

BMW Navigation Buyer's Guide

Factory installed and accessory navigation systems computers identified by type and generation

This document represents a collective effort from a number of folks; jcarey, Roy in GA, brian, and all others who contributed content on the Bimmerboard Navigation/AV Forum

www.bimmerboard.com/forums/bmwnav/

If we left anyone's name out, please forgive the oversight.

1. Buy Smart—It is easy to make mistakes

Two common threads on our forum are either from someone asking if a navigation computer they have found on eBay or elsewhere is right for their vehicle upgrade or from someone who is seeking validation of a navigation computer they have already purchased. Many people have posted their success stories of various navigation upgrades and retrofits, so the process is very well understood for the E38/E39/E53 families of BMW. Variations in original equipment and the many types of BMW factory installed and accessory navigation systems makes it complicated but not impossible to identify and purchase the right pieces. There are a significant number of misidentified or misunderstood navigation computers for sale out there that can leave buyers stranded and or screwed. This document is an attempt to identify the different BMW navigation computers available and to help you to identify the one that is right for your project.

2. Types of navigation systems

There are three major types of navigation systems that BMW has offered as original equipment options and accessory retrofits over the past several years. These include:

- 2.1. SA608 Navigation System with On Board Computer / SA609 Navigation System with TV receiver module. There have been 8 generations of navigation computers employed in this factory installed system that we are aware of so far, MKI, MKII, MKIII, MKIV, NAVI01, NAVI02, NAVI03, and the latest CCC System.

- 2.1.1. MKI: This is the original BMW factory installed navigation option that was first introduced in the 1994 E38 (7 series) and 1995 E39 (5 series) model years. This Nav system used a CD-ROM drive based nav computer, an external magnetic gyro (compass), a GPS antenna and receiver module (Trimble) and a TV receiver module in conjunction with the On Board Monitor module up front. This same system layout, with newer generation nav computers and simplified modules is still being used in all US-Specification and some European-specification vehicles. (See Diagram 1 at the end of this document for the layout used in MKI systems)

- 2.1.2. MKII: A new computer was introduced for the 1998 model year featuring a simplified system layout, (see Diagram 2 at the end of this document), eliminating the separate magnetic gyro which was now included inside the GPS receiver (Trimble) module. The MKII computer was also faster than its MKI predecessor solving route requests faster and offered a female voice instead of the male voice used in the MKI computer. The MKII was also installed as an option in the E46, X5, and Z8 cars. The Z8 model was designed especially for vertical installation as were the later MKIII and MKIV units for this car.

- 2.1.3. MKIII: These systems were first seen in the E39 in August 2000 production and E38s for the 2001 model year. The MKIII system simplified the layout a bit further (see Diagram 3 at the end of this document), moving the GPS receiver (Trimble) inside the nav computer housing; now GPS antenna is plugged directly into the MKIII computer itself. Software upgrades included more choices of native languages, and a split-screen option for the graphics to take advantage of the wide screen On Board Monitor launched in mid production of the 2001 model year. A faster CPU of course was also another key advancement.

