Dear Calypso friends and partners,

I am pleased to share CNA’s 2021 Activity Report, which highlights the association’s progress and achievements over the past year.

2021 was a very unusual year, marked by the impact of the health crisis on public transport. Travel restrictions and fewer passengers on the networks meant that once again the entire ticketing ecosystem has been affected. Transport authorities, operators and manufacturers have suffered with significantly reduced activity.

Calypso has of course also been affected by the crisis. I am pleased to report, however, that 2021 was an extremely dynamic year for Calypso, as well as for the entire ticketing ecosystem.

As the governing body of Calypso technology, CNA was founded with one simple aim: to support the use of the open Calypso technology standard to enable transport and mobility operators to control and advance their contactless ticketing systems. With the timeline on the following page you can see how much Calypso has evolved over the last 25 years, and take once again the entire ticketing ecosystem.

I extend my sincere thanks to the entire CNA team and broader Calypso community, including our users and partners, for their ongoing contributions to the association over the past 12 months. I look forward to the year ahead.

Best wishes,
Philippe Vappereau
Chairman of Calypso Networks Association
2021 has again been a challenging year on a global scale. The pandemic set the scene and strongly influenced the agenda of the association’s work plan. Despite this challenging framework, CNA has been able to further consolidate its work tasks and to open up new work strands. Once again, with the dedication of the CNA team and the commitment of our members, Calypso has confirmed its leading position on the global market by adding more deployments of technology, following up new work progresses and achieving key results through the activities of its working groups.

The newly launched services for members have been highly appreciated within our community. The capacity of the association to enable open stakeholder exchanges and to share knowledge, experiences and expertise have proven fundamental in implementation projects. We are delighted at the praise that has been given to our training modules, online and offline events, newsletters and our website.

With these consistent communication channels now established, we have been able to give our members the platform to better engage in exchanges and to stay strongly connected and involved in the association’s activities. With the addition of these new services, CNA has increased the possibilities of networking, made the working groups more interactive and increased knowledge sharing.

### 2021 highlights

Supporting the community during the Covid-19 pandemic

2021 has again been a challenging year on a global scale. The pandemic set the scene and strongly influenced the agenda of the association’s work plan. Despite this challenging framework, CNA has been able to further consolidate its work tasks and to open up new work strands. Once again, with the dedication of the CNA team and the commitment of our members, Calypso has confirmed its leading position on the global market by adding more deployments of technology, following up new work progresses and achieving key results through the activities of its working groups.

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Technical milestones

Certification is at the heart of Calypso’s expansion.

2021 has been a very important year for the development of the Calypso products certification programme. For cards, the process managed by Paycert is firmly in place and new cards have been certified, demonstrating the dynamism of Calypso. Development of the certification tool for Basic cards, and the work on terminal certification, also progressed and is essential in addition to card certification to guarantee card/reader interoperability regardless of the supplier.

Looking beyond functionality, 2021 was also characterised by a new activity for CNA: the implementation of security certification processes. The original security of Calypso relies on software mechanisms implemented in security components, certified to a minimum Common Criteria EAL4+ level. With the HCE mobile solution, it is no longer possible to rely on the security of such components, so CNA has implemented a security certification to address this issue. CNA has also implemented a security certification for the new Basic card, based on a minimum hardware + software EAL2+ protection profile.

Paycert and CNA continued their cooperation launched several years ago to roll out and maintain a certification process for the compliance with the European standard for the communication between contactless readers and fare media in public transport - CEN/TS 16794, which is now the ISO 24192 standard. Eight card certificates were issued, and six for terminals.

A contactless Calypso terminal software was divided into three layers, Reader Layer, Calypso Layer, Ticketing Layer, and requirements were defined at each layer to facilitate integration into the terminals, ensure interoperability between layers and allow the modules to evolve independently of each other. These requirements provide the basis for a terminal certification programme whose definition started in 2021 for the Calypso Layer and the Reader Layer. In the meantime, CNA has established a transitional registration procedure for the Calypso and Reader Layers, which is based on a declaration by the vendors that they comply with the requirements.

