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PROSPECTS OF GENERAL AVIATION
FLEET'S MARKET
IN RUSSIA AND UKRAINE



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Cover photo: Airfield Severka in Moscow region

Current status of general aviation fleet in Russia

According to unofficial data from Rosaviation (FATA) in November 2008 civil aviation fleet in Russian Federation was consisted from 6590 aircrafts but only 2961 aircrafts were in operation.

From total 6590 aircrafts was registered 1869 helicopters manufactured in Russia and 198 helicopters that had been imported to Russia from other countries. That is, the proportion of helicopters in the fleet of civil aviation in 2008 was 31,4%. We shall pay attention to this.

According to Rosaviation in November 2008 there were 756 light aircrafts in the fleet, but only 186 of them were operating. However, analysis of information about the fleet by aircraft type shows that calculation of light aircraft and helicopters is not exact. In Aviation Register in that time was registered: An-2 – 1561 aircrafts (374 – in operation) and 144 light aircrafts with piston and turboprop engines including ultralight X-32 and Aviatika-MAI-890 to Russian M101 Gzhel and Swiss Pilatus PC 12.

Table 1

Fleet of GA in Russia in 2009 r.

	FATA	FAE ¹	VSAAFN ⁵	UF OLA ²	TOTAL
Corporate jet	158				158
Helicopters, including ultra light	114	106	66	10	296
Light aircraft	471	746	356		1573
Aircraft of VLA (LSA) and ULA category	287	49		700	1036
Historical aircraft	9				9
Hydroplanes (amphibians)	41	22			63
Gyroplanes	7			70	77
Gliders, moto-gliders	8	20	127		155
Flex-wing trikes (trikes) ³	306			1500	1806
Hang gliders, paragliders, paramorots, paraplanes ⁴	26			3400	3426
Baloon and airship	143				143
Total	1570	943	549	5680	8742

1 – data provided by Mr. Sabolotskiy V.V. – President of Federation of aviation enthusiasts of the Russian Federation (FAE RF) [1];

2 – expert estimate of Mr. Nikitin I.V – Vice President of The United Federation of light aviation of the Russian Federation (UF OLA RF). [2], minimum;

3 – trikes are included [2];

4 – hang gliders, paragliders, trikes and paratrikes are included [2];

5 – Russian Defense Sports and Technical Organization (RDSTO), from 2010 –

Voluntary Society for Assistance to the Army, Air Force and Navy of the Russian Federation (VSAAFN RF)

Analysis of data of Register of Civil Aviation Fleet, provided by public organization AOPA of Russian Federation, grounds to consider that in November, 2009 in Russia all were registered only 6620 aircrafts (by 0,5% more compared with 2008), from that amount 5050 can be attributed to the commercial aircrafts and helicopters (special mission, regional, trunk passenger and transport), 1570 aircrafts – to aircrafts of General Aviation, including 158 – to corporate jet (table. 1)

Unfortunately, the classification of the aircraft belonged to general aviation or commercial aviation can not be considered absolutely reliable.

Since Russia adopted FAR-118 (Federal Aviation Regulations 118 of Russia), allowing to issue Type Certificate of Single Aircraft Sample for foreign aircrafts or aircrafts without Type Certificate issued by Russian Interstate Aviation Committee (IAC), then 982 from 6620 aircrafts had been referred to this category. Another 203 aircrafts are registered in the FAE RF register of Russian Federation. There is no direct correspondence between Type Certificate of Single Aircraft Sample in Russia and Experimental category in USA. For example, in Russia number of piston aircrafts produced by Cessna Aircraft Company, Piper Aircraft Inc, Hawker Beechcraft Corporation, Diamond Aircraft and others are certified as Single Aircraft Sample, including Cessna 172 and Cirrus SR20 certified by IAC. Officially, aircrafts with Type Certificate of Single Aircraft Sample can not participate in commercial activity, according to FAR-118, however some of them practically is engaged to airwork, passenger transportation, training, etc., as the term “Type Certificate of Single Aircraft Sample” is not defined in Air Code of Russian Federation.

On the other hand, some certified aircrafts have been passed by their owners for lease to commercial airlines, but actually used in the personal purposes. For example, a division of helicopter fleet of Robinson R

44 certified by Russian IAC into 63 helicopters of GA and 101 commercial helicopter did not fully correspond to reality.

Finally, not all aircrafts are registered in the State Register of Civil Aviation Fleet. First of all, it can be referred to hang gliders, paragliders, paramotors, paraplanes, trikes, ultra-light aircrafts (ULA) or light sport aircraft (LSA, microplanes) [2], very light aircraft (VLA), gyroplanes, hydroplanes, and even to helicopters. Robinson's distributors believed that all together up to 300 Robinson R 44 have been imported into Russia, in the State Register only 164 are registered and in registry of FAE RF plus 23 more (with R22).

From data provided by Federation of Aviation Enthusiasts (FAE of RF) in 2004 more than 1200 aircrafts and over 3500 pilots-amateurs was registered in this organization. However as a result of actions of aviation administration of Russian Federation from 2004 to 2008 in 227 offices of FAE of RF locate in 51 regions of Russia the only 943 aircrafts (250 are abroad) and less than 3000 pilots-amateurs have left [1]. Part of fleet of FAE of RF was added to the national register of civil aircrafts, other – exported from Russia.

There is another large public organization In Russia is – United Federation of Ultralight Aviation (UF UA), in its 52 regional offices more then 6000 pilots of hang gliders, trikes and ULA/LSA/VLA (microplanes) are registered . From data of this organization her members have in their possession from 5680 to 7560 aircrafts, greater part of which are by paragliders, paramotors, paraplanes, trikes and microplanes [2].

In addition, 549 light aircraft, helicopters and gliders, made mainly in the USSR, Poland and the Czech Republic until 1991 are registered in the Russian Defense Sports and Technical Organization (RDSTO), from 2010 – Voluntary Society for Assistance to the Army, Air Force and Navy of the Russian Federation (VSAAFN RF). This is Yak-52, Yak-55, Su-29, Su-31, Yak-18T, Mi-2, the Mi-8, PZL-35A, An-2, L-13 Blanik gliders and other that got a registration number RF as state aircraft. They are not formally included in the GA fleet, although in fact they should be.

Considerable part of corporate aircrafts are not registered in Russia as well. From data of “Aerospetzproject” LTD, in 2007 Russian owners controlled 525 business jets, including 214 produced in Russian and Ukraine, 311 – foreign [3]. In a register from 6020 aircrafts to the business aviation can be referred 158 only. Other ones have foreign registration numbers.

Reasons due to which they do not register private aircrafts and helicopters and expensive corporate lets are different, but as the result the exact information on GA fleet in Russian Federation is currently unavailable. We assume that according to data provided by Rosaviaton and public aviation organization GA fleet in Russia in 2009 consisted from 8742 aircrafts (Table 1). In this case, should be considered relatively accurate information on the number of helicopters and light aircrafts, information about ultralight non-engine and engine aircrafts in GA is most uncertain.



Airfield Bolshoe Gryzlovo in Moscow region

Table 2

Commercial aircrafts in Russian Federation in 2009 r.

