IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent of: Robert J. Davies

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Filing Date: June 7, 2001

Title: COMMUNICATION SYSTEM

Mail Stop Patent Board

Patent Trial and Appeal Board

U.S. Patent and Trademark Office

P.O. Box 1450

Alexandria, VA 22313-1450

SECOND DECLARATION OF DR. CHARLES D. KNUTSON

1. My name is Charles D. Knutson. I am over the age of 18, have personal knowledge of the facts set forth herein, and am competent to testify to the same.

2. The IrDA Object Exchange Protocol, Version 1.2 ("**IrOBEX**"; Ex. 1006) was publically available as of the March 18, 1999 date listed on the document. Ex. 1006, 1. Specifically, as discussed below, the IrOBEX protocol was published on a website, www.irda.org, maintained by the Infrared Data Association and available to the general public through the website. The IrOBEX protocol also was distributed to IrDA members through IrDA's email reflector list.

3. I have personal knowledge that the IrOBEX v.1.2 specification was published at that time and was available to members of the public. For instance, I personally accessed the IrOBEX v.1.2 specification multiple times through the www.irda.org website after March 18, 1999. Further to my personal knowledge, and as explained in more detail below, I have attached appendices as additional documentation from the Internet Archives that show the availability of the IrOBEX v.1.2 specification online shortly after March 18, 1999.

4. In 1999, the Infrared Data Association (IrDA) was an association of over 150 companies worldwide focused on providing standards to ensure the

quality and interoperability of infrared data communications technology.
App. 10AA, 1. IrDA was founded in 1993 as a non-profit organization.
App. 10BB, 1. IrDA's mission was to create and promote interoperable,
low-cost infrared data interconnection standards that support a walk-up,
point-to-point user model. App. 10BB, 1. As part of this mission, IrDA
developed and published communication protocols and/or specifications.
App. 10BB, 1-2 ("IrDA publishes the IrDA specification").

5. Specifically, in the ordinary course of its regularly conducted business
activities, and pursuant to its standard business practices, IrDA published
technical specifications and/or protocols and other documents related to the
development of short-range wireless data communication standards. Such
documents were published for the purposes of discussion and establishment
of industry standards for short-range infrared communications.

6. In 1999, I was the Chair of IrDA's Test and Interop Committee. App.
10CC, 1. The Test and Interop Committee was responsible for producing
measurement requirements to ensure compliance with IrDA standards,
establishing standards for interoperability between devices, and protecting
the integrity of the IrDA trademarks. The committee developed
documentation to assist device manufactuers in testing their products to
verify that they met the requirements of the specifications. Through my role

as one of the three IrDA Committee Chairs, I became familiar with IrDA's standard business practices involved in developing and publishing communication standards. I also routinely visited IrDA's website and accessed standard documents from the website as needed.

7. In 1999, IrDA specifications and protocols were published on IrDA's website. As new versions of a specification or protocol were approved by the IrDA member companies, IrDA would update its website and make the new versions available online. The IrDA specifications or protocols were made available to the general public through the website. Thus, the general public had access to IrDA specification or protocol documents through the irda.org website.

8. The general access and availability of IrDA's website is evidenced through the Internet Archive captures of the website shown in Exs. 10AA-10CC and 10EE-10II. App. 10DD, 8 ("the Archive collects web pages that are publicly available"). The date at the top of the page of the Internet Archive documents indicates the date on which a particular web page was archived by the Internet Archive.

9. IrDA's website also included search functionality. App. 10EE, 1. In addition to locating IrDA content through general Internet search engines, users could search the content of IrDA's website through keyword searching

using the website's search functionality. App. 10EE, 1. In this regard, the IrDA website content, including the specifications or protocols, was indexed for keyword searching.

10. Appendix 10FF provides a table that lists the IrDA specifications available on IrDA's website on October 11, 1999. App. 10FF, 1-2; App. 10DD, 8 ("Date/Time of Wayback captures"). As shown in the last row of the table on page 1, the website included a listing for a specification named "IrOBEX 1.2" with a description of "IrDA Object Exchange Protocol (362KB)." App. 10FF, 1. The listing included a link ("Get specification.") that visitors to the website could use to download the "IrOBEX 1.2" specification. App. 10DD, 1. As noted on the website and based on my personal knowledge, the documents were made "available at no charge" to the general public. App. 10FF, 1.

11. Based on my personal knowledge, I recognize Exhibit 1006 ("IrOBEX") as a true and correct copy of the "IrOBEX 1.2" specification made available through the link ("Get specification.") shown in Appendix 10FF. Based on my personal knowledge of IrDA's website and as noted in Appendix 10FF, the "IrOBEX 1.2" specification was published and freely available on IrDA's website by at least October 11, 1999, likely earlier. As mentioned above, in 1999, I was an IrDA Committee Chair and gained extensive

knowledge of IrDA's business practices and operation of its website. Also, through my work with IrDA, I personally reviewed the "IrOBEX 1.2" specification during this time frame and routinely accessed specifications from the IrDA website, including the "IrOBEX 1.2" specification. From my recollection, Exhibit 1006 ("IrOBEX") is a true and correct copy of the "IrOBEX 1.2" specification that was generally available for download on IrDA's website in 1999, at least by October 11, 1999.

12. Further, by 1999, more than 150 companies were members of the Infrared Data Association and generally included those interested in the discussion, creation, and adoption of short-range wireless communication standards. App. 10AA, 1; App. 10GG, 1-3 ("Membership Roster 1998"); App. 10HH, 1-3 ("Membership Roster 1999"). Each of these companies typically delegated multiple individuals to regularly participate in quarterly IrDA meetings, which were also open to the general public. As an IrDA Committee Chair, I consistently attended these meetings.

13. Further, pursuant to IrDA's standard business practices, IrDA notified its members of standard publications using its email reflector list. App. 10II, 1 ("communications via IrDA Internet e-mail reflector"). Based on my personal knowledge, Ex. 1006 ("IrOBEX") would have been distributed to

IrDA members on IrDA's email reflector upon its publication on March 18, 1999.

14. As further evidence of the public availability of Exhibit 1006 ("IrOBEX") by at least October 11, 1999, IrDA Object Exchange Protocol, Version 1.2 was regularly cited by authors in the 1999 and early 2000 time frame. For example, John R. Bell filed a patent application on October 22, 1999 that cited "the IrDA Standard as described in the IrOBEX Specification 'IrDA Object Exchange Protocol', Version 1.2, Counterpoint Systems Foundry, Inc and Microsoft Corporation, Mar. 18, 1999." App. 10JJ, 2:27-32. As another example, Lars Novak, Björn Ekberg, and Andreas Jönsson filed a patent application on May 10, 2000 (claiming priority to September 20, 1999) explaining that "[o]ne of the protocol standards published by the IrDA is OBEX … For more information regarding OBEX, the interested reader should refer to 'IrDA Object Exchange Protocol IrOBEX', Counterpoint Systems Foundry, Inc., Version 1.2, Mar. 18, 1999 …" App. 10KK, 1:33-49. As yet another example, Ari Tourunen filed a patent application on July 2, 1999 citing "IrDA Object Exchange Protocol 1.2" and explaining that "IrDA standards and protocols are available over the internet from the Infrared Data Association at www.irda.org." App. 10LL, 2:10-11. As these citations confirm, the IrDA Object Exchange Protocol, Version 1.2 (Ex.

1006; "IrOBEX") was publicly available to persons of ordinary skill in the art through IrDA's website as discussed above.

15. Appendix 10AA is a true and correct copy of the Internet Archive capture of the website www.irda.org from February 24, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website www.irda.org as it existed at the time of capture.

16. Appendix 10BB is a true and correct copy of the Internet Archive capture of the website http://irda.org:80/about/indAppendixasp from February 24, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://irda.org:80/about/indAppendixasp as it existed at the time of capture.

17. Appendix 10CC is a true and correct copy of the Internet Archive capture of the website http://www.irda.org:80/about/officers.asp from October 8, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://www.irda.org:80/about/officers.asp as it existed at the time of capture.

18. Appendix 10DD is a true and correct copy of the Internet Archive's Frequently Asked Questions website

https://archive.org/about/faqs.php#The_Wayback_Machine from November 9, 2018.

19. Appendix 10EE is a true and correct copy of the Internet Archive capture of the website http://irda.org:80/search.asp from April 17, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://irda.org:80/search.asp as it existed at the time of capture.

20. Appendix 10FF is a true and correct copy of the Internet Archive capture of the website http://www.irda.org:80/standards/specifications.asp from October 11, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://www.irda.org:80/standards/specifications.asp as it existed at the time of capture.

21. Appendix 10GG is a true and correct copy of the Internet Archive capture of the website http://irda.org:80/members/members.asp from February 19, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://irda.org:80/members/members.asp as it existed at the time of capture.

22. Appendix 10HH is a true and correct copy of the Internet Archive capture of the website http://irda.org:80/members/members.asp from November 10,

1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://irda.org:80/members/members.asp as it existed at the time of capture.

23. Appendix 10II is a true and correct copy of the Internet Archive capture of the website http://www.irda.org:80/about/application.asp from October 8, 1999. Based on my personal knowledge of the IrDA website from 1999, the Internet Archive capture reflects an accurate representation of the website http://www.irda.org:80/about/application.asp as it existed at the time of capture.

24. I declare under penalty of perjury that the foregoing is true and correct. I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code.

Dated: November 11, 2018

Charles D. Knutson

APPENDIX 10AA

About IrDA | Standards | IrDA Members | Design With IrDA | Products | Using IrDA | News/Events | Articles

Welcome to IrDA

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Meetings/Events

Public Newsgroup

The IrDA is an association of over 150 companies world wide focused on providing IR standards to ensure the quality and interoperability of the Infrared Technology.

Infrared Data Association sm

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Hewlett-Packard
Sponsors of the IrDA January General Meeting in San Francisco

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elektravision

APPENDIX 10BB

http://irda.org:80/about/index.asp   Go

JAN **FEB** APR

◄ **24** ▶

1998 **1999** 2000

29 captures
24 Feb 1999 - 7 Sep 2015

▼ About this capture

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Infrared Data Association.

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The Company:	IrDA, The Infrared Data Association
Headquarters:	Walnut Creek, California
Key Dates:	1993: Founded as a non-profit organization
Strategy:	IrDA is an International Organization that creates and promotes interoperable, low cost infrared data interconnection standards that support a walk-up, point-to-point user model. The standards support a broad range of appliances, computing and communications devices.
Membership:	IrDA has over 150 members drawn from major hardware, systems, software, peripherals, component, and communications manufactureres, cable and telephone companies, automobile and service providers.

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TECHNICAL MILESTONES

February 1998	IrDA publishes IrDA Control, a new standard specification for cordless human input devices (i.e. mice, keyboards, joysticks and gamepads).
November 1997	IrDA publishes IrMC, a new standard specification for interoperability between mobile communication devices.
October 1997	Desktop Charter meeting establishes wireless infrared connectivity between desktop computers and peripheral devices such as cameras, PDA's cellular phones and handheld pcs initiative.
October 1997	IrDA publishes IrTran-P (Infrared Picture Transfer) standard specification for image exchange used in Digital Image capture devices/cameras.
July 1997	Automobile Charter Meeting establishes infrared Bi-Directional standards initiative
January 1997	Telecommunications Charter Meeting to draft proposal for standards that will empower wireless communications devices, (i.e. cellular phones, pagers) to transfer information using bi-directional IrDA.

October 1996	Camera-Digital Still Charter Meeting Establishes infrared bi-directional standards initiative</td>
February 1996	Consumer IR Charter Meeting establishes consumer infrared bi-directional standards initiative
November 1995	Microsoft announced support for IrDA connectivity to Windows 95, enabling low-cost wireless connectivity between Windows 95 based PC's and peripheral devices
October 1995	Released extensions to SIR standard including 4Mbs
June 1994	IrDA publishes the IrDA specification which includes Serial Infrared (SIR) Infrared Link, Protocol Stack Link Access Protocol (IrLAP), and Link Management Protocol (IrLMP).
September 1993	IrDA determines basis for the IrDA Serial Infrared (SIR) Physical Layer Link Specification
June 1993	IrDA Charter Meeting of 50 Companies.

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Infrared Data Association

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Executive Director	Lawrence Faulkner (IrDA)
President	Mike Watson (Calibre)
Vice President	Eng Tan (Hewlett-Packard)
Secretary	Daphne Terrell(IrDA)
Treasurer	Vanessa Hutchison (ESI)
Marketing Chair	Brian Ingham (IBM)
Marketing CoChair - Market Requirements	Robert Stuart (Sharp Electronics)
Marketing CoChair - Market Development	(OPEN)
Technical Chair	Dave Suvak (Counterpoint Systems)
Technical CoChair - Protocol	Gontarou Kitazumi (Okaya Systemware Co Ltd.)
Technical CoChair - Physical	Ray Chock (Calibre)
Test and Interop Chair	Charles D. Knutson (Counterpoint Systems)
Test and Interop CoChair - Test	John Petrilla (Hewlett Packard)
Test and Interop CoChair - Interop	Mitsuji Matsumoto (Waseda Unv.)

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APPENDIX 10DD

Frequently Asked Questions

[**The Internet Archive** | **Search Tips** | **Prelinger Movies** | **The Wayback Machine** | **Borrow from Lending Library** | **Audio** | **MS-DOS Emulation** | **Archive BitTorrents** | **Accounts Information** | **Navigation** | **Live Music Archive** | **Movies** | **Collections** | **Downloading Content** | **Law Enforcement Requests** | **The Internet Arcade** | **Uploading Content** | **Books and Texts** | **Item page management** | **Rights** | **The Grateful Dead Collection** | **Report Item** | **Forums** | **SFLan** | **Archive-It** | **Equipment** | **Errors**]

Questions

The Internet Archive

Does the Archive issue grants?

No; although we promote the development of other Internet libraries through online discussion, colloquia, and other means, the Archive is not a grant-making organization.

Can I donate Bitcoins?

Yes, please do. Our Bitcoin address is: 1Archive1n2C579dMsAu3iC6tWzuQJz8dN . Every bit helps.

What is the nonprofit status of the Internet Archive? From where does its funding come?

The Internet Archive is a 501(c)(3) nonprofit organization. It receives in-kind and financial donations from a variety of sources as well as you.

How do I get assistance with research? How about research about a particular book?

The Internet Archive focuses on preservation and providing access to digital cultural artifacts. For assistance with research or appraisal, you are bound to find the information you seek elsewhere on the internet. You may wish to inquire about reference services provided by your local public library. Your area's college library may also support specialized reference librarian services. We encourage your support of your local library, and the essential services your library's professional staff can provide in person. Local libraries are still an irreplaceable resource!

What statistics are available about use of Archive.org?

What user stats do you keep and share?
The only users stats we track are the "views" of items on the site.

Where are they?
For collections they are viewable in a chart form in the "About" tab on a collection page. These numbers represent views in all the items in that collection. These are updated daily. For items they are shown on the right side of the details page. These are updated daily. Search results pages also show the "views" to the left of the page title. These numbers may differ from those on item and collection pages because they are updated monthly rather than daily.

What is a "view"?
A "view" used to be called a "download" on archive.org. How are "views" counted? archive.org calculates a view as: one action (read a book, download a file, watch a movie, etc.), per day, per IP Address. So, for each item page, using multiple files or accessing from multiple accounts in a single day will only count as one view.

How often are they counted?
Item pages are updated daily so the current number would reflect the count through the previous day.
Collection counts shown in the graph on the "About" page are updated monthly.

Other Internet Archive stats links
Aggregated operational stats are viewable at https://archive.org/stats/

What's the significance of the Archive's collections?

Societies have always placed importance on preserving their culture and heritage. But much early 20th-century media -- television and radio, for example -- was not saved. The Library of Alexandria -- an ancient center of learning containing a copy of every book in the world -- disappeared when it was burned to the ground.

Questions

Search Tips

Where is advanced search?

On archive.org there is an "Advanced Search" link just below the search input field. For searches done in the search field in the top black nav bar the "Advanced Search" link will be present on the search results page just below the search input field.

What search APIs are available

Information about how to use the various search APIs can be found at https://archive.org/help/aboutsearch.htm

Can I search by Creative Commons license?

Yes, you can. But it's a little complicated.

Here's how to break it down. See the license types at creative commons. When you want to find all of the items assigned a certain license by an uploading party, you'll plug their abbreviation for it into this search query:
licenseurl:http***abbreviation***

So if you're looking for Attribution Non-commercial No Derivatives (by-nc-nd), you'd put this in the search box:
licenseurl:http***by-nc-nd***

If you want to use this in combination with other queries, like "I want by-nc-nd items about dogs" you'd do this:
licenseurl:http***by-nc-nd*** **AND dog**.
The AND tells the search engine all the items returned should have that license AND they should contain the word dog. AND has to be in all caps.