Card functional certification

In 2021, eight products were certified, two Calypso Prime rev 3.2 and six Calypso Applet on Java platform. The website was improved to better identify Java-based cards and mobile secure elements. The Calypso basic test tool was achieved, and the certification process is ready. Work has started to define the additional tests necessary for the certification of a Calypso Prime rev 3.3 card which is planned mid-2022.

Contactless interface certification

A contactless Calypso terminal software was divided into three layers, Reader Layer, Calypso Layer, Ticketing Layer, and requirements were defined at each layer to facilitate integration into the terminals, ensure interoperability between layers and allow the modules to evolve independently of each other. These requirements provide the basis for a terminal certification programme whose definition started in 2021 for the Calypso Layer and the Reader Layer. In the meantime, CNA has established a transitional registration procedure for the Calypso and Reader Layers, which is based on a declaration by the vendors that they comply with the requirements.

Calypso HCE security certification

In 2020, CNA started a security certification process for a Calypso HCE mobile application to provide a scheme that gives a guarantee of a certain level of security. Once defined, the complete security reference framework was achieved in October 2020, a first process was set-up and a pilot phase was launched beginning 2021 with an accredited security lab, concluding with the award of a first security certificate to the company HID Global, in July.

Calypso Basic security certification

A first option for a Calypso Basic product is, as for Prime and Light products, to implement it on a secured hardware platform at Common Criteria (CC) EAL4+ level a minima. To foster cheaper components, CNA proposes a second option: a CC EAL2+ certification for both hardware and software, based on a Protection Profile (PP) defined by CNA in 2021 and certified by the ANSSI, the French government agency for information systems security.
Eclipse Keyple is an open-source ticketing SDK, a reference library to facilitate the implementation of Calypso applications in a terminal. 2021 was the year of maturity for Keyple, with the publication of version 2.0. A great effort was made on documentation and source code of examples of transactions, local and remote. Many actors of the ticketing ecosystem, operators and manufacturers, have adopted Keyple to develop their new applications or to modernise their system, now made possible without requiring specialist transport knowledge.

Eclipse Keyple

Keyple 2.0 means transport organisations can now modify ticketing software independently from their hardware solutions; for example whenever they want to implement a new tariff. Ticketing suppliers no longer need to develop and maintain their own complex library to handle Calypso processing or solution evolutions, nor do they need to adapt solutions specifically to integrate an existing ticketing system. Keyple’s modular approach enables developers—whatever their expertise—to start using Keyple quickly, easily and inexpensively to integrate advanced smart ticketing solutions into their public transport offer.

Philippe Vappereau
Calypso Network’s CEO

Calypso Applet

CNA provided customer support for the version 1.3.9 of the Calypso Applet delivered end 2020 and published a version 1.3.10, which mainly follows some evolutions of JavaCard and GlobalPlatform with some specific adaptation for the iOS environment.

Calypso specifications

Early 2021, a significant update of the Calypso documentation on the Calypso Technical Support was published with the new Calypso technical documentation template. This concerned more than 20 documents either new or updated or deprecated. Another update of the main specifications of the Calypso cards (Prime, Light, Basic, and HCE) was prepared for beginning 2022.

Promotion of Calypso and institutional relationship

2021 was characterised by the continuation of the established activities of promotion and institutional relations.

We successfully started the operation of our new representation office in Mexico marked by the organisation of the Mexico Tech Days. Besides Mexico we have significantly extended our business network in the Latam market thanks to the successful operations of our Sao Paulo office (CNA Brazil).

• On the African continent we have seen the launch of the Dakar project and increased significantly our market outreach through this success story.
• On the European market we gave momentum to our new strategic partnership with Asstra through a series of jointly organised webinars.

From an institutional perspective we have signed a liaison agreement with the NFC Forum and successfully started our involvement into the workstream MIT SIG by providing use cases. We have maintained our support to the UITP subgroups on Ticketing in MaaS, digitalisation and blockchain. CNA has strongly supported the works of the STA. CNA is also member and an active contributor to the following associations ADCEIT with focus on developing multiservice usages, ECLIPSE, ATEC ITS, Club Italia and Ukrelektrotrans.

CNA continued its work to build partnerships with its members and other parties that want to know Calypso better. The CNA team believes this knowledge and relationship is vital to better integrate the needs of all users and suppliers in the development of the standard and to prioritise work activity.