	2009
Passengers aircraft (LH and MR)	688
Aircrafts RAL (turbojet bypass engines)	321
Aircrafts RAL (turboprop engines)	36
Aircrafts LAR (turboprop engines)	256
Aircrafts LAR (piston engines)	162
Transportation aircraft (turbojet bypass engines)	327
Transportation aircraft (turboprop engines)	185
Transportation aircraft (piston engines)	226
Helicopters produced in USSR and RF	1749
Helicopters produced abroad	125
Hydroplanes (amphibian)	2
Training aircrafts	201
Special mission	772
Total	5050

LR – long range aircrafts;
 MR – mid range aircrafts;
 RAL – regional airlines;
 LAR – local airlines;
 TBE – turbojet bypass engines;
 TE – turboprop engines;
 PE – piston engines.

Equivalent fleet of GA in Russia

Distribution on GA and commercial aircrafts in Russia given in Table 1-2, does not match to methodology of statistical account of GA aircrafts in General aviation Manufacturers association (GAMA) – Association of aircraft producers for GA.

This association publishes the most comprehensive annual reports on GA status in the United States and in other countries, and is the most authorized corporate expert in this field.

Differences in the aircraft fleet classification in the United States and Russia can be seen in Table. 3 [4].

As we see, in the United States to GA aircrafts the following category of aircrafts as Aerial Application, Aerial Observer, Aerial Other, External Load, Other Work, Sight Sea, Air Taxi, Air Tours, Air Medical are related, in Russia they are considered as commercial, but In USA , according to FAR 91 and FAR 135 belong to GA fleet.

Similar methodology they use in GAMA for estimation of GA fleet in other countries From the position of aircraft manufacturing companies such practice is logical and justified, as to estimate the prospects for production of aircraft, which can be used for various tasks, it is more correct to take into account requirements of aircrafts in all fields of civil aviation, where they are used.

First time this approach was used in the report, provided by National Business Aircraft Association (NBAA), which identified 9 categories GA aircrafts [5].

Table 3

GA fleet in USA in 2008

	2008
GA FAR Part 91 USE	
Personal	154417
Business	22432
Corporate	11715
Instructional	14975
Aerial Application	3106
Aerial Observer	5304
Aerial Other	1036
External Load	374
Other Work	934
Sight Sea	673
Air Medical	411
Other	4786
Total GA Part 91 USE	220163
On-Demand FAR Part 135 Use	
Air Taxi	6873
Air Tours	389
Air Medical	1237
Total GA Part 135 USE	8499
Total Aircraft	228663

Therefore, to predict GA fleet in Russia on the basis of foreign statistics we should lead the primary data to the equivalent by one of two methods. Either, exclude from the GA of compared countries like the United States, aircrafts, used by analogy with the requirements of FAR 91 and FAR 135, or conditionally add similar aircrafts of Russian Federation to its GA fleet.

In the first variant the amount of GA fleet of U.S. decreased to 203540 units (on 12.2%). The results to bring GA fleet in Russia to the world equivalent are presented in Table. 4. As you can see, the number of GA fleet increased almost on 23%.

Table 4

Equivalent GA in Russia in 2009

	2009
Corporate and business jets	158
Helicopters	1048
Light aircraft	2812
Aircrafts of VLA (LSA) and ULA category	1036
Historical aircraft	9
Hydroplanes (amphibians)	63
Gyroplane	77
Glider, moto-gliders	155
Trikes	1806
Hang gliders, paragliders, paramorots, paraplanes	3426
Balloon & airship	143
Total	10733

We've got such result because practically all 239 foreign helicopters and 513 helicopters of Russian production, as well as 1239 light aircrafts, including 1214 from 1438 An-2, referred to Use of Aviation in the National Economy (UANE) - the equivalent of Aerial Application& Aerial Observer&Aerial Other& Air Medical and etc, to educational institutions, and also all PC-12, used as an air taxi, 6 from 19 An-3 and other aircrafts

used in Russia similar to the requirements of FAR- 91 and FAR - 35, raised up the equivalent number of GA fleet in Russian Federation.

As in GAMA's reports statistics for several countries is not as detailed, as for the USA in Table. 4, for a comparative estimation we will use data about GA fleet in Russia, presented in Table. 4

Predictors – factors forecasting development of GA fleet

As shown above, in 2009, according to unofficial data from Rosaviation to GA can formally be included about 1570 aircrafts of different categories (including 158 business jets). GA fleet of the Russian Federation, equivalent to GAMA's accounting system, is higher in kind – 10733 aircrafts. But these numbers are small for such a big country. Some reasons of the slow development of GA in Russia discussed below. We will try to evaluate the prospects for increasing of GA fleet in Russia.

As there is no statistics for past years (official definition "general aviation" was introduced in Russia only in 1998), it is necessary to find reliable indicators allowing to forecast the development of this industry. As forecasting factors in mathematical statistics is named predictors, we will use this term.

To the present, Russian public organizations and individual researchers decided to give as an example the state GA fleet in USA, where is it most developed. However this example does not provide reference-points for the estimation of prospects of GA fleet development not only Russia but also in other countries, as from 320000 aircrafts of GA, which are registered now in the countries of ICAO (without China and Russian Federation), 228663 aircrafts, i.e. more than 71%, owned by U.S. citizens [4].

In the commercial aviation its fleet can be predicted, comparing the change of passenger traffic with the transport capacity of the existing passenger aircrafts.

Estimating the prospects of cargo traffic, usually use the same approach- comparing cargo traffic with carrying capacity of existing fleet.

Prognosis of demand for exact type of aircraft for GA is done based on comparison of expenses on its acquisition and operation with the profits to potential owner, taking into account the cost of his business hours.

However it is clear, that none of these approaches can be applied to estimation of practically zero-based prospects of total GA fleet growth.

Obviously, the potential predictors could be some indicators of economic development of the country and welfare of its citizens, as well as indicators that characterize the features of its geography and development of infrastructure.

Table. 5 shows some of the predictors that are potentially available for accounting and forecasting. Data sources are reports [4, 6, 7, 8].



Airfield Bolshoe Gryzlovo in Moscow region

Table 5

Comparison of GA fleet in different countries on economic and geographical indicators

	NGAA	P	GDP	IPC	LE	AC	D	HNWI	NA
USA	228663	304,06	14093	47930	78	9363,00	32,2	2460	19729
Canada	32933	33,31	1501	43640	81	9976,14	3,3	213	2452
Great Britain	19890	61,41	2674	46040	80	244,82	248,2	362	482
Germany	21327	82,11	3649	42710	80	357,02	230,8	810	584
Brazil	16576	191,97	1575	7300	72	8511,97	22,3	131	737
Republic of South Africa	10693	48,69	276	5820	51	1219,91	36,1	100	86
Australia	11750	21,43	1015	40240	81	7686,85	2,7	129	270
New Zealand	4000	4,27	130	27830	80	268,68	15,3	15	209
Switzerland	3800	7,65	492	55510	82	41,29	183,0	185	67
Russia	?	141,95	1680	9660	68	17075,40	8,3	101	330
Ukraine	?	46,26	180	3210	68	603,7	76,7	6*	68*

NGAA – Number of General Aviation Aircraft in 2008, Nos.;

P – Population, mln. people.;

GDP – Gross domestic product, \$ mlrd.;

IPC – Income per capita in 2008, \$;

LE – Life expectancy, years;

AC – The area of the country, thousands sq.km.;

D – Density, persons/sq.km;

HNWI – High Net Worth Individual, \$, thousands of people in 2008;

NA – Number of airports, Nos.; *, ** – inaccurate data.

