

PATENT SPECIFICATION

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H3Q AR



(54) IMPROVEMENTS IN TELEVISION PROGRAMME SELECTION MONITORING

(71) We, INFAS INSTITUT FÜR
ANGEWANDTE SOZIALWISSENSCHAFT GMBH,
a Company duly organised under the Laws
of the Federal Republic of Germany, of
5 Margarethenstrasse 1, 5300 Bonn-Bad
Godesberg, Federal Republic of Germany, do
hereby declare the invention, for which we
pray that a Patent may be granted to us, and
the method by which it is to be performed,
10 to be particularly described in and by the fol-
lowing statement:-

The invention relates to a device for de-
tecting and indicating information on tele-
vision viewer behaviour and programme selec-
15 tion, the device consisting of an AC mains
power unit and a data detector with an
electronic memory connected to an input
logical circuit and an output logical circuit,
the input logical circuit being connected to a
20 clock, a sender-station selector and a viewer-
operated selector switch unit, the device also
having an electronic control unit for con-
trolling all the processes.

Devices are known which identify the sender
25 station chosen by the viewer of a television
receiver, this being done by measuring the
frequency to which the tuner of the television
receiver has been adjusted. Other known de-
vices detect the selector switches which the
30 viewer has actuated, or the position of this
selector switch. But in order to ensure that
these devices reliably detect the relevant data,
it is necessary to interfere technically to a con-
siderable degree with the television receiver
35 and this not only makes the installation of the
detecting device in the television receiver a
considerable operation, but also involves an
undesirable interference with private property.
The construction of the known devices makes
40 this kind of interference necessary, if accurate
results are to be obtained.

The problem tackled in the present invention
is to avoid the necessity of interfering with the
viewer's television receiver, this being obtained
45 by constructing the detector in such a way that

the desired information on viewer switching
behaviour is detected accurately and reliably
without it being necessary to interfere techni-
cally in any way with the viewer's television
receiver. 50

According to the invention there is provided
a device for monitoring selection of channels
by a viewer of a multi-channel television re-
ceiver, the device being separate from such re-
ceiver and arranged for interposition between 55
a receiver antenna and an antenna input ter-
minal of a receiver, comprising channel selector
means operable by a viewer, a clock, and
memory means for recording information pro-
vided by the selector means and the clock, 60
wherein the selector means includes a tuner, an
input signal connection for enabling the tuner
to be connected to an antenna, a frequency
convertor adapted to convert the signals from
the tuner into signals of a predetermined fre- 65
quency range, and an output signal connection
for enabling signals from the convertor to be
supplied to an antenna input terminal of a
receiver.

In the first version of the invention the 70
sender-station detector has its own station
selector in the form of a diode tuner equipped
with a set of viewer-operated selector switches,
this set being combined with a further set of
selector switches electrically connected to 75
the input logical circuit, the station selector
having an input terminal connected to the
antenna of the television receiver, a converter
being interposed between the station selector
and the television receiver, the converter trans- 80
forming the antenna signals delivered by the
station selector into a certain television chan-
nel or television frequency range and de-
livering the transformed signals over a cable
to the antenna socket of the television re- 85
ceiver.

In the operation of the detector it is
necessary to determine whether the television
receiver is really switched on, or not. To ob-
tain this information the device according to 90

the invention is arranged so that in addition to the sender-station detector, the device has a sensor acting as a switch-on detector, for detecting whether the television receiver has been 5 switched on, or not, the sensor having an oscillation circuit tuned to the line frequency of the television receiver and having an amplifier for amplifying the signals delivered by the oscillation circuit, a memory unit for storing 10 these signals, and an electronic switch connected to the input logical circuit.

Nowadays a considerable percentage of 15 television receivers are equipped with remote control, and it is desirable, in further development of the invention, to ensure that the detector operates without inconveniencing viewers who are using remote control for their television receivers.

Further details and advantages of the present 20 invention may be derived from the following description of several examples, and with the help of the drawing, in which:

Figure 1 is a block circuit diagram of a device according to the invention for detecting 25 and indicating technical information on television viewer behaviour and programme selection.

Figure 2 shows details of the sender-station 30 detector of the device shown in Figure 1.

Figure 3 illustrates an extra switch-on detector for the device shown in Figures 1 and 2.

In the drawing corresponding parts have the same index numbers.

