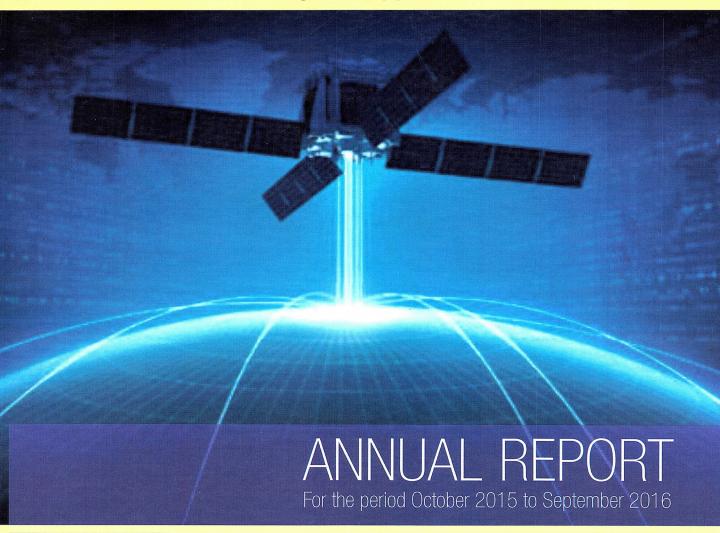


NATIONAL TELECOMMUNICATIONS REGULATORY COMMISSION SAINT LUCIA



September 15, 2017

Rajana Group of Companies Bldg. Bois D'Orange Gros Islet P. O. Box GM 690 Castries, Saint Lucia, West Indies

Tel: (758) 458 2035 Fax: (758) 453 2558 Email:ntrc_slu@candw.lc/ ntrcsaintlucia@ntrcslu.lc Website: www.ntrc.lc

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Telecommunications Licence Fees Collected by the Government of Saint Lucia and ECTEL

ABBREVIATIONS AND ACRONYMS

Act Telecommunications Act, Saint Lucia, No. 27 of 2000

Commission Saint Lucia National Telecommunications Regulatory Commission

CTU Caribbean Telecommunications Union

ECTEL Eastern Caribbean Telecommunications Authority

ECTEL Member States Dominica, Saint Lucia, St. Vincent & the Grenadines, Grenada, St. Kitts & Nevis

ECTEL Treaty Treaty Establishing the Eastern Caribbean Telecommunications Authority

ITU International Telecommunications Union

Minister With responsibility for Telecommunications

MMS Mobile Monitoring Station

NTRCs National Telecommunications Regulatory Commissions in the ECTEL Member States

OECS Organisation of Eastern Caribbean States

TICT Telecommunications and Information Communications Technologies

Treaty Treaty Establishing the Eastern Caribbean Telecommunications Authority

USF Universal Service Fund

USFO Universal Service Fund Office

ENUM E-Numeration

ICT Information Communications Technologies

NANP North America Numbering Plan

HIPCAR Harmonisation of ICT Policies Legislation and Regulation Procedures in the Caribbean

DRR Disaster Risk Reduction

BAC Budget Advisory Committee

CARIBNOG Caribbean Network Operators Group

VOIP Voice Over Internet Protocol

SLASPA Saint Lucia Air and Sea Port Authority

GOSL Government of Saint Lucia
FM Frequency Modulation
FRS Family Radio Service

HSPA HSPA+, or Evolved High-Speed Packet Access
IMT International Mobile Telecommunications

LMR Land Mobile Radio
LTE Long-Term Evolution

SLARC Saint Lucia Amateur Radio Club.

SMS4DC Spectrum Management Software 4 Developing Countries.

TU Technical Unit (NTRC)

UMTS The Universal Mobile Telecommunications System

EXECUTIVE SUMMARY

The operating year October 1, 2015- September 30, 2016 proved to be another year in which the Commission was required to address some substantial tasks in executing its mandate. Notwithstanding the significance of these tasks, it was also proven that they were not insurmountable.

Over its last year of operation, the Commission addressed matters relating to the acquisition/integration of the parent companies of local telecommunications operators and the correlated impact on the market in Saint Lucia and in particular on consumers, and the advent of aerial device operations in the air space of Saint Lucia. The Commission also continued work on its Remuneration and Post Classification Guidelines and Broadband Guidelines. The Universal Service Fund Projects implemented in this period were of national reach and significance with the provision of services and access devices to institutions for differently abled individuals and orphans, libraries and community access centres throughout Saint Lucia. We also continue to engage in public awareness activities, and enforcement activities such as fee collection and monitoring of service providers' operations, inclusive of broadband and voice services.

The following sections of this Report provides further information on the Commission's accomplishments for the 2015-2016 period of operation.

1 NATIONAL TELECOMMUNICATIONS REGULATORY COMMISSION

1.1 Constitution of the Commission for 2015/2016

The Commissioners of the National Telecommunications Regulatory Commission as of September 30, 2016, were:

Mr. Gerry George

Mr. Fred Alvin Malaykhan

Mr. Jason Edgar Mr. Effrem Edgar

1.2 THE SECRETARIAT

ORGANISATIONAL CHART

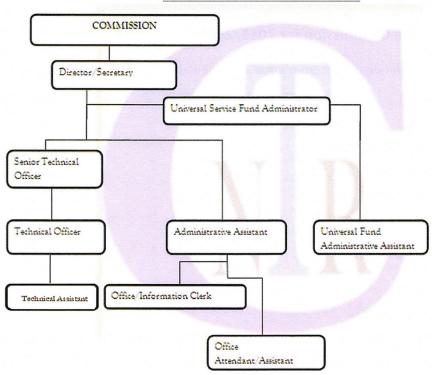


Figure 1.2.1: Organisational Structure for the National Telecommunications Regulatory Commission

1.3 APPOINTMENTS

1.3.1 Position of Universal Service Fund Administrative Assistant

Ms. Natoya Cassius was appointed as the Commission's Universal Service Fund Administrative Assistant and commenced her contract on October 1, 2015.

1.3.2 Position of Office/Information Clerk

Mrs. Wilma Burton-Samuel was appointed as the Commission's Office/Information Clerk and commenced her contract on November 16, 2015.

1.3.3 Position of Technical Assistant

Mr. Bronte Bess was appointed as the Commission's Technical Assistant on a full contractual term and commenced his contract on December 16, 2015. Mr. Bess' previous appointments were on a short-term basis.

2.1

DIARY OF KEY EVENTS

A Diary of Key Events during the period October 2015 to September 2016 has been presented below, however below is a summary of the most significant events.

2.2 TRAINING & PROFESSIONAL DEVELOPMENT

Financial Year October 2015/September 2016

r mancial real October 2013/3eptember 2010		т	
COURSE/ MEETING TITLE	PLACE	DATE	ATTENDEES
Strategic Broadband Infrastructure for Development for the Americas	Brazil	25-30 October, 2015	Senior Technical Officer, Alden St. Clair
Accessible Americas 11 Information and Communication for All	Mexico	28-30 November, 2015	Universal Service Fund Administrator, Sandra Jones
Public Procurement Law: Major Procurement Projects	Barbados	1-2 December, 2015	Universal Service Fund Administrator, Sandra Jones and Director/Secretary, Shana Willie-Matoorah
Telecommunications & Media Forum	Miami	23-25 May, 2016	Commissioner Gerry George and Director/ Secretary, Shana Willie-Matoorah
Reschedule of Capacity Building Exercise – Number Portability – Best Practices and Lessons Learned	Grenada	1 July, 2016	Senior Technical Officer, Alden St. Clair
ITU/CTU Regional Radiocommunications Seminar	Trinidad & Tobago	18-22, July 2016	Technical Officer, Shaun Julien
CANTO 32nd Annual Conference & Trade Exhibition	Puerto Rico	31 July – August 5, 2016	Commissioner Gerry George
Antitrust Economics Workshop	New York	21-23 September, 2016	Commissioner Gerry George and Director/ Secretary, Shana Willie-Matoorah

3 FINANCIAL REVIEW

In this chapter, the Financial Reports for the National Telecommunications Regulatory Commission, for the period October 1st, 2015 to September 30th, 2016, are presented. The discussion is supported by the Auditor's Financial Report, which is included as Appendix A.

3.1 SUMMARY OF INCOME INFLOWS AND USAGE

For the period October 1st, 2015 to September 30th, 2016, ECTEL disbursed EC\$ 904,654.00 to meet the Commission's operating budget.

3.2 FINANCIAL AUDIT REPORT

The Financial Audit Report was prepared by an independent auditor, Mario Lendor.

In the main, the Commission's audited report revealed that its financial statement and cash flow for the period October 1st, 2015 to September 30th, 2016 was presented and was in keeping with the International Financial Reporting Standards.

4 TELECOMMUNICATIONS LICENCE/FREQUENCY AUTHORISATION

4.1 TELECOMMUNICATIONS LICENCE/FREQUENCY AUTHORISATION UPDATE

Pursuant to s.14 (7) of the Act, the Commission prepared for publication in the Saint Lucia Government Gazette a list of the Telecommunications Licences that have been Issued, Modified, Renewed or Revoked in Saint Lucia, as of September 30th, 2016. The list is included herein. (See Section 4.2).

The table below specifies the following:

- i. The number of licence applications that the Commission received or the period under review;
- ii. The number of those applications for which positive recommendations were submitted to the Minister; and iii. The number of licences that the Commission has on record as having been issued by the Minister within the stated year.

Table 4.1: Status of Telecommunications Licence Applications Received and Processed through the Commission for the period October 2015 to September 2016

	October 2015 to September 2016
No. of Licence Applications Received by the Commission	79
No. of Applications Closed with Positive Recommendations	75
No. of Licences Granted by the Minister	32

The Issuance of Licences and Frequency Authorisations pursuant to sub-section 13 (7)(a) of the Telecommunications Act, No. 27 of 2000, 2008 Revision and in keeping with its records, the National Telecommunications Regulatory Commission hereby lists the telecommunications licences that have been issued, modified, renewed or revoked in Saint Lucia by the Minister, as at September 30, 2016. Please view Appendix D.

For the period October 2015 to September 2016, the following amounts in telecommunications fees were collected by the Government of Saint Lucia and by ECTEL in Saint Lucia.

5.0 TELECOMMUNICATIONS FEES

Licence Fees (GOSL)	EC\$ 11,887,790.29	
Spectrum Fees (ECTEL)	EC\$ 2,650,066.16	
TOTAL	EC\$ 14,537,856.45	

5.1 Telecommunications Licence Fees

The telecommunications licence fees collected by the Inland Revenue Department (IRD) on behalf of the Government of Saint Lucia for 2015/2016 as indicated above.

5.2 Frequency Authorisation (Spectrum) Fees

The Commission remains reliant on spectrum fees for its day-to-day operations. In a continued effort to fulfil its enforcement mandate through revenue collection, the Commission partnered with ECTEL to meet with delinquent providers to discuss the implications of their non-payment of fees and to obtain commitments from them to honour their debts. Some payments were received but they were not significant enough to be recorded as a success. The Commission will continue to intensify its collection efforts during the year 2016/2017.

PROVIDERS SPECTRUM FEES PAYMENT FOR 2015/2016

OUTSTANDING SPECTRUM FEES FOR 2015/2016

PROVIDERS	AMOUNT DUE
All Biz	4,250.00
Adolphus Adolphus Francis & Manley Richard	2,000.00
Almus Mc Dowall	4,500.00
ARINC Incorporated	4,000.00
BDSL Limited (Smugglers Cove)	200.00
C&W C'bean Cellular (SLU) Ltd.	11,000.00
Cable & Wireless (WI) Ltd - SLU	244,200.00
Cable & Wireless (WI) Ltd - SLU	240,000.00
Cable & Wireless (WI) Ltd - SLU	88,000.00
Digicel (St. Lucia) Ltd.	200,000.00
Digicel (St. Lucia) Ltd.	240,000.00
Digicel (St. Lucia) Ltd.	547,000.00
Dystreek Inc	4,500.00
AEP & Sons	200.00
Globecast Africa - SLU	12,000.00
Green Dot	18,000.00
Green Dot	101,000.00
Harrris Customs Brokerage	200.00
HOT FM Inc.	5,000.00
Helen Television System Ltd.	72,500.00
Helen Television System Ltd.	19,000.00
Helen Television System Ltd.	30,000.00
Hit Radio	6,600.00
Hitz FM	4,400.00
Hot FM Communications	4,500.00
Indigo	15,000.00
Island Broadcasting, Advertising Ser.	4,500.00
IMG Media Ltd	2,000.00
Jalousie Plantation (Sugar Beach)	1,600.00
Kwency Griffith (Vibe Radio)	04,400.00

Nature Island Communications	6,200.00
NEMO	4,200.00
Landings Resort	400.00
Liberty FM (92.3)	2,000.00
John Poleon (Love FM)	4,250.00
Mediazone Productions Inc.	3,500.00
MIX Broadcasting Co.	4,500.00
PATWA	396,000.00
Pentecostal Assemblies of the W. Indies	4,250.00
RASCO Ltd	200.00
Ronin Guardian Agency Services	200.00
Rhythm FM Inc.	5,000.00
Rubis West Indies Ltd.	200.00
Secure St. Lucia	200.00
Solar Energy Services Company	200.00
Soufriere Development Foundation	2,200.00
Southern Broadcast Services	2,200.00
Southern Taxi Association	400.00
Splash Island Water Park	400.00
St. Lucia Air & Sea Port Authority	4,800.00
St. Lucia Helicopters	200.00
St. Lucia Electricity Services Ltd	5,200.00
St. Lucia Distillers	200.00
Stompid Electronics	2,000.00
Sunrod Property Inc	1,000.00
Ten Sports	600.00
The Wave - Gem Radio	8,750.00
UNO Broadcasting	4,000.00
Upsurge	4,250.00
Valerie Octave	2,250.00
Viking Trading Ltd	200.00
West Indies Cricket Board	12,000.00
Windjammer Landing	600.00
Wireless Ventures (SLU) Ltd.	518,000.00
TOTAL	2,891,100.00

The Commission continues to carry out its mandate by sending letters and invoices to all Providers, especially delinquent Providers. The Commission and ECTEL also continue to make recommendations for the revocation of licences to the Minister with responsibility for Telecommunications in the instances where Providers fail to comply with the numerous requests made for them to meet their fee payment obligations. As a result of our enforcement initiative, the Commission has noted that Providers have made payments towards their outstanding fees or have begun entering into arrangements to make payments by instalments. The Commission anticipates that payments will be continued in the period 2015/2016.

6.1 Acquisition/Integration of Columbus International Inc. by Cable & Wireless Communications PLC.

During the reporting period of October 1, 2015 to September 30, 2016, considerable effort was expended in addressing the matter involving the acquisition/integration of Columbus Communications by CWC. One of the major impediments to handling this matter was the lack of legislation to provide adequately for acquisitions/integrations, mergers or competition matters. This was indicated in the Commission's previous Annual Report 2014/15. In the latter Report, the Commission's action on this matter, which included submitting a recommendation to the Minister with responsibility for Telecommunications, was addressed extensively. In the current reporting period, 2015/16, the Commission continued its efforts by teaming up with other relevant agencies, such as ECTEL, notwithstanding the obvious lack of legal provisions.

In that regard, the Regulatory Machinery decided to formulate a Merger Agreement to direct the behaviour of Cable & Wireless and Columbus during and post-integration. The parties to the proposed Agreement were:

TELECOMMUNICATIONS AUTHORITY AND GOVERNMENT

Eastern Caribbean Telecommunications Authority (ECTEL); Government of Grenada; Government of St. Vincent & the Grenadines; and Government of Saint Lucia.

TELECOMMUNICATIONS PROVIDERS

Columbus Communications (St. Lucia) Ltd. trading as FLOW;
Cable & Wireless (St. Lucia) Ltd. trading as LIME;
Columbus Communications (St. Vincent & the Grenadines) Ltd., trading as FLOW;
Cable & Wireless (St. Vincent & the Grenadines) Ltd. trading as LIME;
Columbus Communications (Grenada) Ltd. trading as FLOW; and
Cable & Wireless (Grenada) Ltd. trading as LIME.

The main regulatory matters addressed in the proposed Merger Agreement included:

Price for entry level Broadband;

Net Neutrality;

Open Access and Infrastructure sharing;

Release of Duplicate Pole Attachments;

Services:

Fixed and Mobile Number Portability:

Confidentiality:

Protection of Third Parties;

Wholesale obligations:

Dominance; and

Reference Offers for Wholesale Access.

In correspondence dated March 8, 2016, the Commission was informed by ECTEL that negotiations to finalise the proposed Merger Agreement were unsuccessful. According to ECTEL, the provisions which created the impasse are as follows:

"Price for entry Level Broadband.

The calculation of the rate for the entry-level broadband plan. The method proposed by LIME/FLOW did not comply with international standards and would not result in affordable prices for consumers;

Net Neutrality.

Net neutrality including the requirement in the definition that LIME/FLOW should not "charge differentially";

Over the Top services (OTTs).

In relation to Over the Top services (OTTs) and the blocking of content, the LIME/FLOW negotiators sought power to block "illegal content". The Telecommunications Act makes provision for the blocking of content which appears dangerous to national security, public order or decency or which in the opinion of the receiving person, the message contains elements that constitute an offence. The Directorate was of the view that no further authority should be given than that contained in the legislation to block content. The concern of the Directorate is that operators would use this to block "OTTs", which is outside the spirit of the Act;

Release of duplicate attachments/lines on poles.

LIME/FLOW stressed the need for three (3) years to release duplicate pole attachments. The Directorate requested a schedule for the release of duplicate pole attachments to ascertain why 3 years was needed, as the Directorate had proposed 18 months. The request for 3 years by LIME/FLOW could therefore not be granted as the information requested to justify the request has not been supplied.

LIME/FLOW insisted that Subscriber Television should not be included in the Agreement as a service to which telecommunications rules of sharing should be applied. Neither would LIME/FLOW agree to dominance as a provider of such a service, as this represents the Directorate delving into content which it does not regulate. The Directorate has sought to clarify that it is regulating the transmission of content and not the content itself and has therefore insisted on the inclusion of Subscriber Television into the Agreement."

At the time of penning this Report, the requisite legislation for guiding acquisition/integration/mergers or competition matters was not promulgated nor was there the commencement of any other process concerning this matter.

In the absence of legislation and other resources, the Commission decided to continue its efforts. In that vein, the Commission engaged in training initiatives and partnered with relevant agencies to address this matter.

6.2 CONSUMER MATTERS

Subsequent to the announcement of the acquisition of Columbus Communications by CWC and the changes made by their local subsidiaries, Columbus Communications (St. Lucia) Ltd and Cable & Wireless (St. Lucia) Ltd., the Commission noted that there had been a proliferation of complaints about telecommunications services provided by the aforementioned service providers.

