الهيئة العامة للطيران المدني
General Authority of Civil Aviation

Published Every 2 Months By The
General Authority of Civil Aviation, Kingdom of Saudi Arabia

# CIVIL AVIATION

Issue 81, March 2014, Jumada'I 1435

Prince Fahd in Singapore
for the Aviation Leadership Summit

# The World's Most Extreme Runways

**The New KAIA Project.. Opening 2015**

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# The New National Air Carriers: Points to Clarify

Dr. Faisal H. Al-Sugair

VP. General Authority for Civil Aviation

Many parties are wondering lately about the newly licensed national air carriers approved a year ago by the General Authority of Civil aviation in Saudi Arabia (GACA). Out of the responding fifteen airline consortiums only seven were prequalified and only six submitted their proposals as previously announced by GACA.

The esteemed Shoura Council, which is probably the most important of these parties, has discussed this matter when reviewing GACA's annual report. It requested GACA to speed up this process to help reducing the current shortage in domestic air travel. The same issue was also raised by a number of writers and journalists. All this entails GACA to give a justification for the delay in finalizing the new air carriers licensing formalities.

Those who are really concerned about this issue should know that the procedures adopted by GACA were in fact derived from FAA policies and procedures in this respect. These policies and procedures require a new air carrier to submit certain documentations such as applicable procedures, and operation manuals including training, safety, maintenance, ..etc. Further, each new air carrier is required to register its fleet of aircraft in the Kingdom of Saudi Arabia and to subject these aircraft to the necessary testing under the supervision of GACA's authorized inspectors. GACA also tests and licenses the air carriers' pilots and reviews its sta7.experience records and training programs. No doubt the main purpose behind all this is to ensure the aviation safety and to prevent the occurrence of accidents that might result into major damages or injuries.

To expedite this process and enable these new air carriers to fly in the Kingdom's domestic routes as early as possible, His Highness the President of GACA, Prince Fahd Bin Abdullah, directed the formation of a specialized team from GACA (in collaboration with external consultants as required) to contact the two qualified air carriers and provide them with all the support they need, to enable them, and to avail all means of their success in the Kingdom aviation sector.

The two licensed air carriers which (Qatar Airways which named its Saudi venture "Air Maha" and the Saudi Gulf Airline owned by Al-Qahtani Group and enjoys technical support from Gulf Air, have announced their business plans and commencement dates of operation in the local and regional newspapers. It's worth mentioning that GACA gives the two air carriers the freedom to start their domestic operations once they are ready by fulfilling all GACA's requirements including operation safety and performance of activities.

I hope this clarify GACA's viewpoint and answers all raised queries and assures GACA's keenness to enable the new air carriers to start their successful domestic operations as early as possible ■

## The President of GACA:
# 60% of New KAIA is Accomplished

His Highness Prince Fahd Bin Abdullah, President of the General Authority of Civil Aviation (GACA), stated that New KAIA Project works are on schedule as construction works will be completed by the end of 2014 and the commissioning phase will follow in the first five months of 2015.

In his tour around the Project on 4/1/2014 accompanied by the Minister of Finance, Dr. Ibrahim Al-Assaf, His Highness pointed out that 60% of the Project is done, while the remaining work will be expedited, so it will be ready by the end of this year.

On the other hand, Minister of Finance, Dr. Ibrahim Al-Assaf, commended the close cooperation between the Ministry of Finance and GACA in encouraging the involvement of the Private Sector's in the aviation's mega projects. Indeed, the Hajj and Umrah Terminals Complex and Mohammed Bin Abdulaziz International Airport in Madina are examples of this joint venture. He added that many other opportunities are available for the Private Sector in New KAIA Project.

His Highness emphasized that work is rapidly progressing in the Project while many are talking about the delay in other Government projects. His Highness was accompanied by the Vice President of GACA, Dr. Faisal Al-Sugair, Director General of the Saudi Arabian Airlines, Eng. Khalid Al-Milhim, and Director General of KAIA, Mr. Abdulhameed H. Abalary.

# Prince Fahd Attended Singapore Airshow Aviation Leadership Summit

His Highness Prince Fahd Bin Abdullah, President of the General Authority of Civil Aviation (GACA) attended Singapore Airshow Aviation Leadership Summit recently held in Singapore. The Summit was attended by the World's Civil Aviation Leaders, international professional organizations, and aircraft/ air transport industry executives. His Highness accompanied by the Singapore Minister of Transport, Mr. Lui Tuck Yew, attended the Airshow which was part of the Summit activities. The Airshow included a special display of the new Airbus aircraft A350. Singapore Airshow is one of the most important major aviation Airshows. The number of

participants this year reached one thousand companies from 44 countries with an increase of 11% compared to the numbers two years ago. Attendents exchanged ideas and visions that aim to address aviation issues and find appropriate solutions for them in addition to making preparations for handling the challenges faced by the Air Transport Sector in view of the rapid increase in the world's air traffic volume. Discussions also covered providing the required regulatory support that allows the world's aviation industry to utilize all its resources and potentials, commercial aviation's major issues, appropriate means for building a sustainable industry in the light of the talks on climatic changes that took place in ICAO's General Assembly 38th Session held last September. His Highness the President of GACA made a tour around the Airshow's participant stands accompanied by a number of GACA senior officials.

# 8 Billions to Develop La Guardia and Newark airports

$8bn will be invested in New York's airports over the next decade as part of a £27.6bn Capital Plan announced by the Port Authority of New York and New Jersey.

Plans to redevelop La Guardia's central terminal building from 1964 are already with a private partner to be announced in the first half of the year. But new plans in the initiative include the redevelopment of Newark Liberty International Airport's terminal A and 144 acres of associated airfield, and a new roadway system and 3,000-space parking garage at the airport. The district's rail network PATH, will also be extended to Newark.