The block circuit diagram of Figure 1 shows 35 the circuit units of the device according to the invention as blocks which are connected together electrically as indicated. The device has a power supply unit 1 for connection to the AC mains 2. The power supply unit 1 supplies DC 40 current to all the circuit units of the device according to the invention. For the sake of simplicity the electric leads used for this purpose are not shown in the diagram.

Further important circuit units comprise 45 an input logical circuit 3, an electronic memory unit 4, an output logical unit 5, a clock 6, a central control unit 7, a viewer-operated selector switch unit 8 and a sender-station detector 9.

The input logical circuit 3 has input terminals 10, 11, 12 feeding signals to the input logical circuit 3 from the viewer-operated selector switch unit 8, the sender-station detector 9 and the clock 6, which can for example 50 be a quartz clock. The input logical circuit 3 detects changes of state in the viewer-operated selector switch unit 8 and in the sender-station detector 9, delivering signals, combined with a time signal from the clock 6, to the electronic memory unit 4.

After processing these signals, the electronic memory unit 4 delivers signals to the output logical unit 5. The central control unit 7 is connected to the input logical circuit 3, the 60 electronic memory unit 4, the output logical

unit 5 and the clock 6. The central control unit 7 controls all the functions of the device on the basis of periodic time signals delivered by the clock 6. The output logical unit 5 is connected over a cable 13 to a "post-modem" in such a way that when interrogated the output logical unit 5 delivers the memorized data on the basis of the postal standard. 70

The sender-station detector 9 can be constructed in either of two alternative ways, 75 which are represented in Figures 2 and 3.

The first version of the sender-station detector 9 is shown in Figure 2. In this version the sender-station detector 9 has its own station selector 20 in the form of a diode tuner 80 with a set of viewer-operated selector switches 21, which are themselves combined with further selector switches 23 connected to the input logical circuit 3. The station-selector 20 is connected over its input terminal 24 to the antenna of the television receiver 27, the station selector 20 being adjusted to agree with the transmission frequencies of the locally operative television senders. The station selector 20 delivers signals to a converter 25 which 85 converts the received signals into a certain television channel or television frequency range and delivers the converted signals over a cable 26 to the antenna socket of the television receiver 27, which is tuned to the output frequency of the converter 25. When the viewer selects a programme, actuation of the further selector switches 23 applies signals to the electronic memory unit 4. After transmission over the "post-modem" to the central exchange 90 (not shown) the signals are decoded and indicate the sender station which has been engaged by the television receiver 27. 95

In order to determine whether the television receiver 27 is switched on, or not, a switch-on 100 detector can be used of the kind shown in detail in Figure 3. The switch-on detector has a coil 30 which responds to the 15 625 kHz signal of the line transformer with which a conventional television receiver is equipped. The signal delivered by the coil 30 is encoded and stored in a memory unit to indicate that the television receiver has been switched on. The switch-on detector is arranged as follows:

In addition to the sender-station detector 9 115 shown in Figures 1 and 2, the television receiver 27 is equipped with a switch-on detector which has an oscillation circuit tuned to the line frequency of the television receiver, the switch-on detector comprising the coil 30 and a capacitor C1. The oscillation circuit is connected to an operational amplifier OP1, whose amplification is determined by the ratio between two resistors R2 and R1. The operational amplifier OP1 delivers signals to a memory unit 120 consisting of a diode D1, a capacitor C2 and a resistor R3. The memory unit is connected to an electronic switch consisting of a resistor R4, a transistor T1 and a resistor R5. The switch-on detector is connected over a lead 31 to the in- 125 130

put logical circuit 3.

Detection that the television receiver has been switched on is obtained as follows:

The coil 30, together with the capacitor C1, forms an oscillation circuit tuned to the line frequency. When this oscillation circuit receives a signal, this is transmitted to the operational amplifier OP1, which amplifies the signal in the ratio of resistors R2 and R1. The amplified signals are rectified by the diode D1 of the memory unit, the resulting DC current charging capacitor C2 up to a voltage U, which is applied over resistor R4 to the base of transistor T1, making the transistor conductive, 10

The current flowing over transistor T1 allows the voltage U across resistor 5 to rise to about 4 volts. This voltage is stored and is evaluated as indicating that the television receiver has been switched on. Subsequently after the television receiver has been switched off, so that the coil is no longer receiving a signal, the resistor R3 discharges capacitor C2. Consequently transistor T1 becomes non-conductive and the voltage U across resistor 5 falls to 15 almost zero. This fact is stored and evaluated as an indication that the television receiver has been switched off.

