



# China Civil Aviation Report

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# 民航报导

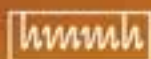


Beijing Capital International Airport and Chicago O'Hare International Airport Become Sister Airports  
首都机场与芝加哥奥黑尔机场缔结姊妹机场

China Occupied Two of the Top Four Spots in Global Civil Aviation  
全球民航前四位国内夺两席

Aviation Safety Management Manual Implemented  
《航空安全管理手册》实施

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**Celebrating  
our 13th  
anniversary**

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步入第13个年头，  
感谢国内外读者  
13年的支持！**

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## 中国迫切需要建立 通用航空应急救援系统

最近，日本大地震引发海啸，带来相当大的灾难。由于日本通用航空没有随着商业运输航空的蓬勃发展而形成规模，在此次因海啸而造成的破坏中，道路毁损，地面救援无法快速实施，而立体空中救援又厥如的情况下，多多少少造成救援的遗憾，错过了很多救援机会。

中国对航空的管理政策与日本政府一样：全面发展商业运输航空，对通用航空持以保留态度。这个保留态度在下一波大型灾难的阴影下必须立即更正，快速纠正过往对通用航空的忽视与荒废，当下完善通用航空法规，明确设备与运行的准入与认证程序，政策鼓励国内业者与国际有经验资质的伙伴展开合作，在最快的速度下建立基本应急救援网络以备不时之需。

此前中国大规模中东撤侨行动赢得国际喝彩与认同，由于国家的快速反应，机制的灵活运用，强大的行动决心，才获得如此的辉煌成果。试想如果撤侨行动中充满了信心决心与毅力，但缺乏最关键的运输工具，将会是什么样的结果？商业运输航空在这次撤侨行动中凸显了运输工具（当然也包括游轮与旅游巴士）的重要性，而通用航空正是灾难时刻应急救援的最主要工具，不能等闲视之。

我们无法预知老天爷将要赋予我们的挑战，何时？何地？何事？但我们却可以预知延误发展和建设通用航空将会使我们在灾难后感觉后悔与心痛。无知不是罪，但明知而不为，我们则罪大莫及，最终将悔不当初！



**Francis Chao 赵嘉国**  
**Publisher 发行人**

## Six Civil Aviation Policies to Ensure Safety 中国民航六大措施保安全

CAAC would apply six policies in 2011 to further promote the sustainable safety strategy to guarantee flight and aerial defense safety as well as passenger's safety on board of an aircraft.

At the National Civil Aviation Conference held on Jan. 11, 2011, Wang Changshun, Deputy Minister of CAAC, expressed that the civil aviation passenger volume is expected to breakthrough 300 million this year. To prevent enormous air transportation incidents, aircraft hijack and explosion, aerial defense incidents, chaotic general aviation flight incidents, disastrous air-land incident and massive aircraft maintenance problems, and the flight incidents/10,000 hrs rate of less than 0.5 are the safety goals confirmed by CAAC this year.

Wang Changshun stated that in order to realize the goal of sustainable safety, CAAC would apply the following six grand policies this year: 1) strict implementation of primary responsibilities for safe production, 2) strict guard on qualifying abilities for professional technicians, 3) definite arrangement of major task for safe production, 4) further reinforce establishment of safety supervision abilities, 5) devote swift establishment of airworthiness appraisal abilities and 6) highly focus on establishment of emergency response-rescue system for safe production.

中国民航局2011年将采取六大措施, 进一步推进持续安全战略, 保障飞行和空防安全, 保旅客乘机平安。

中国民航局副局长王昌顺1月11日在此间举行的全国民航工作会议上表示, 今年民航旅客运输量预计将突破3亿人次, 防止运输飞行重大事故, 防止劫机、炸机事件, 防止空防事故, 防止通用航空重大飞行事故, 防止重大航空地面事故和特大航空器维修事故, 全行业运输航空事故征候万时率不超过0.5, 是民航局今年确定的安全目标。

王昌顺说, 为实现持续安全的目标, 民航局今年将采取以下六大措施:

一是严格落实安全生产主体责任。二是严把专业技术人员资质能力关。三是切实抓好安全生产重点工作。四是进一步强化安全监管能力建设。五是着力加快适航审定能力建设。六是高度重视安全生产应急救援体系建设。

## CAAC: Seven Key Tasks in 2011 民航局: 2011年七项重点工作

At the National Civil Aviation Conference, CAAC has planned some major tasks for 2011, requesting key focus in seven aspects:

### A) promote further the sustainable safety strategy to ensure flight and aerial defense safety

1. strict reinforcement of primary responsibilities for production safety,
2. strict guard on ability qualifications for professional technicians,
3. firm identification on major works toward production safety,
4. further strengthen safety supervision ability establishment,
5. speed up establishment on airworthiness inspection capability, and
6. highly focus on building the emergency response-rescue system for production safety.

### B) improve further the operational management and services to raise the quality of transport services

在全国民航工作会议上, 民航局对2011年的主要工作任务进行了部署, 要求重点抓好七方面:

### 1. 进一步推进持续安全战略, 保障飞行和空防安全

- 一严格落实安全生产主体责任。
- 二严把专业技术人员资质能力关。
- 三切实抓好安全生产重点工作。
- 四进一步强化安全监管能力建设。
- 五着力加快适航审定能力建设。
- 六高度重视安全生产应急救援体系建设。

### 2. 进一步改进运行管理和服务工作, 提高运输服务品质

1. deepen regulations on flight delays to produce higher punctuality rate,
2. establish long-term service quality supervision mechanism to better protect consumer rights,

3. continue full commitment on better aviation transport for major, emergency and/or special situations, and guarantee aviation service on holidays.

### C) strengthen further the infrastructure construction and resources consolidation and utilization to realize structure and efficiency unity

1. identify proper infrastructure construction to raise the utilization efficiency of equipment installations and facilities,
2. control over-growth transport capacity to improve aircraft's "3 rates",
3. optimize air-space structure to raise its usage rate,
4. promote energy conservation and emission reduction to raise energy efficiency.

### D) further improve market management policy and finance policy to reinforce development coordination

1. improve air transportation market management policy,
2. improve general aviation policy system,
3. improve civil aviation finance policy system,
4. continue active local involvement on developing civil aviation.

### E) further promote reform and openness policy to optimize the management system and mechanism

1. deepen systemic reform,
2. raise external openness level.

### F) further implement science & education stimulation and resourceful professional strategy, cultivate continual development force

1. reinforce science & technology innovations,
2. strengthen informationalization,
3. enhance academic institution construction,
4. reinforce human resources.

### G) further promote the industry's cultural construction to raise its soft power

1. adopt multi-format, widely deepen initiation of continual safety concepts to establish promotional education on strong civil aviation nation strategy,

2. continue to host better strong civil aviation nation forums to build exchange platforms on industrial cultures,

3. fully employ the functions of civil aviation industry's cultural construction & broadcasting council, national civil aviation committee & national civil aviation labor union, to organize and hold various activities,

4. serious initiation of research on industry's core value system, to intensify industrial spirits, to sum-up and pass-on civil aviation safety & service cultures, and

5. vigorously promote the establishment of sincerity; to build a perfectly sincere management system and binding mechanism to promote healthy development of the industry.

一深化航班延误专项整治, 千方百计提高航班正常率。

二建立服务质量监管长效机制, 做好消费者权益保护工作。

三继续全力做好重大、紧急、特殊航空运输和假日航空运输保障工作。

### 3. 进一步加强基础设施建设和资源集约利用, 实现规模效率相统一

一抓好基础设施建设, 提高设施设备利用效率。

二控制运力过快增长, 提高飞机“三率”水平。

三优化空域结构, 提高空域利用效率。

四推进节能减排, 提高能源利用效率。

### 4. 进一步完善市场管理政策和财政政策, 增强发展协调性

一完善航空运输市场管理政策。

二完善通用航空政策体系。

三完善民航财经政策体系。

四继续发挥地方建设发展民航的积极性。

### 5. 进一步推进改革开放, 完善管理体制机制

一深化体制改革。

二提高对外开放水平。

### 6. 进一步实施科教兴业和人才强业战略, 培植持续发展后劲

一加强科技创新。

二加强信息化工作。

三加强院校建设。

四加强人才工作。

### 7. 进一步推动行业文化建设, 提升行业软实力

一采取多种形式, 广泛深入开展持续安全理念、建设民航强国战略宣传教育。

二继续办好民航强国论坛, 搭建行业文化建设交流平台。

三充分发挥民航行业文化建设与传播理事会、全国民航团委和全国民航工会的作用, 组织开展各类文化建设活动。

四认真开展行业核心价值体系的研究, 提炼行业精神, 总结和传承民航安全文化和服务文化。

五大力推动行业诚信文化建设, 建立完善诚信管理制度和约束机制, 促进行业健康发展。



## China Academy of Civil Aviation Science and Technology Established Formally

### 中国民航科学技术研究院隆重成立

Jan. 10, 2011, the establishment celebration of CAAC's first integrated science & technology institute---China Academy of Civil Aviation Science and Technology---was ceremoniously held at the Great Hall of the People in Beijing. Liu Yandong, Committee Member of CPC Central Committee Political Bureau & State Councilor, attended and delivered an important speech at the event. Wan Gang, Vice Chairman of the Chinese People's Political Consultative Conference and Minister of the Ministry of Science and Technology of the People's Republic of China, Deng Nan, Routine Deputy Chairwoman of the China Association for Science and Technology, Huang Wenping, Deputy Director of the State Commission Office for Public Sector Reform, Jiang Xiaojuan, Vice Minister for Research Office of the State Council, Cheng Hong, Deputy Mayor of Beijing, Yao Jiannian, Deputy Director of the National Natural Science Foundation of China, Li Jiexiang, Minister of Civil Aviation Administration of China, Wang Changshun, Deputy Minister of CAAC, primary leaders from various civil aviation enterprises and others, nearly 500 guests, attended the ceremony. Xia Xinghua, Deputy Minister of CAAC presided the event.

Li Jiexiang requested that the China Academy of Civil Aviation Science & Technology made contributions to the safety and high efficiency development of civil aviation, to raise China civil aviation's competitive ability internationally, and to the development of China aviation manufacturing industry.

1月10日，中国民航第一所综合性科学技术研究院——中国民航科学技术研究院成立大会在北京人民大会堂隆重举行。中共中央政治局委员、国务委员刘延东出席大会并发表重要讲话。全国政协副主席、科技部部长万钢，中国科协常务副主席邓楠，中编办副主任黄文平，国务院研究室副主任江小涓，北京市副市长程红，国家自然科学基金委员会副主任姚建年，民航局局长李家祥，副局长王昌顺，来自民航各企事业单位的主要领导以及业外嘉宾近500人出席了成立大会。会议由民航局副局长夏兴华主持。

李家祥要求民航科学技术研究院要为民航的安全发展做贡献；要为民航的高效发展做贡献；要提高中国民航的国际竞争力做贡献；要为中国航空制造业的发展做贡献。

## China Occupied Two of the Top Four Spots in Global Civil Aviation

### 全球民航前四位国内夺两席

After several changes on the 2010 ranking of global civil aviation industry, with strong recovery in Asia-Pacific regions especially China, at the end of 2010, China became the leading country in global aviation industry.

Overseeing the capital market performances on airline companies worldwide, Air China Limited, with a market value of US \$20 billion, ranked first among all airlines, followed by Singapore Airlines and Cathay Pacific Airways Ltd., China Southern Airlines Company Limited ranked fourth with a market value of US \$11 billion. Airline companies in China were not the world's largest in structural scale, but the powerful growth of China's economy and the developmental potential of China's aviation market have investor's faith on airlines of China.

2010全球民航业排名数度更替后，2010年末，因亚太地区尤其是中国地区的强劲复苏，全球航空业头把交椅落座中国。

综观全球航空公司在资本市场的表现，中国国际航空公司以200亿美元的市值高居全球航空公司榜首，其次是新加坡航空、国泰航空。中国南方航空公司以110亿美元的市值位列第四位。就规模而言，中国的航空公司并不是全球最大的航空公司，但中国经济的强劲增长和中国航空市场的发展潜力，令投资者看好中国航空公司。



# 2011

China Civil Aviation Development Forum

## 中国民航发展论坛

## Accelerating the Transformation of Global Civil Aviation

### 民航业与转变经济发展方式

May 11-12, 2011  
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# International Aircraft Manufacturer: Continue to be Optimistic on China's Regional Aviation Market

## 国际飞机制造商：持续看好中国支线航空市场

Embraer S.A., an aircraft manufacturing company from South America, announced its signing agreement with CDB (China Development Bank) Leasing Co. for selling ten E-190 jets. The aircraft would be delivered starting the second half of this year, and would be operated by China Southern Airlines Company Limited for various regional routes in Xinjiang Uygur Autonomous Region.



巴西航空工业公司，这家来自南美的飞机制造公司宣布与中国国银金融租赁有限公司签订了出售10架E-190喷气飞机的协议。这批飞机将从今年下半年开始交付，由中国南方航空公司运营，执飞新疆各条支线。

“我们对中国支线航空市场未来的发展充满信心。”巴西航空工业公司中国区

“We are fully confident on the future development of China's regional aviation market,” said Guo Qing, Vice President of Marketing & Strategy of Embraer S.A. in China.

This is the first contract deal for Embraer S.A. after CAAC announced the waiver of airport management construction fees on certain domestic regional flights that are operated by feeder aircraft beginning Jan. 1, 2011.

Thus far, Embraer S.A. has 80 aircraft of various models launched into operation in China market; after signing this new order, Embraer would subsequently deliver twenty-nine E-190 aircraft to China in the next few years. Guo Qing stated that Embraer would anticipate optimistically next towards having the policy-supported, enormous potential regional aviation market in China.

市场及战略副总裁郭青说。

这是巴西航空工业在今年中国民用航空局免征部分支线航班机场管理建设费后公布的第一笔订单。就在今年初，民用航空局下发通知，宣布自1月1日起支线飞机执飞的国内支线航班机场管理建设费予以免征。

截至目前，巴西航空工业公司已有80架各型号飞机投入中国市场运营，此次新订单签署后，公司在未来几年里将向中国市场陆续交付29架E-190飞机。郭青表示，巴西航空工业公司下一步将继续看好拥有政策支持、潜力巨大的中国支线航空市场。

simplifying business plan launched by IATA, the whole industry saved US \$55 billion or else the deficit might reach US \$105 billion. In 2010, the whole industry's profit margin was only 2.7%. If a large payoff is wanted for the shareholders so that they continue to be confident in doing the business, the investment return has to be 7-8% at least. Judging from this year's situation, the profit margin might even drop to 1.5%.

Meanwhile, Mr. Bisignani gave a more confident prediction: the anticipated 2011 global aviation industry profit would reach US \$9.1 billion, within which US \$4.6 billion comes from Asia. Among the present top five airline companies worldwide, Asia has four. Ranking #1 is China's Air China Ltd., which worths US \$20 billion; Chile and Brazil rank 2nd with US \$15 billion; Singapore Airlines occupies the 3rd spot; Cathay Pacific Airways Ltd. of Hong Kong makes the 4th while China Southern Airlines Co. Ltd. being the top 5th with a market value of US \$11 billion. What presently predictable is the international air travelers volume would have increased 0.8 billion persons at 2014. But we should also see the tremendous impact on fuel price towards the development of aviation industry; for example, airline companies of the whole aviation industry had put in US \$135 billion just for crude oil last year. View from the present situation, oil price is at an incessant rise. For every one US dollar increase in oil price, airline companies worldwide might need to spend an extra US \$1.6 billion.

Now that we know civil aviation has become more useful and selected transportation during the Spring Festival, there might be 360 million aviation industry related passengers at 2014 in China; how should aviation industry, including civil aviation, handle the situation then? Mr. Giovanni Bisignani said that enough exploration of the stimulated economic growth potential needs the highly efficient transport management, and a tight cooperation of every country is needed in providing the highly effective airport facilities and aviation businesses.

协推出的简化商务项目，整个行业节省了550亿美元，否则航空业将亏损高达1050亿美元。在过去的2010年，整个行业的利润率只有2.7%，其实如果想要股东有丰厚的回报，有继续的信心来从事这样一个事业的话，那么股东的回报率至少要在7%到8%。从今年的情况来看，今年的利润率可能还会下降到1.5%。

不过乔瓦尼·比西尼亚尼先生也给出了一个让人比较有信心的一个预期：2011年预计全球航空业收益将达到91亿美元，其中有46亿将是来自亚洲的。拿目前排名前5位的航空公司来说，亚洲有4个，排名第一的就是我们的国航，现在它的总市值有200亿美元，第二位是智利和巴西有150亿美元，第三位是新加坡，第四位是香港国泰，第五是中国南航，市值达到110亿美元。现在可以预期的是，到2014年的时候国际航空旅客运输新增8亿人次。但是人们也应该看到，航空业的发展受油价的影响是非常大的。比如说在去年的时候，整个航空业的航空公司在原油方面就投入了1350亿美元。从现在的情况看，油价处于一个不断上升的趋势。油价每上升1美元，全球的航空公司可能需要多支出达到16亿美元。

现在我们知道，在春运当中民航发挥的作用越来越多，选择民航出行的人也越来越多了，到2014年可能有3.6亿人是与中国的航空业有关的旅客，到时候航空业包括民航该怎么应对呢？乔瓦尼·比西尼亚尼先生说，充分挖掘由此带来的经济增长潜力需要高效的运输管理，并且提供增加高效的机场设施和航空业务，需要各国加紧合作。

# IATA Director-General Visited China Anticipated Aviation Future Rather Dim

## 国际航协理事长到访中国 预期航空前景黯淡

The Director-General of International Aviation Transport Association visited China and held a press conference; he predicted the situation of global aviation industry is rather dim.

At the conference, Mr. Giovanni Bisignani, Director-General & Chief Executive Officer of IATA, stated that the aviation industry's deficit reached US \$50 billion under the crisis influence of the past ten years, but with the

国际航空运输协会理事长3月份到访中国并举行媒体见面会，就全球航空业给出了“前景黯淡”的预期。

在见面会上，国际航协理事长兼首席执行官乔瓦尼·比西尼亚尼先生介绍说，受过去十年危机的影响，航空业亏损达到500亿美元，但是随着国际航

**DYNASAFE**  
Safety is our business  
气密性防核生化排爆罐

机场作为恐怖主义与恶意袭击的首要目标，恐怖主义带来的威胁不只局限于爆炸装置，有毒气体、生化病毒甚至“脏弹”的核辐射成为新的威胁，DYNASAFE 能为机场的每个区域都提供安全设备。从简单的抑制罐，到全方位的气密性排爆罐，这种全方位的排爆密封系统，不仅可以抑制整个爆炸而且可以防止毒气与核辐射的泄漏。设备成功应用在北京、广州、深圳和澳门的公安系统。

最大可容纳物体体积：1400mm×800mm×600mm

北京海润创业科技有限责任公司  
地址：北京朝外大街22号泛利大厦 1512B  
邮编：100020  
电话：010-65885796 010-65885797  
传真：010-65885823  
Email: alea@vip.163.com

最大可容纳物体体积：1100mm×800mm×650mm



## Aviation Safety Management Manual Implemented 《航空安全管理手册》实施

Jan. 6, 2011, written and assembled by CAAC North China Regional Administration for more than nine months with four million words, the Aviation Safety Management Manual was issued officially for implementation. CAAC Minister Li Jiaxiang attended the initiation event and unveiled the Manual.

