DUTCH TELEVISION AUDIENCE MEASUREMENT

METHODOLOGICAL DESCRIPTION

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STICHTING KIJKONDERZOEK

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This document is written by GfK, The Nielsen Company and KANTAR TNS in collaboration with SKO office.

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CHAPTER 1

INTRODUCTION

1   INTRODUCTION

In the world of television, audience ratings matter. Audience ratings are an indicator of the size and makeup of the audience for a television programme. As such, they are a means of measuring the success of a programme. With this information, programme makers and broadcasters can adjust programme content and broadcast schedules in response to audience reaction. In the television advertising market place, audience ratings function as the "stock quotations" on which broadcasters, media bureaus and advertisers base their trade. In The Netherlands, audience ratings are generated in the continuous audience research carried out by GfK and The Nielsen Company under contract to Stichting KijkOnderzoek (SKO), the council for Dutch Television Audience Measurement.

This document is a description of the audience research methodology. It has been prepared for clients who use the results of the audience research and other interested parties. Chapter 2 provides a brief description of SKO, the organisation responsible for the audience research in The Netherlands. Chapter 3 discusses the Media Standard Survey, which provides a basis for the audience research. The research methodology, including People Meter technology, is described in Chapter 4. The methods used to determine broadcast times and classify programmes and spots are discussed in Chapter 5. In Chapter 6, the raw data and reporting are described. Chapter 7 provides a description of the reliability criteria for reporting channels in the Dutch Television Audience Measurement. A brief history of the audience research in The Netherlands is presented in Chapter 8. The calculation and reporting rules used by SKO can be obtained at www.kijkonderzoek.nl.

In compiling this methodological description, we attempted to describe and summarise the methodological information of relevance to users of audience research results. However, given the complexity and the speed of adaptation required by the continually changing technological and demographic setting in which the methodology is used, we cannot guarantee an absolutely complete and up-to-date description at all times. Regularly, the diverse methods applied in the research are critically evaluated, and when necessary, adjusted or improved.

For further information concerning the audience research, please contact Stichting KijkOnderzoek (info@kijkonderzoek.nl).

CHAPTER 2

STICHTING KIJKONDERZOEK

2 STICHTING KIJKONDERZOEK

Stichting KijkOnderzoek (SKO), the council for Dutch Television Audience Measurement is a market-wide organisation in which all parties that are directly involved in the sale and purchase of commercial broadcast time are represented. These include Screenforce (the organisation for the promotion and optimisation of television advertising), Publieke Omroep (Dutch Public Broadcasting), BVA/Bond van Adverteerders (the Association of Dutch advertisers) and Platform Media-Adviesbureaus (PMA, the media agencies platform), under an independent chairman. The SKO Board is responsible for the organisation, form and content of the television audience research. A Technical Committee provides advice on the content and method of research. The television audience measurement in The Netherlands is organised in a Joint Industry Committee (JIC). This formal organisation is increasingly seen as the model for the modern organisation of audience research. Decision-making in SKO is based on consensus.

SKO was established in 2000 for the purpose of:

- conducting (continuous) audience research on television broadcasts for the benefit of the public and commercial broadcasters and interested parties including broadcasting associations, advertisers and media bureaus involved in television (and Internet) advertising;

- managing the rights over the audience research data its publication.

SKO's strength is that it can act on behalf of all relevant parties in the media market to conduct the unique research on audience behaviour in The Netherlands. This audience research is accepted as the benchmark in the market; an acceptance based on the active involvement in the research by all the relevant parties in the market, including broadcasters, advertisers and media agencies. In the past, this was not always the case. Advertisers, in particular, had little or no involvement in the audience research, despite the fact that they are, after all, the principal focus of the commercial strategies of both public and commercial broadcasters. Through the participation of all interested parties in SKO, a generally accepted, statistical "gold standard" has been created as a basis for a scientifically accurate, valid, reliable and relevant determination of audience behaviour. The audience research is highly valued because of its verifiability and transparency, as evidenced by this methodological description.

2.1 RESEARCH AGENCIES

For the initial period 2011-2015, and prolonged until 31-12-2018, SKO commissioned GfK and The Nielsen Company to conduct the audience research.

These contracts allow SKO to take into account the newest technological developments in television viewing that could affect the measurement of audience behaviour in the coming years.

Since 2011, GfK has been conducting the measurement of the TV-viewing behaviour by means of people meters registration in a panel survey. To register viewing behaviour, they use an audio matching technique from their own research and development center, the Common Technology Center (CTC), with Kantar Media Audiences in the UK. This technique to recognise tv-broadcasts guarantees a future-proof and accurate registration of viewing behaviour.

Developing innovative research projects is part of the contract between SKO and GfK. These projects are aimed to research newer forms of viewing behaviour, in addition to the live broadcasting viewing through the TV set. For instance, improving the measurement and classification of unknown screen use and integration in the tv-ratings of the linear streaming of tv broadcasts within the household.

As of January 2011, The Nielsen Company is the partner of SKO for the registration, classification and harmonisation of broadcast information. Nielsen registers which programmes and spots are actually broadcasted on television by means of the TvEvents system, developed in Italy. The proven international expertise of The Nielsen Company guarantees a future-proof registration of all possible new kinds of broadcasts and advertisements appearing on the TV screen.

Since 2010, SKO has been working together with the organisations in charge of the Dutch Radio, Print and Internet audience research to set up the Media Standard Survey (MSS). This survey started in 2011 and is conducted every year by Kantar TNS. It provides census information on media ownership and media behaviour in The Netherlands. The MSS is also used as a basis to recruit households for the television panel. As of 2011, the MSS replaces the previous SKO Establishment Survey. The contract for the MSS survey was renewed until the end of 2018.

2.2   NEW STRATEGY

In 2013, SKO revealed its new strategy, which is a result of audiences' changing viewing behaviour, caused by the increasing penetration of online devices. An increasing number of people in The Netherlands own a laptop, tablet or smartphone and use these devices to view audiovisual content. Such content not only consists of TV programmes or clips of TV programmes, but also of non-TV video streams. In the face of these developments, SKO decided to expand its activities to include all kinds of video content on all kinds of devices. Measuring viewing behaviour with regards to online content and online commercials enables SKO to broaden the scope of its ratings research and to draw conclusions from the data with regards to the audience's total viewing behaviour on TV and online devices.

Back in October 2012, the SKO Board asked its Technical Committee to draw up a plan for the reliable measuring and reporting of (online) video use. In 2013, this initiative resulted in an effort to develop a platform independent video measuring scheme. This scheme should allow us to measure all video content (including live broadcasts and delayed viewing content) on every possible device, such as TV screens, laptops, PC's, tablets, smartphones, game consoles and Connected TV's. In other words: every kind of video content one can think of will be incorporated in the SKO researchers' measuring efforts.

SKO includes both programme content and video advertising. As a result, the ratings have end to end relevance for the TV and online video chain: for programme and content producers, media bureaus, advertisers and operators. One thing is clear: there is no such thing as one simple total solution. Viewing behaviour across the different kinds of TV and video is too diverse, requiring us to integrate different kinds of data sources. That's why SKO has developed the SKO Video Data Integration Model (SKO-VIM). Figure 1 offers a schematic representation of the SKO-VIM video measuring strategy. The model consists of a number of core elements that are described below.

FIGURE 1: SKO VIDEO DATA INTEGRATION MODEL (SKO-VIM)
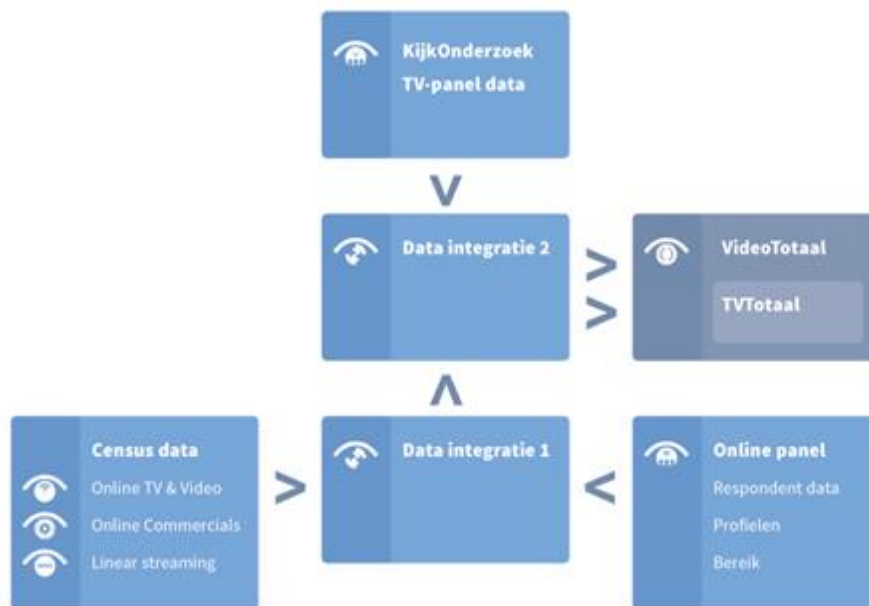
Census data: We need to measure the number of times video content is accessed by the end consumer and the total amount of minutes viewed. This needs to be done as closely as possible to the viewing location, i.e. from within the content players used by the audience. SKO identifies three different video census projects:

- linear streaming (e.g. live streams of operators, such as ZIGGO, KPN et cetera)
- online TV&Video project
- online commercials.

In each of these projects, SKO wants to register actual viewing behaviour as close to the user as possible.

Online panel measurement: Census data does not offer information on user profiles and unique reach. That's why it is necessary to measure the behaviour of actual persons. This involves the measuring of video behaviour through a high quality online panel, including each of the three video components: linear streaming, online TV&Video and online commercials.

TAM: This is the existing Television Audience Measurement. Of course, TAM will retain a central role in our model. The online viewing data are integrated with the TAM-based TV data.

Data integration - 1: in order to create reliable online video ratings, the online panel and census data are combined. This calibration is the first step towards data integration.

Data integration - 2: Next, the offline viewing data (television; TAM) and online viewing data are fused, which creates a full dataset with combined TV and Online viewing data. This fusion is the second step towards data integration.

Output: the outputs are: TV ratings, Online video ratings and combined TV and Online video ratings

The SKO Video Data Integration Model is translated into a Ratings Factory model (see Figure 2).

FIGURE 2. THE RATINGS FACTORY (IN DUTCH: KIJKCIJFERFABRIEK)
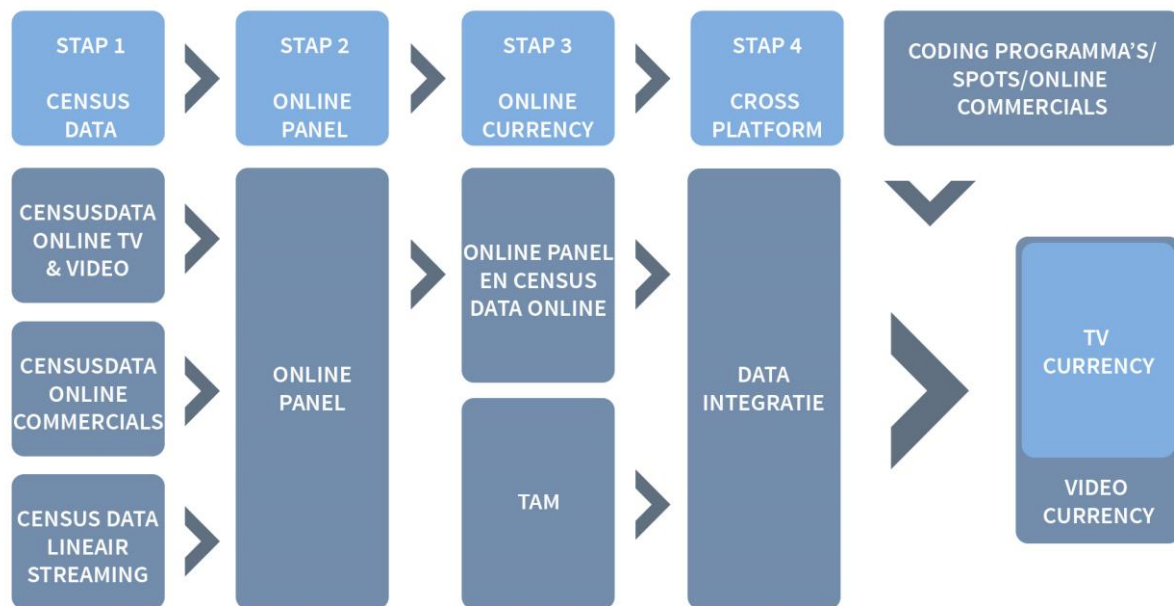
SKO strongly believes in a reliable and independent market standard that offers an objective, representative overview of the online video market. Such a standard is only possible through close collaboration with other online video parties that are not affiliated with SKO. SKO is currently discussing possibilities with several parties and is actively approaching online parties to work together in online video projects.

SKO's goals are ambitious and challenging, but necessary in a media landscape in which change is a constant factor. In the period ahead of us, SKO will closely collaborate with current JIC partners and new parties to extend the online video measurement. On the SKO website, you can keep track of our progress in the different projects.

Information about the new strategy can be found at the SKO-website (https://kijkonderzoek.nl/nieuwe-strategie). For an overview of the strategy, see also our brochure: (https://kijkonderzoek.nl/images/Brochures/140513_SKO_brochure_SKO-Videodata_Integratie_Model.pdf).

The methodological description of the VIM Model and the census measurement projects are published separately. They are available at the SKO site, under the different projects (For example, for online TV and video, see https://kijkonderzoek.nl/online-tv-video, for media panel, see https://kijkonderzoek.nl/over-online-panel).

ESTABLISHMENT SURVEY

3 ESTABLISHMENT SURVEY

3.1 FROM SKO ESTABLISHMENT SURVEY (SKO ES) TO MEDIA STANDARD SURVEY (MSS)

For the purposes of the audience research, Intomart GfK conducted an annual Establishment Survey between 2002 and 2010, used to recruit the households for the television panel. The ES consisted of a nationally representative sample with an annual net size of 6000 households, with an additional 200 households included for the purposes of regional over-sampling in the viewer panel.

As of 1-1-2011, the research is set up together with other media audience measurement services and conducted by TNS NIPO (now Kantar TNS).

As of the autumn of 2006, the organisations in charge of media audience measurement services in The Netherlands (SKO, NLO, STIR[1] and NOM) jointly decide on methodological issues, such as the standardisation of variables, weighting and recruiting basis, in order to set up a common source for reliable and stable census information on media ownership and media behaviour.

In 2007, these four parties started discussions to organise a joint establishment survey: Media Standard Survey (MSS). The aim of this new MSS is to obtain results of variables that are used by all the media audience measurement services as recruitment or weighting norms.

The MOA Golden Standard (MOA GS[2]), developed by the Dutch market research organisation, is now used by all audience measurement services as the norm for their questionnaire, weighting and recruitment. However, not all relevant (weighting) variables for SKO, NOM and NLO are available within this standard (e.g. the penetration of computers and internet in Dutch households). Therefore, another media standard survey was necessary.

MSS is important because it allows obtaining common universes for all the media audience measurements, both at the household and the individual level, for all the variables needed for weighting which are not available in the MOA Golden Standard. If necessary, the MSS can be used as an alternative to the MOA GS to calculate the universes in the television, radio, print and internet audience measurement services.

In 2010 a contract was signed with Kantar TNS (previously TNS NIPO) to execute the common MSS from 2011 to 2013, which was revewed in 2013 for the period 2014-2016 and prolonged until 31-12-2018.

The MSS aims to obtain reliable and stable universes based on the Dutch population for recruitment, weighting and control of the media audience measurements.

Important goals are:

- Standardisation of questionnaires and weighting norms, regarding socio demographic variables, audiovisual equipment in households, internet penetration, media imperatives and other variables used as population sources.

- Alternative sources of universes in cases where MOA GS norms are not available.

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[1] STIR, the internet audience measurement service ended in January 2014.

[2] See also p. 16.

- Measurement of market trends to evaluate the media audience measurements of television, radio, print and internet. These may be used as future weighting or recruitment variables (e.g. digital television or internet radio penetration).

- The regular provision of addresses for the recruitment of new households to the television audience panel. The research may be carried out so that a sufficient number of respondents can be found to recruit and maintain a representative panel for SKO.

The universes obtained from the MSS represent private households in The Netherlands as well as individuals of 13 years and older.

The methodology of the MSS is further described in this chapter.

3.2   THE UNIVERSE

The universe for the MSS includes:

1. Households: the household universe consists of all private households in The Netherlands. Students living in collective housing but with their own room are also included in the household universe.

