The Monoscope

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AT ONE time the monoscope was one of the most popular methods of generating a test card signal. Some broadcasters preferred to use a slide, but where space was limited or cost permitted a monoscope was usually to be found. It had no optical system, and required little if any setting up, making its use as a picture source in factories particularly attractive.

The monoscope tube is basically a small cathode-ray tube with a bulb diameter of about 5in. A specially prepared target, on which the test card or caption image is printed, was mounted inside the tube. This target had different secondary emission characteristics from the target base. When scanned by the electron beam, a signal voltage was developed and passed to a small pip on the tube's blank faceplate. This was then amplified and processed in the normal manner.

The picture definition was about 400 lines, allowing frequency gratings of up to about 5MHz to be used. The grey scale was limited however, and had to be accomplished by being printed in a similar manner to a printed photograph, i.e. as a fine dot detail which is inadequately resolved – if you expand the monoscope's picture, it's just possible to see the granular appearance of the "grey" areas.

Many monoscope cameras were probably made, some rack mounted and others portable. The Marconi BD617B shown in the photographs was a portable version first made in the early 1950s, for 405-line use. By altering the value of the line sawtooth amplifier's anode load however the unit can be made to operate at 625 lines. The unit shown is fitted with a monoscope tube that gives a Polish test card – it's driven by interlaced pulses from the pulse generator described in the May 1977 issue of Television.

The camera, in a metal case, measures $8\frac{1}{2} \times 16\frac{1}{4} \times 26$in. and weighs about 75lb. It uses twenty eight valves. Most of the small components are mounted on tagboards and are individually labelled with their circuit reference numbers. Access is gained by removing the side covers, which are secured by spring fasteners. With both removed the top of the tube housing can be taken off and the tube withdrawn. This is mounted vertically, with the faceplate uppermost, at the rear of the unit inside a Mumetal shield.

At the rear of the case there are sockets for video output, sync input if a composite output is needed, a separate video output for a monitor, a three-cord mains connector, and a multiway socket for blanking, line drive and field drive from a sync pulse generator.

The operating controls are mounted on the front, including a meter to indicate the mains input voltage and a multiposition on-off switch which selects the correct mains tap on the mains transformers.

Circuit

A 310V mains transformer supplies two 5V4 full-wave rectifiers, with two 6AS7s, a 6AU6 and a 0D3/VR150 neon stabiliser to produce a stabilised h.t. of 250V.

The field drive pulses feed a sawtooth amplifier driving a 6SN7 strapped as a single triode for the field output to the scan coils via an output transformer. There are no linearity controls, only vertical centring and height, mounted on the front panel.

The line drive pulses feed a basically similar circuit with a 6BG6 line output valve. Again there are only line width and centring controls on the front panel. Pulses from the line output stage are also fed to a clamp-pulse generator to operate the black-level clamp after the video amplifiers. Both line and field pulses are fed to the scan failure protection circuit. There is no line or field oscillator.

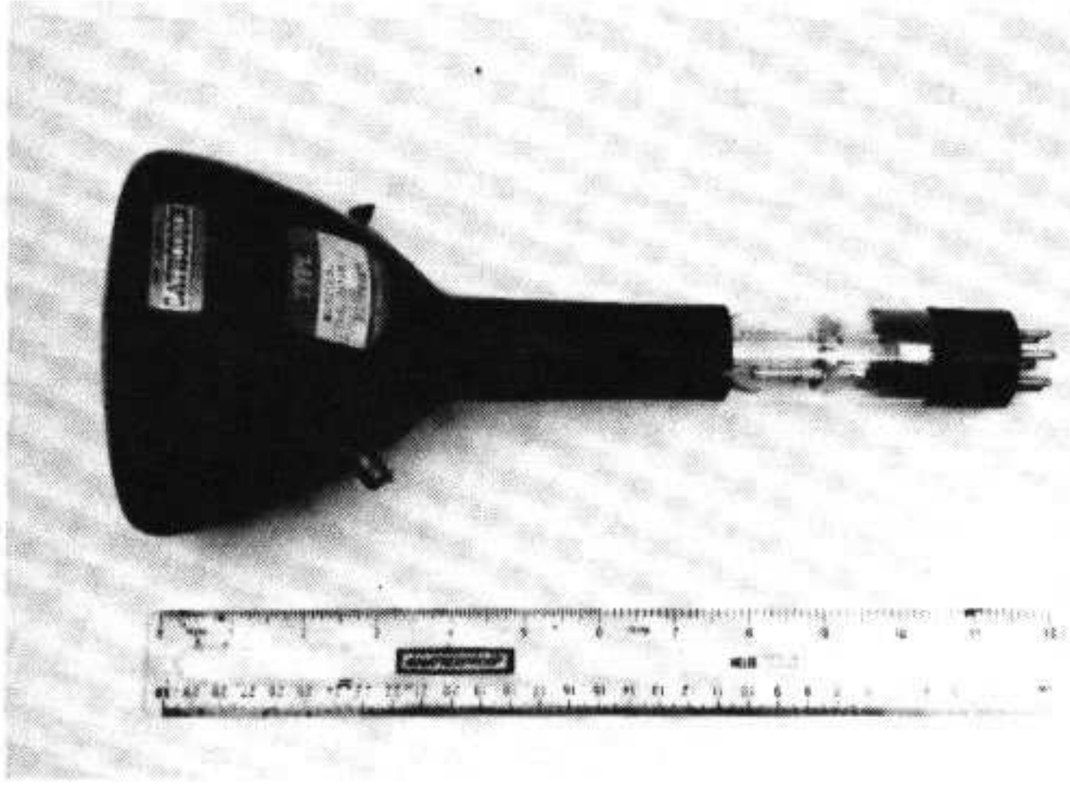
The video output from the tube is connected by a short screened lead to the head amplifier, which consists of three 6AU6 valves on a rubber-mounted subchassis to absorb microphony. The video signal is then passed to a further chain of these valves and is finally clamped, blanked and has the sync pulses added to provide a suitable signal for distribution.

