

North American Interlibrary Loan and Document Delivery Project

# **Interlibrary Loan Protocol Implementors Group (IPIG)**

## **Profile for the ISO ILL Protocol**

*Version 3.1*

*11 February 2004*

This version 3 of 11 July 2002 cancels and replaces version 2 (dated April 11, 2001), which has been revised to include amendments 1 – 6 and Defect Reports 1-5, and to update references to the *IPIG Guidelines for Implementors of the IPIG Profile*, version 2.0 and to other online resources.

Amendments included:

- clarification of the status of Z39.50/ILL Profiles in Clause 6.10.2 Note
- clarification of the meaning of "a single APDU" in Clause 6.10.3
- addition of new procedures for handling system-address changes as Clause 6.10.2.1
- addition of requirements for {1 0 10161 13 9} IPIG-ILL-Request-Extension in Clauses 6.9.4, A.4, A.6.1 ref. 26, A.7 and related deletion of requirements for use of OID {1 0 10161 13 2} OCLC ILL Request Extension (both in Clauses 6.9.4, A.4, A.6.1 ref. 26, A.7) and {1 0 10161 7 2} Item-Language-Translation (in Clauses 6.9.2, A.4, A.6.1 ref. 18, A.7)

Version 3.1 records the fact that this profile is an Internationally Registered Profile for ISO 10160:1997 and 10161-1:1997

The most current versions of this and related documents in the IPIG Profile suite are available on the Interlibrary Loan Application Standards Maintenance Agency web site at:

<http://www.nlc-bnc.ca/iso/ill/ipigprfl.htm>

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## 1 Introduction

The Interlibrary Loan Protocol Implementors Group (IPIG) was established in late 1995 by the Association of Research Libraries' (ARL) North American Interlibrary Loan and Document Delivery (NAILDD) Project to facilitate implementation of the international standard for interlibrary loan communication, the ISO Interlibrary Loan Application Protocol Specification (referred to hereafter as the ISO ILL Protocol). Aimed initially at ILL/DD vendors and service providers in the U.S., the IPIG was opened up in mid-1996 to allow participation by all organizations and projects worldwide interested in or implementing the ISO ILL Protocol.

This document defines the Interlibrary Loan Protocol Implementors Group (IPIG) Profile for the ISO ILL Protocol. The Profile reflects the common set of decisions, options, and values agreed upon by members of the IPIG to-date; the Profile may be amended in the future and will continue to be developed as implementors reach consensus on additional issues.

The IPIG Profile is based on the second edition of the ISO Interlibrary Loan Application Standards (10160 & 10161-1), published in 1997. Development of the IPIG Profile has benefited from the work on earlier interlending profiles, the Canadian Standardized Profile (CSP), November 4, 1991 and the International Standardized Profile 12066-2, Interlibrary Loan Generic.

**Clauses 1-4** provide introductory and preliminary information. **Clause 5** discusses how conformance to the Profile is to be achieved. **Clause 6** identifies the constraints imposed by and specific to this IPIG Profile that differ from those specified in the base application standard (ISO 10161-1:1997). **Clause 7** identifies additional constraints imposed by this IPIG Profile on the formatting of specific data values.

**Annex A**, the *IPIG Profile Conformance Statement Requirements List*, which forms an integral part of the IPIG Profile, provides a series of tables indicating the requirements, parameter by parameter, for compliance with the IPIG Profile. Implementors should complete the Requirements List, indicating the capabilities supported by their implementations, as a statement of static conformance to this Profile.

A separate publication, *IPIG Guidelines for ILL Application Developers*, provides background information for the developers of interlibrary loan management systems conforming to the IPIG Profile. The purpose of the Guidelines is to help the developers of ILL applications establish procedures that will further facilitate system interoperability. This publication will be updated as implementors gain experience in the implementation of the ILL Protocol and the IPIG Profile, and as new procedures evolve.

The most current profile suite can be found on the Interlibrary Loan Application Standards Maintenance Agency web site at:

<http://www.nlc-bnc.ca/iso/ill/ipigprfl.htm>

## 2 References

### 2.1 ILL Protocol Implementors Group (IPIG)

#### 2.1.1 IPIG Web Site

Home page: <<http://www.arl.org/access/naildd/ipig/ipig.shtml>>

## 2.2 Maintenance Agencies/Registration Authorities

### 2.2.1 Maintenance Agency Web Sites

#### 2.2.1.1 Interlibrary Loan Application Standards Maintenance Agency (ILL ASMA)

Home page: <<http://www.nlc-bnc.ca/iso/ill/>>

#### 2.2.1.2 ISO 23950/Z39.50 Maintenance Agency

Home page: <<http://lcweb.loc.gov/z3950/agency/agency.html>>

### 2.2.2 Registers

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ISO 9735:1988, *Electronic Data Interchange for Administration, Commerce and Transport (EDIFACT) -- Application Level Syntax Rules*. Genève: ISO/IEC, 1998.

ISO 10160:1997, *Information and Documentation -- Open Systems Interconnection -- Interlibrary Loan Application Service Definition*. Genève: ISO/IEC, 1997.

ISO 10161-1:1997, *Information and Documentation -- Open Systems Interconnection -- Interlibrary Loan Application Protocol Specification -- Part 1: Protocol Specification*. Genève: ISO/IEC, 1997.

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(Another representation of this standard is ISO 23950:1998 *Information and Documentation -- Information Retrieval (Z39.50) -- Application Service Definition and Protocol Specification*, which is available in hard copy from ISO and related national standards bodies.)

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## 2.6 Miscellaneous Documents

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CONTU Guidelines on Photocopying under Interlibrary Loan Arrangements. In *Final Report of the National Commission on New Technological Uses of Copyrighted Works*, July 31, 1978. Washington, DC, Library of Congress, 1979. pages 54-55.

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*The Unicode Standard, Version 2.1*. (Unicode Technical Report #8) (Revision 2, February 18, 1998; available from the Unicode Consortium)

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### 3 Definitions

"**SHALL**" is used wherever the criterion for conformance with the specific recommendation requires that there be no deviation, denoting a **mandatory** requirement.

"**SHALL NOT**" is used to denote an **absolute prohibition** of the behaviour.

"**SHOULD**" is used wherever non-compliance with the specific recommendation is permissible, denoting a **recommendation**.

"**SHOULD NOT**" is used to mean that there may exist valid reasons in particular circumstances when the particular behavior is acceptable or even useful, but the full implications should be understood and the case carefully weighed before implementing any behavior described with this label.

### 4 Abbreviations & Acronyms

APDU	Application Protocol Data Unit
ARL	Association of Research Libraries
ASE	Application Service Element
ASN.1	Abstract Syntax Notation One
BER	Basic Encoding Rules
CCG	Conforms to Copyright Guidelines (i.e., the CONTU Guidelines on Photocopying under Interlibrary Loan Arrangements)
CCL	Conforms to Copyright Law
CFP	Copyright Fee Paid
CONTU	National Commission on New Technological Uses of Copyright Works
EDIFACT	Electronic Data Interchange For Administration, Commerce & Transport
FTP	File Transfer Protocol
GEDI	Group on Electronic Document Interchange
IANA	Internet Assigned Numbers Authority
IEC	International Electrotechnical Commission
ILL	Interlibrary Loan
ILL ASMA	Interlibrary Loan Application Standards Maintenance Agency
IPIG	ILL Protocol Implementors Group
IRV	International Reference Version (of ISO 646)
ISO	International Organization for Standardization
MARC	Machine Readable Cataloguing

MIME	Multipurpose Internet Mail Extensions
NAILDD	North American Interlibrary Loan and Document Delivery Project
PICS	Protocol Implementation Conformance Statement
PDU	Protocol Data Unit
RFC	Request For Comment
SICI	Serial Item and Contribution Identifier
SMTP	Simple Mail Transfer Protocol
TCP/IP	Transmission Control Protocol/Internet Protocol
URL	Uniform Resource Locator
UTC Time	Coordinated Universal Time

## 5 Conformance

This IPIG Profile states requirements for implementations of the ISO ILL Protocol to achieve interworking. A claim of conformance to this IPIG Profile is a claim that all requirements in the relevant base standards are satisfied, and that all the requirements of this Profile are satisfied.

The IPIG Profile for the ISO ILL Protocol imposes additional constraints on implementations, beyond those specified in the base application standards (ISO 10160:1997 and ISO 10161-1:1997).

### 5.1 Static Conformance

Static conformance requirements for this IPIG Profile are concerned with the stated capability claims for an implementation. These are to be recorded in a copy of the IPIG Profile Conformance Statement Requirements List proforma provided in Annex A of this document. The static constraints imposed by this Profile, beyond those specified in the base application standards, are stated in Clause 6 of this Profile.

The static conformance requirements are:

- Implementations **SHALL** support mandatory features defined in the IPIG Profile Conformance Statement Requirements List found in Annex A of this Profile.
- Implementations **SHALL** support the receipt of all mandatory and optional data types for all APDUs that may legitimately be received by an implementation according to its supported role(s).
- Implementations that support optional data types as specified in Annex A.6 **SHALL** be capable of defining data for such types. However, the data for such optional types need not always be present in the corresponding APDUs. This Profile does not define the circumstances in which such optional data types **SHALL** be present.

### 5.2 Dynamic Conformance

Dynamic conformance requirements for this IPIG Profile **SHALL** be as specified in Clause 10.2 of ISO 10161-1:1997.

In addition, an implementation that claims dynamic conformance to the IPIG Profile for the ISO ILL Protocol **SHALL** exhibit external behaviour consistent with having implemented an ILL application-service-element (e.g., an ILL Protocol Machine) constrained by Clauses 6 and 7 of this Profile.

### 5.3 Bilateral Agreements Out-of-Scope

The IPIG Profile is intended to achieve a level of interoperability among ISO ILL Protocol compliant systems. The profile does not prevent implementors from modifying, extending, constricting, or otherwise changing the behaviour of their implementations when there are bilateral agreements with other organizations that allow or require such modifications. The IPIG Profile does not address or attempt to deal with these bilateral arrangements. Conformance to the Profile is maintained as long as an implementation adheres to the arrangements defined by the Profile when no special behaviour has been agreed to a priori.

Implementations supporting behaviour that is out of scope of the IPIG Profile may wish to make available appropriate documentation, possibly completing relevant portions of the PICS proforma.

## 6 Conformance with Static Constraints

Conformance to the constraints on behaviour described in this clause **SHALL** be stated in terms of static conformance and recorded in the IPIG Profile Conformance Statement Requirements List (i.e., Annex A of this document).

Each sub-clause in this section is followed by a reference, enclosed in brackets and right justified, to the table or row in Annex A in which static compliance to the described constraint is to be recorded.

### 6.1 ILL-Service-User Roles

ISO 10161-1:1997 defines three roles for the ILL-Service-User: **Requester**, **Responder** and **Intermediary**. An implementation conforming to the IPIG Profile **SHALL** support one role, at minimum.

[A.3.2]

### 6.2 Transaction Types

ISO 10161-1:1997 defines three ILL transaction types: "*Simple*", "*Chained*" and "*Partitioned*". If the implementation supports the Requester and/or the Responder role(s), it **SHALL** support the "*Simple*" transaction type. If the implementation supports the Intermediary role, it **SHALL** support one or both of the "*Chained*" and "*Partitioned*" transaction types.

[A.3.3]

### 6.3 Protocol Amendments

Amendment 1 to ISO 10161-1:1997 defines the use of value "*I*" in the Identifier parameter of the Extension data type. Implementations conforming to the IPIG Profile **SHALL** support value "*I*" for the instance of Identifier in any data type Extension.

[A.3.1, Ref. 4,  
A.6.1, Ref. 26.1]

### 6.4 Mandatory Parameters

#### 6.4.1 requester-id and responder-id

In ISO 10161-1:1997, support of the **requester-id** and **responder-id** parameters is conditional on the supporting communication service chosen; that is, it is mandatory if the supporting communication service is store-and-forward but optional if the supporting communication service is connection-oriented.

These parameters **SHALL** be present in all APDUs, regardless of the supporting communication service in use.

[Ref. 4 & 5 in all A.6 tables]

#### 6.4.2 transaction-id.initial-requester-id

Implementations conforming to the IPIG Profile **SHALL** specify **initial-requester-id** in all occurrences of **transaction-id**.

[A.6.1, Ref.2.1]

#### 6.4.3 currency-code

In ISO 10161-1:1997, support of the **currency-code** data element is optional.

Implementations conforming to the IPIG Profile **SHALL** specify the **currency-code** in the following parameters (defined as **IMPLICIT Amount**):

ILL-REQUEST.cost-info-type.maximum-cost	[A.6.1, Ref. 19.2.1]
SHIPPED.supply-details.cost	[A.6.3, Ref. 14.4.1]
SHIPPED.supply-details.insured-for	[A.6.3, Ref. 14.7.1]
SHIPPED.supply-details.return-insurance-required	[A.6.3, Ref. 14.8.1]
RETURNED.insured-for	[A.6.10, Ref. 9.1]

### 6.5 Field Lengths

In general, the IPIG Profile does not specify maximum field lengths for data types. However, a maximum value for an Integer and maximum field lengths for the component elements of the data parameters, System-Id and Transaction-Id have been defined.

