II

(Acts whose publication is not obligatory)

COMMISSION

COMMISSION DECISION

of 1 December 1999

declaring a concentration compatible with the common market and the functioning of the EEA Agreement

(Case COMP/M.1601 — AlliedSignal/Honeywell)

Council Regulation (EEC) No 4064/89

(notified under document number C(1999) 4057)

(Only the English text is authentic)

(Text with EEA relevance)

(2001/417/EC)

THE COMMISSION OF THE EUROPEAN COMMUNITIES,

Having regard to the Treaty establishing the European Community,

Having regard to the European Economic Area (EEA) Agreement, and in particular Article 57(2)(a) thereof,

Having regard to Council Regulation (EEC) No 4064/89 of 21 December 1989 on the control of concentrations between undertakings [1], as last amended by Regulation (EC) No 1310/97 [2], and in particular Article 8(2) thereof,

Having regard to the Agreement between the European Communities and the Government of the United States of America regarding the application of their competition law [3], and in particular Articles II and VI thereof,

Having regard to the Commission Decision of 30 August 1999 to initiate proceedings in this case,

Having regard to the opinion of the Advisory Committee on Concentrations [4],

Whereas:

(1) On 15 July 1999, the Commission received a notification of a proposed concentration pursuant to Article 4 of Regulation (EEC) No 4064/89 (hereinafter referred to as 'the Merger Regulation') by which AlliedSignal (US) Inc. (Allied Signal) and Honeywell (US) Inc. (Honeywell) proposed to enter into a full merger within the meaning of Article 3(1)(a) of the Merger Regulation.

(2) On 30 August 1999 the Commission decided in accordance with Article 6(1)(c) of the Merger Regulation to initiate proceedings in this case.

(3) The proposed operation does not qualify for cooperation with the EFTA Surveillance Authority under the EEA Agreement.

I. THE PARTIES

(4) AlliedSignal (US) is a manufacturing company with operations in the businesses of aerospace, automotive products and engineered materials (polymers, specialised chemicals and electronic materials).

[1] OJ L 395, 30.12.1989, p. 1; corrected version, OJ L 257, 21.9.1990, p. 13.
[2] OJ L 180, 9.7.1997, p. 1.
[3] OJ L 95, 27.4.1995, p. 47.
[4] OJ C 164, 7.6.2001.

(5) Honeywell (US) is an international controls company that develops and supplies advanced technology products, systems and services to homes and buildings, industry, aviation and space.

II. **THE OPERATION**

(6) Pursuant to an agreement entered into on 4 June 1999, Honeywell and AlliedSignal will merge into AlliedSignal, but the latter's name will be changed into Honeywell International Inc. Each share of Honeywell common stock will be exchanged for 1,875 shares of AlliedSignal common stock. The Board of Directors of the combined company will comprise nine members from the current AlliedSignal board and six members from the current Honeywell board.

III. **CONCENTRATION**

(7) The operation whereby AlliedSignal and Honeywell merge into AlliedSignal is a full merger within the meaning of Article 3(1)(a) of the Merger Regulation.

IV. **COMMUNITY DIMENSION**

(8) The undertakings concerned have a combined aggregate worldwide turnover of more than EUR 5 000 million ([5]). (AlliedSignal EUR 14 100 million, Honeywell EUR 7 500 million). AlliedSignal and Honeywell each have a Community-wide turnover in excess of EUR 250 million (AlliedSignal EUR […] (*), million, Honeywell EUR […], million), but they do not achieve more than two thirds of their aggregate Community-wide turnover within one and the same Member State. The notified operation therefore has a Community dimension.

V. **COMPATIBILITY WITH THE COMMON MARKET**

(9) This operation creates a company that will be active in the following sectors: aerospace, automotive products, engineered materials and home and industrial controls. The parties' activities overlap in the area of avionics. Even though the parties have important sales in the military and space avionics markets, these latter sales in the EEA are of a limited nature. It appears that effective competition within the EEA would not be significantly impeded as a result of the operation on any of the potential markets for avionics for military or space applications. Therefore, the effects of the operation are assessed only in relation to avionics having commercial applications.

A. PRODUCT MARKET

(10) Avionics products consist of a range of equipment, the controls of which are installed in the cockpit, and which are used for the control of the aircraft, for navigation and communication, and also for the assessment of flying conditions. AlliedSignal also manufactures other aerospace equipment (that is to say, non-avionics) such as auxiliary power units (APU), environmental control systems (ECS) aircraft lighting, landing systems (wheels and brakes) and engines for small business aircraft. (A full glossary of the technical terms and abbreviations used is given at Annex II).

1. **General market characteristics**

1.1. *Different segments*

(11) The avionics sector is generally divided into six demand segments that are defined by types of aircraft: air transport, regional transport, business aviation, general aviation, helicopters and military/space applications. The reason for this division lies in the non-homogeneous structure of supply and demand across these segments (integrated versus federated cockpit), in dissimilarities of technical interchangeability and prices of the products, and in the nature of the customers (airlines, original equipment manufacturers (OEMs) or individual owners) as well as in differentiation for the applicable regulatory safety requirements.

(12) The Commission's market investigation has confirmed that there are different segments defined by the types of aircraft, that the avionics products/(or sub-)systems for each segment are different according to their price, their size and their capabilities, and that the players in each segment are different. However, there is no clear segmentation between the regional transport and the business aviation segments with regard to the avionics products/(sub-)systems that are offered, since the latter are the same in terms of price, size and capabilities.

([5]) Turnover calculated in accordance with Article 5(1) of the Merger Regulation and the Commission notice on the calculation of turnover (OJ C 66, 2.3.1998, p. 25). Where figures include turnover for the period before 1 January 1999, they are calculated on the basis of average ecu exchange rates and converted into euro on a one-for-one basis.

(*) Parts of this text have been edited to ensure that confidential information is not disclosed; those parts are enclosed in square brackets and marked with an asterisk.

Therefore, no further distinction will be drawn between the regional transport and business aviation segments (regional/business segment).

(13) Air transport includes large commercial planes (greater than 100 passengers) which cost between USD 35 million and USD 140 million, regional transport covers medium commercial planes that are worth between USD 5 million and USD 25 million, whereas business aviation includes small jets costing in general between USD 3 million and USD 35 million. General aviation is composed of light planes ranging in cost between USD 150 000 and USD 500 000. The cost of avionics sold for these aircraft follows similar cost patterns. Helicopters consist of civil airborne vehicles with rotary wings. Military and space applications include every airborne military application as well as satellites, international space stations and space shuttles.

(14) In the air transport segment, the customers of the avionics suppliers are two OEMs, namely Airbus Industry (Airbus) and Boeing, and the airlines. The products/(sub-)systems supplied in this segment are in general stand-alone products/(sub-)systems that are federated into an avionics cockpit suite by the OEMs (as forward-fit products) or are installed on existing aeroplanes by service 'shops' or the OEMs as retro-fit items (that is, as replacement parts or entirely novel products). The same avionics suppliers supply the same products/(sub-)systems used for forward-fit in new aeroplanes and for retro-fit of existing aeroplanes.

(15) In the regional and business segments, a somewhat clearer distinction can be drawn between forward-fit and retro-fit (even though this would not justify their designation as 'separate product markets'), because of the fact that more products are sold as part of an integrated (forward-fitted) cockpit. With respect to forward-fit, it is noted that the avionics suppliers provide integrated avionics suites to the OEMs (such as Aerospatiale Matra ATR, Bombardier, Embraer, Dassault, Raytheon, Gulfstream, British Aerospace, Fairchild Dornier). The latter do not integrate the avionics products/(sub-)systems themselves, but rely on the 'system integration' capabilities of the avionics suppliers (such as Honeywell, Rockwell Collins and Sextant Avionique (Sextant)). If such a system integrator does not dispose of an avionics product, he will purchase the missing product from a supplier of stand-alone avionics products/(sub-)systems, such as AlliedSignal. (Some surveillance products, such as ACAS processors, which are currently not part of the core avionics suite, are purchased by the aircraft owners, mainly as retro-fit.) As regards retro-fit, the avionics suppliers (such as AlliedSignal, Universal Avionics, and BF Goodrich) provide stand-alone avionics products/(sub-)systems to their customers, the aircraft owners.

