DRAB POL® AUTOMOTIVE NEWS

www.drabpol.pl

Quarterly Newsletter no 1(86) January - February - March 2020

TIRE PRESSURE AND TEMPERATURE MONITORING IN MULTI-AXLE SEMI-TRAILERS

„The fundamental principle of transportation is its safety”

IN THIS ISSUE YOU CAN FIND:

FROM THE EDITOR

Ladies and Gentelman, Dear Readers!

the first, this year's issue of our quarterly newsletter reaches you in an unusual situation. Probably none of us could predict the scenario that this year is writing for us.

The pandemic that we are facing has forced us to change our lifestyle, stay at home, work remotely or undertake other forms of activity. Our company, like many others these days, has to face the current situation. Despite of hardships, we still try to work for our clients, complying with their needs and expectations. New reality requires more flexibility from us. One of actions that we have taken is opening up our online shop, which, we hope in the present situation, will satisfy our customers.

Because of the pandemic, this issue of our newsletter will be posted to you via email.

We hope that this form will appeal to our Readers.

Alicja Drabczyńska

DRABPOL AVIONICS NEWS

Published by DRABPOL
Editor:
Drabpol sp. jawna P. Drabczyński i Wspólnik
42-233 Mykanów, ul. Akacjowa 24/26
tel.0-34 366 00 22, fax 0-34 366 01 02
centrala@drabpol.pl, www.drabpol.pl

The ceremonial 29th anniversary of the Polish Chamber of Railway Equipment Producers and Railway Service Providers

25 February 2020

We celebrate the 20th anniversary of the Chamber

Being a member of the Polish Chamber of Railway Equipment Producers and Railway Service Providers we were pleased to take part in the celebration of the 20th anniversary of this organization.

A ceremonial Gala with the participation of 300 guests took place at Opera Nova in Bydgoszcz.

Let us remind that our company became a member of the Chamber last year, in April. For many years, our activity has been extended to include a railway market, and many of our products are successfully used in railway vehicles.

The Chamber deals with organizing periodic thematic conferences, seminars, trade/economic missions, trainings, workshops and exhibition events, which present numerous offers to a large number of recipients operating on the railway market. From the moment of joining the Chamber, we took part in a few Chamber's conferences throughout the country. These meetings give us the opportunity to promote our comprehensive offer for railway vehicles and railway market.

The speaches during the Gala repeatedly highlighted the effectiveness of the Chamber in the field of increasing railway safety. An important point on the programme was awarding of state and departmental decorations, including honorary budges „Zasłużony dla Kolejnictwa" (Distinquished in Railroading).

The culmination of the Gala was a concert of Jacek Stachurski and a ceremonial ball.

We congratulate the Chamber of its round anniversary and we wish further success in realization of future projects.

Meeting of European Mix Telematics dealers

What's new in the TELEMATICS WORLD?

The representatives of the European Mix telematics network arrived at Birmingham at the end of January. The meeting aimed at Sumary of the previous year as well as presenting the company's new product offer.

Year 2019 was successfull for the whole Mix Telematics network. It brought realization of many grobal contarcts, and Mix Telematics itself has strenghtened its strong position among TOP5 telematics companies in the world with nearly one milion of installed Premium devices on the global market.

What deserves for the particular attention from the presented offer is the new MiX RIBAS+, which will be the successor of the current MiX RIBAS. The new device is an LCD display that will fulfill the eco-driving trainer function in an even more accessible and modern way.

Thanks to exstensive technical functionality, the device will be able to: cooperate with MobilEye and inform about its alerts, as well as vehicle diagnostics alerts coming from CAN.

It can be said that the new MIX RIBAS+ is the last missing link to closing the refresh cycle and expanding the product range that has been going constantly for a year and a half.

Thanks to this proccess, all Mix Telemetics products are still considered to be No. 1 in setting trends in supporting such sectors as working machinery, public communication and ADR transport in terms of safety, vehicle economy and caring for the natural environment.

Sample information and alerts in a new one MIX RIBAS +

130 Electric Solaris buses with Konvekta air conditioning units and USB ports for MZA Warszawa

Warsaw buses with our solutions

In 2020, 130 articulated, 18-meter long Urbino nE18 electric buses bought by Miejskie Zakłady Autobusowe Warszawa (Warsaw transit company) from Solaris Bus & Coach will go on the streets of Warsaw. All buses will be equipped with Konvekta UL 500EM air conditioners and USB chargers.

Five electric buses manufactured by Solaris appeared on Warsaw streets in the first quarter, and in February the MZA fleet was reinforced by another 10 vehicles. The rest will be gradually sent to the Warsaw transit company within the comming months.
Purchase of 130 electric articulated buses – supported by European founds - is undoubtedly one of the biggest electromobile investments in Europe.
We are all the more pleased that these electric buses have been equipped with our solutions.
The first of them are Konvekta UL500EM air conditioning units (the second generation). There are two units installed on each articulated bus. Konvekta UL500EM air conditioning units of the second generation installed on Solaris buses, equipped with electric powertrain, cooling capacity of 24,000 watts and heating capacity of 30,000 watts, provide a high level of comfort for the passengers' compartment.
The constant rotation of the compressor offers the optimal cooling performance within the entire range of device operation. In addition, the evaporator in the Frontbox, for air conditioning and heating of the driver's cabin, is connected to the air conditioner installed on the front wagon.

To reduce nosie, the standard version is equipped with fans and brushless blowers with a long life cycle – their service life has been increased four times, ensuring lower operating costs. Condenser fans are pressure controlled, which undoubtedly has a great impact on noise reduction and saving of energy demand.

UltraLight air conditioning units installed on Solaris buses have been popular with bus manufacturers and public transit companies for many years. An important aspect, which is taken into consideration by the latter is lowering the costs associated with using air conditioners, and the ULTRA LIGHT II series provides the operator with such savings.

The most important of these is lowering fuel consumption thanks to weight reduction - the weight of the air conditioner compared to the traditional one has been reduced by approx. 30%. Huge savings on weight reduce also the CO_2 emission. Due to low power consumption – below 65 A, energy balance has improved. Importantly, thanks to an easy access to components and consequently quick and simple replacement, service and maintenance costs have been reduced by 25%. In addition, thanks to the materials used to make air conditioners, less dust and dirt gets into the device.
It is worth noting that Konvekta air conditioning units are 100% recyclable, and thus environment friendly.

Our second solution that can be found in Warsaw buses is USB charger. An easy access to USB ports and the ability to charge favourite mobile devices is one of the most appreciated convenience both in public buses, intercity and long-distance buses, as well as on trains.

Each Solaris bus in MZA has been equipped with three USB chargers. It is worth noting that Solaris is our one of the biggest recipients, as far as USB ports are concerned. By now the manufacturer from Bolechowo has bought five thousand units, while in the MZA vehicles in Warsaw there are already several hundred of them.

News – 1st Quarter

- Five Autosan buses went to ZKM Wałcz (Wałcz transit company) Each of them has been equipped with FAP+ driver's workplace and USB charger.
- The bus fleet of MZA Warszawa (Warsaw transit company) has been reinforced by 15 Solaris electric buses, 18-metre long, with Konvekta air conditioning units and USB ports (3 items per vehicle).
- Ten USB chargers have been installed on 5 Solaris buses for MPK Siedlce (Siedlce transit company).
- Six, 12-metre long Solaris buses have been equipped with 18 USB ports (3 items per vehicle). The buses are currently used in the fleet of MPK Poznań (Poznań transit company).
- Białostocka Komunikacja Miejska (Białystok transit company) has bought 13 Solaris buses with 26 USB chargers (2 items per vehicle) and two VOLVO hybrid buses – with one item per vehicle.
- Twelve USB chargers has been installed on two Volvo electric buses that went to MPK Świdnica (Świdnica transit company).

Trainings - 1st Quarter

21 January
Training in the field of Konvekta products for Industrial Division - conducted at customer's headquarters in Nowy Sącz.

30 January
Training in the field of UDS-AT accidental for Volvo Polska – conducted at customer's headquarters in Wrocław

28 February
Periodic training for Workshop Technicians in the field of installation, check, inspection and repair of digital tachographs – conducted at our headquarters in Warsaw

13 March
Technical training for TACHO-SOFT in the field of DTCO 4.0 – conducted at our headquarters in Mykanów.

Sixteen Modertrans trams for Tramwaje Śląskie with Konvekta heating, ventilation and air- conditioning systems

Air conditioning units in Tramwaje Śląskie

This year Tramwaje Śląskie company will reinforce its tram rolling stock with 16 trams offered by Modertrans from Poznań. All of them will be equipped with Konvekta heating, ventilation and air-conditioning systems.