#### 6.5.1 Maximum Value for Integer

Integers **SHALL** lie between the low and high values for a signed 32-bit integer [i.e. values between -2,147,483,648 and +2,147,483,647].

#### 6.5.2 System-ID

Implementations conforming to the IPIG Profile **SHALL** set maximum lengths for each of the components of the system-id, whether used explicitly or implicitly as **requester-id**, **responder-id**, **initial-requester-id**.

**person-or-institution-symbol**: 25 characters

**name-of-person-or-institution**: 150 characters

[A.3.5, Ref. 1]

#### 6.5.3 Transaction-ID

Implementations conforming to the IPIG Profile **SHALL** set maximum lengths for each of the components of this parameter:

**initial-requester-id**

**person-or-institution-symbol**: 25 characters

**name-of-person-or-institution**: 150 characters

**transaction-group-qualifier**: 25 characters

**transaction-qualifier:** 25 characters

**subtransaction-qualifier:** 25 characters

[A.3.5, Ref. 2]

## 6.6 protocol-version-num

In ISO 10161-1:1997, there are two values defined for the parameter **protocol-version-num**: version "1" and version "2".

Implementations conforming to the IPIG Profile **SHALL** support value "2".

[Ref. 1 in all A.6 tables]

## 6.7 Time

### 6.7.1 ISO-Time

ISO 10161-1:1997 specifies that the **ISO-Time** parameter is to be expressed as the local time of the person or institution invoking the ILL service, with a fixed length of 6 characters.

Implementations conforming to the IPIG Profile **SHALL** express **time** implicitly as Universal Time (UTC), rather than local time. **UTC Time** is to be expressed implicitly because ISO 10161-1:1997 has defined **time** as having a fixed length of 6 characters, HHMMSS. There is currently no allowance for the additional character "z" used to identify a string as Universal Time (UTC Time), specified in Clause 40 of ISO 8824, the specification of basic notation for ASN.1.

[A.6.1, Ref. 3.1.2]

### 6.7.2 Service-Date-Time

In ISO 10161-1:1997, the **time** parameter is optional. Implementations conforming to the IPIG Profile **SHALL** supply a value for **time**.

[A.6.1, Ref. 3.1.2,  
A.6.1, Ref. 3.2.2.  
Ref. 3 in all other A.6 tables]

## 6.8 Behaviour with Regard to Extensions

The abstract syntax for ILL-APDUs permits any APDU to be extended through the addition of new data types in the extension parameter of the APDU. Any extension data type may be marked critical or not.

When an application receives an APDU containing an extension, if the extension is marked critical and the application does not recognize or does not support the extension, the application **SHALL** respond as follows:

- if the unrecognized or unsupported critical extension occurs in an ILL-Request APDU, the responder **SHALL** respond with an ILL-Answer - Unfilled, with Reason-unfilled value "*critical extension not supported*". Otherwise,
  - if the critical extension is not recognized, the application **SHALL** issue a StatusOrErrorReport indicating a provider error with value "*critical extension not recognized*";
  - if the critical extension is recognized but is not supported, the application **SHALL** issue a StatusOrErrorReport indicating a user error with value "*critical extension not supported*".

In these last two cases, no state change is to take place and history information **SHALL NOT** be recorded.

In no case may an extension marked critical be ignored.

If the extension is not marked critical and the application does not recognize or does not support the extension, the application **SHALL** ignore the extension and proceed with the transaction as if the extension were not present.

Applications conforming to this profile need not recognize or support an extension marked as critical unless that extension is explicitly declared to be permitted by this profile. The inclusion, by bilateral agreement, of extensions not identified by this profile in a particular communication, is outside the scope of this profile.

Note that this profile mandates support for some extensions. This implies that a conforming implementation will never reply with a "*critical extension not recognized/supported*" error when an APDU containing one of these extensions is received, and will not ignore the extension.

[A.6.1, Ref. 26,  
tables 5-9 in A.7]

## 6.9 EXTERNALS

### 6.9.1 EXTERNALS for use in system-no

ISO 10161-1:1997 defines System-No as an external object. There is one external object that, optionally, may be used by IPIG implementors for this parameter.

{1 0 10161 6 1} IPIG-System-Number

[A.6.1, Ref. 17.18 and 17.21,  
A.7.1]

### 6.9.2 EXTERNALS for use in Supplemental-Item-Description

ISO 10161-1:1997 defines Supplemental-Item-Description as a sequence of external objects. External objects that, optionally, may be used by IPIG implementors for this parameter are

{1 0 10161 7 1} SICI

any MARC record syntax registered by the Z39.50 Maintenance Agency within the object class

{1 2 840 10003 5} Record Syntaxes

[A.6.1, Ref. 18,  
A.7.2, A.7.3]

### 6.9.3 EXTERNALS for use in e-delivery-mode and e-delivery-parameters

ISO 10161-1:1997 defines **e-delivery-mode** as an object identifier. Three objects have been registered in the Public Object Identifiers for ISO 10161 and may, optionally, be used by IPIG implementors for this parameter

{1 0 10161 9 1 1} SMTP

{1 0 10161 9 1 2} FTP

{1 0 10161 9 2} Fax delivery service

[A.6.1, Ref. 8.2.1.1,  
A.7.4, A.7.5]

The data type **e-delivery parameters** is defined in the objects defined for **e-delivery-mode**. The external objects currently defined for **e-delivery mode** specify that any **e-delivery-parameters** are also external objects. There is one object registered in the Local Object Identifiers for ISO 10161 that may be used by IPIG implementors for this second parameter.

{1 0 10161 10 1000 7 1} JEDDS ILL Electronic Delivery Parameters

When **e-delivery-mode** is {1 0 10161 9 1 1} SMTP, the EXTERNAL {1 0 10161 10 1000 7 1} **SHALL** contain a single ILL string with a the value of either "GEDI" or "Ariel MIME".

When **e-delivery-mode** is {1 0 10161 9 1 2} FTP, the EXTERNAL {1 0 10161 10 1000 7 1} **SHALL** contain a single ILL string with a value of either "GEDI" or "Ariel FTP".

When **e-delivery-mode** is {1 0 10161 9 2} Fax, the EXTERNAL {1 0 10161 10 1000 7 1} **SHALL** contain a single ILL string with a value of "FAX".

[A.6.1, Ref. 8.2.1.2,  
A.7.4, A.7.5]

#### 6.9.4 Externals for use in Extension

The following external objects have been approved by IPIG for use in the **extension** parameters of one or more ILL APDUs.

Applications conforming to the IPIG Profile **SHALL** support the following external objects for extensions in the appropriate APDUs.

{1 0 10161 13 3} APDU-Delivery-Info

{1 0 10161 13 6} IPIG-Additional-User-Error-Information

As well, applications **SHOULD** support the following external objects defined by IPIG implementors for use in the extension parameter.

{1 0 10161 13 4} ILL-Supplemental-Client-Info

{1 0 10161 13 8} Internal-Reference-Number

{1 0 10161 13 9} IPIG-ILL-Request-Extension

The A.6 tables identify which external objects are appropriate for use for the variously named extension parameters that are part of each APDU.

[A.6.1, Ref. 26 and extension parameter in all other tables of A.6,  
tables 5-9 in A.7]

## 6.10 Use of Supporting Services

### 6.10.1 Transfer Syntax

ISO 10161-1:1997 mandates use of the Abstract Syntax Notation One Basic Encoding Rules (ASN.1 BER) as defined in ISO/IEC 8825:1990. It also permits use of EDIFACT as defined in ISO 9735 as a supplemental transfer syntax.

Implementations conforming to the IPIG Profile **SHALL** use the Abstract Syntax Notation One Basic Encoding Rules (ASN.1 BER) as the transfer syntax. Interactions with EDIFACT implementations are outside the scope of this Profile.

## 6.10.2 Communication Services

Implementations conforming to the IPIG Profile **SHALL** be able to employ Store-and-Forward communication services provided by Internet mail (RFC 821, RFC 822) supporting Multipurpose Internet Mail Extensions (MIME) (RFC 2045-2049) for the receipt and transmission of ILL-APDUs.

Although not mandatory, it is highly recommended that implementations conforming to the IPIG Profile also are able to employ connection-oriented communication services provided by a TCP/IP connection for the receipt and transmission of ILL-APDUs.

Note: Implementations that do not support Internet mail for delivering ILL-APDUs may not claim conformance to this profile. Thus implementations that support delivery of APDUs only via Direct Transfer over TCP/IP as described in 6.10.4 or using some other mechanism such as X39.50 Extended Services as described in Z39.50/ILL Profile 1, are not IPIG Profile compliant.

### 6.10.2.1 Procedures for Handling *system-address* Changes

Implementations conforming to the IPIG Profile **SHALL** send APDUs to the system-address in the transport parameter of sender-info in APDU-Delivery-Info extension in the most recently received-APDU for the ILL-transaction.

The determination of the system-address to which an initial ILL-REQUEST APDU is to be sent is currently out of scope of the IPIG Profile.

## 6.10.3 Using Internet Mail

The Internet RFC 2503, *MIME Types for Use with the ISO ILL Protocol* describes MIME content types that can be used to carry BER encoded APDUs in MIME messages.

For those MIME messages, implementations conforming to the IPIG Profile **SHALL** use the registered media type defined for BER encoded ISO ILL Application Protocol Data Units (APDUs):

*application/iso-10161-ill-1*

When MIME mail is used for transport, a single ILL-APDU will be carried in a MIME body part. The APDU **SHALL** be encoded using the ASN.1 Basic Encoding Rules (BER) (ISO 8824-1994) to serialize data types. A single mail message **SHALL** contain a single APDU and nothing else.

The RFC 822 SUBJECT line in the message header is redundant and need not be supplied. However, if supplied, it **SHALL** contain an identification of the message type:

*"ISO-10161-ILL-1"*

The FROM line contains the identity of the person(s) who wishes this message to be sent. It **SHALL** contain the e-mail address of a contact person for ILL transaction problems.

The SENDER line contains the e-mail address of the AGENT (person, system, or process) that sends the message.

The REPLY-TO line provides a general mechanism for indicating any mailbox(es) to which ILL-APDUs are to be sent. It **SHALL** contain the e-mail address of the ASE to which ILL-APDUs are to be sent.

#### 6.10.4 Using Direct Transfer over TCP

**Port 499** and **port 1611** have been registered with IANA as well-known ports for the use of ILL Protocol messaging. Implementations conforming to the IPIG Profile using direct transfer over TCP **SHALL** listen on port 1611 and may also listen on port 499.

Multiple APDUs may be sent in a single TCP stream. They need not relate to the same transaction, but multiple APDUs for a single transaction **SHOULD** be transmitted in the order in which they are to be processed.

##### 6.10.4.1 One-way messaging on Port 1611:

If connecting to **port 1611**, implementations conforming to the IPIG Profile **SHALL** send one or more ILL-APDUs. If "connected-to" on port 1611, implementations conforming to the IPIG Profile **SHALL** be able to receive any number of ILL-APDUs and **SHALL NOT** send any ILL-APDUs on the same connection.

##### 6.10.4.2 Two-way messaging on Port 499:

If connecting to **port 499**, implementations conforming to the IPIG Profile **SHALL** send zero or more ILL-APDUs and **SHALL** be able to receive zero or more ILL-APDUs on the same connection. If "connected-to" on port 499, implementations conforming to the IPIG Profile **SHALL** be able to receive any number of ILL-APDUs.

[A.3.7, Ref. 2]

#### 6.10.5 Security Control

Implementations conforming to the IPIG Profile **SHALL** be able to send and receive the Z39.50 Prompt-1 extension (OID { 1.2.840.10003.8.1 }) in all APDUs.

Details on the Prompt-1 Access Control Format are found in *Appendix 7, ACC of Z39.50:1995*.

[Note: In the 2002 revision of Z39.50, details on the Prompt-1 Access Control Format are found in Appendix 18, subsection ASN1.9.1 Prompt-1]

If the Prompt-1 external is used, it **SHALL** only contain the **response CHOICE**.

The **Response** parameter consists of 2 data types, **prompt-id** and **prompt-response**.

Two data types have been defines for **Prompt-Id**. However, implementations conforming to the IPIG Profile **SHALL** use only the **enumerated prompt**. The only values of **enumerated-prompt** applicable to IPIG implementations are (0) "group-id", (1) "user-id", and (2) "password".

Although **prompt-response** is defined as a CHOICE, **[1] String** is the only choice relevant to IPIG implementations.

[A.7.10]

#### 6.11 Character Sets

When an ILL-String is used to carry an ASN.1 General-String, the initial assignment of G0 **SHALL** be the International Reference Version (IRV) of ISO 646, the initial assignment of G1 **SHALL** be ISO 8859-1 (ISO Latin-1), the initial assignment of C0 **SHALL** be the C0 set of ISO 646, and C1 **SHALL** be unassigned.

