



A Technical Overview of the  
GUIDE Plus+<sup>®</sup> System

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**GUIDE** *plus+*<sup>®</sup>  
CELESTAR

**PHILIPS**

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## Introduction

In today's multi-channel TV environment it is becoming increasingly difficult to plan your television viewing. The wide variety and availability of a high number of channels means that listings for all of the programmes that a consumer may want to watch are not always available in their favourite TV magazine or newspaper. With these channels being delivered via a number of different sources it also becomes harder to record a favourite programme as you may have to program a number of different products in parallel to make the recording. The GUIDE Plus+® electronic programme guide has been designed so that all this can be done in an easy and simple way on the TV screen.

GUIDE Plus+ is an easy to use, electronic version of a TV magazine. It allows a consumer to find out about the programmes that will be broadcast over the coming days. It allows the user to search for programmes by category and to decide to record them with a single button push. Alternatively the user can set a reminder to let them know when the programme is about to start. All of this is done without missing any of the programme that is currently being watched. Philips and Gemstar TV Guide have worked together to bring to market a new way of managing TV viewing.

This document provides a technical overview of the GUIDE Plus+ electronic programme guide.



Figure 1 GUIDE Plus+® grid screen

Gemstar TV Guide's GUIDE Plus+ electronic programme guide (EPG) has been developed to give the consumer a single interface for management of all of their TV viewing, scheduling and recording needs. It is designed to offer an easy to use interface that will allow simple navigation through the multitude of TV channels that are now available, independent of the source that provides them, be that FTA broadcast, Digital Terrestrial, Satellite or Cable. It will also manage the switching of the various signals to ensure that you can spend your time watching and recording what you want and not worrying about which remote control to use to control the various pieces of equipment.

A consumer purchasing a product containing the GUIDE Plus+ EPG, will find a 'GUIDE Plus+' button on their remote control. Pressing this button will call up the display illustrated in Figure 1. This is the main programme navigation grid, where channels are shown on the vertical axis against time on the horizontal axis. From this screen the user can navigate through all the features of GUIDE Plus+ using arrow keys and the coloured fast text keys on the remote control. At any time pressing the GUIDE Plus+ button will return to the full screen display of the programme you were watching. This document does not seek to describe the user interface for GUIDE Plus+.

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# A Technical Overview of the GUIDE Plus+<sup>®</sup> System

The GUIDE Plus+ user interface (UI) is technically the 'client' of a 'client / server' data delivery system, where the data is programme schedule and other information. The UI is only the client part of the system.

The 'server' part of the system, which is responsible for delivering the programme schedule (and other) information that GUIDE Plus+ requires to operate, is managed externally to the set in Gemstar's broadcast control centre.

The operation of this client / server pair is described later under the headings *Data Origination and broadcast and Receiver EPG implementation*.

One key point to note is that in an analogue broadcast model, there is a one-way connection between client and server. That is, programme schedule information is always 'pushed' to the client receiver. This means that schedule information is periodically refreshed at the server side and then sent to the GUIDE Plus+ client over the air (OTA).

An important feature of the GUIDE Plus+ client is that the service data (schedule, advertising and information data) is cached within the receiver. The major advantage of caching service data is low latency operation. Unlike systems utilizing data from a continuously rotating carousel such as teletext, there is no data capture latency i.e. delay in accessing the information. The required information is taken directly from cache memory meaning that response times to user commands are instantaneous. While the majority of programme information does not change it is important to note that Gemstar can also broadcast real time updates to the TV to ensure that late changes of programming are incorporated into the EPG. This latter point is dependent on the timely delivery of relevant information from the channel instigating the change.

## Technical Overview

The GUIDE Plus+ system is illustrated in Figure 2. In this diagram, the Gemstar TV Guide Data Broadcast System (GDBS) and the broadcast facility form the server side of the system, while the TV broadcast receiver is the client.

### Data Origination and broadcast

GUIDE Plus+ service delivery involves:

- gathering schedule and other information
- data preparation and formatting and
- broadcast over the air on the VBI of the host analogue channel.

### Schedule Data Origination

Programme schedule information is gathered from a variety of sources. Programme schedule information is reformatted for consumption by the GUIDE Plus+ client application. Once schedule data has been prepared and formatted for GUIDE Plus+ usage, it is sent via ftp or Internet to the GDBS.