Tramwaje Śląskie will receive 14 one-way trams – Modertrans Beta MF10AC and 2 two-way trams – MF11AC BD.
At the beginning of March, our team participated in tests of both types of trams. The Modertrans tram for Katowice is at the stage of approval.

All 16 trams from Modertrans (Poznań) will be equipped with Konvekta heating, ventilation and air-conditioning systems. These will be HVAC 6406 intended for passengers' compartment and HVAC 3405 units, which provide comfortable conditions in the tram driver's cabin.

HVAC 6406 air conditioner with a cooling capacity of 24,500 Watt will provide a high level of comfort throughout the whole year. The compact unit occupying little space on the roof, characterizes with low weight. The HVAC 6406 unit weights only 315 kg.

Due to compact construction, the assembly of HVAC 3405 unit is fast. The unit has been equipped with electric heating and metal reusable air filter. A direct air blow and centrally located air inlet grille provide its optimal flow. A wide-opening flap in the air conditioning facilitates carrying out conservation operations, which is particularly important for service staff.

Both air conditioners are made of durable and stable aluminium construction that allows them to function for a long time. To reduce noise in these units, blowers and fans are controlled steplessly.

It is worth noting that Konvekta air conditioning units comply with strict standards for devices used in railway vehicles, e.g. flammability standard EN 45545.

Tire pressure and temperature monitoring in multi-axle semi- trailers

Our proprietary solutions for tire protection

Basing on our six-year experience in the field of tire pressure and temperature monitoring, we know that the fast pressure loss is a real problem for drivers, especially in case of the multi-axle semi-trailer.

Above mentined multi-axle semi-trailer means a typically specialised equipment. They have at least three axles and twelve wheels, whereas in case of trailers intended for the heaviest and the biggest oversize loads even more than 20 axles and 200 wheels. Taking into account the significant number of wheels working under high loads, in very difficult conditions, an important aspect influencing the reduction of running costs is effective monitoring of tire pressure and temperature.

Depending on the application and design, multi-axle semi-trailers can be divided into two basic types: low-loaders and modular semi-trailers.

Every year, customers get at least several dozens vehicles – from simplest semi-trailers, costing from 150,000 PLN, used for ordinary transport of construction machinery, to the most complex ones, costing several million zlotys, intended for the transport of the most difficult oversized loads.

Due to transported oversized loads, low-loaders are equipped with small wheel diameters. Given that they are under considerable pressure and work in particularly difficult conditions, such as hitting the curb and other obstacles, such tires are exposed to frequent damage. In addition, we have to deal with the phenomenon of dragging tires – in case of a defect in the steering system of the semi-trailer wheels.

If we add lack of control over tire pressure and temperature, one can not be surprised why so many tires are damaged. Such situation not only increases operating costs, but also has influence on delivery time of transported oversized loads. Because of the possible communication disturbances, transport of oversized loads most often takes place at night, and the carrier must obtain the consent of the appropriate authorities. Any delays caused, for example, by frequent tire changes make the journey even longer, which consequently costs more than damaged tires.

For this reason tire pressure and temperature monitoring is a very useful tool for carriers offering oversized loads transport.

A damaged tire that has broken the tread due to excessive heat.

TPMS TPMS_WIFI_TRAILER – solution for frequently changed trailers – up to 8 axles/ 32 wheels.

Change of semi-trailers reqires reconfiguration of settings, what can be particuralry troublesome in the case of changes made in different places and at different times. In addition, it requires a proper programmer and trained employees. In order to meet expectations in the field of tire pressure and temperature monitoring in semi-trailers, often changed and multi-axle, at the end of 2018, our company developed and then introduced to the market a metod of wireless data transfer from the control unit of the ContiPressureCheck system (Continental) to the driver's cabin. This solution called TPMS_WIFI_NACZEPA (TPMS_WIFI_SEMI-TRAILER) allows the driver to have constant supervision over tire pressure and temperature. Sensors that send information via radio waves to the central control unit (CCU)

A semi-trailer of the EMTECH company, in which the TPMS_WIFI_NACZEPA wireless tire pressure and temperature monitoring system has been installed.

are glued on the inner surface of the tires.

After data proccessing, information concerning current tire pressure and temperature, and alerts is sent in a CAN wire harness format (J1939 protocol) from the central control unit CCU to the TPMS_WIFI MASTER transmitter located in the front of the semi-trailer.
Then data is wirelessly sent to the TPMS_WIFI SLAVE receiver, located next to the display, that is attached to the windshield.

Power is drawn from the lighter socket. The display is pre-programmed (in term of communication) for the specific semi-trailer, so it is assigned to only one semi-trailer.
Therefore, in the semi-trailer there is a special storage box for depositing the display, after disconnecting it from the traktor.

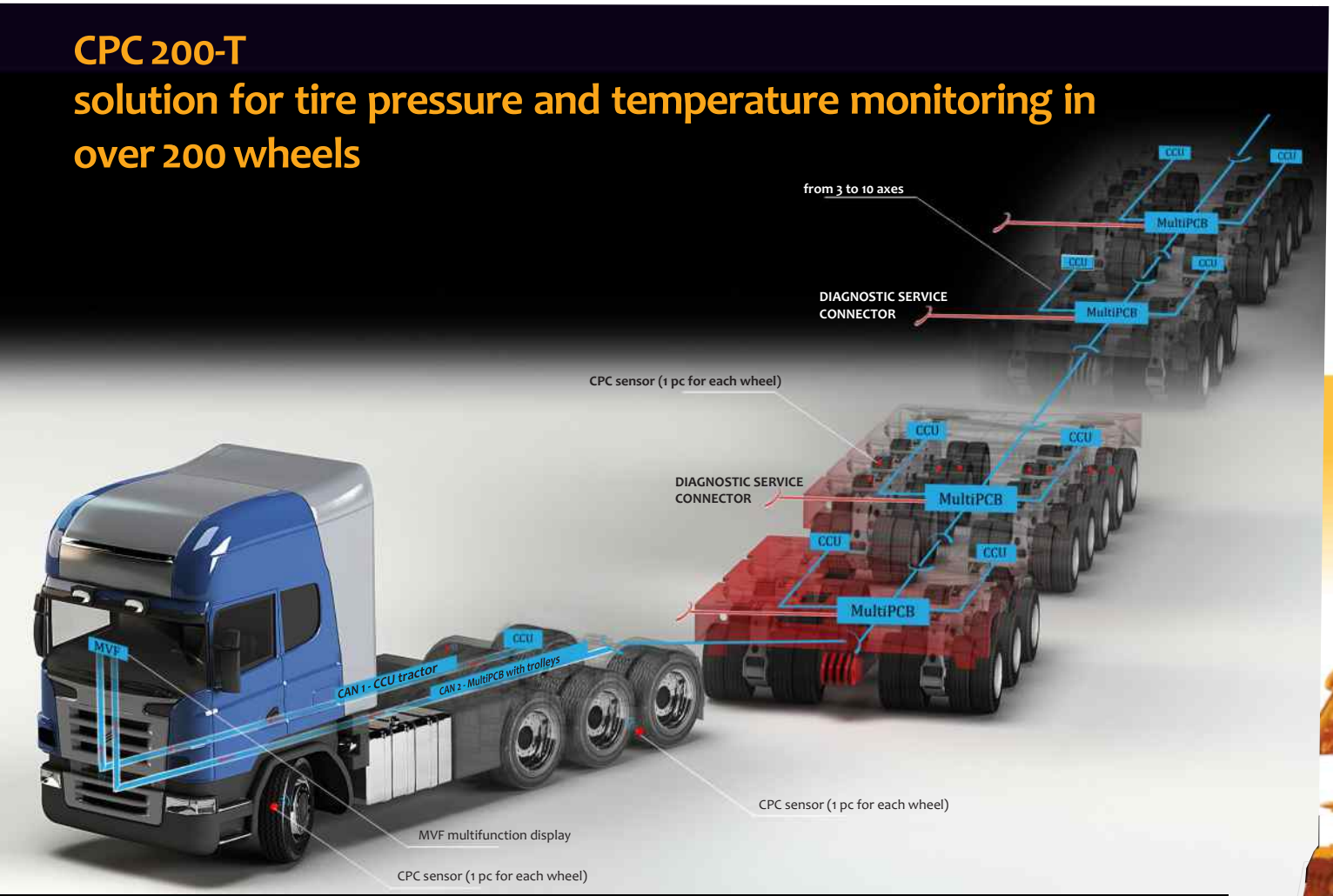
This solution can monitor tire pressure and temperature in semi-trailers with up to 8 axles and 32 wheels. Because this solution enables quickly change of semi-trailer without re- programming the set of tire sensors, it is especially recommended for companies hiring semi-trailers.