"The proposed $27.6bn,10-year capital plan lays out a bold vision that combines significant investment in state-of-good repair projects with funding for vital new transportation infrastructure such as the raising of the Bayonne Bridge, a new Goethals Bridge and the extension of PATH to Newark Liberty International Airport," said Port Authority Deputy Executive Director Deborah Gramiccioni.

La Guardia's redevelopment is expected to cost $3.6bn but provide $4.2bn in overall economic activity. Construction is expected to begin in the second half of the year.

Also included in the new Capital Plan are a $71m project to rehabilitate Runways 9-27 and 16-34, the two main runways at Stewart International Airport .

# Boeing Increases the Dreamliner Production Rate


The first Boeing 787 Dreamliner built at the rate of 10 airplanes per month has been rolled out of the assembly line. The airplane, a B787-8 and the 155th Dreamliner built, will be delivered to International Lease Finance Corp. for operation by Aeromexico.

The new 10 per month rate is the highest ever for a twin-aisle airplane. The B787 program has now increased its production rate three times in just over a year, including to five airplanes per month in November 2012 and seven per month in May 2013. "This rate increase reflects the continued strong demand for the B787," said Larry Loftis, vice president and general manager, B787 program, Boeing Commercial Airplanes. "A disciplined approach that combined employee teamwork with technology was key to achieving the higher rate."

Boeing assembles and delivers B787s in two locations: Everett, WA, and North Charleston, SC.

"The entire B787 team is now focused on capturing efficiencies at this historic level of production, as well as meeting our commitment to increase the production rate to 12 per month in 2016 and to 14 per month by the end of the decade," Loftis said.

To date, 115 B787s have been delivered to 16 customers. The program has 1,030 total orders from 60 customers worldwide. This airplane will be the fourth B787 operated by Aeromexico and will be used on the airline's Mexico City - London Heathrow route.

# United builds San Francisco hub with new concourse

United Airlines has moved into the new boarding area E at San Francisco International airport, as it continues to leverage the hub to expand its operations to Asia.

"We are delighted to be moving into this beautiful new boarding area," says Jeff Smisek, chairman, president and chief executive of the Chicago-based Star Alliance carrier.

The 10-gate concourse – gates 60 to 69 – in the airport's terminal 3 will primarily handle mainline domestic operations for United. Three of the gates – 64, 66 and 67 – can handle wide body aircraft up to a B777.

The $138 million Gensler-designed facility builds on San Francisco airport's success in terminal 2. United is investing $50 million in the boarding area in addition to the airport's construction costs. This includes a new United Club, elite frequent flier check-in area and flight operations centre.

Boarding area E will also allow the airline to consolidate its operations in terminal 3. Select regional flights operate from eight gates in terminal 1 currently. The new concourse represents more than a modern facility designed for tech savvy travelers and an opportunity to consolidate operations; it is also a symbol of United's investment in San Francisco and Asia.

"San Francisco is the premier Asian gateway from the United States… [and] is key to our growth strategy to Asia," says Smisek.

That strategy is targeting secondary cities in Asia, with the first addition being new three-times weekly service to Chengdu, China, on a B787-8 starting 9 June .

# The World's Most Extreme Runways

Dr Mostefa Bourchak *

Most air travelers have only experienced landings and takeoffs on wide, long, flat and clear runways. However, a number of runways that would send shivers down passengers and pilots spines at first sight. Short runways, high altitudes, low visibility, and treacherous landing strips combined together are the perfect cocktail for a scary landing. These conditions can subject the pilots and their passengers to some intense moments that can seem life threatening. In fact, many air accidents that resulted in fatalities were due to the difficulty that pilots experienced at certain runways. In this article, we present what many aviation experts consider the world's most extreme runways where pilots still have to occasionally abort their landings until this day. These runways are presented here starting with the less severe runway and ending with the most severe one.

Kai Tak airport runway, Hong Kong, China

Perhaps the most occurring cause of classifying a runway as extreme is the intensity of air traffic combined with man-made obstructing structures. This is mostly found in cities such as the one at Lindbergh Field in San Diego. The latter was the scene of a deadly air collision that caused many lives.

Some worldwide locations desperately needed airports for economic purposes but the landscape forced engineers to construct runways that sometimes start at sea and end up facing cliffs or mountains. One typical runway of this type is the one at Madeira Island, which is almost carved out the side of the mountain while extending into the ocean. Moreover, since it is located between mountains and the sea that makes it exposed to unpredictable winds. This airport is reported to have Canyon winds which blow from both ends of the runway but in different directions.

Toncontin airport runway, Houndouras

Other runways such as the one at Eagle Vail where is located in a rocky mountainous area where the air is less thinner and therefore less dense a7ecting both the aircraft ability to generate lift as well as its thrust. To make up for the lack of horsepower, pilots have to increase their speed which is not something that is usually done while landing especially with a limited runway length. The bad weather and mountainous landscape combination also a7ect aircraft during takeo7. since a longer taking o7.distance is required to generate the necessary take o7. lift. Additionally, pilots □ying to this runway have reported that the weather is so unpredictable that sometimes when it is reported at the beginning of an approach is all clear but half way through the approach a snowstorm can move in and brings visibility level to a minimum, forcing pilots to go around and try their approach again.

Other mountainous air□elds like Courchevel at the French Alps have a bumpy and steep runways leading to roller-coaster takeo7s and landings. The high altitude also leads to unpredictable weather causing immense problems to the pilots. Additionally, the steep runway can lead to pilots landing nose down if their approach is not judged right from the beginning.

