

Patent Description

Title: An electronic program guide selection system with fast search, compact presentation and flexible programming capabilities

BACKGROUND OF THE INVENTION

1. Field of the Invention

10 The present invention relates to a system allowing to select one or more programs from a TV service in a user friendly and fast way, such system allowing such selected programs to be recorded to an internal or
15 external storage device such as a hard disc or flash memory.
Most especially it relates to a system allowing to find one or more programs of which the user knows the title or a part of
20 the title.
It also relates to a presentation of the event listing and the recording listing in a more compact way reducing the time spent to browse all events or records.

2. Vocabulary

When digital Broadcast TV was introduced a confusion was possible because more than
30 one TV service was usually broadcast on one Radio Frequency (RF) channel. Thus the habit of using the word Channel to refer to the TV service carried by a RF channel was not valid any more.

35 There was also some possible confusion with the word TV program which could refer to a full TV service, or to an event on such a service.

In order to avoid any further confusion this document will use the definitions specified by the Digital Video Broadcast organization, as follows:

- A TV “service” (previously usually called channel) is composed of a video service
45 with one or more associated sound and other data
- A Radio “service” (previously usually called radio channel) is composed of one or more related sound streams
- 50 – A TV or radio service broadcasts a succession of “events” (previously usually called programs). An event is the

part of a TV or radio service that is usually identified by a title, a start and end time and has an homogeneous content.

55 The Electronic Program Guide (EPG) is usually carried in Event Information Tables (EIT) and carries the information of a
60 succession of events for one or more TV services.

3. Description of prior art

65 The programming of a recording device for TV or radio events is usually achieved by either entering manually the channel, date, start and end time of the event to record, or selecting the targeted event from the list contained in an Electronic Program Guide (EPG).

The selection from an EPG is usually done in current implementations by browsing manually through the list of events
75 contained in the EPG and displayed by the receiving device, then activating the timer function by the appropriate user interface.
The search for a given event within the
80 many events that the EPG can contain may be very long.

Alternately, in some advanced implementation the user may input through
85 a virtual keyboard the title of the event he wants to record, which is then searched for within the EPG and presented to the user for him to confirm the recording. Such implementation is usually long because of
90 the time it takes to enter characters in the virtual key board.

Virtual keyboards are used in mobile phones in a faster and more efficient way
95 which uses a real-time lookup function into an embedded dictionary.

In any current implementation, the recordings programmed via an EPG are
100 limited to the EPG programs or programs that are repeated at regular intervals such as daily or weekly.

The current invention combines a number of

features to enable a very fast program selection and a very flexible recording scheme, even beyond the existing EPG.

5 Once records are done on a mass storage media such as a hard disc, so many records may be available that browsing through their list may take the user a long time, such list requiring usually several pages of display.
10

Summary of the Invention:

Accordingly it is an object of this invention to
15 provide an improved, faster and flexible means of selecting one or more events simultaneously from within the electronic program guide (EPG). This feature will be referred to as EPG Quick Search.
20

It is a further object of this invention to let the user program timers for viewing or recording using the EPG quick search to automatically select all or only some events
25 from within a list.

It is an other objective of the invention to let programmed recordings record in a way that avoids duplicate recordings when so
30 requested.

It is an other objective of this invention to give the option to show the list of events of the EPG in a compact format for faster
35 browsing, where all events with the same or, optionally with similar titles are grouped into one item, as shown in the example of Figure 2.

40 It is an other object of this invention to let the user decide to program recordings so that new records overwrite the previous records that carry the same title or previous records that carry partially the same title.

45 It is an other object of this invention to let the user set the programmed recordings so that the event selection process is carried out beyond the end of the currently available EPG by checking at appropriate
50 intervals the updated EPG, without the obligation to keep the receiving device constantly awake in full or almost full power mode.
55

It is an other object of the invention to enable compact record listing for multiple records of events with the same or, when so setup, with similar titles, as shown in the example of figure 6.
60

The attainment of these and related objects may be achieved through the use of the novel combinations of a direct access to a
65 title selection menu from a remote control key or other input method.