Serial system TPMS_WIFI_NACZEPA is installed on semi-trailers manufactured by Przedsiębiorstwo Produkcyjne EMTECH Sp. z o.o. For the first time, this solution was applied by Benski company (Lubliniec) in its tank semi-trailer intended for transport of hazardous materials. The company specializes in ADR transport, where tire temperature monitoring is particularly important to prevent dangerous tire ignition.

The market offers also simple wireless solutions , in which pressure sensors are installed on tire valves. They usually measure the pressure drop and alert the driver when the pressure drops by a specified value.

They do not actually measure tire temperatures, since it is possible only when the sensor is placed in constant contact with tire surface. It is important in case of significant increase of tire temperature caused by significant rolling resistance. But also in case of sudden heat increase resulting from galling of wheel bearing , blocking of break terminal, as well as dragging tires, in case of a defect in the steering system of the semi-trailer wheels.

CPC 200-T
solution for tire pressure and temperature monitoring in over 200 wheels



Functional diagram of the CPC-200T tire pressure and temperature monitoring system in a modular semi-trailer with 8 wheels per axle.

For semi-trailers with a large number of wheels – over 8 axles and 32 wheels and for modulr semi-trailers with eight wheels in a row, our company has developed and implemented CPC-200T – a system of tire pressure and temperature monitoring that can operate over 2000 wheels.
The solution is intended for oversized transport vehicles, such as mult-section semi-trailers, semi-trailers and traktor units.

In CPC 200-T we used some components of the ContiPressureCheck, a tire pressure and temperature monitoring system

from Continental, such as tire sensors and central control units – CCU.
The system was expanded by MPCB (Multi Purpose Controller Bard) – out own solution, which is a universal electronic system, responsible for downloading data from numerous CCUs, collecting and proccessing data from the sensors located in semi-trailer wheels.

Data transmission is carried out remotelly via the CAN bus of the vehicle. The universal character of CPC-200T system enables an automatic wheel detection and their localization in the entire set, regardless where and which direction the unit has been joined.

In the event of tire failure there are two information levels: danger (orange) and critical state (red). In addition, the system informs about the correct level of pressure and temperature (green) and lack of communication (gray).

MVP multifunction display of the CPC-200T system with visualization of tire pressure and temperature in one of the modular semi-trailers.

The multifunction 7-inch MVF display by Continental with additional mechanical switches has been equipped with our proprietary programme that allows for visualization of all information about tires being in danger and in critical state. In case of several messages at the same time, the software gives priority to the most important information.

CPC-200T system has been applied in semi-trailers in Panas Transport. The company **speializes in international transport of special loads.** CPC-200T influences not only reduction of tire operating costs but also improves the road safety.

It is worth noting that equipping multi-axle semi-trailers, intended for transport of oversized loads, with tire pressure and temperature system is not a cost but an investment that pays back in a short time.

Semi-trailer for the transport of oversize loads belonging to the Panas Transport company with the CPC-200T tire pressure and temperature monitoring system installed.

ON-LINE SHOP ALREADY ACTIVE!

Welcome to our shop:

https://sklep.drabpol.pl/

We are pleased to announce that our online shop has been operating since April 1, 2020.

We do our best to update the product database and introduce new branches on an ongoing basis (the entire avionics department is under development).

Enjoy Your Shopping!

DRABPOL Sp.J. P. Drabczyński i Wspólnik
Akacjowa 24/26
42-233 Mykanów
tel.: 34 366 09 05

DRAB POL® AVIONICS NEWS

www.drabpol.pl

Quarterly Newsletter no 1(86) January - February - March 2020

MX™-8

the best, professional camera for UAVs, helicopters and small aircraft

We invite you for trainings dedicated to L3 HARRIS MX™ camera operators and O-level maintenance staff !

L3HARRIS™

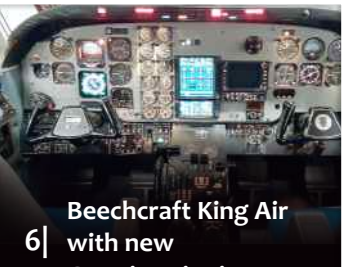
DRAB POL® AVIONICS

„The fundamental principle of transportation is its safety”

IN THIS ISSUE YOU CAN FIND:

4| We improve our skills

8| AVIDYNE flexes of its muscles



6| Beechcraft King Air with new Garmin avionics

12| Influence of ADS-B Out on European market

FROM THE EDITOR

Ladies and Gentelman, Dear Readers!

At the beginning of the year, probably none of us predicted such development of the situation that we have to face. However, despite the pandemic situation, Avionics Department tries to function normally.

The situation in small civil and business aviation is fundamentally different from that of large airlines, which have practically been grounded. Thus, we continue the ongoing projects, of course taking the necessary safety precautions.

In February, just before the global pandemic, we managed to take part in another training carried out in L3 Harris training center in Loveland, Kolorado, USA. The training aimed at improving skills of operators of the Mx electro optical turrets, and we are very pleased that we took part in this event.

In the first quarter, we also completed another important avionics project involving avionics modernization i.e. equipping the Beechcraft King Air C90A with modern Garmin systems.

Additionally, we encourage our Readers to get familiar with the new products and innovations offered by our partners.

Have a nice reading!

Alicja Drabczyńska

DRABPOL AVIONICS NEWS

Published by DRABPOL
Editor:
Drabpol sp. jawna P. Drabczyński i Wspólnik
42-233 Mykanów, ul. Akacjowa 24/26
tel.0-34 366 00 22, fax 0-34 366 01 02
centrala@drabpol.pl, www.drabpol.pl

Product Novelties at AEA Europe Connect

Every year, professionals from the general aviation industry meet at the annual AEA Europe Connect conference. Former the event had a character of regional meetings of AEA members. At present, the European conference grow beyond simply discussing regulation updates or conducting technical trainings on products offered by leading avionics manufacturers.

A lot of time is spend on discussions, analysis in the field of problem solving, exchange of experience, or joint projects. AEA Conference is also a presentation of the existing and the latest avionics technologies. The offer presented by Garmin met with great interest, and especially the revolutionary GI 275 with a touchscreen, that offers a range of systems that can be configured according to the user's needs. Depending on the needs, one can choose GI 275 as: Electronic Flight Display, Multi-Function Display/Moving Map, Engine Indication System

and Electronic HSI/CDI Indicator. The device has been designed to fit into the 3-inch space intended for a classic navigation device. It is possible to place it behind the plastic cover of the instrument panel, often provided in older aircraft.

Another range of new products was presented by BendixKing. During the meeting, the company presented its new series in the field of engine monitoring with the possibility of their recording – AeroPoint series, electronic PFD – AeroFlight, combo of

NAV/COM/GPS/FMS type – AeroNav series and autopilot – AeroCruze series.

Continuation of the European Convention is this year's AEA Conference in the US.

What deserved special attention among new products was the BendixKing product series in the field of engine monitoring with the option of their registration.

Garmin presented the revolutionary GI 275 system with a touch screen, being a range of configurable systems for the needs of the user.

Training for Operators of the MX™-series Elektro-Optical Turrets in L3 Harris Training Center in USA 11-14 February

SKILLS DEVELOPMENT

L3HARRIS™

Six months after we obtained the certificate entitling us to train the L3 Harris MX™ turret operators and the personel of the O operational level, we participated in another training dedicated to the operators of the electro-optical turrets. This time, the training took place in the L3 Harris training center in Loveland, Colorado, US.

During practical classes on the ground, the participants could operate the Mx-8 and MX™-15 turrets, installed stationary on the ground and connected to the operator's stand, located in the properly prepared camper.

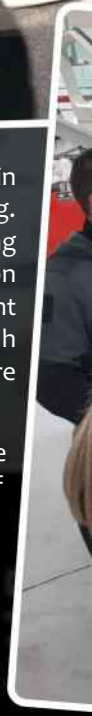
The training had a different character than the provious one. It was a training mastering the skills of the MX™ turret operators in the field of aerial recognition. The process itself consisted of three parts: theoretical, practical on the ground and in flight. The theoretical part discussed the properties of all types of MX™ turrets, both the newest ones, as well as older versions.

The programme included:

- configuration characteristics of MX™ series systems,
- characteristics of the possibilities and limitations of MX™ series systems,
- identification of menu items and graphic information displayed on the screen,
- operating of the MX™ system controller,
- selection of appropriate sensors in changing atmospheric conditions,
- optimalization of sensors and MX™ system,
- location of objects involving sensors of visible and infrared light,
- objects identification,
- video image registration in different operating modes.