Just to make it easier, here are the basic searches:
• Public Domain
• Attribution Non-commercial No Derivatives (by-nc-nd)
• Attribution Non-commercial Share Alike (by-nc-sa)
• Attribution Non-commercial (by-nc)
• Attribution No Derivatives (by-nd)
• Attribution Share Alike (by-sa)
• Attribution (by)

How do I sort search results

The "SORT BY" bar has options to allow you to control which results are displayed, in what order and what "view":
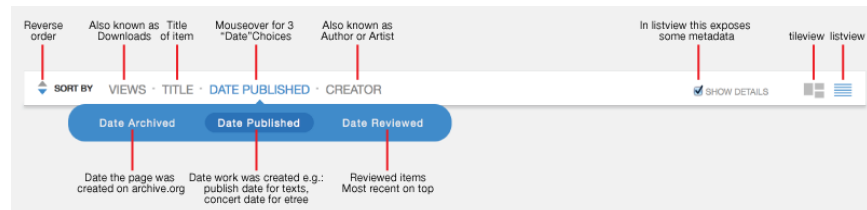
How do I search just within a collection?

On a collection page there will be a "Search this Collection" input field on the right side of the page. Enter a term there and hit your return/enter key. The results will be of items in that collection.

For advanced boolean search you can use "AND collection:[IDENTIFIER]" in your query.

How can I use list view instead of tile view?

For most search results pages you can choose the view in the "Sort by" bar; Tile view (the icon with three rectangles) or List view (the icon with multiple lines.) Tile view is the default view.

What is indexed in the search engine?

Only the metadata in an item page is indexed. So the search engine does not have the text of books, individual file metadata or embedded metadata.

Questions

Prelinger Movies

How did you digitize the films?

The Prelinger Archives films are held in original film form (35mm, 16mm, 8mm, Super 8mm, and various obsolete formats like 28mm and 9.5mm). Films were first transferred to Betacam SP videotape, a widely used analog broadcast video standard, on telecine machines manufactured by Rank Cintel or Bosch. The film-to-tape transfer process is not a real-time process: It requires inspection of the film, repair of any physical damage, and supervision by a skilled operator who manipulates color, contrast, speed, and video controls.

The videotape masters created in the film-to-tape transfer suite were digitized in 2001-2003 at Prelinger Archives in New York City using an encoding workstation built by Rod Hewitt. The workstation is a 550 MHz PC with a FutureTel NS320 MPEG encoder card. Custom software, also written by Rod Hewitt, drove the Betacam SP playback deck and managed the encoding process. The files were uploaded to hard disk through the courtesy of Flycode, Inc.

More recently, Prelinger films have been digitized and uploaded by Skip Elsheimer at AV Geeks. We are also digitizing home movies and other materials on Internet Archive's ScanStation scanner.

The files were encoded at constant bitrates ranging from 2.75 Mbps to 3.5 Mbps. Most were encoded at 480 x 480 pixels (2/3 D1) or 368 x 480 (roughly 1/2 D1). The encoder drops horizontal pixels during the digitizing process, which during decoding are interpolated by the decoder to produce a 720 x 480 picture. (Rod Hewitt's site Coolstf shows examples of an image before and after this process.) Picture quality is equal to or better than most direct broadcast satellite television. Audio was encoded at MPEG-1 Level 2, generally at 112 kbps. Both the MPEG-2 and MPEG-4 movies have mono audio tracks.

To convert the MPEG-2 video to MPEG-4, we used a program called FlasK MPEG. This is an MPEG-1/2 to AVI conversion tool that reads the source MPEG-2 and outputs an AVI file containing the video in MPEG-4 format and audio in uncompressed PCM format. We then use a program called Virtual Dub that recompresses the audio using the MPEG-1 Level 3 (MP3) format. This process is automated by the software that runs the system.

Do I need to inform the Internet Archive and/or Prelinger Archives when I reuse these movies?

No. However, we would very much like to know how you have used this material, and we'd be thrilled to see what you've made with it. This may well help us improve this site. Please consider sending us a copy of your production (postal mail only), and let us know whether we can call attention to it on the site. Our address is:

> Rick Prelinger
> PO Box 590622
> San Francisco, CA 94159
> United States

How can I get access to stock footage from these films?

Access to the movies stored on this site in videotape or film form is available to commercial users through Getty Images, representing Prelinger Archives for stock footage sales. Please contact Getty Images directly:

> Getty Images

Please visit us at www.prelinger.com/prelarch.html for more information on access to these and similar films. Prelinger Archives regrets that it cannot generally provide access to movies stored on this Web site in other ways than through the site itself. We recognize that circumstances may arise when such access should be granted, and we welcome email requests. Please address them to Rick Prelinger.

The Internet Archive does not provide access to these films other than through this site.

An article on re-coding Prelinger Archive films to SVCD so you can watch them on your DVD player.

See archived version of www.moviebone.com/

Do I need to credit the Internet Archive and Prelinger Archives when I reuse these movies?

We ask that you credit us as a source of archival material, in order to help make others aware of this site. We suggest the following forms of credit:

> Archival footage supplied by Internet Archive (at archive.org) in association with Prelinger Archives

or

> Archival footage supplied by Internet Archive (at archive.org)

or

> "Archival footage supplied by archive.org"

What parameters were used when making the Real Media files on the website?

Rod Hewitt posted some very useful information here

Are there restrictions on the use of the Prelinger Films?

The films are available for reuse according to the Creative Commons licenses, if any, that appear with on each film's detail page. Pursuant to the Creative Commons license, you are warmly encouraged to download, use and reproduce these films in whole or in part, in any medium or market throughout the world. You are also warmly encouraged to share, exchange, redistribute, transfer and copy these films, and especially encouraged to do so for free.

Any derivative works that you produce using these films are yours to perform, publish, reproduce, sell, or distribute in any way you wish without any limitations.

Descriptions, synopses, shotlists and other metadata provided by Prelinger Archives to this site are copyrighted jointly by Prelinger Archives and Getty Images. They may be quoted, excerpted or reproduced for educational, scholarly, nonprofit or archival purposes, but may not be reproduced for commercial purposes of any kind without permission.

If you require a written license agreement or need access to stock footage in a physical format (such as videotape or a higher-quality digital file), please contact Getty Images. The Internet Archive does not furnish written license agreements, nor does it comment on the rights status of a given film above and beyond the Creative Commons license.

We would appreciate attribution or credit whenever possible, but do not require it.

Can you point me to resources on the history of ephemeral films?

See the bibliography and links to other resources at www.prelinger.com/ephemeral.html.

Why are there very few post-1964 movies in the Prelinger collection?

Largely because of copyright law. While a high percentage of ephemeral films were never originally copyrighted or (if initially copyrighted) never had their copyrights properly renewed, copyright laws still protect most moving image works produced in the United States from 1964 to the present. Since the Prelinger collection on this site exists to supply material to users without most rights restrictions, every title has been checked for copyright status. Those titles that either are copyrighted or whose status is in question have not been made available. For information on recent changes in copyright law, see the circular Duration of Copyright (in PDF format) published by the Library of Congress

For more information...

Check out our Prelinger Archives Forum

Questions

The Wayback Machine

Can I link to old pages on the Wayback Machine?

Yes! The Wayback Machine is built so that it can be used and referenced. If you find an archived page that you would like to reference on your Web page or in an article, you can copy the URL. You can even use fuzzy URL matching and date specification... but that's a bit more advanced.

Who was involved in the creation of the Internet Archive Wayback Machine?

"The original idea for the Internet Archive Wayback Machine began in 1996, when the Internet Archive first began archiving the web. Now, five years later, with over 100 terabytes and a dozen web crawls completed, the Internet Archive has made the Internet Archive Wayback Machine available to the public. The Internet Archive has relied on donations of web crawls, technology, and expertise from Alexa Internet and others. The Internet Archive Wayback Machine is owned and operated by the Internet Archive."

How was the Wayback Machine made?

Alexa Internet, in cooperation with the Internet Archive, has designed a three dimensional index that allows browsing of web documents over multiple time periods, and turned this unique feature into the Wayback Machine.

How do you archive dynamic pages?

There are many different kinds of dynamic pages, some of which are easily stored in an archive and some of which fall apart completely. When a dynamic page renders standard html, the archive works beautifully. When a dynamic page contains forms, JavaScript, or other elements that require interaction with the originating host, the archive will not contain the original site's functionality.

How can I use the Wayback Machine's Site Search to find websites?

The Site Search feature of the Wayback Machine is based on an index built by evaluating terms from hundreds of billions of links to the homepages of more than 350 million sites. Search results are ranked by the number of captures in the Wayback and the number of relevant links to the site's homepage.

Can I search the Archive?

Using the Internet Archive Wayback Machine, it is possible to search for the names of sites contained in the Archive (URLs) and to specify date ranges for your search. We hope to implement a full text search engine at some point in the future.

How do I determine the Date/Time of Wayback captures?

Take a look at the date code embedded in the archived URL. This is the list of numbers in the middle; it translates as yyyymmddhhmmss in GMT. For example in this url http://web.archive.org/web/20000229123340/http://www.yahoo.com/ the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds.

Do you collect all the sites on the Web?

No, the Archive collects web pages that are publicly available. We do not archive pages that require a password to access, pages that are only accessible when a person types into and sends a form, or pages on secure servers. Pages may not be archived due to robots exclusions and some sites are excluded by direct site owner request.

Why isn't the site I'm looking for in the archive?

Some sites may not be included because the automated crawlers were unaware of their existence at the time of the crawl. It's also possible that some sites were not archived because they were password protected, blocked by robots.txt, or otherwise inaccessible to our automated systems. Site owners might have also requested that their sites be excluded from the Wayback Machine.

How can I have my site's pages excluded from the Wayback Machine?

You can send an email request for us to review to info@archive.org with the URL (web address) in the text of your message.

How can I use the Wayback Machine's Site Search to find websites?

The Site Search feature of the Wayback Machine is based on an index built by evaluating terms from hundreds of billions of links to the homepages of more than 350 million sites. Search results are ranked by the number of captures in the Wayback and the number of relevant links to the site's homepage.

Why is the Internet Archive collecting sites from the Internet? What makes the information useful?

Most societies place importance on preserving artifacts of their culture and heritage. Without such artifacts, civilization has no memory and no mechanism to learn from its successes and failures. Our culture now produces more and more artifacts in digital form. The Archive's mission is to help preserve those artifacts and create an Internet library for researchers, historians, and scholars. The Archive collaborates with institutions including the Library of Congress and the Smithsonian.

Do you archive email? Chat?

No, we do not collect or archive chat systems or personal email messages that have not been posted to Usenet bulletin boards or publicly accessible online message boards.

How can I get a copy of the pages on my Web site? If my site got hacked or damaged, could I get a backup from the Archive?'

Our terms of use do not cover backups for the general public. However, you may use the Internet Archive Wayback Machine to locate and access archived versions of a site to which you own the rights. We can't guarantee that your site has been or will be archived. We can no longer offer the service to pack up sites that have been lost.

Is there any personal information in these collections?

We collect Web pages that are publicly accessible. These may include pages with personal information.

Can I add pages to the Wayback Machine?

On https://archive.org/web you can use the "Save Page Now" feature to save a specific page one time. This does not currently add the URL to any future crawls nor does it save more than that one page. It does not save multiple pages, directories or entire sites.

How do I contact the Internet Archive?

All questions about the Wayback Machine, or other Internet Archive projects, should be addressed to info@archive.org.

Where is the rest of the archived site? Why am I getting broken or gray images on a site?

Broken images occur when the images are not available on our servers. Usually this means that we did not archive them.

How can I get pages authenticated from the Wayback Machine? How can use the pages in court?

Some sites are not available because of robots.txt or other exclusions. What does that mean?

What is the Wayback Machine's Copyright Policy?

You can tell if the image or link you are looking for is in the Wayback Machine by entering the image or link's URL into the Wayback Machine search box. Whatever archives we have are viewable in the Wayback Machine.

The best way to see all the files we have archived of the site is: http://web.archive.org/*/www.yoursite.com/*

There is a 3-10 hour lag time between the time a site is crawled and when it appears in the Wayback Machine.

Why are some sites harder to archive than others?

If you look at our collection of archived sites, you will find some broken pages, missing graphics, and some sites that aren't archived at all. Some of the things that may cause this are:

- Robots.txt -- A site's robots.txt document may have prevented the crawling of a site.
- Javascript -- Javascript elements are often hard to archive, but especially if they generate links without having the full name in the page. Plus, if javascript needs to contact the originating server in order to work, it will fail when archived.
- Server side image maps -- Like any functionality on the web, if it needs to contact the originating server in order to work, it will fail when archived.
- Orphan pages -- If there are no links to your pages, the robot won't find it (the robots don't enter queries in search boxes.)

As a general rule of thumb, simple html is the easiest to archive.

Can I find sites by searching for words that are in their pages?

No, at least not yet. Site Search for the Wayback Machine will help you find the homepages of sites, based on words people have used to describe those sites, as opposed to words that appear on pages from sites.

Can I still find sites in the Wayback Machine if I just know the URL?

Yes, just enter a domain or URL the way you have in the past and press the "Browse History" button.

What is the Wayback Machine? How can I get my site included in the Wayback Machine?

The **Internet Archive Wayback Machine** is a service that allows people to visit archived versions of Web sites. Visitors to the Wayback Machine can type in a URL, select a date range, and then begin surfing on an archived version of the Web. Imagine surfing circa 1999 and looking at all the Y2K hype, or revisiting an older version of your favorite Web site. The Internet Archive Wayback Machine can make all of this possible.

How can I get my site included in the Wayback Machine?

Much of our archived web data comes from our own crawls or from Alexa Internet's crawls. Neither organization has a "crawl my site now!" submission process. Internet Archive's crawls tend to find sites that are well linked from other sites. The best way to ensure that we find your web site is to make sure it is included in online directories and that similar/related sites link to you.

Alexa Internet uses its own methods to discover sites to crawl. It may be helpful to install the free Alexa toolbar and visit the site you want crawled to make sure they know about it.

Regardless of who is crawling the site, you should ensure that your site's 'robots.txt' rules and in-page META robots directives do not tell crawlers to avoid your site.

What are the sources of your captures?

When you roll over individual web captures (that pop-up when you roll over the dots on the calendar page for a URL,) you may notice some text links shows up above the calendar, along with the word "why". Those links will take you to the Collection of web captures associated with the specific web crawl the capture came from. Every day hundreds of web crawls contribute to the web captures available via the Wayback Machine. Behind each, there is a story about factors like who, why, when and how.

Why are some of the dots on the calendar page different colors?

We color the dots, and links, associated with individual web captures, or multiple web captures, for a given day. Blue means the web server result code the crawler got for the related capture was a 2nn (good); Green means the crawlers got a status code 3nn (redirect); Orange means the crawler got a status code 4nn (client error), and Red means the crawler saw a 5nn (server error). Most of the time you will probably want to select the blue dots or links.

How does the Wayback Machine behave with Javascript turned off?

If you have Javascript turned off, images and links will be from the live web, not from our archive of old Web files.

How did I end up on the live version of a site? or I clicked on X date, but now I am on Y date, how is that possible?

Not every date for every site archived is 100% complete. When you are surfing an incomplete archived site the Wayback Machine will grab the closest available date to the one you are in for the links that are missing. In the event that we do not have the link archived at all, the Wayback Machine will look for the link on the live web and grab it if available. Pay attention to the date code embedded in the archived url. This is the list of numbers in the middle; it translates as yyyymmddhhmmss. For example in this url http://web.archive.org/web/20000229123340/http://www.yahoo.com/ the date the site was crawled was Feb 29, 2000 at 12:33 and 40 seconds.

You can see a listing of the dates of the specific URL by replacing the date code with an asterisk (*), ie: http://web.archive.org/*/www.yoursite.com

Where does the name come from?

The Wayback Machine is named in reference to the famous Mr. Peabody's WABAC (pronounced way-back) machine from the Rocky and Bullwinkle cartoon show.

How do I cite Wayback Machine urls in MLA format?

This question is a newer one. We asked MLA to help us with how to cite an archived URL in correct format. They did say that there is no established format for resources like the Wayback Machine, but it's best to err on the side of more information. You should cite the webpage as you would normally, and then give the Wayback Machine information. They provided the following example: McDonald, R. C. "Basic Canary Care." _Robirda Online_. 12 Sept. 2004. 18 Dec. 2006 [http://www.robirda.com/cancare.html]. _Internet Archive_. [http://web.archive.org/web/20041009202820/http://www.robirda.com/cancare.html]. They added that if the date that the information was updated is missing, one can use the closest date in the Wayback Machine. Then comes the date when the page is retrieved and the original URL. Neither URL should be underlined in the bibliography itself. Thanks MLA!

What is the Archive-It service of the Internet Archive Wayback Machine?

For information on the **Archive-It** subscription service that allows institutions to build and preserve collections of born digital content, see **https://www.archive.org/about/faqs.php#Archive-It**

How can I help the Internet Archive and the Wayback Machine?

The Internet Archive actively seeks donations of digital materials for preservation. If you have digital materials that may be of interest to future generations, please let us know by sending an email to info at archive dot org. The Internet Archive is also seeking additional funding to continue this important mission. You can click the donate tab above or click here. Thank you for considering us in your charitable giving.

