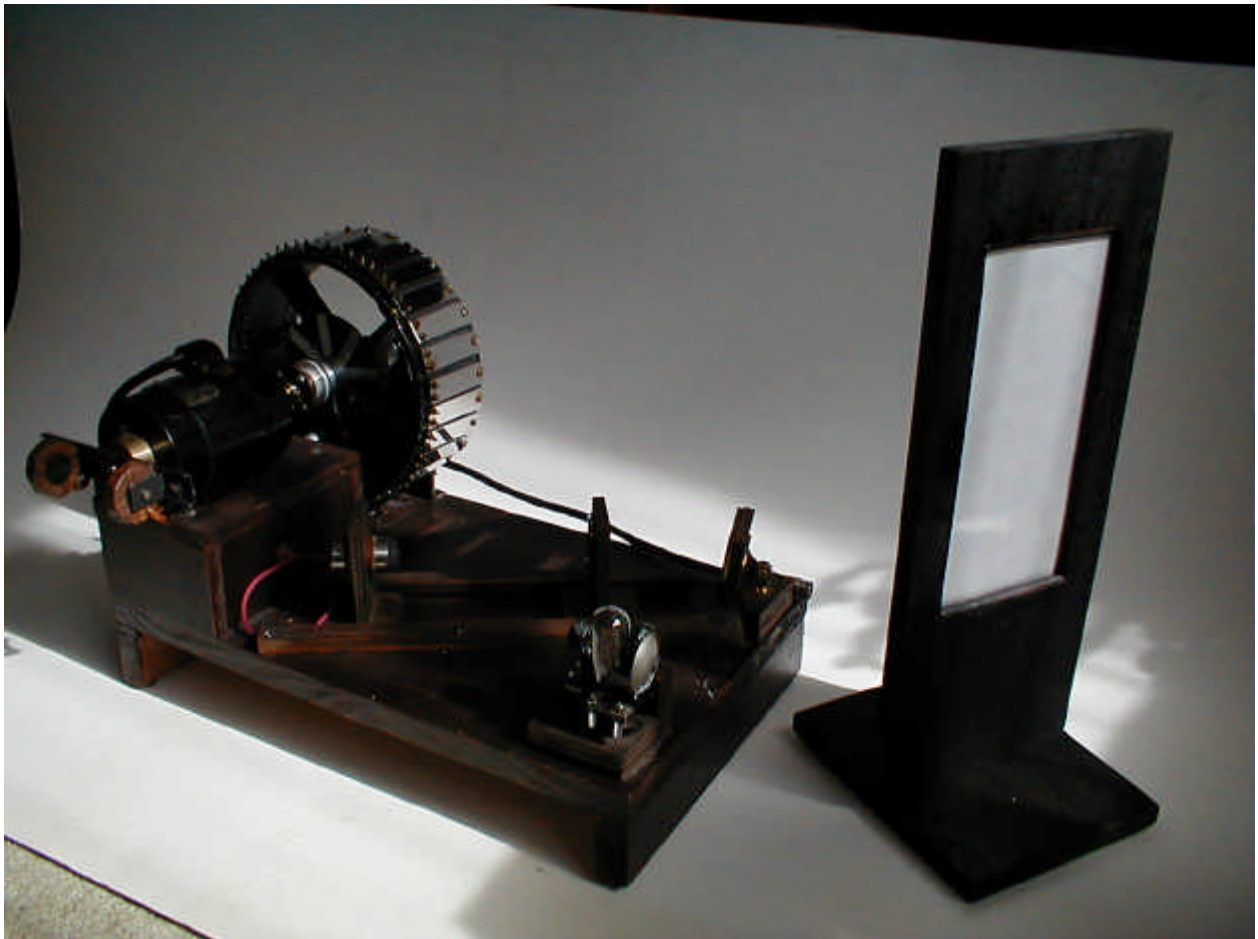


Special 2000  
Addition

# From Cats-whisker to Television.



By Peter Smith  
G4JNU

# From Catswhisker to Television

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My interest in wireless began during the war, the second of course! when my father gave me a crystal set. The only other wireless in the house was a home built 2 valve Scott Taggard ST 100.