Kai Tak runway at Hong Kong airport had such a high rate of accident that over 13 years ago it was closed down. Pilots had great di8culty navigating to the runway especially with the low visibility. Authorities there had to build a big

marker in the city to show pilots where to begin their turn. However, when the mark is not visible, pilots either had some of the most spectacular landings or they had to go round and try again.

The runway at Gibraltar is greatly a7ected by the location surroundings especially the nearby huge rock. Adverse weather their causes severe crosswinds and turbulence. High-rise buildings do not aid the situation either. Unlike all other runways, it is the only one a7ected by politics since it is located in Spain but owned by Britain. As well as having a highway going straight through the air□eld which causes the aircraft ground movement to intermingle with the road tra8c, Spain has also banned □ights into Gibraltar from its airspace forcing pilots to make sharp 90 degrees turns.

Princess Julian airport at St Maarten Island in the Caribbean has one of the best known extreme runways because it is located on a popular holiday destination. The runway is right on a busy beach making aircraft landings within meters of those on the beach!

Kai Tak airport runway, Hong Kong, China

St Barth's airport in the French Caribbean Island of St Barthélemy has an unbelievably very short 2100-foot runway heading directly towards a beach while coupled with a treacherous approach pattern that includes a busy road and a steep hill.

Toncontin airport in the Honduras has one of the most severe runway approaches where aircraft are forced to descend rapidly because of the nearby terrain. And that is not it; the runway is extremely short and has a 65-foot cli7 looming ominously at the end of it.

Table showing the high risk factors associated with some of the world's extreme runways

| | Short Runway | High Altitude | Low Visibility | Crosswind | Surrounding Obstacles |
|---|---|---|---|---|---|
| Lukla, Nepal | ✓ | ✓ | ✓ | ✓ | ✓ |
| Toncontin, Tegucigalpa, Honduras | ✓ | | | | ✓ |
| St □arth's, St □athele□y, Caribbean □□ance□ | ✓ | | | | ✓ |
| □rincess □uliana, St □aarten, Caribbean □Netherlands□ | | | | | ✓ |
| □□braltar, Spain □□□ | | | | ✓ | ✓ |
| □ai Tak, Hong □ong, China | | | ✓ | | ✓ |
| Courche□el, □rance | | ✓ | ✓ | ✓ | ✓ |
| □agle Vail, Colorado, □SA | | ✓ | ✓ | ✓ | ✓ |
| □unchal, □adeira, □ortugal | | | | ✓ | ✓ |
| Lindbergh □eld, San □iego, □SA | | | | | ✓ |

Lindbergh Field, San Diego, USA

Marolambo airstrip, Marolambo, Madagascar

Lukla airport at Nepal has undoubtedly the world's most extreme runway. It is located high on the Himalaya Mountains bringing together all the variables that make a runway extreme. It has high altitude, huge surrounding mountains, wind shear, turbulence and a short runway. Aircraft approaching this runway experience a big decrease in their horsepower because of such a high altitude conditions. As a result, once a landing attempt is begun, there is no going back! Takeo 7. and Landing at Lukla requires a coordinated e 7ort in the sky and on the ground where everyone needs to be ready!

There are undoubtedly many other runways and remote airstrips that would have similar condition to the ones mentioned in this article but it would be prohibitive to mention every single one of them. But the most common ones are Juancho E. Yrausquin runway at Saba Island for having a short runway and dangerous cli 7s, Qamdo Bamda runway in Tibet which is the former highest runway in the word (It has now been surpassed by Daocheng Yading airport runway), Ice runway at Antarctica for obvious reasons, Barra International airport runway in Scotland which is submerged by sea water, Matekane and Marolambo airstrips for their wild appearances!

Fortunately, modern training makes even the most demanding landings relatively safe. very high-tech, 3-D simulators can recreate the conditions of □ying into these airports so well that pilots really feel like they are □ying into these areas. However, some conditions are just impossible to simulate and pilots have to go to there to gain experience. These extreme conditions made local authorities subject pilots to extra special training and in some air□elds only specially certi□ed pilots are allowed to □y from and into these places ■

Gibraltar runway, Spain/UK

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# Unmanned Aircraft and their Interference with Air Traffic Control

Prof. Mahmoud Nadim Nahas *

Unmanned Aerial Vehicle (UAV) stands for powered aircraft without human pilot on board which uses the aerodynamic forces to generate lift. Its flight is controlled either autonomously by computers on board, or under the remote control of a pilot on the ground or in another vehicle. It may be of the type that is used in a single trip, or can be retrieved for use repeatedly. It can carry a civilian or military load. The UAV is an American expression that is equivalent to the British expression Remotely Piloted Vehicle (RPV).

The idea of UAV for military uses started during World War II, when German scientists made some experiments in this regard. In addition, we all remember that the unmanned spacecraft preceded manned space vehicles, as it did not make sense to send humans on trips of unknown results. In the sixties of the last century, the urge for use of UAV in air reconnaissance started after some manned reconnaissance aircraft were shot down. Some UAVs were designed, produced and used for spying, monitoring and aerial photographing during the Vietnam War . UAVs were also used to spy or to mislead the artillery in October 1973 war. They were also used in the Gulf War in the last decade of the last century in monitoring operations, reconnaissance and target detection.

The development of UAV has led to some civilian applications with higher efficiency than the traditional aircraft. In fact UAV can do tasks that are difficult for manned aircraft to perform, such as tasks requiring long duration. UAVs can operate for full day, and some for few days, while it is not possible to assign a pilot to fly for more than few hours.

UAVs are less expensive in design and production as they may be smaller than the manned aircraft. Moreover, their requirements of technical support are less.

Due to the tremendous progress made in the remote sensing devices and remote control operations, as well as in the methods of data and signals processing, and wireless communications and embedded electronic devices, UAVs have become an interesting option. Added to this is that the information from UAV can be available to the ground control station and can be displayed on screens making it easier to monitor the unmanned aircraft.