In 2021 the CNA team held more than twenty bilateral meetings, remote or face-to-face, with members of the association, local authorities and operators wishing to better understand the benefits of Calypso and open standards. Discussions also covered key topics such as the shortage of components, with manufacturers wishing to integrate Calypso in their commercial offer. Many institutional partners financing ticketing projects highlighted their interest in the principles of openness and sovereignty of Calypso. These exchanges have also been extended to other fields of activity beyond public transport, such as MaaS or parking management.

These exchanges will be further intensified in 2022.
CNA Worldwide

Countries and regions with Calypso deployment*

Conference and event highlights

Three events were organised by CNA in 2021. All were held face-to-face and allowed the Calypso community to meet:

Partners Day (July 2021)
The Partners Day was the first event we were able to organise in person in the new CNA Paris offices (although remote participation was possible). Our industrial members were finally able to exchange directly and there was an opportunity to gather from suppliers their market vision, positioning of Calypso and the ongoing development of the standard.

Mexico Tech Day (November 2021)
Organised by CNA, hosted by RTP and with the participation of the Secretario de Movilidad, Andre Lajous CDMX and Metrobus, the event featured a presentation of the ticketing system of Mexico City, the largest Calypso metropolis in the world, and showcased the benefits of using open standards.

Open Session (December 2021)
After two years we were finally able to organise the traditional Calypso annual event on December 1st in Paris at the Peninsula Hotel, with more than 100 participants who were happy to meet in a friendly atmosphere. A day full of events included a General Assembly during which the Advisory Board was elected, and an afternoon dedicated to technical workshops on the Calypso product range, mobile ticketing, Keyple and terminal certification, the evolution of ticketing and the positioning of Calypso.

Industry liaison

In 2021, CNA participated in several exhibitions, with a stand at the Rencontres Nationales du Transport Public in September in Toulouse, and at Vivatech, the international exhibition of digital innovation in June in Paris, at the Village de l’Innovation, as well as at the virtual exhibition of the UITP Latam week.

The CNA team also regularly participates in numerous industry events where the transport ticketing community meet. These events include presentations and roundtable discussions, either in webinar format or during face-to-face meetings, at forums organized by the World Bank, by the NFC Forum, by our partners and members, the association Asstra, at the Assises de l’Adcet in Rennes, as well as at conferences organized by Club Italia, by Ville, Rail et Transport, at MOVE in London, at the Annual Ticketing Summit in Berlin, at the Economic Forum in Karpacz, etc.
In 2021 the work to achieve a partner-
ship with OSPT has continued. Major
milestones have been achieved with
the approval of a Strategic
Alliance Agreement between the two
organisations by the CNA Board. This
Strategic Alliance Agreement provides
the foundation to continue mapping
out next steps and detail how the
partnership will evolve.

We also launched a joint ‘Ticketing open
standard’ website which provides us
with a neutral, informative platform
on which to promote our joint work
items, in addition to explaining the
reason for our collaboration, you can
download our eBook on the benefits
of open standards.

An essential work item undertaken
together over the last year, was
the CNA and OSPT Alliance hosted
focus groups with operators and
authorities, as well as manufacturers
and consultants, to better understand
longer-term requirements and
expectations, and how transport
ticketing standards can support these
needs. To view the outcomes of
this discussion, read our Focus
Group Report.

Looking to 2022, work has begun on
the production of an ‘Automatic
Fare Collection systems’ guideline
to better position our collective views
on the market, and once again, the role
open standards play.

CNA/OSPT webinars:

Two joint focus groups have been held
with CNA and OSPT Alliance members, in two
dedicated sessions, one for mobility providers
(operators and authorities), and another for
representatives of suppliers. These sessions
aimed to help CNA and OSPT Alliance to align
stakeholders around the issue of evolving
ticketing and open technologies. They were
dedicated to exchanges designed to better
understand their needs and expectations
regarding cooperation between these two
open standards. These exchanges identified
that implementing a new standard should
be an ‘evolution’ rather than a ‘revolution’,
and have enabled both associations to better
define future steps for the ticketing open
standards journey.