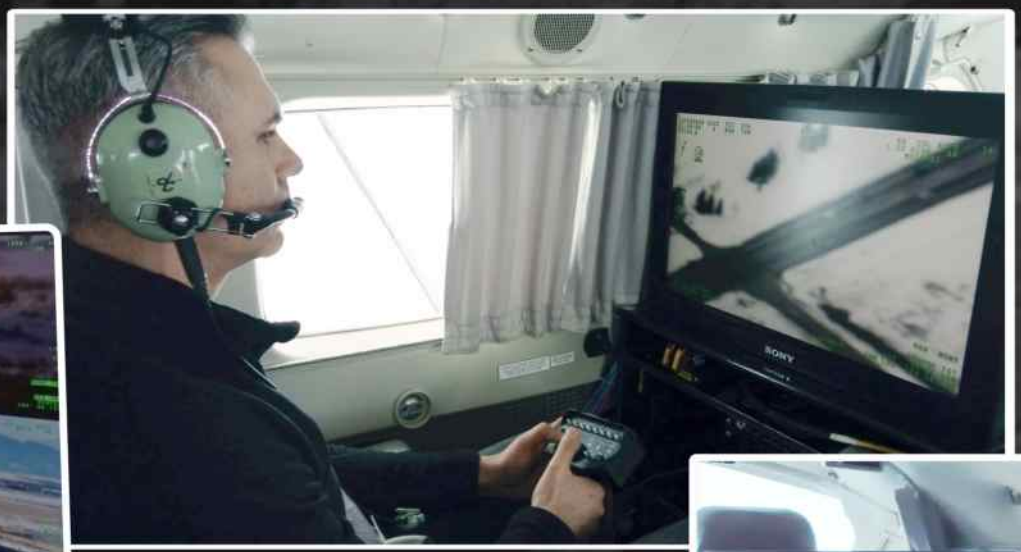
This part allowed for improving skills in the field of turret sensors steering. Another element of practical training was an on ground turrets operation involving elements such as a pre-flight inspection, filling the turrets with nitrogen and replacement of moisture absorbents.

The last part of the training was the most awaited one. It consisted of flights, during which training participants in practice performed the



tasks of the turret operator. The airplane used during the training was Cessna 208 Caravan equipped with MX™-15 turret. Each training participant performed missions and operated turret sensors, both in daytime and nighttime conditions. Turret operation in various lightening conditions, in case of fog or snowfall allowed to get to know the influence of optimization processes on the obtained image of stationary and moving objects.

The training not only strengthened our knowledge, but also gave us a number of new skills that we will be happy to share with MX™ systems operators.



We “refresh” avionics on the Beechcraft King Air C90A aircraft in the framework of joint project.

Beechcraft King Air with new avionics ready for photogrammetric flights

Our PART 145 Maintenance Organization has realized another project, this time related with equipping Beechcraft King Air C90A aircraft with the new Garmin avionics systems.

This refreshment was a part of a bigger modernization project of this aircraft.

A few months ago one of the leaders in the Polish Business Aviation industry started modification of Beechcraft King Air C90A, aiming at adaptation of the aircraft to photogrammetric flights.

Such flights allow for taking photogrammetric pictures, that enable preparation of terrain models, and recreation of shapes, dimensions and location of objects on the territory.

In order to implement the project successfully, the aircraft had to be equipped with camera turret for taking pictures and all accessories (monitors, control panels) to operate the camera.

However, this is not all. Additionally, adequate navigation equipment, allowing

BEFORE MODERNIZATION

precise flight over imaged areas, became necessary. This type of flight means a duplication of specific patterns/templates in the sky while maintaining the right altitude and stable direction during the flight, without unnecessary rolling. This is crucial in terms of photos quality and time they were taken.

At the moment of decision concerning modernization, the aircraft was equipped with classic, slightly worn out, but still functional avionics by Collins Aerospace (former Rockwell Collins) from Pro Line II series and Bendix/King KLN 94 GPS system.

Architecture of avionics in the heyday of these devices implied the complete autonomy of each functional block, i.e. the radio block fulfilled only the function of a radio, the navigation block was only VOR beacon receiver, and the GPS system only served as a satellite navigation, thus the screen of such device may seem completely inadequate to a modern pilot because of its diagonal screen size, quality of graphics, ergonomics or the amount of information.

Due to the need for change of the above mentioned equipment, our company has been invited to cooperate on this project. After many conversations and consultations, we decided to retrofit the plane with currently the most popular **Garmin GTN 750 and GTN 650 systems** that hold good on General on Business Aviation market. These are two systems, which differ mainly in terms of the diagonal of the screen, systems integrating a radio navigation receiver, transceiver with separation (8.33kHz) and a satellite navigation system with a touch screen. Thus, the systems have three most significant functions that are known to most users, although there are also other possibi-lities about which we could write a lot.

Basing on this equipment also transponders were replaced. They were replaced with two GTX 345R devices – remote, controlled from GTNs, with the ADS-B Out and IN. We also installed the GMA 35 audio panel – also remote one, that allows to eliminate the rows of an earlier, lever audio management system, located in the center of the aircraft panel.

All new systems have been also integrated with avionics, which at that moment was not subjected to replacement, including – among others – the autopilot, which before the modification was unable to implement aircraft recurrence procedures at taking over the next area to take pictures.

The modernization of Beechcraft changed not only the use profile of the aircraft, but also allowed to meet the current minima of equipment and navigation within the meaning of such terms as PBN, 8.33kHz, ADS-B Out/In, GPS WAAS.

It is safe to say that it also reversed the age of the aircraft by a dozen of years, and consequently, gave the opportunity for further development in terms of pilot-navigation systems.

AFTER MODERNIZATION

AVIDYNE
FLEXES ITS MUSCLES

The company's new Atlas multifunction flight management system can help bring older aircraft firmly into the 21st century

STORY BY JOSEPH E. (JEB) BURNSIDE

Source: Avionics News, January 2020

As a general rule, aircraft are not disposable. They're designed, engineered and manufactured to be durable and repairable, often without a defined life span. Inspect and overhaul the engines and other components from time to time, update the interior, splash on some fresh paint and go fly. Back on the ground, you can bask in the knowledge your older aircraft does things almost as well as the latest version of the same model, but for a lot less in acquisition costs.

Since there are various ways to define performance, "almost" is doing a lot of work in that previous sentence. An obvious area in which a newer version of the same aircraft model will do things better is automation: The avionics installed in today's version of a generic business aircraft can be an order of magnitude more capable and easier to use than what was available aboard the same basic model just 20 or 30 years ago.

Today's business jets typically feature an integrated flight deck, with color displays replacing separate flight instruments and managing critical tasks. Navigation, communications and surveillance capabilities are baked into the equipment, which usually carries a single brand name and is designed to work and play well with the other bits. Older aircraft, however, typically featured equipment which is more modular - or less integrated, if you prefer - with console- or panel-mounted components, and an

"IN A LOT OF RESPECTS -AND YOU CAN TELL BY THE BRANDING, THE ATLAS BRANDING – THIS IS A FORK IN THE PRODUCT LINE FOR US, WHERE WE TAKE OUR CORE TECHNOLOGY AND WE GO TO A PARTICULAR, IN THIS CASE UPSTREAM MARKET, WITH THE ATLAS."

-AVIDYNE CEO DANSGHWINN

occasional control head to operate a remote device.

Like so many other things, avionics systems with such an architecture can be a blessing and a curse. It can be easy and relatively inexpensive to replace a single small component when something goes wrong. On the other hand - and as many operators of older but perfectly capable business aircraft have learned in the last few years as they faced ADS-B Out compliance - it can be a bit expensive to upgrade some of their avionics systems with the latest and greatest in capabilities.

MISSING CAPABILITIES

Today, capabilities perhaps missing from older aircraft can be as operationally consequential as SBAS-enhanced navigation that enables LPV minima on an RNAV (GPS) approach procedure, something simpler that allows elmnnating paper charts in favor of a digital, panel-mounted display, or merely a feature allowing crews to wirelessly upload a flight plan from their electronic flight bag to the airplane's navigation system. Those are things older aircraft simply can't do without a significant upgrade. And until recently, that kind of upgrade has either been prohibitively expensive or lacking in features.

In fact, updating a legacy aircraft to bring its avionics capabilities into the current century isn't as difficult or as expensive as it has been in the past. And industry demand reflects it: According to the data from the association's quarterly and annual AEA Avionics Market Report, the retrofit avionics market has been outpacing its forward-fit sibling since 2017. Yes, a lot of that demand stems from this month's ADS-B Out compliance deadline, and it will be interesting going forward to see what happens both to overall sales and the forward-fit/retrofit relationship.