Recognising that this is indeed a grave issue and notwithstanding its limited legal powers, the Commission agreed to take the following action:

Meet the NCA and the Ministry of Consumer Affairs to join forces to address the above-mentioned matter;

Inform Members of the public on the recourse available as prescribed by the Telecommunications (Dispute Resolution) Regulations 2008. Notices will be placed in print media – particularly in widely circulated local newspapers;

Continue its monitoring of telecommunications services through software testing, analysing spectrum operations and engaging consumers; and

Address telecommunications service providers on the matter.

The Commission will continue to focus on consumer matters in upcoming periods.

6.3 Acquisition of Cable & Wireless Communications (CWC) by Liberty Global Plc. (Liberty Global)

During the period that the Commission was addressing the acquisition/integration of Columbus Communications by CWC and the possible merger of the local subsidiaries, Cable & Wireless (St. Lucia) Ltd. and Columbus Communications (St. Lucia) Ltd. in Saint Lucia, the Commission received notification of the proposed acquisition of CWC by Liberty Global Plc (Liberty Global).

This statement was made in written correspondence signed by the former Chief Executive Officer of CWC, Mr. Phil Bentley. In the said communique, Mr. Bentley provided information on Liberty Global, the premise on which CWC agreed to the acquisition and the distinction between the current transaction and that related to Columbus. An excerpt from CWC's notification is herein below documented,

"Liberty Global is the world's largest international cable television company, with nearly 27 million customers receiving over 57 million distinct services and generating approximately \$18 billion of annual revenues. Liberty Global offers a wide range of advanced broadband Internet, voice, and video services to its customers, including B2B services, as we also do. Enclosed is a fact sheet about Liberty Global, and further information can be found at http://www.libertyglobal.com/.

By joining forces at this time, we combine our high growth assets in the Caribbean and Latin America, with the

scale and complementary skills of a truly World Class global player, materially improving our ability to offer leading products and services to our customers in the region we serve.

Unlike the Columbus transaction, there is no overlap in any of the markets we serve, but we do share the same philosophy of investment in superior networks, leading technology, unrivalled content, and offering great products and service for all our customers."

In relation to this matter, ECTEL requested Expressions of Interest for the conduct of a consultancy on the legislative frame-work for competition matters, and consideration of the most recent acquisition of CWC by Liberty Global.

The Commission agreed with ECTEL's proposed actions and was prepared to provide full support, particularly in light of the Commission's numerous requests for analysis of the telecommunications sector in Saint Lucia. The sector has seen much change with the acquisitions/integrations which took place from 2005 with the acquisition of Cingular Wireless, and more recently, Antilles Crossing by Columbus in 2012, Karib Cable by Columbus in 2013, Columbus by CWC in 2014, and CWC by Liberty Global in 2016. By corollary, the legal framework must be adequate and the regulatory machinery must be equipped to address this matter effectively.

At the time of penning this report, the Commission had not received an update on this matter from ECTEL as it relates to the consultancy work for which expressions of interest were requested.

6.4. Cable &Wireless (St. Lucia) Ltd.'s rebranding as "FLOW"

In correspondence dated April 1, 2016 the Commission was informed of Cable & Wireless (St. Lucia) Ltd.'s (C&W) intention to launch its new operating brands. C&W's correspondence, which was signed by its former Country Manager, Ms. Geraldine Pitt, indicated that the provider will be operating with a two-tiered brand structure, with business operations being branded "C&W Business" and the customer (retail) operations to be branded "FLOW".

The Commission requested and received ECTEL's recommendation on C&W (St. Lucia) Ltd.'s notification of rebranding as "FLOW". In the main, ECTEL in its cover letter advised that the Commission considered the designation of joint dominance in relation to C&W (St. Lucia) Ltd. and Columbus Communications (St. Lucia) Ltd. in fixed voice and domestic private leased circuits telecommunications services. ECTEL's premise for its recommendation was based on the view that the providers "enjoy a position of economic strength affording them the power to behave to an appreciable extent independently of competitors and customers."

Further, the Commission was advised that a request for consent to the dominance designation should be sent out solely to Columbus, as C&W has already accepted regulation in relation to the aforementioned services.

ECTEL's recommendation also included a template of the letter to be transmitted to Columbus with a "consent" form. Upon review of the attachment, the Commission noted that "fixed broadband" was also included in the services that Columbus is deemed dominant; however, ECTEL excluded this reference in its cover letter. Also

noteworthy is the fact that C&W has not been declared dominant in the said relevant market.

It was also noted that ECTEL's recommendation did not include the mechanism for regulation should the provider accept the designation of dominance; nor was there an indication of the course of action to be taken should the provider not accept the designation.

Noticeably absent from ECTEL's recommendation was advice on the divestment of infrastructure, spectrum allocation, technical matters relating to the Subscriber TV Services and specific quality of service obligations in view of the proliferation of complaints/issues on the poor service currently provided.

Based on the foregoing, the Commission sought clarification from ECTEL. Upon receipt of a satisfactory explanation, the Commission adopted ECTEL's recommendation in part and approached C&W and Columbus as it relates to obtaining their consent for joint dominance.

Subsequent to its dialogue with ECTEL, the Commission obtained expert assistance in developing an effective strategy in dealing with the subject providers; their behaviours & operations under the integrated brand, FLOW. Mr. C. Monson, a Consulting Economist, was contacted in that regard.

Mr. Monson provided some guidance on the information that should be requested from the providers to determine its status under the integrated brand. The providers were engaged and submitted general information on its newly branded operations.

The Commission also took action by conducting a search in the Companies Registry of Saint Lucia to confirm the legal status of the providers, in which it was confirmed that the providers remained separate legal entities.

With these developments in the sector, the Commission once again made a call for the conduct of the appropriate analysis of the market to determine the need for regulation, the level and type of regulation.

6.5. REGULATION OF MOBILE SERVICES

As mentioned in the preceding section of this Report, the Commission has made several requests for the conduct of market analysis.

With the implementation of PCP in previous years, certain services of the incumbent C&W had been regulated. However, with the evolution of the telecommunications market, particularly in the mobile services market, the conduct of a market study or analysis to determine whether or not the said market should be regulated has been deemed necessary by the Commission. One of the main indicators is the price increases over the years by mobile services providers.

Notwithstanding limited financial resources, the Commission engaged Mr. C. Monson and the CTU to obtain their services in that regard. Prior to approaching external parties, the Commission had made requests to ECTEL, as the technical repository established to serve the Commission for the conduct of these services.

The proposals of Mr. Monson and CTU were sent to ECTEL for consideration, a response has not been received at the time of penning this report

6.6. AERIAL DEVICES

With the technological phenomenon of aerial devices, such as drones, the Commission was faced with a new matter to be studied with the objective of making a determination on whether or not some level of regulation was required.

The Commission decided that a multi stakeholder approach was most prudent in view of the capability/function of these devices. The Commission deemed it imperative to meet with the relevant agencies to decide on the formulation of policy/guidelines to manage the use of these devices as it relates to the issues of national security and privacy of individuals.

The relevant agencies that the Commission proposed to consult included SLASPA, ECCAA, Ministry of Finance – Customs Department, the Royal Saint Lucia Police Force and the Bordelais Correctional Facility. It was proposed that the consultative team consider the development of an "entry level" policy/guidelines which may encompass a registration process at port of entry, specified fly zones, and specified uses, among other matters.

Shortly prior to the Commission convening its consultation on this matter, it was communicated that the Ministry of Home Affairs had taken the lead on the matter in collaboration with ECCAA. Based on the information received from a representative of the said Ministry, the Commission cancelled its meeting and decided to participate in the meeting to be conducted under the direction of the Ministry.

The Commission also conducted research in this matter. The paper formulated by its TU is attached in Appendix E.

At the time of penning this report, the Commission did not receive any further information or received an invitation to attend a meeting on this matter.

6.7 SERVICE/RESOURCE APPLICATIONS FROM PROVIDERS

6.7 Service/Resource Applications from Providers

PROVIDERS	SERVICES
Cable & Wireless (LIME)	Regulatory approval for USSD and IVR Shortcodes for FLOW LEND Service, Launch of New LIME Local Talk 100 Prepaid Plan, Launch of Free After 4 Promotion, Launch of Deezer Premium Music Apps, and LIME's Broadband Promotion.

As Produced by Eastern Caribbean Telecommunications Authority

Selected Telecommunications Indicators

44 SAINT LUCIA 2016 2012 2013 2014 2015 \$263 \$247 \$238 \$223 \$233 Provider Revenue (EC\$M) Investment (EC\$M) \$29 \$23 \$49 \$30 \$28 311 354 **Employment** 506 425 361 21% 20% 19% 20% 21% Fixed line penetration 129% 125% 110% 109% 95% Mobile penetration 16.5% 16.5% 13.1% 14.6% 16.0% Fixed broadband penetration 36.0% Mobile broadband penetration 0.0% 8.1% 37.1% Local fixed traffic (million minutes) 147 143 137 135 131 142 Local mobile traffic (million minutes) 241 217 170 150 International incoming traffic (million 43 36 30 35 9 minutes) International outgoing traffic (million 19 25 24 25 25



Source: ECTEL/operators

minutes)

7. 2015/2016 WORK PROGRAMME

In the current reporting period 2015/16, the Commission continued to focus on strategic reform and capacity strengthening to administer effective regulation in the areas where outright reform is not necessary. In that vein, the Commission formulated some Guidelines and worked on some matters related to the mergers/acquisitions as documented in the earlier part of this Report. In the sections below, the Commission's technical operations and work with regards to its Universal Service Mandate are addressed in more detail.

8.1 INTRODUCTION

The Technical Unit (TU) of the National Telecommunications Regulatory Commission (NTRC) is charged with assisting the Commission in executing its duties set out in the Telecommunications Act No.27 of 2000. Fulfilling these tasks requires an approach that effectively accomplishes all goals mandated by the Commission to the TU. The staff of the TU had the privilege of attending training sessions, working groups, seminars and workshops. Attendance at these sessions has equipped the unit to effectively accomplish its goals. This document is designed to help the reader understand the role of the TU and how the unit has or intends to accomplish its mandate. A glossary of technical terms has been included to help the reader to better understand certain terminologies in the document.

8.2 TRAINING AND PROFESSIONAL DEVELOPMENT

Below are sessions the TU attended during the course of 2015/2016.

Maths Drives Careers

Mr. Alden St Clair (STO) was invited to Mon Du Don Primary School on the November 19, 2015 to speak to students on how Math encouraged his career. The STO spoke on the following topics:

How mathematics is used in execution of work duties;

The importance of Mathematics in acquiring a job; and

Gave words of encouragement to students in relation to their academic studies.

Regulation of Subsea Fiber, Principles of Open and Retail Access and Quality of Service.

The TU attended this workshop held from October 19-21, 2015. The workshop discussed several topics and an assessment done by a Consultant during the period September 28-30, 2015. Satellite Communications Workshop

Mr. Shaun Julien attended this workshop held in Trinidad from the September 14-18, 2015.

The workshop targeted practising engineers and information technologists as well as managers and employees from regulators, government institutions, and telecommunication companies who are interested in acquiring a technical understanding of satellite systems and detailed knowledge of current systems design. The workshop provided participants with an in-depth understanding of satellite systems and protocols as well as a comprehensive introduction to VSAT concepts, satellite communications systems, technologies and protocols, and allowed participants to understand and assess VSAT systems for deployment into corporate wide area network solutions. It covered a wide range of issues relating to satellite communications, and regulatory issues, including the role of the regional and international satellite communications organisations, and examined issues to be addressed at this year's World Radiocommunication Conference.

Strategic Broadband Infrastructure for Development for the Americas

This workshop was attended by Mr. Alden St Clair (STO) in Sao Paulo Brazil from October 26 – 29, 2015. The workshop discussed Conformance and Interoperability (C&I), competition, quality of telecommunications services and e-applications.

Cross Border Interference Meeting

Mr. Alden St. Clair attended this meeting in Antigua from June 13-14, 2016.

The meeting was attended by the Agence Nationale Des Fréquences (ANFR), Ministry responsible for ICT/ Telecommunications within the government of Antigua and Barbuda, ECTEL, the NTRCs and the mobile telecommunications providers operating in the respective ECTEL Member States. Participants discussed and agreed on a framework for cross border radio frequency coordination agreement.

National Workshop on Maritime Transport Policy

Mr. Alden St Clair attended this workshop from June 22-24, 2016.

This workshop was sponsored by SLASPA. This workshop was aimed at having attendees understand the relationship between the ocean and the economic benefit that can be derived. Several regulations of countries were examined and the role IMO and its influence on the maritime industry. The balance between regulations and the economic benefit was also discussed. SLASPA is currently working on a Maritime Transport Policy.

Maritime/Sport Fishers meeting

Mr. Alden St Clair (STO) and Joanita Alexander (AA) attended this meeting on May 30, 2016.

The Sport fishers requested a meeting so as to explain the regulation and procedures on the application for use of VHF radios and the prescribed licensing conditions. The NTRC team also presented a 5-10-minute presentation followed by questions from the audience.

8.3 MILESTONES ACHIEVED/ONGOING

Monitoring Exercises

Overview

The TU has developed a strategy of weekly monitoring of the radio frequency spectrum. This involves the monitoring of all applicants in class and individual licences who use radio frequency to provide a service and/or for communication within the company/entity. This exercise has proven to be successful in updating the TU database and identifying illegal users of the spectrum.

Summary of weekly monitoring

The TU focused heavily on the FM frequency band which was set out in the Enforcement Drive implemented by the Commission at the commencement of the periods 2014, and 2015 into 2016. The TU conducted island

wide monitoring¹, visiting districts and the two main areas/towers (the Morne and Moule-a-Chique (Annex 1) consisting of sixty percent (60%) of the island's FM broadcasters (Annex 2)). This exercise was conducted to verify that assigned frequency was being utilised in keeping with the Technical Broadcast Standards and to detect any illegal broadcasters. While implementing this drive, the TU noticed the erection of towers by broadcasters without any notification to the Commission.

INTERFERENCE ISSUES 2015/2016

With reference to the 2013 and 2014 Annual Report, the document which was forwarded to the ITU via ECTEL concerning interference issues between St. Lucia and Martinique has not been resolved. The Commission is awaiting a response from the said entity.

The Commission received almost no complaints as compared to 2014 from the airports concerning interference from local FM broadcasters. This is due to positive efforts exercised by the parties involved (SLASPA, NTRC and FM broadcasters) to minimise interference issues. The Commission is continually working with all stakeholders to keep interference at a minimum.

ENFORCEMENT 2015/2016

The Secretariat is continuing its enforcement drive to which the TU has contributed by delivering letters to companies/individuals who use licensed telecommunications services without a valid licence. The TU approach is a two (2) step process; the first letter is an enforcement letter (Annex 3), informing the company/individual of the need to comply, if there is no redress from the said company/individual, a second letter (Annex 4) is sent informing the latter of their breeching of the law and the actions that are to be taken against them. To date the TU has electronically delivered letters to all operators and users who require a licence. To date, several persons have complied and submitted the respective licenses for the services to which they provide/ utilise. It should be noted that several operators/users have been exempted from being licensed by an order promulgated on June 10, 2014.

2016

Although several delinquent licensees renewed their licences, a few have not shown any interest in doing so. Therefore, the TU took the initiative and hand delivered letters informing the licensees of the urgency in renewing. This is still ongoing.

With the addition of the Technical Assistant (TA), the Commission enforced a rigorous sifting of all amateur radio operators, land mobile radio operators and family radio operators on island. Letters (Annex 5, 6 and 7) were forwarded to all operators/users. Pertaining to amateur operators, the effort was assisted by local licensed

Utilizing the Anritsu handheld analyzer to track/measure the behavior of assigned frequencies, used by FM broadcasters. This exercise would also detect illegal users of the spectrum.

amateur operators who encouraged delinquent operators to become licensed. The endeavor was productive as several operators/users applied for renewal. This is ongoing.

CONDUCTING TESTS OF OVER THE TOP SERVICES (OTT)

2015

Since the advent of OTT services Telecommunications providers have been resorting to bandwidth throttling or even blocking these services from customers (however being denied by the same providers). The Commission however is of the view and supported by the Act, that customers are entitled to these services and should not be hindered by providers. Therefore, the TU began conducting initial tests of major OTT services (i.e. WhatsApp, Viber, and IMO) over a period of 2 months.

2016

A report (Annex 8) was produced by the TU, proving that the providers were in fact blocking the services. To date the blocking/throttling of the services have ceased. Continuous monitoring of the services is ongoing.

MY PC CONNECTION

The Commission has embarked on the monitoring of broadband services (focusing on customer premises). Currently the software My Connection PC has been sourced to assist with this venture. The purpose of this is to monitor the quality of service a customer receives at the premises, then place this data in a report to be forwarded to the provider. This endeavor will assist not only the Commission in understanding the current climate of the island's broadband, but will also help the provider know the actual environment of customers.

UPDATE OF FM BROADCASTERS

With the increasing number of FM broadcasters, the limited amount of available frequency used for this application is depleting considerably. Broadcasters are also inundated with interference from their counterparts and have at times abandoned assigned frequencies or relocated towers for better reception in order to reach their listeners/customers without informing the NTRC.

The TU, through its weekly monitoring, recognised this and has embarked on the task of updating its database. Letters were mailed (via email and hard copy) to broadcasters requesting all technical parameters (Annex 9) of their equipment used for broadcasting. This is still ongoing since some broadcasters have not yet sent in a response.

3.6 Integrated Spectrum Monitoring and Management System (ISMMS)

ECTEL along with the NTRCs has embarked on project, procuring a system that will monitor and manage the spectrum. This includes the installation of fixed station across the islands. This system is also a management system that will aid in spectrum assignment, billing/invoicing of spectrum and submission of applications. Procurement of the system is ongoing and will be commissioned very soon.

8.4 RECOGNISED TRENDS

The TU has recognised a growth in the applications being submitted to the NTRC and the trend emanating is that providers are technologically up to date. This growth is very much welcomed, but to providers using the spectrum, assignment as mentioned in various areas in this section, needs to be managed effectively and efficiently. The different classes which experienced growth are as follows:

INDIVIDUAL LICENCE:

New applications were not received, only renewals were submitted. It should be noted that the services to be licensed in this category require extensive planning and financial support to be implemented. Therefore, applications will be very few.

