The invention concerns a circuit arrangement for the correction of geometric distortions during the reproduction of signals on the screen of a cathode-ray tube of a picture reproduction device with an arrangement for the coupling in of a correction current at line-frequency in the switching circuit which deflects the electron beams in the vertical direction.

Since the colour picture tubes of picture reproduction devices are presently already provided during manufacture with means for the deflection of the electron beams, a high degree of accuracy is necessary for the adjustment of the deflection unit with reference to the picture tube during mounting. The optimal positioning of the deflection unit on the throat of the picture tube must be matched to colour purity, sharpness and convergance. Since the beam systems in a colour picture tube have unavoidable tolerances, the optimal position of the deflection unit may be only a compromise between the required adjustments. In many picture tube units, therefore, there remains one of these characteristic errors which is characterised in that horizontal lines are slightly rotated relative to the horizontal reference raster, i.e. the horizontal lines are rotated about points which lie on the mid-vertical of the picture so that they display a slightly falling or rising tendency. Such an angular error is particularly noticeable during the display of lines of text.

Circuits are already known which remove the geometric distortions in the form of pincushion distortions on the screen. For this purpose a correction current at line frequency is coupled into the vertical deflection circuit by means of a non-linear component such as a transductor. For the correction of this special

distortion, the current at line frequency must first be converted into parabolic form, which is expensive DE-A-19 16 104.

In US-A-4 296 359 there is described a circuit which is also concerned with the object of correcting a rotated raster on the screen of a television tube, in which the oppositely rotated rasters for blue and red have to be returned to congruence. For this purpose a special deflection coil is introduced which produces a magnetic field in the direction of the beam current in the television tube. In this way a combined rotation of the horizontal and vertical lines is achieved. Its efficiency is poor, however, on account of the great spacing of the winding.

The invention is limited solely to the removal of the above described error and thus its object is to remove the error of the rotated horizontal lines by the simplest means possible. This object is achieved by the invention set forth in the claim.

An embodiment of the invention is described below with reference to the drawing.

On the picture tube throat 10 of a reproduction tube 1, there is located the deflection unit for deflecting the electron beams. It comprises the horizontal deflection coils 2 and 2′ and the vertical deflection coils 3 and 3′. The defection coils 2,2′,3,3′ are supplied with currents i_H from the line output stage 4 and i_V from the vertical output stage 5. The primary winding 6,6′ of a differential transformer 7 is connected in the circuit for the line deflection current. The secondary winding 8 of this differential transformer 7 is connected into the vertical deflection circuit. With the assistance

of a ferrite core 9 the current coupled in can, in a conventional manner, altered asymmetrically in order to detect asymmetrical errors.

By coupling a saw-tooth current at line frequency into the vertical deflection circuit, correction currents directed in opposite directions arrive at the line beginning and at the line end, so that there results the desired effect of a rotation. Since the arrangement is very small and the line and vertical currents pass directly therethrough, it can be mounted directly adjacent to the deflection unit and may also be integrated with this into a single unit.

* C L M S *

Claim

A circuit arrangement for the correction of geometric distortions during the reproduction of signals on the screen of a cathode-ray tube of a picture reproduction device with an arrangement for the coupling in of a correction current at line-frequency via a differential transformer in the switching circuit which deflects the electron beams in the vertical direction, characterised in that the primary winding (6,6') of the differential transformer (7) is connected in the circuit of the line deflection current (iH), and in that the secondary winding (8) of the differential transformer (7) is connected in the circuit of the vertical deflection current (iV), the saw-tooth-like correction current at line frequency in the vertical deflection circuit being coupled in such that lines of the reproduced picture which are inclined at an angle to the horizontal reference raster are rotated about centres which lie on the mid-vertical of the picture, the differential transformer (7) having two primary windings (6,6'), which are located in sections of the bobbin of the differential transformer and wound correspondingly at an axial spacing, and between which is arranged a section for accommodating the secondary winding (8), and in that the coupling of the primary windings (6,6') with the secondary winding (8) is assisted by a ferrite core (9) extending axially of the bobbin and thereby magnitude and direction of the coupled-in current are adjustable.