From the viewpoint of mathematical statistics, sampling, proposed in the Table. 5, is not representative and does not allow to do quantitative predictions with an acceptable confidence probability. If we collect data on GA fleet status in more than 25-30 countries, the quality of forecasting will be considerably higher. But collection of such information takes time.

Nevertheless, the comparative analysis of these predictors, gives grounds to consider Russia most close to an array of features to Brazil. Both countries have the same kind of parameters such as quantity of population P, the gross domestic product GDP, per capita income IPC, the average life expectancy LE, the number of millionaires HNWI.

For 15 years, with 1993 for 2008, the network of airports in Russia reduced almost in four times – from 1404 to 351. But according to plans of Russian Federation government in 2009-2010 already 112 run ways have to be in operation after reconstruction It is possible to consider that with their renewal in the future and on the index of NA both countries are close [9]. Less in twice area of the Brazilian territory with a greater quantity of population defines an almost threefold greater density of population in this country. However, as shown by the analysis of pair correlation coefficients between the investigated indicators, population density and life expectancy are not predictors in estimation the prospects of GA fleet changing.

Table 6

Table of pair correlation coefficients

	NGAA	IPC	D	HNWI	LE	NA
NGAA	1,00	0,28	-0,19	0,96	0,09	1,00
IPC	0,28	1,00	0,46	0,37	0,79	0,28
D	-0,19	0,46	1,00	0,03	0,26	-0,22
HNWI	0,96	0,37	0,03	1,00	0,15	0,95
LE	0,09	0,79	0,26	0,15	1,00	0,10
NA	1,00	0,28	-0,22	0,95	0,10	1,00

The most powerful indicators of GA development are the number of airports NA, the number of millionaires HNWI and in less degree, the average per capita income IPC.

It should be emphasized that these conclusions are based on preliminary analysis and should not be regarded as proven.

In addition, to the number of predictors, of course, non-quantitative indicators are included. For example, what is the air traffic control system in the country - permissive or informative; how much customs legislation is loyal to GA development (yes, no); is fuel available for GA aircrafts (high or acceptable price, presence or absence of ecological limitations) etc. The list of indicators of GA can be continued. Moreover, it is quite possible to construct reasonable enough regression model, for example linear:

$$NGAA = a + b_1 NA + b_2 HNWI + \sum b_i X_i,$$

where a – constant term;

b_1, b_2, b_i – regressive coefficients;

X_i – unknown for a while predictors, similar to NA and HNWI.

At the presence of a representative and reliable statistics, we can construct not only linear, but polynomial models. Along with such indexes as the coefficient of multiple and partial correlation and others, they will allow to estimate the certainty of the forecast.

But such models do not exist for while.

Therefore, making a quality comparison of Brazil and Russia, we should pay attention to actively growing influence of Brazilian aviation industry in the world and renewal of this sector of economy in Russia. In a social sphere characteristic features are common for both countries- low average per capita income and a large difference in incomes of the most wealthy and poorest layers of population.

As in this case is not intended to compare the socio-economic development of the two countries we will be limited with the conclusion that GA fleet in Russia potentially would be one level with Brazil, i.e. to reach 16000 – 17000 aircrafts.

At least two questions arise in connection with this conclusion:

- whether it possible in the visible future to increase GA aircraft fleet in Russia to the level of Brazil?
- change of what factors, except listed above, will assist to a significant increase in activity in the sector of Russian GA?

Answering the first question, it is possible to use as an example the prognoses of development of GA in China, country, where till recently as well as in Russia there were no private aircrafts. From data [10] GA fleet in China grew from 335 aircrafts in 2002 up to 570 in 2006. In addition the grow up to 12000 GA aircrafts in 2012 was projected. Obviously, the prognosis done in 2006 is too much optimistic. But this country for several decades shows strong growth in all sectors of economy. Therefore it is quite likely that its fleet of GA will develop higher, than in the rest of world. Nevertheless, a park SS AOH must Russia raise, as well as in China, by higher rates, than in countries, where AOH is developed enough.

Factors that assist or prevent it, discussed in detail in the article "But I want to fly" ("GA" № 10'2009). Let's recall them briefly.

Institutional factors of the development of GA fleet

As all most influential from listed above predictors of GA development in Brazil and Russia practically is almost the same, obviously, that other factors brake the increase of GA fleet.

Among them, first first of all are so-called institutional factors i.e. group of the factors, related to the management and regulation of individual spheres, areas of public relations. In this case – general aviation.

Their developing process sometimes make an effective influences on the state of GA in a country. For example, if we analyze the change in GA fleet in Switzerland from 1998 to 2006 (table. 7, [4, 6, 7]), we note that throughout the period, per capita income in this country grow, and GA fleet decreases. Reasons for this are very strict environmental legislation, which was adopted in this country in 2001, As the result some pilots moved their aircrafts and helicopters into neighboring countries, especially to France and Italy, and fly there. Although there was the small falling of profits in 2003

Even more dramatic events took place in the USA. Fig. 1 shows the diagram of GA aircrafts production the USA from 1974 to 2009 [4]. Collapse, which began in 1978 with unexpectedly breaking out fuel crisis has resulted in reduction in production from 17,811 aircrafts in 1978 to 1085 aircrafts in 1987!

Then there has been increase to 1,539 aircrafts in 1989 and again falling to 928 aircraft in 1994, but the reason was no longer in the fuel crisis, but "unfair", according to GAMA, laws on responsibility for the quality of production [5].

Therefore, institutional factors have on the development of GA no less destructive or stimulating influence than economical.

Table 7

Change in GA fleet and per capita income in Switzerland [4, 6, 7]

	1998	1999	2000	2001	2002	2003	2004	2005	2006
GA fleet	4039	4021	4048	4067	4030	3972	3893	3841	3822
Per capita income, \$	29599,5	30140,7	31690,5	32357,4	33658,1	33580,5	34851,6	35773,4	38372,3

General Aviation Shipments of Airplanes Manufactured in the U.S. (1974-2009)