(16) In the general aviation segment, the cockpit is federated and the customers are OEMs and distributors. The avionics products/(sub-)systems used for forward-fit and for retro-fit are supplied by the same avionics suppliers.

1.2. *Buyer furnished equipment (BFE)/supplier furnished equipment (SFE)*

(17) A further distinction often referred to in the industry is that between 'buyer furnished equipment' (BFE) and 'supplier furnished equipment' (SFE), referring respectively to the buyer and the supplier of the airframe.

(18) In the case of BFE, an airframe manufacturer will, in general, obtain certification for two or three substitutable avionics products/(sub-)systems between which the airline can choose. The commercial terms are then set between the airline and the avionics supplier. The only role of the airframe manufacturer with regard to BFE relates to the certification of that product/(sub-)system.

(19) Furthermore, SFE can either be SFE-standard or SFE-option. In the latter case, an airframe manufacturer will obtain certification for more than one (and in general two) substitutable avionics products/(sub-)systems for that aircraft type and will leave it to the buyer of that aircraft, the airline, to choose one or other product/(sub-)system. The difference with BFE is that SFE-option (and SFE-standard) is purchased by the OEM and not by the airlines. SFE-option is found on Airbus aircraft. On Boeing aircraft, SFE-option does not exist and competition between the SFE-avionics suppliers only

takes place at the design phase of an aircraft. If an avionics product/(sub-)system is SFE-standard, meaning that the airframe manufacturer has only certified one product/(sub-)system, then the airline has no opportunity to choose a substitutable avionics product/(sub-)system from another supplier.

(20) The market investigation has pointed out that there is a trend towards SFE replacing BFE.

(21) The market investigation has also shown that for retro-fit SFE, the airlines will negotiate directly with the avionics supplier, such as Honeywell.

(22) Given the fact that the qualification of a product as BFE or SFE may differ depending on the client and may vary over time, distinct markets for BFE and SFE are not warranted.

1.3. *Certification*

(23) Each avionics product/(sub-)system to be installed on an aircraft has to be certified separately for each aircraft type on which it will be installed. Certificates for avionics equipment are granted in the USA by the FAA (Federal Aviation Administration) and in Europe via the JAA (Joint Aviation Authorities) by the national civil aviation authorities. The certification procedure is normally granted on an aircraft-level basis, whereby all components and parts of the aircraft are certified together, known as 'type certification' (TC). For modifications on existing aircraft, a supplemental type certification (STC) will be granted. Both TC and STC are forms of design approval. OEMs apply for TC and occasionally suppliers apply for STC. Production certifications to the supplier are granted only after the issuance of the TC/STC.

(24) The certification procedure is lengthy (from one to three years for the avionics and other systems in a new aircraft and from one to six months in case of a supplemental certification where only a few components are being changed) and costly (between 5 % and 20 % of the development costs of the avionics for a new platform, that is, up to USD 10 million and between USD 0,1 and USD 1 million in case of a supplemental certification involving a change of a few components).

1.4. *Standardisation*

(25) In the air transport segment, there is a considerable degree of standardisation in avionics products, at least for BFE sold to airlines. The airline operators depend on standardised avionics to create interchangeability of avionics in order to promote competition and freedom of choice.

(26) The standardisation is carried out by the Airlines Electronic Engineering Committee (AEEC). This organisation adopts standards that are formulated by the organisation ARINC (aeronautical radio incorporated) on behalf of the AEEC. The AEEC comprises representatives from, among others, the major US airlines, the European Airlines Electronics Committee (EAEC), and the Oriental Airlines Association. The major avionics suppliers and OEMs usually also take part in discussions on standardisation.

(27) ARINC standards define the form, fit and function of the avionics products to be inserted in the aeroplane. They cover a range of component characteristics, including interfaces (analogue and digital bus architecture), minimal functionality, interoperability, size, weight, voltage, cooling and even colour.

(28) ARINC standards apply foremost to BFE in the air transport segment. ARINC standardisation is carried out on a voluntary basis and is not a legal requirement; although it may help to obtain the necessary (FAA) certification, adherence to an ARINC standard is not required for certification purposes. ARINC standards currently exist for most of the avionics (BFE) equipment in air transport, with the notable exception for EGPWS/TAWS (enhanced ground proximity warning system/terrain avoidance warning system) (see below).

(29) For products sold in other aviation segments, standardisation generally does not apply. The organisation GAMMA (General Aviation Manufacturers Association) has a modest standardisation role in the regional/business and general aviation segments. However, its standards cover a mere four-digital bus specification.

2. **Affected product markets**

(30) The market investigation has shown that products that perform the functions necessary to operate an aircraft are constantly evolving as a result of product innovation and integration. Especially in the air transport segment,

there is a trend towards product integration, whereby functions which were, for instance, carried out by two stand-alone avionics products are now being integrated into a single subsystem. The ADIRS/ADIRU (air data inertial reference system/air data inertial reference unit) is an example of such an integrated product: it combines the functions of the IRS (inertial reference system) and the air data computer. In the regional/business segment, the integration process has already led to fully integrated avionics suites, where all avionics functions are integrated into a system. In the general aviation segment the cockpit is federated, which means that different stand-alone avionics products/(sub-)systems are wired together.

(31) The parties have identified five product markets, which, due to the overlapping products of AlliedSignal and Honeywell, would be affected by the merger. In the air transport segment, the affected markets are the market for ACAS (airborne collision avoidance system) processors and mode S transponders and the market for CMU (communication management units) and ACARS (aircraft communication addressing and reporting systems). In the regional/business segment, the affected markets are also the market for ACAS processors and mode S transponders and the weather radar market. In the segment for civil helicopters, the market for weather radar is affected by this operation.

2.1. *ACAS processor and mode S transponder*

Air transport

(32) An ACAS processor is considered to be the brain of the collision avoidance system. It provides pilots with information on surrounding traffic and provides alerts when nearby traffic is (or has the potential to become) a hazard. An ACAS processor is mandatory in Europe and in the USA for certain types of aircraft ([6]), mainly, all aircraft in the air transport and regional/business segments. An ACAS processor is generally BFE.

(33) The mode S transponder sends and receives signals to and from other aircraft, including unique identification and altitude and speed information. Mode S transponders function together with ACAS processors for the identification of other planes and their bearing, as well as determining the appropriate response to a threat of collision. However, a mode S transponder also has functions other than working with the ACAS processor, such as communication with the air traffic control (ATC) system and for usage in the new FMS (flight management system). The anti-collision avoidance system further consists of antennae, control heads and a display.

(34) The parties further submit that ACAS processors and mode S transponders are generally bought together from the same avionics supplier. This has not been confirmed by the market investigation. It has become apparent that ACAS processors and mode S transponders have different functions, although operating together. Moreover, the only suppliers of mode S transponders in this segment are the suppliers of ACAS processors.

(35) On the basis of the above, it could be concluded that ACAS processors and mode S transponders belong to different product markets. However, given that the assessment of the case would not be different if ACAS processors and mode S transponders were considered as belonging to one market, the definition of the relevant product market can be left open.

Regional/business aviation

(36) In this segment, ACAS processors and mode S transponders do not only have different functions; they are generally not sold together. The mode S transponder is in general integrated in the avionics suite, whereas the ACAS processor is supplied on a stand-alone basis.

(37) On the basis of the above, it could be concluded that ACAS processors and mode S transponders belong to different product markets. However, given that the assessment of the case would not be different if ACAS processors and mode S transponders were considered as belonging to one market, the definition of the relevant product market can be left open.

([6]) Europe: an ACAS is mandatory by 1 January 2000 for all aircraft with more than 30 seats or weighing more than 15 000 kg cargo and by 1 January 2005 for all aircraft with more than 19 seats or carrying more than 5 700 kg.
USA: an ACAS (called TCAS II), which provides audible resolution guidance, has been mandatory for all passenger aircraft in excess of 30 seats since 1993. A TCAS I (i.e. an ACAS without audible resolution guidance) has been mandatory since 1995 for passenger aircraft with more than 10 seats.