Who has access to the collections? What about the public?

Anyone can access our collections through our website archive.org. The web archive can be searched using the Wayback Machine.

The Archive makes the collections available at no cost to researchers, historians, and scholars. At present, it takes someone with a certain level of technical knowledge to access collections in a way other than our website, but there is no requirement that a user be affiliated with any particular organization.

How can I get pages authenticated from the Wayback Machine? How can use the pages in court?

The Wayback Machine tool was not designed for legal use. We do have a legal request policy found at our legal page. Please read through the entire policy before contacting us with your questions. We do have a standard affidavit as well as a FAQ section for lawyers. We would prefer that before you contact us for such services, you see if the other side will stipulate instead. We do not have an in-house legal staff, so this service takes away from our normal duties. Once you have read through our policy, if you still have questions, please contact us for more information.

Some sites are not available because of robots.txt or other exclusions. What does that mean?

Such sites may have been excluded from the Wayback Machine due to a robots.txt file on the site or at a site owner's direct request.

What is the Wayback Machine's Copyright Policy?

The Internet Archive respects the intellectual property rights and other proprietary rights of others. The Internet Archive may, in appropriate circumstances and at its discretion, remove certain content or disable access to content that appears to infringe the copyright or other intellectual property rights of others. If you believe that your copyright has been violated by material available through the Internet Archive, please provide the Internet Archive Copyright Agent with the following information:

- Identification of the copyrighted work that you claim has been infringed;
- An exact description of where the material about which you complain is located within the Internet Archive collections;
- Your address, telephone number, and email address;
- A statement by you that you have a good-faith belief that the disputed use is not authorized by the copyright owner, its agent, or the law;
- A statement by you, made under penalty of perjury, that the above information in your notice is accurate and that you are the owner of the copyright interest involved or are authorized to act on behalf of that owner;
- Your electronic or physical signature.

The Internet Archive Copyright Agent can be reached as follows:

Internet Archive Copyright Agent
Internet Archive
300 Funston Ave.
San Francisco, CA 94118
Phone: 415-561-6767
Email: info at archive dot org

Questions

Borrow from Lending Library

What books can I borrow? How can I find them?

The easiest way to find books to borrow is to jump straight to the Lending Library which shows works which have editions that are available through the Internet Archive.

Which reading devices can be used to read the eBooks borrowed through archive.org?

Internet Archive offers borrowable books in BookReader, PDF and ePub formats. BookReader editions may be read online immediately in any web browser. Downloadable eBooks are readable in Adobe Digital Editions and some other software platforms. Here is a list of supported devices on Adobe's website. ADE also provides support for Sony's Reader.

How many books can I check out at once?

You can borrow 5 books at a time from archive.org. Each loan will expire after 2 weeks and will automatically "return" at the end of that time period.

How can I see which books I've checked out?

There's a page under your archive.org Account which displays all the books you've checked out at any one time - https://archive.org/account/loans.php. Additionally you can see your loan history by going to https://archive.org/account/your Account page and clicking the "Profile" link.

Can I put a library book on hold?

Yes. If you try to borrow a book that is currently on loan you will be offered a link to be put on a waiting list. You will be notified via email when the book becomes available.

Where do I get Adobe Digital Editions?

You can download Adobe Digital Editions from adobe.com. It's free. If you are using a device that can not run Adobe Digital Editions, you still need an Adobe account. You can get one online here. An older version of Adobe Digital Editions can be found at this link.

How do I authorize Adobe Digital Editions? Who is my ebook vendor?

The first time you run Adobe Digital Editions, it will prompt you for authorization. This is completely optional and is not linked to your archive.org ID. If you do not want to set up an Adobe ID, check the box in the lower left where it says "I want to Authorize my computer without an ID" and click Authorize.

If you do want to set up an ID, click the "create an Adobe ID" link next to the eBook vendor line (which should remain set on "Adobe ID"). You can authorize your computer at a later date by going under the Help menu of ADE and selecting the "Authorize

computer..." option.

What about using ereaders?

Regardless of which ereader you have, you can read archive.org eBooks online in your browser with our BookReader. Many devices support PDF files, which can be downloaded from archive.org. Below are some tips for using some popular ereader devices. Feel free to send your feedback and questions to info@archive.org.

Can I read or borrow books on my Kindle?

The procedure varies depending what model Kindle you have.

If you have a Kindle Fire, you will need to "sideload" an Adobe Digital Editions compatible application such as Overdrive Media Console to borrow modern ebooks. Here is a handout from one of our partner libraries explaining the process.

For older non-Fire Kindles, you can only read Classic Ebooks not borrow Lending Library books.

How does borrowing a book work through archive.org?

The Internet Archive and participating libraries have selected digitized books from their collections that are available to be borrowed by one patron at a time from anywhere in the world for free. These books are in BookReader, PDF and ePub formats (and Daisy for the print disabled). You can choose which format you prefer as you complete the borrowing process.

BookReader editions may be read online immediately in your web browser. No special software is required.

Other Internet Archive loans are managed through Adobe Digital Editions, which you may need to download to manage your library of borrowed books.

How do I get set up to borrow books through archive.org?

Follow these steps:

1. Sign up for an archive.org account
2. Some ebooks require Adobe Digital Editions (This is where you can read the books you've borrowed, manage your current loans, or return books).
3. Get an Adobe.com account (If you create an Adobe account, you can access your library from a variety of locations. If not, your loans will be tethered to a specific computer or device.)
4. Find a book to borrow
5. If a BookReader edition is available, you can read it instantly online in your web browser. Other formats will require that you download a file and open it in Adobe Digital Editions

Can I borrow books on my Ipad or Android tablet?

Yes! You can read our books using our BookReader via your browser or by using a reader app like Bluefire Reader or Overdrive Media Console (iPad) or Aldiko Book Reader or Overdrive Media Console (Android tablet). For more information on Bluefire, go to their site at bluefirereader.com. Before you start, register an Adobe ID. You'll need to do this once. If you don't have one, create one at this page.

Here are some step-by-step instructions on using Overdrive Media Console:
1. Make sure you have downloaded and installed the free app "Overdrive Media Console" on to your iPad
2. Find a book you'd like to borrow; feel free to try a sample book that is small such as this one
3. Click on the "ebook" link under the "borrow" heading on the right
4. Log in if you have not logged in to archive.org
5. Choose one of the download options. Please note: Overdrive Media Console *can not read PDFs*.

Here are step-by-step instructions for Aldiko Reader:

1. Download and install Aldiko Book Reader from Google Play Store.
2. Open Aldiko, Select Other Catalogs under the Get Books section of the menu.
3. Select My Catalogs at the top and tap New Catalog on the green bar at the top.
4. Create an entry for the archive.org using openlibrary.org for the URL. Tap on the library and sign in.
5. When you have found a book you like, check it out. When the next screen comes up, select the pdf or epub version. You will then be prompted to enter your Adobe id and password. Your book will then download into Aldiko and you can open it and read it at your leisure.

The only downside to this process is that books can not be returned early via non-Adobe applications, so you'll just have to let them expire or we can return them early if you need to free up space on your loans list.

How do I borrow books to read on my Nook?

You will need Adobe Digital Editions(ADE) to use your Nook. Once you have ADE follow these instructions:

1. Quit Digital Editions, if it's running
2. Plug in the Nook, and start ADE
3. ADE should recognize the Nook, and offer to associate with it. Make sure you can see the Nook under 'Bookshelves' on the left. Ok!
4. Go to the Lending Library and borrow a book in pdf or epub format.
5. If ADE is working properly, you should see your book!
6. Next, go to 'Library View' in ADE – in the upper left.
7. In the Library View, drag your new book over to the Nook icon under 'Bookshelves.'

8. Quit ADE and eject your Nook.

To read on the Nook:

1. Go to your Library (on a Nook Color, do this by touching the bottom of the touchscreen)
2. Go to 'my files' – at the top – and open 'Digital Editions'
3. Open your book! (if it says 'sorry, can't open this book', try again.)

To return your book early so that others can borrow it:

1. Quit ADE if it's running
2. Plug in your Nook and start ADE
3. Open 'Library View' and click 'All Items' on the left
4. On your book icon, there's a drop down menu (a little triangle) in the upper left – select 'Return Borrowed Item'
5. Open the Nook, in the bookshelf area on the left.
6. On your book icon – select 'Return Borrowed Item'.
7. Your book should now be available to borrow again!

If you run into trouble, **here's a forum** on the Barnes and Noble site about how to get ADE working with the Nook.
Here are instructions on how to do this from Barnes and Noble.

Can I return a library book early?

Yes, usually. If you borrowed a BookReader edition, simply return it from your Loans page.

If you downloaded another type of ebook, you'll need to do that through Adobe Digital Editions. If you checked out your book with other software like Overdrive Media Console or Bluefire Reader, you will not be able to return your book early.

In Adobe Digital Editions, look for your "library". That's the book spines icon in the top left corner of the application (1). Once you're in your library, click on the menu for book you'd like to return which is behind the tiny triangle that appears by the book cover (2) and select "Return Borrowed Item" from the menu (3). This image will show you where to look.
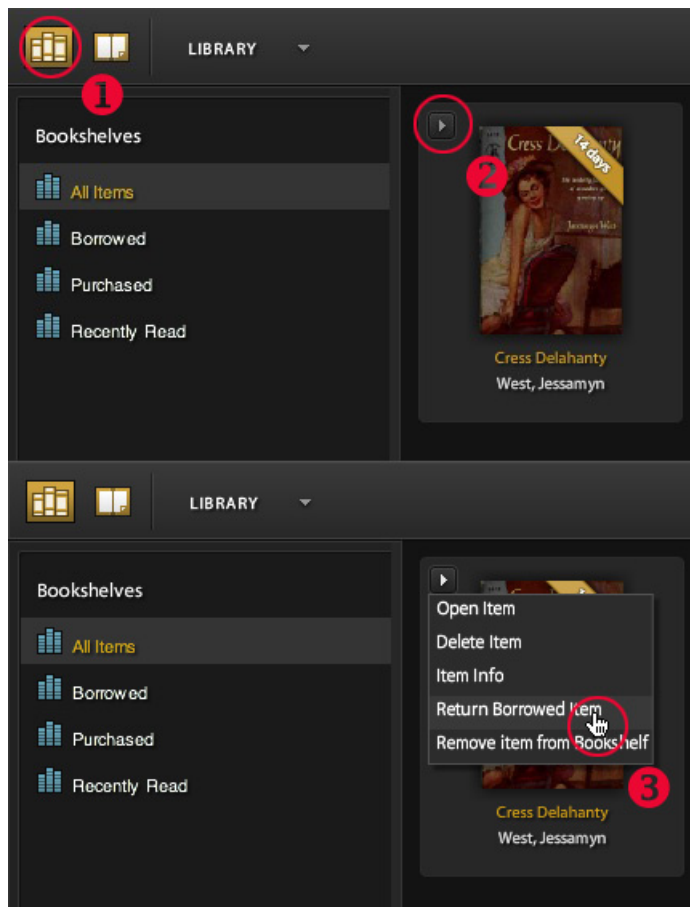
You may also be able to right-click on your item and select "Return Borrowed Item" from the contextual menu. Here is a screenshot of this option.
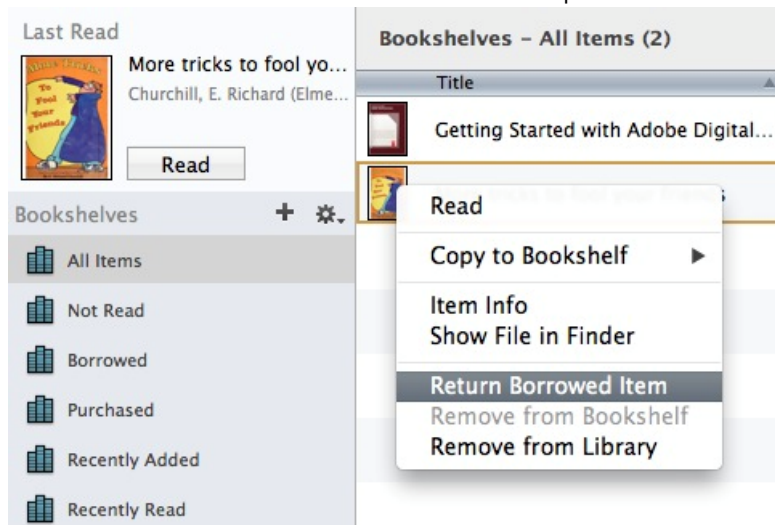
If you used other software to access your book, you may not be able to return it early but the item will be automatically returned at the end of the loan period. Please contact us if you are having trouble returning your items.

Questions

- How do I specify an image for my page?
- How do I link to a specific audio track?
- How do I add cover art?
- What are the other non-audio format files that were derived?
- How do I control the order of tracks in the playlist?
- What is the squiggly line in the player?
- How can I adjust the volume in the player?
- How do I embed the player?
- How can I play ogg or lossless formats (flac, wav, aiff, shn) files?
- How do I change the titles in the track playlist?
- Can I upload a zip file of audio tracks and have them be playable?
- Should I use the html5 or Flash player?
- How can I play a downloaded audio track?
- What is the bitrate of derived audio files?
- What kind of audio file should I submit?

Audio

How do I specify an image for my page?

Once you've uploaded it to the item follow this clickpath: Edit > change the information > scroll down to Files, formats and derivations > in dropdown menu next to the image file choose "Item Image" > click the "Submit" button.

How do I link to a specific audio track?

You would need the URL of the file to link to it. To get that click "SHOW ALL" link in the DOWNLOAD OPTIONS section of an item's details page. There you can control/right-click on the link to the file and copy the URL.

How do I add cover art?

An uploaded image file will automatically be displayed to the left of the audio player. Ideally the image would be at minimum 750p wide. Images should be jpg, png or gif format.

What are the other non-audio format files that were derived?

These files are important for the display/setup/research of items.
Columbia Peaks-.afpk are audio fingerprint files created by running the audfprint package by Prof Daniel Ellis from Columbia University. These can be bulk downloaded and then loaded into a database that allows matching clips and whole songs. We have not tried this at scale. if you are interested, please let us know-- we want this to happen.
esslow/esshigh-These are a series of analyses of the nature of the music.
spectrogram-a file derived from audio data the is a visual representation of the audio. it can be used by researchers and others to analyze audio data.
waveform-a derived image file that is a visual representation of the volume of the audio track.
_rules.conf-If you selected to not have lossy files derived this file will appear in the item directory.

How do I control the order of tracks in the playlist?

The order of the playlist is determined by the alphanumeric order of the file names, not the titles. To force a desired order you can add number prefixes to the file names. Always use the same amount of digits for the prefix so if there are more than 10 start with 01, more than 100 start with 001. As an example: 01trackone.flac 02tracktwo.flac 03trackthree.flac etc.

What is the squiggly line in the player?

The is a spectrogram representation of the volume of the audio track. It can be helpful to spot silences between sound or particularly loud or quite sections. This can help you locate sections you might want to find without having to listen to the entire track. It is not scrubbable. Move the play bar to move to another section of the track

How can I adjust the volume in the player?

At this time the volume is an on/off toggle. To control the volume use the volume adjust on your computer or device.

How do I embed the player?

Click the "Share" icon near the player. A popup window will offer URLs for embedding. For more advance options click the "Advanced embedding details, examples, and help!" link at the bottom of the popup.

How can I play ogg or lossless formats (flac, wav, aiff, shn) files?

There are many players available for these formats. Some are free, some are devices. Search online for ogg player or flac player to get started.

How do I change the titles in the track playlist?

Follow this clickpath:
Edit > change the information > scroll down to the "Files, Formats & Derivatives" section > enter a title in the "Title" field adjacent to the file name > click the "Submit" button

Can I upload a zip file of audio tracks and have them be playable?

For audio item files in compressed formats (zip, tar, etc.) will neither be derive to other formats nor be used by the audio player. You should upload the files as separate files.

Should I use the html5 or Flash player?

The html5 audio player is the default player. Some browsers may prefer to use Flash. Clicking the "lightning bolt" icon on the right side of the player will with it to a Flash based player.

How can I play a downloaded audio track?

There are many players available. Many come standard on devices such as Quicktime (Mac) or Windows Media Player (PC). You can search for others online. VLC is a nice and flexible free player for audio and video.

What is the bitrate of derived audio files?

VBR MP3 and ogg files that are derived from other formats are typically in the 150-200kbps bitrate range.

What kind of audio file should I submit?

The archive is all about free access to information, so you should submit file formats that are easily downloadable and/or streamable for other site patrons.

We prefer that you submit the highest quality file that you have available. We will attempt to create smaller file sizes and formats automatically with our deriver program. We recommend that you do not attempt to do any special encoding of your files - the more settings you mess around with, the less likely our deriver code will be able to process the file.

If you are submitting a Live Music Archive item, please only submit lossless formats such as flac, wav, aiff or shn files. Even for non-LMA items, these are the best formats to use.