2. Individuals: this universe consists of all persons of 13 years of age and older living in private households in The Netherlands.

Group housing[3], institutions, nursing homes, companies, governmental organisations and persons without a fixed address, such as families living on barges or in mobile homes are excluded from the research population.

The composition of the universe of the Media Standard Survey is based on the annual MOA Golden Standard data. The Golden Standard is a calibration tool for national and regional sampling in The Netherlands. This is a tool developed by the Market Research Association (MarktOnderzoekAssociatie -MOA) in collaboration with the National Statistics Agency (Centraal Bureau voor de Statistiek). Prior to 2006, the universe was based on the MiniCensus conducted by GfK Netherlands, which was adjusted on the Monday of week 27 in accordance with CBS trend figures.

3.3   SAMPLING AND QUOTAS

The MSS forms the basis for recruitment, weighting and audit of the media audience measurement. These audience measurements are vital to the media industry, they are at the base of the trading currencies for trade associations such as advertisers, agencies, and broadcasters. MSS is therefore subject to high sample quality requirements. Results should not be biased due to over- or underrepresentation in the sample of particular groups with specific response patterns. This is usually defined as a "representative sample". This is a somewhat ambiguous term that is mostly used (by sampling theory professionals) for specific variables. Large samples for generic use are, as a rule, expected to be self-weighting. That means that every research unit has the same probability to be selected. MSS meets both criteria: specific representativity requirements and generic self-weighting of the sample. Kantar TNS works together with Prof. Dr. Dirk Sikkel (Sixtat) to select the MSS sample.

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[3]   With the exception of students as mentioned above.

The MSS sample is obtained through a two-stage sampling procedure. In the first stage, a sample of Dutch municipalities is drawn, and in the second stage, households are sampled within these municipalities. In the first stage, municipalities are ranked according to size.

For the selection within the municipalities, MSS uses TNT's postal delivery point database, which contains all private residential addresses in The Netherlands. To select households within the municipalities, additional estimates of educational levels and the age of the heads of households are used. These have proven to be good predictors of media behaviour. Within the municipalities, all individual addresses are sorted by these two variables; as a result, the sample is representative for these sorting variables as well.

Within the households, the next-birthday method is applied to create a sample of individuals. This method is validated and appears to be the most effective (O'Rourke and Blair, 1983; Salmon & Spicer Nichols, 1983). Although all households are sampled with an equal selection probability, individuals do not have an equal sampling probability. After the sample of households has been drawn, individuals within a one-person household have a probability of 1 (or 100%) to be included in the person sample, an individual in a two-person household has a ½ (or 50%) probability to be drawn and this decreases further, as the household becomes larger. To account for this, sampling weights are assigned to the persons selected. Weights are proportional to the number of individuals aged 13 years and above within the households. An individual in a three-person household (based on the number of persons aged 13 years and above) will, in reality, represent 3 persons.

The household sample of the MSS is drawn up once a year, based on a systematic sampling procedure of municipalities and all private households in The Netherlands provided by TNT's postal database and Cendris. Every quarter, all sampled addresses are improved with name and telephone numbers information provided by Cendris. By doing so, Kantar TNS works with the most up to date information. EDM Data conducts an extra improvement of the telephone number data. Their aim is to provide a telephone number for each selected address.

3.4   REPRESENTATIVITY

The households and persons in the samples of the Media Standard Survey are representative of all private households in The Netherlands and all persons of 13 years of age and above within these households. To this end, the following variables have been established:

Household-level	**Person-level**
Age of head of the household	Age
	Sex
Educational level head of the household	Educational level
Household size	Household size
Household composition	Position in household
Social status head of the household	Social status head of the household
	Nielsen region
Province	Province
	Cebuco region

3.5   SAMPLE SIZE

In the MSS the following numbers of respondents are surveyed yearly:

- The household survey consists of net N = 6,000 households. The head of the household (male/female) is interviewed, or his/her partner. The head of the household is the person aged 15 years or over who contributes most to the household income.

- The individual level sample consists additionally of a net sample of N = 5,100 persons aged 13 years and older.

3.6   QUESTIONNAIRE AND FIELDWORK

The questionnaire of the MSS includes questions regarding the presence of media equipment in the household and the media use of households and persons (selected according to the date of their next birthday). The questionnaire also includes questions on social and demographic characteristics of the household and the household members.

Fieldwork for the MSS is carried out on a continuous basis using a multi-instrument approach, combining fieldwork done face-to-face, by telephone, online, or by paper questionnaires.

An introductory letter is sent by mail to every selected person in the gross household sample. The letter is written in Dutch, and includes summaries in English, Turkish and Moroccan-Arabic. The letter is addressed to the head of the household. In order to do that, the TNT postal delivery point database is used. The addresses on this file are addressed to the head of the household.

The first contact with the respondent takes place using CAWI (Computer Assisted Web Interviewing). In a second attempt, respondents are contacted through CATI (Computer Assisted Telephone Interviewing) or CAPI (Computer Assisted Personal Interviewing), depending on whether a telephone number is available.

FIGURE 3: FLOWCHART MSS FIELDWORK METHOD
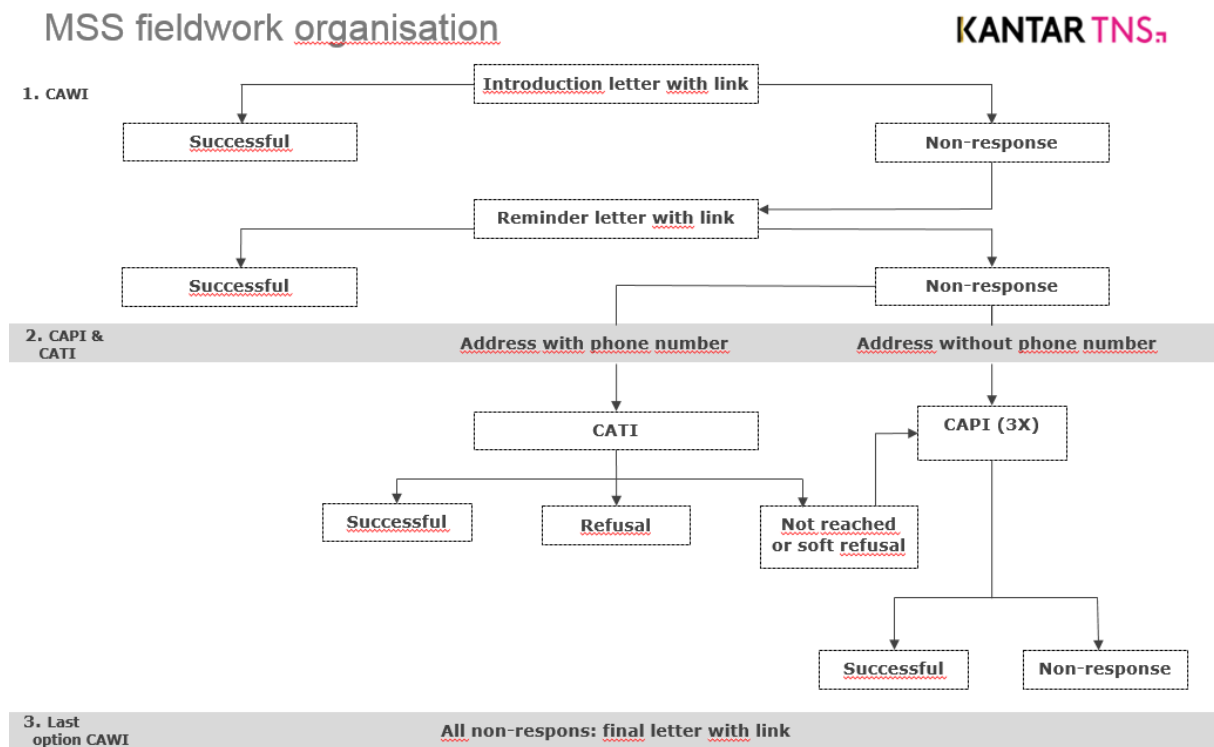
After the first contact with a letter containing a CAWI link, non-responsive respondents receive a reminder letter.

In the second phase, addresses with an available telephone number are contacted by telephone (CATI). If there is no answer, the telephone number will be called again a maximum of 25 times on various days of the week and times a day. If there is still no contact, these addresses are visited by an interviewer for a face-to-face interview (CAPI).

Addresses with no telephone number available are also visited by a CAPI interviewer. These addresses are approached a maximum of three times. If there is still no contact, a letter including a link to the online questionnaire, and a paper version of the questionnaire is sent to the household's address or left behind.

The three fieldwork techniques CAWI, CATI and CAPI are applied by Kantar TNS to obtain previously agreed response percentages. To obtain the highest response possible is important given the nature of the survey: researching the composition of the universe for media audience measurement.

Conversion to the person questionnaire, addressed to the person in the household having celebrating his/her birthday first, is conducted as efficiently as possible, preferably through the same fieldwork technique as used to interview the head of the household or his/her partner. However, the respondent is free to use the interview method he/she prefers. In cases where the head of the household and the first person in the household having a birthday are the same person, the household and person questionnaires follow each other, so the respondent doesn't notice he/she answers two questionnaires.

3.7 RESPONSE ENHANCING MEASURES

A high level of response is required in order to ensure the representativity of the MSS. A large number of measures designed to enhance response have been adopted in order to achieve a minimum response of about 60% on household level and 85% on a personal level. The following measures are adopted:

- *An introductory letter is sent by mail to every selected person in the sample.*
- *€10 is offered to each household for participation in the survey.*
- *All contact attempts are distributed as efficiently as possible among days, day-parts and time-slots to improve the contact probabilities.*
- *Households who initially declined to participate are contacted again after a while.*
- *A telephone card is sent with the CAWI introductory letter, so respondents can choose for a telephone interview if they wish so.*
- *When calling on the household in person, if no one is home, a card is left behind with the request to contact Kantar TNS (by e-mail, telephone, or by mail).*
- *A specific website about the research (www.tns-nipo.com/mediaonderzoek) and an online helpdesk (mediaonderzoek@tns-nipo.com) is available for respondents during the fieldwork. The helpdesk can also be used for general questions regarding the research.This helpdesk can also be reached via a toll-free telephone number.*
- *Kantar TNS uses preferably bilingual interviewers.*
- *When questioning immigrant households, the interviewer may ask other household members for help when the respondent does not speak Dutch. Other household members can help translating the answers.*

3.8 IMMIGRANT POPULATION

An immigrant household is defined based on the:
- country of birth of the mother of the principal breadwinner;
- country of birth of the father of the principal breadwinner.

Because the universe of the MSS is based on all addresses in The Netherlands in the TNT postal delivery point database, the immigrant population has an equal chance to be sampled. However, in order to minimise non-response among the immigrant population group, special attention is given to the recruitment of these immigrant households:

1. When necessary, using a bilingual researcher for telephone and face-to-face interviews;

2. A supplementary sheet with multi-language text is included with the introductory letter, announcing the survey and explaining its purpose to non-Dutch speaking persons;

3. When questioning immigrant households, the interviewer may ask other household members for help when the respondent does not speak Dutch. Other household members may help translating the answers.

3.9   REPORTING

Data from MSS is reported to SKO and the NLO, NOM, and since 2015 Vinex partners in a two weekly fieldwork report, and a quarterly dataset. Every (half) year, Kantar TNS delivers a complete report to the partners of SKO, in which the results are described for a number of target groups. Reported results are weighted according to the annual MOA GS data so that the results are representative for the Dutch population of 13 years and older.

Yearly reports on television use and presence of tv-equipment in Dutch households are published by SKO in the report 'TV in Nederland' and are available at www.kijkonderzoek.nl.

As of 2011, the MSS-partners publish an overall annual summary of the MSS-results. In this summary, medium-specific information and media-imperatives are reported by target group and medium type.

CHAPTER 4

MEASURING AUDIENCE BEHAVIOUR

4 MEASURING AUDIENCE BEHAVIOUR

To achieve a valid and reliable measurement of audience behaviour in the Dutch population, two things are absolutely necessary: 1) a representative viewer panel whose members allow their viewing behaviour to be monitored over a period of time and 2) an up to date, reliable measurement technique that is capable of registering audience behaviour, or in other words everything that can be defined as "watching television".

This chapter contains a detailed description of the measurement of audience behaviour and the procedures used to ensure the validity and reliability of the results of the audience research.

4.1 THE TV PANEL

The viewing data is gathered on a daily basis from a panel of at least 1,250 households, whose members aged three years and over have agreed (or have their elders' consent) to participate in the research (approximately 2,750 persons). Until the end of 2017, the panel was composed of a nationwide sample of 1,215 households, with an additional 35 households for regional over-sampling in the provinces of Drenthe, Flevoland and Zeeland. Since January 2018, these 35 additional households are not oversampled in these provinces anymore but are nationally spread.

This section describes the criteria used to select the households for the panel and the method by which they are recruited to take part in the research. Additionally, the methods used by GfK to maintain contact with the panel members are discussed.

4.1.1 POPULATION AND REPRESENTATIVITY

The composition of the audience panel must meet a number of criteria, in order to obtain as representative a sample of the Dutch population as possible. Prior to 2006, these criteria were drawn from two different censuses:
- the biennial GfK MiniCensus (approximately 10,000 households);
- the annual trend figures for population size published by the CBS.

From 2007 onwards, criteria for population size and composition are based on the MOA Golden Standard, which in turn uses population figures from CBS/Statistics Netherlands. The MOA Golden Standard 2016 is used to calculate population universes from Monday week 1 2017. The MOA Golden Standard 2016 represents the demographic structure of the Dutch population on 1-1-2015 as calculated in 2014.

In addition, until 2011 norm figures were determined based on the SKO-Establishment Survey. Since 2012, MSS has been providing the norm figures used by SKO and the other media audience measurement services. Through these norm figures, common and unambiguous population figures for recruitment and weighting are ensured.

In addition to the groups listed in section 3.2, the following groups are excluded from the Media Standard Survey and thus from the audience panel:
- Households in which most household members do not write/speak adequate Dutch;

- Group housing, institutions, nursing homes, companies, governmental organisations and persons without a fixed address;
- Employees of television stations, broadcasting organisations, market research bureaus, advertising bureaus or media bureaus.

The first and second groups are excluded from the research for practical reasons; the third group is excluded to avoid potential undue influence on the results.

A maximum of eight members of a household can take part in the research.

The panel consists of a nationally representative sample of about 1,250 households (with at least one television set at home).

Furthermore, a number of 'fictive' households are added to the sample to represent households without a television set at home; in (July) 2017, these were an additional 43 (fictive) households. This is done to ensure that the basis for the results reflects all Dutch households, also those without a television set at home. The number and characteristics of the "no television" households to be added are determined on the basis of the yearly figures of the most recent Media Standard Survey.

To ensure that the daily panel size of 1,250 households is not put at risk by, for example, technical problems or panel households moving, a buffer of extra households is maintained in the sample. On a daily basis, the gross panel includes more than 1,350 households plus fictive households without television. This includes households in the entrance phase (see §4.1.4).

If possible, panel households who move are reconnected at the new address. When households break up, the participation of those persons leaving the household is terminated. If they wish, they can maintain their assigned button on the remote control, but their future viewing behaviour will be registered as "guest viewing" (see §4.2.11).

4.1.2   SELECTION OF HOUSEHOLDS

Maintaining the audience panel at an acceptable level for the criteria defined by the SKO-Technical Commitee is a complex operation and demands constant attention. Checks on the representativity of the panel are carried out by GfK every week. If the panel is found to be skewed for one or more crucial characteristics, new households with those characteristics are recruited, which will "straighten out" the panel. For example, if there are too few one-person households in social class D from one of the three large urban centres, such households are sought for inclusion until the panel's composition is once again acceptable with respect to these and all other criteria.

The values for each of the selection criteria are known for every household in the MSS. This database can be used in a targeted search for the replacement of households with particular characteristics or when adding supplementary households to the audience panel.

The selection of households is based on the recruitment matrix. The procedure is described in the following section.

4.1.3   RECRUITMENT MATRIX

Recruitment from the MSS-sample for the audience panel is based on a 65-cell matrix. The matrix is constructed based on region, household phase, principal breadwinner's highest level of education and occupation, with a separate cell for ethnicity (based on Non-Western immigrants). The fictive "no television" households added to the panel are included in the entire cell matrix. The composition of the recruitment matrix is presented in appendix 4 on the website (www.kijkonderzoek.nl).

The required size of each cell in the matrix is determined using the Media Standard Survey, weighted for MOA Golden Standard values. GfK uses these requirements to determine the requisite panel composition. Households that are surplus to cell requirements can be decoupled from the panel and additional households are recruited for cells with a shortfall. The households in the Media Standard Survey serve as the basis sample for this selection procedure. The procedure for recruiting households is discussed further in section 4.1.4.