2.2. *CMU and ACARS*

(38) CMU provide the two-way communication link between an aircraft and the ground control centres. The system transmits and receives text and data messages. According to the information provided by the parties, ACARS provide the same functionality as CMU, but a CMU has additional functions that allow for routing and prioritisation of incoming information. The parties have submitted that prices of both products, at least of those provided by AlliedSignal, are identical.

(39) The results of the market investigation have indicated that CMU are largely viewed as an evolution of ACARS, since the former have a higher level of functionality. According to others, the current version of ACARS now implements the CMU protocols and the costs of both systems would be similar.

(40) One of the major airframe manufacturers (Airbus) is installing the ATSU (air traffic services unit) system supplied by Aerospatiale Matra (which includes CMU/ACARS functions) on new aircraft. The parties claim that this product competes directly with their own CMU/ACARS products, which has been confirmed by the investigation.

(41) On the basis of the above, it can therefore be concluded that CMU and ACARS belong to the same product market.

2.3. *Weather radar*

Regional/business aviation

(42) Weather radar provides pilots with detailed visual information on the weather surrounding and ahead of the aircraft, permitting the pilot to avoid dangerous weather conditions. It displays rainfall, turbulence and, in certain models, windshear. In the regional/business segment most weather radar is supplied as part of an integrated cockpit.

(43) The market investigation has shown that weather radar in the different aviation segments clearly constitutes a different product in terms of size, functions and price. Weather radar in air transport is supplied as BFE, generally includes predictive windshear and has a much larger, heavier and more expensive antenna than in the other aviation segments. Weather radar in the general aviation segment offers fewer features and lower performance.

(44) On the basis of the above, it can therefore be concluded that weather radar in the regional/business segment constitutes a different product market from weather radar in the other aviation segments.

Civil helicopters

(45) Weather radar for civil helicopters includes specialised search and surveillance features (used in search and rescue operations and to identify destinations, particularly off-shore oil platforms). These products have historically been installed principally in helicopters. The weather detection capability plays only a secondary role. Weather radar used in other aviation segments does not have these search and rescue characteristics.

(46) On the basis of the above, it can therefore be concluded that weather radar for civil helicopters constitutes a distinct product market.

3. **Other avionics and non-avionics products for commercial aviation**

(47) Within the avionics sector, a number of other product markets can be identified which, according to the parties and the market investigation, would constitute separate product markets, but on which the parties have no directly overlapping activities (see also the table preceding recital 62). Some of the products listed below are in fact (sub-)systems that could be further distinguished into single products. However, the decision whether they constitute different product markets or not can be left open (with the exception of TAWS), since the assessment would not be different if such a further distinction were made.

(48) Based on their functionality, these avionics products/(sub-)systems can be grouped into four categories: equipment for surveillance, communication, navigation and a last category containing all other remaining avionics.

(49) These avionics products/(sub-)systems are supplied in the air transport segment, in the regional/business segment and some also in the general aviation segment. However, as mentioned in recital 12, the products and

systems belonging to different aviation segments constitute different product markets.

3.1. *Surveillance products*

(50) TAWS (terrain avoidance warning system) is a system that provides the flight crew with a map-like display of nearby terrain and sounds an audible alert about a minute's flight time or more away from the terrain (such as the ground, a mountain, etc.). AlliedSignal is the only supplier of a certified TAWS, with its EGPWS (enhanced ground proximity warning system). TAWS is SFE. However, as there will be a mandate for TAWS, many airlines are buying TAWS as retro-fit. The predecessor of AlliedSignal's EGPWS is the GPWS (ground proximity warning system).

(51) On the basis of the above, it can be concluded that there is a market for TAWS.

(52) Other surveillance products are ACAS processors and weather radar, respectively at recitals 32 to 37 and 42 to 46.

3.2. *Communication equipment*

(53) Communication systems are a combination of avionics products that allow the flight crew to communicate with ground and air resources and to identify the aircraft to air traffic control systems and other aircraft. They include many products such as radios, satellite communication systems (SatCom), CMU/ACARS, multimode radio/receiver (MMR, which provides precision approach guidance to airports and non-precision approach guidance using its built-in GPS, meaning global positioning system) and others.

3.3. *Navigation equipment*

(54) This equipment navigates the aircraft to the appropriate destination and includes many products such as global positioning systems (GPS), the air data computer, which computes aircraft airspeed, altitude and vertical speed, IRS (inertial reference systems) which are the primary airframe motion sensors and navigation sensors used by a multitude of avionics systems, ADIRS/ADIRU (air data inertial reference system/air data inertial reference unit) which combine the air data computer with the IRS, fly-by-wire, flight controls (automatic pilots) and flight management system (FMS). The latter consists of a central processor, display and keyboard and is connected to the aircraft's sensors. Based on data received from those sensors and the pilot, the FMS calculates the most fuel-efficient route, controls speed and thrust for optimum fuel economy, automatically complies with speed and altitude restrictions, advises the pilot of proper landing speed and makes other calculations for a safe and efficient flight.

3.4. *Other avionics products*

(55) These are, *inter alia*, display, head-up displays, cockpit voice recorders (CVR) and flight data recorders (FDR). CVR and FDR are the 'black boxes' which safety investigators look for to determine the cause of an aircraft accident. Furthermore, there are still some other products, which the parties do not deal with (mainly controls).

3.5. *Other non-avionics aerospace products*

(56) These include in-flight entertainment products, APUs and wheels and brakes.

4. **New integrated products in surveillance avionics**

IHAS (integrated hazard awareness system)

(57) The market investigation has pointed out that the trend towards further product integration in avionics is general, but that the area of hazard surveillance is particularly suited to further product integration. The product integration could be limited to ensuring a better interoperability of the stand-alone hazard surveillance products. (Examples of such improved interoperability already exist since it is currently possible to show

weather radar and EGPWS information on a single display; also, with the assistance of Boeing, AlliedSignal has developed a system that prioritises alerts in the cockpit). The integration of hazard surveillance products is actually expected to go much further, as far as the development of a new integrated black box which integrates the functionalities of the ACAS processor, weather radar and TAWS. AlliedSignal has announced its commitment to developing a complete integrated hazard awareness system (IHAS) which they would like to have as standard equipment on the new Airbus 3XX. It has set up a business unit especially for IHAS development.

(58) Market investigation has shown that there would be a clear demand for such a product, as it would lead to increased flight safety. Therefore, it can be concluded that a future market for an integrated hazard awareness system exists.

B. GEOGRAPHIC MARKET DEFINITION

(59) The relevant geographic market for avionics products is, according to the parties, worldwide. This has been recognised by the Commission in prior decisions relating to the equipment for civil aircraft ([7]) and has been confirmed by the investigation.

C. COMPETITIVE ASSESSMENT

1. **General**

(60) This operation will lead to the combination of the first- and third-largest worldwide suppliers of commercial avionics, namely Honeywell and AlliedSignal. The parties' main competitors are Rockwell Collins and Sextant, but there are also smaller players such as Litton and Smiths Industries, who do not produce a range of avionics products. The parties' turnover in commercial avionics would account for 40 % to 50 % of the overall turnover in commercial avionics, whereas Rockwell Collins and Sextant would have a share of 20 % to 30 % and 10 % to 20 % respectively.

(61) The new entity will be present in all aviation segments: air transport, regional/business aviation and general aviation. The air transport segment represents [between 50 % and 60 %]* of all sales of commercial avionics, whereas the regional/business segment and the general aviation segment represent [between 30 % and 40 %]* and [less than 10 %]* respectively.

1.1. *Air transport*

Table 1: *Presence in the air transport segment*

	Product	AlliedSignal	Honeywell	Rockwell Collins	Sextant	Others
Surveillance	Weather radar (BFE)	X	—	X	—	—
	ACAS processor/mode S transponder (BFE)	X	X	X	—	—
	TAWS (SFE)	X	—	—	—	—
Communication	Com/Nav (BFE)	X	—	X	X	—
	SatCom (BFE)	— ([1])	X	X	—	—
	MMR (BFE)	X	—	X	X	—
	CMU/ACARS (BFE)	X	—	X	—	Teledyne/ Aerospatiale Matra

([7]) For example Case IV/M. 697 — Lockheed Martin/Loral Corporation, Commission Decision of 27 March 1996 (OJ C 314, 24.10.1996, p. 9); Case IV/M.290 — Sextant/BGT-VDO, Commission Decision of 21 December 1992 OJ C 9, 14.1.1993, p. 3).