Whatever format you choose, please upload each file to your item individually (you can submit multiple files per item), in a non-compressed format. Uploading content in a .zip or .rar file makes your item unstreamable and significantly less accessible to others. If you upload .zip, .rar, non-audio formats (like .exe), or password-protected files, they may be removed by our moderators.

This page lists the file formats we will attempt to derive depending on what type of file you submit.

Questions

MS-DOS Emulation

The Program is running WAY TOO FAST!

Some of the programs running in EM-DOSBOX relied on timing loops and CPU types that the emulator is not showing. We're working on a solution where we can pre-repair the speed before running, but until then, there is a fix: While the program is running, press CTRL-F11 to slow the program down. Pressing CTRL-F11 repeatedly will slow it down further, until the speed is more reasonable. (Pressing CTRL-F12 repeatedly will attempt to speed things up.)

I want to save my game! How do I do that?

Currently, there is no way to save your game, although we are trying to work out if this is technologically possible.

What is MS-DOS Emulation on the Internet Archive?

The Internet Archive's software collections have a number of in-browser emulators to allow limited access to software, by making the software play within (most) browsers. The majority of this is done with the JSMESS (Javascript MESS) system, which is utilized in multiple collections, such as the Console Living Room or the Internet Arcade. For one collection, the MS-DOS Software Library, we have implemented the EM-DOSBOX emulator, which is based off of the DOSBOX project and which is designed specifically for DOS-compatible programs.

I can see my mouse and the program's mouse.

In the programs where a mouse cursor is provided, your mouse will generally work. However, to prevent both mouse cursors (the DOS cursor and your computer's cursor) from being on the screen at the same time, select the **full screen** option.

I have questions or want to walk through a non-working program.

The MS-DOS emulation is part of the Software Library of the Internet Archive, which is overseen by curator Jason Scott Please mail him at jscott@archive.org with any questions, suggestions or discussions.

The program runs very slow.

The EM-DOSBOX emulator is a javascript program running in a browser - it requires a lot of CPU to run, and definitely requires the most up-to-date browsers to take advantages of speed enhancements. We highly suggest you update to the latest Chrome or Firefox to ensure the program runs at top speed. The difference between versions even a few months or a year apart can be multiple times. In a few rare cases, the game or program being run does certain video or programming tricks that confuse the emulator, and the whole program runs notably slow, slower than even a taxed system should run. This is due to incompatibility with the emulator, and unfortunately will require the DOSBOX project to improve emulation going forward.

It's not working for me. (Common Issues)

As it is experimental and very new technology, there are a number of places that the MS-DOS Em-DOSBOX emulator can fail to work.

- The most common is **browser incompatibility** - the EM-DOSBOX emulator works best in the Firefox and Chrome browsers, but also works in Internet Explorer and Safari. Bear in mind that only the most recent versions of these browsers will work best with EM-DOSBOX.
- If you do not see the DOSBOX Logo in the player, **be sure you do not have javascript blockers or ad blockers working on the page** - the player is created in Javascript.

- If the browser has slowdown issues or crashes, please let us know - there might be a MS-DOS program that is not compatible with EM-DOSBOX in a way our testing has not yet revealed.
- If the "spinning disk" after pressing SPACE to load the program never stops spinning, there is an error with the program image. Please let us know about the non-functioning program and we'll track down the issue.

These are the most common problems; be sure to contact the software curator if there are additional problems you are seeing.

My Favorite Game isn't in there! What's wrong?

There are multiple reasons the MS-DOS section might not have a game or application in its library. They include:

- The game requires a CD-ROM's amount of information to run. *Since this is an in-browser emulation, larger datasets (greater than 10 or 20mb) run into all sorts of issues when being loaded.* The size, not the use of a CD-ROM, is the core issue, so even disk-based games that used a lot of space are not being loaded up.
- The game, in some way, is not compatible with the EM-DOSBOX emulator. If we find the current incarnation of the emulator plus the version of the game is causing crashes, freezing or strange errors, we will likely remove the item just to limit frustration for users - there's nothing more bothersome than trying to track down a problem that could be anything from your browser to a strange programming choice made 25 years ago.
- The game is still for sale. Happily, a number of vintage DOS programs have been updated, fixed for compatibility, and continue to be sold at a deep discount to a modern audience. Sites that provide sales to these updated DOS versions include Good Old Games and Steam.
- Finally, we may simply not be aware of the application or game and not have an example of it. We're always adding more programs as we can.

Questions

How do I edit metadata of my item?

How do I find Torrents on the Archive?

Can I download only part of an item using an Archive BitTorrent?

My Torrent download never completes?

My Torrent download never starts?

How do I tell if a Torrent is being seeded?

Does the Internet Archive run trackers?

How do I use Torrents to upload to archive.org?

How is the Internet Archive using BitTorrent?

How to prevent an Archive Torrent from being made

Why is the Torrent link for an Item lined out (~~Torrent~~)?

What are peers, seeds, leechers, and snatches?

Archive BitTorrents

How do I edit metadata of my item?

For existing items use this clickpath from the item's details page:
Edit > change the information > modify/add metadata as desired > click the "Submit" button at the bottom of the page.

You can only modify items that you created.

How do I find Torrents on the Archive?

You can search and browse all our Torrents on the Torrents collection homepage (or one of the media-specific subcollections).

To narrow your own Search or Advanced Search query, add *format:"Archive BitTorrent"* to your search terms, e.g. https://archive.org/search.php?query='scifi AND mediatype:audio AND format:"Archive BitTorrent"'.

The most popular and recent Torrents are available on each tracker's hotlists, e.g. bt1.archive.org Hot List.

Can I download only part of an item using an Archive BitTorrent?

Yes, almost all contemporary BitTorrent clients allow you to select which files included in the Torrent are downloaded. And even when you download only one or some files, you get the speed advantages of using the format.

Many show a list of the files contained in the Torrent, and both folders and individual files can be selected or deselected both before, and during, download.

It is recommend, in fact, that you deselect the top-level directory within the Torrent named **._____padding_file** if there is one, as this contains unnecessary (empty) Internet Archive padding files.

My Torrent download never completes?

Most likely, you have an out-of-date Torrent for the Item you are trying to download. The first thing to try is re-downloading the Items' Torrent, and trying again.

Torrents for Items on the Internet Archive can become obsolete when the Item the Torrent is for changes. In that case, some or (more rarely) all of the files within the Torrent will fail to download completely.

This is because our Torrents rely heavily on webseeding (download directly from our servers, when no peers have the files you are seeking). When files on our servers have changed since the Torrent was made, they will not match expected 'piece hashes'; **some BitTorrent clients (e.g. Transmission) will attempt to re-download file pieces from changed files over and over, forever, assuming there was an error in transmission, when in fact the file has changed**.

Torrents that never download at all most likely are the result of a different problem, lack of client support for Getright-style webseeding.

My Torrent download never starts?

It's worth mentioning that **some BitTorrent clients take a very long time to begin downloading when relying on webseeding** (a common requirement when using Archive BitTorrents). At times downloads can take upwards of several minutes to start.

We're not sure exactly why; we suspect those clients exhaust all other options, such as DHT, before falling back on webseeds. (We have observed this behavior with Transmission.)

If you download an up-to-date (current) Torrent from the Archive, and it loads into your BitTorrent client, but download **never** begins, the most likely cause is that you are using a BitTorrent client that does not support Getright-style webseeding.

Our Torrents rely heavily on webseeding (download directly from our servers, when no peers have the files you are seeking). **Some BitTorrent clients (e.g. rTorrent) do not support Getright-style webseeding, and will not be able to download un-seeded Internet Archive Torrents**.

At the moment, the only solution to this problem is to use a different client.

Another possibility is that your Torrent file is out of date, because the Item has moved to a new server, and your client does not support redirection of our canonical webseeding URL (and no tracked or discoverable peers are seeding the Torrent).

In this case, the problem can be solved by re-downloading the Torrent file.

How do I tell if a Torrent is being seeded?

Current seed and leech counts are displayed for each Archive Torrent on the relevant Item details pages, in parenthesis next to the *Torrent* link. These values are cached for five minutes or so, and because clients do not always update our trackers regularly, they may be somewhat out of date.

The number of seeders is shown first, and the number of leechers (downloaders without the complete Torrent) second. The seeder number includes 'webseeds,' however, which are only usable by BitTorrent clients that support Getright-style webseeding.

Does the Internet Archive run trackers?

Yes, Internet Archive torrents are tracked by bt1.archive.org and bt2.archive.org.

We are using opentracker, which has proven to be highly scalable.

Our trackers are closed (they track our only own torrents).

How do I use Torrents to upload to archive.org?

Retrieval of Torrents is not the best solution for uploading unless you already have an existing mechanism for creating and seeding Torrents.

This capability is not intended as an alternative to our uploader. It merely enables the Archive to capture material already being distributed via BitTorrent.

Torrent retrieval by the Archive works like this:

If a valid .torrent file is uploaded (e.g. through our Uploader) into an item, when that item is derived, we will instantiate a BitTorrent client (Transmission) and attempt to retrieve the Torrent. If the Torrent is successfully retrieved, its contents will be added to the item. 'Valid' in this case means, well-formed and seeded.

Our client will attempt to scrape any listed trackers to find seeding peers, but will also attempt to find peers via DHT and can fall back on Getright-style webseeding when possible.

The Torrent file itself is leeched only long enough to retrieve the file; we do not seed the Torrent after retrieval.

However, all items contents, including those retrieved through this method, are made available via the item's own Archive Torrent. (Because it contains additional contents, this Archive Torrent will, alas, have a different infohash from the original Torrent. So uploading a Torrent to the Archive does not make us a seeder of it.)

Bonus feature: if you have only a magnet link, and not a Torrent file, you can create a dummy .torrent file by pasting that magnet link into a text file and naming it foo.torrent.

If you upload this dummy Torrent file, we'll detect that you gave us a magnet link and take care of the rest.

How is the Internet Archive using BitTorrent?

Downloading Internet Archive Content

As of summer 2012, the Internet Archive is beta-testing the distribution of our public collections via the BitTorrent protocol (as a supplement to traditional HTTP download).

Currently over 1.4 million Archive Items are available via the BitTorrent protocol, comprising almost a petabyte of public domain materials.

As testing continues, more and more content will be made available through Torrents. For the details, see the related FAQ, Details of Archive-made Torrents.

BitTorrent download requires an up-to-date BitTorrent client.

For general information on the BitTorrent protocol, see Wikipedia or BitTorrent.com.

Uploading BitTorrents to the Internet Archive

Starting in 2011, the Internet Archive began automatically retrieving BitTorrent files uploaded into most Community collections.

Uploading a Torrent provides a convenient way to upload many files or large contents, provided seeds (including webseeds) are available for the Torrent.

How to prevent an Archive Torrent from being made

Internet Archive BitTorrents are automatically made for community-contributed items in many collections, and automatically updated when item contents or metadata change.

If you prefer that your item **not** have an Archive Torrent made for it; or that items within a collection you maintain do not, you can prevent Torrents from being made by including the following metadata tag in your item:

    noarchivetorrent=true

Note: adding this tag does not remove existing Torrents, those must be removed using the Item Manager item file management tool.

For instructions on how to edit an item or collection's metadata, see the FAQ Uploading Content.

Why is the Torrent link for an Item lined out (~~Torrent~~)?

While an Item is being updated, its Torrent link is **<u>temporarily</u>** disabled and shown as ~~Torrent~~.

Changes to an item usually render any existing Archive BitTorrent for it obsolete. Attempts to download obsolete Archive Torrents will usually fail, as described here: My Torrent download never completes?. (Technically, the problem is that when files within an Item change, they can no longer download correctly via webseeding because the piece hashes for updated files change).

<u>The Torrent link will return to normal when the Item finishes updating and the torrent is updated</u>. The Torrent link may be unavailable for a few minutes or a few hours depending on the size of the Item and how busy the Archive processing cluster is (in very rare cases, it might be disabled for a day or more).

Note: obsolete torrents will continue to be tracked by Archive trackers for some time, but will only be retrievable when seeded by peers who have downloaded the referenced version of the item.

What are peers, seeds, leechers, and snatches?

BitTorrent is a peer-to-peer file-sharing protocol facilitated by centralized trackers. The

Internet Archive runs several BitTorrent trackers to allow for peer discovery.

Archive trackers track (**<u>but do not log or otherwise record</u>**) which peers have pieces of which Torrents; real-time statistics are summarized on tracker hotlists for each of our Trackers.

<u>Internet Archive tracker statistics of interest include</u>:

- **Peers**: the total number of clients known by the tracker to have pieces of a Torrent, i.e. the sum of seeds and leechers.

- **Seeds**: the number of clients known by the tracker to have *all* of the pieces of a Torrent available, i.e. those which have downloaded the entire Torrent but remain online.

- **Leechers**: the number of clients known by the tracker to have *some* of the pieces of a Torrent available, i.e. those currently downloading the Torrent.

- **Snatches**: the number of clients known by the tracker to have downloaded a given Torrent, but which are not currently seeding it.

Note: Internet Archive seeder and peer counts include webseeds; these seeds are available only when using clients that support Getright-style webseeding.

Questions

How do I bookmark an item?

What is the "Summary of " link above the graph on the calendar page telling me?

What is GDPR?

How do I create an account?

Can I find sites by searching for word specific to that site?

How do I retrieve my password?

Where is my account information?

How can I change my account information?

How can I delete my account?

If I delete my account will all my uploads be deleted?

I changed my email address and now I cannot access my items?

How do I add an avatar image to my account page?

Where are my favorites?

How do I add an avatar image to my favorites page?

I changed my user name but the identifier of my account page did not change?

If I change my screen name will it change on my reviews and forums posts as well?

Why is my account locked?

Why did my login fail?

Accounts Information

How do I bookmark an item?

Bookmarks are now referred to as "Favorites". To Favorite an item click the star icon that is in the top right area of an item details page to the right of the player.

What is the "Summary of " link above the graph on the calendar page telling me?

It shows you the breakdown of the web captures for a given domain by content type (text, images, videos, PDFs, etc.) In addition, it shows the number of captures, URLs and new URLs, by year for all the years available via the Wayback Machine, so you can see how a certain site has changed over time.

What is GDPR?

The EU General Data Protection Regulation (GDPR) builds upon and modernizes existing EU Data Protection and Privacy rules. We operate under a terms of service, copyright policy and privacy policy, that are available here. Please read these.
As a library, the Internet Archive has, in the words of the GDPR, a "legitimate interest" in building collections, providing permanent public access, and maintaining archival integrity.
In general, the Internet Archive, well, *archives* digital and physical materials that we collect ourselves or is contributed by users based on their uses of our services. This includes collecting available provenance information such as uploader and dates. We try to keep everything forever and try to make everything available publicly, and if not publicly, then at least to researchers, historians, and scholars. That is how we see our job.
Updating, deleting, and exporting account information is available to each user, not limited to residents of the EU. If you have uploaded things to the Internet Archive, you can find a list of them from the "my library" link on your settings page. From there, you can download the items and take them anywhere.
We use limited automated techniques to reduce spam and limit damage to our services. We hope to increase these in the future. Users that object may write to info@archive.org.
Our collections reside on servers in many locations in order to keep them safe, and data may be processed outside of the European Economic Area.

How do I create an account?

You can create a new account at the Create An Account page. Once you create an account you should receive a verification email (please check you spam/trash filed if you do not see it in your inbox). If responding to the verification email fails to activate your account please let us know by emailing to info@archive.org.

Can I find sites by searching for word specific to that site?

Yes, by adding in "site:" your results will be restricted to the specified domain. E.g. "site:gov clinton" will search for sites related to the term "clinton" in the domain "gov".

How do I retrieve my password?

On the login page you can click the "Forgot password?" link or go directly to

Where is my account information?

Follow this clickpath:
Click your screen name in the top black navigation bar > click "My Library" in the drop down menu > click "Settings" in the upper right.

How can I change my account information?

Follow this clickpath:
Click your screen name in the top black navigation bar > click "My Library" in the drop down menu > click "Settings" in the upper right > under "Account Settings" enter your password and click "Change Account Settings".

How can I delete my account?

Follow this clickpath:
Click your screen name in the top black navigation bar > click "My Library" in the drop down menu > click "Settings" in the upper right > under "Account Settings" enter your password and click "Change Account Settings" > click the "Delete Account" button.

This cannot be reversed.

Note: deleting your account will NOT remove any pages you created on the site. To do that you would need to send a request to info@archive.org.

If I delete my account will all my uploads be deleted?

No. Deleting your account will NOT remove any pages you created on the site. To do that you would need to send a request to info@archive.org. Please send it from the account email address if possible. Otherwise, please offer an explanation as to how we might verify that this is/was your account.

I changed my email address and now I cannot access my items?

To have existing items associated with a new account email address please email us at info@archive.org. Please include your previous email and the new email addresses.

How do I add an avatar image to my account page?

Simply drag an image over or mouseover the icon on your "My Library" page > click "Submit > wait for tasks to run and then refresh the page

Where are my favorites?