Military UAVs are classiped into the following categories:

- Target and decoy: providing ground and aerial gunnery a target that simulates an enemy aircraft or missile.
- Reconnaissance: providing battle□eld intelligence.
- Combat: providing attack capability for high-risk missions.
- Armed attacks: used for hitting ground targets and individual people.
- Logistics: used for cargo and logistics operations.
- Research and development: used to further develop the
- UAV technology.
- multi-role UAVs.

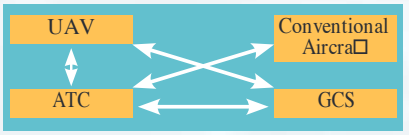
Civil UAVs have been used so far in the following tasks:

- Remote sensing: to detect the presence of various waves.
- Commercial aerial surveillance of large areas.
- Domestic police work.
- Geophysical surveys for mineral, oil and gas exploration.
  Transport of materials such as medicines, vaccines and mail.
  Scienti□c research, especially to penetrate areas that may be too dangerous for manned aircraft.
- Search and rescue, especially in di8cult situations.
- Maritime patrol.
- Forest □re detection.

It is to be mentioned here that King Abdulaziz University (Jeddah, Saudi Arabia), in collaboration with Tokai University (Japan) is developing a UAV powered by solar energy for some civil roles.

The term unmanned aircraft system, UAS (previously unmanned-aircraft vehicle system, UAVS) emphasizes the importance of other elements beyond an aircraft itself. A typical UAS consists of the following: unmanned aircraft (UA); control system, such as Ground Control Station (GCS); control link (a specialized datalink); and other related support equipment.

Is there any interference between UAS and Air Tra8c Control (ATC) system? The following □gure summarizes the situation.




How do UAVs gain safe, secure and e8cient integration into non-segregated airspace and aerodromes? A necessary safety aspect is the introduction of UAS into 'high reliability' ATC systems. These include: ground-based ATC, policies and designs of airspace, collision avoidance ground/airborne equipment, and aircrew see-and-avoid. On the other hand, however, airlines and passengers would ask: "Could UAVs create risks of mid-air collision?".

In this regard, there is a useful document prepared by the USA Federal Aviation Administration (FAA) for integrating UAS into ATC. The concept is that UAVs must comply with existing, adapted and/or new operating rules or procedures; not requiring new classes or types of airspace; and comply with ATC separation minima in controlled airspace. Each UAS should have an appropriate □ight crew, including a pilot in control, controlling only one UAV and complying with all ATC instructions. The UAV should have an appropriate airworthiness certi□cate; and a necessary communications spectrum must be available. ATC is responsible for separation services as required by the airspace class/type of □ight plan for all aircraft, and has no direct link to the UAV for □ight control purposes.

There is also a UK Civil Aviation Authority (CAA) document which states that it is required from non-military RPV larger than 20 kg to automatically sense other aircraft and steer to avoid them.

Finally, will the unmanned aircraft reach high degree of automation so that they can deal with the information and dispense with the role of human being? The answer is that if the purpose of these aircraft is to help human being, how can they dispense the role of mankind? For sure, technical development always leads to progress in the human being role as well, so that decisions stay in the hand of mankind. We should proceed in technology development, because whosoever delays he will be left behind in a world where the strongest will solely survive ■

* *Aeronautical Engineering Specialist*

# Aircraft Aviation Communications (*Traditional Systems*)

Dr. Mohamed Elfatih Elamin *

Traditional aircraft communications are based on analog voice on either a Very High Frequency (VHF),Ultra High frequency(UHF) or High Frequency (HF) radio waves. In the mid 1980s the use of data-based communications became a reality. Airspace management is transcending into the computer age and as new requirements evolve and the choice of communications technologies expand, regulating the world's air traffic flow can safely become more automated. Aircraft are currently being equipped with communications technologies that transport data via satellite plus while they are on the ground; mobile communication and in some cases broadband networks can receive or broadcast strategic information regarding aircraft situation and even maintenance trends.

Aircraft communications are being expanded; in fact, in recent years a new abbreviation has surfaced. CNS ATM stands for "Communication, Navigation, and Surveillance and Air Traffic Management" which was created to support modernization of the dated and overload prone Air Traffic Control system.

Aircraft that are intended to transport passengers are equipped with radios that enable analog voice communications. This is currently and will be for the foreseeable future the primary means for pilots to communicate with different entities of the Air Traffic Control (ATC) system.

Frequency utilization in all Aviation-related entities are published in ICAO documents and are periodically updated. The frequency band 118.0-137.0 MHz is subdivided into sub-bands serving Tower, Approach, enroute and other supporting services. The service range of each frequency is limited by the assigned flight level for each flight segment.

ITU radio spectrum allocations

The allocation of radio spectrum is defined by the International Telecommunications Union (ITU) and relates the use of a frequency to a specific service. In the case of civil aviation there are separate ITU allocations for communications, navigation, and surveillance. Such differentiation between functions corresponds to the safety requirements for Air Traffic Control. The ITU has assigned frequencies for use by aircraft analog voice dialogue in parts of the "High Frequency" (3-30 MHz) band and in the 118-137 MHz section of the wider "Very High Frequency" range. Aircraft can use radios operating in the HF radio band for long-range communications as the signals are reflected by the ionosphere. Unfortunately when using HF the link audio quality is very poor due to this long propagation of the wave. Aircraft can use radios operating in the VHF band to communicate with other radios in line-of-sight coverage. These signals do not reflect off the ionosphere or penetrate obstacles such as mountains or buildings. The advantage of VHF over HF is that the link quality is much better and there is greater reuse of the frequency channel. The use of the

VHF Ground Radio Station

word “analog” in relation to voice radio communications means that the changes in the sound of the voice are converted by the transmitter into corresponding variations in the radio signal and converted back by the receiver.