An invertor stage is incorporated to enable tubes with either positive or negative patterns to be used. This is activated by an internal push-pull switch.

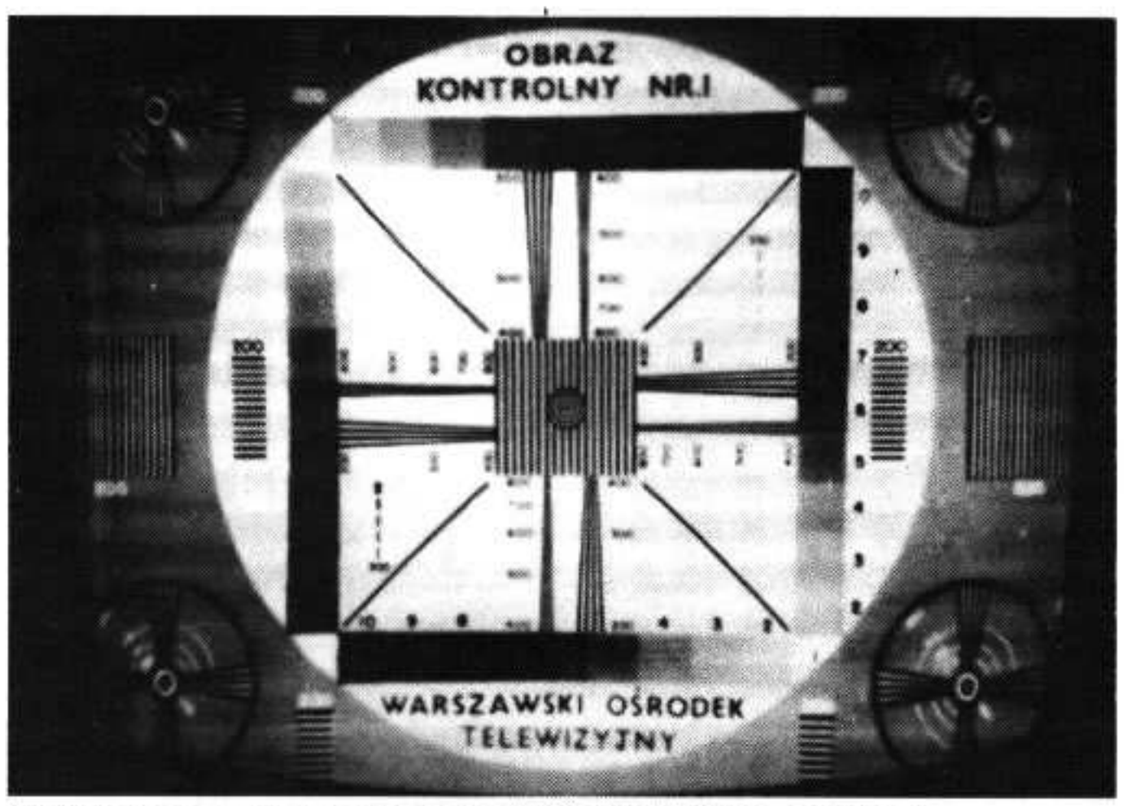
The monoscope tube needs about 1·1kV e.h.t. Since this would place the target at an unmanageable potential, the final anode is connected to the "earthy" end of a bleeder network which also supplies the first anode, focus and cathode electrodes from a shunt-stabilised negative supply derived from a mains transformer.

Basic Operation

With all controls except the gain at minimum (unless previously undisturbed) the unit is connected to a source of



The monoscope tube.



Polish test card, shown on a 625 line 19in. monitor.