Follow this clickpath:
Click your screen name in the top black navigation bar > click "My Favorites"

How do I add an avatar image to my favorites page?

Simply drag an image over or mouseover the icon on your "My Favorites" page > click "Submit > wait for tasks to run and then refresh the page

I changed my user name but the identifier of my account page did not change?

The identifier of your account page is permanently established when you create your account. It will not change even if you change your screen name.

If I change my screen name will it change on my reviews and forums posts as well?

No. They will retain the screen name you had when you wrote the reviews and/or posts.

Why is my account locked?

Accounts may be locked for a variety of reasons including violating the Terms of Use.

Why did my login fail?

If your login in fails please be sure:
1. You are using the email address of the account rather than your screen name.
2. You keyed in the email exactly as originally used to create the account. The login is case sensitive. Check to be sure your Caps Lock is not engaged.
3. If you believe you may not have the correct password you may click the "Forget password?" link to have email sent to you with instructions to create a new password.

Questions

How can I remove a favorite?

Where is the upload button?

Where is my account information?

Where are my bookmarks (favorites)?

Where are forums?

Where is a collection's full description?

Where are the 'most recent uploads'?

Where are the "picks" and "recommended items?

Navigation

How can I remove a favorite?

Use this clickpath: Click the "My Favorites" link in the black bar at the top of the site > click "Remove items" in the upper right of the page > use the red "X" on each item to remove it > Click "Remove items" again to turn off the functionality.

Where is the upload button?

The upload icon (the up arrow) is located in black top navigation bar on the right side.

Where is my account information?

Follow this clickpath: Clicking your "Screen Name" in the top black navigation bar > click "My Library" > click "Settings".

Where are my bookmarks (favorites)?

Bookmarks are now called favorites. To find them use this clickpath: click your screen name in the black top navigation bar > select "My Favorites"

Where are forums?

Use these clickpaths:
• On a collection page click the "Forum" tab (example:archive.org/details/americana&tab=about)
• The 50 most recent forum post on the entire site: archive.org/iathreads/posts-display-new.php?limit=50
• A list of all forums is at archive.org/iathreads/forums.php

Where is a collection's full description?

On a collection page either click "More" at the bottom of the description summary or, click the "About" tab

Where are the 'most recent uploads'?

This feature is limited to the top media types. Use this clickpath:
Click a mediatype (texts, audio, movies, software) icon in the black top navigation bar > click the "This Just In" link under "Featured" (Example)

Where are the "picks" and "recommended items?

At this time that feature is not part of archive.org

Questions Live Music Archive

Can I upload live recordings that were broadcast on XM Radio or Sirius Satellite Radio?

At this point in time, Archive.org cannot host recordings that were broadcast over either of these services. Subscribers have informed us that they were required to sign a "Terms of Use" document that forbids the recording/hosting/rebroadcasting of any material received from these services. Until we hear otherwise, thes recordings cannot be hosted here.

A recording I uploaded and marked 'no lossy formats' had them created (mp3, ogg, m3u, etc...) . How I remove them?

If you come across this situation and you are the uploader, click [edit], select the derivation option you prefer then 'Update'. You should see the message "Format Options Updated Successfully". Within 10 minutes the system will create a "_rules.conf" file in the recording's folder. Then, the next time the system performs an automatic sweep looking for changes, it will notice the new rules file and remove the lossy files automatically sweep occurs approximately twice a day, so you should see the files removed within 12-24 hours.

If you are not the uploader, send us an email (etree at archive dot org) and an admin will remove them.

How do I search for an artist by date of the concerts?

As an example I'll search for Del McCoury: start at https://archive.org/details/etree type "Del McCoury in the "Search this Collection" text field on the right side and hit return. I prefer list view so I click the icon (the four stacked horizontal lines) all the way on the right side of the "SORT BY" bar. And, I check the "SHOW DETAI box to show more information. Now I've got results for Del McCoury in the Live Music Archive at https://archive.org/details/etree?&and[]=Del%20McCoury Now click the "DATE PUBLISHED" link in the "SOF BY" bar above the results. Now I've got them sorted by concert date from newest to oldest at https://archive.org/details/etree?and[]=Del+McCoury&sort=-date To reverse the order click the Up/Down arro just to the left of the words "SORT BY in the "SORT BY" bar. Now they concert dates are from oldest to newe https://archive.org/details/etree?and[]=Del+McCoury&sort=date

Why is a .txt file required?

The .txt file is used by the LMA collection to populate metadata in the item, especially the titles of tracks in th playlist. Please be sure it is a .txt file and not another text format.

Should I upload checksum files like MD5 or ftp?

We no longer require nor desire checksum or fingerprint files. Often they cause problems when files are chai in the item. Systems have improved to the point where we no longer see checksums as necessary to verify accurate upload/download.

Can I upload concert videos?

At this time, video uploads are not being accepted, namely because most of the bands archived prohibit the taping of their shows. Moreover, unlike audio, where we actually have a shot at archiving the vast majority of given band's live concerts (in very high quality format), video is scarce and, unless made by the artist (in whic case, it's typically for commercial purposes), is not of particularly good quality.

There's no set list for this show, or, The set list does not match up with the number of files. Should I submit an error report?

There has been an increasing number of shows uploaded to the Live Music collection without set list informa or the set list was not properly matched to the files. When you notice a recording like this, please email us (e at this domain) **only** if you have an updated set list, or you are able to match the files up correctly.

We would prefer that you do not submit error reports letting us know that there is no set list - tracking down s lists for every concert and matching them up to the recordings is a monumental task that has grown beyond capabilities of the small group of Archive.org admins. We would like fans that are familiar with each artist's material to help us with this project - in your email, please give us specific instructions on what changes to m and we will do so.

The progress of my upload says 'File metadata XML invalid. Waiting for user to correct.' How can I fix this?

Can bands place restrictions on material to be archived?

Do you provide an RSS feed of new updates to the LMA?

What does the 'Transferred by' field mean?

Regarding removing the lossy files ... I edited my show, checked the box to remove them and clicked update. Now when I click update again, the box is still not checked. Why?

Where can I find other recordings by [trade-friendly band] that aren't in the collection?

What are the options for streaming a full recording?

What file formats are accepted for contributions to the Live Music Archive?

I like adding concerts. Do you have a

I'm an artist who would like to be included in the Archive, what do I need to do?

We'd love to have you! Just write to us at etree at archive dot org in English giving some kind of permission f to archive your shows for public download and noncommercial, royalty-free circulation. It does not need to be formally worded declaration, and can come from anyone you feel has the "say-so." We just need to be clear how you feel about the project. We will put relevant quotes onto a new "collection" page (examples) for your performances, along with a link to your official website.

It is necessary for you to email us at etree at archive dot org in order to create a new section. We want to be that the go-ahead really is coming from you. Please do not attempt to create your own collection, or to uploa of the band's shows, in advance of receiving an emailed confirmation message from curators; such attempts significantly complicate or delay the curators' setup process.

You can give as much or as little scope for archiving as you like. Some bands place limits on what can be hc and we can accommodate those. Archive Curators, volunteer fans who have proven to be in line with the spi this archive, will attempt to screen contributions for OK'ed material only.

At the same time you give the go-ahead, feel free to pass along any notes or policy links on your general taping/trading stance as well. You don't need to have a formal written or posted policy before inclusion, but w like to know how you feel about the topic.

Besides fans sending their copies of your shows, you can also prepare and upload your own live recordings Archive, if you like. In fact, if you'd like to limit your material to selected contributions from you only, please ju us know.

If you have any questions about the project, please ask us anytime at etree at archive dot org.

I have a different source for a show that is already in the archive, should I upload it anyway?

Yes! In keeping with the nature of this Archive, it is appropriate for multiple sources of the same show to be available for download. When you upload the new source, be sure to name the source in the show's top leve folder to avoid confusion. Some bands do place limits on the types of sources allowed (such as soundboard recordings), so please check the policy for any given band.

The progress of my upload says 'File metadata XML invalid. Waiting for user to correct.' How can I fix this?

This is typically caused by illegal symbols being used somewhere in the information that was put into one of forms submitted with the show (either the import form or "File Options"). Double check that the only characte used are those visible on a standard English-language 104 key keyboard. More information and a few exam; are here.

If you have trouble finding the cause, please post to the forum for help. An admin will have to resubmit the recording for another try, so please send an email including a link to the recording to etree AT archive DOT c you believe you have cleared the issue.

More information on what XML files are and how they are created can be read here.

Can bands place restrictions on material to be archived?

Yes. Each band can tailor the extent of their permission to the Archive. We quote the band's wishes in the Ri section of the band's Collection page. Here are some examples of special restrictions bands have requested point out different cases in a band's policy information using a shorthand "Limited Flag" tag.

We have a contribution system set up to accommodate individual bands' requirements. During the upload process, contributors are urged to double check the band's policy notes at different stages. Archive Curators volunteer fans who have proven to be in line with the spirit of this archive, will attempt to screen contributions approved material only. In addition, access to a particular item can be removed if it becomes restricted later example, a date newly chosen for commercial release must be removed under some band's policies).

preference on the way I put in information?

Bands, please contact us at etree at archive dot org anytime to let us know how we can work with you to mal things happen.

Where can I see the rest of the 'Most Downloaded Items' in the Live Music Archive?

I have more Live Music Archive questions...who do I ask?

How can I add a logo to my collection page?

How do I upload a show to the LMA?

How are view (download) counts calculated?

What is the Live Music Archive all about?

What are the options for downloading a full recording?

How can I help get bands into the Live Music Archive?

How do I make corrections to shows?

Do you provide an RSS feed of new updates to the LMA?

Indeed! The URL of the feed is http://www.archive.org/services/collection-rss.php?mediatype=etree&collection=etree You can plug this into a front end like AmphetaDesk (available at: http://www.amphetadesk.com)

What does the 'Transferred by' field mean?

This field indicates the person who did the original DAT/MD/Cassette to WAV conversion. Also, note that in t case of recordings made directly to laptops there is no transfer.

Regarding removing the lossy files ... I edited my show, checked the box to remove them and clicked update. Now when I click update again, the box is still not checked. Why?

It takes 2-10 minutes for your checking of that box to 'stick' ... see this discussion board post: http://www.archive.org/iathreads/post-view.php?id=22816 for an explanation of why.

Where can I find other recordings by [trade-friendly band] that aren't in the collection?

If the artist is OK with Internet trading, you may be able to find downloadable recordings through http://bt.etree.org. Also, check http://db.etree.org to find people who have copies of shows and who may be to trade. Etree.org has additional trading forums at http://forums.etree.org Lastly, you can check out a band's fan forums and mailing lists. Good luck!

In contrast, the Live Music Archive forum at the Internet Archive is *not* a good place to post about trades, or t for shows that are not yet archived here, whether or not the band presently has a section here. Moderators n delete these posts. More posting etiquette tips for that forum are here.

What are the options for streaming a full recording?

Hi-Fi: An MP3 playlist, readable by most players, that has the addresses of MP3 files encoded with a variabl rate.

Lo-Fi: An MP3 playlist, readable by most players, that has the addresses of MP3 files encoded with at a con bit rate of 64 kilobits per second. These files are ideal for users with slower Internet connections.

What file formats are accepted for contributions to the Live Music Archive?

Currently, the Live Music Archive will only accept lossless audio files in these formats: flac, aiff, wav or shn.

Do not upload the lossy files (MP3 or OGG) next to your lossless format files. The derive task creates those automatically, provided that the contributor agrees to having them available. This ensures that all the files he have uniform quality options selected.

Please follow etree.org's Seeding Guidelines when preparing your contributions for addition to the collection. particular attention to the Naming Standards section. A well-named identifier helps patrons find your show in large collection. A well-named set of files allows files to be listed in the proper order at the site, and allows pa to listen to them in playlists and burn them to CD in the proper order, too.

I like adding concerts. Do you have a preference on the way I put in information?

Yes, here are some guidelines that will help us maintain good records for each concert.

- Do not include HTML in the source and lineage fields.
- Do not repeat information in the notes fields (such as source information, or number of discs). Only in information in the notes fields that is not already in any other field.
- If at all possible, keep absolutely nothing but song names in the set list (even things like disc splits, se splits, etc. should not be in this field). If possible, putting all song names on one line, separated by con is wonderful.
- Do not fill in unknown field with questions marks or N/A - just leave them blank. The exception to this guideline is the venue, set list and source fields (which are mandatory) - in the event that this informat not known, simply write "unknown".

Once again, thank you so much!

Where can I see the rest of the 'Most Downloaded Items' in the Live Music Archive?

To view the entire Live Music Archive (everything in the "etree collection") sorted by 'Most Downloaded Items to this link: http://www.archive.org/search.php?query=collection%3Aetree&sort=-%2Fmetadata%2Fdownload

And here's one that lists everything but the Grateful Dead (like the one on the LMA front page):
http://www.archive.org/search.php?
query=collection%3Aetree%20AND%20NOT%20collection%3AGratefulDead&sort=-%2Fmetadata%2Fdown

I have more Live Music Archive questions...who do I ask?

Feel free to email etree@archive.org with any questions, and we'll do our best to post the answers here as s as possible. Also, the message board is a great resource; with so many helpful, knowledgeable folks out ther you can often get a speedy answer to your question.

How can I add a logo to my collection page?

Yes. Follow this clickpath: drag and image over the existing one next tot he band name > click the submit bu wiat for the tasks to complete > refresh the page.

These image formats will work: jpg, png or gif

The image you upload should be named identifier (where identifier is your item's identifier name) followed by format. So, identifier.jpg, identifier.png or identifier.gif will work.

How do I upload a show to the LMA?

Uploading instructions for the etree collections can be found at
https://archive.org/download/lmaupload/lmaupload.html

Before uploading any show<, read the band's policy notes for this site. Many artists place limitations on their material here, and info is often updated. Please do not upload shows for any band that does not yet have a curator-created collection page here, even if you know the band has recently emailed their permission. Adva attempts may significantly complicate or delay the curators' setup process for the band.

Next, be sure that you are logged in as an Internet Archive member. Have the fileset on your computer alrea correctly prepared and correctly named. Files **must** be in lossless format (.flac or .shn), from *lossless* parent source material; we will optionally create the extra "lossy derivative" copies (.mp3, .ogg) onsite.

How are view (download) counts calculated?

Views (formerly known as downloads) are calculated per item page, per IP address, per day. If you stream a today, that's one download. If you view the txt file tomorrow, that's another download. If you download every from a show's page the next day, that counts as one more download. If you download the same file a thousa times the day after that, that still only counts as one more download.

What is the Live Music Archive all about?

This audio archive is an online public library of live recordings available for royalty-free, no-cost public downl We only host material by trade-friendly artists: those who like the idea of noncommercial distribution of some of their live material. Live recordings are a part of our culture and might be lost in 100 years if they're not arcl We think music matters and want to preserve it for future generations.

The LMA draws strength from the members of etree.org and other online communities of music fans devotec providing public access to high-quality digital recordings of tradable performances. Typically, recordings are by the fans. Recordings are preserved in "Lossless" archival compression formats such as Shorten or FLAC is not Lossless) for highest quality preservation.

Patrons may download from the LMA with the understanding that the artists still hold their copyrights. All mat is strictly noncommercial, both for access here and for any further distribution.

What are the options for downloading a full recording?

Lossless: A ZIP file containing Shorten files or Flac files. Unlike formats like MP3, lossless formats are true original - there is no degradation in quality.

Hi-Fi: A ZIP file containing MP3 files encoded with a variable bit rate to deliver high quality at roughly 160kild per second.

Lo-Fi: A ZIP file containing MP3 files encoded at a constant bit rate of 64 kilobits per second. These files are for users with slower Internet connections.

Other Web Options: All files are displayed as individual links on any item's details page. Web-based downlo managers can be set up to download all the files you want from the page, as a group. For Firefox, the extens DownThemAll is a popular option.

BitTorrent: Some Items that are downloadable via HTTP are also downloadable via a BitTorrent client; thes items show a 'Torrent' link next to the 'HTTP' download link. (To trigger creation of a BitTorrent file for an iter the LMA that does not yet have one, write a review for it, e.g. "Make me a Torrent!"). *Note: only items downloadable via HTTP can be downloaded via BitTorrent.*

How can I help get bands into the Live Music Archive?

If you know of a trade-friendly live-performing band that is a good candidate for the Archive, you can initiate contact. Some tips and letter templates can be found here. When you write, make it clear you are asking abc the Live Music Archive at archive.org. Don't just ask about their general taping/trading stance. We want banc know what's up.

Next, follow up with a message to etree at archive dot org. Mention when you tried to contact the band and v contact point you used. These are important in order to update our contact records. Admins will update the contact status in an announcement forum about Pending Bands based on the message you send us.

If you receive a reply from the band, positive **or** negative, send a complete copy of the email, complete with i sender's address/brief header info, to etree at archive dot org. It's a good idea to send a copy of what you as them as well (if not quoted in the reply), since it will give context to the answer. We need to have full info in h in order to set up the band appropriately in the Archive, and we may need to contact them for follow up ques

If you are hesitant to make contact yourself, you can mention the band to Archive admins (send email to etre archive dot org) and they can try a contact as time permits. To help out, supply any contact or policy info you already know about the band.