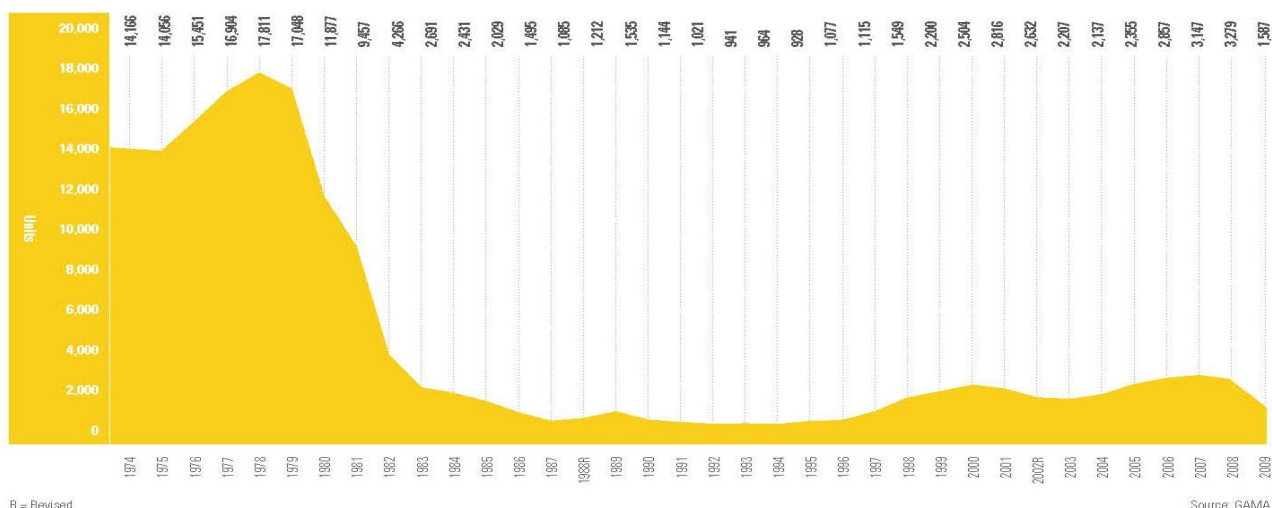


Рис. 1. Change of GA fleet from 1974 r. to 2009 r. [4]

Use of airspace

Structure of air space of Russian Federation so far does not meet ICAO's recommendation and became a "proverb". The archaic declarative air traffic control system generates a semi-formal turnover of money, which does not stimulate the implementation of the recommendations of ICAO on the introduction of the modern structure of the airspace.

Government Decree № 138 " On approval of the Federal Aviation Regulations use of airspace of Russian Federation" (FAR UA RF) was accepted and came into force on November 1, 2010. May be FAR UA RF will be introduced later, but as soon as notification procedure is set in G space then will disappear the most serious barrier to the development of GA, that depriving it today the main benefits - a significant time savings in the private and business flights.

Naturally, introduction of FAR UA RF will assist the increase of GA fleet in Russia. But the explosive growth shall not be expected.

First, look at Table. 5. Per capita income IPC, as well as the number of individuals with large capital NNWI in Ukraine is the lowest from the entire countries getting in a selection. Secondly, an innovation was on the period of economic crisis. Thirdly, not all issues are resolved. For example, the admission for foreign aircraft to airspace of Ukraine only with lidirovshikom limits the number of flights from foreign countries. An increase in the number of such operations would contribute to the development of ground infrastructure. Influence of other institutional factors still remains, in particular, prohibition to use in the country aviation gasoline. So notisable increase in GA in Ukraine will be observed with the improvement in economic conditions and the removal of fuel barriers.

In Russia, UA factor should have more noticeable impact on the development of GA (FAR UA RF have been introduced on Nov. 1, 2010, author's note).

Customs barriers

Import duties on aircraft with a takeoff weight of empty equipped less than two tons in Russia is 20%, the cost will increase additional on 18% VAT as soon as it is imported into the customs territory of Russian

Federation [12]. Together with the associated charges the prices of most aircrafts of GA, imported to Russia has increased by 42% compared with the prices of manufacturers.

It is expected that customs duty on import of aircraft with a weight of up to 2 tons will be equal to 0%. But while the barrier for import of foreign GA aircrafts remains high, therefore dominates the import of cheaper equipment from the secondary market.

In Ukraine, the customs duty on import of aircraft and components are equal or close to zero. But the reasons for the slow growth of the fleet were mentioned above.

Removal of customs barriers, probably, will lead not so much to increase of the total number of aircrafts, as to redistribution of the procurement of equipment: the share of new aircraft and helicopters will increase in the overall fleet.

Certification of GA aircrafts

Air Code of Russian Federation does not correspond to modern realities. According to this document, the requirements for the airworthiness of aircraft are determined by FAR RF, and admission to the operation realizes at availability of the airworthiness certificate based on type certificate. It is issued by the Interstate Aviation Committee (IAC).

Generally IAC is not a national certification organisation. And for Russia, the type certificate issued by the IAC, formally is not different from the certificate issued by the FAA, CAA and the aviation administration of any other country. Even this can be considered as some kind of casus, if to close eyes to the intergovernmental agreement of 1991.

This practice is based on the recommendations of ICAO, eliminating the lengthy and costly procedure of re-certification, which basically consists in estimating the compliance with national aviation regulations (in this case, the rules of the IAC) of documents presented by the manufacturer.

Aircraft with a type certificate of IAC in Russia have a certificate of airworthiness in accordance with FAR - 132 RF.

In addition to 23 aircraft (Table 8), which can be attributed to GA, type certificates received 20 helicopters of Russian and foreign production. This is products of Mil, Kamov, Kazan Helicopters, Robinson, Agusta, Eurocopter, Bell, MD Helicopter companies (in the table also does not included corporate, business aircraft, balloons, airships).

A total only 138 type certificates has been issued by IAC during 18 years of existence. This is extremely small for GA, where the variety of aircraft types are great. Obviously IAC does not have sufficient resources to certify the aircraft in a reasonable timeframe, and it is due to imperfection of aviation legislation in Russian Federation brakes the development of GA.

In Russia an order of Ministry of Transport of Russian Federation № 118 dated 17.04.2003 was issued, approved "Regulation on the admission to operation of Single Aircraft Samples of general aviation" (FAR-118 RF). But a definition of "Type Certificate of Single Aircraft Sample" is not certain in Air Code of Russian Federation.

Despite casus, FAR-118 RF have opened sky for many aircrafts, which today belong to the GA fleet in Russia: less than for six years, 982 aircrafts have been certified as Single Aircraft Sample. And however some owners of aircrafts do not go through this procedure.

Russia has recognized 23 on aviation certification, organizations on maintenance and repair service for aircrafts and ground equipment. Thus number includes only 5 centers on Single Aircraft Sample certification, that for country like Russia is very small.

Obviously, the factor of certification will no longer be a barrier to the GA in Russia, where aviation authority will conclude agreements with certification authorities in other countries, allowing to validate national type certificates in Russia and will not require re-certification for type certification for the aircraft, imported to Russia for operation exceptionally in GA.

Table 8

Aircrafts certified by IAC, that could be refer to GA
(without Corporate and Business)

	Type	Нэк	Ндв	Manufacturer	Country
1	A-27M	2	1 ПД	Avantazh	Russia
2	Su-29	2	1 ПД	Sukhoy	Russia
3	Su-31M	2	1 ПД	Sukhoy	Russia
4	Yak-54	2	1 ПД	Yakovlev	Russia
5	Corvet	2	2 ПД	Gydroplan	Russia
6	Иl-103	4	1 ПД	Ilyshin	Russia
7	172R/S	4	1 ПД	Cessna Aircraft	USA
8	182T	4	1 ПД	Cessna Aircraft	USA
9	SR20/SR22	4	1 ПД	Cirrus Aircraft	USA
10	DA 40D	4	1 ПД	Diamond Aircraft	Austria
11	206H/N206H	6	1 ПД	Cessna Aircraft	USA
12	PA-46	6	1 ПД	Piper Aircraft	USA
13	DA 42	4	2 ПД	Diamond Aircraft	Austria
14	PA-44	4	2 ПД	Piper Aircraft	USA
15	PA-34	6	2 ПД	Piper Aircraft	USA
16	Accord-201	6	2 ПД	Авиа Ltd	Russia
17	Be-103	6	2 ПД	Beriev	Russia
18	CM-92T	6	1 ТВД	Tekhnoavia	Russia
19	M-101T	6	1 ТВД	HA3 «Sokol»	Россия
20	PC 12	11	1 ТВД	Pilatus Aircraft	Switzerland
21	An-3	14	1 ТВД	Antonov	Russia
22	208/208B	14	1 ТВД	Cessna Aircraft	USA
23	B300, B300C	15	2 ТВД	Beech Aircraft	USA

* – A-27M ferrefs to VLA category ;

** – Corvet, Accord-201 и Be-103 – hydroplanes-amphibians;

*** – An-3, Cessna 208/208B, Beech B300/B300C are operated in commercial aviation

Registration of GA aircraft

Unlike a certification that in Russia can be interpreted as an estimation of conforming of aircraft to requirements of FAR-118 for Single Aircraft Sample and FAR-132 for copies of certified aircraft, registration – is having aircraft in the file, namely: inclusion in Register of civil aircrafts. Registration is made in accordance with FAR-85 RF. The result is a certificate of registration.