	Product	AlliedSignal	Honeywell	Rockwell Collins	Sextant	Others
Navigation	GPS (stand-alone) (BFE)	—	X	—	—	Litton
	IRS and ADIRS/ADIRU (SFE-option on Airbus)	—	X	—	X ([2])	Litton
	Air data computer (SFE)	—	X	—	—	Smiths
	FMS (SFE-option on Airbus)	—	X	—	X ([3])	Smiths
	Flight controls (SFE)	—	X	X	X	GEC
Other avionics	Head-up displays (SFE)	—	—	X	X	—
	Displays (SFE)	—	X	X	X	—
	Recorders (BFE)	X	—	—	—	L3Communications, Universal, SFIM
	Controls, monitoring, measurement and warning systems	—	—	X	X	BECO, Smiths, Eldec
Non-avionics	In-flight entertainment	—	—	X	X	Sony, Matsushita
	APUs	X	—	—	—	UTC
	Wheels and brakes	X	—	—	—	ABS, BF Goodrich, Dunlop, Snecma/ Messier-Bugatti

([1]) Although AlliedSignal has been a distributor of an antenna (made by Dassault), this agreement has now come to an end and AlliedSignal is no longer active with regard to SatCom.
([2]) Sextant is developing an ADIRU with Litton. This is a SFE-option on Airbus aircraft. Sextant/Litton have obtained half of the orders on new Airbus aircraft.
([3]) Sextant is developing an FMS with Smiths. This is a SFE-option on Airbus aircraft. Sextant/Smiths have obtained two thirds of the orders on new Airbus aircraft.

(62) The merged entity will be able to provide a broader range of avionics products to the airlines (BFE) and to the two OEMs, Boeing and Airbus (SFE-avionics). As can already be seen from this Table (and as will be explained further), in comparison with its competitors, the parties will be particularly strong in safety avionics, namely products used for surveillance (ACAS processor, TAWS and weather radar). AlliedSignal and Honeywell are both strong suppliers of ACAS processors and mode S transponders. AlliedSignal is one of the two suppliers of weather radar and is the only company with TAWS. On Airbus aircraft AlliedSignal's former product range offered to the airlines is extended with SatCom (BFE) and with FMS and ADIRS (both SFE-option). Honeywell's SFE product range is enlarged with TAWS (SFE). However, even after the merger there will be no company that can supply aeroplanes to the airlines and to the OEMs all the avionics necessary to operate an air transport service.

1.2. *Regional and business aviation*

(63) As has already been mentioned, in this segment a further segmentation between forward-fit and retro-fit can be made. The system integrators supplying the forward-fit sub-segment, do not provide stand-alone products, whereas the suppliers of stand-alone products do not supply integrated avionics suites. The parties

therefore submit that there is no competitive overlap between them. As regards forward-fit, there are only three system integrators: Honeywell and Rockwell Collins, each having a similar share of sales, with Sextant as an emerging player. AlliedSignal is an important provider of stand-alone products to airlines for retro-fit, but also to system integrators.

1.3. *General aviation*

(64) Only AlliedSignal is present in this aviation segment and is an important supplier for many products.

2. **Effects of the operation on the affected markets**

2.1. *General*

(65) The market data referred to below are generally based on the market investigation and on the parties' best estimates, acquired through their own market research. The parties have had to rely on such estimates owing to the absence of publicly available market research data. The parties have principally based their evaluation of the market on deliveries made of the product referred to, rather than on orders placed. The notifying parties submit that data based on orders are not reliable in determining actual future sales, since customers frequently reduce or eliminate (or sometimes expand) orders after they have been placed. For the products of the affected product markets there is only a short time lag between the purchase order and the delivery, and therefore the parties are of the opinion that data based on purchase orders would not probably differ significantly from deliveries. In order to properly evaluate the market strength of the competitors in the market, the Commission considers it appropriate to look also at orders placed, given that these would better indicate the current competitive potential of the producers. However, the market investigation did not allow an adequate picture to be drawn on the basis of orders, one of the reasons being the apparent discrepancies in what market operators consider 'orders' (only fixed orders or those inclusive of options). For the above reasons (and especially because there is only a short time lag between purchase orders and deliveries) the data used in the assessment are based on deliveries. Nevertheless, the assessment (recitals 66 et seq.) is also based on orders where appropriate.

2.2. *ACAS processors and mode S transponders*

Air transport

(66) The total worldwide market for ACAS processors and mode S transponders has expanded, following a European mandate for these products, from USD [between 50 and 60]* million in 1996 to USD [between 130 and 140]* million in 1998. On this market the notifying parties would have a combined market share of [between 65 % and 75 %]* (AlliedSignal [between 30 % and 40 %]*; Honeywell [between 30 % and 40 %]*). The only competitor is Rockwell Collins, with an estimated market share of [between 30 % and 40 %]*. Since 1996 AlliedSignal's market share has remained stable, whereas the market share of Honeywell has risen from [between 15 % and 25 %]* to [between 30 % and 40 %]*, leading to a decline of Rockwell Collins' share from [between 40 % and 50 %]* in 1996 to [between 25 % and 35 %]* in 1998.

(67) The parties submit that Sextant has announced that it has, in conjunction with Dassault and Thomson-CSF, Sextant's parent company, the technology to produce ACAS. According to the parties, BF Goodrich, which already has a TCAS I product, and GEC Marconi are also likely potential entrants. However, third parties have indicated that it is not clear whether these projects mentioned by the parties will materialise, especially if the present merger were to be completed.

(68) The parties argue that the large combined market share will not give them the chance to behave to any significant degree independently from competitors and customers, for the following reasons: (a) the shares of demand for ACAS fluctuate substantially between the world's regions and are not an indicator of market power; (b) the ACAS market volume is decreasing; (c) customers exercise great buyer-power; (d) the barriers to entry are low and (e) ACAS is susceptible to technology leap-frogging.

(69) With regard to the parties' first argument, it has to be noted that the geographic scope of the market to be taken into account is worldwide and not regional. Furthermore, following the transaction the market structure in each region will be very similar: the parties will have a market share of [more than two thirds]*.

(70) The parties submit as a second argument that the ACAS market volume is decreasing, since almost all passenger aircraft in the USA are equipped with ACAS and that approximately 90 % of the potential retro-fitting orders for air transport in Europe have already been placed. Since there is no aftermarket for ACAS, as the system has an extremely long lifecycle, the future market for

ACAS for air transport will accordingly be limited to new aircraft estimated to be 600 to 800 air transport aircraft per year worldwide. The parties submit that with decreasing demand, competition between the remaining suppliers is expected to become even more ferocious.

(71) With regard to this argument it has to be noted that, given the decreasing volume, the likelihood that new suppliers will enter this market diminishes, since they will not be able to spread their development costs over a sufficient product volume.

(72) With regard to buying power, the parties have submitted that there is a high degree of purchasing power in the market. The parties submit that should they seek to exercise any market power, customers are strong enough to retaliate. In fact, the parties submit that their large product range makes them more vulnerable to such retaliation than smaller suppliers, since the effects of retaliation would have much greater consequences, by affecting the sale of all products in their range.

(73) The Commission has considered whether the purchasing power is such that no competition concerns would arise, in spite of the high market share resulting from the merger. Demand in the air transport avionics market is indeed concentrated, as far as the OEMs are concerned. They undoubtedly have strong buying power. However, at the level of airlines this is much less the case, the group of customers being much larger and including many smaller (national) airlines. On the other side, the structure of supply in avionics is highly concentrated. That level of concentration will further increase following the merger. Consequently, the Commission has come to the conclusion that the purchasing power of the customers with regard to ACAS, which is bought by the airlines, would not outweigh the position of the new entity.

(74) As regards barriers to entry, these are in general considered to be very high in the field of avionics, owing to the complex technical nature of the products. The market investigation has pointed out that market entry is not to be expected. With particular regard to ACAS processors and mode S transponders, the parties themselves submit that it takes some two years and around USD 10 million to develop an ACAS processor. Furthermore, the market investigation has shown that ACAS processors and mode S transponders are sophisticated high-technology products that have to match the environment in which they operate.