New resources for
the CNA community

CNA continues its commitment to be a
valuable resource to the contactless
ticketing community. Following the launch in 2020 of the
calypso website, it is now available in five
languages. English, French, Italian, Spanish and
Portuguese. This means our website is more
accessible to all, providing comprehensive
information on CNA membership benefits
and details of all upcoming CNA events and
webinars, as well as up-to-date information
on all Calypso technology details of Calypso’s strategic
services including training and technical support
and much more...

We are also proud to continue to share on the
platform insights and new content with the
ticketing community. Over the last year, this
includes 12 articles on Transport Ticketing
Trends, 5 press releases, 6 press briefings and
interview articles, 42 media articles, 50+ LinkedIn
updates, 4 product brochures, 2 eBooks.
New board members

Additionally, to further strengthen the contribution of the providers of Calypso solutions and increase their participation to CNA, which we recognise as essential in the life of the association and its governance, the Board of Directors created an Advisory Board of adhering members (Calypso providers). The purpose of the Advisory Board is to share the vision of the industrial world, and its insights on the evolution of ticketing and Calypso technology. It will also take action to increase awareness of Calypso and facilitate its implementation.

Advisory board

The Advisory Board includes four elected members and one gold member:

- Cubic, represented by Christian Senly;
- HID represented by Cristiano Pardo;
- Thales represented by Maria Ramírez;
- Wizway represented by Louis Brosse;
- Infineon represented by Katja Kienzl.

Financial statements

As indicated, 2021 is the first year marked by a financial impact of the pandemic. The number of shipped cards drops from 29 million in 2019 to 22 million in 2020, representing a decline of approximately 25% in brand licensing revenue for CNA. With the increase in membership at CNA, however, fee revenues are growing by about 10%. In total, CNA’s revenues remained at a high level in 2021 at €1.8 million.

There is a time lag of approximately one year between the shipping of a card by a manufacturer and the licensing revenue received by CNA.

Once again in 2021, the budget for Calypso promotion and events was greatly reduced due to the pandemic. But CNA has maintained a high level of exchange with digital technologies and enhanced communication through WG4.

Improved governance for CNA

To enhance representation from across the transport ticketing world and to ensure that CNA’s leadership continues to reflect the diverse ticketing community with the right balance between founder members and elected members, the CNA Board has expanded the number of seats occupied by representatives elected from CNA’s members. In 2021 we welcomed Carris, represented by Miguel Brito da Silva, Île-de-France Mobilités, represented by Laurent Probst, and Metropolitano de Lisboa, represented by Fausto Sà Marques.
Despite the complex conditions set by the global pandemic, CNA continues to be the leader in ticketing based on open-source solutions. By relying on our growing number of success stories and use cases, we are working to further expand Calypso as the post-Covid sovereign ticketing solution to deliver NFC, MaaS and complement the pay-as-you-go (PAYG) concept.

With many new communication channels in place, we will continue our educational activity to promote the value of the Calypso product range, including cards and mobiles as well as promoting Calypso certification with the availability of the terminal functional certification.

Finalising all elements of Eclipse Keyple is central to CNA’s 2022 commitments, with a work plan to integrate all Calypso functionalities.

Making member services more tangible for the ticketing community will see CNA extend the current policy of services. In addition to our existing service offering of training, technical support, test kit, delivery of HAM/SAM, we will concentrate on offering tailored and unique support to operators and authorities. This includes a Club to facilitate better exchange of information among Calypso users about the daily operation of ticketing systems, focusing in particular on the analysis of quality of service and security.

CNA will undertake for the benefit of its members the necessary actions to fulfil its mission.

CNA’s strategic priorities for 2022

CNA is a not-for-profit organisation that brings together members of the transport, mobility and services communities to exchange ideas, experiences and requirements to advance open systems that support consumer ticketing needs.

CNA’s mission

Connecting the contactless ticketing community

The CNA community combines transport and mobility authorities, operators, and service providers, as well as technology manufacturers and transport consultants. It is a diverse and welcoming community which spans public and private sector organisations.
Join the CNA community

CNA provides a unique opportunity to exchange ideas, experiences, and requirements within a supportive and collaborative environment. By working together, it creates an opportunity to secure control over the smart ticketing ecosystem and create a sustainable framework for the future.