One bottom line is that operators of older aircraft now have more upgrade options than before, with more bells and whistles than ever. And a new entrant in the market for avionics aboard transport category airplanes and rotorcraft - the new "Atlas" flight management system from Avidyne -may make it easier and less-expensive than ever to install the latest and greatest cockpit solutions into an older aircraft.

Atlas is the newest product from Avidyne. It's a Dzus-mounted, multifunction GPS/SBAS flight management system offering full LPV approach guidance per FAA TSO-C146c and based on the company's FMS software found in the panel-mounted IFD440/540/550 products. Atlas employs Avidyne's hybrid user

Avidyne's Atlas in a Hawker panel

interface - touch-screen or hardware-based controls - and offers a full-featured, FMS that integrates with existing equipment in the aircraft. That equipment includes a long list of EFIS, PFD, CDI and HSI options, plus remote sensors and autopilots.

MORE FEATURES

Atlas also is an approved GPS position source for numerous transponders, necessary for ADS-B Out compliance. And like its IFD siblings, it brings full-color display of moving map features, including weather, traffic, geo-referenced approach charts and airport diagrams, plus radar and video display capabilities.

Avidyne built into Atlas extensive I/O capabilities, including the company's unique GPS Legacy Avionics Support, which provides a direct interface to legacy Collins Pro Line 21 and Honeywell Primus EFIS systems for vertical guidance during approach operations. Put another way, Avidyne's GLAS offers to bring SBAS/LPV approach capability to cockpits where it never existed with minimum disruption.

The Avidyne FMS aboard Adas also brings all the features found in its IFD product line, including "one-touch" departure, airway and arrival navigation, plus the company's GeoFill waypoint nomination. Atlas has a full QWERTY-style keyboard, along with its touch-screen capabilities that provide easy map panning and "rubber-banding."

Atlas also offers traditional moving map and glass-panel capabilities, like displaying SiriusXM Weather or ADS-B In graphics as an overlay, plus traffic from TCAS, TAS or ADS-B. Georeferenced electronic approach plates and airport diagrams using Jeppesen data also is included, as are integrated Wi-Fi and Bluetooth connectivity, allowing use of popular electronic flight bag apps like ForeFlight. And to support EFBs, Atlas also comes with a built-in USB charging port.

All of this is standard equipment. Options include an integrated 16-watt VHF comm transmitter, plus a VOR, localizer and glideslope receiver, TAWS-B integration and the ability to serve as a display for BendixKing digital radars.

OPENING NEW MARKETS

Atlas represents a new direction for Avidyne, something company CEO Dan Schwinn emphasized to Avionics News. ***"In a lot of respects - and you can tell by the branding, the Adas branding - this is a fork in the product line for us, where we take our core technology and we go to a particular, in this case upstream market, with the Adas,"*** Schwinn said.

With all the avionics being installed aboard in-service aircraft as the ADS-B Out compliance deadline loomed, has Avidyne missed the retrofit wave? Not according to Schwinn. ***"This is something you haven't seen in business aviation: Not only is the FMS 'in the box,' this is a one-box system, with the GPS and the FMS and the display and everything in one box,"*** Schwinn said, pointing out that some earlier FMS products require two or three separate devices to perform their functions.

"One of the other opportunities that we have identified is there are a lot of business aviation guys right now who are - and this has been true for the whole year (of 2019) and it's going to be true in the next year - just scrambling to get ADS-B compliant. The way they're doing that is - depending on what transponders and whether they have a TCAS -they're either modifying their transponders or replacing their transponders, and they're putting in a blind-mount WAAS-compliant position source," he told us.

"That allows them to check the box of ADS-B compliance. It does, however, not provide any other benefit other than being able to continue doing what you've been doing all along. From our perspective, they check the compliance box, but they really haven't gotten into the new world of SB AS and certainly not multifunction capabilities," Schwinn said.

The bells and whisties also are important to Avidyne and its strategy with Atlas. ***"One of the things we've put a lot of effort into and which has not really been all that prevalent in this market - especially in retrofit - has been the wireless connectivity with the nav system and the mapping,"*** Schwinn told us. ***"Since we've been doing this for a while, we have integration with most apps. Of course, ForeFlight is the most popular app, and we have very good integration with ForeFlight."***

Avidyne sees Adas as a logical upgrade path for legacy aircraft operators. Those include Part 135 charters and Part 91 flight departments happy with their current airframe and powerplants, but still on the outside looking in when it comes to the latest avionics features. Target aircraft include the Beechjet 400A, Bombardier's Challenger 604, Dassault's Falcon 50/900/100/200 fleet, Gulfstream's II/ni/TV models, Hawker 800 models and perhaps many others. According to the company, the potential market eligible for an Atlas retrofit represents more than 9,700 airframes.

Does Atlas mean Avidyne is going in a direction different from its comprehensive collection of panel-mount products like the IFD line? Not really. It should be considered a logical next step for the company, Schwinn feels. ***"You may see us emphasizing things that are more appropriate for lighter general aviation on the IFDs, and business aviation and helicopters on the Atlas as time goes on,"*** he added. Regardless, ***"We're going to continue to innovate and improve our IFD products,"*** Schwinn said.

Is a multifunction FMS like the Adas a new avionics category? ***"In terms of what's on the market right now, there's nothing like this,"*** Schwinn noted.

UA eNews
A Universal Avionics publication | January 2020

Influence of ADS-B Out in the European Market

When it comes to the European aviation market, two technologies seem to be driving demand the most; Automatic Dependent Surveillance – Broadcast (ADS-B) Out and Localizer Performance with Vertical Guidance (LPV). Thus far, operators have been slow to upgrade their aircraft for the June 7, 2020 European ADS-B Out mandate. However, as we get deeper into 2019, UA Authorized Dealers in Europe are seeing an uptick in Satellite-Based Augmentation System-Flight Management System (SBAS-FMS) upgrades in support of the upcoming ADS-B Out requirements.

Top European UA Authorized Dealers share their thoughts:

„ADS-B Out is definitely top of mind in the North Sea. In fact, it has been mandated for flying to certain oilfields for the last couple of years. Heli-One has installed ADS-B Out in older aircraft types, including the Airbus AS332 Super Puma which includes UA's UNS-1Fw SBAS-FMS as part of the upgrade."

– **Tor Baustad,** Senior Manager, Design Engineering, Heli-One Norway

„At the moment, we are seeing a lot of interest from customers for ADS-B Out upgrades – especially from Citation 550/560 aircraft operators interested in the UA SBAS-FMS. Right now, we're working on a dual UA UNS-1Ew SBAS-FMS installation with the UniLink™ UL-801 Communications Management Unit on a Lear 31A."