This receiver did not survive long enough to be got at by me, as Hitler got there first, with a direct hit from a German bomb during one of the air raids on Reading.

The ST 100 was replaced by a Marconiphone 911; a 3 band 4 valve (plus rectifier) mains superhet.



I progressed to a one valver using a BTH B5 and was allowed to share the long wire aerial used by the broadcast receiver. After several months of successful listening I realised that the only station I could hear was the same as that received by the B.C. set. I was too young to understand that I was detecting the 465Kc/s signal radiated from the I.F. stage.

I replaced my one valver with the Eddystone All World Two set which I bought from Bill Good's wireless shop in Church Street, Caversham.

It was during the war that I first met Mauri Handcocks (G5HN), when he came to see my father with a request to manufacture a copy of the tuning mechanism from an HRO receiver.



After the war I made the most of an abundance of government surplus equipment. The "Shop on the Bridge" and Bob Iles's shop in Southampton Street were my second and third homes.

My first TX consisted of a self-oscillating 6L6 valve with a carbon mike in the anode. Later I bought a government surplus 38 set; my friend acquired an 18 set. It took many hours to get them working as the M.O.D. had removed the T.R. switch on the 38 set and the coils on the 18 set. Luckily someone had obtained copies of the original circuits.



My interests in Television started in 1953 when I completed a 405 line T.V. in time for the coronation. This was based on a government surplus radar unit and the VCR 97 C.R.T.

911, 38 & 18 Set Pictures Supplied by G3XTZ



It was not until the late 1970's that I found time to resurrect my interest in amateur radio and become licensed as G8UNF, now G4JNU. My interest in TV was rekindled in 1980, when at a Reading club meeting, I was inspired by Phil G8MFG and his TV TX on 70 cms. Also Phil's 'bacon slicer' demo of 30 line TV, at one of the construction contests, set me down the road of mechanical TV.

In 1983 I built my first 30 line Televisor which was demonstrated at a special event station (GB0RAR) run by the Reading club at Shire Hall in July 1985.

## GB0RAR July 1985



Members of the Reading and District Amateur Radio Club during their 24-hour "Ham Aid" to raise funds for Ethiopia.

### ...AND THE 'HAMS' WHO DO IT FOR FUN

A MARATHON "Ham Aid" raising more than £400 for charity took place at the week-end.

The event, organised by Reading Amateur Radio Club, lasted from 12 noon on Saturday until 12 noon on Sunday, at Shire Hall, Shinfield Park.

Members of the club were sponsored to contact as many radio enthusiasts around the world as possible in the 24 hours. They set up six transmitters and managed to speak to 400 people from all corners of the globe.

The general public visited the radio enthusiasts as they told the world about their event and about Reading. A two way TV network was also used to transmit pictures of the goings-on to other "hams" in the area.

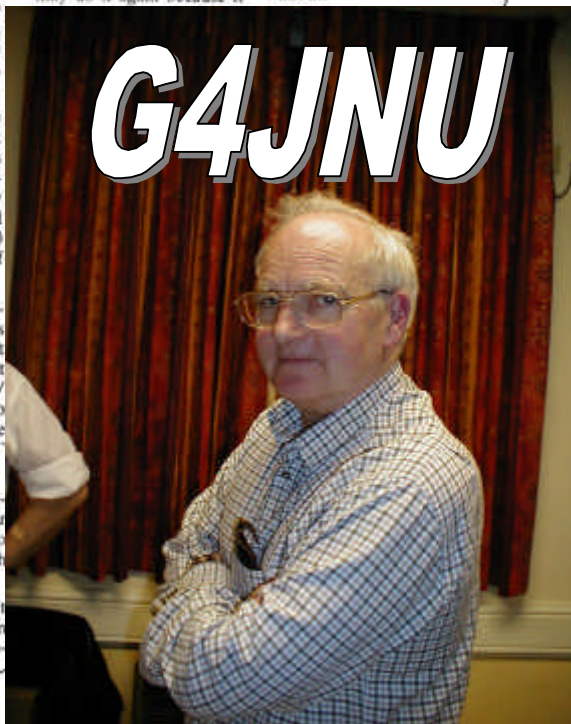
The marathon radio presenters worked in two hour shifts and took breaks to eat sandwiches or to snatch a minute's sleep.