Li Jiaxiang emphasized that the implementation of the Aviation Safety Management Manual has enormous significance in accomplishing the raised standard of safe management through utilizing the Manual. The issued implementation of the Manual marked that North China Regional Administration's safety management has transformed gradually from rules & regulations in accordance to risk management and safe performance supervision based on rules & regulations.

It would cast an important effect on further improving the safety management system, standardizing administrative execution, raising safety management standards, and structuring a long-term, effective mechanism on safety management.

1月6日，中国民用航空华北地区管理局（简称“华北局”）编写9个多月、长达400万字的《航空安全管理手册》（以下简称《手册》）正式颁布实施。中国民用航空局简称“民航局”）局长李家祥出席《手册》启用大会，并为《手册》揭幕。

李家祥强调，华北局颁布实施《航空安全管理手册》意义重大，要通过启用《手册》，达到提升安全监管水平的目的。

《手册》的颁布实施，标志着华北局安全监管逐渐从规章符合性向以规章为基础的风险管理和安全绩效监管转变，对于进一步完善安全监管体系，规范行政执法行为，提升安全管理水平和构建安全监管长效机制将起到重要作用。

## Airport Construction Fees for Regional Flights are Waived Starting Jan. 1, 2011

### 2011年1月1日起 免征支线航班机场建设费

国家有关部门批准，自2011年1月1日起，免征支线飞机执飞国内支线航班机场管理建设费。该政策将对优化中国支线航空发展政策环境具有重要意义。

根据规定，此次纳入免征范围的支线机型包括国产新舟60、CRJ200在内的8种支线飞机。这些支线飞机执行的航班涉及航线844条，连接29个省（区）的129个机场（其中：中西部省份占64%，吞吐量200万人次以下的中小机场占71%）。预计每年将有近1000万旅客受惠于此项政策。免征政策的实施将会有效促进中国民航事业全面协调发展。



Approved by nation's concerned department, starting Jan. 1, 2011, airport management and construction fees were waived for all feeder aircraft conducting the domestic regional flights. Such policy would bear significant meaning towards optimizing China's regional aviation developmental policies and situation.

According to the rules, eight models of feeder aircraft, including the domestic-made Modern Ark 60 (MA60) and CRJ200, are incorporated into the waiver program. The aircraft operated regional flights on 844 routes that connected 129 airports (64% in mid-western provinces, 71% medium-small airports with passenger volume below 2 million) in 29 provinces. Nearly 10 million travelers annually would benefit from the waiver policy, and its implementation would effectively promote the overall coordinated development on China's civil aviation industry.

## 空管雷达监测的重要性与检测方式

作者：张立国

### 前言

作为空管的主要组成部分，雷达和ADS-B系统的方位数据的建立是保障管制空域内应用飞行器标准间隔的主要手段，二次监视雷达是依赖于飞机应答机发送的回复信号获得飞机的位置信息；最新发展的ADS-B设备，是依靠来自GPS系统的获得飞行器的位置信息。显而易见，这些系统的最佳功能就是为保障航空安全提供必要条件。那么这些监视系统的质量评估和性能监测也就成为能否提供安全高效的空中交通控制的关键。

随着雷达系统的复杂程度越来越高，雷达现场的环境不断变化，加之不断增加的空中交通流量和垂直间隔的缩小，使得ATC系统的总体质量控制变成一项极端重要但又十分困难的任务。因此对这些设备定期进行检验和维护，检查其性能指标是否符合要求，在第一时间掌握雷达状态是至关重要的工作。一旦雷达设备出现性能下降的现象，将影响到飞机的识别，从而造成飞行管制中的严重后果。但国内目前尚缺乏针对航管雷达定期测量的相关方法和设备。本文主要针对目前民航使用的雷达，讨论并介绍经欧美国家验证和ICAO推荐的航管雷达检测技术，为雷达系统性能评估提供重要的判别方案，更好地保障雷达设备安全正常地运行，保障雷达管制的可靠和有效。

### 一、雷达检测技术简介

航管雷达是一种高复杂度、高精度的设备，这些设备的安装、验收、调试或部分零件的翻新整修都需要专用工具。直到目前为止，这些工作主要倚赖传统的实验室设备，如示波器、频谱分析仪、功率计等标准射频设备来完成，一线的工程技术人员往往采用统计参数的方法分析雷达的错误源，不断替换可疑的元器件，直到设备正常。这种方法既费时又费钱更重要的是被维修雷达通常要停机几天，给空中交通管制工作带来许多困难。

上世纪90年代，欧控组织在全球招标希望在工业上开发出能够在探测设备运行环境下测试的工具和方法。比利时Intersoft-Electronics公司提出的对雷达链路自上而下的检测理论，能检查每个单元的工作状态，并获得欧控组织的认可。目前RASS-S雷达工具箱已成为唯一被欧洲民航管理局（CAA）、美国联邦航空局（FAA）、欧控组织（Eurocontrol），以及各大雷达制造商（EADS、洛克西德马丁、雷神、泰雷兹等）与其他空管服务供应商所认可的独立于第三方的雷达质量分析与支持系统，在世界管制雷达范围内得到了广泛的应用，是对民用雷达检测的必备工具，并在过去几年里被进一步应用于军用雷达的检测。RASS-S作为独立于雷达制造商以外的测试系统；无需介入详情只需提供标准配置的内容，被测试的设备通常无需中断其运行，硬件设备和软件工具可协助工程师完成雷达信号的测量与采

集，实现对雷达一系列电气参数的检测、分析和处理。

### 其特点和利益：

- 设备能用于每个制造商的雷达，且独立于雷达制造商以外，减少对生产厂家的依赖
- 快速、准确评估每个组成单元，记录分析重要信号，提供综合测试报告
- 可在雷达运行状态下测试，减少现场测试时间
- 实现故障的早期发现，做到预防性维修，节约维护开支

### （一）雷达检测系统的组成

雷达分析支持系统主要用于雷达系统的全面检测评估。该系统主要分成三大系列，包括RASS-S系统，RASS-R系统和雷达升级系统（RADAR UPGRADES），其中RASS-S雷达现场分析支持系统，用于雷达或ADS-B系统自上而下的各个组成单元的全面检查；RASS-R雷达实时维护与监测系统，用于雷达站和处理中心的日常维护与监测，可对雷达现场或管制中心的雷达信号质量进行记录和分析；RADAR UPGRADES 雷达升级产品，用于一、二次老雷达的技术升级，主要针对录取器信号处理能力和雷达循环运行的扩展能力。

### （二）雷达分析支持系统RASS的功能



1、系统能够从雷达现有的数据输出接口（串口或网口）中记录各种格式的雷达数据，并对雷达数据进行回放、统计和质量分析，为雷达性能优化提供可靠的系统性能诊断数据和分析报告。

2、系统能够记录并处理用户要求的任何格式的雷达信号。在用户对雷达格式没有提出特别要求时，至少应能记录以下厂家生产的一次、二次以及一/二次合装雷达数据：

- Thales雷达
- Raytheon/Cossor雷达
- ALENIA/AMS/Selex雷达
- TOSHIBA雷达
- Westinghouse/Northrop Grumman雷达
- Telephonics雷达
- Indra雷达
- 中国制造雷达

3、系统能通过统计和质量分析，得出以下雷达性能指标：

- 距离误差
- 距离分辨率
- 方位误差
- 方位分辨率
- 目标检测概率
- 假目标
- 非同步干扰 (Fruit)
- 3/A码和C码的代码有效性
- 目标高度和速度的连续性
- 雷达垂直覆盖和水平覆盖
- 反射物

4、系统具有雷达数据传输协议分析功能；包括：信息正北丢失检测，信号扇区丢失检测，信号中断或丢失字节检测，信号周期检测；

5、系统具有S模式数据分析功能；

6、系统能以图形、表格和文字说明的形式提供统计和质量分析报告；

7、在原有硬件平台故障或损毁等不可用的情况下，系统上的所有应用软件能通过厂家提供的恢复光盘安装到新的硬件平台上；

8、系统具有独立的主机、显示和人机操作界面设备；

9、系统具备多种雷达信号和数据转换接口，能与多种雷达信号和数据输出相匹配，接口包括：RS-232、RS-422、

RS-485和RJ45等。

10、能够测量天线的水平极化图、垂直极化图；

11、能对雷达发射波形进行分析，包括：3dB波束宽度、交叉点、击穿点、第一旁瓣电平、背瓣电平、最大旁瓣电平、OBA记录等；

12、能够测量接收机的动态范围、灵敏度、接收机带宽、响应曲线、STC或DSTC曲线、GTC曲线；

13、射频测试，包括：旋转铰链的发射、插入损耗、VSWR，射频电缆的插入损耗、VSWR，电缆的相位测量比较；

14、能对天线转台的机械性能和编码器的性能进行测量分析，包括编码器、旋转装置、ACP和ARP误差、稳定性和风力载荷；

15、能够对雷达原始视频数据进行记录和回放，进行点迹分析。

## 二、检测方法及其可取得的结果

利用雷达现场分析支持系统 (RASS-S)，可为航管一、二次监视雷达进行现场自上而下全面检测与分析。RASS-S系统配置可涵盖整套雷达系统：从雷达射频信号直到雷达信号串口输出；在短时间内即可对所有信号加以测量并分析。



(图一)



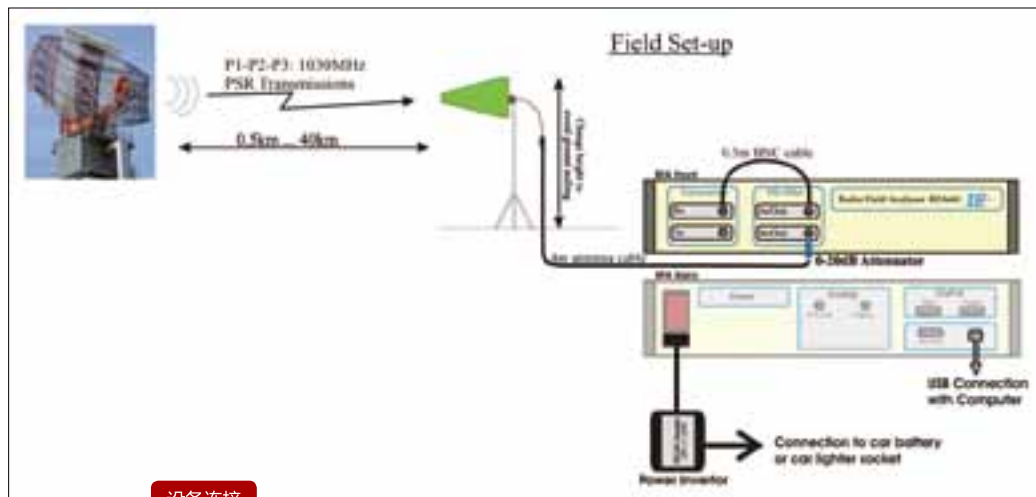
(图二)

RASS-S6系统基本配置主要由五个部分组成(图一)：雷达现场分析仪 (RFA641)；雷达射频测试仪 (RFT646)；雷达接口模块 (RIM782)；雷达数据记录仪 (UDR600)；雷达陀螺仪和倾角计 (RGI596)。

### 1、天线系统测试 (以雷达天线发射波瓣测试为例)

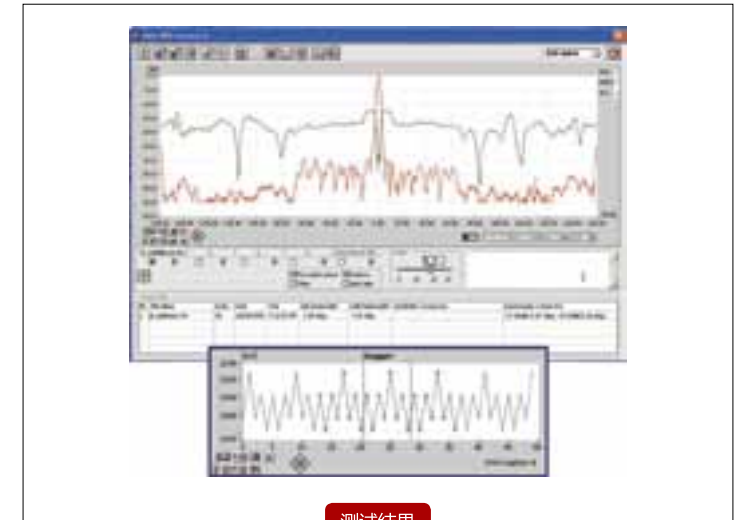
**目的：**获取天线水平波瓣图 (上行链路)，检测天线发射性能。

**原理：**记录天线辐射脉冲，根据P1/P3和P2脉冲能量和天线旋转周期，计算出天线 (SUM/SLS通道) 波瓣图。波瓣图中提供了主瓣3db波束宽度、旁瓣电平、击穿信息等参数。



设备连接

在距离雷达0.5~40公里外场选择测试点，要求测试点处可见雷达天线。垂直极化天线对准天线，射频线缆经YIG滤波器连接至RFA (外场测试仪) RX端口，RFA使用USB线缆连接主机 (运行RASS-S软件工具)。

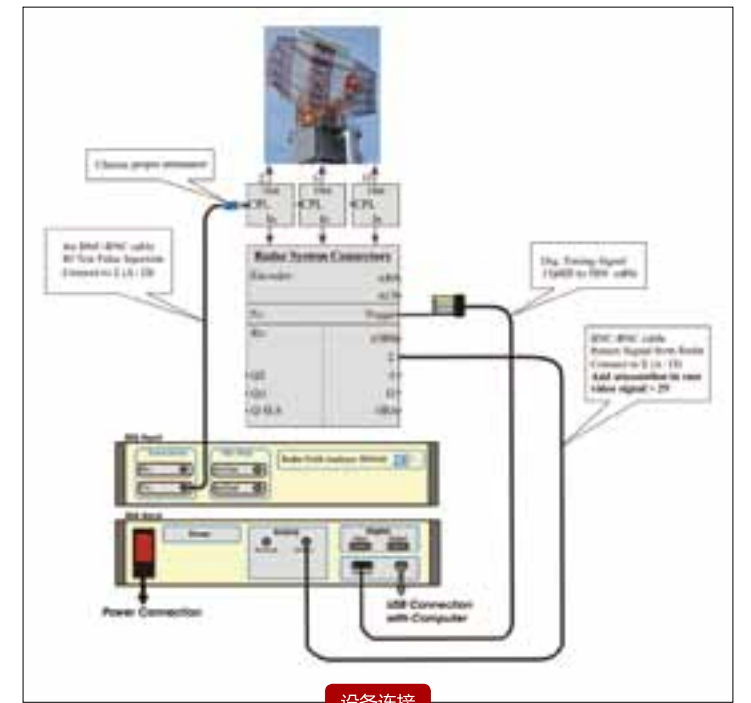


测试结果

### 2、接收机测试 (以接收机带宽扫描为例)

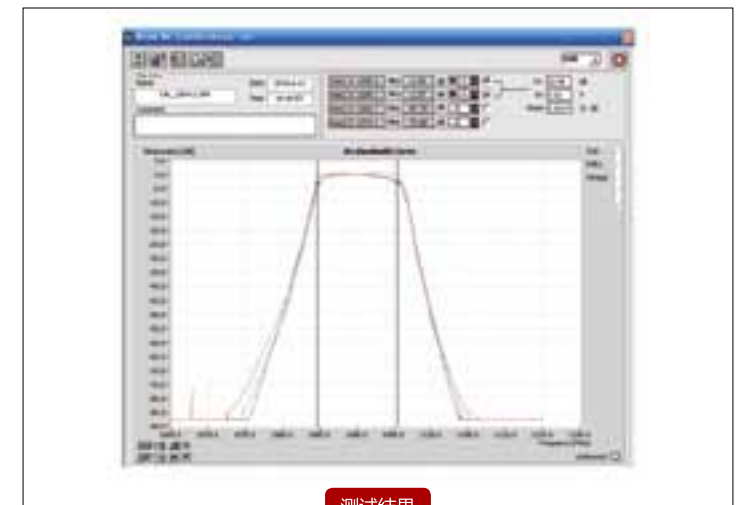
**目的：**获取接收机通道的带宽响应曲线。

**原理：**向接收机注入测试信号，测试信号频率在设定的范围内由低向高渐变，在输出测试端对输出信号能量进行检测。分别计算出3个通道的“能量衰减”相对于“频率”的坐标图。通过此图可以查看接收机带宽和通道间带宽匹配。



设备连接

RFA的Tx端口连线到接收机前级，接收机视频输出 (测试端口) 连接到RFA的Analog Ch2端口，将Trigger连接到RFA的Digital Azimuth端口，RFA通过USB线缆与主机 (运行RASS-S) 连接。



测试结果

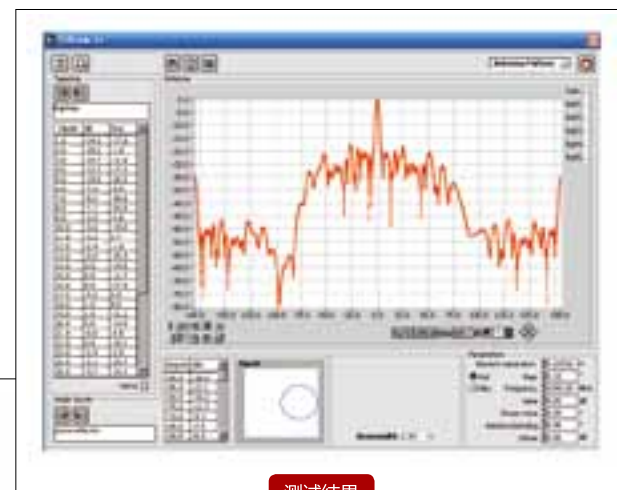
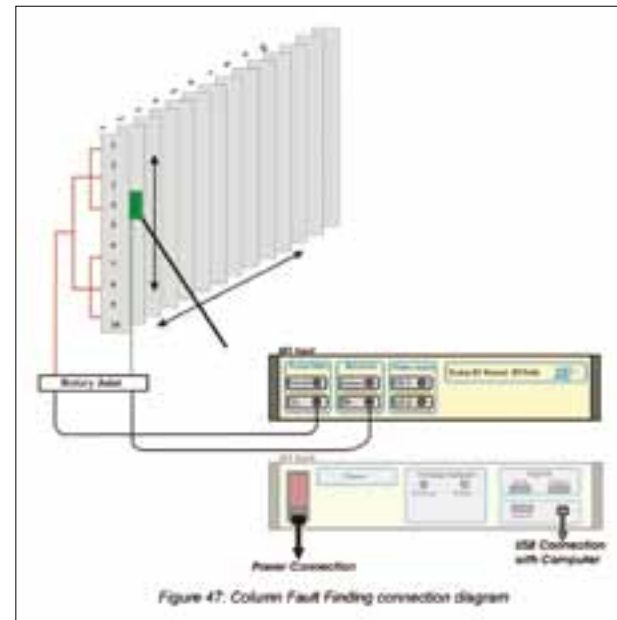