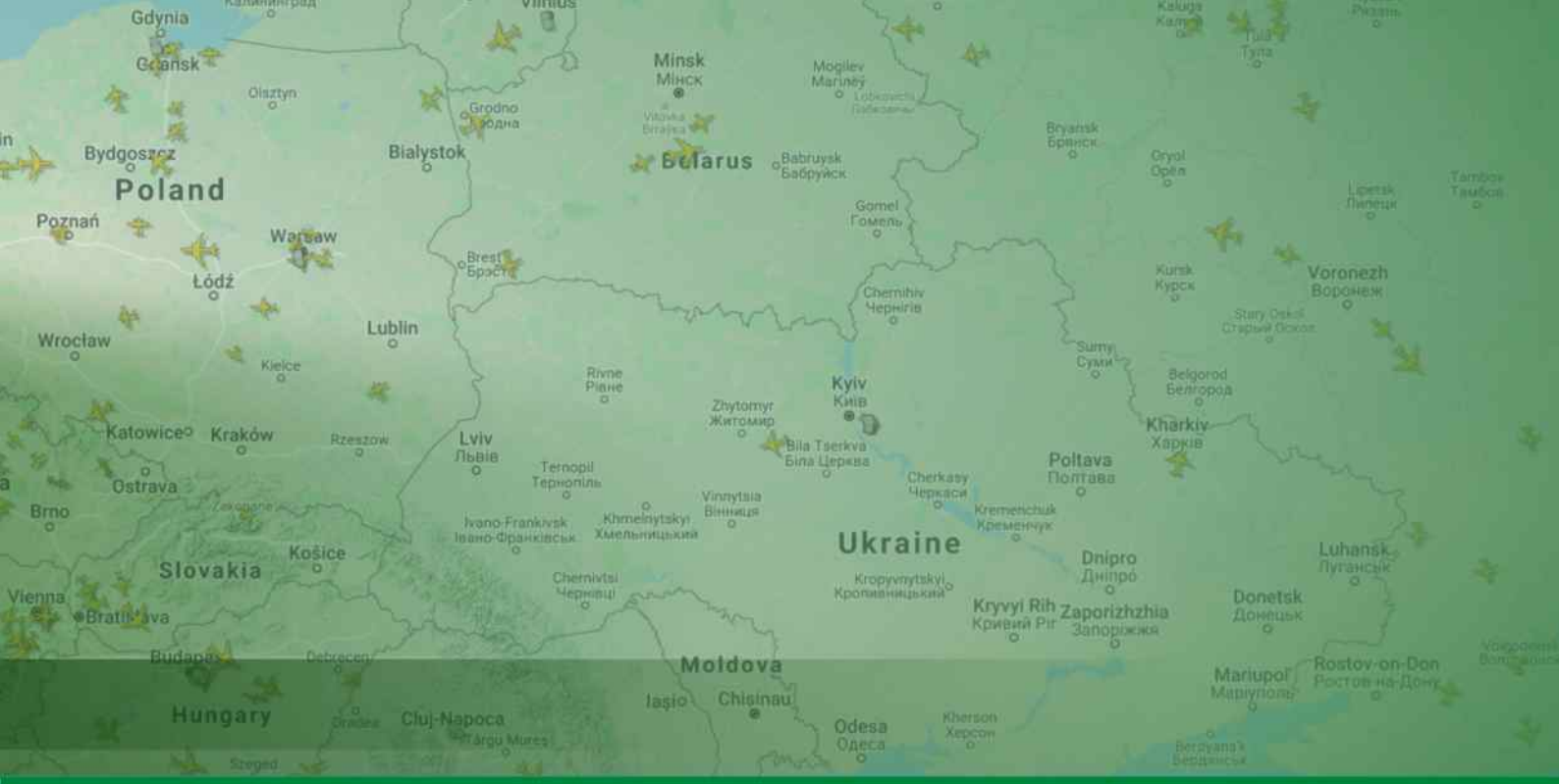
– **Josef Breu,** Technical Director, Avionik Straubing GmbH

„The European ADS-B Out mandate in 2020 is causing an extensive workload for Scandinavian Avionics in order to satisfy the market requirements. Different aircraft configurations require different upgrade concepts and the very capable and qualified SBAS-FMSs from UA are a most attractive and successful solution to a vast number of our customers. As such, our customers have succeeded to not only to become ADS-B Out compliant, but to also gain the operational benefits of LPV compliance and additional technologies."

– **Harry Truelsen,** Sales & Marketing Director, Scandinavian Avionics A/S

„With the mandate quickly approaching, we are seeing an increase in inquiries and contracts for ADS-B Out modifications. In our experience, operators are using the upcoming mandate to benefit from additional features and functionality like PRNAV, LPV, and ADS-B In, instead of just complying with the actual mandate. Still, there are several platforms for which no STC is available. Therefore, I highly recommend operators to get in touch with their installers now to confirm the availability of an STC and to book an installation slot right away, as the STC process can easily take 3 to 6 months."

– **Florian Kindzorra,** Chief Operating Officer, Airplus Maintenance GmbH



June7, 2020:

Date by which all aircraft weighing more than 5,700 kg or having a max cruise speed greater than 250 knots will need to be equipped with ADS-B Out capabilities to be operated in European airspace.

7750 # of aircraft affected by the European ADS-B Out mandate.

1000 # of aircraft operating in European airspace at risk of not being equipped with ADS-B Out avionics in time for the region's airspace equipage mandate.

Countries with ADS-B Out mandates and proposals:

Australia, Canada, Europe, China, Indonesia, Mexico, Singapore, Sri Lanka, Taiwan, United States, Vietnam

Featured Flight Deck
Dornier Do 228

This Dornier Do 228 upgrade features new UA displays, FMS, and radio control, offering its government operator increased operational capabilities and regulatory compliance

UA Equipment Installed:

- 3 EFI-890R Advanced Flight Displays
- UNS-1Lw SBAS-Flight Management System
- Radio Control Units

Efficient Government Operations

This extensive Dornier Do 228 avionics upgrade was performed by UA Authorized Dealer, Scandinavian Avionics. The aircraft's government operator can now fly with increased operational capabilities and meet regulatory compliance, including Automatic Dependent Surveillance – Broadcast (ADS-B) Out. In addition, the operator can expect lowered maintenance costs with new equipment standards.

Contact your UA Sales Representative to learn more.

Did You Know?

Commonly classified as a Short Takeoff and Landing (STOL)-capable aircraft, the DO 228 is able to operate from rough runways and in hot climates.

Universal Avionics InSight™ Display System Selected for MD Helicopters' MD 900/902 Explorer

UA and MD Helicopters announce a strategic partnership to integrate InSight as the full-digital flight deck solution for the MD 902 Explorer. OEM application for integrated flight deck solution will meet a wide range of mission requirements

Universal Avionics (UA) and MD Helicopters, Inc. (MDHI) announce a strategic partnership to integrate UA's advanced InSight Display System as the full-digital flight deck solution for MD Helicopters' MD 900/902 Explorer. MDHI will integrate the InSight Display System into the production and retrofit of the twin-engine helicopters.

The InSight Display System for the MD 900/902 Explorer replaces steam gauge displays with two portrait format high-resolution LCD displays with LED backlighting. The 10.4-inch InSight Displays are compatible with Night Vision Goggles (NVG) and provide the latest in Synthetic Vision (SVS), 2D Topographical Moving Maps, electronic charts, checklists, systems synoptics, engine instruments, rotor data, and more.

The MD 900/902 Explorer helicopters are designed to support a range of missions including offshore transport, law enforcement, emergency medical services, and search and rescue. With UA's InSight Display System solution, operators are offered a single-pilot Instrument Flight Rules (IFR)-capable flight deck tailored to their operations with display graphics that are video and mission display capable.

The InSight Display System is complemented with twin EFIS Control Display Units (ECDU), an Alphanumeric Keyboard (ANK), and Cursor Controls which offer control of the MD 900/902 Explorer's flight deck system. Replacing multiple legacy controllers from the previous system, the ECDU eliminates clutter and centralizes a multitude of flight deck controls such as the flight displays, Flight Management System (FMS), radios, weather, traffic, and terrain.

The ANK provides tactile user input to the InSight Display System and integrated UA UNS-1Lw SBAS-FMS, while providing a means for uploading InSight databases into the system. Function keys streamline control of the FMS while alphanumeric keys can be used to edit and enter information as an alternative to the ECDU. Cursor Control mounted on the primary flight controls provide pilots with a 'point and click' user interface, enabling pilots to easily change frequently used Primary Flight Display (PFD) and Multi-Function Display (MFD) selections while maintaining positive control of the aircraft.

"We are proud to provide our InSight flight deck solution to MDHI," **said Dror Yahav, UA Chief Executive Officer.** "InSight was designed to bring the most advanced capabilities while maintaining a friendly Human Machine Interface," he added. "This technology will put the MD 900/902 Explorer in the front line of the light helicopters segment."

"We are impressed by the capability and flexibility of UA's InSight Display System," **said Lynn Tilton, Chief Executive Officer for MD Helicopters, Inc.** "As the product roadmap for this highly capable light, twin-engine platform evolved, we recognized the need for a robust and adaptable solution, capable of meeting the current and future requirements of our global operators. The InSight Display System is that solution."

News for GA – AWIONICS

GARMIN

Garmin Unveils GTN™ 650Xi and GTN 750Xi Series

Fourth-generation GPS/Nav/Comm Systems, Available Immediately

Garmin is pleased to introduce the GTN™ 650Xi series and GTN 750Xi series — the next generation of in-flight navigation technology.

Designed as a direct slide-in upgrade to the previous generation GTN 650/750, pilots can preserve their panel and modernize the cockpit with the new GTN 650Xi and GTN 750Xi.

Available in five different versions, the GTN Xi series matches its predecessor in providing options with or without Comm or Nav radios. The all-in-one GTN 750Xi GPS/Nav/Comm boasts a large feature-rich multifunction display and can integrate with new or existing remote-mount equipment such as a transponder or audio panel. Dual-core processors and modern hardware also prepare the GTN Xi series for future advanced capabilities. The GTN 650Xi and GTN 750Xi have received FAA STC approval and are available immediately for fixed-wing single-engine and multi-engine piston, turbine and experimental aircraft, with helicopter, business & EASA registered aircraft approvals soon to follow.

Modern processing power and state-of-the-art hardware within GTN 650Xi/750Xi supports faster map rendering and smoother panning throughout the touchscreen navigator.