In order to achieve a 65-cell matrix, in some instances, categories have been combined for some of the variables discussed above. Thus, there is no guarantee that the panel will have a perfect composition for all of the underlying categories of the variables in the recruitment matrix.

In 2015, an in-depth analysis of the cell matrix has led to changes in 27 cells, mostly on the cell definitions of cells based on the fact that not the variable Education is now chosen before Working status in the ranking used for aggregating categories within the cells

4.1.4   RECRUITING STEPS PANEL MEMBERS

As a first step in recruiting and incorporating households in the panel, a brochure introducing the television audience research is sent to the selected households, along with an invitation to participate in the research. The brochure contains a description of the audience research and what participation in the research involves. The accompanying cover letter contains the web address of the site that provides further information on participation in the audience panel: www.kijkerspanel.nl. Through the Web, households can reply whether they would like to participate in the audience measurement.

If after a certain time, GfK receives no online reply, the household is contacted by telephone, or (in exceptional cases) face-to-face by an interviewer to determine whether the members of that particular household are willing to take part in the audience panel. If so, the Panel Management department of GfK conducts an introductory interview by telephone, explaining the audience research and making an appointment for a technician to visit. A card confirming this appointment is sent by mail.

A GfK technician will install the necessary measurement equipment and check to make sure it is functioning correctly. He will also run a test of the connection used by the GfK computer to read the recorded data. Normally, the call-in takes place at night, but it is run at the technician's request to check the quality of the connection itself, and to see if the test procedures carried out with the installed equipment were correctly registered by the audience meter.

Using visual aids, the technician explains in detail what participation in the audience panel involves and demonstrates the use of the equipment to the new panel members. A set of

instructions for the audience meter is also provided, explaining how the meter works and giving step-by-step instructions for logging on and off. The new panel members also receive a special introductory issue of the panel newsletter, which includes the conditions of participation and the agreements for financial compensation (see §4.1.5). The technician's visit lasts at least one hour and at most six hours, depending on the number of television sets involved and the complexity of the installation of the measurement equipment.

Following the technician's visit, an interviewer will call the panel household to conduct the basis interview (see §4.1.6).

During the first four weeks after joining the panel, audience data from a new panel household is not included in the reported figures. Based on past experience, their viewing behaviour may be atypical in the new situation. It is assumed that after a few weeks, their viewing behaviour will turn to a level comparable to their viewing behaviour before joining the panel.

4.1.5   COMPENSATION AND INCENTIVES

Every panel member aged 13 and older is entitled to financial compensation to the amount of €22.50 a year, with a minimum payment of €45 a year per household. People in one person households participating in the panel thus receive €45 a year. This amount covers more than the meter's energy use. Each child in the panel between 3 and 12 years of age receives a gift with a value of €22.50 each year

After the successful installation of the meter, new panel households can choose from a selection of "welcome" gift coupons. In addition, every household automatically joins a quarterly lottery with a prize of €450. The results of this lottery are published in the panel newsletter sent four times a year to all panel households. The newsletter also contains an article on GfK's research activities, a short story for children, a puzzle and a Top 10 list of television programmes of the previous quarter.

Each panel member receives a birthday card and a Christmas card.

4.1.6   INTERVIEWS AND RESEARCHER VISITS

Following the installation of the meter, an interview is conducted in the new panel household. Since 2002, the interviews have been conducted face-to-face, but from 2015 we have gradually switched to interviews by telephone. In 2016 100% of the panellists interview have been conducted through CATI. In 2018, respondents will be given the opportunity to either complete the interview by telephone or online.

The interview questionnaire consists of a household section and an individual section. The household section is administered to the principal breadwinner or his/her partner and deals with topics such as household composition, the presence of audiovisual equipment and membership of a public broadcasting organisation. The questions in the individual section deal with viewing behaviour and preferred broadcasting organisation or channel, but also more general questions regarding interest in politics, art and sport, culture, political affiliation, religion, education and employment of each of the individual household members, among others.

Each household is additionally sent a household and personal booklet containing a questionnaire on product use. This questionnaire can be completed online or via the booklet.

The basic and product questionnaires are repeated annually in March - May in all households in the audience panel, in order to register any changes within the participating households. These changes are incorporated annually (on Monday in week 27) in the background characteristics of the audience research raw data (demographics).

Every September, the panellists are re-contacted in order to update their claimed online media behaviour. This is necessary for the data fusion with the Online Media Panel in the framework of the SKO VIM model.

4.1.7   TELEPHONE CONTACT

In addition to contact for the basic and product use questionnaires, telephone contact with panel households is made when necessary. Panel members can use a toll-free number to contact GfK Panel Management if they have questions on panel membership, logging on and off or other equipment use. In this way, they can also report the acquisition of new audiovisual equipment such as a new (smart) television set, mediacenter, DVD player/recorder, hard disk recorder or set-top box. Furthermore, by telephone or by e-mail they can report technical difficulties or equipment malfunction. In turn, the Panel Management department contacts panel households to discuss logging on and off and other issues essential to the correct conduct of the research. In addressing these issues, Panel Management is able to draw on a large number of checks and quality control reports (see §4.3.3).

4.1.8   WEBSITE WWW.KIJKERSPANEL.NL

A special website has been set up for panel members. It includes:
* information on the audience research and panel membership for households that have been selected for recruitment. A link to this site is included in the introductory brochure sent to these households prior to initial contact;
* information for new panel members with answers to the most frequently asked questions;
* clear step-by-step instructions on operating the meter;
* information on panel membership and other aspects of the research for all participating households;
* an e-mail link that allows panel members to send questions or comments directly to the Panel Management department.

4.1.9   TERMINATING PANEL MEMBERSHIP

When a panel membership ends, a technician will visit the household to disconnect and remove the audience measurement equipment. Shortly thereafter, an exit questionnaire is sent to the household. In this survey, respondents are asked to evaluate their experience as members of the panel, contact with the research organisation GfK and use of the meter, as well as to give their opinion on the panel newsletter. A gift certificate is included with the exit questionnaire.

In principle, a household can remain in the panel for a maximum of six years[4]. Each year, about 30% of the panel is replaced. Households can continue to participate in the panel only as long as

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[4]   Analysis of TV viewing has shown that the duration of panel membership does not have an effect on a household's viewing behaviour. Households that remain in the panel for 5 to 6 years do not exceed 20% of the gross panel.,

all of the members of the household (living at the same address) are willing to take part in the audience research. If one or more people in the household no longer wish to take part in the research, the household will be removed from the panel and a replacement is sought.

Households may voluntarily withdraw from the panel; GfK may also terminate a household's panel membership. In order to guarantee the quality of the data, daily validation checks are run on the log-on behaviour of the panel members (see also §4.3.2). If there is a problem with the log-on behaviour of a panel member, the household is contacted to discuss the possible problem and their participation in the research. If the unsatisfactory behaviour continues despite repeated discussions, the entire household will be dropped from the panel. In fact, this seldom occurs: experience has shown that, in such situations, the household involved usually withdraws voluntarily before it is removed. GfK may also remove households in the panel for panel maintenance reasons. In that case, households are informed about this before their panel membership is ended.

When a household is removed from the panel, a replacement is sought and recruited. Replacement households may be sought that have similar characteristics or, depending on the composition of the total audience panel at that moment, different characteristics.

4.2   THE AUDIENCE METER

In this section, a description of the meter is provided which is used for the audience measurement to register the viewing behaviour of all persons in the TAM-panel.

The audience meter currently used to record the viewing behaviour of all the members of the audience panel is the TARiS 5000meter. It has been developed by the Common Technology Centre, in conjunction with GfK and Kantar Media (previously TNS Taylor Nelson Sofres and Gallup Denmark). The TARiS 5000 meter can be used with all brands of television sets and smart tv's currently available in Europe. The transfer and storage of data meet the latest technological requirements; all components are "EC" approved.

An audience meter is attached to every (smart) television set, video recorder, DVD player/recorder, hard disk recorder, set-top box, mediacenter and possibly other TV-connected devices at the address where the household currently lives. The various meters form a household network, with one meter serving as the central unit. The meter system also contains a small display that is placed near the television set and a specially designed remote control whose use is explained in section 4.2.7.

4.2.1   METER SYSTEM REQUIREMENTS

SKO set the following requirements for the meter system:

1. a minimum amount of activity is required of panel members and their guests;
2. capable of identifying national, regional, local and foreign stations;
3. capable of identifying digital and/or compressed digital signals;
4. suitable for all types of reception;

5. suitable for all types of receivers, including PCs and other mobile devices if connected to the TV set;

6. system already in use or in field tests in other countries.

The TARiS 5000 audience meter meets all of the above requirements[5].

FIGURE 4: THE TARIS 5000 AUDIENCE METER

In 2015/2016, an updated CPU (central processing unit) of the audience meter is implemented with greater memory size and quicker data processing.

4.2.2 SIGNAL IDENTIFICATION

Signal identification takes place by audio matching, using Enhanced Audio Matching (EAM). EAM matches audio samples to identify stations. In the past, additional techniques have been used (Picture Matching and Vertical Blanking Interval (VBI)). Until the end of 2017, a 'watermarking' technique based on Metric Line has been used as a second form of signal recognition. This technique used a sound signal inaudible to the human ear. VBI measurement stopped in 2016 and Metric Line measurement stopped in 2017.

Additional modules can be added to the meter when technological developments demand it, such as a module, for example, that can read the codes from digital set-top boxes, with the cooperation of the digital provider.

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[5] The former Intomart GfK/AGB 4900 frequency meter met all of these criteria, with the exception of points 3 and 5.

Enhanced Audio Matching works independently of the station being broadcasted. It does not matter whether television programmes are received by antenna, cable, satellite antenna, a decoder or Digitenne (digital terrestrial reception), internet/adsl or glass fiber. Nor does it matter whether the broadcast is tuned in directly via the television set's tuner or indirectly through an external tuner such as a mediacenter.

4.2.3   ENHANCED AUDIO MATCHING

Audio Matching makes it possible to reliably measure and report audience behaviour for the most modern television sets and smart tv's as well as all kinds of devices that can be connected to the TV set, including:

- Video recorder
- DVD player/recorder (with or without Hard Disk)
- Hard Disk (HD) recorder
- Set-top box (with or without Hard Disk)
- PC and mobile devices (laptop, tablet, smartphone)
- Mediacenter or dongle for TV-streaming (including USB-sticks)
- Game console and other devices

Enhanced Audio Matching (EAM) uses the technique of audio matching for signal identification. To make this possible, all potential audio sources must be connected to the TARiS 5000-meter. An example of an EAM installation involving the television set and several TV-connected devices is illustrated in Figure 5.

FIGURE 5: INSTALLATION FOR ENHANCED AUDIO MATCHING
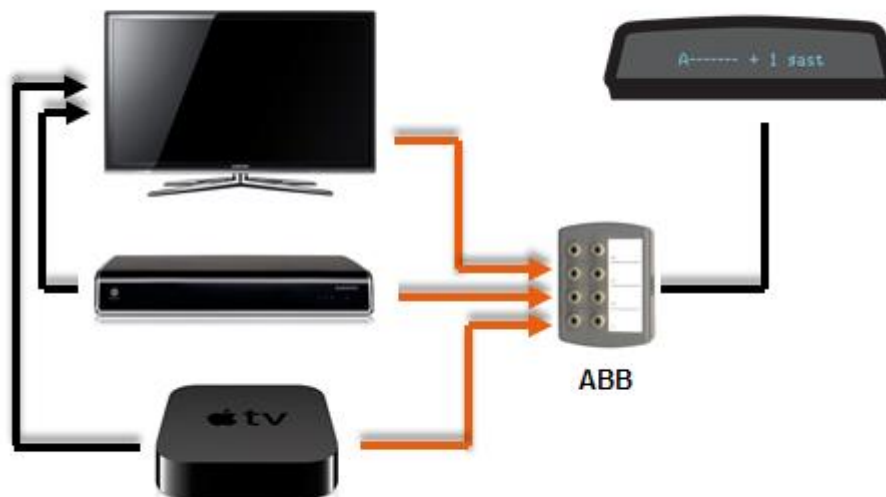
The audio output cables of the television set and of all the peripherals attached to it are connected to the TARiS 5000 meter through an "Audio Breakout Box" (ABB). The ABB identifies the source of an audio signal and transmits this information to the TARiS 5000 meter.

With EAM, signal identification is possible for those stations stored at the reference sites (see §4.2.4). What is not known, however, is what action a peripheral device is performing (e.g. playing a DVD, recording a programme, watching the electronic programme guide, etc.).

Sampling for audio matching is not done according to a fixed time schedule. Instead, in a Triggered Sampling Scheme, the quality of the audio signal itself determines the sampling moment (see Figure 2). Sampling occurs at a moment when there is a change in the character of the sound, such as a change in tone. As a result, audio samples are taken several times a minute.

This information is transmitted at night from the meter in the household to GfK, where the sound samples are compared to the reference samples collected at the EAM reference sites (see §4.2.4). The signal recognition is done by matching meter data with reference data. The Triggered Sampling Scheme provides a very efficient way of assigning the audio samples to audio reference records.

FIGURE 6: AUDIO MATCHING PROCESS
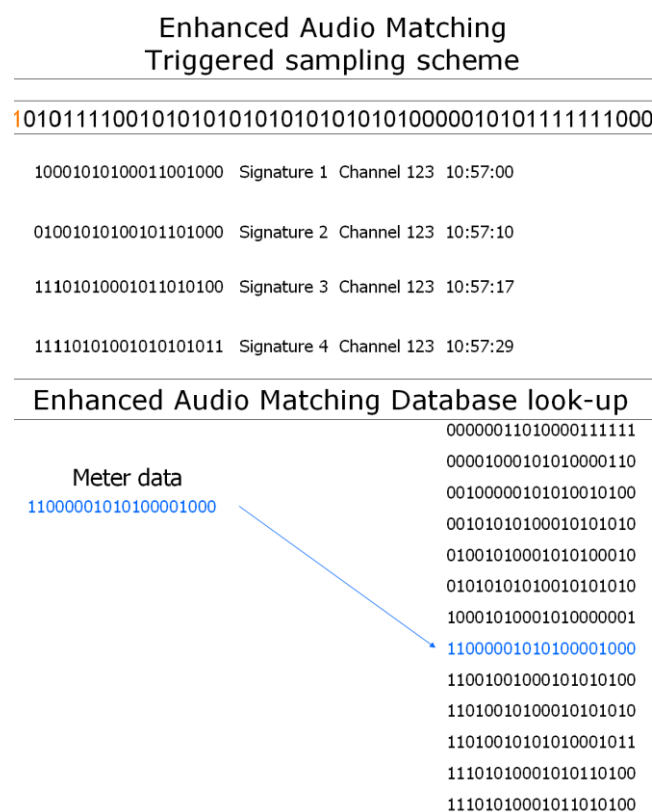
If EAM does not find any match with the channels in the references, this statement is classified as unknown screen use (see §4.2.10).

If more than one TV-station is recognised by the EAM-technique, meaning that several TV-stations in the reference site are similar to the viewing data coming from the households, and it is known which TV-stations it concerns, this is called 'simulcast'. This is caused if two or more TV-stations

broadcasted the same sound, for instance if a soccer game is simultaneously broadcasted in different countries. In this case, specific validation rules apply, which are discussed in Section 4.3.2. These rules have been revisited and updated when the MetricLine measurement ended per 1-1-2018.

4.2.4   REFERENCE SITES

The Enhanced Audio Matching (EAM) technique involves reference sites in which national and regional channels are registered.

These reference sites were needed to match the audio samples. At present, reference sites are available at two GfK's office and at Glashart (KPN). As of 1-1-2017, 116 TV-channels are referenced through these sites.

By means of this information, TV-stations, VCR, DVD, HDR, other channels and the channel total can be reported in the raw TAM data.

Of course, it is important to ensure that the correct coding of stations at the reference site is not changed unexpectedly (for example, when a cable company makes an unannounced change in the channel assignments for stations) or that the registration of a sender at the reference site is not hindered by local disruptions or other problems. For this reason, a variety of controls are ran on the signal of each coded station. In addition, all stations are doubly verified from different reference sites.