These rules do not apply for registration of ultralight aircrafts, meteorological devices and pilotless balloons.

But according to FAR-85 act of registration of civil aircraft in the State Register is not an act of registration of rights on the aircraft and deals with it.

In practice registration of aircraft costs \$6000 – \$12000 for applicants. For the VLA and light aircraft, prices of which are in the range of \$ 60–300 thousand dollars, the registration may be considered too expensive.

With high probability we can assume that if the rules of certification and registration of GA aircrafts in Russia will become easier and cheaper it would lead to a dramatic increase in fleet of registered aircrafts. Not because they will be built on Russian enterprises or imported into the country by distributors, and as a result of legalization. This event would positively impact not only on the general status of GA in the country, but on a more precise prediction of its development.

Ownership of GA aircraft

Greater problem in Russian Federation is confirmation of right of ownership on aircraft.

It exists in business aviation, where it is proposed to solve the introduction of the registry of property rights on the aircraft in accordance with the Cape Town Convention. This inventory will change the attitude of foreign institutions to aircraft, that were in operation in Russia, will increase their remaining cost and liquidity in the event of resale, that is especially important for expensive corporate aircraft.

In the sector of light aircraft and helicopters of GA nature of the problems of ownership is different. Especially in those cases when the question is about homemade aircrafts.

If the problems securing the rights of ownership will be solved, there will be a noticeable increase in the number of corporate and business aircrafts included into Russian register of civil aircrafts. Not because of bulk purchases, and as a result of re-registering of aircrafts owned by Russian citizens (HNWI) and their companies that are currently operating under foreign registrations. Fleet of business aircraft can grow in two – three times – from 158–242 to 400–500 aircrafts, because just the same amount today, either directly or indirectly, belonged to Russian citizens.

Training and licensing of private pilots

Requirements for pilots in Russian Federation stated in FAR-147 RF. In order to have the right to issue pilot certificate at the end of training, aviation school (AS) must be certified in accordance with FAR -23 RF. For example, a flying club RDSTO can not issue a private pilot license. It has the right to issue a flying book that is not evidence of the certificate of pilot license.

For the training of private pilots Rosaviatsia certified 22 aviation training center. Two of them have the right to prepare commercial pilots as well. In addition, Russia can learn the program in four commercial pilots of aircraft flying schools of civil aviation. There are another 39 AS, which allowed to offer retraining and upgrade qualifications for 1 commercial pilots.

In area of pilots training there are problems caused by causes of certification of AS, by the deficit of instructors, aircrafts, single methodology of educating. However basic problem – all together educational establishments and AS prepare not enough pilots. For example, in an aviation educational center FAE RF in a period with 2004 for 2008 it was trained only 60 pilots-amateurs on airplanes Yak-52 and Yak-18T.

Meantime, according to the prognosis of consulting company "Airpersonnel" needs of the CIS countries by 2026 is estimated in 13000 pilots only of CPL category. This means that at gradual approach of GA in Russian to world standards, in this period should be prepared not less than the same number of private pilots. For this, each of the 22 AS must prepare annually for at least 32 pilots of the category PPL, which is more than they graduate today. However, in the near future due to a sharp reduction in the number of pilots of commercial aircraft on age, the need for private pilots training with a certificate of PPL category, as basis for the preparation of CPL, are several times higher. Therefore the intensity of training should be even higher.

In FAR-23 RF the procedures of approval and recognition of foreign AS are described. Rosaviation acknowledges 48 foreign educational centers, that provide training of aviation personnel for civil aviation of Russian Federation and 16 Russian centers which allowed training for aircrafts of foreign manufacture. Most of them are busy at preparation of commercial pilots, including helicopter pilots for Bell, Eurocopter, Robinson and aircrafts Cessna, Piper and Diamond Aircraft.

In Ukraine, numbers of training centers are also insufficient, although with each passing year the new one appear. When the current problems of training of private and commercial pilots in Russia and Ukraine will be resolved, an important factor limiting the number of pilots, will remain only economic, related to the profits of different population groups and financial ability of future pilots.

Medical examination

Presently in Russia the rules of "Medical examination of civil aviation personnel" must be changed.

Unfavorable factor for GA in Russia there are hardening of requirements to Medical-Flying Expert Agencies (MFEA). To meet requirements, MFEA is forced to purchase an expensive equipment. Funds are not

Expenses of Agencies, of course, raise the cost of medical examination. In Moscow and other regions it is about \$117. But there are examples of passing MFEA for \$800. Taking into account that most private pilots in Russia are people of middle age, new FAR for older than 40 years requires to confirm medical conclusion once every 24 months, while those over 50 years - once a year. Therefore, prices for medical examination will be a deterrent. Because the less active pilots in the AON, the smaller than the park.

Meteorological and navigation service

According to FAR-28 in Russia for meteorology cal support of each flight it is necessary to pay from \$28 to \$90 depending on the type of air craft and region. This means that for meteo informationi private pilot should pay up to \$ 20 thousand a year. Clear that such charges in GA are not justified.

After the introduction of FAR UA RF may increase the demand for navigation maps. Presently in Russia two organizations provide them - Center of the navigation information (CAI) and the Regional Centre Aviakominfo. Both are currently in preparation for the introduction of FAR UA RF. In addition, maps in a scale 5 km are published at regional level. So that this factor will not have a substantial influence on control of GA development.

Especially in the future the basic suppliers of navigation information promise to sell maps through the Internet.

Taxes

There is a threat in Russia that tax on luxury will be increased. If GA aircrafts will be attributed to this category, will appear another brake for GA development.

However a tax on a transport equipment may seem the easy misunderstanding as compared to a tax on the industrial use of earth, that has to be paid for landings sites and air fields. In Moscow region land rent comes to 10000 euro per 1 hectare. In addition, you must pay attention to the proper use of land. If the site is located on agricultural land, its leaseholder may be in sight of the prosecutor's office for the no-purpose use of earth. Pilots find a way out of situation, organizing farms in which are aircrafts among other farm machinery for field inspections, etc. You can transfer land from one category in other. But it is difficult and expensive.

Thus, land taxes will brake the growth of airfields and landings grounds for GA – one of the most influential predictors of GA development in Russia. Consequently, aviation public organizations must more actively defend the rights of private pilots and airclubs in this area.