It boasts a large, ultra-high-resolution display and wide viewing angle that offers superior readability in the cockpit. The displays initialize within seconds of start-up, providing immediate access to frequencies and flight plan information, saving valuable time in the aircraft.
Preserving the same form factor as the previous generation GTN 650/750, the 6-inch-tall GTN 750Xi and the 2.65-inch-tall GTN 650Xi offer an intuitive touchscreen design with a dedicated direct-to button and a dual concentric knob that provide added convenience when interfacing with the display.

Retaining all the features of the GTN 650/750, the GTN Xi series adds a vibrant display and vivid colors that enhance the contemporary look of the new navigators.
When installed alongside a G500 TXi or G600 TXi flight display, the GTN Xi series brings a new level of modernization to the cockpit. Highly complementary, the GTN Xi and the TXi flight displays share similarities in display, appearance and hardware qualities. For example, both products feature an angular bezel with a flush glass display — so the pilot has a near-seamless experience when transitioning between the touchscreen flight display and the navigator.

The GTN 650Xi/750Xi offer advanced navigation functions, including ILS and LPV instrument approach procedures, as well as visual approach guidance. Based on a published glide path angle or a three-degree glideslope from the threshold of the runway, visual approaches also consider terrain and obstacle clearance to assist pilots in flying a stabilized approach to the runway in visual flight conditions.

Approach types that incorporate radius-to-fix (RF) leg types are also supported by the GTN Xi series. Additional capabilities include the option to add a published or custom holding procedure, vertical navigation (VNAV), graphical flight plan editing on the moving map and more.

The colorful, multifunction display-like map allows pilots to better visualize their dynamic position relative to potential hazards, such as terrain, weather and traffic. Geo-referenced instrument approach procedures can be overlaid on the map page, offering superior situational awareness when transitioning from the enroute to approach phase of flight.
Terrain alerting is included within the GTN Xi series and further enhances situational awareness by using its internal terrain

and obstacle database to provide audible and visual terrain proximity alerts, including, "terrain ahead, pull up" and "obstacle ahead, pull up." Helicopter Terrain Awareness and Warning System (HTAWS), TAWS-A and TAWS-B are also available as options.

Superior integration with an array of avionics on the market make the GTN 650Xi/750Xi a simple and straightforward solution to incorporate into any cockpit. Options for remote audio panel or transponder display and control allow aircraft owners to simplify their panel.

When paired with a Garmin autopilot, such as the GFC™ 500 or GFC 600, pilots can fly fully coupled VNAV profiles and instrument approach procedures. Pilot workload-reducing features such as Telligence™ voice control is also available within GTN Xi when paired with the optional GMA™ 35c. When paired with a GSR 56 Iridium® datalink, global text and voice calling can be completed through the touchscreen display on the navigator.

Wireless connectivity is available with the optional Flight Stream 510, allowing pilots to connect their mobile devices running the Garmin Pilot™ and FltPlan Go applications to the GTN 650Xi/750Xi. When connected to the navigator, pilots can save time in the cockpit by wirelessly transferring aviation databases and flight plans from their mobile devices to the navigator.

Flight Stream 510 also supports the sharing of traffic, weather, GPS position information and more. The GTN Xi series is also compatible with the cost-effective Garmin navigation database.

NEW

Garmin Introduces GI 275 Electronic Flight Instrument

Reimagine Thousands of Aging Cockpits with Modern Flight Instrumentation

Garmin is pleased to introduce GI 275, a powerful electronic flight instrument that directly replaces legacy primary flight instruments in the cockpit.

GI 275 is suitable as a direct replacement for a variety of instruments, including an attitude indicator, attitude directional indicator (ADI), course deviation indicator (CDI), horizontal situation indicator (HSI), multi-function display (MFD) and engine indication system (EIS)[1].

Capable of serving as a 4-in-1 flight instrument with attitude, airspeed, altitude and heading information, GI 275 can also be installed as a standby to a number of glass flight displays and is available with a 60-minute back-up battery. Lightweight and compact, the GI 275 is intentionally designed to take advantage of the common 3.125-inch flight instrument size, reducing installation time and preserving the existing aircraft panel. It's also compatible with a variety of third-party autopilots and does not require a separate interface adapter, further reducing installation labor.

GI 275 has received Federal Aviation Administration (FAA) approval and is available immediately for installation in more than 1,000 single-engine and multi-engine aircraft models. The EASA validation of this STC is expected shortly.

Suitable as a replacement to many aging flight instruments and gyro-based attitude indicators on the market — such as the popular KI-256 — GI 275 gives aircraft owners the benefits of a modern and reliable flight instrument. GI 275 boasts a standard 3.125-inch form factor and rear-mount

design that minimizes panel modification. Its bright, highre-solution touchscreen display and wide viewing angle offer superior readability in the cockpit.

A dual concentric knob allows pilots to access a variety of key functions within the flight instrument, such as adjustments to the baro setting or airspeed bug.

Highly scalable, aircraft owners can start with a single GI 275 and add up to a total of six in a single panel, paving the way for incremental upgrades and an array of individualized panel configurations.

Several variants of GI 275 are available to meet the needs of more than 1,000 business and general aviation aircraft models.

The GI 275 Base variant can be utilized as a dedicated EIS or CDI/MFD with features such as traffic[2], weather[2], terrain, SafeTaxi® airport diagrams, and more. The GI 275 ADAHRS variant includes a built-in ADAHRS and backup battery, making it capable for use as a dedicated 3-in-1 flight instrument with attitude, airspeed and altitude.

When connected with an optional magnetometer, this variant can serve as a dedicated HSI or 4-in-1 flight instrument with attitude, airspeed, altitude and heading information. The GI 275 ADAHRS+AP variant is also available, which carries the capabilities of the ADAHRS variant and adds the ability to interface with many popular legacy autopilots.

Primary Attitude Indicator

When installed as a primary attitude indicator, GI 275 offers improved reliability, potential weight savings and reduced maintenance compared to failure-prone vacuum-driven atti-tude indicators. In addition to serving as primary for attitude information, pilots can also view primary altitude, airspeed and heading[3] information on the instrument.

Optional SVT™ overlays a rich, 3D topographic view of terrain, traffic, obstacles, airport sign posts and more all within the GI 275 attitude display. With SVT, the GI 275 also displays a flight path marker, which considers crosswind, angle of attack and other factors to show precisely where the aircraft is flying. GI 275 is compatible with the GFC™ 600 autopilot — as well as an array of third-party autopilots — and can replace the primary attitude indicator installed with these autopilots. GFC 500 compatibility is expected later this year.

GI 275 flight instrument is also approved for installation as a dedicated standby flight instrument to Garmin glass flight displays and is capable of serving as a back-up to a variety of third-party flight displays on the market. When installed as a standby to G500 TXi, GI 275 is capable of displaying additional multifunction display features. For back-up navigation

information, a built-in VFR GPS enables convenient direct-to navigation guidance, displaying aircraft position information on a moving map.

Course Deviation Indicator (CDI) & Horizon-tal Situation Indicator (HSI)