This analog system is simpler than more recent digitized voice systems that periodically measure the sound of the voice, convert the sound into a number in a predefined range, and send the numbers over the radio link. Aircraft VHF analog radios can use channels of varying width and the minimum width depends on the precision of the technology.

Aircraft have been using VHF radios for the past six decades and advancements in electronics have enabled the minimum channel width to be reduced from 100 kHz down to 8.33 kHz, which gives an exponential increase to the number of usable frequencies

## Aircraft Communications Addressing and Reporting System (ACARS)

Aircraft began to be equipped with computers in the 1970s and this led to the development in 1978 of a data communications system called the “Aircraft Communications Addressing and Reporting System” (ACARS).

Aircraft with ACARS can exchange data messages via a network of automated ground stations incorporating internal computers. Airlines first used the data link system to send movement reports to the ACARS service processors using the telex formats that operators had previously used to send those reports. ACARS are widely used today with airborne installations exceeding 10,000 aircraft.

ACARS units are connected to a VHF radio and in many cases, interfaced with satellite systems. This type of data communications is sent via conventional VHF radio waves that are received through a network of ground stations linked via a terrestrial network to a centralized data link service processor. This is what provides the connection to the ground systems of the users.

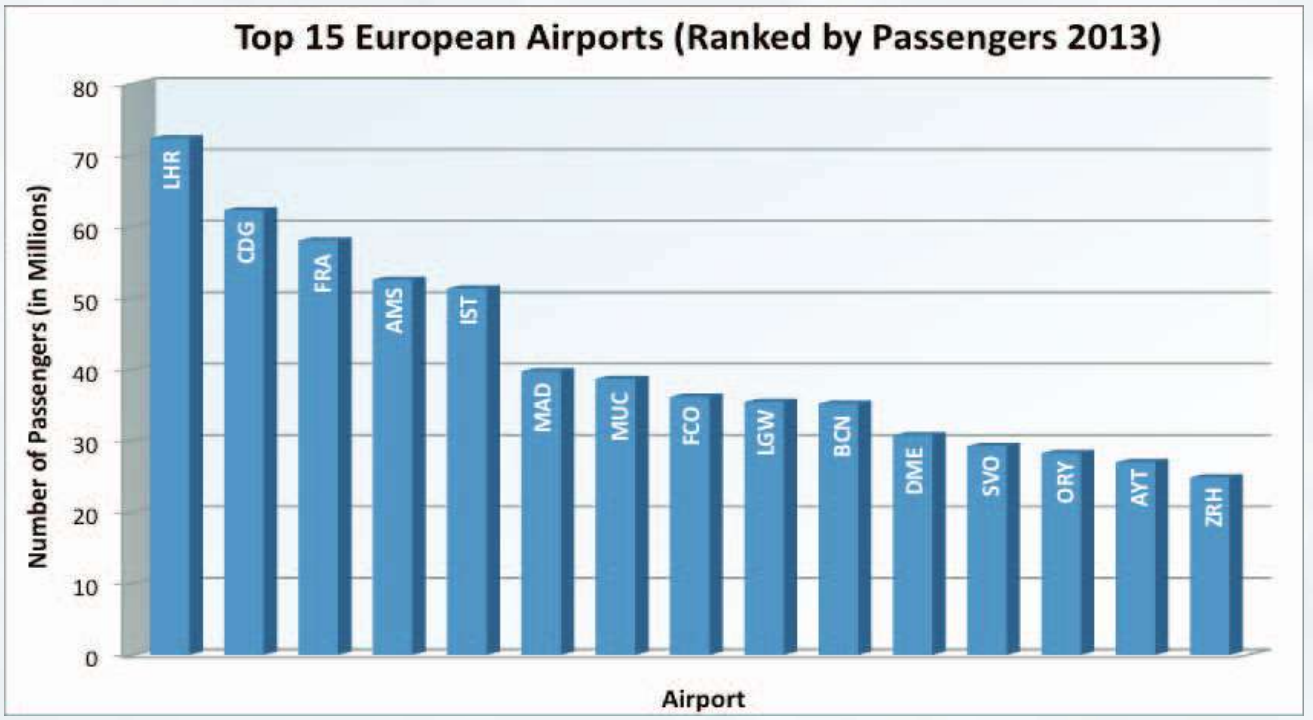
Data communications can also be sent via satellite networks but will ultimately link to the service processor that supports the VHF ACARS service. The function of the service processor is to route messages automatically between the user aircraft and ground systems, using mostly a fixed configuration of delivery addresses by message type for downlink messages and by memorizing the ground station to be used for uplink messages.