- 2.1.4.MKIV: This computer was first used in E46, Z4, Z8, and E83 models starting in the 2003 model year, featuring a faster computer with a DVD-ROM drive in place of the CD drives used in the first three generations. This allowed NavTeq the map disc supplier to fit the entire US and Canada on one disc instead of 8 individual CD's required previously. System configuration is identical to the MKIII system.
- 2.1.5.NAVI-01, NAVI-02 and NAVI-03: The first generation nav system used for the early E65/66 production was a CD based unit named NAVI01. This system was quickly replaced by a DVD based replacement NAVI02. At this time, BMW also made the transition from its earlier CAN control bus (known as iBus) to a MOST bus over an optical fiber cable. The CD and DVD based NAVI01/02/03 computers are **not** compatible in any way with the earlier iBus vehicles which use the MKI-MKIV computers.
- 2.2. SA 606 Low Navigation Systems. Uses a monochrome display ("Navigation Radio"). There are two generations of this system used by BMW that we are aware of so far. The computers used for radio nav systems are manufactured by the same OEM (Philips) as the SA608/609 systems, however these computers do not have the same external connections as the MKI-MKIV computers do, and they are **not** compatible as upgrades or to build a Color screen Nav system such as the SA608/609. The video output from these computers is intended to be displayed on a small amber, 4 or 5-line display on the radio or separate control panel on the dash. The Monochrome Radio Navigation systems were installed in some E46, Z4 and Z8 cars in Europe but none were brought into the USA by BMW-NA—the least is known about these systems by the authors.
- The E36 and E46 cars also had an additional style of navigation called the "Arrow Display" system and the computer was called a type III L. We have only seen pictures of the display and do not know what the connections look like. The computer appears to be similar to an (SZ) type Ili unit from the ETK diagram.
- 2.3. Navigation System type SA602 Optional Accessory Navigation Systems. Use a small video monitor mounted on a flexible gooseneck or a small display panel mounted in the dash. These were popular in 95 or 96 on E38s and E30s as an optional dealer installed Navigation option. Once navigation systems became popular, most 7 series were equipped with the SA609 system from the factory for the US market. By 2001, all E38 7 series imported to the USA were equipped with the BMW factory navigation system as a standard option. There was a custom computer model designated as the MKIli used in the (SZ) SA602 system at the time when on Board monitor systems were using MKII computers, however later systems used the MKIII with modified connections.
- 2.4. The Becker Traffic Pro system was available as an option in the E36, E38, E39, E46, and X3 cars. It is basically a dash mounted radio navigation instruction system.

In general, the components from these different systems are not interchangeable. However, it is very common to see someone selling a Monochrome or SZ nav computer as if it could work with the color 4:3 or 16:9 On Board Monitor system (sometimes the seller knows, sometimes they do not). It is also common to see someone selling a NAVI01/02/03 computer but calling it a MKIII or MKIV. If you buy one of these computers by mistake, you pretty much got yourself a paper weight. It may be valuable to someone else, but it will be worthless to you if your intention is to retrofit it into an iBus based vehicle. All of BMW's navigation systems are upgradeable to some extent, but the key is in knowing which parts go with your navigation and or vehicle electrical systems.

3. BMW Navigation System Upgrade Paths

The following table shows the possible upgrade options, based on the computer you currently have installed in your car. For example, look up your current computer in the purple column at the left side and the green cells to the right will tell you which nav computers you may be able to upgrade to by following the column up to the top. So for example if I have a MKII nav in my car, I

can upgrade to either the MKIII or the MKIV. The notation indicates that to do so, I will also need to remove the Trimble module and plug my GPS antenna directly into the rear of the MKII or MKIV computer.

Compatibility table										
Upgrade -->	MKI	MKII	MKII SZ	MKIII	MKIII _m	MKIII-SZ	MKIV	MKIV _m	NAVI-CD	NAVI-DVD
Original Equip										
MKI	X	X ¹		X ²			X ²			
MKII		X		X ³			X ³			
MKIII				X			X			
MKIV							X			
MKII SZ Type			X			X				
MKIII-SZ Type						X				
MKIII mono					X			X		
MKIV mono								X		
NAVI01-CD									X	X
NAVI02 DVD										X
1 Need adapter cable 61-12-8-377-432										
2 Needs an adapter cable E38 pn 61-12-6-907-840, E39 pn 61-12-6-915-132										
3 Remove Trimble GPS receiver connect GPS antenna to Nav computer										

4. Color MKxx Navigation Computers

Buying a Color MKxx requires the greatest care. The vast majority of people who buy one of these are fine; however this is also where people tend to make the most mistakes. The problem is that the Color MKxx nav computers look physically identical to the Monochrome computers, and the faceplates look very similar to the SZ computers. Fortunately, there are good part number listings to reference, and if necessary people on www.bimmerboard.com will usually be able to help, if you are wondering about one part number in particular.