### 3、射频传输系统测试（以LVA天线扫描为例）

**目的：**获取“被检测RF器件”通过波的“能量衰减”和“相位”响应曲线，获取天线水平/垂直波瓣图（LVA天线扫描）。

**原理：**向“被检测RF器件”出入测试脉冲，测量器件输出信号的能量衰减和相位变化；在“LVA”天线扫描测试中，根据天线各馈列的“能量衰减”和“相位”构建天线水平波瓣图，根据天线馈列各偶极点的“能量衰减”和“相位”构建天线的垂直波瓣图。

测试对象为一支10db的衰减器，经TX口向衰减器注入一组测试脉冲（起始频率1000Mhz，终止频率1060Mhz），RX接收衰减器的输出信号。系统对输入输出信号进行比对计算，生成衰减曲线图（“衰减”相对于“频率”）和相位曲线图（“相位”相对于“频率”）。

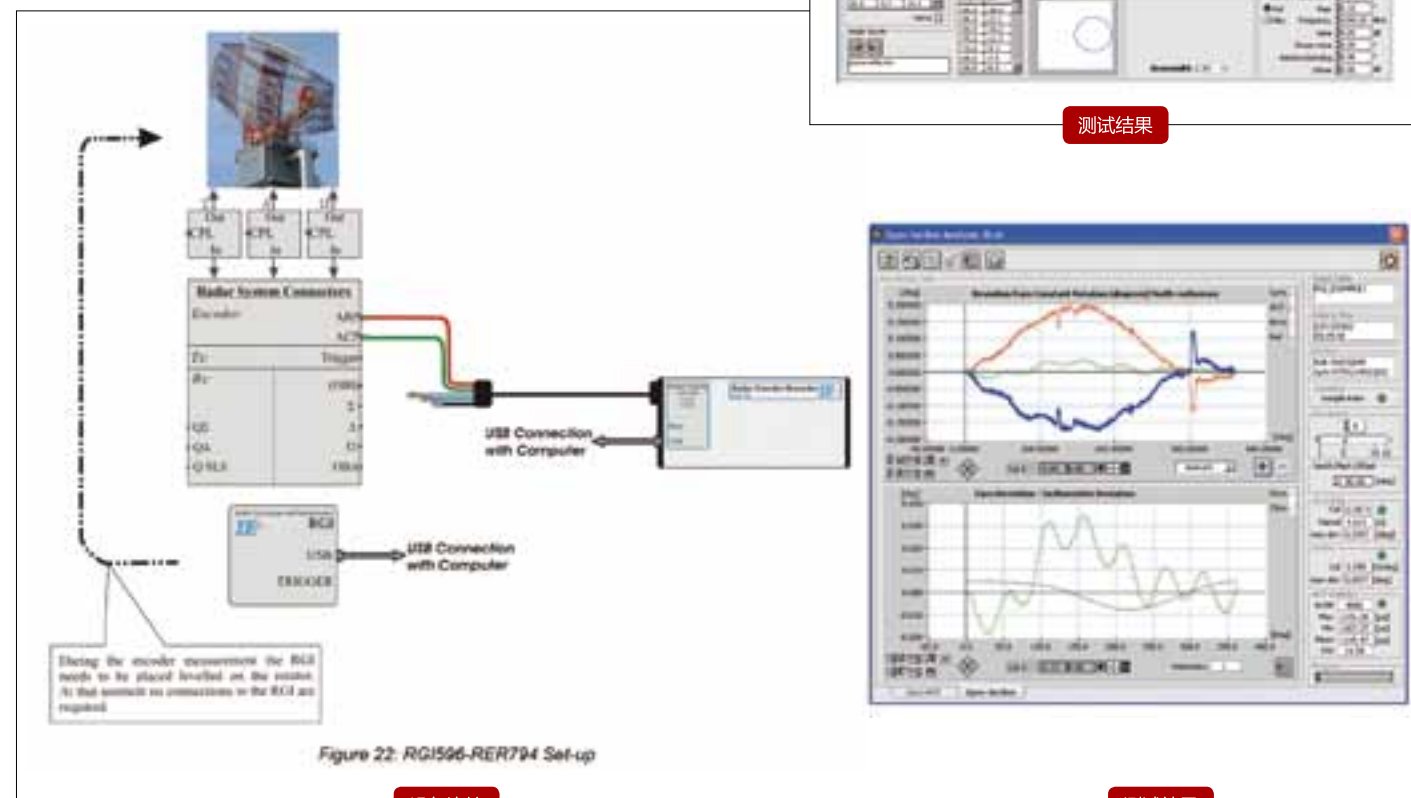


测试结果

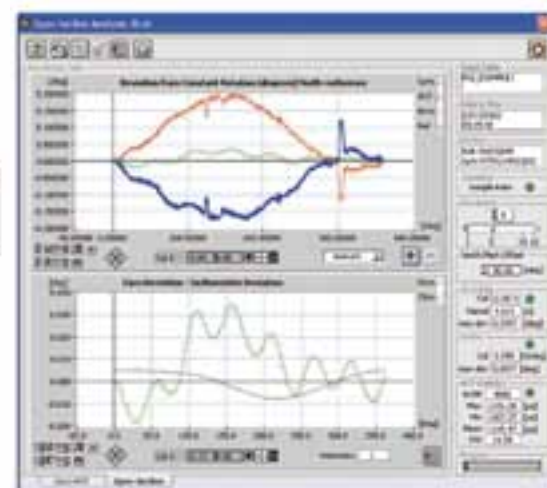
### 4、天线机械部分稳定性测试

**目的：**获取编码器和机械系统准确性曲线图。

**原理：**使用陀螺仪和倾角计测量机械系统偏差、计算编码器误差。

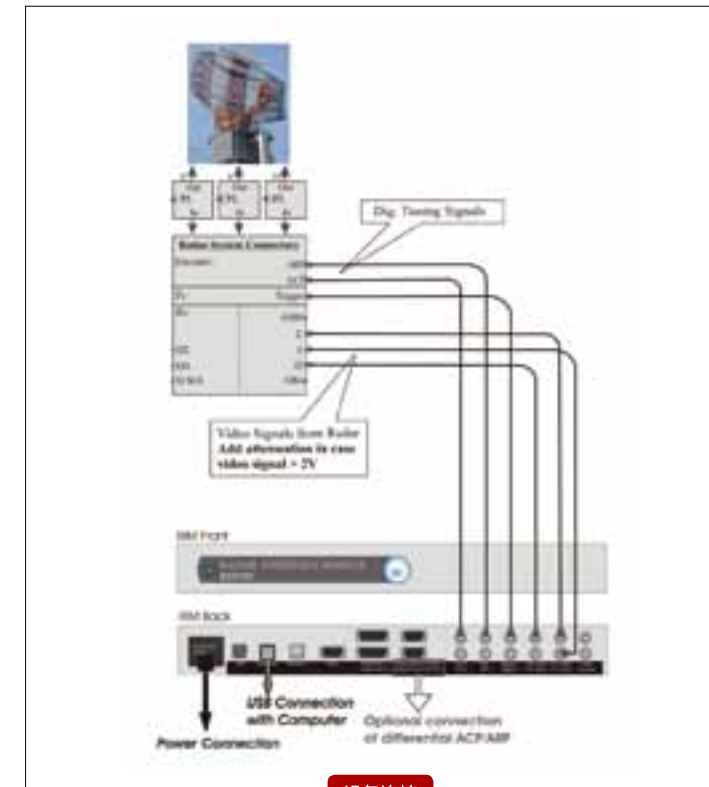


设备连接



测试结果

天线馈列测量的搭建，使用射频线缆连接RFT的TX端口到天线发射端口，向天线发射测试信号（始频率1000Mhz，终止频率1130Mhz），连接RX端口到测试手柄，逐个扫描接收天线各馈列的辐射信号，生成天线水平波瓣图。

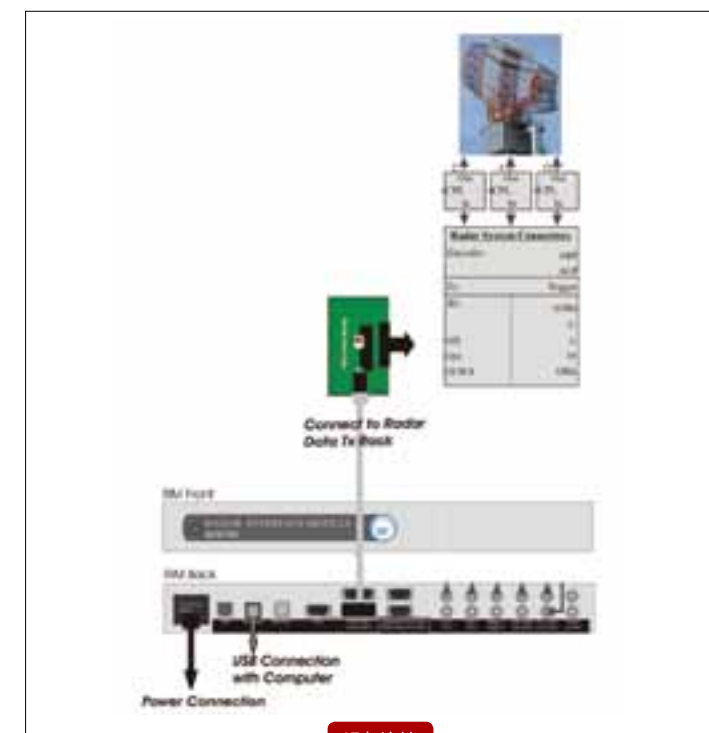


设备连接

### 6、数据记录

**目的：**记录雷达数据

RASS-S 工具箱支持许多功能的雷达串行数据记录和转换，现在通用的几种雷达数据记录都可以应用这个工具记录，将雷达数据数输出（RS232或RS422）连接至RIM 的Data1端口，RIM的USB data 连接主机。

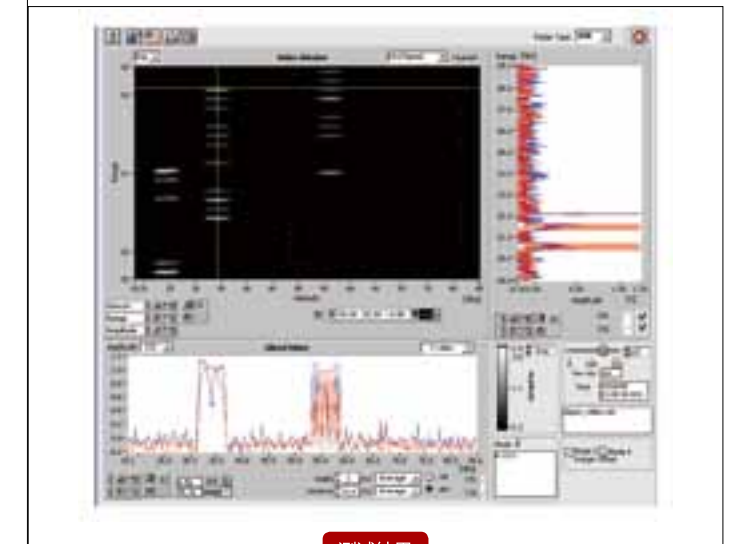


设备连接

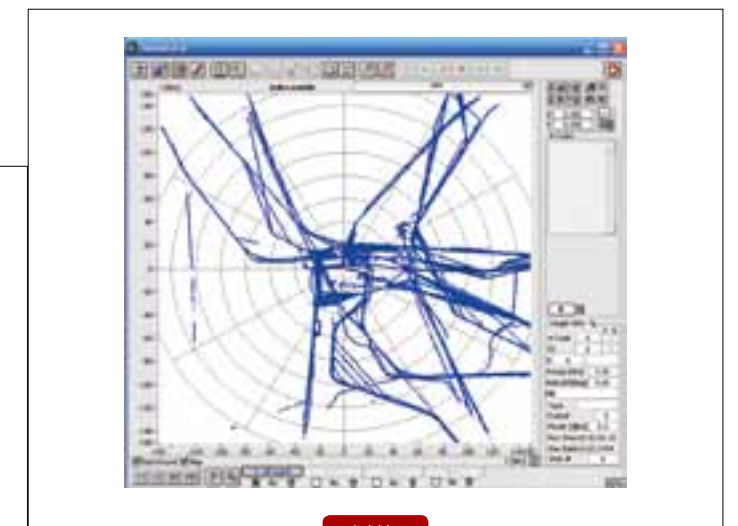
### 5、视频信号记录

**目的：**记录雷达视频信号

将接收机视频输出（测试端口Sum、Delta、Omega）连接到RIM的Ch1、Ch2、Ch3端口，将Trigger、ACP、ARP连接到RIM的Trigger1、ACP1、ARP1端口，RIM通过USB线缆与主机（运行RASS-S）连接。



测试结果



测试结果

### 结束语：

航管雷达作为空中交通监视和控制的主要设备，对其性能参数进行有效的评估有着十分重要的作用。雷达分析支持系统采用模块化设计，结合计算机系统和软件工具构成实用、可靠的检测平台，可快速采集雷达的电气参数，并通过功能强大的软件实现记录、分析和显示，为评估雷达性能指标提供重要的判别依据，保障航管雷达设备安全正常运行。



## Beijing Capital International Airport and Chicago O'Hare International Airport Become Sister Airports 首都机场与芝加哥奥黑尔机场缔结姊妹机场

In March, Beijing Capital International Airport and Chicago Department of Aviation jointly signed a 'Memorandum of Becoming Sister Airports', officially established the friendly cooperation relationship. Such signing would enhance further cooperative exchanges on aspects of hub establishment, airport planning and airport management, motivate exploration and realization on environment friendly airport and sustainable development, and ceaselessly open the swiftly developed asian aviation market.

Beijing Capital International Airport and Chicago O'Hare International Airport rank the second and third busiest airport in the world respectively, and have been maintaining close communication for a long time. Last year, there were 3.155 million passengers from China to America or from America to China, increasing 33% compared to the year 2009. 11 American airports can be reached from Beijing with 72 flights per week. Becoming Sister Airports with Chicago O'Hare International Airport is another important step in Beijing Capital International Airport's internationalization development process. O'Hare Airport takes being construction of the 21st century airport as its goal, sets a good example in aspects of modernization revamp, hub construction and airport planning for the global aviation community, and has achieved good results in sustainable development and construction of environment friendly airport.

General Manager Dong Zhiyi of Capital Airports Holding Company expressed at the signing ceremony that, in the just-concluded year 2010, the passenger throughput volume of Capital Airport reached 73,948 million, maintaining 2nd place in the world, ranking 4th place in terms of ACI customer satisfaction, and ranking 2nd place among airports with passenger throughput volume up to 40 million, which makes it the first domestic SKYTRAX four-star airport. Capital Airport hopes to enhance further cooperative exchanges on aspects of each other's city development, economy and culture, airport operation, airport management and business management, etc. by this cooperation, and also hopes to make motivate exploration and realization on new technologies and new concepts, and ceaselessly open the swiftly developed global aviation market, establishing an efficient and smooth air bridge for economic and trade exchanges between China and America.

Up till now, Beijing Capital International Airport have established friendly cooperation relationship with ten international airports, that is, Chicago O'Hare International Airport, Airports of Thailand Public Company Limited, Hong Kong International Airport, Eleftherios Venizelos International Airport, Singapore Changi Airport, Aéroports de Paris Management, Canada Vancouver International Airport, Japan Narita International Airport, Sydney Kingsford Smith International Airport and the Netherlands Amsterdam Airport Schiphol.

General Manager Zhang Guanghui and Secretary of the Communist Party Committee Li Xiaomei of Beijing Capital International Airport Co. Ltd. and Commissioner Rosemarie S. Andolino of Chicago Department of Aviation attended the signing ceremony.

3月,北京首都国际机场与芝加哥航空局共同签署了《北京首都国际机场股份有限公司与芝加哥航空局缔结姊妹机场备忘录》(以下简称“备忘录”),正式缔结友好合作关系。签约后,双方将在枢纽建设、机场规划、机场管理等诸多领域进一步加强合作交流,并推动双方在绿色机场、可持续发展等方面的探索与实践,不断开拓快速发展的亚洲航空市场。

首都机场和芝加哥奥黑尔机场分别是位列世界上最繁忙机场第二、三位,长久以来保持着密切交流的友好关系。2010年,往来于中国-美国的客流达315.5万,同比增幅达33%,是中国往返于美洲的最佳“国家对”。由北京始发可前往11个美国航点,周频达72班。与奥黑尔机场结为姊妹机场,是首都机场国际化发展进程中的又一项重要举措。奥黑尔机场以建设二十一世纪机场为目标,在现代化改造、枢纽建设、机场规划方面为全球航空界做出了表率,并在可持续发展、绿色机场建设等方面取得了卓越的成绩。

首都机场集团公司总经理董志毅在签约仪式上表示,在刚刚结束的2010年,首都机场旅客吞吐量达到7394.8万人次,稳居全球次席;ACI旅客满意度名列全球第四位,在4000万级以上机场中位列第二,成为中国内地首家SKYTRAX四星级机场。首都机场希望通过这次合作,能与奥黑尔机场在双方城市发展、经济文化和机场运行、机场管理、商业管理等诸多领域进一步加强合作交流,更加希望能借助这一契机,推动双方在新技术、新观念、新理念等方面的探索与实践,不断开拓快速发展的世界航空市场,为加强中美之间经贸往来架起一座顺畅高效的空中桥梁。

截止目前,首都机场已同包括芝加哥奥黑尔机场、泰国机场集团公司、香港机场、雅典机场、新加坡樟宜机场、法国巴黎机场管理公司、加拿大温哥华机场、日本成田国际机场、澳大利亚悉尼机场、荷兰阿姆斯特丹史基浦机场在内的10家国际机场建立了友好合作关系。

当天,首都机场股份公司总经理张光辉、首都机场股份公司党委书记李小梅、芝加哥航空局局长罗塞玛丽·安多里诺等出席了签字仪式。

## Mutual Recognition of Civil Aviation Education Across the Strait Made an Ice-Breaking Fulfillment 海峡两岸民航教育学分互认实现“破冰”



In February, the 1st ten graduates of Civil Aviation University of China went to China University of Science and Technology in Taiwan to start their one-semester learning of aircraft maintenance. As understood, this formal selection and sending of students from Civil Aviation University of China to study in Taiwan's University was the 1st among all civil aviation universities nationwide, thus signified the official beginning of current university students' study in Taiwan.

"Actively promote the civil aviation education, science & technology, and cultural exchanges of the two lands are Civil Aviation University of China's responsibilities," said Principal Wu Tongshui. Since 2000, under the huge support of Hong Kong, Macau and Taiwan Affairs Office of CAAC, Civil Aviation University of China fully utilized the resourceful advantages of civil aviation educational trainings, acted and tried first to open actively the program on educational exchanges towards Taiwan; emphasized on propelling civil aviation education and training cooperations across the strait. Several Taiwan-exchange programs were listed as key-focus exchange plans at the Taiwan Affairs Office of The State Council.

In recent years, Civil Aviation University of China and Taiwan's China University of Science and Technology, Kao Yuan University, National Cheng Kung University, Kainan University, Evergreen Airlines Company and Evergreen Aviation Technologies Corp. etc., through mutual visits and communications, teacher-student research learning, hiring guest professor, and hosting seminars etc. to start the diversified cooperative-communicative activities. It has received 120-plus persons of Taiwan university students doing short-term trainings in China, a powerful movement of civil aviation exchange and cooperation between both lands across the strait.