4.2.7   THE REMOTE CONTROL: REGISTERING VIEWERS

The audience meter automatically records the station to which the television set is tuned and the type of screen use (television programme, HDR or DVDR, teletext). In order to register *who* is watching, panel members must log when they start and stop watching television themselves. In the audience research, this can be done with little effort using the buttons on the special remote control supplied with the meter (see figure 8). Every person in the panel household over the age of two is assigned a personal character (A-H) corresponding to one of the buttons on the remote control. When person A begins watching television, he or she presses the button marked A on the remote control. His or her name will appear on the meter's display screen. When he or she stops watching, they once again press the button marked A. Viewers should log on to all forms of screen use, including:

- Watching a programme or other broadcasted content (including commercial breaks);
- Time shifted viewing: watching a recorded programme or other broadcasted content;
- Watching series or movies (online streaming, rented, purchased or downloaded);
- Watching online video content (videoclips, vlogs, social media videos)
- Accessing Teletext (on the Dutch or foreign station);
- Viewing a cable news page.

FIGURE 8: THE REMOTE CONTROL

If the television is only used as a display screen (for gaming, for example), no one needs to log on, but the "No Viewers" button should be pressed. This button should also be used when people are listening to the radio through the television set.

When the television set is on, the meter asks every 15 minutes whether everyone who is watching has logged in and those who have stopped watching have logged off. This is done by displaying the message "Zijn aanmeldingen OK?" ("Are log-ons correct?") for a few seconds. If this is the case, then no further action needs to be taken. If the television is turned on, but no one logs on within 15 seconds, then the message "Wie kijkt?" ("Who is watching?") is displayed. In audience research in other countries, any panel member present in the TV room with the television set switched on, is required to log on and is counted as a viewer in the audience ratings ("presence in the room"). In the Dutch audience research, individuals only have to log on if they are actually watching television ("in the room and watching"). It is up to panel members themselves to decide when they are actually watching, but in the instructions provided by Panel Management it is stressed that even when someone is only "half watching" (for example, watching television while eating a meal), they are still considered viewers and should log on.

When a panel household goes on vacation, they can use the remote control to inform GfK, as there is a special button 'vacation'. In that case, the quality controls normally carried out by Panel Management (see §4.3.3) will be temporarily suspended. The vacation status ends automatically as soon as the television is turned on. While on vacation, members of the household remain part of the reporting sample: they are counted as non-viewers.

4.2.8   VCR, DVD, HARD DISK, SET-TOP BOX, MEDIACENTERS, GAME CONSOLES AND CONNECTED TV SETS

The Audio Breakout Box (ABB) and the EAM modules in the meter system are used to identify and register various forms of equipment use (VCRs, DVD players/recorders, hard disks, mediacenters and set-top boxes). The ABB identifies the source of an audio signal.

All viewing behaviour that involves watching videotapes or DVDs (pre-recorded and self-recorded) is included in the data reporting as "video" and "DVD", respectively. All viewing behaviour that involves watching via a hard disk recorder and cannot be matched to broadcast content is included in the data reporting as "HDR". On-demand viewing through the set-top box or a Connected TV set is registered as well. When viewing occurs through a game console or other mobile devices connected to the TV set (for instance Smart or Connected TV's or USB sticks), this viewing is registered as watching through the TV set.

With the help of Enhanced Audio Matching, it is possible to establish whether pre-recorded or on-demand content of previously aired programmes is viewed through VCR or DVD equipment. The same occurs with the content viewed through hard disk or set-top box. Viewing television content

at a time other than the moment of broadcasting is defined as Time Shifted Viewing (see §4.2.9). In the Dutch TAM, time shifted viewing on the day of broadcast and the six subsequent days is included in the consolidated ratings of a specific broadcast. In the reports on Total Viewing, this time shifted viewing behaviour is discounted from viewing through VCR, DVD, Hard disk, Set-top box or Connected TV sets.

The remaining viewing behaviour (time shifted viewing occurring at least seven days after the moment of broadcasting) is reported separately as 'Video', 'DVD' or 'HDR'. Time shifted viewing through set-top box or Connected TV/Smart TV set that takes place more than six days after the moment of broadcast, is not anymore reported in the raw data as of January 2018.

4.2.9   TIME SHIFTED VIEWING

Time shifted viewing is viewing of television content, programmes and commercials at a time other than the moment of broadcasting. This behaviour may consist of 'near live' viewing, after a short time span. But it can also refer, for instance, to the viewing of a film pre-recorded on the hard disk weeks earlier.

In the Dutch TAM, the time shifted viewing behaviour that takes place on the day of broadcasting and the six subsequent days is reported together with the live viewing behaviour. Viewing a pre-recorded videotape or viewing a programme through the hard disk, set-top box, game console or Connected TV one day after this was aired, is included in the consolidated ratings for the specific programme or time slot.

Viewing pre-recorded content or self-made recordings of broadcasts (through hard disk, VCR or DVD equipment, a set-top box or a Connected TV set) is reported separately, but only encompasses viewing behaviour occurring beyond the first six days after the day of broadcasting (see §4.2.8).

Time shifted viewing within six days of broadcasting is made available in additional data files (see §6.2.2).

4.2.10   UNKNOWN SCREEN USE

GfK guarantees continuous monitoring of the percentage of the TV screen time that is unknown. This is called Unknown Screen Use (in Dutch: Onbekend Schermgebruik, OS). Registered device time which is due to devices used for other purposes than watching television/video content (such as game consoles and photo cameras) are ignored for the calculation of the percentage of Unknown Screen Use.

Registered time (television set on and viewers logged on) for which no station is recognised and for which there is no indication of video or DVD or hard disk recorder use is, in principle, unknown screen use. This can include viewing behaviour as well as other forms of screen use. Several situations can be identified in which the meter reports "unknown screen use", including:
a.   watching video on demand content (e.g. Netflix, Videoland, Amazon Prime)
b.   watching online video content (e.g. YouTube, Facebook streams) on a connected TV or smart TV
c.   the station selected is not included in the Enhanced Audio Matching reference, as might be the case with some foreign stations or local broadcasters;

d.   certain functions of the decoder/set-top box (e.g. the electronic programme guide, EPG) or of the connected TV are being used;

e.   a video game is being played, but no one has pressed the "no viewers" button;

f.   the television set is being used to listen to the radio, and no one has pressed the "no viewers" button;

g.   watching homemade videos or photos from digital cameras, and no one has pressed the "no viewers" button.

4.2.11   GUEST VIEWING

In addition to household members, guests who watch television in the household are asked to log on as viewers. This applies to all visitors over 2 years of age who watch television in a panel household. The guest button on the remote control can be used to register the sex and age (in eight age categories) of the guest as well as their viewing behaviour by pressing the separate guest log (on/off) buttons (see figure 8).

If they desire, individuals who frequently watch television in a panel household can be assigned their own button on the People Meter's remote control. From then on, a frequent visitor can log on and off in the same way as other members of the household. In reporting, however, these frequent guests are treated as other guests. If one or more new members join a panel household after the basic interviews, they will be treated as a frequent guest until all of their background characteristics can be collected in the next annual basic interview.

The viewing behaviour of guests in the panel serves as an indication or proxy for the unregistered viewing behaviour of panel members outside the household. Since April 1, 2003, it has been possible during validation to assign the registered viewing behaviour of guests to members who were not at home at the moment of viewing, but who would have had a high probability of watching television at that precise moment. The behaviour is not assigned to one of the television sets in the household, but to a "virtual" television set tagged "viewing behaviour outside the house". This is done based on the region, sex and age category of the guest and the probability of viewing outside the household for panel members, as measured in the basic interview.

4.3   DATA COLLECTION AND CALCULATION

4.3.1   DATA COLLECTION

Every night between 02:00 and 05:00 A.M., all of the People Meters in panel households automatically contact the computer system at GfK via GPRS. All new data from the households is read out, the parameters are checked against the meter settings and the internal clock is checked. Each night, more than 98% of the households make contact with the central computer, barring local technical difficulties with the phone lines. Households that cannot be reached are contacted the next night (see below).

If the first attempt to contact fails (e.g. due to technical difficulties), the meter will try again several times during the night. If the fourth attempt to make contact also fails, then the following night, the computer will collect data from two (or more) days. The meter stores as much data as possible; when the meter's memory is full, the oldest data is overwritten.

If a significant portion of the panel data cannot be collected (for example, because of a widespread disruption of GPRS service lasting all night), SKO is alerted the next morning. A provisional report of the viewing behaviour on the day affected is prepared. A definitive report is prepared only after the uncollected data has been gathered (which can happen on the same day or the following night).

As with all other procedures in the data collection, calculation and reporting processes, the data collection procedure is fully automated. The amount of data collected is checked every 10 minutes. If there is less data than expected, a GfK employee is automatically alerted so that steps can be taken to resolve any possible problems.

The data file that is collected each night from a panel household is a record of all the viewing activity that has taken place using television sets and/or video recorders, DVD recorders/players, HD recorders, set-top boxes and mediacenters at whatever time by whichever viewer. After collection, the data is entered in GfK's COMTEL software (COMmon TELevision audience measurement system) for further processing.

Similar to the data collection procedure, the COMTEL system contains a large number of automatically built-in checks and correction mechanisms. If, for whatever reason, irregularities occur that could disrupt the data collection, calculations or the reporting, the system automatically alerts the GfK employee on call. This usually means calling him/her at home, since these procedures are largely carried out at night. He/she can then log on to the computer at GfK to see what the problem is and how it can be resolved. Most problems are usually solved directly by the employee from home.

4.3.2   VALIDATION

Daily at 05:00 A.M., after the data has been collected at GfK, the validation software starts automatically. Among other things, the programme checks for completeness and reliability of the data collected. Inconsistencies in the data are localised and corrected when possible. During validation, the following activities take place:

- The meter data is translated to a data format that can be read by other modules.
- The assignment of remote control buttons to specific panel members is determined (button B assigned to person 1, and so forth).
- The meter clock is checked against the correct summer/winter time.
- Meter statements are discarded for which the button "no viewers" was used to indicate that no one was watching.
- Other types of data not of interest to the users of the audience data are processed separately, when necessary, and removed from the raw data.
- Problems in communication between the meter components are identified (for example, the People Meter did not reset after having been disconnected from the main meters). When the connection between the main meter and another meter is lost, it is assumed that the television set involved has been turned off.
- The viewing behaviour records of guests (including frequent guests) are assigned to the appropriate sex and age categories. As of April 1, 2003, guest viewing behaviour is assigned to panel members (see §4.2.11).

- Viewing records that begin before and continue past 02:00 A.M. are split; the portion of the record from 02:00 A.M. is assigned to the day in question.
- If more than one station is recognised by the Enhanced Audio Matching, the simulcast rules are applied.
- Corrections made in the meter clock times are recorded and included in the reporting.
- Stations that broadcast on the same channel are separated on the basis of time.
- Viewing records are combined when two consecutive viewing records are attributed to the same station (the log on/log off statements from panel members are reported separately).
- The 15-second persistence limit used in the old 4900 frequency meter is reconstructed. To prevent meter memory from becoming full in less than a day, viewing behaviour that lasted less than 15 seconds, such as rapidly switching between channels, was generally not registered by the frequency meter. For example, if someone watches a programme on NPO1, then switches to NPO2 for four seconds, then watches NPO3 for three seconds before switching to RTL4 for a longer time, the seven seconds spent switching channels are ignored and a switch from NPO1 to RTL4 is recorded as the actual change in viewing behaviour. In a separate validation study, it was found that the persistence level used had no significant effect on the audience ratings for the reported programmes and advertising blocks[6]. A similar "persistence threshold" or "persistence" is used in the audience meter research in most other countries as well[7].
- When two or more viewing records that overlap in time are attributed to the same person, this duplication is corrected according to the following rules:
  1. the person remains logged on for the meter at which he/she is the only viewer;
  2. the person remains logged on for the last meter to which he/she logged on.
- If panel members log on and later log off at a television set, but between these times log on and off at a second television set without having logged off at the first, then they are considered to be logged on at the first set until the moment they log on to the second set. They continue as viewers at the second set until the moment they log off at the second set, at which point they are again considered viewers at the first set until they log off there.
- Whenever a television set is on but there are no viewers registered, there is a gap in the data. Small gaps of two minutes or less can be filled in using the data preceding or following the gap. Four types of gaps can be distinguished:
  1. **simple gap**: television is turned on and then turned off, without any viewers (this is not corrected);
  2. **leading gap**: television set is turned on without viewers, but a viewer logs on later. When the television set is turned on, it may take some time before the viewer involved logs on. If the time between the set being turned on and the viewer logging on is less than 120 seconds, it is assumed in the validation process that the viewer began watching from the moment that the television set was turned on. The same correction of the starting time is made for viewers who log on immediately after the first viewer. This correction is only made for persons who were not logged on at another television set at that particular moment;

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6   A. van Meurs (1998). When every second counts: Looking into the effects of a 15 second persistence threshold on audience ratings. In *Worldwide electronic and broadcast audience research symposium*, 239-246. Amsterdam: ESOMAR, New York: ARF.

7   Syfret, T. (2001). *Television People Meters in Europe.* World Advertising Research Center, Henley-on-Thames, United Kingdom.

3. **trailing gap**: the television set remains on for a short time after the last viewer has logged off. In such cases, the viewers who had been logged on are considered viewers for the remaining time the set is on. This correction is only made for persons who were not logged on at another television set at that particular moment;
4. **embedded gap**: viewers have logged off, but the television set remains on, and after a while new viewers log on. The same principle that is applied to the leading gap is applied to an embedded gap: the viewers who logged on later are assigned as viewers to the time the television set was on.

Another editing rule occurs directly in the meter. This is the person persistence rule: if someone logs off then on again within 15 seconds, this behaviour is ignored by the meter. This rule provides a correction for the behaviour of people who accidentally log off and then immediately log back on.

4.3.3 PANEL MANAGEMENT CONTROLS

Following validation, a large number of quality control reports are prepared by GfK to enable the Panel Management department to monitor the functioning of the equipment as well as the (log on/off) behaviour of the panel members. After analysis of any error messages, potential problems are inventoried. If equipment is not operating correctly, an appointment is made with the panel household in question for a technician to come and deal with the problem. If the cause of the problem is not technical in nature or if the control reports indicate that panel members are not logging on and off correctly, then the household in question is contacted to determine what caused the error message and what can be done about it.

The functioning of the equipment, including the video and DVD modules, is checked in response to error messages such as:
* the meter failed to call into GfK overnight;
* one or more of the components of the meter system are not communicating correctly with other components. Problems such as a loose connection or damaged cable are usually quickly identified;
* a module has been used but no channel has been registered;
* the batteries in the meter's power source need to be replaced.

In addition to monitoring the functioning of the equipment, the Panel Management department is able to check on panel members' use of the equipment aided by a number of reports and control procedures. This monitoring is extremely important. People are required to perform a set of tasks with the equipment, and people can make mistakes. Thanks to excellent monitoring and rapid response by the Panel Management department, consistent errors and misunderstandings about the use of the meter can be quickly identified and corrected. Mostly, additional explanation to the panel household is sufficient to deal with the problem. Occasionally, these human errors may be the result of technical problems such as weak batteries, a defective remote control or a loose connection (see above).

In monitoring the use of the meter in the panel, the Panel Management department responds to error messages such as the following:
* "uncovered viewing": the television is being watched but no viewer is logged on;

* "no viewing sets": there has been no viewing behaviour registered for one of the television sets in the household for some time. When no behaviour is registered over a long period of time, a household is contacted to determine whether, in fact, the television set is still in use. If this is the case, then a technician will call to inspect the equipment connected to the television set;

* "no viewing persons": there has been no viewing behaviour registered for one or more members of the household for some time. In that case, the household is contacted to determine the possible cause. It may sometimes be necessary to (again) make clear that all members of the household must take part in the research. It is also possible that the person or persons in question may be temporarily absent from the household. If they are no longer members of the household living at that particular address, then they must be removed from the household registration.

In fact, it may be the case that a particular television set is seldom or never used or that a specific panel member seldom watches television. In some households, it may be normal for the television set to be on even though no one is in the room or no one claims to be watching it (for information about households on vacation, see §4.2.7). In such cases, a note is made of the situation to avoid contacting the household when the error message is repeated. However, such households are monitored for changes in the situation. For example, when a panel member who claimed almost never to watch television suddenly begins watching regularly, they will again be part of the normal quality control procedures.

4.3.4   WEIGHTING

After validation of the collected data from all households is completed, the data processing begins. The first step in this process is the calculation of the daily weighting of the sample. Weighting is necessary when the distribution of essential background variables in the sample does not correspond to that in the research population. The main reason for this is that the selection of households for the sample is not random. Panel households are drawn from the MSS so as to ensure that the audience panel is as representative for the total population as possible for a large number of variables, using a recruitment matrix (see also §4.1.2, §4.1.3).

Another reason for a rather low level of sample variation is that the level of "no response" in the panel households is minimal in comparison with traditional survey research. Besides "no viewing persons", with electronic registration in a fixed panel, "no response" can only occur as a result of technical problems such as faulty equipment or a disruption of the GPRS-service.

