CRT REJUVENATOR

L.COX

The circuit of a simple, inexpensive monochrome c.r.t. rejuvenator that has been built and used successfully on numerous occasions is shown in Fig. 1: the basic idea is to connect the grid and cathode of the c.r.t. into the circuit as a diode, the flow of grid current reactivating the cathode. The device has been used on all sizes of tubes, including modern 24in. ones: there have been only two failures and these were only to be expected since one tube gave a reading of only 3V across its heater while the other had an intermittent cathode connection.

The basic procedure for using the rejuvenator is to switch the set off and remove the c.r.t. base, then fit the base from the rejuvenator to the c.r.t. and plug the rejuvenator into the mains. The 100W bulb will light up immediately of course since it provides the heater supply: it is essential to use a 100W type and it is advisable to paint the bulb to reduce glare. The current flowing in the tube will produce various degrees of fireworks—depending on the c.r.t.'s age and condition—in the neck of the tube. The essential thing is to watch the pygmy bulb which will flash intermittently while the bombardment in the c.r.t. neck is going on: once this bulb glows brightly and continuously the c.r.t. should be fully reactivated.

If when the set is reconnected again the picture still seems silvery a second session with the rejuvenator should sort the problem out. The old tried and tested method of tapping the c.r.t. neck to remove loose particles prior to using the device is helpful with some older tubes. Obstinate cases may require two or three applications before best results are obtained.

Use of the reactivator has often resulted in tubes with hardly a glimmer of life being restored to as new. Note that due to the increased efficiency of the c.r.t. after rejuvenation a new e.h.t. rectifier (and in rare cases a line output valve) is often necessary (DY87, EY87 etc.), especially in older sets where they are running low but operate quite happily until called upon to do some real work. ■

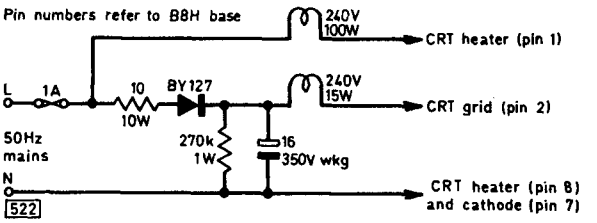

Fig. 1: Circuit of the c.r.t. rejuvenator.

LINE OUTPUT VALVE CHECKS

by K. J. Young

THE line output valve is one of the most important parts in a television set. It is however one of the most difficult components to check in operation as the high-amplitude pulses present at the anode make it risky to use a voltmeter or oscilloscope at this point. Servicing data often shows the shape and amplitude of the waveform to expect at the grid so that the drive can be checked using an oscilloscope (the receiver under test should be fed from a double-wound isolating transformer when this is done). This is a very useful check since if it is found that the grid drive is insufficient then we know immediately that the cause of the fault must be sought earlier in the circuit: we also get a warning not to continue operating the line output valve under these conditions.

It is nevertheless feasible—provided the set is fed from a double-wound isolating transformer—to use an oscilloscope in conjunction with a resistor-capacitor potential divider to observe the anode pulse waveform. Say the grid leak resistor of the oscilloscope's Y amplifier input stage is 1MΩ: this could be shunted with a 470pF earth-isolation ceramic capacitor to form the lower arm of the potential divider, the upper arm, between the top cap of the line output valve and the scope's Y input, consisting of 20MΩ (two 10MΩ resistors in series) with a 22pF disc (ionisation free) ceramic capacitor in parallel. The amplitude of the pulse will then be divided by 20.

It is better however to monitor the line output valve anode current pulse by using a small current transformer, preferably of the bar-primary toroidal type. This can be made using a ferrite ring on which about 50 turns of 26 s.w.g. enammelled wire have been wound. This forms the secondary, the ends being taken to tags for connection to the scope (do not connect the scope to the receiver chassis). A tube of tufnol or other reliable insulation, if possible of internal diameter such that the top cap and lead of the line output valve can be passed through (with the set switched off!), is then fitted inside the wound ferrite ring.

If this set-up is first calibrated using a receiver in good working order the results obtained with faulty receivers can be readily interpreted. The effect of ringing for example should show clearly.

If a shorted turn in the line output transformer is suspected it is usually best to check by substituting a known good transformer or to make a separate test with the receiver switched off. ■