2月,中国民航大学首批10名本科生前往台湾中华科技大学,开始了他们在台湾一个学期的机务维修学习之旅。据了解,民航大学此次成规模地选派学生赴台湾高校研修学分,在全国民航高校中尚属首次,也标志着中国民航大学在校大学生赴台学习项目正式启动。

“积极推进两岸民航教育、科技、文化的交流,是中国民航大学的职责所系。”民航大学校长吴桐水说,自2000年以来,在中国民航局港澳台办的大力支持下,中国民航大学充分发挥民航教育培训的资源优势,先行先试,积极开展对台教育交流项目,致力于推动海峡两岸民航教育和培训的合作,多项对台交流项目已列入国务院台办重点对台交流计划。

近年来,中国民航大学与台湾中华科技大学、高苑科技大学、成功大学、开南大学、长荣航空公司和长荣航太公司等,通过互访交流、师生研习、聘请客座教授、举办研讨会等方式开展了形式多样的合作交流活动,接收120余人次台湾大学生在大陆进行短期培训,有力促进了海峡两岸的民航交流与合作。



## Civil Aviation Administration of China & Brazil Signed a Memorandum of Understanding on Promoting Civil Aviation Safety

### 中巴民航局签署《促进民用航空安全谅解备忘录》

Feb. 15, 2011, Deputy Minister Li Jian of CAAC led a delegation to meet with Director-President Solange Paiva Vieira of ANAC (National Civil Aviation Agency of Brazil). Both parties signed the "Memorandum of Understanding About Promoting Civil Aviation Safety" at ANAC Rio de Janeiro Office after the meeting. Consulate General of China in Brazil, Chen Xiaoling, attended the meeting and signing ceremony upon invitation, major officials of ANAC and members of the Chinese delegation also participated the above activities.

Deputy Minister Li Jian thanked Consulate Chen for attending and witnessing the signing, emphasized that the Chinese Government valued the cooperation of both nations in aviation. The memorandum signing would strengthen further the aviation safety management, enhance aviation departmental exchanges, and promote the actual cooperation on aviation manufacturing industry of China and Brazil; he believed the cooperation between both nation's airworthiness bureaus would also promote cooperation among international civil aviation systems.

2月15日，中国民用航空局副局长李健率团与巴西民航局局长维埃拉举行了会晤，会后双方在巴民航局里约办公室共同签署《关于促进民用航空安全谅解备忘录》（以下简称《备忘录》）。驻里约总领事陈小玲应邀出席了会晤和签字仪式，巴西民航局主要官员及中方代表团的其他成员也出席了上述活动。

李健副局长在会晤中感谢陈总出席并见证签字仪式，强调中国政府重视中巴两国在航空领域合作，此次《备忘录》的签署将进一步加强双方航空安全管理，促进两国航空部门的交流，推动双方在航空制造业开展务实合作等，相信中巴两国适航当局的合作还将推进国际民航体系的合作。

## The Training Base of the 3rd Air Police Team Opened Officially

### 空警三支队训练基地正式启用

February 7, 2011, the training base of the 3rd Air Police Team of Civil Aviation of China was officially opened for operation. Yang Yanmeng, Deputy Head of Air Police Team of Civil Aviation of China, Li Yong, Director of Service Department of Air Police Team, and Assistant General Manager Chen Dezhi of China Southern Airlines Co. Ltd. attended the opening and participated in the ribbon-cutting ceremony.

The training base would formally bear the multipurposes of routine trainings, theories learning, and various meeting hosting for the 3rd branch of the Air Police Team as well as all aviation police safety officers of China Southern Airlines. The Base also provides facility and equipments for Guangzhou based air police safety officers who go for voluntary physical trainings, and air police officers who, from China Southern Airlines' subsidiaries, stay over or post at Guangzhou. The opened Base would greatly promote the training enthusiasm and activeness of vast majority air police officers of China Southern Airlines, and raise their work-related abilities and technical strategy level that contribute long-term effects on Airlines' air defense and safety.



2月7日，空警三支队训练基地正式启用。中国民航空警总队杨延孟副队长、空警总队勤务处李勇处长、中国南方航空股份有限公司陈德志总经理助理出席了空警三支队空警训练基地的启动仪式，并为训练基地剪彩。

该训练基地正式启用后，将正式承担起空警三支队以及南航保卫部所有空警安全员日常训练、理论学习、以及召开各种会议的多重功能，也为广州地天空警安全员自觉进行体能训练提供了场所和条件，同时该训练基地也会为南航各分子公司来广州驻外过夜的空警安全员提供训练场所。该训练基地的正式启用，将会极大的促进南航广大空警安全员的训练热情和训练积极性，提高空警安全员的业务能力和技战术水平，为南航空防安全的长治久安提供保障。

## Official Operation of Sanya Approach Control

### 三亚进近管制的正式运行

Sanya's approach control formally operated on Jan. 11, 2011 at 1PM symbolized Sanya's aviation traffic control service has entered a new milestone, putting up a safer and more stable aerial bridge at Hainan Province's southern air-space.

The Upper Area Control of Sanya Area Control Centre has taken over the task of air-space control of South China Sea at 2000. Great amount of international flights changed routes flying over the sky through Hainan Island and South China Sea, causing a rapid increase in flight volume of 70 thousand movements last year. Until now, with the continual deepening construction of Hainan International Tourist Island, Sanya's existing air traffic control of airspace environment, installations and facilities, and personnel etc. were no longer sufficient to handle the rapid growth of future activities. The aircraft takeoffs-landings conflict was becoming more complicated; in order to resolve the flight conflicts at mid-low altitude airspace, relief the pressure of fast growing flight volume, increase the flow of air traffic, raise the punctuality of flights and lessen the burdens of control officers, Sanya's approach control service has started trial operation on Dec. 20, 2010. Through more than 20 days' trial, every task of the approach control has smoothly passed the assessment by CAAC Central South ATMB and CAAC Air Traffic Management Hainan Branch Bureau, got high appraisal from supervisors and specialists of civil aviation, and Sanya's approach control service got permission to operate officially.

1月11日1时整，三亚进近管制正式运行，它标志着三亚空中交通管制服务进入了一个新的里程，在海南南部空域上架起了更加安全、稳固的空中桥梁。

2000年三亚区域管制中心的高空管制服务接管南海空域的管制任务，大量的国际航班改变航线飞经海南岛和南海上空，航班量快速增长，去年航班量突破7万架次。时至今日，随着海南国际旅游岛建设的不断深入，三亚空中交通管制现有的空域环境、设备设施、人员等条件已不能满足未来业务量快速增长的需求，三亚空域中航空器上升和下降的冲突越来越复杂，为了解决中低空的飞行冲突，缓解航班量快速增长的压力，加大空中交通流量，提高航班正点，减轻管制员的负担，三亚进近管制服务已于2010年12月20日开始了试运行，经过20多天的试运行，进近管制的各项工作顺利通过了民航中南空管局和海南空管分局的评估考核，得到了民航上级领导和专家的高度评价，三亚进近管制服务获得了正式运行的许可。

## Qingdao Airport's 2011 Dangerous Goods Training Principles Got CAAC Official Reply

### 青岛机场2011年危险品训练大纲获民航局批复

Recently, the 2011 Training Principles on Dangerous Goods filed by Qingdao International Airport got CAAC's reply, allowing Qingdao Airport to conduct the approved trainings on personnel involved at the related posts. This is also the fifth time that Qingdao Airport got approved by CAAC since its first approval as a qualified organization for trainings on dangerous goods since 2008.

At this year's dangerous goods training, Qingdao Airport would concentrate on better trained the newly hired personnel at relative posts, increase the number of trainers, and would actively try to finish the reporting and inspecting of personnel training principles on dangerous goods transportation for class 3 and 6 in order to raise higher the training level.

日前，青岛流亭国际机场（简称“青岛机场”）申报的2011年度危险品训练大纲获得中国民用航空局批复，获准可以在年内按照批准的训练大纲对相关岗位员工进行危险品培训。这也是青岛机场自2008年首次取得危险品训练机构资质以来，第五次获得国家民航局批准。

在今年的危险品训练中，青岛机场将着力做好有关岗位新进员工的培训，扩大危险品教员队伍，并将积极争取完成危险品运输3、6类人员训练大纲的报批审批工作，进一步提高机场的危险品训练水平。



## Property Handover Ceremony for Penglai Shahekou Airport was Held

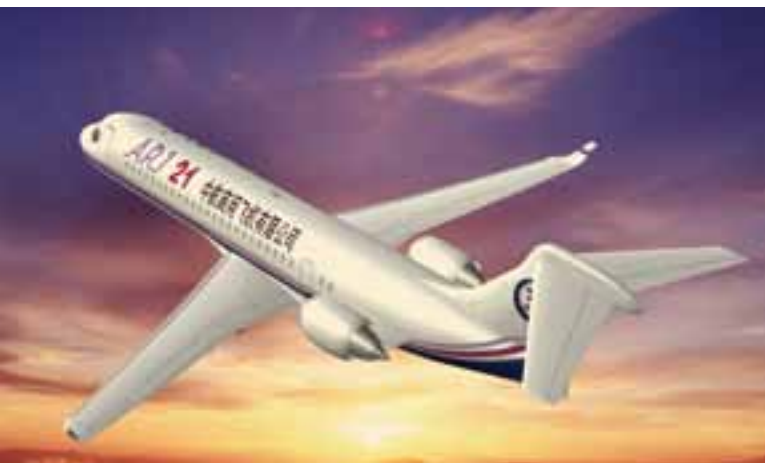
### 交通运输部收购沙河口机场资产交接仪式举行

The property handover ceremony of Penglai Shahekou Airport to the Ministry of Transport of the People's Republic of China was held at Penglai City recently. Together at the ceremony, Penglai City signed the Penglai Shahekou Airport Property Handover Agreement with Beihai Rescue Bureau of the Ministry of Communications & Transport and Shandong Airlines Co. Ltd.,

Officially opened in 2002, Penglai Shahekou Airport was a general aviation airport built jointly by the Municipal Government of Penglai, who invested more than 9 million Yuan, and Shandong Airlines. In December 2003, Beihai No. 1 Rescue Flying Squad of the Ministry of Communications started the rental use of the airport as well as took up the rescue duty on-site. Up till now, the Flying Squad has flown over 3300 hours and saved 466 disaster victims in life-threatening situations. The take-over Shahekou Airport by the Ministry of Transport would become China's dedicated sea-rescue airport that further raised the tridimensional rescue abilities of Yellow Sea and Bohai Sea.

交通运输部收购沙河口机场资产交接仪式日前在蓬莱市举行。仪式上，蓬莱市与交通运输部北海救助局、山东航空股份有限公司简称“山航”）共同签署了《蓬莱沙河口机场资产交接协议》。

蓬莱市沙河口机场是一个通用航空机场，由蓬莱市政府投资900多万元与山航合作修建，2002年正式通航。2003年12月，交通运输部北海第一救助飞行队开始租用机场并担负救助值班任务。截至目前，依托机场执行飞行总时间达3300多小时，从生死线上挽救了466名遇险人员。交通运输部这次接收沙河口机场，将把机场作为我国海上专用的救助机场使用，进一步提升黄渤海立体救助能力。



## China Civil Aviation Has Its Own Test Pilots Will Conduct Maiden Flight on ARJ21 Aircraft

### 中国民航有了自己的试飞员 将首飞ARJ21飞机

The first test flight organization for China civil aviation---the Test Flight Office of CAAC Shanghai Aircraft Airworthiness Certification Center---got CAAC approved for setup. The first group made up of three test pilots had finished their studies abroad, came back and joined the airworthiness certification unit, making significant that the test flight system of civil aircraft type certification had primarily established.

Planned for March 2011, the certifying test flight of the independently researched and developed domestic-made feeder aircraft ARJ21 would be China's debut as the first group of test pilots of China civil aviation.

中国民航首家试飞机构——民航上海航空器适航审定中心试飞室获中国民航局批准成立，中国民航首批3名试飞员陆续学成归国并加入到适航审定的队伍中，这标志着中国民航民用航空器型号合格审定局方试飞体系已初步建立。

2011年3月中国自主研发的支线飞机ARJ21计划进行的审定试飞将是他们作为中国民航第一批试飞员的首次亮相。



## Shandong Airlines Signed a Buying Contract for Fifteen B737 with Boeing

### 山航与波音签订15架波音737飞机购买合同

In Ji'nan, Shandong Province on Jan. 10, 2011, Shandong Airlines Co. Ltd. and The Boeing Company signed a buying contract of fifteen B737-800 aircraft. Those 15 aircraft would join Shandong Airlines' fleet sequentially during the 12th Five-year Plan. Jim Simon, Boeing's Vice President of Sales for China, Zhang Xingfu, Chairman of Shandong Airlines, and Zeng Guoqiang, Deputy President of Shandong Airlines Group Co. Ltd. & General Manager of Shandong Airlines, attended the signing ceremony; Qiu Feng, Deputy General Manager of Shandong Airlines, presided the signing.

The total cost of the 15 aircraft is US \$1.35 billion as calculated by the listed price. China civil aviation has gradually come out of the economic depression since the 2008 international financial crisis, and the developmental trend is on a steady rise. The 15 airliners purchased would effectively strengthen Shandong Airlines' operational ability and sustain its manage capability, providing operational power support to company's twelfth five-year plan.

1月10日，山东航空股份有限公司简称“山航”）与波音公司在山东济南签订15架波音737-800飞机的购买合同。该15架飞机将于“十二五”期间陆续加盟山航。波音民航大中华区销售副总裁 Jim Simon、山航集团党委书记、山航股份董事长张幸福，山航集团副总裁、山航股份总经理曾国强出席签字仪式。签字仪式由山航股份公司副总经理丘峰主持。

按照目录价计算，这批15架飞机总价值约为13.5亿美元。今年以来，中国民航已逐步走出08年国际金融危机以来的低迷局面，发展势头企稳回升。山航与波音公司签订这15架飞机购买订单，将有效增强公司的营运能力和持续经营能力，为公司“十二五”发展提供运力支撑。





## Beijing Capital International Airport Signed a Rescue Agreement in Response to Emergencies 应对突发事件 首都机场签署救援协议

Dec. 30, 2010, Beijing Capital International Airport Co. Ltd. and Beijing Municipal Health Bureau formally signed the Joint Prevention & Action Cooperation Agreement on Emergency Medical Care for Sudden Incidences in Beijing Capital Airport, ensuring that the municipal medical care and rescue agencies could rush to the airport and deliver medical help at the earliest, thus provided a solidly strong backing for the airport's public safety as well as the safety of travelers' lives and possessions.

According to the Agreement, the Coordination Committee for Beijing Capital International Airport's Emergency Medical Care was setup officially. Meanwhile, emergency classification, graded response levels, information reporting and rescue process were confirmed to guarantee the immediate responses from nearly 20 emergency medical rescue agencies within Beijing, to arrive at the airport and administer all necessary rescue tasks.

Leaders of the Coordination Committee Members, including Flight Standards Department of CAAC, Beijing Municipal Emergency Office, CAAC North China Regional Administration, Beijing Capital International Airport Co. Ltd., various big emergency medical rescue agencies in Beijing, Inspection & Quarantine Bureau of Beijing Capital International Airport, and Beijing Capital International Airport's Emergency Medical Center, attended the signing ceremony.

2010年12月30日，北京首都国际机场股份有限公司与北京市卫生局正式签署了《北京首都国际机场突发公共事件紧急医疗卫生救援联防联控合作协议》（以下简称《协议》），确保在首都机场发生突发重大事件时，北京市医疗卫生救援机构能第一时间赶赴首都机场进行医疗支援，为首都机场航空公共安全和旅客生命财产安全提供坚强后盾。

根据该《协议》，首都机场突发公共事件紧急医疗卫生救援协调委员会正式成立。同时，明确了突发事件分类、分级响应等级以及信息报送、救援流程等，以确保首都机场出现紧急情况时，北京市近20家紧急医疗卫生救援机构能立即赶赴首都机场开展各项医疗救援工作。

民航局飞行标准司、北京市应急办、民航华北地区管理局、北京首都国际机场股份有限公司、北京市各大紧急医疗卫生救援机构、首都机场检验检疫局和首都机场急救中心等首都机场突发公共事件紧急医疗卫生救援协调委员会成员单位的相关领导出席了签署仪式。

## Phase II Expansion Construction of Hubei Enshi Airport Started 湖北恩施机场二期扩建工程动工

The expansion project totaled around 200 million Yuan is designed according to the projected year 2020's annual passenger volume of 1.5 million, cargo-mail volume of 2,500 tons, and flight movements of 16,962. The major constructions include: extends 250m of the existing runway to 2,600m; builds a new 10,000 sq.m terminal building; adds new parking of 4,000 sq.m; builds 4 new class C aircraft bays; and reconstructs and increases capacity of some air control facilities such as adding one set of Runway Visual Range (RVR) Atmospheric Transmission Meter, and supplemental projects on fire prevention, sewage system, electricity supply and special vehicles.

After completion, Enshi Airport can handle flight movements of Boeing 737-800, Airbus A320 and any models under; longer range direct flights to Beijing and Haikou etc. are added.

It casts important functions on shaping Enshi's multifaceted transport system, speeding up the construction of West Hubei Province's Ecological-cultural Tourism Circle, and promoting Enshi's social-economic development after the completion of the phase II expansion of Enshi Airport.

Enshi Airport's phase II expansion fills several important flight routes near the 500 km blind zone of China's aerial territory, thus bears significance on aviation industry's development.

本次扩建项目总投资2亿元左右，按2020年旅客吞吐量150万人次、货邮吞吐量2500吨、年运输飞行起降16962架次设计。主要建设内容包括：将现有跑道延长250米至2600米；新建航站楼10000平方米；新增停车场4000平方米；新建4个C类机位；对空管部分设施进行增容改造，新增跑道视程大气透射仪（RVR）1套，以及配套消防、给排水、供电、特种车辆等工程。

项目建成后，恩施机场可供波音737-800、空中客车A320及以下机型的全载起降，并增加北京、海口等较远航程的直达航线。

恩施机场二期扩建完工后，将为打造恩施立体交通、加快鄂西生态文化旅游圈建设、促进恩施州社会经济发展发挥重要作用。

恩施机场二期扩建工程的建设发展，填充了我国领空几条重要航线近500KM的盲区，对航空事业的发展具有重要意义。

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## International Terminal of Wuhan Tianhe Airport Opened Officially 武汉天河机场国际航站楼正式启用

In the morning of Dec. 28, 2010, the takeoff of China Southern Airlines CZ3075 marked the official operation of the international terminal of Wuhan Tianhe Airport. The grand opening celebration ceremony took place at 9:30AM with Han Zhiliang, General Manager of Hubei Airports Group Company, announcing the official operation of the international terminal, which was presently the only detached international terminal in central China.

The newly built Wuhan Tianhe International Terminal was located at the west side of T2 and north of #2 tarmac; an area of 5,310 square meters that could satisfy a 160-persons passenger volume at peak hours. The operation of the new terminal would effectively raise the airport operation efficiency and better served the travelers.

Before the completion of T3 of Wuhan Airport, the new terminal would serve as international terminal. The international passenger and cargo business would then move into T3 after its completion, and the now international terminal would convert into business flight or special charter flight terminal.