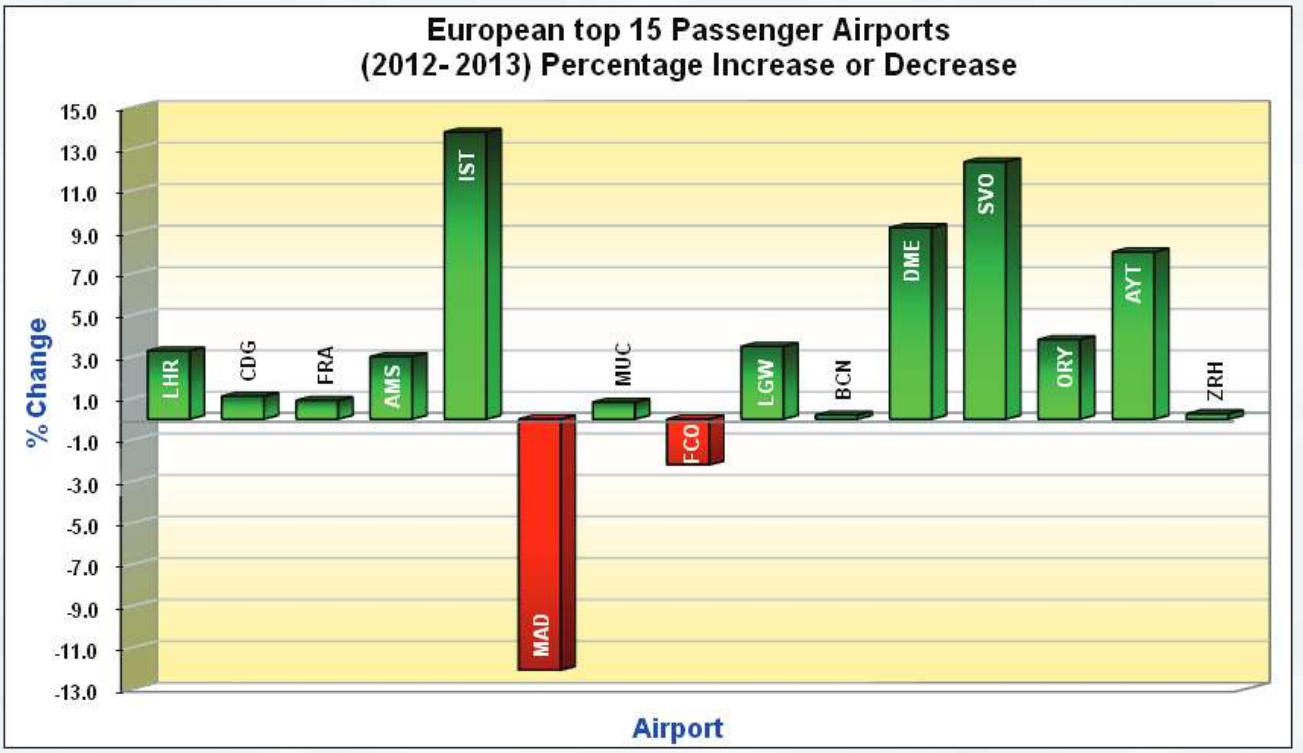
The main restriction on the ACARS system is that it uses character codes representing only printable characters. This limitation applied to all early generation data communications systems. This did not prevent the ACARS system from becoming the foundation of airline operations efficiency. However, the development of new radio communications technology and the need to support air traffic management, calls for newer technologies to be implemented ■

* *Technical Advisor - GACA/ANS/SED/COMMUNICATIONS*

# Top 30 European Airports 2013 (Ranked by Passenger)

| Rank | Country | Airport | City | IATA Code | 2012 | 2013 | % Change |
|---|---|---|---|---|---|---|---|
| 1 | UK | Heathrow | London | LHR | 70037417 | 72332160 | ▲ 3.3% |
| 2 | France | Charles de Gaulle | Paris | CDG | 61611934 | 62289665 | ▲ 1.1% |
| 3 | Germany | Frankfurt | Frankfurt | FRA | 57520001 | 58036948 | ▲ 0.9% |
| 4 | Netherland | Amsterdam | Amsterdam | AMS | 51035590 | 52569250 | ▲ 3% |
| 6 | Turkey | Atatürk | Istanbul | IST | 45091962 | 51320875 | ▲ 13.8% |
| 5 | Spain | Barajas | Madrid | MAD | 45190528 | 39729027 | ▼ 12.1% |
| 7 | Germany | Munich | Munich | MUC | 38360604 | 38672644 | ▲ 0.8% |
| 8 | Italy | Leonardo da Vinci | Rome | FCO | 36980911 | 36166345 | ▼ 2.2% |
| 9 | UK | Gatwick | London | LGW | 34235982 | 35433178 | ▲ 3.5% |
| 10 | Spain | El Prat | Barcelona | BCN | 35144503 | 35210735 | ▲ 0.2% |
| 11 | Russia | Domodedovo | Moscow | DME | 28165657 | 30760000 | ▲ 9.2% |
| 12 | Russia | Sheremetyevo | Moscow | SVO | 26032975 | 29256000 | ▲ 11.7% |
| 13 | France | Paris-Orly | Paris | ORY | 27232263 | 28274154 | ▲ 3.8% |
| 14 | Turkey | Antalya | Antalya | AYT | 24993667 | 27003712 | ▲ 8.0% |
| 15 | Switzerland | Zürich | Zürich | ZRH | 24802466 | 24865138 | ▲ 0.3% |
| 16 | Denmark | Copenhagen | Copenhagen | CPH | 23336187 | 24067030 | ▲ 3.1% |
| 17 | Norway | Gardermoen | Oslo | OSL | 22080433 | 22956540 | ▲ 4% |
| 18 | Spain | Palma de Mallorca | Palma de Mallorca | PMI | 22666858 | 22768082 | ▲ 0.4% |
| 19 | Austria | Vienna | Vienna | VIE | 22165794 | 21999926 | ▼ 0.7% |
| 20 | Germany | Düsseldorf | Düsseldorf | DUS | 20833246 | 21228226 | ▲ 1.9% |
| 21 | UK | Manchester | Manchester | MAN | 19736502 | 20682907 | ▲ 4.8% |
| 22 | Sweden | Arlanda | Stockholm | ARN | 19642029 | 20681554 | ▲ 5.3% |
| 23 | Ireland | Dublin | Dublin | DUB | 19099649 | 20200000 | ▲ 5.8% |
| 24 | Germany | Tegel | Berlin | TXL | 18164203 | 19591838 | ▲ 7.9% |
| 25 | Belgium | Brussels | Brussels | BRU | 18971332 | 19133222 | ▲ 0.9% |
| 26 | Turkey | Sabiha Gökçen | Istanbul | SAW | 14487242 | 18641842 | ▲ 28.7% |
| 27 | Italy | Malpensa | Milan | MXP | 18537301 | 17955075 | ▼ 3.1% |
| 28 | UK | London Stansted | London | STN | 17472699 | 17849071 | ▲ 2.2% |
| 29 | Portugal | Lisbon Portela | Lisbon | LIS | 15301176 | 16024955 | ▲ 4.7% |
| 30 | Finland | Helsinki- Vantaa | Helsinki | HEL | 14858215 | 15279043 | ▲ 2.8% |