CLASS LICENCE TYPE A:

Submission of this type of licence is almost nil and this value is contrary to the vast providers/users of these types of services. As mentioned earlier the TU has embarked on an enforcement drive. This enforcement is geared towards not only having persons to comply with the Telecommunications Act but also to create an awareness amongst the providers/users. As mentioned earlier certain providers/users are now exempt from acquiring a licence, however they are required to be registered with the NTRC.

CLASS LICENCE TYPE B:

LMR/FRS: There was a continued increase in applications for the Land Mobile Radio (LMR) Licence versus the Family Radio Licence (FRS) which was previously the preferred method of communication between companies in close proximity. As previously mentioned this ideology was realigned and persons were informed of the proper service to use according the use of the equipment to be utilised for communication. Also, with the updating of the Commission's database, delinquent licensees were requested to update their status with the Commission.

Maritime Radio: With the assistance of SLASPA, submission of this type of licence is steadily growing compared to last year. As mentioned earlier the TU has embarked on an enforcement drive. This enforcement is geared towards not only having persons to comply with the Telecommunications Act but also to create an awareness amongst maritime users.

Amateur Radio: This licence is mainly utilised as a hobby. Submission of this licence came from two groups: locals and visitors. Locals are realising the benefits of having an amateur radio licence particularly during disasters. Visitors who come on holiday utilise this communication as a hobby and praise the great reception/ communication they can achieve when communicating with other amateur radio operators worldwide. Also, with the assistance of licensed operators the Commission beckoned delinquent operators to renewal.

FREQUENCY AUTHORISATION:

Many providers - with the advent of fourth generation technology and Long Term Evolution (LTE) - are increasing their bandwidth, backbone links and increasing their bank of frequencies so as to satisfy their increasing customers and the demand of data from their customers. Applications for 3G, 4G and LTE have been submitted. The implementation of new technology is always welcomed but management of the spectrum needs to be enforced.

BROADCAST LICENCE:

Applications for this type of licence have lessened. The decrease may be a result of many factors, but the FM spectrum is depleting and needs to be managed efficiently and effectively. Also, the issues we currently experience with cross-border interference also increase when this resource depletes. Therefore, the TU is currently paying particular attention to this area and exercising a continuous monitoring effort so as to avert problems of interference.

GLOSSARY:

3G: 3G, short for third Generation, is the third generation of mobile telecommunications technology. This is based on a set of standards used for mobile devices and mobile telecommunications use services and networks that comply with the International Mobile Telecommunications-2000 (IMT-2000) specifications by the International Telecommunication Union. 3G finds application in wireless voice telephony, mobile Internet access, fixed wireless Internet access, video calls and mobile TV.

4G: 4G, short for fourth Generation, is the fourth generation of mobile telecommunications technology succeeding 3G. A 4G system, in addition to usual voice and other services of the 3G system, provides mobile ultrabroadband Internet access, for example to laptops with USB wireless modems, to smartphones, and to other mobile devices. Even though 4G is a successor technology of 3G, there can be signification issues on 3G network to upgrade to 4G as many of them were not built on forward compatibility. Conceivable applications include amended mobile web access, IP telephony, gaming services, high-definition mobile TV, video conferencing, 3D television, and cloud computing.

Amateur Radio: Amateur radio (also called ham radio) is the use of designated radio frequency spectra for purposes of private recreation, non-commercial exchange of messages, wireless experimentation, self-training, and emergency communication. The term "amateur" is used to specify persons interested in radio technique solely with a personal aim and without direct monetary or other similar reward, and to differentiate it from commercial broadcasting, public safety (such as police and fire), or professional two-way radio services (such as maritime, aviation, taxis, etc.).

ANFR: Agence Nationale Des Fréquences – French Radio Spectrum Assignment Authorities.

Bandwidth Throttling: It is a reactive measure employed in communication networks to regulate network traffic and minimize bandwidth congestion (for large companies that can afford to pay the ISP to take away service for local households and carry more bandwidth to them). Bandwidth throttling can occur at different locations on the network.

Commission: Same as NTRC.

CTU: Caribbean Telecommunications Union.

ECTEL: Eastern Caribbean Telecommunications Regulatory Authority.

FM: Frequency Modulation.

FRS: Family Radio Service.

HSPA: HSPA+, or Evolved High-Speed Packet Access, is a technical standard for wireless, broadband telecommunication. HSPA+ enhances the widely used WCDMA based 3G networks with higher speeds for the end user that are comparable to the newer LTE networks.

Interference: Interference is anything which alters, modifies, or disrupts a signal as it travels along a channel between a source and a receiver. The term typically refers to the addition of unwanted signals to a useful signal.

ITU: International Telecommunications Union.

LMR: Land Mobile Radio.

LTE:LTE, an acronym for Long-Term Evolution, commonly marketed as 4GLTE, is a standard for wireless communication of high-speed data for mobile phones and data terminals. It is based on the GSM/EDGE and UMTS/

HSPA network technologies, increasing the capacity and speed using a different radio interface together with core network improvements.

Maritime Mobile Radio: The Maritime Mobile Service is an internationally-allocated radio service providing for safety of life and property at sea and on inland waterways. It includes the Maritime Mobile Service, the Maritime Mobile-Satellite Service, the Port Operations Service, the Ship Movement Service, the Maritime Fixed Service, and the Maritime Radio determination Service.

NTRC: National Telecommunication Regulatory Commission.

OTT: Over-the-top content is a term used in broadcasting and technology business reporting to refer to audio, video, and other media transmitted via the Internet as a standalone product, that is, without an operator of

multiple cable or direct-broadcast satellite television systems (so-called multiple-system operators) controlling or distributing the content.

Radio Frequency: Radio frequency (RF) is a rate of oscillation in the range of around 3 kHz to 300 GHz, which corresponds to the frequency of radio waves, and the alternating currents which carry radio signals.

RF Filters: Radio frequency (RF) and microwave filters represent a class of electronic filter, designed to operate on signals in the megahertz to gigahertz frequency ranges (medium frequency to extremely high frequency). This frequency range is the range used by most broadcast radio, television, wireless communication (cellphones, Wi-Fi, etc.), and thus most RF and microwave devices will include some kind of filtering on the signals transmitted or received. Such filters are commonly used as building blocks for duplexers and diplexers to combine or separate multiple frequency bands.

SLASPA: Saint Lucia Air and Seaport Authority.

Spectrum Management: Spectrum management is the process of regulating the use of radio frequencies to promote efficient use and gain a net social benefit.

Subsea Fiber: A submarine communications cable is a cable laid on the sea bed between land-based stations to carry telecommunication signals across stretches of ocean. The first submarine communications cables, laid in the 1850s, carried telegraphy traffic. Subsequent generations of cables carried telephone traffic, then data communications traffic. Modern cables use optical fiber technology to carry digital data, which includes telephone, Internet and private data traffic.

TU: Technical Unit (NTRC).

UMTS: The Universal Mobile Telecommunications System (UMTS) is a third generation mobile cellular system for networks based on the GSM standard. Developed and maintained by the 3GPP (3rd Generation Partnership Project), UMTS is a component of the International Telecommunications Union IMT-2000 standard set and compares with the CDMA2000 standard set for networks based on the competing cdma One technology. UMTS uses wideband code division multiple access (W-CDMA) radio access technology to offer greater spectral efficiency and bandwidth to mobile network operators.

VSAT: Very Small Aperture Terminal is a satellite communications system that serves home and business users. A VSAT end user needs a box that interfaces between the user's computer and an outside antenna with a transceiver. The transceiver receives or sends a signal to a satellite transponder in the sky.

Wireless Broadband: Wireless broadband is technology that provides high-speed wireless Internet access or computer networking access over a wide area.

9. UNIVERSAL SERVICE FUND ANNUAL REPORT

October 2015 -September 2016

BACKGROUND

The Universal Service Fund (USF) was established under section 44 of the Telecommunications Act (27 of 2000) of Saint Lucia. Under the provision of the Act, the Fund is managed by the National Telecommunications Regulatory Commission (NTRC) through the office of the Universal Service Fund which collects, disburses and makes relevant decisions with regards to the prudent management of the Fund.

KEY ACTIVITIES OF THE UNIVERSAL SERVICE FUND OFFICE

9.1 TRAININGS/WORKSHOPS

Accessible Americas 11 information and Communication for All- The workshop was held in Medellin Colombia from November 4-6, 2015. The Universal Service Fund Administrator (USFA) attended this meeting. The meeting's highlight was the disabled, their right of inclusion in the use of modern communication technologies and the best practices and use of equipment and software to ensure inclusion for all.

- Public Procurement Law: Major Procurement Projects The workshop was held in Barbados on December 1 2, 2015. The Universal Service Fund Administrator (USFA) and the Director/Secretary (D/S) participated in this workshop. The aim of the NTRC/USFO participation was to further apprise ourselves of new procurement procedures pertinent to the USF operations.
- Project Monitoring and Evaluation training by CARCIP The workshop facilitated by the ministry of the Public Service, Information and Broadcasting was held in St Lucia on March 7 -15, 2016 - this workshop was attended by the USFA. The CARCIP project's objective is closely related to the mandate of the USFO. Monitoring and Evaluation is one of the USFO's main role therefore any training in this area would be an asset to the office.

9.2 USFO PLANS AND DOCUMENTS

The USFO included the following documents with possible edits for review by the Commission in September 2016:

- Module 2- Regulatory procedure- Internal procedures of the Universal Service Fund Office.
- Module 3- Fund Accounting and Financial Procedures Internal. procedures of the Universal Service Fund
 Office.
- Financial offer for contracts.
- Bid evaluation form.
- Application form for USF Proposals.

This became necessary to improve the USFO's functions and processes as we progress.

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9.3 USFO ACTIVITIES

- Public Awareness Campaign to be produced by Clair Solutions- Mrs. Stacy Mc. Vane was engaged to produce the campaign before the end of 2015. A draft was submitted by January 2016 of which further changes were discussed and addressed. Clair Solutions was further engaged to produce the rates to air short clips. After noting issues to be addressed in the production Clair Solutions indicated that they were unable to make the changes and keep seamless transition without the final product. The only alternative would be to create a short clip of each section. The decision to further select possible clips from the overall production was made following the July 2016 meeting.
- **Prospective project meeting-** The USFO met with Bordelais prison officials on March 2, 2016 to evaluate the needs of the prison in terms of their mandate to engage in learning. This intervention did not materialise as it was apparent that there was no appropriate space to house the equipment.
- International Girls in ICT Day- An ITU initiative held on April 28, 2016

 The USFO activity took the form of a panel discussion featuring the Upton Garden Girls Centre and the Centre for Adolescent Renewal and Education (C.A.R.E), mainly because of their similarity in programmes for girls. The Upton Garden Girls Centre for instance, engages in rehabilitation programmes such as, counseling, life and social skills training, character education and empowerment training, continued education, computer literacy skills and career guidance. Other neighbouring schools participating were Leon Hess Comprehensive Secondary School, St. Joseph's Convent Secondary School, Entrepot Secondary School and Bocage Government Combined Secondary School.
- Labeling/signage of the USF Projects Merchandising Plus was recruited to produce and install plaques for all of the USFO completed projects by July 2016. These included all libraries and community access centers under the NICTO Project, including the Holy Family Children's Home. The aim of this venture was to ensure the public was made aware of the improved services in these facilities compliments of the USFO.
- **St Lucia News Online** A write up was submitted to the producers in an effort to raise awareness among online users. The document outlined the Universal Service Fund mandate, the projects commissioned thus far, other initiatives of the Fund and the criteria for submitting project proposals.

9.4 USFO PROJECTS

The following proposals/projects have been implemented, approved by the Commission and commenced in the reporting year.

USF 01/13- To Provide Equipment and Related Services for Establishment of Internet Access at the Soufriere
Community Access Centre (Submitted by the National ICT Office of the Ministry of the Public Service,
Information and Broadcasting carried out by Cable and Wireless (St. Lucia) Ltd.) Following the signing off
and approval of deliverables of this project, the USFO conducted various monitoring exercises at the center

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throughout the reporting year. Management of the facility also submitted as requested, project update reports to the USFO.

- 2. USF 02/13- Installation of payphones in rural communities and public institutions (Submitted and carried out by Digicel (St. Lucia) Ltd.) Subsequent to the installation of all payphones throughout the reporting year Digicel officials continued to submit status reports as requested. The payphones continued to serve the targeted areas very well as evidenced with the recorded usage and financial returns.
- 3. USFO SLU 003/14- Internet access web enabled training facility for Babonneau Library (Submitted by Babonneau community carried out by Cable and Wireless (St. Lucia) Ltd.) During the commencement of the second half of 2015, the Babonneau Library's report became due, numerous attempts was made by the USFO to retrieve this report from the Babonneau Management Council whose responsibility it was at the time. By March 2016, one of the original proposers of the project opted to assist by producing a report which was submitted to the USFO, the report indicated that all was well in terms of equipment usage and performance.

However, the report came following a forced shut down of the Access Points in that area at the end of January 2015. By this time as well the NTRC/USFO decided to transfer management responsibility to the Central Library which also indicated its willingness to do so through a letter of acceptance from the Director of Library Services in June 2016.

The USFO carried out a monitoring exercise by the end of the reporting period and concluded that there were no present issues at the facility and its environs.

- 4. USF SLU 004/14 -Supply of equipment and related services for the establishment of internet access at the Ciceron Secondary School (Submitted by Ciceron Secondary School carried out by Cable and Wireless (St. Lucia) Ltd.) During the reporting period the Ciceron Secondary School produced the necessary reporting for the project. The USFO also conducted the necessary site visits to the facility and the environs. There were a few reported faults in terms of dropping of connection through Access Points which was promptly dealt with via Cable and Wireless St. Lucia Ltd., the contracted Service Provider.
- 5. USF SLU 005/15 Supply and installation of broadband equipment and related services for the establishment of internet access at the libraries and community access centres throughout St. Lucia (Submitted by the National ICT Office of the Ministry of Public Service, Information and Broadcasting carried out by Cable and Wireless (St. Lucia) Ltd.)

The bidding aspect of this project concluded in October 2015. The winning bidders were LIME for internet connectivity, the contract between Cable and Wireless (St. Lucia) Ltd. and the NTRC was signed on December 24, 2015. B and B Money Savers was also contracted for the provision and installation of equipment and subsequently for networking tasks of the said project.

Kiosks were also procured for (10) ten libraries; they were completed and delivered as scheduled. The USFO conducted a verification site visit on March 4, 2016 to confirm that the libraries received them and that they

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were in acceptable condition. There were no pending issues as it regards the kiosks.

The period March to September 2016 was filled with meetings, site visits and the creation of deadlines between the contractors Cable and Wireless St. Lucia Ltd. and B and B Money Savers.

The parties were also required to produce numerous status reports as one party's work impacted on the other.

On July 12 and 14, 2016, the USFO together with the Commissioner conducted two (2) site visits with the contractors of the project (Cable and Wireless (St. Lucia) Ltd. and B and B Money Savers) to further clarify and finalise some existing issues at various sites/libraries.

Cable and Wireless (St. Lucia) Ltd. indicated that some of their final works are to be postponed until B and B Money Savers complete some networking issues. The project was expected to be completed by the end of August 2016 once all parties implement all agreed changes etc.

Additionally, another major concern expressed to the National ICT Office of the Ministry of Public Service, Information and Broadcasting on September 6, 2016, was the three (3) remaining libraries and access centre as mentioned below:

- Monchy Library security and repair;
- Micoud Community Access Centre- access to the building; and
- Anse- La- Raye Library accommodation for the desktops.
- 6. USF SLU 007/16 Supply and installation of broadband equipment and related services for the Sir Arthur Lewis Community College (SALCC)-Southern Campus St. Lucia (Submitted by SALCC carried out by Digicel (St. Lucia) Ltd.)

Subsequent to the submission of the original proposal by Sir Arthur Lewis Community College, a revised version was requested before submission for approval to the Commission.

This proposal took a very different format from the usual proposals which consisted of improved internet connectivity and completed ready to use equipment. This particular proposal consisted of parts to be assembled, as a learning and practice exercise for the students while being able to utilise the finished product in the various labs. This proposal ultimately raised a few questions as it regards responsibility for assembling and how the USFO will conduct monitoring of the computers once assembled.

In April 2016, SALCC submitted clarifications and quotations as it regards the computer parts for approval. The internet connectivity aspect of this project also took place simultaneously with the soliciting of quotes for the computer parts. In June 2016 a revised bid document for equipment and broadband was shared with bidders and relevant parties after confirmation with the Commission.

The bid evaluation was conducted on July 4, 2016. The contract was awarded to Digicel (St. Lucia) Ltd. However, a site visit was conducted by the USFO, NTRC Commissioner (Mr. Gerry George) and Digicel (St. Lucia) Ltd. on July 26, 2016 to confirm and finalise some components of the project at the project site in Vieux Fort, as noted at the evaluation stage. This was deemed necessary in order to finalise the contract.

Following the site visit a report was submitted by the Commissioner including all proposed changes to be made. The report was shared with Digicel St. Lucia Ltd. and a revised financial highlighting the proposed change was resubmitted by Digicel St. Lucia Ltd. The USFO at this point commenced the final draft contract for signage.

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7. USF SLU 006/16 -Improving Internet Access for the Differently Abled Throughout St. Lucia (Submitted by the Ministry of Education carried out by Cable and Wireless (St. Lucia) Ltd.) — At the beginning of the reporting period the verification of the Differently Abled proposal officially began, the Commission highlighted some items to be removed which did not fall into the USF mandate for funding. This was followed by a revised Checklist and Expanded Appraisal prepared for the attention of the Commission. A meeting was held on March 16, 2016 with Ministry of Education Officials, Special Education Unit and NTRC/USFO. A decision was made to eliminate the Special Education Units from the project as they were deemed mainly administrative. Following the meeting a revised checklist and expanded appraisal was produced.

On April 19, 2016- Draft bids were sent to the Director/Secretary NTRC for perusal for both aspects of the project: equipment and broadband.

April 25, 2016 - Tender notices were distributed to contributors, media, our website, NTRCs and ECTEL.

May 10, 2016 – Bid clarification- Differently Abled Project- decision to visit Dunnottar Special Ed., Soufriere Special Ed. and Lady Gordon Opportunity Centre to re-evaluate their broadband need.

May 20 & 23, 2016 – Site visits were conducted with prospective bidders as it regards broadband.

May 25 & 27, 2016 – Site visits were conducted with prospective bidders as it regards equipment.

May 31, 2016 – Site visit report with proposed adjustments to the bid documents presented to the Commission.

Subsequent to the bid evaluation, B&B Money Savers successfully emerged as the supplier of equipment. However, this was pending a decision among evaluators to consider their initial offer or amended offer as it regards the provision of tablets. It was decided that the initial offer would be considered and the contract was prepared accordingly and signed on September 9, 2016.