2010年12月28日上午，随着南航CZ3075从武汉机场起飞，武汉天河机场国际航站楼正式启用。当日9时30分，武汉机场举行了隆重的国际航站楼启用庆典仪式。湖北机场集团总经理韩志亮宣布国际航站楼正式启用。该座航站楼是目前中部地区唯一的一座独立式国际航站楼。

武汉天河国际机场新建国际航站楼位于T2航站楼西侧、现有2号站坪北侧，航站楼面积为5310平方米，可满足高峰小时旅客吞吐量160人。该工程的启用将有效提高机场运行效率，更好地为旅客提供服务。

该楼在武汉机场第三航站楼（T3）建成前，将作为国际航站楼使用。T3建成后，机场国际客货业务将整体搬入T3，国际航站楼将转作公务机楼或专机楼使用。

## Guangzhou Plans to Build an Airport Economic Zone Using Baiyun International Airport as the Core 以白云机场为核心 广州规划建设空港经济区

"Guangzhou plans to build the Northern Airport Economic Zone using Guangzhou Baiyun International Airport as the core, giving Guangzhou city the Class 1 managing authority to enlarge the consolidative level of service industry." This information was revealed by Chen Mingde, Deputy Mayor of Guangzhou City, during the Joint Construction Recognition Conference of Guangzhou Port Office on January 11, 2011.

Chen stated that Guangzhou would further speed up the key trinity port construction project of combining aviation, railway and harbor this year. The Baiyun Port, the Nansha section of Guangzhou Port, the Tianhe Railway Passenger Port, and the up-coming South Guangzhou Railway Port have become the leading projects that played important roles in Guangzhou. With the official external opening of Nansha Bonded Harbor, the approved setup of Comprehensive Bonded Zone of Baiyun International Airport, and the launching construction of Sino-Singapore Guangzhou Knowledge City Port Special Function Zone, the building of Guangzhou Port's Special Function Zone has entered into full development stage.

According to statistics of Guangzhou Port Office, 2010 Port entering-exiting passenger volume was 10.2363 million, a 20% increase from previous year; transport vessels movement totaled 109.7 thousands, a 10% rise; customs tax of 113.58 billion Yuan, a 41.3% growth, and import-export goods volume of 90.42 million tons, a 6.8% increase.

"广州规划以白云机场为核心，建设北部空港经济区，赋予广州市一级管理权，以加大服务业聚集水平。"这是广州市副市长陈明德1月11日在广州市口岸办共建表彰会议上透露的消息。

陈明德说，广州今年将进一步加快航空、铁路和海港三位一体的口岸重点项目建设。白云口岸、广州港口岸南沙港区，以及天河铁路客运口岸、正在筹建的广州南铁路口岸，已成广州口岸的“龙头”项目，日益发挥出重要作用。随南沙保税港区正式对外开放、白云机场综合保税区获批设立，以及“中新知识城”口岸特殊功能区建设正式启动，广州口岸特殊功能区建设已进入全面发展阶段。

据广州市口岸办统计，2010年广州口岸出入境人员1023.63万人次，同比增长20%；进出境交通工具10.97万艘（架、列）次，同比增长10%；海关征收税款1135.8亿元，同比增长41.3%；进出口货物吞吐量9042万吨，同比增长6.8%。

## The Approach Control Space For Haikou and Sanya Is 6km 海口、三亚进近管制间隔为6公里

Beginning 12 midnight on February 25, the radar control space of Haikou and Sanya's approach control area under Hainan Provincial ATMB, CAAC, has shortened to 6km from the original 10km. This was the 1st improvement and change on technical operation since the formal launch of approach control at Haikou and Sanya; it would further employ the advantage of radar control as well as raise the protection level of air traffic safety.

Such enforcement of space-shortening of the approach control by Hainan ATMB would further relief the pressure of speedily growing flight volume of Haikou and Sanya airports, speed up air traffic flow, minimize flight delays and increase the on-schedule rate of flights. Meanwhile, the in-flight duration would be shortened that energy saving and emission reduction could be accomplished better for airline companies; it served active function on building Hainan Province as an international tourist island.

自2月25日零时（北京时）起，民航海南空管分局海口和三亚进近管制区雷达管制间隔，从原来的10公里缩小为6公里。这是自海口、三亚进近管制正式运行以来，首次在技术操作上的提升与变革，此举将进一步发挥雷达管制优势，提高空中交通安全保障水平。

此次海南空管实施进近管制缩小间隔，将进一步缓解海口三亚两大机场航班量快速增长的压力，加速空中交通流量，减少航班延误，提高航班飞行的正点率。同时将缩短航班空中飞行时间，为各航空公司的节能减排带来更多的实惠，为海南国际旅游岛建设发挥积极作用。



## Standards Met for Jixi Airport's Various Performance Parameters - Flight Correction-Inspection Passed

### 鸡西机场各性能参数达标 顺利通过飞行校验

In March, the Flight Inspection Center of CAAC conducted a 2-day correction flight on Jixi Airport. All performance parameters of navigation devices and navigation lighting system etc. met the technical standards, and successfully passed the flight correction inspection.

March 1-2, the Citation 650 aircraft from the Flight Inspection Center carried out a series of correction inspections on Jixi Airport's navigation device, navigation lighting system and flight procedure. All were passed during the inspection flight, which ensure the airport's continuance in providing accurate, reliable communicative navigation information for safe takeoffs and landings; it also provided the powerful protection on Jixi Airport's safe production.

3月，中国民用航空局（简称“民航局”）校验飞行中心对鸡西机场进行了为期2天的校飞。导航设备、助航灯光系统等各项性能参数符合技术标准，顺利通过飞行校验。

3月1日至2日，校飞中心奖状C650型飞机，对鸡西机场的导航设备、助航灯光系统等设施设备及飞行程序，进行了一系列校验并顺利通过校飞，确保了机场继续向进出航班的安全降落提供准确、可靠的通信导航信息，也为鸡西机场的安全生产提供了强有力的保障。

## Zhengzhou Airport Integrated Transportation Hub Project Started—One-stop Transit Realized

### 郑州机场综合交通枢纽工程开工 实现零换乘

Dec. 20, 2010, the groundbreaking ceremony of Zhengzhou Xinzheng International Airport's Integrated Transportation Hub Project was held in Zhengzhou. The initialization of the 15 billion plus Yuan project marked Zhengzhou Airport, subsequent to Shanghai Hongqiao International Airport, as the nation's second airport that linked effectively the intercity railway, highway and high-speed railway to provide better access and choice of the available transports. Deputy Governor of Henan Province, Zhang Dawei, attended the ceremony and announced the starting of the project.

In recent years, as the advanced transportation such as high-speed railway, highway and aviation developed, the demand for building a better transportation hub in Henan has been raised. Being an important part of Henan's integrated transport system, Zhengzhou Xinzheng International Airport's integrated transportation hub project is one of the three largest hubs in Zhengzhou. The project included mainly the intercity railway hub, airport transit center, Zhengzhou Airport's Phase II expansion project and land traffic system. At completion of the system, the seamless transit could be established between civil aviation and high-speed railway, intercity railway, highway, and municipal public transportation.

2010年12月20日，郑州新郑国际机场综合交通枢纽工程开工奠基仪式在郑州举行。这一总投资150多亿元的工程开工，标志着郑州机场将成为继上海虹桥国际机场之后，全国第二个将城际铁路、高速公路、高速铁路等多种交通方式立体引入、有效衔接的机场。河南省副省长张大卫出席开工仪式并宣布开工。

近年来，随着高铁、高速公路、航空等先进交通运输方式的发展，对河南的交通枢纽建设提出了更高要求。郑州机场综合交通枢纽工程作为河南省综合交通体系建设的重要组成部分，是郑州三大枢纽站之一，工程主要包括城际铁路枢纽站、机场换乘中心、机场二期扩建工程和地面交通系统。该系统建成后，可以形成民航与高铁、城际铁路、公路、城市公共交通等多种方式“零距离”换乘。

## Okay Airways Satisfactorily Completed the Introductory Plan-B737 Aircraft Reached 7

### 奥凯航空圆满完成引进计划 B737客机达到7架



At 00:50 on Jan. 1, 2011, the Boeing 737-800 passenger aircraft introduced by Okay Airways Company Limited landed smoothly at Tianjin Binhai International Airport.

The welcoming group lead by Liu Jieyin, the Executive Vice President of Okay Airways, came along the arriving flight; President Liu Weining and other leaders of Okay Airways went to welcome the plane's arrival at the airport.

Until now, the 2010 transporting capacity introduction plan of Okay Airways has fulfilled. Okay Airways has formed an aircraft fleet consists of seven Boeing 737 passenger aircraft, one Boeing 737 freighter, and two domestic-made Modern Ark 60 (MA60).

1月1日00:50，奥凯航空有限公司（Okay Airways Company Limited，简称“奥凯航空”）引进的波音737-800客机顺利降落在天津滨海国际机场。

奥凯航空刘捷音常务副总裁率领的接机团随机抵达，刘伟宁总裁等公司领导前往机场迎接。

至此，奥凯航空2010年度运力引进计划圆满完成。奥凯航空形成了拥有七架波音737客机、一架波音737货机、两架新舟60国产飞机的机队规模。

## CAAC Flight Inspection Center Performed Test Flight on Jinjiang Airport's Navigation System

### 飞行校验中心针对晋江机场导航设备二次校飞

In March, the Flight Inspection Center of CAAC performed a one-day ILS (Instrument Landing System) test flight on Jinjiang Airport's 03 runway using an A350 aircraft. The test result revealed all data is normal, and meets the requirements for operation.

This monitoring trial flight is based on the previous test flight in January. Between the two flights, the control center at Jinjiang Airport and related departments were coordinating closely with the test flight group in using sufficiently the spare time between flights to arrange rational flight test. It guaranteed the normal operation of the scheduled flights and smoothly completed the trial tasks.

3月，民航飞行校验中心使用空中客车A350飞机对晋江机场进行为期1天的校飞，主要针对晋江机场03号跑道盲降进行二次校验。校验结果显示03号跑道盲降数据正常，符合开放使用。

此次校飞是在1月初投产校飞的基础上进行的监视校飞，在两次校飞期间，晋江机场指挥中心及相关部门密切配合校飞机组，充分利用航班间隙，合理安排校飞计划，既保证了航班运行正常，又顺利完成了校飞任务。





摄影/春秋航空 刘杨

## Adding Power to Low Cost Carrier The 22nd Aircraft of Spring Airlines Arrived Shanghai

### 春秋航空第22架飞机抵沪 为低成本航空再添力

At 16:42 on February 15, 2011, tail No. B-6752 Airbus A320 landed at Shanghai Pudong International Airport, received formally by Spring Airlines Company Limited as its 22nd brand-new Airbus aircraft. Deputy President Wang Zhijie of Spring Airlines and Manager Zhang Lei of Flight Division led a group to welcome the flight crews with flower greetings.

As Spring Airlines planned, the newly added 22nd passenger aircraft would officially start flying the new route on February 16.

2月15日下午16点42分，尾号为B-6752的空中客车A320飞机降落在上海浦东国际机场（简称“浦东机场”），春秋航空有限公司（简称“春秋航空”）正式迎来第22架全新的空客飞机。春秋航空王志杰副总裁、飞行部经理张磊亲自带队，前往迎接机组成员并为他们送上鲜花。

据春秋航空规划，春秋航空新增的第22架客机将于2月16日正式开始执行新航线。

## Private Capital Fully Involved in Major Airline Companies' Operation 民营资本全面加入主要航空公司运营

At the February Press Conference held by The State Council Information Office, CAAC Minister Li Jiaxiang introduced that China civil aviation has a total of 43 airline companies, but none is strictly owned by the State of China.

"Although the nationally owned stockholding enterprises have occupied a certain ratio of our nation's present aviation transport industry, but the Chinese Government, including CAAC, has actively supported and encouraged private capitals' involvement in civil aviation industry. Including Air China Ltd., China Eastern Airlines Corporation Ltd. and China Southern Airlines Co. Ltd. have registered as public companies. There were 8 privately owned airlines among the 43 total, closed to 1/5 of the market."

Li Jiaxiang also revealed that CAAC still accepts new applicants at present; there are 3 applicants preparing to apply now. "As soon as requirements are qualified, we would actively give support and help."

Li Jiaxiang said that Chinese aviation transport industry has practiced diverse development; since The State Council of the People's Republic of China announced its support and encouragement of plans and measures for private enterprises development, CAAC also announced quickly the methods and measures that helped private investments entered the civil aviation industry. "Our policy is active encouragement and support toward such development."

在国务院新闻办公室2月举办的新闻发布会上，中国民用航空局局长李家祥介绍说，中国民航一共有43家航空公司，纯国有的公司已经没有了。

“虽然现在中国航空运输业国有控股企业从量上占了一定比例，但是中国政府包括民航局积极支持和鼓励民营资本投入民航业。包括国航、东航、南航，已经上市变为公众公司了。43家航空公司中民营的有8家，占了接近1/5。”

李家祥同时透露，现在民航局还在接受新的申请者，目前准备申请的还有三家，“一旦符合条件，我们都会积极给予扶持和帮助。”

李家祥说，中国航空运输业实行多元化的发展方式，自从中国国务院颁布了支持、鼓励民营企业发展的办法和措施之后，民航局很快也颁布了促进民营资本进入民航业的办法和措施。“我们的政策是对这种发展积极鼓励和支持”。

## Changde Taohuayuan Airport Expands to Level 4D Flight Zone

### 常德桃花源机场扩建 飞行区等级提升至4D级

In February 2011, Changde City People's Government and Hunan Airports Co. Ltd. signed the framework agreement on promoting the infrastructure construction of Changde Taohuayuan Airport as well as Changde's aviation transport industry development. According to the agreement, the flight zone level will raise to 4D with an annual passenger volume reaching 2.2 million after the Airport's expansion construction completes.

Changde Taohuayuan Airport is located at Doumuhu Township, Dingcheng District, presently a Level 4C civil airport. Target designs for year 2020, the airport's expansion project costs 548 million Yuan acquiring a land area of 50.41 hectares. Phase I construction funds is 398 million Yuan, which will be used on expanding the parking apron, building a new terminal and square-front, and buying facility equipments. The new terminal project will start late June this year, a 19,500 square meters construction.

2011年2月，常德市人民政府与湖南机场股份有限公司就推进常德桃花源机场基础设施建设、促进常德航空运输业发展签订框架协议。根据协议，桃花源机场扩建工程竣工后，飞行区等级将提升到4D级，年旅客吞吐量可达220万人次。

常德桃花源机场地处鼎城区斗姆湖镇，现为国家4C级民用机场。机场扩建项目以2020年为建设目标年，总投资5.48亿元，征地面积50.41公顷。首期工程计划投入资金3.98亿元，主要为扩建停机坪、新建航站楼与候机楼前广场及购置设施设备，其中新航站楼工程将于今年6月下旬开工，建设规模约为1.95万平方米。





> 航站楼通往东环高铁

## "Popular South vs Rare North" Tourist Plot Changed Gradually Due to Combined Air-Railway Transport Established at Meilan Airport 美兰机场实现空铁联运 南热北冷旅游格局逐步改变

The opening of Hainan East Ring Intercity Rail at Haikou Meilan International Airport realized the seamless connection between air transport and city's high-speed railway, making Hainan Province's traditional tourist condition---popular south yet rare north---changed gradually.

High-speed railway transforms Hainan Province into a big city. Travelers from within or outside Hainan can travel at the shortest time from Haikou Meilan International Airport to eastern tourist cities of Hainan Province, or to Sanya's tourist zone. Air-railway combined transportation has gotten perfect demonstration at Haikou Meilan International Airport.

According to statistics, during the "golden week" of Chinese New Year, Haikou Meilan International Airport has operated a total of 1,944 flight movements with a passenger volume of 263 thousand, a 3.3% growth from the same period last year, and a new high record. Meilan high-speed railway station has accommodated more than 2,100 out-bound and 2,800 in-bound passengers at the busiest day. The advantage of air-railway combined transport has visibly flourished at Meilan Airport.

美兰机场东环铁路的开通实现空中交通与城市高铁的无缝连接，促使海南岛“南热北冷”的传统旅游格局在逐步改变。

“高铁让海南岛变成一座大城市”。岛内外旅客在海口美兰国际机场可以用最短的时间往返于海口和东线旅游城市及三亚旅游圈，“空铁联运”在海口美兰国际机场得到了完美体现。

据统计，春节黄金周期间，海口美兰国际机场共执行1944个架次，吞吐量26.3万人，与去年同期相比增长3.3%，创历史新高；美兰高铁站最高峰日发送旅客2100多人次，到达旅客2800多人次。空铁联运的优势在美兰机场翘然绽放。

## China will Build Its First Runway at Sea for Domestic-Made Large Aircraft

### 中国将建首条海上飞机跑道 供国产大飞机试飞

The reserve test flight runway for domestic-made large aircraft has recently finished the first crucial construction segment---four closure gaps of the cofferdam were closed smoothly.

This reserve test flight runway is situated at the most eastern side of Shanghai Pudong International Airport, an intertidal mudflat near Donghai (East Sea). As primarily designed, part of the runway would extend onto the sea with the widest part as 2.43 km., and this will be China's first runway over the sea at completion.

国产大飞机的专用试飞跑道日前完成了首个关键建设节点---4个围堰龙口全部顺利合龙。

这条专用的试飞跑道选址在上海浦东国际机场最东侧，一块临近东海的滩涂淤泥地带。初步的设计方案中，跑道的一部分将延伸至海里，延伸处最宽达2.43公里。据了解，建成后这将是第一条海上飞机跑道。

# Aviation EXPO CHINA 2011

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## NEC Lead-in the Centralized Monitoring System for ATMB of CAAC

Recently, NEC announced its joint effort with Aero-Info Technologies Co. Ltd. to introduce the centralized monitoring system of air traffic management equipments in 48 major monitoring centers of air traffic management bureaus/stations nationwide under the authority of Air Traffic Management Bureau of Civil Aviation Administration of China. NEC provided building of basic system including hardwares and general softwares, and the final on-site installation and debugging. Aero-Info Technologies was responsible for the implementation of the applied system.

The final on-site joint system debugging is expected to be completed by early 2011, and will lay a solid foundation for the full promotion of the centralized monitoring system of civil aviation air traffic management equipments within the whole nation.

## NEC为民航空管局导入空管设备集中监控系统

近日, NEC宣布与北京航管科技有限公司共同为中国民用航空局空中交通管理局(简称“民航局空管局”)在全国48个主要空管局/站监控中心导入空管设备集中监控系统。NEC提供包括硬件、通用软件在内的基础系统的搭建,以及最终现场的安装调试工作。航管科技负责应用系统的导入。

该项目预计在2011年初完成最终现场系统的联调工作,将为民航空管设备集中监控系统工程在全国范围内的全面推广奠定坚实的基础。

## China & Switzerland Re-Sign the Aviation Transport Agreement 中瑞两国重签航空运输协定

In March, CAAC Minister Li Jiaxiang and Switzerland Ambassador in China, Blaise Godet, representing China and Switzerland respectively, signed again at Beijing the "Air Transport Agreement Between The People's Republic of China and The Swiss Federal Council".

Compared to the original agreement, such signed air transport agreement has added terms on aviation security, safety, and protection measures that widen the cooperative scope of both nations' air transport enterprises; and amended the standard terms for designated transporters, setting a good legal framework for air transport enterprises to open further the China-Swiss aviation transport market.