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WHAT WE CLAIM IS:—

1. A device for monitoring selection of channels by a viewer of a multi-channel television receiver, the device being separate from such receiver and arranged for interposition between a receiver antenna and an antenna input terminal of a receiver, the device comprising 30

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channel selector means operable by a viewer, a clock, and memory means for recording information provided by the selector means and the clock, wherein the selector means includes a

tuner, an input signal connection for enabling the tuner to be connected to an antenna, a frequency convertor adapted to convert the signals from the tuner into signals of a pre-determined frequency range, and an output signal connection for enabling signals from the convertor to be supplied to an antenna input terminal of a receiver.

2. The device as claimed in claim 1 and including an oscillator tuned to a standard receiver line frequency, and means for indicating whether the oscillator is energised whereby to indicate that the receiver is switched on.

3. Device according to Claims 1 and 2, characterised in that in addition to the sender-station detector, the device has a sensor acting as a switch-on detector, for detecting whether the television receiver has been switched on, or not, the sensor having an oscillation circuit tuned to the line frequency of the television receiver and having an amplifier for amplifying the signals delivered by the oscillation circuit, a memory unit for storing these signals, and an electronic switch connected to the input logical circuit.

4. Device for detecting and indicating information on television viewer behaviour and programme selection, substantially as hereinbefore described with reference to the accompanying drawings.

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AGENTS FOR APPLICANT

1574964 COMPLETE SPECIFICATION

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the Original on a reduced scale
Sheet 1

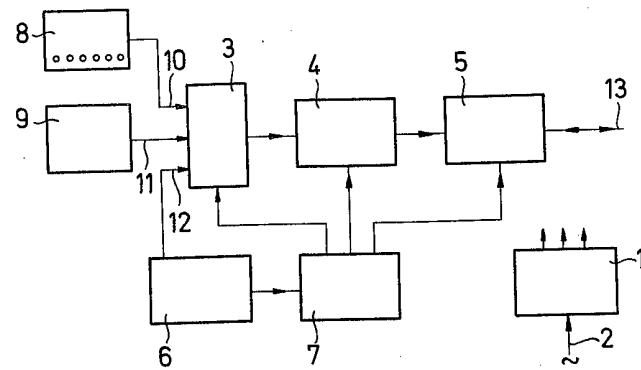


FIG. 1

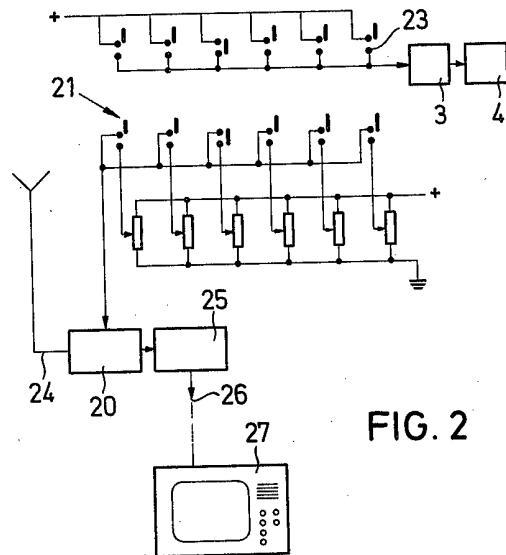


FIG. 2

1574964 COMPLETE SPECIFICATION

2 SHEETS *This drawing is a reproduction of
the Original on a reduced scale
Sheet 2*

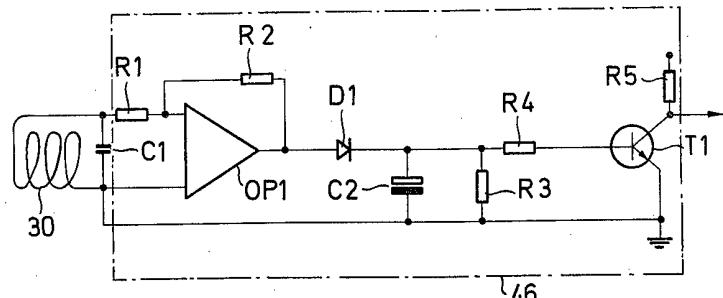


FIG. 3