Implementations conforming to the IPIG Profile **SHALL** be able to recognize escape sequences for other character sets, as specified in ISO 2022.

NOTE: Recognition of the escape sequences is not intended to imply support for any character sets other than the IRV of ISO 646 and ISO 8859-1 (i.e., ISO Latin-1), but to preclude incorrect treatment of characters from other sets. Implementations conforming to the IPIG Profile **SHALL** employ character set identifiers as specified in ISO 2375.

It is highly recommended that implementations conforming to the IPIG Profile support Unicode with UTF-8 encoding.

*Examples:*

<esc> 2/5 2/15 4/9 =Unicode UTF-8 (implementation level 3, without standard return)  
<esc> \$ 1 = East Asian Character Code (EACC) a.k.a. "CJK"  
<esc> ( N = Basic Cyrillic (including the Russian alphabet)  
<esc> ( Q = Extended Cyrillic (letters from other Slavic languages)  
<esc> ( 2 = Hebrew  
<esc> ( 3 = Basic Arabic (including the alphabet of the Arabic language)  
<esc> ( 4 = Extended Arabic (letters from alphabets of other languages written in Arabic script)  
<esc> ( B = Latin

### 6.11.1 Exceptions from use of Escape Sequences

Escape sequences **SHALL NOT** be used in the following data types:

ILL-REQUEST.search-type.level-of-service  
ILL-REQUEST.item-id.ISBN  
ILL-REQUEST.item-id.ISSN

NOTE: External objects, such as MARC records, carried in ILL-APDUs as a type of **Supplemental-Item-Description** **SHALL** be transmitted in the character set as specified by the object.

[A.3.8]

## 6.12 Forwarding

The Forward Service and the Forward Notification Service are out-of-scope for the IPIG Profile.

## 7 Conformance with Dynamic Constraints

Conformance to the constraints on behaviour described in this clause **SHALL** be exhibited dynamically as external behaviour by implementations conforming to the IPIG Profile.

### 7.1 System-Id.Person-Or-Institution-Symbol

In ISO 10161-1:1997, the **Person-Symbol** and **Institution-Symbol** data types are defined as ILL-Strings.

Because a single library may have and use multiple symbols (one for each network or system), there is a need to identify the network or system for which a symbol is used.

Implementations conforming to the IPIG Profile **SHALL** identify the network or system (i.e., the authority from which a symbol is taken) within the ILL-String for the **Institution-Symbol** or **Person-Symbol**.

*Format:*

<identifier of name authority>:<symbol>

NOTE: Identifiers of name authorities are registered with the ILL Application Standards Maintenance Agency as namespaces in the *Register of Identifiers of Name Authorities* available online at < <http://www.nlc-bnc.ca/iso/ill/regiina.htm> >

*Formatting rules:*

- Use : [colon] to separate the identifier of the name authority from the institution or person symbol.

*Example:*

*Institution symbols for the British Library Document Supply Centre, as used internally by the National Library of Canada, by OCLC, by RLG for the RLIN network, and by the British Library for the UK Directory of Library Codes:*

NLC-BNC:UK0013  
OCLC:BRI  
RLG:UKBW  
BL:XY/N-1

See also Clause 6.5.2 for information on maximum lengths defined for components of the person-or-institution-symbol parameter.

## 7.2 System-Address

System-Address is a SEQUENCE of **telecom-service-identifier** and **telecom-service-address**.

### 7.2.1 System-Address.telecom-service-identifier

In ISO 10161-1:1997, the **telecom-service-identifier** data type is defined as an ILL-String. This data type identifies the semantics of the ILL-string in the **telecom-service-address**.

The following values for **telecom-service-identifier** have been identified:

1. *FAX*
2. *FTP*
3. *SMTP*
4. *TCP (direct connect)*
5. *URL*
6. *VOICE*

These values are not case sensitive.

### 7.2.2 System-Address.telecom-service-address

In ISO 10161-1:1997, the **telecom-service-address** data type is defined as an ILL-String. Within the ILL-String for the **telecom-service-address**, implementations conforming to the IPIG Profile **SHALL** identify electronic system addresses uniquely and globally. The syntax and semantics of **telecom-service-address** for each type of **telecom-service-address** are as follows:

#### 7.2.2.1 Fax/Voice

To provide an ILL-String that any IPIG implementation can parse, implementations conforming to the IPIG Profile **SHALL** use the following convention when transmitting a voice telephone and/or fax number to a partner implementation.

*Format:*

+ <country code>.<area/city code>.<local phone number>x<extension>

*Formatting rules:*

- Use + [plus sign] to indicate that the dial string includes information for international access.
- Use . [period] as the field delimiter between elements.
  - 1st delimiter (after the country code) is mandatory.
  - 2nd and subsequent delimiters are optional.
- Use x [lower-case letter "x"] to identify the telephone extension.

*Examples:*

+1.613.996-4424

*Fax number, for National Library of Canada (NLC), Interlibrary Loans (ILL), Ottawa, Ontario*

*1 = Country code for North America*

*613 = Area code for Eastern Ontario, including Ottawa*

*996-4424 = Local telephone number for NLC ILL*

+ 31.71.524 66 00

*Voice number for Pica Helpdesk, Leiden, Netherlands*

*31 = Country code for Netherlands*

*71 = City code for Leiden*

*524 66 00 = Local telephone number for the Pica Helpdesk*

+ 44.1937.546060

*Voice number for British Library Document Supply Centre (BLDSC), Customer Services, Boston Spa, England*

*44 = Country code for the United Kingdom*

*1937 = City code for Boston Spa*

*546060 = Local telephone number for Customer Services at BLDSC*

+1.416.660-0374x37

*Voice number, including extension for Interlibrary Loans, Leonard Library, Wycliffe College, Toronto, Ontario, Canada*

*1 = Country code for North America*

*416 = Area code for Toronto*

*660-0374 = Local telephone number for Wycliffe College*

*37 = Extension for Leonard Library's ILL department*

#### 7.2.2.2 FTP

There is no standard convention for formatting the **telecom-service-address** to be used with an FTP service, as each user must follow the file naming conventions of the file systems involved in the transfer. However, addressing practices are well established in the Internet community. See RFC 1635, p. 3. *How to Use Anonymous FTP*. under the heading *A Sample Session* for a brief discussion of addressing conventions used for FTP services.

#### 7.2.2.3 SMTP

Semantics for the **telecom-service-address** to be used with a SMTP service are specified in RFC 822 *Standard for the Format of ARPA Internet Text Messages*.

#### 7.2.2.4 TCP (direct connect)

This defines the TCP hostname and port to use when sending data directly over a TCP connection.

It has two applications:

Used in **ILL-APDU-Delivery-Info** extension, it specifies the hostname/port to which BER encoded ILL-APDUs should be sent. Values for the port will usually be "499" or "1611".

Used in **Electronic-Delivery-Service**, it specifies where an electronic item is to be sent, when using a telecom service that runs directly on top of TCP. The value for port will depend on which telecom service is being used, in particular ports 499 and 1611 may not be used in this context.

The hostname is one which, when looked up in the DNS directory, will return an IP address. It is formatted as a domain identifier.

Syntax for the telecom-service-address to be used with a TCP (direct connect) ILL service is as follows:

*Format:*

<domain identifier>:<port>

*Formatting rules:*

Use colon (":") as the field delimiter.

*Examples:*

isoill.bl.uk:499

*TCP address for ILL service at the British Library, for use in **ILL-APDU-Delivery-Info** extension.*

pdp.dra.com:5195

*Address to use to send a document to DRA using the PDP (Pigeon Delivery Protocol), used in **Electronic-Delivery-Service**.*

muswell.demon.co.uk:9100

*Used to send documents directly to the HP printer on the LAN at the muswell site.*

#### 7.2.2.5 URL

Semantics for the **telecom-service-identifier** type "URL" are specified in RFC 1738 *Uniform Resource Locators (URL)*.

#### 7.2.2.6 Voice

See 7.2.2.1 Fax/Voice for semantics for formatting voice telephone numbers.

### 7.3 Delivery Services

In ISO 10161-1:1997, there are two data types that record information about the electronic delivery address:

- **Delivery-Address.electronic-address**
- **Delivery-Service.electronic-delivery.e-delivery-details.e-delivery-address**

Implementations conforming to the IPIG Profile **SHALL** use **Delivery-Service.electronic-delivery.e-delivery-details.e-delivery-address**.

If APDUs are received containing both data types, implementations conforming to the IPIG Profile **SHALL** ignore the content of **Delivery-Address.electronic-address**.

## 7.4 ILL-service-type and related parameters

### 7.4.1 ILL-REQUEST.iLL-service-type

When initiating an ILL-REQUEST APDU, a Requester can specify from 1 to 5 choices of **ILL-Service-Type**, in order of preference.

Implementation conforming to the IPIG Profile **SHALL** support at least one of "*Loan*" or "*Copy/Non-returnable*" service types. The Requester and Intermediary must be able to send the parameter with at least one of these two values. The Responder and Intermediary must be able to respond appropriately to a request containing at least one of these two values.

If the Requester selects "*estimate*" as an ILL-REQUEST.iLL-service-type, the ILL-REQUEST **SHOULD** also include a **requester-note** indicating whether the request is for an estimate of a loan or a copy/non- returnable, etc.

### 7.4.2 SHIPPED.shipped-service-type

The Responder **SHALL** only supply a **SHIPPED.shipped-service-type** "*loan*" or "*copy-non-returnable*" if these values were included in the sequence of values supplied in **iLL-service-type** in the original **ILL-REQUEST**.

### 7.4.3 ILL-ANSWER.Transaction-Results

There is no dependency dictated by the value of ILL-REQUEST.iLL-service-type on the value used for ILL-ANSWER.transaction-results. Any of the seven defined Transaction-Results values are valid.

The Responder may provide any appropriate value for ILL-ANSWER.transaction-results, including "*locations-provided (4)*" or "*estimate (7)*" to any ILL-REQUEST, even if these values were not included as values in ILL-REQUEST.iLL-service-type.

## 7.5 Optional APDUs

Implementations conforming to the IPIG Profile **SHALL** send a message, including any message described as OPTIONAL in ISO 10161-1:1997, when the corresponding service is invoked.

The values assigned to the component data types of **Responder-Optional-Messages** **SHALL** be consistent throughout the life of a transaction. An application, on receipt of inconsistent values, **SHALL** treat the inconsistency as a protocol error.

## 7.6 Abstract Levels of Service

In ISO 10161-1:1997, the **level-of-service** data type is defined as a one-character ILL-String.

Implementations conforming to the IPIG Profile **SHALL** support receipt and mapping of a set of symbols representing abstract levels of service.

This set of symbols has been defined to provide a generic list of levels of service that can be universally understood within the international interlending community. The defined set covers different levels of material handling (i.e., Normal, Priority, Rush, Express, and When Convenient) in combination with a range of breadth of searching for the requested item. (i.e., Local, Full, and Extended).

In the **level-of-service** data parameter, the following symbols are reserved to represent the abstract levels of service and **SHALL NOT** be used in this data parameter for other purposes by implementations conforming to the IPIG Profile:

“<”, “(”, “{”, “[”, “|”, “]”, “)”, “)”, “>”

### 7.6.1 Symbols used for Abstract Levels of Service

The symbols for abstract levels of service are to be interpreted as follows:

Symbol	Handling	Search
<	When convenient	Local
(	Normal	Local
{	Normal	Extended
[	Normal	Full
	Priority	Local
]	Priority	Extended
}	Rush	Local
)	Rush	Extended
>	Express	Local

### 7.6.2 Definitions of Abstract Levels of Service

#### *Handling*

##### **When convenient**

Time is not of the essence in this request.  
Handle the request with low priority.

##### **Normal**

Process and ship the request in turn, in the normal workflow.

##### **Priority**

Process and ship the request out of turn, before the normal workflow.

##### **Rush**

Enter into the request processing work stream without significant delay. Same day service requested. (Same day service is defined as having the item shipped on the day the request arrives if the request is received before a certain, responder specific, time of day. Otherwise it is shipped on the following business day.)

##### **Express**

Process the request and ship the item immediately.

#### *Search*

##### **Local**

Search local collections for the request.

##### **Extended**

Search local collections and those of collaborating partners for the request.

##### **Full**

Extend the search as far as needed to locate the request.

### 7.7 ILL-REQUEST.copyright-compliance

The copyright-compliance data parameter is defined as an ILL-String. Values used in this parameter may be country-specific.

*Format:*

<domain identifier>:<copyright-compliance notation>;<domain identifier>:<copyright-compliance notation>

*Formatting rules:*

- Use : [colon] to separate the domain identifier from the copyright compliance notation.
- Use ; [semi-colon] to separate each copyright compliance notation, when multiple notations are provided.

*Example:*

US:CCG;BL:CFP

NOTE: Copyright domain identifiers are listed in the *Register of Copyright Domains*, which is maintained on the IPIG website < <http://www.arl.org/access/naldd/ipig/ipig.shtml> >.