Cable & Wireless (St. Lucia) Ltd. was awarded the contract to carry out the broadband works at the various sites.

8. EDU/NET – Improving internet access for secondary schools throughout St. Lucia (Submitted by National ICT Office of the Ministry of Public Service, Information and Broadcasting) The NTRC/USFO awaited a confirmation of sites from the National ICT Office of the Ministry of Public Service, Information and Broadcasting (NICTO) since the beginning of the reporting period October 2015. This confirmation was not presented and on April 8th 2016, a letter of project approval and the NTRC plans to approach the project in a phased approach, was sent to the Permanent Secretary of the Ministry of the Public Service at the time and forwarded to NICTO. This letter was not acknowledged and was resubmitted on June 28, 2016. The USFA agreed to resume the project with NICTO at the earliest convenience of both parties. The project was expected to commence with the secondary schools.

A correspondence dated August 24, 2016 was received from the Ministry of Finance, Economic Growth, Job Creation, External Affairs and Public Service. The letter indicated the Ministry's support of a phased approach in implementing the project. The USFO at this time prepared to resume the site visits to the various Secondary Schools to evaluate the project proposal.

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9. USF SLU 008/16 -Supply and installation of broadband equipment and related services for the establishment of internet services at the Holy Family Children's Home (NTRC initiative carried out by St. Lucia ICT Association (SLICTA)- The Holy Family Children's Home project was submitted to the Commission on October 8, 2015 for approval. The Commission has decided that the list of items presented in order to provide connectivity to the home will be sourced locally after reviewing quotations.

The St. Lucia ICT Association (SLICTA) has also agreed to partner with the NTRC/USF on this initiative, equipment was funded by the NTRC/USFO and installations and maintenance was conducted by the Association. Quotes for material to carry out the work were requested locally. The USFO received a letter of commitment from the SLICTA and a commencement date to be determined by the USFO.

The SLICTA carried out installation works on the Holy Family Children's Home on April 2, 2016. The USFO has since requested quotations from the then major providers, Cable and Wireless St. Lucia Ltd., Digicel St. Lucia Ltd. and Columbus/ Flow to submit quotations for the cost of the improved DSL connection at 20 Megabits Down/ 5 Megabits Up.

The quotation from Columbus/ Flow was successful. As a result, on:

- April 19, 2016 Letter of acceptance to Columbus/FLOW from NTRC was forwarded.
- May 3, 2016- Revised rates were shared with the Commission for confirmation.
- May 4, 2016 Draft contract was shared with FLOW/CW Business.
- May 30, 2016- Draft was confirmed.
- June 14, 2016— Signing of contract between parties (NTRC and Columbus/FLOW). FLOW is expected to complete work by June 30, 2016 according to contract.

A contract was issued to FLOW to upgrade the internet at the Holy Family Children's Home; the work was concluded on June 30, 2016. The USFO confirmed that the work was completed via a site visitation. A letter was subsequently sent out to the SLICTA requesting completion of the computer configurations which are still pending on the existing computers at the Home.

The remaining installations at the Home to be completed by SLICTA were carried out on August 20, 2016.

10. St. Lucia Fisher Folk Cooperative Society Ltd Project Proposal - As a follow up from their original project proposal, a revised Project Proposal was received from the St. Lucia Fisher Folk Cooperative Society Ltd. (SLFCSL) on January 12, 2016. An acknowledgement of receipt was sent to the establishment.

In February 2016, the USFO made a request to conduct a verification site visit to the St. Lucia Fisher Folk Cooperative; however, no confirmation was made by the SLFCSL at the time.

Mr. Lynch of the St. Lucia Fisher Folk Cooperative indicated on June 5, 2016 that they were ready to conduct site visits and proceeded with their project proposal. No follow ups or confirmation of dates were received by the Co-operative.

WI-FI Access for the Serenity Park -The proposal was submitted on June 6, 2016 by Mr. John Quinlan. Town

9.5 UNIVERSAL SERVICE FUND BUDGET

Clerk. In July, the USFO met with Mr. Quinlan regarding the project proposal which was not being considered by the Commission due to the fact that the objective of the project was to fund Wi-Fi which already existed at the Serenity Park. This proposal was not synonymous with the mandate of the USFO.

UNIVERSAL SERVICE FUND CONTRIBUTION

According to the Telecommunications (Universal Service Fund Contribution) Order 2009:

A Telecommunications provider shall contribute to the Universal Service Fund as follows:

- In respect of the first year, 0.25 % of Gross Annual Revenue of licence,
- In respect of the second year, 0.5% of Gross Annual Revenue of licence;
- In respect of the third year, 1.0% of Gross Annual Revenue of licence and throughout the duration of the licence.

The due date for payment shall be within 45 days of the reporting year and shall be accompanied by a gross annual revenue report and supporting attachments that provide details of the calculation.

PROVIDERS' CONTRIBUTION 2015/2016

As set forth in the Telecommunications (Universal Service Contribution) Order 2009, of Saint Lucia, all telecommunications providers shall contribute to the Universal Service Fund. Parliament may also appropriate funds for use by the Fund. Official grants, donations bequests, other contributions or transfers by legal entities may also be made to the Fund.

The following Service Providers have not honored its obligations to the USF for the period 2015/16:

- Helen Television System;
- Antilles Crossing (St. Lucia) Ltd.;
- Southern Caribbean Fibre; and
- Kelcom International Ltd. now operating as Columbus Communications (St. Lucia) Ltd.

Contributions/Bidding fees were received by the following Service Providers for the reporting period:

- Cable and Wireless (St. Lucia) Ltd \$1,010,200.00;
- Digicel (St Lucia) Ltd-\$ 901,327.00; and
- Tele (St. Lucia) Inc. \$ 1,216.14.

Total Contributions received: \$1,912,743.14

9.5 UNIVERSAL SERVICE FUND BUDGET

OPERATING EXPENSES OF THE UNIVERSAL SERVICE FUND OFFICE

As provided by the Telecommunications (Universal Service Fund) Regulation, SI 120 of 2008, and the Guidelines and Procedures for the Universal Service Fund, the operating budget shall be used for operating expenses of the Fund and shall not exceed 10% of the annual budget of the Fund.

According to the Legislation, the fund shall be financed primarily by contributions collected from licensed telecommunications providers as mandated in the Telecommunications (Universal Service Fund) Order. In addition, there are provisions for funds to be made available to the USF via Parliamentary appropriations, or in the form of grants, donations, bequests or other contributions made by individuals or legal entities. It is important to note that the Commission may refuse any bequest, donation, grant or other contribution if the Commission considers it inconsistent with the best interest of the fund.

The funds used to cover the administrative expenses of the USF are disbursed on a quarterly basis after approval by the Commission the administrative expenses of the USF are limited to payments for the following expenditure items:

- Salaries, emoluments, remunerative packages and allowances for Fund Administrator and Administrative Assistant and other persons employed to work on staff matters;
- Office equipment specifically and directly related to requirements of Fund administration;
 - Administrative and operational costs specifically and directly related to requirements of the Fund administration;
 - Costs of carrying out technical, socio-economic or demand studies pertinent to the development of the Operating Plan;
 - Consultancy or advisory contracts directly related to Fund activities; and
 - Financial audit costs of the Fund.

FUND DISBURSEMENT

Fund disbursements from the designated Fund Bank Accounts are restricted to payments for eligible expenditure as approved by the Commission under the categories specified below:

- 1. Approved budgeted operational/administration expenses; and
- 2. Approved payments for Fund Project.

UNIVERSAL SERVICE FUND 2015/2016

Total funds accrued for the period	EC \$1,912,743.14
Approved Annual Allocation for administration operating expenses	EC \$ 536,954.00
Total Funds Disbursed during the period	EC\$1,151,876.64
Project Fund Disbursement	EC\$ 555,607.14

10. FINAL REMARKS

In its operations during the reporting period of 2015- 2016, the Commission's commitment and diligence continued to be evident in its conduct of matters, which allowed the Organisation to remain equal to the challenges presented.

The Commission still encountered issues of limited resources, delays and inadequate support from the external agencies with which it collaborates on certain telecommunications matters. However, its approach of partnering with other agencies on crucial issues, such as consumer affairs, and engaging in human resource development has yielded satisfactory results.

It is the Commission's intention to continue its earnest efforts in all aspects of operations, ensure the continuation of collaborative activity and pooling of resources with relevant agencies, to achieve the Commission's legally established mandate.

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APPENDIX A



- MARIO LENDOR

Tel: 758-453 2356 Fax: 758-453-2270



P.O. Box 1131, Providence Villa, Cedars Road, Castries, St. Lucia

Tel: 758-453-2356 Fax: 758-453-2270 E mail: mo_lendor@hotmail.com

Auditor's Report to the Commissioners of:

NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Report on the Financial Statements

I have audited the financial statements of the National Telecommunication Regulatory Commission which comprise of the Statement of Financial Position as at 30th September, 2016 as well as the Statement of Changes in Shareholders' Equity, the Statement of Support and Expenditure and the Statement of Cash Flows for the year then ended. Also included is a summary of significant accounting policies and other explanatory notes.

Management's Responsibility for the Financial Statements

The financial statements are the responsibility of the commission's management, which includes the preparation and fair presentation of these financial statements in accordance with International Financial Reporting Standards. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of the financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances

Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit. I conducted my audit in accordance with International Standards on Auditing. Those Standards require that I conform to ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Opinion

In my opinion, the accompanying financial statements referred to above, presents fairly, in all material respects, the financial position of the commission as at 30th September, 2016 and the results of its operations and cash flows for the year then ended is accordance with International Financial Reporting Standards.

CHARTERED ACCOUNTANT

28th January, 2017

National Telecommunication Regulatory Commission

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30th September, 2016

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NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Statement of Financial Position

As at 30th September, 2016 With comparative figures as at 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

Current Assets	<u>Notes</u>		<u>2016</u>	<u>2015</u>
Cash and cash equivalents	5	\$	764,557	652,034
Accounts receivable and prepayments	6	-	35,170	39,043
Due from related party			2,600	2,600
Total current assets			802,327	693,677
Non-Current Asset				
Property, plant and equipment	8		36,983	52,341
Total non-current asset			36,983	52,341
Total assets			839,310	746,018
<u>Current Liabilities</u>				
Accounts payable and accruals	7		138,203	102,724
Total current liabilities			138,203	102,724
Total liabilities			138,203	102,724
Shareholders' Equity				
Accumulated surplus			701,107	643,294
Total shareholders' equity			701,107	643,294
Total liabilities and shareholders' equity		\$	839,310	746,018

Approved by:

--- Chairman,

Commissioner.

National Telecommunication Regulatory Commission

Statement of Changes in Shareholders' Equity

For the year ended 30th September, 2016 With comparative figures for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

	2016	<u>2015</u>
Balance - beginning of year	\$ 643,294	518,852
Excess support over expenditure	57,813	124,442
Balance - end of year	\$ 701,107	643,294

NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Statement of Support and Expenditure

For the year ended 30th September, 2016 With comparative figures for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

		<u>2016</u>	<u>2015</u>
Support -			
Contributions from ECTEL	\$	904,654	862,518
Application fees		20,280	156,461
Numbering fees		51,021	52,838
Other income		10,929	5,386
Total support		986,884	1,077,203
Expenditure			<u>-</u>
Advertising and promotion		5,150	7,294
Professional fees		10,975	10,525
Bank charges and interest		2,135	2,522
Depreciation		33,760	48,472
Gratuity		85,957	68,235
Însurance		5,981	6,752
Membership and subscriptions		916	17,812
Office		40,464	35,334
Rent		90,000	90,000
Repairs and maintenance		15,817	15,232
Salaries and wages		479,837	471,348
Staff training and welfare		10,779	17,543
Staff uniforms		340	6,676
Supplies		2,109	7,716
Meeting,travel and entertainment		66,415	67,471
Utilities		37,338	54,078
Sundry		9,198	5,028
Public education		7,900	-
Service contract fees		24,000	20,723
Total expenditure	_	929,071	952,761
Excess support over expenditure	\$_	57,813	124,442

The accompanying notes form an integral part of these financial statements.

NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Statement of Cash Flows

For the year ended 30th September, 2016 With comparative figures for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

	<u> 2016</u>	<u>2015</u>
Cash Flows from Operating Activities		
Excess of support over expenditure for the year \$	57,813	124,442
Adjustments for:		
Depreciation	33,760	48,472
Cash flows before changes in operating assets and liabilities	91,573	172,914
Accounts receivable and prepayments	3,873	(36,361)
Accounts payable	35,479	(23,462)
Cash generated from operations	130,925	113,091
Cash Flows from Investing Activities		
Purchase of property, plant and equipment	(18,402)	(12,190)
Net cash used in Investing Activities	(18,402)	(12,190)
Increase in cash and cash equivalents	112,523	100,901
Cash and cash equivalents - beginning of year	652,034	551,133
Cash and cash equivalents - end of year \$	764,557	652,034

National Telecommunication Regulatory Commission

Notes to Financial Statements

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

1. Background and Principal Activity

The National Telecommunications Regulatory Commission ("the Commission") was established by the Telecommunications Act Cap 8.11 of the Revised Edition Law of Saint Lucia on 22nd November, 2000. The Commission commenced operations on 18th March, 2002.

The principal activity of the Commission is to oversee the development of the telecommunications sector in Saint Lucia.

The Commission's principal place of business is situated at Bois D'Orange, Gros Islet.

The financial statements were approved by the Commissioners and authorized for issuance on April 24th, 2017.

2. <u>Summary of Significant Financial Reporting Policies</u>

a. Overall Policy

The principal financial reporting policies adopted are stated in order to assist in the general understanding of the financial statements.

Statement of Compliance

The financial statements of National Telecommunications Regulatory Commission have been prepared in accordance with International Financial Reporting Standards (IFRS) as issued by the International Accounting Standard Board (IASB) and under the historical cost convention.

The preparation of financial statements in conformity with IFRS requires the use of certain accounting estimates. It also requires management to exercise its judgment in the process of applying the Commission's accounting policies. The areas involving a higher degree of judgment or complexity, or areas where assumptions and estimates are significant to the financial statements are disclosed in Note 3.

b. Adoption of New and Revised IFRS

During the current year the Commission adopted all the new and revised International Financial Reporting Standards (IFRS) which are relevant to its operations and are effective for the accounting periods. The adoption of these standards did not have a material effect on the financial statements. At the date of authorization of these financial statements, some standards were issued but not yet effective. The Commission expects that the adoption of these standards in future periods will not have a material effect on the financial statements.

NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Notes to Financial Statements... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

2. Summary of Significant Financial Reporting Policies... (Cont'd)

c. Foreign Currency Translation

Functional and Presentation Currency

Items in the financial statement are measured using the currency of the primary economic environment in which the entity operates (the functional currency). The financial statements are presented in Eastern Caribbean Dollars, which is the Commission's functional and presentation currency.

Transactions and Balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognized in the statement of support and expenditure.

d. Cash and Cash Equivalents

Cash and cash equivalents are carried on the statement of financial position at cost. For the purpose of the statement of cash flows, cash and cash equivalents comprise balances with a maturity of three months or less from the date of acquisition including: cash on hand, deposits held on call with banks and bank overdrafts. Bank overdrafts are shown within borrowings in current liabilities on the statement of financial position.

e. Trade Receivables

Trade receivables are recognized initially at fair value and subsequently measured at amortized cost less provision for impairment. A provision for impairment of trade receivables is established when there is objective evidence that the Commission will not be able to collect all amounts due according to the original terms of receivables. Significant financial difficulties of the debtor, probability that the debtor will enter bankruptcy or financial delinquency in payments are considered good indicators that the trade receivable is impaired. The amount of the provision is the difference between the carrying amount and the present value of the estimated future cash flows, discounted at the effective interest rate. The carrying amount of the asset is reduced through the use of an allowance account and the amount of the loss is recognized in the statement of support and expenditure.

When a trade receivable is uncollectible, it is written-off against the allowance account for trade receivables. Subsequent recoveries of amounts previously written off are credited in the statement of support and expenditure,

National Telecommunication Regulatory Commission

Notes to Financial Statements ... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

2. Summary of Significant Financial Reporting Policies... (Cont'd)

f. Property, Plant and Equipment

Property, plant and equipment are stated at historical cost less accumulated depreciation and impairment losses. Historical cost includes expenditure that is directly attributable to the acquisition of the items. Subsequent costs are included in the assets carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Commission and the cost of the item can be measured reliably. All other repairs and maintenance are charged to the statement of support and expenditure during the financial period in which they are incurred.

Depreciation is calculated on the straight line method to allocate the cost of each asset over their estimated useful lives as follows:-

Furniture and Equipment 15%-25%

Leasehold Improvements 2.5% - 25%

The assets' residual values and useful lives are reviewed, and adjusted if appropriate, at each statement of financial position date.

An asset's carrying amount is written down immediately to its recoverable amounts, if the asset's carrying amount is greater than its estimated recoverable amount.

Gains and losses on disposals are determined by comparing proceeds with carrying amounts. These are included in the statement of support and expenditure. When revalued assets are sold, the amounts included in other reserves are transferred to accumulated surplus.

g. Accounts payable

Accounts payable is measured at amortized cost.

h. Provisions

Provisions are recognized when the Commission has a present legal or constructive obligation as a result of past events; it is probable that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.

i. Revenue recognition

Revenue is recognized when the agreed contributions become due and on the completion of other service transactions when the related fees can be reliably estimated.

i. Income tax

The Commission is exempt from Income tax under the provision of the Telecommunications Act.

k. Comparative

Where necessary, comparatives have been adjusted to conform to changes in the presentation in the current year.

The accompanying notes form an integral part of these financial statements

NATIONAL TELECOMMUNICATION REGULATORY COMMISSION

Notes to Financial Statements... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

3. Critical Accounting Estimates and Judgments

Estimates and judgments are continually evaluated and are based on historical experience and other factors including expectation of future events that are believed to be reasonable under the circumstances.

The Commission makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom equal the related actual results. The Commission does not consider that there are estimates and assumptions that will have a significant risk, causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

4. Financial Instruments

In accordance with the provisions of International Financial Reporting Standard No. 7, disclosure is required regarding credit risks, liquidity risk, interest rates and fair values of financial assets and liabilities.

a. Credit Risk

Credit risk arises from the possibility that counterparties may default on their obligations to the Commission. The amount of the Commission's maximum exposure to credit risk is indicated by the carrying amount of its financial assets.