(75) Moreover, in order to enter the market and acquire a position on the market, the new entrant could offer the products at lower prices. However, this requires the new entrant to be able to sell at least large quantities of the products in order to amortise R & D costs. Given the presence of the combined entity, the new entrant may, however, be precluded from benefiting from the required economies of scale.

(76) With regard to the parties' argument that the ACAS processor will be susceptible to technological leap-frogging, it has to be noted that the market investigation has shown that it will take some 10 years before ADS-B (automatic dependent surveillance-broadcast), a satellite-based situational awareness tool, could be extended to include collision-avoidance functions and be certified by the civil aviation authorities. Therefore, this last argument cannot be accepted.

(77) Furthermore, it has to be noted that the parties' strong position on the market for ACAS processors also has an effect on the future market for IHAS, since the ACAS processor is one of the key elements of this system (see recitals 93 et seq.).

(78) On the basis of the above, there are serious doubts about the compatibility of the operation with the common market and the EEA Agreement, on the grounds that the operation would lead to the creation of a dominant position with regard to ACAS processors and mode S transponders in the air transport segment. However, the remedies described (see recitals 125 et seq.) address this specific issue.

Regional/business aviation

(79) The total worldwide market for ACAS processors and mode S transponders in this segment has expanded, following the European mandate, from USD [45 to 55]* million in 1996 to USD [95 to 105]* million in 1998. On this market the notifying parties have a combined market share of [70 % to 80 %]* (AlliedSignal [25 % to 35 %]* and Honeywell [40 % to 50 %]*). The competitors are Rockwell Collins with a market share of [20 % to 30 %]* and BF Goodrich with a [0 % to 5 %]* market share. The latter however, has no ACAS conforming to the European mandate, but only has a

TCAS I product (see recital 67). Since 1996 AlliedSignal's and Honeywell's market share has been increasing from [10 % to 20 %]* and [10 % to 20 %]* respectively, to [25 % to 35 %]* and [40 % to 50 %]*, leading to a decline in Rockwell Collins' share from [60 % to 70 %]* in 1996 to [20 % to 30 %]* in 1998.

(80) The parties submit that after the execution of the European mandate the market volume for ACAS in regional and business aviation will decrease and will consist only of 150 to 250 new aircraft annually worldwide. The parties submit that with decreasing demand, competition between the remaining suppliers is expected to become even more ferocious.

(81) With regard to this argument, it has to be noted that, given the decreasing volume, the likelihood that new suppliers will enter this market diminishes, since they will not be able to spread their development costs over a sufficient product volume.

(82) Further reference must also be made to the section on ACAS processors and mode S transponders in air transport, since the same reasons as regards barriers to entry and buying power apply to this aviation segment.

(83) On the basis of the above, there are serious doubts about the compatibility of the operation with the common market and the EEA Agreement, on the grounds that the operation would lead to the creation of a dominant position with regard to ACAS and mode S transponders in the regional/business segment. However, the remedies described below (at recital 125 et seq.) address this specific issue.

2.3. *CMU/ACARS*

(84) CMU is generally BFE. In 1998 the market was worth USD [15 to 25]* million. According to the information provided by the parties, AlliedSignal had a share of sales of [45 % to 55 %]* worldwide in 1998. Honeywell has not yet started to supply its stand-alone CMU, but has already been able to secure orders for it. Rockwell Collins has a [30 % to 40 %]* and Teledyne a [5 % to 15 %]* estimated market share. This information has been largely confirmed by the market investigation, although the share of the new entity is even smaller.

(85) Aerospatiale Matra is offering the ATSU on Airbus aircraft. The parties expect that by the beginning of 2000 over 95 % of the Airbus aircraft with datalink will have the ATSU system and will therefore no longer need a CMU or ACARS.

(86) The proposed operation will have the effect that AlliedSignal's position will be reinforced, since Honeywell has already been able to secure orders for its stand-alone CMU. However, given the fact that Rockwell Collins and Teledyne are now also offering a stand-alone CMU and that Aerospatiale Matra has launched the ATSU, the operation will not lead to the creation or strengthening of a dominant position with regard to CMU and ACARS.

2.4. *Weather radar*

Regional/business aviation

(87) The total worldwide market for weather radar for regional/business aviation has grown from USD [25 to 35]* million in 1996 to USD [35 to 45]* million in 1998. On this market, the notifying parties have a combined market share of [35 % to 45 %]* (AlliedSignal [0 % to 10 %]*, Honeywell [30 % to 40 %]*). The only competitor is Rockwell Collins, with an estimated market share of [55 % to 65 %]* in 1998.

(88) Given that the increment in market share is very small, that AlliedSignal is mainly a supplier of weather radar for retro-fit whereas Honeywell is a supplier of weather radar for forward-fit, and that the parties' only competitor has a market share of more than 50 %, it can be concluded that no dominant position will be created or strengthened on the market for weather radar for regional/business aviation.

Civil helicopters

(89) The total worldwide market for weather radar for civil helicopters amounts to USD [5 to 15]* million in 1998. On this market, the notifying parties have a combined market share of 100 % (AlliedSignal [75 % to 85 %]*; Honeywell [15 % to 25 %]*), whereby AlliedSignal is supplying a stand-alone weather radar for retro-fit and federated cockpits and Honeywell focuses on forward-fit integrated cockpits.

(90) The parties submit that Fiar is competing for new programs and that Rockwell Collins has a weather radar product designed for military aviation that could be certified for use in civil helicopters.

(91) The parties further submit that as the beaconing capabilities of weather radar will no longer be needed on account of the elimination of beacon technology and its replacement by GPS, weather radar in civil helicopters can be replaced by weather radar for general aviation or by higher-end avionics suites.

(92) However, given the fact that there are no other actual suppliers of weather radar for civil helicopters, there are serious doubts about the compatibility of the operation with the common market and the EEA Agreement, on the grounds that the operation would lead to a strengthening of a dominant position on the market for weather radar for civil helicopters. However, the remedies described below (at recital 125 et seq.) address this specific issue.

3. **Effects of the operation on other markets**

TAWS and IHAS

(93) The merger raises serious doubts about the compatibility of the operation with the common market and the EEA Agreement, on the grounds that a dominant position would be strengthened on the market for TAWS and would be created on the future market for integrated hazard awareness systems (IHAS), for the reasons set out below. Although, as explained in the section on product market definition, one may distinguish the TAWS market according to the aviation segment in which it is sold, the analysis below covers all aviation segments where AlliedSignal is currently active.

The new entity currently has a dominant position on the market for TAWS

(94) With its enhanced ground proximity warning system (EGPWS), AlliedSignal currently has a 100 % market share.

(95) The parties have submitted, however, that some five companies have TAWS products in development. These are Sextant, Universal Avionics, BF Goodrich, EuroTelematik GmbH (ETG) and British Aerospace.

(96) The market investigation has pointed out that, although these companies have competing TAWS products in development and are anticipating their market entry, currently none of them has an established TAWS product on the market. Certification procedures are underway for Sextant's and Universal Avionics' TAWS products ([8]). BF Goodrich is developing a product that will be suited to a smaller number of business aircraft. ETG has a TAWS product available, although it is only suited for the general aviation segment. British Aerospace's TAWS only has applications on military aircraft, so it is questionable how far their product would be suited for commercial applications.

(97) The above shows that although currently AlliedSignal has a dominant position in TAWS, and any market entry will not be immediate, several companies may attempt to enter the market in the coming years and challenge the position of the new entity as the sole supplier. The expected growth in the market for TAWS (see below) makes such market entry attractive. However, as explained below, the merger will have the effect of increasing barriers to entry for such new entrants.