As a guide, here are some of the key physical differences between the Color MKxx, NAVIxx and CCC navigation computers:

- 4.1. True DIN form factor. The NAVIxx computers are actually a little taller (higher) than a DIN form factor and the metal housing extends about 3/8" below the front trim panel. This can be often be seen in photos as a bright silver line across the bottom of the nav computer when viewed from the front.
- 4.2. Disk eject button locations. MKI –MKIV have these on the left side of the disk opening. The NAVIxx computers have their eject button on the right side of this opening.
- 4.3. Rear Connector type and location.
 - 4.3.1. If it is a MKI, there will be four black, flat-pin plugs with a 3A fuse arranged in a square configuration on the right side looking at the back.
 - 4.3.2. If it is a MKII, MKII or MKIV, it will have two plugs, one blue and the other either burgundy or yellow located on the right side looking at the back.
 - 4.3.3. NAVI01/02/03 computers have two connectors one green and one black. The black one has two optical connections located inside of it.
- 4.4. External GPS receiver, (Trimble). The MKI and MKII navigation computers require a separate component called the Trimble module that handles the GPS satellite reception and translation. With the MKIII and MKIV, the Trimble module is built internal to the nav computer. There is a MKI version of the Trimble module (with Gyro input) and a different MKII version (without Gyro input). These two Trimble modules are not interchangeable,

so, if you are replacing or upgrading a MKI or MKII navigation computer, be sure to get the correct Trimble module with it.

- 4.5. From the front, MKI and MKII computers look identical. They are both characterized by a square disk eject button on the left of the disc opening, but they have different rear panel connectors. The MKIII and MKIV computers also look very similar from the front. These both have a smaller rounded disk eject button on the left of the disc opening, but the MKIV has "DVD" printed on the front center below the disc opening.

4.6. NAVI01, NAVI02, and NAVI03 MOST Bus Color Navigation Systems

The NAVIxx computes are the easiest to differentiate from the others, yet they are often misidentified in eBay auctions and private sales. There are two styles (the in-dash version and the trunk mounted version), but the in-dash version is very different looking from everything else and rarely mistaken. The trunk unit looks similar to the others, but it is bigger than a true DIN, it has the disk eject button on the right side, and the plugs are different. The in-dash version is used in the new 5 Series and new 6 Series. The trunk version is used in the new 7 Series.

NAVI02 DVD Computers used from 03/03-03/05 look identical to the NAV01 at the rear but the front panel has the DVD logo printed on it. After 03/05 we suspect that the DVD Computers are updated to NAVI03 types, but we do not have any specific information or part numbers on that type yet.

Key physical differentiators of the NAVIxx navigation computers:

- Taller than a standard DIN (7 Series versions at least are)
- Small unit with just an exposed CD or DVD slot and face plate trim that matches the console contours. (5 Series and 6 Series version)
- Disk eject button on the right side of the face.
- 2 plugs (one smaller green plug and a slightly larger black plug with 2 optical connections inside the black connector housing).

5. Photos and Part Numbers

5.1. SA 609 MKI System: Used from 1/95 - 8/97

Below are a few example pictures and part numbers of MKI computers and Trimble modules.

65-90-8-375-128

65-90-8-364-421



MKI Front



MKI Rear

MKI Trimble is identified by the D type connector and the coax connector for the GPS antenna unit
 Part no. 65-90-8-361-757



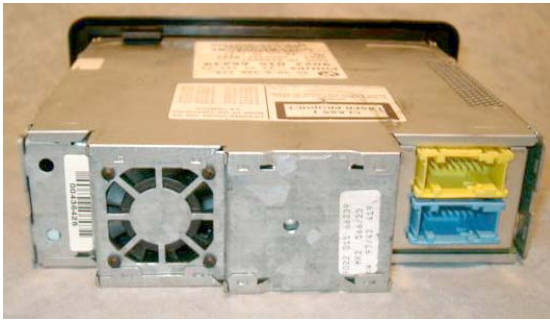
5.2. SA 609 MKII System: Used from 09/97 – 08/00

Example pictures and part numbers of MKII computers and Trimble modules.

65-90-4-105-062	65-90-8-378-168
65-90-6-908-309	65-90-8-385-439*
65-90-6-908-311	65-90-8-386-849*
65-90-6-908-313	65-90-8-386-851*
65-90-8-368-226	
	* resistor failure problem
L807A Nav Japan	Vertical Z8 units
65-90-8-372-494	65-90-6-903-260/261
65-90-8-376-416	65-90-6-908-619/620
65-90-8-379-562	



MKII Front



MKII Rear with Yellow connector



MKII Rear with Burgundy connector

MKII Trimble units are the GPS receiver units that accept the GPS antenna input
 Part no: 65-90-8-374-296 and 65-90-4-149-541



5.3. SA 609 MKIII System: Use from 08/00 – 09/02

Example pictures and part numbers of MKIII computers.