The Commission operates within the telecommunication regulatory environment, and financial assets which may potentially expose the Commission to concentrations of credit risk, consist primarily of contributions and receivables. The Commission does not believe that significant credit risk exists at 30th September, 2016.

b. Liquidity Risk

Liquidity risk management implies maintaining sufficient cash and cash equivalents and the availability of funding through adequate amounts of committed credit facilities. The Commission does not believe that significant liquidity risk exists at 30th September, 2016.

c. Interest Rate Risk

Differences in contractual repricing or maturity dates and changes in interest rates may expose the Commission to interest rate risk. The Commission was not exposed to interest rate risk at 30th September, 2016.

d. Fair Value of Financial Instruments

Fair value amounts represent estimates of the consideration that would currently be agreed upon between knowledgeable, willing parties who are under no compulsion to act and is best evidenced by a quoted market value, if one exists. None of the Commission's financial assets and liabilities are traded in a formal market. Estimated fair values are assumed to approximate their carrying values

National Telecommunication Regulatory Commission

Notes to Financial Statements... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

		2016	<u>2015</u>
5.	Cash and Cash Equivalents		
	Cash on hand Bank of St, Lucia Limited RBTT Bank Caribbean Limited	\$ 500 557,990 206,067 764,557	500 493,865 157,669 652,034
6,	Accounts Receivable and Prepayments		
	Prepaid expenses Other receivables	2,220 32,950 35,170	2,230 36,813 39,043
7.	Accounts Payable and Accruals	<u>2016</u>	<u>2015</u>
	Other payable Gratuity payable	\$ 14,805 123,398 138,203	20,840 81,884 102,724

The accompanying notes form an integral part of these financial statements.

National Telecommunication Regulatory Commission

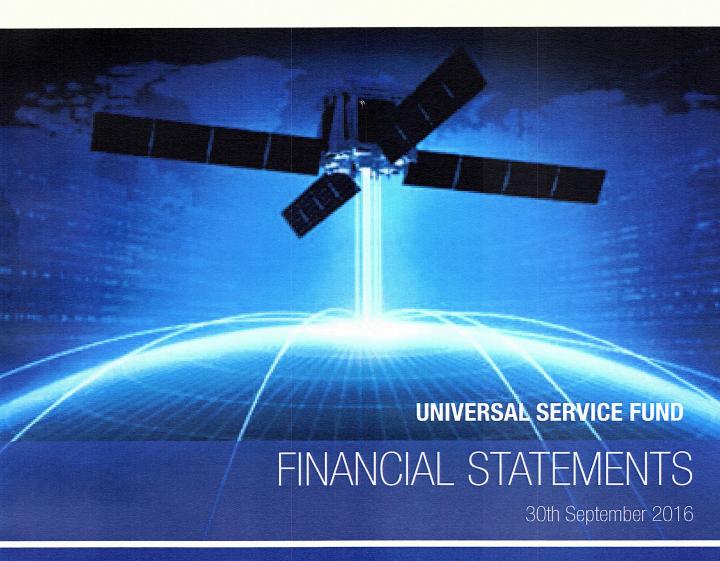
Notes to Financial Statements ... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

8. Property, Plant and Equipment

ed depreciation alue ar ended 30 th September, 2015	\$ 315,546 (248,794) 66,752	120,467 (98,596) 21,871	436,013 (347,390) 88,623
et book value or the year ended 30 th September, 2015	(248,794) 66,752	(98,596)	(347,390)
Neccumulated depreciation Net book value For the year ended 30 th September, 2015 Opening net book value	66,752	***************************************	
or the year ended 30 th September, 2015		***************************************	88,623
	66,752		
pening net book value	66,752		
		21,871	88,623
ditions in the year	12,190	-	12,190
epreciation charge for the year	(33,687)	(14,785)	(48,472)
osing net book value	45,255	7,086	52,341
s at 30 th September, 2015			
ost	327,736	120,467	448,203
ccumulated depreciation	(282,481)	(113,381)	(395,862)
book value	45,255	7,086	52,341
the year ended 30 th September, 2016			
ening net book value	45,255	7,086	52,341
litions in the year	5,319	13,083	18,402
reciation for the year	(30,115)	(3,645)	(33,760)
ing net book value	20,459	16,524	36,983
at 30 th September, 2016			
st	333,055	133,550	466,605
umulated depreciation	(312,596)	(117,026)	(429,622)
book value	20,459	16,524	36,983

The accompanying notes form an integral part of these financial statements.



P.O. Box 1131, Providence Villa, Cedars Road, Castries, St. Lucia

Tel: 758-453-2356 Fax: 758-453-2270 e mail: mo_lendor@hotmail.com

Auditor's Report to the Commissioners of:

Universal Service Fund

Report on the Financial Statements

I have audited the financial statements of Universal Service Fund which comprise of the Statement of Financial Position as at 30th September, 2016 as well as the Statement of Changes in Shareholders' Equity, the Statement of Support and Expenditure and the Statement of Cash Flows for the year then ended. Also included is a summary of significant accounting policies and other explanatory notes.

Management's Responsibility for the Financial Statements

The financial statements are the responsibility of the Fund's management, which includes the preparation and fair presentation of these financial statements in accordance with International Financial Reporting Standards. This responsibility includes: designing, implementing and maintaining internal control relevant to the preparation and fair presentation of the financial statements that are free from material misstatement, whether due to fraud or error; selecting and applying appropriate accounting policies; and making accounting estimates that are reasonable in the circumstances.

Auditor's Responsibility

My responsibility is to express an opinion on these financial statements based on my audit, I conducted my audit in accordance with International Standards on Auditing. Those Standards require that I conform to ethical requirements and plan and perform the audit to obtain reasonable assurance whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the entity's preparation and fair presentation of financial statements in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by management, as well as evaluating the overall presentation of the financial statements,

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Opinion

In my opinion, the accompanying financial statements referred to above, presents fairly, in all material respects, the financial position of the Fund as at 30th September, 2016 and the results of its operations and cash flow for the year then ended is in accordance with International Financial Reporting Standards.

CHARTERED ACCOUNTANT

28th January, 2017

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Statement of Changes in Shareholders' Equity	2
Statement of Support and Expenditure	3
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Notes to Financial Statements	5-10

Statement of Financial Position

As at 30th September, 2016 With comparative figures as at 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

	Notes	2016	2015
Current Assets			
Cash and cash equivalents	5	\$ 10,799,302	10,031,714
Total current assets		10,799,302	10,031,714
Non-Current Assets			
Property, plant and equipment	7	10,040	16,581
Total non-current assets		10,040	16,581
Total assets		10,809,342	10,048,295
Current Liabilities			
Accounts payable	6	48,130	46,933
Total current liabilities		48,130	46,933
Total liabilities		48,130	46,933
Shareholders' Equity			
Accumulated surplus		10,761,212	10,001,362
Total shareholders' equity		10,761,212	10,001,362
Total liabilities and shareholders'	equity	\$ 10,809,342	10,048,295

Approved by:

- Chairman.

-- Commissioner.

Statement of Changes in Shareholders' Equity

For the year ended 30th September, 2016 With comparative figures for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

	2016	<u>2015</u>
Balance - beginning of year	\$ 10,001,362	9,597,645
Excess support over expenditure	759,850	403,717
Balance - end of year	\$ 10,761,212	10,001,362

Statement of Support and Expenditure

For the year ended 30th September, 2016 With comparative for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

Sunnad	<u>Note</u>	2016	2015
Support Contributions from telecommunications p Interest income Other income Total support	roviders	\$ 1,911,527 500 1,912,027	2,034,360 210,053 450 2,244,863
Expenditure			
Training and professional development Employee Benefits Expenses Rent Utilities Advertising and promotion Projects Bank charges and interest Depreciation expense Sundry	.8	11,577 208,270 36,000 17,956 2,349 855,945 1,364 6,541	34,450 188,910 36,000 19,449 14,557 1,528,225 721 8,163 1,855
Meeting Repairs and Maintenance Public education		34 2,261 9,619	450 400 7,966
Total expenditure Excess support over expenditure		\$ 759,850	1,841,146 403,717

Statement of Cash Flows

For the year ended 30th September, 2016 With comparative figures for the year ended 30th September, 2015 (Expressed in Eastern Caribbean Dollars)

		2016	2015
Cash Flows from Operating Activities			
Excess of support over expenditure for the year	\$	759,850	403,717
Adjustments for:			
Depreciation		6,541	8,163
Cash Flows before changes in operating assets and liabilitie	S	766,391	411,880
Increase in accounts payable		1,197	40,662
Net cash generated from operations		767,588	452,542
Cash flows from Investing Activities			
Purchase of equipment		-	_ (7,319) ⁶
Net cash flows used in investing activities		-	(7,319)
Increase in cash and cash equivalents		767,588	445,223
Cash and cash equivalents - beginning of year		10,031,714	9,586,491
Cash and cash equivalents - end of year	\$	10,799,302	10,031,714

Notes to Financial Statements

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

1. Background and Principal Activity

The Universal Service Fund was established pursuant to the Telecommunications Act of Saint Lucia. The act indicates that the National Telecommunications Regulatory Commission shall establish a Fund to be known as the Universal Service Fund, which shall be managed by the Commission in accordance with the Telecommunications (Universal Service Fund) Regulations.

The main goal of the Universal Service Fund (USF) is to support the provision of Universal Service in telecommunications throughout the island,

- (a) public voice telephony;
- (b) internet access;
- (c) telecommunications services to schools, hospitals and similar institutions and the disabled and physically challenged; or
- (d) office service by which people access efficient, affordable and modern telecommunications.

The financial statements were approved by the Commissioners and authorized for issuance on 24th April, 2017.

2. Summary of significant financial reporting policies

Overall policy

The principal financial reporting policies adopted are stated in order to assist in the general understanding of the financial statements.

a. Basis of preparation

The financial statements of Universal Service Fund have been prepared in accordance with the International Financial Reporting Standards (IFRS) and under the historical cost convention.

The preparation of financial statements in conformity with IFRS requires the use of certain critical accounting estimates. It also requires management to exercise its judgment in the process of applying the Fund accounting policies. The areas involving a higher degree of judgment or complexity or areas where assumptions and estimates are significant to the financial statements are disclosed in Note 3.

b. Adoption of new and revised IFRS

During the current year the Fund adopted all the new and revised International Financial Reporting Standards (IFRS) which are relevant to its operations and are effective for the accounting period. The adoption of these Standards did not have a material effect on the financial statements. At the date of authorization of these financial statements, some Standards were issued but not yet effective. The Commission expects that the adoption of these Standards in future periods will not have a material effect on the financial statements of the Fund.

Notes to Financial Statements... (Contd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

2. Summary of significant financial reporting policies... (Contd)

c. Functional and presentation currency

Items in the financial statement are measured using the currency of the primary economic environment in which the entity operates (the functional currency). The financial statements are presented in Eastern Caribbean Dollars, which is the Fund's functional and presentation currency.

d. Foreign currency translation

Transactions and balances

Foreign currency transactions are translated into the functional currency using the exchange rates prevailing at the dates of the transactions. Foreign exchange gains and losses resulting from the settlement of such transactions and from the translation at year end exchange rates of monetary assets and liabilities denominated in foreign currencies are recognised in the statement of support and expenditure.

e. Cash and cash equivalents

Cash and cash equivalents are carried on the statement of financial position at cost. For the purpose of the statement of cash flows, cash and cash equivalents comprise balances with a maturity of three months or less from the date of acquisition including: cash on hand, deposits held on call with banks and bank overdrafts.

f. Property, plant and equipment

Property, plant and equipment are stated at historical cost less accumulated depreciation and impairment losses. Historical cost includes expenditure that is directly attributable to the acquisition of the items.

Subsequent costs are included in the assets carrying amount or recognised as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Fund and the cost of the item can be measured reliably. All other repairs and maintenance are charged to the statement of support and expenditure during the financial period in which they are incurred.

Depreciation is calculated on the straight line method to allocate the cost of each asset to their residual values over their estimated useful lives as follows:-

Furniture and Fittings 15%-25%

The assets' residual values and useful lives are reviewed and adjusted if appropriate, at each statement of financial position date.

An asset's carrying amount is written down immediately to its recoverable amounts, if the asset's carrying amount is greater than its estimated recoverable amount. Gains and losses on disposals are determined by comparing proceeds with carrying amounts. These are included in the statement of support and expenditure. When revalued assets are sold, the amounts included in other reserves are transferred to accumulated surplus.

Notes to Financial Statements... (Control)

30th September, 2016: (Expressed in Eastern Caribbean Dollars)

2. Summary of significant financial reporting policies... (Contd)

g. Provisions

Provisions are recognized when the Fund has a present legal or constructive obligation as a result of past events; it is probable that an outflow of resources will be required to settle the obligation; and the amount has been reliably estimated.

h. Revenue recognition

Revenue is recognized when the agreed contributions become due and on the completion of other service transactions when the related fees can be reliably estimated.

i. Income tax

The Fund is exempt from income tax under the provision of the Telecommunications Act.

j. Income and expenses

Income is recognized on the accrual basis as has been used for recording of income and expenses, Interest income and expenses are recognized in the statement of support and expenditure for all instruments measured at amortized cost using the accrual method.

3. Critical accounting estimates and judgments

Estimates and judgments are continually evaluated and are based on historical experience and other factors including expectation of future events that are believed to be reasonable under the circumstances.

The Fund makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom equal the related actual results. The Commission does not consider that there are estimates and assumptions that will have a significant risk, causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

Notes to Financial Statements... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

4. Financial Instruments

In accordance with the provisions of International Financial Reporting Standard No. 7, disclosure is required regarding credit risks, liquidity risk, interest rates and fair values of financial assets and liabilities.

a. Credit Risk

Credit risk arises from the possibility that counterparties may default on their obligations to the Fund. The amount of the Fund's maximum exposure to credit risk is indicated by the carrying amount of its financial assets.

The Fund operates within the telecommunication regulatory environment, and financial assets which may potentially expose the Fund to concentrations of credit risk consist primarily of contributions and receivables. The Commission does not believe that significant credit risk exists at 30th September, 2016.

b. Liquidity Risk

Liquidity risk management implies maintaining sufficient cash and cash equivalents and the availability of funding through adequate amounts of committed credit facilities. The Commission does not believe that significant liquidity risk exists at 30th September, 2016.

c. Interest Rate Risk

Differences in contractual repricing or maturity dates and changes in interest rates may expose the Fund to interest rate risk. The Fund was not exposed to interest rate risk at 30th September, 2016.

d. Fair Value of Financial Instruments

Fair value amounts represent estimates of the consideration that would currently be agreed upon between knowledgeable, willing parties who are under no compulsion to act and is best evidenced by a quoted market value, if one exists. None of the Fund's financial assets and liabilities are traded in a formal market. Estimated fair values are assumed to approximate their carrying values.

Notes to Financial Statements ... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

5.	Cash and Cash Equivalents	<u>2016</u>	2015
	Bank of St. Lucia Limited – operating ac. Bank of St. Lucia Limited - super saver ac. Cash on Hand	\$ 101,839 10,696,963 500	23,998 10,007,216 500
		10,799,302	10,031,714
6.	Accounts Payable		
	Trade pâyable Other payable	\$ 32,950 15,180 48,130	36,813 10,120 46,933
7.	Property, Plant and Equipment	Furniture & Fittings	
	For the year ended 30 th September, 2015 Opening net book value Additions in the year Depreciation charge for the year Glosing net book value As at 30 th September, 2015 Cost Accumulated depreciation Net book value-2015	\$ 17,425 7,319 (8,163) 16,581 41,767 (25,186) 16,581	
	For the year ended 30 th September, 2016 Opening net book value Additions in the year Depreciation charge for the year Closing net book value	16,581 (6,541) 10,040	
	As at 30 th September, 2016 Cost Accumulated depreciation Net book value-2016	41,767 (31,727) \$ 10,040	

The accompanying notes form an integral part of these financial statements.

Notes to Financial Statements... (Cont'd)

30th September, 2016 (Expressed in Eastern Caribbean Dollars)

8.	Employee Benefit Expenses			<u>2016</u>	<u>2015</u>
	Salaries and wages Other staff expenses Gratuity Staff insurance travel and medical	;	\$	170,534 4,949 32,340 447 208,270	155,230 2,758 28,425 2,497 188,910
	Key Management Compensation Salaries and other short-term benefits		\$	208,270	188,910

The average number of employees during the year was 2.