The money will be split between the Ethiopian Famine Relief fund and lo-

cal charities such as the Sue Ryder Home at Nettlebed.

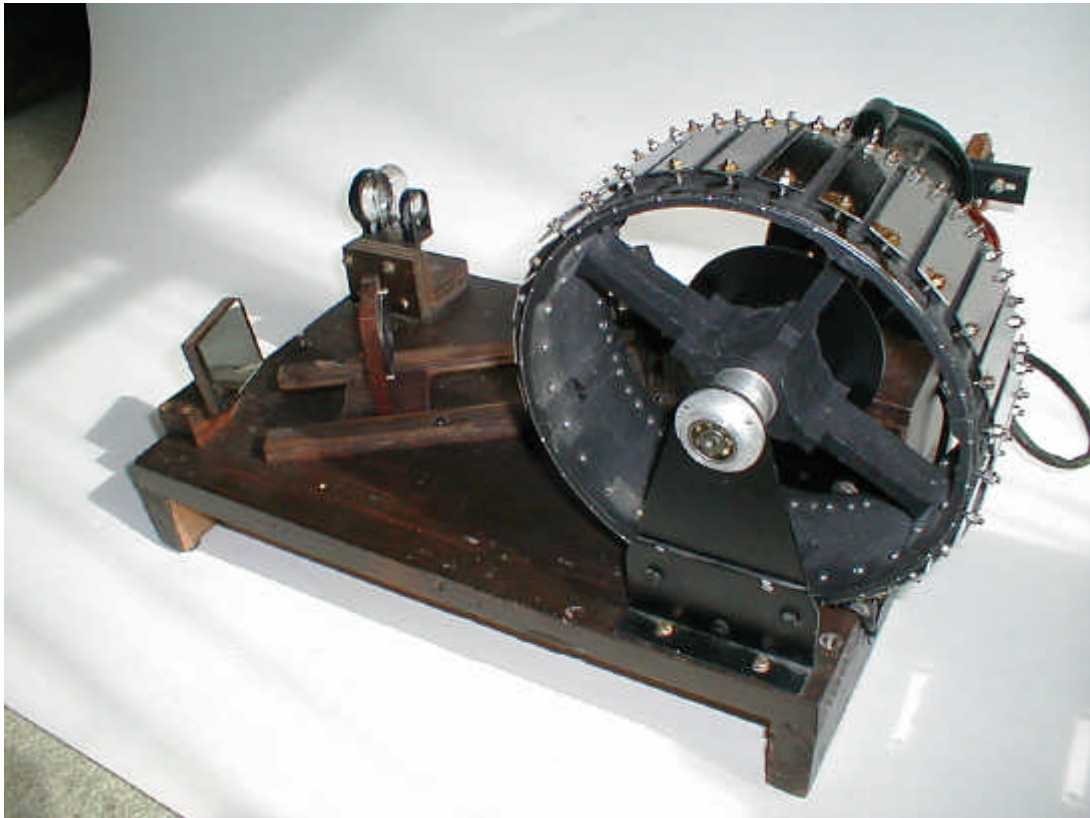
Mr Andrew Barrett, Chairman of the Radio Club said afterwards: "We may do it again because it

went down so well. People don't mind giving up time for a good cause and it helped the public understand what local radio is all about."





About this time I renewed my friendship with Mauri Handcocks and our mutual interest in 30 line television prompted him to resurrect both his Nipkow disc and Mirror drum televisions.