All CNA members benefit from greater ownership over the smart ticketing ecosystem via:

- Networking and collaboration: CNA brings together the brightest minds within the transport and mobility community to share experiences and facilitate industry collaboration
- Access to CNA’s working groups: Join and participate in CNA’s working groups to promote open standards and influence the future direction of Calypso technology
- Invitations to CNA’s global events programme: Partake in CNA’s global programme of events, networking opportunities and annual awards ceremony
- Strategic support and expertise: Receive preferential rates on strategic support aligned to local, national or global ticketing requirements
- Training opportunities: Gain new skills via preferential rates on CNA’s year-round training programme, tailored to member requirements
- Exclusive access to Calypso technology documents: Access the Calypso library, including documentation, specifications and guidelines
- Technical support: Receive comprehensive technical support and preferential rates on Calypso technology

Please find the list of CNA members in 2021 below:

CNA members in 2021*

- 5T DATARAXYS IQUANTICS PW CONSULTANTS
- ACTV DEJAMOBILE ITSO QILIUM
- ANY Security Printing Company ATEC LINK CONSULTING SET SRL
- ASTREIA ELIGIA LIAISONS SIA RIGA KARTE
- AZIENDA TRASPORTI MOLINARI ELITT LOGPLUS SIGMA SPA
- B-BUS FAMOCO LI CARDO SICOF
- BILLIOTELIQUE SERVICES FINO MANAGER ONE SHOWBALL TECHNOLOGY CO., LTD.
- BMC FLOWBIRD MASITECH SOCIETE DE TRANSPORT DE MONTREAL
- BROXEL GIESCEK & DEVREHT MEDIAZONE ITALIA S.P.A. SONDA S.A.
- RUSSI GRAND AVIAISON MERCADO LIBRE SP TRANS
- CARIBO GSI PLUS METROPOLITANO DE LIGURIA SP TRANSPORT
- CARRIS NB TECHNOLOGIES MICROSAFE ST MICROELECTRONICS
- COMX – MEXICO CITY HOGA GLOBAL MEXICAN JSC STIB
- CEDUS IDHQ COMPUTERSLÖSNINGEN MFCARD SYTRAL
- COMM-IT EMBEDDED ICMICROTECHNOLOGIES NAGELS TELÉMETRICA GRUPPO LEFIC
- COMMTITRES ICUBE NOUVELLE AQUITAINE MOBILITES THALES
- CONDUENT IDEAS ELECTRONICA NCR TELECOMUNICACIONES TIDSECO
- CONOSAFE IDENA ONEWAVE TN SPORT LLC
- CONSORTIUM CB IDENTIV GITW – Gestión de Transporte de Vehículos TML
- CONTROLON SA ILE-DE-FRANCE MOBILITÉS PARAISON ID TRANSDATA
- CIE TRANSPORTS STRASBOURGEOIS INFINEON PHCRETE UBRITRANSPORT
- CUBE INTERTRADING PLURISERVICE WATCHDATA TECHNOLOGIES
- Digital Africa Telecom PIZOCAS SERVICES AND TECHNOLOGIES PREFEITURA MUNICIPAL DE PORTO ALEGRE WIZWAY

*Member list correct as of 31 December 2021
Board of directors

CNA is managed by a Board of Directors appointed by the General Assembly every three years. There are currently 17 board members, represented by 17 officers.

ACTV – Azienda Consorzio Trasporti Veneziano
Vice-Chairperson, User Committee, Promotion & Marketing Represented by Gianluca Cuzzolin

LANDR枚S KONSTANZ
General Secretary Represented by Zeno Dannert

RATP – R枚gie Autonome des Transports Parisiens
Chairman Represented by Philippe Vappereau

CARRIS de Lisboa
Represented by Miguel Brito da Silva

STIB/MIVB – Soci枚t枚 des Transports Intercommunaux de Bruxelles
Represented by Jean-Luc Van Ginder Deuren

TML – Transportes Metropolitanos de Lisboa
Vice-Chairperson, Keyhole Development Represented by Sonia Alegre

