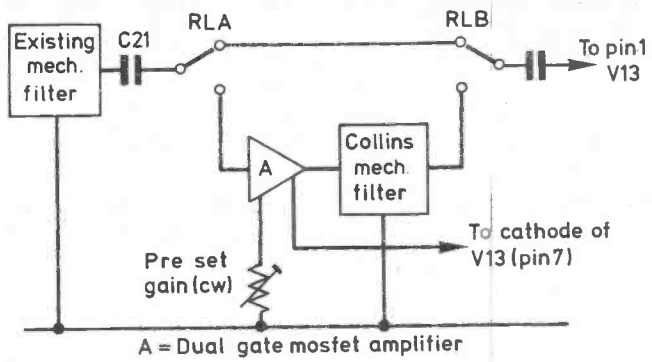

FIG.105. Block diagram of the improved cw filter

benefit of those who wish to modify the writers' system for their own requirements. It was considered that problems might arise if the original SSB filter was switched out of circuit on CW and replaced by a narrower filter, since out-of-passband signals might leak around the original SSB filter due to the extra wiring of the switching system. This would affect both transmit and receive operation. So it was decided to leave the SSB filter in the signal path on both SSB and CW, inserting the extra filter *as well* when required. At first the narrower filter was simply put in series with the receive final IF path, and although selectivity was much improved the receive gain was drastically reduced. So the amplifier of **Fig. 106** was constructed and inserted between the existing filter and the extra filter. This worked well, but it was found that the AGC behaved in a rather odd fashion on CW. This was found to be due to there being no AGC on the extra MOSFET stage. This problem was very simply cured by deriving the Gate 2 voltage for the MOSFET from the cathode of one of the existing AGC controlled IF stages in the *KW2000*. Because of the AGC action, this voltage varies with signal level, dropping as the increasing signal causes the AGC to move the valves towards cut-off and thus reduces the current through the cathode resistor. This is just what is needed, since reducing the Gate 2 voltage reduces the gain of the MOSFET. Most of the components for the amplifer can be mounted on a small piece of *Veroboard* positioned adjacent to the main filter. The new filter, which is rectangular in shape, can conveniently be mounted on the top of the existing filter on top of the chassis, using a large capacitor clamp and an aluminium strap to hold the old and new filters respectively, and making the connections to the new filter with miniature co-ax. The capacitance of this co-ax must be taken into account in determining the terminating capacitance required for the filter, which was found to be approximately 130pF in parallel with the input and output connections for this type of filter. If a different type of filter is used, the required value of terminating capacitance should be obtained from the manufacturer's data sheet. RLB was mounted adjacent to pin 1 of V13. The two transistors TR2 and TR3 in **Fig. 104** are used to remove the CW filter from circuit during transmit. These transistors obtain their base bias from the cathode of V12, one of the receive IF stages. During transmit V12 is biased off, which means that its cathode voltage is zero, so there is no forward bias on TR2 and TR3. On receive V12 is turned on, producing a voltage drop across its cathode resistor and thus supplying forward bias to TR2 and TR3. The values of the base resistors for these transistors are chosen to ensure that both devices are turned on hard despite the variation of V12's cathode voltage caused by the AGC action. Turning off S1 removes the supply from the amplifier and the relays, preventing the filter from being switched into circuit on receive, and this is the condition used for SSB operation.

Setting up the filter system is very simple, merely involving the adjustment of the amplifier gain control RV1001, and the selection of the correct value of terminating capacitance for the filter. The procedure is to set RV1001 to minimum resistance, switch S1 to on and tune in a steady carrier of about S5. Now try various values of capacitor a little above and below the maker's specified value across the input terminals of the filter, using the value which is found to give the maximum S-meter reading. Then repeat the procedure for the output terminals. The exact value seems not to be all that critical and a few pF either way will make little or no difference. To set RV1001 the same S5 signal should be tuned in with the switch S1 set to ON, and S1 then switched off. Note the S-meter reading, switch S1 back on again, and adjust RV1001 to obtain the same reading.

Again it may be found that it is necessary to use the IRT control when operating since the transmit frequency may not coincide with the centre frequency of the filter until the keying modification has been carried out. **Part 5 of this series in our July issue will describe this modification as well as others.**

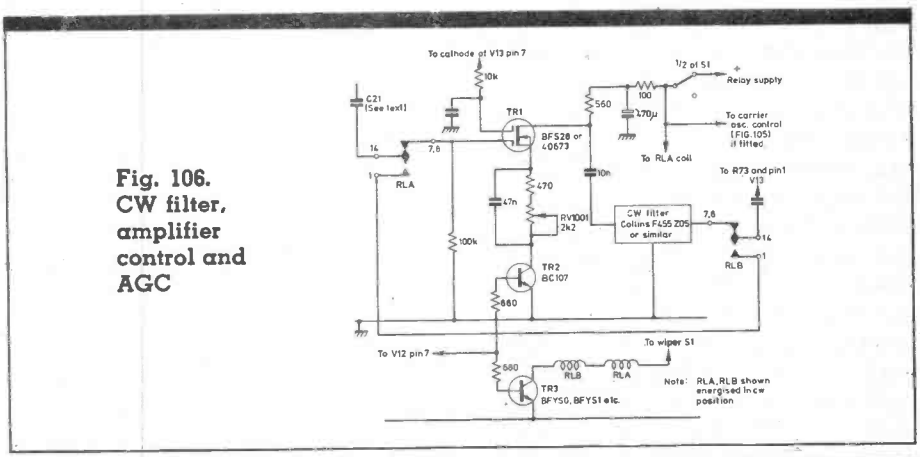

Fig. 106. CW filter, amplifier control and AGC