Fuel

In Russia the problem is not lack of aviation gasoline, which is not produced in the country, but its high cost. Therefore, 100LL is not available at all airports and landing fields. In addition, the price of aviation fuel in Russia for 15 years have raised in several times, and over the past five years – more than in 2,5 times (Fig. 2).

Therefore choosing aircraft for GA with engines up to 100 hp. motors of Rotax, Jabiru are preferable, because they use motor-car petrol, and for speed six place aircrafts and helicopters a choice is remains in favor of gas turbo-engines working on more cheap and accessible kerosene. On the whole problems with a fuel limit the choice of aircraft, that also is the brake for growth of aircrafts and helicopters fleet in Russia and Ukraine.

Presently it is impossible to quantify the influence of 10 mentioned above factors to aviation fleet change.

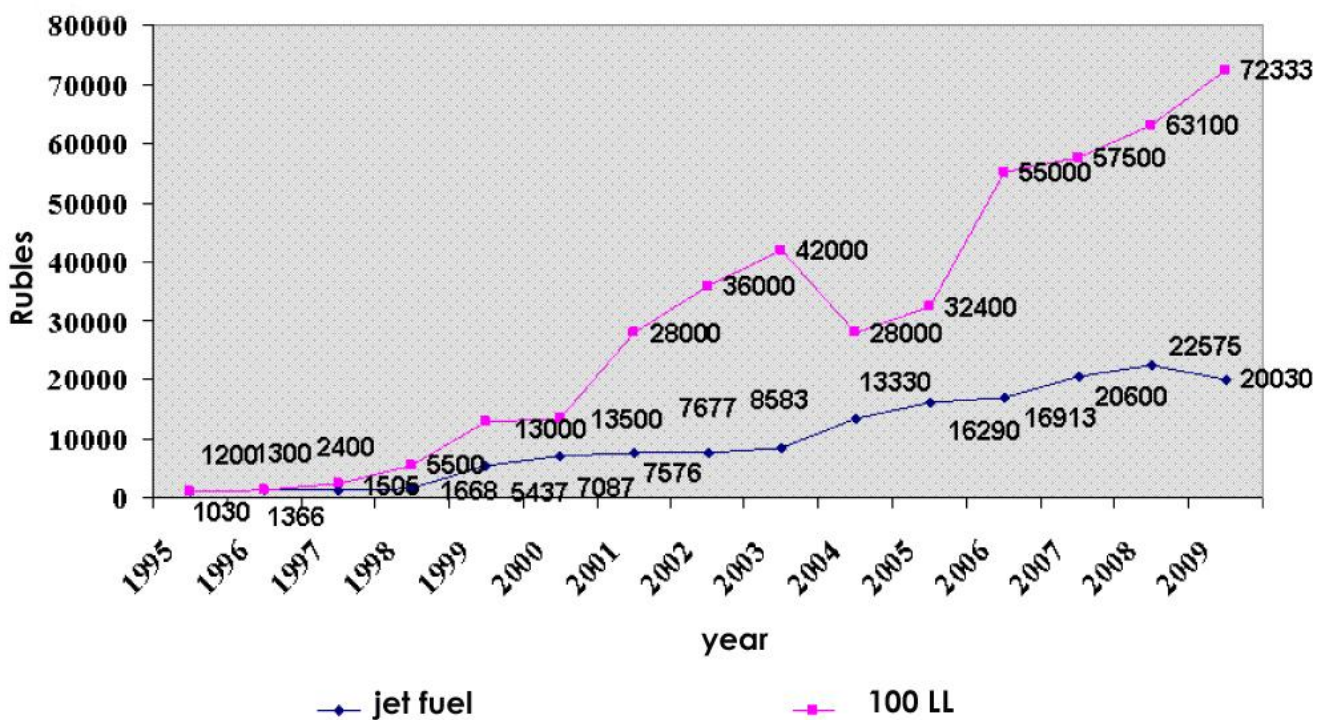


Fig. 2. Raise of fuel cost in Russia



Airfield Severka in Moscow region

Forecast of GA fleet in Russia

In the countries, where representative statistics for GA is collected, fleet can be forecasted determining the trend changes in the number of each type of aircraft for GA. An example is Table. 9, built from data [4, 16, 17]. But the rates of GA fleet growth in Russia and Ukraine can not be similar to the rates in the USA, as all segments of GA market in this country are filled enough. Wherein GA only begins to develop, the growth of its fleet may be higher (in percents, but not in natural or money measuring).

From Table. 5 appears that to predict GA fleet in Russia would be more correct by analogy with Brazil. However, the reliability of this prediction, figuratively speaking, to a large part depends on the accuracy of the exactness of determination of beginning of coordinates. But this is still a problem for Russia. It is therefore important to determine as precisely as possible the original number of GA aircrafts in Russia. Table10 shows statistics of GA fleet in Brazil with the calculation of change in %. I must admit that the problem with statistics is in this country as well. Data on aircrafts and helicopters, published in [16,17] for 1996-2003, are different in the smaller side of [4]. In addition, in the report [4] from 1999 appeared category of Experimental aircrafts. And, at once more than 3000 BC, though earlier they were not taken into account. In [4], the number of gliders suddenly increased by range that, apparently, is the result of simple misprint in the table. Reason of sudden growth by almost 20% of the fleet with turbofan engines in 2008 and reduce by almost 30% of Experimental aircrafts category in 2006 are also unknown. In general, statistics of GA in Brazil also need to investigate further.

Table 9

FAA forecast trends fleet GA U.S. (with aircraft of FAR-135), в % [4, 16, 17]

Year	Aircrafts				Helicopters		Exp	VLA	Others	Total
	Pistons		Turbines		ПД	ТВлД				
	1 ПД	>1 ПД	ТВД	ТРДД						
2007	0,3	-0,2	0,6	6	5,7	2,1	2,3	28,4	0,1	1,4
2008	0,5	-0,9	1,6	5,6	4,7	1,9	2,2	9,9	0,0	1,4
2009	0,1	-0,1	1,4	4,5	3,7	2,4	2,0	4,7	0,0	0,9

Table 10

Change of GA fleet in Brazil according to [4]

Year	Aircrafts						Helicopters	GLDR	Bal	Air ship	EXPRM	Total	IBC	
	Piston		Turboprop		Jet									
1996	7987	%	1013	%	462	%	547	%	302	4		%	10315	%
1997	8055	0,85	1111	9,67	488	5,63	649	18,65	304	4	1		10611	2,87
1998	8172	1,45	1182	6,39	513	5,12	749	15,41	306	4	1		10927	2,98
1999	8273	1,24	1192	0,85	497	-3,12	791	5,61	307	4	1	3152	14217	30,11
2000	8333	0,73	1218	2,18	500	0,60	841	6,32	308	4	1	3348	6,22 14553	2,36
2001	8412	0,95	1260	3,45	542	8,40	897	6,66	309	3	1	3513	4,93 14937	2,64
2002	8455	0,51	1303	3,41	579	6,83	940	4,79	310	3	1	3684	4,87 15265	2,20
2003	8496	0,48	1323	1,53	560	-3,28	955	1,60	316	3	1	3882	5,37 15536	1,78
2004	8604	1,27	1348	1,89	559	-0,18	981	2,72	316	3	1	4069	4,82 15881	2,22
2005	8718	1,32	1361	0,96	596	6,62	989	0,82	316	3	1	4286	5,33 16270	2,45
2006	8798	0,92	1399	2,79	603	1,17	1011	2,22	309	3	1	3001	- 29,98 15125	-7,04
2007	8909	1,26	1488	6,36	647	7,30	1097	8,51	303	3	1	3225	7,46 15673	3,62
2008	9164	2,86	1617	8,67	773	19,47	1194	8,84	299	3	1	3525	9,30 16576	5,76
2009	9354	2,07	1700	5,13	820	6,08	1255	5,11	3000*	3	1	3632	3,04 19765	19,24
Min. without DP		0,48		0,85		0,60		0,82					3,04	1,78
Average		1,22		4,10		4,67		6,71					2,14	5,48
Average without DP		1,22		3,64		5,31		4,84					5,7	0,03
Max. without DP		2,86		8,67		8,40		8,84					9,30	0,06