## 7.8 History-Report.most-recent-service

ISO 10161-1:1997, Clause 7.6, 2<sup>nd</sup> paragraph discusses use of most-recent-service element in a history report. The 3rd sentence in that paragraph states that:

“An exception is when a STATUS-OR-ERROR-REPORT is sent in response to a STATUS-QUERY, in which case the "most-recent-service" is the one prior to the STATUS-QUERY.”

This requirement is deemed unimplementable by IPIG. However, it is clear that the wording was an attempt by the editors of the Protocol to maintain useful history. IPIG has chosen to interpret this sentence to mean that the invocation or receipt of **STATUS-QUERY** or **STATUS-OR-ERROR-REPORT** does not change the history variables.

## 7.9 Truncation of data types

With the exceptions noted in Clause 6.5, this profile does not specify minimum or maximum sizes or values for data types. Implementors must therefore be prepared to receive messages containing data types larger than their system can accommodate. In this case, implementors should truncate types that exceed local implementation bounds, observing the following rules.

### 7.9.1 Report All Truncation to Initiator

When data types are truncated, the truncating implementation **SHALL** return a **STATUS-OR-ERROR-REPORT** APDU, containing the **IPIG Additional User Error Information** extension {1 0 10161 13 6} to the initiator of the APDU to inform them that truncation has taken place.

### 7.9.2 Truncating simple data types

If an implementation receives an APDU containing individual data types that exceed the maximum size handled by that system, the implementation **SHOULD** attempt to process the received APDU by truncating those data types to the maximum length it can support.

### 7.9.3 Truncating a SEQUENCE OF types

If an implementation receives an APDU containing a SEQUENCE OF data types that exceeds the maximum size handled by that system, the implementation **SHALL** truncate the sequence of data in such a way that only complete instances of the data types are retained.

*Example:*

The **locations** component of the **Locations-Results** data parameter is composed of a SEQUENCE OF **Location-Info**, as shown here:

```

Locations-Results ::= SEQUENCE {
reason-locs-provided  [0]  IMPLICIT Reason-Locs-Provided OPTIONAL,
locations              [1]  IMPLICIT SEQUENCE OF Location-Info
}
Location-Info ::= SEQUENCE {
location-id           [0]  IMPLICIT System-Id,
location-address      [1]  IMPLICIT System-Address OPTIONAL,
location-note         [2]  ILL-String OPTIONAL
}

```

To truncate the **Locations-Results** data, an application would discard one or more entire instances of the **Location-Info** and not just a single type within **Location-Info**. For example, the **Location-Results** would not be shortened by deleting only the data supplied for **location-note**, but by deleting all the data types supplied in that occurrence of **Location-Info** (**location-id**, **location-address** and **location-note**).



## Annex A. IPIG Profile Conformance Statement Requirements List

(Normative)

This Annex forms an integral part of the *IPIG Profile for the ISO Protocol*. It provides a series of tables indicating the requirements, parameter by parameter, for compliance with the IPIG Profile for the ISO ILL Protocol. Implementors wishing to assert conformance to this Profile **SHALL**:

- Complete a copy of this Annex, the IPIG Profile Conformance Statement Requirements List, indicating the capabilities supported by their implementations, as a statement of static conformance to this Profile;
- Make a completed Requirements List network-accessible via a URL;
- Inform the ILL ASMA of the URL for listing in the central registry of completed Conformance Statement Requirements Lists.

The ILL ASMA maintains a central registry of completed Conformance Statement Requirements Lists.

### A.1. Notations Used in the IPIG Profile Conformance Statement Requirements List

#### A.1.1. Notation for Column Headings

**IPIG** Defined in the IPIG Profile. This column indicates the level of support required for conformance to this Profile.

**Impl** Implementation Indicator. This column is to be completed by the implementor to indicate the level at which the implementation supports each service or parameter.

#### A.1.2. Notation used in the IPIG Column

**M** Mandatory: Mandatory support of an ILL service implies that the implementation **SHALL** be capable of invoking the specified service, including the initiation and receipt of the APDU(s) associated with the service, as appropriate to the user role (Requester, Responder, or Intermediary).

Mandatory support of a parameter implies that an implementation **SHALL** be capable of transmitting data values for that parameter in APDUs according to the protocol specifications in ISO 10161-1:1997. If data are available, having been explicitly supplied or able to be generated by a user application, that data **SHALL** be carried in the APDU.

Mandatory support of a data type within a parameter implies that an implementation **SHALL** be capable of transmitting values for that specific data type if the parent parameter is transmitted. For example, if the optional **maximum-cost** parameter is supported, it is mandatory that values for **currency-code** and **monetary-value** data types are included.

**O** Optional: Optional support of an ILL service or parameter implies that it is permitted but not mandatory for the IPIG Profile. However, if this feature is implemented, it **SHALL** conform to the specifications and restrictions contained in the IPIG Profile.

**C** Conditional: Support of this ILL service or parameter depends on certain conditions identified for the feature in the **Reference, Usage or Range of Values** column, or elsewhere in this IPIG Profile.

**X** Out-of-scope: Support of this ILL service or parameter is not addressed in the IPIG Profile.

-- Not applicable.

### A.1.3. Notation used in the Impl Column

This notation is to be supplied by the implementor when stating the conformance of an ILL implementation to the IPIG Profile.

**Y** Yes, this ILL service or parameter has been implemented.

**N** No, this ILL service or parameter has not been implemented.

Non-support of a service implies that an implementation does not have the capability to transmit the APDUs associated with the service, and has no support for the service beyond the capability to receive the associated APDUs without failure.

### A.1.4. Numbering

In the tables of Annex A, each row that requires implementation details to be supplied is numbered at the left-hand edge of the row. This numbering is included as a means of uniquely identifying all possible implementation details within the Requirements List.

### A.1.5. Completion by the Implementor

The implementor, when stating conformance with the IPIG Profile for the ISO ILL Protocol, **SHALL** complete all "[ ]"marked entries in the **Impl** column of the IPIG Profile Conformance Statement Requirements List and all other appropriate sections in the IPIG Profile. Implementors may remove the contents of the "References, Usage or Range of Values" column and add details specific to their implementation. However, they should not make any other changes to this established proforma when preparing a Conformance Statement. Where the response exceeds the space available, references may be made to additional annexes where complete descriptions are provided.

## A.2. Implementation Details

### A.2.1. Date of Statement

Date of Statement (YYYY-MM-DD)	
--------------------------------	--

### A.2.2. Identification of the Implementation

1	Implementation Supplier (i.e., Company name)	
2	Implementation Name	
3	Implementation Version Number	
4	Implementation Contact Information	

**A.2.3. Statement of Conformance**

Ref.		Impl	Comments
1	All mandatory features of version 1.0 of the <i>IPIG Profile for the ISO ILL Protocol</i> have been implemented.	[ ]	
1.1	All static constraints identified in Clause 6 of version 1.0 of the <i>IPIG Profile for the ISO ILL Protocol</i> have been implemented.	[ ]	
1.2	The implementation exhibits behaviour consistent with dynamic constraints as specified in Clause 7 of version 1.0 of the <i>IPIG Profile for the ISO ILL Protocol</i> .	[ ]	

**A.3. General Details****A.3.1. ISO 10161 Details**

1	Protocol Version Number	
2	Other Version Number(s) supported	
3	Defect Report Number(s) implemented	
4	Amendment(s) implemented	

**A.3.2. Roles Supported**

See Clause 6.1 for details on the dynamic constraints imposed by the IPIG Profile concerning support of the ILL-Service-User roles.

Ref.		IPIG	Impl
1	Requester	O	[ ]
2	Responder	O	[ ]
3	Intermediary	O	[ ]

**A.3.3. Transaction Types Supported**

See Clause 6.2 for details on the static constraints imposed by the IPIG Profile concerning support of Transaction Types.

Ref.	Transaction Type	Requester		Responder		Intermediary	
		IPIG	Impl	IPIG	Impl	IPIG	Impl
1	Simple	M	[ ]	M	[ ]	--	[ ]
2	Chained	O	[ ]	O	[ ]	C	[ ]
3	Partitioned	O	[ ]	O	[ ]	C	[ ]

**A.3.4. ILL Service Types Supported**

See 7.4 for details on the dynamic constraints imposed by the IPIG Profile concerning support for **ILL-REQUEST.iLL-service-type**.

Ref.	Service Type	Requester		Responder		Intermediary	
		IPIG	Impl	IPIG	Impl	IPIG	Impl
1	Loan	O	[ ]	O	[ ]	O	[ ]

2	Copy/Non-returnable	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]
3	Locations	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]
4	Estimate	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]
5	Responder-specific	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]	<input type="radio"/>	[ ]

### A.3.5. Maximum Field Lengths: System-Id and Transaction-Id

See 6.5 for details on the static constraints imposed by the IPIG Profile on the maximum lengths of specific data parameters.

Ref No.	Parameter	IPIG	Impl
1	System-Id	Total of 175 characters	
1.2	- person-or-institution-symbol	25 characters	
1.3	- name-of-person-or-institution	150 characters	
2	Transaction-Id	Total of 250 characters	
2.1	- initial-requester-id	175 characters	
2.1.1	- - person-or-institution-symbol	25 characters	
2.1.2	- - name-of-person-or-institution	150 characters	
2.2	- transaction-group-qualifier	25 characters	
2.3	- transaction-qualifier	25 characters	
2.4	- sub-transaction-qualifier	25 characters	

### A.3.6. Transfer Syntax

See 6.10.1 *Transfer Syntax* for a more detailed discussion of the Transfer Syntax requirements for implementations conforming to the IPIG Profile.

Ref.		IPIG	Impl
1	ASN.1BER	M	[ ]
2	EDIFACT	X	--

### A.3.7. Transport Services

See 6.10.2 *Communication Services*, 6.10.3 *Using Internet Mail*, and 6.10.4 *Using Direct Transfer over TCP* for more detailed discussions of the Transport Services requirements for implementations conforming to the IPIG Profile.

Ref.		IPIG	Impl
1	Internet mail	M	[ ]
1.1	- MIME encoding	M	[ ]
2	Direct Transfer over TCP	<input type="radio"/>	[ ]
2.1	- Listen on port 1611	M	[ ]
2.2	- Connect to port 1611	M	[ ]
2.3	- Listen on port 499	<input type="radio"/>	[ ]
2.4	- Connect to port 499	<input type="radio"/>	[ ]

### A.3.8. Character Sets Support

See 6.11 *Character Sets* for a more detailed discussion of the requirements for the handling of character sets by implementations conforming to the IPIG Profile.

Ref.		IPIG	Impl
1	Supports ISO Latin-1 (ISO 8859-1)	M	[ ]
2	Recognizes escape sequences for other sets	M	[ ]
3	Supports Unicode UTF-8	O	[ ]
4	Supports additional character sets, as specified	O	[ ]
4.1	- character set 1	O	[ ]
4.2	- character set 2	O	[ ]
4.3	- etc.	O	[ ]

Note to implementors: Add additional rows in the A.4 table, e.g., 4.3, 4.4, etc., as required to specify the character set escape sequences supported.

## A.4. Syntaxes

This section identifies requirements for support of the various possible syntaxes associated with the ILL Protocol. Support of a particular syntax implies that an implementation can generate and receive information defined by that syntax.

Indicate in the table below the implementation's degree of support for each abstract syntax listed.

The tables of A.7 indicate the degree of support of specific data parameters defined for use in the external objects associated with each abstract syntax listed below.

The tables of A.6 specify which external objects are defined for use in specific parameters within each APDU.

Ref.	Object Class	Abstract Syntax Name	OID	IPIG	Impl
1	system-no (6)	IPIG-System-Number	1 0 10161 6 1	O	[ ]
2	supplemental-item-description (7)	SICI	1 0 10161 7 1	O	[ ]
3	supplemental-item-description (7)	[all MARC record syntaxes registered by Z39.50 MA]	1 2 840 10003 5 +	O	[ ]
4	e-delivery-mode (9)	Internet Delivery Service	1 0 10161 9 1	O	[ ]
4.1	e-delivery-mode (9)	- SMTP	1 0 10161 9 1 1	O	[ ]
4.2	e-delivery-mode (9)	- FTP	1 0 10161 9 1 2	O	[ ]
5	e-delivery-mode (9)	Fax Delivery Service	1 0 10161 9 2	O	[ ]
6	e-delivery-parameters	JEDDS ILL Electronic Delivery Parameters	1 0 10161 10 1000 7 1	O	[ ]
7	extension (13)	APDU-Delivery-Info	1 0 10161 13 3	M	[ ]
8	extension (13)	ILL-Supplemental-Client-Info	1 0 10161 13 4	O	[ ]
9	extension (13)	IPIG-Additional-User-Error Information	1 0 10161 13 6	M	[ ]

10	extension (13)	Internal-Reference-Number	1 0 10161 13 8	O	[ ]
11	extension (13)	IPIG-ILL-Request-Extension	1 0 10161 13 9	O	[ ]
12	Access Control Format (Z39.50)	Prompt-1	1 2 840 10003 8 1	M	[ ]

**Note to implementors:** The abstract syntax specification (ASN.1) for each external object listed in the above table is available in the online Register of the Maintenance Agency responsible for it.

OIDs beginning with the number sequence "1 0 10161" describe objects registered by the Interlibrary Loan Application Standards Maintenance Agency. Copies of the specifications are accessible through the *Register for the ILL Application Standards (ISO 10160 and ISO 10161-1)*.

If an OID contains "1000" within the number sequence (such as {1 0 10161 10 1000 7 1} **JEDDS ILL Electronic Delivery Parameters**), it is a "local" object, listed in the *Register of Local Object Identifiers* <URL: <http://www.nlc-bnc.ca/iso/ill/regiloid.htm> >.

All other OID beginning with "1 0 10161" represent "public" objects, listed in the *Register of Public Object Identifiers* <URL: <http://www.nlc-bnc.ca/iso/ill/regipoid.htm> >.

OIDs beginning with the number sequence "1 2 840" describe objects registered by the Z39.50 Maintenance Agency. Copies of the specifications are accessible through the *Registry of Z39.50 Object Identifiers* <URL: <http://lcweb.loc.gov/z3950/agency/defns/oids.html> >.

## A.5. Interlibrary Loan Application Services

This section describes ILL services rather than APDUs. Invocation of an ILL application service requires the transmission of the APDUs associated with the service.

Indicate in the table below the implementation's degree of support for each ILL Service listed.

Use the tables of A.6 to indicate the degree of support of specific data parameters defined for use in the APDUs associated with each service.

### A.5.1. Support of Services

Ref.		Requester		Responder		Intermediary		References, Usage or Range of Values
		IPIG	Impl	IPIG	Impl	IPIG	Impl	
1	ILL-REQUEST	M	[ ]	M	[ ]	M	[ ]	
2	FORWARD	--	--	X	[ ]	X	[ ]	Service out-of-scope for the IPIG Profile.
3	FORWARD-NOTIFICATION	X	[ ]	X	[ ]	X	[ ]	Service out-of-scope for the IPIG Profile.
4	SHIPPED	M	[ ]	M	[ ]	M	[ ]	
5	ILL-ANSWER	M	[ ]	M	[ ]	M	[ ]	
6	CONDITIONAL-REPLY	M	[ ]	C	[ ]	M	[ ]	Responder implementations supporting <b>transaction-results</b> with the value " <i>conditional</i> " <b>SHALL</b> also support the CONDITIONAL-REPLY service; otherwise it is not applicable.
7	CANCEL	O	[ ]	M	[ ]	M	[ ]	
8	CANCEL-REPLY	C	[ ]	M	[ ]	M	[ ]	Requester implementations

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Ref.		Requester		Responder		Intermediary		References, Usage or Range of Values
		IPIG	Impl	IPIG	Impl	IPIG	Impl	
								supporting the <b>CANCEL</b> service <b>SHALL</b> also support the <b>CANCEL-REPLY</b> service; otherwise it is not applicable.
9	RECEIVED	M	[ ]	M	[ ]	M	[ ]	
10	RECALL	C	[ ]	C	[ ]	C	[ ]	Implementations supporting the "loan" service type <b>SHALL</b> also support the <b>RECALL</b> service; otherwise it is not applicable.
11	RETURNED	C	[ ]	C	[ ]	C	[ ]	Implementations supporting the "loan" service type <b>SHALL</b> also support the <b>RETURNED</b> service; otherwise it is not applicable.
12	CHECKED-IN	C	[ ]	C	[ ]	C	[ ]	Implementations supporting the "loan" service type <b>SHALL</b> also support the <b>CHECKED-IN</b> service; otherwise it is not applicable.
13	OVERDUE	C	[ ]	C	[ ]	C	[ ]	Implementations supporting the "loan" service type <b>SHALL</b> also support the <b>OVERDUE</b> service; otherwise it is not applicable.
14	RENEW	O	[ ]	C	[ ]	C	[ ]	This service is applicable only for implementations that also support the "loan" service type.  Implementations functioning as Responder or Intermediary <b>SHALL</b> support the <b>RENEW</b> service.  However, if functioning only as a Requester, it is optional to support the <b>RENEW</b> service.
15	RENEW-ANSWER	C	[ ]	C	[ ]	C	[ ]	This service is applicable only for implementations that support the "loan" service type.  Implementations, functioning as Responder and Intermediary, <b>SHALL</b> support the <b>RENEW-ANSWER</b> service.  Requester implementations that support the <b>RENEW</b> service <b>SHALL</b> also support the <b>RENEW-ANSWER</b> service.
16	LOST	M	[ ]	M	[ ]	M	[ ]	
17	DAMAGED	O	[ ]	O	[ ]	M	[ ]	
18	MESSAGE	O	[ ]	O	[ ]	M	[ ]	
19	STATUS-QUERY	O	[ ]	O	[ ]	M	[ ]	
20	STATUS-OR-ERROR-REPORT	M	[ ]	M	[ ]	M	[ ]	
21	EXPIRY	M	[ ]	M	[ ]	M	[ ]	Requester and Intermediary implementations <b>SHALL</b> have the capability to accept an <b>EXPIRY</b> APDU.

Ref.		Requester		Responder		Intermediary		References, Usage or Range of Values
		IPIG	Impl	IPIG	Impl	IPIG	Impl	
								Responder and Intermediary implementations <b>SHALL</b> maintain an expiry-timer.

## A.6. Support of APDU Parameters

In ISO 10161-1:1997, an implementation capable of receiving an APDU **SHALL** be capable of accepting data for all parameters defined for the APDU. This section is used to identify the capability of an IPIG implementation conforming to the IPIG Profile to transmit specific data parameters within each APDU.

Indicate in the tables below the degree of support of the data parameters defined in clause 9 of ISO 10161-1:1997. If the implementation supports different values (or has different constraints) for different roles, this **SHALL** be indicated.

Use the table in A.5 to indicate the degree of support for associated ILL Services.

**NOTE:** In the tables following in A.6, the first occurrence of a data parameter is expanded to include its component data types. In all subsequent instances where identical expansions of data types occur, table and row number references point back to these expansions.

### A.6.1. ILL-Request APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2". See 6.6 for a discussion of the requirements for this data parameter.
2	transaction-id	M	[ ]	See <i>IPIG Guidelines 6.1.3</i> for a discussion of the use of the <b>transaction-id</b> parameter.
2.1	- initial-requester-id	M	[ ]	See 6.4.2 for a discussion on the maximum length set for this data parameter.
2.1.1	-- person-or-institution-symbol	O	[ ]	Maximum length: 25 characters. See 6.5.2 and 6.5.3 for a discussion on the maximum length set for this data parameter. <i>Format:</i> <identifier of name authority>:<symbol> <i>Examples:</i> NLC-BNC:UK0013 OCLC:BRI RLG:UKBW For details on formatting this parameter, see 7.1.
2.1.1.1	--- person-symbol	O	[ ]	
2.1.1.2	--- institution-symbol	O	[ ]	
2.1.2	-- name-of-person-or-institution	O	[ ]	Maximum length: 150 characters. See 6.5.2 and 6.5.3 for a discussion on the maximum length set for this data parameter. See <i>IPIG Guidelines 6.1.1</i> for a discussion of the use of the <b>name-of-person-or-institution</b> parameter.

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
2.1.2.1	- - - name-of-person	O	[ ]	
2.1.2.2	- - - name-of-institution	O	[ ]	
2.2	- transaction-group-qualifier	M	[ ]	Maximum length: 25 characters. See 6.5.3 for a discussion on the maximum length set for this data parameter.
2.3	- transaction-qualifier	M	[ ]	Maximum length: 25 characters. See 6.5.3 for a discussion on the maximum length set for this data parameter. See <i>IPIG Guidelines 6.1.4</i> for a discussion of the use of the <b>transaction-qualifier</b> parameter.
2.4	- sub-transaction-qualifier	C	[ ]	Maximum length: 25 characters. See 6.5.3 for a discussion on the maximum length set for this data parameter. Intermediaries <b>SHALL</b> have the ability to provide values for the <b>sub-transaction-qualifier</b> .
3	service-date-time	M	[ ]	
3.1	- date-time-of-this-service	M	[ ]	
3.1.1	- - date	M	[ ]	
3.1.2	- - time	M	[ ]	Implementations conforming to the IPIG Profile <b>SHALL</b> express time values as UTC, rather than as local time. For details on formatting this parameter, see 6.7.1.
3.2	- date-time-of original-service	O	[ ]	
3.2.1	- - date	M	[ ]	
3.2.2	- - time	M	[ ]	See A.6.1, Ref. 3.1.2.
4	requester-id	M	[ ]	See 6.4.1 for a discussion of the requirements for <b>requester-id</b> and <b>responder-id</b> . At least one element <b>SHALL</b> be present.
4.1	- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
4.2	- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
5	responder-id	M	[ ]	See 6.4.1 for a discussion of the requirements for <b>requester-id</b> and <b>responder-id</b> . At least one element <b>SHALL</b> be present.
5.1	- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
5.2	- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
6	transaction-type	C	[ ]	ISO 10161-1:1997 specifies the default value for the <b>transaction-type</b> parameter as (1) <i>simple</i> . Implementations that support chaining or partitioning <b>SHALL</b> support values (2) <i>chained</i> and (3) <i>partitioned</i> for this parameter. DEFAULT: <i>simple</i> (1)
7	delivery-address	O	[ ]	
7.1	- postal-address	O	[ ]	

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
7.1.1	-- name-of-person-or-institution	O	[ ]	
7.1.1.1	--- name-of-person	O	[ ]	
7.1.1.2	--- name-of-institution	O	[ ]	
7.1.2	-- extended-postal-delivery-address	O	[ ]	
7.1.3	-- street-and-number	O	[ ]	
7.1.4	-- post-office-box	O	[ ]	
7.1.5	-- city	O	[ ]	
7.1.6	-- region	O	[ ]	
7.1.7	-- country	O	[ ]	
7.1.8	-- postal-code	O	[ ]	
7.2	- electronic-address	O	[ ]	To specify a <b>System-Address</b> for electronic delivery, use of <b>Delivery-Service.e-delivery-address electronic-delivery.e-delivery-details</b> is required. If <b>ILL-Request.delivery-address.electronic-address</b> is also present in an APDU, it <b>SHALL</b> be ignored. See also A.6.1, Ref. 8.2.4.1.  For details on formatting this parameter, see 7.2.  See also 7.3 for a discussion of the data parameters to be used for electronic delivery addresses.
7.2.1	-- telecom-service-identifier	O	[ ]	For details on formatting this parameter, see 7.2.1.
7.2.2	-- telecom-service-address	O	[ ]	For details on formatting this parameter, see 7.2.2.
8	delivery-service	O	[ ]	See 7.3 for a discussion of the data parameters to be used for electronic delivery addresses.
8.1	- physical-delivery	O	[ ]	
8.2	- electronic-delivery	O	[ ]	
8.2.1	-- e-delivery-service	O	[ ]	
8.2.1.1	--- e-delivery-mode	O O	[ ] [ ]	For details on the use of this parameter, see 6.9.3.  The following external objects have been defined for use in this parameter:  {1 0 10161 9 1} <b>Internet Delivery Service</b> {1 0 10161 9 2} <b>Fax Delivery Service</b>
8.2.1.2	--- e-delivery-parameters	O	[ ]	For details on the use of this parameter, see 6.9.3.  The following external object has been defined for use in this parameter:  {1 0 10161 10 1000 7 1} <b>JEDDS ILL Electronic Delivery Parameters</b>
8.2.2	-- document-type	O	[ ]	
8.2.2.1	--- document-type-id	O	[ ]	The following external object has been defined for use in this parameter:  {1 0 10161 11 1} <b>IANA Media Type</b> See 2.2.2.4 for URL for IANA's directory of Media Types assignments.
8.2.2.2	--- document-type-parameters			If the object identifier of <b>document-type-id</b> is {1 0 10161 11 1} <b>IANA Media Type</b> , the content of this parameter is a SEQUENCE OF Visible-String.

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
8.2.3	-- e-delivery-description	O	[ ]	
8.2.4	-- e-delivery-details	O	[ ]	
8.2.4.1	--- e-delivery-address	O	[ ]	Use this parameter to provide a <b>System-Address</b> for electronic delivery, If this parameter is present in an <b>ILL-REQUEST</b> , then Implementations <b>SHALL</b> ignore the presence of <b>delivery-address.electronic-address</b> (See A.6.1, Ref. 7.2) in the same transaction. For details on formatting this parameter, see 7.2. See also 7.3 for a more detailed discussion of the data parameters to be used for electronic delivery addresses.
8.2.4.2	--- e-delivery-id	O	[ ]	See A.6.1, Ref. 2.1.1 and 2.1.2 for the expansion of component data types for <b>System-Id</b> and details on its use. See A.6.1, Ref. 7.2.
8.2.5	-- name-or-code	O	[ ]	
8.2.6	-- delivery-time	O	[ ]	See A.6.1, Ref. 3.1.2.
9	billing-address	O	[ ]	
9.1	- postal-address	O	[ ]	See <i>IPIG Guidelines 6.2.6</i> for a discussion of the use of the <b>postal-address</b> parameter.
9.1.1	-- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 7.1.1.
9.1.2	-- extended-postal-delivery-address	O	[ ]	
9.1.3	-- street-and-number	O	[ ]	
9.1.4	-- post-office-box	O	[ ]	
9.1.5	-- city	O	[ ]	
9.1.6	-- region	O	[ ]	
9.1.7	-- country	O	[ ]	
9.1.8	-- postal-code	O	[ ]	
9.2	- electronic-address	O	[ ]	See A.6.1, Ref. 7.2.
9.2.1	-- telecom-service-identifier	O	[ ]	For details on formatting this parameter, see 7.2.1.
9.2.2	-- telecom-service-address	O	[ ]	For details on formatting this parameter, see 7.2.2.
10	iLL-service-type	M	[ ]	See 7.4 for details on the use of this data parameter. Use the table at A.3.4 to specify the use of <b>iLL-service-type</b> parameter in more detail. See <i>IPIG Guidelines 6.2.7</i> for a discussion of the use of the <b>iLL-service-type</b> parameter.
11	responder-specific-service	O	[ ]	No OIDs are registered for this external object.
12	requester-optional-messages	M	[ ]	See 7.5 and <i>IPIG Guidelines 5.3</i> for discussion of treatment of optional APDUs.
12.1	- can-send-RECEIVED	M	[ ]	
12.2	- can-send-RETURNED	M	[ ]	
12.3	- requester-SHIPPED	M	[ ]	

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
12.4	- requester-CHECKED-IN	M	[ ]	
13	search-type	O	[ ]	
13.1	- level-of-service	O	[ ]	See 7.6 for a discussion of abstract levels of service defined for use by IPIG implementors. See <i>IPIG Guidelines 6.2.12</i> for a discussion of the use of the <b>level-of-service</b> parameter.
13.2	- need-before-date	O	[ ]	
13.3	- expiry-flag	O	[ ]	DEFAULT: <i>"no-expiry"</i> (3)
13.4	- expiry-date	O	[ ]	
14	supply-medium-info-type	O	[ ]	
14.1	- supply-medium-type	M	[ ]	
14.2	- medium-characteristics	O	[ ]	
15	place-on-hold	O	[ ]	DEFAULT: <i>"according-to-responder-policy"</i> (3)
16	client-id	O	[ ]	See <i>IPIG Guidelines 6.2.1</i> for a discussion of the use of the <b>client-id</b> parameter.
16.1	- client-name	O	[ ]	
16.2	- client-status	O	[ ]	
16.3	- client-identifier	O	[ ]	
17	item-id	M	[ ]	Although all parameters within the item-id are optional, the <b>item-id SHALL</b> contain sufficient information to identify the requested item. This need be no more than a system number that the responder application can use to identify the item in its database. The <b>ILL-REQUEST</b> may also carry a <b>Supplemental-Item-Description</b> that might contain additional information, e.g., a bibliographic record.
17.1	- item-type	O	[ ]	
17.2	- held-medium-type	O	[ ]	
17.3	- call number	O	[ ]	
17.4	- author	O	[ ]	
17.5	- title	O	[ ]	
17.6	- sub-title	O	[ ]	
17.7	- sponsoring-body	O	[ ]	
17.8	- place-of-publication	O	[ ]	
17.9	- publisher	O	[ ]	
17.10	- series-title-number	O	[ ]	
17.11	- volume-issue	O	[ ]	
17.12	- edition	O	[ ]	
17.13	- publication-date	O	[ ]	
17.14	- publication-date-of-component	O	[ ]	
17.15	- author-of-article	O	[ ]	

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
17.16	- title-of-article	O	[ ]	
17.17	- pagination	O	[ ]	
17.18	- national-bibliography-no	O	[ ]	Use <b>IPIG-System-Number</b> {1 0 10161 6 1}.  Several commonly used system numbers are defined within the data structure of the external object, <b>IPIG-System-Number</b> {1 0 10161 6 1}. If a national bibliography number is not enumerated in this object, use the "other" data type and enter the database identification <b>database-ID</b> and <b>number</b> as ILL-Strings.  See <i>IPIG Guidelines 6.2.8</i> for a discussion of the use of the <b>national-bibliography-no</b> parameter.
17.19	- ISBN	O	[ ]	
17.20	- ISSN	O	[ ]	
17.21	- system-no	O	[ ]	Use <b>IPIG-System-Number</b> {1 0 10161 6 1}.  Several commonly used system numbers are defined within the data structure of the external object, <b>IPIG-System-Number</b> {1 0 10161 6 1}. If a system number is not enumerated in this object, use the "other" data type and enter the database identification <b>database-ID</b> and <b>number</b> as ILL-Strings.
17.22	- additional-no-letters	O	[ ]	
17.23	- verification-reference-source	O	[ ]	
18	supplemental-item-description	O	[ ]	The following external objects have been defined for use in this parameter:  {1 0 10161 7 1} <b>SICI</b>  In addition, the Record Syntax for MARC record formats as registered with Z39.50 Maintenance Agency (values 1-99) may be used in this parameter. For example:  {1 2 840 10003 5 10} <b>USMARC</b> {1 2 840 10003 5 11} <b>UK MARC</b> {1 2 840 10003 5 10} <b>CANMARC</b> {1 2 840 10003 5 20} <b>AUSMARC</b>  See 2.2.2.2 for URL of <i>Registry of Z39.50 Object Identifiers</i> .
19	cost-info-type	O	[ ]	See <i>IPIG Guidelines 6.2.3</i> for scenarios on interaction of various data elements in the <b>cost-info-type</b> parameter.
19.1	- account-number	O	[ ]	
19.2	- maximum-cost	O	[ ]	
19.2.1	- - currency-code	M	[ ]	See 6.4.3 for a discussion of the requirements for this data parameter.
19.2.2	- - monetary-value	M	[ ]	
19.3	- reciprocal-agreement	O	[ ]	DEFAULT: "false"  See <i>IPIG Guidelines 6.2.4</i> for a discussion of the use of the <b>reciprocal-agreement</b> parameter.
19.4	- will-pay-fee	O	[ ]	DEFAULT: "false"
19.5	- payment-provided	O	[ ]	DEFAULT: "false"

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
20	copyright-compliance	C	[ ]	Because copyright compliance information is country-specific, implementations conforming to the IPIG Profile <b>SHALL</b> support the <b>copyright compliance</b> types of those countries in which their systems are used, or as appropriate for the institutions to which requests are sent.  For details on formatting this parameter, see 7.7.  See <i>IPIG Guidelines 6.2.2</i> for a discussion of the use of the <b>copyright-compliance</b> parameter.
21	third-party-info-type	C	[ ]	Implementations that permit or support chaining or partitioning <b>SHALL</b> have the ability to transmit values for the <b>third-party-info-type</b> parameter.  See <i>IPIG Guidelines 6.2.13</i> for a discussion of the various <b>third-party-info-type</b> permissions.
21.1	- permission-to-forward	X	--	DEFAULT: <i>"false"</i>  NOTE: The <b>Forward</b> Service is out of scope for the IPIG Profile.
21.2	- permission-to-chain	O	[ ]	DEFAULT: <i>"false"</i>
21.3	- permission-to-partition	O	[ ]	DEFAULT: <i>"false"</i>
21.4	- permission-to-change-send-to-list	O	[ ]	DEFAULT: <i>"false"</i>
21.5	- initial-requester-address	C	[ ]	Intermediaries that support partitioning <b>SHALL</b> have the ability to transmit values for the <b>initial-requester-address</b> parameter.
21.5.1	- -telecom-service-identifier	O	[ ]	For details on formatting this parameter, see 7.2.1.
21.5.2	- -telecom-service-address	O	[ ]	For details on formatting this parameter, see 7.2.2.
21.6	- preference	O	[ ]	DEFAULT: <i>"unordered"</i> (2)
21.7	- send-to-list	O	[ ]	<b>ILL-REQUESTs</b> generated by implementations conforming to the IPIG Profile <b>SHALL</b> contain no more than 5 entries in the <b>send-to-list</b> . Individual entries in the <b>send-to-list</b> <b>SHALL NOT</b> be truncated.
21.7.1	- - system-id	M	[ ]	
21.7.1.1	- - - person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
21.7.1.2	- - - name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
21.7.2	- - account-number	O	[ ]	
21.7.3	- - system-address	O	[ ]	
21.7.3.1	- - - telecom-service-identifier	O	[ ]	For details on formatting this parameter, see 7.2.1.
21.7.3.2	- - - telecom-service-address	O	[ ]	For details on formatting this parameter, see 7.2.2.
21.8	- already-tried-list	C	[ ]	Intermediaries <b>SHALL</b> be able to transmit values for the <b>already-tried-list</b> .  <b>ILL-REQUESTs</b> generated by implementations conforming to the IPIG Profile <b>SHALL</b> contain no more than 25 entries in the <b>already-tried-list</b> . Individual entries in the <b>already-tried-list</b> <b>SHALL NOT</b> be truncated.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
21.8.1	-- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
21.8.2	-- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
22	retry-flag	O	[ ]	DEFAULT: <i>"false"</i>  See <i>IPIG Guidelines 6.2.11</i> for a discussion of the use of the <b>retry-flag</b> parameter.
23	forward-flag	X	--	DEFAULT: <i>"false"</i>  NOTE: The Forward Service is out of scope for the IPIG Profile.
24	requester-note	O	[ ]	
25	forward-note	X	--	NOTE: The <b>Forward</b> Service is out of scope for the IPIG Profile.
26	ill-request-extensions	M O O O C	[ ] [ ] [ ] [ ] [ ]	The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 4} <b>ILL-Supplemental-Client-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 0 10161 13 9} <b>IPIG-ILL-Request-Extension</b>  {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.
26.1	- identifier	M	[ ]	Implementations conforming to the IPIG Profile <b>SHALL</b> support the value <i>"1"</i> , as defined in ISO 10161-1:1997 AM 1.
26.2	- critical	O	[ ]	DEFAULT: <i>"false"</i>
26.3	- item	M	[ ]	

### A.6.2. Forward-Notification APDU

Service not supported by IPIG Profile.

### A.6.3. Shipped APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value <i>"2"</i> .
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	responder-address	C	[ ]	See A.6.1, Ref. 7.2.  Implementation supporting partitioning or chaining <b>SHALL</b> be able to supply the <b>responder-address</b> , <b>intermediary-id</b> , and <b>transaction-type</b> parameters.
6.1	- telecom-service-identifier	O	[ ]	For details on formatting this parameter, see 7.2.1.

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
6.2	- telecom-service-address	O	[ ]	For details on formatting this parameter, see 7.2.2.
7	intermediary-id	C	[ ]	Implementation supporting partitioning or chaining <b>SHALL</b> be able to supply the <b>responder-address</b> , <b>intermediary-id</b> , and <b>transaction-type</b> parameters.
7.1	- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
7.2	- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
8	supplier-id	C	[ ]	If an implementation permits the supplier of the item to be different from the final responder, that is, if an implementation supports acting as the agent for other, possibly non-automated, suppliers, then the <b>supplier-id</b> parameter <b>SHALL</b> be transmitted.
8.1	- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
8.2	- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
9	client-id	C	[ ]	If <b>client-id</b> data were supplied on the initial <b>ILL-REQUEST</b> , implementations conforming to the IPIG Profile <b>SHALL</b> transmit data for this parameter in the <b>SHIPPED</b> APDU. Otherwise, it is optional. See ISO 10160:1997 Clause 7.3.4.1.  See A.6.1, Ref. 16 for the expansion of component data types for <b>client-id</b> .  See <i>IPIG Guidelines 6.3.1</i> for a discussion of the use of the <b>client-id</b> parameter.
10	transaction-type	C	[ ]	DEFAULT: "simple" (1)  Implementations supporting partitioning or chaining <b>SHALL</b> be able to supply the <b>responder-address</b> , <b>intermediary-id</b> , and <b>transaction-type</b> parameters.
11	supplemental-item-description	O	[ ]	See A.6.1, Ref. 18.
12	shipped-service-type	M	[ ]	Values for this parameter (a subset of <b>ILL-service-type</b> ) are limited to (1) "loan" and (2) "copy/non-returnable".  See 7.4.2 for guidelines on the use of this parameter.  See <i>IPIG Guidelines 6.3.3</i> for a discussion of the use of the <b>shipped-service-type</b> parameter.
13	responder-optional-messages	M	[ ]	See 7.5 and <i>IPIG Guidelines 5.3</i> for discussion of the treatment of Optional APDUs.
13.1	- can-send-SHIPPED	M	[ ]	
13.2	- can-send-CHECKED-IN	M	[ ]	
13.3	- responder-RECEIVED	M	[ ]	
13.4	- responder-RETURNED	M	[ ]	
14	supply-details	M	[ ]	At least one of the component types of <b>supply-details</b> <b>SHALL</b> be present.
14.1	- date-shipped	O	[ ]	
14.2	- date-due	C	[ ]	If the "loan" service type is supported, then the implementation must be able to transmit values for the <b>date-due</b> parameter.

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
14.2.1	- - date-due-field	O	[ ]	
14.2.2	- - renewable	O	[ ]	DEFAULT: "true"
14.3	- chargeable units	O	[ ]	
14.4	- cost	O	[ ]	
14.4.1	- - currency-code	M	[ ]	See 6.4.3 for a discussion of the requirements for this data parameter.
14.4.2	- - monetary-value	M	[ ]	
14.5	- shipped-conditions	O	[ ]	
14.6	- shipped-via	O	[ ]	
14.6.1	- - physical-delivery	O	[ ]	
14.6.2	- - electronic-delivery	O	[ ]	See A.6.1, Ref. 8.2.
14.7	- insured-for	O	[ ]	
14.7.1	- - currency-code	M	[ ]	See 6.4.3 for a discussion on the requirements for this data parameter.
14.7.2	- - monetary-value	M	[ ]	
14.8	- return-insurance-required	O	[ ]	
14.8.1	- - currency-code	M	[ ]	See 6.4.3 for a discussion on the requirements for this data parameter.
14.8.2	- - monetary-value	M	[ ]	
14.9	- no-of-units-per-medium	O	[ ]	
14.9.1	- - medium	M	[ ]	
14.9.2	- - no-of-units	M	[ ]	
15	return-to-address	O	[ ]	
15.1	- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 7.1.1.
15.2	- extended-postal-delivery-address	O	[ ]	
15.3	- street-and-number	O	[ ]	
15.4	- post-office-box	O	[ ]	
15.5	- city	O	[ ]	
15.6	- region	O	[ ]	
15.7	- country	O	[ ]	
15.8	- postal-code	O	[ ]	
16	responder-note	O	[ ]	
17	shipped-extensions	M O O C	[ ] [ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 4} <b>ILL-Supplemental-Client-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
				Mandatory if user authentication is required by the recipient of the APDU.

#### A.6.4. ILL-Answer APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	transaction-results	M	[ ]	See 7.4.3 for a discussion on the use of this parameter.
7	results-explanation	C	[ ]	If the value of <b>transaction-results</b> is " <i>conditional</i> ", " <i>locations-provided</i> ", or " <i>estimate</i> ", the <b>results-explanation</b> parameter <b>SHALL</b> be present.  See <i>IPIG Guidelines 6.4.2</i> for examples of values used in the <b>estimate-results.cost-estimate</b> parameter.
7.1	- conditional-results	C	[ ]	Mandatory if the value of <b>transaction-results</b> is " <i>conditional</i> ".  See <i>IPIG Guidelines 6.4.1</i> for recommendations on handling multiple conditions.
7.1.1	-- conditions	M	[ ]	
7.1.2	-- date-for-reply	O	[ ]	
7.1.3	-- locations	O	[ ]	
7.1.3.1	--- location-id	M	[ ]	
7.1.3.1.1	---- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
7.1.3.1.2	---- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
7.1.3.2	--- location-address	O	[ ]	See A.6.1, Ref. 7.2.
7.1.3.3	--- location-note	O	[ ]	
7.1.4	-- proposed-delivery-service	O	[ ]	See A.6.1, Ref. 8.
7.2	- retry-results	O	[ ]	See <i>IPIG Guidelines 6.4.5</i> for an example of the use of <b>retry</b> .
7.2.1	-- reason-not-available	O	[ ]	
7.2.2	-- retry-date	O	[ ]	
7.2.3	-- locations	O	[ ]	See A.6.4, Ref. 7.1.3.
7.3	- unfilled-results	O	[ ]	See 6.8 for a discussion of the use of this <b>results-explanation</b> if an unrecognized or unsupported critical extension occurs in an <b>ILL-REQUEST</b> APDU.
7.3.1	-- reason-unfilled	M	[ ]	
7.3.2	-- locations	O	[ ]	See A.6.4, Ref. 7.1.3.

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Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
7.4	- locations-results	C	[ ]	Mandatory if the value of <b>transaction-results</b> is "locations-provided".
7.4.1	-- reason-locs-provided	O	[ ]	See <i>IPIG Guidelines 6.4.3</i> for a discussion of the use of the <b>reason-locs-provided</b> parameter.
7.4.2	-- locations	M	[ ]	See A.6.4, Ref. 7.1.3.
7.4.2.1	--- location-id	M	[ ]	
7.4.2.1.1	---- person-or-institution-symbol	O	[ ]	See A.6.1, Ref. 2.1.1. For details on formatting this parameter, see 7.1.
7.4.2.1.2	---- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
7.4.2.2	--- location-address	O	[ ]	See A.6.1, Ref. 7.2.
7.4.2.3	--- location-note	O	[ ]	
7.5	- will-supply-results	O	[ ]	
7.5.1	-- reason-will-supply	M	[ ]	
7.5.2	-- supply-date	O	[ ]	
7.5.3	-- return-to-address	O	[ ]	See A.6.1, Ref. 7.1 for the expansion of component data types for <b>postal-address</b> .
7.5.4	-- locations	O	[ ]	See A.6.4, Ref. 7.1.3.
7.5.5	-- electronic-delivery-service	O	[ ]	See A.6.1, Ref. 8.2.
7.6	- hold-placed-results	O	[ ]	
7.6.1	-- estimated-date-available	M	[ ]	
7.6.2	-- hold-placed-medium-type	O	[ ]	
7.6.3	-- locations	O	[ ]	See A.6.4, Ref. 7.1.3.
7.7	- estimate-results	C	[ ]	Mandatory if the value of <b>transaction-results</b> is "estimate".
7.7.1	-- cost-estimate	M	[ ]	
7.7.2	-- locations	O	[ ]	See A.6.4, Ref. 7.1.3.
8	responder-specific-results	O	[ ]	No OIDs are registered for this external object.
9	supplemental-item-description	O	[ ]	See A.6.1, Ref. 18.
10	send-to-list	O	[ ]	See A.6.1, Ref. 21.7.
11	already-tried-list	O	[ ]	See A.6.1, Ref. 21.8.
12	responder-optional-messages	M	[ ]	See A.6.3, Ref. 13. See 7.5 and <i>IPIG Guidelines 5.3</i> for discussion of treatment of optional APDUs.
13	responder-note	O	[ ]	
14	iLL-answer-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter. The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
				Mandatory if user authentication is required by the recipient of the APDU.

### A.6.5. Conditional-Reply APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	answer	M	[ ]	
7	requester-note	O	[ ]	
8	conditional-reply-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>  Mandatory if user authentication is required by the recipient of the APDU.

### A.6.6. Cancel APDU

See *IPIG Guidelines 6.6* for a discussion of the use of the CANCEL APDU.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	requester-note	O	[ ]	
7	cancel-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>  Mandatory if user authentication is required by the recipient of the APDU.

**A.6.7. Cancel-Reply APDU**

See *IPIG Guidelines 6.7* for a discussion of the use of the CANCEL-REPLY APDU.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	answer	M	[ ]	
7	responder-note	O	[ ]	
8	cancel-reply-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>  Mandatory if user authentication is required by the recipient of the APDU.

**A.6.8. Received APDU**

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	supplier-id	C	[ ]	Support of this parameter is required only when a responder is acting as an agent for the actual supplier of the item (and so the <b>supplier-id</b> will differ from the <b>responder-id</b> ), or if a value for the <b>system-id</b> has been transmitted as a parameter in the <b>SHIPPED APDU</b> .
7	supplemental-item-description	O	[ ]	See A.6.1, Ref. 18.
8	date-received	M	[ ]	
9	shipped-service-type	M	[ ]	Values for this parameter (a subset of <b>ILL-service-type</b> ) are limited to (1) "loan" and (2) "copy/non-returnable".  See <i>IPIG Guidelines 6.8.1</i> for a discussion of the use of the <b>shipped-service-type</b> parameter.
10	requester-note	O	[ ]	
11	received-extensions			See A.6.1, Ref. 26 for data types included in any "extensions" parameter.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
		M O C	[ ] [ ] [ ]	The following external objects have been defined for use in this parameter: {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.9. Recall APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	responder-note	O	[ ]	
7	recall-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter. The following external objects have been defined for use in this parameter: {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.10. Returned APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	supplemental-item-description	O	[ ]	See A.6.1, Ref. 18.
7	date-returned	M	[ ]	
8	returned-via	O	[ ]	
9	insured-for	O	[ ]	
9.1	- currency-code	M	[ ]	See 6.4.3 for a discussion of the requirements for this data parameter.
9.2	- monetary-value	M	[ ]	
10	requester-note	O	[ ]	

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
11	returned-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>  Mandatory if user authentication is required by the recipient of the APDU.

#### A.6.11. Checked-in APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	date-checked-in	M	[ ]	
7	responder-note	O	[ ]	
8	checked-in-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b>  Mandatory if user authentication is required by the recipient of the APDU.

#### A.6.12. Overdue APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	date-due	M	[ ]	See A.6.3, Ref. 14.2 for an expansion of the component data types of <b>date-due</b> .
7	responder-note	O	[ ]	
8	overdue-extensions			See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
		M O C	[ ] [ ] [ ]	for use in this parameter: {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.13. Renew APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	desired-due-date	O	[ ]	
7	requester-note	O	[ ]	
8	renew-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter. The following external objects have been defined for use in this parameter: {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.14. Renew-Answer APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	answer	M	[ ]	
7	date-due	C	[ ]	If the value of the <b>answer</b> parameter is "true", then a new value for the <b>date-due</b> parameter <b>SHALL</b> be sent as part of this APDU. See A.6.3, Ref. 14.2 for an expansion of the component data types of <b>date-due</b> .
8	responder-note	O	[ ]	
9	renew-answer-extensions			See A.6.1, Ref. 26 for data types included in any "extensions" parameter.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
		M O C	[ ] [ ] [ ]	<p>The following external objects have been defined for use in this parameter:</p> <p>{1 0 10161 13 3} <b>APDU-Delivery-Info</b>                      {1 0 10161 13 8} <b>Internal-Reference-Number</b>                      {1 2 840 10003 8 1} <b>Prompt-1</b></p> <p>Mandatory if user authentication is required by the recipient of the APDU.</p>

**A.6.15. Lost APDU**

See *IPIG Guidelines 6.15* for a discussion of the use of the LOST APDU.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	note	O	[ ]	
7	lost-extensions	M O C	[ ] [ ] [ ]	<p>See A.6.1, Ref. 26 for data types included in any "extensions" parameter.</p> <p>The following external objects have been defined for use in this parameter:</p> <p>{1 0 10161 13 3} <b>APDU-Delivery-Info</b>                      {1 0 10161 13 8} <b>Internal-Reference-Number</b>                      {1 2 840 10003 8 1} <b>Prompt-1</b></p> <p>Mandatory if user authentication is required by the recipient of the APDU.</p>

**A.6.16. Damaged APDU**

See *IPIG Guidelines 6.16* for a discussion of the use of the DAMAGED APDU.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	damaged-details	O	[ ]	
6.1	- document-type-id	O	[ ]	<p>The following external object has been defined for use in this parameter:</p> <p>{1 0 10161 11 1} <b>IANA Document Type</b></p>
6.2	- damaged-portion	M	[ ]	
7	note	O	[ ]	

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
8	damaged-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.17. Message APDU

See *IPIG Guidelines 6.17* for a discussion of the use of the MESSAGE APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	note	M	[ ]	See <i>IPIG Guidelines 6.17.1</i> for a discussion of the use of the <b>note</b> parameter in the MESSAGE APDU.
7	message-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.18. Status-Query APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	note	O	[ ]	See <i>IPIG Guidelines 6.18.1</i> for a discussion of the use of the <b>note</b> parameter in the STATUS-QUERY APDU.
7	status-query-extensions			See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
		M O C	[ ] [ ] [ ]	{1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.19. Status-or-Error-Report APDU

See *IPIG Guidelines 6.19* for a discussion of the use of the STATUS-OR-ERROR-REPORT APDU

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	reason-no-report	C	[ ]	Responders capable of sending an APDU in which neither the <b>status-report</b> nor the <b>error-report</b> parameter is present <b>SHALL</b> support this parameter; otherwise it is not applicable.  The circumstances in which no report might be sent are not specified either in the base standard or in the IPIG Profile.
7	status-report	O	[ ]	
7.1	- user-status-report	M	[ ]	
7.1.1	-- date-requested	O	[ ]	
7.1.2	-- author	O	[ ]	
7.1.3	-- title	O	[ ]	
7.1.4	-- author-of-article	O	[ ]	
7.1.5	-- title-of-article	O	[ ]	
7.1.6	-- date-of-last-transition	M	[ ]	
7.1.7	-- most-recent-service	M	[ ]	Implementations <b>SHALL</b> be capable of sending all values consistent with the <b>INTERLIBRARY LOAN APPLICATION SERVICES</b> (see A.5) and <b>ILL-service-types</b> (see A.3.4) supported.
7.1.8	-- date-of-most-recent-service	M	[ ]	
7.1.9	-- initiator-of-most-recent-service	M	[ ]	
7.1.9.1	--- person-or-institution-symbol	M	[ ]	For details on formatting this parameter, see 7.1.
7.1.9.2	--- name-of-person-or-institution	O	[ ]	See A.6.1, Ref. 2.1.2.
7.1.10	-- shipped-service-type	C	[ ]	If this information has been transmitted in an earlier <b>SHIPPED</b> or <b>RECEIVED</b> APDU, then an implementation conforming to the IPIG Profile <b>SHALL</b> supply the most current information as a value for this parameter.

IPIG Profile for the ISO ILL Protocol

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
				See A.3.4.
7.1.11	-- transaction-results	C	[ ]	If this information has been transmitted in an <b>ILL-ANSWER</b> APDU, then an implementation conforming to the IPIG Profile <b>SHALL</b> supply it as a value for this parameter.
7.1.12	-- most-recent-service-note	C	[ ]	If a note has been supplied in the most recent service APDU received or the most recent service request invoked, then an implementation conforming to the IPIG Profile <b>SHALL</b> supply it as a value for this parameter.
7.2	- provider-status-report	M	[ ]	Implementations <b>SHALL</b> be capable of sending all values consistent with the <b>INTERLIBRARY LOAN APPLICATION SERVICES</b> (see A.5) and <b>ILL-service-types</b> (see A.3.4) supported.
8	error-report	O	[ ]	
8.1	- correlation-information	M	[ ]	This parameter includes Information that permits correlation of the error-report with the ILL service to which it applies.
8.2	- report-source	M	[ ]	
8.3	- user-error-report	C	[ ]	If the value of <b>report-source</b> is "user", then the <b>user-error-report</b> parameter <b>SHALL</b> be present. Otherwise it is not applicable.
8.3.1	-- already-forwarded	X	--	The Forward Service is out of scope for the IPIG Profile.
8.3.1.1	--- responder-id	M	[ ]	See A.6.1, Ref. 5.
8.3.1.2	--- responder-address	O	[ ]	See A.6.3, Ref. 6.
8.3.2	-- intermediary-problem	O	[ ]	
8.3.3	-- security-problem	O	[ ]	
8.3.4	-- unable-to-perform	O	[ ]	
8.4	- provider-error-report	C	[ ]	If the value of <b>report-source</b> is "provider", then the <b>provider-error-report</b> parameter <b>SHALL</b> be present. Otherwise it is not applicable.
8.4.1	-- general-problem	O	[ ]	
8.4.2	-- transaction-id-problem	O	[ ]	
8.4.3	-- state-transition-prohibited	O	[ ]	
8.4.3.1	--- aPDU-type	M	[ ]	For a list of possible values, see A.5.
8.4.3.2	--- current-state	M	[ ]	
9	note	O	[ ]	

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
10	status-or-error-report-extensions	M C  O C	[ ] [ ]  [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 6} <b>IPIG Additional User Error Information</b> Mandatory if an implementation supports truncation of data. {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

### A.6.20. Expired APDU

See *IPIG Guidelines 6.6* for a discussion of the use of the EXPIRED APDU.

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	protocol-version-num	M	[ ]	Implementations conforming to IPIG Profile <b>SHALL</b> support the value "2".
2	transaction-id	M	[ ]	See A.6.1, Ref. 2.
3	service-date-time	M	[ ]	See A.6.1, Ref. 3.
4	requester-id	M	[ ]	See A.6.1, Ref. 4.
5	responder-id	M	[ ]	See A.6.1, Ref. 5.
6	expired-extensions	M O C	[ ] [ ] [ ]	See A.6.1, Ref. 26 for data types included in any "extensions" parameter.  The following external objects have been defined for use in this parameter:  {1 0 10161 13 3} <b>APDU-Delivery-Info</b> {1 0 10161 13 8} <b>Internal-Reference-Number</b> {1 2 840 10003 8 1} <b>Prompt-1</b> Mandatory if user authentication is required by the recipient of the APDU.

## A.7. External Objects

The table in A.4 indicates the degree of support for the associated abstract syntaxes for which these external objects have been defined.

The tables in A.6 specify which external objects are defined for use in specific parameters within each APDU.

Indicate in the tables below the degree of support of the data parameters defined for use in the external objects to be used by implementations conforming to the IPIG Profile. If the implementation supports different values (or has different constraints) for different roles, this **SHALL** be indicated.

**Note to implementors:** The abstract syntax specification (ASN.1) for each external object listed in the above table is available in the online Register of the Maintenance Agency responsible for it.

See the *Note to implementors* following A.4 for guidance on how to identify the Maintenance Agency with which each of the following external objects is registered.

system-no (6)

### A.7.1. {1 0 10161 6 1} IPIG-System-Number

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	type	M	[ ]	
1.1	- well-known-system	O	[ ]	
1.2	- system-id	O	[ ]	
2	database-ID	O	[ ]	
3	number	M	[ ]	

supplemental-item-description (7)

### A.7.2. {1 0 10161 7 1} SICI

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	SICI	M	[ ]	

**A.7.3. {1 2 840 10003 5} Record Syntaxes,**

The official and complete Z39.50 MA register of record syntaxes is available online at <http://lcweb.loc.gov/z3950/agency/defns/oids.html#5>

Note to Implementors: This list of record syntaxes provides only a selection of formats registered by the Z39.50 Maintenance Agency. Add additional rows as required to the table below to specify additional MARC record syntax from the list in the Z39.50 register, which are supported by the implementation.

Ref. no.	OID	Record Syntax	IPIG	Impl	References, Usage or Range of Values
1	1.2.840.10003.5.1	Unimarc	O	[ ]	
2	1.2.840.10003.5.10	USmarc	O	[ ]	
3	1.2.840.10003.5.11	UKmarc	O	[ ]	
4	1.2.840.10003.5.17	Canmarc	O	[ ]	
5	1.2.840.10003.5.20	Ausmarc	O	[ ]	
6	1.2.840.10003.5.24	JPmarc	O	[ ]	
7	1.2.840.10003.5.25	SWEMarc	O	[ ]	
		other (please specify)			

**e-delivery-mode (9) & e-delivery-parameters (10)****A.7.4. Internet and Fax Delivery Services**

The use of **e-delivery parameters** is contingent on specifications in the external objects defined for **e-delivery-mode**. The external objects currently defined for **e-delivery mode** (Internet Delivery Services (SMTP and FTP) and Fax Delivery Service) require that **any e-delivery-parameters** are also external objects.

Ref. no.	OID	Object Subclass	IPIG	Impl	References, Usage or Range of Values
1	1.0.10161.9.1	Internet Delivery Service	O	[ ]	
1.1	1.0.10161.9.1.1	- SMTP	O	[ ]	
1.1.1	1 0 10161 10 1000 7 1	-- JEDDS-ILL-Edelivery-Parameters	O	[ ]	Values include "GEDI" and "Ariel MIME".
1.2	1.0.10161.9.1.2	- FTP	O	[ ]	
1.2.1	1 0 10161 10 1000 7 1	-- JEDDS-ILL-Edelivery-Parameters	O	[ ]	Values include "GEDI" and "Ariel FTP".
2	1.0.10161.9.2	Fax Delivery Service	O	[ ]	
2.1	1 0 10161 10 1000 7 1	- JEDDS-ILL-Edelivery-Parameters	O	[ ]	Defined value: "FAX".

**extension (13)****A.7.5. {1 0 10161 13 3} APDU-Delivery-Info**

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	sender-info	M	[ ]	
1.1	- encoding	M	[ ]	Implementations conforming to the IPIG Profile <b>SHALL</b> support the following values: (2) "bER-In-MIME" (3) "bER"

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1.2	- transport	M	[ ]	
1.3	- aliases	O	[ ]	
2	recipient-info	M	[ ]	See A7.5, Ref. 1
3	transponder-info	O	[ ]	See A7.5, Ref. 1

#### A.7.6. {1 0 10161 13 4} ILL-Supplemental-Client-Info

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	Client-Info-Type	M	[ ]	
1.1	- standard	O	[ ]	
1.2	- local	O	[ ]	
2	Client-Info-Content	M	[ ]	
2.1	- string-content	O	[ ]	
2.2	- postal-address	O	[ ]	
2.3	- name-or-id	O	[ ]	
2.4	- status-code	O	[ ]	
2.5	- defined-number	O	[ ]	
2.6	- nested	O	[ ]	
2.7	- amount	O	[ ]	

#### A.7.7. {1 0 10161 13 6} IPIG-Additional-User-Error-Information

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	element-truncated	O	[ ]	
1.1	- element	M	[ ]	
1.2	- truncated-value	M	[ ]	
2	missing-required-element	O	[ ]	
3	unsupported-field-length	O	[ ]	
3.1	- element	M	[ ]	
3.2	- min-length	O	[ ]	
3.3	- max-length	O	[ ]	
4.	unrecognized-data	O	[ ]	
4.1	- element	M	[ ]	
4.2	- data	O	[ ]	
4.3	- expected-format	O	[ ]	
4.4	- supported-values	O	[ ]	
5	inconsistent-data	O	[ ]	
6	other	O	[ ]	

#### A.7.8. {1 0 10161 13 8} Internal-Reference-Number

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	requester-internal-reference	O	[ ]	Implementors <b>SHALL</b> supply either one of <b>requester-internal-reference</b> and/or <b>responder-internal-</b>

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
				reference when using this object.
1.1	- reference-authority	M	[ ]	
1.2	- internal-reference	M	[ ]	
2	responder-internal-reference	O	[ ]	Implementors <b>SHALL</b> supply either <b>requester-internal-reference</b> and/or <b>responder-internal-reference</b> when using this object.
2.1	- reference-authority	M	[ ]	
2.2	- internal-reference	M	[ ]	

#### A.7.9. {1 0 10161 13 6} IPIG-ILL-Request-Extension

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	uniform-title	O	[ ]	
2	material-type	O	[ ]	
3	responder-specific-info	O	[ ]	
4	dissertation-thesis	O	[ ]	
4.1	- type	O	[ ]	
4.2	- details	O	[ ]	
4.2.1	- - granting-institution	O	[ ]	
4.2.2	- - date-granted	O	[ ]	
5	volume	O	[ ]	
6	issue-numer	O	[ ]	
7	affiliations	O	[ ]	
8	requested-material-language	O	[ ]	
9	form-content-info	O	[ ]	
10	payment-method	O	[ ]	
10.1	- reciprocal-agreement	O	[ ]	
10.2	- prepaid	O	[ ]	
10.3	-uNESCO-voucher	O	[ ]	
10.4	- aLIA-voucher	O	[ ]	
10.5	- iFLA-voucher	O	[ ]	
10.6	- other-voucher-or-coupon	O	[ ]	
10.7	- rLG-shares	O	[ ]	
10.8	- oCLC-iFM	O	[ ]	
10.9	- other-payment-scheme	O	[ ]	
10.10	- cash	O	[ ]	
10.11	- check	O	[ ]	
10.12	- credit-card	O	[ ]	
10.12.1	- - type	M	[ ]	
10.12.2	- - card-number	M	[ ]	
10.12.3	- - expiry-date	M	[ ]	

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
10.12.4	-- name-on-card	M	[ ]	
10.13	- deposit-account	O	[ ]	
10.13.1	-- account-name	M	[ ]	
10.13.2	-- account-number	M	[ ]	
10.14	- bank-electronic-payment	O	[ ]	
10.14.1	-- bank-name	M	[ ]	
10.14.2	-- bank-address	M	[ ]	
10.14.3	-- routing-address	M	[ ]	
10.14.4	-- account-number	M	[ ]	
10.15	- other-payment-type	O	[ ]	
11	this-edition-only	O	[ ]	
12	unique-item-ID	O	[ ]	
13	rights-info	O	[ ]	
13.1	- rights-information-country	M	[ ]	
13.2	- rights-information-type	M	[ ]	
13.3	- rights-information-value	M	[ ]	

## Access Control

### A.7.10. {1 2 840 10003 8 1} Prompt-1

This object is registered as an Access Control Format in the *Registry of Z39.50 Object Identifiers*, available online at <http://lcweb.loc.gov/z3950/agency/defns/oids.html#8>

The full ASN.1 definition of the Access Control Format Prompt-1 is found in *ANSI/NISO Z39.50-1995, Annex 7*.

[Note, in the revision of Z39.50 released for ballot in 2002, see subsection ASN.1.9.1 of *Appendix 18, ASN.1, Section ASN1.9 Z39.50 ASN.1 Definition for Access Control Formats* for the full ASN.1 definition of Prompt-1.]

Ref. no.	Parameter	IPIG	Impl	References, Usage or Range of Values
1	challenge	X	--	
2	response	M	[ ]	
2.1	- prompt-id	M	[ ]	
2.1.1	-- enumerated-prompt	M	[ ]	
2.1.1.1	--- type	M	[ ]	Support required for (0) "group-id", (1) "user-id" and (2) "password". Support for other defined values is optional.
2.1.1.2	--- suggested-string	O	[ ]	
2.1.2	-- non-enumerated-prompt	X	--	
2.2	- prompt-response	M	[ ]	[1] "String" is the only choice relevant for IPIG implementations.