How do I make corrections to shows?

Sometimes people make typos or other mistakes on uploads, or leave gaps in info that can be filled in later. can help supply good information for archived items. Here is the current best method to submit corrections:

If you uploaded the show, you can make the changes to the details page yourself. Make sure you are logged the user who uploaded the show and go to the details page of the show you are trying edit. Click on the "edit next to the band name at the top of the details page and you will be able to edit the show details including ve location, source, set list, etc. Be aware that editing these fields will only change the show details, not the files themselves.

If you uploaded the item and would like to replace or add to files within your item, under the current system tl can be done without reuploading the entire fileset. More description may follow; meanwhile there is a walkthr as a Word document with screenshots.

If you did not upload the show, please email the admins (etree at archive dot org), and state precisely what tl problem with that particular show is. If the problem is a missing set list, please see this FAQ). If there are one more missing or broken files that you can provide, please re-upload and re-import the entire show under a ne directory name, and then email us a link to the old, broken show, asking for that show to be removed.

Questions

How do I specify an HD derive?

How do I embed a movie?

Should I use the html5 or Flash player?

How can I link to a start in the middle of a movie?

Where is the hi-res file?

What is an editable file?

Can I stream the movies?

My movie doesn't start fast or buffers a lot?

Sometimes when I play a movie, the video is choppy or very pixelated. Why is that?

Why do I get errors when I try to play a movie?

Who owns the rights to these movies?

What movies can I upload?

What kind of movie file should I submit?

What are the archive.org encoding specification?

Can I change the static start image in the movie player?

How do I add closed captions?

Are there thumbnail images?

Movies

How do I specify an HD derive?

At this time we do not derive HD files. HD files need to be derived by our system for the HD button to appear in the player.

How do I embed a movie?

Click the "Share" icon near the player. A popup window will offer URLs for embedding. For more advance options click the "Advanced embedding details, examples, and help!" link at the bottom of the popup.

Should I use the html5 or Flash player?

The html5 audio player is the default player. Some browsers may prefer to use Flash. Clicking the "lightning bolt" icon on the right side of the player will with it to a Flash based player.

How can I link to a start in the middle of a movie?

To set a start time add ?start=XXX (where XXX is the start time calculated in seconds) to the end of the URL. At this time there is not a way to specify the end time.

Where is the hi-res file?

If a hi-res source file was uploaded it will be available in the DOWNLOAD OPTIONS section or by clicking SEE ALL.

What is an editable file?

An editable file is a file which can be downloaded and used in an editing program. The MPEG-4 are the highest bitrate versions we could do with the linux mpeg-2 to mpeg-4 conversion tools we use. These files can be read directly into FinalCut-Pro from Apple, and can be converted to mov using Quicktime-pro and read directly into iMovie from Apple.

Can I stream the movies?

There are several programs you can use to stream movies in the Archive. Because we allow users to upload video files in any format, the same player will not always work for every single file, so it's a good idea to have a couple of programs available that you can try. Also, some files simply can't be streamed. Usually, this happens when the program that created the video file uses a codec that our software doesn't understand. So if you click on a stream link and get an "unsupported media" sort of error, use the download links instead.

Here are some free players that might come in handy:

Quicktime
If you have Quicktime installed, many mp4 streaming movies will play right in your browser window just by clicking a stream (or download) link. Make sure you have the latest version so that you can play the widest array of files.

VLC Media Player
Open your VLC Media Player and go to File > Open Network Stream. Click the File tab and enter the **download** link of the file you want to watch. Yes, this seems backward, but it works!

So, if you were trying to stream the movie Duck and Cover found at http://www.archive.org/details/DuckandC1951 you would:
Use this URL:
http://www.archive.org/**download**/DuckandC1951/DuckandC1951_256kb.mp4

VLC will stream mp4, avi, mpg and other file formats, so it is quite useful for viewing the majority of the files in the archive.

Real Player
You can use Real Player to stream Real Media files.

We support two bitrates: 32Kbps-192Kbps for modem and ISDN users plus 256Kbps-450Kbps for DSL and cable-modem users.

My movie doesn't start fast or buffers a lot?

The in browser player typically uses an mp4 file. Most encoding (codecs) that are used do not add a "fast start atom" to the file to get it to start without the file having to load. If you are uploading an mp4 it is best to use .mpeg4 rather than .mp4 as the extension in the file name. That way our system will create an mp4 with the fast start atom.

Sometimes when I play a movie, the video is choppy or very pixelated. Why is that?

Try downloading the movie to your computer and watching it locally. Sometimes choppiness occurs when we can't stream it to you quickly enough (because your connection is slow or our servers are overloaded).

If you're watching an MPEG-4 that we derived from an original MPEG-2, we first reduce its size to 320 x 240 - a quarter of the resolution of NTSC video. We then translate it at 350 kbps, which is really borderline for that resolution. You see errors occasionally because there simply isn't enough bandwidth available, so the MPEG-4 encoder either drops frames - resulting in jerky or choppy motion - or drops macro blocks - resulting in blurred or pixelated video. That is the price we pay for the small file size - 80 MB for a 1/2-hour clip is really very small in the digital video world. If this is the case, download the original MPEG-2 to solve the problem.

Why do I get errors when I try to play a movie?

The best all-around, free player is VLC Media Player - it handles most of the movie files you will find on this site. If you're seeing errors when you try to play movies, please try downloading VLC and using that instead. This clears up many people's problems.

Here are some other possible problems:

1. There is heavy traffic to our site. If you experience a delay, please try again later or at a different time of day.
2. You're behind a firewall and the firewall software is attempting to modify incoming bits. Contact your network or firewall administrator.
3. Your Internet connection went down or timed out. Check with your ISP or network administrator to see if there's a special policy about keeping a connection live.
4. If your browser seems to hang after a "100% downloaded" message, check to see that you have sufficient hard-disk and TMP disk space. Rebooting the system sometimes helps.
5. You are trying to play an MPEG-2 file on a platform other than Windows or Linux. At present, you need VLC (http://www.videolan.org) or the for-pay quicktime6 add-on to play MPEG-2 files on the Macintosh. Please contact us at info at archive dot org if you have information about other players that work on platforms other than Windows.
6. Your player tried to stream the movie, and it isn't streamable. Download the movie first, and then play it. (Right-click > Save As)
7. Some conflict exists between your computer's configuration and the player you're using. Unfortunately, because PCs can be set up in so many different ways and because different standards exist for playing video, finding a player

that will work is a hit-and-miss process. Try Rod Hewitt's evaluations of a number of players.

If you still have trouble, post your question to the moving images forum.

Who owns the rights to these movies?

This will vary from movie to movie.

Many of the movies and collections are licensed with Creative Commons Licenses. Uploaders may designate whether or not an item has a CC License. If they do so, the Creative Commons logo will appear on the left hand side of the movie's detail page. Click on this logo to see details about the specific type of license that the uploader has assigned to the movie. Archive.org cannot guarantee the accuracy of uploader-provided information.

Some films may have the contact information listed for the filmmaker. If the information is provided, feel free to contact the filmmaker or organization the film comes from.

What movies can I upload?

You may upload movies that you own the copyright to, or that are in the public domain.

We are not copyright lawyers, and copyright is a tricky business, so you may want to consult a copyright researcher to clear material before you use it. You may also want to check this list of movies that one of our volunteers has already researched.

Here is some general information on the subject that may help you decide if your movie is okay to upload. The information below applies to films produced in the United States only.

1) **Is there a copyright notice visible in the film?** It is usually visible with the title or at the end of the film.

If the work was made in 1923 or earlier, it is probably public domain and can be uploaded. **NOTE!** Restored versions of the film or new soundtracks for silent films can have more recent copyrights that are still valid - usually a copyright notice for a new soundtrack or restoration will appear in the film.

For works made from 1923 to 1949, post a question to the movie forum on this site before you upload. The copyright could have been renewed and there isn't a way online to check a film's copyright status.

For works made from 1950 to 1963, you can check the title at the Library of Congress Copyright Database for copyright renewals: http://www.copyright.gov/records/cohm.html . This will list copyright renewals for most films.

If the copyright notice is 1964 or later, the copyright is probably still valid and the film should not be uploaded unless you are the copyright holder.

2) **Is the copyright notice in the correct format?** It needs to state three things - the word 'copyright' or the copyright symbol or '(c)', the year and who owns the copyright? If it is missing one of those elements or if there is no notice, it could be public domain. If you aren't sure, please post a question to the movie forum on this site.

3) **Is the film foreign (not from the U.S.)?** Foreign titles might not have a copyright notice, but still may be copyrighted in their country of origin. Traditionally the U.S. wouldn't recognize the copyright of a foreign film unless it was registered in the U.S. That has recently changed with the GATT treaty. Many foreign works had their copyrights restored. Please post a question to the movie forum on this site about these films before you upload.

What kind of movie file should I submit?

The archive is all about free access to information, so you should submit file formats

that are easily downloadable and/or streamable for other site patrons.

We prefer that you submit the highest quality format that you have available, and then we will attempt to create smaller file sizes and formats automatically with our deriver program. MPEG2 files are the easiest file type for us to deal with. We recommend that you do not attempt to do any special encoding of your files - the more settings you mess around with, the less likely our deriver code will be able to process the file.

Whatever format you choose, please upload each file to your item individually, in a non-compressed format. Uploading content in a .zip or .rar file makes your item unstreamable and significantly less accessible to others. If you upload .zip, .rar, non-video formats (like .exe), or password-protected files, they may be removed by our moderators.

The table on the Derivative Formats page shown below describes what file formats we will attempt to derive depending on what type of file you submit.

This is automatically generated.
NOTE: inner whitespace is significant.
(*) Some derivatives only apply to certain collections.

Derivatives for Movies Items

If your source file is format:	Cinepack	h.264	h.264 486P	h.264 720P	h.264 popcorn	MP3	MPEG2
3GP		🎞					🎞 (*)
56Kb QuickTime		🎞					🎞 (*)
64Kb MPEG4							🎞 (*)
64Kb QuickTime		🎞					🎞 (*)
256Kb MPEG4							🎞 (*)
256Kb QuickTime		🎞					🎞 (*)
512Kb MPEG4							
Cinepack		🎞		🎞 (*)			🎞 (*)
DivX		🎞		🎞 (*)			🎞 (*)
DV Video		🎞		🎞 (*)			🎞 (*)
Flash Video		🎞		🎞 (*)			🎞 (*)
FLV 400k		🎞					

What are the archive.org encoding specification?

You can find the specs we use for encoding in the "Additional info on audio/video derivatives" section

Can I change the static start image in the movie player?

That is not possible at this time.

How do I add closed captions?

You can upload a properly formatted .srt file for closed captioning. The file should be named IDENTIFIER.srt. If you have more than one language add the language to the file name e.g. IDENTIFIER_english.srt

Are there thumbnail images?

Yes. Once the video is started and file has sufficiently loaded you can see thumbnails by mousing over the playbar. They should pop up above the playbar.

Questions

How do I create a collection?

How do I add an image/logo to my collection page?

Why can't I add my item to any collection?

Can I add admins to my collection?

Where are sub collections/related collections?

Why is my item is not appearing in my collection?

How do I move an item into my collection?

Collections

How do I create a collection?

Collections can only be created for you by Internet Archive admins.

Because we receive so many requests for collections it is our policy to only build a collection for users who have a minimum of 50 items (an item is a web page) created on archive.org that are related and of the same mediatype. Once you have reached this threshold, please contact us and we would be happy to build a collection for your items. Until you have a collection your items will remain in a public opensource collection.

To create a collection we would need:
• The email address(es) of the account(s) that uploaded the content
• A list of the item links or a search query which will identify your items
• The name and a brief description (to be used on your collection page) of your organization and/or the material housed in the collection.
• A suggested identifier for the collection page (please use meaningful words and it should be 5-80 characters, letters and numbers only, no spaces or special characters)
• At least one Subject tag that describes the collection
• (optional) The logo you would like to display in the upper right hand corner of the collection page and items. Best if it is at least 500p x 500p or, at least 500px wide or high.
• The archive.org account email address(es) that you would like to have administrative privileges for this collection (these addresses will be able to upload directly to the collection as well as edit information about the collection).

Once your collection is created any existing items will be moved to it and you will have admin priviledges to upload to it.

Collection requests should be sent to info@archive.org.

How do I add an image/logo to my collection page?

If you have an existing collection you can add or change the images on the collection page by dragging an image over the existing image to the left of the title or mouser the existing image and use "Select" to choose a file. Click "Submit", wait for the tasks to complete and refresh the page.

Why can't I add my item to any collection?

Except for the public collections (Community Texts, Community Audio, Community Video, Community Media) all collections are restricted to the uploader of the items in that collection. Internet Archive has also created some restricted collections. If you feel your item belongs in one of those collections contact us with your request to move it. Please include the URL of the item page.

Can I add admins to my collection?

Yes. Collections can have multiple admins. To add an admin please send us the email address of the archive.org account that you wish to be added. (Note: admins have editing privileges to all items in a collection regardless as to whether they uploaded it or not so please add admix with that in mind.)

Where are sub collections/related collections?

Sub-collections - when a collection has sub-collections you can find them by clicking the "collections" facet link in the right hand column

Related Collections - when a collection has related collections they are listed on the right in the "About" tab on the collection page

Why is my item is not appearing in my collection?

Typically there are two reasons for this:
1. The item was unintentionally uploaded to a Community collection
2. The item is not yet in the search engine. All item creation task need to run before it will be indexed. Indexing takes about 20 minutes once the tasks are complete. You can click the "History" link on the item page to check the status of the tasks. If all else fails please contact us rather than re-uploading. We can usually solve the problem.

How do I move an item into my collection?

Only Internet Archive admins can move items to other collections. Please contact us at info@archive.org. Please include the URL of the item to move and the collection to where it should be moved.

Questions

Downloading Content

How can I create an RSS feed?

RSS feed URLs can be crafted using an advanced search query: 1. Create a search query that returns only the items you want to be in the feed 2. On the results page click "Advanced Search" neat the top of the page 3. In the advanced search form in the "Advanced Search returning JSON, XML, and more" section select "RSS format:" and click the "Search" button. 4. The URL of the returned RSS feed page can be used for your feed.

Why can't I download "Stream Only" files?

These files are restricted to online use only and are not downloadable.

How do I bulk download?

At this time there are two methods to do bulk downloading. Both require some comfort working in a unix environment:
wget - please see http://blog.archive.org/2012/04/26/downloading-in-bulk-using-wget for guidance
python wrapper - the Internet Archive has created a python wrapper useful for many functions including bulk download. It can be found at https://github.com/jjjake/internetarchive

How do I download just one file?

Start on the item's details page. Use this clickpath:
Show All (in the Download Options section) > right-click or control-click on the link to the file to download > in the pop-up choose the "Save link as" option > Save file to your device

How do I download all the files in just one format?

Start on the item's details page. In the "Download Options" click the format you want to download. If there are multiple files in that format you will be prompted to download a zip file containing all the files in that format. If there is only one file in that format it will either open in your browser (a pdf for example) or download if it is a format that does not render in your browser (such as epub).

How do I download all the source/original files and metadata

Start on the item's details page. In the "Download Options" click the "[number] Originals" link in the lower right side. You will be prompted to download a zip file containing all the original files

How do I download all the files in an item?

Start on the item's details page. In the "Download Options" click the "[number] Files" link in the lower right side. You will be prompted to download a zip file containing all the original files

What are all the derived file formats for?

Generally speaking there are three categories:
Data files - for use by various devices for experiencing the media whether it is a book, audio file, movie, etc.
Metadata files - such as xml allow the item page to function on the site
Research files - such as spectrogram, fingerprint or checksum files

This page shows the files typically derived from the uploaded source files. (Note: The system will not derive a file format that is a duplicate of the source file uploaded. So if an mp3 is uploaded the system will not derive an mp3 from it.)

Why can't I download/view this book?

Due to rights issues some books may only be available in DAISY (Digital Accessible Information System) format. This format is specifically for text to audio devices for the print-disabled community. for more information on DAISY see https://archive.org/help/derivatives.php

Questions

Law Enforcement Requests

Does the Internet Archive have general guidelines for how it treats requests for non-public information about users from law enforcement?

Does the Internet Archive take a public stance on bulk surveillance by governments?

Does the Internet Archive release transparency reports about law enforcement requests?

Does the Internet Archive have general guidelines for how it treats requests for non-public information about users from law enforcement?

The Internet Archive requires appropriate legal process (i.e., subpoena, court order, or other valid process) before disclosing non-public user account information.

The Internet Archive requires a search warrant before disclosing to law enforcement the contents of non-public user communications.

The Internet Archive attempts to notify users about criminal subpoenas or other formal requests seeking their non-public data unless prohibited by law or if doing so would be futile or ineffective.

Does the Internet Archive take a public stance on bulk surveillance by governments?