65-90-4-106-227	65-90-6-915-036
65-90-6-908-529	65-90-6-920-758
65-90-6-908-530	65-90-6-920-759
65-90-6-908-619	65-90-6-922-720
65-90-6-908-620	65-90-6-924-829
65-90-6-915-035	
Z8 vertical mount	L807A Japan
65-90-6-908-531/532	65-90-6-905-923
65-90-6-915-037/038	
65-90-6-924-830	MKIIIL Arrow type
65-90-6-922-721	65-90-9-416-251



MKIII Front



MKIII Rear

5.4. **SA 609 MKIV System: 09/03- present for E53, E46, X3, and Z4, and these will retrofit to the E39 and E38 iBus vehicles**

Example pictures and part numbers of MKIV computers.

65-90-6-920-182	65-90-6-957-604
65-90-6-920-713	65-90-6-969-263
65-90-6-942-908	65-90-6-971-353
65-90-6-942-910	65-90-6-971-809
	65-90-6-972-752
	65-90-6-951-629
L807A Japan	Z8 vertical mount units
65-90-6-925-449	65-90-6-920-183
	65-90-6-920-714
	65-90-6-942-911



MKIV Front



MKIV Rear

6. Radio Navigation Systems:

The Monochrome/Business navigation computers present the greatest challenge, because they can look physically identical to the Color/Professional computer from the front, and there is no exhaustive parts list to help identify these. Further complicating the purchase is that some sellers believe that a navigation computer can be recoded by the dealer to switch between Monochrome/Business and Color/Professional modes of operation. There is a great deal of debate on this subject, so tread with caution.

The Monochrome/Business navigation computer displays its routing information on a simple, 4 or 5 line amber monochrome displays that are either part of the radio or a separate component on the dash. The pictures below show example computers and what the display looks like. These vary from a radio/computer in one to a dual component system with a controller in the console and the computer mounted in the trunk or elsewhere in the vehicle. These later version are the ones that can be confused with color /professional Nav system computer intended for use with the On Board monitor.

6.1. Type 1: This unit is called the Arrow Display System and was available for the E36 and E46 cars. The picture below was recently seen on e-Bay and shows the dash monitor and the CD computer which seems to be similar in appearance to the computer used by

the early (SZ) MKIII units. The picture shows the E46 monitor which was slightly different from the E36 monitor.

The computer is called a MKIIIIL and has the part no 65-90-9-416-251



Arrow Nav System Controller and Computer Front View.

6.2. Type 2: Becker Traffic Pro Radio Nav:

This radio nav system was an option for the E36, E38, E39, E46, and X3 vehicles. This photo below was posted here a few weeks ago by David Cecil as a possible replacement for the original radio in cars where someone didn't want to go for a full Nav and On Board Monitor retrofit. This type is an all in one system. The rear panel photo shows that the GPS antenna plugs directly into the back of the unit. The CD map is inserted into the front panel and it is self contained.

Part no's for the Becker Traffic Pro Computers

65-90-0-153-186	65-90-0-027-973
65-90-0-027-972	



Becker Traffic Pro Controller Front View



Becker Traffic Pro Rear View

- 6.3. Type 3: The Radio Nav system was available for the E46, Z4, and Z8 vehicles. The systems shown below if for the Z4. The other two units have slightly different appearance for the dash mounted monitor and controller. This system uses the dash mounted controller and a separate Nav computer. A few of the computer part numbers were listed earlier in the write-up. The actual plugs on the rear of the computer look just like the color monitor computers, however the wiring is different and they do not interchange. There is a video output that I believe is referred to as the Navi bus that carries the nav display information for these small text only screens.



Radio Nav controller Front (Z4 model shown)



Radio Nav controller Rear (Z4 model shown)

- 6.4. Key physical differentiators of the Monochrome/Business MKxx navigation computers:
- 6.4.1.1. No discernable physical difference from a Color/Professional computer when viewed from the front for the MKII through the MKIV computers.
 - 6.4.1.2. True DIN form factor.
 - 6.4.1.3. Disk eject button on the left side of the face.
 - 6.4.1.4. Two plugs (one blue and the other either burgundy or yellow).