The anticipated growth in the market for TAWS leaves significant scope for market entry

(98) Considerable market growth is anticipated for TAWS. That growth will be supported by the fact that mandates for TAWS will come into place. The earlier generation ground-proximity warning systems (GPWS) are currently mandated in the USA and Europe for all turbine-powered commercial aircraft and for turbine powered aircraft for 10 passengers or more. For TAWS (EGPWS), currently no mandate exists but there is a proposed FAA mandate which will make TAWS mandatory in 2002/2003 for new aircraft and by 2005 for existing aircraft respectively (for aircraft with a minimum of six passengers). In anticipation of those mandates, and because of the safety improvement which the product confers, the number of orders is expected to increase strongly. Currently, AlliedSignal has already taken orders for some 8 000 EGPWS. The parties have submitted that the current market for TAWS may cover as many as [10 000 to 20 000]* aircraft. The size of the market may be expected to attract new entrants. A further driver for market entry is that AlliedSignal has been until now the only supplier of TAWS, and market operators (including the parties) are expecting new

([8]) The parties have provided information that Universal has in fact already sold its TAWS to an Indonesian (regional) airline company. However, type certification still has to be obtained.

TAWS suppliers to push market prices downwards, to the benefit of customers. However, in spite of (future) demand, new entrants, which already have to face certain hurdles in entering the market, are confronted with additional barriers to entry created by the merger.

As a result of the merger market entry barriers for competing TAWS are increased

(99) As described in recitals 97 and 98, a number of potential entrants exist on the market for TAWS. Even without the merger, these potential competitors would have a number of hurdles to overcome in order to enter the market. For instance, new entrants face the problem that they do not have a reputation with an established TAWS product. Moreover, not all of the potential suppliers mentioned above have an established position both in air transport and in the regional/business aviation segment. For example, Universal Avionics is historically not a supplier of avionics in the air transport segment. In addition, in contrast with AlliedSignal, newcomers do not have an installed base of an earlier-generation product (i.e. the GPWS), which, apart from the reputation that it provides, can be beneficial for retro-fit sales with existing customers. Finally, a new supplier would face (initially at least) disadvantages relating to economies of scale.

(100) From the fact that the abovementioned suppliers are indeed working towards market entry, it may be concluded that although certain obstacles already existed prior to the merger, these are not considered insurmountable. However, the investigation has pointed out that as a result of the merger, further obstacles are created, to the detriment of new entrants.

(101) The new entity will be able technically to link its EGPWS to other avionics equipment, so as to reduce (potential) competition on the TAWS market. Indeed, Honeywell has a considerable market share for products with which a TAWS must interoperate (on the input as well as on the output side), both in air transport and in the regional/business segment. Those products are, among others, the GPS, FMC (flight management computer), flight controls and displays. In the regional/business segment, Honeywell has delivered around half of the integrated cockpits, into which a TAWS is to be retro-fitted. If a new TAWS competitor were to wish to connect its product to such Honeywell equipment, it would have to have access to the technical interface information of that other equipment, so as to be able to make its TAWS interoperable. The new entity could deprive any newcomer of such essential information (to the advantage of its own EGPWS), and thereby significantly limit the scope for market entry, both for retro-fit and for for-wardfit TAWS.

(102) The requisite interface information not only involves hardware specifications (for example, as regards the size of the LRU (line replaceable unit) and form of the connections), but also data, such as data on the electrical signals and the software specifications. Although a piece of the interface data may be defined in a public format, a large part of the interface information may be of a proprietary nature. It is noted that in the regional/business segments ARINC standards that would ensure an open infrastructure do not apply and that the interface data are completely of a proprietary nature ([9]).

(103) Therefore, whereas, in general, the technical bundling of avionics products would not be detrimental to competition (owing to the role of the OEMs and ARINC standardisation: see (at recital 112 et seq.) under technical integration), in the area of surveillance products, and notably as regards TAWS, such negative effects could indeed occur. However, the undertakings submitted by the parties will provide adequate safeguards in the sense that they will ensure that Honeywell products and systems will have open standards so that future TAWS providers will not be further hampered in their attempts to enter the market. These undertakings are further described (at recital 125 et seq.).

([9]) In this regard, an example provided by the parties may serve as an illustration: the parties have submitted a contract which shows that for previous integration of the EGPWS with a Honeywell display-product (EFIS-display), AlliedSignal had to pay a considerable amount of money to Honeywell to obtain the technical specification of the EFIS, so that it could make the EGPWS compatible. Now, these costs would fall away, to the detriment of competitors of EGPWS, which either would not obtain the specifications or would have to pay large amounts of money for them.

In the absence of alternative TAWS suppliers, the merged entity will be in a position to foreclose competition on the future market for IHAS (integrated hazard awareness surveillance system)

(104) As was described in recitals 97 and 98, a number of companies are expected to try to enter the market with a competing TAWS technology. However, it is not certain that their entry will be successful. It may be, for example, that their technology proves to be inferior to the EGPWS. For the time being, there is no alternative TAWS available. In the investigation, market operators have stated that they feel that market entry may still take several years. They have expressed the view that if EGPWS technology remains the only established TAWS technology available, the new entity would, as a result of the merger, be able to foreclose competition for IHAS.

(105) Although AlliedSignal already had available in-house the three products necessary for an integrated hazard surveillance system, Honeywell's engineering know-how will permit the new entity to develop an IHAS successfully for the following reasons. According to its statements, AlliedSignal is primarily a provider of stand-alone products. Until now, AlliedSignal, although it has already announced the IHAS development, has had to rely on third parties (Boeing and Airbus) for further product integration. The fact that in the negotiations with Rockwell Collins for the supply of the EGPWS, AlliedSignal has insisted on a development in cooperative form and has insisted on obtaining a grant-back licence for newly developed integration technology, is an illustration of the more limited engineering capacity of AlliedSignal. Honeywell is a company that has long experience in integrating products and even supplying fully integrated cockpits. That experience is regarded as essential in designing an IHAS [reference to internal document]*.

(106) As has been stated, a systems integration potential (engineering know-how) is required to further develop an integrated hazard surveillance system. That integration capability, in the general sense, is available with at least two other suppliers on the market, Sextant and Rockwell Collins, and, to a considerable degree, also with the air transport OEMs. Rockwell Collins has shown its interest in obtaining the EGPWS functionality for further product integration and product development.

(107) At present, the EGPWS of AlliedSignal is an essential element of an IHAS. Therefore the new entity will be able to control the future IHAS market. The parties have submitted that there are already a number of alternative suppliers of TAWS technology on the market. However, as explained in recital 96, there is, as yet, no established alternative for the EGPWS, and any third party wishing to develop an IHAS currently has to rely on AlliedSignal's EGPWS technology. That technology is protected by several hundreds of patents, some of which are considered 'key patents', especially for further product development.

(108) Before the merger, AlliedSignal has shown a willingness to provide the EGPWS to third parties with a system integration capacity (see above as regards the Memorandum of Understanding negotiated with Rockwell Collins), which would allow such product development. After the merger, the new entity will have no incentive to supply such an essential input to its competitors. The product development of IHAS in a more competitive environment will therefore be restricted, and as a result the new entity would have the capacity and capability to become dominant on the future market for IHAS.

Conclusion for the TAWS market and the future market for IHAS

(109) For the above reasons, the Commission considers that there are serious doubts as to the compatibility of the operation with the common market and the EEA Agreement, on the grounds that the merger will lead to the strengthening of a dominant position for TAWS and to the creation of a dominant position on the future market for IHAS. However, the undertakings provided by the parties discussed below (at recital 125 et seq.) will provide an adequate remedy.

4. **Range-effects**

(110) Third parties, and in particular competitors, have complained that the merger would harm competition because of foreclosure effects that would occur. Such effects would be due to the fact that the new entity would be in a position to offer a broader product range (of avionics as well as non-avionics products) than any other competitor. That broader product range would give the new entity an increased ability to technically integrate products and to offer packages of avionics

products (multi-product bids). According to those third parties, the consequence would be that competitors who offer (stand-alone) products in competition with the new entity, but who cannot benefit from a similar product range, would be put at such a competitive disadvantage that clients would no longer consider buying products from them. In the end, this would lead to a loss of competitors, which, in an industry which is already highly concentrated, would work to the detriment of customers of avionics.

(111) Given these allegations, the Commission has investigated how far the merger would offer the new entity such competitive advantages and if these would result in the creation or strengthening of a dominant position.

4.1. *Technical integration*

(112) The market investigation has shown that, in general, it is considered an advantage that a company is able to supply a larger range of products. A supplier can thereby ensure a certain common core in its product range and ensure an enhanced interoperability of such products, especially where these products are within the same category of avionics products (communication, navigation, and surveillance). From internal documents supplied by the parties it appears that they themselves see improved interfaces between their respective avionics products as a particular opportunity resulting from the merger. As long as such technical integration does not lead to foreclosure effects, improved technical interoperability may generally be considered to be in the interest of customers (although OEMs in the air transport segment in many instance prefer to carry out technical integration themselves and therefore do not necessarily see this as a benefit).