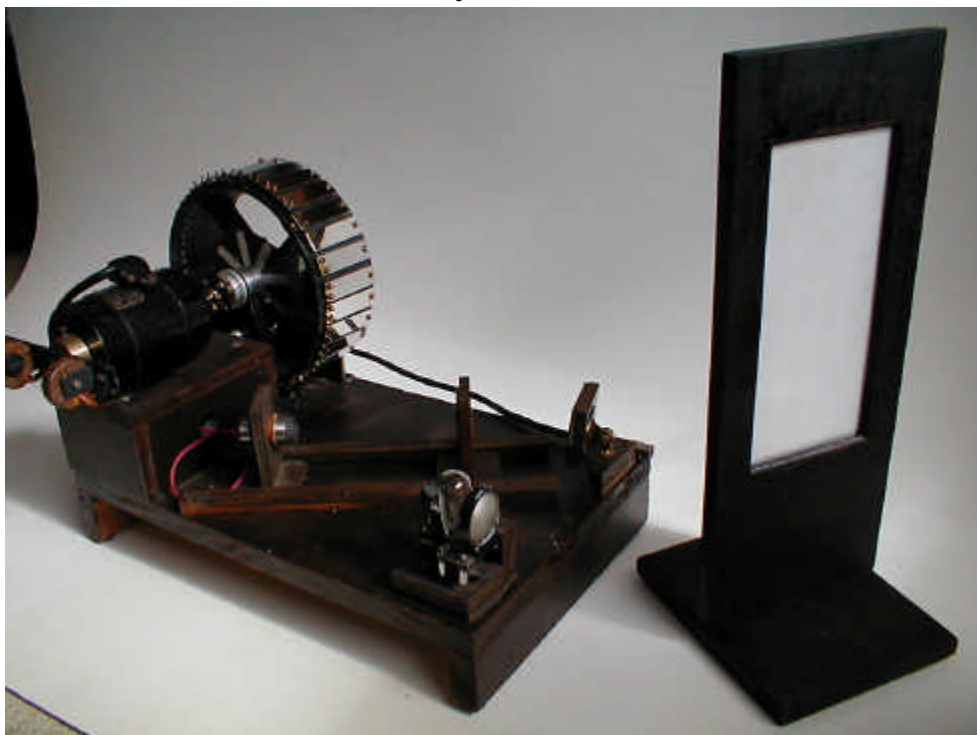


### **Restored Mirror Drum Televisions**

Sadly he died before he could finish the rebuild. I was lucky enough to have the opportunity to restore them both and they have been passed on to the Chalkpits museum at Amberley.

**Mirror Drum built by G5HN in 1934**

**Restored by G4JNU 2000**



# Restoration of the 1934 Mirror Drum Television

First the television had to be restored and any missing parts replaced without altering, in any way, its original form. The mirrors on the drum were missing and needed replacing. Originally these were silvered glass slides which were clipped or tied to adjustable backing plates.

The thought of 30 glass slides tied to metal plates rotating at **750 RPM** persuaded me to use polished stainless steel mirrors, which were bolted to the drum.

Having cleaned the drum bearings and realigned the brackets I could now concentrate on the electronics.

The control of the drum speed at 750 RPM was not difficult as I had designed a very simple circuit for a previous project.

To detect the speed of the drum I used an optical sensor to reflect light from the 30 mirrors as the original 30 tooth wheel, used for speed control, was missing. (this would be restored at a later date) Originally the intensity of the filament light source was controlled by a combination of 2 light polarisers (Nicol prisms) and a Kerr cell.

For simplicity I decided to use a white light LED which can be intensity modulated, and a lens to produce the spot of light. It will be an interesting project to power up the Kerr cell at a later date but the thought of applying several hundred volts across two parallel plates immersed in nitrobenzene is a bit daunting.

Having built and tested the electronics I could not put off the task of adjusting the mirrors. This took many hours and still the alignment is not 100%.

I have included the circuit used to drive the mirror drum motor as it can be adapted to drive a wide range of brush motors.