APPENDIX B: REGISTER OF TYPE APPROVED EQUIPMENT

Certificate Number	Manufacturer	Equipment Identifier	Model Identifier	Date Granted	Date Of Expiry
LCT/AU16.1178	Adtran Inc.	Outdoor Wireless Access Point	BSAP-2135	August 11, 2016	August 10, 2026
LCT/AU16.1179	Adtran Inc.	Wireless 802.11ac/a/b/g/n Access Point	BSAP-2020	August 11, 2016	August 10, 2026
LCT/AU16.117E	Alps Electric Co. Ltd.	TPMS/RKE Receiver	TWD1G776	August 15, 2016	August 14, 2026
LCT/AU16.117D	Alps Electric Co. Ltd.	Keyless Entry System (Hand Unit)	TWB1G762	August 15, 2016	August 14, 2026
LCT/NO15.1081	Alps Electric Co. Ltd.	TPMS/Keyless Tuner	TD1G049	November 10, 2015	November 9, 2025
LCT/NO15.1080	Alps Electric Co. Ltd.	Keyless Entry System	TB1G077	November 10, 2015	November 9, 2025
LCT/FB16.109D	Apple Inc.	Magnetic Charging Dock	A1714	February 2, 2016	February 1, 2026
LCT/DC15.1084	Apple Inc.	Portable Bluetooth Speaker	A1680	December 8, 2015	December 7, 2025
LCT/DC15.1083	Apple Inc.	Apple Pencil	A1603	December 8, 2015	December 7, 2025
LCT/DC15.1089	Apple Inc.	Tablet Device	A1652	December 8, 2015	December 7, 2025
LCT/NO15.107C	Apple Inc.	Apple TV	A1625	November 5, 2015	November 4, 2025
LCT/NO15.1079	Apple Inc.	Apple Remote	A1513	November 5, 2015	November 4, 2025
LCT/NO15.107E	Apple Inc.	Apple iPhone 6S	A1688	November 5, 2015	November 4, 2025
LCT/NO15.107D	Apple Inc.	Apple iPhone 6S PLUS	A1687	November 5, 2015	November 4, 2025
LCT/NO15.107B	Apple Inc.	Apple iPad Mini	A1550	November 5, 2015	November 4, 2025
LCT/NO15.107A	Apple Inc.	Apple iPad Mini	A1538	November 5, 2015	November 4, 2025
LCT/DC15.1085	Apple Inc.	Magic Mouse 2	A1657	December 8, 2015	December 7, 2025
LCT/DC15.1087	Apple Inc.	Magic Keyboard	A1644	December 8, 2015	December 7, 2025
LCT/DC15.1086	Apple Inc.	Track Pad	A1535	December 8, 2015	December 7, 2025
LCT/DC15.1088	Apple Inc.	Tablet Device	A1584	December 8, 2015	December 7, 2025
LCT/JA16.108D	AutoLiv ASP Inc.	Vehicle Radar System	6181175	January 11, 2016	January 10, 2026
LCT/MR16.1104	Breitling SA	Connected Wrist Watch	B55	March 15, 2016	March 14, 2026
LCT/JL16.1125	Calsonic Kansei Corp	RKE Receiver	BN011	July 13, 2016	July 12, 2026
LCT/JL16.1126	Canon Inc.	Laser Beam Printer	LBP151DW	July 13, 2016	July 12, 2026
LCT/OC15.1075	Caterpillar Inc.	Cellular Radio Equip- ment Telematics Hard- ware	PL641	October 19, 2015	October 18, 2025
LCT/NO15.1082	Clarion Corporation of America	Gen 3.1 Bluetooth Car Audio	A8DGEN31DE	November 10, 2015	November 9, 2025
LCT/AP16.110A	Continental Automo- tive GmbH	Innovative RF Receiver	5WK49096	April 13, 2016	April 12, 2026
LCT/AP16.1109	Continental Automo- tive GmbH	Transponder Authenti- cation Transceiver	HFM_CMFB_01	April 13, 2016	April 12, 2026
LCT/MR16.1105	Continental Automo- tive GmbH	Vehicle Lock/Unlocking System	TXN1	March 15, 2016	March 14, 2026

APPENDIX B: REGISTER OF TYPE APPROVED EQUIPMENT

LCT/MR16.1102	Continental Automotive GmbH	Body Control Module	40737300	March 15, 2016	March 14, 2026
LCT/JA16.1091	Continental Automotive GmbH	Wireless Key fob	Alfa434	January 18, 2016	January 17, 2026
LCT/JA16.1090	Continental Automotive GmbH	RF/LF Communications Device	AlfaRFHM1	January 18, 2016	January 17, 2026
LCT/JA16.108E	Continental Automotive Systems	Remote Keyless Entry	A2C31244300	January 11, 2016	January 10, 2026
LCT/JA16.108F	Delphi Deutschland GmbH	Remote Keyless Entry and Tire Pressure Monitor	FO3-AM433RX	January 11, 2016	January 10, 2026
LCT/MR16.1108	Denso Corporation	Passive Entry Passive Start System (LF Trans- mitter)	U2NA0	March 22, 2016	March 21, 2026
LCT/MR16.1107	Denso Corporation	Passive Entry Passive Start System (LF Trans- mitter)	UPE01	March 22, 2016	March 21, 2026
LCT/JA16.1095	Denso Corporation	Electronic Key	4EA	January 18, 2016	January 17, 2026
LCT/JA16.1094	Denso Corporation	Electronic Key	2EB	January 18, 2016	January 17, 2026
LCT/JA16.1093	Denso Corporation	Electronic Key	1EA	January 18, 2016	January 17, 2026
LCT/SP16.1181	Denso Corporation	Electro static Capacity Sensor	DECS001	September 16, 2016	September 15, 2026
LCT/JA16.109C	Fuji Heavy Industries	Vehicle Immobilizer	FJ16-2	January 21, 2016	January 20, 2026
LCT/JA16.109B	Fuji Heavy Industries	Keyless Access with Push Button Start System	FJ16-1	January 21, 2016	January 20, 2026
LCT/AU16.117B	Fujistsu Ten Limited	Car Audio	FT0107A	August 4, 2016	August 3, 2026
LCT/JA15.108C	Fujitsu Ten Limited	Car Audio	FT0087A	January 11, 2016	January 10, 2026
LCT/NO15.107F	Fujitsu Ten Limited	Car Audio	FT0052D	November 10, 2015	November 9, 2025
LCT/SP16.1182	Harman Becker Automotive System GmbH	Infotainment System With Bluetooth	MIB GLOBAL ENTRY	September 16, 2016	September 15, 2026
LCT/AU16.1194	Harman International Industries, Inc.	Automotive Infotain- ment Unit with Blue- tooth	GEN3 MID	August 22, 2016	August 21, 2026
LCT/AU16.1173	Harman International Industries, Inc.	Automotive Infotain- ment Unit with Blue- tooth	GEN3 BASE	August 22, 2016	August 21, 2026
LCT/JL16.1127	Humax Automotive Co. Ltd.	Vehicle Infotainment	CMF-R3000E- 17P-A	July 13, 2016	July 12, 2026
LCT/AU16.1177	Hyundai Mobis Co Ltd.	Digital Car Audio Sys- tem	ACB10G3BN	August 16, 2016	August 15, 2026

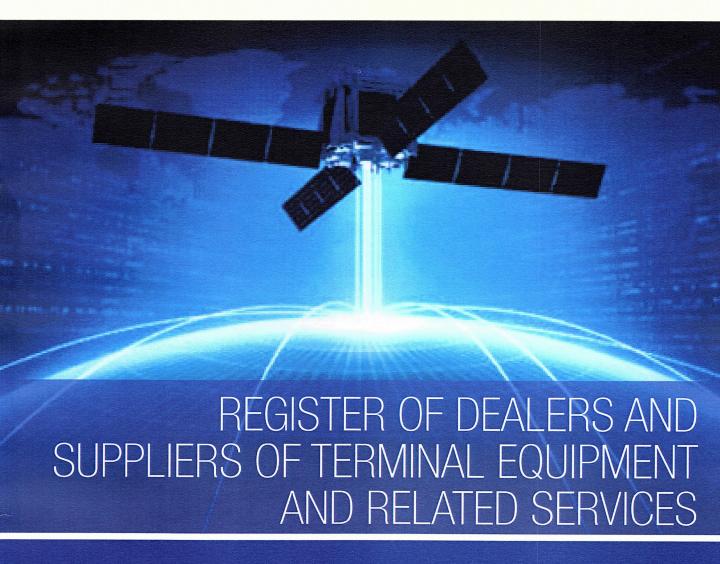
APPENDIX B: REGISTER OF TYPE APPROVED EQUIPMENT

LCT/JA16.109A	Hyundai Mobis Co. Ltd.	Digital Car Audio Sys- tem	ACB11G5GN	January 21, 2016	January 20, 2026
LCT/JA16.1099	Hyundai Mobis Co. Ltd.	Digital Car Audio Sys- tem	ACB10G5GN	January 21, 2016	January 20, 2026
LCT/AU16.1176	Hyundai Mobis Co., Ltd.	Digital Car Audio Sys- tem	ACB10G6GN	August 25, 2016	August 24, 2026
LCT/AU16.1171	Hyundai Mobis Co., Ltd.	Car Audio System	AC110HDGN	August 23, 2016	August 22, 2026
LCT/AU16.1172	Hyundai Mobis Co., Ltd.	Car Audio System	ACB10HDGN	August 23, 2016	August 22, 2026
LCT/SP16.1184	Hyundai Mobis Co., Ltd.	Digital Car Audio Sys- tem	ACB10H8GN	September 28, 2016	September 27, 2026
LCT/SP16.1183	Hyundai Mobis Co., Ltd.	Digital Car Audio Sys- tem	ACB14H8GN	September 28, 2016	September 27, 2026
LCT/DC15.108B	Jaguar Land Rover Limited	Infotainment Slave Controller	ISC1.0	December 8, 2015	December 7, 2025
LCT/DC15.108A	Jaguar Land Rover Limited	Infotainment Master Controller	IMC1.0_ROW	December 8, 2015	December 7, 2025
LCT/AU16.117C	Kyocera Document	Communication Module	LBWA1ZZ1CA	August 9, 2016	August 8, 2026
LCT/SP16.1180	LG Electronics Inc.	LG Slim Remote	AN-SP700	September 13, 2016	September 12, 2026
LCT/JN16.1123	Mitsubishi Electric Corp.	Keyless Entry System	SKE13D-02	June 20, 2016	June 19, 2026
LCT/OC15.1076	Mitsubishi Electric Corporation	Head Unit with WLAN	NR-000	October 19, 2015	October 18, 2025
LCT/MR16.1100	Novero Dabendorf GmbH	Onboard Vehicle Wire- less Charging Unit	WCH-177	March 7, 2016	March 6, 2026
LCT/MR16.1103	Panasonic Corpora- tion of America	Ford Sync Gen 3	SYNCG3-L	March 15, 2016	March 14, 2026
LCT/FB16.109F	Pioneer Corporation	Car Audio with Blue- tooth/WLAN	PVH-5248	February 15, 2016	February 14, 2026
LCT/AU16.117F	Pioneer Corporation	Car Audio	AVH-6868ZH	August 9, 2016	August 8, 2026
LCT/FB16.109E	Robert Bosch Car Multimedia GmbH	Human Machine Inter- face with BT, WLAN and GPS	NG 2.5 HMI	February 9, 2016	February 8, 2026
LCT/AU16.117A	Samsung Electronics Co. Ltd.	Wi-Fi Module	WIDT30Q	August 8, 2016	August 7, 2026
LCT/AU16.118A	Schrader Electronics Ltd.	Tyre Pressure Monitor- ing Sensor	SHS4	August 23, 2016	August 22, 2026
LCT/OC15.1078	Sicom Systems Inc.	Mini PC	SI-AQ01	October 20, 2015	October 19, 2025
LCT/OC15.1077	Sicom Systems Inc.	Mini PC	SI-AQ01-Plus	October 20, 2015	October 19, 2025

APPENDIX B: REGISTER OF TYPE APPROVED EQUIPMENT

LCT/MR16.1101	Symbol Technologies Inc.	Touch Computer	TC75AH	March 7, 2016	March 6, 2026
LCT/JA16.1098	Tokai Rika Co, Ltd.	Electronic Key	BR2EX	January 21, 2016	January 20, 2026
LCT/JA16.1097	Tokai Rika Co, Ltd.	Tuner	BF3US	January 21, 2016	January 20, 2026
LCT/AU16.1170	Tokai Rika Co., Ltd.	Electronic Key	BS1EW	August 29, 2016	August 28, 2026
LCT/JA16.1096	Toyota Motor Corporation	Smart Ld Oscillator	TMLF15-3	January 18, 2016	January 17, 2026
LCT/MR16.1106	Universal Electronics Inc.	DirectV RC71 RF4CE 2012	RC72L	March 15, 2016	March 14, 2026
LCT/OC15.1074	Valeo Comfort and Driving Assistance	Integrated Keyhead Transmitter	N5F-A08TDA	October 19, 2015	October 18, 2025
LCT/JA16.1092	Visteon Corporation	Car Audio	Ford Audio	January 18, 2016	January 17, 2026

APPENDIX C



APPENDIX C: REGISTER OF DEALERS AND SUPPLIERS OF TERMINAL **EQUIPMENT AND RELATED SERVICES**

Sorted by Registrant Name	The state of the s				
Registration Name	Registration Date	Registration No	DARESEA DA PROPERTO DE LA COMPANSA DEL COMPANSA DE LA COMPANSA DEL COMPANSA DE LA		
CALIDAD Services	31-Aug-06	LSTE/AU06.0004	\$1.00 million \$4.00 \$2.00 million \$2.00 mill		CH MIN OF THE PARTY OF
CLICKCOM	15-Dec-05	LSTE/NO05.0002			***************************************
Communications Systems & Services Ltd.	31-Aug-06	LSTE/AU06.0005	SERVICE AND	***************************************	400,000,000,000
Cox Radio Limited	15-Dec-05	LSTE/NO05.0003	BOARTOCO TO TO THE OWNER OF THE OWNER OF THE OWNER OF THE OWNER OW		Access and two different
Icon Security & Private Investigation Services Limited	27-Sep-06	LSTE/SP06.0007			
Island Water World (St. Lucia) Limited	26-Jan-07	LSTE/JA07.0009			***************************************
Johnsons Hardware Limited	16-Oct-06	LSTE/OC06.0008		Ca 74450 (744 Pe 14450) (747 Pe 145 C	
Kent's Hi Tech Electronics	10-Nov-05	LSTE/NO05.0001	9100matt.0910mat07001140 000m 2000		
N. V. Commercial Services Limited	27-Sep-06	LSTE/SP06.0006	ustartitis and Surfreshitzen numbers on the surfreshitzen		
Phone Links	30-Mar-07	LSTE/MR07.0010	***************************************		
G&G Limited	24-Apr-07	LSTE/AP07.0011			-
Emdee Electronics	17-02-12	LSTE/AP12.0012			

APPENDIX D



Pursuant to sub-section 13(7)(a) of the Telecommunications Act, No. 27 of 2000,2008 Revision and in keeping with its records, the National Telecommunications Regulatory Commission hereby lists the telecommunications licences that have been issued, modified, renewed or revoked in Saint Lucia by the Minister, as at September, 2016.			
Telecommunications Licences Issued	Licensee	Date Issued	length valid (in years)
(i) For the Establishment and Operation of a Fixed Public Telecommunications Network and the Provision of Certain Fixed Public Telecommunications Services in Saint Lucia	Cable & Wireless (West Indies) Lim- ited	October 10, 2001	15
	Digicel (St. Lucia) Limited	April 17, 2008	15
	Kelcom Interna- tional	April 17, 2008	15
	Tele (St. Lucia) Limited	June 24, 2008	15
(ii) For the Establishment and Operation of a Public Cellular Mobile Telecommunications Network and the Provision of Public Cellular Mobile Telecommunications Services in Saint Lucia	Cable & Wireless Caribbean Cellular (St. Lucia) Limited	October 10, 2001	15
	Digicel (St. Lucia) Limited	September 06, 2002	15
	AWS Caribbean Holdings Limited[1]	September 10, 2002	15
	Wireless Ventures (St. Lucia) Limited, transferred from AWS Caribbean Holdings Limited[2]	September 10, 2006	15
	21st Century Tele- coms Network (Ca- ribbean) Limited.	December 19, 2007	15
	PATWA (St. Lucia) Inc.	April 29, 2010	15

(iii) For the Installation and Operation of an Internet Network and the Provision of Internet Services in Saint Lucia	Cable & Wireless (West Indies) Lim- ited	October 10, 2001	15
	Antilles Crossing (St. Lucia) Limited	April 22, 2006	15
	21st Century Tele- coms Network (Ca- ribbean) Limited.	December 19, 2007	15
	Link Technologies Limited	February 15, 2008	15
	Kelcom Interna- tional Limited	April 17, 2008	15
	Digicel (St. Lucia) Limited	April 17, 2008	15
	Tele (St. Lucia) Limited	June 19, 2008	15
	PATWA (St. Lucia) Inc.	April 29, 2010	15
	Helen Television System (HTS)	December 29, 2011	15
(iv) For the Landing of a Submarine Cable and the Establishment and Operation of a Submarine Cable Telecommunications Network and the Provision of Certain Telecommunications Services in Saint Lucia	Antilles Crossing (St. Lucia) Limited	February 2, 2005	20
	Southern Caribbe- an Fibre Limited	August 2, 2007	20
(v) For the Establishment and Operation of a Private Telecommunications Network and Services in Saint Lucia	Helen IT Systems	July 27, 2004	15
	FINMAN Informa- tion Technology Unit	September 22, 2004	15
	PBL Sat	July 02, 2009	15
	Globecast UK	May 20, 2011	15

	West Indies Cricket Board	January 15, 2013	15
(vi) For the Use of Radio Frequencies in Connection with the Operation of Certain Telecommunications Networks and the Provision of Certain Telecommunications Services in Saint Lucia	Cable & Wireless Caribbean Cellular (St. Lucia) Limited	October 10, 2001	15
	Helen Television Systems Limited	February 2, 2007	15
	Link Technologies	November 3, 2008	15
	Digicel (St.Lucia) Limited	November 3, 2008	15
	Cable & Wireless (St.Lucia) Limited	November 3, 2008	15
	World on Wireless Communications	November 3, 2008	10
	21 CTN Telecoms Network (Caribbe- an) Limited	November 3, 2008	15
	SES Americom Incorporated	March 1, 2009	15
	Arqiva	March 30, 2009	15
	Link Technologies	June 2, 2009	15
	PBL SAT	July 2, 2009	15
	Gem Radio (The Wave)	July 6, 2009	15
	Cable & Wireless (Trading as LIME)	April 6, 2010	15
	Uno Broadcasting	April 6, 2010	5
	Globecast Africa Limited	April 29, 2010	15
	PATWA (St. Lucia) Inc.	June 1, 2010	15
	Tele (St. Lucia) Inc.	April 11, 2011	12

Globecast UK Lim-	May 20, 2011	15
ited		
Cable & Wireless (Trading as LIME)	May 20, 2011	5
Cletus Hippolyte	June 6, 2011	5
Digicel (St.Lucia) Limited	June 6, 2011	6
Stompid Electron- ics	June 6, 2011	5
Jaycom Interna- tional	September 30, 2011	5
Upsurge	June 6, 2012	5
Digicel (St.Lucia) Limited	January 18, 2012	5
Helen Television Systems Limited	July 3, 2012	10
Dystreek Inc. (Ray- neau Gajadhar)	February 19, 2013	5
Cable & Wireless (Trading as LIME)	February 6, 2013	3
Island Broadcast- ing, Advertising Services (IBAS)	February 19, 2013	5
West Indies Cricket Board	January 15, 2013	15
Globecast UK Ltd.	July 30, 2014	15
Soufriere Region- al Development Foundation	September 19, 2014	15
Globecast UK	July 1, 2015	1
Digicel (St. Lucia) Ltd.	September 2 ,2015	15
Martinus Eugene (Liberty FM 92.3)	November 13, 2015	5
Kwency Griffith	March 11, 2016	5

	Vibert Jacobs (HITZ FM)	August 18, 2016	5
	UNO Broadcasting Limited	June 14, 2017	5
(vii) Special Licence for Land Mobile Radio and Frequency Authorisation for Operation in Saint Lucia	Discovery at Marig- ot Bay Limited	December 1, 2006	
(viii) For the operation of a Maritime Mobile Service in Saint Lucia	Andre Delice	July 30, 2014	5
	Buckeye St. Lucia Terminal Ltd.	August 15, 2014	5
	Norbert Joseph	August 15, 2014	5
	Godfrey Joseph	August 15, 2014	5
	The Landings St. Lucia	June 08, 2015	5
	SLASPA	July 25, 2015	5
	Le Sport- The Body Holiday	May 30, 2016	5
	CATS (1995) Ltd	October 18, 2016	5
	Soufriere Marine Management Asso- ciation	October 18, 2016	5
	Wave Riders Ltd.	May 17, 2017	5
	Soufriere Region- al Development Foundation	June 14, 2017	5
	Hilroy Emanus	October 10, 2017	5
(viiii) For the use of Amateur Radio Service in Saint Lucia	Bernard Thomas	March 14, 2014	5
	Frans Van Sant- brink	May 16, 2014	5