(113) The investigation has shown it to be unlikely that the potential of the new post-merger entity to technically bundle products will significantly impede competition. First, this is because, in the air transport segment, the OEMs have a considerable engineering capability themselves and would only allow the technical bundling of avionics to take place if it was to their own advantage. Secondly, ARINC standardisation is widespread in air transport, so that the potential to link products through proprietary interface technology is very limited. Thirdly, there are third-party suppliers available for all the products which the new entity would supply, (with the exception of TAWS; see recital 114), so that there is scope for customers to retaliate in the event of any unwanted technical bundling. Lastly, for the regional/business segment the technical bundling issue would not manifest itself to the same extent, since competition already takes place for complete integrated cockpits, and in the general aviation segment, cockpits are federated (non-integrated) and there are no indications that this will change subsequent to the merger.

(114) A notable exception to the above, however, is the area of TAWS and surveillance equipment, where the new entity would be the only supplier with a TAWS. Also it will be in a strong position for weather radar and ACAS processors and mode S transponders. The above description of TAWS and IHAS makes clear that, in the absence of the undertakings discussed below, foreclosure effects might occur as a result of technical bundling practices, in both the air transport and the regional/business segments. The remedies described below (at recital 125 et seq.) will serve to prevent such a situation from occurring.

4.2. *Commercial aspects*

Range-effect in relation to the OEMs in air transport

(115) The market investigation has indicated that any range-effect relating to multi-product bids is not likely to arise in relation to the OEMs, who are the customers for SFE and SFE-option. In developing a new aircraft, the OEMs request separate bids for non-avionics and avionics products, which take place at different stages in the development phase of an aircraft, as well as separate bids for the individual avionics products.

Range-effect in relation to the airlines

(116) As was mentioned in recitals 17 to 21, airlines buy BFE avionics and choose SFE-option avionics, which are in fact purchased by the OEMs. Following the merger, the product range that the new entity will have on offer to airlines will not be significantly extended. The focus of Honeywell's activities has been on the OEMs (SFE sales), with the exception of ACAS/mode S transponders and

SatCom. Following implementation of the undertakings described below, Honeywell's ACAS/mode S transponders will be divested, while SatCom represents a relatively modest value, the overall worldwide market representing a value of some USD [30 to 40]* million.

(117) The new entity will have a larger product range than its competitors. However, Rockwell Collins has an almost equivalent product range to be sold to airlines, and in fact the value of all BFE avionics sold by Rockwell Collins is higher. Sextant also has a product range that is sold to airlines and it has a growing presence for SFE-option avionics (FMS and IRS/ADIRS/ADIRU ([10])).

(118) In addition, there is scope for competitors to extend their product range, either via internal development of products or by 'teaming' with other competitors. Although competitors have pointed out that teaming is not an alternative, on account of the extra cost and organisation involved, it is considered that teaming can still be a realistic alternative. This is for instance the case for technical teaming, if an OEM asks avionics suppliers to cooperate in order to develop a new product (for example: Airbus has requested Sextant and Smiths to develop a new FMS and Sextant and Litton to make an ADIRU). With regard to commercial teaming it is true that disadvantages exist, but there are several examples where commercial teaming has been successful.

(119) In relation to the airline customers, the investigation has shown that the practice of negotiating packages of avionics products is relatively common in the industry, although data obtained from the parties show that such bids occur only in a minority of cases. Where such packaging has occurred, it has mostly taken place for forward-fit on new aircraft.

(120) Moreover, the investigation has shown that customers can and do break the packages by 'mixing and matching' products from various suppliers. That mixing and matching is facilitated by the fact that ARINC standards make products interchangeable. The parties have provided data, which show that only [20 % to 30 %]* of AlliedSignal's multi-product bids (representing [less than 10 %]* of the total bid value) are not broken — that is, where airlines have decided to buy the whole package from the same supplier.

(121) As to the option the new entity will have, just as AlliedSignal does at present, of offering packages of avionics and non-avionics, it must be noted that although packages of non-avionics and avionics have existed, they nevertheless are rare. In this respect the merger does not change the situation to any great degree. Moreover, there is no natural link between avionics and non-avionics. The airlines are sophisticated buyers who seek to purchase the best products from the various suppliers. It is therefore not likely that their choice of avionics products will be determined by the non-avionics products. In addition, Rockwell Collins and Sextant are both engaged in the rapidly growing market of in-flight entertainment, which are high-value products, whereas the new entity is not active in this respect. The annual market value of in-flight entertainment is estimated to be USD [1 000 to 2 000]* million, whereas the annual market value of APUs and wheels and brakes is estimated to be USD [150 to 250]* million and USD [800 to 1 300]* million respectively. In terms of the ability to supply avionics and non-avionics, these competitors would therefore be able to offer significant competition to the new entity. In any event, the Commission notes that the parties have undertaken that they will not bundle avionics and non-avionics products in a single proposal to any aerospace customer unless (i) the customer to whom the proposal is submitted has requested this or (ii) a competitor has offered a similar bundle of products and the offer is intended to meet competition. If a customer requests alternative sources for any avionics product included in the bundle of products the parties will include alternative sources for that product in its offering.

(122) In addition, the packages sold to airlines are likely to decrease in importance, given the increasing trend for supplies to be made on an SFE-basis rather than on a BFE-basis. This trend, which has been widely confirmed by the investigation, will have the effect that the OEMs, which already enjoy buying power, will be able to ensure the availability of choice.

(123) As regards the airlines, therefore, it can be concluded that the proposed operation will not give the new entity the scope to create or strengthen a dominant position.

([10]) The ADIRU developed jointly by Sextant and Litton has obtained half of the orders on new Airbus aircraft. On FMS, Sextant is developing, together with Smiths, a new FMS for Airbus aircraft and they have secured two thirds of the orders for new aircraft.

Regional/Business Aviation

(124) The market investigation also made it clear that in this segment Honeywell's product range is extended with TAWS, for which AlliedSignal is currently the only supplier. Consequently, Honeywell will have a commercial advantage over Rockwell Collins and Sextant, the only two competitors supplying integrated avionics suites. Indeed, the latter are dependent on supplies of AlliedSignal/Honeywell in order to be able to supply an avionics suite, which includes TAWS. However, the remedies described below address this specific issue.

VI. **UNDERTAKINGS SUBMITTED BY THE PARTIES**

(125) In order to remove the serious doubts raised by the operation, on 15 October 1999, AlliedSignal and Honeywell submitted a proposal for modification of the operation in accordance with the terms of Article 8(2) of the Merger Regulation. This proposal involved undertakings related to the worldwide markets for ACAS processors and mode S transponders (for air transport and regional/business aviation) weather radar for civil helicopters and TAWS (all aviation segments) ([11]).

1. **Description of the undertakings**

(126) As regards ACAS processors and mode S transponders, the parties have undertaken to divest Honeywell's entire TCAS business (including mode S transponders) in favour of a viable and independent third party, within six months of the Commission's decision. Once implemented, this will remove the overlap between the parties' activities in ACAS processors and mode S transponders. An independent trustee will be appointed to report to the Commission, on, *inter alia*, the hold-separate obligation, the suitability of the purchaser, the conduct of the negotiations and whether the agreements with the purchaser properly provide for the divestiture of the relevant assets and business.

(127) With respect to weather radar, the parties undertake to divest AlliedSignal's weather radar business which consists of the RDR-1400 and RDR-1500 series search and weather radar, in favour of a viable and independent third party within six months of this Decision. Once executed, this will remove the overlap between the parties' activities with regard to weather radar for civil helicopters. As for ACAS processors and mode S transponders, an independent trustee will be appointed to report to the Commission on the issues mentioned above.