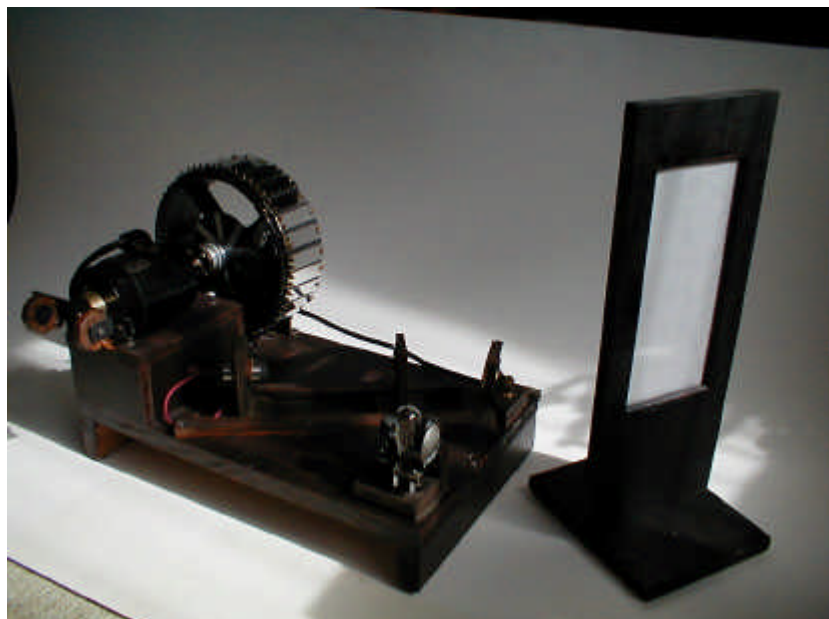
## Motor Drive Circuit description.