Dudley Du Boulay	2014-2019	5
		5
Albert Tot Henry	June 06, 2014	
Lyndell St. Ville	June 06, 2014	5
Gerd Uhlig	July 30, 2014	1
Ian Plummer	July 30, 2014	5
William J. Schmidt II	July 30, 2014	5
Derek Noel Kirkham	July 30, 2014	5
Cecile Whiltshire	August 15, 2014	5
Joanna Harmsen	August 15, 2014	5
Junior A. Mathurin	September 15, 2014	5
Matthew Nelson	September 15, 2014	5
Lionel Ellis	September 18, 2014	5
William Richards II	September 19, 2014	1
Linus Theclus Herelle	September 19, 2014	5
James M. Worth- ington	October 24, 2014	1
Bengt Falkenberg	October 24, 2014	1
Ronnie Nilsson	October 24, 2014	1
Winslow N Hall	October 24, 2014	1
William Loeschman	October 24, 2014	1
James L Teeple	October 24, 2014	1
Budd Lee Drum- mond	October 24, 2014	5

Christopher David Drummond	October 24, 2014	5
Joseph C Kelly	October 24, 2014	1
Annette Du Boulay	November 10, 2014	5
Tony Du Boulay	November 10, 2014	5
Anselm Gittens	November 10, 2014	
Fabian Lewis	December 05,2014	5
Ned Fahmi	December 05,2014	1
Errol D Reid	December 05, 2014	5
Givan George	December 05, 2014	5
Frans Van Sant- brink	December 05, 2014	5
Francis Philgence	December 19, 2014	5
Howard Andrew Sine	January 14, 2015	5
Gary Glen Dein	January 08, 2015	1
Tadeusz Kolodzie- jczak	January 30, 2015	1
Zbigniew Tycman	January 30, 2015	1
Jerzy Jakubowski	January 30, 2015	1
Przemyslaw Gol- embowski	January 30, 2015	1
SLARC- St. Lucia Amateur Radio Club	February 02, 2015	5

Ancletus Ernest	February 26, 2015	5
Stephen A. Licht	February 26, 2015	1
David Lianez Fer- nandez	February 26, 2015	1
Pius Stephen	February 26, 2015	5
Albert Tot Henry	February 26, 2015	5
Andrea Falgiani	March 17, 2015	1
Peter James	April 20, 2015	5
Stephen Harry Whitfield	April 20, 2015	5
Thomas Steve Colburn	April 29, 2015	1
Frans Van Sant- brink	April 29, 2015	5
Daren George Hager	May 14, 2015	5
David J Nicholson	May 18, 2015	5
Clem Bobb	May 18, 2015	5
Fay M Ernest	June 2, 2015	5
John Emerson Blaize	July 3, 2015	5
William P. Tempel	July 2, 2015	1
Joseph C. Kelly	July 2, 2015	1
David A. Wright	July 2, 2015	1
Barclay M. Thomas	July 2, 2015	1
Frank Richard Gruber	July 2, 2015	1
Russell Mickiewicz	July 2, 2015	1
Ralph E. Bates	,	1
Cyril St. Jour	September 2, 2015	5

David Bern	November 16, 2015	1
Richard Arthur Lloyd	November 17, 2015	3
Thomas Hardison	November 17, 2015	1
Larry L. Ryan	November 17, 2015	1
Johnathan Wayne Demaree	November 17, 2015	1
Bryan W. Webler	November 24, 2015	1
Anceltus Ernest	December 4, 2015	3
Stephen Pinill	February 2, 2016	5
Jeffery B. Otterson	February 12, 2016	3
Bill Priakos	February 12, 2016	1
Stephen A. Licht	February 12, 2016	3
Frans van Santbrink	February 19, 2016	1 week
Kerri Mills	February 23, 2016	5
Terry Goodman	March 8, 2016	5
Rosemond Clery	March 25, 2016	5
Gary Glen Dein	April 7, 2016	3
Erald Mitchison Martin	May 3, 2016	3
William P. Temple	May 10, 2016	3
Joseph C. Kelly	May 11, 2016	3
Barclay M. Thomas	May 11, 2016	3
Gerd Uhlig	May 17, 2016	3
Steven Strauss	May 17, 2016	1

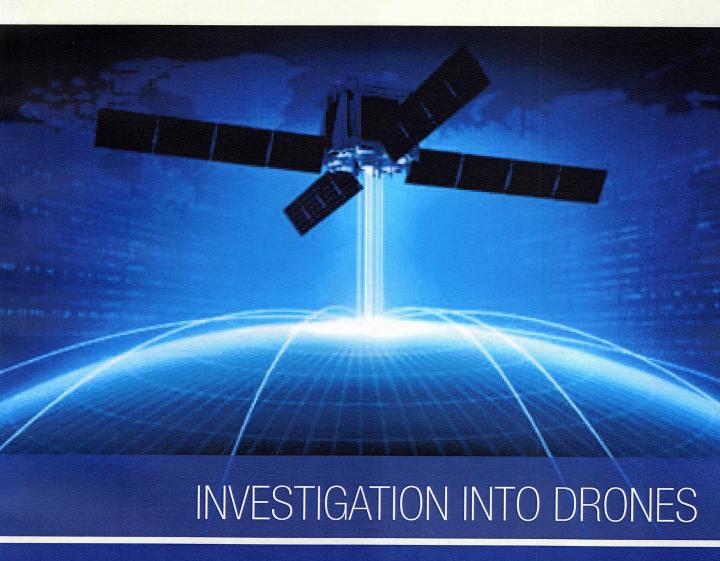
	Thomas M. Samu- lenas	May 17, 2016	1
	Yasmin Elius-St. Jour	August 25, 2016	5
	William Hicks Jr.	August 25, 2016	1
	David Bern	December 8, 2016	3
	Ann Marie Santos	December 8, 2016	1
	Robert Finkelsen	December 08th,2016	1
	Jason Hilaire	April 4, 2017	5
	Christopher Bristol	October 10, 2017	5
(x) For the operation of a Broadcast Licence in Saint Lucia	Daher Broadcasting Service Limited	December 17, 2002	
	Nature Island Com- munications Corp Ltd. (Kairi FM)	January 30, 2015	5
	Martinus Eugene (Liberty FM 92.3)	November 13, 2015	5
	Kwency Griffith	March 11, 2016	5
	Vibert Jacobs (HITZ FM)	August 18, 2016	5
	UNO Broadcasting Limited	June 14, 2017	5
(xi) Private Land Mobile and Frequency Authorisation	Courtesy Taxi Co-Operative Society Ltd.	May 16, 2014	5
	IMG Media Limited	July 31, 2014	5
	Sugar Beach, A Viceroy Resort (Jalousie Plantation)	August 21, 2014	5
	National Insurance Corporation	September 15, 2014	5

Ten Sports/Taj TV Ltd.	September 15, 2014	5
Treasure Bay St. Lucia Limited	November 10, 2014	5
Cox & Company Ltd.	November 10, 2014	5
NEMO	December 5,2014	5
Southern Taxi Association	January 16th, 2015	5
Sugar Beach, A Viceroy Resort (Jalousie Plantation)	January 30, 2015	5
Sunrod Property Inc.	May 5, 2015	5
Chuganis Industries Ltd.	June 17, 2015	5
Carib Prem OC (St. Lucia) Ltd.	June 22, 2015	1
Caribbean Dispatch Services	February 2, 2016	5
St. Lucia Distillers	October 18, 2016	5
Cap Maison Resort	May 17, 2017	5
The Body Holiday – Le Sport	June 01, 2017	5
BDSL Limited	June 1, 2017	5
Royal St. Lucia by Rex Resorts	June 14, 2017	5
Sandals Halcyon	June 14, 2017	5
Sandals Golf Resort & Spa La Toc	June 14, 2017	5
Sandals Grande St. Lucia Spa & each Resort	June 14, 2017	5

	Alternative Security Service (St. Lucia) Ltd.	July 7, 2017	5
	Caribbean Pre- miere League	July 31, 2017	5
	RTC Investments (St. Lucia) Ltd.	August 11, 2017	5
(xiii) For the Establishment and Operation of a Family Radio Service Operation (Open Land Mobile)	Beachcomber Ltd.	June 6, 2014	5
	Wamtec Services/ Wendell Stevens	August 6, 2014	5
	Winners Sport Inc. (Winners TV)	December 19, 2014	5
	Travis Ernest	June 8, 2015	5
	Splash Island Water Park	July 24, 2015	5
	Lance N. Octave	August 7, 2015	5
	Severin Francois	September 2,2015	5
	Keston Dick	September 2, 2015	5
	Stephen Sonson	September 22,2015	5
	Solar Energy Services Co. Ltd.	May 30, 2016	5
	Antonia George	June 2, 2016	5
	Unicomer (St. Lu- cia) Ltd.	July 31, 2017	5
	Ricardo Charles	October 10, 2017	5
(xiiii) For the Establishment and Operation of an Aeronautical Mobile Radio Station	ARINC (Saint Lucia) Limited	December 19, 2014	5
	Goddard Catering St. Lucia	July 1, 2015	5
	St. Lucia Helicop- ters	February 2, 2016	5

	Caribbean Dispatch Services Ltd.	August 11, 2017	5
Telecommunications Licences Modified	Rhythm FM	September 11, 2009	
	the state of the state of		
Telecommunications Licences Revoked	SES Americom Inc.	September 25, 2009	
	Antilles Crossing (St. Lucia) Limited	September 11, 2008	15
	Antilles Crossing (St. Lucia) Limited	April 22, 2006	15
AWS Licence was transferred to Wireless Ventures			
Digicel gained control of Wireless Ventures through purchase of Cingular Wireless LLC			

APPENDIX E



Potential RF Monitoring Tool MARCH 14, 2016 **NTRC** St. Lucia





EXECUTIVE SUMMARY

This document is in keeping with the functions of the NTRC to: a) Be responsible for technical regulation and the setting of technical standards of telecommunications and ensure compatibility with international standards; and b) Plan, supervise, regulate and manage the use of the radio frequency spectrum in conjunction with ECTEL, including the assignment and registration of radio frequencies to be used by all stations operating in Saint Lucia or on any ship, aircraft, vessel, or other floating or airborne contrivance or spacecraft registered in Saint Lucia.

It is under the above-mentioned auspices; online desk research has been conducted on Drone Technology which can ultimately aid the Commission in its duty to regulate and monitor the finite resource that is the Radio Frequency Spectrum. This document attempts to inform all relevant stakeholders on the current and continuously advancing drone evolution and also points to some of the pros and cons involved in adapting to this technology. Included in this document is a proposal for the use of drones as an RF monitoring tool.

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List of Abbreviations	Other Drone terminologies
(ICAO) International Civil Aviation Organisation (FAA) Federal Aviation Administration (FPV) First person view (NAV) Nano Air Vehicle (MAV) Micro Air Vehicles, (sUA) small Unmanned Aircraft (sUAS) small Unmanned Aircraft System (RPA) Remotely Piloted Aircraft (RPVs) Remotely Piloted Vehicles (RPAS) Remotely piloted aircraft systems (UAS) Unmanned Aircraft Systems (UAV) Unmanned Aerial Vehicles	Rotorcraft Quadcopters Ornithopter Hybrid Lift Glider Hexacopter Multicopters

INTRODUCTION

Drones are arguably one of the most controversial technological developments in our world today. Unlike (RC) radio-controlled aircrafts and/or model airplanes (which were eventually retrofitted with cameras and used as drones by the military), there are currently no mandatory international licensing nor registering processes in place for owning and operating a drone; what's more, the majority of drones can be flown by any first-time operator and are capable of achieving distances outside the operator's line of sight (>15miles). For this reason, many countries consider drones to be a nuisance and opt to prohibit its use until such international regulations have been put in place to curb the increased risk of incidents due to misuse. Contrary to this, other countries have already coordinated local regulations and praise the drones as innovative solutions to common problems.

WHAT ARE DRONES?

A drone, in a technological context, is an unmanned aircraft and are known by several other names (see list of Acronyms) such as RPAS (Remotely Piloted Aeronautical Systems), UAVs (Unmanned Aerial Vehicles), Quad copters, etc., essentially, a drone is a flying robot. The aircraft may be remotely controlled or can be flown autonomously through software-controlled flight plans in their embedded systems working in conjunction with GPS armed with a series of algorithms used to navigate the airways, avoiding obstacles and allowing the drone to achieve its destination. Drones have most often been associated with the military and to distance themselves from the stigma attached to their notorious use as killing machines, commercial/ hobbyist drone manufacturers are using alternate friendlier generic terms explaining the extensive variation of acronyms used to describe the same technology.

BRIEF HISTORY OF DRONES

Drones have a history that date as far back as 1849 with ancestors that include: pilotless balloons mounted with bombs and launched over enemy lines as well as kites mounted with cameras used for reconnaissance and surveillance missions. In 1970 the military unveiled the technology and funded two private airplane manufacturers Boeing and Ryan, to develop high altitude, long endurance drones. The funding helped to advance the drone technology but the biggest breakthrough came in the 90's when a private citizen by the name of Abraham Karem discovered a way to extend the Drones RF capabilities using C-band satellite data links which would control the military drone at much further distances outside the operator's line of sight. A private company by the name of Atomics improved on his design and included the KU satellite link which allowed military operators to control the drone in any weather condition and outside the operator's line of sight. That drone was named the 'Predator' and though many versions have been developed, the technology behind its performance allows it the title of the world's most formidable military drone capable of crossing continents.

From the very large to the very small, in 2011 the Defense Advanced Research Projects Agency (DARPA) awarded a project to develop a NAV (Nano Air Vehicle) to a company known as Aero Vironment. The results of the of the 1.7Million dollar project was a camouflage aircraft, capable of achieving speeds of 10m/sec. This drone resembles the flying characteristics of a hummingbird and was mainly intended for urban missions, where use

of huge equipment is not possible (see photo below).



CATEGORIES OF DRONES

The drone world as mentioned earlier is full of abbreviations, acronyms and confusion. While debate continues as to the most appropriate terms for the various types of drones we can begin by categorising them according weight, the manner in which they fly and their use etc.

According to one such site, with the exclusion of military drones, there are primarily two classes of Drones.

- Civilian/Amateur drones (flown for fun):
 - To be flown five miles from airport;
 - Below 400 feet;
 - Within sight;
 - Max power allowed is 36dBm (EIRP); and
 - Max transmit power 1W (30dBm).
- Commercial drone— flown with the objective of making money.

Furthermore, DIY Drones, a self-proclaimed leading community for UAVs, encourages people to use these definitions with the intention of defining the language before the corporate community takes control. The following drone categories were extracted from that page (see link http://diydrones.com/forum/topics/standards-categories-or-classes-of-drones):

CLASS 1: Small hobby drones/toys: Fairly obvious.

CLASS 2: Sport/ Small Racing class: Under 10 pounds, 500mm or less; Capable of 100mph or more; this would cover up to the larger drone copters we have today.

CLASS 3: Heavy Aerobatic: Under 30 pounds, less than 1500/2000mm, with small or no payload, but possibly heavy with on-board electronics or gadgetry. Capability: Must be capable of minimum of 20 minutes flight time, and minimum speed of 100mph. Designed and built for speed, maneuverability, and likely some kind of special purpose, if only for true, serious stunt flying. Half or more of the ideal payload is used for a strong frame, large engines, power, and on-board gadgetry of whatever sort, etc.

CLASS 4: "Dreadnought": Any drone which is heavier than 30 pounds, and greater than 1500mm engine to engine (existing standard) or 2000mm clearance including props (my suggested standard) The FAA has so far classed private drones as being under 55 (52?) pounds, but this class must exist, as larger drones are inevitable.

CLASS 5: "Carrier": Under 55 (52?) pounds, less than 3000mm, must be capable of lifting at least 10 pounds payload and flying with it for at least 1 mile, for at least 10 minutes. (Keep in mind this is based on us taking things to the next level, not what is practical or common now.) *This class must also be assumed to be able to carry other drones on/with it, or for mid-air/in-flight battery exchange/refueling, and for recovery of other non-functioning/crashed/etc. drones.

Drones can also be classified into other groups. They can be formed into groups according to their performance. Each drone has a different range and different flying abilities in different air conditions. By using these fields, the drones can be categorised. The following method is preferred by the US military:

1. Very Close Range Drones

These drones are mainly used as toys. They have ranges of about 5km. Their batteries provide them with a fly time of around 20-45 minutes. According to the estimations done in 2012, \$10,000 USD. The Dragon Eye and the Raven are some of the types of these kinds of drones. Their main design closely resembles model aircrafts.

2. Close Range Drones

These drones have a significantly higher fly time and range. On an average, they can be controlled within a range of 50km. They have a very high power battery, giving them a flight time of 1-6 hours. Because of their high range and flight time, they are availed by the military in conducting surveillance missions.

3. Short Range Drones

These are much better than the close range drones and significantly more useful for the military. Their range extends to 150km, which is 100km more than the close range drones. They have a flight time of 8-12 hours, twice that of the close range drones.

Though its main features are at a higher level than the close range drones, they are still used for the same purpose, i.e., spying and reconnaissance.

4. Mid-Range Drones

These drones are much further ahead than all the previous categories. They are high speed drones, having

a mind boggling range of 650km. They are also used for surveillance purposes, but they do have much more important work. These are the basic types of drones used in the collection of meteorological data. With its large range and high fly time, they are perfect to collect these data.

5. Endurance Drones

These are the best types of drones possible. They have a maximum flight time of 36 hours. They have the capability of reaching to a height of 30,000ft above sea level. This is no mere feat for a drone. These are also used for high end surveillance.

DRONE APPLICATIONS



Chinese manufacturer Ehang has unveiled the world's first passenger-carrying drone, which will transport individuals through the air without a pilot (+ movie). The Ehang 184 drone measures around 1.4 metres high, and features eight propellers held on four arms that can be folded into the vehicle's body for storage. Ehang has called the vehicle the "safest, smartest and eco-friendly low-altitude autonomous aerial vehicle aiming on providing medium-short distance transportation solutions".

Used in the army, The Cargo Pocket Intelligence, Surveillance and Reconnaissance program, known also as CP-ISR, is a new nano-drone concept dreamed up by the folks at the Army's Natick Soldier Research Center—and as the name suggest it is used by the military as an expendable, yet highly effective piece of reconnaissance equipment. This technology works on a powerful military grade data-link, along with low light video capabilities and improved controllability for operating indoors, and other dense environments.