The said title selection menu comprising a title field that contains optionally the current
70 title as a preselected title but is otherwise initially empty.

The said title field being completed by the use of a virtual keyboard, which is
75 preferably set as a "T9" mode in which the use of numeric keys represent a small subset of the alphabet, numerals and other typographic characters, as commonly used on cell phones, as shown in figure 1.

80 The said virtual keyboard can also be set in various other input modes such as plain alphanumeric selection and contains a mean to input a wild card, which can
85 replace any character for the title search matching algorithm.

The said title field is further used to display on the fly the title of the events that match
90 the so far selected character or characters or combination thereof.

The said matching event titles being automatically displayed as a list on the
95 same display on a separate area where the said list can be extended over more than one page if necessary.

The said list being preferably presented in a compact format where events with the same
100 title are listed only once together with an indication of the number of occurrences of the said title within the current EPG, as shown in figure 2.

105 The said compact presentation can also be expanded to the usual list showing each event with its date, start and end time as shown in figure 3, such expansion being
110 applicable to all or one or more events

preselected by the user by means of a dedicated key.

5 The user can also select one or more events from the thus displayed list of events for automatic recording with several, directly selectable modes.

10 The said recording modes include a mode to record unconditionally all selected records, a mode to record all selected records on the condition that they are not pure repeats such as the same episode of a series, and a mode to record all selected
15 events but in which each new recording will overwrite the previous recoding of the list that has the same title.

20 The said conditions for checking whether each occurrence of an event is a repeat or a different instance with the same title may use a parsing for numbers in the title or the description carried by the EPG or may check if the description carried by the EPG
25 is the same or different for each such selected event.

30 The user is furthermore given a possibility to set a background search for the selected events, with the same conditions continuing to be applied, where background search means that the software will search automatically in future EPG for the same title again with the same selection criteria
35 and the same recording mode.

40 The said background search may be automatically applied any time before the last event described in the current EPG elapses, the software updating then the new time at which it must check the EPG again.

45 The said background search may be applied also in standby mode on the condition that a timer is still available, which the software sets to wake up at intervals that match the last available event schedule.

50 The said timer is used to wake up the receiver, check and update the EPG, search for the programmed title(s) and recording conditions, which are applied automatically to program further recordings when
55 appropriate, the said timer being then set

again for a next wakeup and the receiver being put back to standby mode for energy savings purposes, unless otherwise ordered by a user action.

60 The list of thus programmed recordings, whether within the current EPG or for background search in future EPG, can also be accessed from a list (the "timer list") for editing or deletion.
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70 The recordings thus programmed may be recorded with so called meta data that relate to the title and mode of recording so that records with the same title can be presented in a record list in a grouped manner in order to minimize the number of records to browse when choosing a record to play back, as shown in the example of
75 figure 6.

80 The said presentation of grouped recordings may be shown with a dedicated indication that explains that those titles have more than one occurrence on the recording media.

85 The thus grouped recordings may be shown as separate records upon user request by a simple selection and/or key press as shown in the example of figure 7.

90 The invention is set out in claims 1, 3, 4, 5, 6, 7, 8, 11, 12, 13, 18, 19.

95 The attainment of the objective of the invention should be more readily apparent to those skilled in the art after review of the detailed description of the preferred embodiment and its related pictures.

Description of a preferred embodiment

100 In the preferred embodiment the user accesses the title selection menu for the timer setup function in either of three ways. The first method is through a timer menu,
105 the second method is by pressing a dedicated key of the remote control (hot key) that automatically enters the current event title into the title field and the third method is by pressing an other hot key that
110 leaves initially the title field blank.

Optionally a choice is given to the user to search only the current channel, which is the default setting, or all channels on the current multiplex, or all channels

Another possible option is to let the user look for words instead of full titles, those words being located either in the title of the events to search, or in the description of such events.