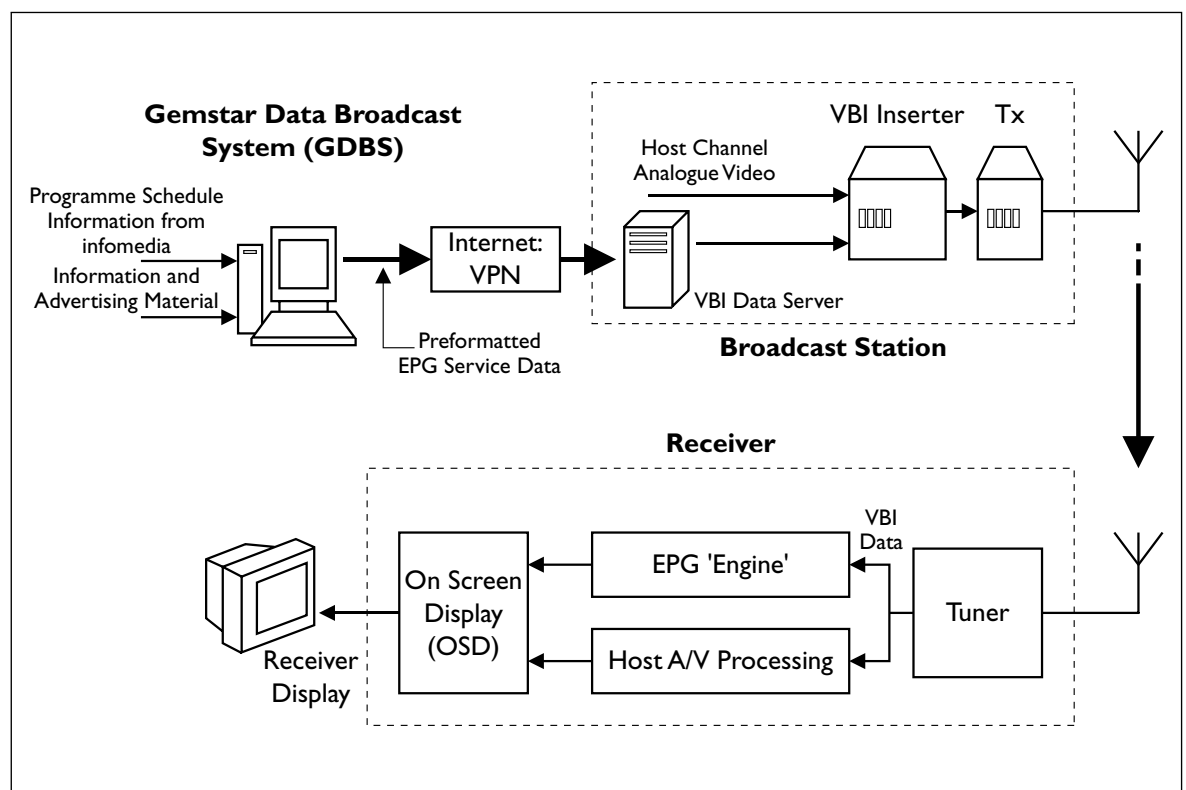


Figure 2 GUIDE Plus+® Service System

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## **Data Preparation and Formatting**

Once ready for broadcast, the service data is sent to the broadcaster for transmission.

At the broadcaster a VBI data inserter is used to insert GUIDE Plus+ service data into the Teletext lines available in the vertical blanking period of the TV signal, the host broadcast channel. This host broadcast channel will vary from region to region.

## **Data Broadcast Format**

GUIDE Plus+ service data broadcast exists as a number of 'pre-load' bursts transmitted at regular intervals throughout the day. Additionally, there is a very low, but continuous data transmission. The timing and frequency of these data bursts can be varied. The GUIDE Plus+ receiver monitors these pre-load bursts while in standby and caches the service data when it starts receiving.

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### **Receiver EPG implementation**

GUIDE Plus+ can be integrated into a manufacturer's TV or DVD recording device as a sub-module containing its own hardware and firmware, but it is more efficiently integrated with the manufacturer's own firmware, using the host product's hardware resources.

### **Service data recovery**

GUIDE Plus+ service data must be recovered off the host channel carrying the pre-load bursts. Usually this will occur when the receiver is in standby. A real time clock on the receiver will wake sufficient parts of the receiver (e.g. the tuner) at time dictated by the pre-load schedule, in order to recover pre-load data. GUIDE Plus+ then reads the service data flow from the VBI of the host channel, recombines data flow into modules and then caches those modules in non-volatile memory (this might be standby refreshed dynamic RAM).

### **Selecting GUIDE Plus+®**

When a viewer uses their remote control to select GUIDE Plus+, the TV screen changes to the home display illustrated in Figure 1. At this point, GUIDE Plus+ has control of the TV display. This is facilitated using the on screen display (OSD) shown in Figure 2. The EPG engine is responsible for drawing the GUIDE Plus+ display, and then populating its information fields (e.g. the main programme grid) using schedule data cached from the last pre-load.

Another important function of the OSD is to handle the picture in graphic (PIG) capability. The PIG facility allows the viewer to continue to see their selected channel while navigating the guide. This is the video window shown in the top left of the GUIDE Plus+ home page shown in Figure 1. The channel audio is also maintained.

### **Summary**

The GUIDE Plus+ electronic programme guide has been designed to offer easy access and control of television viewing in a multi-channel, multi source environment. It is a free system and operated via the normal aerial connection. There are no additional charges and once installed all of the information is delivered automatically and you can concentrate on enjoying your television viewing.

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