Nonetheless, weighting is necessary in the audience research, because the panel is not a fixed group of people; its composition changes to some extent each day as a result of households leaving the panel or entering it, as well as a result of technical difficulties. Through daily weighting of the sample, we can compensate for shifts in the panel composition with regard to a number of population variables.

Weighting takes place each night after completing the collection and validation of the audience data. In this procedure, the panel is weighted for a number of variables against the target population. The target population is determined each year and has been, since 2011, based on population data from the Media Standard Survey (MSS) and the MOA Golden Standard. The changes in the population data are annually introduced on the Monday of week 1.

Weighting is done for national as well as regional variables. All of the variables included in the weighting are given in appendix 5 at the SKO-website (www.kijkonderzoek.nl).

Weighting is performed using an iterative procedure that permits weighting for a reasonably large number of variables. In consecutive "loops" or repetitive passes, weighting is done for all weight categories, until an optimal fit is found. First, weighting is conducted in three loops in each region for regional variables, after which the sample is weighted three times for national variables. This is repeated 14 times, so that a total of 3 x 14 = 42 regional and 42 national loops are completed. Thanks to the large number of repetitions, an optimal solution is achieved with a very high fit for the weighted sample on all universes.

The maximum weight factor allowed is 3. Higher weight factors may sometimes occur in smaller cells with too few panel members; however, to increase reliability of the audience ratings, weight factors that are too high are "capped" at the maximum 3.

The result of this procedure is a daily weight factor for each panel member aged 3 years and older that provides an optimal fit with the universe for all weight variables. This sum of all weight factors is equal to the size of the total Dutch population of 3 years and older.

4.3.5   REPORTING

The calculation procedure begins automatically after validation and weighting are completed. In this process, reference reports are calculated and raw data files prepared which can be used by clients to calculate their own reporting based on their own specifications. This raw data file contains the following information (see also chapter 7):
*   the viewing behaviour as reported in all meter statements. This file also contains a control field with a total of the viewing time per station for all panel members aged three years and older;
*   the background characteristics and the product use data for each respondent;
*   a weight file;
*   a codebook containing, among other things, an overview of all stations reported on;
*   a separate set of files containing the time shifted viewing.

In combination with the broadcast data from the Nielsen Company (see chapter 5), this information can be used to calculate audience behaviour for programmes and commercials.

4.4 DATA DELIVERY

Each day at 07:30 A.M., GfK makes the raw data available to all clients on the FTP servers ftp.intomartgfk.nl and ftp.kijkonderzoek.nl.nielsen.com.

The standard reports and reference reports prepared by GfK (see chapter 7) become available at 08:30, 13:00 on holidays.

Revised, updated versions of the standard and reference reports are available again the following day at 08:30, 13:00 on holidays.

Each week, the updated final versions of standard and reference reports for the preceding week (Monday through Sunday) are made available; the reference reports on Tuesday at 17:30, the standard reports on Wednesday at 10:00.

4.5 CONTROLS

4.5.1 MONITORING UNKNOWN SCREEN USE

In unknown screen use ('Onbekend schermgebruik' (OS) in Dutch), the meter registers screen use on the television set and a logged-on panel member. GfK guarantees permanent monitoring of the percentage of the viewing time per TV set that remains unknown. The TV set and equipment usage identified as use for other than television content viewing (like use of game computers or photo camera's) is not taken into account in the calculation of the percentage of unknown screen use. The Unknown Screen Use is regularly monitored by the SKO Technical Committee, at overall level and by TV-connected devices (such as mediacenters, set-top boxes etc).

4.5.2 MONITORING UNCOVERED VIEWING

Uncovered viewing (UV): the TV set in a panel household is turned on, but no household members are logged on as viewers. UV may be due to legitimate reasons, such as a panellist that has left the room. But uncovered viewing may also indicate that a panellist failed to register while watching the tv. Therefore, it is important to monitor UV closely. GfK guarantees a maximum percentage of covered viewing. Currently, this norm is 5% of the total device time (based on autochtonous households). The development of UV is continuously reported and discussed by the SKO Technical Committee.

4.5.3 COINCIDENTAL CHECKS

The aim of coincidental checks is to audit the extent to which the television audience measurement system produced results comparable to the actual viewing behaviour of the panel households. As since 2011, these checks are evenly spread over a year. Previously, the fieldwork of this research was restricted to a number of weeks a year.

REGISTRATION OF BROADCAST TIME AND CLASSIFICATION FOR PROGRAMMES AND SPOTS

5.   REGISTRATION OF BROADCAST TIME AND CLASSIFICATION FOR PROGRAMMES AND SPOTS

As part of the audience research, The Nielsen Company determines the broadcast time and classification for programmes and spots broadcast on 35 TV-stations (status as of January 1, 2018, see overview on www.kijkonderzoek.nl). This is the so-called Full Audit. A semi-automated system is used for registering the starting and ending times for broadcasts and segments of broadcasts, commercial breaks, promos and station related material. The Nielsen Company provides a basis for this registration on what is actually broadcasted and seen on the television screen. This information is linked to the broadcast schedules provided beforehand by the stations.

Three sets of registration lists are prepared and reported each day:

1.   The programme lists containing the programmes, programme segments (for interrupted programmes), commercial breaks, station promotional material, billboards, etc. Programme lists are reported as PRL files.

2.   The advertising lists containing all advertising messages occurring in commercial breaks. This includes traditional spots as well as other forms of advertising spots, promos in the break and billboards in or outside the breaks. Spot lists reported as SPL files.

3.   The new commercial elements receive a unique TVTID and get classified on Brand and product level by Nielsen. The classification fields of these new commercial elements are reported in the CLA files.

Following the initial delivery of the programme and spot lists in the morning, a number of checks are conducted and corrections made before the revised lists are made available in the afternoon on Monday through Friday. The revised lists of the Fridays, Saturdays and Sundays are made available on Monday afternoon. In addition, the CLA file is provided every afternoon on Monday through Friday. Furthermore, there is final delivery of the files with revisions that primarily reflect changes made by stations exported 2 working days after broadcast.

Section 5.1 below provides a brief description of the information the TV-stations provide to The Nielsen Company. The process of determining broadcast times, classifying programmes and classifying spots is described in section 5.2. Section 5.3 contains an overview of the checks and quality controls carried out. Section 5.4 describes when and how The Nielsen Company makes the data available. Finally, Section 5.5 provides further information on the technique that forms the basis of the tasks performed by The Nielsen Company.

5.1   STATION INPUT

In order to proceed with a determination of broadcast times, The Nielsen Company registers information as seen on screen. This information is linked afterwards to information provided by the stations and media providers responsible for the broadcasting of the programmes and spots to be registered. The broadcast schedules provided by stations and media providers provide channel-specific information necessary for the classification and coding of programmes and spots, such as spot and programme ID, buying and billing agency, etc. (see § 5.2).

Stations and media owners need therefore to provide The Nielsen Company with the broadcast schedules for programmes, commercial breaks and spots prior to broadcast. These files should reach The Nielsen Company at the latest by 07:30 on the day of broadcast. For weekends and holidays, the files should reach The Nielsen Company by 17:00 of the last preceding workday. The schedules are sent online using an FTP protocol (kijkonderzoek.nl.nielsen.com), a format specified by The Nielsen Company. This format must be used so that the data can be read properly.

In addition to the pre–broadcast schedules, media providers need to provide the "planning after" (the broadcast schedules corrected after the actual broadcast) for commercial breaks and spots, in order to incorporate changes in the broadcast information in the daily second delivery of the files. This includes changes in spot details, the film numbers of broadcast spots, the names of commercial breaks and other changes in the planning. This information should be sent to The Nielsen Company systematically at the latest by 15:00 of the first working day after broadcast.An updated version of the "planning after"file should be sent to The Nielsen Company systematically at the latest by 13.00 of the second working day after broadcast. If the planning after is not sent, only the information retrieved during Nielsen registration and via the pre-broadcast schedule is used in the file redelivery.

In addition to the pre-broadcast schedules, media providers need to provide an updated version of the "program before" (the broadcast schedules corrected after the actual broadcast) for programs, in order to incorporate changes in the broadcast information in the daily second delivery of the files. This includes changes in program details, the ProgID and Repeat codes of broadcasted programs and other changes in the schedule. This information should be sent to The Nielsen Company systematically at the latest by 15:00 of the first working day after broadcast. If the updated version of the program before is not sent, only the information retrieved during Nielsen registration and via the pre-broadcast schedule is used in the file redelivery. Notification of changes can also be done by phone or e-mail. The Nielsen Company incorporates relevant comments and additional information provided by stations or media providers in the second daily delivery of the revised files, provided this information reaches The Nielsen Company before 15:00. Most of the comments can be submitted through an application developed by the Nielsen Company. This application, the WebInterface, allows the Nielsen Company to use all the feedback that stations have available (which are closely in contact with producers and programme makers) to classify the programmes.

All the information provided by broadcasters and media users before and after the broadcast is archived by The Nielsen Company.

5.2   TIMING, HARMONISATION AND CLASSIFICATION OF PROGRAMMES AND SPOTS

The Nielsen Company is in charge of the daily timing and registration of programmes and spots. The broadcast schedules provided by stations are loaded in the system and compared with the Nielsen registration to link the data of the broadcasters. This process is described below.

5.2.1 REGISTERING BROADCAST TIMES FOR PROGRAMMES AND SPOTS

5.2.1.1 REGISTRATION OF PROGRAMMES EN SPOTS

On the basis of digitised images, The Nielsen Company determines the initial image for each broadcast. Clicking on this image enters the starting time for a programme, programme segment, advertising block or promo. Starting times are thus never entered manually. The same applies to ending times. Eventual gaps in the registration (at broadcast) are automatically detected and registered correctly. All elements lasting one second or more and which fill the screen are registered in their entirety. Product placements are not registered. As of 2011, The Nielsen Company registers other advertising items, which do not fill the entire screen, like split screens spots and billboards. A new field (Emission Kind) is available in the files with spot data (see § 6.1.2). Events may be broadcasted in different formats; the new field allows singling out the formats Full Screen, Split Screen, Ident, Crawl Add en Banner Ad from elements classified by a TVTId.

The start of an advertising break is determined by the opening jingle or bumper; the end, by the end of the closing jingle. If there is no starting or ending jingle, then the start of the block is determined by the start of the first spot or promo and the end of the break by the end of the last spot or promo.

5.2.1.2 REPORTING

While timing is done in seconds, the SKO convention is to report time in minutes. All starting and ending times are reported as follows: from minute X to minute Y. By starting time, the event is seen as beginning at the minute and zero seconds. The event continues through the 59th second of the minute preceding, the ending time.

The change from seconds to minutes occurs in the following manner:

• The seconds are removed from the starting times registered by The Nielsen Company; they are simply dropped. If, as a result, various elements occur at the same moment, they are all assigned the same starting minute.

• Similarly, the seconds are dropped from the registered ending times. If an element starts and ends in the same moment, the ending time is moved op one minute.

• For spots, only the starting minute is determined. Initially, the actual starting times are determined to the second for all spots in an advertising block. The seconds are then dropped in to establish the minute in which the spot falls. The actual length of the spot in seconds is reported separately in the Nielsen data.

5.2.1.3 REGISTERING TIME: AN EXAMPLE

The example below illustrates the rules applied on the timing for programmes and spots.

	Recorded time		Reported time	
Description	Starting (sec)	Ending (sec)	Starting (min)	Ending (min)
Programme A	14:52:33	15:16:09	14:52	15:16
Billboard	15:16:10	15:16:18	15:16	15:17
Start commercial block	15:16:19	15:18:59	15:16	
Spot 1	15:16:22	15:16:51	15:16	
Spot 2	15:16:52	15:17:22	15:16	
Spot 3	15:17:23	15:17:33	15:17	
Spot 4	15:17:34	15:18:04	15:17	
Spot 5	15:18:05	15:18:24	15:18	
Spot 6	15:18:25	15:18:56	15:18	
End commercial block		15:18:56		15:18
Programme B	15:19:00	15:41:32	15:19	15:41

5.2.1.4 SPECIAL CIRCUMSTANCES

Advertising breaks that straddle day break point

If an advertising break straddles the day break point at 26:00 (02:00) with even a portion of the advertising break, the break's starting minute is moved back so that the entire break falls within the first day (time is taken from the preceding programme). The spots are placed in the resulting break in accordance with their actual length.

Every advertising break has a theoretical broadcast day (broadcast according to the planning). When an advertising break straddles the day break point and is moved back, the planned broadcast day is present in the field Theoretical Day.

Summer time and winter time

On the first day of the summer time period (Sunday), the Nielsen registration and reporting does not include the first hour (2:00:00 – 02:59:59) because this hour does not exist.

On the Sunday of the changeover from summer time to winter time, one hour (02:00:00 – 02:59:59) occurs twice. Timing proceeds as usual for the preceding Saturday through 25:59:59; on Sunday, timing begins at 02:00:00 hours. The timing is carried out using images broadcast in the second hour.

5.2.2 CLASSIFICATION OF PROGRAMMES

In addition to the timing and registration, the procedure carried out by The Nielsen Company also involves classifying programmes. In addition to starting and ending times, the following information is provided in the programme lists (PRL files) for all programmes and programme segments broadcasted from station opening to station closing:

- Programme title (as appears on screen)

- The unharmonised programme title as delivered in the pre-broadcast schedule
- Basic information provided by station (programme ID, subtitle, repeat code)
- Programme coding (programme type, SKO code)
- Promo information (Promo type, harmonised 1st, 2nd and 3rd title)
- The variable follows
- Broadcaster (in Dutch: Omroep) (for public channels)
- Duration in seconds

In addition, any disruptions to broadcasting are identified as an element, static.

A detailed description of PRL files is included in appendix 7.

5.2.2.1 BASIC INFORMATION

In addition to broadcast schedules, stations provide basic information on the programmes broadcasted. A portion of this information is accepted by The Nielsen Company as is, without further checks or processing. This includes the programme identification code, a programme subtitle and a repeat code (if desired; max. 40 characters).

The basic information also includes the programme title (max. 40 characters), which plays a central role in further classification: at The Nielsen Company, programmes are identified by their title. The programme titles provided by stations are checked by The Nielsen Company on the basis of screen images and harmonised when necessary.

The Nielsen Company maintains the programme titles in the system, TVEvents. For each programme, a coder checks the title of the broadcast against the information in this system. Even the smallest variation in spelling is taken into account, in order to ensure that this is the programme in question. The image on screen can always provide a definitive identification. If no programme with this title exists, a new entry is created in TVEvents. The new programme is also encoded (see § 5.2.2.2).

Because a programme is identified by its title, the manner in which a title is written out is extremely important. SKO has established rules for programme titles (see appendix 8), which The Nielsen Company follows.

Taking the titles from the database system ensures that the PRL files contain the correct form of the title. PRL files contain basic information provided by the stations, such as Programme ID, Unharmonised title, subtitle and repeat code.

5.2.2.2 ENCODING PROGRAMMES

The programme types reported in the .PRL files are: programmes, promos, billboards, commercial breaks, Postbus 51 blocks, home shopping, station ID's and static.

In addition to programme type, The Nielsen Company assigns a central code, the SKO code, which is based on content and form features as well as other characteristics (see appendix 16).

The Nielsen Company creates the SKO code for a programme, but the broadcasting station is responsible for the accuracy of the codes. Each day, Nielsen (through the WebInterface) provides SKO codes when new titles are available to stations: http://kijkonderzoek.nl.nielsen.com/programs.

5.2.2.3 THE VARIABLE FOLLOWS

The variable *follows* is used to indicate whether a broadcast element encoded in the PRL file is a programme that stands alone or a programme segment that is joined with other programme segments to form a complete programme.

The variable follows is created by The Nielsen Company according to SKO rules when the following criteria are met:

- The programme segments belong to an element classified as a program (no advertising block or Postbus 51 break).

- The programme segments are only separated by an advertising block, a news bulletin, static, a weather bulletin, billboard, promo or a short programme.

- The programme segments are broadcast on the same day.

- The programme segments have identical titles.

There are number of standard exceptions involving programmes that are never combined, despite satisfying the criteria (see appendix 13).

5.2.2.4 IDENTIFYING STATIC

Disruptions during the broadcast of programmes that adversely affect the quality of the image are identified as static. The static images are reported as a Programme with the title 'Storing' in the data.

5.2.2.5 PROMO CLASSIFICATION

As of 1-1-2011, Nielsen classifies all promotional elements that are broadcasted.

As of 2-1-2017 this promo classification is changed (some fields, such as PromotedChannelID en PromotionDay are not included anymore). The fields are still available in the data but are empty from this date. Also the number of promotypes has been limited to ensure easier and better data.

The new classification can be found in Appendix 17.