The title selection menu is composed of three windows shown on separate, non overlapping parts of the display,

The first window of the title selection menu shows a virtual keypad as shown in figure 1,

The second window of the title selection menu shows a help list that contains at least the current and real-time updated functions assigned to some remote control hot keys, usually the four green, red, cyan and yellow colored keys, as shown in figure 4

The third window of the title selection menu shown in figure 2 displays the list of titles extracted from the Electronic Program Guide (EPG) which match the current string selection made by the user

In figure 1 and 2, The user pressed successively "6", then "3". Since the input mode is the so-called T9 mode, as shown in figure 1 item "a", the titles are those for which the first letter is either M, N, O or 6, and the second letter is either D, E, F or 3. The first such occurrence is "Men and Women" as seen in figure 2. This is why item "b" of figure one displays "Me"

Note that the user can change the input mode to alphanumerical, where he chooses only one character rather than a choice of characters for each position in the title. The T9 mode however allows the user to select the title or titles he wants to see or record with the least number of key presses. Statistical studies on real weekly EPG show that the average number of key strokes to display a given event in the list of figure 2 is less than 3 in T9 mode with the combined title search in EPG, which is one of the claims of this invention.

A further option is that a dedicated key can be assigned to enter a "universal" character. Such character would act as the "?" in DOS search and replace any letter at the position it occupies. This special character is useful for example to skip the first letters of the many titles which start with "The" or any equivalent string, which of course depends on the broadcast language.

Figure 2 shows for each matching title, the number of occurrences of such title within the current EPG. This number is shown in the column pointed to by item "d" of figure 2. For instance "News updates" is mentioned 8 times in the current EPG. It is an other claim of this invention that the use of such grouping gives a much faster access to a target event or set of events than the usual display of events in chronological order

The user can then select any displayed title, which will then be pointed to by a special color or rendering (called highlight) and by pressing an appropriate key, see the detailed date and time when those events will be broadcast as shown in figure 3, item "g"

Whether in the grouped or ungrouped display, the user can select one or all of the recordings for actual recording. This is indicated in item "e" of figure 2 or item "h" of figure 3.

As soon as one or more titles have been selected, the user can use a hot key as shown in figure 4, to confirm the recording in either of three modes.

The first recording mode, named "Record last, overwrite previous" would typically be used to let the user have immediate access at any time to the latest news broadcast

The second recording mode, named "Record all selected" will record all events selected by the user, regardless of their content or description.

The third recording mode, named "Record if different" will record a new broadcast of the selected events only after having verified that the same event is not already available

on the media or medias used for the recording. This verification uses the other descriptors contained in the EPG, which are recorded as meta data for each recording.

5 Once the recording mode has been selected, the user is asked if he want to continue recording such events beyond the existing current EPG. If he selects so, the software will check from time to time the updated EPG for new occurrences of the selected title and will apply the same recording mode in order to decide whether such new broadcast must be recorded or not. This recording option is called background recording mode

20 The background recording mode checks the EPG in two different ways depending on whether the receiver is in standby or in full power mode.

25 When in full power mode, the EPG updates are checked in the background and the programming of the background recording updated as soon as and whenever a new matching event is scheduled in the updated EPG.

30 Some receivers maintain the tuning and main processor awake in standby mode. For those type of receivers, the background recording search is the same in standby and in full power mode

35 Normally receivers would switch off the tuning function and maintain only a lower power timer during standby. The algorithm used by the background recording is then adapted as follows: At the moment a standby is requested, the software checks if a background search is active. If it is, it will check the date and time of the end of the last event described in the current EPG. It will then set a timer to wake up just before that date and time. Then the software enables the standby mode. When it wakes up it receives the updated EPG and checks for any necessary update for its background recordings. It is a claim of this invention that this background check uses virtually no power in standby mode while nonetheless letting updates be used whenever necessary for the background recording.

55 The worst case would be for a channel that

broadcasts only a present and following event information as opposed to a weekly schedule. With an average event time of 30 minutes, and the receiver would use its full power typically for 30 seconds every 30 minutes. If the power used by the receiver is 1Watt in standby and 15 Watt in full power mode, the average power used with the background recording would be only 1.25 Watt. With a full weekly EPG, it would be only 1.00015 Watt.