Our position is that governments should limit surveillance to specific, known users for lawful purposes and not undertake bulk collection of non-public communications data.

Does the Internet Archive release transparency reports about law enforcement requests?

Below are the most recent report statistics:

Summary of Requests for User Data from US Law Enforcement for 2015	
Law enforcement requests for user data	3
Requests for which data was handed over	3
User accounts targeted	6
User accounts for which data was handed over	6
National security requests (NSL or FISA order)	0

Summary of Requests for User Data from non-US Law Enforcement for 2015 (includes requests submitted via MLAT)	
Law enforcement requests for user data	8
Requests for which data was handed over	5
User accounts targeted	12
User accounts for which data was handed over	5

Summary of Requests for User Data from US Law Enforcement for 2014

Law enforcement requests for user data	8
Requests for which data was handed over	8
User accounts targeted	13
User accounts for which data was handed over	13
National security requests	0
FISA requests	0

Summary of Requests for User Data from non-US Law Enforcement for 2014

Law enforcement requests for user data	6
Requests for which data was handed over	0
User accounts targeted	13
User accounts for which data was handed over	0

2013 Summary of Law Enforcement Requests for User Data to Internet Archive

Law enforcement requests for user data	3
Requests for which data was handed over	2
User accounts targeted	at least 3*
User accounts for which data was handed over	2
National security requests	0

*inadequate information submitted for one request such that # of accounts targeted unclear (counted as "at least 1") – user data was not provided for this request

Questions

The Internet Arcade

How is it Playing Arcade Games in my Browser?

The Internet Arcade uses a program called JSMESS, which is a Javascript port of the MESS and MAME emulator projects. MESS/MAME have been developed over nearly 20 years and are able to emulate hundreds of computer systems and thousands of console and arcade games. A volunteer group has been able to convert MESS/MAME into pure Javascript and make it run in most modern browsers.

What is the Internet Arcade?

The Internet Arcade is a collection of emulated arcade games from the 1970s-1990s that can be played in your browser. It is located here. There are similar collections of playable console games (the Console Living Room) and general computer software (the Software Library).

What Plugins are Needed?

There are no plugins needed to run the Internet Arcade. It uses 100% Javascript (not to be confused with Java), which is a scripting module inside all modern browsers that has great flexibility for running code, playing sound and video, and doing everything necessary to provide an arcade game in a window. Ironically, if the system is not working for you, a plugin may be preventing it: there are a number of plugins, such as NoScript, which automatically turn off Javascript processing for a site and require you to turn it back to run. If that is the case, the Arcade will not function - please enable Javascript on archive.org to run the Arcade.

How do I Play a Game on the Arcade?:

In each entry for a game on the Arcade, you are taken to a page with a description of the game, and a screenshot in the right-hand corner of the gameplay. A line underneath the screenshot says **"Run an in-browser emulation of the program"**. You can click on the screenshot or the word "Run" to go to the Player page. On the Player page, you are shown a box and underneath it controls for Fullscreen, Mute/Unmute, Dark Background, and possibly others. Inside the box, there should be a MAME or MESS logo. Clicking inside this box, or hitting the spacebar, should start a disk icon spinning and the program will load. When the program is finished loading, the disk icon will stop spinning and the box will expand out to the resolution of the given program. At this point, the arcade machine will begin running. *If you do not see the MESS/MAME logo, the program will not start. See other FAQ questions for possible solutions to this problem.*

I Don't See Anything in the Box.

If you do not see a MAME/MESS logo in the box above the "Fullscreen, Dark Background, Mute" buttons on the player page, then JSMESS is not running in your browser for some reason. Some possible reasons to investigate:

- Are you running a script blocker like NoScript, that blocks Javascript?
- Does your browser have Javascript disabled?
- JSMESS can take a few seconds to load - wait 30 seconds to see if the logo appears.
- JSMESS generally runs in Firefox, Chrome, Opera, IE and Safari. Are you running a different browser than these?
- Is your browser a recent version? JSMESS prefers browsers from the last few months (although it should run, albeit poorly, in earlier versions).
- Are you low on memory? Disk space?

If none of these seem to apply, contact us with your setup and situation as you see it.

I Don't Hear Any Sound.

For reasons that we will explain, sound is muted by default on JSMESS. To enable sound, you (currently) need to start a program (i.e., click on the logo), wait for the arcade machine to start, and then hit the "Unmute" button at the bottom of the running game. This will set a cookie for "Unmute" and after you hit Refresh (F5) on your browser, all later games will have sound. We are aware this is clunky, and intend to rewrite our Player to more intuitively work in the future.

The Sound Sounds Horrible/Scratchy/Distorted!

The JSMESS program uses a standard called "Web Audio" that is still in its early stages - as a result, the JSMESS program is extremely burdensome to this standard, and unless your machine is very fast and the arcade game being run a simpler one, the sound can easily distort, even when doing something like switching between tabs or moving the mouse! This is why the program is, by default, muted. As of November, 2014, a new Web Audio specification has been proposed that allows Javascript programs like JSMESS to run audio more dependably, as we expect for sound and video, and the committees in charge of this specification are very aware of JSMESS as a real-world example of how to improve their specification. We currently can only wait, at which point newer versions of browsers will have much better sound. Sometimes, a refresh/restart of the arcade player page will bring the sound back into shape, for at least a while.

Why did the Arcade Game start with All Sorts of Weird Graphics?

The JSMESS system provides an as-accurate-as-possible presentation of an arcade machine when it is powered on. A large amount of arcade machines had "boot-up" or "checksum" sequences, where they would show a variety of messages and graphics to indicate the state and quality of the machine. If a ROM chip failed, or a circuit had burned out, various error messages would show and the arcade machine owner or operator would have to do hardware repairs. This situation continues in the emulations, although the machines are generally not going to blow a fuse or lose hardware. That said, there are a very small number of machines that will start up, and then sit at a cryptic operations message, or be awaiting a key. Where possible, the instructions underneath the game's video window will give information on what key or keys to press to have the game continue to boot up properly.

At the bottom it mentions a Gamepad. Do I need a Gamepad?

Every arcade game can be played using your keyboard; no gamepad or joysticks are needed. That said, it is possible under some circumstances to hook a USB Gamepad to your computer and have it recognized.

Questions

Uploading Content

What can I upload?

You may contribute content to the Internet Archive if it's in the public domain or if you own the rights to it. Please refer to the Terms of Use.

Please note that if you wish to be contacted with inquiries regarding your item, you'll need to supply public contact information. Some chose to provide a web address, mailing address, or other means of contact in the description text for the item.

How do I upload files?

1. Log in and click the upload icon in the top black navigation bar
2. Click the "Upload Files" button
3. Add files and complete the metadata form. Click the "Upload and Create Your Item" button
4. When the item creation tasks are complete you will automatically be redirected to your new item page.

How should I name my files?

Support for Filenames is limited to basic ASCII characters.
Please use only unaccented letters, numbers, dashes, underscores or periods.
Do not use special characters

I need help choosing a license?

From the Creative Commons website: "Creative Commons licenses help you share your work but while keeping your copyright. Other people can copy and distribute your work, but only on certain conditions."

You can choose a license to associate with your contribution and this license will be linked to when users see the details page.

Why is there more than one type of upload page?

There are currently 3 in-browser options for uploading at archive.org/upload:
The "Upload Files" button has several advantages:
1. Files larger than 2GB can be uploaded
2. More metadata options to make the item more complete and findable in search without having to edit the item once it is up
3. It is based on html5 so it does not require or use Flash
4. Automatically redirects to the item page once it is created
The "Classic Uploader" button:
1. Uses Flash
2. Can only upload files that are less than 2GB **Live Music Archive button:**
1. Required for all Live Music Archive uploads
2. Uses the "Classic Uploader" so it requires Flash
3. Workflow requires some metadata choices that are unique to the Live Music Archive

What is the "Test Collection" for?

We provide a Test Collection for uploading test items. There are two considerations for uploading to this collection:
1. The pages are not indexed in the search engine
2. The are removed from the site approximately every 30 days.

My upload failed. What do I do?

How many files and how much data can I upload to a single item?

How do I add a file to an existing item

How do I prevent lossy formats from being derived

How should I name my files?

If you see the "Resume" button it indicates that the upload likely failed due to some network interruption. You may click the "Resume" button to continue uploading. It may take several tries. If it continually fails the only option is to refresh the page and start the upload again.

Where can I see all my uploads?

Use this clickpath from any page:
click your screename in the black top navigation bar > select "My Library"

How do I batch/bulk upload?

For bulk or automated uploading we offer a python wrapper. It required some comfort in a unix environment. It can be found at github.com/jjjake/internetarchive

How long does it take before my stuff is ready/derived?

The time before the item is has completed its task can range from a few seconds to a few hours and in some cases, days. It is dependent on a number of factors including the type and size of files as well as the load on the system. To check an item's history: on the /details/ page click the "History" link on the left side of the page next to the title.

Should I upload a MARC record file for a book?

A MARC record will populate an item as soon as the item derives if the MARC file is named correctly. If it's a binary (ISO 2709) MARC, it should be called {itemID}_meta.mrc, If it's MARCXML, it should be called {itemID}_marc.xml.

Is there a limit to what I can upload?

At this time there is no limit. Due to system architecture we recommend that item pages not exceed either 1000 files or 50GB.

Do you backup my files?

Yes. We duplicate/backup all files at various locations.

What upload apis do you offer?

For bulk or automated uploading we offer a python wrapper. It can be found at github.com/jjjake/internetarchive. It requires some comfort in a unix environment. If you wish to use this and need additional information please contact us at info@archive.org.

What kinds of formats do you want me to use for uploading?

We encourage users making contributions to the Archive to create as high quality versions of their media as possible.

Most typical formats are acceptable. Please do not upload encrypted or executable files as these may be removed.

What are your fees?

At this time we have no fees for uploading and preserving materials. We estimate that permanent storage costs us approximately $2.00US per gigabyte. While there are no fees we always appreciate donations to offset these costs.

How long will you store it?

As an archive our intention is to store and make materials in perpetuity.

My item is missing?

There are several reasons you may not be able to locate items you created:
1. It is possible that items are not properly indexed.
2. Items that may violate our terms of use may result in items being removed from the site.
3. Claims by rights holders may result in items being removed from the site.

How can I take my files off the site?

If you would like us to take down an item you have posted, please send an email to info [AT] archive [DOT] org. Please include the exact URLs of the items. Your email **must** come from the same email address you used to upload the item.

Why can't I upload a meta.xml file?

The architecture of the system does not allow uploading of meta.xml files. Attempts to do so will encounter an error.

What languages are supported by Archive.org?

Archive.org supports all metadata about items in just about any language so long as the characters are UTF8 encoded.

How can I use accented or special characters in my title or description?

You can use accented and other special characters in your item text and file titles, but you need to make sure you use the xml-safe code for those characters instead of typing them directly into the forms.

Typing accented characters directly into forms can break the xml for your item, making your files unavailable through the site. Instead, you'll want to use a special code to represent those letters. You can find a complete listing of these codes on http://en.wikipedia.org/wiki/List_of_XML_and_HTML_character_entity_references .

How many files and how much data can I upload to a single item?

Because items can "break" we typically recommend that you not exceed 1,000 files and/or 50GB per item page.

You can upload very large files, up to 100GB. However, large files that require deriving may take a very long time or even timeout and fail.

How do I add a file to an existing item

There are two ways. clickpath:
1. On the /details/ page click "Edit" > "change the files" > "Classic Uploader" button > elect files and click "Open" or "OK" > after the progress bar indicates that the files are uploaded click "Update Item" button. A new derive task should automatically start.
2. Using your item's identifier you can craft a URL that will let you use the html5 upload form. clickpath:
Use https://archive.org/upload?identifier=youridentifier > hit your return/enter key > drag file(s) into gray box or use button to select the file(s) > click "Add files to item" button. A new derive task should automatically start.

How do I prevent lossy formats from being derived

This is only possible for audio items.
Use this clickpath:
After your item is created click "Edit" link on the /details/ page > click "change the information > scroll to the bottom and select "Do not allow lossy* derivatives for files in this item" > go back to the /details/ click "Edit" > click "change the information" > click "Item Manager"> in the "Re-Derive" section select "all" > click the "derive" button. It will take some time for the item to rederive.

How should I name my files?

Support for Filenames is limited to basic ASCII characters.
Please use only unaccented letters, numbers, dashes, underscores or periods.
Do not use special characters

Questions

Books and Texts

How do I read a book online?

Books can be read on the item details page. To make it larger click the expand icon in the nav bar at the bottom of the bookreader

How do I view the PDF books?

Usually you can click the PDF link and it will open in your browser. Otherwise you should download the pdf file and read it on your device using a reader such as Adobe Acrobat Reader.

How do I read the books in other formats, like ePub, Mobi, DJVU?

• ePub is an open textual format (not images of pages). Many readers are available. A free one is from Adobe. • Mobi is a proprietary textual format from Amazon supported on the Kindle. • DjVu is an open format for scanned documents with free readers for windows, mac os-x, linux. It is compact, searchable, good looking, and open format.

Tips for uploading scanned books and other text documents.

• Scan individual pages rather than spreads. • Pdf is easiest format to use for uploading books. • Use hi-res files (we use 600 ppi). Add _images.zip to uploaded zip files that contain images. png, jpg, jp2 and tif files are the accepted formats. • For file names use only unaccented roman letters, numbers, dashes, underscores and spaces. • Keep file names to under 100 characters. • When uploading multiple books to a single page prepend the file names with numbers to force the list order you would like to see. e.g. use 01, 02, 03, etc. • Always specify the language so OCR can run correctly. if there is more than one language additional metadata field for each additional language. • Include as much metadata as possible such as date (published), creator (author), isbn and lccn numbers (add a metadata fields for these), description, subject tags, creative commons license, etc. • For the "title" field use the title as it is shown on the title page of the book. That is how the system tries to choose the title page to display in the preview and in search results. • If possible upload a MARC file along with your book file. Name is the same as the book file and, depending on the MARC file format, end with _marc.xml or _meta.mrc. For example, a book file named mybook.pdf would have a MARC file named mybook_marc.xml. • Upload books to the Community Texts collection if you you do not have a private collection. If you feel the book should be in another collection please contact us at info@archive.org with that request. Collections can be created on request when you have created at least 50 item pages on archive.org.

I want to scan a book. What resolution should I scan at?

Hi-resolution originals are always preferred. We scan at 600dpi.

What file format should I upload?

A hi-res pdf is the easiest format to upload. To upload image files read the "How do I make a flip book out of loose images" section of this FAQ.

Can I upload a MARC record?

You can upload a MARC record with your text file. The MARC record will populate the item as soon as the item derives if the MARC file is named correctly. If it's a binary (ISO 2709) MARC, it should be called {itemID}_meta.mrc, If it's MARCXML, it should be called {itemID}_marc.xml.

What formats are derived from my source file?

Please refer to this chart for the formats typically derived.

Why is OCR so bad? Why do the epub, djvu, mobi, text files have garbled or missing text?

OCR (Optical Character Recognition) is inexact. Sometimes it can be poor. It largely relies on factors of the physical book such as type font, color, cleanliness of the page, language (some are not OCRable at this time), and page orientation (sometimes charts are turned at 90°). At this time we do not offer a way for you to either correct bad OCR or add your own corrected OCR file. Several of the derived file formats such as mobi, epub and djvu rely on OCR. So, if the OCR is poor, those files will also have garbled or misspelled words.

My subject tags are lumped together. How do I fix that?

Because MARC records use commas and semi-colons archive.org text items do not honor those characters as a way to separate subject keywords. To separate them you need to create individual metadata key:value pairs for each subject. To do this in the upload form (archive.org/upload) add your first subject in the "Subject Tags*" field. For any additional subjects follow this clickpath: Add additional metadata... (in the More Options cell) > in the left field key in "subject" (without quotes) > add your subject in the right field > repeat if there are more subjects

How do I change the title page in the flip book?

Our system attempts to detect the title page of a book. The basic criteria is dependent on OCR. It will try to choose the first page with large font size that best matches the title you used for the item page. If that fails it is somewhat random.

To change the title page follow these click paths: On the item details page click SHOW ALL > right-click or control-click the scan data.xml file link and select "Save link as.... to download it > open the scandata.xml file in a plain text editing application > find "Title" and replace it with "Normal" >On the leaf you want to be the first page replace "Normal" with "Title" .

Now replace the existing file with this modified one by uploading it to the item using the URL scheme https://archive.org/upload?identifier=ID (where ID is the identifier of the item.)

Where are the hi-res images in an item?

All files for an item can be found on the ALL FILES page. For books scanned by the Internet Archive the largest compressed (tar or zip) file holds the original scans. You can usually download this file, expand it and use the images.

Where are the thumbnail images?

To view thumbnails click the expand icon (four arrows aiming out) to the right of the book preview. In the book reader click the thumbnails icon (four squares) at the bottom of the page.

How do I link to a book?

On the item details page click the expand icon (for arrows pointing outward) > in the bookreader click the Share icon (3 dots linked together) > the popup window will offer several links.