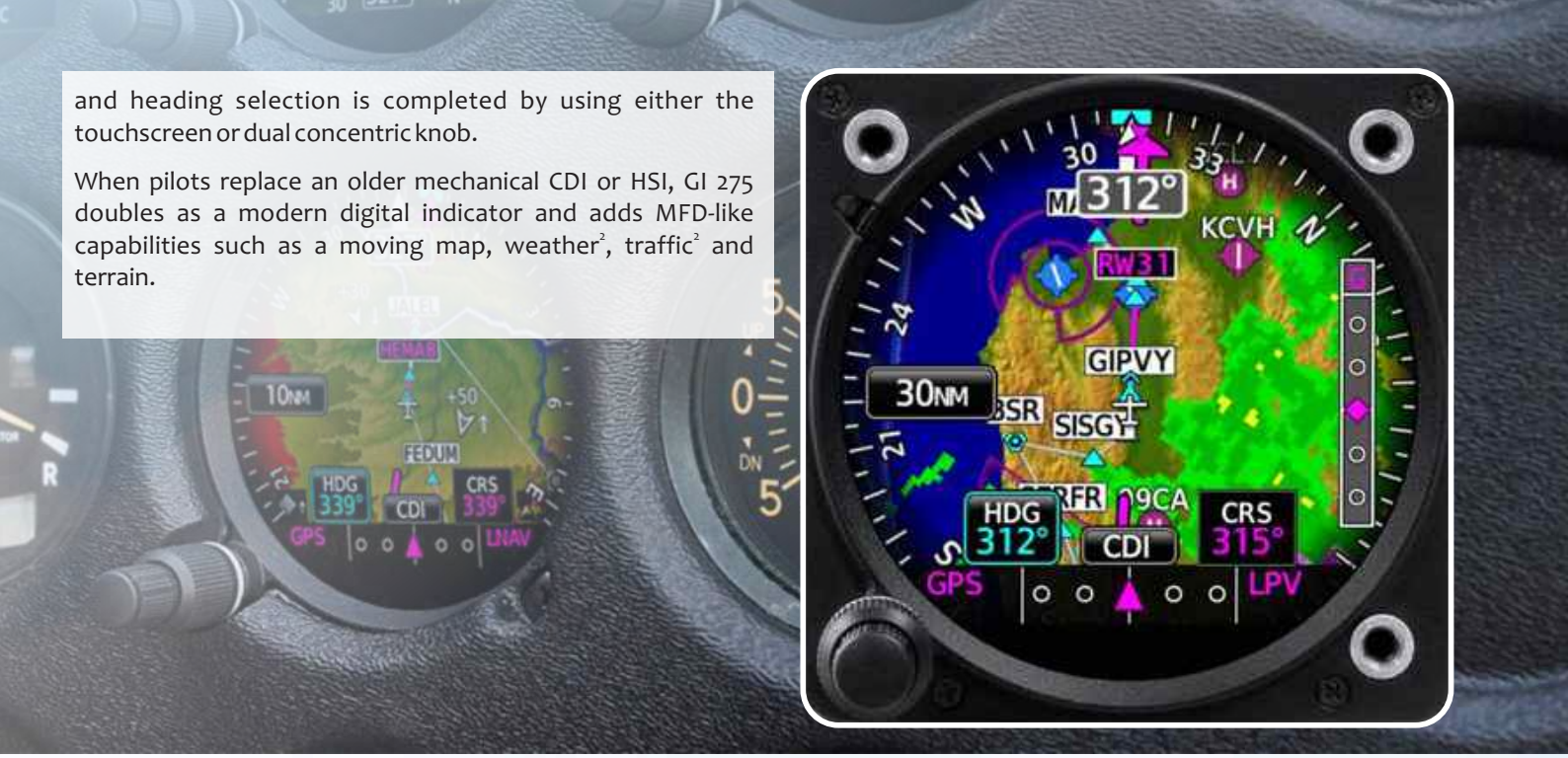
When installed as a CDI or HSI, the GI 275 flight instrument is designed to accept a variety of GPS or navigation inputs, allowing up to two GPS sources and two VHF navigation sources.

The GI 275 features an Omni Bearing Resolver that allows the flight instrument to interface to a variety of legacy navigation sources without the need for an expensive adapter. With an optional magnetometer, it is also capable of providing magnetic-based HSI guidance.

Vertical and lateral GPS, VOR/LOC and glideslope deviation can be viewed on the GI 275. CDI source selection can be accomplished through the touchscreen interface, while course

and heading selection is completed by using either the touchscreen or dual concentric knob.

When pilots replace an older mechanical CDI or HSI, GI 275 doubles as a modern digital indicator and adds MFD-like capabilities such as a moving map, weather[2], traffic[2] and terrain.



Suitable as a replacement to display primary engine information

When configured as primary to display engine information, GI 275 is capable of interfacing with single-engine and multi-engine normally aspirated or turbocharged aircraft with select powerplants, including Lycoming and Continental 4 or 6-cylinder engines.

When GI 275 replaces mechanical gauges and is configured as primary for engine information, GI 275 can display RPM, manifold pressure, oil pressure and temperature, cylinder head temperature (CHT), exhaust gas temperature (EGT), turbine inlet temperature (TIT), fuel flow, fuel quantity, fuel pressure, volts and amps. Lean assist functionality is also available, so pilots can choose to operate rich of peak or lean of peak. GI 275 also features exceedance alerting, allowing installers to configure caution and warning alerts per the Pilot's Operating Handbook (POH).

Advisory alerts such as "high oil temp" or "high CHT" can be configured by the pilot. These exceedances, as well as additional engine data can be shared wirelessly with the Garmin Pilot™ app[4] on Apple® mobile devices and can also be viewed on the flyGarmin® website for post-flight analysis. In multi-engine aircraft, dual GI 275 flight instruments are required to display engine information. To gather engine data, the GI 275 uses either the GEA™ 24 or GEA 110 engine interface adapters as well as the same engine sensors as TXi flight displays.

Multifunction Display

Depending on the configuration and installation, GI 275 is capable of displaying additional page functions and features beyond a traditional flight instrument. These features can include the following:

- A multifunction display (MFD) with a moving map can display terrain, obstacles, traffic[2], weather[2], airspace information, airways, and more.
- When interfaced to a GTX™ 345 or GNX™ 375, traffic information can be displayed on the dedicated traffic page or moving map. Patented TargetTrend™ relative motion technology and pop-up traffic alerts further enhance situational awareness.
- GI 275 can also be interfaced to a variety of traffic systems, including select Traffic Advisory (TAS) and Traffic Alert and

Collision Avoidance Systems (TCAS). Traffic advisories are displayed on the dedicated traffic page and moving map.

- SafeTaxi airport diagrams display runways, taxiways, Fixed Based Operators (FBO's), hangars and more relative to the aircraft's location on the airport surface.

- Terrain shading incorporates yellow and red contouring indicating that the aircraft is 1,000 and 100 feet above ground level (AGL) respectively. Terrain information — as well as obstacle and WireAware™ database information — can be viewed on the terrain and map pages.

- GI 275 uses its internal terrain and obstacle database to provide audible and visual terrain proximity alerts, including, "terrain ahead, pull up" and "obstacle ahead, pull up."

- When paired with the GDL® 69 datalink receiver, GI 275 is capable of displaying SiriusXM® Aviation Weather. It can also display Flight Information Service-Broadcast (FIS-B) weather from either a GTX™ 345 or GNX 375.

- An airport information page displays a variety of information, including frequencies, runway dimensions and more.

- GI 275 can be paired with the GRATM 55 or GRA 5500 radar altimeters – as well as other third-party products – to display radar altimeter readings on a dedicated page. Visual and aural annunciations are also available.

Built-in Wi-Fi® connectivity enables Database Concierge, the wireless transfer of aviation databases to the GI 275. Pilots also have the option of transferring databases to GI 275 by using a USB flash drive and the GSB™ 15 USB charger.

Databases can also be synced among multiple GI 275 flight instruments in a single cockpit. When configured to display engine information, GI 275 can wirelessly send engine data to display within the Garmin Pilot™ app[4] on Apple® mobile devices. This data is also automatically synced and can also be viewed on the flyGarmin® website.

Wireless flight plan transfer via BLUETOOTH® technology is available when GI 275 is paired with a GPS 175, GNC® 355 or GNX™ 375. Additional wireless functions include the sharing of GPS position and back-up attitude information with Garmin Pilot.

GI 275 has been approved for installation in more than 1,000 single-engine and multi-engine aircraft models. The GI 275 Base variant will begin shipping immediately in limited quantities. The GI 275 ADAHRS and GI 275 ADAHRS+AP variants are expected to begin shipping later this month. Pricing for various configurations of GI 275 can be found in the attached ordering guide. A trial period of SVT™ also comes with the purchase of a GI 275 when it's configured as an attitude indicator.

GI 275 is covered with a two-year warranty and is supported by the award-winning Garmin aviation support team. Please contact your regional sales manager with any questions.

1) Features and functions depend on configuration and variant selected
2) Requries compatible source
3) With optional magnetometer
4) Available with software v2.03

DRAB POL®

AVIONICS

Drabpol Avionics – an authorized dealer of the world's leading manufacturers of avionics in Poland.

Drabpol Avionics means:

- Guarantee of high quality services (Certificates: PART 145, PART 21, AQAP 2110-2006; ISO 9001-2009);
- Services offered in the territory of Poland;
- The use of modern control and measurement instruments;
- Direct contact with manufacturers;
- Certainty of using original spare parts;
- Fast delivery of products on request;
- Professional warranty and post-warranty service;
- Qualified and constantly trained technical staff;
- Civil Aviation Liability Insurance in the amount of $.1,000,000.00;

Scope of activities:

- Warranty service;
- Post-warranty service;
- Laboratory tests, calibrations and repairs of devices removed from SP.

Modlin Lotnicze® CENTRUM SERWISOWE

EPMO Lotnisko Modlin - Hangar nr 1
05-102 Nowy Dwór Mazowiecki, ul. Gen. Thommee 1a
tel/fax: (0048) (22) 467 11 90
e-mail: lcsmodlin@drabpol.pl
www.drabpol.pl

Laboratorium Analiz Zapisów z Tachografów

DRAB POL AUTOMOTIVE

DRAB POL AWIONIKA

PART 21 DRAB POL

TELEMATICS