5.2.3 CLASSIFICATION OF SPOTS

Advertising spots are also classified in the timing procedure. In this process, each advertising spot is treated as a part of an advertising block, even when it is broadcast separately.

Advertising spots have to be identified. This identification is done on the basis of visual and, if necessary, audio information. A unique identification code, the TVTID (see § 5.2.3.3) is assigned to all broadcasts of the same advertising spot. The first broadcast of an advertising spot is always saved in the The Nielsen Company database and serves as reference for subsequent broadcasts.

In addition to the starting time for spots determined in TVEvents, the SPL files contain basic information together with broadcaster specific information received via the pre-broadcast schedule. This includes:

- actual length of the spot

- TVTID (harmonisation code)
- actual position in the advertising break
- emission kind; as of 1-1-2011, the field Emission Kind allows users to single out the following formats: Full Screen, Split Screen, Ident, Crawl Add and Banner Add among elements with a TVTID.
- harmonised media agency name
- contract number; as of 1-9-2014, The Nielsen Company reports to the broadcasters any possible mismatch between Contract numbers for twinspots. Thus, it is possible to use contract numbers to report linked twin spots.

A separate CLA file contains the CLA classification, with the following information:

- brand/sub brand/product
- advertiser
- principal branch/sub branch
- title of commercial

The CLA classification is available as a separate file.

Detailed descriptions of SPL and CLA files can be found in Appendix 11.

5.2.3.1 BASIC INFORMATION

The media providers provide The Nielsen Company with basic information on spots that is accepted as is, with no checks or further processing. This information is reported in SPL files and includes the spot ID, the film number, the title of the commercial, the commercial length, the 30 seconds tariff for the advertising break, the media agency placing the spot, the media agency that was billed for the spot and the contract number. In case of a break that straddles the day break point, a theoretical day field (the original planned date of broadcasting) is delivered within the basic information.

The spot types reported in the SPL files are: commercials, promos, foreign commercials, Postbus 51, local advertising spots, split screen spots, billboards and static.

5.2.3.2 SPOT LENGTH

In addition to the commercial length reported by the media providers, The Nielsen Company also determines the actual length of a spot in seconds. In this process, the blue/black images (neutral transitional frames) placed by stations between spots are assigned to the next spot.

5.2.3.3 TVTID

The Nielsen Company checks each spot to see if it was broadcasted as planned. The sound and image of a broadcast spot are compared to that of the reference spot stored in the Nielsen database. If the spot is a match it is assigned the appropriate TVTID. If it varies from the reference spot or if it is a completely different spot than the one planned, the planned spot is deleted and the media provider informed. When confronted with a new media provider film number, The Nielsen Company searches the spot database to see if this spot has previously been broadcasted (for example, by another media provider). Reference spots are examined and compared with the spot broadcast concerned. If, in fact, it is the first broadcast of the spot in The Netherlands, it is given a new, unique TVTID number. The spot becomes a reference spot and is incorporated in the spot

database. The correspondence between the media provider's film number and the new TVTID is noted.

If it is only the first broadcast of a spot on a specific station, then the spot already exists in the database; it is only necessary to record the correspondence between the film number provided by the media provider and the existing TVTID.

5.2.3.4 CLA CLASSIFICATION

In addition to the SPL file containing basic spot data, The Nielsen Company also provides a CLA file with information on the products advertised in the spot. The Nielsen Company harmonises the titles and the names of advertisers provided by the station and encodes the spot for brand, product and branch using the CLA Branch Classification Code. Since 1-1-2011, multiple advertisers and products for Billboards have been present in the file (see appendix 12).

5.2.3.5 IDENTIFYING STATIC

When static occurs in spots, the disrupted images are identified. If at least one image can be seen, the spot remains on the spot list. However, if static occurrs during the entire spot broadcast, the spot is removed from the list and, and instead of spot information, the broadcast is identified as static.

When static lasts for longer than three seconds during a spot, the media provider is informed in the PRB file.

The Nielsen Company does not check the sound quality of broadcast spots.

5.3   CONTROL PROCEDURES

5.3.1   FIRST DAILY CHECK (MORNINGS)

- starting times for all coded elements;
- harmonised programme titles of existing programmes;
- station information and programme announcements;
- check all programme titles;
- check broadcast organisation codes;
- check SKO coding programmes;
- check timing and coding commercial breaks;
- check programme segments;
- broadcasting organisation indicated by public channels;
- use of follows;
- coherency in titles of interrupted elements;
- station-specific business rules.

As soon as possible after the morning delivery, The Nielsen Company reports any deviations in the broadcast schedules of spots, indicating what was actually broadcasted as well as any broadcasting problems experienced by stations via the broadcaster-specific PRB files. Spots that were not included in the planning files or were included but not broadcasted are also reported.

This file is only sent to the media provider of the spot in question, to inform them of a deviation from the planning files. Switches in commercials (film A was expected but film B was broadcasted), deviations in duration and static are also indicated in the PRB file. The purpose of the PRB files and related communication is to produce corrected "planning after" files that can be integrated in The Nielsen Company SPL files.

5.3.2 SECOND DAILY CHECK (AFTERNOONS)

The following checks, encoding and, where necessary, corrections are carried out before the daily second delivery in the afternoon:

- CLA classification of new spots and billboards
- check promos (station information, station promotional material and programme announcements)
- check sport programmes
- check special programmes
- comparison with 'planning after' file from station
- comparison with updated version of 'program before' from station
- commercial breaks not included in the planning
- commercial breaks not broadcasted
- spots not included in the planning
- spots not broadcasted
- spots too long or too short
- spot broadcasted other than planned spot
- coding unplanned spots
- coding of added spots

Relevant changes received from the station or media provider before 15:00 are also included in the second delivery.

Together with the second delivery, The Nielsen Company exports an updated version of the PRB file to the stations. This file is a comparison between what has been coded by Nielsen and what has been received in the "planning after" file.

If SKO, a station, media provider or client has any questions, The Nielsen Company staff can retrieve the images to run any additional checks required for up to 30 days after broadcast.

5.3.3 FINAL CONTROL AND DELIVERY

For the final delivery, additional controls are run and, when necessary, corrections made:

- check of changes in the daily second delivery
- check of changes in SKO coding
- comparison with new 'planning after' file from station
- extra control specific programmes
- extra control self-introduced breaks and spots

Stations have until 13:00 of the 2nd working day after broadcast to send their feedback and "planning after" files for the previous days to The Nielsen Company. New adjustments and changes included in the "planning after" will be processed by The Nielsen Company.

The Nielsen Company checks to see if all of the incidents and errors about which they informed media providers have actually been incorporated in the "planning after". Only those changes actually made by the station are included in the Nielsen data.

As a final check, an automatic programme checks for any remaining inconsistencies in the data. After all checks are run, data is delivered by 17:00 from Monday to Friday.

5.3.4   BRD FILES

At the same time as the first daily delivery, each station receives a specific file listing all differences at the programme level between the pre-broadcast schedule and the coding of The Nielsen Company. This is called a BRD file. The station has the opportunity to react to these differences.

The BRD file contains the following differences:

- Programme missing in pre-broadcast schedule

- Programme not broadcasted

- Difference in starttime of more than 15 minutes

- Difference in duration of more than 3 minutes

- Difference in Programma title

5.4   DATA DELIVERY

As a result of the control procedures described above, there is no single delivery of the PRL and SPL files. Instead, there is daily delivery in the morning and a second delivery in the afternoon, as well as a final delivery.

SPL, PRL and CLA are available to clients of the raw data as both zipped and unzipped files on the FTP servers: ftp.intomartgfk.nl and kijkonderzoek.nl.nielsen.com. PRB and BRD files are placed in the folder of the appropriate media provider or station on the FTP server kijkonderzoek.nl.nielsen.com.

All files sent by The Nielsen Company are also archived for the duration of the contract.

5.4.1   FIRST DAILY DELIVERY

After the initial checks are conducted, the first version of the programme and spot lists (the PRL and SPL files) are delivered by The Nielsen Company by 07:30 on the day after broadcast. At this point, spot lists are harmonised but do not contain TVTIDs for new spots.

On the following official holidays, delivery takes place by 12:00 instead of 07:30:

- New Year's Day

5.4.2 DAILY SECOND DELIVERY

Complete revised programme and spot lists (PRL and SPL files) are available from The Nielsen Company from Monday through Friday by 18:00 at the latest. The second daily delivery for the Friday, Saturday and Sunday will be delivered on Mondays by 18:00 at the latest. These files incorporate the feedback from stations received before 15:00 as well as changes made as a result of control procedures. In the daily second delivery, all new spots have been given a TVTID.

CLA files are delivered by 18:00 weekdays.

The files in the second delivery overwrite the files from the first daily delivery, so that these are no longer available.

On the following official and special holidays, the second and final delivery will be pushed forward:

- New Year's Day
- Good Friday
- Easter
- King's Day
- Liberation Day (once every five years)
- Feast of the Ascension
- Friday after the Feast of the Ascension
- Pentecost
- Christmas

5.4.3 FINAL DELIVERY

Final revised programme and spot lists (PRL and SPL files) are available from The Nielsen Company from Monday through Friday by 18:00 at the latest. The final delivery for the Friday, Saturday and Sunday will be delivered on Tuesdays by 18:00 at the latest. These files incorporate the feedback from stations received before 13:00 as well as changes made as a result of control procedures.

5.5 TECHNICAL ASPECTS

5.5.1 VIDEO AND AUDIO SIGNAL RECEPTION

Video signals are received via a local cable operator or a satellite dish. The Nielsen Company captures 25 frames per second (Full Pal 720 x576, 24-bits colour). Data Entry is able to see one image per second; this image contains a time marker and is compressed (via JPEG). The local clock is synchronised with a time service on one of the file servers, which itself is synchronised with the Frankfurt DCF77 radio signal. It is estimated that the registration is accurate to 0.1 seconds, while the time marker is accurate to 0.01 seconds.

The registered times are the times that the television images are received via the Amsterdam cable operator.

The audio signal is continually digitalised (mono, 16-bits PCM, 22 KHz sampling), split into one-minute fragments with a time marker (for synchronisation with the video images) and compressed with M3, 32 kbps.

Image and sound are saved to local disk, at a rate of one file per minute for images, one file per minute for audio and one file per second for the JPEG's.

As a precaution against technical problems, the digitisation is done three times; twice in Diemen and once in Brussels.

The images are stored on three different servers.

5.5.2   GRABBERS

The grabbers of The Nielsen Company continually download new reception files, remove the oldest files and deliver reception files on request to be registration stations. Digital images are kept for a maximum of 30 days, in order to draw up programme and spot lists and to run checks.

5.5.3   FILE AND DATABASE SERVER

The file server stores the list files and the archive of advertising spots for the long term. The database (Postgres) stores the links between film identification numbers and files in the archive. It also contains copies of the various classification data for advertising spots. The lists and the databanks are backed up twice a day to a hot standby server located in different locations.

5.5.4   REGISTRATION OF WORK STATIONS

The coders are used for the actual registration, although not necessarily in "real time". Registration begins immediately after images are digitally captured and stored for quick access.

At all workstations, coders can play videos with sound, code programmes, call up title lexicons, consult histories, encode advertising breaks, spots and station promotions and display dated as well as upcoming programme and spot schedules, next to the registration schedule for another day or another station, with the ability to cut and paste.

The coders are responsible for identifying advertising spots. This is done by comparing images from the broadcasted spot with images from reference spots stored in the databank. The coder examines images from both spots side-by-side.

RAW DATA AND REPORTING

6. RAW DATA AND REPORTING

This chapter describes the information that is provided by the research bureaus GfK and The Nielsen Company on a daily, weekly and monthly basis on the ftp servers ftp.intomartgfk.nl and kijkonderzoek.nl.nielsen.com. This includes the broadcast data collected by The Nielsen Company and the respondent panel data measured by GfK, which users of the audience research can then link to each other. Additionally, a number of standard and reference reports are regularly provided by GfK.

6.1 BROADCAST DATA FILES

6.1.1 PROGRAMMES
The file **jjjjmmdd.PRL** contains a number of items of information that pertain to all programme types (programme types: programme, promos and station Id, Billboard, Postbus 51, advertising breaks, home shopping and static) broadcasted on the encoded stations (see www.kijkonderzoek.nl) on the day in question. In addition to the title, the starting and ending minutes and programme type of a broadcasted element, this file contains the SKO code. Furthermore, the file contains a variable that indicates, in the case of programme segments, which segments belong together and a serial number per broadcasted element per station per day.

From 1-1-2011 on, this file also includes an additional field for programme title. This field contains the programme title that the stations provide in their pre-log files. This title is not harmonised by The Nielsen Company. On 1-1-2011, more information on promos became available and new fields Promo Type Id, Promoted day, Promoted channel ID were added. Programme titles are added in the files Secondary and Tertiary programme titles in case the promo refers to more than one programme. The fields Promoted Day and Promoted Channel ID are not filled anymore since 1-2-2017.

As of 1-1-2012, the duration (in seconds) of promo's and other programme types on the PRL file is included.

6.1.2 SPOTS
The file **jjjjmmdd.SPL** contains a number of items of information that pertain to all spots broadcasted on the encoded stations on the day in question. In addition to formal items such as the station and block code, the serial number of each spot in the block, the spot identification code, the starting moment and the actual length of the spot, this file contains a number of variables regarding the commercial (commercial type, commercial length, film number and harmonised TVTid) as well as the title of the commercial used by the media provider, the 30 seconds tariff[8] and the harmonised name of the mediating media agencies.

As of 1-1-2011, this file also includes the Emission Kind field. Events may be broadcasted in different formats; this new field allows distinguishing between the following formats:
Full Screen, Split Screen, Ident, Crawl Add and Banner Ad for all elements with a TVTID.

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[8] If this data is provided by the media provider to The Nielsen Company.

Since 1-1-2011, Nielsen has been registering billboards with an exclusive TVTID. These billboards may also be found in the SPL files.

On 4-7-2016, new fields Promo Type Id, Promoted day, Promoted channel ID were added to give more information about the promos broadcasted inside the regular commercial breaks. Programme titles are added in the files Secondary and Tertiary programme titles in case the promo refers to more than one programme. The fields Promoted Day and Promoted Channel ID are not filled anymore since 1-2-2017.

6.1.3. CLASSIFICATION OF ADVERTISEMENTS

The file **jjjjmmdd.cla** contains information on the commercial broadcasted on the day in question that can be used to classify the broadcasted spots. Per TVTID, the file includes the link of the reference commercial, its harmonised title and harmonised information on the product advertised in the commercial (brand, sub-brand, product name, branch and advertiser).

As of 1-1-2011, for billboards, this file can also contain multiple advertisers and products per TVTIDs. For this reason, a new field has been added to the file (MultipleProdcut). On 1-1-2011, the field ProductSequenceNumber was deleted from the CLA file.

TVTID's have a product (combination of brand-subbrand-productname) and an advertiser assigned to them, which are presented in the CLA. Since the product's advertiser can change over time, due to company takeovers, new CLA-file structure was introduced on 1-7-2012. In the new file structure, it is possible to assign a new advertiser to an existing product with a valid as of-date.

As of 1-7-2012, the full list of TVTID's and their respective information, is supplied in one file (the COMPLETECLA) on a monthly basis.

6.2 RESPONDENT DATA FILES

6.2.1 VIEWING STATEMENTS

The file VWGwwwwd.DAT contains information indicating which panel member watched which station when and for how long on which television set. The data is presented in viewing statements, each of which reflects an unchanged situation: the same person watching the same station on the same television set. When the situation changes (for example when someone stops watching, and someone else begins watching when the channel is changed), a new viewing statement begins.

Viewing behaviour that cannot be assigned to a panel member is not included in the raw data. The viewing of Teletext is assigned to the station on which it was watched. This file also includes watching videos (both pre-recorded and self recorded tapes), DVD and HD. Video, DVD and HD each have their own station code.

SKO determines which stations are assigned a station code. All other stations are coded as "Other". In total, 115 stations (incl. video, DVD, HD and "Other") are included in the reporting (status per 1-1-2018). A station table (see §6.3.1) delivered daily can be used to determine which station codes occur in the raw data for the day in question. An updated overview of all stations can be found at www.kijkonderzoek.nl.

6.2.2   TIME SHIFTED VIEWING

The file **UGKwwwwd.DAT** contains information on the time shifted viewing of pre-recorded television broadcasts viewed through VCR, DVD- and hard disk (HD) recorders, as well as the on-demand television content requested though the set-top box or other equipment.

As of January 1, 2008, the **UGKwwwwd.DAT** file also contains data on the time shifted viewing of self-made video, DVD or hard disk recordings of television broadcasts.