7. "Optional Accessory / SZ MKxx Navigation Computers

- 7.1. The SZ navigation computers are a little bit easier to identify from the Color/Professional computers. If it is a MKII, the face looks silver-ish instead of the matte black color of all the other BMW navigation computers and it is also wider than the normal units .

One part no I found for a MKII SZ type nav computer is 65-90-9-408-772



MKII SX Optional Accessory Nav Front



MKII SZ Optional Accessory Nav Rear

- 7.2. The MKIII SZ looks the very same but the connections on the back are totally different from any of the other navigation computers. One part no I found for the MKIII SZ type computer is 65-90-0-028-275.



MKIII SZ Optional Accessory Nav Front



MKIII SZ Optional Nav Rear

- 7.3. Key physical differentiators of the SZ MKxx navigation computers:

8. NAVIxx Navigation Computers:

The NAVIxx computers are the easiest to differentiate from the others, yet they are often misidentified in eBay auctions and private sales. There are two styles (the in-dash version and the trunk mounted version), but the in-dash version is rarely mistaken for a MKIV due to the trim panel that is normally attached to it. The trunk unit looks similar to the MKIII or MKIV, but it is bigger than a true DIN, it has the disk eject button on the right side, and the plugs are different. The in-dash version is used in the new 5 Series and new 6 Series. The trunk version is used in the new 7 Series.

8.1. NAVI01 CD Computers used from the start of E65/66 - 03/03 are shown in these photos below. Note the silver metal work that shows below the faceplate.

Part No's for NAVI01 CD computers:

65-90-6-922-642	65-90-6-919-128
65-90-6-925-270	65-90-6-920-570
65-90-6-927-712	65-90-6-921-398
65-90-6-929-592	65-90-6-921-399
65-90-6-935-555	65-90-6-921-919
	65-90-6-913-883



NAVI01 CD based unit Front



NAVI01 CD based unit Rear

8.2. NAVI02/ NAVI03 DVD Computers used from 03/03-03/05 look identical to the NAV01 at the rear but the front panel has the DVD logo printed on it. After 03/05 we suspect that the DVD Computers are updated to NAVI03 types, but we do not have any specific information or part no's on that type yet.

Part no's for NAVI02 DVD based computers.

65-90-6-927-823	65-90-6-948-983
65-90-6-935-555	65-90-6-971-353
65-90-6-939-151	65-90-6-959-114
65-90-6-942-166	65-90-6-966-511
65-90-6-943-642	65-90-6-971-353
65-90-6-947-829	



NAVI02 DVD nav Front



NAVI02 DVD Rear

8.3. Key physical differentiators of the NAVIxx navigation computers:

- Taller than a standard DIN (7 Series versions at least are)
- Small unit with just an exposed CD or DVD slot and face plate trim that matches the console contours. (5 Series and 6 Series version)
- Disk eject button on the right side of the face.
- 2 plugs (one smaller green plug and a slightly larger black plug with 2 optical connections inside the black connector housing).
- There is no outward difference between the NAVI02 and NAVI03, it may only be in the Software the unit was constructed with or some other internal; change in circuitry

9. **CCC or Car Communication Computer:** This is the latest generation navigation system that BMW introduced on the e60/61 and e63/64. This integrated navigation and central computer is used as a controller for various entertainment and communications systems in the newest BMW models. The CCC mounts in the dash and looks totally different than all the other navigation computers we have discussed above. CCC computer characteristics are integration with the radio audio controller and DVD navigation unit in a dash unit. This system requires a larger monitor than used in the non-Nav cars (8.8" vs 6.5") and also a high I-drive controller.

9.1. CCC for E65 navigation computer front view



10. Key questions to ask about the unit before you buy

These are just a few key questions to ask prior to buying a navigation computer to help identify what it is.