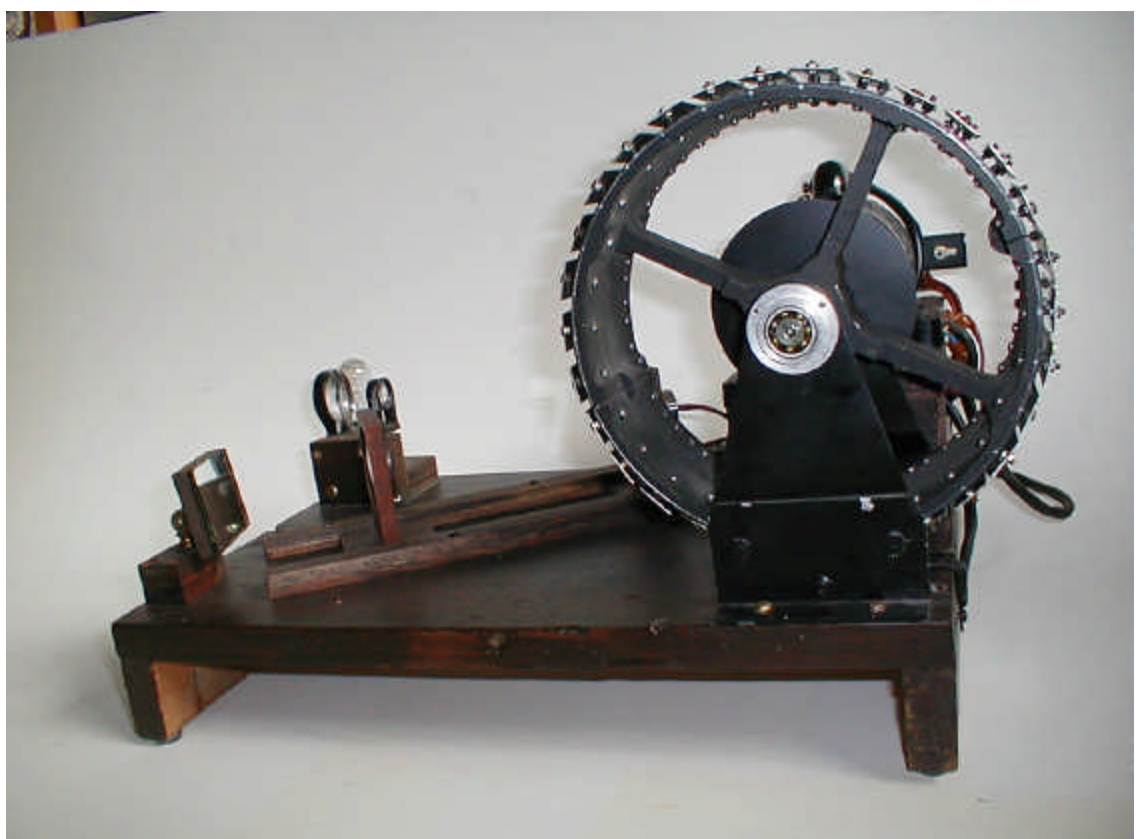
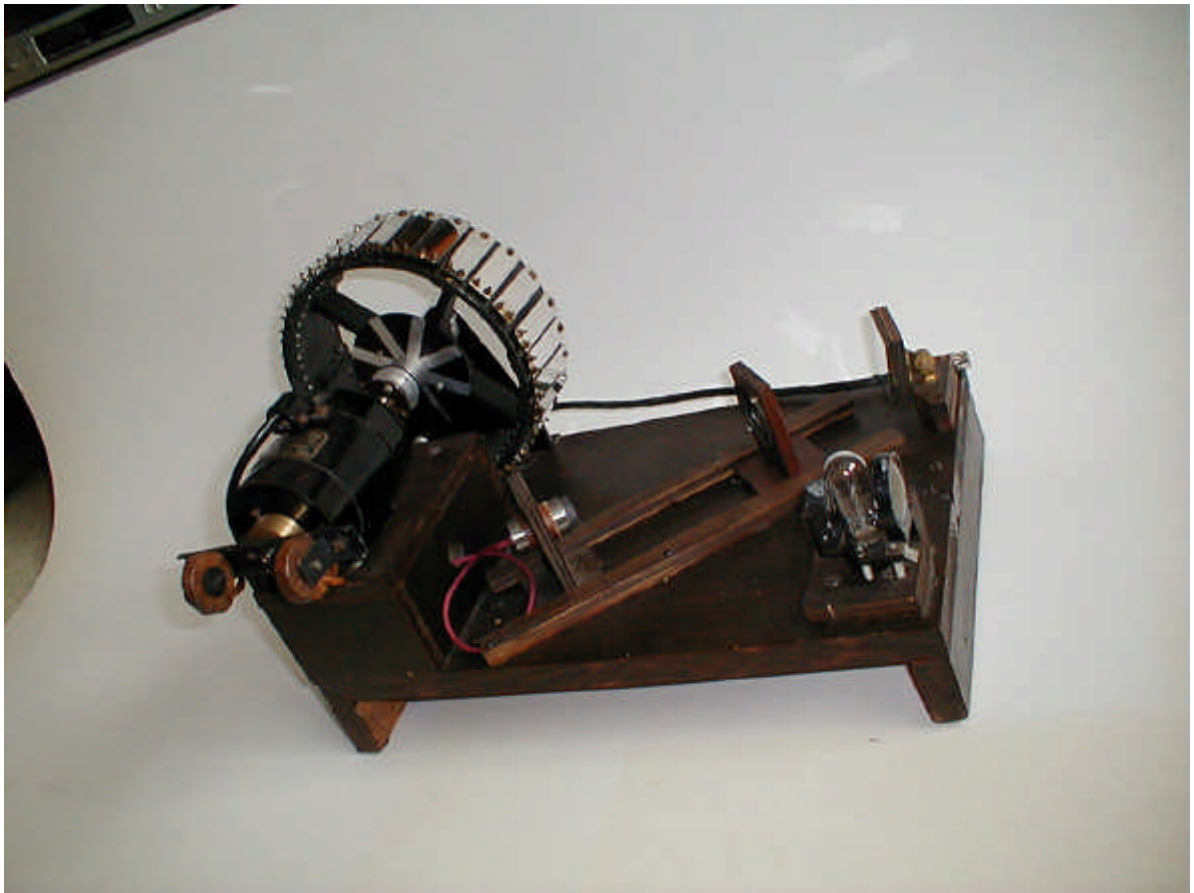
The circuit uses only two active components, the 4046 and the IRF 520 Powerfet which can handle 8 amps at 100 volts. The 4046 contains two phase comparators and the advantage of using No. 2 is that its function is independent of the input waveform's duty cycle. The error voltage on the output (pin 13) of the phase comparator is a pulse whose width and polarity represents the phase difference between the sync pulse and the pulses from the drum optical speed sensor.

