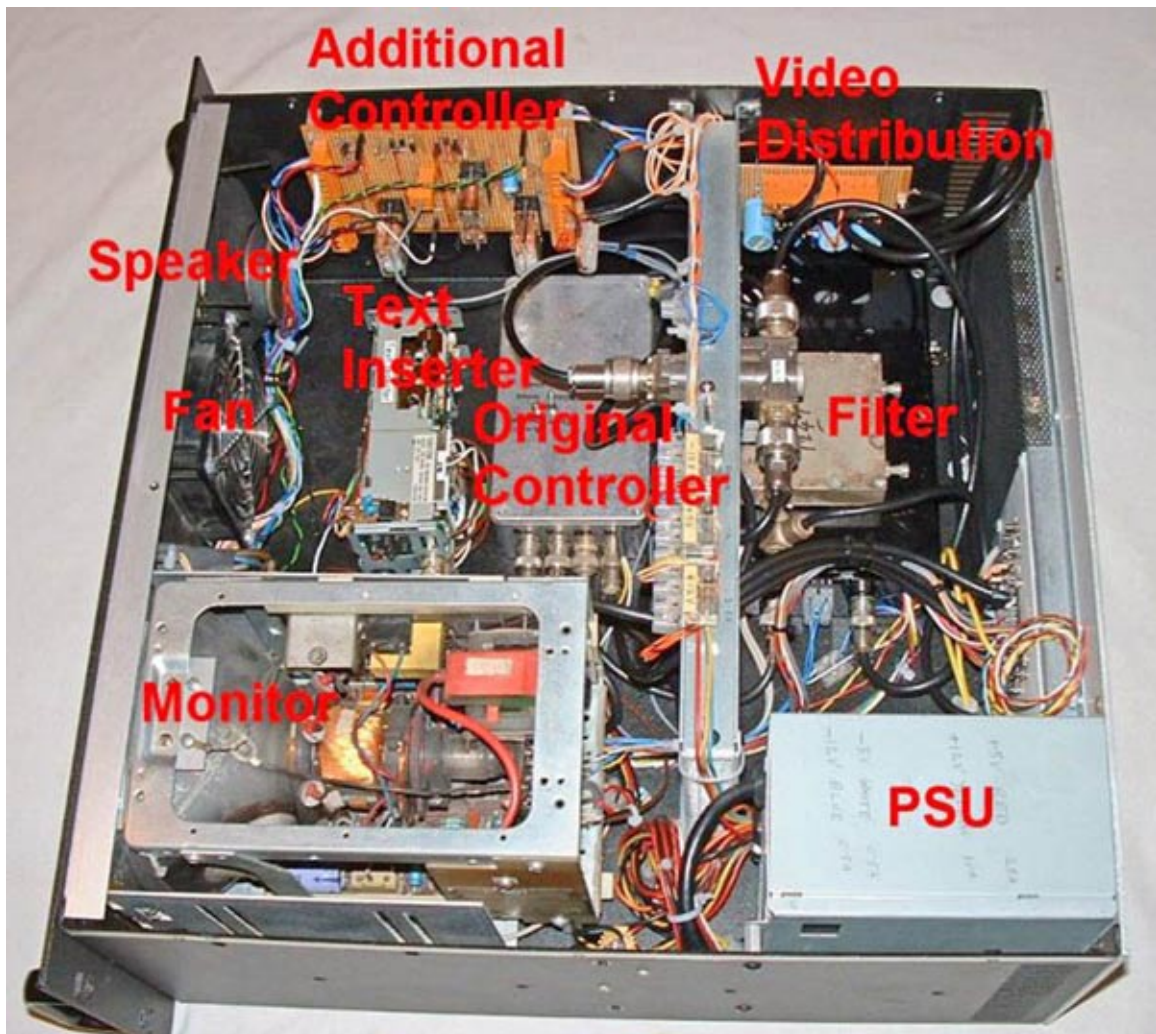
The Club ATV Station includes a G6RC monochrome test card and 4-channel video switch to select any one of 3 video inputs or the test card. A sequencer can be selected if desired.

The close up of the microphone shows the available controls.