Before this date, this file only contained data on time shifted viewing of self-made video recordings of television broadcasts.

The daily file contains data on the time shifted viewing of programmes broadcasted in the preceding seven days. For example: the daily file for May 22 contains the records of time shifted viewing of all programmes recorded from May 14 onwards.

The file with time shifted viewing behaviour is supplementary. Time shifted viewing behaviour (via Video, DVD and HD recorder, set-top box) is also included in the raw data as audience behaviour for the day on which the viewing took place (see § 3.1). If someone watches a programme twice during the week following the broadcast, this time shifted viewing is reported in the UGK file.

Between January 2015 and December 2017, GfK measured and reported for SKO the time shifted viewing on the day of broadcast and the following 27 days. The standard reporting on the Viewing Total (day of broaddcast plus six) are still guaranteed for the consolidated ratings. The data on TSV27 is an additional data delivery, available every morning at 07:30 AM on GfK's FTP server in the a separate folder and it is named RUWUGK27wwwwd.zip. This data is delivered to participants from Friday July 17th 2015 and daily files include the time shifted viewing of 28 days.The first file is delivered on Friday July 17th and refers to programs which were broadcasted on June 18th 2015.

Besides the regular raw data files there are two more files available: UGK27wwwwd.DAT and STAU27wwwwd.COD. For using the UGK27 data all of these data files must be used. Per 1-1-2018, the Time shifted viewing after 6 days is not reported anymore.

6.2.3   BACKGROUND CHARACTERISTICS

The file **DEMwwwwd.DAT** contains the background characteristics of all panel members, as measured in the basic and product interviews. These characteristics are used to define target groups. The layout of this file is changed once a year. A file with descriptions and positions, **DEMwwwwd.COD**, is provided daily (see § 7.3.2). This file contains a count of all the characteristics for the daily sample in question. In addition to background characteristics, the **DEMwwwwd.DAT** contains a weight factor, which is the same as the weight factor in the WGT file (see § 6.2.4).

6.2.4 WEIGHTING FACTORS

The file **WGTwwwwd.DAT** contains a daily weight factor for the panel members. This weighting factor contains eight positions, of which the last should be read as a decimal. This weight factor already includes a projection factor, with which the number of panel members is projected on the population totals. The sum of the weight factors for a day yields the population size. Panel members that do not appear in the WGT file have a weighting factor of zero.

As a result of the withdrawal of households, the addition of new households, technical difficulties, vacations and such, the composition of the viewing panel can vary from day to day. To compensate for this shifting, the weighting procedure (see § 4.3.4) is carried out on a daily basis. As a result, each respondent of three years of age and over is assigned a separate daily weighting factor.

6.3 CODE BOOKS

6.3.1 STATION TABLE

The station table file **STAwwwwd.COD** contains all of the station codes that occur in the raw data for the day in question (currently max. 116 codes, including "video", "DVD", "HD" and "Other"). In addition, the file contains a control field for each station containing the audience rating (to for decimal places) for the target group 3+. This variable can be used to check the completeness of the data. The reference reports (see § 6.4.2) should be used for a more precise checked.

As of 31-12-2008, control fields for time shifted viewing are reported in the **STU0wwwwd.COD** to STU6wwwwd.COD files. On July 2 2012, the control fields in these files changed to a check digit that is calculated by the sum of the viewing statements multiplied by the weighting factor per channel.

6.3.2 BACKGROUND CHARACTERISTICS CODE BOOK

The variable code book for background characteristics **DEMwwwwd.COD** lists all of the variables measured in the basis and product interviews and indicates whether they are household or individual variables, what positions they occupy in the **DEMwwwd.DAT** file (see § 6.2.3) and what categories are associated with them. The file also contains an unweighted and a weighted count of all these background characteristics for the sample on the day concerned.

6.3.3 TV SET LOCATION CODE BOOK

The TV set location codebook **LOCwwwwd.COD** contains the codes and categories for possible locations for a television set.

6.4 REPORTING

In addition to the raw data, GfK makes a number of reports available on a daily, weekly and monthly basis on the FTP servers: ftp.intomartgfk.nl and kijkonderzoek.nl.nielsen.com.

6.4.1   STANDARD REPORTS

The standard reports provide an overview of the SKO standard results, as displayed on the SKO website. The standard result types are audience rating, market share, viewing time and reach for programmes and for time periods (02.00 to 26.00 and 18.00 to 24.00) for all SKO standard target groups. The SKO standard target groups are listed in appendix 3.

Each day, SKO is provided with standard reports with the following results from the preceding day:

•   audience rating and market share per programme (only programme type "programme") for the stations encoded by The Nielsen Company (see www.kijkonderzoek.nl);

•   audience ratings for all the public report stations (see www.kijkonderzoek.nl) and for total TV per time period, per hour and per quarter hour.

The weekly standard reports include the average audience rating for the public report channels and total TV per time period and per hour in the preceding week (Monday through Sunday).

The monthly standard reports contain the average audience rating for the public report stations per time period and per hour during the preceding calendar month. In addition, a monthly reach report is provided containing the monthly reach per station, with the condition that a respondent watched a station for at least one minute without interruption and 15 minutes with or without interruption.

6.4.2   REFERENCE REPORTS

In addition to standard reports, GfK providesreference reports. These are primarily intended to allow parties using the raw data to run checks on the data. A daily quarter report is provided as a reference, with the audience ratings for the target groups 3+, 6+ and 13+, for the result types Common Currency as well as for Overnight. As of 2-7-2012, new control figures are included in the daily STA and STAU files. The aim of these figures is to facilitate analysis software to check that the daily files with the viewing statements "kijktrajecten" (VWGwwwwd.DAT) and weights (WGTwwwwd.DAT) are uploaded correctly. Ratings in the 3+ target group for the timeslot between 02:00-26:00 are determined by the sum of the viewing statements per channel, multiplied by the weights of the respondents.

During the change from summer to winter time, the first hour of the first winter day, from 02:00 to 03:00 appears two times, and is reported as 01:00 to 02:00 in the VWGwwwwd.DAT file. These viewing statements are also included in the control figures in the reference reports.

RELIABILITY CRITERIA FOR CHANNEL REPORTING

7. RELIABILITY CRITERIA FOR CHANNEL REPORTING

SKO has established that ratings should be published only when they are reliable. In the case of the SKO digital channels, this means that only results on reach may be published. Reporting rules that apply to Dutch TAM data are described in the document 'Mandatory calculation and reporting rules SKO'. This document can be downloaded from www.kijkonderzoek.nl.

Reporting rules make a distinction between different channel types available in the raw data: Standard, SKO-Digital and other channels.

7.1 CHANNELS IN THE DUTCH TAM

Currently (status 1-1-2018), the Dutch TAM includes 149 TV-channels; 115 of those are reported in the raw data files.

A number of channels (34) are currently excluded from the raw data. GfK is responsible for the registration of viewing behaviour regarding these channels. In the raw data, they are allocated to the category "Other".

7.1.1 STANDARD CHANNELS IN THE RAW DATA

Dutch TAM standard channels are also included in the raw data.

35 channels are subject to a full audit (status per 1-1-2018, see www.kijkonderzoek.nl for an overview of the channels in this group). The full audit, carried out by The Nielsen Company, encompasses the registration of broadcast schedules and the classification of all programmes and commercials (see § 5.2).

Other channels are included in the raw data, including regional channels. Individual results should only be used in interim reports of SKO partners and participants.

See www.kijkonderzoek.nl for an up to date list of the standard channels in the raw data.

7.1.2 SKO LIGHT-CHANNELS

Since January 1 2010, a number of digital TV channels have also been included in the raw data. This means that individual reporting on each of these channels is possible from 2010 on. In the period September 2008-December 2009, SKO ran the 'SKO Digital Pilot' to test the ratings of these channels.

The objective of the pilot was to assess whether the ratings of these channels could be measured through audio identification techniques and whether they could be reported reliably. All the viewing behaviour regarding these channels has already been included in the raw data since September 1st 2008, under the group "Other".

In 2009, the SKO Technical Committee concluded that these channels could be reliably reported within the Dutch TAM. A new reporting criterion was developed in order to test the reliability of reach and GRPs figures. This criterion enabled SKO to create reliable, individual reports of the SKO digital channels.

See Appendix 6 at the website www.kijkonderzoek.nl for an up to date list of the SKO light TV-channels in the raw data. As of 1-1-2018, 46 SKO Light TV-stations are included.

7.2 RELIABILITY CRITERIA

7.2.1 CRITICAL SAMPLE SIZES

To test the reliability of standard channels in the raw data, a criterion based on a minimum or critical sample sizes should be applied. Carrying out analyses with fewer respondents than the critical sample size may compromise the representativity of the sample or the margin of reliability.

For different periods, commercials, weighting and clustering effects, different critical minimum unweighted sample sizes should be applied. Please refer to the SKO Mandatory calculation and reporting for sample thresholds for external publication.

7.2.2 MINIMUM REACH CRITERION

A minimum reliability threshold applies when reporting reach for SKO digital channels.

This entails that minimum net reach is used as a criterion in order to establish whether reliable reports can be produced for this channel.

For all SKO targets, a minimum reach threshold is needed to reliably report reach figures.

In order to test whether the reach figures can be published, we compare these with a net reach threshold. Net reach is calculated in terms of the total number reached in the daily period sample. Obtained net reach figures may be compared to the minimum reach of 10 individuals, regardless of the target group attributed to the individual. When the obtained reach of an SKO Digital channel fails to reach the threshold, results may not be published.

The reach threshold of 10 persons in the sample applies to previously specified reach conditions. As from 01-01-2017 one is free to set this reach condition. For instance, if the lower limit for reach is set to include viewers that watched at least 60 consecutive seconds of a time slot, reach can only be reported reliably if at least 10 respondents viewed 60 consecutive seconds of the time slot. If the reach threshold is set as the half of the programme length, non consecutive-viewing, the reach may be reported when a minimum of 10 respondents has viewed (non-consecutively) at least half of the programme.

The criterion has been developed by Estics Media and has been audited by Pointlogic (1-7-2008). In order to assess the reliability of a viewing figure, the following notions[9] have been introduced.

• We regard a viewing figure as substantial, if the lower boundary of the 95% confidence interval is at least half as high as the viewing figure under consideration (and also at least 0.0005). For example: a viewing figure of 1.6% is substantial if the lower boundary of the confidence interval is at least 0.8%.

• We regard a viewing figure as measurable, if the lower boundary of the 95% confidence interval is at least 0.0005. In that case, the lower boundary of the confidence interval is (after rounding) 0.1% and we can be confident – at a 95% probability level – that the unknown true viewing figure in the population differs from zero.

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[9] These notions can be applied generally to all viewing figures.

7.2.3 GRPS CRITERION

It is possible to establish whether the net reach is substantial based on the average or cumulative reach, for each channel and period.

When the reach of a campaign, a number of spots or a period is substantial-reliable, it has been demonstrated that the cumulative ratings (sum of GRPs) are measurable-reliable for the same period or number of commercials.

A BRIEF HISTORY OF THE AUDIENCE RESEARCH

8. A BRIEF HISTORY OF THE AUDIENCE RESEARCH

8.1 1965 - 1974: DIARY RESEARCH

On January 2, 1965, Intomart GfK began conducting audience research in The Netherlands under contract to Publieke Omroep (previously NOS and the public broadcasting associations), joined in 1967 by the STER. From 1965 through mid-1987, audience behaviour was measured in a panel of 1500 people, 12 years old and older. Panel members were issued a diary or logbook listing the television programmes broadcasted each week on Nederland 1 and 2. They were asked to mark the programmes they had at least watched half way through and to express their opinion of the programme using an appreciation scale of one to ten. Until 1974, logbooks were distributed and returned by post. Pages from a weekly diary showing daily listings of television programmes can be seen in Figure 9 below.

FIGURE 9: TELEVISION LOGBOOK

In addition to the logbook-based measurement at the individual level, a supplementary measurement was carried out at the television set level. A meter (the audience meter) especially developed for GfK (formerly named Intomart GfK, since January 1st 2014 GfK) by Electrologica, a Phillips subsidiary, was connected to a television set. A unique signal containing a date and time code was broadcasted on the audio channel of each station (Nederland 1 and 2) every five minutes during programmes and every 15 seconds during commercial breaks. If the television set was turned on, this coded signal was recorded on an audiocassette in the audience meter (see figures 10 and 11). The cassette was collected and replaced each week. Until 1974, this measurement was carried out in an independent sample of 600 households.

8.2   1974 - 1987: DIARY COMBINED WITH FREQUENCY METER

From 1974, both measurement techniques were combined in a single sample of approximately 600 households. All of the members of a household logged their television viewing in diaries (children under 12 under the supervision of a parent or minder) and a frequency audience meter ('intometer') was connected to the household television set. It was now possible to relate individual viewing behaviour to viewing per television set.

FIGURE 10: THE FIRST AUDIENCE METER: FROM 1966, REGISTRATION PER TELEVISION SET
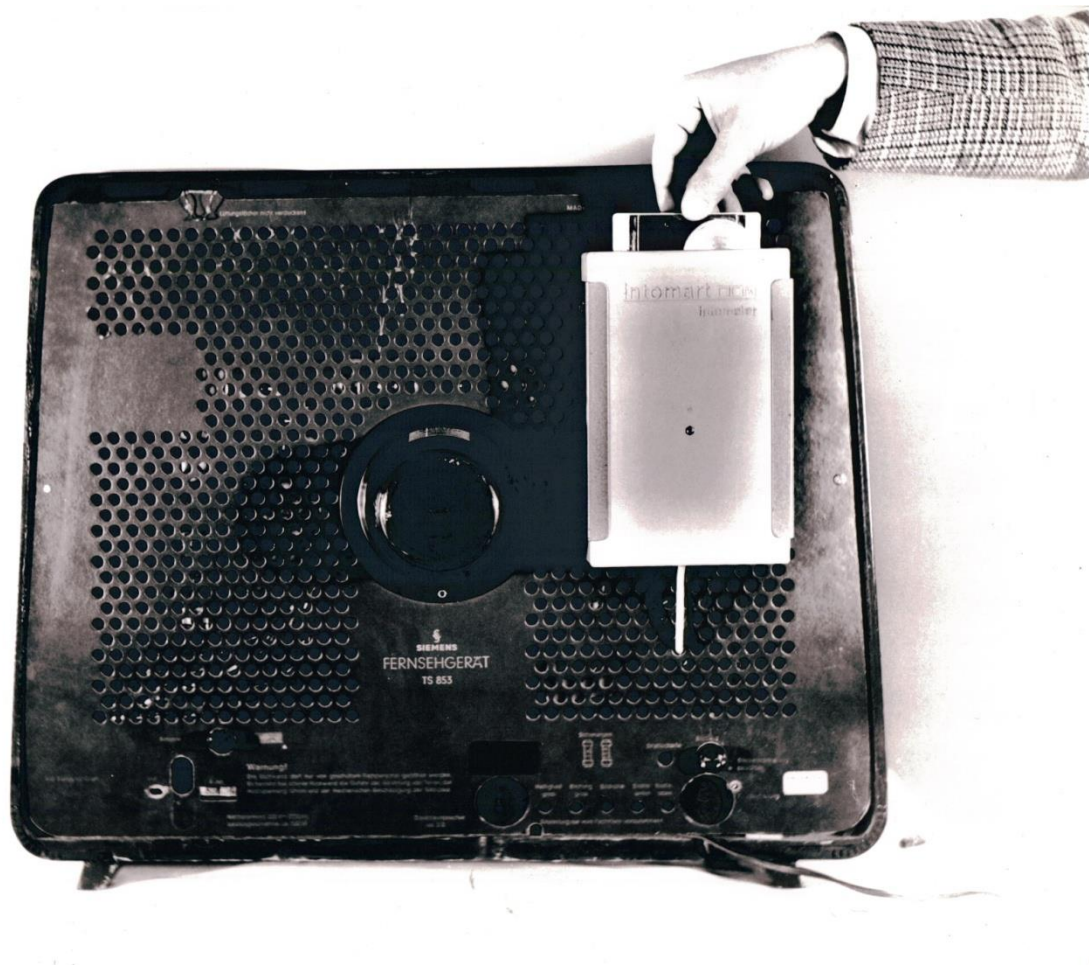
Each week, an Intomart GfK staff member collected both the cassettes and diaries and provided new ones. The data collected in the diaries and cassettes was processed by computer to produce reports with audience ratings and appreciation scores per programme and, of special interest to the STER, reach per set per five minutes (per minute for commercial breaks). Approximately two weeks after the date of broadcast, the results were made available to the contracting parties (NOS, the public broadcaster organisation – later known as Publieke Omroep - and the STER, as well as to advertising and media bureaus). The diaries contained programme listings for Nederland 1 and 2. Two weeks of the year, this was expanded to include programme listings for a number of foreign channels to provide information on audience behaviour with respect to foreign channels.