Top 15 European Airports (Ranked by Passengers 2013)
Number of Passengers (in Millions)
80
70
60
50
40
30
20
10
0
LHR
CDG
FRA
AMS
IST
MAD
MUC
FCO
LGW
BCN
DME
SVO
ORY
AYT
ZRH
Airport


European top 15 Passenger Airports
(2012- 2013) Percentage Increase or Decrease
% Change
15.0
13.0
11.0
9.0
7.0
5.0
3.0
1.0
-1.0
-3.0
-5.0
-7.0
-9.0
-11.0
-13.0
LHR
CDG
FRA
AMS
IST
MAD
MUC
FCO
LGW
BCN
DME
SVO
ORY
AYT
ZRH
Airport

# Forthcoming Aviation Conferences, Exhibitions & Seminars

## 15 March –15 May 201□

17 - 19 March
Airport Development Russia & CIS
Moscow, Russia
adamsmithconferences.com/ event/ airport-development-russia-cis

17 - 20 March
NBAA's International Operators Conference
Tampa, FL, USA
web.nbaa.org/ events/ ioc/ 2014/

18 March
Airline Engineering & Maintenance
Hong Kong, China
airlineengineering-cea.com/

18 - 21 March
7th Asian Ground Handling International Conference
Bangkok, Thailand
groundhandling.com/ ghicon/

24 - 26 March
Myanmar Civil Aviation Development Conference
Yangon, Myanmar
mcadc.sphereconferences.com/

25 - 26 March
Aviation Financing Asia Summit
Singapore, Singapore
capaevents.com/ ehome/ 71918

AviationPros LIVE Conference &Expo
Las Vegas, NV, USA
aviationproslive.com/

25 - 27 March
Passenger Terminal Conference & Expo
Barcelona, Spain
passengerterminal-expo.com/

25 - 28 March
Air□eld Engineering & Maintenance Summit
Singapore, Singapore
equip-global.com

26 March
ACI-NA Commissioners Congressional Reception
Washington, DC, USA
aci-na.org/ event/ 4598

26 - 27 March
Business Airport World Expo
London, UK
businessairportworldexpo.com/

26 - 28 March
ACI EUROPE 23rd Airport Trading Conference & Exhibition
Zurich, Switzerland
aci-europe-events.com/ airport-trading-conference/

28 March
Aircraft Finance and Lease Russia & CIS
Moscow, Russia
events.ato.ru/ eng/ events/ air□nance

29 March - 1 April
Air Cargo Conference
Orlando, FL, USA
aci-na.org/ event/ 3204

31 March - 2 April
Airport Cities World Conference & Exhibition
Kuala Lumpur, Malaysia
globalairportcities.com/ page.cfm/ link=17

1 - 3 April
WATS - World Aviation Training Conference & Tradeshow
Orlando, FL, USA
halldale.com/ wats-2014/ overview#.Uv7T7XTnat8

6 - 8 April
National Air Service Conference
Indianapolis, IN, USA
events.aaae.org/ sites/ 140404/

Routes Europe
Marseille, France
routesonline.com/ events/ 165/ routes-europe-2014/

7 - 9 April
Airport Concessions, Finance & Human Capital Conference
Dallas, TX, USA
aci-na.org/ event/ 3207

Legal A7airs Spring Conference
Dallas, TX, USA
aci-na.org/ event/ 3208

8 - 10 April
Regional Seminar on Machine Readable Travel Documents (MRTDs) &Traveler Identi□cation Management
Tashkent, Uzbekistan
icao.int/ Meetings/ mrtd-tashkent-2014/ Pages/ default.aspx

MRO Americas
Phoenix, AZ, USA
mroamericas.aviationweek.com/ amer14/ public/ enter.aspx

AAAE Airport Emergency Management Conference
Los Angeles, CA, USA
aaae.org/ meetings/ meetings_calendar/ mtgdetails.cfm?Meeting_ID=140405

3rd Annual Japan Air□nance Conference
Tokyo, Japan
euromoneyseminars.com/ EventDetails/ 0/ 6982/ 3rd-Annual-Japan-Air□nance-Conference.html

Aircraft Interiors Expo
Hamburg, Germany
aircraftinteriorsexpo.com/

9 - 10 April
3rd Annual Emerging Airports Show Conference &Exhibition
Abu Dhabi, UAE
emergingairports.com/

9 - 11 April
32nd Annual Texas Aviation Conference
Dallas, TX, USA
tti.tamu.edu/ conferences/ tac14/

9 - 12 April
AERO - International Trade Exhibition for General Aviation
Friedrichshafen, Germany
aero-expo.com/ aero-en/ supporting-programme/ aero-conferences.php

10 - 11 April
Central American & Caribbean Aviation
Panama City, Republic of Panama
aeropodium.com/ panama.html

The Premier Global Airline Strategy Summit
Dublin, Ireland
capaevents.com/ ehome/ 75940/ AIT2014/ ?&

14 - 16 April
Air□eld Operations Conference & Preventing Aircraft Damage
Dublin, Ireland
airportdata.com/ events-and-news.aspx