Once multiple recordings have been made by use of the "Record all selected" or "Record all if different" modes, a novel means of fast access from the record list is given by grouping these records into one item as shown in the example of figure 6, Compared to the traditional list in which all records are displayed separately in the record list, as shown in the example of figure 5, it reduces the number of records to browse and thus gives the user a faster access to any of his records.

80 As shown in figure 7, a grouped record can also be ungrouped so as to show its individual records and the user can see the description and recording date and time of each of them by changing the highlighted title, then play back only one of those records.

CLAIMS

1. A digital television Electronic Program Guide quick search function (EPG quick search) for digital TVs and STBs, whereby the viewer has a fast way to select the programming material that he or she wishes to record or watch.
2. An EPG quick search function according to claim 1, in which the viewer has the option to enter into a text input mode whereby the on screen keypad is used to type in the required event name for the software function to search the EPG or Event Information Table (EIT) data.
3. An EPG quick search function according to claim 1, in which the viewer has the option to enter into a special text input mode whereby numeric keys on the remote control unit are used to indicate the search word to the software function. The function will automatically try to complete the event name based on information about all events as transmitted in the Event Information Table (EIT).
4. An EPG quick search function according to claim 1, in which the viewer has the option to search for future occurrences of the current event (for the system to then automatically record or decode when they occur) based on information already transmitted in the EIT.
5. An EPG quick search function according to claim 1, in which the list of events can be grouped by title and sorted by time or alphabetic order in order to reduce the number of items to display for the target selection.
6. An EPG quick search function according to claim 1, in which the system, once told which events to record, will go ahead to record those events by setting appropriate timers, but, if selected to do so, not only for events that have already been transmitted in the EIT, but also for events that will be transmitted in a future EIT. (A background task searches new EIT information as it becomes available).
7. An EPG quick search function according to claim 6, in which the system, if selected to do so, will wake up out of standby mode just prior to the last event of the current EIT in order to download the new EIT data, and then perform the same search on this data as had been previously done on the previous EIT data. The timers are then set to record or wake up as required. The TV or STB then goes back to low power mode.
8. A digital television Electronic Program Guide thumbnail display (EPG thumbnail) for digital TVs and STBs with hard disk drive (HDD) or other recording media, whereby the viewer has a clear and hence fast way to select the programming material that he or she wishes to watch or manage.
9. An EPG thumbnail function according to claim 8, in which the viewer can see and navigate each record displayed as a single frame picture on the TV screen.
10. An EPG thumbnail function according to claim 8, in which the viewer can see and navigate groups of multiple records, where each record of a group has the same title.
11. An EPG thumbnail function according to claim 10 in which the multiple group record is shown as a single frame picture, but with a special frame icon to indicate the occurrence of multiple records with the same event title.

12. An EPG thumbnail function according to claim 8 in which the single event record according to claim 8 can be viewed and navigated within the same menu
5 graphic as the multiple event records according to claim 9. 55

13. An EPG thumbnail function according to claim 12 in which the number
10 of records with the same event title is displayed concurrently with the single frame picture when the multiple frame icon is highlighted.

15 14. An EPG thumbnail function according to claim 13 in which options are available to view the records in either alphabetic or chronological order across the screen.

20 15. An EPG thumbnail function according to claim 8 in which an option is available to start to watch a particular record.

25 16. An EPG thumbnail function according to claim 8 in which an option is available to delete a particular record.

30 17. An EPG thumbnail function according to claim 8 in which an option is available to enter into an edit function for the particular record.

35 18. An EPG thumbnail function according to claim 8 and claim 11 in which a special multiple records icon, when highlighted, and the associated function executed, allows the user to browse the
40 individual records of the group.

19. An EPG thumbnail function according to claim 8, claim 11 and claim 18 in which the individual event records of a
45 group are displayed encompassed within a larger frame box display, with text overlaid onto said larger frame box to indicate that the said event records are event records of the said group.

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