Li Jiaxiang said that the relationship between China and Switzerland has become closer in recent years. Switzerland became the chosen country for tourists from China in 2004 that enhanced further the commercial trading, tourist and cultural exchanges between China and Switzerland. Up till the end of 2009, China had approved a total of 1,224 Swiss investment projects in China, a bilateral trade amount of US \$9.56 billion. These all contribute to good opportunities for air transport development between China and Switzerland.

Swiss Ambassador Blaise Godet stated that the Swiss and China Government signed the air transport agreement in 1973, and Swiss International Airline opened the Zurich-Beijing-Shanghai route in 1975.

3月, 民航局局长李家祥和瑞士驻华大使顾博礼分别代表中瑞两国政府在北京重签了《中华人民共和国政府和瑞士联邦委员会航空运输协定》。

与原协定相比, 此次签署的航空运输协定文本新增了航空保安、安全以及保障措施条款, 扩大了双方空运企业合作的范围, 并对指定承运人标准条款进行了修订, 为双方空运企业进一步拓展中瑞航空运输市场奠定了良好的法律框架。

李家祥说, 近年来, 中瑞两国间的关系越来越紧密。2004年, 瑞士成为中国公民旅游目的地国, 进一步促进了中瑞两国间商贸、旅游和文化交流。截至2009年年底, 中国累计批准瑞士在华投资项目1224个, 双边贸易额为95.6亿美元。这些都为中瑞两国间的航空运输发展提供了良好契机。

瑞士驻华大使顾博礼表示, 1973年, 中瑞两国政府签署航空运输协定, 1975年, 瑞航开通了苏黎士—北京—上海航线。

## CAAC & Jiangsu Province Boost Jiangsu's Civil Aviation Development 民航局与江苏省共同推进江苏民航快速发展

In March, Civil Aviation Administration of China and Jiangsu Provincial Government signed the "Meeting Minutes on Speeding up the Civil Aviation Development of Jiangsu Province" in Beijing to jointly boost Jiangsu's civil aviation development.

As stated by the Minutes, during the "twelfth five-year plan" period, the two parties will try to establish the "7+2 airport lay-out", and will strengthen cooperations to impel Nanjing Lukou International Airport to become a hub airport in the Yangtze River Delta area, to support and establish Sunan Shuofang International Airport into a regional hub airport, and to back constructions of Jiangsu's regional airports and ATC projects.

Meanwhile, the two parties will also work together to boost Jiangsu's passenger & cargo transportation, to support Nanjing Lukou International Airport to construct the integrated traffic & transportation system, and to speed up the development of Jiangsu's GA industry.

During the "eleventh five-year plan" period, Jiangsu's civil aviation kept the good situation of continuous, fast, healthy development. Jiangsu province initiated its "7+2 airport lay-out" and the "two-hubs with one-big & six-medium airport system", completing the total construction investments of nearly 8 billion yuan, a 17.5 times of that of the "tenth five-year plan" period. Furthermore, the Phase II construction of Nanjing Lukou International Airport and Suzhong Jiangdu Airport construction were launched, and Huai'an Lianshui Airport was completed for use. In 2010, Jiangsu province achieved a passenger volume of 17.3 million persons and cargo throughput volume of 310 thousand tons, a respective increase of 156% and 90% compared to year 2005. Nanjing Lukou International Airport stepped into the rank of millions-of-person; Sunan Shuofang International Airport's passenger throughput volume increased 3 times in five years, and the transportation of other regional airports in Jiangsu province also increased quickly. Since April 2008, the flight from Nanjing to Frankfurt, Germany was run officially, which showed the aviation communication abilities of Jiangsu had obviously improved. In 2010, the international passenger throughput of the whole province reached 1.202 million persons, a 140% growth compared to year 2005.

3月, 民航局与江苏省政府在京签署了《加快推进江苏民航发展会谈纪要》, 共同推进"十二五"期间江苏民航快速发展。

根据会谈纪要, "十二五"期间, 双方将努力推动形成江苏"7+2"机场布局, 并在推进南京禄口机场建成长三角地区枢纽机场、支持苏南硕放机场建成区域性枢纽机场、支持江苏省支线机场建设和支持江苏省内民航空管工程建设等方面加大合作力度。

同时, 双方还将共同推进江苏机场客货运航线航班发展, 支持南京禄口国际机场开展综合交通运输体系建设, 加快发展江苏通用航空。

"十一五"期间, 江苏民航业保持了持续快速健康发展的良好势头, 初步确立了"7+2"机场布局和"两枢纽、一大、六中"机场体系, 5年累计完成投资近80亿元, 为"十五"的17.5倍, 南京禄口机场二期工程、苏中江都机场建设启动, 淮安涟水机场建成通航。2010年, 江苏完成旅客吞吐量、货邮吞吐量分别为1730万人次和31万吨, 较2005年分别增长156%和90%; 南京禄口机场跨入千万人次机场行列, 苏南硕放机场旅客吞吐量五年增长3倍, 其他支线机场运输增幅持续加快。自2008年4月南京至德国法兰克福航班正式运营, 江苏的国际航空通达能力明显提高。2010年全省国际(地区)旅客吞吐量120.2万人次, 比2005年增长140%。

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## Beijing Capital International Airport and Suvarnabhumi Airport Thailand Become Sister Airports 首都国际机场与泰国机场缔结姊妹机场

In February, Beijing Capital International Airport and Airports of Thailand Public Company Limited jointly signed a "Memorandum of Becoming Sister Airports", officially established the friendly cooperation relationship. Such signing would enhance further cooperative exchanges on aspects of airport operations, service improvement, and business management; motivate exploration and realization on new technologies and new concepts, and ceaselessly open the swiftly developed asian aviation market.

General Manager Dong Zhiyi of Capital Airports Holding Company expressed at the signing ceremony that both Capital Airports Holding Co. and Airports of Thailand Public Co. were managing organizations of important aviation hubs, and have enormous contributions on individual nation's aviation transportation industrial development and economic growth. As the continual intensity of ASEAN-China communicative cooperating relationship, the economic-cultural exchanges between China and Thailand also deepen progressively, in such aviation cooperation between China-Thailand casts important purpose, becoming

2月, 北京首都国际机场与泰国机场集团共同签署了《北京首都国际机场股份有限公司与泰国机场集团公司缔结姊妹机场备忘录》(以下简称"备忘录"), 正式缔结友好合作关系。此次签约, 将使双方在机场运行、服务提升、商业管理等诸多领域进一步加强合作交流, 并推动双方在新技术、新观念等方面的探索与实践, 不断开拓快速发展的亚洲航空市场。

首都机场集团公司总经理董志毅在签约仪式上表示, 首都机场股份公司与泰国机场集团公司同为两国重要航空枢纽的管理机构, 为本国航空运输业的发展和经济的增长做出了重大贡献。随着东盟10+1对话合作关系的不断加强, 中国与泰国经济文化交流也日趋深入, 这其中, 中泰之间航空领域的合作发挥了重要作

## Baggage Pre-screening System of Guangzhou Baiyun Airport Passed Inspection

### 广州白云国际机场海关RFID行李预检系统通过验收

Recently, Guangzhou Baiyun International Airport Customs RFID (Radio Frequency Identification) baggage pre-screening tracking system passed the related inspection and acceptance and put into operation.

The RFID baggage pre-screening tracking system was one of the supporting projects of the Sixteenth Asian Games/Asian Games 2010. This system was independently researched and developed by the Second Research Institute of CAAC. It is the first time that the RFID positioning technology is adapted to accurately position the suspicious luggage. By this technology, suspicious luggage can be effectively tracked and its owner can be intercepted by China's customs.



近日, 广州白云国际机场海关RFID行李预检追踪系统通过竣工验收并正式投入运行。

海关RFID行李预检追踪系统属2010年广州亚运保障项目之一。该系统由民航二所自主研发, 在中国海关首次采用RFID定位技术对可疑行李进行实时精确定位, 能有效实现对可疑行李的追踪与旅客通关拦截。

the air-bridge of intimate exchange for China-Thailand and China-ASEAN. Under such background, persistent strengthening both parties' exchange and cooperation, establishing harmonious and friendly relationship, facing challenges together, embracing opportunities, and promoting development would fulfill both nations' benefits and satisfy each other's good intentions on mutually benefitting winning.

General Manager Zhang Guanghui and Secretary of the Communist Party Committee Li Xiaomei of Beijing Capital International Airport Co. Ltd., President Serirat Prasutanond of Airports of Thailand Public Co. Ltd., and General Manager Anirut Thanomkulbutra of Suvarnabhumi Airport Thailand attended the signing ceremony.

用, 成为了架通中国与泰国, 中国与东盟之间密切交往的空中桥梁。在这样的背景下, 持续加强双方的交流与合作, 建立和谐友好关系, 共同面对挑战、迎接机遇、促进发展, 符合双方的利益, 满足彼此间互利共赢的良好愿望。

当天, 首都机场股份公司总经理张光辉、首都机场股份公司党委书记李小梅、泰国机场集团公司总裁塞利来·普拉苏塔诺、曼谷新国际机场总经理阿尼拉·塔农库布等出席了签字仪式。





## ST Aerospace (Guangzhou) Aviation Services Company Limited Listed

### 广州新科宇航科技有限公司挂牌成立

In March, Singapore Technologies Aerospace Ltd. and Guangdong Airport Management Corporation (GAMC) held jointly in Guangzhou the listing ceremony of the joint venture company named ST Aerospace (Guangzhou) Aviation Services Company Limited. Such event signified the formal settlement of the largest global airframe maintenance enterprise in Guangzhou, and Guangzhou Baiyun International Airport could become the world's biggest aircraft maintenance base. Wang Yang, Secretary of Guangdong Provincial Committee of the CPC and member of the Political Bureau of the CPC Central Committee, and Huang Huahua, Governor of Guangdong Province, had entrusted Li Chunhong, Deputy Secretary-General of Guangdong Provincial People's Government, to express their enthusiastic congratulations to the listing establishment. As introduced, ST Aerospace Guangzhou Aircraft Maintenance Base is likely to start construction in the first half of this year; it is also another milestone event of Guangzhou aerial port economic construction subsequent to the settlement of FedEx APAC Hub at Guangzhou Baiyun International Airport.

The registered capital of ST Aerospace (Guangzhou) Aviation Services was US \$40 million, which GAMC holds 51% while Singapore Technologies Aerospace Ltd. holds 49% shares.

As planned, the first hangar would be completely built by the end of this year. Meanwhile, the land acquisition and construction of the second hangar would be initiated (estimated to finish building in 2013), and six hangars would be built subsequently within ten years. Per future developmental situation, ST Aerospace (Guangzhou) has also planned for developing another five hangars in the long run. By then, ST Aerospace (Guangzhou) Aviation Services Co. Ltd. and GAMECO of China Southern Airlines Co. Ltd. at Baiyun International Airport would own about 15 aircraft maintenance hangars, thus Baiyun

3月, 新加坡科技宇航有限公司与广东省机场管理集团公司在广州联合举行合资公司——广州新科宇航科技有限公司的挂牌仪式。这意味着全球最大的飞机机身维修企业正式落户广州, 白云机场有望成为全球最大的飞机维修基地。中共中央政治局委员、广东省委书记汪洋和广东省省长黄华华委托广东省政府副秘书长李春洪, 对广州新科宇航挂牌成立表示热烈祝贺。据介绍, 新科宇航广州飞机维修基地有望今年上半年开工建设, 这也是继联邦快递亚太转运中心落户白云机场后, 广州空港经济建设的又一个里程碑式的事件。

此次组建的广州新科宇航注册资金4000万美元, 广东省机场集团持股51%, 新科宇航持股49%。

根据发展规划, 广州新科宇航的第一个机库预计于今年年底建成, 同时启动第二个机库的征地建设工作(预计于2013年建成), 十年内公司将陆续建成6个机库。根据未来发展情况, 广州新科宇航远期还规划预留另外5个机库发展空间。届时, 广州新科宇航与南航在白云机场的GAMECO将拥有15个左右的飞机维修库, 白云机场有望成为全球最

## AVIC Wuhan Industrial Park Settled in Huangpi to Develop Airport Economy

### 中航工业武汉产业园落户黄陂 发展临空经济

Total investments of 3 billion Yuan, with nearly 10 billion Yuan of industry's total earnings, AVIC Wuhan Industrial Park would start building in Huangpi Airport Economic Zone. On March 5th, Wuhan Municipal Government and Aviation Industry Corporation of China (AVIC) signed in Beijing the "Strategic Cooperation Agreement" and "Memorandum of Strategic Cooperation", beginning a series of cooperations hand-in-hand.

Ruan Chengfa, Secretary of Wuhan Municipal Committee of the CPC, Tang Liangzhi, Mayor of Wuhan, and Lin Zuoming, Secretary of the Party Leadership Group & Manager of AVIC, witnessed the signing ceremony.

Both parties agreed to build together the 700-800 mu AVIC high-tech industrial zone in Wuhan Huangpi Airport Economic Zone, for research, development and sales of float aircraft, civil aircraft seats, inner decorations' R&D and sales operation services, R&D and sales of automobiles and motorcycles parts, R&D and manufacture of water management equipments, aviation modern material distribution and distribution networking, modern services and demonstrations as well as international cooperations, so as to accelerate the characterization of Wuhan airport economic development.

AVIC would establish Regional Headquarters for Business in Wuchang District, Wuhan City, or Donghu High-tech Zone, including: AVIC International Central China Operation Headquarter, AVIC Electromechanics Central China Headquarter, and Aerosat Development Center. In addition, aircraft seats, internal decorations, aircraft parts local branch, AVIC Modern Material Distribution Central China Headquarter, Aviation Operation Services & Training Branch, and AVIC Electronic Informations (including TFT) Local Center etc. would also be major establishments.

International Airport might become the world's largest aircraft maintenance base.

Zeng Zhaode, President of ST Aerospace Ltd. & Deputy Chairman of ST Aerospace (Guangzhou) Aviation Services Co. Ltd. said the projected annual business amount would be US \$150-200 million for ST Aerospace Guangzhou within the next five years. Not only the joint venture company focus in domestic clients, it would also introduce more clients from abroad to conduct international aircraft maintenance business in Guangzhou.

The purpose for setting up the joint venture company, expressed Chen Xiaoning, Deputy President of GAMC & Chairman of ST Aerospace (Guangzhou) Aviation Services Co. Ltd., is to build ST Aerospace (Guangzhou) as a high-tech venture as well as a world-class commercial aircraft maintenance company that possesses relevant airworthiness certificates. The main business is overhaul and modifications for civil aircraft, including B747's passenger airliner converting to freight carrier, A380's maintenance inspection, and parts' manufacture and maintenance.

总投资30亿元, 产业总收入近100亿元的中国航空工业武汉产业园将在黄陂临空经济区开建。3月5日, 武汉市政府与中国航空工业集团公司(简称“中航工业”)在京签署《战略合作协议》及《战略合作备忘录》, 携手开展一系列合作。

武汉市委书记阮成发, 市长唐良智, 中国航空工业集团公司党组书记、总经理林左鸣见证签约仪式。

双方协议, 联合在武汉黄陂临空经济区打造中航工业高技术产业区, 占地700-800亩, 用于浮空飞行器研发和销售、民用航空座椅、内饰件研发与营销服务、汽车摩托车零部件研发和销售、水处理装备研发与生产、航空现代物流和物流网络、现代服务与展示、国际合作等, 加快特色化的武汉临空经济发展。

中航工业集团公司将在武汉市武昌区或东湖高新区设立业务板块地区总部, 包括: 中航国际华中运营总部、中航机电华中总部、浮空器开发中心。此外还将重点建设航空座椅、内饰件、航空器件地区分中心, 中航现代物流华中地区总部, 航空运营服务及培训分中心, 中航电子信息(含TFT)地区中心等。

大的飞机维修基地。

新加坡科技宇航有限公司总裁、广州新科宇航科技有限公司副董事长曾昭德说, 未来五年之内广州新科宇航的年营业额预计为1.5亿美元到2亿美元。合资公司不仅专注于国内客户, 还将从国外引入更多客户在广州进行国际飞机维修业务。

广东省机场管理集团公司副总裁、广州新科宇航科技有限公司董事长陈晓宁表示, 省机场集团和新科宇航成立合资公司的目的, 是要将广州新科宇航建成高新技术企业, 并获得有关适航部门证书的世界级商用飞机维修公司, 主要业务为民用飞机的大修与改装, 包括B747的客机改货机, 未来A380的维修检查, 以及相关零部件的制造维修等。





# Airport Noise Mitigation Project: Port Columbus International Airport Southwest Noise Berm/Wall Columbus, Ohio, USA

## 机场降噪项目：哥伦布国际机场西南侧噪音防护堤/防护墙 哥伦布，俄亥俄州，美国

改造后街景 Future Views

By Douglas E. Barrett and Timothy M. Johnson, Harris Miller Miller & Hanson Inc.  
作者：道格拉斯·巴雷特、蒂莫西·詹森，HMMH公司  
Translated by: Vivian Chen / 翻译：陈春桦

The Columbus Regional Airport Authority (CRAA) plans to relocate Runway 10R-28L at Port Columbus International Airport (CMH) in Columbus, Ohio 702 feet (214 m) south of its existing location. To meet Federal Aviation Administration (FAA) airport design standards, the runway relocation would require the acquisition and removal of 35 houses that would fall in or near the Runway Protection Zone (RPZ) of the relocated runway. In addition, trees within a wooded area in or near the RPZ would be removed to meet FAA airport design standards. The Airport's most recent Federal Aviation Regulations (FAR) Part 150 Noise Compatibility Plan (NCP) (1) includes an approved noise abatement measure to construct a noise berm/wall to help reduce noise and minimize the visual impacts caused by removal of the houses.

The CRAA retained HMMH to conduct a noise mitigation study to determine the final location, length, height, and composition of the berm/wall. In addition, the study sought to confirm whether the proposed measure would

哥伦布地方机场当局 (CRAA) 计划将位于俄亥俄州哥伦布市的哥伦布国际机场 (CMH) 跑道 10R-28L 向南迁移 702 英尺 (214 米)。为满足联邦航空管理局的机场设计标准，此次跑道迁移需要征用并移除靠近或处于跑道保护区 (PRZ) 内的 35 处住宅。另外靠近或处于跑道保护区的茂密树林将被移除以满足联邦航空管理局的机场设计标准。最新的机场联邦航空管理条例 150 部噪声相容性计划 (NCP) (1) 包括了一个已经核准的噪声控制方法以建造一个噪声防护堤/防护墙来帮助减少噪声并将由于房屋拆除而造成的视觉影响降到最低。

哥伦布地方机场当局 (CRAA) 聘请 HMMH 公司进行降噪研究来决定噪音防护堤/防护墙的最终地点、长度、高度以及建筑成分。另外此次研究争

comply with FAA noise reduction standards, thereby making it eligible, as an approved NCP measure, for FAA funding. In accordance with this FAA guidance, the acoustical design goal for this project was to reduce A-weighted maximum sound levels (Lmax) generated by aircraft during start-of-takeoff roll on Runway 10R by at least 5 decibels at the noise-sensitive community locations closest to the berm/wall relative to the future condition without a noise berm or barrier.