Figure 1 Military Nano Drone used for reconnaissance

New Amazon Drones are now being considered to deliver food and light weight items to homes.



Figure 2 Amazon Drones deliver packages



Military Drone operators can sit in a Nevada desert, huddled in air-conditioned cubicles and now control a fleet of robots that can loiter above the landscape with advanced sensing capabilities.

NEGATIVES ASSOCIATED WITH THE USE OF DRONES?

The most common issue facing drones is the invasion of privacy. Because of their small size they are able to spy on persons which is good in a military setting but is illegal in society. Other points include:

- They fly into national air space and can cause airplane crashes if left unchecked;
- · They can be modified to make dangerous remote weapons;
- Some are noisy; and
- New Air conflict has arisen between firefighting aircrafts and drones used by amateur photographers and curious hobbyists.

POSITIVES ASSOCIATED WITH THE USE OF DRONES?

The following points list the positives associated with drones:

- Large farm owners e.g. in the US, are now using drones to review the growth of their crops from an aerial view which sometimes reveal dead spots (areas where nothing grows on large farms). These dead spots if caught in time can save the farmers hundreds of thousands of dollars;
- Other farmers use them to conduct routine checks for persons committing praedial larceny;
- Other farmers use them for spraying pesticides over crop as opposed to renting a crop duster;
- Photographers and film makers use drones for unique low cost aerial views;
- Engineers use them for surveying isolated utility lines, power lines and water pipelines;
- Realtors use them for achieving aerial views of houses and even flying through the houses;
- Law enforcement uses them to patrol borders and even conduct sting operations;
- In some countries they are used for anti-poaching air surveillance;
- Drones have now been designed to deliver emergency equipment;
- Drones are now being considered to deliver food and light weight items to homes;
- Regulators such as LS telecoms are using drones to monitor frequencies at high altitudes;
- · Drones are now used for recreational purposes as drone racing, a new extreme sport is being developed; and
- More interesting is that Facebook founder Mark Zuckerberg is developing drones that will be capable of providing internet to underdeveloped countries at no cost initially!

WHO IS RESPONSIBLE FOR DRONE REGULATION?

Officially there have been no reported issues of drones causing RF interference due in part to its use of the ISM band in most cases (see table of drone frequencies below). Pilots however have formally filed complaints of interference from drones flying too close to manned airplanes. The (FAA) Federal Aviation Authority and (ICAO) International Civil Aviation Organisation are the international bodies charged with regulating and creating standards for this technology. In keeping with world standards, it may be the responsibility of (ECCAA) Eastern Caribbean Civil Aviation Authority to oversee aviation safety and the relevant rules, including rules regarding the use of drones in the Eastern Caribbean. At a national level, the agency responsible for overseeing aviation

standards and regulations in St. Lucia may be charged with the responsibility of regulating aerial devices such as drones.

DRONE REGISTRY

Other issues associated with the technology have been identified but the positive impact of its many applications has ensured that it receives a fair hearing. Some countries have taken the initiative by implementing regulation, whilst others continue to allow public opinion and general consensus to shape a way forward. The implantation of a drone registry now will encourage operators to use their equipment responsibly by making them accountable. In the interim it is expected that a drone registry will assist authorities in tracking users; a study conducted showed more than 150 close calls with drones were reported in the last two years, in 28 of those cases, pilots took evasive action.

The Federal Aviation Administration rolled out its drone registration program to rein in reckless drone users on the 21st of December 2015. Under the FAA's UAS/ Drone registry (which is inaccessible via the internet from St. Lucia), persons who do not register their drone would be subject to civil and criminal penalties. The following are a few of the listed requirements for registration as seen on the FAA home page:

- Must be 13 years of age and older to register;
- A person below that age must register under the name of a guardian; and
- The owner must be a US citizen or legal permanent resident.

The FAA further goes on to say that a UAS / drone must be registered online if:

- It weighs more than 0.55LBs and less than 55lbs;
- It is owned by an individual person; and
- It is operated for recreational purposes (including hobby and model aircraft).

And a UAS / drone must be registered by paper format if:

- It weighs over 55LBs and must comply with 14 Code of Federal Regulation Part 47;
- It is used for commercial purposes;
- It is used for other than hobby and recreation; and
- It will be operated outside the US.

DRONE FREQUENCIES

Many countries reserve specific frequency bands (ranges) for radio control use. Due to the longer range and potentially worse consequences of radio interference, model aircrafts have exclusive use of their own frequency allocation in some countries. The following is a list of the RF bands most commonly used by Drones:

- Band 1: WiFI g/b/n: 2.4GHz -2.5GHz 5.8GHz
- Band 2: 433MHz ISM band: 433.05-434.79MHz

In keeping with ITU standards it is anticipated that St. Lucia in region 1 should be in line with USA and Canada reserved frequency bands included below:

- 72 MHz: aircraft only (France also uses US/Canada channels 21 through 35);
- 75 MHz: surface vehicles;
- 53 MHz: all vehicles, only for older equipment on 100 kHz spacing, with the operator holding a valid amateur radio (FCC in the USA) licence. The 53 MHz band began to become vulnerable to amateur radio repeater stations operating on the 53 MHz area of the 6-meter band during the early 1980s. The 53 MHz bands can still be used with relative safety for ground-based (cars, boats/ships) powered modeling activities;
- 50.8 to 51 MHz: on the 6-meter band for all vehicles at 20 kHz spacing, with the operator holding a valid amateur radio (FCC in the USA) licence. Added in the 1980s as the amateur radio repeater interference problem on the earlier 53 MHz bands in the United States began to manifest itself;
- 27 MHz: general use, toys; and
- 2.400-2.485 GHz: spread Spectrum band for general use (amateur radio licence holders have 2.39-2.45 GHz licensed for their general use in the USA) and using both frequency-hopping spread spectrum and direct-sequence spread spectrum RF technology to maximise the number of available frequencies on this band, especially at organised events in North America.

Military drones utilise the higher bands as common practice for example:

- Military C band (500- 1000 MHz) was utilised by the Gnat 750 series, first developed by Abraham Kareem. The aircraft was still controlled by a line of sight data link and whilst this was effective out to a range of 150 miles, the next stage of development of this UAV was already well underway.
- **Ku band datalinks** occupying 12–18 GHz of the electromagnetic spectrum are utilised by the Predator Drone. The SATCOM (Satellite Communication) data links allow the technology to fly even further outside the line of site. The uplink-band to the satellite is typically 13.75 14.5 GHz, and the downlink from the satellite is 10.95 12.75 GHz

DRONE JAMMERS

Drones are becoming a nuisance to some and can compromise personal privacy as they become cheaper every day. As the amount of unmanned aerial vehicles (UAVs) increases each year, contracting parties are stepping up their efforts to keep the devices out of the air. Battelle, a large nonprofit research and development organisation headquartered in Ohio, has now developed a portable, shoulder-mounted rifle, and dubbed it the Drone Defender, which attacks UAVs with radio waves.

In a press release from Battelle, the gun is stated to use "radio control frequency disruption technologies to safely stop drones in the air, before they can pose a threat to military or civilian safety." The gun operates on standard GPS and ISM radio bands, allowing it to interfere with commercial UAV signals.

Reportedly, the Drone Defender can hit objects up to 400 meters with an effective cone diameter of 30°. This is about as far as Battelle goes with the technical details, so the actual frequency ranges of the rifle still remain unknown. However, it is easy to determine which ISM radio bands they most likely run on by looking at the consumer UAV market.

When a remote-control signal is interfered with, drones will often enter into their safety protocols, which usually include one of three options. They will either hover in place until the pilot can regain a control link, or attempt to land so the pilot can recover it physically, or try to return to its point of origin. Since the 'Drone Defender', is mentioned to be attacking the GPS signal as well, the likely scenario is that the device will hover for a while or try to land.

On a legal standpoint, the 'Drone Defender' seems to be in a grey area. According to FCC regulations, federal law prohibits the operation, marketing, or sale of any type of jamming equipment, including devices that interfere with cellular and Personal Communication Services (PCS), police radar, Global Positioning Systems (GPS), and wireless networking services (Wi-Fi). Operation of a jammer in the United States may result in substantial monetary penalties, seizure of the unlawful equipment, and criminal sanctions including imprisonment.

The main reason for outlawing radio jamming equipment has to do with ensuring that emergency signals are not interfered with. If an accident occurs and a signal gets disrupted, lives could be at risk. See pic of drone defender below.



With an almost completely congested FM broadcasting band and with an average of one aeronautical complaint from SLASPA per year since 2012 concerning FM intermodulation products; it can be said that of the approximately 8 (eight) complaints, only (1) one was fully resolved by the technical Unit. The other complaints were (un) fortunately self- resolved after a period and although the interference issue may have been an annual or semi-annual recurrence due probably in part to changing weather patterns, the technical Unit could never be sure

because of the lack of resources capable of high altitude RF measurements.

Airborne RF measurements with remotely piloted aircrafts (RPA)/Drones achieve accurate antenna patterns and readings because antennas are always mounted on towers or high above the ground. The ability to detect audible live streaming from a demodulated FM signal is also of critical importance as it eliminates the need to request assistance from an incoming flight or schedule flight time with St. Lucia helicopters. Airborne RF measurements would also allow TU to monitor point to point Tx such as STL and Back haul microwave transmissions.

Ground measurements offer fruitful indications about the transmitted signal, but have some critical limitations:

- Reflections from the ground; and
- Only at selected points / limited areas (iterations necessary) not adapted to exactly determine antenna patterns and corresponding coverage.

The role of antennas in the transmission network and coverage achievement is predominant. Wrongly designed antennas or simply faulty antennas (for e.g. due to wrong installation) can conduct serious perturbations in a network.

KEY POINTS

- Antenna radiation characteristics of the broadcasting antennas should be verified:
 - a. First after initial installation;
 - b. When modifications are performed; and
 - c. After a certain time of use.
- But how to qualify them and to test their characteristics? The only solution is to perform a measurement "on air".
- Some broadcasters have been doing such kind of airborne measurement by using conventional helicopter:
 - a. Expensive solution, not everywhere possible; and
 - b. Difficult to achieve a good accuracy.
- The development of "drones" or "remotely piloted aircrafts" offer new possibilities to realise highly accurate airborne measurements.

ALL IN ONE SOLUTION TO AIRBORNE MONITORING

Colibrex a subsidiary of LS telecoms offers RF measurements, mast inspections and site surveys using Remotely Piloted Aircrafts (RPA). These are used to determine in an easy, quick and cost-efficient way, the true radiation characteristics of your RF transmission installations and to receive high resolution video and photography of the ground facilities and of the mast. It is not known whether this RPA is for sale, LS telecoms offers regulators this option as a service. Further investigation to be conducted

on the Principles of RPA Airborne Measurement Use of a Remotely Piloted Aircraft (RPA) specially adapted with:

- Dedicated measurement sensor & data processor (incl. real-time download).
- High resolution flight positioning and orientation.
- Autopilot capabilities.
- Calibrated measuring antennas.
- Specific software for data analysis.
- Specific RF shielding.
- Radiating antenna patterns measurement.
- Absolute ERP and antenna gain.
- Photographic/video records of mast occupancy.
- Quality of installations photo/video records.
- Mast and equipment maintenance status survey.
- Propagation modelling.
- General RF measurements.
- Such applications also apply for further operators of radio communications systems.

The advantages of RPA airborne measurement compared to ground measurement are summarised below:

- No or limited effect of ground reflection, which represents a major source of error of ground measurement / field testing. In general, morphology on the ground is a big issue and affects the results.
- Topology and access to suitable measuring points is a challenge for ground measurement. Depending on the regulation in place, RPA can fly even in congested areas and can cope with difficult topography.
- Airborne measurement enables a fine recording of the horizontal and vertical antenna patterns, whereas ground measurements require many iterations and volumetric measurements (at different geographical points).
- Specific antenna data like tilt or null fills are impossible to obtain with ground measurements. Airborne measurement provides directly these results.
- The extensive engineering of the Colibrex RPA solution has conducted to a system with a very low "typical measurement uncertainty ", as described in ITU-R SM.2056. The uncertainty factor and calibration errors of ground measurement can conversely be problematical.

CHEAPER AIRBORNE RF SOLUTION

Where the cost of hiring or buying a specialised drone may exceed the Commission budget, a low budget airborne interference analysis solution exists. By combining a USB powered spectrum analyzer to a well-chosen drone, high altitude monitoring can be conducted. Gone are the days when an effective and efficient analyzer was considered a bulky apparatus. Today highly efficient analyzers have taken advantage of common laptops and focused primarily on the functions of the RF analyzer, in doing so, compact spectrum analyzers are performing calculations more efficiently than their bulkier counterparts and by eliminating the keyboard, LED screen

and speakers, including other non-essential parts, they have created ultra-light real time spectrum analyzers, weighing from 3.4Kg and less. Of course, there is the existence of several variables that must be considered when purchasing the equipment separately. Identified below are two of the most efficient real time analyzers that can work in tandem with a sturdy Drone such as The DJI S100s 8 propeller assembly, which allows for fantastic aerial stabilization due to its 8 propellers—the design also allows for greater lifting capacity.

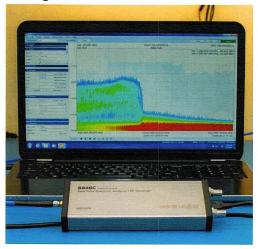
COMPACT SPECTRUM ANALYZERS

Tektronics—RSA306



Tektronix RSA306 USB Spectrum Analyzer provides real time spectrum analysis, streaming capture, and deep signal capabilities for signals from 9 KHz to 6.2GHz. The highly portable package at a cost of US \$3490, it sells for less than half the cost of a conventional unit, makes this the ideal instrument for field, factory, or academic use. The RSA306 Spectrum Analyzer runs with the full-featured Tektronix SignalVu-PC™ signal analysis software. Application programming interface (API) is included as well for Microsoft Windows environments.

The Signal hound BB60C series



The Signal Hound BB60C Real-Time Spectrum Analyzer and RF Recorder is a 9 kHz to 6 GHz Spectrum Analyzer and RF Recorder with an instantaneous bandwidth of 27 MHz, and sweep speeds of 24 GHz/sec, it weighs 3.4KG and sells for US\$2879. This compact analyzer can be used for interference hunting of intermittent signals, RF spectrum monitoring, recording and Das monitoring.

DRONE

MULTI-COPTER AS RF MONITORING TOOL

There are many shapes and styles of drones, some have stiff wings and fly like planes, others have wings that flap like birds and yet others can hover. Having researched the various drones' shapes and sizes, Multi-copters appeared to be the most widely accepted choice for the intended use as a RF monitoring tool. There are three categories of Multi-copter/ drones: the quadcopter (four motors), the hexacopter (6 motors) and the octocopter (8 motors). It is important to note that the technology is still evolving and this information may be obsolete as soon as new multicopters emerge.

The Octocopter was chosen as the most stable of the hovering drones, having researched the various shapes, sizes, and carrying capacity. Design-wise, this copter features 8 motors and propellers. These 8 motors provide the same benefit that the hexacopter provides over the quadcopter. This design is also used by the all in one airborne drone RF monitoring solution from Colibrex/LS telecoms.

The pros of an octocopter are as follows:

- Very fast and agile.
- Reach exceptionally high elevations.
- Extremely powerful.
- Can hold heavy equipment.
- Very safe and stable.

The cons are as follows:

- Big in size.
- Expensive compared to the hexacopter and quadcopter.
- Battery life is often far less.

The DJI Spreading Wings S1000 is considered the best octocopters on the market today as claimed by the manufacturer. Unfortunately little information in the form of public independent reviews exists to verify these claims. The DJI brand however is considered one of the best in the drone space. The base specifications seen on the S1000 are much higher than any other multicopter seen. The drone offers:

- Flight Time: 15 minutes.
- Weight: 9.25 pounds.
- Motors: 8 independent DJI 4115 400kv.
- Landing: Retractable.
- Propellers: Foldable, 1552 high performance.
- Propeller Size: 15×5.2".
- Battery: LiPo 10000 mAh 20000 mAh compatible.



Manufactures of this drone claim that it can carry 24lbs from takeoff. With the added weight of an external USB power source to connect to the 3.4kg of analyzer equipment this drone seems ideally suited for the task. The drone has a maximum price range of \$4000-\$1600 which seems odd. It is important to note that the technology is new and marketers are still deciding on the bestselling price. Amazon showed the price of this new drone on sale for \$1600.00. This drone has only one identified limit, it requires some level of skill to maneuver and does not have a return to home function. Should the Commission make a positive recommendation this can be easily resolved through the use of self-help books which are already gaining popularity online. There are also startup companies offering training in the US for approximately US \$590.00.

CONCLUSION

Arguably drones are becoming an indispensable part of everyday living. Within a short space of time it has stirred up and caused as much controversy and debate that has been likened by some as being equivalent to the competition that cars gave horse drawn buggies when they entered the market, the only difference being that instead of the roads, airspace is contended, similarly, pilots have now taken the place of horse drawn buggy drivers; afraid to adapt.

It is apparent that drone technology continues to grow and take root around the world; still, the debate continues as to whether the pros outweigh the cons. Some countries continue to prohibit its use whilst others, for example, Australia, New-Zealand and South America, have put together country specific regulations as a way of preventing major incident and hazards without missing out on the opportunity to embrace the technology.

The designated regulatory bodies responsible for setting industry standards for regulation of drones, is the (ICAO) International Civil Aviation Organization, and the Federal Aviation Authority, other aviation Authorities are also involved. For now, consumer/ hobbyist drones are configured to Wi-Fi and ISM bands and therefore the technology does not necessarily require regulation from the Telecommunications Regulator; drones however could play a critical role in airborne RF monitoring.

It is envisioned that a specially outfitted drone would attain altitudes of over 400ft, allowing the Commission the freedom to monitor aeronautical frequencies at high altitudes. In the past, the Commission has had to request the assistance of St. Lucia helicopters for monitoring at high altitudes above an affected area and most recently for the LIAT interference issue, both provide evidence of the need for this monitoring capability. Interference issues within the Aeronautical Band, continues to be of the highest priority to the Commission. Drones are here to stay and purchasing one will not only allow the Commission to keep abreast with this technology, but will also provide a functional solution to the critical issue of reoccurring aeronautical interference.

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Rajana Group of Companies Bldg.
Bois D'Orange
Gros Islet
P. O. Box GM 690
Castries, Saint Lucia, West Indies

Tel: (758) 458 2035
Fax: (758) 453 2558
Email: ntrc_slu@candw.lc/ ntrcsaintlucia@ntrcslu.lc
Website: www.ntrc.lc