(128) In respect of TAWS, the parties undertake to provide any supplier of TAWS seeking to make its TAWS product interface with any of the parties' other avionics products with all licences and interface specification data necessary to enable the TAWS product to interface with the parties' avionics products. These undertakings will be of unlimited duration. The parties also undertake to supply EGPWS boxes, EGPWS modules (that is, a circuit card assembly module with a standard or a customised interface) and future products with TAWS functionality on a non-discriminatory basis to other (potential) avionics suppliers and aircraft manufacturers. The parties will also provide them with all licences and interface specification data necessary to enable them to interface their products with the EGPWS boxes, EGPWS modules and future products with TAWS functionality supplied by the parties. This undertaking will remain in effect for a period of eight years from the date of the Commission's decision. However, supplies of EGPWS boxes, EGPWS modules or other implementations of TAWS functionality pursuant to the undertakings, as well as interface data, will be provided as long as an aircraft and/or platform in which that product is installed or designed to be installed remains in production. To ensure compliance with the undertaking relating to TAWS, an independent expert will be nominated and an arbitration procedure will be established.

(129) The Commission conducted a market test to verify that the proposed undertakings were sufficient to remove the competitive concerns raised by this operation. In view of the market test certain modifications to the proposed undertakings were submitted on 27 October 1999. The final divestment proposal is set out in more detail in the text of the modification as accepted, which is annexed hereto and forms an integral part of this Decision.

2. **Assessment of the undertakingsg**

(130) The undertakings have the effect of eliminating the overlap created by the merger for ACAS processors and

([11]) The parties have also submitted undertakings to the United States Department of Justice (DoJ). These commitments are the same as the ones submitted to the Commission, with two exceptions: the undertakings on TAWS are not included, but a divestiture of the parties' overlapping activities as regards their space and military activities is foreseen. In particular the parties have undertaken to divest AlliedSignal's Teterboro Space and Navigation business (gyroscopes and navigation and pointing systems), its Cheshire Operations (IMU and gyroscopes), and its MicroSCIRAS Technology.

mode S transponders in the air transport and regional/business segments and for weather radar for civil helicopters. With respect to TAWS, the undertakings have the effect of removing the barriers to entry created by the merger and will ensure that further product integration and future product development by third parties remains possible.

(131) In the first phase, the parties also submitted undertakings with respect to ACAS processors and mode S transponders and weather radar for civil helicopters. However, these undertakings were not considered to be sufficient to remove serious doubts, for the following reasons. First, with respect to ACAS processors and mode S transponders, the parties undertook to divest AlliedSignal's business. According to the market investigation, AlliedSignal's products were the less-advanced products of the parties' ACAS processors and mode S transponders. Secondly, as regards weather radar for civil helicopters, the parties undertook to divest only one product line, which, according to the market investigation, did not constitute a viable business.

(132) The proposed divestment, submitted in the second phase, of Honeywell's TCAS business, including ACAS processors and mode S transponders, which are according to the market investigation the state-of-the-art products, corresponds to a market share of [30 % to 40 %]* in the air transport segment and of [40 % to 50 %]* in the regional/business segment and removes all overlap between the parties on these markets. Moreover, the TCAS divestment, together with the undertakings concerning TAWS, will influence the parties' position in the area of surveillance avionics. This divestment will also allow the purchaser of this business to extend its scope for offering packages of avionics products.

(133) With respect to the proposed divestment of AlliedSignal's weather radar business for civil helicopters, it has to be noted that this divestment represents a market share of [75 % to 85 %]* and eliminates all overlap between the parties on this market.

(134) As regards TAWS, the parties' commitment to provide any supplier of TAWS with all licences and interface specification data necessary to enable its TAWS product to interface with the parties' avionics products, will have the effect of removing the barriers to entry created by the merger. The new entrant will be able to hold, free of charge and for an unlimited period, all the information needed to make its TAWS product interoperate with the merged entity's products.

(135) With respect to the parties' commitment to supply EGPWS boxes, EGPWS modules and future products with TAWS functionality to other (potential) avionics suppliers and aircraft manufacturers (including all licences and interface specification data necessary for interface purposes), this undertaking has the effect that (potential) avionics suppliers and aircraft manufacturers desiring to integrate the merged entity's TAWS products into their integrated avionics suite or into a new integrated surveillance system can do so on equal terms. Further product development of more integrated systems, including IHAS, will therefore remain possible, both technically and commercially.

VII. **CONCLUSION**

(136) Consequently, the Commission concludes that, subject to full compliance by AlliedSignal and Honeywell, their subsidiaries, successors and assigns, including the new company created by the merger, namely Honeywell International Inc., with the conditions and obligations laid down in Annex I, the proposed concentration will not create or strengthen a dominant position as a result of which effective competition would be significantly impeded in the common market, or in a substantial part of it, or in the EEA,

HAS ADOPTED THIS DECISION:

Article 1

Subject to full compliance by AlliedSignal and Honeywell, their subsidiaries, successors and assigns including the new company created by the merger, Honeywell International Inc., with the conditions and obligations contained in the commitments laid down in Annex I, the concentration by which AlliedSignal and Honeywell propose to enter into a full merger is declared compatible with the common market and the functioning of the EEA Agreement.

Article 2

This Decision is addressed to:

AlliedSignal Inc.
101 Columbia Road
PO Box 1087
Morristown
New Jersey 07962-1087
USA

and

Honeywell Inc.
Honeywell Plaza
PO Box 524
Minneapolis
Minnesota 55440-0524
USA

Done at Brussels, 1 December 1999.

For the Commission

Mario MONTI

Member of the Commission

ANNEX I

The full English text of the commitments referred to in Article 1 may be consulted on the following Commission website:

http://europa.eu.int/comm/competition/index_en.html

ANNEX II

GLOSSARY

Product	Description
ACARS	aircraft communication addressing and reporting system
ACAS processor	airborne collision avoidance system: helps prevent collisions by identifying and displaying the location of surrounding aircraft providing audible warnings and in advanced versions manoeuvering instructions
ADIRS/ADIRU	air data inertial reference system/unit: device that combines the functions air data computer and inertial reference system
AEEC	Airlines Electronic Engineering Committee
Air data computer	the air data computer computes aircraft 'true ' airspeed, altitude and vertical speed
APU	auxiliary power unit: generates the electrical power on the aircraft
ARINC	aeronautical radio incorporated
ATC	air traffic control
BFE	buyer furnished equipment: refers to the buyer of the aircraft
CMU	communication management unit: manages the two-way text and data communication link between an aircraft and ground control centres
Com/Nav	communication/navigation: transmits and receives pilot voice and other communications to/from ground or airborne operation centres
CVR	cockpit voice recorder
Displays	electronic instrument systems that display information from avionics subsystems
EAEC	European Airlines Electronics Committee
ECS	environmental control systems: air-conditioning systems, blend air control systems, cabin-pressure systems and smoke-detection systems
EGPWS/GPWS	(enhanced) ground proximity warning system: displays nearby terrain and warns of potential impact
FAA	Federal Aviation Administration (USA)
FDR	flight data recorder
Flight controls	autopilot systems
FMC	flight management computer

Product	Description
FMS	flight management system: helps flight crews compute the most efficient flight profile and automatically navigates the aircraft
GPS	global positioning system (satellite based)
IHAS	integrated hazard awareness (or avoidance) system
IRS	inertial reference system: are airframe motion sensors and navigation sensors that are used by other navigation systems (autopilot/flight director, attitude/heading display, flight management system weather radar antenna stabilisation and SatCom antenna pointing)
JAA	Joint Aviation Authorities (Europe)
LRU	line replaceable unit: standardised equipment 'black box'
MMR	multimode radio/receiver: provides precision approach guidance to airports that have traditional ground-based instrument landing systems (ILS) and satellite-based non-precision approach guidance using a built-in global positioning system (GPS)
Mode S transponder	functions together with ACAS processors for the identification of other planes and their bearing, as well as determining the appropriate response to a threat of collision
OEM	original equipment manufacturer: the aircraft manufacturer in this industry
Recorders	record flight data information and cockpit voice
SatCom	(satellite communications): sends and receives data and voice telephony to the ground via satellite
SFE	supplier furnished equipment: refers to the seller of the aircraft
STC	supplementary type certification
TAWS	terrain avoidance warning system
TC	type certification
TCAS	traffic alert and collision avoidance system: the American term for ACAS
Weather radar	displays rainfall, turbulence and, in certain models, wind shear