取确定提案的方法是否遵守了联邦航空管理局的降噪标准，从而使其符合条件成为被认可的噪声相容性计划以获得联邦航空管理局的资金援助。在联邦航空管理局的指导下，此项目的声学设计目标是在噪声敏感社区接近防护堤/防护墙的位置，将航空器在跑道 10R 上起飞滑跑开始的过程中产生的 A 加权最大声级相对于未来不设噪音防护堤或障碍物等情况下减少至少 5 个分贝。

Figure 1 shows the existing and future runway layouts at CMH and the location of the affected 12th and 13th Avenue neighborhood southwest of Runway 10R-28L. 图1显示了哥伦布估计机场目前和未来跑道布局，以及在跑道 10R-28L 西南方向的第 12 和第 13 大街所受影响位置



Figure 1 Project Location Map  
图1 项目位置图

HMMH conducted the evaluation using the General Prediction Method (GPM) (2) as implemented in the SoundPLAN® computer model (3). On previous projects, HMMH has used SoundPLAN®'s implementation of ISO Standard 9613-2 (4). For this project, however, the authors found the GPM to provide results that were more uniform and also in closer agreement with prior measured and predicted results than those computed by ISO 9613-2.

### Methodology

This noise study was conducted using a combination of field measurements and computer modeling. This combination of measurements and modeling provided an efficient and accurate means

HMMH公司利用SoundPLAN®电脑模型(3)中通用预测方法 (GPM) (2)进行了此次评估。在早先的项目中，HMMH公司已使用SoundPLAN®执行ISO9613-2标准(4)。然而，对于这个项目2位笔者发现通用预测方法 (GPM) 提供的结果比ISO9613-2标准计算得更加统一且更加接近之前测量和预计的结果。

### 方法

这个噪音研究运用现场测量和计算机建模相结合的方式进行。此种测量和建模的结合提供了一个有效且准确的方法来计算将要在未来条件下产生的声音级



to compute sound levels that would occur under the future condition and also improved the affected community's confidence in the noise modeling process. At the outset of the evaluation, HMMH conducted community noise measurements to determine baseline sound levels in the affected community and to obtain data that could be used for validating the noise prediction model. Subsequently, HMMH used published sound level data, obtained through noise measurements made under controlled conditions, as input to a computer noise model to characterize each of the representative aircraft types at takeoff power. The noise model then was used to compute existing sound levels at community locations that would be generated by aircraft departing on Runway 10R at its current location. The computer model's results then were compared to the community noise measurement data to validate its results for this project area. Finally, the future configuration with the relocated runway was evaluated using the validated prediction model. This future-condition noise model was used for the acoustical design of the noise berm/wall.

别，同时也改善了受干扰社区对噪声建模程序的信心。在评估开始，HMMH公司进行社区噪声测量来测定受影响社区的声音级别的基线，并获得可用于确认噪声预测模型的数据。随后，HMMH公司运用已公布的声音级别数据，获取在受控条件下的噪声测量数据后，录入计算机噪音模型以表示每种具有代表性的飞行器起飞功率的不同特点。噪声模型随后被用于计算社区特定位置的现有声音级别，此声音可能由飞行器离开跑道10R当前位置时产生。计算机模拟的结果随后会与社区噪音的测量数据进行比较为项目区域核实模拟结果。最后，利用经验证的预测模型评估搬迁后的跑道和其未来的配置。这个“未来状况”的噪音模型被用来进行噪音防护堤/防护墙的声学设计。

### Study Results

The validated noise model was used to generate contour plots showing takeoff power maximum sound levels for each of the two representative aircraft types at the takeoff roll starting point near the westernmost end of the Runway 10R in both its existing and future locations. This condition would generate the highest sound levels in community locations to the southwest of CMH during east flow (Runway 10R and 10L) departures.

### 研究结果

经验证的噪音模型用来生成噪声等值线图展示任意两种代表性的飞行器类型在邻近跑道10R现有及未来位置最西端的起飞滑跑出发点起飞功率的最大声音级别。这种情况将在位于哥伦布国际机场西南方的社区位置当东侧跑道（跑道10R和10L）上的飞机起飞时产生最高的声音级别。

### Mitigation Recommendation

Sound levels in community locations could be reduced by a 20-foot-high (6-m) berm/wall combination located along the Airport's perimeter near 12th and 13th Avenues. The recommended configuration is a 10-foot-high (3-m) noise barrier wall constructed on top of a 10-foot-high (3-m) earth berm extending for approximately 2,080 feet (635 m) along the Airport's property line. Figure 2 shows the proposed location of the berm/wall. The berm would be graded at a horizontal: vertical slope of 2:1 on each side with an approximately 10-foot-wide (3-m) flat top. The berm would be planted with grass or shrubs to prevent soil erosion and to provide an attractive landscape element. A 20-foot-wide (6-m) buffer zone allowing for access and maintenance would be maintained between the Airport's boundary fence and the foot of the berm's slope.

### 减噪建议

社区特定位置的声音级别可被安置于机场边缘靠近第12和第13大街的一个20英尺高（6米）的堤/墙的组合物所降低。我们建议的构造是在10英尺（3米）高的土堤上搭建一个高10英尺（3米）的噪音隔墙并沿机场地界线延伸大约2080英尺（635米）。图2展示了我们建议的防护堤/防护墙的位置。每侧的防护堤将被建成水平与垂直斜面成2:1的比例并带有一个大约10英尺宽（3米）的平顶。防护堤将用玻璃或灌木布置以防止土壤侵蚀，并提供一个吸引人的自然景观。一个20英尺（6米）宽的缓冲区域考虑到了进入方便

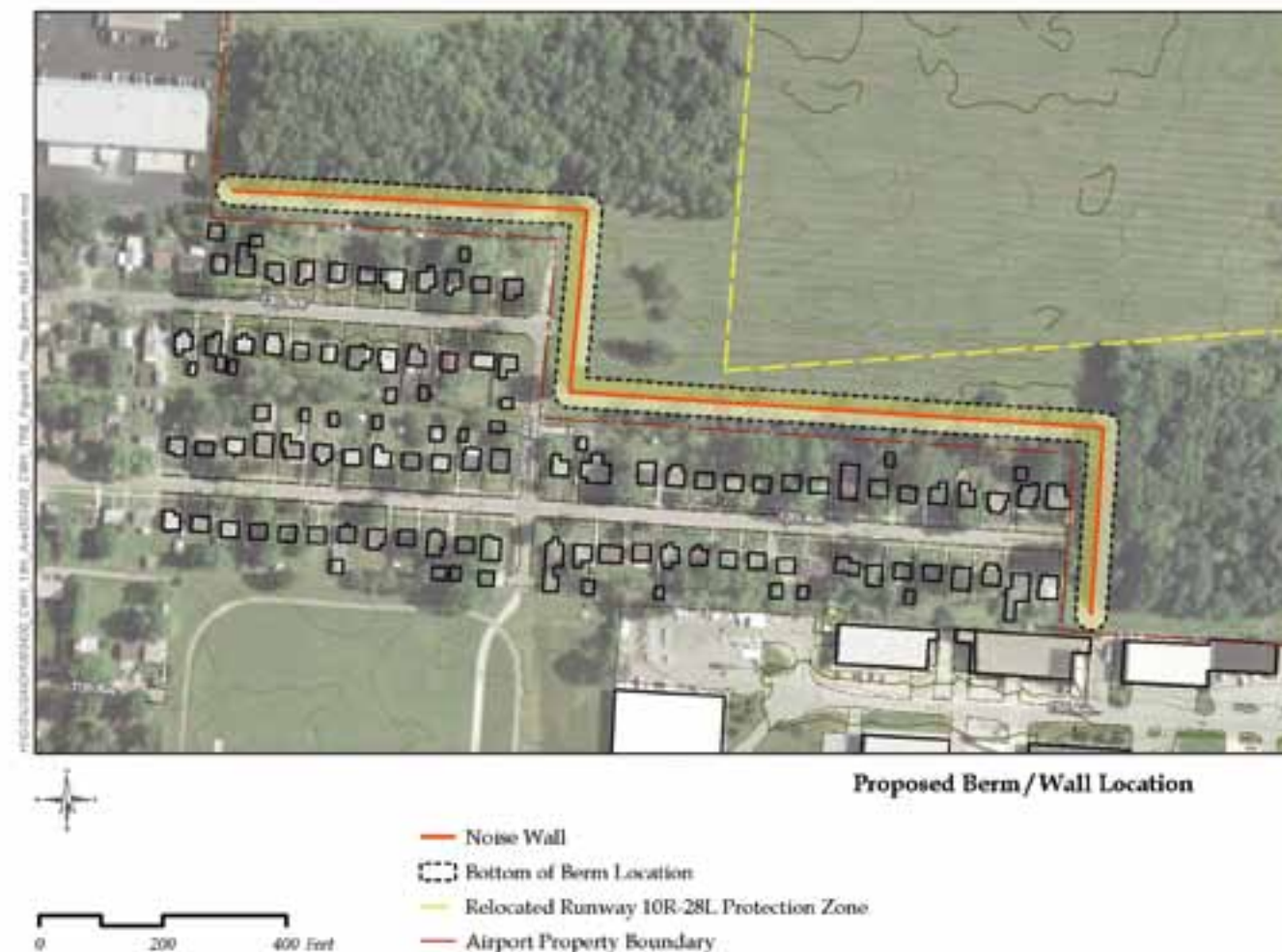


FIGURE 2 Proposed Berm/Wall Location  
图2 建议的堤/墙的位置

Figure 3 provides computed insertion loss contours for a B737 departure on relocated Runway 10R. The contours show the expected noise reduction relative to the future condition without the berm/wall. Although insertion loss values of 10 dBA or more may occur immediately adjacent to the berm/wall, typical noise reductions would vary between about 6 dBA and 10 dBA at houses along the north-south running portions of the Airport property line, closest to the berm/wall. In the backyards of houses on the north side of 12th Avenue and 13th Avenue, noise reductions would be lower, ranging from only 1 to 2 dBA near the houses up to about 6 to 8 dBA at locations near the rear of backyards, closest to the berm/wall. In all cases, projected sound levels from start-of-takeoff roll on the relocated runway with the berm/wall would be lower than sound levels for similar operations on the existing runway. Based on this analysis, the proposed berm/wall is expected to exceed the acoustical design goal for each of the representative aircraft types.

以及在机场边篱和防护堤的坡底进行维护工作。图3提供了波音737飞机飞离搬迁后的跑道10R时计算得出的噪声衰减。等高线图显示了在没有堤/墙的未来条件下的降噪预期。尽管防护堤/防护墙附近将立即产生10分贝或是更高的介入损耗，沿着由北向南部分运行的机场地界线接近防护堤/防护墙的住宅中，典型的噪声降低将在6分贝到10分贝之间变化。第12和第13大街北侧住宅后院的噪声降低较弱，范围从住宅附近仅有1到2分贝到接近防护堤/防护墙后院后方的6到8分贝。无论什么情况，在有防护堤/防护墙的搬迁后的跑道上，从起飞滑跑开始产生的声音级别将低于在现有跑道上类似操作所产生的声音级别。基于这个分析，对于每个有代表性的飞行器类型，提议的防护堤/防护墙有望超过声学设计目标。

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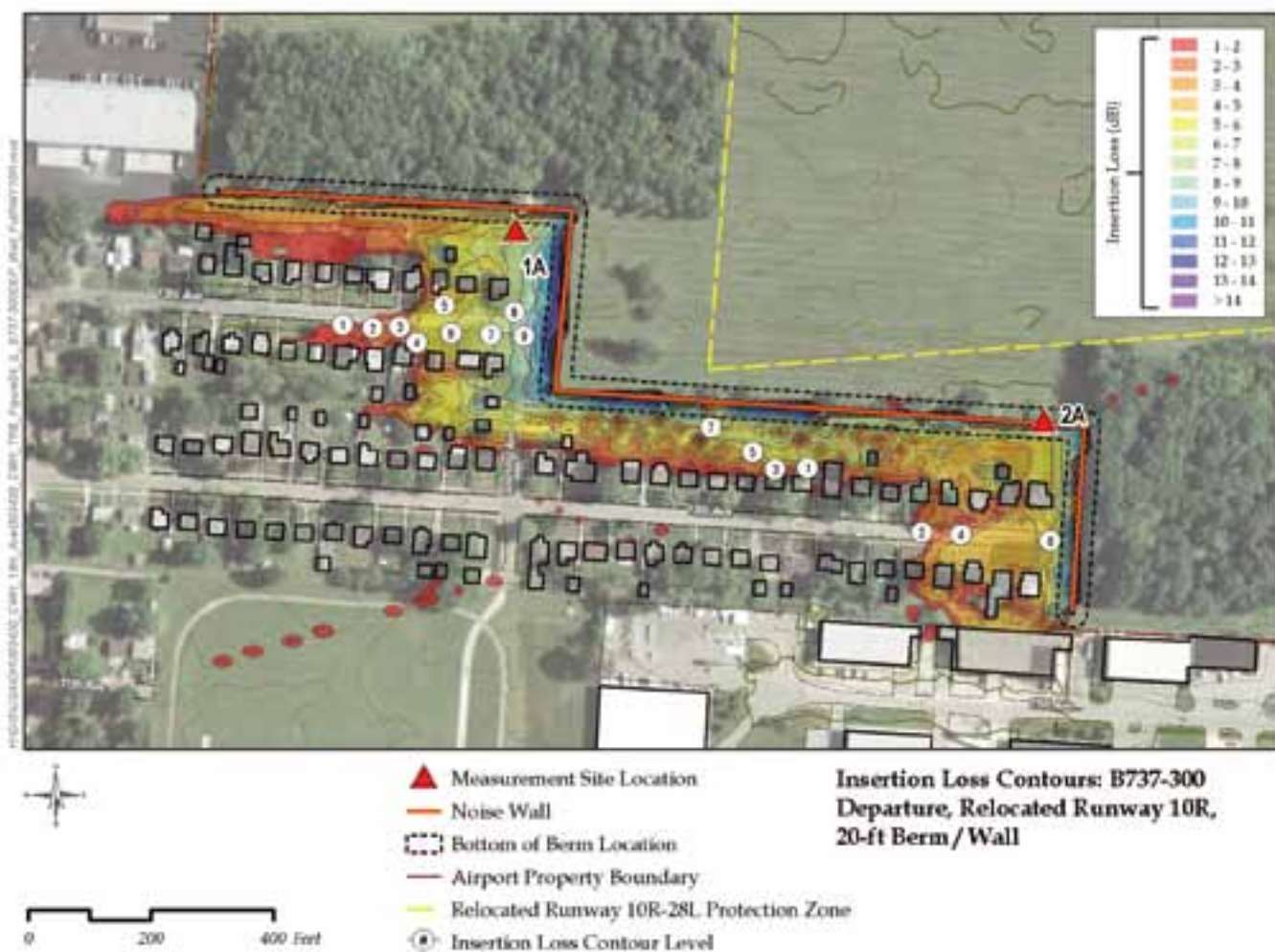


FIGURE 3 Insertion Loss Contours: B737-300 Departure, Relocated Runway 10R with 20-foot (6-m) Berm/Wall. 图3 介入损耗等高线图：波音737-300离场，搬迁后的跑道10R建有20英尺（6米）防护堤/防护墙

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## Aviation Noise Abatement 机场航空噪声治理

Use of business jet aircraft sharpen the aviation noise problem in busy airports around the world. By the end of last century, the aviation noise problem in China's main cities like Beijing, Shanghai, Guangzhou was very serious. It also caused some aggressive behaviors that had a serious effect on the society, for example many petitioners came from the communities experienced excessive noise to seek help from CAAC, a few irrational people disrupted flights and airport operation maliciously. With the rapid development of China's air transportation and also the environmental policy, control of aviation noise became more and more important as it will not only effect the airport planning but also the safety of the airports. Here this article will summarize the general information of aviation noise and control methods. We hope aviation noise abatement will get more and more understanding and recognition by people in or out of airport and aviation field.

### ● What is Noise?

From a physical perspective, noise is the sound emitted by sound source dose irregular vibration. From an environmental protection angle, all "unwanted sound" that have a bad influence on people's study, work and rest can be generally called noise. Like the roar of machine, voice of motor and honing by all kinds of vehicle, noise from people and all unexpected sound. Noise is a kind of human's subjective evaluation and all the sound that annoy people can be called noise.

### ● What is Aviation Noise?

Aviation noise comes from aircraft operations, for example, take off, landing, maintenance, engine test-run and etc. Its two primary sources are engine and airframe noise. As we make quieter and quieter engine, the airframe noise plays a more and more important role in aviation noise.

### ● How to Know how Loud of an Airport?

Most airports in European and American countries install Noise and Operations Monitoring System and calculate the noise dB by using

商用喷气式飞机的出现使全球繁忙机场的航空噪声问题逐渐尖锐。上世纪末中国北京、上海、广州等大城市的机场航空噪声问题已十分严重，由此引发了受过分噪声侵扰的社区居民集体上访民航局、不理智的群众恶意妨碍机场正常运行等过激行为，造成了较为严重的社会影响。随着中国民用航空运输业的快速发展，特别是环境保护国策的不断推进实施，民用机场噪声影响控制管理工作日益重要，它不仅影响到民用机场的规划建设，而且也与机场的安全运行息息相关。借此以此文概述机场航空噪声的基本情况以及治理方法。希望机场航空噪声的治理可以得到越来越多中国机场及航空业内外人士的了解及重视。

### ● 什么是噪声？

从物理角度看，噪声是发声体做无规则振动时发出的声音。从环境保护的角度看，凡是影响人们正常学习、工作和休息的声音，凡是人们在某些场合“不需要的声音”，都统称为噪声。如机器的轰鸣声，各种交通工具的马达声、鸣笛声，人的嘈杂声及各种突发的声响等。噪声是一种主观评价标准，一切影响他人的声音均可称为噪声。

### ● 什么是机场航空噪声？

航空器起降、滑行、航机维修、试车时产生的噪声。主要来源于飞机发动机和机身噪音。由于目前已经能够生产噪音越来越低的发动机，所以机身本身的噪音逐渐演变为越来越主要的噪声来源。

### ● 如何知晓机场航空噪声到底有多少？

欧美机场大多通过安装机场噪声与运行监测系统，利用固定监测器和便携式监测器测量到机场及周

The figure shows the general sound level of outdoor and indoor situation 下图为室内外一般环境下的声音级别





the permanent and portable monitors. Then the sound data will be processed by some professional tools like RealContours™ automated aircraft noise contour development program and InFLIGHT™ ARTS data acquisition, processing, analysis and reporting software. After the data analysis, noise event identification & classification, noise and flight track correlation, the final report could help airport understand the noise situation of airport and nearby communities. Meanwhile, the airport can get some other information like aircraft' take off and land density in different period of time and the sound level difference caused by different flight path.