The operation of the audience meter in the period from 1966 to 1987 is summarised in Figure 12.

FIGURE 12: THE AUDIENCE METER FROM 1966 TO 1987

De Intometer van 1966 tot 1987

Om de 5 minuten werd een datum / tijdcode meegezonden, één signaal per zender.

Nederland 1
Nederland 2

De bij 600 huishoudens geïnstalleerde intometer bevatte een cassette waarop het signaal van de zender die aanstond werd geregistreerd.

In een dagboekje hield ieder gezinslid bij wanneer hij keek. Tot 1974 werd het dagboek door een apart panel uitgevoerd. Vanaf 1974 werden dagboek en intometer bij één panel ondergebracht.

Kijk-dagboek

NEDERLAND 1
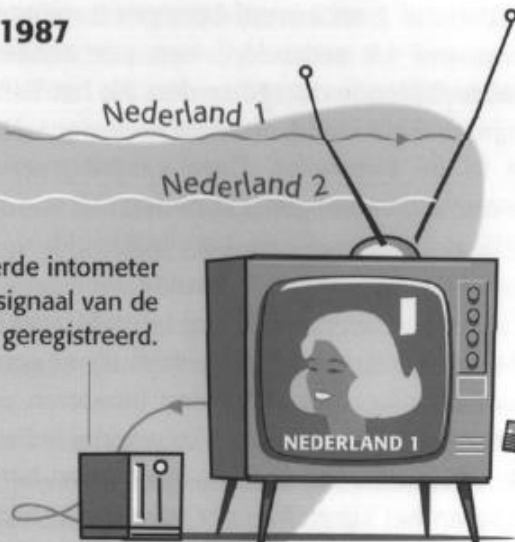
Dagboekje en cassette werden wekelijks opgehaald door Intomart. Twee weken later waren de rapporten beschikbaar.

8.3   1987 - 2001: THE CONTINUOUS AUDIENCE RESEARCH (CKO)

With the expansion of cable coverage in The Netherlands and the resulting increase in the number of stations available, it was clear that the diary method was inadequate for measuring increasingly complex viewing behaviour. Moreover, there was a need for a method that would make results available much sooner. With these issues in mind, the parties involved agreed to radical changes in the method of data collection.

The 4900 People Meter, an electronic measuring system developed by the AGB group (which at the time included Intomart), was selected for the new research. The 4900 People Meter (see figure 13) made it possible to measure audience ratings and programme appreciation for broadcasts on all stations received. Much less effort was required from panel members than with the diary method. Moreover, results were directly available online the morning after the actual broadcast.

The new system was inaugurated on June 29, 1987 by the then WVC Minister L.C. Brinkman.

FIGURE 13: THE 4900 METER WITH REMOTE CONTROL
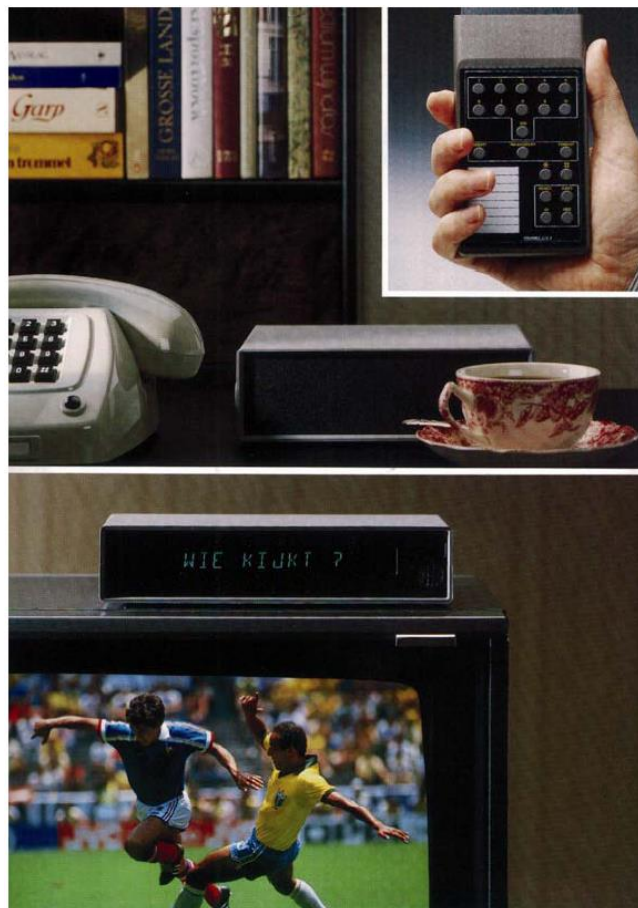
In the 4900 meter, a channel detector registered the frequency to which the television was tuned. Using information provided by the cable companies and data collected from panel households, the viewing behaviour associated with a frequency or channel could be assigned to a station. Moreover, this new technique made per second registration possible. For further information on
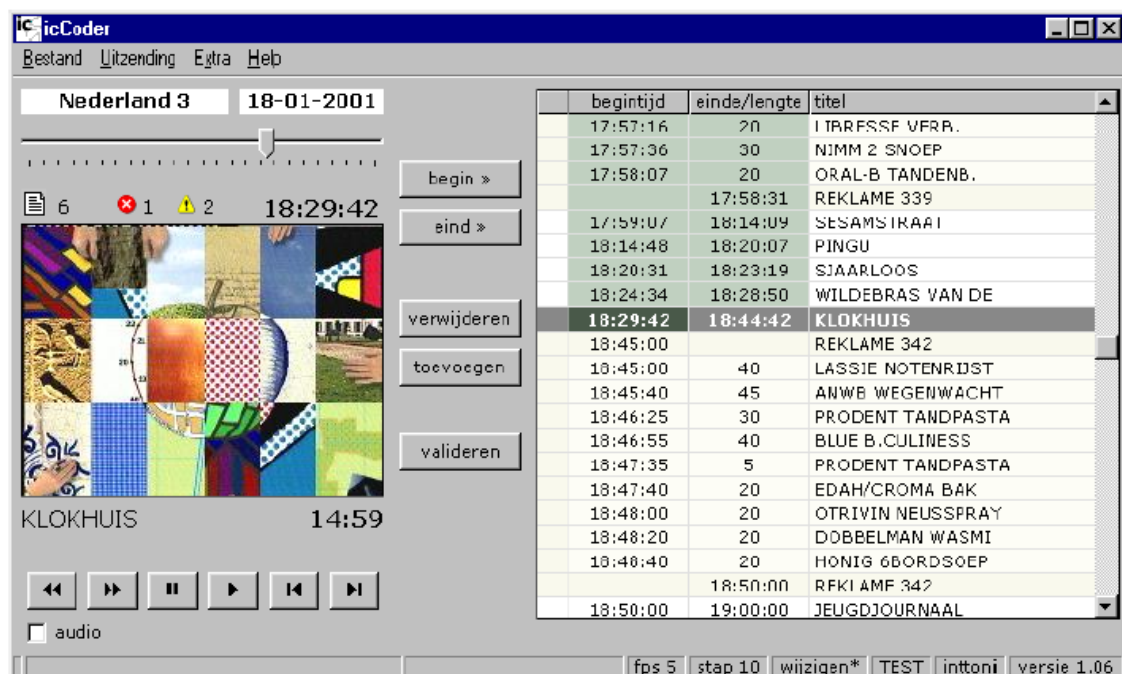
the 4900 meter or on the audience research methodology in general prior to 2002, we refer you to the methodological description of the CKO10.

In order to report on programmes and spots on the day after broadcast, it is necessary to quickly code data on programmes and commercials from a large number of stations. Prior to 2000, coders did the coding by hand. From September of that year onwards, much of the work was automated using the icCoder (see figure 14)[11]. The shift from videotape to digital registration of images and the semi-automation this made possible, insured the speed and precision of the coding process in the face of an increasing number of stations.

The CKO advisory committee, which functioned as the CKO Technical Commission, decided to leave the revision of calculation and reporting procedures to the new organisation that was being set up to conduct the audience research from 2002.

FIGURE 14: THE ICCODER

Following the introduction of the 4900 meter, a large number of changes were made in the audience research in addition to the changes in the encoding process. Between 1987 and 2001, these included:

- IP (representing RTL and Veronica) joined the principal contractors at the start of 1995.

- At the start of 1991, the national sample was expanded from 700 to 850 households and, in 1995, to 1,000 households.

- An additional 150 households (oversampling) were added at the start of 1992 for local measurement in Amsterdam and (through 1996) Rotterdam.

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10   Intomart GfK. (2000). *Het Continu Kijkonderzoek: Methodologische beschrijving van het Continu KijkOnderzoek (CKO) versie 7 Maart 2000.* Hilversum: Intomart GfK.

11   For a description of "Intocodering" see: Intomart GfK. (2000). *Het Continu Kijkonderzoek: Methodologische beschrijving van het Continu KijkOnderzoek (CKO) versie 7 maart 2000.* Hilversum.

- In April 1999, the sample was expanded to 1,250 households, a portion of which was used to disproportionately raise sample size in a number of regions. With this increase, "region" was included as an extra variable in the weight matrix and expanded regional reporting was made possible.

- As a response to the increased number of television sets in households, as well as the increased use of video recorders and satellite receivers, various additional registration modules were introduced.

- In 1996, a newer remote control was introduced that was more durable and easier to maintain.

- Starting from 1996, commercials from different providers were harmonised, making it easier to define campaigns.

- Following a trial run, the raw data from the audience research was made available to all participants from the start of 1999.

- In November 1999, following another trial run, data from households with a 4900 meter using the new measurement technique Picture Matching™ (see § 4.2.3) was included in the daily reporting of audience ratings. The number of households using Picture Matching was expanded slowly in 2000 and 2001; in particular, these included households with digital reception, which meant that viewing behaviour could not be registered by the standard 4900 meter.

- Panel recruitment based on the Radio Basis Interview was automated in 2000, allowing the automatic selection of a correct mix of the necessary households. Among other things, the procedure took into account probable response for each recruitment characteristic. This has made panel maintenance and management more efficient. The criteria used in recruiting households have been made more transparent, allowing better management of the process.

- In preparation for the new contract for the audience research (see following section), in June 2001 the new 5000 meter was installed in a test panel. In addition to Picture Matching, the 5000 meter uses the VBI code to identify stations. From October 2001, data from households equipped with the 5000 meter was included in the audience ratings. By December 2002, all of the remaining 4900 meters in the audience panel were replaced with the new 5000 meter.

8.4   1997: EXTERNAL REVIEW OF THE VALIDITY AND RELIABILITY OF THE CKO

In 1997, the Dutch advertisers' organisation, BVA/Associatie Nederlandse Adverteerders, commissioned an external review of the audience research[12]. Conducted by Professor M. Wedel (University of Groningen) and Dr. A.K. den Boon (Independent expert), the study evaluated the validity and reliability of the CKO data and the accessibility and relevance of this information for advertisers.

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[12] A.K. den Boon & M. Wedel (1997). *Validiteit en betrouwbaarheid van kijkcijfers: Onderzoek naar de kijkdichtheidsgegevens van het Continu KijkOnderzoek van Intomart GfK.* Amsterdam: Mediacommissie van de BVA/Associatie van Nederlandse Adverteerders.

The study focused on the following aspects of the audience research:

1. The drawing and composition of the master sample (basis file).

2. The drawing and composition of the panel sample, including the procedures used to recruit households and replenish the panel from the master sample.

3. The button meter system.

4. The evaluation of the significance and the quality of the coincidental research conducted by Intomart GfK.

5. An analysis and evaluation the validity and reliability of the audience ratings.

6. The formulation of recommendations for the audience research with reference to the above-mentioned points.

Drawing on information provided by Intomart GfK, the validation committee investigated in detail all aspects of the audience research. This included a series of analyses of the raw data and the calculations of the daily reporting carried out by Intomart GfK.
The conclusions contained in the validation study were very positive:

"The conclusion that can be drawn from the findings is that the CKO does not show a single significant shortcoming in the sample selection procedures, in the gathering and processing of the data or in quality control. In general, it can be said that the audience research has a high degree of validity, including for the sale of advertising space on television."

The final report included a number of suggestions for improving the audience research. Above all, it was felt that a larger sample was needed to increase reliability of the outcomes. At that time, the sample contained 1,000 households; it has since been expanded to include 1,240 households. Other recommendations from the advertisers included making the research more representative with regards to immigrant populations, conducting additional research on viewing behaviour outside the household, lowering the persistence limit of 15 to five seconds and spreading coincidental research over the entire year.

8.5   SINCE 2002: THE SKO AUDIENCE RESEARCH

On January 1, 2002, the CKO became the Stichting KijkOnderzoek (SKO) audience research. There are a number of differences between the CKO and SKO audience research.

- SKO is responsible for the reporting of the audience research. Stichting KijkOnderzoek is given as the source.

- The panel of 1,300 households (a national sample of over 1,225 households plus additional 75 households for regional over-sampling) has been reduced to a panel of 1,220 households (a national sample of 1200 households with a regional oversampling of 20 extra households in the provinces of Drenthe, Flevoland and Zeeland).

- Population characteristics used for recruiting and weighting the panel are no longer taken from the SKO ES, an establishment survey designed specifically for SKO, but from the Media Standard Survey, which has been commissioned by SKO in collaboration with the

media audience measurement services for radio (RAB), internet (until 2014 JIC STIR) and print (NOM). The Media Standard Survey (MSS) is based on interviews conducted in (net) 6,000 households and among 5,100 individuals of 13+ years of age.

- Households are recruited from the current year's Media Standard Survey sample. Previously they were recruited from the SKO Establishment Survey sample of the six months previous.This ensures recruitment in a sample of relatively fresh addresses.

- The recruitment of households is bases on a cell matrix of maximum 65 cells, controlled by additional criteria.

- Since January 1st 2007, the television panel has been weighted based on the MOA Golden Standard (MOA GS). Starting Monday week 1 2007, all the background variables universes were changed to meet the MOA GS criteria. Every year the universes are calculated based on MOA GS figures. The new universes apply yearly from Monday week 1.

- The 4900 frequency Meter was totally replaced by the TARiS 5000 in 2002. The measurement technique was based on Picture Matching and VBI-codes. On April 12th 2007, a new measurement technique - Enhanced Audio Matching - became operational in the meter. This technique uses audio samples and matches them to reference audio for channel detection. EAM is the third detection technique, together with Picture Matching and VBI-codes and facilitates the reliable measurement and reporting of viewing behaviour through modern TV sets and other tv-equipment. In 2011 a new technique, the French watermarking system of MetricLine (ML-code), was implemented in the TARiS 5000. This is an audio code that is added as a watermark to the channels. Processing is done in a similar way to other techniques, according to GfK's validation rules.

- Guests in the household of panellists can be logged by means of the remote control. The remote allows collecting detailed, combined information on age and sex (16 categories). Since April 1st 2003, the guest viewing behaviour been included in the official ratings.

- On January 1st 2003, DVD was added as a new channel (code 345). The new channel HD (hard disk recorder) was added on February 13th 2006. These channels contain all the viewing different from live TV viewing during the time that both DVD or HD recorder and the TV set are switched on. This viewing time includes time shifted viewing, near-live viewing of television broadcasts through the equipment but also the use of the equipment to view other content, such us EPG, games or rented/homemade films.

- In 2011, an effort was made to recruit foreign/immigrant households to their target group in the panel. This effort also aimed to increase the participation period of households in this target group and to optimise their compliance, by offering a translation of the introductory letter and the welcome material, additional information on the panel member website and an instruction film (on DVD) in panel members' own language.

- The life style classification of NPO (Public Broadcasters) is delivered in the standard data of the Dutch TAM. Since 2007, life style characteristics and the NPO life style classification have been available on a daily basis, in order to allow participants to improve their programmes and adapt them to Dutch audiences. In 2009-2010, a new life style classification was made available by NPO (see appendix 18). Since Monday, week 27 2010, all panellists of 13 years of age and over have been classified according to the new life style types. In 2011, the same new typology became available in all the other Dutch media audience measurement services.

- Since 1-1-2011, the daily encoding, classification and harmonisation of programme and spot files of 19 national channels (Full Audit) is no longer done by MediaXim Nederland, but by The Nielsen Company.

- Between September 2009 and July 2017, SKO commissioned a Limited Audit to provide the market with relevant spot data for the regional channels (ORN-channels). Four times a year, The Nielsen Company performed an audit to check whether the information provided by the stations was effectively broadcasted. This Limited Audit stopped in July 2017.

The relevant changes are discussed in detail in this methodological description.