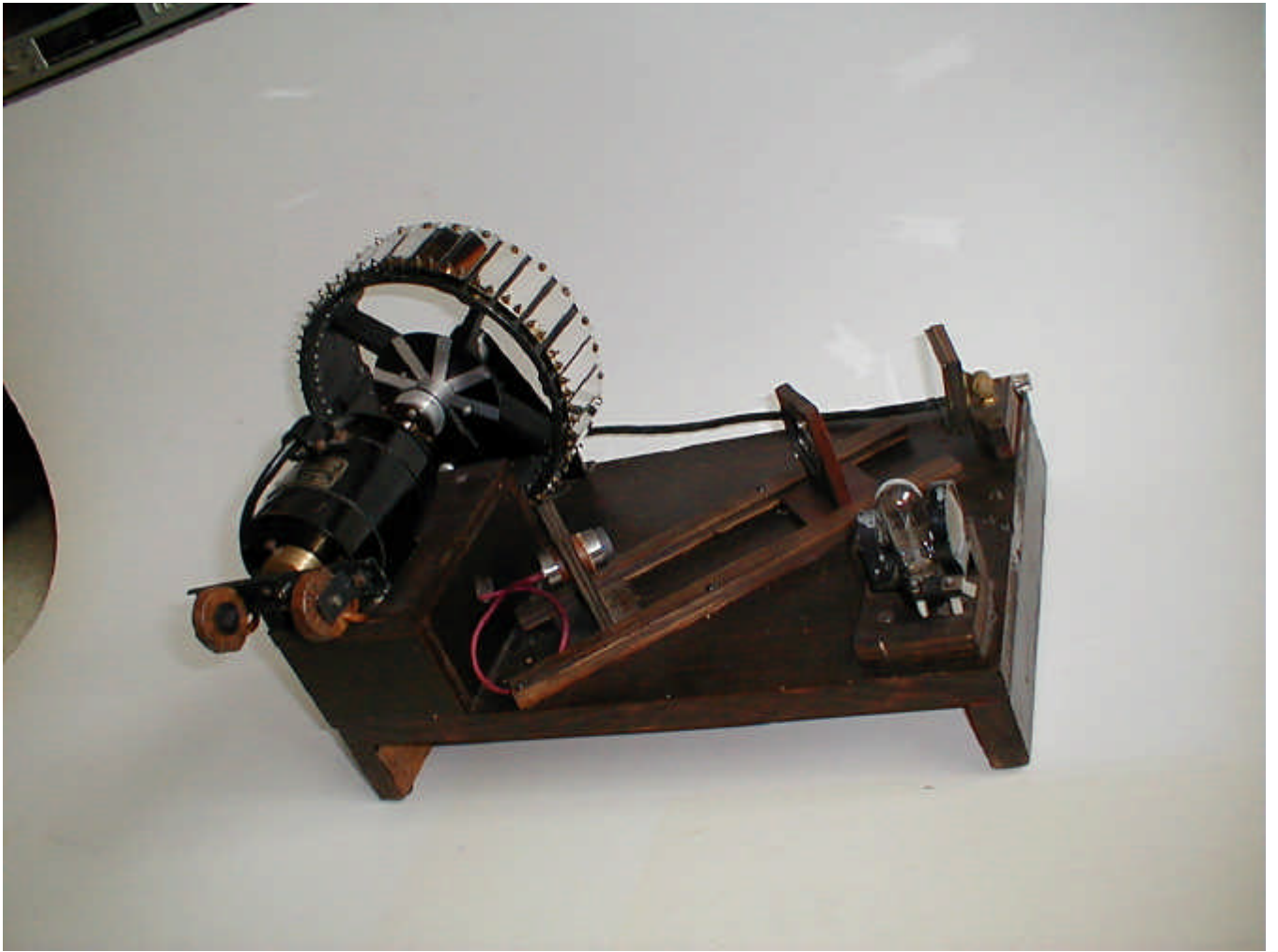
This signal is integrated by R5 and C4 and mixed with a proportion of the signal fed back from the motor via R8, VR1 and R6. This provides the damping of the motor to eliminate "hunting".

Peter Smith  
G4JNU  
Oct. 2000

Photos & arrangement  
by Min Standen G0JMS  
[www.radarc.org](http://www.radarc.org)







# G5HN Mirror Drum

## PHASE COMPARATOR AND MOTOR DRIVE