14 - 17 April
Public Safety & Security Spring Conference
Baltimore, MD, USA
aci-na.org/ event/ 3211

Aircraft Airworthiness & Sustainment (AA&S) Conference
Baltimore, MD, USA
aasconference.com/

AMC - Improving Maintenance & Reducing Costs
Toronto, Canada
aviation-ia.com/ amc/

15 - 17 April
Asian Business Aviation Conference & Exhibition (ABACE2014)
Shanghai, China
abace.aero/ 2014/

16 - 17 April
ICAO - WCO Joint Conference on Enhancing Air Cargo Security & Facilitation
Manama, Bahrain
icao.int/ Meetings/ jointconferencebahrain/ Pages/ default.aspx

Business Aviation Safety Seminar
San Diego, CA, USA
nbaa.org/ events/ bass/ 2014/

16 - 18 April
MCOA Airports Conference
Bemidji, MN, USA
mnairports.org/ activities-events/

5th China Airport Check-In Summit
Shanghai, China
summitasia.cn/ checkin/ 2014

21 - 24 April
Operations & Technical A7airs Conference
Montréal, Canada
aci-na.org/ event/ 3214

22 - 23 April
Civil Avionics International Forum
Shanghai, China
galleonevents.com/ CAIF2014/ en/ home.html

22 - 24 April
NBAA Maintenance Management Conference
Tampa, FL, USA
web.nbaa.org/ events/ mmc/ 2014/

23 April
3rd Aviation HR Management & Training Conference
Moscow, Russia
events.ato.ru/ eng/ events/ pro 7.

27 - 30 April
27th IGHC Ground Handling Conference
Kuala Lumpur, Malaysia
iata.org/ events/ Pages/ ighc-2014.aspx

29 - 30 April
ATAG Global Sustainable Aviation Summit
Geneva, Switzerland
envirosummit.aero/

2 May
Business Aviation Taxes Seminar
San Francisco, CA, USA
web.nbaa.org/ events/ taxes-seminar/ 2014/

3 - 4 May
Great Alaska Aviation Gathering Conference
Anchorage, AK, USA
greatalaskaaviationgathering.org/

4 - 6 May
Southeast Chapter AAAE Annual Conference & Exposition
Myrtle Beach, SC, USA
myrtlebeach2014.com/

5 - 7 May
Wisconsin Aviation Conference
Rothschild, WI, USA
wiama.org/ conference-welcome.html

CANSO Asia-Paci□c Conference
Colombo, Sri Lanka
canso.org/ asiapaci□cconference2014

6 - 8 May
The Global MRO Procurement Expo
London, UK
apmexpo.com/

7 May
Sanctions in Civil Aviation
Dubai, UAE
aeropodium.com/ sanctions.html

11 - 13 May
Global Airport Leaders Forum, Airport Show
Dubai, UAE
theairportshow.com/ portal/ home.aspx

Travel Catering Expo
Dubai, UAE
travelcateringexpo.com/

12 - 14 May
ACI EUROPE Regional Airports Conference & Exhibition
Madeira, Portugal
aci-europe-rac.com/

# The new force in AVIATION

**For over 20 years Arabasco has been the market leader in the Middle East for corporate aviation support service. Innovation and customer service have been key in Arabasco maintaining this position and Arabasco continues to grow its service portfolio.**

- Arabasco provides premier FBO facilities at both King Abdulaziz International Airport – Jeddah, King Khalid International Airport – Riyadh and our new facility at Yanbu Airport.
- Arabasco maintenance services include Repair Station approval's for the Saudi Arabian Presidency of Civil Aviation, the US Federal Aviation Authority and the Aruban Registry.
- Our highly qualified Engineering team have 2 or more industry qualifications PCA Mechanics certificate, FAA A & P certificate or ICAO Type II License.
- Recent addition to Arabasco services is our rapidly expanding aircraft management program where owners can relax in the knowledge that their high value asset is being well cared for.
- A new venture between Arabasco and Emirates National Oil Company (ENOC) in providing aviation fuel at Jeddah airport. The new company, United Gulf Aviation Fuel Company (UGAFCO), provides an efficient and competitive service to the aviation market.

**Owners, passengers, pilots, engineers and cabin crew are all assured of a warm "Marhaba" from a team of dedicated professionals experience in delivering consistently high levels of customer service with facilities dedicated to the well being of our clients.**

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عرباسكو
ARABASCO


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لمزيد من المعلومات يرجى الاتصال على فريق التسويق والمبيعات على الأرقام التالية:
تليفون: ٦٨٥ ٥٣٥٠ (٢ ٩٦٦+) فاكس: ٦٨٥ ٠٣٤٢ (٢ ٩٦٦+) سيتا: JEDARUV


يوجافكو
UGAFCO
United Gulf Aircraft Fueling Company


A joint venture between Emirates National Oil Company (ENOC) and Arabian Aircraft Services Company (ARABASCO) was established to supply fuel to all type of private, commercial and military Aircrafts at King Abdul Aziz International Airport (KAIA) the second busiest Airport in the Gulf.

UGAFCO has been operational at KAIA since August, 2004 and extending fueling services to many International and General aviation customers through its state of the arts equipments with latest the Quality/safety features such as digital pressure control module, electronic meters and electronic tickets printers. The Company thrust in operation is to ensure the compliance of best practices in the Industry are followed at KAIA, conforming to the best International safety/Quality standards.

UGAFCO is the technology trend setter at KAIA and the only Company having AVR 2000 fuel data management system installed on all its equipments. Both ENOC and ARABASCO, the joint venture partners of UGAFCO believe in the development of latest technology and best trained personnel to maintain the highest Customers Services Standards. UGAFCO is committed for operational excellence.


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عرباسكو ARABASCO
اينوك ENOC