

# Modifications to the KR400 rotator

By Barry White VK2AAB

I had the unfortunate experience of a book falling on one of the switches of my rotator control box, sending the rotator to one end and burning out the motor.

I rewound the motor, which was not all that hard to do.

However, once bitten twice shy. I decided to fit microswitches as limit switches to the rotator. I also now have my rotator controlled by my Pactor BBS's computer. This system sends the rotator to the counter clockwise end on a reset occurring and limit switches are essential in this type of unattended service.

Also if you use rotators to follow satellites then you should also have limit switches.

It is a quite straight forward job. Because the circuit is interrupted by the limit switches it is necessary to remove the starting capacitor from the control box and fit it into the rotator itself. It will fit just behind the terminal block.

There are a number of preliminary steps you must take before opening the rotator and I can assure you it will save considerable time. Connect up the rotator on the bench and send it to due north. Measure the resistance between the arm of the potentiometer and each

end. If it is not the same then move the rotator until it is the same. Then with a marking pen mark the sides of the rotator so that you can put it back together the same way. With the rotator upside down undo the bolts that hold the rotator together. Hold the rotator together and turn it over so that it is right side up and you can now lower the ring holding the ball bearings. Watch out that you don't spill ball bearings everywhere. Be careful there is another set of ball bearings.

You can now remove the top of the housing.

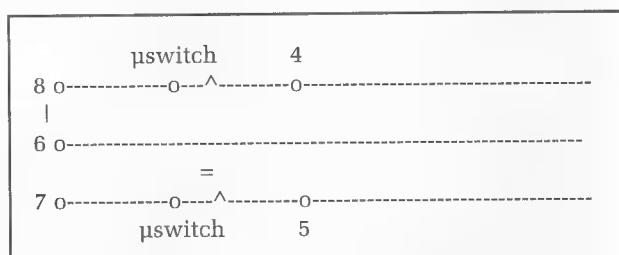
You can now see as in the photograph where the lever which is the mechanical stop is located on top of the plate. If you look inside the top housing you will see that there is a part of the diecast that comes around and pushes the limit stop lever. This is hinged so that the rotator

can get a full 360 degree rotation. The limit switches are operated by this lever.

Note the ring gear just below the internal top plate. It has four blocks moulded into its casting. They are not the same size. One is larger than the others. This one fits into the top casing on the opposite side from the part of the top housing moulding that operates the limit lever. If you positioned the rotator correctly it

should be alongside the limit lever. If for some reason it is not midway between the limit lever stops then lift the ring gear clear of the potentiometer gear and move it until it is midway between the stops. Replace the ring gear and check the potentiometer.

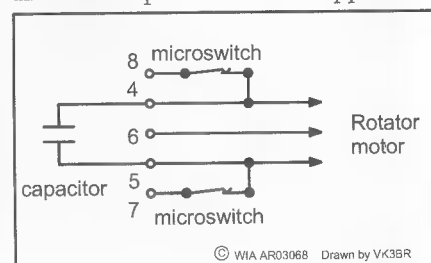
The microswitches I used had 100



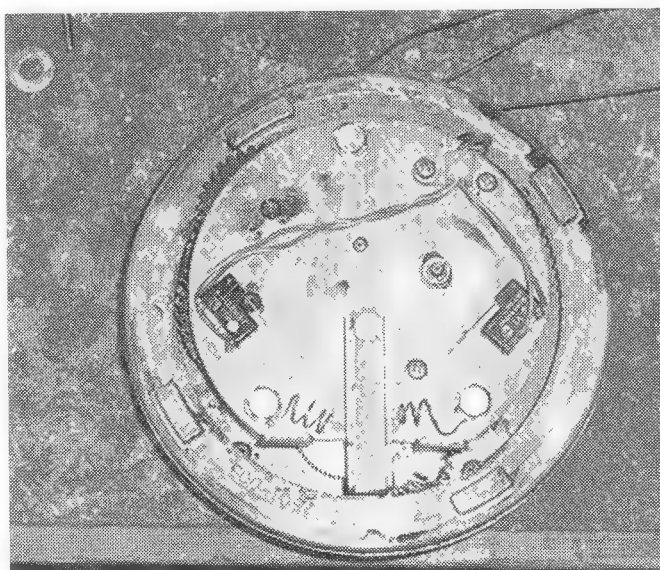
Microswitch wiring

gram operating force at the ends of their operating arms and it worked very satisfactorily for some years. They had sufficient force to push the limit lever out of the way when the motor was reversed. However recently I found the rotator would not turn in one direction. At first I thought it was a faulty microswitch, but when I got the rotator on the bench it worked perfectly. I opened the rotator and after a while it failed and I could see that the limit lever stayed against the switch. I removed a pair of springs from an AA battery holder and fitted them under the adjacent set screws. Make sure that the springs press on the lever itself and not the microswitch arm.