* – it is possible that in report [4] misprint was made or in 2009 r. In Brazil the system of glider registration has been changed изменили систему учета планеров;

DP – dropped out points in [4]

If to accept for a base known with a large error amount GA aircrafts in Russia and to suppose the rates of its growth similar to Brazil, it is possible also with a large enough error to do the prognosis of changes in Russian GA fleet for the nearest 5-6 years.

However such error is better than complete uncertainty or illusions of large prospects. Naturally, not quite correctly mechanically to multiply the quantity of SS in every segment on coefficients determined by simply using minimum, middle or maximal percents of growth or decrease of GA fleet in Brazil, considering the same growth rate during the entire period. But even if you this, we will get by 2015 the range of values of introduced fleet from 11119 to 17313 with an average value of 14015 aircraft. If exclude those aircraft that in Russia considered as commercial, average value will go down to 2120, and maximum up to 2633 GA aircraft.

Focusing on the middle rates of GA fleet change in Brazil (without dropped out points), it is possible to get an idea about distribution of GA fleet in Russia (Table. 11). In this case the error of prognosis will substantially depend on exactness of expert estimation of amount of hang gliders, paragliders, paraplanes, paramotors, trikes and VLA/LSA/microaircrafts [2]. Also uncertainty arises from the forecast of light aircrafts, as in basic data there is an error at the estimation of classifying them, as well as VLA and ULA to the category of Single Aircraft Sample. Data on the number of helicopters is similar to real. Obviously, that the prognosis of corporate aircrafts and hydrolanes is undervalued and the estimation of trikes, motoparagliders and paragliders is overestimated. Check of these prognosis can be done specifying basic data, and also to determine an adequate regressive model, estimating change of economic predictors. However the range of resulting figures is near to data about GA fleet in Brazil, that testifies in favor of the hypotesis expressed above.

Table 11

Change in GA fleet in Russia (preliminary prognosis)

	2009	2010	2011	2012	2013	2014	2015						
Corporate and business jets	158	1,0531	166	1,0531	175	1,0531	185	1,0531	194	1,0531	205	1,0531	216
Helicopters	1048	1,0484	1099	1,0484	1152	1,0484	1208	1,0484	1266	1,0484	1327	1,0484	1392
Light aircrafts	2812	1,0122	2846	1,0122	2881	1,0122	2916	1,0122	2952	1,0122	2988	1,0122	3024
VLA and ULA	1036	1,057	1095	1,057	1157	1,057	1223	1,057	1293	1,057	1367	1,057	1445
Historical aircrafts	9	1,057	1012	1,057	1013	1,057	11	1,057	11	1,057	12	1,057	13
Hydroplanes (amphibian)	63	1,057	67	1,057	70	1,057	74	1,057	79	1,057	83	1,057	88
Gyroplanes	77	1,0484	81	1,0484	88	1,0484	96	1,0484	105	1,0484	115	1,0484	126
Gliders, motoglidors	155	1,057	164	1,057	173	1,057	183	1,057	193	1,057	205	1,057	216
Trike	1806	1,057	1909	1,057	2018	1,057	2133	1,057	2254	1,15	2383	1,20	2519
Hanggliders, paraplanes, paramotors	3426	1,057	3621	1,057	3828	1,057	4046	1,057	4276	1,057	4520	1,057	4778
Balloon & airship	143	1,057	151	1,057	160	1,057	169	1,057	178	1,057	189	1,057	199
Introduced fleet	10733		11209		11713		12244		12803		13393		14015

Forecast of GA fleet in Ukraine

If for Russia in area of GA Brazil can be recognized as an analogue, then for Ukraine from the presented selection, Republic of South Africa is closer on economic and geographical indicators (table. 5). Countries are close on the quantity of population, gross domestic product (although in Republic of South Africa it was 1,5 time higher, than in Ukraine), per capita income (but on the average Ukrainians have almost twice less profits), number of air fields (and there South Africa is also ahead of Ukraine) The recent past of RSA, related to the apartheid, reminds about itself by very low lifespan and greater, than in Ukraine, population split on incomes. The first indicator, as well as population density, practically does not influence on the state of GA. But second, especially the number of HNWI, is very essential. At near quantity of population number of millionaires in Republic of South Africa is higher in a kind then in Ukraine, almost as much as in Russia – 100 thousand people.

Consequently, GA fleet of Republic of South Africa – 11000 aircraft – for Ukraine at her present indexes of economy is absolutely inaccessible.

Least amount of HNWI among countries in Table 5 is in New Zealand – 15 thousand people. In Ukraine in 2008 were registered 7423 people with incomes greater than 1 million UAH. Because tax authorities did not bother to bring the income of local millionaires to world equivalent it is impossible to say exactly how much HNWI are in the country. It is clear that less than 7000, but as far?

In Ukraine gross domestic income is more than in New Zealand, but population is smaller in kind, and therefore per capita incomes is almost 9 times higher. But on the territory that is twice smaller the number of airports in New Zealand is almost four times more than in Ukraine. But GA fleet, extrapolated from data of 1998-2005, is close to 4000 aircrafts.

Thus, in the absence of more reliable data it is possible to suggest that at current indexes Ukraine could potentially have from 4000 to 11000 aircrafts. How many actually?

According to State Aviation Authority (SAA) of Ministry of Transport of Ukraine at the end of June, 2010 more than 330 aircrafts (table. 12) is listed in the register of this establishment, although as of September, 2008 there were about 150, and now register of GA fleet increases every day. Partly due to registration of produced in a country and imported aircrafts, partly because of transfer of aircrafts from the incorporated

registration list containing aircrafts, operated by aviation organizations - members of All-Ukrainian Association "Airclub of Ukraine" (AUAAU) and Society of Assistance to Defense of Ukraine (SADU – former DOSAAF). In this incorporated registration list on temporal rules from 1998 noncommercial aircrafts were registered. Few years ago several hundred aircrafts was registered in this incorporated list. Now there were left only 129 and 85 belong to SADU (in addition, 80 from them already included in State Register). Registrations of 500 aircraft, mostly ultra-light, belonged to the aviation organizations AUAAU at different times, were not renewed by owners. Therefore, it is impossible to say how many of those five hundred are serviceable.