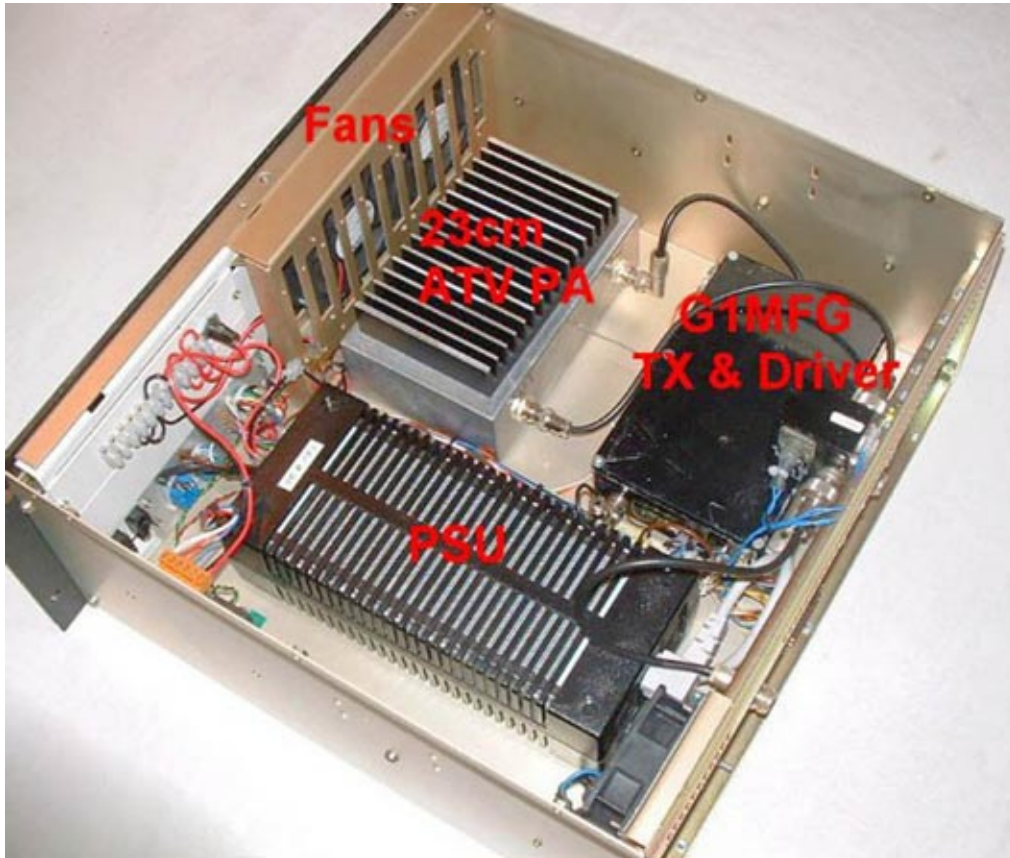
The Relay Station TX and RX aerials are 'Double-8s' mounted on a pole attached to the shack. The RX aerial is mounted well above the TX aerial.