ST-FORDINO
Represented by Massimo Coccozza

ASSITRA
Associations Trasporti
Represented by Giovanni Foti

STIFER
Azienda Trasporti Milanese
Represented by Roberto Andreoli

B-BUS
Represented by Vitalij Komars

ASSTRA
Associazione Trasporti
Represented by Giovanni Foti

ATM – Azienda Trasporti Milanesi
Represented by Roberto Andreoli

5T-TORINO
Represented by Massimo Coccozza

INTERPARKING
Represented by Roland Cracco

METROPOLITANO DE LISBOA
Represented by Fausto Sà Marques

METROPOLITANO DE LISBOA
Represented by Fausto Sà Marques

CTS – Compagnie des Transports Strasbourgeois, Hoplink Governance
President – Represented by Alain Caffart

ÎLE-DE-FRANCE MOBILITES
Represented by Laurent Probst

SNCF – Soci枚t枚 Nationale de Chemins de fer Fran枚ais
Vice-Chairperson, Industrial Strategy
Represented by Jo枚l Eppe

GIE CARTES BANCAIRES
Represented by Pierre Chassigneux

INFINEON
Represented by Katja Kienzl

ASSTRA
Associazione Trasporti
Represented by Giovanni Foti

B-BUS
Represented by Vitalij Komars

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Vice-Chairperson, Industrial Strategy
Represented by Jo枚l Eppe

GIE CARTES BANCAIRES
Represented by Pierre Chassigneux

INFINEON
Represented by Katja Kienzl
The CNA Team

CNA is led by a world-class team of industry experts with extensive knowledge and experience across the transport and mobility sector.

The team operates from Paris, Brussels, Lisbon, Konstanz, São Paulo, Mexico and the Island of la Réunion to support CNA and its members.

We would like to commemorate Guy Van Keer, our colleague from the Calypso team, who left us in 2021. He worked tirelessly and faithfully for many years for the development of Calypso and was at the origin of the creation of the CNA office in São Paulo. Our sympathy goes out to his family.

In February 2021, the CNA team moved into its new offices at: 
2 RUE DE LA ROQUETTE, 75011 PARIS
where we will be pleased to welcome all our members passing through Paris.

The core team also benefits from local support across the globe. The extended team is available to answer any local questions with their regional knowledge and can also act as a bridge to the core global experts.
CNA is committed to providing free, valuable resources for the contactless ticketing community including eBooks, brochures and blogs.

**Calypso Certification:** For Ticketing Today, Tomorrow and the Future
Learn why certification is needed, and the value it brings to the transport ticketing and mobility communities. CNA’s eBook makes it easy to understand all elements of Calypso certification and licensing with helpful guidance for manufacturers.

**For all you need to know about Calypso Prime, Calypso Light, Calypso Basic and Calypso’s solutions for mobile, our short guides provide the perfect introduction.**

**Read the latest updates and announcements from CNA in the newsroom.**

**Subscribe to CNA’s monthly newsletter to stay up to date with the latest news, events and insights from the organisation. Your email address will never be shared with third parties and you can unsubscribe at any time.**

**CNA offers a global programme of events for members and non-members throughout the year with the latest information on the website.**

**Member benefits**
Read CNA’s member benefits brochure to understand how members will receive greater ownership over the smart ticketing ecosystem, alongside access to networking, events and much more.

**2021 training programme**
View CNA’s full training brochure for 2021 with details of all modules, as well as information on how to arrange bespoke training tailored to specific requirements.

**Read CNA’s official blog, Transport Ticketing Trends, to get the latest insights and commentary from the CNA team on contactless ticketing advancements, opportunities and challenges.**

Some highlights from the last year include:
- How contactless ticketing is transforming public transport on one of the world’s largest networks on our work to improve public transport in Mexico
- Building bridges to advance contactless ticketing on our collaboration with the NFC Forum to help embrace the full potential of NFC technologies in transport
- Are QR codes a long-term solution for smart ticketing? exploring whether the visual codes are a credible long-term solution for transport ticketing.
Calypso Networks Association

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留下来 company/calypso-networks-association
🎬 Youtube Calypso Channel

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**Resources**

Read CNA's recent eBook:
Calypso Certification: For Ticketing Today, Tomorrow and the Future

Read CNA's brochures:
• Member benefits
• Training programme

Learn more about CNA's upcoming events:
calypsonet.org/events

Visit the CNA newsroom:
calypsonet.org/newsroom

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**Newsletter:**
Subscribe to the CNA newsletter via the contact form