In 2002 in database of AUAAU–SADU were 450 aircrafts, in 2004 – 423 at the beginning of the year and 381 in the end, in 2007 remained 267 aircrafts, and presently, as mentioned above, – 129. That within two years from 80 to 140 aircrafts were included in the State Register. According to chief engineer of SADU, it is expected that in the nearest one-two years from the incorporated list of AUAAU–SADU in State Register it can be included from 20 to 30 aircrafts belonged to AUAAU and up to 50 aircrafts belonged to SADU. And another 100 – 200 aircrafts will be bought by new private owners. In other words, the number of aircrafts in Register for two-four years can grow up to 170-280 aircrafts. To increase of registered in Ukraine aircrafts contribute developed in the past two years acceptable requirements for the aircraft, pilots and landing sites. Unfortunately, are not available not only registration but also reliable expert estimations on amount of paragliders, paraplanes, paramotors and trikes, therefore data of Table 12 give an incomplete picture about GA fleet in Ukraine

Table 12

GA fleet in Ukraine (without corporate)
in 2010 r.*)

	SR	AUAAU-SADU	Total
Helicopters	67	2	69
Light aircrafts	124	53	177
VLA and ULA	43	10	53
Historical aircrafts	1	0	1
Hydroplanes(amphibian)	1	1	2
Hydroplanes	1	0	1
Glider, motogliders	55	40	95
Deltaplanes, trike	3	12	15
paramotors¶planes	0	11	11
Balloon & airship	36	0	36
Total	331	129	460

* – of the end of June 2010;

SR – State Register of aircrafts;

All-Ukrainian Association "Airclub of Ukraine" (AUAAU) and Society of Assistance to Defense of Ukraine (SADU – former DOSAAF)

However, if to sum up all GA aircrafts that are now in State Register and просуммировать and in incorporated list of flying "Club of Ukraine" and SADU, the total amount will approach to 500 (460 as of the end of June, 2010, Table 12). Although taking into account unregistered ultralights (motogliders and paramotors in Ukraine obviously more than 15 and 11 aircrafts accordingly) this number may be close to 700-900 aircraft and more.

Comparing GA fleet and commercial aircrafts in Ukraine, it is necessary to say that they are close in numbers. Aviation administration actively excludes from State Register aircrafts and helicopters, put out of operation, and fill up fleet of commercial aircrafts mainly few large companies that make single purchases. Thus, number of commercial aircrafts in Ukraine in the near time may be reduced from current 730 to 400-430.

At the moment of preparation of the article there were no data in order to bring GA fleet in Ukraine to equivalent of GAMA's accounting method. But if from a general amount of aircrafts in each of two countries, Republic of South Africa and New Zealand, take away aircrafts that in Ukraine do not refer as GA, and to define the middle increase of fleets in two countries, it will appear at the level of 3,6% per year. And since registration of aircraft being in exploitation in Ukraine developed, we can say that while their total number does not exceed 1000 aircraft. Consequently, with increase of 3.6% per year GA fleet in Ukraine by 2016 will not exceed 1300 aircrafts. A growth potential – maximum 4000 aircrafts – reachable within an indefinite period for a while. But if every year to correct this prognosis, quite possible, that in two-three years GA fleet

of Ukraine by 2016 could be defined more precisely. And it is not quite eliminated, that it will be somewhere between 1500 and 4000 GA aircraft, nearer to 2000, including ultralights: gliders, paragliders, paraplanes, paramotors, hang gliders, trike and ultralight, However, much depends on the development of Ukrainian economy and changes in institutional factors.

Conclusions

It is possible to argue with many assumptions and conclusions of this article. One thing is certain - come a time when the aviation administration and social organizations should produce regular reports on the number of aircrafts in operation, domestically produced, imported, exported, on their distribution by categories and types, on total flight hours and per one aircraft , number of airfields, various grades of fuel consumed per year , number of pilots, number of incidents of flight catastrophes, about prospects of changes of different indexes of GA.

And this should be done so that you can properly compare the published statistics with data on GA fleet in other countries.

New in the article is proposal to predict the state of GA on external indicators that really to find in the process of the special researches.

It is quite clear that the predictions of the future may not be, interesting to the owners, designers of hand-made and pilot-enthusiasts. However those, who occupies or plan to be engaged in development, manufacture, import or export, maintenance of aviation equipment analysis similar to described in the article, is extremely necessary.

Doing the reasonable prognosis of quantity GA aircrafts, number of pilots, it is possible to define the future contribution of GA to development of a transport system and economy of country as a whole. And this are real arguments of public organizations, that undertook to defend the rights of airamateurs, private pilots, flying clubs, enterprises engaged in production and sales of equipment for GA.



Photo by Yuri Yegorov and Tatiana Novgorodtseva

Therefore, the editors of “General Aviation” journal will continue their researches and apply to all motivated persons to contribute to our work. We will be grateful for the information on the topic provided not only by official institutions and by enterprises, aero club and individual researchers as well. Together, we can dispel the fog and make clear look into the future.

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translation by Anna Jura*

List of sources

1. <http://www.flarf.ru/#top>
2. Nikitin I.V. Classification of ultra light aircrafts and analysis of ultra light equipment state in Russia // Scientific Bulletin, series Aeromechanics, Strength, Airworthiness . – M.: MPTY GA, 2006. № 103, p. 82-88.
3. Reverse has been switched on. Market of business aviation started to cool down /A.Nazarov, E.Kazachkova, M.Fedosov//YearbookATO-2009. p. 72-82
4. 2009 General Aviation Statistical Databook & Industry Outlook – <http://www.gama.aero/publications>
5. General aviation aircrafts in USA and /Belyaev V.V. O.G. Komarov//Technical information. ЦАГИ. Series. Aircrafts and missiles. 1983. №12. p. 1-33.
6. <http://data.worldbank.org/country/>
7. <http://info.minfin.ru/worldecon.php>
8. <http://en.wikipedia.org/wiki/Millionaire>
- Levitin I.E. About main direction of development of aerodrome network in Russian Federation // Ministry of Transport RF. 06.03.2008.
http://www.mintrans.ru/prensa/Levitin_06032008_Pravit.htm
9. Yan Zhonghua. China's general aviation sector takes off. // Xinhua, 28.05.2006.
http://news.xinhuanet.com/english/2006-05/28/content_4612527.htm
10. And I want to fly!/C.A. Арасланов«General Aviaiton» – Kh.: 2009. №10. p. 4 - 26
11. Approval of import duties on certain types of civil aircraft /Постановление №379 от 30.04.2009. – M.: Russian Government. http://www.mak.ru/english/kommissions/aviareg/certificates/aircraft_type.pdf
12. www.piper.com
13. Approval of the Federal Aviation Regulations" Regulations on the admittance to operate of Single Aircraft Samples of General Aviaiton /Order №118 dated 17.04.2003 г. – M.: Ministry of Transport RF.
14. 2008 General Aviation Statistical Databook & Industry Outlook – <http://www.gama.aero/publications>
15. 2007 General Aviation Statistical Databook & Industry Outlook – <http://www.gama.aero/publications>
16. To sell aircrafts in Russia - perspective/ Polyanskiy N. // «General Aviaiton» – Kharkov: OOO HTЦ AOH, №5'2010, p. 4-9.
17. <http://www.avia.gov.ua/development.htm>
18. Market in fog/Araslanov S.A.// «General Aviaiton». – Kh.: 2009. №7. p. 4 - 26