The diagram shows the changes to the wiring. The capacitor is connected across the previously used terminals 4 and 5. The power is now supplied to



Rewiring of controls



Ring gear, limit stop lever, microswitch and additional spring positions

### Roy Haynes VK3RU

Roy was born in Albert Park in 1916 and moved to Northcote where he attended Westgarth School. He enjoyed the outdoor life fishing and camping with his father and was also interested in radio from an early age. Roy left school during the depression and jobs were hard to find, but Roy always knew his path would be in radio and took any job that would lead in that direction. His first job at Footscray Meat Works packing kidneys didn't sound promising, but it led to an electrical apprenticeship followed by many years of night school, an electrician's job with Northcote Council and finally joining the Post Master General (PMG) where he stayed until retirement. But life was not always indoors and radio. During his earlier days, Roy also enjoyed outdoor pursuits where he played golf, became a keen Albert Park sailor and enjoyed winter skiing at Mt Buller long before lifts were installed.

His radio career continued during wartime where he was involved in radar development at the PMG Research Laboratories. Post war, Roy remained with the PMG as a Broadcast Station inspector and finally, Officer in Charge of Radio Australia, Lyndhurst. Working at Lyndhurst became a multi skilled job not limited to broadcast transmitters,

antennas and the Talking Clock machine. Roy found himself involved in sheep farming as the preferred means to manage grass at an appropriate height and a short venture into the drug world when Opium Poppies were found in the Lyndhurst Station garden.

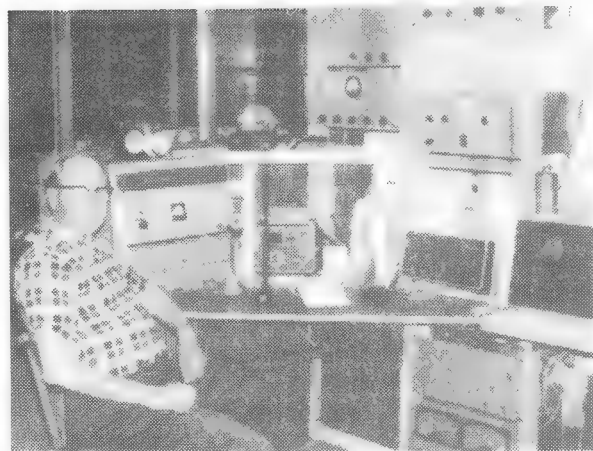
Radio was always his passion and he was one of those fortunate people who worked and played in the field he loved. It is not clear when Roy first became licensed, however an Experimental Licence was awarded to him by the Post Master General during 1948 along with his callsign VK3RU.

Roy retired at 65 and spent much of his retirement in and around his radio shack where he was a great experimenter. His original station equipment was home brewed to a very high standard with antennas modelled on the spider webs and curtains at Lyndhurst. As commercial amateur gear became more readily available, some of the old was replaced with more modern equipment covering 160 m through to 70 cm. Even with this capability, Roy

spent most of his time on 2 or 40 metres usually talking with his mates. Possibly one of Roy's proudest radio moments was receiving his award from NASA for involvement in early Apollo missions and his certificate was prominently displayed in his shack. Roy's health slowed during the early '90s following a stroke, but he still maintained regular 2 m contact with Bill VK3KBL, Bert VK3BH and Max VK3ZCW until very recently and he was an active member of their group luncheons.

Roy was a quiet, undemanding man who lived simply and loved his family and his radio.

David Williams VK3KAB



### Modifications to the KR400 rotator *continued*

terminals 7 & 8, which previously were unused. Terminal 6, the motor common is unchanged.

One normally closed contact of a microswitch is connected between terminal 4 & 8 and the other between 5 & 7.

The controller now supplies power to terminals 7 & 8.

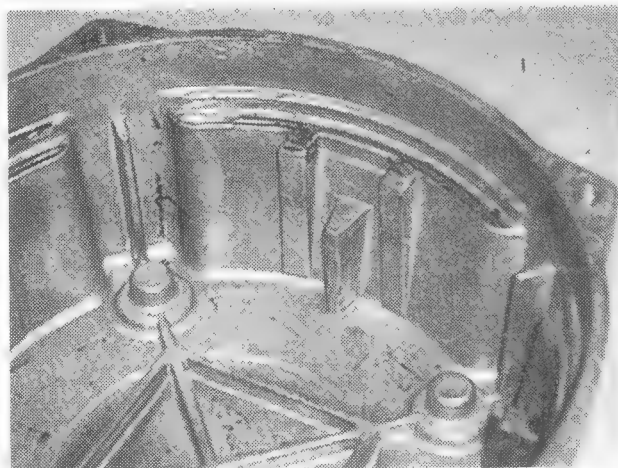
Adjust the arms of the microswitches so that they operate with at least 2 mm before the limit lever hits the stop. This should give reliable operation.

Reassemble in the reverse order but before you replace the top housing check that the potentiometer has not moved by ensuring that the resistance either side of the arm is the same. Likewise the large block on the ring gear should be centred between the limit lever stops.

After assembly operate the rotator

and check its travel at each end and that it switches off reliably. You can hear the brake being dropped when the microswitch operates.

Since all this effort it has occurred to me that it should be possible to sense the increased current when the rotator hits the end stop. There are some problems of logic with doing it this way, mainly because of the indeterminate conditions after a power failure for different types of controller.



View under the top housing showing the rib which operates stop lever