边地区噪声的分贝数是多少，随后声音数据通过RealContours™自动化飞行器噪声等值线图开发项目和InFLIGHT™ ARTS数据取得、处理、分析及报告软件”等此类专业的软件/硬件设备进行数据分析、噪声事件识别及分类、噪声与飞行轨迹的分析等最终输出报告帮助机场当局了解机场及周围社区的噪声状况，同时也可获得诸如不同时段飞行器起降密度、不同飞行航迹所产生的噪声级别的差异等其他信息。

Below figures are permanent and portable noise monitors  
以下2图为固定监测器和便携式监测器



Below figure shows the work flow of noise monitoring software/hardware  
下图为噪声监测软件硬件工作原理



Below figure is the noise contour of Baltimore airport mapped according to the noise measurement  
下图为根据噪声测量结果而绘制的美国巴尔的摩机场噪声等值线图



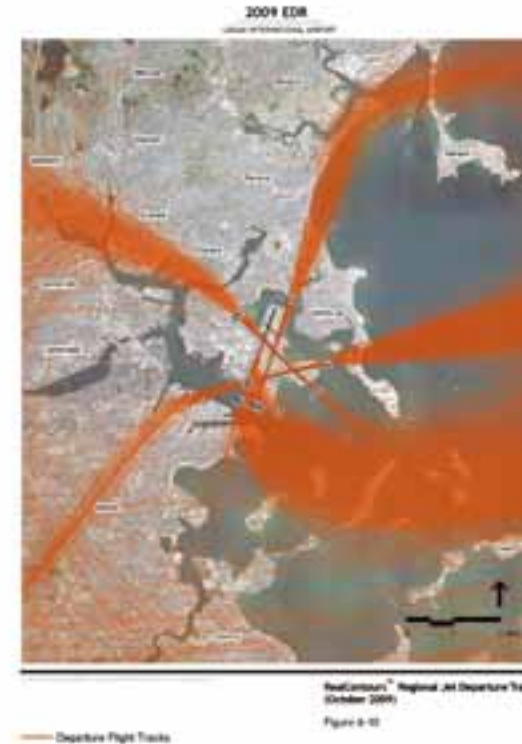
Airports can mapping noise contour with the report data and get a clear understanding of the noise situation of different area in nearby communities and finally work out the relevant noise abatement strategy.

In addition, the professional software could process and analysis the radar data from air traffic control department and model the flight tracks. The report clearly show the aircraft' dencity upon the community. According to this, the depature/arrival procedure can be changed or optimized to appease the annyance of the communities with excessive noise.

通过报告数据机场可测绘噪声等值线图。这样机场可对其周围社区各处有多少分贝噪声的侵扰下有一个准确且直观的了解，随之制订相应的降噪策略。

另外通过专业软件可处理和分析从空管部门获得的雷达数据以形成航空器飞行轨迹图示，生成的报告亦可清晰的显示机场周边社区上空的飞行器密度，继而有针对性的调整并优化飞行器起降程序以缓解噪声污染超标社区的烦扰。

Modeled flight tracks) at Boston Logan International Airport  
模拟波士顿洛根国际机场飞行器离场时的飞行航迹



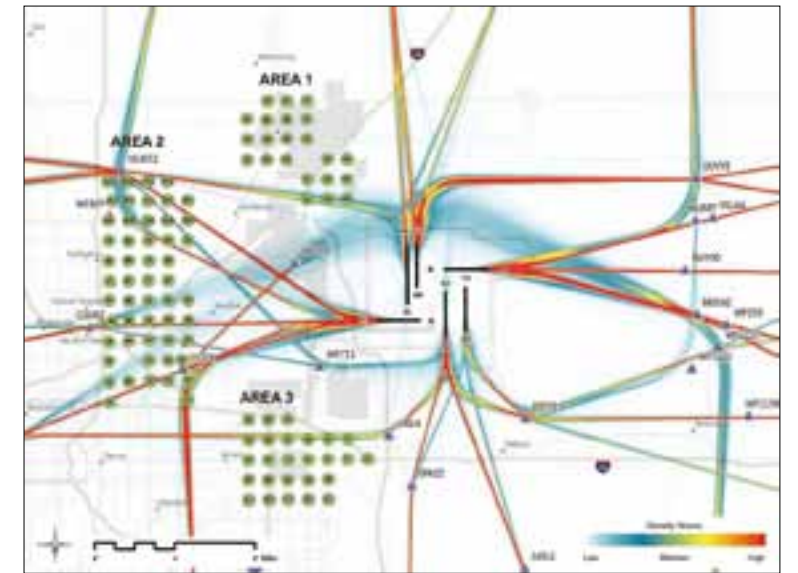
● Aviation Noise Metrics?

Single-event noise metrics that represent the noise that one aircraft flyover the airport. 24-hour cumulative noise metrics that represent total aircraft noise over a 24-hour day. United States use Day-Night Average Sound Level(DNL), which represents the average A-weighted sound level during a 24-hour day. The DNL is calculated from the hourly noise levels by the following:

$$DNL=10 \log_{10} (1/24) [\sum \text{antilog} (HNLD/10) + 10 \sum \text{antilog} (HNLN/10)]$$

Where: HNLD are the hourly levels for the period 0700-2159 hours;  
HNLN are the hourly levels for the period 2200-0659 hours;  
Σ represents a summation.

Modeled the aircraft' departure corridor by the professional tool at Denver airport  
下图为经专业软件模拟的丹佛国际机场飞行器离场的航迹走廊  
It clearly shows the flight tracks over communities  
\*可清晰看出飞行航迹掠过社区上空的情况\*

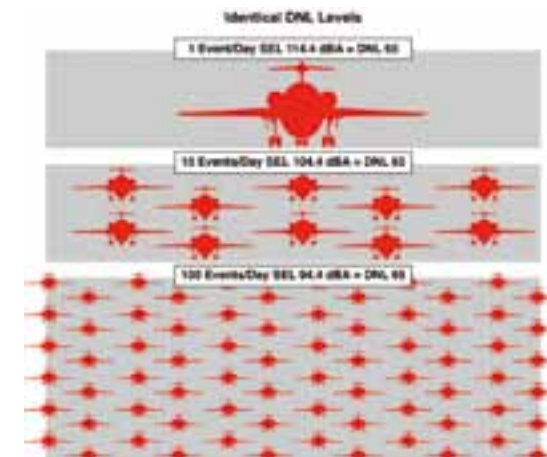


● 机场航空噪声的描述方法有哪些？

单个事件噪音测量法，即测量一架飞机开始影响机场到飞离机场整个过程产生的噪声。24小时内所有飞机噪声事件累积测量法，即测量24小时内所有飞行器的总噪声情况。其中美国使用昼夜声级（DNL）衡量噪声，即一天24小时内的平均A计权声级。DNL是用每小时噪声级按以下公式计算得出的：

当：HNLD为0700-2159之间的每小时声级；  
HNLN为2200-0659之间的每小时声级；  
Σ表示合计。

Identical DNL Levels under different situations  
\*下图展示几种不同情况下产生相同的DNL值\*





China use Weighted Equivalent Continuous Perceived Noise Level (WECPNL). WECPNL is a 24-hour measure proposed by International civil aviation organization (ICAO) to assess the continuous exposure to long-term noise of multiple aircraft. It's calculated by the following:

$$WECPNL=10 \log_{10} [\sum \text{antilog} (EPNLD/10) + 3(\sum \text{antilog} (EPNLE/10)) + 10(\sum \text{antilog} EPNLN/10)] - 39.37$$

Where: EPNLD are the EPNdB levels for aircraft noise events during the period 0700-1859 hours;  
EPNLE are the EPNdB levels for aircraft noise events during the period 1900-2159 hours;  
EPNLN are the EPNdB levels for aircraft noise events during the period 2200-0659 hours;  
Σ represents a summation.

● Why Aviation Noise is Unwelcome?

Being the common fault in all busy airport around the world, aviation noise is widely concern and denounced by the public. It caused many bad influence on people's health and social development. The World Health Organization (WHO) defines health as: "A state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". A 1992 WHO Task Force identified noise-related health "effects", including: Annoyance, cardio-vascular, communication, hearing loss, performance, productivity, psycho-social, Sleep and social behavior, etc. In addition, the social impact includes residents suing the airport, irrational behavior to disturb airport's operation, petitions and other social contradictions.

● The Harm of Aviation Noise-Conflicts between residents and airport, Health threats

Charlotte Residents Plan To Sue Airport Over Noise(November 16, 2010 by WSOCV.com)

Some people who live near Charlotte Douglas International Airport said they're angry and plan on suing the airport. They said their neighborhood has become so noisy since the airport's fourth runway started being used in February that their property values are diminishing. Since 1998, the airport has spent \$76 million in its noise compatibility program, purchasing 450 homes that experienced excessive noise. It also put in new insulation, storm windows and doors in several homes, schools and churches. An airport spokeswoman confirmed that the airport has received several public records requests from lawyers regarding the new runway.

Neighbors to sue airport over noise from new runway (June 15, 2009 Seattle Times)

Some neighbors are demanding compensation for what they call excessive noise and plane traffic at the new third runway of the Seattle-Tacoma International Airport. A class-action lawsuit will be filed today, said attorney Darrell Cochran, who said 10,000 people live in affected areas. Besides money, the lawsuit seeks to restrict air traffic at night. The \$1 billion third runway, which opened last November on the airport's west

而我国使用的是计权等效持续感觉噪声级 (WECPNL), 为国际民航组织 (ICAO) 所推荐的一个24个小时测量方法, 它可评估多架航空器长期的持续噪音暴露值。WECPNL计算公式如下:

当: EPNLD作为0700-1859之间航空器噪声事件的EPNdB级  
EPNLE作为1900-2159之间航空器噪声事件的EPNdB级  
EPNLN作为2200-0659之间航空器噪声事件的EPNdB级  
Σ表示合计。

● 机场航空噪声为什么不受欢迎?

机场航空噪声作为世界所有繁忙机场的通病。从其被人们注意开始便受到了广泛的关注与声讨。它对人类的身体及社会的发展都造成了诸多不利的影响。世界卫生组织对健康的定义是: 健康是集身体、精神和社会良好表现为一个整体的一种状态。并非仅仅没有疾病和缺陷。1992年世界卫生组织的一个特遣分队鉴别了影响健康的噪声相关问题。包括: 烦扰、心血管问题、交流、听觉损失、行为能力、生产力、社会心理、睡眠、社会行为等。另外便是其社会影响, 包括居民投诉及状告机场事件、不理智的妨碍机场正常运行、上访以及可能被引发的其他社会矛盾。

● 机场航空噪声的危害-民众与机场的冲突及健康威胁

夏洛特市民欲就噪声问题起诉机场 (2010年11月16日 来自WSOCV.com)

夏洛特道格拉斯国际机场附近居民称他们非常气愤并计划起诉机场。居民称从2月份机场的第四条跑道开始使用, 周围环境变得非常吵闹, 且他们的房产也开始贬值。从1998年开始夏洛特机场花费在噪声相容性项目的资金已有7600万美元。包括购买了受过度噪声侵扰的450处民宅。并且也对房屋实行了新的隔音处理, 在部分家庭学校及教堂安装护窗、护门。一位机场发言人肯定了机场已接到律师要求其提供新跑道公共档案的请求。

居民为新跑道产生过度噪声起诉机场 (2009年6月15日 西雅图日报)

西雅图-塔科国际机场周围的居民正就该机场第三条新跑道产生的过度噪音和航班量进行索赔。一个共同起诉将与今天提出。据律师Darrell Cochran讲, 有一万居民生活在受影响区域。除了资金赔偿, 此次诉讼欲寻求限制夜间航班。在机场西侧的这条耗资十亿美元兴建的第三条跑道于去年11月投入使用, 原本被

flank, was justified as a relief runway to help in bad weather conditions — but plaintiffs claim the port reneged on its word by using it all the time.

Bangkok Airport Offers Noise Compensation to Residents(2008 By Elizabeth Clifford-Marsh)

Residents living close to Bangko's Suvarnabhumi International Airport have threatened to disrupt flights by firing homemade rockets and releasing balloons in an on-going dispute over noise. Airport operator Airports of Thailand (AoT) had begun negotiations with residents who have been seriously affected by air traffic-related noise pollution. In early Sepember last year AoT began to supply residents with sleeping pills in an attempt to appease growing noise complaints. Only residents living in the area prior to 2001 will be eligible for compensation, which may take the form of AoT buying the resident's houses or paying for repairs.

Airport Noise Increases Hypertension Risk (2008 By Elizabeth Clifford-Marsh)

The European Commission-funded study, led by Lars Jarup at the University of Glasgow, and published in the European Heart Journal, found people living under a flight path near busy airports have a greater risk of developing chronic high blood pressure than people living in quieter areas. An increase in night-time airplane noise of ten decibels increased the risk of high blood pressure by 14 percent in both male and female volunteers.

● Aviation Noise Control noise in China and Developed Countries?

美国机场 Airports in U.S.	中国机场 Airports in China
法律: 美国联邦航空法150部 Laws:FAR Part150	法律: 暂无全国性指导机场降噪法律及财政辅助政策 Laws:Do not have a guidelines and finance support
大部分机场安装专业噪声监测系统 Most airports install a NOMS	仅极少数机场安装专业噪声监测设备 Few airports have a NOMS
根据监测结果采取相应手段降噪 Conduct control methods according to the monitoring data	地方机场多自行短期监测噪声, 采取一定手段降噪 Local airports do short-term monitoring, conduct certain control

● How to Deal with Aviation Noise?

Methods used to control noise at airports include below 5 areas: airport planning, use of airport layout and airspace, aircraft operation, utilization of the land around airport and management of the airport noise control plan. In details the airport could understand the noise pollution near the airport by the noise monitoring equipment and develop the relevant solutions. If necessary, the airport could change or optimize the aircraft departure/arrival procedure, use preferential flight track, reduce red-eye flights, enhance the noise immunity of the house(install storm windows and doors, firm the walls), constrect noise buffer for the communities.

作为在恶劣天气条件下的应急跑道。原告诉讼机场食言全天候使用该条跑道。

曼谷机场向当地居民进行噪声赔偿 (2008年 文/Elizabeth Clifford-Marsh)

2008年2月曼谷国际机场居民此前威胁将在正在进行的抵制机场噪声行动中用发射自制火箭和放飞气球等方式破坏机场航班运行。泰国机场管理者已开始和受到严重航空噪声污染影响的居民进行谈判。去年9月初, 机场当局便开始向居民提供安眠药试图缓解噪声投诉的增长势头。最终只有在2001年前就在机场周围区域生活的居民可获得赔偿, 赔偿形式为机场当局购买居民住宅或支付修缮房屋所需的费用。

机场航空噪声可增加罹患高血压的风险 (2008年 文/Elizabeth Clifford-Marsh)

英国格拉斯哥大学的Lars Jarup先生曾主持进行一项由欧洲委员会资助的研究, 研究报告发表在欧洲心脏期刊。此项研究发现生活在繁忙机场飞行航线下的居民罹患慢性高血压的危险远高于那些生活在较安静地带的人们。夜间飞机噪音每增高10分贝可使男女实验者罹患高血压的风险增高14%。

● 中外机场各是怎样治理机场航空噪声的?

● 怎样处理机场航空噪声问题?

治理手段主要有如下五个方面, 即机场规划、机场和空域的使用、飞行器运行、机场周围土地的利用, 以及机场噪音控制规划的管理。具体可根据噪声监测设备的测量数据了解机场周围的噪声污染情况, 并制定相应解决方案。如有必要可更改或优化飞行器进离场程序、使用优先航路、减少夜间航班、加固机场周边民宅的抗噪性能(如安装加厚门窗、加固墙体等)、在社区周边安装噪音缓冲墙等。



● HMMH Specializes in Airport Noise Abatement for 30 Years



Harris Miller Miller & Hanson Inc. (HMMH) was founded in 1981 to provide the highest quality noise consulting services to airports. Among the 30 years, HMMH devoted exclusively to noise control at nearly 200 aciation facilities throughout the U.S. and in Canada, Australia, Italy, Japan, Spain, Puerto Rico, and Guam. With four offices throughout the country, we serve government and private industry clients with a broad range of innovative and effective solutions. Being the forerunner of China's aviation noise consulting area, HMMH began to popularize aviation noise to China since 1991, after 20 years exploration and research on Chinese civil avation, HMMH undoubtedly became the expert in China's aviation noise cunsulting area.

In late 1990s, with the rapid development of China's economy and civil aviation, aviation noise problem became seriously. In 1999 HMMH was invited by CAAC to hold China's first seminar on "Aviation Noise Effect" which marked a beginning of providing consulting service to Chinese airports . The attendants included: CAAC, State Environmental Protection Administration, BCIA and Civil Aviation University of China. In 2003, one of the founders of HMMH Mr. Andrew S. Harris lead the consulting team received the invitation by CAAC, cooperated with Civil Aviation University of China made a resarch and issued the report of "Case study on noise abatement at the abroad civil airports and the analysis of airport management strategy". The report was regarded as the guidance of Chinese aviation noise control. In year 2005, BCIA being the busiest transportation hub China, the increasing flights caused serious noise problem. CAAC invited HMMH provide consulting service to help BCIA with the establiehment of its Noise and Operations Monitoring System. From 2005 to 2009, HMMH signed totally 4 contracts with BCIA and help them with the whole procedure from system design to staff training.

HMMH's consulting services to airport noise can be sum up as noise and land use compatibility planning, environmental studies, airport ground noise, helicopter/helipad noise, noise monitoring systems, residential/institutional sound insulation and training. In aviation area, HMMH could provide the service on airspace modeling and simulation, airspace policy planning (Work in JPDO office of FAA for implementation of NextGen), air quality modeling and analysis, renewable energy and energy use analysis and training.

● 美国HMMH公司专注机场噪声治理30年

美国HMMH公司成立于1981年，旨在提供有关航空噪音的高水平专业咨询服务。成立的30年间，我们曾在美国，加拿大，澳大利亚，意大利，日本，西班牙，波多黎各和关岛等地近200个航空设施致力于噪音控制工作。目前美国境内设立的四家分公司正在为政府机构以及私人企业客户在诸多领域提供创新及有效的解决方案。作为中国航空噪声咨询领域的先驱，HMMH公司于1991年开始对中国民航相关系统进行航空噪声知识的普及和宣传，经过20年的探索和对中国民用航空的持续研究，HMMH公司无疑成为中国航空噪声咨询领域的专家。

上世纪90年代末随着我国经济发展与民航业的快速发展，机场噪声问题随之严重。1999年美国HMMH公司受邀来京举办了中国第一次关于“机场噪声影响控制”的技术讲座。当时民航局、国家环保总局、首都机场、民航大学等相关单位参加讲座。从此拉开了HMMH公司在中国推广机场航空噪声的序幕。2003年HMMH公司创始人之一Andrew S. Harris先生带领的咨询团队与中国民航大学合作，受民航总局委托进行《国外民用机场噪声处置案例分析及管理政策研究》。该报告成为民航局治理中国机场噪声重要的引路石。时至2005年，首都机场作为我国最为繁忙的航空枢纽，航班流量不断增加，噪声问题剑拔弩张。民航局邀请HMMH公司进行首都机场安装噪声与运行监测系统的咨询工作。2005到2009年间，4个咨询服务合同的签订帮助首都机场完成了噪声与运行监测系统从设计到最终人员培训的全套流程。

HMMH公司可提供的各项顾问咨询服务可概括为制定噪声及土地相容性计划、环境研究、机场地面噪声控制、直升机/停机坪噪声控制、噪声监测系统、当地居民及教育场所的噪声防护措施以及培训。航空方面，HMMH公司还可提供空域模型制作及演示、空域规划（参与JPDO办公室的新航行系统项目）、空气质量模型及研究、可再生能源及能源使用研究以及培训。



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China Civil Aviation Report  
民航报导

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