- 10.1. From what kind of car was this removed?
- 10.2. Was this unit used with the in-dash color, LDC screen or with the monochrome screen on the radio?
- 10.3. Was this navigation computer used with an add-on display mounted to a stalk?
- 10.4. What are the BMW part number, HW version number, and SW version number printed on the part label?
- 10.5. Was this navigation computer used with a 4:3 display or a 16:9 display?
- 10.6. Does the unit have two labels? The second label, if present, will have the VIN of the car it came from and indicates the computer came in the car from the factory. A number search for the VIN will show the option list from the factory for that car. The List will say SA606 Business Navigation (for the Radio Nav system) or SA 609 Professional Navigation (for the color monitor system). Here are some example pictures for a MKII, MKIV and NAVI01.

Diagram 1 MKI Nav System Layout:

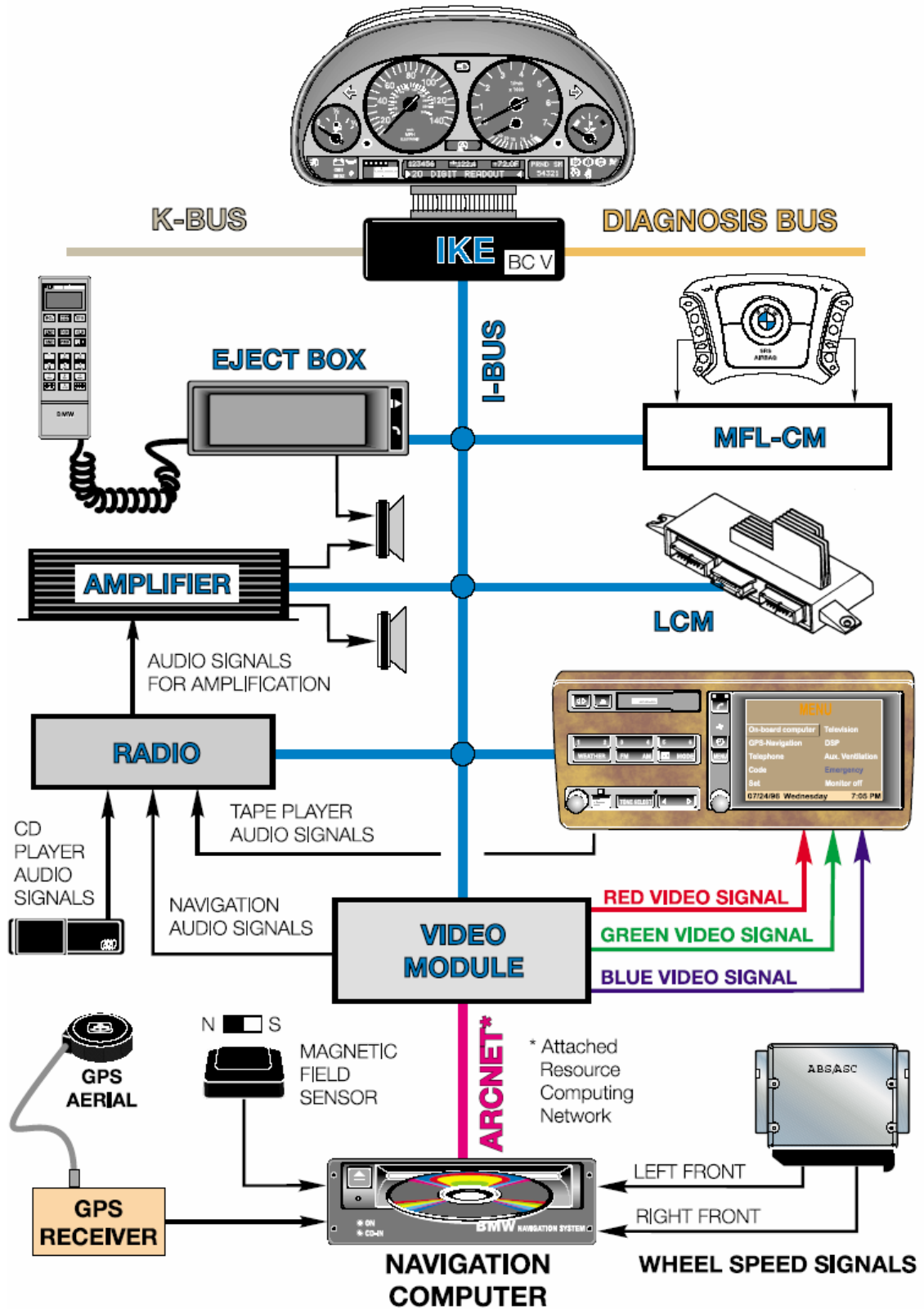


Diagram 2 MKII System Layout:

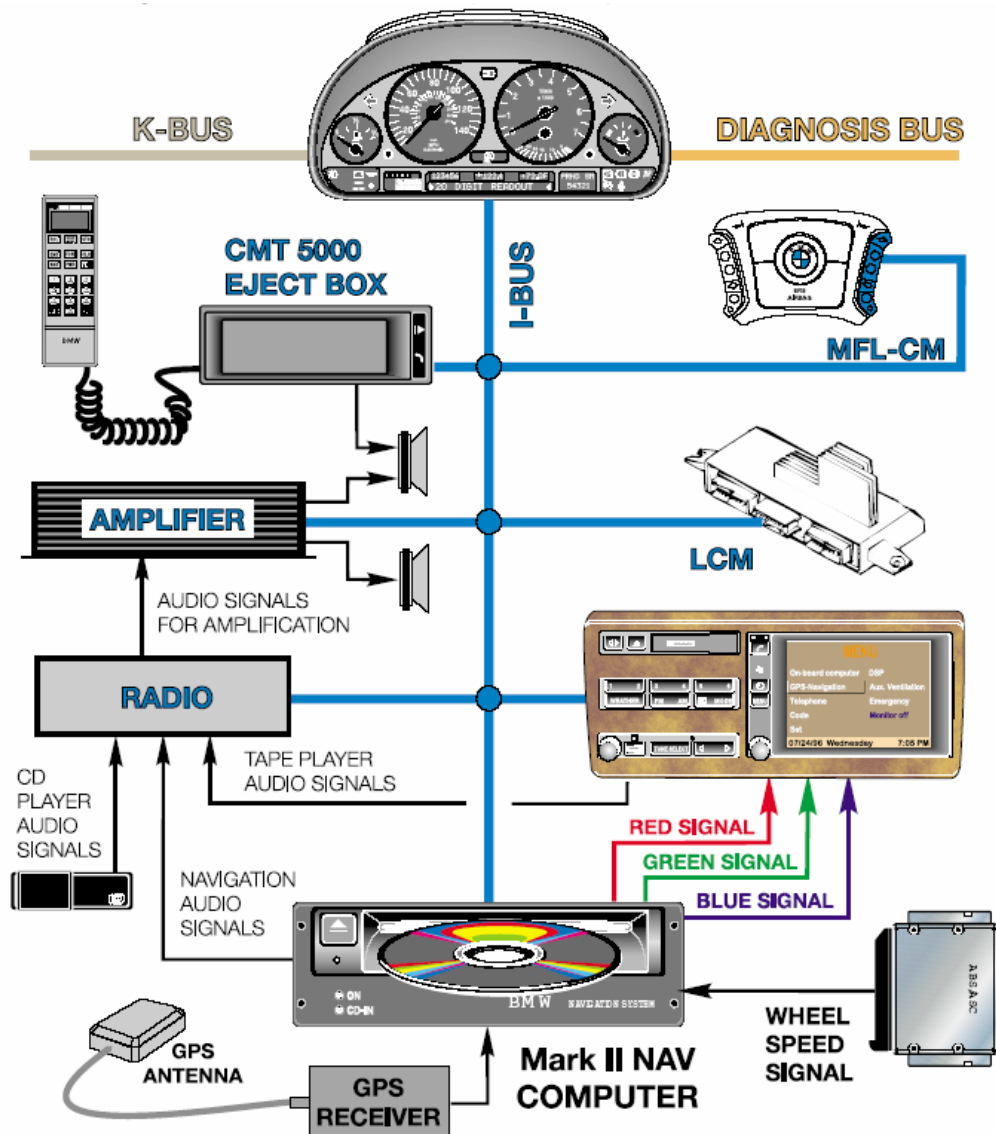


Diagram 3 MKIII System Layout:

