

4 ERROR RECOVERY

If the Host or the Host Controller lose synchronization in the communication over RS232, then a reset is needed. A loss of synchronization means that an incorrect HCI packet indicator has been detected, or that the length field in an HCI packet is out of range.

If the UART synchronization is lost in the communication from Host to Host Controller, then the Host Controller shall send a Hardware Error Event to tell the Host about the synchronization error. The Host Controller will then expect to receive an HCI_Reset command from the Host in order to perform a reset. The Host Controller will also use the HCI_Reset command in the byte stream from Host to Host Controller to re-synchronize.

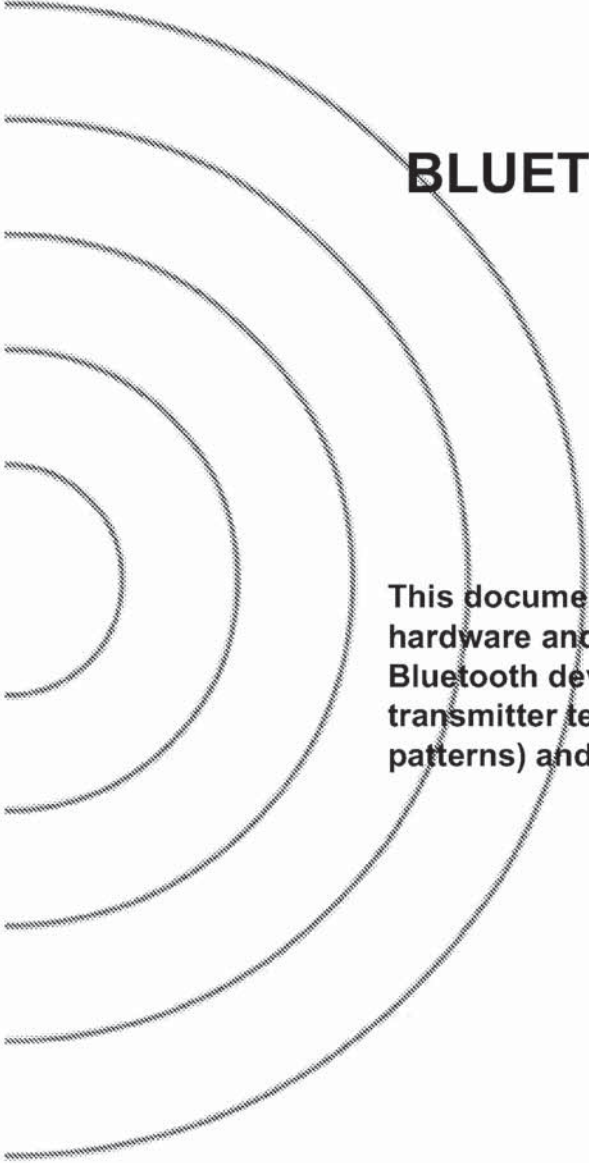
If the UART synchronization is lost in the communication from Host Controller to Host, then the Host shall send the HCI_Reset command in order to reset the Host Controller. The Host shall then re-synchronize by looking for the HCI Command Complete event for the HCI_Reset command in the byte stream from Host Controller to Host.

See "Host Controller Interface Functional Specification" on page 517 for HCI commands and HCI events.



Part I:1

BLUETOOTH TEST MODE



This document describes the test mode for hardware and low-level functionality tests of Bluetooth devices. The test mode includes transmitter tests (packets with constant bit patterns) and loop back tests.

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1 GENERAL DESCRIPTION

The test mode supports testing of the Bluetooth transmitter and receiver. It is intended mainly for certification/compliance testing of the radio and baseband layer, and may also be used for regulatory approval or in-production and after-sales testing.

A device in test mode must not support normal operation. For security reasons the test mode is designed such that it offers no benefit to the user. Therefore, no data output or acceptance on a HW or SW interface is allowed.

1.1 TEST SETUP

The setup consists of a device under test (DUT) and a tester. Optionally, additional measurement equipment may be used.

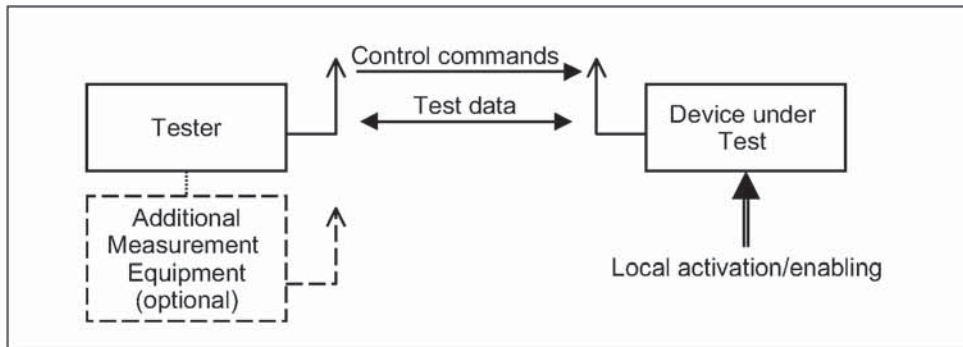


Figure 1.1: Setup for Test Mode

Tester and DUT form a piconet where the tester acts as master and has full control over the test procedure. The DUT acts as slave.

The control is done via the air interface using LMP commands (see Section 3 on page 817 and “Link Manager Protocol” on page 185). Hardware interfaces to the DUT may exist, but are not subject to standardization.

The test mode is a special state of the Bluetooth model. For security and type approval reasons, a device in test mode may not support normal operation. When the DUT leaves the test mode it enters the standby state. After power-off the Bluetooth device must return to standby state.

1.2 ACTIVATION

The activation may be carried out locally (via a HW or SW interface), or using the air interface.

- For activation over the air interface, entering the test mode must be locally enabled for security and type approval reasons. The implementation of this local enabling is not subject to standardization.

The tester sends an LMP command that forces the DUT to enter test mode. The DUT terminates all normal operation before entering the test mode.

The DUT shall return an LMP_Accepted on reception of an activation command. LMP_Not_Accepted shall be returned if the DUT is not locally enabled.

- If the activation is performed locally using a HW or SW interface, the DUT terminates all normal operation before entering the test mode.

Until a connection to the tester exists, the device shall perform page scan and inquiry scan. Extended scan activity is recommended.

1.3 CONTROL

Control and configuration is performed using special LMP commands (see Section 3 on page 817). These commands must be rejected if the Bluetooth device is not in test mode. In this case, an LMP_not_accepted is returned. The DUT shall return an LMP_accepted on reception of a control command when in test mode.

A Bluetooth device in test mode must ignore all LMP commands not related to control of the test mode. LMP commands dealing with power control and the request for LMP features (LMP_features_req) are allowed in test mode; the normal procedures are also used to test the adaptive power control.

The DUT can be commanded to leave the test mode by an LMP_Detach command or by sending an LMP_test_control command with test scenario set to 'exit test mode'.

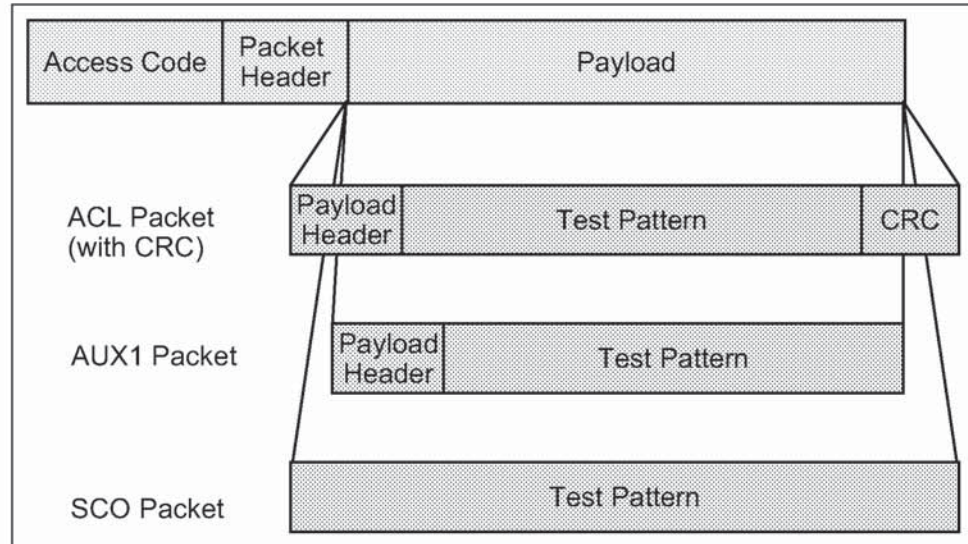


Figure 2.2: General Format of TX Packet

During configuration the tester defines:

- the packet type to be used
- payload length

For the payload length, the restrictions from the baseband specification apply (see "Baseband Specification" on page 33.). In case of ACL packets the payload structure defined in the baseband specification is preserved as well, see Figure 2.2.

For the transmitter test mode, only packets without FEC should be used; i.e. HV3, DH1, DH3, DH5 and AUX1 packets. Support of packet type is only mandatory up to the longest implemented packet type.

In transmitter test mode, the packets exchanged between tester and DUT are not scrambled with the whitening sequence. Whitening is turned off when the DUT has accepted to enter the transmitter test mode, and is turned on when the DUT has accepted to exit the transmitter test mode, see Figure 2.3.¹

1. Note: Implementations must ensure that retransmissions of the LMP_Accepted messages use the same whitening status.

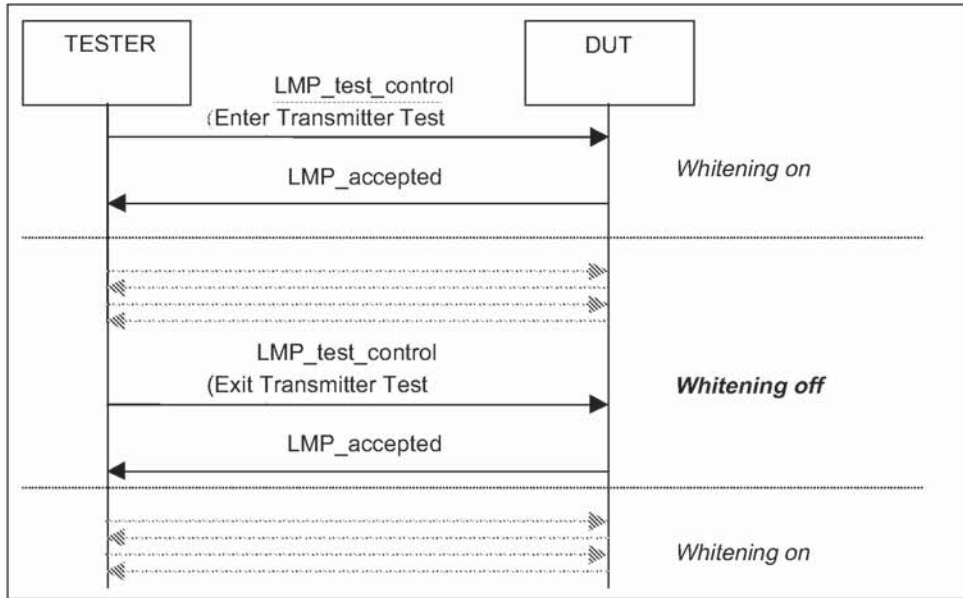


Figure 2.3: Use of whitening in Transmitter mode

2.1.2 Pseudorandom Sequence

In case of pseudorandom bit sequence, the same sequence of bits is used for each transmission (i.e. the packet is repeated, see above). A PRBS-9 Sequence² is used, see [2] and [3].

The properties of this sequence are as follows (see [3]). The sequence may be generated in a nine-stage shift register whose 5th and 9th stage outputs are added in a modulo-two addition stage (see Figure 2.4), and the result is fed back to the input of the first stage. The sequence begins with the first ONE of 9 consecutive ONES; i.e. the shift register is initialized with nine ones.

- Number of shift register stages: 9
- Length of pseudo-random sequence: $2^9 - 1 = 511$ bits
- Longest sequence of zeros: 8 (non-inverted signal)

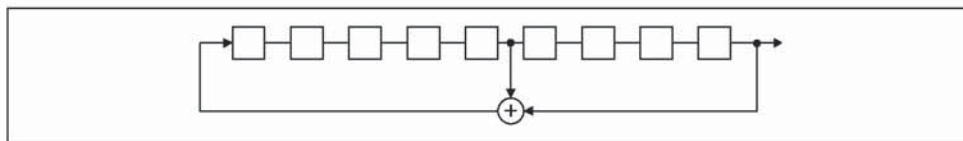


Figure 2.4: Linear Feedback Shift Register for Generation of the PRBS sequence

2. Some uncertainties about Japanese regulatory requirements have been reported. If necessary for regulatory type approval in Japan, some features might be added; e.g. a longer PN sequence.

2.1.3 Reduced Hopping Sequence

To support quick testing of the radio over the complete frequency range, a reduced hopping mode is defined. Implementation of this mode is optional for Bluetooth devices and modules.

Reduced hopping uses only five frequencies, on which a sequential hopping is done (channels 0, 23, 46, 69 and 93 are used³), see Figure 2.5.

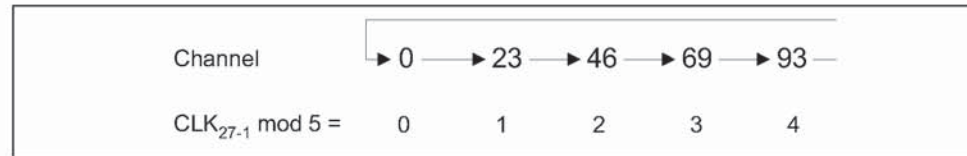


Figure 2.5: Reduced hopping scheme

The timing is based on the Bluetooth clock of the tester. The value of CLK_{27-1} (i.e. not using CLK_0 , representing half slots) modulo 5 is used to determine the transmit frequency.

2.1.4 Control of Transmit Parameters

The following parameters can be set to configure the transmitter test:

1. Bit pattern:
 - Constant zero
 - Constant one
 - Alternating 1010...⁴
 - Alternating 1111 0000 1111 0000...⁴
 - Pseudorandom bit pattern
 - Transmission off
 2. Frequency selection:
 - Single frequency
 - Hopping Europe/USA
 - Hopping Japan
 - Hopping France
 - Hopping Spain
 - Reduced Hopping (implementation in Bluetooth devices and modules is optional)
 3. TX frequency
 - $k \Rightarrow f := (2402 + k)$ MHz
3. The range is chosen to test the whole frequency range, which covers the normal 79 channels, as well as Spanish, French and Japanese hopping schemes. The frequency assignment rule is the same as for the fixed TX frequency: $f = (2402 + k)$ MHz.
4. It is recommended that the sequence starts with a one; but, as this is irrelevant for measurements, it is also allowed to start with a zero.

4. Default poll period in TDD frames ($n * 1.25$ ms)
5. Packet Type
6. Length of Test Sequence (user data of packet definition in Baseband Specification" on page 33.)

2.1.5 Power Control

If adaptive power control is tested, the normal LMP commands will be used. The DUT starts to transmit at the maximum power and reduces/increases its power by one step on every command received.

2.1.6 Switch between different Frequency Settings

A change in the frequency selection becomes effective when the LMP procedure is completed:

The tester switches to a new frequency or hopping pattern after the LMP_Accepted message has been received.

- | The DUT switches after the LMP_accepted message has been sent.

Note: Loss of the LMP_Accepted packet will eventually lead to a loss of frequency synchronization that cannot be recovered. Similar problems occur in normal operation, when the hopping pattern changes.

2.2 LOOPBACK TEST

The device under test receives normal baseband packets. The received packets are decoded in the DUT, and the payload is sent back using the same packet type. The return packet is sent back in either the TX slot directly following the transmission of the tester, or it is delayed and sent back in the slot after the next transmission of the tester (see Figure 2.7 to Figure 2.9 on page 815).

Alternatively, it is possible to implement a delayed loopback instead. Then the return packet is delayed to the following TX slot. There is no signalling to determine or control the mode. The device behavior must be fixed or adjusted by other means, but must not change randomly.

- | The tester can select, whether whitening is on or off. This setting holds for both up- and downlink. For switching the whitening status, the same rules as in Section 2.1 on page 808 (Figure 2.3) apply.

The following rules apply (for illustration see Figure 2.6 on page 814):

- Clearly, if the synch word was not detected, there will be no reply.
- If the header error check (HEC) fails, the DUT replies with a NULL packet with the ARQN bit set to NAK. It is not mandatory to return a NULL packet in this case; the DUT may send nothing.

- If the packet contains an LMP message relating to the control of the test mode this command is executed and the packet is not returned, though ACK or NAK is still returned as usual procedure. Other LMP commands are ignored and no packet is returned.
- The payload FEC is decoded and the payload is coded again for transmission. This allows testing of the FEC handling. If the pure bit error rate shall be determined the tester chooses a packet type without FEC.
- The CRC is evaluated. In case of a failure, the payload is returned with ARQN = NAK. The CRC for the return packet is calculated for the returned payload.
- If the CRC fails the number of bytes as indicated in the (possibly erroneous) payload header shall be looped back.

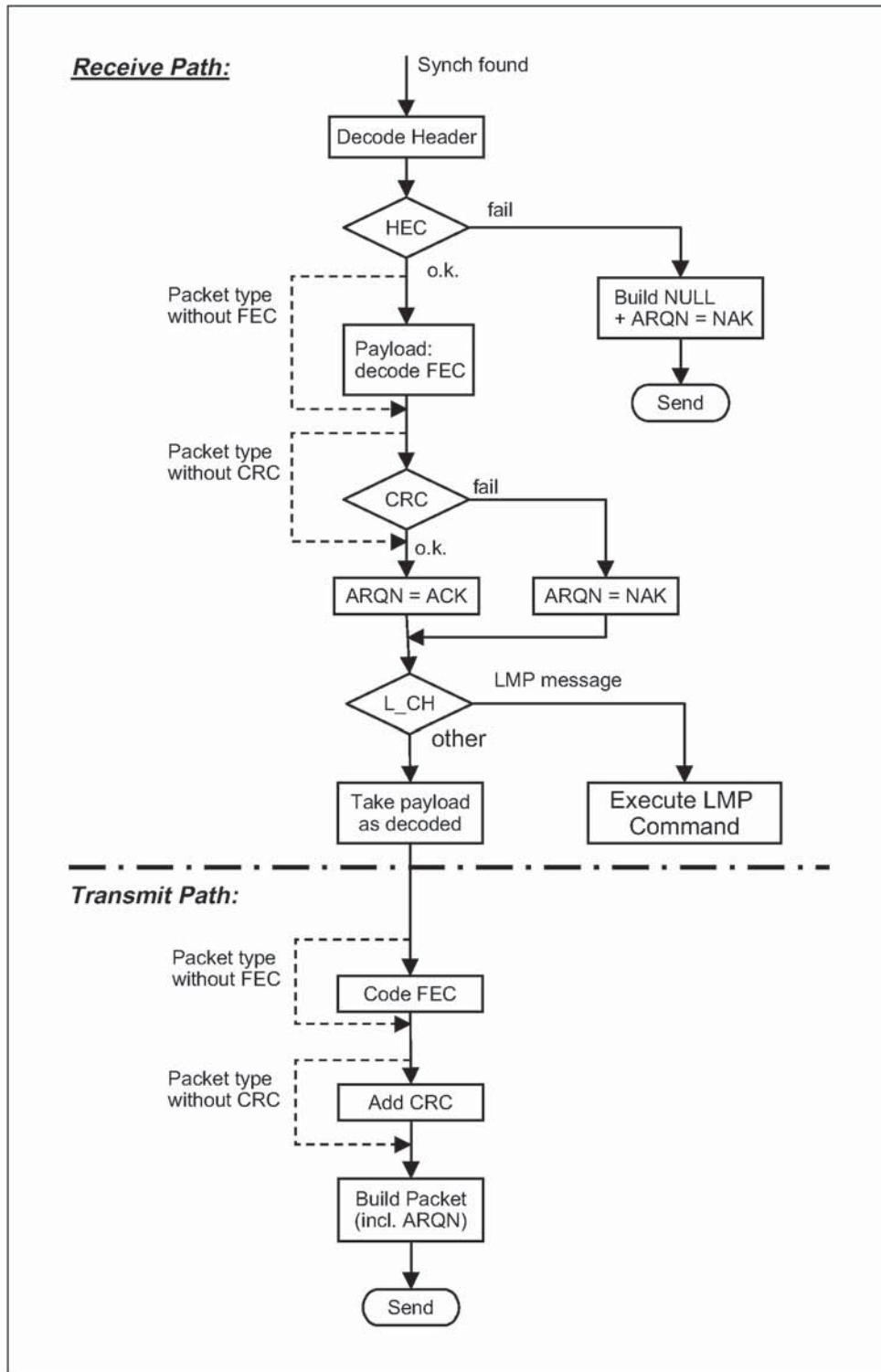


Figure 2.6: DUT Packet Handling in Loop Back Test

The timing for normal and delayed loopback is illustrated in Figure 2.7 to Figure 2.9:

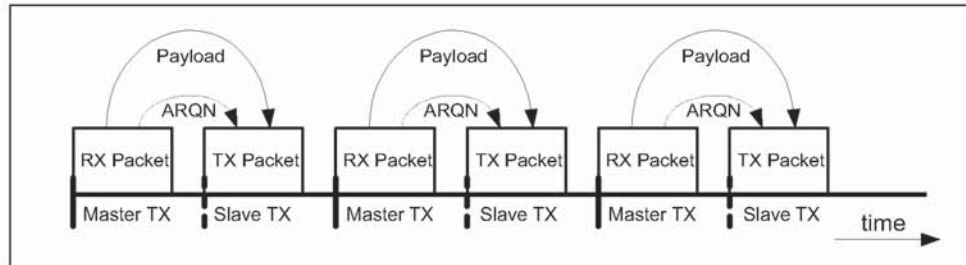


Figure 2.7: Payload & ARQN handling in normal loopback.

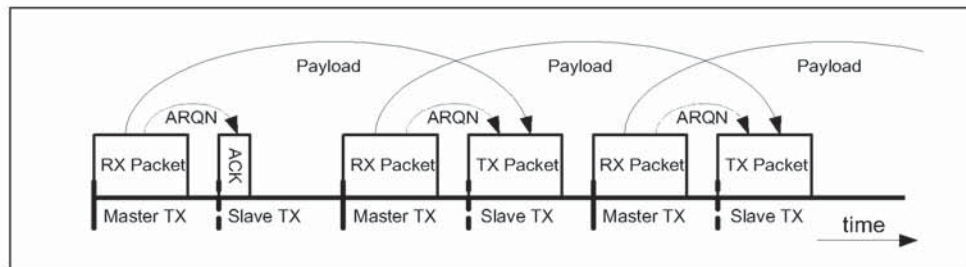


Figure 2.8: Payload & ARQN handling in delayed loopback - start.

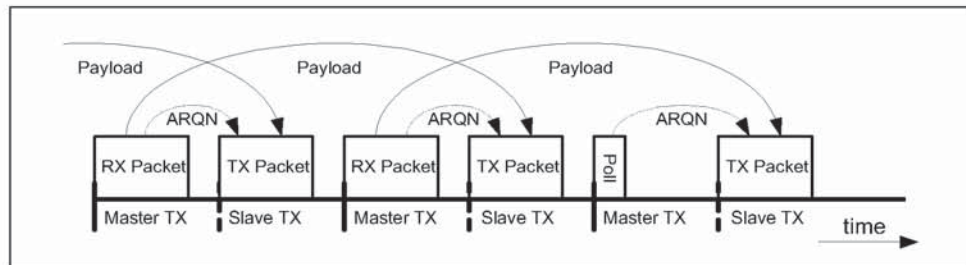


Figure 2.9: Payload & ARQN handling in delayed loopback - end.

The whitening is performed in the same way as it is used in normal active mode.

The following parameters can be set to configure the loop back test:

1. Packet Class⁵
 - ACL Packets
 - SCO Packets
 - ACL Packets without whitening
 - SCO Packets without whitening

5. This is included because, in the future, the packet type numbering may not remain unambiguous.

2. Frequency Selection

- Single frequency (independent for RX and TX)
- Hopping Europe/USA
- Hopping Japan
- Hopping France
- Hopping Spain
- Hopping reduced (optional)

Hopping reduced uses only five frequencies on which a sequential hopping is done on (channel: 0, 23, 46, 69 and 93 is used).

3. Power level: (To be used according radio specification requirements)

- power control or fixed TX power

The switch of the frequency setting is done exactly as for the transmitter test (see Section 2.1.6 on page 812).

3 OUTLINE OF PROPOSED LMP MESSAGES

Table 3.1 lists all LMP messages used for test mode (see Link Manager Protocol, Section 6 on page 237).

LMP PDU	PDU number	Possible Direction	Contents	Position in Payload
LMP_test_activate	56	m → s		
LMP_test_control	57	m → s	test scenario hopping mode TX frequency RX frequency power control mode poll period packet type length of test data	2 3 4 5 6 7 8 9-10
LMP_detach	7	m → s		
LMP_accepted	3	m ← s		
LMP_not_accepted	4	m ← s		

Table 3.1: LMP messages used for Test Mode

Name	Length (bytes)	Type	Unit	Detailed
Test scenario	1	u_int8		0 Pause (TX off) 1 Transmitter test – 0 pattern 2 Transmitter test – 1 pattern 3 Transmitter test – 1010 pattern 4 Pseudorandom bit sequence 5 Closed Loop Back – ACL packets 6 Closed Loop Back – SCO packets 7 ACL Packets without whitening 8 SCO Packets without whitening 9 Transmitter test – 1111 0000 pattern 10–254 reserved 255 Exit Test Mode
Hopping mode	1	u_int8		0 RX/TX on single frequency 1 Hopping Europe/USA 2 Hopping Japan 3 Hopping France 4 Hopping Spain 5 Reduced Hopping (optional) 6–255 reserved
TX frequency (for DUT)	1	u_int8		$f = [2402 + k] \text{ MHz}$

Table 3.2: Parameters used in LMP_Test_Control PDU

Name	Length (bytes)	Type	Unit	Detailed
RX frequency (for DUT)	1	u_int8		f = [2402 + k] MHz
Power control mode	1	u_int8		0 fixed TX output power 1 adaptive power control
Poll period	1	u_int8	1.25 ms	
Packet type	1	u_int8		numbering as in packet header, see Baseband Specification)
length of test sequence (=length of user data in Baseband Specification)	2	u_int16	1 byte	unsigned binary number

Table 3.2: Parameters used in LMP_Test_Control PDU

The control PDU is used for both transmitter and loop back tests. The following restrictions apply for the parameter settings:

Parameter	Restrictions Transmitter Test	Restrictions Loopback Test
TX frequency	$0 \leq k \leq 93$	$0 \leq k \leq 93$
RX frequency	same as TX frequency	$0 \leq k \leq 93$
Poll period		not applicable (set to 0)
Length of test sequence	depends on packet type: DH1: ≤ 28 byte DH3: ≤ 181 byte DH5: ≤ 339 byte AUX1: ≤ 29 Byte HV3: = 30 byte	not applicable (set to 0)

Table 3.3: Restrictions for Parameters used in LMP_Test_Control PDU

4 REFERENCES

- [1] Bluetooth Link Manager Protocol.
- [2] CCITT Recommendation O.153 (1992), Basic parameters for the measurement of error performance at bit rates below the primary rate.
- [3] ITU-T Recommendation O.150 (1996), General requirements for instrumentation for performance measurements on digital transmission equipment.
- [4] Bluetooth Baseband Specification.

Part 1:2

**BLUETOOTH COMPLIANCE
REQUIREMENTS**

This document specifies the requirements for
Bluetooth compliance.



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1 SCOPE

The Bluetooth Promoters and the Bluetooth Adopters have signed the Promoters' Agreement and the Adopters' Agreement respectively. These agreements grant Promoters and Adopters a Bluetooth license for "products which comply with the Specification".

This document specifies the requirements which must be met by a Promoter or Adopter to demonstrate that a particular product does "comply with the Specification", thereby qualifying that particular product to be subject to the rights extended by the Promoters' and Adopters' Agreements respectively.

The Bluetooth Qualification Program is the process by which a Promoter or an Adopter demonstrates that a particular product meets the requirements specified herein. This document provides an overview of the requirements and the Bluetooth Qualification Program. Further details are available through the Bluetooth Web site.

Regulatory requirements and governmental type approval requirements are outside the scope of this document.

2 TERMS USED

Bluetooth Trademark – As defined in the Promoters' Agreement and the Adopters' Agreement.

Bluetooth Brand – Covers all the brand elements specified in the "The Bluetooth Brand Book". Equal to the Bluetooth Trademark.

Bluetooth Logo or Logo – the brand element referred to as the 'figure mark' in the 'The Bluetooth Brand Book'.

Bluetooth License – all the rights, defined in the Promoters' and Adopters' Agreements respectively, that are granted by compliance with the specification, i.e. the Bluetooth Patent License and the Bluetooth Brand License.

Bluetooth Patent License – the applicable parts of the Bluetooth license consisting of patent rights or parts thereof as defined in the Promoters' and Adopters' Agreements respectively.

Bluetooth Brand License – the applicable parts of the Bluetooth license consisting of trademark rights as defined in the Promoters' and Adopters' Agreements respectively.

Protocol specification – defines the communication between two peer devices at a certain layer.

Profile specification – defines the usage of (parts of) the protocol stack for a certain Bluetooth usage model.

Bluetooth qualification process – the rules and procedures by which the manufacturer demonstrates compliance to the Bluetooth specification.

Bluetooth qualification program – the implementation of the Bluetooth qualification process.

Bluetooth Qualification Review Board (BQRB) – responsible for managing, reviewing and improving the Bluetooth qualification program. The original Bluetooth SIG companies will appoint BQRB initial members.

Bluetooth Qualification Test Facility (BQTF) – a test facility that is officially authorized by BQRB to test Bluetooth products.

Bluetooth Qualification Body (BQB) – a specific person authorized by the BQRB to be responsible for checking declarations and documents against requirements, reviewing product test reports, and listing products on the official database of Bluetooth qualified products.

Bluetooth Qualification Administrator (BQA) – a person responsible for administering the Bluetooth Qualification Program on behalf of BQRB.

Implementation Conformance Statement (ICS) – a document that the manufacturer attaches to the product when submitting it for qualification. It specifies all the implemented Bluetooth capabilities in detail.

Bluetooth Fellow Adopter – equal to Bluetooth Promoters + Bluetooth Adopters.

3 LEGAL ASPECTS

Rules and guidelines on how to use the Bluetooth Brand elements are stated in the document "The Bluetooth Brand Book" which is available on the Bluetooth Web site.

The Bluetooth Specification has been created, according to our best knowledge, to meet regulatory requirements worldwide. Regulatory certification as such is not a part of the Bluetooth qualification requirements, yet it is a requirement in all markets. It is the sole responsibility of each manufacturer to ensure that their products have all necessary regulatory approvals for the markets where their product(s) are intended to be sold or used.

A product must complete Bluetooth Qualification to meet the requirements for "complying with the Specification". The Bluetooth license granted by the Promoters' and Adopters' Agreements respectively is valid only for qualified products and is not transferable to other products.

In this document, the 'Bluetooth license' is sometimes divided into the 'Bluetooth patent license' and the 'Bluetooth brand license' for practical reasons. These terms correspond, respectively, to the terms 'necessary claims' and 'trademark' in the Promoters' and Adopters' Agreements respectively.

Sanctions will be invoked against any company responsible for producing or trading (a) products containing elements of the Bluetooth Interface, as defined in the Bluetooth Promoters' Agreement and Adopters' Agreement respectively, that do not comply with the Specification, or (b) products containing elements of the Bluetooth Interface that have not completed Bluetooth Qualification.

The Bluetooth SIG reserves the right to define a process for adding new Bluetooth profiles after the release of the Specification 1.0.

A Bluetooth brand license is granted by Ericsson to all Fellow Adopters for the use of the trademark in connection with products complying with the Specification.

Ericsson further provides Fellow Adopters a limited indemnity for costs and expenses incurred by the Fellow Adopter based upon the use of the trade mark within countries where Ericsson has registered the trademark. Ericsson does not take upon itself any liability regarding product, whether such liability is based on damages caused by the product for persons or property, or defects in the product itself.

4 THE VALUE OF THE BLUETOOTH BRAND

The purpose of this document is to define the requirements for Bluetooth compliance. This has been done while bearing the basic Bluetooth philosophy in mind:

“Wireless Connections Made Easy”

Examples of important end-user experiences are:

- Reliable high-quality radio links,
- Interoperability between products of any brands,
- Easily understood product capabilities.

A reliable radio link experience depends upon all products demonstrating compliance with the Bluetooth radio link performance specifications. Interoperability is achieved by protocol and profile implementation conformance. Ease of use depends upon clear, consistent documentation of Bluetooth capabilities in product literature. All these elements are addressed in the requirements for Bluetooth compliance.

5 THE BLUETOOTH QUALIFICATION PROGRAM

This paragraph specifies the framework of the Bluetooth qualification program that a Bluetooth qualification applicant must perform. When completed, the full Bluetooth qualification program will be published at the Bluetooth web site.

The Bluetooth qualification program ('Program') establishes the rules and procedures by which the manufacturer demonstrates compliance to the Bluetooth specifications, and the process by which the Bluetooth license may be used by product manufacturers and distributors.

The Program defines the following entities:

- *Bluetooth Qualification Review Board (BQRB)* – responsible for managing, reviewing and improving the Bluetooth qualification program. The original Bluetooth SIG companies will appoint BQRB initial members.
- *Bluetooth Qualification Administrator (BQA)* – responsible for administering the Bluetooth Qualification Program on behalf of BQRB.
- *Bluetooth Qualification Test Facility (BQTF)* – a test facility that is officially authorized by BQRB to test Bluetooth products.
- *Bluetooth Qualification Body (BQB)* – a specific person authorized by the BQRB to be responsible for checking declarations and documents against requirements, reviewing product test reports, and listing products on the official database of Bluetooth qualified products.

Functions and relationships are illustrated in Figure 5.1.

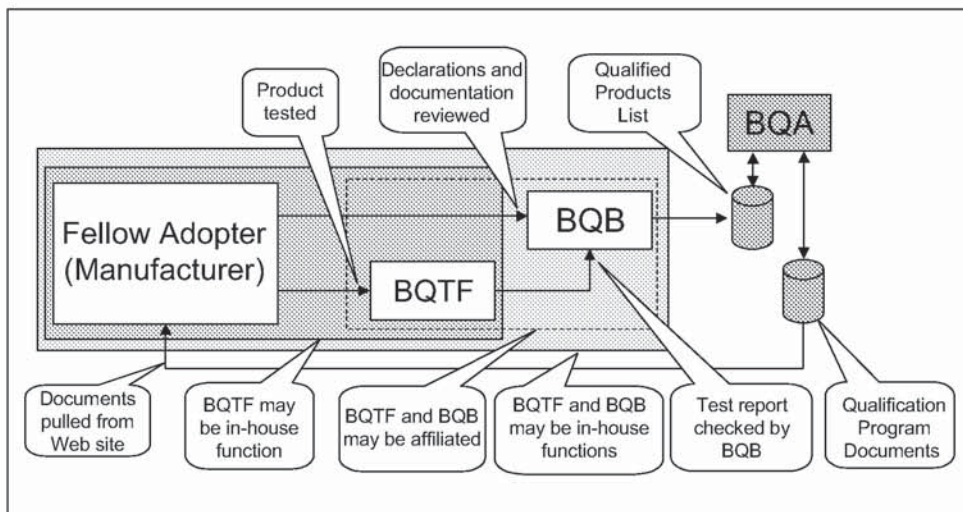


Figure 5.1: Bluetooth Qualification Process

Summary of the Qualification process:

1. The Fellow Adopter submits the product for Bluetooth qualification to a BQTF. The manufacturer must add temporary interfaces and/or functionality so that all implemented Bluetooth capabilities can be tested. The BQTF is not responsible for providing any secondary systems such as a LAN, PSTN or GSM network to facilitate the testing. Necessary documentation shall be provided; e.g. product description, user's manual and the Implementation Conformance Statement (a template for this document will be available at the Bluetooth web site). The BQTF tests each Bluetooth feature declared in the Implementation Conformance Statement according to the current Test Specification and BQRB policies and prepares a test report.
2. The test results and product documentation are then sent to the BQB. The Fellow Adopter sends an application to the BQB requesting that the product be listed as 'Bluetooth Qualified'. The application shall contain –
 - a) Precise product description, and
 - b) Declaration of Compliance with the Bluetooth Specification (including this entire document) and the Bluetooth Brand Book, signed by a duly authorized official of the Fellow Adopter.
3. When the application is complete, the BQB issues a Qualified Product notice and (with the applicant's permission) lists the product on the official Bluetooth Qualified products databases which can be viewed by all Fellow Adopters.

The BQTF may either be a third-party test house or an internal function of the applying Fellow Adopter. Also the BQB can be either internal or external. Both the BQTF and the BQB must always be authorized by the BQRB.

It is the responsibility of the manufacturer to establish any necessary non-disclosure agreements with BQTF, BQB and (if required) BQA. In the event the BQB cannot determine compliance the BQB may, with the applicant's permission, submit information to the BQA for a ruling. In the event the BQRB must be consulted, the applicant will be requested to prepare a submission according to BQRB guidelines.

The Fellow Adopter will be invoiced directly from BQTF and BQB for their respective services and expenses. The BQRB will also charge a fee to finance the administration associated with the Qualification program. Initially, this fee will be \$3000 per listed product. It will subsequently be adjusted once per year, to reflect the actual cost.

6 BLUETOOTH LICENSE REQUIREMENTS FOR PRODUCTS

This section summarizes the product requirements that must be met to complete a Bluetooth Qualification.

The product requirements are divided into:

- Bluetooth radio link requirements
- Bluetooth protocol requirements
- Bluetooth profile requirements
- Bluetooth information requirements

6.1 BLUETOOTH RADIO LINK REQUIREMENTS

6.1.1 Requirement description

The Bluetooth radio link shall meet certain minimum requirements, which are documented in the Test Specification. This is to establish and maintain the Bluetooth technology as the preferred choice for wireless short-range links. The Test Specification for the Bluetooth radio link requirements will be based on the Bluetooth specification Part A (Radio specification).

6.1.2 Qualification

The BQRB will issue a list of BQTFs that are allowed to qualify products against the Bluetooth performance requirements.

6.2 BLUETOOTH PROTOCOL REQUIREMENTS

The implementation of the lower layers of the Bluetooth protocol stack shall meet certain minimum requirements, which are documented in the Test Specification. In order to verify that these requirements are met, individual testing of these protocols will be performed. The verification will be done by accessing the upper interface of these protocols through the Bluetooth Test Control Interface, TCI. How this test control interface will be used during verification is described in the Test Specification.

The Test Specification for the Bluetooth protocol requirements will be based on the Bluetooth specification Part B, C, D and H (Base band, Link Manager, Logical Link Control and Adaptation and, if applicable, the Host Controller Interface).

6.2.1 Qualification

The BQRB will issue a list of BQTFs that are allowed to qualify products against the Bluetooth protocol requirements.

The manufacturer is allowed to modify both the HW and SW of the product, to make it possible to perform the protocol tests. If this is done, the manufacturer must guarantee that an identical implementation of Bluetooth specification Part B, C, D and H (Base band, Link Manager, Logical Link Control and Adaptation and, if applicable, the Host Controller Interface) is used in the real product.

6.3 BLUETOOTH PROFILE REQUIREMENTS

6.3.1 Requirement description

The Bluetooth products shall meet certain minimum Bluetooth profile requirements which, for each profile, is defined in the Test Specification. This is to ensure that the end user can benefit from interoperability between different products and brands. The Test Specification for the Bluetooth profile requirements will be based on the Bluetooth specification Part K (Profile specifications).

The following general Bluetooth profile requirements must always be met:

- The “Generic Access” profile must be complied with.
- All implemented Bluetooth services must be described in the “Implementation Conformance Statement”.
- All Bluetooth profiles declared in the “Implementation Conformance Statement” must be implemented according to each profile specification.
- All mandatory features of a Bluetooth profile role shall be implemented. All implemented optional Bluetooth features of a profile role shall be implemented according to the profile specification.
- If a service, for which there exists a Bluetooth profile, shall be implemented, it must be done according to that profile. It is permitted to make improvements or add features to a profile, as long as interoperability is maintained with other products that have implemented the standard profile as described in the previous paragraph. Improvements or new features can only be activated after proper negotiation between two Bluetooth devices.

Notification: A Fellow Adopter that wants to implement a new service, for which there is no sufficient standardized Bluetooth profile specification available, is allowed to do so. However, this new service must never be referred to in a way that it could mistakenly be interpreted as being a standard Bluetooth profile and part of the Bluetooth specification. The manufacturer must inform the market as well as the end user in a clear and consistent way about these limitations in general interoperability.

6.3.2 Qualification

The BQRB will issue a list of BQTF that are allowed to qualify products against the Bluetooth profile requirements.

6.4 BLUETOOTH INFORMATION REQUIREMENTS

6.4.1 Requirement description

The manufacturer shall inform the market and end users in a clear and consistent way about the implemented Bluetooth capabilities.

6.4.2 Qualification

The product will be qualified against the Bluetooth information requirements.

6.5 REQUIREMENTS ON BLUETOOTH ACCESSORY PRODUCTS

6.5.1 Definition of ‘Bluetooth accessory products’

A Bluetooth accessory product is defined as “A product marketed to the end user, containing at least the hardware for the Bluetooth radio and baseband, yet not being a stand-alone Bluetooth product. After being installed in a host system, the product acts like a complete Bluetooth product.” Examples of Bluetooth accessory products: PC-Cards, serial port dongles, USB dongles.

Bluetooth accessory products must also pass through the complete Bluetooth qualification process. To facilitate testing, the Bluetooth accessory product and the provided Bluetooth SW will be installed in a host device that is provided by the manufacturer.

6.5.2 Qualification

Same as in Section 6.1 - Section 6.4 above.

6.6 REQUIREMENTS ON BLUETOOTH COMPONENTS

6.6.1 Definition of “Bluetooth components”

A Bluetooth component is defined as “A component product designed and marketed for the enabling of a complete Bluetooth product, which component product containing at least a subset of an existing Bluetooth Profile (see Section 6.3 on page 833), yet not being able to function as a complete Bluetooth product”. For example, a Bluetooth component might be a complete module designed for integration on a PC board, or an integrated circuit implementing all Bluetooth baseband and protocol functions.

A Bluetooth component is typically purchased and integrated by an original equipment manufacturer (OEM) into a product designed for sale to an end user.

A Bluetooth component manufacturer will typically obtain a limited Bluetooth License enabling the manufacturer to identify the component's Bluetooth capabilities. A component manufacturer may also wish to minimize their OEM customer's qualification testing requirements through one-time qualification testing of a reference design based on the component. Qualifying a component is not necessary as long as the final product is qualified. The possibility has been created only to ease the marketing of Bluetooth components.

6.6.2 Requirement description

Bluetooth components must pass through the complete Bluetooth qualification process in a reference design configuration documented in an application note.

Bluetooth products incorporating a limitedly licensed Bluetooth component must also pass through the complete Bluetooth qualification process. However, certain tests may be waived if so indicated in the limited Bluetooth License valid for the component.

A component's limited Bluetooth License identifies specific qualification tests that may be considered pre-qualified by an OEM manufacturer using the component in an end-user product. Those specific qualification tests are identified by the BQTF, which performs qualification testing of the Bluetooth component in its reference design. BQTF identifies those tests based on the unique design characteristics of the component in consultation with the manufacturer.

6.6.3 Qualification

A product which includes an integrated Bluetooth component must be qualified as described in Section 6.1 - Section 6.4 above, possibly with some of the tests waived if so indicated in the limited Bluetooth License valid for the component.

7 BLUETOOTH LICENSE PROVISIONS FOR EARLY PRODUCTS

The process and conditions for qualifying early products (that may contain reasonable deviations from the Bluetooth specification) will be defined and published on the Bluetooth web site.

8 BLUETOOTH BRAND LICENSE PROVISIONS FOR SPECIAL PRODUCTS & MARKETING

This section defines the requirements for using the Bluetooth Brand elements for special products and marketing.

8.1 BLUETOOTH DEVELOPMENT TOOLS AND DEMOS

8.1.1 Definition of 'Bluetooth Development tools and demos'

Bluetooth Development tools and demos are products intended either for developing commercial Bluetooth products or for demonstrating the Bluetooth technology in a certain application. Neither one may be sold to ordinary consumers.

8.1.2 Requirement description

The manufacturer and/or seller of these products shall clearly inform the targeted audience/customer that the products are for development and/or demonstration purpose only, and that they have not been qualified to the Bluetooth specification.

8.1.3 Qualification

Qualification testing by a BQTF is not required. Qualification is based upon the applicant's declaration of compliance with the Specification and Brand Book.

8.2 MARKETING

The Bluetooth Brand elements may be used for general marketing and product announcements. The rules of the Bluetooth Brand Book must be followed.

If the Bluetooth Brand is used on a give-away item, where it is not obvious to everyone that the product doesn't contain a Bluetooth radio, then a clear disclaimer has to be displayed on the product (e.g. a give-away calculator with the Bluetooth brand must have a visible disclaimer since the idea of calculators with in-built Bluetooth actually makes sense).

9 RECOMMENDATIONS CONCERNING INFORMATION ABOUT A PRODUCT'S BLUETOOTH CAPABILITIES

In addition to the requirements set forth in the Brand Book, it is recommended that at least the following pieces of information are provided for the market and the end-user:

- The Bluetooth capabilities of the product should be stated, at least in brief, on the product box.
- The user's manual (or corresponding information) should contain a section where all the Bluetooth capabilities are described. A list of qualified standard profiles using the profile names listed in Appendix B should be contained. If applicable, revision numbers of the implemented profiles shall be included. For early products a list of interoperable products instead of profiles should be contained.

Important places for end-user information are user's manuals (user guides), leaflets, boxes and other advertisement material.

An example of information in a user's manual can be found in Appendix A on page 840.

It is important that new profiles, not sanctioned by the Bluetooth SIG, cannot be mistaken for profiles contained in the Bluetooth specification. In case of new profiles it is important that the manufacturer inform the market and the end user about what other *products* that interoperability can be expected with.

10 QUALITY MANAGEMENT, CONFIGURATION MANAGEMENT AND VERSION CONTROL

Each manufacturer is responsible for keeping a high quality level when mass-producing an approved product. Products that are put on the market shall meet the requirements for which the product has been qualified.

A Bluetooth Qualification covers specific product hardware and software versions. The product's manufacturer is responsible for ensuring that all production units perform identically to the qualified version, by maintaining appropriate quality management and configuration management programs.

Major hardware or software modifications related to the Bluetooth part of a qualified product, shall be documented and submitted to the BQB for review. Based on the manufacturer's representations, the BQB may certify that the product requires no further testing and allow the license to be updated to include the new version. In other cases, the BQB may identify a limited subset of tests that must be performed by a BQTF to qualify the new version.

Addition of Bluetooth capabilities requires a new qualification of the product.



11 APPENDIX A – EXAMPLE OF A “BLUETOOTH CAPABILITY STATEMENT”

This is an example of a Bluetooth Capability Statement in a User’s Manual.

.....

Bluetooth Capability Statement

This product is manufactured to meet the Bluetooth Specification 1.0. The following Bluetooth functions are supported:

- Service Discovery
- Cordless Telephony
- Local Telephony
- Headset

.....

The profiles normally use roles. In most cases it is obvious which role a certain product has implemented. Where doubt or misunderstanding could arise, the implemented role shall be explicitly stated after the profile name.

12 APPENDIX B - MARKETING NAMES OF BLUETOOTH PROFILES

Bluetooth uses profiles to ensure interoperability between products and brands. The profile specifications are technical documents. In the marketing communication it is strongly recommended to use the names listed in Table 12.1.

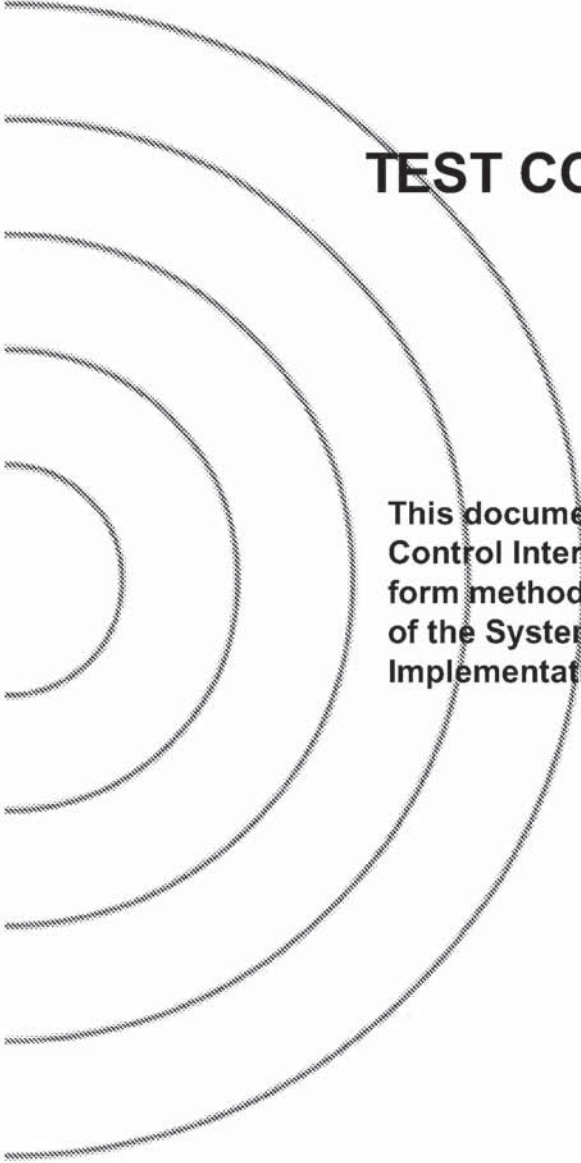
Profile name	Marketing name	Comments
Generic Access	Generic Access	Mandatory
Service Discovery	Service Discovery	
Cordless Telephony	Cordless Telephony	
Intercom	Local Telephony	
Headset	Headset	
Speaker phone	Speakerphone	
Dial-up networking	Modem	
Fax	Fax	
LAN Access	Network access point	
Conferencing	Conferencing	
Serial port	Serial port	
Generic Object Exchange	Object Exchange	
Object Push	Object push	
File Transfer and Browsing	Data sharing	
Synchronization	Synchronization	

Table 12.1: Marketing names for Bluetooth profiles



Part I:3

TEST CONTROL INTERFACE



This document describes the Bluetooth Test Control Interface (TCI). The TCI provides a uniform method of accessing the upper interface of the System Under Test (SUT) and/or the Implementation Under Test (IUT).

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1 INTRODUCTION

1.1 TERMS USED

IUT = Implementation Under Test: An implementation of one or more OSI protocols in an adjacent user/provider relationship, being that part of a real open system which is to be studied by testing.

This term will be used when describing the test concept for Bluetooth accessory products and Bluetooth components. The definition of Bluetooth accessory products and Bluetooth components can be found in Part I:2 / Section 6.5.1 on page 834 and in Part I:2 / Section 6.6.1 on page 834.

SUT = System Under Test: The real open system in which the IUT resides. This term will be used when describing the test concept for Bluetooth products.

TCI = Test Control Interface: The interface and protocol used by the tester to send and receive commands and messages to and from the upper interface of the SUT/IUT.

1.2 THE NEEDS FOR A UNIFIED TEST INTERFACE

For all Bluetooth accessory products, Bluetooth components and Bluetooth products, protocol testing will be used to verify the implemented functionality in the lowest layers; i.e. conformance testing.

For this type of testing, an upper tester (UT) will be required to completely test the implementation.

In order to shield the tester from having to adopt to each and every implementation of IUTs or SUTs, the use of a standardized control interface is mandated. This concept puts some extra burden upon the manufacturer of the IUT/SUT. The manufacturer must:

- adopt the implementation-dependent interface to the TCI
- supply, with the IUT, the adapter needed (can be HW, SW or FW)

1.3 USAGE OF THE INTERFACE

The Bluetooth Test Control Interface, TCI, will be used when verifying the Bluetooth protocol requirements for a Bluetooth accessory product, Bluetooth component or a Bluetooth product. More specifically, the TCI will be used when verifying implemented functionality of the:

- Baseband layer, BB (the protocol-related part)
- Link Manager Protocol, LMP
- Logical Link Control and Adaptation Protocol, L2CAP

and, if support of the HCI is claimed by the manufacturer:

- Host Control Interface, HCI

2 GENERAL DESCRIPTION

The interface used between the tester and the SUT/IUT will be either of two types:

1. TCI-HCI
This interface is semantically and syntactically identical to the HCI interface described in "Part H:1" on page 517.
2. TCI-L2CAP
This interface is based on the HCI interface, and will be used during verification of the L2CAP layer of the SUT/IUT.

The proposed physical bearer is one of the transport layers specified for the HCI: USB, RS232 or UART, see "Part H:2" on page 759, "Part H:3" on page 775 or "Part H:4" on page 795. However, alternatives do exist. More details will be given in the following sections.

2.1 BASEBAND AND LINK MANAGEMENT VERIFICATION

For the verification of the link control part of the Baseband layer and for the Link Manager layer, the TCI-HCI interface will be used as the interface between the test system and the upper interface of the SUT/IUT. The test system accesses the upper interface of the SUT/IUT by sending HCI commands and receiving HCI events from the SUT/IUT as described in the "Host Controller Interface Functional Specification" on page 517. The supported functionality on the TCI-HCI interface depends on the implemented functionality of the BB and LM layers.

The transport bearer used between the tester and the SUT/IUT can be of either of two types:

1. A physical bearer of one of the types USB, RS232 or UART, as defined in Part H:2, Part H:3 or Part H:4. It is recommended to use one of these three physical bearers as transport bearer between the SUT/IUT and the test system.
2. A 'software' transfer bearer; i.e. there is no physical connection between the tester and the SUT/IUT. In this case, the manufacturer of the SUT/IUT must supply, when sending in the device for testing, a test software that can be operated by a test operator. The operator will receive instructions from the tester and will execute them on the SUT/IUT. The software must support the same functionality as if using the TCI-HCI with a physical bearer. Use of the 'software' interface must be agreed upon between the manufacturer of the SUT/IUT and the test facility that will perform the verification. The test facilities can themselves specify requirements placed on such an interface.

A schematic example is shown in Figure 2.1 of a possible test configuration for BB and LM verification of Bluetooth products which do not support HCI, and which use a physical transport bearer for the TCI-HCI interface. In this figure,

the TC (Test Control) Software represents what the manufacturer has to supply with the SUT/IUT when sending it in for verification. The functionality of the TC software is to adapt the implementation-dependent interface to the TCI-HCI interface.

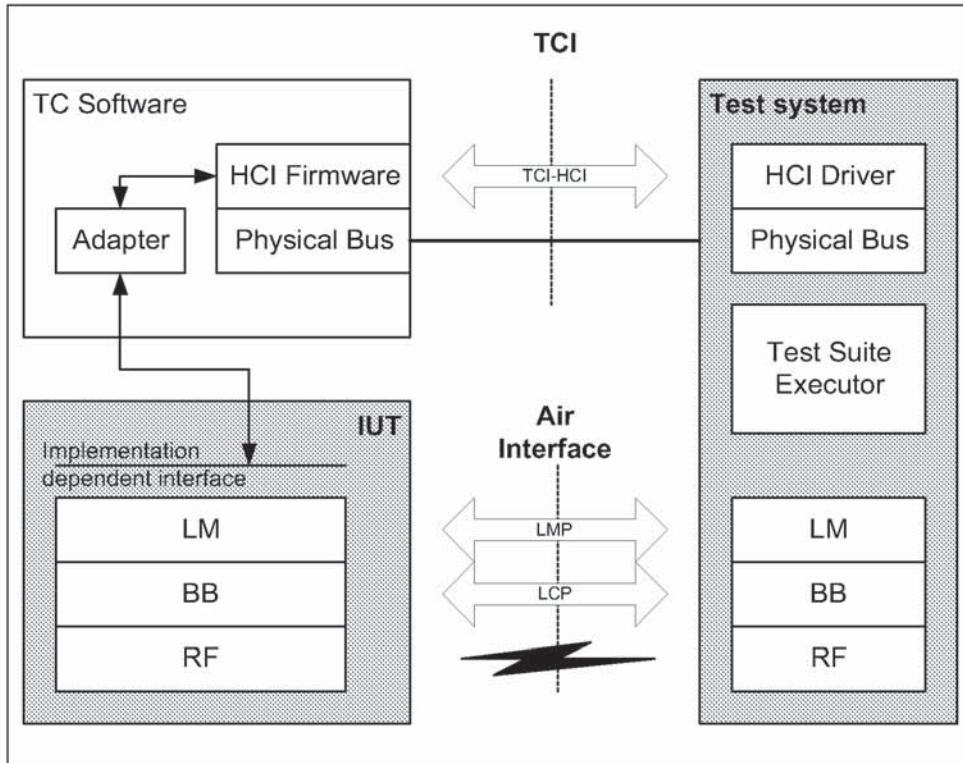


Figure 2.1: Baseband and LM verification without HCI – physical transport bearer

Figure 2.2 shows a schematic example of the test configuration for the same Bluetooth product using a 'software' transfer bearer for the TCI-HCI interface. Here, the role of the TC Software is to represent the application that can be controlled by the test operator.

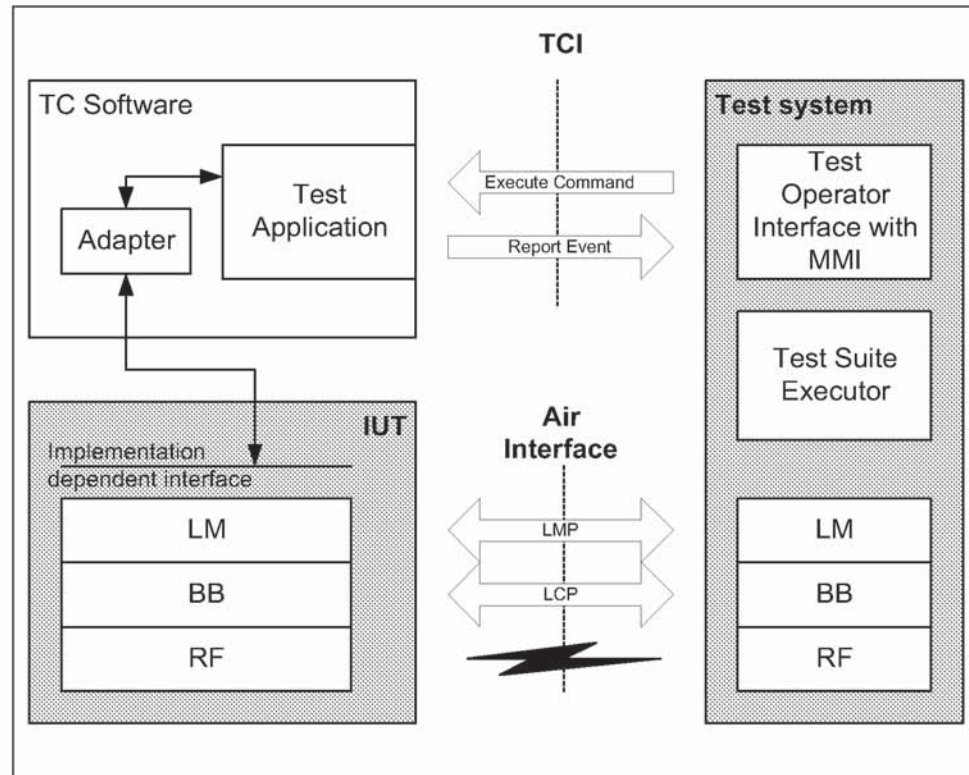


Figure 2.2: Baseband and LM verification without HCI – software transport bearer

2.2 HCI VERIFICATION

The TCI-HCI interface may also be used for HCI signalling verification. The HCI signalling will only be verified if support of the HCI functionality is claimed by the manufacturer.

The transport bearer between the tester and the SUT/IUT shall be one of the types USB, RS232, or UART, as defined in Part H:2, Part H:3 or Part H:4.

A schematic example is shown in Figure 2.3 of one possible test configuration for HCI verification of Bluetooth products, using a physical transport bearer for the TCI-HCI interface. As can be seen from the figure, no extra test control software is needed. Instead, the implemented HCI will be used as the interface to the tester.

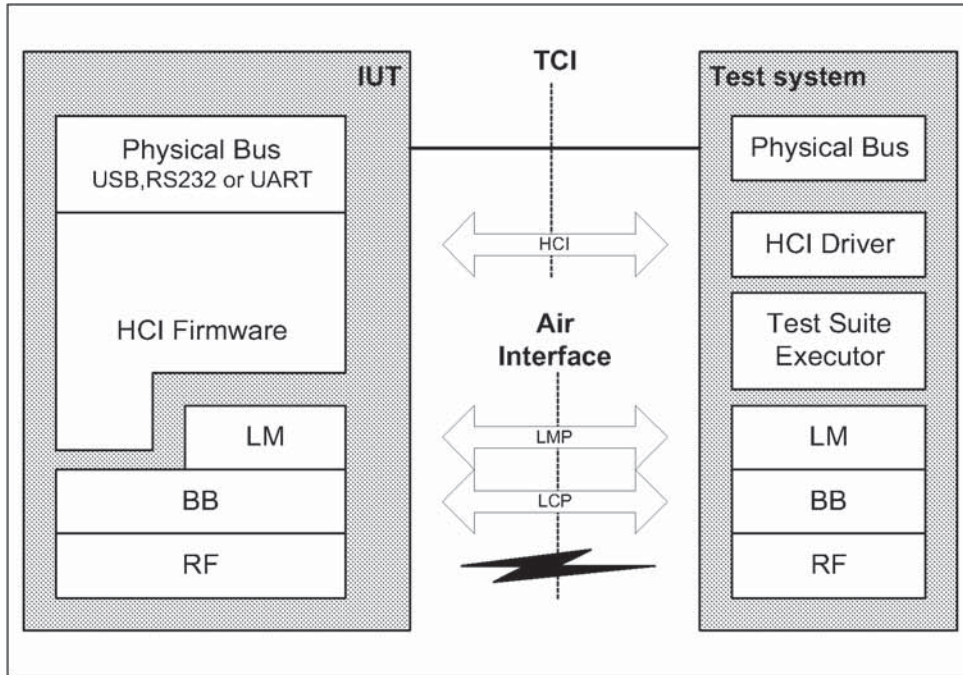


Figure 2.3: HCI verification

2.3 L2CAP VERIFICATION

The TCI-L2CAP interface is based on the HCI and will be used during verification of the L2CAP layer of the SUT/IUT. It uses the general event and command syntax as specified in Part H:1, and the mapping to transport layers is also identical to the ones defined in Part H:2, Part H:3 or Part H:4. Commands and events are defined according to the specified L2CAP service interface. See Part D / Section 7 on page 295.

The defined service primitives in the Logical Link and Control Layer specification, Part D / Section 7 on page 295, will be used as reference. However, the primitives for L2CAP events and commands must be converted into messages of the same format as used for the HCI events and commands. The mapping of the L2CAP events and commands to HCI format is described in Section 4 of this document.

A schematic example is shown in Figure 2.4. of how the test configuration can look for L2CAP verification of Bluetooth products, using a physical transport bearer for the TCI-L2CAP interface. In this figure, the TC (Test Control) Software represents what the manufacturer has to supply with the SUT/IUT when sending it in for verification. The functionality of the TC software is to adapt the implementation-dependent interface to the TCI-L2CAP interface.

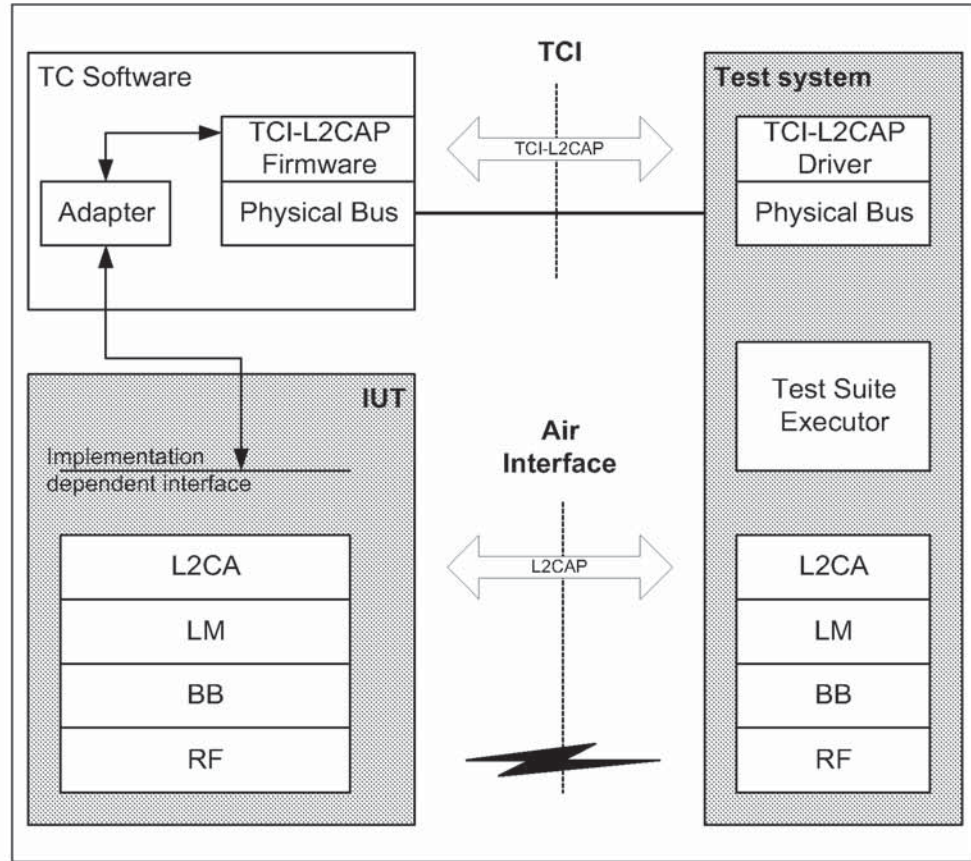


Figure 2.4: L2CAP verification

3 TEST CONFIGURATIONS

This section describes the test configurations that will be used when verifying the different Bluetooth requirements.

3.1 BLUETOOTH RF LINK REQUIREMENTS

For the verification of the Bluetooth RF Link requirements, the defined test mode will be used, see "Part I:1" on page 803.

The Test Specification for the Bluetooth radio link requirements will be based on the Bluetooth specification Parts A and B, and will contain the relevant test instructions that should be carried out on the SUT/IUT.

3.1.1 Required Interface(s)

For this type of verification, only the air interface is required. See Figure 3.1. As stated in Part I:1 / Section 1.2 on page 807, for security reasons, the test mode must be locally enabled. The implementation of this local enabling is not subject to standardization.

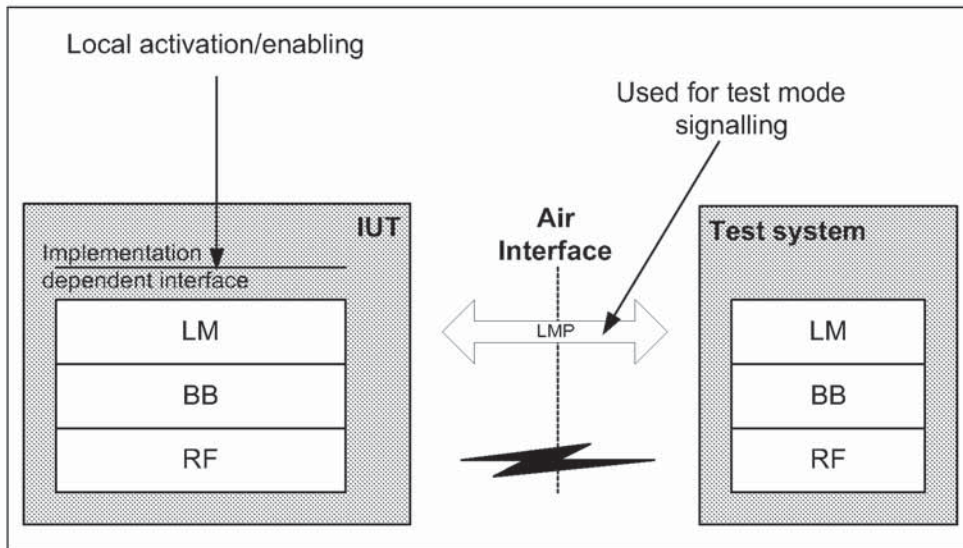


Figure 3.1: Test Configuration for RF link requirement verification

3.2 BLUETOOTH PROTOCOL REQUIREMENTS

Dependent on which Bluetooth layers BB, LM, HCI or L2CAP are implemented in the product sent in for verification, the amount of testing needed to verify the Bluetooth protocol requirements will differ. Also, the TCI used during the verification may be different.

The Test Specification for the Bluetooth protocol requirements will be based on the Bluetooth specification Part A to Part D and Part H, if applicable, and will contain the relevant test instructions that should be carried out on the SUT/IUT.

3.2.1 Required Interface(s)

For this type of verification, both the air interface of the SUT/IUT and the test control interface are required. The latter will be one of the types described in section 2.

3.3 BLUETOOTH PROFILE REQUIREMENTS

For each profile the Bluetooth product claims to conform to, profile testing will be performed to verify the Bluetooth profile requirements in order to ensure interoperability between products; i.e. interoperability testing.

The Test Specification for the Bluetooth profile requirements will be based on the Bluetooth specification Part K Volume 2, and will contain the relevant test instructions that should be carried out on the SUT.

3.3.1 Required Interface(s)

For this type of verification, both the air interface of the SUT and the supported MMI, as described in the profile, will be used during verification, see Figure 3.2.

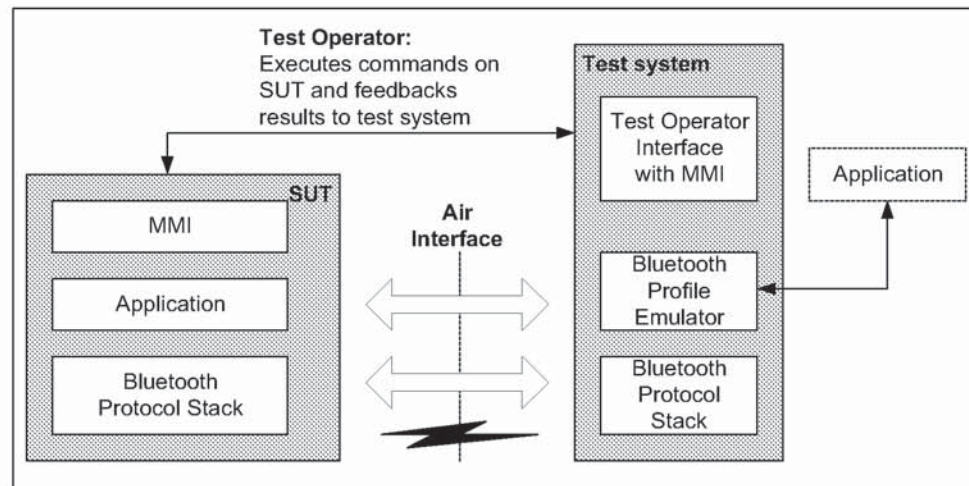


Figure 3.2: Test Configuration for Profile requirement verification

4 TCI-L2CAP SPECIFICATION

Note: This specification maps the L2CAP service interface to an appropriate TCI. This section is based on the 0.95b version of the L2CAP specification.

4.1 EVENTS

In the L2CAP service interface, indications are mapped to callback functions. The corresponding response parameters are submitted in the return parameter of these functions. For the TCI, the indications are mapped to events and the responses to commands.

A single event code is reserved for testing purposes: 0xFE. To distinguish the L2CAP events, a parameter 'Event_ID' is submitted as first parameter. This parameter is a single octet, resulting in 256 possible events. The assignment is given in Table 4.1.

Event_ID	L2CAP event
0x00	Reserved
0x01	L2CA_ConnectInd
0x02	L2CA_ConfigInd
0x03	L2CA_DisconnectInd
0x04	L2CA_QoSViolationInd
0x05 – 0xFF	Reserved

Table 4.1: Assignment of event IDs

The events in this test interface follow the HCI syntax as defined in Part H:1 / Section 4.4.2 on page 535.

4.1.1 Connect Indication

Event	Event Code	Event Parameters
L2CA_ConnectInd	0xFE	Event_ID, BD_ADDR, CID, PSM, Identifier

For more details and the event parameter, see Part D / Section 7.1 on page 295.

4.1.2 Configuration Indication

Event	Event Code	Event Parameters
L2CA_ConfigInd	0xFE	Event_ID, CID, OutMTU, InFlow, FlushTO

For more details and the event parameter, see Part D / Section 7.1 on page 295.

4.1.3 Disconnect Indication

Event	Event Code	Event Parameters
L2CA_DisconnectInd	0xFE	Event_ID, CID

For more details and the event parameter, see Part D / Section 7.1 on page 295.

4.1.4 Violation Indication

Event	Event Code	Event Parameters
L2CA_QoSViolationInd	0xFE	Event_ID, BD_ADDR

For more details and the event parameter, see Part D / Section 7.1 on page 295.

4.2 COMMANDS

The commands in this test interface follow the HCI syntax as defined in Part H:1 / Section 4.4.1 on page 532. The return parameters are sent back using a Command Complete event, see Part H:1 / Section 5.2.14 on page 723 and Part H:1 / Section 4.4.1 on page 532.

To distinguish the commands used for L2CAP testing from HCI commands, a single subgroup is reserved for the L2CAP test interface. Figure 4.1 shows how to code and decode the OpCode field in the HCI command packet used for testing.

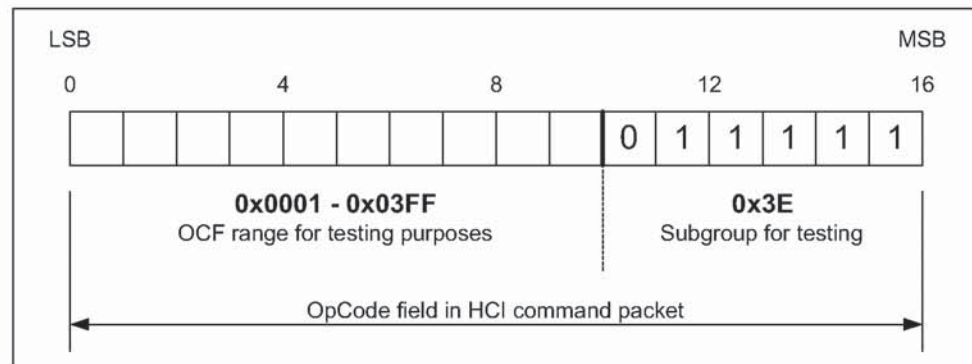


Figure 4.1: HCI OpCode field values used for testing

The assignment of the OpCode Command Field, OCF, for the L2CAP commands is summarized in Table 4.2. It is also detailed following the table, in a format similar to the HCI specification, see "Part H:1" on page 517.

OCF	L2CAP command
0x0000	Reserved
0x0001	L2CA_ConnectReq
0x0002	L2CA_DisconnectReq
0x0003	L2CA_ConfigReq
0x0004	L2CA_DisableCLT
0x0005	L2CA_EnableCLT
0x0006	L2CA_GroupCreate
0x0007	L2CA_GroupClose
0x0008	L2CA_GroupAddMember
0x0009	L2CA_GroupRemoveMember
0x000A	L2CA_GroupMemebership
0x000B	L2CA_WriteData
0x000C	L2CA_ReadData
0x000D	L2CA_Ping
0x000E	L2CA_GetInfo
0x000F	Reserved
0x0010	Reserved
0x0011	L2CA_ConnectRsp
0x0012	Reserved
0x0013	L2CA_ConfigRsp
0x0014 – 0x03FF	Reserved

Table 4.2: Assignment of Opcode Command Field values

4.2.1 Connection Establishment

Command	OCF	Command Parameters	Return Parameters
L2CA_ConnectReq	0x0001	PSM, BD_ADDR	LCID, Result, Status

Description:

Requests the creation of a channel representing a logical connection to a physical address (for more details and input/output parameter definition see Part D / Section 7.2 on page 296).

4.2.2 Connect Response

Command	OCF	Command Parameters	Return Parameters
L2CA_ConnectRsp	0x0011	BD_ADDR, Identifier, LCID, Response, Status	Result

Description:

Issues a response to a connection request event indication (for more details and input/output parameters definition see Part D / Section 7.3 on page 298)

4.2.3 Connection Release (Disconnect)

Command	OCF	Command Parameters	Return Parameters
L2CA_DisconnectReq	0x0002	CID	Result

Description:

Requests the disconnection of the channel. Input parameter is the *CID* representing the local channel endpoint (for more details and input/output parameter definition see Part D / Section 7.6 on page 302).

4.2.4 Configuration

Command	OCF	Command Parameters	Return Parameters
L2CA_ConfigReq	0x0003	CID, InMTU, OutFlow, FlushTO, LinkTO	Result, InMTU, OutFlow, FlushTO

Description:

Requests the initial or new configuration of a channel to a new set of channel parameters (for more details and input/output parameter definition see Part D / Section 7.4 on page 299).

4.2.5 Configure Response

Command	OCF	Command Parameters	Return Parameters
L2CA_ConfigRsp	0x0013	CID, OutMTU, InFlow	Result

Description:

Issues a response to a configuration request event indication (for more details and input/output parameter definition see Part D / Section 7.5 on page 301).

4.2.6 Disable Connectionless Traffic

Command	OCF	Command Parameters	Return Parameters
L2CA_DisableCLT	0x0004	N, List of PSMs	Result

Description:

For details and input/output parameter definition see Part D / Section 7.16 on page 311.

4.2.7 Enable Connectionless Traffic

Command	OCF	Command Parameters	Return Parameters
L2CA_EnableCLT	0x0005	N, List of PSMs	Result

Description:

For details and input/output parameter definition see Part D / Section 7.17 on page 312.

4.2.8 Group Create

Command	OCF	Command Parameters	Return Parameters
L2CA_GroupCreate	0x0006	PSM	CID

Description:

Request the creation of a channel identifier to represent a logical connection to multiple devices. On creation, the group is empty (for more details and input/output parameter definition see Part D / Section 7.9 on page 305).

4.2.9 Group Close

Command	OCF	Command Parameters	Return Parameters
L2CA_GroupClose	0x0007	CID	Result

Description:

This command closes down a Group (for more details and input/output parameter definition see Part D / Section 7.10 on page 305).

4.2.10 Group Add Member

Command	OCF	Command Parameters	Return Parameters
L2CA_GroupAddMember	0x0008	CID, BD_ADDR	Result

Description:

This command adds a member to the group (for more details and input/output parameter definition see Part D / Section 7.11 on page 306).

4.2.11 Group Remove Member

Command	OCF	Command Parameters	Return Parameters
L2CA_GroupRemoveMember	0x0009	CID, BD_ADDR	Result

Description:

Remove a member from the group (for more details and input/output parameter definition see Part D / Section 7.12 on page 307).

4.2.12 Group Membership

Command	OCF	Command Parameters	Return Parameters
L2CA_GroupMembership	0x000A	CID	Result, N, BD_ADDR_Lst

Description:

Get report of the members of the group (for more details and input/output parameter definition see Part D / Section 7.13 on page 308).

4.2.13 Ping

Command	OCF	Command Parameters	Return Parameters
L2CA_Ping	0x000D	BD_ADDR, ECHO_DATA	Result, ECHO_DATA

Description:

For more details and input/output parameter definition see Part D / Section 7.14 on page 309.

4.2.14 Get Info

Command	OCF	Command Parameters	Return Parameters
L2CA_GetInfo	0x000E	BD_ADDR, InfoType	Result, InfoData

Description:

For more details and input/output parameter definition see Part D / Section 7.15 on page 310.

4.3 DATA TRANSFER

Data transfer is modelled with read and write functions. Handling is like an L2CAP command.

To be able to send the amount of data that is needed to verify how the L2CAP implementation handles large chunks of data (i.e. segmentation and reassembly), and since it is not possible to use HCI Command packets as well as HCI Event packets to send the data, the use of HCI ACL Data packets will be used. The procedure/signalling used on the TCI-L2CAP interface to transfer data packets will be described with MSCs.

4.3.1 Write

Command	OCF	Command Parameters	Return Parameters
L2CA_WriteData	0x000B	CID, Length, OutBuffer	Size, Result

Description:

Parameters are the CID, the length of the data and the data itself. The data will be sent in a HCI ACL data packets as described in Figure 4.2. For more details and input/output parameter definition see Part D / Section 7.7 on page 303.

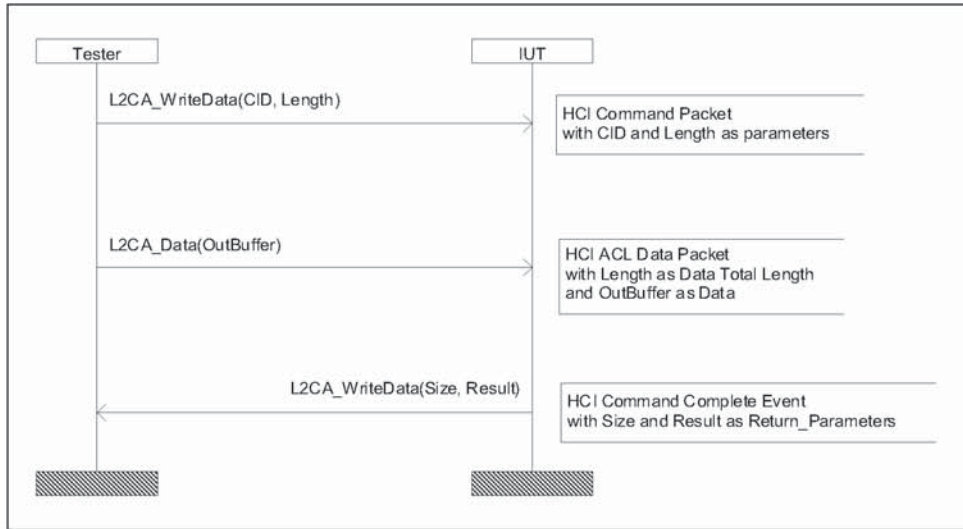


Figure 4.2: MSC showing how to write data to L2CAP

The L2CA_Data primitive is used as an abstract name for the data transmitted between the Tester and the IUT. The Tester will use Connection Handle 0x0001 for the data and will set the Flags-field to 0x02. The Data Total Length field will contain the length of the OutBuffer.

After the IUT has received the data, it shall send back an HCI Command Complete Event (named L2CAP_WriteData in the figure) with the N parameter set to 0x01, the OpCode parameter set to the corresponding OCF and subgroup (that is OCF = 0x000B and the subgroup = 0x3E). The Size and Result are sent in the Return_Parameters field of the HCI ACL Data packet.

4.3.2 Read

Command	OCF	Command Parameters	Return Parameters
L2CA_ReadData	0x000C	CID, Length, InBuffer	Result

Description:

Input parameter is the CID, length and the InBuffer. Output parameters are the result. The data will be sent in HCI ACL data packets as described in Figure 4.3. For more details and input/output parameter definition see Part D / Section 7.8 on page 304).

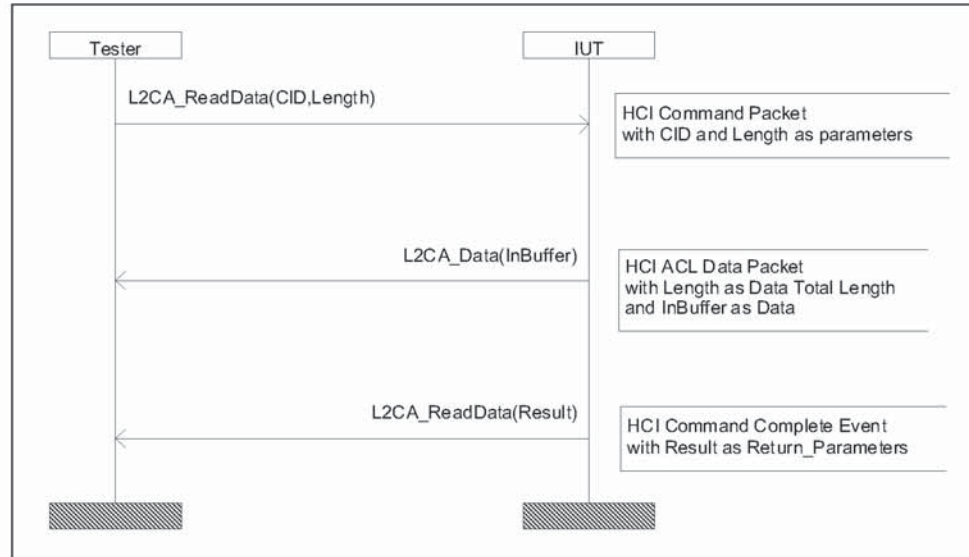


Figure 4.3: MSC showing how to read data from L2CAP

The L2CA_Data primitive is used as an abstract name for the data transmitted between the Tester and the IUT. The IUT shall use Connection Handle 0x0001 for the data and shall set the Flags-field to 0x02. The Data Total Length field shall contain the length of the InBuffer.

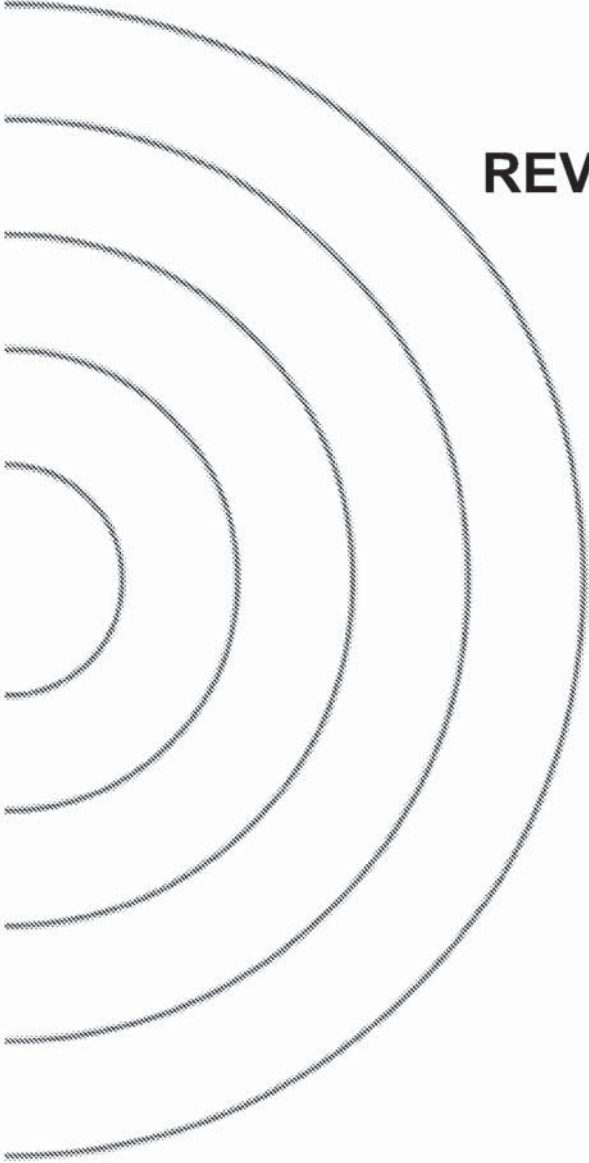
After the IUT has sent the data, it shall send back an HCI Command Complete Event (named L2CAP_ReadData in the figure) with the N parameter set to 0x01, the OpCode parameter set to the corresponding OCF and subgroup (that is OCF = 0x000C and the subgroup = 0x3E). The Size and Result are sent in the Return_Parameters field of the HCI ACL Data packet.

5 ABBREVIATIONS

BB	BaseBand (see LC)
FW	Firmware
HCI	Host Controller Interface
HW	Hardware
IUT	Implementation Under Test
L2CA	Logical Link Control And Management part of the Bluetooth protocol stack
L2CAP	Logical Link Control And Management Protocol
LC	Link Controller (or baseband) part of the Bluetooth protocol stack
LCP	Link Control Protocol
LM	Link Manager part of the Bluetooth Protocol Stack
LMP	Link Management Protocol
MMI	Man-Machine Interface
OCF	Opcode Command Field
RF	Radio part of the Bluetooth protocol stack
SUT	System Under Test
SW	Software
TC	Test Control layer for the test interface
TCI	Test Control Interface
UART	Universal Asynchronous receiver Transmitter
USB	Universal Serial Bus
UT	Upper Tester

Appendix I

REVISION HISTORY



Revision History

Part A / Radio Specification

Rev	Date	Comments
0.8	Jan 21st 1999	<ul style="list-style-type: none"> • System ambient temperature range • Power control step size • Transmit Spectrum mask • Frequency drift in a packet • New paragraph "Receiver susceptibility to frequency drift" • Adjacent interference levels • Measurement frequency for intermodulation test • Maximum useable level defined • New paragraph "Reference Interference-Signal Definition"
0.9	April 30th 1999	<ul style="list-style-type: none"> • Eye-diagram added • Out-of band blocking included • RSSI included
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> • Appendix A and B added, (extreme conditions definition and test conditions) • Tolerances of the Eye-diagram added
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view. • Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part B / Baseband Specification

Rev	Date	Comments
0.7	Oct 19th 1998	<ul style="list-style-type: none"> • Minor changes in chapter 1-9. • "Link Monitoring" chapter removed (chapter 12 in v0.6). • Most parts of chapter 10 - 14 re-written.
0.8	Jan 21st 1999	<ul style="list-style-type: none"> • Some editorial changes in chapter 1-13. • Chapter 14 revised and partly re-written.
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> • Please see revision bars in document.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view. • Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part C / Link Manager Protocol

Rev	Date	Comments
0.7	Oct 19th 1998	<ul style="list-style-type: none"> • EEE address ⇒ BD_ADDR (or BD address) • M_ADDR ⇒ AM_ADDR • response nbr ⇒ PM_ADDR • Added section 3.1.4 • Added section 3.4 "Change the current link key" • Changed section 3.5 "Encryption". Added negotiation for encryption mode and encryption key size. • 3.14 "Sniff mode". Removed author's note in italic. It is now decided how to determine the first sniff slot. • 3.15 "Park mode". This section is totally changed. • 3.18 "Quality of Service". Added a parameter N_{BC} in one of the LMP messages. • 3.19 "SCO links". Removed author's note in italic. It is now decided how to determine the first SCO slot. • Added section 4 "Connection establishment" • 5.1 "Description of parameters" The length, type and unit of many parameters changed. Especially, all time-parameters are now measured in slots. • Added section 6 "Test modes"
0.8	Jan 21st 1999	<ul style="list-style-type: none"> • general: Changed "PDU nbr" to OpCode throughout the document. Two errors found in 0.80 were corrected. Table 5.1: It says that the length of LMP_SCO_link_req is 7. This should be 8. Table 5.2: It says that the length of hold_time is 1. This should be 2. • 2. Added transactionID in bit0 of the byte in the payload where we have the OpCode. • 3.1 Removed LMP_accepted/not_accepted after receiving LMP_sres (3.1). • 3.1.2 Removed the last sentence "It the claimant is Ö initiate pairing, see 3.2.1" • 3.2 Major change since the initiator of the pairing procedure does not have to be the master. • 3.2.3 Minor clarification. • 3.3 Clarified that if the unit key is changed, the units must go through the initialisation procedure in order to change the link key. • 3.5.3 Modified the calculation of Kc according to changes in chapter 14 of the Baseband Specification. • 3.10 Switch can now be done anytime during the connection and it can be initiated by both master and slave. • 3.15 Clarified that the broadcast scan window is only valid for the current beacon. • 3.19.5 Added description that the PDU includes a reason parameter with information about why the SCO link is removed. • 3.21 This section was removed. Instead error handling is described in a separate chapter (CH. 7) • 4. Added LMP_host_connection_req and removed the LMP_accepted or LMP_not_accepted that the slave sends after the paging procedure. • 5.1 Added reason "invalid parameters" • 6. Added sequences. The slave can return LMP_not_accepted if not allowed to enter test or if not in test mode. Changed OpCodes for the two test mode PDU

0.9	April 30th 1999	<ul style="list-style-type: none"> • Name request procedure: Coding of the characters was changed from ASCII to UTF-8. The length of the name parameter was increased from 16 bytes to 248 bytes. • The detach reason and the reason parameter were merged into one parameter (reason). The coding of this parameter was changed and is now the same as in HCI. • Sniff procedure: Sniff interval and sniff offset parameters were changed from one byte to two bytes. Two parameters, sniff offset and sniff timeout, were also added. • The PDU LMP_slot_offset was added. • The PDU LMP_page_mode_req was added. • The PDU LMP_page_scan_mode_req was added. • Caption text was added to all figures, tables and sequences where such text was missing. • A maximum reply time was defined for response messages in LMP procedures. • The pairing procedure was modified to allow a claimant with fixed PIN to request to become verifier. • Changed some parameters in LMP_test_control to match the latest revision of "Bluetooth test modes". • The PDU LMP_supervision_timeout was added. • The parameter user data rate was removed from the PDU LMP_SCO_link request. • The length of the parameters CompId and SubVersNr included in the PDU LMP_version_req/res was increased to two bytes. • Some editorial changes and clarifications were made here and there.
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> • Added figure 3 explaining sequence diagram conventions (Section 3). • Modified procedure to negotiate encryption key size to match changes in the Baseband specification (Section 3.6.2). • Added further description about the parameters in the version request (Section 3.10). • Clarified name request procedure and changed parameter name from "name" to "name fragment" (Section 3.13). • Added description that test mode can also be ended by sending LMP_test_control (Section 6.1). • Some editorial comments. • Decoupled RSSI and power control in the features parameter. Changed parameter "TBD" to "for future use". • Rewrote Section 3.20.
1.0a	July 26th 1999	<ul style="list-style-type: none"> • Correction of Table 5.3: Byte 1/Bit 1 "and power control" deleted Byte 2/Bit 2 "power control" added
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view. • Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

**Part D
Logical Link Control and Adaptation Protocol Specification**

Rev	Date	Comments
0.8	Jan 21st 1999	<ul style="list-style-type: none"> Changes include the addition of an operational overview section, increasing CID lengths to 16 bits and removing the source CID from normal data flow. Moved all connection, termination, and configuration commands to a separate "CID". Changed the name of the "Connection ID" to the "Channel ID". Added the state machine Re-defined the timers to more clearly indicate their responsibilities. New Flags field in Configuration Request packet defined. Several minor editorial corrections.
0.9	April 30th 1999	<ul style="list-style-type: none">
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Replaced all references to "termination" with "disconnection". KTX timer removed - link loss results in channel loss. OSI naming terms applied to state machine. State machine table revised to remove superfluous states. Added some message sequence charts for clarification. Service interface defined in more detail and no longer specified as a guideline - this interface still needs work to complete. Service interface revised corrections to state machine added, and security key management removed from service interface. Editorial cleanup of various sections with the majority of the edits being in the state machine and service interface. Added L2CA_Response service primitives. Clean up of state machined, closed outstanding issues dealing with MTU, Implements major editorial changes to the configuration process (section 6.3), replacing SCID and DCID with RCID and LCID, removal of flush signalling PDU, and editorial comments from reviewers.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part E / Service Discovery Protocol (SDP)

Rev	Date	Comments
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Removed the Icon10 attribute and the Icon data element type. Re-assigned the IconURL attribute ID to be 0x000C. Updated Example 3. Removed "notes to reviewers". Removed the list of TBD items, since it is empty. A few corrections to example 3. Modified the BluetoothProfileList attribute to become the BluetoothProfileDescriptorList attribute, which contains a version number for each profile as well as the profile's UUID Added a description of the protocol version number included in the BluetoothProfileDescriptorList attribute. No change to the 'phonebook' and 'calendar' data store indicators as the values in example 3 already match those of the synchronization profile. Replaced the browse hierarchy diagram in 2.8.1 because the previous version triggered a bug in MS-Word.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part F:1 / RFCOMM with TS 0710

Rev	Date	Comments
0.8	Jan 21st 1999	<ul style="list-style-type: none"> Table 2.1 corrected. Revised section 2.3. Revised chapter 3. Revised section 5.2, 5.3. Clarifications added to Figure 5.1. Changed title and contents of section 5.4 (old section 5.4 not needed any more). Text removed from section 5.5 and 5.6. Added text on Service Discovery in section 7.3.
0.9	April 30th 1999	<ul style="list-style-type: none"> Lots of editorial changes and clarifications. Added statement on baud rate settings vs. RFCOMM throughput in chapter 2. Removed section 7.2 on flow control (information duplicated in TS 07.10). Added DLC parameter negotiation command support (section 4.3, 5.7) Added clarifications on session closure handling in section 5.2. Major update regarding SDP; section 7.2. Added section 7.3 on lower layer dependencies.
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Editorial changes and clarifications in chapters 5 and 7. Removed sections implying possibility to have more than one RFCOMM entity in a device.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part F:2 / IrDA Interoperability

Rev	Date	Comments
0.9	April 30th 1999	<ul style="list-style-type: none"> Many linguistic changes made, Bluetooth OBEX related specifications chapter added, Separate Application profile chapters gathered into one chapter, OBEX operation requirements moved into the profile specifications, Refers to COMM-ports removed. Service Records moved into the profile specifications, and added clarification for the use of connection-oriented OBEX
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Changed reference to new version of IrOBEX specification, corrected wrong TCP port number, reference list updated Updated Chapter 3.2
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Part F:3 / Telephony Control Specification (TCS)

Rev	Date	Comments
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Version for 1.0 Release, only editorial changes since 0.9
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars. Figure A and Figure B in Appendix are replaced.

Part F:4 Interoperability Requirements for Bluetooth as a WAP Bearer

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

**Part H:1
Bluetooth Host Controller Interface Functional Specification**

Rev	Date	Comments
0.8	Jan 21st 1999	<ul style="list-style-type: none"> Many editorial corrections
0.9	April 30th 1999	<ul style="list-style-type: none">
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Flow control for data changed. Format of HCI Data Packet header changed. Command Pending Event replaced by Command Status Event and functionality regarding which event should be returned when a command involving LMP actions can not start to execute due to an error changed. Some commands and events have been renamed. Changed parameters, descriptions and functionality for many commands and events. Many new commands have been added. HCI_Store_Clock_Offset command has been removed. This information is now provided at connection set up or name request as a parameter together with other new baseband related parameters. Some new events have been added. Descriptions of error codes added.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part H:2 / HCI USB Transport Layer

Rev	Date	Comments
0.8	Jan 21st 1999	<ul style="list-style-type: none"> Added info about 64 byte isochronous endpoints. Added a section detailing one of the mail messages - that discussed how SCO traffic would travel across the interface
0.9	April 30th 1999	<ul style="list-style-type: none"> Updated revision # & HCI Header sizes
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Updated endpoint information, interface information relating to isoch, and Device Firmware Upgrade Requirements Tidied up table describing interface/endpoint/alternate setting information
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part H:3 / HCI RS232 Transport Layer

Rev	Date	Comments
0.9	April 30th 1999	<ul style="list-style-type: none"> Assumption about error free link has been removed. A simple error recovery, negotiation scheme and a resynchronisation/error indication scheme using RTS/CTS were added as proposed by IBM. New document outline. Added synchronisation using delimiters with COBS. Added a support for CCITT-CRC. Available Baud Rate Changed. Only 8 bit data length is valid. HCI Event packet type is added. Available error type has been modified. Editorial changes.
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Assumption about error free link has been removed. A simple error recovery, negotiation scheme and a resynchronisation/error indication scheme using RTS/CTS were added . New document outline. Added synchronisation using delimiters with COBS. Added a support for CCITT-CRC Available Baud Rate Changed. Only 8 bit data length is valid. HCI Event packet type is added. Available error type has been modified. Editorial changes.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

**Part H:4
HCI UART Transport Layer**

Rev	Date	Comments
0.9	April 30th 1999	<ul style="list-style-type: none"> was not a part of 0.8 First revision. Based on HCI RS232 Transport Layer 0.80. Added Default Settings, HW flow control and Error Recovery. Improved description of RTS/CTS Changed HCI packet indicator for HCI event packet
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> No changes since 0.9
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Part I:1 / Test Mode

Rev	Date	Comments
0.9	April 30th 1999	<ul style="list-style-type: none"> • Transmitter Test: added pseudorandom bit sequence • Corresponding changes for LMP messages • Editorial Changes: Explanatory paragraph and figure added to the test packet format of the transmitter test • Proposal of a loopback alternative that has less demanding time constraints. • Reduced Hopping Sequence added • Modification/Clearification of TX packet format • Editorial changes • Statement in introduction that test mode may be used also for regulatory approval. • Description of delayed loopback added • proposed timing for reduced hopping scheme from Ericsson • timing for reduced hopping scheme refined • Loopback: transmission of NULL packet on failed HEC is not mandatory. • Added AUX1 packet explicitly to Figure 3 • Included AUX1 to Table 3 • Mentioned delayed loopback in first paragraph of Section 2.2 • Features request command is allowed, while in test mode. • Added codes for LMP packets according to LMP V0.9 review document • Changed maximum packet length in Table 3 • FH timing: clarify that clock of tester is used • editorial changes • Clearifications about Whitening for both TX and Loopback mode • Clearification that RX and TX in the control command refer to the DUT. • Clearification in Table 3: For ACL packets a maximum length is given, for HV3 the exact length is given. • Editorial Changes
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> • Description over use of whitening in transmitter test mode. • Added an exit command in the test mode control. • Editorial changes to whitening in transmitter test.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view. • Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Part I:2 Bluetooth Compliance Requirements

Rev	Date	Comments
1.0A	July 26th 1999	<ul style="list-style-type: none"> • The text in Section 6.6.1 "Definition of Bluetooth components" first paragraph has been revised.
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view.

Part I:3 Test Control Interface

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Appendix IV / Sample Data

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Appendix V / Bluetooth Audio

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Appendix VI / Baseband Timers

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Appendix VII /Optional Paging Scheme

Rev	Date	Comments
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view.

Appendix VIII / Bluetooth Assigned Numbers

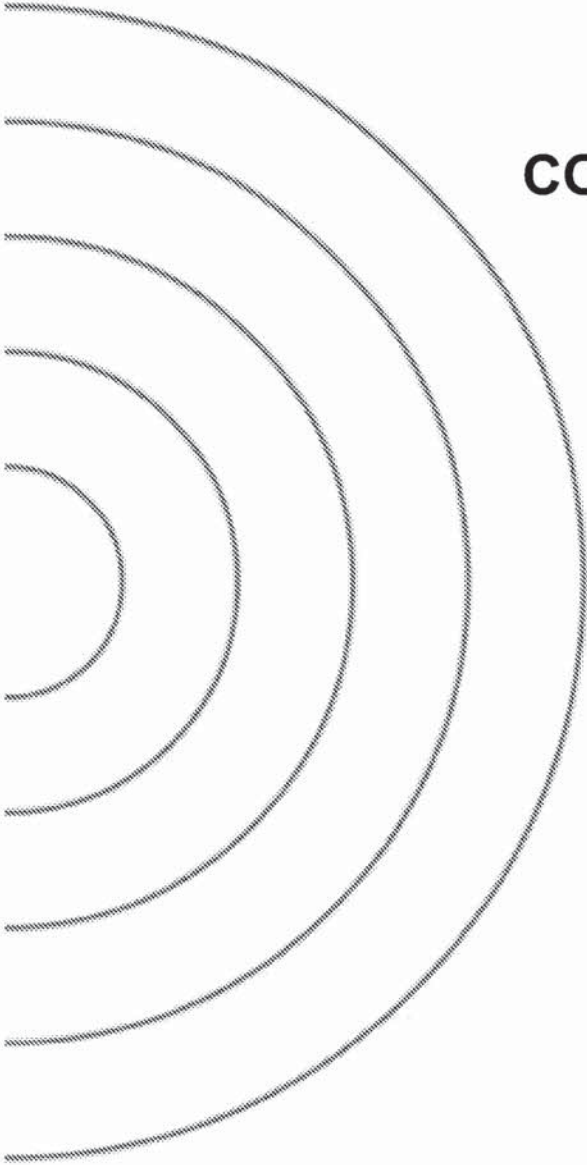
Rev	Date	Comments
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> Renamed some of the service class mnemonics. Added a bit to indicate if a node is in Limited Discoverable Mode (useful in a reply to GIAC). Updated after review. Added the IAC LAP codes. Minor editorial and clarifications, including section "Universally Unique Identifier (UUID) short forms".
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> Revised from a linguistic point of view. Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars.

Appendix IX / Message Sequence Charts

Rev	Date	Comments
1.0 draft	July 5th 1999	<ul style="list-style-type: none"> • Command and Parameter updated; Chapter 7 added; Local- and Remote Hold-Mode removed; Chapter 8 clarified; No HCI-Num-Completed-Packets-Event in ACL- and SCO-Connection creation; LMP-feature-req/-res added in ACL-Connection-Setup; LMP-feature-req/-res removed in SCO-Connection-Setup • MSC "Onetime-Inquiry" and "Periodic-Inquiry" clarified with additional ID-Packet; • MSC "Local Loopback-Mode" exited with HCI_Write_Loopback_Mode instead with HCI_Reset; • MSC "Remote Loopback-Mode" exited with HCI_Write_Loopback_Mode instead with HCI_Reset; • MSC "Switch Role" updated with LMP_clkoffset_req/-res and LMP_slot_offset; • Editorial changes; • MSC "Switch Role": subscenario 2 added; Modified as Toru's proposal; • MSC "ACL-Connection Request": slot-offset and clock-offset exchange subscenario3; • Figure 4: no loopback to Page/Page-Res in case of Role-Switch; • LMP_features_req/-res: added in MSC "Pairing" and MSC "Authentication", removed in MSC "Encryption and Setup Complete"; • MSC "Local Loopback Mode": two additional SCO-Connections added;
1.0B	Dec 1st 1999	<ul style="list-style-type: none"> • Revised from a linguistic point of view. • Errata items previously published on the web has been included. These corrections and clarifications are marked with correction bars. The following figures are modified: 3.2, 3.3, 4.3 and 4.9

Appendix II

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Part F:1

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Part H:1 Bluetooth Host Controller Interface Functional Specification

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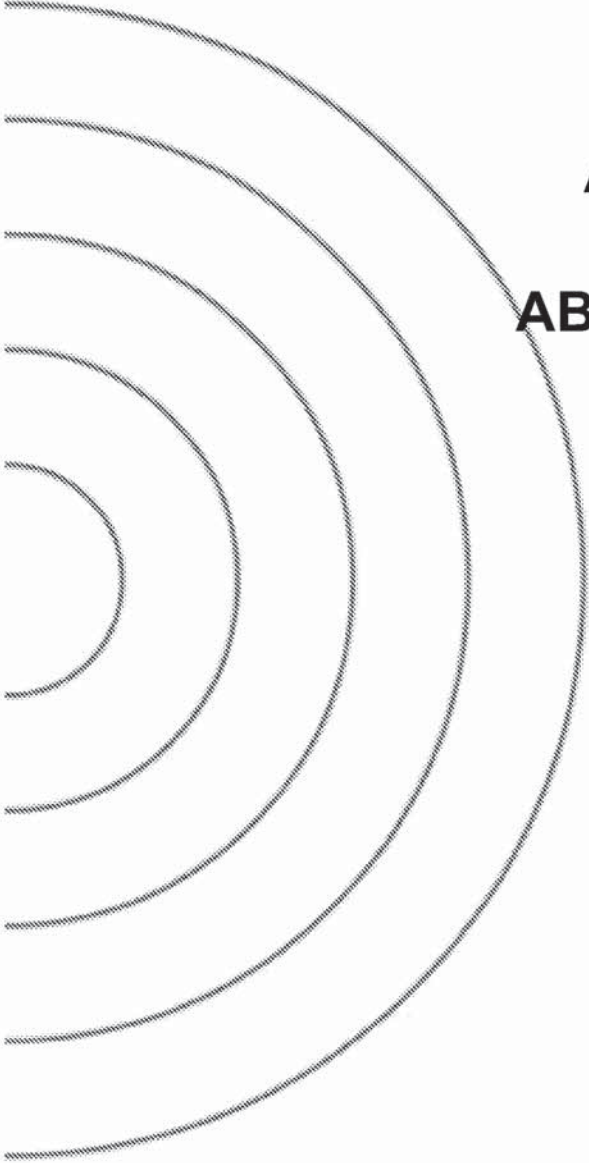
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Appendix III

**ACRONYMS
AND
ABBREVIATIONS**





List of Acronyms and Abbreviations

Acronym or abbreviation	Writing out in full	Which means
ACK	Acknowledge	
ACL link	Asynchronous Connection-Less link	Provides a packet-switched connection.(Master to any slave)
ACO	Authenticated Ciphering Offset	
AM_ADDR	Active Member Address	
AR_ADDR	Access Request Address	
ARQ	Automatic Repeat reQuest	
B		
BB	BaseBand	
BCH	Bose, Chaudhuri & Hocquenghem	Type of code The persons who discovered these codes in 1959 (H) and 1960 (B&C)
BD_ADDR	Bluetooth Device Address	
BER	Bit Error Rate	
BT	Bandwidth Time	
BT	Bluetooth	
C		
CAC	Channel Access Code	
CC	Call Control	
CL	Connectionless	
CODEC	COder DECoder	
COF	Ciphering Offset	
CRC	Cyclic Redundancy Check	
CVSD	Continuous Variable Slope Delta Modulation	
D		
DAC	Device Access Code	
DCE	Data Communication Equipment	

Acronym or abbreviation	Writing out in full	Which means
DCE	Data Circuit-Terminating Equipment	In serial communications, DCE refers to a device between the communication endpoints whose sole task is to facilitate the communications process; typically a modem
DCI	Default Check Initialization	
DH	Data-High Rate	Data packet type for high rate data
DIAC	Dedicated Inquiry Access Code	
DM	Data - Medium Rate	Data packet type for medium rate data
DTE	Data Terminal Equipment	In serial communications, DTE refers to a device at the endpoint of the communications path; typically a computer or terminal.
DTMF	Dual Tone Multiple Frequency	
DUT	Device Under Test	
DV	Data Voice	Data packet type for data and voice
€		
ETSI	European Telecommunications Standards Institute	
£		
FCC	Federal Communications Commission	
FEC	Forward Error Correction code	
FH	Frequency Hopping	
FHS	Frequency Hop Synchronization	
FIFO	First In First Out	
FSK	Frequency Shift Keying	type of modulation
FW	Firmware	
Ⓔ		
GEOP	Generic Object Exchange Profile	
GFSK	Gaussian Frequency Shift Keying	
GIAC	General Inquiry Access Code	
GM	Group Management	

Acronym or abbreviation	Writing out in full	Which means
⋮		
HA	Host Application	SW using Bluetooth
HCI	Host Controller Interface	
HEC	Header-Error-Check	
HID	Human Interface Device	
HV	High quality Voice	e.g. HV1 packet
HW	Hardware	
⋮		
IAC	Inquiry Access Code	
IEEE	Institute of Electronic and Electrical Engineering	
IETF	Internet Engineering Task Force	
IP	Internet Protocol	
IrDA	Infra-red Data Association	
IrMC	Ir Mobile Communications	
ISDN	Integrated Services Digital Networks	
ISM	Industrial, Scientific, Medical	
IUT	Implementation Under Test	
⋮		
L_CH	Logical Channel	
L2CA	Logical Link Control and Adaption	Logical Link Control And Management part of the Bluetooth protocol stack
L2CAP	Logical Link Control and Adaption Protocol	
LAP	Lower Address Part	
LC	Link Controller	Link Controller (or baseband) part of the Bluetooth protocol stack Low level Baseband protocol handler
LCP	Link Control Protocol	
LCSS	Link Controller Service Signalling	
LFSR	Linear Feedback Shift Register	
LM	Link Manager	

Acronym or abbreviation	Writing out in full	Which means
LMP	Link Manager Protocol	For LM peer to peer communication
LSB	Least Significant Bit	
ℳ		
M	Master or Mandatory	
M_ADDR	Medium Access Control Address	
MAC	Medium Access Control	
MAPI	Messaging Application Procedure Interface	
MMI	Man Machine Interface	
MS	Mobile Station	
MS	Multiplexing sublayer	
MSB	Most Significant Bit	
MSC	Message Sequence Chart	
MTU	Maximum Transmission Unit	
MUX	Multiplexing Sublayer	a sublayer of the L2CAP layer
ℕ		
NAK	Negative Acknowledge	
NAP	Non-significant Address Part	
ℚ		
O	Optional	
OBEX	OBject EXchange protocol	
OCF	Opcode Command Field	
ℙ		
PCM	Pulse Coded Modulation	
PCMCIA	Personal Computer Memory Card International Association	
PDU	Protocol Data Unit	a message
PIN	Personal Identification Number	
PM_ADDR	Parked Member Address	
PN	Pseudo-random Noise	
PnP	Plug and Play	
POTS	Plain Old Telephone system	

Acronym or abbreviation	Writing out in full	Which means
PPM	Part Per Million	
PPP	Point-to-Point Protocol	
PRBS	Pseudo Random Bit Sequence	
PRNG	Pseudo Random Noise Generation	
PSTN	Public Switched Telephone Network	
Q		
QoS	Quality of Service	
R		
RAND	Random number	
RF	Radio Frequency	
RFC	Request For Comments	
RFCOMM		Serial cable emulation protocol based on ETSI TS 07.10
RSSI	Received Signal Strength Indication	
RX	Receiver	
S		
S	Slave	
SAP	Service Access Points	
SAR	Segmentation and Reassembly	
SCO link	Synchronous Connection-Oriented link	Supports time-bounded information like voice. (Master to single slave)
SD	Service Discovery	
SDDB	Service Discovery Database	
SDP	Service Discovery Protocol	
SEQN	Sequential Numbering scheme	
SRES	Signed Response	
SS	Supplementary Services	
SSI	Signal Strength Indication	
SUT	System Under Test	
SW	Software	

Acronym or abbreviation	Writing out in full	Which means
T		
TAE	Terminal Adapter Equipment	
TBD	To Be Defined	
TC	Test Control	Test Control layer for the test interface
TCI	Test Control Interface	
TCP/IP	Transport Control Protocol/Internet Protocol	
TCS	Telephony Control protocol Specification	
TDD	Time-Division Duplex	
TTP	Tiny Transport Protocol between OBEX and UDP [TBD]	
TX	Transmit	
U		
UA	User Asynchronous	Asynchronous user data
UAP	Upper Address Part	
UART	Universal Asynchronous receiver Transmitter	
UC	User Control	
UDP/IP	User Datagram Protocol/Internet Protocol	
UI	User Isochronous	Isochronous user data
UIAC	Unlimited Inquiry Access Code	
US	User Synchronous	Synchronous user data
USB	Universal Serial Bus	
UT	Upper Tester	
W		
WAP	Wireless Application Protocol	
WUG	Wireless User Group	

Definitions

Baseband. The Bluetooth baseband specifies the medium access and physical layers procedures to support the exchange of real-time voice and data information streams and ad-hoc networking between Bluetooth units.

Coverage area . The area where two Bluetooth units can exchange messages with acceptable quality and performance.

Host Terminal interface. Host terminal interface is the Interface between Bluetooth Host and Bluetooth Unit.

Inquiry. A Bluetooth unit transmits inquiry messages in order to discover the other Bluetooth units that are active within the coverage area. The Bluetooth units that capture inquiry messages may send a response to the inquiring Bluetooth unit. The response contains information about the Bluetooth unit itself and its Bluetooth Host.

Isochronous user channel . Channel used for time bounded information like i.e. compressed audio (ACL link).

Logical Channel. The different types of channels on a Physical Link.

Bluetooth Host. Bluetooth Host is a computing device, peripheral, cellular telephone, access point to PSTN network, etc. A Bluetooth Host attached to a Bluetooth unit may communicate with other Bluetooth Hosts attached to their Bluetooth units as well. The communication channel through the Bluetooth units provides almost wire-like transparency.

Bluetooth Unit. Bluetooth Unit is a voice/data circuit equipment for a short-range wireless communication link. It allows voice and data communications between Bluetooth Hosts.

Bluetooth. Bluetooth is a wireless communication link, operating in the unlicensed ISM band at 2,4 GHz using a frequency hopping transceiver. It allows real-time voice and data communications between Bluetooth Hosts. The link protocol is based on time slots.

Packet. Format of aggregated bits that can be transmitted in 1, 3, or 5 time slots.

Paging. An Bluetooth unit transmits paging messages in order to set up a communication link to another Bluetooth unit who is active within the coverage area.

Physical Channel. Synchronized RF hopping sequence in a piconet

Physical Link. Connection between devices.

Piconet. In the Bluetooth system, the channel is shared among several Bluetooth units. The units sharing a common channel constitute a piconet.

RFCOMM Client. An RFCOMM client is an application that requests a connection to another application (RFCOMM server).

RFCOMM initiator. The device initiating the RFCOMM session, i.e. setting up RFCOMM channel on L2CAP and starting RFCOMM multiplexing with the SABM command on DLCI 0 (zero).

RFCOMM Server. An RFCOMM server is an application that awaits a connection from an RFCOMM client on another device. What happens after such a connection is established is out of scope of this definition.

RFCOMM Server Channel. This is a subfield of the TS 07.10 DLCI number. This abstraction is used to allow both server and client applications to reside on both sides of an RFCOMM session.

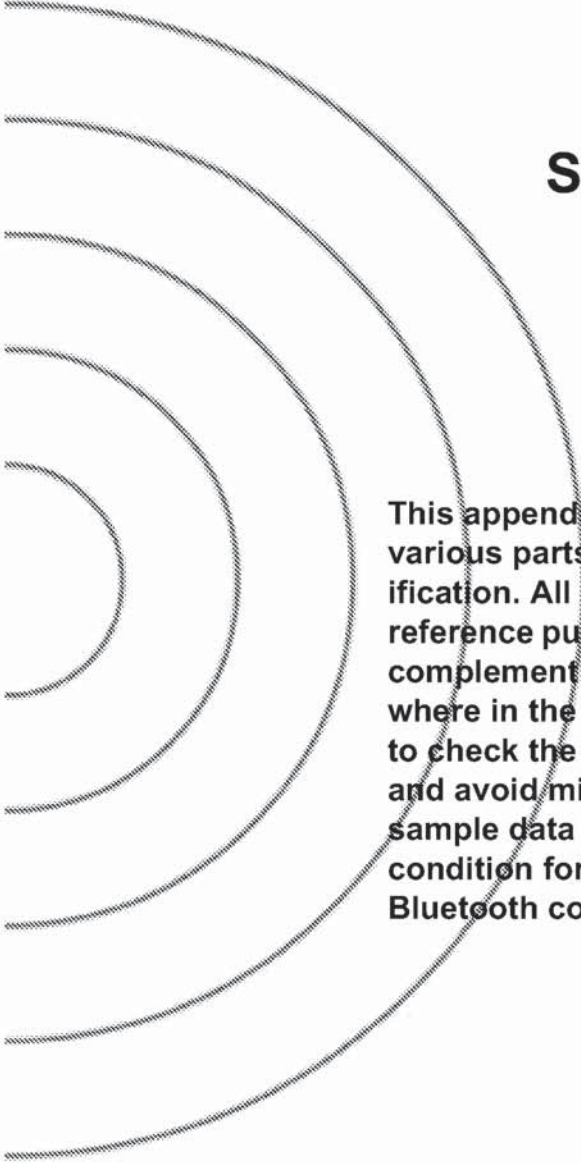
Service Discovery. The ability to discover the capability of connecting devices or hosts

Scatternet. Two or more piconets co-located in the same area (with or without inter-piconet communication).

Time Slot. The Physical Channel is divided into 625 μ s long time slots.

Appendix IV

SAMPLE DATA



This appendix contains sample data for various parts of the Bluetooth baseband specification. All sample data are provided for reference purpose only; they are intended as a complement to the definitions provided elsewhere in the specification. They can be used to check the behavior of an implementation and avoid misunderstandings. Fulfilling these sample data is a necessary but not sufficient condition for an implementation to be fully Bluetooth compliant.



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1 ENCRYPTION SAMPLE DATA

This part consist of four sets of sample data for the encryption process.

With respect to the functional description of the encryption engine in the Bluetooth baseband specification, the contents of registers and resulting concurrent values are listed as well. This by no means excludes different implementations (as far as they produce the same encryption stream) but is intended to describe the functional behavior.

In case of misunderstandings or inconsistencies, these sample data form the normative reference.

1.1 GENERATING KC' FROM KC,

where $Kc'(x) = g2(x)(Kc(x) \text{ mod } g1(x))$.

Note: All polynomials are in hexadecimal notation.
 'L' is the effective key length in bytes.
 The notation 'p: [m]' implies that $\text{deg}(p(x)) = m$.

		MSB	LSB
L = 1			
g1:	[8]	00000000	00000000 00000000 0000011d
g2:	[119]	00e275a0	abd218d4 cf928b9b bf6cb08f
Kc:		a2b230a4	93f281bb 61a85b82 a9d4a30e
Kc mod g1:	[7]	00000000	00000000 00000000 0000009f
g2(Kc mod g1):	[126]	7aa16f39	59836ba3 22049a7b 87f1d8a5

L = 2			
g1:	[16]	00000000	00000000 00000000 0001003f
g2:	[112]	0001e3f6	3d7659b3 7f18c258 cff6efef
Kc:		64e7df78	bb7ccaa4 61433123 5b3222ad
Kc mod g1:	[12]	00000000	00000000 00000000 00001ff0
g2(Kc mod g1):	[124]	142057bb	0bceac4c 58bd142e 1e710a50

L = 3			
g1:	[24]	00000000	00000000 00000000 010000db
g2:	[104]	000001be	f66c6c3a b1030a5a 1919808b
Kc:		575e5156	ba685dc6 112124ac edb2c179
Kc mod g1:	[23]	00000000	00000000 00000000 008ddbc8
g2(Kc mod g1):	[127]	d56d0adb	8216cb39 7fe3c591 1ff95618

L = 4			
g1:	[32]	00000000	00000000 00000001 000000af
g2:	[96]	00000001	6ab89969 de17467f d3736ad9
Kc:		8917b4fc	403b6db2 1596b86d 1cb8adab
Kc mod g1:	[31]	00000000	00000000 00000000 aa1e78aa
g2(Kc mod g1):	[127]	91910128	b0e2f5ed a132a03e af3d8cda

Appendix IV - Sample Data



```

L = 5
g1:          [40]      00000000 00000000 00000100 00000039
g2:          [88]      00000000 01630632 91da50ec 55715247
Kc:          [40]      785c915b dd25b9c6 0102ab00 b6cd2a68
Kc mod g1:   [38]      00000000 00000000 0000007f 13d44436
g2 (Kc mod g1): [126] 6fb5651c cb80c8d7 ea1ee56d f1ec5d02
-----
    
```

```

L = 6
g1:          [48]      00000000 00000000 00010000 00000291
g2:          [77]      00000000 00002c93 52aa6cc0 54468311
Kc:          [48]      5e77d19f 55ccd7d5 798f9a32 3b83e5d8
Kc mod g1:   [47]      00000000 00000000 000082eb 4af213ed
g2 (Kc mod g1): [124] 16096bcb afcf8def 1d226a1b 4d3f9a3d
-----
    
```

Appendix IV - Sample Data



```
L = 7
g1:          [56]      00000000 00000000 01000000 00000095
g2:          [71]      00000000 000000b3 f7fffce2 79f3a073
Kc:          [56]      05454e03 8ddcfbe3 ed024b2d 92b7f54c
Kc mod g1:   [55]      00000000 00000000 0095b8a4 8eb816da
g2(Kc mod g1): [126]  50f9c0d4 e3178da9 4a09fe0d 34f67b0e
-----
```

```
L = 8
g1:          [64]      00000000 00000001 00000000 0000001b
g2:          [63]      00000000 00000000 a1ab815b c7ec8025
Kc:          [63]      7ce149fc f4b38ad7 2a5d8a41 eb15ba31
Kc mod g1:   [63]      00000000 00000000 8660806c 1865deec
g2(Kc mod g1): [126]  532c36d4 5d0954e0 922989b6 826f78dc
-----
```

```
L = 9
g1:          [72]      00000000 00000100 00000000 00000609
g2:          [49]      00000000 00000000 0002c980 11d8b04d
Kc:          [72]      5eef7ca 84fc2782 9c051726 3df6f36e
Kc mod g1:   [71]      00000000 00000083 58ccb7d0 b95d3c71
g2(Kc mod g1): [120]  016313f6 0d3771cf 7f8e4bb9 4aa6827d
-----
```

```
L = 10
g1:          [80]      00000000 00010000 00000000 00000215
g2:          [42]      00000000 00000000 0000058e 24f9a4bb
Kc:          [80]      7b13846e 88beb4de 34e7160a fd44dc65
Kc mod g1:   [79]      00000000 0000b4de 34171767 f36981c3
g2(Kc mod g1): [121]  023bc1ec 34a0029e f798dcfb 618ba58d
-----
```

```
L = 11
g1:          [88]      00000000 01000000 00000000 0000013b
g2:          [35]      00000000 00000000 0000000c a76024d7
Kc:          [88]      bda6de6c 6e7d757e 8dfe2d49 9a181193
Kc mod g1:   [86]      00000000 007d757e 8dfe88aa 2fcee371
g2(Kc mod g1): [121]  022e08a9 3aa51d8d 2f93fa78 85cc1f87
-----
```

```
L = 12
g1:          [96]      00000001 00000000 00000000 000000dd
g2:          [28]      00000000 00000000 00000000 1c9c26b9
Kc:          [96]      e6483b1c 2cdb1040 9a658f97 c4efd90d
Kc mod g1:   [93]      00000000 2cdb1040 9a658fd7 5b562e41
g2(Kc mod g1): [121]  030d752b 216fe29b b880275c d7e6f6f9
-----
```

```
L = 13
g1:          [104]     00000100 00000000 00000000 0000049d
g2:          [21]      00000000 00000000 00000000 0026d9e3
Kc:          [104]     d79d281d a2266847 6b223c46 dc0ab9ee
Kc mod g1:   [100]     0000001d a2266847 6b223c45 e1fc5fa6
g2(Kc mod g1): [121]  03f11138 9cebf919 00b93808 4ac158aa
-----
```


Appendix IV - Sample Data



```

L = 14
g1:          [112]      00010000 00000000 00000000 0000014F
g2:          [14]       00000000 00000000 00000000 00004377
Kc:          cad9a65b 9fca1c1d a2320fcf 7c4ae48e
Kc mod g1:   [111]      0000a65b 9fca1c1d a2320fcf 7cb6a909
g2 (Kc mod g1): [125]    284840fd f1305f3c 529f5703 76adf7cf
-----
L = 15
g1:          [120]      01000000 00000000 00000000 000000e7
g2:          [7]        00000000 00000000 00000000 00000089
Kc:          21f0cc31 049b7163 d375e9e1 06029809
Kc mod g1:   [119]      00f0cc31 049b7163 d375e9e1 0602840e
g2 (Kc mod g1): [126]    7f10b53b 6df84b94 f22e566a 3754a37e
-----
L = 16
g1:          [128]      00000001 00000000 00000000 00000000 00000000
g2:          [0]        00000000 00000000 00000000 00000001
Kc:          35ec8fc3 d50ccd32 5f2fd907 bde206de
Kc mod g1:   [125]      35ec8fc3 d50ccd32 5f2fd907 bde206de
g2 (Kc mod g1): [125]    35ec8fc3 d50ccd32 5f2fd907 bde206de
-----

```

1.2 FIRST SET OF SAMPLE DATA

Initial values for the key, pan address and clock

```

K'c1[0] = 00 K'c1[1] = 00 K'c1[2] = 00 K'c1[3] = 00
K'c1[4] = 00 K'c1[5] = 00 K'c1[6] = 00 K'c1[7] = 00
K'c1[8] = 00 K'c1[9] = 00 K'c1[10] = 00 K'c1[11] = 00
K'c1[12] = 00 K'c1[13] = 00 K'c1[14] = 00 K'c1[15] = 00

```

```

Addr1[0] = 00 Addr1[1] = 00 Addr1[2] = 00
Addr1[3] = 00 Addr1[4] = 00 Addr1[5] = 00

```

```

Clk1[0] = 00 Clk1[1] = 00 Clk1[2] = 00 Clk1[3] = 00

```

Fill LFSRs with initial data

t	clk#	LFSR1	LFSR2	LFSR3	LFSR4	X1	X2	X3	X4	Z	C[t+1]	C[t]	C[t-1]
0	0	0000000*	00000000*	000000000*	0000000000*	0	0	0	0	0	00	00	00
1	1	0000000*	00000001*	000000000*	0000000001*	0	0	0	0	0	00	00	00
2	2	0000000*	00000002*	000000000*	0000000003*	0	0	0	0	0	00	00	00
3	3	0000000*	00000004*	000000000*	0000000007*	0	0	0	0	0	00	00	00
4	4	0000000*	00000008*	000000000*	000000000E*	0	0	0	0	0	00	00	00
5	5	0000000*	00000010*	000000000*	000000001C*	0	0	0	0	0	00	00	00
6	6	0000000*	00000020*	000000000*	0000000038*	0	0	0	0	0	00	00	00

Appendix IV - Sample Data

Bluetooth.

7	7	0000000*	00000040*	000000000*	0000000070*	0	0	0	0	0	00	00	00
8	8	0000000*	00000080*	000000000*	00000000E0*	0	0	0	0	0	00	00	00
9	9	0000000*	00000100*	000000000*	00000001C0*	0	0	0	0	0	00	00	00
10	10	0000000*	00000200*	000000000*	0000000380*	0	0	0	0	0	00	00	00
11	11	0000000*	00000400*	000000000*	0000000700*	0	0	0	0	0	00	00	00
12	12	0000000*	00000800*	000000000*	0000000E00*	0	0	0	0	0	00	00	00
13	13	0000000*	00001000*	000000000*	0000001C00*	0	0	0	0	0	00	00	00
14	14	0000000*	00002000*	000000000*	0000003800*	0	0	0	0	0	00	00	00
15	15	0000000*	00004000*	000000000*	0000007000*	0	0	0	0	0	00	00	00
16	16	0000000*	00008000*	000000000*	000000E000*	0	0	0	0	0	00	00	00
17	17	0000000*	00010000*	000000000*	000001C000*	0	0	0	0	0	00	00	00
18	18	0000000*	00020000*	000000000*	0000038000*	0	0	0	0	0	00	00	00
19	19	0000000*	00040000*	000000000*	0000070000*	0	0	0	0	0	00	00	00
20	20	0000000*	00080000*	000000000*	00000E0000*	0	0	0	0	0	00	00	00
21	21	0000000*	00100000*	000000000*	00001C0000*	0	0	0	0	0	00	00	00
22	22	0000000*	00200000*	000000000*	0000380000*	0	0	0	0	0	00	00	00
23	23	0000000*	00400000*	000000000*	0000700000*	0	0	0	0	0	00	00	00
24	24	0000000*	00800000*	000000000*	0000E00000*	0	1	0	0	1	00	00	00
25	25	0000000*	01000000*	000000000*	0001C00000*	0	0	0	0	0	00	00	00
26	26	0000000*	02000000*	000000000*	0003800000*	0	0	0	0	0	00	00	00
27	27	0000000*	04000000*	000000000*	0007000000*	0	0	0	0	0	00	00	00
28	28	0000000*	08000000*	000000000*	000E000000*	0	0	0	0	0	00	00	00
29	29	0000000*	10000000*	000000000*	001C000000*	0	0	0	0	0	00	00	00
30	30	0000000*	20000000*	000000000*	0038000000*	0	0	0	0	0	00	00	00
31	31	0000000*	40000000*	000000000*	0070000000*	0	0	0	0	0	00	00	00
32	32	0000000*	00000001*	000000000*	00E0000000*	0	0	0	1	1	00	00	00
33	33	0000000*	00000002*	000000000*	01C0000000*	0	0	0	1	1	00	00	00
34	34	0000000*	00000004*	000000000*	0380000000*	0	0	0	1	1	00	00	00
35	35	0000000*	00000008*	000000000*	0700000000*	0	0	0	0	0	00	00	00
36	36	0000000*	00000010*	000000000*	0E00000000*	0	0	0	0	0	00	00	00
37	37	0000000*	00000020*	000000000*	1C00000000*	0	0	0	0	0	00	00	00
38	38	0000000*	00000040*	000000000*	3800000000*	0	0	0	0	0	00	00	00
39	39	0000000*	00000080*	000000000*	7000000000*	0	0	0	0	0	00	00	00

Start clocking Summation Combiner

40	1	0000000	00000100	000000000	6000000001	0	0	0	0	0	00	00	00
41	2	0000000	00000200	000000000	4000000003	0	0	0	0	0	00	00	00
42	3	0000000	00000400	000000000	0000000007	0	0	0	0	0	00	00	00
43	4	0000000	00000800	000000000	000000000E	0	0	0	0	0	00	00	00
44	5	0000000	00001001	000000000	000000001D	0	0	0	0	0	00	00	00
45	6	0000000	00002002	000000000	000000003B	0	0	0	0	0	00	00	00
46	7	0000000	00004004	000000000	0000000077	0	0	0	0	0	00	00	00
47	8	0000000	00008008	000000000	00000000EE	0	0	0	0	0	00	00	00
48	9	0000000	00010011	000000000	00000001DD	0	0	0	0	0	00	00	00
49	10	0000000	00020022	000000000	00000003BB	0	0	0	0	0	00	00	00
50	11	0000000	00040044	000000000	0000000777	0	0	0	0	0	00	00	00
51	12	0000000	00080088	000000000	0000000EEE	0	0	0	0	0	00	00	00
52	13	0000000	00100110	000000000	000001DDDD	0	0	0	0	0	00	00	00
53	14	0000000	00200220	000000000	000003BBBB	0	0	0	0	0	00	00	00
54	15	0000000	00400440	000000000	0000077777	0	0	0	0	0	00	00	00
55	16	0000000	00800880	000000000	00000EEEE	0	1	0	0	1	00	00	00
56	17	0000000	01001100	000000000	00001DDDD	0	0	0	0	0	00	00	00
57	18	0000000	02002200	000000000	000003BBBB	0	0	0	0	0	00	00	00
58	19	0000000	04004400	000000000	0000077777	0	0	0	0	0	00	00	00
59	20	0000000	08008800	000000000	00000EEEE	0	0	0	0	0	00	00	00
60	21	0000000	10011000	000000000	00001DDDD	0	0	0	0	0	00	00	00

Appendix IV - Sample Data

Bluetooth.

61	22	0000000	20022000	000000000	00003BBBBB	0	0	0	0	0	00	00	00
62	23	0000000	40044000	000000000	0000777777	0	0	0	0	0	00	00	00
63	24	0000000	00088001	000000000	0000EEEEEE	0	0	0	0	0	00	00	00
64	25	0000000	00110003	000000000	0001DDDDDD	0	0	0	0	0	00	00	00
65	26	0000000	00220006	000000000	0003BBBBBB	0	0	0	0	0	00	00	00
66	27	0000000	0044000C	000000000	0007777777	0	0	0	0	0	00	00	00
67	28	0000000	00880018	000000000	000EEEEEEE	0	1	0	0	1	00	00	00
68	29	0000000	01100031	000000000	001DDDDDDC	0	0	0	0	0	00	00	00
69	30	0000000	02200062	000000000	003BBBBBB8	0	0	0	0	0	00	00	00
70	31	0000000	044000C4	000000000	0077777770	0	0	0	0	0	00	00	00
71	32	0000000	08800188	000000000	00EEEEEEE0	0	1	0	1	0	01	00	00
72	33	0000000	11000311	000000000	01DDDDDDC1	0	0	0	1	0	00	01	00
73	34	0000000	22000622	000000000	03BBBBBB83	0	0	0	1	1	11	00	01
74	35	0000000	44000C44	000000000	0777777707	0	0	0	0	1	10	11	00
75	36	0000000	08001888	000000000	0EEEEEEE0E	0	0	0	1	1	01	10	11
76	37	0000000	10003111	000000000	1DDDDDDC1D	0	0	0	1	0	01	01	10
77	38	0000000	20006222	000000000	3BBBBBB83B	0	0	0	1	0	11	01	01
78	39	0000000	4000C444	000000000	7777777077	0	0	0	0	1	01	11	01
79	40	0000000	00018888	000000000	6EEEEEE0EF	0	0	0	1	0	10	01	11
80	41	0000000	00031110	000000000	5DDDDDC1DE	0	0	0	1	1	00	10	01
81	42	0000000	00062220	000000000	3BBBBB83BC	0	0	0	1	1	01	00	10
82	43	0000000	000C4440	000000000	7777770779	0	0	0	0	1	01	01	00
83	44	0000000	00188880	000000000	6EEEEEE0F2	0	0	0	1	0	11	01	01
84	45	0000000	00311100	000000000	5DDDC1DE5	0	0	0	1	0	10	11	01
85	46	0000000	00622200	000000000	3BBBB83BCB	0	0	0	1	1	01	10	11
86	47	0000000	00C44400	000000000	7777707797	0	1	0	0	0	01	01	10
87	48	0000000	01888801	000000000	6EEEE0EF2F	0	1	0	1	1	11	01	01
88	49	0000000	03111003	000000000	5DDC1DE5E	0	0	0	1	0	10	11	01
89	50	0000000	06222006	000000000	3BBB83BCBC	0	0	0	1	1	01	10	11
90	51	0000000	0C44400C	000000000	7777077979	0	0	0	0	1	00	01	10
91	52	0000000	18888018	000000000	6EEEE0EF2F2	0	1	0	1	0	10	00	01
92	53	0000000	31110030	000000000	5DDC1DE5E5	0	0	0	1	1	11	10	00
93	54	0000000	62220060	000000000	3BB83BCBCB	0	0	0	1	0	00	11	10
94	55	0000000	444400C1	000000000	7770779797	0	0	0	0	0	10	00	11
95	56	0000000	08880183	000000000	6EE0EF2F2F	0	1	0	1	0	00	10	00
96	57	0000000	11100307	000000000	5DC1DE5E5F	0	0	0	1	1	01	00	10
97	58	0000000	2220060E	000000000	3B83BCBCBF	0	0	0	1	0	00	01	00
98	59	0000000	44400C1C	000000000	770779797E	0	0	0	0	0	11	00	01
99	60	0000000	08801838	000000000	6E0EF2F2FC	0	1	0	0	0	01	11	00
100	61	0000000	11003070	000000000	5C1DE5E5F8	0	0	0	0	1	11	01	11
101	62	0000000	220060E0	000000000	383BCBCBF0	0	0	0	0	1	01	11	01
102	63	0000000	4400C1C0	000000000	70779797E0	0	0	0	0	1	11	01	11
103	64	0000000	08018380	000000000	60EF2F2FC1	0	0	0	1	0	10	11	01
104	65	0000000	10030701	000000000	41DE5E5F82	0	0	0	1	1	01	10	11
105	66	0000000	20060E02	000000000	03BCBCBF04	0	0	0	1	0	01	01	10
106	67	0000000	400C1C05	000000000	0779797E09	0	0	0	0	1	10	01	01
107	68	0000000	0018380A	000000000	0EF2F2FC12	0	0	0	1	1	00	10	01
108	69	0000000	00307015	000000000	1DE5E5F825	0	0	0	1	1	01	00	10
109	70	0000000	0060E02A	000000000	3BCBCBF04B	0	0	0	1	0	00	01	00
110	71	0000000	00C1C055	000000000	779797E097	0	1	0	1	0	10	00	01
111	72	0000000	018380AA	000000000	6F2F2FC12F	0	1	0	0	1	11	10	00
112	73	0000000	03070154	000000000	5E5E5F825E	0	0	0	0	1	11	11	10
113	74	0000000	060E02A8	000000000	3CBCBF04BC	0	0	0	1	0	11	11	11
114	75	0000000	0C1C0550	000000000	79797E0979	0	0	0	0	1	00	11	11
115	76	0000000	18380AA0	000000000	72F2FC12F2	0	0	0	1	1	10	00	11
116	77	0000000	30701541	000000000	65E5F825E5	0	0	0	1	1	11	10	00
117	78	0000000	60E02A82	000000000	4BCBF04BCB	0	1	0	1	1	00	11	10

Appendix IV - Sample Data

Bluetooth.

118	79	0000000	41C05505	000000000	1797E09796	0	1	0	1	0	11	00	11
119	80	0000000	0380AA0A	000000000	2F2FC12F2C	0	1	0	0	0	01	11	00
120	81	0000000	07015415	000000000	5E5F825E59	0	0	0	0	1	11	01	11
121	82	0000000	0E02A82A	000000000	3CBF04BCB2	0	0	0	1	0	10	11	01
122	83	0000000	1C055054	000000000	797E097964	0	0	0	0	0	01	10	11
123	84	0000000	380AA0A8	000000000	72FC12F2C9	0	0	0	1	0	01	01	10
124	85	0000000	70154151	000000000	65F825E593	0	0	0	1	0	11	01	01
125	86	0000000	602A82A3	000000000	4BF04BCB26	0	0	0	1	0	10	11	01
126	87	0000000	40550546	000000000	17E097964C	0	0	0	1	1	01	10	11
127	88	0000000	00AA0A8D	000000000	2FC12F2C99	0	1	0	1	1	01	01	10
128	89	0000000	0154151A	000000000	5F825E5932	0	0	0	1	0	11	01	01
129	90	0000000	02A82A34	000000000	3F04BCB264	0	1	0	0	0	10	11	01
130	91	0000000	05505468	000000000	7E097964C9	0	0	0	0	0	01	10	11
131	92	0000000	0AA0A8D0	000000000	7C12F2C992	0	1	0	0	0	01	01	10
132	93	0000000	154151A1	000000000	7825E59324	0	0	0	0	1	10	01	01
133	94	0000000	2A82A342	000000000	704BCB2648	0	1	0	0	1	00	10	01
134	95	0000000	55054684	000000000	6097964C91	0	0	0	1	1	01	00	10
135	96	0000000	2A0A8D09	000000000	412F2C9923	0	0	0	0	1	01	01	00
136	97	0000000	54151A12	000000000	025E593246	0	0	0	0	1	10	01	01
137	98	0000000	282A3424	000000000	04BCB2648D	0	0	0	1	1	00	10	01
138	99	0000000	50546848	000000000	097964C91A	0	0	0	0	0	01	00	10
139	100	0000000	20A8D090	000000000	12F2C99235	0	1	0	1	1	00	01	00
140	101	0000000	4151A120	000000000	25E593246A	0	0	0	1	1	11	00	01
141	102	0000000	02A34240	000000000	4BCB2648D5	0	1	0	1	1	01	11	00
142	103	0000000	05468481	000000000	17964C91AB	0	0	0	1	0	10	01	11
143	104	0000000	0A8D0903	000000000	2F2C992357	0	1	0	0	1	00	10	01
144	105	0000000	151A1206	000000000	5E593246AE	0	0	0	0	0	01	00	10
145	106	0000000	2A34240C	000000000	3CB2648D5C	0	0	0	1	0	00	01	00
146	107	0000000	54684818	000000000	7964C91AB8	0	0	0	0	0	11	00	01
147	108	0000000	28D09030	000000000	72C9923571	0	1	0	1	1	01	11	00
148	109	0000000	51A12060	000000000	6593246AE2	0	1	0	1	1	10	01	11
149	110	0000000	234240C0	000000000	4B2648D5C5	0	0	0	0	0	00	10	01
150	111	0000000	46848180	000000000	164C91AB8A	0	1	0	0	1	01	00	10
151	112	0000000	0D090301	000000000	2C99235714	0	0	0	1	0	00	01	00
152	113	0000000	1A120602	000000000	593246AE28	0	0	0	0	0	11	00	01
153	114	0000000	34240C04	000000000	32648D5C51	0	0	0	0	1	10	11	00
154	115	0000000	68481809	000000000	64C91AB8A2	0	0	0	1	1	01	10	11
155	116	0000000	50903012	000000000	4992357144	0	1	0	1	1	01	01	10
156	117	0000000	21206024	000000000	13246AE288	0	0	0	0	1	10	01	01
157	118	0000000	4240C048	000000000	2648D5C511	0	0	0	0	0	00	10	01
158	119	0000000	04818090	000000000	4C91AB8A23	0	1	0	1	0	00	00	10
159	120	0000000	09030120	000000000	1923571446	0	0	0	0	0	00	00	00
160	121	0000000	12060240	000000000	3246AE288D	0	0	0	0	0	00	00	00
161	122	0000000	240C0480	000000000	648D5C511B	0	0	0	1	1	00	00	00
162	123	0000000	48180900	000000000	491AB8A237	0	0	0	0	0	00	00	00
163	124	0000000	10301200	000000000	123571446F	0	0	0	0	0	00	00	00
164	125	0000000	20602400	000000000	246AE288DF	0	0	0	0	0	00	00	00
165	126	0000000	40C04800	000000000	48D5C511BE	0	1	0	1	0	01	00	00
166	127	0000000	01809001	000000000	11AB8A237D	0	1	0	1	1	00	01	00
167	128	0000000	03012002	000000000	23571446FA	0	0	0	0	0	11	00	01
168	129	0000000	06024004	000000000	46AE288DF5	0	0	0	1	0	01	11	00
169	130	0000000	0C048008	000000000	0D5C511BEA	0	0	0	0	1	11	01	11
170	131	0000000	18090011	000000000	1AB8A237D5	0	0	0	1	0	10	11	01
171	132	0000000	30120022	000000000	3571446FAA	0	0	0	0	0	01	10	11
172	133	0000000	60240044	000000000	6AE288DF55	0	0	0	1	0	01	01	10
173	134	0000000	40480089	000000000	55C511BEAA	0	0	0	1	0	11	01	01
174	135	0000000	00900113	000000000	2B8A237D54	0	1	0	1	1	10	11	01

Appendix IV - Sample Data

Bluetooth.

175	136	0000000	01200227	000000000	571446FAA8	0	0	0	0	0	01	10	11
176	137	0000000	0240044E	000000000	2E288DF550	0	0	0	0	1	00	01	10
177	138	0000000	0480089C	000000000	5C511BEAA0	0	1	0	0	1	11	00	01
178	139	0000000	09001138	000000000	38A237D540	0	0	0	1	0	01	11	00
179	140	0000000	12002270	000000000	71446FAA81	0	0	0	0	1	11	01	11
180	141	0000000	240044E0	000000000	6288DF5503	0	0	0	1	0	10	11	01
181	142	0000000	480089C0	000000000	4511BEAA06	0	0	0	0	0	01	10	11
182	143	0000000	10011381	000000000	0A237D540D	0	0	0	0	1	00	01	10
183	144	0000000	20022702	000000000	1446FAA81A	0	0	0	0	0	11	00	01
184	145	0000000	40044E04	000000000	288DF55035	0	0	0	1	0	01	11	00
185	146	0000000	00089C08	000000000	511BEAA06A	0	0	0	0	1	11	01	11
186	147	0000000	00113810	000000000	2237D540D5	0	0	0	0	1	01	11	01
187	148	0000000	00227021	000000000	446FAA81AA	0	0	0	0	1	11	01	11
188	149	0000000	0044E042	000000000	08DF550355	0	0	0	1	0	10	11	01
189	150	0000000	0089C085	000000000	11BEAA06AA	0	1	0	1	0	10	10	11
190	151	0000000	0113810A	000000000	237D540D54	0	0	0	0	0	10	10	10
191	152	0000000	02270215	000000000	46FAA81AA9	0	0	0	1	1	10	10	10
192	153	0000000	044E042A	000000000	0DF5503553	0	0	0	1	1	10	10	10
193	154	0000000	089C0854	000000000	1BEAA06AA7	0	1	0	1	0	01	10	10
194	155	0000000	113810A8	000000000	37D540D54E	0	0	0	1	0	01	01	10
195	156	0000000	22702150	000000000	6FAA81AA9D	0	0	0	1	0	11	01	01
196	157	0000000	44E042A0	000000000	5F5503553A	0	1	0	0	0	10	11	01
197	158	0000000	09C08540	000000000	3EAA06AA75	0	1	0	1	0	10	10	11
198	159	0000000	13810A80	000000000	7D540D54EA	0	1	0	0	1	10	10	10
199	160	0000000	27021500	000000000	7AA81AA9D5	0	0	0	1	1	10	10	10
200	161	0000000	4E042A00	000000000	75503553AB	0	0	0	0	0	10	10	10
201	162	0000000	1C085400	000000000	6AA06AA756	0	0	0	1	1	10	10	10
202	163	0000000	3810A800	000000000	5540D54EAC	0	0	0	0	0	10	10	10
203	164	0000000	70215000	000000000	2A81AA9D58	0	0	0	1	1	10	10	10
204	165	0000000	6042A001	000000000	5503553AB0	0	0	0	0	0	10	10	10
205	166	0000000	40854002	000000000	2A06AA7561	0	1	0	0	1	10	10	10
206	167	0000000	010A8004	000000000	540D54EAC3	0	0	0	0	0	10	10	10
207	168	0000000	02150009	000000000	281AA9D586	0	0	0	0	0	10	10	10
208	169	0000000	042A0012	000000000	503553AB0C	0	0	0	0	0	10	10	10
209	170	0000000	08540024	000000000	206AA75618	0	0	0	0	0	10	10	10
210	171	0000000	10A80048	000000000	40D54EAC30	0	1	0	1	0	01	10	10
211	172	0000000	21500091	000000000	01AA9D5861	0	0	0	1	0	01	01	10
212	173	0000000	42A00122	000000000	03553AB0C3	0	1	0	0	0	11	01	01
213	174	0000000	05400244	000000000	06AA756186	0	0	0	1	0	10	11	01
214	175	0000000	0A800488	000000000	0D54EAC30D	0	1	0	0	1	01	10	11
215	176	0000000	15000911	000000000	1AA9D5861A	0	0	0	1	0	01	01	10
216	177	0000000	2A001223	000000000	3553AB0C35	0	0	0	0	1	10	01	01
217	178	0000000	54002446	000000000	6AA756186A	0	0	0	1	1	00	10	01
218	179	0000000	2800488D	000000000	554EAC30D5	0	0	0	0	0	01	00	10
219	180	0000000	5000911B	000000000	2A9D5861AA	0	0	0	1	0	00	01	00
220	181	0000000	20012236	000000000	553AB0C355	0	0	0	0	0	11	00	01
221	182	0000000	4002446C	000000000	2A756186AA	0	0	0	0	1	10	11	00
222	183	0000000	00488D9	000000000	54EAC30D54	0	0	0	1	1	01	10	11
223	184	0000000	000911B2	000000000	29D5861AA8	0	0	0	1	0	01	01	10
224	185	0000000	00122364	000000000	53AB0C3550	0	0	0	1	0	11	01	01
225	186	0000000	002446C8	000000000	2756186AA0	0	0	0	0	1	01	11	01
226	187	0000000	00488D90	000000000	4EAC30D540	0	0	0	1	0	10	01	11
227	188	0000000	00911B20	000000000	1D5861AA81	0	1	0	0	1	00	10	01
228	189	0000000	01223640	000000000	3AB0C35502	0	0	0	1	1	01	00	10
229	190	0000000	02446C80	000000000	756186AA05	0	0	0	0	1	01	01	00
230	191	0000000	0488D901	000000000	6AC30D540B	0	1	0	1	1	11	01	01
231	192	0000000	0911B203	000000000	55861AA817	0	0	0	1	0	10	11	01

Appendix IV - Sample Data

Bluetooth.

232	193	0000000	12236407	000000000	2B0C35502F	0	0	0	0	0	01	10	11
233	194	0000000	2446C80E	000000000	56186AA05F	0	0	0	0	1	00	01	10
234	195	0000000	488D901C	000000000	2C30D540BF	0	1	0	0	1	11	00	01
235	196	0000000	111B2039	000000000	5861AA817E	0	0	0	0	1	10	11	00
236	197	0000000	22364072	000000000	30C35502FD	0	0	0	1	1	01	10	11
237	198	0000000	446C80E4	000000000	6186AA05FB	0	0	0	1	0	01	01	10
238	199	0000000	08D901C8	000000000	430D540BF6	0	1	0	0	0	11	01	01
239	200	0000000	11B20391	000000000	061AA817EC	0	1	0	0	0	10	11	01

- Z[0] = 3D
- Z[1] = C1
- Z[2] = F0
- Z[3] = BB
- Z[4] = 58
- Z[5] = 1E
- Z[6] = 42
- Z[7] = 42
- Z[8] = 4B
- Z[9] = 8E
- Z[10] = C1
- Z[11] = 2A
- Z[12] = 40
- Z[13] = 63
- Z[14] = 7A
- Z[15] = 1E

 Reload this pattern into the LFSRs
 Hold content of Summation Combiner regs and calculate new C[t+1] and Z values

LFSR1 <= 04B583D
 LFSR2 <= 208E1EC1
 LFSR3 <= 063C142F0
 LFSR4 <= 0F7A2A42BB
 C[t+1] <= 10

 Generating 125 key symbols (encryption/decryption sequence)

240	1	04B583D	208E1EC1	063C142F0	0F7A2A42BB	0	1	0	0	0	10	11	01
241	2	096B07A	411C3D82	0C78285E1	1EF4548577	1	0	1	1	1	10	10	11
242	3	12D60F4	02387B04	18F050BC3	3DE8A90AEF	0	0	1	1	0	01	10	10
243	4	05AC1E9	0470F609	11E0A1786	7BD15215DF	0	0	0	1	0	01	01	10
244	5	0B583D2	08E1EC13	03C142F0C	77A2A42BBF	1	1	0	1	0	00	01	01
245	6	16B07A5	11C3D827	078285E18	6F4548577E	0	1	0	0	1	11	00	01
246	7	0D60F4B	2387B04F	0F050BC30	5E8A90AEFD	1	1	1	1	1	00	11	00
247	8	1AC1E97	470F609E	1E0A17860	3D15215DFA	1	0	1	0	0	11	00	11
248	9	1583D2E	0E1EC13D	1C142F0C0	7A2A42BBF4	0	0	1	0	0	01	11	00
249	10	0B07A5D	1C3D827B	18285E181	74548577E9	1	0	1	0	1	10	01	11
250	11	160F4BB	387B04F7	1050BC302	68A90AEFD2	0	0	0	1	1	00	10	01
251	12	0C1E976	70F609EE	00A178605	515215DFA5	1	1	0	0	0	00	00	10
252	13	183D2ED	61EC13DD	0142F0C0B	22A42BBF4B	1	1	0	1	1	01	00	00
253	14	107A5DA	43D827BA	0285E1817	4548577E97	0	1	0	0	0	00	01	00
254	15	00F4BB4	07B04F74	050BC302F	0A90AEFD2E	0	1	0	1	0	10	00	01
255	16	01E9769	0F609EE8	0A178605E	15215DFA5C	0	0	1	0	1	11	10	00
256	17	03D2ED3	1EC13DD0	142F0C0BD	2A42BBF4B9	0	1	0	0	0	00	11	10
257	18	07A5DA7	3D827BA0	085E1817B	548577E972	0	1	1	1	1	11	00	11

Appendix IV - Sample Data

Bluetooth.

258	19	0F4BB4F	7B04F740	10BC302F6	290AEFD2E5	1	0	0	0	0	01	11	00
259	20	1E9769F	7609EE80	0178605ED	5215DFA5CA	1	0	0	0	0	10	01	11
260	21	1D2ED3F	6C13DD01	02F0C0BDA	242BBF4B94	1	0	0	0	1	00	10	01
261	22	1A5DA7E	5827BA03	05E1817B4	48577E9729	1	0	0	0	1	01	00	10
262	23	14BB4FC	304F7407	0BC302F69	10AEFD2E53	0	0	1	1	1	00	01	00
263	24	09769F9	609EE80E	178605ED2	215DFA5CA7	1	1	0	0	0	10	00	01
264	25	12ED3F2	413DD01C	0F0C0BDA4	42BBF4B94F	0	0	1	1	0	00	10	00
265	26	05DA7E5	027BA038	1E1817B49	0577E9729F	0	0	1	0	1	01	00	10
266	27	0BB4FCA	04F74071	1C302F693	0AEFD2E53F	1	1	1	1	1	11	01	00
267	28	1769F95	09EE80E3	18605ED27	15DFA5CA7F	0	1	1	1	0	11	11	01
268	29	0ED3F2B	13DD01C6	10C0BDA4F	2BBF4B94FE	1	1	0	1	0	10	11	11
269	30	1DA7E56	27BA038D	01817B49F	577E9729FD	1	1	0	0	0	10	10	11
270	31	1B4FCAD	4F74071B	0302F693E	2EFD2E53FB	1	0	0	1	0	01	10	10
271	32	169F95B	1EE80E37	0605ED27D	5DFA5CA7F7	0	1	0	1	1	01	01	10
272	33	0D3F2B7	3DD01C6E	0C0BDA4FB	3BF4B94FEF	1	1	1	1	1	00	01	01
273	34	1A7E56F	7BA038DC	1817B49F6	77E9729FDE	1	1	1	1	0	01	00	01
274	35	14FCADF	774071B9	102F693ED	6FD2E53FBD	0	0	0	1	0	00	01	00
275	36	09F95BE	6E80E373	005ED27DB	5FA5CA7F7B	1	1	0	1	1	10	00	01
276	37	13F2B7C	5D01C6E7	00BDA4FB6	3F4B94FEF7	0	0	0	0	0	11	10	00
277	38	07E56F9	3A038DCE	017B49F6C	7E9729FDEE	0	0	0	1	0	00	11	10
278	39	0FCADF2	74071B9C	02F693ED8	7D2E53FBDD	1	0	0	0	1	10	00	11
279	40	1F95BE5	680E3738	05ED27DB0	7A5CA7F7BA	1	0	0	0	1	11	10	00
280	41	1F2B7CA	501C6E71	0BDA4FB60	74B94FEF74	1	0	1	1	0	01	11	10
281	42	1E56F94	2038DCE2	17B49F6C0	69729FDEE8	1	0	0	0	0	10	01	11
282	43	1CADF29	4071B9C4	0F693ED80	52E53FBDD1	1	0	1	1	1	11	10	01
283	44	195BE53	00E37389	1ED27DB01	25CA7F7BA3	1	1	1	1	1	01	11	10
284	45	12B7CA6	01C6E713	1DA4FB602	4B94FEF747	0	1	1	1	0	01	01	11
285	46	056F94C	038DCE26	1B49F6C04	1729FDEE8E	0	1	1	0	1	11	01	01
286	47	0ADF299	071B9C4D	1693ED808	2E53FBDD1C	1	0	0	0	0	10	11	01
287	48	15BE532	0E37389A	0D27DB011	5CA7F7BA38	0	0	1	1	0	10	10	11
288	49	0B7CA64	1C6E7135	1A4FB6022	394FEF7471	1	0	1	0	0	01	10	10
289	50	16F94C9	38DCE26A	149F6C044	729FDEE8E2	0	1	0	1	1	01	01	10
290	51	0DF2993	71B9C4D4	093ED8089	653FBDD1C4	1	1	1	0	0	00	01	01
291	52	1BE5327	637389A9	127DB0112	4A7F7BA388	1	0	0	0	1	11	00	01
292	53	17CA64E	46E71353	04FB60224	14FEF74710	0	1	0	1	1	01	11	00
293	54	0F94C9C	0DCE26A6	09F6C0448	29FDEE8E21	1	1	1	1	1	01	01	11
294	55	1F29939	1B9C4D4D	13ED80890	53FBDD1C42	1	1	0	1	0	00	01	01
295	56	1E53272	37389A9A	07DB01121	27F7BA3884	1	0	0	1	0	10	00	01
296	57	1CA64E5	6E713534	0FB602242	4FEF747108	1	0	1	1	1	00	10	00
297	58	194C9CE	5CE26A69	1F6C04485	1FDEE8E210	1	1	1	1	0	11	00	10
298	59	1299397	39C4D4D3	1ED80890A	3FBDD1C420	0	1	1	1	0	00	11	00
299	60	053272F	7389A9A6	1DB011214	7F7BA38840	0	1	1	0	0	11	00	11
300	61	0A64E5E	6713534C	1B6022428	7EF7471081	1	0	1	1	0	00	11	00
301	62	14C9CBD	4E26A699	16C044850	7DEE8E2102	0	0	0	1	1	10	00	11
302	63	099397A	1C4D4D32	0D80890A0	7BDD1C4205	1	0	1	1	1	00	10	00
303	64	13272F4	389A9A65	1B0112141	77BA38840B	0	1	1	1	1	00	00	10
304	65	064E5E8	713534CB	160224283	6F74710817	0	0	0	0	0	00	00	00
305	66	0C9CBD1	626A6997	0C0448507	5EE8E2102E	1	0	1	1	1	01	00	00
306	67	19397A3	44D4D32E	180890A0E	3DD1C4205C	1	1	1	1	1	11	01	00
307	68	1272F46	09A9A65D	10112141D	7BA38840B8	0	1	0	1	1	10	11	01
308	69	04E5E8C	13534CBA	00224283A	7747108171	0	0	0	0	0	01	10	11
309	70	09CBD19	26A69975	004485075	6E8E2102E3	1	1	0	1	0	10	01	10
310	71	1397A32	4D4D32EB	00890A0EA	5D1C4205C7	0	0	0	0	0	00	10	01
311	72	072F465	1A9A65D7	0112141D5	3A38840B8F	0	1	0	0	1	01	00	10
312	73	0E5E8CA	3534CBAF	0224283AA	747108171F	1	0	0	0	0	00	01	00
313	74	1CBD194	6A69975E	044850755	6E8E2102E3E	1	0	0	1	0	10	00	01
314	75	197A329	54D32EBC	0890A0EAB	51C4205C7D	1	1	1	1	0	01	10	00

Appendix IV - Sample Data

Bluetooth.

315	76	12F4653	29A65D79	112141D56	238840B8FA	0	1	0	1	1	01	01	10
316	77	05E8CA6	534CBAF2	024283AAD	47108171F4	0	0	0	0	1	10	01	01
317	78	0BD194D	269975E5	04850755B	0E2102E3E9	1	1	0	0	0	11	10	01
318	79	17A329A	4D32EBCB	090A0EAB6	1C4205C7D2	0	0	1	0	0	00	11	10
319	80	0F46535	1A65D797	12141D56D	38840B8FA5	1	0	0	1	0	11	00	11
320	81	1E8CA6A	34CBAF2F	04283AADA	7108171F4B	1	1	0	0	1	01	11	00
321	82	1D194D5	69975E5F	0850755B4	62102E3E97	1	1	1	0	0	01	01	11
322	83	1A329AA	532EBCBF	10A0EAB68	44205C7D2F	1	0	0	0	0	11	01	01
323	84	1465355	265D797F	0141D56D1	0840B8FA5E	0	0	0	0	1	01	11	01
324	85	08CA6AB	4CBAF2FF	0283AADA2	108171F4BC	1	1	0	1	0	01	01	11
325	86	1194D56	1975E5FF	050755B45	2102E3E979	0	0	0	0	1	10	01	01
326	87	0329AAD	32EBCBFF	0A0EAB68A	4205C7D2F3	0	1	1	0	0	11	10	01
327	88	065355A	65D797FF	141D56D14	040B8FA5E7	0	1	0	0	0	00	11	10
328	89	0CA6AB4	4BAF2FFF	083AADA28	08171F4BCF	1	1	1	0	1	11	00	11
329	90	194D569	175E5FFF	10755B450	102E3E979E	1	0	0	0	0	01	11	00
330	91	129AAD3	2EBCBFFF	00EAB68A1	205C7D2F3C	0	1	0	0	0	10	01	11
331	92	05355A6	5D797FFF	01D56D142	40B8FA5E78	0	0	0	1	1	00	10	01
332	93	0A6AB4D	3AF2FFFE	03AADA285	0171F4BCF1	1	1	0	0	0	00	00	10
333	94	14D569B	75E5FFFD	0755B450A	02E3E979E2	0	1	0	1	0	01	00	00
334	95	09AAD37	6BCBFFFA	0EAB68A15	05C7D2F3C4	1	1	1	1	1	11	01	00
335	96	1355A6E	5797FFF4	1D56D142A	0B8FA5E788	0	1	1	1	0	11	11	01
336	97	06AB4DC	2F2FFFE8	1AADA2854	171F4BCF11	0	0	1	0	0	11	11	11
337	98	0D569B8	5E5FFFD0	155B450A9	2E3E979E23	1	0	0	0	0	11	11	11
338	99	1AAD370	3CBFFFA1	0AB68A153	5C7D2F3C46	1	1	1	0	0	10	11	11
339	100	155A6E0	797FFF43	156D142A7	38FA5E788D	0	0	0	1	1	01	10	11
340	101	0AB4DC0	72FFFE87	0ADA2854E	71F4BCF11B	1	1	1	1	1	10	01	10
341	102	1569B81	65FFFD0E	15B450A9D	63E979E236	0	1	0	1	0	11	10	01
342	103	0AD3703	4BFFFA1C	0B68A153B	47D2F3C46C	1	1	1	1	1	01	11	10
343	104	15A6E07	17FFF438	16D142A76	0FA5E788D8	0	1	0	1	1	10	01	11
344	105	0B4DC0F	2FFFE870	0DA2854EC	1F4BCF11B0	1	1	1	0	1	11	10	01
345	106	169B81F	5FFFD0E1	1B450A9D8	3E979E2360	0	1	1	1	0	01	11	10
346	107	0D3703F	3FFFA1C3	168A153B0	7D2F3C46C1	1	1	0	0	1	10	01	11
347	108	1A6E07E	7FFF4386	0D142A761	7A5E788D83	1	1	1	0	1	11	10	01
348	109	14DC0FD	7FFE870C	1A2854EC2	74BCF11B07	0	1	1	1	0	01	11	10
349	110	09B81FB	7FFD0E19	1450A9D84	6979E2360E	1	1	0	0	1	10	01	11
350	111	13703F6	7FFA1C33	08A153B09	52F3C46C1C	0	1	1	1	1	11	10	01
351	112	06E07EC	7FF43867	1142A7612	25E788D838	0	1	0	1	1	00	11	10
352	113	0DC0FD8	7FE870CF	02854EC25	4BCF11B071	1	1	0	1	1	11	00	11
353	114	1B81FB1	7FD0E19E	050A9D84B	179E2360E3	1	1	0	1	0	00	11	00
354	115	1703F62	7FA1C33D	0A153B096	2F3C46C1C7	0	1	1	0	0	11	00	11
355	116	0E07EC4	7F43867B	142A7612C	5E788D838E	1	0	0	0	0	01	11	00
356	117	1C0FD88	7E870CF6	0854EC259	3CF11B071C	1	1	1	1	1	01	01	11
357	118	181FB11	7D0E19ED	10A9D84B3	79E2360E38	1	0	0	1	1	11	01	01
358	119	103F622	7A1C33DA	0153B0967	73C46C1C71	0	0	0	1	0	10	11	01
359	120	007EC45	743867B5	02A7612CE	6788D838E3	0	0	0	1	1	01	10	11
360	121	00FD88B	6870CF6B	054EC259C	4F11B071C6	0	0	0	0	1	00	01	10
361	122	01FB117	50E19ED7	0A9D84B38	1E2360E38C	0	1	1	0	0	10	00	01
362	123	03F622F	21C33DAE	153B09671	3C46C1C718	0	1	0	0	1	11	10	00
363	124	07EC45F	43867B5C	0A7612CE2	788D838E30	0	1	1	1	0	01	11	10
364	125	0FD88BF	070CF6B9	14EC259C4	711B071C61	1	0	0	0	0	10	01	11

1.3 SECOND SET OF SAMPLE DATA

Initial values for the key, BD_ADDR and clock

K'c2[0] = 00 K'c2[1] = 00 K'c2[2] = 00 K'c2[3] = 00
 K'c2[4] = 00 K'c2[5] = 00 K'c2[6] = 00 K'c2[7] = 00
 K'c2[8] = 00 K'c2[9] = 00 K'c2[10] = 00 K'c2[11] = 00
 K'c2[12] = 00 K'c2[13] = 00 K'c2[14] = 00 K'c2[15] = 00

Addr2[0] = 00 Addr2[1] = 00 Addr2[2] = 00
 Addr2[3] = 00 Addr2[4] = 00 Addr2[5] = 00

Clk2[0] = 00 Clk2[1] = 00 Clk2[2] = 00 Clk2[3] = 03

 Fill LFSRs with initial data

t	clk#	LFSR1	LFSR2	LFSR3	LFSR4	X1	X2	X3	X4	Z	C[t+1]	C[t]	C[t-1]
0	0	0000000*	00000000*	000000000*	0000000000*	0	0	0	0	0	00	00	00
1	1	0000001*	00000001*	000000001*	0000000001*	0	0	0	0	0	00	00	00
2	2	0000002*	00000002*	000000002*	0000000003*	0	0	0	0	0	00	00	00
3	3	0000004*	00000004*	000000004*	0000000007*	0	0	0	0	0	00	00	00
4	4	0000008*	00000008*	000000008*	000000000E*	0	0	0	0	0	00	00	00
5	5	0000010*	00000010*	000000010*	000000001C*	0	0	0	0	0	00	00	00
6	6	0000020*	00000020*	000000020*	0000000038*	0	0	0	0	0	00	00	00
7	7	0000040*	00000040*	000000040*	0000000070*	0	0	0	0	0	00	00	00
8	8	0000080*	00000080*	000000080*	00000000E0*	0	0	0	0	0	00	00	00
9	9	0000100*	00000100*	000000100*	00000001C0*	0	0	0	0	0	00	00	00
10	10	0000200*	00000200*	000000200*	0000000380*	0	0	0	0	0	00	00	00
11	11	0000400*	00000400*	000000400*	0000000700*	0	0	0	0	0	00	00	00
12	12	0000800*	00000800*	000000800*	0000000E00*	0	0	0	0	0	00	00	00
13	13	0001000*	00001000*	000001000*	0000001C00*	0	0	0	0	0	00	00	00
14	14	0002000*	00002000*	000002000*	0000003800*	0	0	0	0	0	00	00	00
15	15	0004000*	00004000*	000004000*	0000007000*	0	0	0	0	0	00	00	00
16	16	0008000*	00008000*	000008000*	000000E000*	0	0	0	0	0	00	00	00
17	17	0010000*	00010000*	000010000*	000001C000*	0	0	0	0	0	00	00	00
18	18	0020000*	00020000*	000020000*	0000038000*	0	0	0	0	0	00	00	00
19	19	0040000*	00040000*	000040000*	0000070000*	0	0	0	0	0	00	00	00
20	20	0080000*	00080000*	000080000*	00000E0000*	0	0	0	0	0	00	00	00
21	21	0100000*	00100000*	000100000*	00001C0000*	0	0	0	0	0	00	00	00
22	22	0200000*	00200000*	000200000*	0000380000*	0	0	0	0	0	00	00	00
23	23	0400000*	00400000*	000400000*	0000700000*	0	0	0	0	0	00	00	00
24	24	0800000*	00800000*	000800000*	0000E00000*	1	1	0	0	0	01	00	00
25	25	1000000*	01000000*	001000000*	0001C00000*	0	0	0	0	0	00	00	00
26	26	0000001	02000000*	002000000*	0003800000*	0	0	0	0	0	00	00	00
27	27	0000002	04000000*	004000000*	0007000000*	0	0	0	0	0	00	00	00
28	28	0000004	08000000*	008000000*	000E000000*	0	0	0	0	0	00	00	00
29	29	0000008	10000000*	010000000*	001C000000*	0	0	0	0	0	00	00	00
30	30	0000010	20000000*	020000000*	0038000000*	0	0	0	0	0	00	00	00
31	31	0000020	40000000*	040000000*	0070000000*	0	0	0	0	0	00	00	00
32	32	0000040	00000001	080000000*	00E0000000*	0	0	1	1	0	01	00	00
33	33	0000080	00000002	100000000*	01C0000000*	0	0	0	1	1	00	00	00
34	34	0000101	00000004	000000001	0380000000*	0	0	0	1	1	00	00	00

Appendix IV - Sample Data



35	35	0000202	00000008	000000002	0700000000*	0	0	0	0	0	00	00	00	00
36	36	0000404	00000010	000000004	0E00000000*	0	0	0	0	0	00	00	00	00
37	37	0000808	00000020	000000008	1C00000000*	0	0	0	0	0	00	00	00	00
38	38	0001011	00000040	000000011	3800000000*	0	0	0	0	0	00	00	00	00
39	39	0002022	00000080	000000022	7000000000*	0	0	0	0	0	00	00	00	00

Start clocking Summation Combiner

40	1	0004044	00000100	000000044	6000000001	0	0	0	0	0	00	00	00	00
41	2	0008088	00000200	000000088	4000000003	0	0	0	0	0	00	00	00	00
42	3	0010111	00000400	000000111	0000000007	0	0	0	0	0	00	00	00	00
43	4	0020222	00000800	000000222	000000000E	0	0	0	0	0	00	00	00	00
44	5	0040444	00001001	000000444	000000001D	0	0	0	0	0	00	00	00	00
45	6	0080888	00002002	000000888	000000003B	0	0	0	0	0	00	00	00	00
46	7	0101111	00004004	000001111	0000000077	0	0	0	0	0	00	00	00	00
47	8	0202222	00008008	000002222	00000000EE	0	0	0	0	0	00	00	00	00
48	9	0404444	00010011	000004444	00000001DD	0	0	0	0	0	00	00	00	00
49	10	0808888	00020022	000008888	00000003BB	1	0	0	0	1	00	00	00	00
50	11	1011110	00040044	000011111	0000000777	0	0	0	0	0	00	00	00	00
51	12	0022221	00080088	000022222	0000000EEE	0	0	0	0	0	00	00	00	00
52	13	0044442	00100110	000044444	0000001DDD	0	0	0	0	0	00	00	00	00
53	14	0088884	00200220	000088888	0000003BBB	0	0	0	0	0	00	00	00	00
54	15	0111109	00400440	000111111	0000007777	0	0	0	0	0	00	00	00	00
55	16	0222212	00800880	000222222	000000EEEE	0	1	0	0	1	00	00	00	00
56	17	0444424	01001100	000444444	000001DDDD	0	0	0	0	0	00	00	00	00
57	18	0888848	02002200	000888888	000003BBBB	1	0	0	0	1	00	00	00	00
58	19	1111090	04004400	001111110	0000077777	0	0	0	0	0	00	00	00	00
59	20	0222120	08008800	002222220	00000EEEEE	0	0	0	0	0	00	00	00	00
60	21	0444240	10011000	004444440	00001DDDDD	0	0	0	0	0	00	00	00	00
61	22	0888480	20022000	008888880	00003BBBBB	1	0	0	0	1	00	00	00	00
62	23	1110900	40044000	011111100	0000777777	0	0	0	0	0	00	00	00	00
63	24	0221200	00088001	022222200	0000EEEEEE	0	0	0	0	0	00	00	00	00
64	25	0442400	00110003	044444400	0001DDDDDD	0	0	0	0	0	00	00	00	00
65	26	0884800	00220006	088888800	0003BBBBBB	1	0	1	0	0	01	00	00	00
66	27	1109000	0044000C	111110000	0007777777	0	0	0	0	1	01	01	00	00
67	28	0212001	00880018	022222001	000EEEEEEE	0	1	0	0	0	11	01	01	01
68	29	0424002	01100031	044444002	001DDDDDDC	0	0	0	0	1	01	11	01	01
69	30	0848004	02200062	088888004	003BBBBBB8	1	0	1	0	1	10	01	11	11
70	31	1090008	044000C4	111110008	0077777770	0	0	0	0	0	00	10	01	01
71	32	0120010	08800188	022220010	00EEEEEEE0	0	1	0	1	0	00	00	10	10
72	33	0240020	11000311	044440020	01DDDDDDC1	0	0	0	1	1	00	00	00	00
73	34	0480040	22000622	088880040	03BBBBBB83	0	0	1	1	0	01	00	00	00
74	35	0900081	44000C44	111100080	0777777707	1	0	0	0	0	00	01	00	00
75	36	1200103	08001888	022200101	0EEEEEEE0E	0	0	0	1	1	11	00	01	01
76	37	0400207	10003111	044400202	1DDDDDDC1D	0	0	0	1	0	01	11	00	00
77	38	080040E	20006222	088800404	3BBBBBB83B	1	0	1	1	0	01	01	11	11
78	39	100081C	4000C444	111000808	7777777077	0	0	0	0	1	10	01	01	01
79	40	0001038	00018888	022001010	6EEEEEEE0EF	0	0	0	1	1	00	10	01	01
80	41	0002070	00031110	044002020	5DDDDDC1DE	0	0	0	1	1	01	00	10	10
81	42	00040E0	00062220	088004040	3BBBBBB83BC	0	0	1	1	1	00	01	00	00
82	43	00081C1	000C4440	110008081	777777079	0	0	0	0	0	11	00	01	01
83	44	0010383	00188880	020010103	6EEEEEEE0EF2	0	0	0	1	0	01	11	00	00
84	45	0020707	00311100	040020206	5DDDDC1DE5	0	0	0	1	0	10	01	11	11
85	46	0040E0E	00622200	08004040C	3BBBB83BCB	0	0	1	1	0	11	10	01	01
86	47	0081CID	00C44400	100080819	7777707797	0	1	0	0	0	00	11	10	10
87	48	010383A	01888801	000101032	6EEEEEEE0EF2F	0	1	0	1	0	11	00	11	11
88	49	0207075	03111003	000202064	5DDDC1DE5E	0	0	0	1	0	01	11	00	00

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89	50	040E0EA	06222006	0004040C8	3BBB83BCBC	0	0	0	1	0	10	01	11
90	51	081C1D5	0C44400C	000808191	7777077979	1	0	0	0	1	00	10	01
91	52	10383AB	18888018	001010323	6EEE0EF2F2	0	1	0	1	0	00	00	10
92	53	0070756	31110030	002020646	5DDC1DE5E5	0	0	0	1	1	00	00	00
93	54	00E0EAC	62220060	004040C8C	3BB83BCBCE	0	0	0	1	1	00	00	00
94	55	01C1D59	444400C1	008081919	7770779797	0	0	0	0	0	00	00	00
95	56	0383AB2	08880183	010103232	6EEE0EF2F2	0	1	0	1	0	01	00	00
96	57	0707565	11100307	020206464	5DC1DE5E5F	0	0	0	1	0	00	01	00
97	58	0E0EACA	2220060E	04040C8C8	3B83BCBCBF	1	0	0	1	0	10	00	01
98	59	1C1D594	44400C1C	080819191	770779797E	1	0	1	0	0	00	10	00
99	60	183AB28	08801838	101032323	6E0EF2F2FC	1	1	0	0	0	00	00	10
100	61	1075650	11003070	002064647	5C1DE5E5F8	0	0	0	0	0	00	00	00
101	62	00EACAL	220060E0	0040C8C8E	383BCBCBF0	0	0	0	0	0	00	00	00
102	63	01D5943	4400C1C0	00819191D	70779797E0	0	0	0	0	0	00	00	00
103	64	03AB286	08018380	01032323A	60EF2F2FC1	0	0	0	1	1	00	00	00
104	65	075650C	10030701	020646475	41DE5E5F82	0	0	0	1	1	00	00	00
105	66	0EACA18	20060E02	040C8C8EA	03BCBCBF04	1	0	0	1	0	01	00	00
106	67	1D59430	400C1C05	0819191D4	0779797E09	1	0	1	0	1	00	01	00
107	68	1AB2861	0018380A	1032323A9	0EF2F2FC12	1	0	0	1	0	10	00	01
108	69	15650C3	00307015	006464752	1DE5E5F825	0	0	0	1	1	11	10	00
109	70	0ACA186	0060E02A	00C8C8EA4	3BCBCBF04B	1	0	0	1	1	00	11	10
110	71	159430C	00C1C055	019191D48	779797E097	0	1	0	1	0	11	00	11
111	72	0B28618	018380AA	032323A90	6F2F2FC12F	1	1	0	0	1	01	11	00
112	73	1650C30	03070154	064647520	5E5E5F825E	0	0	0	0	1	11	01	11
113	74	0CA1860	060E02A8	0C8C8EA40	3CBCBF04BC	1	0	1	1	0	11	11	01
114	75	19430C0	0C1C0550	19191D480	79797E0979	1	0	1	0	1	11	11	11
115	76	1286180	18380AA0	12323A900	72F2FC12F2	0	0	0	1	0	11	11	11
116	77	050C301	30701541	046475201	65E5F825E5	0	0	0	1	0	11	11	11
117	78	0A18602	60E02A82	08C8EA402	4BCBF04BCB	1	1	1	1	1	10	11	11
118	79	1430C04	41C05505	1191D4804	1797E09796	0	1	0	1	0	10	10	11
119	80	0861808	0380AA0A	0323A9008	2F2FC12F2C	1	1	0	0	0	01	10	10
120	81	10C3011	07015415	064752011	5E5F825E59	0	0	0	0	1	00	01	10
121	82	0186022	0E02A82A	0C8EA4022	3CBF04BCB2	0	0	1	1	0	10	00	01
122	83	030C045	1C055054	191D48044	797E097964	0	0	1	0	1	11	10	00
123	84	061808A	380AA0A8	123A90088	72FC12F2C9	0	0	0	1	0	00	11	10
124	85	0C30115	70154151	047520111	65F825E593	1	0	0	1	0	11	00	11
125	86	186022A	602A82A3	08EA40222	4BF04BCB26	1	0	1	1	0	00	11	00
126	87	10C0455	40550546	11D480444	17E097964C	0	0	0	1	1	10	00	11
127	88	01808AA	0AA0A8D0	03A900888	2FC12F2C99	0	1	0	1	0	00	10	00
128	89	0301155	0154151A	075201111	5F825E5932	0	0	0	1	1	01	00	10
129	90	06022AA	02A82A34	0EA402222	3F04BCB264	0	1	1	0	1	00	01	00
130	91	0C04555	05505468	1D4804445	7E097964C9	1	0	1	0	0	10	00	01
131	92	1808AAA	0AA0A8D0	1A900888A	7C12F2C992	1	1	1	0	1	00	10	00
132	93	1011555	154151A1	152011115	7825E59324	0	0	0	0	0	01	00	10
133	94	0022AAB	2A82A342	0A402222B	704BCB2648	0	1	1	0	1	00	01	00
134	95	0045556	55054684	148044457	6097964C91	0	0	0	1	1	11	00	01
135	96	008AAAC	2A0A8D09	0900888AE	412F2C9923	0	0	1	0	0	01	11	00
136	97	0115559	54151A12	12011115D	025E593246	0	0	0	0	1	11	01	11
137	98	022AAB2	282A3424	0402222BA	04BCB2648D	0	0	0	1	0	10	11	01
138	99	0455564	50546848	080444575	097964C91A	0	0	1	0	1	01	10	11
139	100	08AAAC8	20A8D090	100888AEA	12F2C99235	1	1	0	1	0	10	01	10
140	101	1155591	4151A120	0011115D5	25E593246A	0	0	0	1	1	00	10	01
141	102	02AAB22	02A34240	002222BAA	4BCB2648D5	0	1	0	1	0	00	00	10
142	103	0555644	05468481	004445755	17964C91AB	0	0	0	1	1	00	00	00
143	104	0AAAC88	0A8D0903	00888AEAA	2F2C992357	1	1	0	0	0	01	00	00
144	105	1555911	151A1206	011115D55	5E593246AE	0	0	0	0	1	01	01	00
145	106	0AAB222	2A34240C	02222BAAA	3CB2648D5C	1	0	0	1	1	11	01	01

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146	107	1556445	54684818	044457555	7964C91AB8	0	0	0	0	1	01	11	01
147	108	0AAC88B	28D09030	0888AEEAA	72C9923571	1	1	1	1	1	01	01	11
148	109	1559117	51A12060	11115D555	6593246AE2	0	1	0	1	1	11	01	01
149	110	0AB222F	234240C0	0222BAAAB	4B2648D5C5	1	0	0	0	0	10	11	01
150	111	156445F	46848180	044575557	164C91AB8A	0	1	0	0	1	01	10	11
151	112	0AC88BF	0D090301	088AEEAAE	2C99235714	1	0	1	1	0	10	01	10
152	113	159117F	1A120602	1115D555D	593246AE28	0	0	0	0	0	00	10	01
153	114	0B222FE	34240C04	022BAAABA	32648D5C51	1	0	0	0	1	01	00	10
154	115	16445FD	68481809	045755574	64C91AB8A2	0	0	0	1	0	00	01	00
155	116	0C88BFA	50903012	08AEEAAE8	4992357144	1	1	1	1	0	01	00	01
156	117	19117F5	21206024	115D555D1	13246AE288	1	0	0	0	0	00	01	00
157	118	1222FEA	4240C048	02BAAABA2	2648D5C511	0	0	0	0	0	11	00	01
158	119	0445FD5	04818090	057555744	4C91AB8A23	0	1	0	1	1	01	11	00
159	120	088BF8A	09030120	0AEEAAE88	1923571446	1	0	1	0	1	10	01	11
160	121	1117F55	12060240	15D555D11	3246AE288D	0	0	0	0	0	00	10	01
161	122	022FEAA	240C0480	0BAAABA22	648D5C511B	0	0	1	1	0	00	00	10
162	123	045FD54	48180900	175557444	491AB8A237	0	0	0	0	0	00	00	00
163	124	08BFAA9	10301200	0EAAAE889	123571446F	1	0	1	0	0	01	00	00
164	125	117F553	20602400	1D555D113	246AE288DF	0	0	1	0	0	00	01	00
165	126	02FEAA7	40C04800	1AAABA227	48D5C511BE	0	1	1	1	1	10	00	01
166	127	05FD54F	01809001	15557444F	11AB8A237D	0	1	0	1	0	00	10	00
167	128	0BFAA9F	03012002	0AAAE889E	23571446FA	1	0	1	0	0	00	00	10
168	129	17F553F	06024004	1555D113D	46AE288DF5	0	0	0	1	1	00	00	00
169	130	0FEAA7E	0C048008	0AABA227A	0D5C511BEA	1	0	1	0	0	01	00	00
170	131	1FD54FC	18090011	1557444F5	1AB8A237D5	1	0	0	1	1	00	01	00
171	132	1FAA9F9	30120022	0AAE889EB	3571446FAA	1	0	1	0	0	10	00	01
172	133	1F553F2	60240044	155D113D7	6AE288DF55	1	0	0	1	0	00	10	00
173	134	1EAA7E4	40480089	0ABA227AE	55C511BEAA	1	0	1	1	1	00	00	10
174	135	1D54FC9	00900113	157444F5D	2B8A237D54	1	1	0	1	1	01	00	00
175	136	1AA9F93	01200227	0AE889EBA	571446FAA8	1	0	1	0	1	00	01	00
176	137	1553F26	0240044E	15D113D75	2E288DF550	0	0	0	0	0	11	00	01
177	138	0AA7E4C	0480089C	0ABA227AE	5C511BEAA0	1	1	1	0	0	00	11	00
178	139	154FC98	09001138	17444F5D4	38A237D540	0	0	0	1	1	10	00	11
179	140	0A9F931	12002270	0E889EBA9	71446FAA81	1	0	1	0	0	00	10	00
180	141	153F262	240044E0	1D113D753	6288DF5503	0	0	1	1	0	00	00	10
181	142	0A7E4C5	480089C0	1A227AE7A	4511BEAA06	1	0	1	0	0	01	00	00
182	143	14FC98B	10011381	1444F5D4F	0A237D540D	0	0	0	0	1	01	01	00
183	144	09F9316	20022702	0889EBA9E	1446FAA81A	1	0	1	0	1	11	01	01
184	145	13F262D	40044E04	1113D753D	288DF55035	0	0	0	1	0	10	11	01
185	146	07E4C5A	00089C08	0227AEA7A	511BEAA06A	0	0	0	0	0	01	10	11
186	147	0FC98B4	00113810	044F5D4F5	2237D540D5	1	0	0	0	0	01	01	10
187	148	1F93169	00227021	089EBA9EB	446FAA81AA	1	0	1	0	1	11	01	01
188	149	1F262D2	0044E042	113D753D7	08DF550355	1	0	0	1	1	10	11	01
189	150	1E4C5A4	0089C085	027AEA7AE	11BEAA06AA	1	1	0	1	1	10	10	11
190	151	1C98B48	0113810A	04F5D4F5C	237D540D54	1	0	0	0	1	10	10	10
191	152	1931691	02270215	09EBA9EB8	46FAA81AA9	1	0	1	1	1	01	10	10
192	153	1262D22	044E042A	13D753D71	0DF5503553	0	0	0	1	0	01	01	10
193	154	04C5A44	089C0854	07AEA7AE2	1BEAA06AA7	0	1	0	1	1	11	01	01
194	155	098B488	113810A8	0F5D4F5C4	37D540D54E	1	0	1	1	0	11	11	01
195	156	1316910	22702150	1EBA9EB89	6FAA81AA9D	0	0	1	1	1	11	11	11
196	157	062D220	44E042A0	1D753D712	5F5503553A	0	1	1	0	1	11	11	11
197	158	0C5A440	09C08540	1AEA7AE25	3EAA06AA75	1	1	1	1	1	10	11	11
198	159	18B4880	13810A80	15D4F5C4B	7D540D54EA	1	1	0	0	0	10	10	11
199	160	1169100	27021500	0BA9EB897	7AA81AA9D5	0	0	1	1	0	01	10	10
200	161	02D2201	4E042A00	1753D712E	75503553AB	0	0	0	0	1	00	01	10
201	162	05A4403	1C085400	0EA7AE25C	6AA06AA756	0	0	1	1	0	10	00	01
202	163	0B48807	3810A800	1D4F5C4B8	5540D54EAC	1	0	1	0	0	00	10	00

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203	164	169100F	70215000	1A9EB8971	2A81AA9D58	0	0	1	1	0	00	00	10
204	165	0D2201E	6042A001	153D712E3	5503553AB0	1	0	0	0	1	00	00	00
205	166	1A4403C	40854002	0A7AE25C6	2A06AA7561	1	1	1	0	1	01	00	00
206	167	1488079	010A8004	14F5C4B8D	540D54EAC3	0	0	0	0	1	01	01	00
207	168	09100F2	02150009	09EB8971B	281AA9D586	1	0	1	0	1	11	01	01
208	169	12201E5	042A0012	13D712E37	503553AB0C	0	0	0	0	1	01	11	01
209	170	04403CA	08540024	07AE25C6E	206AA75618	0	0	0	0	1	11	01	11
210	171	0880795	10A80048	0F5C4B8DD	40D54EAC30	1	1	1	1	1	11	11	01
211	172	1100F2A	21500091	1EB8971BA	01AA9D5861	0	0	1	1	1	11	11	11
212	173	0201E54	42A00122	1D712E374	03553AB0C3	0	1	1	0	1	11	11	11
213	174	0403CA9	05400244	1AE25C6E9	06AA756186	0	0	1	1	1	11	11	11
214	175	0807952	0A800488	15C4B8DD3	0D54EAC30D	1	1	0	0	1	11	11	11
215	176	100F2A5	15000911	0B8971BA6	1AA9D5861A	0	0	1	1	1	11	11	11
216	177	001E54A	2A001223	1712E374C	3553AB0C35	0	0	0	0	1	00	11	11
217	178	003CA94	54002446	0E25C6E98	6AA756186A	0	0	1	1	0	11	00	11
218	179	0079528	2800488D	1C4B8DD31	554EAC30D5	0	0	1	0	0	01	11	00
219	180	00F2A50	5000911B	18971BA62	2A9D5861AA	0	0	1	1	1	10	01	11
220	181	01E54A0	20012236	112E374C4	553AB0C355	0	0	0	0	0	00	10	01
221	182	03CA940	4002446C	025C6E988	2A756186AA	0	0	0	0	0	01	00	10
222	183	0795280	000488D9	04B8DD310	54EAC30D54	0	0	0	1	0	00	01	00
223	184	0F2A500	000911B2	0971BA620	29D5861AA8	1	0	1	1	1	10	00	01
224	185	1E54A00	00122364	12E374C40	53AB0C3550	1	0	0	1	0	00	10	00
225	186	1CA9400	002446C8	05C6E9880	2756186AA0	1	0	0	0	1	01	00	10
226	187	1952800	00488D90	0B8DD3101	4EAC30D540	1	0	1	1	0	11	01	00
227	188	12A5000	00911B20	171BA6202	1D5861AA81	0	1	0	0	0	10	11	01
228	189	054A000	01223640	0E374C404	3AB0C35502	0	0	1	1	0	10	10	11
229	190	0A94000	02446C80	1C6E98808	756186AA05	1	0	1	0	0	01	10	10
230	191	1528001	0488D901	18DD31011	6AC30D540B	0	1	1	1	0	10	01	10
231	192	0A50003	0911B203	11BA62023	55861AA817	1	0	0	1	0	11	10	01
232	193	14A0006	12236407	0374C4047	2B0C35502F	0	0	0	0	1	11	11	10
233	194	094000C	2446C80E	06E98808E	56186AA05F	1	0	0	0	0	11	11	11
234	195	1280018	488D901C	0DD31011D	2C30D540BF	0	1	1	0	1	11	11	11
235	196	0500030	111B2039	1BA62023A	5861AA817E	0	0	1	0	0	11	11	11
236	197	0A00060	22364072	174C40475	30C35502FD	1	0	0	1	1	11	11	11
237	198	14000C0	446C80E4	0E98808EA	6186AA05FB	0	0	1	1	1	11	11	11
238	199	0800180	08D901C8	1D31011D5	430D540BF6	1	1	1	0	0	10	11	11
239	200	1000301	11B20391	1A62023AB	061AA817EC	0	1	1	0	0	10	10	11

- Z[0] = 25
- Z[1] = 45
- Z[2] = 6B
- Z[3] = 55
- Z[4] = 5F
- Z[5] = C2
- Z[6] = 20
- Z[7] = E5
- Z[8] = C4
- Z[9] = F8
- Z[10] = 3A
- Z[11] = F1
- Z[12] = FF
- Z[13] = 89
- Z[14] = 02
- Z[15] = 35

 Reload this pattern into the LFSRs

Appendix IV - Sample Data



Hold content of Summation Combiner regs and calculate new C[t+1] and Z values

```

=====
LFSR1 <= 1C45F25
LFSR2 <= 7FF8C245
LFSR3 <= 1893A206B
LFSR4 <= 1A02F1E555
C[t+1] <= 10
    
```

Generating 125 key symbols (encryption/decryption sequence)

```

=====
240  1  1C45F25  7FF8C245  1893A206B  1A02F1E555  1  1  1  0  1  10  10  11
241  2  188BE4A  7FF1848B  1127440D7  3405E3CAAB  1  1  0  0  0  01  10  10
242  3  1117C95  7FE30917  024E881AF  680BC79557  0  1  0  0  0  01  01  10
243  4  022F92B  7FC6122F  049D1035E  50178F2AAF  0  1  0  0  0  11  01  01
244  5  045F257  7F8C245E  093A206BD  202F1E555E  0  1  1  0  1  10  11  01
245  6  08BE4AE  7F1848BC  127440D7A  405E3CAABC  1  0  0  0  1  01  10  11
246  7  117C95C  7E309178  04E881AF4  00BC795579  0  0  0  1  0  01  01  10
247  8  02F92B8  7C6122F0  09D1035E8  0178F2AAF2  0  0  1  0  0  11  01  01
248  9  05F2570  78C245E1  13A206BD0  02F1E555E5  0  1  0  1  1  10  11  01
249  10 0BE4AE1  71848BC2  07440D7A0  05E3CAABCA  1  1  0  1  1  10  10  11
250  11 17C95C3  63091784  0E881AF40  0BC7955795  0  0  1  1  0  01  10  10
251  12 0F92B87  46122F09  1D1035E80  178F2AAF2B  1  0  1  1  0  10  01  10
252  13 1F2570F  0C245E12  1A206BD01  2F1E555E56  1  0  1  0  0  11  10  01
253  14 1E4AE1F  1848BC25  1440D7A03  5E3CAABCAC  1  0  0  0  0  00  11  10
254  15 1C95C3E  3091784A  0881AF407  3C79557958  1  1  1  0  1  11  00  11
255  16 192B87D  6122F094  11035E80F  78F2AAF2B1  1  0  0  1  1  01  11  00
256  17 12570FA  4245E128  0206BD01E  71E555E562  0  0  0  1  0  10  01  11
257  18 04AE1F4  048BC250  040D7A03D  63CAABCAC5  0  1  0  1  0  11  10  01
258  19 095C3E8  091784A0  081AF407A  479557958A  1  0  1  1  0  01  11  10
259  20 12B87D1  122F0941  1035E80F4  0F2AAF2B14  0  0  0  0  1  11  01  11
260  21 0570FA3  245E1283  006BD01E9  1E555E5628  0  0  0  0  1  01  11  01
261  22 0AE1F46  48BC2506  00D7A03D2  3CAABCAC50  1  1  0  1  0  01  01  11
262  23 15C3E8C  11784A0C  01AF407A5  79557958A0  0  0  0  0  1  10  01  01
263  24 0B87D18  22F09419  035E80F4A  72AAF2B140  1  1  0  1  1  11  10  01
264  25 170FA30  45E12832  06BD01E94  6555E56280  0  1  0  0  0  00  11  10
265  26 0E1F460  0BC25065  0D7A03D28  4AABCAC501  1  1  1  1  0  00  00  11
266  27 1C3E8C0  1784A0CB  1AP407A50  1557958A03  1  1  1  0  1  01  00  00
267  28 187D181  2F094196  15E80F4A0  2AAF2B1406  1  0  0  1  1  00  01  00
268  29 10FA302  5E12832C  0BD01E941  555E56280C  0  0  1  0  1  11  00  01
269  30 01F4604  3C250658  17A03D283  2ABCAC5019  0  0  0  1  0  01  11  00
270  31 03E8C09  784A0CB0  0F407A506  557958A033  0  0  1  0  0  10  01  11
271  32 07D1812  70941960  1E80F4A0C  2AF2B14066  0  1  1  1  1  11  10  01
272  33 0FA3024  612832C1  1D01E9419  55E56280CD  1  0  1  1  0  01  11  10
273  34 1F46049  42506583  1A03D2832  2BCAC5019A  1  0  1  1  0  01  01  11
274  35 1E8C093  04A0CB07  1407A5065  57958A0335  1  1  0  1  0  00  01  01
275  36 1D18127  0941960F  080F4A0CB  2F2B14066B  1  0  1  0  0  10  00  01
276  37 1A3024F  12832C1F  101E94196  5E56280CD7  1  1  0  0  0  00  10  00
277  38 146049F  2506583E  003D2832C  3CAC5019AE  0  0  0  1  1  01  00  10
278  39 08C093E  4A0CB07D  007A50658  7958A0335D  1  0  0  0  0  00  01  00
279  40 118127C  141960FA  00F4A0CB0  72B14066BA  0  0  0  1  1  11  00  01
280  41 03024F8  2832C1F4  01E941961  656280CD74  0  0  0  0  1  10  11  00
281  42 06049F1  506583E9  03D2832C2  4AC5019AE9  0  0  0  1  1  01  10  11
282  43 0C093E2  20CB07D2  07A506585  158A0335D3  1  1  0  1  0  10  01  10
283  44 18127C5  41960FA5  0F4A0CB0B  2B14066BA7  1  1  1  0  1  11  10  01
284  45 1024F8A  032C1F4B  1E9419616  56280CD74F  0  0  1  0  0  00  11  10
285  46 0049F15  06583E97  1D2832C2C  2C5019AE9F  0  0  1  0  1  10  00  11
    
```

Appendix IV - Sample Data

Bluetooth.

286	47	0093E2B	0CB07D2F	1A5065859	58A0335D3E	0	1	1	1	1	00	10	00
287	48	0127C56	1960FA5E	14A0CB0B2	314066BA7D	0	0	0	0	0	01	00	10
288	49	024F8AD	32C1F4BC	094196164	6280CD74FB	0	1	1	1	0	11	01	00
289	50	049F15A	6583E978	12832C2C8	45019AE9F6	0	1	0	0	0	10	11	01
290	51	093E2B5	4B07D2F0	050658591	0A0335D3ED	1	0	0	0	1	01	10	11
291	52	127C56B	160FA5E0	0A0CB0B22	14066BA7DA	0	0	1	0	0	01	01	10
292	53	04F8AD7	2C1F4BC1	141961645	280CD74FB5	0	0	0	0	1	10	01	01
293	54	09F15AF	583E9783	0832C2C8A	5019AE9F6A	1	0	1	0	0	11	10	01
294	55	13E2B5E	307D2F06	106585915	20335D3ED5	0	0	0	0	1	11	11	10
295	56	07C56BD	60FA5E0D	00CB0B22B	4066BA7DAA	0	1	0	0	0	11	11	11
296	57	0F8AD7A	41F4BC1B	019616457	00CD74FB54	1	1	0	1	0	10	11	11
297	58	1F15AF4	03E97836	032C2C8AF	019AE9F6A9	1	1	0	1	1	10	10	11
298	59	1E2B5E9	07D2F06C	06585915E	0335D3ED52	1	1	0	0	0	01	10	10
299	60	1C56BD2	0FA5E0D8	0CB0B22BC	066BA7DAA4	1	1	1	0	0	10	01	10
300	61	18AD7A5	1F4BC1B0	196164578	0CD74FB549	1	0	1	1	1	11	10	01
301	62	115AF4B	3E978361	12C2C8AF0	19AE9F6A92	0	1	0	1	1	00	11	10
302	63	02B5E96	7D2F06C2	0585915E0	335D3ED524	0	0	0	0	0	10	00	11
303	64	056BD2D	7A5E0D85	0B0B22BC1	66BA7DAA49	0	0	1	1	0	00	10	00
304	65	0AD7A5B	74BC1B0A	161645783	4D74FB5493	1	1	0	0	0	00	00	10
305	66	15AF4B6	69783615	0C2C8AF07	1AE9F6A926	0	0	1	1	0	01	00	00
306	67	0B5E96D	52F06C2B	185915E0F	35D3ED524C	1	1	1	1	1	11	01	00
307	68	16BD2DB	25E0D857	10B22BC1F	6BA7DAA499	0	1	0	1	1	10	11	01
308	69	0D7A5B7	4BC1B0AF	01645783F	574FB54933	1	1	0	0	0	10	10	11
309	70	1AF4B6F	1783615F	02C8AF07F	2E9F6A9266	1	1	0	1	1	01	10	10
310	71	15E96DF	2F06C2BF	05915E0FF	5D3ED524CC	0	0	0	0	1	00	01	10
311	72	0BD2DBF	5E0D857F	0B22BC1FE	3A7DAA4998	1	0	1	0	0	10	00	01
312	73	17A5B7F	3C1B0AFE	1645783FD	74FB549331	0	0	0	1	1	11	10	00
313	74	0F4B6FF	783615FD	0C8AF07FA	69F6A92662	1	0	1	1	0	01	11	10
314	75	1E96DFF	706C2BFB	1915E0FF5	53ED524CC4	1	0	1	1	0	01	01	11
315	76	1D2DBFE	60D857F6	122BC1FEB	27DAA49988	1	1	0	1	0	00	01	01
316	77	1A5B7FD	41B0AFEC	045783FD7	4FB5493310	1	1	0	1	1	10	00	01
317	78	14B6FFA	03615FD8	08AF07FAE	1F6A926620	0	0	1	0	1	11	10	00
318	79	096DFF4	06C2BFB1	115E0FF5D	3ED524CC40	1	1	0	1	0	01	11	10
319	80	12DBFE8	0D857F63	02BC1FEBB	7DAA499881	0	1	0	1	1	10	01	11
320	81	05B7FD0	1B0AFEC6	05783FD77	7B54933103	0	0	0	0	0	00	10	01
321	82	0B6FFA1	3615FD8C	0AF07FAEF	76A9266206	1	0	1	1	1	00	00	10
322	83	16DFF42	6C2BFB18	15E0FF5DE	6D524CC40C	0	0	0	0	0	00	00	00
323	84	0DBFE85	5857F631	0BC1FEBBD	5AA4998819	1	0	1	1	1	01	00	00
324	85	1B7FD0B	30AFEC62	1783FD77A	3549331033	1	1	0	0	1	00	01	00
325	86	16FFA16	615FD8C5	0F07FAEF5	6A92662067	0	0	1	1	0	10	00	01
326	87	0DFF42D	42BFB18B	1E0FF5DEA	5524CC40CE	1	1	1	0	1	00	10	00
327	88	1BFE85B	057F6317	1C1FEBBD5	2A4998819C	1	0	1	0	0	00	00	10
328	89	17FD0B7	0AFEC62E	183FD77AA	5493310339	0	1	1	1	1	01	00	00
329	90	0FFA16F	15FD8C5C	107FAEF55	2926620672	1	1	0	0	1	00	01	00
330	91	1FF42DF	2BFB18B9	00FF5DEAA	524CC40CE5	1	1	0	0	0	10	00	01
331	92	1FE85BF	57F63172	01FEBBD55	24998819CA	1	1	0	1	1	00	10	00
332	93	1FD0B7F	2FEC62E4	03FD77AAA	4933103394	1	1	0	0	0	00	00	10
333	94	1FA16FF	5FD8C5C9	07FAEF555	1266206728	1	1	0	0	0	01	00	00
334	95	1F42DFF	3FB18B93	0FF5DEAAA	24CC40CE51	1	1	1	1	1	11	01	00
335	96	1E85BFF	7F631727	1FEBBD554	4998819CA3	1	0	1	1	0	11	11	01
336	97	1D0B7FE	7EC62E4F	1FD77AAA9	1331033947	1	1	1	0	0	10	11	11
337	98	1A16FFC	7D8C5C9F	1FAEF5553	266206728E	1	1	1	0	1	10	10	11
338	99	142DFF9	7B18B93F	1F5DEAAA7	4CC40CE51D	0	0	1	1	0	01	10	10
339	100	085BFF3	7631727F	1EBBD554E	198819CA3B	1	0	1	1	0	10	01	10
340	101	10B7FE6	6C62E4FF	1D77AAA9C	3310339477	0	0	1	0	1	00	10	01
341	102	016FFCC	58C5C9FE	1AEF55538	66206728EE	0	1	1	0	0	00	00	10
342	103	02DFF98	318B93FC	15DEAAA70	4C40CE51DC	0	1	0	0	1	00	00	00

Appendix IV - Sample Data

Bluetooth.

343	104	05BFF31	631727F8	0BBD554E1	18819CA3B9	0	0	1	1	0	01	00	00
344	105	0B7FE62	462E4FF1	177AAA9C2	3103394772	1	0	0	0	0	00	01	00
345	106	16FFCC5	0C5C9FE2	0EF555384	6206728EE4	0	0	1	0	1	11	00	01
346	107	0DF98A	18B93FC4	1DEAAA709	440CE51DC9	1	1	1	0	0	00	11	00
347	108	1BFF315	31727F88	1BD554E12	0819CA3B93	1	0	1	0	0	11	00	11
348	109	17FE62A	62E4FF11	17AAA9C24	1033947726	0	1	0	0	0	01	11	00
349	110	0FFCC54	45C9FE22	0F5553849	206728EE4C	1	1	1	0	0	01	01	11
350	111	1FF98A8	0B93FC44	1EAAA7093	40CE51DC99	1	1	1	1	1	00	01	01
351	112	1FF3150	1727F889	1D554E127	019CA3B933	1	0	1	1	1	10	00	01
352	113	1FE62A0	2E4FF112	1AAA9C24F	0339477267	1	0	1	0	0	00	10	00
353	114	1FCC541	5C9FE225	15553849E	06728EE4CF	1	1	0	0	0	00	00	10
354	115	1F98A82	393FC44B	0AAA7093C	0CE51DC99F	1	0	1	1	1	01	00	00
355	116	1F31504	727F8897	1554E1279	19CA3B933E	1	0	0	1	1	00	01	00
356	117	1E62A09	64FF112F	0AA9C24F2	339477267D	1	1	1	1	0	01	00	01
357	118	1CC5412	49FE225E	1553849E4	6728EE4CFB	1	1	0	0	1	00	01	00
358	119	198A824	13FC44BC	0AA7093C9	4E51DC99F7	1	1	1	0	1	10	00	01
359	120	1315049	27F88979	154E12792	1CA3B933EE	0	1	0	1	0	00	10	00
360	121	062A093	4FF112F3	0A9C24F24	39477267DC	0	1	1	0	0	00	00	10
361	122	0C54127	1FE225E6	153849E48	728EE4CFB8	1	1	0	1	1	01	00	00
362	123	18A824E	3FC44BCD	0A7093C91	651DC99F71	1	1	1	0	0	11	01	00
363	124	115049C	7F88979A	14E127922	4A3B933EE2	0	1	0	0	0	10	11	01
364	125	02A0938	7F112F35	09C24F244	1477267DC5	0	0	1	0	1	01	10	11

1.4 THIRD SET OF SAMPLES

Initial values for the key, pan address and clock

K'c3[0] = FF K'c3[1] = FF K'c3[2] = FF K'c3[3] = FF
 K'c3[4] = FF K'c3[5] = FF K'c3[6] = FF K'c3[7] = FF
 K'c3[8] = FF K'c3[9] = FF K'c3[10] = FF K'c3[11] = FF
 K'c3[12] = FF K'c3[13] = FF K'c3[14] = FF K'c3[15] = FF

Addr3[0] = FF Addr3[1] = FF Addr3[2] = FF
 Addr3[3] = FF Addr3[4] = FF Addr3[5] = FF

Clk3[0] = FF Clk3[1] = FF Clk3[2] = FF Clk3[3] = 03

 Fill LFSRs with initial data

t	clk#	LFSR1	LFSR2	LFSR3	LFSR4	X1	X2	X3	X4	Z	C[t+1]	C[t]	C[t-1]
0	0	0000000*	00000000*	000000000*	0000000000*	0	0	0	0	0	00	00	00
1	1	0000001*	00000001*	000000001*	0000000001*	0	0	0	0	0	00	00	00
2	2	0000003*	00000002*	000000003*	0000000003*	0	0	0	0	0	00	00	00
3	3	0000007*	00000004*	000000007*	0000000007*	0	0	0	0	0	00	00	00
4	4	000000F*	00000009*	00000000F*	000000000F*	0	0	0	0	0	00	00	00
5	5	000001F*	00000013*	00000001F*	000000001F*	0	0	0	0	0	00	00	00
6	6	000003F*	00000027*	00000003F*	000000003F*	0	0	0	0	0	00	00	00
7	7	000007F*	0000004F*	00000007F*	000000007F*	0	0	0	0	0	00	00	00
8	8	00000FF*	0000009F*	0000000FF*	00000000FF*	0	0	0	0	0	00	00	00
9	9	00001FF*	0000013F*	0000001FF*	00000001FF*	0	0	0	0	0	00	00	00
10	10	00003FF*	0000027F*	0000003FF*	00000003FF*	0	0	0	0	0	00	00	00
11	11	00007FF*	000004FF*	0000007FF*	00000007FF*	0	0	0	0	0	00	00	00
12	12	0000FFF*	000009FF*	000000FFF*	0000000FFF*	0	0	0	0	0	00	00	00
13	13	0001FFF*	000013FF*	000001FFF*	0000001FFF*	0	0	0	0	0	00	00	00
14	14	0003FFF*	000027FF*	000003FFF*	0000003FFF*	0	0	0	0	0	00	00	00
15	15	0007FFF*	00004FFF*	000007FFF*	0000007FFF*	0	0	0	0	0	00	00	00
16	16	000FFFF*	00009FFF*	00000FFFF*	000000FFFF*	0	0	0	0	0	00	00	00
17	17	001FFFF*	00013FFF*	00001FFFF*	000001FFFF*	0	0	0	0	0	00	00	00
18	18	003FFFF*	00027FFF*	00003FFFF*	000003FFFF*	0	0	0	0	0	00	00	00
19	19	007FFFF*	0004FFF*	00007FFFF*	000007FFFF*	0	0	0	0	0	00	00	00
20	20	00FFFF*	0009FFF*	0000FFFF*	00000FFFF*	0	0	0	0	0	00	00	00
21	21	01FFFF*	0013FFF*	0001FFFF*	00001FFFF*	0	0	0	0	0	00	00	00
22	22	03FFFF*	0027FFF*	0003FFFF*	00003FFFF*	0	0	0	0	0	00	00	00
23	23	07FFFF*	004FFF*	0007FFFF*	00007FFFF*	0	0	0	0	0	00	00	00
24	24	0FFFF*	009FFF*	000FFFF*	0000FFFF*	1	1	0	0	0	01	00	00
25	25	1FFFF*	013FFF*	001FFFF*	0001FFFF*	1	0	0	0	1	00	00	00
26	26	1FFFFFF	027FFFF	003FFFF	0003FFFF	1	0	0	0	1	00	00	00
27	27	1FFFFFF	04FFFF	007FFFF	0007FFFF	1	1	0	0	0	01	00	00
28	28	1FFFFFF	09FFFF	00FFFF	000FFFF	1	1	0	0	0	01	00	00
29	29	1FFFFFF	13FFFF	01FFFF	001FFFF	1	1	0	0	0	01	00	00
30	30	1FFFFFF	27FFFF	03FFFF	003FFFF	1	1	0	0	0	01	00	00
31	31	1FFFFFF	4FFFF	07FFFF	007FFFF	1	1	0	0	0	01	00	00
32	32	1FFFFFF	1FFFFFF	0FFFFFF	00FFFFFF	1	1	1	1	0	10	00	00
33	33	1FFFFFF	3FFFFFF	1FFFFFF	01FFFFFF	1	1	1	1	0	10	00	00
34	34	1FFFFFF	7FFFFFF	1FFFFFF	03FFFFFF	1	1	1	1	0	10	00	00

Appendix IV - Sample Data

Bluetooth.

35	35	1FFFFFFF	7FFFFFFF9	1FFFFFFFFF	07FFFFFFF* 07FFFFFFF* 07FFFFFFF* 07FFFFFFF* 07FFFFFFF*	1	1	1	1	0	10	00	00
36	36	1FFFFFFF	7FFFFFFF3	1FFFFFFFFF	0FFFFFFF* 0FFFFFFF* 0FFFFFFF* 0FFFFFFF* 0FFFFFFF*	1	1	1	1	0	10	00	00
37	37	1FFFFFFF	7FFFFFFE7	1FFFFFFFFF	1FFFFFFF* 1FFFFFFF* 1FFFFFFF* 1FFFFFFF* 1FFFFFFF*	1	1	1	1	0	10	00	00
38	38	1FFFFFFF	7FFFFFFCF	1FFFFFFFFF	3FFFFFFF* 3FFFFFFF* 3FFFFFFF* 3FFFFFFF* 3FFFFFFF*	1	1	1	1	0	10	00	00
39	39	1FFFFFFF	7FFFFFF9F	1FFFFFFFFF	7FFFFFFF* 7FFFFFFF* 7FFFFFFF* 7FFFFFFF* 7FFFFFFF*	1	1	1	1	0	10	00	00

Start clocking Summation Combiner

40	1	1FFFFFFF	7FFFFFF3F	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	01	10	00
41	2	1FFFFFFF	7FFFE7F	1FFFFFFFFF	7FFFFFFF	1	1	1	1	1	10	01	10
42	3	1FFFFFFF	7FFFCFF	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	10	10	01
43	4	1FFFFFFF	7FFF99F	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	00	10	10
44	5	1FFFFFFF	7FFF3FF	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	11	00	10
45	6	1FFFFFFF	7FFFE7FE	1FFFFFFFFF	7FFFFFFF	1	1	1	1	1	00	11	00
46	7	1FFFFFFF	7FFFCFFC	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	00	00	11
47	8	1FFFFFFF	7FFF99F9	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	10	00	00
48	9	1FFFFFFF	7FFF3FF3	1FFFFFFFFF	7FFFFFFF	1	1	1	1	0	01	10	00
49	10	1FFFFFFF	7FFE7FE6	1FFFFFFFFF	7FFFFFFF	1	1	1	1	1	10	01	10
50	11	1FFFFFFE	7FFCFCC	1FFFFFFFFE	7FFFFFFF	1	1	1	1	0	10	10	01
51	12	1FFFFFFC	7FF999F9	1FFFFFFFCC	7FFFFFFF	1	1	1	1	0	00	10	10
52	13	1FFFFFF8	7FF3FF33	1FFFFFFF88	7FFFFFFF	1	1	1	1	0	11	00	10
53	14	1FFFFFF0	7FE7FE67	1FFFFFFF00	7FFFFFFF	1	1	1	1	1	00	11	00
54	15	1FFFFFFE0	7FCFFCCF	1FFFFFFFE0	7FFFFFFF	1	1	1	1	0	00	00	11
55	16	1FFFFFFC0	7F9999F9	1FFFFFFFC0	7FFFFFFF	1	1	1	1	0	10	00	00
56	17	1FFFFFF80	7F3FF33E	1FFFFFFF80	7FFFFFFFE	1	0	1	1	1	00	10	00
57	18	1FFFFFF00	7E7FE67C	1FFFFFFF00	7FFFFFFFC	1	0	1	1	1	00	00	10
58	19	1FFFE01	7CFCCCF8	1FFFE01E	7FFFFFFF8	1	1	1	1	0	10	00	00
59	20	1FFFC03	799999F0	1FFFC03C	7FFFFFFF0	1	1	1	1	0	01	10	00
60	21	1FFF807	73FF33E0	1FFF8078	7FFFFFFFE1	1	1	1	1	1	10	01	10
61	22	1FFF00F	67FE67C0	1FFF00F0	7FFFFFFFC3	1	1	1	1	0	10	10	01
62	23	1FFE01E	4FFCCF80	1FFE01E1	7FFFFFFF87	1	1	1	1	0	00	10	10
63	24	1FFC03C	1FF999F00	1FFC03C3	7FFFFFFF0F	1	1	1	1	0	11	00	10
64	25	1FF8078	3FF33E01	1FF80787	7FFFFFFFE1E	1	1	1	1	1	00	11	00
65	26	1FF00F0	7FE67C02	1FF00F0F	7FFFFFFFC3C	1	1	1	1	0	00	00	11
66	27	1FE01E1	7CFFCF805	1FE01E1E	7FFFFFFF878	1	1	1	1	0	10	00	00
67	28	1FC03C3	7F999F00A	1FC03C3C	7FFFFFFF0F0	1	1	1	1	0	01	10	00
68	29	1F80787	7F33E015	1F807878	7FFFFFFFE1E1	1	0	1	1	0	10	01	10
69	30	1F00F0F	7E67C02A	1F00F0F0	7FFFFFFFC3C3	1	0	1	1	1	11	10	01
70	31	1E01E1E	7CCFF8054	1E01E1E1	7FFFFFFF8787	1	1	1	1	1	01	11	10
71	32	1C03C3C	7999F00A9	1C03C3C3	7FFFFFFF0F0F	1	1	1	1	1	01	01	11
72	33	1807878	733E0152	18078787	7FFFFFFE1E1E	1	0	1	1	0	00	01	01
73	34	100F0F0	667C02A5	100F0F0F	7FFFFFFC3C3C	0	0	1	1	0	10	00	01
74	35	001E1E0	4CF8054B	001E1E1F	7FFFFFF87878	0	1	1	1	1	00	10	00
75	36	003C3C1	19F00A96	003C3C3F	7FFF0F0F0	0	1	1	1	1	00	00	10
76	37	0078783	33E0152C	0078787F	7FFE1E1E1E	0	1	1	1	1	01	00	00
77	38	00F0F07	67C02A59	00F0F0FF	7FFFC3C3C3	0	1	1	1	0	11	01	00
78	39	01E1E0E	4F8054B3	01E1E1FF	7FFF878787	0	1	1	1	0	11	11	01
79	40	03C3C1C	1F00A966	03C3C3FF	7FFF0F0F0F	0	0	1	1	1	11	11	11
80	41	0787838	3E0152CC	078787FF	7FE1E1E1E1E	0	0	1	1	1	11	11	11
81	42	0F0F070	7C02A598	0F0F0FFF	7FFC3C3C3C	1	0	0	1	1	11	11	11
82	43	1E1E0E0	78054B30	01E1E1FFF	7FF8787878	1	0	0	1	1	11	11	11
83	44	1C3C1C0	700A9660	03C3C3FFE	7FF0F0F0F0	1	0	0	1	1	11	11	11
84	45	1878380	60152CC0	078787FFC	7FE1E1E1E0	1	0	0	1	1	11	11	11
85	46	10F0700	402A5980	0F0F0FFF8	7FC3C3C3C0	0	0	1	1	1	11	11	11
86	47	01E0E00	0054B300	01E1E1FFF0	7F87878780	0	0	1	1	1	11	11	11
87	48	03C1C00	00A96601	03C3FFE0	7F0F0F0F00	0	1	1	0	1	11	11	11
88	49	0783800	0152CC03	0787FFC0	7E1E1E1E01	0	0	1	0	0	11	11	11

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89	50	0F07000	02A59806	10F0FFF80	7C3C3C3C03	1	1	0	0	1	11	11	11
90	51	1E0E000	054B300D	01E1FFF00	7878787807	1	0	0	0	0	11	11	11
91	52	1C1C001	0A96601A	03C3FFE01	70F0F0F00F	1	1	0	1	0	10	11	11
92	53	1838003	152CC035	0787FFC03	61E1E1E01E	1	0	0	1	0	10	10	11
93	54	1070007	2A59806E	0F0FFF807	43C3C3C03C	0	0	1	1	0	01	10	10
94	55	00E000F	54B300D7	1E1FFF00F	0787878078	0	1	1	1	0	10	01	10
95	56	01C001F	296601AE	1C3FFE01F	0F0F0F00F1	0	0	1	0	1	00	10	01
96	57	038003F	52CC035C	187FFC03F	1E1E1E01E2	0	1	1	0	0	00	00	10
97	58	070007F	259806B8	10FFF807F	3C3C3C03C4	0	1	0	0	1	00	00	00
98	59	0E000FE	4B300D71	01FFF00FE	7878780788	1	0	0	0	1	00	00	00
99	60	1C001FD	16601AE2	03FFE01FD	70F0F00F10	1	0	0	1	0	01	00	00
100	61	18003FA	2CC035C5	07FFC03FB	61E1E01E21	1	1	0	1	0	11	01	00
101	62	10007F4	59806B8E	0FFF807F7	43C3C03C43	0	1	1	1	0	11	11	01
102	63	0000FE8	3300D717	1FFF00FEE	0787807887	0	0	1	1	1	11	11	11
103	64	0001FD0	6601AE2F	1FFE01FDC	0F0F00F10E	0	0	1	0	0	11	11	11
104	65	0003FA0	4C035C5F	1FFC03FB8	1E1E01E21D	0	0	1	0	0	11	11	11
105	66	0007F40	1806B8BE	1FF807F70	3C3C03C43B	0	0	1	0	0	11	11	11
106	67	000FE81	300D717C	1FF00FEE1	7878078877	0	0	1	0	0	11	11	11
107	68	001FD02	601AE2F8	1FE01FDC2	70F00F10EF	0	0	1	1	1	11	11	11
108	69	003FA05	4035C5F0	1FC03FB84	61E01E21DE	0	0	1	1	1	11	11	11
109	70	007F40B	006B8BE0	1F807F708	43C03C43BC	0	0	1	1	1	11	11	11
110	71	00FE816	00D717C0	1F00FEE11	0780788778	0	1	1	1	0	10	11	11
111	72	01FD02C	01AE2F81	1E01FDC23	0F00F10EF1	0	1	1	0	0	10	10	11
112	73	03FA059	035C5F02	1C03FB847	1E01E21DE3	0	0	1	0	1	10	10	10
113	74	07F40B3	06B8BE05	1807F708F	3C03C43BC7	0	1	1	0	0	01	10	10
114	75	0FE8166	0D717C0B	100FEE11E	780788778F	1	0	0	0	0	01	01	10
115	76	1FD02CD	1AE2F817	001FDC23D	700F10EF1F	1	1	0	0	1	11	01	01
116	77	1FA059B	35C5F02F	003FB847A	601E21DE3F	1	1	0	0	1	10	11	01
117	78	1F40B37	6B8BE05E	007F708F4	403C43BC7F	1	1	0	0	0	10	10	11
118	79	1E8166E	5717C0BD	00FEE11E9	00788778FF	1	0	0	0	1	10	10	10
119	80	1D02CDC	2E2F817A	01FDC23D3	00F10EF1FE	1	0	0	1	0	01	10	10
120	81	1A059B9	5C5F02F5	03FB847A6	01E21DE3FD	1	0	0	1	1	01	01	10
121	82	140B373	38BE05EB	07F708F4C	03C43BC7FB	0	1	0	1	1	11	01	01
122	83	08166E7	717C0BD7	0FEE11E98	0788778FF7	1	0	1	1	0	11	11	01
123	84	102CDCF	62F817AE	1FDC23D31	0F10EF1FEF	0	1	1	0	1	11	11	11
124	85	0059B9F	45F02F5C	1FB847A63	1E21DE3FDE	0	1	1	0	1	11	11	11
125	86	00B373E	0BE05EB9	1F708F4C7	3C43BC7FBC	0	1	1	0	1	11	11	11
126	87	0166E7D	17C0BD72	1EE11E98F	788778FF78	0	1	1	1	0	10	11	11
127	88	02CDCFB	2F817AE5	1DC23D31F	710EF1FEF1	0	1	1	0	0	10	10	11
128	89	059B9F7	5F02F5CA	1B847A63F	621DE3FDE2	0	0	1	0	1	10	10	10
129	90	0B373EF	3E05EB94	1708F4C7F	443BC7FBC4	1	0	0	0	1	10	10	10
130	91	166E7DF	7C0BD728	0E11E98FF	08778FF788	0	0	1	0	1	10	10	10
131	92	0CDCFBE	7817AE50	1C23D31FF	10EF1FEF10	1	0	1	1	1	01	10	10
132	93	19B9F7D	702F5CA1	1847A63FE	21DE3FDE21	1	0	1	1	0	10	01	10
133	94	1373EFB	605EB942	108F4C7FC	43BC7FBC43	0	0	0	1	1	00	10	01
134	95	06E7DF7	40BD7285	011E98FF8	0778FF7886	0	1	0	0	1	01	00	10
135	96	0DCFBFB	017AE50A	023D31FF0	0EF1FEF10D	1	0	0	1	1	00	01	00
136	97	1B9F7DF	02F5CA15	047A63FE1	1DE3FDE21A	1	1	0	1	1	10	00	01
137	98	173EFBF	05EB942B	08F4C7FC3	3BC7FBC434	0	1	1	1	1	00	10	00
138	99	0E7DF7F	0BD72856	11E98FF87	778FF78869	1	1	0	1	1	00	00	10
139	100	1CFBFBF	17AE50AC	03D31FF0F	6F1FEF10D3	1	1	0	0	0	01	00	00
140	101	19F7DFE	2F5CA159	07A63FE1E	5E3FDE21A7	1	0	0	0	0	00	01	00
141	102	13EFBFC	5EB942B3	0F4C7FC3C	3C7FBC434F	0	1	1	0	0	10	00	01
142	103	07DF7F8	3D728566	1E98FF878	78FF78869F	0	0	1	1	0	00	10	00
143	104	0FBFBFB	7AE50ACD	1D31FF0F0	71FEF10D3E	1	1	1	1	0	11	00	10
144	105	1F7DFE1	75CA159B	1A63FE1E1	63FDE21A7D	1	1	1	1	1	00	11	00
145	106	1FBFBFC	6B942B36	14C7FC3C3	47FBC434FB	1	1	0	1	1	11	00	11

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146	107	1DF7F86	5728566D	098FF8786	0FF78869F7	1	0	1	1	0	00	11	00
147	108	1BEFF0C	2E50ACDB	131FF0F0C	1FEF10D3EF	1	0	0	1	0	11	00	11
148	109	17DFE19	5CA159B6	063FE1E19	3FDE21A7DF	0	1	0	1	1	01	11	00
149	110	0FBFC33	3942B36D	0C7FC3C32	7FBC434FBF	1	0	1	1	0	01	01	11
150	111	1F7F866	728566DB	18FF87865	7F78869F7E	1	1	1	0	0	00	01	01
151	112	1EFF0CC	650ACDB6	11FF0F0CB	7EF10D3EFC	1	0	0	1	0	10	00	01
152	113	1DFE199	4A159B6D	03FE1E196	7DE21A7DF9	1	0	0	1	0	00	10	00
153	114	1BFC333	142B36DB	07FC3C32C	7BC434FBF3	1	0	0	1	0	00	00	10
154	115	17F8666	28566DB6	0FF878659	778869F7E6	0	0	1	1	0	01	00	00
155	116	0FF0CCC	50ACDB6D	1FF0F0CB3	6F10D3EFC	1	1	1	0	0	11	01	00
156	117	1FE1999	2159B6DA	1FE1E1966	5E21A7DF99	1	0	1	0	1	10	11	01
157	118	1FC3332	42B36DB5	1FC3C32CC	3C434FBF33	1	1	1	0	1	10	10	11
158	119	1F86664	0566DB6E	1F8786599	78869F7E67	1	0	1	1	1	01	10	10
159	120	1F0CCCC	0ACDB6D6	1F0F0CB33	710D3EFCCE	1	1	1	0	0	10	01	10
160	121	1E19991	159B6DAC	1E1E19666	621A7DF99D	1	1	1	0	1	11	10	01
161	122	1C33323	2B36DB58	1C3C32CCC	4434FBF33B	1	0	1	0	1	00	11	10
162	123	1866647	566DB6B0	187865999	0869F7E676	1	0	1	0	0	11	00	11
163	124	10CCC8F	2CDB6D60	10F0CB333	10D3EFCCEC	0	1	0	1	1	01	11	00
164	125	019991E	59B6DAC0	01E196666	21A7DF99D9	0	1	0	1	1	10	01	11
165	126	033323C	336DB580	03C32CCCD	434FBF33B3	0	0	0	0	0	00	10	01
166	127	0666478	66DB6B01	07865999A	069F7E6766	0	1	0	1	0	00	00	10
167	128	0CCC8F0	4DB6D603	0F0CB3334	0D3EFCCECD	1	1	1	0	1	01	00	00
168	129	19991E1	1B6DAC07	1E1966669	1A7DF99D9B	1	0	1	0	1	00	01	00
169	130	13323C3	36DB580E	1C32CCCD3	34FBF33B37	0	1	1	1	1	10	00	01
170	131	0664786	6DB6B01C	1865999A7	69F7E6766F	0	1	1	1	1	00	10	00
171	132	0CC8F0D	5B6D6039	10CB3334F	53EFCCECDF	1	0	0	1	0	00	00	10
172	133	1991E1A	36DAC073	01966669E	27DF99D9BF	1	1	0	1	1	01	00	00
173	134	1323C35	6DB580E6	032CCCD3C	4FBF33B37E	0	1	0	1	1	00	01	00
174	135	064786A	5B6B01CD	065999A78	1F7E6766FC	0	0	0	0	0	11	00	01
175	136	0C8F0D5	36D6039B	0CB3334F0	3EFCCECDF9	1	1	1	1	1	00	11	00
176	137	191E1AA	6DAC0737	1966669E1	7DF99D9BF3	1	1	1	1	0	00	00	11
177	138	123C354	5B580E6E	12CCCD3C3	7BF33B37E7	0	0	0	1	1	00	00	00
178	139	04786A9	36B01CDC	05999A787	77E6766FCE	0	1	0	1	0	01	00	00
179	140	08F0D53	6D6039B8	0B3334F0E	6FCCECDF9C	1	0	1	1	0	11	01	00
180	141	11E1AA6	5AC07370	166669E1D	5F99D9BF38	0	1	0	1	1	10	11	01
181	142	03C354C	3580E6E0	0CCCD3C3A	3F33B37E70	0	1	1	0	0	10	10	11
182	143	0786A99	6B01CDC0	1999A7875	7E6766FCE1	0	0	1	0	1	10	10	10
183	144	0F0D533	56039B81	13334F0EB	7CCECDF9C2	1	0	0	1	0	01	10	10
184	145	1E1AA66	2C073703	06669E1D6	799D9BF385	1	0	0	1	1	01	01	10
185	146	1C354CC	580E6E06	0CCD3C3AC	733B37E70B	1	0	1	0	1	11	01	01
186	147	186A998	301CDC0C	199A78759	66766FCE17	1	0	1	0	1	10	11	01
187	148	10D5331	6039B818	1334F0EB2	4CECDF9C2F	0	0	0	1	1	01	10	11
188	149	01AA662	40737031	0669E1D65	19D9BF385E	0	0	0	1	0	01	01	10
189	150	0354CC5	00E6E063	0CD3C3ACB	33B37E70BD	0	1	1	1	0	00	01	01
190	151	06A998A	01CDC0C6	19A787596	6766FCE17B	0	1	1	0	0	10	00	01
191	152	0D53315	039B818C	134F0EB2C	4ECDF9C2F6	1	1	0	1	1	00	10	00
192	153	1AA662A	07370318	069E1D659	1D9BF385ED	1	0	0	1	0	00	00	10
193	154	154CC54	0E6E0630	0D3C3ACB3	3B37E70BDB	0	0	1	0	1	00	00	00
194	155	0A998A8	1CDC0C60	1A7875967	766FCE17B6	1	1	1	0	1	01	00	00
195	156	1533151	39B818C0	14F0EB2CE	6CDF9C2F6C	0	1	0	1	1	00	01	00
196	157	0A662A3	73703180	09E1D659D	59BF385ED8	1	0	1	1	1	10	00	01
197	158	14CC547	66E06301	13C3ACB3A	337E70BDB0	0	1	0	0	1	11	10	00
198	159	0998A8E	4DC0C602	078759675	66FCE17B61	1	1	0	1	0	01	11	10
199	160	133151D	18818C05	0F0EB2CEB	4DF9C2F6C2	0	1	1	1	0	01	01	11
200	161	0662A3B	3703180B	1E1D659D6	1BF385ED85	0	0	1	1	1	11	01	01
201	162	0CC5477	6E063017	1C3ACB3AC	37E70BDB0B	1	0	1	1	0	11	11	01
202	163	198A8EF	5C0C602F	187596759	6FCE17B617	1	0	1	1	0	10	11	11

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203	164	13151DE	3818C05F	10EB2CEB2	5F9C2F6C2F	0	0	0	1	1	01	10	11
204	165	062A3BC	703180BF	01D659D65	3F385ED85E	0	0	0	0	1	00	01	10
205	166	0C54779	6063017E	03ACB3ACB	7E70BDB0BD	1	0	0	0	1	11	00	01
206	167	18A8EF2	40C602FD	075967597	7CE17B617B	1	1	0	1	0	00	11	00
207	168	1151DE4	018C05FA	0EB2CEB2F	79C2F6C2F7	0	1	1	1	1	11	00	11
208	169	02A3BC9	03180BF5	1D659D65E	7385ED85EE	0	0	1	1	1	01	11	00
209	170	0547793	063017EB	1ACB3ACBC	670BDB0BDC	0	0	1	0	0	10	01	11
210	171	0A8EF27	0C602FD6	159675978	4E17B617B9	1	0	0	0	1	00	10	01
211	172	151DE4E	18C05FAD	0B2CEB2F1	1C2F6C2F73	0	1	1	0	0	00	00	10
212	173	0A3BC9C	3180BF5A	1659D65E3	385ED85EE6	1	1	0	0	0	01	00	00
213	174	1477938	63017EB5	0CB3ACBC6	70BDB0BDCC	0	0	1	1	1	00	01	00
214	175	08EF270	4602FD6A	19675978D	617B617B99	1	0	1	0	0	10	00	01
215	176	11DE4E1	0C05FAD5	12CEB2F1A	42F6C2F733	0	0	0	1	1	11	10	00
216	177	03BC9C3	180BF5AA	059D65E34	05ED85EE67	0	0	0	1	0	00	11	10
217	178	0779387	3017EB55	0B3ACBC68	0BDB0BDCCF	0	0	1	1	0	11	00	11
218	179	0EF270F	602FD6AA	1675978D0	17B617B99F	1	0	0	1	1	01	11	00
219	180	1DE4E1F	405FAD54	0CEB2F1A1	2F6C2F733F	1	0	1	0	1	10	01	11
220	181	1BC9C3F	00BF5AA9	19D65E342	5ED85EE67F	1	1	1	1	0	10	10	01
221	182	179387F	017EB552	13ACBC684	3DB0BDCCFE	0	0	0	1	1	10	10	10
222	183	0F270FF	02FD6AA5	075978D09	7B617B99FC	1	1	0	0	0	01	10	10
223	184	1E4E1FF	05FAD54A	0EB2F1A12	76C2F733F9	1	1	1	1	1	10	01	10
224	185	1C9C3FE	0BF5AA94	1D65E3425	6D85EE67F2	1	1	1	1	0	10	10	01
225	186	19387FD	17EB5529	1ACBC684B	5B0BDCCFE4	1	1	1	0	1	01	10	10
226	187	1270FFA	2FD6AA53	15978D096	3617B99FC9	0	1	0	0	0	01	01	10
227	188	04E1FF5	5FAD54A7	0B2F1A12C	6C2F733F93	0	1	1	0	1	11	01	01
228	189	09C3FEB	3F5AA94E	165E34258	585EE67F27	1	0	0	0	0	10	11	01
229	190	1387FD7	7EB5529C	0CBC684B1	30BDCCFE4F	0	1	1	1	1	10	10	11
230	191	070FFAE	7D6AA538	1978D0962	617B99FC9E	0	0	1	0	1	10	10	10
231	192	0E1FF5C	7AD54A70	12F1A12C4	42F733F93D	1	1	0	1	1	01	10	10
232	193	1C3FEB9	75AA94E1	05E342588	05EE67F27A	1	1	0	1	0	10	01	10
233	194	187FD73	6B5529C3	0BC684B10	0BDCCFE4F4	1	0	1	1	1	11	10	01
234	195	10FFAE6	56AA5386	178D09621	17B99FC9E8	0	1	0	1	1	00	11	10
235	196	01FF5CC	2D54A70C	0F1A12C43	2F733F93D0	0	0	1	0	1	10	00	11
236	197	03FEB98	5AA94E19	1E3425887	5EE67F27A1	0	1	1	1	1	00	10	00
237	198	07FD731	35529C33	1C684B10F	3DCCFE4F42	0	0	1	1	0	00	00	10
238	199	0FFAE63	6AA53866	18D09621F	7B99FC9E84	1	1	1	1	0	10	00	00
239	200	1FF5CC6	554A70CD	11A12C43F	7733F93D09	1	0	0	0	1	11	10	00

- Z[0] = 59
- Z[1] = 3B
- Z[2] = EF
- Z[3] = 07
- Z[4] = 13
- Z[5] = 70
- Z[6] = 9B
- Z[7] = B7
- Z[8] = 52
- Z[9] = 8F
- Z[10] = 3E
- Z[11] = B9
- Z[12] = A5
- Z[13] = AC
- Z[14] = EA
- Z[15] = 9E

Appendix IV - Sample Data



```

=====
Reload this pattern into the LFSRs
Hold content of Summation Combiner regs and calculate new C[t+1] and Z values
=====
LFSR1 <= 1521359
LFSR2 <= 528F703B
LFSR3 <= 0AC3E9BEF
LFSR4 <= 4FEAB9B707
C[t+1] <= 00

```

Generating 125 key symbols (encryption/decryption sequence)

240	1	1521359	528F703B	0AC3E9BEF	4FEAB9B707	0	1	1	1	1	00	10	00
241	2	0A426B3	251EE076	1587D37DE	1FD5736E0F	1	0	0	1	0	00	00	10
242	3	1484D67	4A3DC0ED	0B0FA6FBD	3FAAE6DC1E	0	0	1	1	0	01	00	00
243	4	0909ACF	147B81DA	161F4DF7A	7F55CDB83D	1	0	0	0	0	00	01	00
244	5	121359E	28F703B5	0C3E9BEF5	7EAB9B707B	0	1	1	1	1	10	00	01
245	6	0426B3C	51EE076B	187D37DEB	7D5736E0F6	0	1	1	0	0	00	10	00
246	7	084D679	23DC0ED6	10FA6FBD7	7AAE6DC1EC	1	1	0	1	1	00	00	10
247	8	109ACF2	47B81DAC	01F4DF7AF	755CDB83D8	0	1	0	0	1	00	00	00
248	9	01359E4	0F703B59	03E9BEF5E	6AB9B707B1	0	0	0	1	1	00	00	00
249	10	026B3C8	1EE076B3	07D37DEBD	55736E0F63	0	1	0	0	1	00	00	00
250	11	04D6791	3DC0ED67	0FA6FBD7A	2AE6DC1EC7	0	1	1	1	1	01	00	00
251	12	09ACF22	7B81DACF	1F4DF7AF4	55CDB83D8F	1	1	1	1	1	11	01	00
252	13	1359E44	7703B59E	1E9BEF5E8	2B9B707B1F	0	0	1	1	1	10	11	01
253	14	06B3C88	6E076B3C	1D37DEBD0	5736E0F63F	0	0	1	0	1	01	10	11
254	15	0D67911	5C0ED678	1A6FBD7A1	2E6DC1EC7E	1	0	1	0	1	01	01	10
255	16	1ACF223	381DACF0	14DF7AF42	5CDB83D8FD	1	0	0	1	1	11	01	01
256	17	159E446	703B59E0	09BEF5E85	39B707B1FA	0	0	1	1	1	10	11	01
257	18	0B3C88C	6076B3C0	137DEBD0A	736E0F63F4	1	0	0	0	1	01	10	11
258	19	1679118	40ED6780	06FBD7A15	66DC1EC7E8	0	1	0	1	1	01	01	10
259	20	0CF2231	01DACF00	0DF7AF42A	4DB83D8FD1	1	1	1	1	1	00	01	01
260	21	19E4463	03B59E01	1BBF5E854	1B707B1FA3	1	1	1	0	1	10	00	01
261	22	13C88C6	076B3C03	17DEBD0A9	36E0F63F47	0	0	0	1	1	11	10	00
262	23	079118C	0ED67807	0FBD7A152	6DC1EC7E8E	0	1	1	1	0	01	11	10
263	24	0F22318	1DACF00E	1F7AF42A4	5B83D8FD1D	1	1	1	1	1	01	01	11
264	25	1E44630	3B59E01C	1EF5E8548	3707B1FA3B	1	0	1	0	1	11	01	01
265	26	1C88C61	76B3C039	1DEBD0A91	6E0F63F477	1	1	1	0	0	11	11	01
266	27	19118C3	6D678073	1BD7A1523	5C1EC7E8EF	1	0	1	0	1	11	11	11
267	28	1223187	5ACF00E6	17AF42A46	383D8FD1DE	0	1	0	0	0	11	11	11
268	29	044630E	359E01CC	0F5E8548D	707B1FA3BD	0	1	1	0	1	11	11	11
269	30	088C61C	6B3C0399	1EBD0A91A	60F63F477B	1	0	1	1	0	10	11	11
270	31	1118C39	56780733	1D7A15234	41EC7E8EF6	0	0	1	1	0	10	10	11
271	32	0231872	2CF00E67	1AF42A468	03D8FD1DEC	0	1	1	1	1	01	10	10
272	33	04630E5	59E01CCE	15E8548D1	07B1FA3BD8	0	1	0	1	1	01	01	10
273	34	08C61CB	33C0399D	0BD0A91A3	0F63F477B1	1	1	1	0	0	00	01	01
274	35	118C396	6780733A	17A152347	1EC7E8EF63	0	1	0	1	0	10	00	01
275	36	031872D	4F00E674	0F42A468E	3D8FD1DEC7	0	0	1	1	0	00	10	00
276	37	0630E5A	1E01CCE8	1E8548D1D	7B1FA3BD8E	0	0	1	0	1	01	00	10
277	38	0C61CB5	3C0399D0	1D0A91A3B	763F477B1C	1	0	1	0	1	00	01	00
278	39	18C396A	780733A0	1A1523477	6C7E8EF639	1	0	1	0	0	10	00	01
279	40	11872D5	700E6741	142A468EF	58FD1DEC72	0	0	0	1	1	11	10	00
280	41	030E5AB	601CCE83	08548D1DF	31FA3BD8E5	0	0	1	1	1	00	11	10
281	42	061CB57	40399D07	10A91A3BF	63F477B1CB	0	0	0	1	1	10	00	11
282	43	0C396AF	00733A0F	01523477E	47E8EF6396	1	0	0	1	0	00	10	00
283	44	1872D5F	00E6741F	02A468EFD	0FD1DEC72C	1	1	0	1	1	00	00	10

Appendix IV - Sample Data

Bluetooth.

284	45	10E5ABE	01CCE83F	0548D1DFA	1FA3BD8E58	0	1	0	1	0	01	00	00
285	46	01CB57C	0399D07F	0A91A3BF4	3F477B1CB0	0	1	1	0	1	00	01	00
286	47	0396AF9	0733A0FE	1523477E9	7E8EF63961	0	0	0	1	1	11	00	01
287	48	072D5F3	0E6741FD	0A468EFD2	7D1DEC72C3	0	0	1	0	0	01	11	00
288	49	0E5ABE7	1CCE83FA	148D1DFA4	7A3BD8E587	1	1	0	0	1	10	01	11
289	50	1CB57CE	399D07F4	091A3BF49	7477B1CB0F	1	1	1	0	1	11	10	01
290	51	196AF9D	733A0FE9	123477E92	68EF63961E	1	0	0	1	1	00	11	10
291	52	12D5F3B	66741FD2	0468EFD25	51DEC72C3C	0	0	0	1	1	10	00	11
292	53	05ABE77	4CE83FA4	08D1DFA4B	23BD8E5879	0	1	1	1	1	00	10	00
293	54	0B57CEE	19D07F49	11A3BF496	477B1CB0F2	1	1	0	0	0	00	00	10
294	55	16AF9DC	33A0FE92	03477E92C	0EF63961E4	0	1	0	1	0	01	00	00
295	56	0D5F3B8	6741FD25	068EFD259	1DEC72C3C9	1	0	0	1	1	00	01	00
296	57	1ABE771	4E83FA4B	0D1DFA4B3	3BD8E58793	1	1	1	1	0	01	00	01
297	58	157CEE2	1D07F496	1A3BF4967	77B1CB0F26	0	0	1	1	1	00	01	00
298	59	0AF9DC5	3A0FE92D	1477E92CE	6F63961E4D	1	0	0	0	1	11	00	01
299	60	15F3B8B	741FD25A	08EFD259C	5EC72C3C9B	0	0	1	1	1	01	11	00
300	61	0BE7716	683FA4B4	11DFA4B39	3D8E587937	1	0	0	1	1	10	01	11
301	62	17CEE2D	507F4968	03BF49672	7B1CB0F26E	0	0	0	0	0	00	10	01
302	63	0F9DC5B	20FE92D0	077E92CE4	763961E4DC	1	1	0	0	0	00	00	10
303	64	1F3B8B6	41FD25A0	0EFD259C9	6C72C3C9B9	1	1	1	0	1	01	00	00
304	65	1E7716D	03FA4B40	1DFA4B393	58E5879373	1	1	1	1	1	11	01	00
305	66	1CEE2DB	07F49680	1BF496727	31CB0F26E6	1	1	1	1	1	11	11	01
306	67	19DC5B7	0FE92D00	17E92CE4E	63961E4DCD	1	1	0	1	0	10	11	11
307	68	13B8B6F	1FD25A00	0FD259C9C	472C3C9B9A	0	1	1	0	0	10	10	11
308	69	07716DF	3FA4B400	1FA4B3938	0E58793735	0	1	1	0	0	01	10	10
309	70	0EE2DBF	7F496800	1F4967271	1CB0F26E6A	1	0	1	1	0	10	01	10
310	71	1DC5B7F	7E92D000	1E92CE4E2	3961E4DCD4	1	1	1	0	1	11	10	01
311	72	1B8B6FF	7D25A001	1D259C9C4	72C3C9B9A9	1	0	1	1	0	01	11	10
312	73	1716DFF	7A4B4002	1A4B39389	6587937352	0	0	1	1	1	10	01	11
313	74	0E2DBFF	74968005	149672713	4B0F26E6A5	1	1	0	0	0	11	10	01
314	75	1C5B7FE	692D000B	092CE4E26	161E4DCD4B	1	0	1	0	1	00	11	10
315	76	18B6FFC	525A0017	1259C9C4D	2C3C9B9A96	1	0	0	0	1	10	00	11
316	77	116DFF8	24B4002F	04B39389B	587937352C	0	1	0	0	1	11	10	00
317	78	02DBFF1	4968005F	096727136	30F26E6A58	0	0	1	1	1	00	11	10
318	79	05B7FE3	12D000BF	12CE4E26C	61E4DCD4B1	0	1	0	1	0	11	00	11
319	80	0B6FFC7	25A0017F	059C9C4D8	43C9B9A963	1	1	0	1	0	00	11	00
320	81	16DFF8E	4B4002FF	0B39389B1	07937352C6	0	0	1	1	0	11	00	11
321	82	0DBFF1C	168005FF	167271363	0F26E6A58C	1	1	0	0	1	01	11	00
322	83	1B7FE38	2D000BFF	0CE4E26C7	1E4DCD4B18	1	0	1	0	1	10	01	11
323	84	16FFC70	5A0017FF	19C9C4D8F	3C9B9A9631	0	0	1	1	0	11	10	01
324	85	0DFF8E1	34002FFF	139389B1E	7937352C62	1	0	0	0	0	00	11	10
325	86	1BFF1C3	68005FFF	07271363D	726E6A58C4	1	0	0	0	1	10	00	11
326	87	17FE387	5000BFFE	0E4E26C7B	64DCD4B188	0	0	1	1	0	00	10	00
327	88	0FFC70F	20017FFD	1C9C4D8F6	49B9A96311	1	0	1	1	1	00	00	10
328	89	1FF8E1F	4002FFFF	19389B1ED	137352C623	1	0	1	0	0	01	00	00
329	90	1FF1C3F	0005FFF7	1271363DB	26E6A58C46	1	0	0	1	1	00	01	00
330	91	1FE387F	000BFFEE	04E26C7B6	4DCD4B188C	1	0	0	1	0	10	00	01
331	92	1FC70FF	0017FFDC	09C4D8F6D	1B9A963118	1	0	1	1	1	00	10	00
332	93	1F8E1FF	002FFFFB	1389B1EDA	37352C6231	1	0	0	0	1	01	00	10
333	94	1F1C3FF	005FFF70	071363DB4	6E6A58C462	1	0	0	0	0	00	01	00
334	95	1E387FE	00BFFEE0	0E26C7B68	5CD4B188C5	1	1	1	1	0	01	00	01
335	96	1C70FFC	017FFDC1	1C4D8F6D1	39A963118A	1	0	1	1	0	11	01	00
336	97	18E1FF9	02FFFFB8	189B1EDA2	7352C62315	1	1	1	0	0	11	11	01
337	98	11C3FF2	05FFF705	11363DB45	66A58C462B	0	1	0	1	1	11	11	11
338	99	0387FE4	0BFFEE0A	026C7B68B	4D4B188C56	0	1	0	0	0	11	11	11
339	100	070FFC9	17FFDC15	04D8F6D16	1A963118AD	0	1	0	1	1	11	11	11
340	101	0E1FF92	2FFFFB82B	09B1EDA2C	352C62315A	1	1	1	0	0	10	11	11

Appendix IV - Sample Data

Bluetooth.

341	102	1C3FF24	5FFF7057	1363DB458	6A58C462B4	1	1	0	0	0	10	10	11
342	103	187FE48	3FFEE0AE	06C7B68B0	54B188C569	1	1	0	1	1	01	10	10
343	104	10FFC90	7FFDC15C	0D8F6D161	2963118AD2	0	1	1	0	1	01	01	10
344	105	01FF920	7FFB82B9	1B1EDA2C2	52C62315A5	0	1	1	1	0	00	01	01
345	106	03FF240	7FF70573	163DB4584	258C462B4B	0	1	0	1	0	10	00	01
346	107	07FE481	7FEE0AEG	0C7B68B08	4B188C5696	0	1	1	0	0	00	10	00
347	108	0FFC902	7FDC15CD	18F6D1610	163118AD2D	1	1	1	0	1	00	00	10
348	109	1FF9204	7FB82B9A	11EDA2C20	2C62315A5B	1	1	0	0	0	01	00	00
349	110	1FF2408	7F705735	03DB45841	58C462B4B6	1	0	0	1	1	00	01	00
350	111	1FE4810	7EE0AEB6	07B68B082	3188C5696C	1	1	0	1	1	10	00	01
351	112	1FC9021	7DC15CD6	0F6D16105	63118AD2D8	1	1	1	0	1	00	10	00
352	113	1F92042	7B82B9AD	1EDA2C20B	462315A5B0	1	1	1	0	1	00	00	10
353	114	1F24084	7705735A	1DB458416	0C462B4B61	1	0	1	0	0	01	00	00
354	115	1E48108	6E0AEB65	1B68B082C	188C5696C3	1	0	1	1	0	11	01	00
355	116	1C90211	5C15CD6A	16D161059	3118AD2D86	1	0	0	0	0	10	11	01
356	117	1920422	382B9AD5	0DA2C20B3	62315A5B0D	1	0	1	0	0	10	10	11
357	118	1240845	705735AA	1B4584167	4462B4B61A	0	0	1	0	1	10	10	10
358	119	048108A	60AEB655	168B082CF	08C5696C34	0	1	0	1	0	01	10	10
359	120	0902114	415CD6AB	0D161059E	118AD2D869	1	0	1	1	0	10	01	10
360	121	1204228	02B9AD56	1A2C20B3D	2315A5B0D2	0	1	1	0	0	11	10	01
361	122	0408451	05735AAD	14584167B	462B4B61A4	0	0	0	0	1	11	11	10
362	123	08108A2	0AEB655B	08B082CF7	0C5696C348	1	1	1	0	0	10	11	11
363	124	1021144	15CD6AB6	1161059EF	18AD2D8690	0	1	0	1	0	10	10	11
364	125	0042289	2B9AD56C	02C20B3DE	315A5B0D20	0	1	0	0	1	10	10	10

1.5 FOURTH SET OF SAMPLES

Initial values for the key, pan address and clock

K'c4[0] = 21 K'c4[1] = 87 K'c4[2] = F0 K'c4[3] = 4A
 K'c4[4] = BA K'c4[5] = 90 K'c4[6] = 31 K'c4[7] = D0
 K'c4[8] = 78 K'c4[9] = 0D K'c4[10] = 4C K'c4[11] = 53
 K'c4[12] = E0 K'c4[13] = 15 K'c4[14] = 3A K'c4[15] = 63

Addr4[0] = 2C Addr4[1] = 7F Addr4[2] = 94
 Addr4[3] = 56 Addr4[4] = 0F Addr4[5] = 1B

Clk4[0] = 5F Clk4[1] = 1A Clk4[2] = 00 Clk4[3] = 02

 Fill LFSRs with initial data

t	clk#	LFSR1	LFSR2	LFSR3	LFSR4	X1	X2	X3	X4	Z	C[t+1]	C[t]	C[t-1]
0	0	0000000*	00000000*	000000000*	0000000000*	0	0	0	0	0	00	00	00
1	1	0000000*	00000001*	000000001*	0000000001*	0	0	0	0	0	00	00	00
2	2	0000001*	00000002*	000000002*	0000000003*	0	0	0	0	0	00	00	00
3	3	0000002*	00000004*	000000004*	0000000007*	0	0	0	0	0	00	00	00
4	4	0000004*	00000009*	000000008*	000000000F*	0	0	0	0	0	00	00	00
5	5	0000008*	00000013*	000000010*	000000001E*	0	0	0	0	0	00	00	00
6	6	0000010*	00000027*	000000021*	000000003D*	0	0	0	0	0	00	00	00
7	7	0000021*	0000004F*	000000043*	000000007A*	0	0	0	0	0	00	00	00
8	8	0000042*	0000009F*	000000087*	00000000F4*	0	0	0	0	0	00	00	00
9	9	0000084*	0000013F*	00000010F*	00000001E9*	0	0	0	0	0	00	00	00
10	10	0000108*	0000027F*	00000021F*	00000003D2*	0	0	0	0	0	00	00	00
11	11	0000211*	000004FE*	00000043E*	00000007A5*	0	0	0	0	0	00	00	00
12	12	0000422*	000009FC*	00000087C*	0000000F4A*	0	0	0	0	0	00	00	00
13	13	0000845*	000013F8*	0000010F8*	0000001E94*	0	0	0	0	0	00	00	00
14	14	000108B*	000027F0*	0000021F1*	0000003D29*	0	0	0	0	0	00	00	00
15	15	0002117*	00004FEL*	0000043E3*	0000007A52*	0	0	0	0	0	00	00	00
16	16	000422E*	00009FC2*	0000087C6*	000000F4A4*	0	0	0	0	0	00	00	00
17	17	000845D*	00013F84*	000010F8C*	000001E948*	0	0	0	0	0	00	00	00
18	18	00108BA*	00027F08*	000021F18*	000003D290*	0	0	0	0	0	00	00	00
19	19	0021174*	0004FE10*	000043E30*	000007A520*	0	0	0	0	0	00	00	00
20	20	00422E8*	0009FC21*	000087C61*	00000F4A41*	0	0	0	0	0	00	00	00
21	21	00845D1*	0013F842*	00010F8C3*	00001E9482*	0	0	0	0	0	00	00	00
22	22	0108BA3*	0027F084*	00021F186*	00003D2905*	0	0	0	0	0	00	00	00
23	23	0211747*	004FE109*	00043E30C*	00007A520B*	0	0	0	0	0	00	00	00
24	24	0422E8F*	009FC213*	00087C619*	0000F4A417*	0	1	0	0	1	00	00	00
25	25	0845D1E*	013F8426*	0010F8C32*	0001E9482F*	1	0	0	0	1	00	00	00
26	26	108BA3D*	027F084D*	0021F1864*	0003D2905E*	0	0	0	0	0	00	00	00
27	27	011747B*	04FE109B*	0043E30C9*	0007A520BC*	0	1	0	0	1	00	00	00
28	28	022E8F6*	09FC2136*	0087C6192*	000F4A4179*	0	1	0	0	1	00	00	00
29	29	045D1EC*	13F8426C*	010F8C325*	001E9482F2*	0	1	0	0	1	00	00	00
30	30	08BA3D9*	27F084D8*	021F1864B*	003D2905E5*	1	1	0	0	0	01	00	00
31	31	11747B3*	4FE109B0*	043E30C97*	007A520BCA*	0	1	0	0	1	00	00	00
32	32	02E8F67*	1FC21360*	087C6192E*	00F4A41795*	0	1	1	1	1	01	00	00
33	33	05D1ECF*	3F8426C1*	10F8C325C*	01E9482F2B*	0	1	0	1	0	01	00	00
34	34	0BA3D9F*	7F084D82*	01F1864B8*	03D2905E56*	1	0	0	1	0	01	00	00

Appendix IV - Sample Data

Bluetooth.

35	35	1747B3E	7E109B04	03E30C970	07A520BCAC*	0	0	0	1	1	00	00	00
36	36	0E8F67C	7C213608	07C6192E1	0F4A417958*	1	0	0	0	1	00	00	00
37	37	1D1ECF8	78426C11	0F8C325C3	1E9482F2B1*	1	0	1	1	1	01	00	00
38	38	1A3D9F0	7084D822	1F1864B86	3D2905E563*	1	1	1	0	1	01	00	00
39	39	147B3E1	6109B044	1E30C970C	7A520BCAC6*	0	0	1	0	1	00	00	00

Start clocking Summation Combiner

40	1	08F67C2	42136088	1C6192E18	74A417958D	1	0	1	1	1	01	00	00
41	2	11ECF84	0426C111	18C325C30	69482F2B1B	0	0	1	0	0	00	01	00
42	3	03D9F08	084D8222	11864B861	52905E5637	0	0	0	1	1	11	00	01
43	4	07B3E10	109B0444	030C970C3	2520BCAC6E	0	1	0	0	0	01	11	00
44	5	0F67C21	21360889	06192E186	4A417958DC	1	0	0	0	0	10	01	11
45	6	1ECF843	426C1112	0C325C30C	1482F2B1B8	1	0	1	1	1	11	10	01
46	7	1D9F086	04D82225	1864B8619	2905E56370	1	1	1	0	0	01	11	10
47	8	1B3E10D	09B0444B	10C970C32	520BCAC6E1	1	1	0	0	1	10	01	11
48	9	167C21B	13608897	0192E1865	2417958DC3	0	0	0	0	0	00	10	01
49	10	0CF8436	26C1112F	0325C30CB	482F2B1B87	1	1	0	0	0	00	00	10
50	11	19F086D	4D82225E	064B86197	105E56370F	1	1	0	0	0	01	00	00
51	12	13E10DB	1B0444BC	0C970C32F	20BCAC6E1F	0	0	1	1	1	00	01	00
52	13	07C21B7	36088979	192E1865E	417958DC3F	0	0	1	0	1	11	00	01
53	14	0F8436E	6C1112F2	125C30CBD	02F2B1B87F	1	0	0	1	1	01	11	00
54	15	1F086DD	582225E4	04B86197B	05E56370FF	1	0	0	1	1	10	01	11
55	16	1E10DBA	30444BC9	0970C32F7	0BCAC6E1FF	1	0	1	1	1	11	10	01
56	17	1C21B75	60889793	12E1865EE	17958DC3FF	1	1	0	1	0	01	11	10
57	18	18436EA	41112F27	05C30CBDD	2F2B1B87FF	1	0	0	0	0	10	01	11
58	19	1086DD4	02225E4E	0B86197BA	5E56370FFF	0	0	1	0	1	00	10	01
59	20	010DBA8	0444BC9D	170C32F74	3CAC6E1FFF	0	0	0	1	1	01	00	10
60	21	021B750	0889793A	0E1865EE8	7958DC3FFF	0	1	1	0	1	00	01	00
61	22	0436EA0	1112F274	1C30CBDD0	72B1B87FFE	0	0	1	1	0	10	00	01
62	23	086DD40	2225E4E9	186197BA1	656370FFFC	1	0	1	0	0	00	10	00
63	24	10DBA81	444BC9D3	10C32F743	4AC6E1FFF8	0	0	0	1	1	01	00	10
64	25	01B7502	089793A7	01865EE86	158DC3FFF1	0	1	0	1	1	00	01	00
65	26	036EA05	112F274E	030CBDD0D	2B1B87FFE3	0	0	0	0	0	11	00	01
66	27	06DD40B	225E4E9C	06197BA1A	56370FFFC6	0	0	0	0	1	10	11	00
67	28	0DBA817	44BC9D39	0C32F7434	2C6E1FFF8D	1	1	1	0	1	10	10	11
68	29	1B7502E	09793A72	1865EE868	58DC3FFF1B	1	0	1	1	1	01	10	10
69	30	16EA05D	12F274E5	10CBDD0D0	31B87FFE36	0	1	0	1	1	01	01	10
70	31	0DD40BA	25E4E9CB	0197BALA1	6370FFFC6D	1	1	0	0	1	11	01	01
71	32	1BA8174	4BC9D397	032F74343	46E1FFF8DA	1	1	0	1	0	11	11	01
72	33	17502E8	1793A72F	065EE8687	0DC3FFF1B4	0	1	0	1	1	11	11	11
73	34	0EA05D0	2F274E5E	0CBDD0D0F	1B87FFE369	1	0	1	1	0	10	11	11
74	35	1D40BA0	5E4E9CBD	197BALA1F	370FFFC6D2	1	0	1	0	0	10	10	11
75	36	1A81741	3C9D397B	12F74343F	6E1FFF8DA5	1	1	0	0	0	01	10	10
76	37	1502E82	793A72F6	05EE8687F	5C3FFF1B4B	0	0	0	0	1	00	01	10
77	38	0A05D05	7274E5ED	0BDD0D0FF	387FFE3696	1	0	1	0	0	10	00	01
78	39	140BA0B	64E9CBDA	17BALA1FF	70FFFC6D2C	0	1	0	1	0	00	10	00
79	40	0817416	49D397B4	0F74343FE	61FFF8DA59	1	1	1	1	0	11	00	10
80	41	102E82C	13A72F69	1EE8687FD	43FFF1B4B3	0	1	1	1	0	00	11	00
81	42	005D058	274E5ED2	1DD0D0FFA	07FFE36966	0	0	1	1	0	11	00	11
82	43	00BA0B0	4E9CBDA5	1BALA1FF5	0FFFC6D2CD	0	1	1	1	0	00	11	00
83	44	0174160	1D397B4A	174343FEA	1FFF8DA59B	0	0	0	1	1	10	00	11
84	45	02E82C0	3A72F695	0E8687FD4	3FFF1B4B37	0	0	1	1	0	00	10	00
85	46	05D0580	74E5ED2B	1D0D0FFA9	7FFE36966E	0	1	1	1	1	00	00	10
86	47	0BA0B00	69CBDA56	1A1A1FF53	7FFC6D2CDC	1	1	1	1	0	10	00	00
87	48	1741600	5397B4AC	14343FEA6	7FF8DA59B8	0	1	0	1	0	00	10	00
88	49	0E82C01	272F6959	08687FD4D	7FF1B4B370	1	0	1	1	1	00	00	10

Appendix IV - Sample Data

Bluetooth.

89	50	1D05802	4E5ED2B3	10D0FFA9A	7FE36966E0	1	0	0	1	0	01	00	00
90	51	1A0B004	1CBDA566	01A1FF535	7FC6D2CDC0	1	1	0	1	0	11	01	00
91	52	1416009	397B4ACC	0343FEA6B	7F8DA59B80	0	0	0	1	0	10	11	01
92	53	082C013	72F69599	0687FD4D7	7F1B4B3701	1	1	0	0	0	10	10	11
93	54	1058026	65ED2B33	0D0FFA9AF	7E36966E03	0	1	1	0	0	01	10	10
94	55	00B004D	4BDA5667	1A1FF535E	7C6D2CDC06	0	1	1	0	1	01	01	10
95	56	016009B	17B4ACCE	143FEA6BD	78DA59B80D	0	1	0	1	1	11	01	01
96	57	02C0137	2F69599D	087FD4D7B	71B4B3701A	0	0	1	1	1	10	11	01
97	58	058026F	5ED2B33B	10FFA9AF6	636966E034	0	1	0	0	1	01	10	11
98	59	0B004DF	3DA56677	01FF535ED	46D2CDC068	1	1	0	1	0	10	01	10
99	60	16009BF	7B4ACCEF	03FEA6BDB	0DA59B80D0	0	0	0	1	1	00	10	01
100	61	0C0137F	769599DF	07FD4D7B7	1B4B3701A1	1	1	0	0	0	00	00	10
101	62	18026FE	6D2B33BE	0FFA9AF6E	36966E0342	1	0	1	1	1	01	00	00
102	63	1004DFC	5A56677D	1FF535EDD	6D2CDC0684	0	0	1	0	0	00	01	00
103	64	0009BF9	34ACCEFB	1FEA6BDBB	5A59B80D09	0	1	1	0	0	10	00	01
104	65	00137F2	69599DF7	1FD4D7B76	34B3701A12	0	0	1	1	0	00	10	00
105	66	0026FE5	52B33BEF	1FA9AF6EC	6966E03424	0	1	1	0	0	00	00	10
106	67	004DFCA	256677DF	1F535EDD8	52CDC06848	0	0	1	1	0	01	00	00
107	68	009BF94	4ACCEFBE	1EA6DBBB0	259B80D091	0	1	1	1	0	11	01	00
108	69	0137F29	1599DF7C	1D4D7B760	4B3701A123	0	1	1	0	1	10	11	01
109	70	026FE53	2B33BEF9	1A9AF6ECO	166E034246	0	0	1	0	1	01	10	11
110	71	04DFCA7	56677DF2	1535EDD81	2CDC06848D	0	0	0	1	0	01	01	10
111	72	09BF94F	2CCEFBE4	0A6DBBB03	59B80D091B	1	1	1	1	1	00	01	01
112	73	137F29E	599DF7C9	14D7B7607	33701A1236	0	1	0	0	1	11	00	01
113	74	06FE53C	333BEF93	09AF6EC0E	66E034246C	0	0	1	1	1	01	11	00
114	75	0DFCA79	6677DF26	135EDD81D	4DC06848D8	1	0	0	1	1	10	01	11
115	76	1BF94F2	4CEFBE4D	06BDBB03B	1B80D091B1	1	1	0	1	1	11	10	01
116	77	17F29E5	19DF7C9A	0D7B76077	3701A12363	0	1	1	0	1	00	11	10
117	78	0FE53CA	33BEF934	1AF6EC0EF	6E034246C6	1	1	1	0	1	11	00	11
118	79	1FCA794	677DF269	15EDD81DF	5C06848D8C	1	0	0	0	0	01	11	00
119	80	1F94F29	4EFBE4D2	0BDBB03BE	380D091B19	1	1	1	0	0	01	01	11
120	81	1F29E53	1DF7C9A5	17B76077D	701A123633	1	1	0	0	1	11	01	01
121	82	1E53CA6	3BEF934B	0F6EC0EFB	6034246C66	1	1	1	0	0	11	11	01
122	83	1CA794D	77DF2696	1EDD81DF6	406848D8CD	1	1	1	0	0	10	11	11
123	84	194F29B	6FB4D2C	1DBB03BED	00D091B19B	1	1	1	1	0	11	10	11
124	85	129E536	5F7C9A59	1B76077DA	01A1236337	0	0	1	1	1	00	11	10
125	86	053CA6C	3EF934B3	16EC0EFB4	034246C66E	0	1	0	0	1	10	00	11
126	87	0A794D9	7DF26967	0DD81DF69	06848D8CDD	1	1	1	1	0	01	10	00
127	88	14F29B3	7BE4D2CF	1BB03BED3	0D091B19BB	0	1	1	0	1	01	01	10
128	89	09E5366	77C9A59F	176077DA6	1A12363377	1	1	0	0	1	11	01	01
129	90	13CA6CD	6F934B3F	0EC0EFB4D	34246C66EF	0	1	1	0	1	10	11	01
130	91	0794D9B	5F26967F	1D81DF69A	6848D8CDDF	0	0	1	0	1	01	10	11
131	92	0F29B37	3E4D2CFE	1B03BED35	5091B19BBE	1	0	1	1	0	10	01	10
132	93	1E5366F	7C9A59FD	16077DA6B	212363377C	1	1	0	0	0	11	10	01
133	94	1CA6CDF	7934B3FB	0C0EFB4D6	4246C66EF9	1	0	1	0	1	00	11	10
134	95	194D9BE	726967F6	181DF69AD	048D8CDDF2	1	0	1	1	1	11	00	11
135	96	129B37D	64D2CFED	103BED35B	091B19BBE5	0	1	0	0	0	01	11	00
136	97	05366FA	49A59FDA	0077DA6B7	12363377CA	0	1	0	0	0	10	01	11
137	98	0A6CDF5	134B3FB4	00EFB4D6E	246C66EF95	1	0	0	0	1	00	10	01
138	99	14D9BEA	26967F69	01DF69ADD	48D8CDDF2B	0	1	0	1	0	00	00	10
139	100	09B37D4	4D2CFED2	03BED35BB	11B19BBE56	1	0	0	1	0	01	00	00
140	101	1366FA8	1A59FDA5	077DA6B77	2363377CAC	0	0	0	0	1	01	01	00
141	102	06CDF51	34B3FB4A	0EFB4D6EF	46C66EF959	0	1	1	1	0	00	01	01
142	103	0D9BEA2	6967F695	1DF69ADDF	0D8CDDF2B2	1	0	1	1	1	10	00	01
143	104	1B37D45	52CFED2A	1BED35BBF	1B19BBE564	1	1	1	0	1	00	10	00
144	105	166FA8A	259FDA54	17DA6B77E	363377CAC8	0	1	0	0	1	01	00	10
145	106	0CDF515	4B3FB4A9	0FB4D6EFC	6C66EF9591	1	0	1	0	1	00	01	00

Appendix IV - Sample Data

Bluetooth.

146	107	19BEA2B	167F6952	1F69ADDF8	58CDDF2B22	1	0	1	1	1	10	00	01
147	108	137D457	2CFED2A5	1ED35BBF1	319BBE5645	0	1	1	1	1	00	10	00
148	109	06FA8AF	59FDA54A	1DA6B77E2	63377CAC8B	0	1	1	0	0	00	00	10
149	110	0DF515F	33FB4A95	1B4D6EFC4	466EF95916	1	1	1	0	1	01	00	00
150	111	1BEA2BF	67F6952A	169ADDF88	0CDDF2B22C	1	1	0	1	0	11	01	00
151	112	17D457F	4FED2A55	0D35BBF10	19BBE56459	0	1	1	1	0	11	11	01
152	113	0FA8AFE	1FDA54AB	1A6B77E20	3377CAC8B3	1	1	1	0	0	10	11	11
153	114	1F515FD	3FB4A957	14D6EFC40	66EF959166	1	1	0	1	1	10	10	11
154	115	1EA2BFA	7F6952AF	09ADDF880	4DDF2B22CC	1	0	1	1	1	01	10	10
155	116	1D457F4	7ED2A55F	135BBF100	1BBE564598	1	1	0	1	0	10	01	10
156	117	1A8AFE8	7DA54ABF	06B77E200	377CAC8B31	1	1	0	0	0	11	10	01
157	118	1515FD0	7B4A957F	0D6EFC401	6EF9591663	0	0	1	1	1	00	11	10
158	119	0A2BFA1	76952AFE	1ADDF8803	5DF2B22CC7	1	1	1	1	0	00	00	11
159	120	1457F42	6D2A55FD	15BBF1007	3BE564598E	0	0	0	1	1	00	00	00
160	121	08AFE84	5A54ABFB	0B77E200F	77CAC8B31C	1	0	1	1	1	01	00	00
161	122	115FD09	34A957F7	16EFC401F	6F95916639	0	1	0	1	1	00	01	00
162	123	02BFA12	6952AFEF	0DDF8803E	5F2B22CC73	0	0	1	0	1	11	00	01
163	124	057F424	52A55FDF	1BBF1007D	3E564598E7	0	1	1	0	1	01	11	00
164	125	0AFE848	254ABFBF	177E200FA	7CAC8B31CF	1	0	0	1	1	10	01	11
165	126	15FD090	4A957F7E	0EFC401F5	795916639E	0	1	1	0	0	11	10	01
166	127	0BFA121	152AFefd	1DF8803EA	72B22CC73C	1	0	1	1	0	01	11	10
167	128	17F4243	2A55FDFA	1BF1007D4	6564598E78	0	0	1	0	0	10	01	11
168	129	0FE8486	54ABFBF4	17E200FA8	4AC8B31CF0	1	1	0	1	1	11	10	01
169	130	1FD090C	2957F7E8	0FC401F51	15916639E1	1	0	1	1	0	01	11	10
170	131	1FA1219	52AFefd1	1F8803EA3	2B22CC73C2	1	1	1	0	0	01	01	11
171	132	1F42432	255FDFA2	1F1007D47	564598E785	1	0	1	0	1	11	01	01
172	133	1E84865	4ABFBF44	1E200FA8F	2C8B31CF0B	1	1	1	1	1	11	11	01
173	134	1D090CB	157F7E88	1C401F51E	5916639E17	1	0	1	0	1	11	11	11
174	135	1A12196	2AFefd11	18803EA3C	322CC73C2E	1	1	1	0	0	10	11	11
175	136	142432C	55FDFA23	11007D479	64598E785C	0	1	0	0	1	01	10	11
176	137	0848659	2BFBF446	0200FA8F2	48B31CF0B9	1	1	0	1	0	10	01	10
177	138	1090CB2	57F7E88C	0401F51E4	116639E173	0	1	0	0	1	00	10	01
178	139	0121964	2FEFD118	0803EA3C8	22CC73C2E6	0	1	1	1	1	00	00	10
179	140	02432C9	5FDFA230	1007D4791	4598E785CD	0	1	0	1	0	01	00	00
180	141	0486593	3FBF4461	000FA8F23	0B31CF0B9B	0	1	0	0	0	00	01	00
181	142	090CB26	7F7E88C3	001F51E47	16639E1736	1	0	0	0	1	11	00	01
182	143	121964D	7EFD1187	003EA3C8F	2CC73C2E6C	0	1	0	1	1	01	11	00
183	144	0432C9B	7DFA230E	007D4791E	598E785CD8	0	1	0	1	1	10	01	11
184	145	0865936	7BF4461C	00FA8F23C	331CF0B9B0	1	1	0	0	0	11	10	01
185	146	10CB26D	77E88C38	01F51E479	6639E17361	0	1	0	0	0	00	11	10
186	147	01964DA	6FD11870	03EA3C8F2	4C73C2E6C2	0	1	0	0	1	10	00	11
187	148	032C9B4	5FA230E1	07D4791B4	18E785CD84	0	1	0	1	0	00	10	00
188	149	0659368	3F4461C2	0FA8F23C9	31CF0B9B09	0	0	1	1	0	00	00	10
189	150	0CB26D0	7E88C384	1F51E4793	639E173612	1	1	1	1	0	10	00	00
190	151	1964DA0	7D118709	1EA3C8F27	473C2E6C24	1	0	1	0	0	00	10	00
191	152	12C9B41	7A230E12	1D4791E4E	0E785CD848	0	0	1	0	1	01	00	10
192	153	0593683	74461C24	1A8F23C9C	1CF0B9B091	0	0	1	1	1	00	01	00
193	154	0B26D06	688C3848	151E47938	39E1736123	1	1	0	1	1	10	00	01
194	155	164DA0D	51187091	0A3C8F271	73C2E6C247	0	0	1	1	0	00	10	00
195	156	0C9B41A	2230E123	14791E4E3	6785CD848F	1	0	0	1	0	00	00	10
196	157	1936835	4461C247	08F23C9C6	4F0B9B091E	1	0	1	0	0	01	00	00
197	158	126D06A	08C3848E	11E47938D	1E1736123C	0	1	0	0	0	00	01	00
198	159	04DA0D5	1187091C	03C8F271B	3C2E6C2478	0	1	0	0	1	11	00	01
199	160	09B41AA	230E1238	0791E4E37	785CD848F1	1	0	0	0	0	01	11	00
200	161	1368354	461C2470	0F23C9C6F	70B9B091E3	0	0	1	1	1	10	01	11
201	162	06D06A9	0C3848E1	1E47938DF	61736123C6	0	0	1	0	1	00	10	01
202	163	0DA0D52	187091C3	1C8F271BE	42E6C2478D	1	0	1	1	1	00	00	10

Appendix IV - Sample Data

Bluetooth.

203	164	1B41AA4	30E12387	191E4E37C	05CD848F1A	1	1	1	1	0	10	00	00
204	165	1683549	61C2470F	123C9C6F9	0B9B091E34	0	1	0	1	0	00	10	00
205	166	0D06A92	43848E1E	047938DF3	1736123C68	1	1	0	0	0	00	00	10
206	167	1A0D524	07091C3C	08F271BE7	2E6C2478D1	1	0	1	0	0	01	00	00
207	168	141AA49	0E123879	11E4E37CF	5CD848F1A2	0	0	0	1	0	00	01	00
208	169	0835492	1C2470F3	03C9C6F9F	39B091E345	1	0	0	1	0	10	00	01
209	170	106A925	3848E1E6	07938DF3F	736123C68B	0	0	0	0	0	11	10	00
210	171	00D524A	7091C3CD	0F271BE7E	66C2478D16	0	1	1	1	0	01	11	10
211	172	01AA495	6123879B	1E4E37CFD	4D848F1A2D	0	0	1	1	1	10	01	11
212	173	035492A	42470F36	1C9C6F9FB	1B091E345B	0	0	1	0	1	00	10	01
213	174	06A9255	048E1E6C	1938DF3F6	36123C68B7	0	1	1	0	0	00	00	10
214	175	0D524AB	091C3CD8	1271BE7EC	6C2478D16E	1	0	0	0	1	00	00	00
215	176	1AA4957	123879B1	04E37CFD8	5848F1A2DD	1	0	0	0	1	00	00	00
216	177	15492AF	2470F363	09C6F9FB0	3091E345BA	0	0	1	1	0	01	00	00
217	178	0A9255E	48E1E6C7	138DF3F61	6123C68B75	1	1	0	0	1	00	01	00
218	179	1524ABD	11C3CD8F	071BE7EC3	42478D16EB	0	1	0	0	1	11	00	01
219	180	0A4957B	23879B1F	0E37CFD87	048F1A2DD6	1	1	1	1	1	00	11	00
220	181	1492AF6	470F363F	1C6F9FB0E	091E345BAD	0	0	1	0	1	10	00	11
221	182	09255EC	0E1E6C7F	18DF3F61D	123C68B75B	1	0	1	0	0	00	10	00
222	183	124ABD9	1C3CD8FF	11BE7EC3A	2478D16EB6	0	0	0	0	0	01	00	10
223	184	04957B3	3879B1FE	037CFD874	48F1A2DD6D	0	0	0	1	0	00	01	00
224	185	092AF66	70F363FD	06F9FB0E9	11E345BADA	1	1	0	1	1	10	00	01
225	186	1255ECD	61E6C7FA	0DF3F61D3	23C68B75B7	0	1	1	1	1	00	10	00
226	187	04ABD9B	43CD8FF5	1BE7EC3A7	478D16EB6E	0	1	1	1	1	00	00	10
227	188	0957B37	079B1FEA	17CFD874E	0F1A2DD6DD	1	1	0	0	0	01	00	00
228	189	12AF66F	0F363FD4	0F9FB0E9C	1E345BADBB	0	0	1	0	0	00	01	00
229	190	055ECDE	1E6C7FA9	1F3F61D39	3C68B75B76	0	0	1	0	1	11	00	01
230	191	0ABD9BC	3CD8FF53	1E7EC3A73	78D16EB6EC	1	1	1	1	1	00	11	00
231	192	157B379	79B1FEA7	1CFD874E6	71A2DD6DD9	0	1	1	1	1	11	00	11
232	193	0AF66F3	7363FD4E	19FB0E9CD	6345BADBB2	1	0	1	0	1	01	11	00
233	194	15ECDE6	66C7FA9D	13F61D39A	468B75B765	0	1	0	1	1	10	01	11
234	195	0BD9BCC	4D8FF53A	07EC3A735	0D16EB6ECA	1	1	0	0	0	11	10	01
235	196	17B3799	1B1FEA75	0FD874E6A	1A2DD6DD94	0	0	1	0	0	00	11	10
236	197	0F66F33	363FD4EA	1FB0E9CD5	345BADBB28	1	0	1	0	0	11	00	11
237	198	1ECDE67	6C7FA9D5	1F61D39AA	68B75B7650	1	0	1	1	0	00	11	00
238	199	1D9BCCF	58FF53AB	1EC3A7354	516EB6ECA0	1	1	1	0	1	11	00	11
239	200	1B3799E	31FEA756	1D874E6A8	22DD6DD940	1	1	1	1	1	00	11	00

- Z[0] = 3F
- Z[1] = B1
- Z[2] = 67
- Z[3] = D2
- Z[4] = 2F
- Z[5] = A6
- Z[6] = 1F
- Z[7] = B9
- Z[8] = E6
- Z[9] = 84
- Z[10] = 43
- Z[11] = 07
- Z[12] = D8
- Z[13] = 1E
- Z[14] = E7
- Z[15] = C3

Appendix IV - Sample Data



```

=====
Reload this pattern into the LFSRs
Hold content of Summation Combiner regs and calculate new C[t+1] and Z values
=====
LFSR1 <= 0E62F3F
LFSR2 <= 6C84A6B1
LFSR3 <= 11E431F67
LFSR4 <= 61E707B9D2
C[t+1] <= 00

```

Generating 125 key symbols (encryption/decryption sequence)

240	1	0E62F3F	6C84A6B1	11E431F67	61E707B9D2	1	1	0	1	0	00	11	00
241	2	1CC5E7F	59094D63	03C863ECE	43CE0F73A5	1	0	0	1	0	11	00	11
242	3	198BCFF	32129AC6	0790C7D9D	079C1EE74A	1	0	0	1	1	01	11	00
243	4	13179FE	6425358C	0F218FB3A	0F383DCE94	0	0	1	0	0	10	01	11
244	5	062F3FD	484A6B19	1E431F675	1E707B9D28	0	0	1	0	1	00	10	01
245	6	0C5E7FB	1094D632	1C863ECEB	3CE0F73A50	1	1	1	1	0	11	00	10
246	7	18BCFF7	2129AC64	190C7D9D7	79C1EE74A1	1	0	1	1	0	00	11	00
247	8	1179FEE	425358C8	1218FB3AE	7383DCE942	0	0	0	1	1	10	00	11
248	9	02F3FDD	04A6B190	0431F675D	6707B9D285	0	1	0	0	1	11	10	00
249	10	05E7FBB	094D6320	0863ECEBB	4E0F73A50B	0	0	1	0	0	00	11	10
250	11	0BCFF77	129AC640	10C7D9D77	1C1EE74A16	1	1	0	0	0	11	00	11
251	12	179FEEE	25358C80	018FB3AEE	383DCE942C	0	0	0	0	1	10	11	00
252	13	0F3FDCC	4A6B1900	031F675DD	707B9D2859	1	0	0	0	1	01	10	11
253	14	1E7FBB8	14D63200	063ECEBBA	60F73A50B3	1	1	0	1	0	10	01	10
254	15	1CF7771	29AC6401	0C7D9D774	41EE74A167	1	1	1	1	0	10	10	01
255	16	19FEEE2	5358C803	18FB3AEE9	03DCE942CE	1	0	1	1	1	01	10	10
256	17	13FDCC4	26B19007	11F675DD2	07B9D2859C	0	1	0	1	1	01	01	10
257	18	07FBB88	4D63200E	03ECEBBA4	0F73A50B38	0	0	0	0	1	10	01	01
258	19	0FF7711	1AC6401D	07D9D7748	1EE74A1670	1	1	0	1	1	11	10	01
259	20	1FEEE23	358C803B	0FB3AEE91	3DCE942CE1	1	1	1	1	1	01	11	10
260	21	1FDCC47	6B190076	1F675DD23	7B9D2859C2	1	0	1	1	0	01	01	11
261	22	1FBB88F	563200ED	1ECEBBA47	773A50B385	1	0	1	0	1	11	01	01
262	23	1F7711E	2C6401DB	1D9D7748F	6E74A1670A	1	0	1	0	1	10	11	01
263	24	1EEEE2D	58C803B6	1B3AEE91E	5CE942CE15	1	1	1	1	0	11	10	11
264	25	1DDC47A	3190076C	1675DD23D	39D2859C2B	1	1	0	1	0	01	11	10
265	26	1BB88F4	63200ED9	0CEBBA47A	73A50B3856	1	0	1	1	0	01	01	11
266	27	17711E8	46401DB2	19D7748F5	674A1670AD	0	0	1	0	0	11	01	01
267	28	0EE23D0	0C803B64	13AEE91EA	4E942CE15B	1	1	0	1	0	11	11	01
268	29	1DC47A0	190076C8	075DD23D4	1D2859C2B7	1	0	0	0	0	11	11	11
269	30	1B88F41	3200ED90	0EBBA47A9	3A50B3856E	1	0	1	0	1	11	11	11
270	31	1711E83	6401DB20	1D7748F53	74A1670ADC	0	0	1	1	1	11	11	11
271	32	0E23D07	4803B641	1AEE91EA7	6942CE15B8	1	0	1	0	1	11	11	11
272	33	1C47A0F	10076C82	15DD23D4F	52859C2B71	1	0	0	1	1	11	11	11
273	34	188F41E	200ED905	0BBA47A9E	250B3856E3	1	0	1	0	1	11	11	11
274	35	111E83C	401DB20A	17748F53D	4A1670ADC7	0	0	0	0	1	00	11	11
275	36	023D078	003B6414	0EE91EA7A	142CE15B8E	0	0	1	0	1	10	00	11
276	37	047A0F0	0076C828	1DD23D4F5	2859C2B71C	0	0	1	0	1	11	10	00
277	38	08F41E1	00ED9050	1BA47A9EA	50B3856E39	1	1	1	1	1	01	11	10
278	39	11E83C2	01DB20A0	1748F53D5	21670ADC72	0	1	0	0	0	10	01	11
279	40	03D0785	03B64141	0E91EA7AA	42CE15B8E4	0	1	1	1	1	11	10	01
280	41	07A0FOA	076C8283	1D23D4F54	059C2B71C8	0	0	1	1	1	00	11	10
281	42	0F41E14	0ED90507	1A47A9EA9	0B3856E390	1	1	1	0	1	11	00	11
282	43	1E83C29	1DB20A0F	148F53D52	1670ADC720	1	1	0	0	1	01	11	00
283	44	1D07853	3B64141E	091EA7AA5	2CE15B8E40	1	0	1	1	0	01	01	11

Appendix IV - Sample Data

Bluetooth.

284	45	1A0F0A6	76C8283C	123D4F54B	59C2B71C81	1	1	0	1	0	00	01	01
285	46	141E14C	6D905079	047A9EA97	33856E3902	0	1	0	1	0	10	00	01
286	47	083C299	5B20A0F2	08F53D52F	670ADC7204	1	0	1	0	0	00	10	00
287	48	1078533	364141E4	11EA7AA5E	4E15B8E408	0	0	0	0	0	01	00	10
288	49	00F0A67	6C8283C8	03D4F54BC	1C2B71C811	0	1	0	0	0	00	01	00
289	50	01E14CE	59050791	07A9EA978	3856E39022	0	0	0	0	0	11	00	01
290	51	03C299C	320A0F23	0F53D52F1	70ADC72045	0	0	1	1	1	01	11	00
291	52	0785339	64141E47	1EA7AA5E2	615B8E408A	0	0	1	0	0	10	01	11
292	53	0F0A673	48283C8E	1D4F54BC4	42B71C8115	1	0	1	1	1	11	10	01
293	54	1E14CE6	1050791C	1A9EA9788	056E39022B	1	0	1	0	1	00	11	10
294	55	1C299CD	20A0F239	153D52F10	0ADC720456	1	1	0	1	1	11	00	11
295	56	185339B	4141E472	0A7AA5E20	15B8E408AC	1	0	1	1	0	00	11	00
296	57	10A6736	0283C8E4	14F54BC41	2B71C81158	0	1	0	0	1	10	00	11
297	58	014CE6C	050791C9	09EA97882	56E39022B0	0	0	1	1	0	00	10	00
298	59	0299CD9	0A0F2393	13D52F104	2DC7204561	0	0	0	1	1	01	00	10
299	60	05339B3	141E4726	07AA5E208	5B8E408AC3	0	0	0	1	0	00	01	00
300	61	0A67366	283C8E4C	0F54BC411	371C811587	1	0	1	0	0	10	00	01
301	62	14CE6CC	50791C98	1EA978822	6E39022B0F	0	0	1	0	1	11	10	00
302	63	099CD99	20F23930	1D52F1045	5C7204561E	1	1	1	0	0	01	11	10
303	64	1339B33	41E47260	1AA5E208B	38E408AC3D	0	1	1	1	0	01	01	11
304	65	0673666	03C8E4C0	154BC4117	71C811587A	0	1	0	1	1	11	01	01
305	66	0CB6CCC	0791C980	0A978822E	639022B0F5	1	1	1	1	1	11	11	01
306	67	19CD999	0F239301	152F1045C	47204561EB	1	0	0	0	0	11	11	11
307	68	139B332	1E472603	0A5E208B9	0E408AC3D6	0	0	1	0	0	11	11	11
308	69	0736664	3C8E4C06	14BC41172	1C811587AD	0	1	0	1	1	11	11	11
309	70	0E6CCC8	791C980C	0978822E5	39022B0F5A	1	0	1	0	1	11	11	11
310	71	1CD9990	72393019	12F1045CB	7204561EB4	1	0	0	0	0	11	11	11
311	72	19B3320	64726033	05E208B97	6408AC3D69	1	0	0	0	0	11	11	11
312	73	1366640	48E4C067	0BC41172F	4811587AD3	0	1	1	0	1	11	11	11
313	74	06CCC81	11C980CF	178822E5E	1022B0F5A6	0	1	0	0	0	11	11	11
314	75	0D99903	2393019E	0F1045CBC	204561EB4C	1	1	1	0	0	10	11	11
315	76	1B33206	4726033D	1E208B979	408AC3D699	1	0	1	1	1	10	10	11
316	77	166640D	0E4C067B	1C41172F2	011587AD33	0	0	1	0	1	10	10	10
317	78	0CCC81B	1C980CF6	18822E5E5	022B0F5A66	1	1	1	0	1	01	10	10
318	79	1999036	393019EC	11045CBCA	04561EB4CD	1	0	0	0	0	01	01	10
319	80	133206C	726033D9	0208B9794	08AC3D699B	0	0	0	1	0	11	01	01
320	81	06640D9	64C067B3	041172F29	11587AD337	0	1	0	0	0	10	11	01
321	82	0CC81B3	4980CF66	0822E5E53	22B0F5A66F	1	1	1	1	0	11	10	11
322	83	1990366	13019ECC	1045CBCA6	4561EB4CDF	1	0	0	0	0	00	11	10
323	84	13206CC	26033D98	008B9794D	0AC3D699BE	0	0	0	1	1	10	00	11
324	85	0640D98	4C067B31	01172F29B	1587AD337C	0	0	0	1	1	11	10	00
325	86	0C81B30	180CF662	022E5E537	2B0F5A66F9	1	0	0	0	0	00	11	10
326	87	1903660	3019ECC5	045CBCA6F	561EB4CDF3	1	0	0	0	1	10	00	11
327	88	1206CC1	6033D98A	08B9794DE	2C3D699BE6	0	0	1	0	1	11	10	00
328	89	040D983	4067B315	1172F29BD	587AD337CC	0	0	0	0	1	11	11	10
329	90	081B306	00CF662A	02E5E537A	30F5A66F98	1	1	0	1	0	10	11	11
330	91	103660C	019ECC55	05CBCA6F4	61EB4CDF31	0	1	0	1	0	10	11	11
331	92	006CC19	033D98AB	0B9794DE8	43D699BE62	0	0	1	1	0	01	10	10
332	93	00D9833	067B3156	172F29BD0	07AD337CC5	0	0	0	1	0	01	01	10
333	94	01B3066	0CF662AC	0E5E537A0	0F5A66F98B	0	1	1	0	1	11	01	01
334	95	03660CD	19ECC559	1CBCA6F41	1EB4CDF317	0	1	1	1	0	11	11	01
335	96	06CC19B	33D98AB2	19794DE83	3D699BE62F	0	1	1	0	1	11	11	11
336	97	0D98336	67B31565	12F29BD06	7AD337CC5F	1	1	0	1	0	10	11	11
337	98	1B3066D	4F662ACA	05E537A0C	75A66F98BF	1	0	0	1	0	10	10	11
338	99	1660CDB	1ECC5594	0BCA6F418	6B4CDF317E	0	1	1	0	0	01	10	10
339	100	0CC19B7	3D98AB29	1794DE831	5699BE62FC	1	1	0	1	0	10	01	10
340	101	198336F	7B315653	0F29BD062	2D337CC5F9	1	0	1	0	0	11	10	01

Appendix IV - Sample Data

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341	102	13066DE	7662ACA7	1E537A0C5	5A66F98BF2	0	0	1	0	0	00	11	10
342	103	060CDEC	6CC5594F	1CA6F418B	34CDF317E4	0	1	1	1	1	11	00	11
343	104	0C19B78	598AB29F	194DE8317	699BE62FC9	1	1	1	1	1	00	11	00
344	105	18336F1	3315653F	129BD062E	5337CC5F92	1	0	0	0	1	10	00	11
345	106	1066DE2	662ACA7E	0537A0C5C	266F98BF25	0	0	0	0	0	11	10	00
346	107	00CDEC5	4C5594FD	0A6F418B9	4CDF317E4B	0	0	1	1	1	00	11	10
347	108	019B78B	18AB29FA	14DE83172	19BE62FC96	0	1	0	1	0	11	00	11
348	109	0336F16	315653F4	09BD062E5	337CC5F92C	0	0	1	0	0	01	11	00
349	110	066DE2D	62ACA7E8	137A0C5CA	66F98BF258	0	1	0	1	1	10	01	11
350	111	0CDBC5B	45594FD1	06F418B95	4DF317E4B1	1	0	0	1	0	11	10	01
351	112	19B78B6	0AB29FA2	0DE83172B	1BE62FC962	1	1	1	1	1	01	11	10
352	113	136F16C	15653F45	1BD062E57	37CC5F92C5	0	0	1	1	1	10	01	11
353	114	06DE2D9	2ACA7E8B	17A0C5CAE	6F98BF258B	0	1	0	1	0	11	10	01
354	115	0DBC5B2	5594FD16	0F418B95D	5F317E4B16	1	1	1	0	0	01	11	10
355	116	1B78B64	2B29FA2C	1E83172BB	3E62FC962C	1	0	1	0	1	10	01	11
356	117	16F16C8	5653F458	1D062E577	7CC5F92C58	0	0	1	1	0	11	10	01
357	118	0DE2D91	2CA7E8B0	1A0C5CAEF	798BF258B1	1	1	1	1	1	01	11	10
358	119	1BC5B23	594FD161	1418B95DF	7317E4B163	1	0	0	0	0	10	01	11
359	120	178B647	329FA2C2	083172BBF	662FC962C7	0	1	1	0	0	11	10	01
360	121	0F16C8E	653F4584	1062E577F	4C5F92C58E	1	0	0	0	0	00	11	10
361	122	1E2D91C	4A7E8B09	00C5CAEFE	18BF258B1C	1	0	0	1	0	11	00	11
362	123	1C5B238	14FD1613	018B95DFC	317E4B1639	1	1	0	0	1	01	11	00
363	124	18B6471	29FA2C27	03172BBF9	62FC962C72	1	1	0	1	0	01	01	11
364	125	116C8E2	53F4584E	062E577F3	45F92C58E4	0	1	0	1	1	11	01	01

2 FREQUENCY HOPPING SAMPLE DATA— MANDATORY SCHEME

These sets of sample data show the mandatory frequency hopping scheme for three different combinations of addresses and initial clock values. The first part is for the 79-hop system, the second is for the 23-hop system.

2.1 THE 79-HOP SYSTEM SAMPLE DATA

2.1.1 First set

```

=====
                          79 HOP SYSTEM
=====

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:
CLKN start: 0x00000000
ULAP: 0x00000000
#ticks: 0000 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 |
-----
0x00000000: 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
0x00080000: 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
0x00100000: 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 |
0x00180000: 48 | 50 | 52 | 54 | 56 | 58 | 60 | 62 |
0x00200000: 0 | 2 | 4 | 6 | 8 | 10 | 12 | 14 |
0x00280000: 16 | 18 | 20 | 22 | 24 | 26 | 28 | 30 |
0x00300000: 32 | 34 | 36 | 38 | 40 | 42 | 44 | 46 |
0x00380000: 48 | 50 | 52 | 54 | 56 | 58 | 60 | 62 |

Hop sequence {k} for PAGE STATE/INQUIRY STATE:
CLKE start: 0x00000000
ULAP: 0x00000000
#ticks: 00 01 02 03 | 04 05 06 07 | 08 09 0a 0b | 0c 0d 0e 0f |
-----
0x00000000: 48 50 09 13 | 52 54 41 45 | 56 58 11 15 | 60 62 43 47 |
0x00000010: 00 02 64 68 | 04 06 17 21 | 08 10 66 70 | 12 14 19 23 |
0x00000020: 48 50 09 13 | 52 54 41 45 | 56 58 11 15 | 60 62 43 47 |
0x00000030: 00 02 64 68 | 04 06 17 21 | 08 10 66 70 | 12 14 19 23 |
...
0x00010000: 48 18 09 05 | 20 22 33 37 | 24 26 03 07 | 28 30 35 39 |
0x00010100: 32 34 72 76 | 36 38 25 29 | 40 42 74 78 | 44 46 27 31 |
0x00010200: 48 18 09 05 | 20 22 33 37 | 24 26 03 07 | 28 30 35 39 |
0x00010300: 32 34 72 76 | 36 38 25 29 | 40 42 74 78 | 44 46 27 31 |
...
0x00020000: 16 18 01 05 | 52 54 41 45 | 56 58 11 15 | 60 62 43 47 |
0x00020100: 00 02 64 68 | 04 06 17 21 | 08 10 66 70 | 12 14 19 23 |
0x00020200: 16 18 01 05 | 52 54 41 45 | 56 58 11 15 | 60 62 43 47 |
0x00020300: 00 02 64 68 | 04 06 17 21 | 08 10 66 70 | 12 14 19 23 |
...
0x00030000: 48 50 09 13 | 52 22 41 37 | 24 26 03 07 | 28 30 35 39 |
0x00030100: 32 34 72 76 | 36 38 25 29 | 40 42 74 78 | 44 46 27 31 |
0x00030200: 48 50 09 13 | 52 22 41 37 | 24 26 03 07 | 28 30 35 39 |
0x00030300: 32 34 72 76 | 36 38 25 29 | 40 42 74 78 | 44 46 27 31 |

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:
CLKN* = 0x00000010
ULAP: 0x00000000
#ticks: 00 | 02 04 | 06 08 | 0a 0c | 0e 10 | 12 14 | 16 18 | 1a 1c | 1e
-----
0x00000012: 64 | 02 68 | 04 17 | 06 21 | 08 66 | 10 70 | 12 19 | 14 23 | 16
0x00000032: 01 | 18 05 | 20 33 | 22 37 | 24 03 | 26 07 | 28 35 | 30 39 | 32
0x00000052: 72 | 34 76 | 36 25 | 38 29 | 40 74 | 42 78 | 44 27 | 46 31 | 48
0x00000072: 09 | 50 13 | 52 41 | 54 45 | 56 11 | 58 15 | 60 43 | 62 47 | 00

Hop sequence {k} for MASTER PAGE RESPONSE STATE:
Offset value: 24
CLKE* = 0x00000012
ULAP: 0x00000000
#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |
-----
0x00000014: 02 68 | 04 17 | 06 21 | 08 66 | 10 70 | 12 19 | 14 23 | 16 01 |
0x00000034: 18 05 | 20 33 | 22 37 | 24 03 | 26 07 | 28 35 | 30 39 | 32 72 |
0x00000054: 34 76 | 36 25 | 38 29 | 40 74 | 42 78 | 44 27 | 46 31 | 48 09 |
0x00000074: 50 13 | 52 41 | 54 45 | 56 11 | 58 15 | 60 43 | 62 47 | 00 64 |

```

Appendix IV - Sample Data



Hop sequence {k} for CONNECTION STATE:

CLK start:	0x0000010							
ULAP:	0x00000000							
#ticks:	00 02	04 06	08 0a	0c 0e	10 12	14 16	18 1a	1c 1e
0x0000010:	08 66	10 70	12 19	14 23	16 01	18 05	20 33	22 37
0x0000030:	24 03	26 07	28 35	30 39	32 72	34 76	36 25	38 29
0x0000050:	40 74	42 78	44 27	46 31	48 09	50 13	52 41	54 45
0x0000070:	56 11	58 15	60 43	62 47	32 17	36 19	34 49	38 51
0x0000090:	40 21	44 23	42 53	46 55	48 33	52 35	50 65	54 67
0x00000b0:	56 37	60 39	58 69	62 71	64 25	68 27	66 57	70 59
0x00000d0:	72 29	76 31	74 61	78 63	01 41	05 43	03 73	07 75
0x00000f0:	09 45	13 47	11 77	15 00	64 49	66 53	68 02	70 06
0x0000110:	01 51	03 55	05 04	07 08	72 57	74 61	76 10	78 14
0x0000130:	09 59	11 63	13 12	15 16	17 65	19 69	21 18	23 22
0x0000150:	33 67	35 71	37 20	39 24	25 73	27 77	29 26	31 30
0x0000170:	41 75	43 00	45 28	47 32	17 02	21 04	19 34	23 36
0x0000190:	33 06	37 08	35 38	39 40	25 10	29 12	27 42	31 44
0x00001b0:	41 14	45 16	43 46	47 48	49 18	53 20	51 50	55 52
0x00001d0:	65 22	69 24	67 54	71 56	57 26	61 28	59 58	63 60
0x00001f0:	73 30	77 32	75 62	00 64	49 34	51 42	57 66	59 74
0x0000210:	53 36	55 44	61 68	63 76	65 50	67 58	73 03	75 11
0x0000230:	69 52	71 60	77 05	00 13	02 38	04 46	10 70	12 78
0x0000250:	06 40	08 48	14 72	16 01	18 54	20 62	26 07	28 15
0x0000270:	22 56	24 64	30 09	32 17	02 66	06 74	10 19	14 27
0x0000290:	04 70	08 78	12 23	16 31	18 03	22 11	26 35	30 43
0x00002b0:	20 07	24 15	28 39	32 47	34 68	38 76	42 21	46 29
0x00002d0:	36 72	40 01	44 25	48 33	50 05	54 13	58 37	62 45
0x00002f0:	52 09	56 17	60 41	64 49	34 19	36 35	50 51	52 67
0x0000310:	38 21	40 37	54 53	56 69	42 27	44 43	58 59	60 75
0x0000330:	46 29	48 45	62 61	64 77	66 23	68 39	03 55	05 71
0x0000350:	70 25	72 41	07 57	09 73	74 31	76 47	11 63	13 00
0x0000370:	78 33	01 49	15 65	17 02	66 51	70 67	03 04	07 20
0x0000390:	68 55	72 71	05 08	09 24	74 59	78 75	11 12	15 28
0x00003b0:	76 63	01 00	13 16	17 32	19 53	23 69	35 06	39 22
0x00003d0:	21 57	25 73	37 10	41 26	27 61	31 77	43 14	47 30
0x00003f0:	29 65	33 02	45 18	49 34	19 04	21 08	23 20	25 24

2.1.2 Second set

```

Set mode:
Set clock:
Set ULAP:

=====
                          79 HOP SYSTEM
=====

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:
CLKN start: 0x0000000
ULAP: 0x2a96ef25
#ticks: 0000 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 |
-----
0x0000000: 49 | 13 | 17 | 51 | 55 | 19 | 23 | 53 |
0x0008000: 57 | 21 | 25 | 27 | 31 | 74 | 78 | 29 |
0x0010000: 33 | 76 | 1 | 35 | 39 | 3 | 7 | 37 |
0x0018000: 41 | 5 | 9 | 43 | 47 | 11 | 15 | 45 |
0x0020000: 49 | 13 | 17 | 51 | 55 | 19 | 23 | 53 |
0x0028000: 57 | 21 | 25 | 27 | 31 | 74 | 78 | 29 |
0x0030000: 33 | 76 | 1 | 35 | 39 | 3 | 7 | 37 |
0x0038000: 41 | 5 | 9 | 43 | 47 | 11 | 15 | 45 |

Hop sequence {k} for PAGE STATE/INQUIRY STATE:
CLKE start: 0x0000000
ULAP: 0x2a96ef25
#ticks: 00 01 02 03 | 04 05 06 07 | 08 09 0a 0b | 0c 0d 0e 0f |
-----
0x0000000: 41 05 10 04 | 09 43 06 16 | 47 11 18 12 | 15 45 14 32 |
0x0000010: 49 13 34 28 | 17 51 30 24 | 55 19 26 20 | 23 53 22 40 |
0x0000020: 41 05 10 04 | 09 43 06 16 | 47 11 18 12 | 15 45 14 32 |
0x0000030: 49 13 34 28 | 17 51 30 24 | 55 19 26 20 | 23 53 22 40 |
...
0x0001000: 41 21 10 36 | 25 27 38 63 | 31 74 65 59 | 78 29 61 00 |
0x0001010: 33 76 02 75 | 01 35 77 71 | 39 03 73 67 | 07 37 69 08 |
0x0001020: 41 21 10 36 | 25 27 38 63 | 31 74 65 59 | 78 29 61 00 |
0x0001030: 33 76 02 75 | 01 35 77 71 | 39 03 73 67 | 07 37 69 08 |
...
0x0002000: 57 21 42 36 | 09 43 06 16 | 47 11 18 12 | 15 45 14 32 |
0x0002010: 49 13 34 28 | 17 51 30 24 | 55 19 26 20 | 23 53 22 40 |
0x0002020: 57 21 42 36 | 09 43 06 16 | 47 11 18 12 | 15 45 14 32 |
0x0002030: 49 13 34 28 | 17 51 30 24 | 55 19 26 20 | 23 53 22 40 |
...
0x0003000: 41 05 10 04 | 09 27 06 63 | 31 74 65 59 | 78 29 61 00 |
0x0003010: 33 76 02 75 | 01 35 77 71 | 39 03 73 67 | 07 37 69 08 |
0x0003020: 41 05 10 04 | 09 27 06 63 | 31 74 65 59 | 78 29 61 00 |
0x0003030: 33 76 02 75 | 01 35 77 71 | 39 03 73 67 | 07 37 69 08 |

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:
CLKN* = 0x0000010
ULAP: 0x2a96ef25
#ticks: 00 | 02 04 | 06 08 | 0a 0c | 0e 10 | 12 14 | 16 18 | 1a 1c | 1e
-----
0x0000012: 34 | 13 28 | 17 30 | 51 24 | 55 26 | 19 20 | 23 22 | 53 40 | 57
0x0000032: 42 | 21 36 | 25 38 | 27 63 | 31 65 | 74 59 | 78 61 | 29 00 | 33
0x0000052: 02 | 76 75 | 01 77 | 35 71 | 39 73 | 03 67 | 07 69 | 37 08 | 41
0x0000072: 10 | 05 04 | 09 06 | 43 16 | 47 18 | 11 12 | 15 14 | 45 32 | 49

Hop sequence {k} for MASTER PAGE RESPONSE STATE:
Offset value: 24
CLKE* = 0x0000012
ULAP: 0x2a96ef25
#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |
-----
0x0000014: 13 28 | 17 30 | 51 24 | 55 26 | 19 20 | 23 22 | 53 40 | 57 42 |
0x0000034: 21 36 | 25 38 | 27 63 | 31 65 | 74 59 | 78 61 | 29 00 | 33 02 |
0x0000054: 76 75 | 01 77 | 35 71 | 39 73 | 03 67 | 07 69 | 37 08 | 41 10 |
0x0000074: 05 04 | 09 06 | 43 16 | 47 18 | 11 12 | 15 14 | 45 32 | 49 34 |
    
```

Appendix IV - Sample Data



Hop sequence {k} for CONNECTION STATE:

CLK start:	0x0000010							
ULAP:	0x2a96ef25							
#ticks:	00 02	04 06	08 0a	0c 0e	10 12	14 16	18 1a	1c 1e
0x0000010:	55 26	19 20	23 22	53 40	57 42	21 36	25 38	27 63
0x0000030:	31 65	74 59	78 61	29 00	33 02	76 75	01 77	35 71
0x0000050:	39 73	03 67	07 69	37 08	41 10	05 04	09 06	43 16
0x0000070:	47 18	11 12	15 14	45 32	02 66	47 60	49 64	04 54
0x0000090:	06 58	51 52	53 56	08 70	10 74	55 68	57 72	59 14
0x00000b0:	61 18	27 12	29 16	63 30	65 34	31 28	33 32	67 22
0x00000d0:	69 26	35 20	37 24	71 38	73 42	39 36	41 40	75 46
0x00000f0:	77 50	43 44	45 48	00 62	26 11	69 05	73 07	36 17
0x0000110:	40 19	04 13	08 15	38 25	42 27	06 21	10 23	12 48
0x0000130:	16 50	59 44	63 46	14 56	18 58	61 52	65 54	28 64
0x0000150:	32 66	75 60	00 62	30 72	34 74	77 68	02 70	20 01
0x0000170:	24 03	67 76	71 78	22 09	58 43	24 37	26 41	68 47
0x0000190:	70 51	36 45	38 49	72 55	74 59	40 53	42 57	44 78
0x00001b0:	46 03	12 76	14 01	48 07	50 11	16 05	18 09	60 15
0x00001d0:	62 19	28 13	30 17	64 23	66 27	32 21	34 25	52 31
0x00001f0:	54 35	20 29	22 33	56 39	19 04	62 63	66 00	07 73
0x0000210:	11 10	54 69	58 06	23 75	27 12	70 71	74 08	76 33
0x0000230:	01 49	44 29	48 45	13 35	17 51	60 31	64 47	05 41
0x0000250:	09 57	52 37	56 53	21 43	25 59	68 39	72 55	78 65
0x0000270:	03 02	46 61	50 77	15 67	51 36	17 18	19 34	41 24
0x0000290:	43 40	09 22	11 38	57 28	59 44	25 26	27 42	29 63
0x00002b0:	31 00	76 61	78 77	45 67	47 04	13 65	15 02	37 71
0x00002d0:	39 08	05 69	07 06	53 75	55 12	21 73	23 10	33 16
0x00002f0:	35 32	01 14	03 30	49 20	75 60	39 48	43 56	00 66
0x0000310:	04 74	47 62	51 70	08 68	12 76	55 64	59 72	61 18
0x0000330:	65 26	29 14	33 22	69 20	73 28	37 16	41 24	77 34
0x0000350:	02 42	45 30	49 38	06 36	10 44	53 32	57 40	63 50
0x0000370:	67 58	31 46	35 54	71 52	28 13	73 03	75 11	34 17
0x0000390:	36 25	02 15	04 23	42 21	44 29	10 19	12 27	14 48
0x00003b0:	16 56	61 46	63 54	22 52	24 60	69 50	71 58	30 64
0x00003d0:	32 72	77 62	00 70	38 68	40 76	06 66	08 74	18 01
0x00003f0:	20 09	65 78	67 07	26 05	44 29	32 23	36 25	70 43

2.1.3 Third set

Set mode:
Set clock:
Set ULAP:

===== 79 HOP SYSTEM =====

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:

CLKN start:	0x0000000							
ULAP:	0x6587cba9							
#ticks:	0000	1000	2000	3000	4000	5000	6000	7000
0x0000000:	16	65	67	18	20	53	55	6
0x0008000:	8	57	59	10	12	69	71	22
0x0010000:	24	73	75	26	28	45	47	77
0x0018000:	0	49	51	2	4	61	63	14
0x0020000:	16	65	67	18	20	53	55	6
0x0028000:	8	57	59	10	12	69	71	22
0x0030000:	24	73	75	26	28	45	47	77
0x0038000:	0	49	51	2	4	61	63	14

Hop sequence {k} for PAGE STATE/INQUIRY STATE:

CLKE start:	0x0000000															
ULAP:	0x6587cba9															
#ticks:	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
0x0000000:	00	49	36	38	51	02	42	40	04	61	44	46	63	14	50	48
0x0000010:	16	65	52	54	67	18	58	56	20	53	60	62	55	06	66	64
0x0000020:	00	49	36	38	51	02	42	40	04	61	44	46	63	14	50	48
0x0000030:	16	65	52	54	67	18	58	56	20	53	60	62	55	06	66	64
...																
0x0001000:	00	57	36	70	59	10	74	72	12	69	76	78	71	22	03	01
0x0001010:	24	73	05	07	75	26	11	09	28	45	13	30	47	77	34	32
0x0001020:	00	57	36	70	59	10	74	72	12	69	76	78	71	22	03	01
0x0001030:	24	73	05	07	75	26	11	09	28	45	13	30	47	77	34	32
...																
0x0002000:	08	57	68	70	51	02	42	40	04	61	44	46	63	14	50	48
0x0002010:	16	65	52	54	67	18	58	56	20	53	60	62	55	06	66	64
0x0002020:	08	57	68	70	51	02	42	40	04	61	44	46	63	14	50	48
0x0002030:	16	65	52	54	67	18	58	56	20	53	60	62	55	06	66	64
...																
0x0003000:	00	49	36	38	51	10	42	72	12	69	76	78	71	22	03	01
0x0003010:	24	73	05	07	75	26	11	09	28	45	13	30	47	77	34	32
0x0003020:	00	49	36	38	51	10	42	72	12	69	76	78	71	22	03	01
0x0003030:	24	73	05	07	75	26	11	09	28	45	13	30	47	77	34	32

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:

CLKN* =	0x0000010															
ULAP:	0x6587cba9															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000012:	52	65	54	67	58	18	56	20	60	53	62	55	66	06	64	08
0x0000032:	68	57	70	59	74	10	72	12	76	69	78	71	03	22	01	24
0x0000052:	05	73	07	75	11	26	09	28	13	45	30	47	34	77	32	00
0x0000072:	36	49	38	51	42	02	40	04	44	61	46	63	50	14	48	16

Hop sequence {k} for MASTER PAGE RESPONSE STATE:

Offset value:	24															
CLKE* =	0x0000012															
ULAP:	0x6587cba9															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000014:	65	54	67	58	18	56	20	60	53	62	55	66	06	64	08	68
0x0000034:	57	70	59	74	10	72	12	76	69	78	71	03	22	01	24	05
0x0000054:	73	07	75	11	26	09	28	13	45	30	47	34	77	32	00	36
0x0000074:	49	38	51	42	02	40	04	44	61	46	63	50	14	48	16	52

Hop sequence {k} for CONNECTION STATE:

```

CLK start: 0x0000010
ULAP: 0x6587cba9
#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |
-----|-----|-----|-----|-----|-----|-----|-----|
0x0000010: 20 60 | 53 62 | 55 66 | 06 64 | 08 68 | 57 70 | 59 74 | 10 72 |
0x0000030: 12 76 | 69 78 | 71 03 | 22 01 | 24 05 | 73 07 | 75 11 | 26 09 |
0x0000050: 28 13 | 45 30 | 47 34 | 77 32 | 00 36 | 49 38 | 51 42 | 02 40 |
0x0000070: 04 44 | 61 46 | 63 50 | 14 48 | 50 05 | 16 07 | 20 09 | 48 11 |
0x0000090: 52 13 | 06 15 | 10 17 | 38 19 | 42 21 | 08 23 | 12 25 | 40 27 |
0x00000b0: 44 29 | 22 31 | 26 33 | 54 35 | 58 37 | 24 39 | 28 41 | 56 43 |
0x00000d0: 60 45 | 77 62 | 02 64 | 30 66 | 34 68 | 00 70 | 04 72 | 32 74 |
0x00000f0: 36 76 | 14 78 | 18 01 | 46 03 | 72 29 | 42 39 | 44 43 | 74 41 |
0x0000110: 76 45 | 46 47 | 48 51 | 78 49 | 01 53 | 50 63 | 52 67 | 03 65 |
0x0000130: 05 69 | 54 55 | 56 59 | 07 57 | 09 61 | 58 71 | 60 75 | 11 73 |
0x0000150: 13 77 | 30 15 | 32 19 | 62 17 | 64 21 | 34 31 | 36 35 | 66 33 |
0x0000170: 68 37 | 38 23 | 40 27 | 70 25 | 27 61 | 72 71 | 76 73 | 25 75 |
0x0000190: 29 77 | 78 00 | 03 02 | 31 04 | 35 06 | 01 16 | 05 18 | 33 20 |
0x00001b0: 37 22 | 07 08 | 11 10 | 39 12 | 43 14 | 09 24 | 13 26 | 41 28 |
0x00001d0: 45 30 | 62 47 | 66 49 | 15 51 | 19 53 | 64 63 | 68 65 | 17 67 |
0x00001f0: 21 69 | 70 55 | 74 57 | 23 59 | 53 22 | 35 12 | 37 28 | 67 14 |
0x0000210: 69 30 | 23 32 | 25 48 | 55 34 | 57 50 | 39 40 | 41 56 | 71 42 |
0x0000230: 73 58 | 27 36 | 29 52 | 59 38 | 61 54 | 43 44 | 45 60 | 75 46 |
0x0000250: 77 62 | 15 00 | 17 16 | 47 02 | 49 18 | 31 08 | 33 24 | 63 10 |
0x0000270: 65 26 | 19 04 | 21 20 | 51 06 | 06 54 | 65 42 | 69 58 | 18 46 |
0x0000290: 22 62 | 55 64 | 59 01 | 08 68 | 12 05 | 71 72 | 75 09 | 24 76 |
0x00002b0: 28 13 | 57 66 | 61 03 | 10 70 | 14 07 | 73 74 | 77 11 | 26 78 |
0x00002d0: 30 15 | 47 32 | 51 48 | 00 36 | 04 52 | 63 40 | 67 56 | 16 44 |
0x00002f0: 20 60 | 49 34 | 53 50 | 02 38 | 38 78 | 12 05 | 14 13 | 44 07 |
0x0000310: 46 15 | 16 17 | 18 25 | 48 19 | 50 27 | 24 33 | 26 41 | 56 35 |
0x0000330: 58 43 | 20 21 | 22 29 | 52 23 | 54 31 | 28 37 | 30 45 | 60 39 |
0x0000350: 62 47 | 00 64 | 02 72 | 32 66 | 34 74 | 08 01 | 10 09 | 40 03 |
0x0000370: 42 11 | 04 68 | 06 76 | 36 70 | 70 31 | 42 35 | 46 43 | 74 39 |
0x0000390: 78 47 | 48 49 | 52 57 | 01 53 | 05 61 | 56 65 | 60 73 | 09 69 |
0x00003b0: 13 77 | 50 51 | 54 59 | 03 55 | 07 63 | 58 67 | 62 75 | 11 71 |
0x00003d0: 15 00 | 32 17 | 36 25 | 64 21 | 68 29 | 40 33 | 44 41 | 72 37 |
0x00003f0: 76 45 | 34 19 | 38 27 | 66 23 | 11 71 | 05 18 | 07 22 | 13 20 |
    
```

2.2 THE 23-HOP SYSTEM SAMPLE DATA

2.2.1 First set

Appendix IV - Sample Data



Set mode:
Set clock:
Set ULAP:

--

```
=====
=
                        23 HOP SYSTEM
=====
=
```

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:

```
CLKN start: 0x00000000
ULAP:       0x00000000
#ticks:     0000 | 1000 | 2000 | 3000 | 4000 | 5000 | 6000 | 7000 |
```

0x00000000:	0	2	4	6	8	10	12	14
0x00080000:	16	18	20	22	1	3	5	7
0x00100000:	0	2	4	6	8	10	12	14
0x00180000:	16	18	20	22	1	3	5	7
0x00200000:	0	2	4	6	8	10	12	14
0x00280000:	16	18	20	22	1	3	5	7
0x00300000:	0	2	4	6	8	10	12	14
0x00380000:	16	18	20	22	1	3	5	7

Hop sequence {k} for PAGE STATE/INQUIRY STATE:

```
CLKE start: 0x00000000
ULAP:       0x00000000
#ticks:     00 01 02 03 | 04 05 06 07 | 08 09 0a 0b | 0c 0d 0e 0f |
```

0x00000000:	16	18	02	10	20	22	06	14	01	03	04	12	05	07	08	16
0x00000010:	00	02	09	17	04	06	13	21	08	10	11	19	12	14	15	00
0x00000020:	16	18	02	10	20	22	06	14	01	03	04	12	05	07	08	16
0x00000030:	00	02	09	17	04	06	13	21	08	10	11	19	12	14	15	00
...																
0x00010000:	18	20	10	06	22	01	14	04	03	05	12	08	07	00	16	09
0x00010010:	02	04	17	13	06	08	21	11	10	12	19	15	14	16	00	02
0x00010020:	18	20	10	06	22	01	14	04	03	05	12	08	07	00	16	09
0x00010030:	02	04	17	13	06	08	21	11	10	12	19	15	14	16	00	02
...																
0x00020000:	20	22	06	14	01	03	04	12	05	07	08	16	00	02	09	17
0x00020010:	04	06	13	21	08	10	11	19	12	14	15	00	16	18	02	10
0x00020020:	20	22	06	14	01	03	04	12	05	07	08	16	00	02	09	17
0x00020030:	04	06	13	21	08	10	11	19	12	14	15	00	16	18	02	10
...																
0x00030000:	22	01	14	04	03	05	12	08	07	00	16	09	02	04	17	13
0x00030010:	06	08	21	11	10	12	19	15	14	16	00	02	18	20	10	06
0x00030020:	22	01	14	04	03	05	12	08	07	00	16	09	02	04	17	13
0x00030030:	06	08	21	11	10	12	19	15	14	16	00	02	18	20	10	06

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:

```
CLKN* = 0x00000010
ULAP:   0x00000000
#ticks: 00 | 02 04 | 06 08 | 0a 0c | 0e 10 | 12 14 | 16 18 | 1a 1c | 1e
```

0x00000012:	09	02	17	04	13	06	21	08	11	10	19	12	15	14	00	16
0x00000032:	02	18	10	20	06	22	14	01	04	03	12	05	08	07	16	00
0x00000052:	09	02	17	04	13	06	21	08	11	10	19	12	15	14	00	16
0x00000072:	02	18	10	20	06	22	14	01	04	03	12	05	08	07	16	00

Hop sequence {k} for MASTER PAGE RESPONSE STATE:

```
Offset value: 24
CLKE* = 0x00000012
ULAP:   0x00000000
#ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |
```

0x00000014:	02	17	04	13	06	21	08	11	10	19	12	15	14	00	16	02
0x00000034:	18	10	20	06	22	14	01	04	03	12	05	08	07	16	00	09

Appendix IV - Sample Data



0x0000054:	02 17	04 13	06 21	08 11	10 19	12 15	14 00	16 02
0x0000074:	18 10	20 06	22 14	01 04	03 12	05 08	07 16	00 09
Hop sequence {k} for CONNECTION STATE:								
CLK start:	0x0000010							
ULAP:	0x00000000							
#ticks:	00 02	04 06	08 0a	0c 0e	10 12	14 16	18 1a	1c 1e
0x0000010:	08 11	10 19	12 15	14 00	16 02	18 10	20 06	22 14
0x0000030:	01 04	03 12	05 08	07 16	16 02	18 10	20 06	22 14
0x0000050:	01 04	03 12	05 08	07 16	09 18	11 03	13 22	15 07
0x0000070:	17 20	19 05	21 01	00 09	09 18	13 03	11 20	15 05
0x0000090:	17 22	21 07	19 01	00 09	02 11	06 19	04 13	08 21
0x00000b0:	10 15	14 00	12 17	16 02	02 11	06 19	04 13	08 21
0x00000d0:	10 15	14 00	12 17	16 02	18 04	22 12	20 06	01 14
0x00000f0:	03 08	07 16	05 10	09 18	18 04	20 20	22 08	01 01
0x0000110:	11 06	13 22	15 10	17 03	03 12	05 05	07 16	09 09
0x0000130:	19 14	21 07	00 18	02 11	11 20	13 13	15 01	17 17
0x0000150:	04 22	06 15	08 03	10 19	19 05	21 21	00 09	02 02
0x0000170:	12 07	14 00	16 11	18 04	04 13	08 06	06 15	10 08
0x0000190:	20 17	01 10	22 19	03 12	12 21	16 14	14 00	18 16
0x00001b0:	05 02	09 18	07 04	11 20	20 06	01 22	22 08	03 01
0x00001d0:	13 10	17 03	15 12	19 05	05 14	09 07	07 16	11 09
0x00001f0:	21 18	02 11	00 20	04 13	13 22	06 07	17 03	10 11
0x0000210:	21 15	14 00	02 19	18 04	15 01	08 09	19 05	12 13
0x0000230:	00 17	16 02	04 21	20 06	06 15	22 00	10 19	03 04
0x0000250:	14 08	07 16	18 12	11 20	08 17	01 02	12 21	05 06
0x0000270:	16 10	09 18	20 14	13 22	22 08	15 16	01 10	17 18
0x0000290:	07 01	00 09	09 03	02 11	03 12	19 20	05 14	21 22
0x00002b0:	11 05	04 13	13 07	06 15	15 01	08 09	17 03	10 11
0x00002d0:	00 17	16 02	02 19	18 04	19 05	12 13	21 07	14 15
0x00002f0:	04 21	20 06	06 00	22 08	08 17	16 10	12 21	20 14
0x0000310:	01 02	09 18	05 06	13 22	10 19	18 12	14 00	22 16
0x0000330:	03 04	11 20	07 08	15 01	01 10	09 03	05 14	13 07
0x0000350:	17 18	02 11	21 22	06 15	03 12	11 05	07 16	15 09
0x0000370:	19 20	04 13	00 01	08 17	17 03	02 19	19 05	04 21
0x0000390:	10 11	18 04	12 13	20 06	21 07	06 00	00 09	08 02
0x00003b0:	14 15	22 08	16 17	01 10	10 19	18 12	12 21	20 14
0x00003d0:	03 04	11 20	05 06	13 22	14 00	22 16	16 02	01 18
0x00003f0:	07 08	15 01	09 10	17 03	03 12	05 16	11 20	13 01

2.2.2 Second set

Set mode:
Set clock:
Set ULAP:

23 HOP SYSTEM

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:

CLKN start:	0x0000000							
ULAP:	0x2a96ef25							
#ticks:	0000	1000	2000	3000	4000	5000	6000	7000
0x0000000:	7	18	3	8	16	4	12	1
0x0008000:	9	20	5	6	14	2	10	22
0x0010000:	7	18	3	8	16	4	12	1
0x0018000:	9	20	5	6	14	2	10	22
0x0020000:	7	18	3	8	16	4	12	1
0x0028000:	9	20	5	6	14	2	10	22
0x0030000:	7	18	3	8	16	4	12	1
0x0038000:	9	20	5	6	14	2	10	22

Hop sequence {k} for PAGE STATE/INQUIRY STATE:

CLKE start:	0x0000000															
ULAP:	0x2a96ef25															
#ticks:	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
0x0000000:	09	20	18	00	05	06	02	04	14	02	06	11	10	22	13	12
0x0000010:	07	18	14	19	03	08	21	08	16	04	10	15	12	01	17	16
0x0000020:	09	20	18	00	05	06	02	04	14	02	06	11	10	22	13	12
0x0000030:	07	18	14	19	03	08	21	08	16	04	10	15	12	01	17	16
...																
0x0001000:	20	05	00	02	06	14	04	06	02	10	11	13	22	07	12	14
0x0001010:	18	03	19	21	08	16	08	10	04	12	15	17	01	09	16	18
0x0001020:	20	05	00	02	06	14	04	06	02	10	11	13	22	07	12	14
0x0001030:	18	03	19	21	08	16	08	10	04	12	15	17	01	09	16	18
...																
0x0002000:	05	06	02	04	14	02	06	11	10	22	13	12	07	18	14	19
0x0002010:	03	08	21	08	16	04	10	15	12	01	17	16	09	20	18	00
0x0002020:	05	06	02	04	14	02	06	11	10	22	13	12	07	18	14	19
0x0002030:	03	08	21	08	16	04	10	15	12	01	17	16	09	20	18	00
...																
0x0003000:	06	14	04	06	02	10	11	13	22	07	12	14	18	03	19	21
0x0003010:	08	16	08	10	04	12	15	17	01	09	16	18	20	05	00	02
0x0003020:	06	14	04	06	02	10	11	13	22	07	12	14	18	03	19	21
0x0003030:	08	16	08	10	04	12	15	17	01	09	16	18	20	05	00	02

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:

CLKN* =	0x0000010															
ULAP:	0x2a96ef25															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000012:	14	18	19	03	21	08	08	16	10	04	15	12	17	01	16	09
0x0000032:	18	20	00	05	02	06	04	14	06	02	11	10	13	22	12	07
0x0000052:	14	18	19	03	21	08	08	16	10	04	15	12	17	01	16	09
0x0000072:	18	20	00	05	02	06	04	14	06	02	11	10	13	22	12	07

Hop sequence {k} for MASTER PAGE RESPONSE STATE:

Offset value:	24															
CLKE* =	0x0000012															
ULAP:	0x2a96ef25															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000014:	18	19	03	21	08	08	16	10	04	15	12	17	01	16	09	18
0x0000034:	20	00	05	02	06	04	14	06	02	11	10	13	22	12	07	14

Appendix IV - Sample Data



0x0000054: 18 19 | 03 21 | 08 08 | 16 10 | 04 15 | 12 17 | 01 16 | 09 18 |
 0x0000074: 20 00 | 05 02 | 06 04 | 14 06 | 02 11 | 10 13 | 22 12 | 07 14 |

Hop sequence {k} for CONNECTION STATE:

CLK start: 0x0000010
 ULAP: 0x2a96ef25
 #ticks: 00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |

0x0000010:	16 10	04 15	12 17	01 16	09 18	20 00	05 02	06 04
0x0000030:	14 06	02 11	10 13	22 12	00 07	11 12	19 14	01 01
0x0000050:	09 03	20 08	05 10	17 09	02 11	13 16	21 18	22 20
0x0000070:	07 22	18 04	03 06	15 05	14 02	04 05	12 09	17 15
0x0000090:	02 19	15 22	00 03	10 00	18 04	08 07	16 11	13 13
0x00000b0:	21 17	11 20	19 01	06 21	07 18	20 21	05 02	10 08
0x00000d0:	18 12	08 15	16 19	03 16	11 20	01 00	09 04	06 06
0x00000f0:	14 10	04 13	12 17	22 14	02 09	05 22	21 01	03 18
0x0000110:	19 20	22 10	15 12	11 11	04 13	07 03	00 05	01 14
0x0000130:	17 16	20 06	13 08	09 07	18 02	21 15	14 17	19 11
0x0000150:	12 13	15 03	08 05	04 04	20 06	00 19	16 21	17 07
0x0000170:	10 09	13 22	06 01	02 00	09 20	14 08	07 12	12 02
0x0000190:	05 06	10 17	03 21	20 18	13 22	18 10	11 14	08 00
0x00001b0:	01 04	06 15	22 19	16 16	02 13	07 01	00 05	05 18
0x00001d0:	21 22	03 10	19 14	13 11	06 15	11 03	04 07	01 16
0x00001f0:	17 20	22 08	15 12	09 09	20 00	08 05	12 07	02 02
0x0000210:	06 04	17 09	21 11	18 06	22 08	10 13	14 15	00 17
0x0000230:	04 19	15 01	19 03	16 21	13 16	01 21	05 00	18 18
0x0000250:	22 20	10 02	14 04	11 22	15 01	03 06	07 08	16 10
0x0000270:	20 12	08 17	12 19	09 14	04 09	17 12	19 16	13 11
0x0000290:	15 15	05 18	07 22	06 13	08 17	21 20	00 01	09 03
0x00002b0:	11 07	01 10	03 14	02 05	20 02	10 05	12 09	06 04
0x00002d0:	08 08	21 11	00 15	22 06	01 10	14 13	16 17	02 19
0x00002f0:	04 00	17 03	19 07	18 21	15 10	18 00	22 02	05 20
0x0000310:	09 22	12 12	16 14	13 01	17 03	20 16	01 18	03 04
0x0000330:	07 06	10 19	14 21	11 08	08 03	11 16	15 18	21 13
0x0000350:	02 15	05 05	09 07	06 17	10 19	13 09	17 11	19 20
0x0000370:	00 22	03 12	07 14	04 01	22 19	04 07	06 11	16 06
0x0000390:	18 10	00 21	02 02	01 08	03 12	08 00	10 04	12 13
0x00003b0:	14 17	19 05	21 09	20 15	15 12	20 00	22 04	09 22
0x00003d0:	11 03	16 14	18 18	17 01	19 05	01 16	03 20	05 06
0x00003f0:	07 10	12 21	14 02	13 08	19 17	07 22	15 15	02 20

2.2.3 Third set

Set mode:
Set clock:
Set ULAP:

23 HOP SYSTEM

Hop sequence {k} for PAGE SCAN/INQUIRY SCAN:

CLKN start:	0x0000000							
ULAP:	0x6587cba9							
#ticks:	0000	1000	2000	3000	4000	5000	6000	7000
0x0000000:	0	10	14	12	16	9	13	11
0x0008000:	15	2	6	4	8	17	21	19
0x0010000:	0	10	14	12	16	9	13	11
0x0018000:	15	2	6	4	8	17	21	19
0x0020000:	0	10	14	12	16	9	13	11
0x0028000:	15	2	6	4	8	17	21	19
0x0030000:	0	10	14	12	16	9	13	11
0x0038000:	15	2	6	4	8	17	21	19

Hop sequence {k} for PAGE STATE/INQUIRY STATE:

CLKE start:	0x0000000															
ULAP:	0x6587cba9															
#ticks:	00	01	02	03	04	05	06	07	08	09	0a	0b	0c	0d	0e	0f
0x0000000:	15	02	05	11	06	04	19	13	08	17	21	22	21	19	07	01
0x0000010:	00	10	09	15	14	12	00	17	16	09	02	18	13	11	03	20
0x0000020:	15	02	05	11	06	04	19	13	08	17	21	22	21	19	07	01
0x0000030:	00	10	09	15	14	12	00	17	16	09	02	18	13	11	03	20
...																
0x0001000:	02	06	11	19	04	08	13	21	17	21	22	07	19	00	01	09
0x0001010:	10	14	15	00	12	16	17	02	09	13	18	03	11	15	20	05
0x0001020:	02	06	11	19	04	08	13	21	17	21	22	07	19	00	01	09
0x0001030:	10	14	15	00	12	16	17	02	09	13	18	03	11	15	20	05
...																
0x0002000:	06	04	19	13	08	17	21	22	21	19	07	01	00	10	09	15
0x0002010:	14	12	00	17	16	09	02	18	13	11	03	20	15	02	05	11
0x0002020:	06	04	19	13	08	17	21	22	21	19	07	01	00	10	09	15
0x0002030:	14	12	00	17	16	09	02	18	13	11	03	20	15	02	05	11
...																
0x0003000:	04	08	13	21	17	21	22	07	19	00	01	09	10	14	15	00
0x0003010:	12	16	17	02	09	13	18	03	11	15	20	05	02	06	11	19
0x0003020:	04	08	13	21	17	21	22	07	19	00	01	09	10	14	15	00
0x0003030:	12	16	17	02	09	13	18	03	11	15	20	05	02	06	11	19

Hop sequence {k} for SLAVE PAGE RESPONSE STATE:

CLKN* =	0x0000010															
ULAP:	0x6587cba9															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000012:	09	10	15	14	00	12	17	16	02	09	18	13	03	11	20	15
0x0000032:	05	02	11	06	19	04	13	08	21	17	22	21	07	19	01	00
0x0000052:	09	10	15	14	00	12	17	16	02	09	18	13	03	11	20	15
0x0000072:	05	02	11	06	19	04	13	08	21	17	22	21	07	19	01	00

Hop sequence {k} for MASTER PAGE RESPONSE STATE:

Offset value:	24															
CLKE* =	0x0000012															
ULAP:	0x6587cba9															
#ticks:	00	02	04	06	08	0a	0c	0e	10	12	14	16	18	1a	1c	1e
0x0000014:	10	15	14	00	12	17	16	02	09	18	13	03	11	20	15	05
0x0000034:	02	11	06	19	04	13	08	21	17	22	21	07	19	01	00	09

Appendix IV - Sample Data



```

0x0000054:      10 15 | 14 00 | 12 17 | 16 02 | 09 18 | 13 03 | 11 20 | 15 05 |
0x0000074:      02 11 | 06 19 | 04 13 | 08 21 | 17 22 | 21 07 | 19 01 | 00 09 |
    
```

Hop sequence {k} for CONNECTION STATE:

CLK start: 0x0000010

ULAP: 0x6587cba9

```

#ticks:      00 02 | 04 06 | 08 0a | 0c 0e | 10 12 | 14 16 | 18 1a | 1c 1e |
    
```

0x0000010:	16 02	09 18	13 03	11 20	15 05	02 11	06 19	04 13
0x0000030:	08 21	17 22	21 07	19 01	16 02	03 08	07 16	05 10
0x0000050:	09 18	02 11	06 19	04 13	08 21	18 04	22 12	20 06
0x0000070:	01 14	10 15	14 00	12 17	09 18	19 22	21 07	00 03
0x0000090:	02 11	18 04	20 12	22 08	01 16	11 20	13 05	15 01
0x00000b0:	17 09	03 06	05 14	07 10	02 11	12 15	14 00	16 19
0x00000d0:	18 04	11 20	13 05	15 01	17 09	04 13	06 21	08 17
0x00000f0:	10 02	19 22	21 07	00 03	03 12	05 02	09 18	07 04
0x0000110:	11 20	04 13	08 06	06 15	10 08	12 21	16 14	14 00
0x0000130:	18 16	20 17	01 10	22 19	19 05	21 18	02 11	00 20
0x0000150:	04 13	20 06	01 22	22 08	03 01	05 14	09 07	07 16
0x0000170:	11 09	13 10	17 03	15 12	12 21	14 09	16 02	18 13
0x0000190:	20 06	13 22	15 15	17 03	19 19	21 07	00 00	02 11
0x00001b0:	04 04	06 01	08 17	10 05	05 14	07 02	09 18	11 06
0x00001d0:	13 22	06 15	08 08	10 19	12 12	14 00	16 16	18 04
0x00001f0:	20 20	22 17	01 10	03 21	13 22	17 05	21 07	02 13
0x0000210:	06 15	22 08	03 10	07 16	11 18	15 01	19 03	00 09
0x0000230:	04 11	01 12	05 14	09 20	06 15	10 21	14 00	18 06
0x0000250:	22 08	15 01	19 03	00 09	04 11	08 17	12 19	16 02
0x0000270:	20 04	17 05	21 07	02 13	22 08	05 12	07 16	13 20
0x0000290:	15 01	08 17	10 21	16 02	18 06	01 10	03 14	09 18
0x00002b0:	11 22	12 19	14 00	20 04	15 01	21 05	00 09	06 13
0x00002d0:	08 17	01 10	03 14	09 18	11 22	17 03	19 07	02 11
0x00002f0:	04 15	05 12	07 16	13 20	16 02	04 15	08 17	20 08
0x0000310:	01 10	17 03	21 05	10 19	14 21	02 11	06 13	18 04
0x0000330:	22 06	19 07	00 09	12 00	09 18	20 08	01 10	13 01
0x0000350:	17 03	10 19	14 21	03 12	07 14	18 04	22 06	11 20
0x0000370:	15 22	12 00	16 02	05 16	02 11	15 22	17 03	08 15
0x0000390:	10 19	03 12	05 16	19 05	21 09	11 20	13 01	04 13
0x00003b0:	06 17	07 14	09 18	00 07	18 04	08 15	10 19	01 08
0x00003d0:	03 12	19 05	21 09	12 21	14 02	04 13	06 17	20 06
0x00003f0:	22 10	00 07	02 11	16 00	15 01	01 18	17 03	03 20

3 ACCESS CODE SAMPLE DATA

Different access codes (GIAC, DIACs, others...)

LAP with LSB as rightmost bit.

Bit transmit order on air			
----->			
LAP:	Preamble:	Sync word:	Trailer:

000000	5	7e7041e3 400000d	5
ffffff	a	e758b522 7fffffff2	a
9e8b33	5	475c58cc 73345e72	a
9e8b34	5	28ed3c34 cb345e72	a
9e8b36	5	62337b64 1b345e72	a
9e8b39	a	c05747b9 e7345e72	a
9e8b3d	5	7084eab0 2f345e72	a
9e8b42	5	64c86d2b 90b45e72	a
9e8b48	a	e3c3725e 04b45e72	a
9e8b4f	a	8c7216a6 bcb45e72	a
9e8b57	a	b2f16c30 fab45e72	a
9e8b60	5	57bd3b22 c1b45e72	a
9e8b6a	a	d0b62457 55b45e72	a
9e8b75	a	81843a39 abb45e72	a
9e8b81	5	0ca96681 e0745e72	a
9e8b8e	a	aecd5a5c 1c745e72	a
9e8b9c	5	17453fbf ce745e72	a
9e8bab	a	f20968ad f5745e72	a
9e8bbb	5	015f4a1e f7745e72	a
9e8bcc	a	d8c695a0 0cf45e72	a
9e8bde	5	614ef043 def45e72	a
9e8bf1	a	ba81ddc7 a3f45e72	a
9e8c05	5	64a7dc4f 680c5e72	a
9e8c1a	5	3595c221 960c5e72	a
9e8c30	a	cb35cc0d 830c5e72	a
9e8c47	5	12ac13b3 788c5e72	a
9e8c5f	5	2c2f6925 3e8c5e72	a
9e8c78	5	3a351c84 078c5e72	a
9e8c92	5	7396d0f3 124c5e72	a
9e8cad	5	5b0fdfc4 6d4c5e72	a
9e8cc9	a	aea2eb38 e4cc5e72	a
9e8ce6	5	756dc6bc 99cc5e72	a
9e8d04	5	214cf934 882c5e72	a
9e8d23	5	37568c95 b12c5e72	a
9e8d43	5	72281560 f0ac5e72	a
9e8d64	5	643260c1 c9ac5e72	a
9e8d86	a	e044f493 986c5e72	a
9e8da9	5	3b8bd917 e56c5e72	a
9e8dcd	a	ce26edeb 6cec5e72	a
9e8df2	a	e6bfe2dc 13ec5e72	a
9e8e18	a	82dcde3d c61c5e72	a
9e8e3f	a	94c6ab9c ff1c5e72	a

Appendix IV - Sample Data



9e8e67		a		969059a6 799c5e72		a	
9e8e90		a		c4dfccef 425c5e72		a	
9e8eba		5		3a7fc2c3 575c5e72		a	
9e8ee5		5		57985401 69dc5e72		a	
9e8f11		5		0ae2a363 623c5e72		a	
9e8f3e		a		d12d8ee7 1f3c5e72		a	
9e8f6c		5		547063a8 0dbc5e72		a	
9e8f9b		5		063ff6e1 367c5e72		a	
9e8fcb		a		c9bc5cfe f4fc5e72		a	
9e8ffc		5		2cf00bec cffc5e72		a	
9e902e		a		8ec5052f 5d025e72		a	
9e9061		5		1074b15e 61825e72		a	
9e9095		a		9d59ede6 2a425e72		a	
9e90ca		a		f0be7b24 14c25e72		a	
9e9100		5		10e10dd0 c0225e72		a	
9e9137		a		f5ad5ac2 fb225e72		a	
9e916f		a		f7fba8f8 7da25e72		a	
9e91a8		5		2f490e5b c5625e72		a	
9e91e2		a		94979982 91e25e72		a	
9e921d		5		26cda478 2e125e72		a	
9e9259		a		aacb81dd 26925e72		a	
9e9296		a		bfac7f5b da525e72		a	
9e92d4		a		c9a7b0a7 cad25e72		a	
9e9313		a		c142bdde 32325e72		a	
616cec		5		586a491f 0dcda18d		5	
616ceb		5		37db2de7 b5cda18d		5	
616ce9		5		7d056ab7 65cda18d		5	
616ce6		a		df61566a 99cda18d		5	
616ce2		5		6fb2fb63 51cda18d		5	
616cdd		5		472bf454 2ecda18d		5	
616cd7		a		c020eb21 bacda18d		5	
616cd0		a		af918fd9 02cda18d		5	
616cc8		a		9112f54f 44cda18d		5	
616cbf		5		488b2af1 bf4da18d		5	
616cb5		a		cf803584 2b4da18d		5	
616caa		a		9eb22bea d54da18d		5	
616c9e		a		a49cb509 9e4da18d		5	
616c91		5		06f889d4 624da18d		5	
616c83		a		bf70ec37 b04da18d		5	
616c74		a		ed3f797e 8b8da18d		5	
616c64		5		1e695bcd 898da18d		5	
616c53		a		fb250cdf b28da18d		5	
616c41		5		42ad693c 608da18d		5	
616c2e		a		a5b7cc14 dd0da18d		5	
616c1a		a		9f9952f7 960da18d		5	
616c05		a		ceab4c99 680da18d		5	
616bef		a		d403ddde fdf5a18d		5	
616bd8		5		314f8acc c6f5a18d		5	
616bc0		5		0fccf05a 80f5a18d		5	
616ba7		5		25030d57 7975a18d		5	
616b8d		a		dba3037b 6c75a18d		5	
616b72		5		4439ce17 13b5a18d		5	

Appendix IV - Sample Data



616b56		a		8d417247 5ab5a18d		5	
616b39		5		6a5bd76f e735a18d		5	
616b1b		5		592e8166 b635a18d		5	
616afc		5		28609d46 cfd5a18d		5	
616adc		5		51cb8c1f 4ed5a18d		5	
616abb		5		7b047112 b755a18d		5	
616a99		5		4871271b e655a18d		5	
616a76		5		24bdc8c4 9b95a18d		5	
616a52		a		edc57494 d295a18d		5	
616a2d		a		f989f30f 6d15a18d		5	
616a07		5		0729fd23 7815a18d		5	
6169e0		a		8bf0ba4f 81e5a18d		5	
6169b8		a		89a64875 0765a18d		5	
61698f		5		6cealf67 3c65a18d		5	
616965		5		2549d310 29a5a18d		5	
61693a		5		48ae45d2 1725a18d		5	
61690e		5		7280db31 5c25a18d		5	
6168e1		a		ce1b9f34 61c5a18d		5	
6168b3		5		4b46727b 7345a18d		5	
616884		a		ae0a2569 4845a18d		5	
616854		a		ea5fc581 4a85a18d		5	
616823		5		33c61a3f b105a18d		5	
6167f1		a		c49fb8c5 63f9a18d		5	
6167be		5		5a2e0cb4 5f79a18d		5	
61678a		5		60009257 1479a18d		5	
616755		a		86314e62 eab9a18d		5	
61671f		5		3defd9bb be39a18d		5	
6166e8		a		bff7e728 c5d9a18d		5	
6166b0		a		bda11512 4359a18d		5	
616677		5		6513b3b1 fb99a18d		5	
61663d		a		decd2468 af19a18d		5	
616602		a		f6542b5f d019a18d		5	
6165c6		a		dc44b49b d8e9a18d		5	
616589		5		42f500ea e469a18d		5	
61654b		a		bf2885e1 34a9a18d		5	
61650c		a		ec4c69b5 4c29a18d		5	

4 HEC AND PACKET HEADER SAMPLE DATA

Test vectors for HEC and header. Note that UAP, Data, and HEC are in hexadecimal notation, while the header is in octal notation. The header is transmitted from left to right over air.

UAP	Data	HEC	Header (octal not.)
00	123	e1	770007 007070 000777
47	123	06	770007 007007 700000
00	124	32	007007 007007 007700
47	124	d5	007007 007070 707077
00	125	5a	707007 007007 077070
47	125	bd	707007 007070 777707
00	126	e2	077007 007007 000777
47	126	05	077007 007070 700000
00	127	8a	777007 007007 070007
47	127	6d	777007 007070 770770
00	11b	9e	770770 007007 777007
47	11b	79	770770 007070 077770
00	11c	4d	007770 007070 770070
47	11c	aa	007770 007007 070707
00	11d	25	707770 007070 700700
47	11d	c2	707770 007007 000077
00	11e	9d	077770 007070 777007
47	11e	7a	077770 007007 077770
00	11f	f5	777770 007070 707777
47	11f	12	777770 007007 007000

5 CRC SAMPLE DATA

Sample CRC generation

Data:

```
data[0] = 0x4e
data[1] = 0x01
data[2] = 0x02
data[3] = 0x03
data[4] = 0x04
data[5] = 0x05
data[6] = 0x06
data[7] = 0x07
data[8] = 0x08
data[9] = 0x09
```

UAP = 0x47

==> CRC = 6d d2

Codeword (hexadecimal notation):

4e 01 02 03 04 05 06 07 08 09 6d d2

NB: Over air each byte in the codeword
is sent with the LSB first.

6 COMPLETE SAMPLE PACKETS

6.1 EXAMPLE OF DH1 PACKET

Packet header: (MSB...LSB)

AM_ADDR = 011
 TYPE = 0100 (DH1)
 FLOW = 0
 ARQN = 1
 SEQN = 0

Payload: (MSB...LSB)

payload length: 5 bytes
 logical channel = 10 (UA/I, Start L2CAP message)
 flow = 1
 data byte 1 = 00000001
 data byte 2 = 00000010
 data byte 3 = 00000011
 data byte 4 = 00000100
 data byte 5 = 00000101

HEC and CRC initialization: (MSB...LSB)

uap = 01000111

NO WHITENING USED

AIR DATA (LSB...MSB)

Packet header (incl HEC):

111111000
 000000111000
 000111000
 000111111000000000000000

Payload (incl payload header and CRC):

01110100
 10000000
 01000000
 11000000
 00100000
 10100000
 1110110000110110

6.2 EXAMPLE OF DM1 PACKET

Packet header: (MSB...LSB)

```
-----
AM_ADDR = 011
TYPE = 0011 (DM1)
FLOW = 0
ARQN = 1
SEQN = 0
```

Payload: (MSB...LSB)

```
-----
payload length: 5 bytes
logical channel = 10 (UA/I, Start L2CAP message)
flow = 1
data byte 1 = 00000001
data byte 2 = 00000010
data byte 3 = 00000011
data byte 4 = 00000100
data byte 5 = 00000101
```

HEC and CRC initialization: (MSB...LSB)

```
-----
uap = 01000111

NO WHITENING USED
```

AIR DATA (LSB...MSB)

Packet header (incl HEC):

```
-----
111111000
111111000000
000111000
11100000011111111111000
```

Payload (incl payload header, FEC23, CRC and 6 padded zeros):

```
-----
0111010010 11001
0000000100 01011
0000110000 11110
0000100000 00111
1010000011 01100
1011000011 00010
0110000000 10001
```

7 WHITENING SEQUENCE SAMPLE DATA

Whitening sequence generator.

Whitening Sequence (=D7)	Whitening LFSR D7.....D0
1	1111111
1	1101111
1	1001111
0	0001111
0	0011110
0	0111100
1	1111000
1	1100001
1	1010011
0	0110111
1	1101110
1	1001101
0	0001011
0	0010110
0	0101100
1	1011000
0	0100001
1	1000010
0	0010101
0	0101010
1	1010100
0	0111001
1	1110010
1	1110101
1	1111011
1	1100111
1	1011111
0	0101111
1	1011110
0	0101101
1	1011010
0	0100101
1	1001010
0	0000101
0	0001010
0	0010100
0	0101000
1	1010000
0	0110001
1	1100010
1	1010101
0	0111011
1	1110110

Appendix IV - Sample Data



```

1      1111101
1      1101011
1      1000111
0      0011111
0      0111110
1      1111100
1      1101001
1      1000011
0      0010111
0      0101110
1      1011100
0      0101001
1      1010010
0      0110101
1      1101010
1      1000101
0      0011011
0      0110110
1      1101100
1      1001001
0      0000011
0      0000110
0      0001100
0      0011000
0      0110000
1      1100000
1      1010001
0      0110011
1      1100110
1      1011101
0      0101011
1      1010110
0      0111101
1      1111010
1      1100101
1      1011011
0      0100111
1      1001110
0      0001101
0      0011010
0      0110100
1      1101000
1      1000001
0      0010011
0      0100110
1      1001100
0      0001001
0      0010010
0      0100100
1      1001000
0      0000001
0      0000010
    
```

Appendix IV - Sample Data



```

0      0000100
0      0001000
0      0010000
0      0100000
1      1000000
0      0010001
0      0100010
1      1000100
0      0011001
0      0110010
1      1100100
1      1011001
0      0100011
1      1000110
0      0011101
0      0111010
1      1110100
1      1111001
1      1100011
1      1010111
0      0111111
1      1111110
1      1101101
1      1001011
0      0000111
0      0001110
0      0011100
0      0111000
1      1110000
1      1110001
1      1110011
1      1110111
1      1111111
    
```

8 FEC SAMPLE DATA

```
=====
Rate 2/3 FEC -- (15,10) Shortened Hamming Code
=====
```

Data is in hexadecimal notation, the codewords are in binary notation. The codeword bits are sent from left to right over the air interface. The space in the codeword indicates the start of parity bits.

Data:	Codeword:
0x001	1000000000 11010
0x002	0100000000 01101
0x004	0010000000 11100
0x008	0001000000 01110
0x010	0000100000 00111
0x020	0000010000 11001
0x040	0000001000 10110
0x080	0000000100 01011
0x100	0000000010 11111
0x200	0000000001 10101