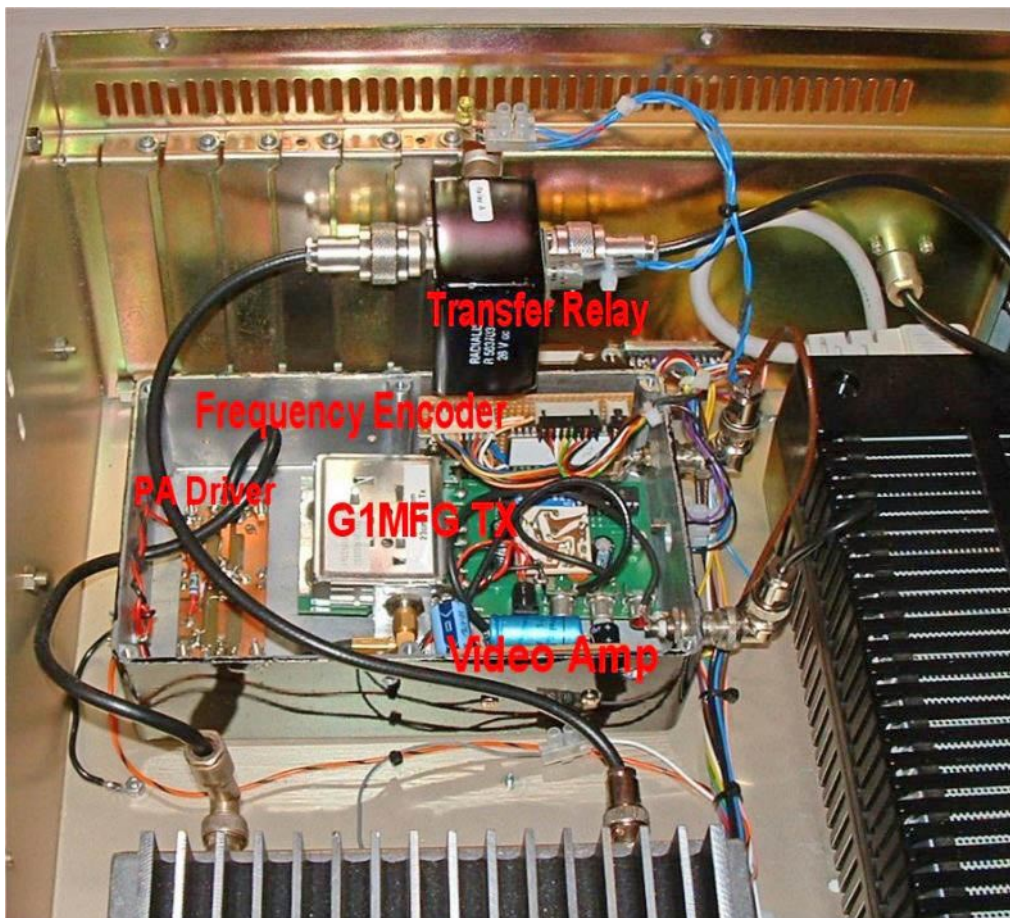
Video Amp



Inside RX

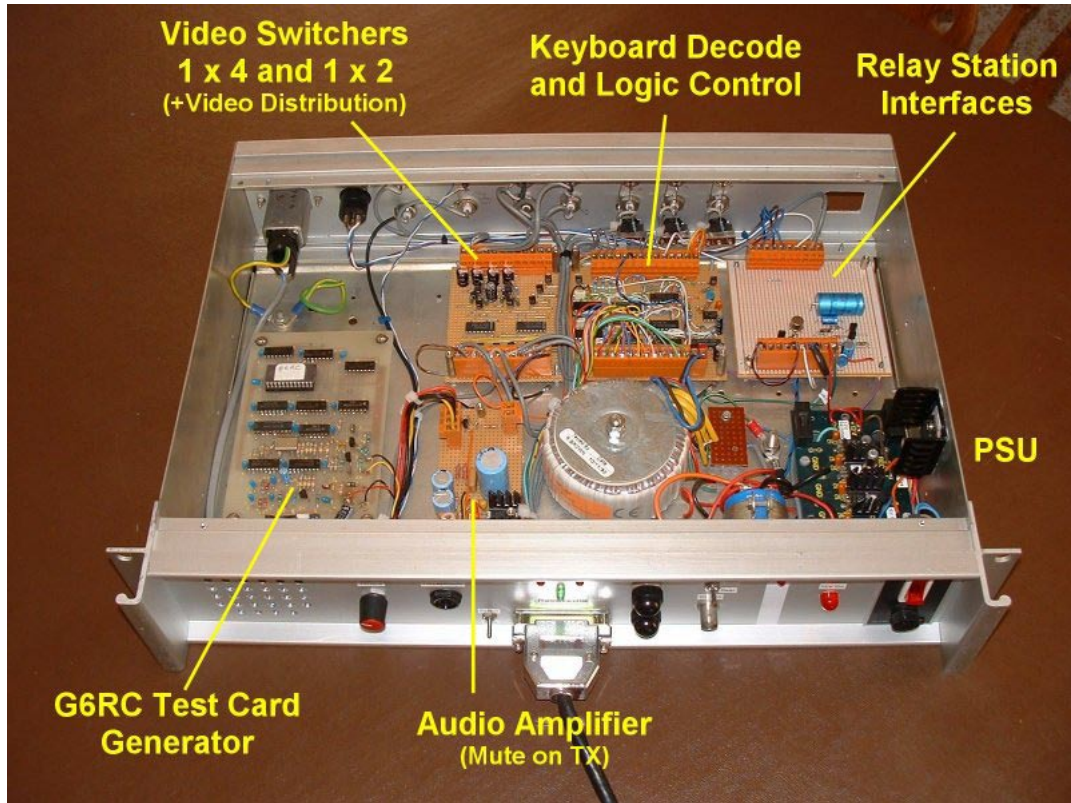


Inside TX



TX Exposed





Station Internal



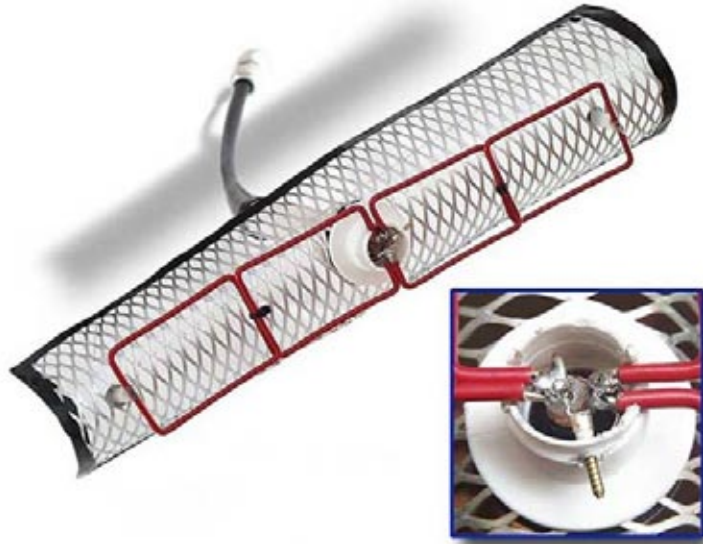
Station Rear

A Yagi for use in simplex mode has not yet been installed on the Club's tower.

Current Status

We currently have a problem with the TX driver stage. It is only giving out about 300 mW, which is not enough power to fully drive the PA to its full 18W. We currently only achieve about 8W. If operation reveals that we need more power we will replace the driver board.

Keith Farrow
G8KZZ



The Relay Station TX and RX aerials are 'Double-8s' mounted on a pole attached to the shack.