How do I embed a book?

On the item details page click the "Share" icon to the right of the book preview. A popup window will offer URLs for embedding. For more advance options click the "Advanced embedding details, examples, and help!" link at the bottom of the popup.

How do I report that something's wrong with a book?

Please send a description of the problem along with the URL of the page to info@archive.org. Thank you. Please be aware that we typically do not modify the metadata of an item that has been created by a user of the site except at their request. We recommend leaving a review on the page explaining the issue. The uploader will automatically be notified. For volume and serial work the publish date often appears to be incorrect. This is because the metadata is populated by a MARC record from one of our partner libraries such as the Library of Congress. At this time volume and serial works are considered to be a single work so there is a single MARC record for it. Typically the date that the first volume was publish is the only date in the record so that is the date that will appear on all volumes of the work regardless of the date that might be printed in a particular volume.

What is the directory structure for the texts?

All files related to an item page reside in the pages directory. Below is a brief explanation of the purpose of each file: IDENTIFIER.djvu IDENTIFIER.epub IDENTIFIER.gif IDENTIFIER.pdf IDENTIFIER_abbyy.gz IDENTIFIER_archive.torrent IDENTIFIER_dc.xml IDENTIFIER_djvu.txt IDENTIFIER_djvu.xml IDENTIFIER_files.xml IDENTIFIER_jp2.zip IDENTIFIER_marc.xml IDENTIFIER_meta.mrc IDENTIFIER_meta.xml IDENTIFIER_metasource.xml IDENTIFIER_orig_jp2.tar IDENTIFIER_scandata.xml IDENTIFIER_toc.xml

What is Open Library?

Open Library is an open project with the mission of having one web page for every book ever published. The software is open, the data are open, the documentation is open, and we welcome your contribution. Whether you fix a typo, add a book, or write a widget--it's all welcome. We have a small team of fantastic programmers who have accomplished a lot, but we can't do it alone! There are no books on Open Library. There may be links to books that are housed on archive.org or links to where you might be able to find the book elsewhere. There is also a lending program where you can borrow up to five books at a time for two weeks. You may find answers to questions about on the Open Library FAQ page

How do I make a flip book out of loose images?

To make a flip book you need to upload a zip or tar that contains the files. Here's how:
1. Use only jpg, jpeg, jp2, tif, tiff, png, gif or bmp files. Any combination of them is acceptable.
2. Name your files sequentially. It is best to use the identifier in the name. For example:
000yourfilename.jpg
001yourfilename.jpg
002yourfilename.jpg
and so on
3. Create a zip or tar of the files and name that zip file using the page identifier e.g. yourfilename_images.zip or yourfilename_images.tar. If possible use a compression tool that does not add extra extraneous files. Sometimes the compression tool that comes with your computer does this (as with the Mac tool for example.) Terminal or Cygwin work well.
4. Upload the zip or tar file. Be sure to specify a language to help OCR. The system should do the rest.

For more detailed information visit uploading-images-for-text-items/

Questions

Item page management

How can I add custom metadata to my item?

Use this clickpath from the item's details page:
Edit > change the information > at the bottom of the page click "Add another field" link > add the metadata key in the left text field and the value in the right field > click the "Submit" button at the bottom of the page.

You can only modify items that you created.

How do I delete, rename or upload files in an existing item?

Use this clickpath from the item's details page:
Edit > change the files > right-click or control-click the file > select Delete or Rename > if Renaming type a new name in the filename box > click OK > "Update Item"

You can also upload files to an existing item using this clickpath: Edit > change the files > click the "Classic Uploader" button > select file(s) to upload and click "OK" > when the files are completely uploaded click "Update Item"

I can't edit an item I uploaded

There are two likely reasons for this: 1. The server where the item lives is temporarily in a read only state. Usually it is fixed and back to a read/write state in a day or less. One way to tell if this is the case is to click the "History" link on the item page. If the server id has a yellow stripe over it then that server is read only. Please be patient and check your item later. 2. You changed your account email address. If this is the case please contact us at info@archive.org. Include your old email, new email and we can move the old items to your current email address.

How do I report spam items or site abuse?

Please send email including the URL of the item page(s) and a description of the problem/error. Send it to info@archive.org.

What is an item and how do I create one?

For simplicity think of a page on the site as an "item". A special page that groups items is termed a collection. To create an item:
1. If you do not have an account please create an account.
2. Log in and click the upload icon in the top black navigation bar
3. Click the "Upload Files" button
4. Add files and complete the metadata form. Click the "Upload and Create Your Item" button
5. When the item creation tasks are complete you will automatically be redirected to your new item page.

How do I edit metadata of my item?

For existing items use this clickpath from the item's details page:
Edit > change the information > modify/add metadata as desired > click the "Submit" button at the bottom of the page.

You can only modify items that you created.

Questions

Can I use this ____ for ____ ?

What is non-Commercial Use?

How can I contact the person / group who uploaded an item?

Rights

Can I use this ____ for ____ ?

Internet Archive does not itself seek to limit use of its digital materials. However, we cannot give ironclad guarantees as to the copyright status of items in our Collections and cannot guarantee information posted on item details or collection pages regarding copyright or other intellectual property rights. Our terms of use (https://www.archive.org/about/terms.php) require that users make use of Internet Archive's Collections at their own risk and ensure that such use is non-infringing and in accordance with all applicable laws.

The person who uploads an item often provides information related to use rights, either by way of directly entering it in the description field or by selection of a Creative Commons license. The latter, if included by the uploader, will be viewable via a **Creative Commons** logo on the details page, which serves as a link to a description of the specific type of license that the uploader has assigned.

One way to attempt to contact an uploader about information that they have posted is to post a review to the item.

You may also find these resources helpful:

CreativeCommons.org

Chilling Effects Clearinghouse Chilling Effects Clearinghouse

Electronic Frontier Foundation Electronic Frontier Foundation

Please see also:

Who owns the rights to these movies?

https://www.archive.org/about/faqs.php#49

Are there restrictions on the use of the Prelinger Films?

https://www.archive.org/about/faqs.php#197

Can I search Archive.org by Creative Commons License?

https://www.archive.org/about/faqs.php#263

What is non-Commercial Use?

What is non-Commercial Use? Please see https://www.archive.org/iathreads/post-view.php?id=111591

A link the **Terms of Use** for Archive.org is at the bottom of each page.

How can I contact the person / group who uploaded an item?

Internet Archive is unable to release any contact information for patrons. However, it may be worth your while to post a review for the item in question - this automatically contacts the uploader's account, notifying them that their upload has been reviewed. You could pose queries/requests for information therein.

Questions

The Grateful Dead Collection

About the Grateful Dead collection:

Audience-made Grateful Dead concert recordings are available as downloads while available soundboards are accessible in streaming format only.

The Grateful Dead is separated from the Live Music Archive into its own collection (with its own forum) to avoid confusion about lossless availability. The metadata and reviews for shows and recordings, even those not available for regular download, will remain available for those who maintain direct links. No filesets have been deleted from the Archive; certain items are simply not public now. Text files are available at a separate database.

At this time, the Grateful Dead collection is not open to public uploads. The Grateful Dead Internet Archive Project (GDIAP) will continue its direct management of this collection for the time being.

As far as we know, there has been no change to standard GD fan trading. It is common for bands to have policies that differ between fan trading, versus archiving here.

How do I search by date, by year?

On the Collection page you will see the years in the right hand column. Clicking them launches searches for those years.

Where is "on this day in history"?

You can find this in the About tab.

Why are some stream only?

This is done at the request of the band.

What are some not even available as stream only?

Shows that have been released commercially are not available.

Where is the recording information?

If that information is in an item you will be able to see it on the details page. Recording metadata may include details page you may include: **Source** - the path from original source to final file format **Taped by** - the original taper **Transferred by** - the person(s) who processed the audio to the final file that was uploaded

Why can't I upload to the Grateful Dead collection? At this time uploads by the public are prohibited at the request of the band.

At this time uploads by the public are prohibited at the request of the band.

Questions

How do I report that there's an issue with an item?

There's a problem with the item, what's next?

How can I take my file off the site?

How do I report that something's wrong with a book?

Report Item

How do I report that there's an issue with an item?

The Internet Archive (Archive.org) is a nonprofit library that preserves digital cultural artifacts, and provides online access to over a million users a day with the goal of universal access to all knowledge.

To report an item that violates the Internet Archive's Terms of Use, please send an email **with the URL (web address) of the item** to info -at- archive.org

For more information, see https://www.archive.org/about/faqs.php#Rights.

There's a problem with the item, what's next?

Some changes to our system, to individual items, or to collections can take a day to appear on Archive.org. If you're experiencing a problem with an item, we recommend trying again after a day. Often the issue will then have already been resolved.

How can I take my file off the site?

If you would like us to take down an item that you have uploaded, please send an email to info -at- archive.org

Please note that you need to include the URL (web address) of the item.

Your email must come from the same email address you used to upload the item. This is the only way we can tell that you are the owner of the item.

As always, if you write in, please be sure any spam filter you have is set to accept email from @archive.org.

Please see also the further resources at https://www.archive.org/about/faqs.php#Uploading_Content

How do I report that something's wrong with a book?

If you see an error with a book that the Internet Archive has digitized, we'd appreciate knowing about it!

Please send an email **with the URL (web address) of the book**, and description of the problem, to info -at- archive.org

In some cases, you may know of *alternate* information about a book that is supplemental to the library bibliographic record. (For example, a new, more modern transliteration of an author's name.)

To share additional information like this, you may wish to post it using the option to write a review of a book.

For more information on the Internet Archive's sponsored scanning, please see https://www.archive.org/about/faqs.php#Texts_and_Books

For more information on books that users upload, or for information on how to upload your own,
please see https://www.archive.org/about/faqs.php#Texts_and_Books

Questions

Forums

How can I format text in my posts

How can I make links clickable in my posts?

How do I subscribe/unsubscribe to a forum email list?

How can I format text in my posts

Since the Internet Archive forum system accepts HTML codes, you can make text bold, italic, underlined, or even colored by using normal HTML codes. See WebMonkey for a list of HTML codes.

How can I make links clickable in my posts?

You may have noticed that some posts have highlighted links in them. Internet Archive forums permit the use of HTML codes. Suppose you want to make a link to the Internet Archive home page, one that looks like this: Internet Archive home page. To do this, you would enter the following HTML code: Internet Archive home page.

How do I subscribe/unsubscribe to a forum email list?

Next to all forums, you will see a small envelope. When logged in, you can click on this envelope which will allow you to subscribe or unsubscribe to any forum.

Questions

SFLan

How can I connect to SFLan?

With a laptop: Be in the vicinity of a SFLan node. Associate with it: The SSID is sflanNN, where NN is the number of node, e.g. sflan13. No WEP. You'll get an IP number assigned via DHCP. With a house: Contact us at info at archive dot org. (Please include your address and a phone number.) Find out if you have line of sight to another SFLan node, buy a node, and we'll put it on your roof.

What about IP addresses?

SFLan uses real, routable IP addresses. These are usually given out dynically via DHCP. The nodes themselves use static addresses. We can also assign static addresses for servers. For the techies: We use tunneling, layer 2 and layer 3 bridging in parts on the network to make it all appear as a "flat" LAN. There are pros and cons about this approach. It has worked best for us so far. However, it is a moving target, and might change in the future.

I still have more questions, what should I do?

SFLan is a work in progress. If you have more questions, try the SFLan forum. If you still need help, write to info at archive dot org.

I live at 123 Main St at Crossing; do I have line of sight access to a node?

You can try netstumbler or kismet to look for a SFLan ssid.

What is the cost of a node?

The nodes cost $1100, which includes the price of parts and installation. Discounts are potentially available depending on the location.

How can I get a node?

Send an email with your name, exact address and phone number to info at archive dot org. Be sure to write "SFLan node" (or something similar) in the subject line. The information will be passed on to our fantastic installation team who will contact you.

If I get a node, can my neighbors connect also?

Yes, a SFLan node can connect your neighbors and co-condo association members.

What is included in the node?

Most of our nodes are composed of two radios, but some have three. The components are in a weather tight box with a four foot coax cable and two antennas attached. The whole unit is mounted on your roof (generally) on a pole. There is a picture of our lovely 5'3" spokesmodel holding one here: http://www.archive.org/iathreads/uploaded-files/AstridB-PICT0017.JPG

What are the power requirements of a node?

A node takes on average 5 watts.

What are the connection characteristics of the network?

There are no average characteristics, but 2MBs shared among 20 or so people would be an example.

What is the percentage of uptime?

SFLan is an experimental network, so the uptime varies. Right now uptime averages around 90% or more.

Questions

Archive-It

What is Archive-It?

What is Archive-It?

Archive-It is a subscription service that allows institutions to build and preserve collections of born digital content. Through the user-friendly web application, **Archive-It partners can harvest, catalog, manage, and browse their archived collections.** Collections are hosted at the Internet Archive data center and are accessible to the public with full-text search.

Why would I subscribe to Archive-It instead of using the Wayback machine at Internet Archive?

Partners to this service can create distinct Web archives called "collections", containing only the born digital content they are interested in harvesting, at whatever frequency suits their needs. All collections are full-text searchable. The collections created with Archive-It can be cataloged with metadata and managed directly by the partner. The Archive-It service maintains a minimum of two copies of each collection online, a primary and a back-up copy.

How frequently can I archive Web sites?

Archive-It is very flexible: you can harvest material from the Web using ten different frequencies, from daily to annually. Partners can select different crawl frequencies for each chosen URL. Additionally, your institution can also chose to start a crawl "on demand" in the case of an unforeseen spontaneous or historic event.

Who gets access to the collections created in Archive-It?

By default, all collections are available for public access from the main page at www.archive-it.org. However, a partner can choose to have their collection(s) made private by special arrangement.

How can I search the collections?

Archive-It provides full text search capability for all public collections. You can also browse by URL from the list provided for each collection. The public can browse and search collections by partner type or collection from www.archive-it.org.

What types of institutions can subscribe to Archive-It?

Archive-It is designed to fit the needs of many types of organizations. The 190+ partners include state archives and libraries, university libraries, federal institutions, non government non profits, museums, art libraries, and local city governments.

Who decides which content to archive in Archive-It?

Partners develop their own collections and have complete control over which content to archive within those collections.

Where is the data stored for Archive-It collections?

All data created using the Archive-It service is hosted and stored by the Internet Archive. We store two copies online and are working with partners to have redundant copies in other locations. Partners can also request a copy of their data for local use and preservation to be shipped either on a hard drive or over the internet.

Questions

What equipment does the Internet Archive use? What APIs?

Equipment

What equipment does the Internet Archive use? What APIs?

Storage systems used by the Internet Archive:

- Large Scale Data Repository: Petabox http://www.petabox.org
- Datacenter in a shipping container -- Internet Archive launch with Sun
  Equipment and software used in the Internet Archive's scanning and OCR services for Contributing Libraries

- The Scribe system
  Documents describing how to use Archive software and services, maintain "special" servers, and so on. Includes our API to archive.org services using JSON format.

- https://www.archive.org/help

Questions   Errors

What does 'The item is not available due to issues with the item's content. If you would like to report this problem as an error report, you may do so here.' mean?

This error message simply means that the item has been removed from the site or is unavailable. There are a variety of reason why this might have occurred including:
• By request of the uploader
• Due to violation of our Terms of Use
• The item has no usable data
• In some cases it means that the server where the item live is temporarily in a read only state. Usually it is back to read/write within 24 hours. Occasionally it may take longer if the disk needs to have a rescue task run on it.

What does 'no metadata' mean when I'm trying to edit my files?

Typically this means that there was a server error while tasks were running. We can usually fix this. If you encounter this please contact us at info@archive.org. Please include the URL of the item.

Why won't my uploaded file create a flip book?

There are a variety of reasons that your uploaded file(s) my not have properly created the files necessary for the online book reader such as, but not limited to:
1. If you uploaded individual scan files they may not have been properly formatted into a compressed file that is named [identifier}_images.zip (where [identifier] is the identifier of your item page.)
2. The file(s) uploaded are corrupt or unreadable
3. The number of pages is too large and the derive task times out
4. The file name includes special characters or accented letters (please only use plain text, numbers, dashes and underscores for file names.)
5. The uploaded pdf file is missing the format extension in the file name
6. The language is missing from the item's metadata and the OCR module requires it.
7. The derive task queue is backed up (please be patient)
8. The dimensions in the pdf are not correct or within the acceptable size range.

How can I tell what has failed with my item?

Each item has a viewable task log. If you are the uploader you should see a "History" link on the left side of the item's details page. It will take you to the task log history.

If you see rows that are not purple that means either tasks are queued (green), are running (blue) or failed (red). If there is a red row please contact us to have it investigated. If there are blue or green rows please be patient and wait for them to run.

FAQ Forum ✉ [🔊 **RSS**]   **New Post**

Subject	Poster	Replies	Date
Please remove failed pages	MadHatterSez	0	Nov 8, 2018 6:57am
An Error has occurred while opening the file	mwell	0	Nov 7, 2018 7:39am
An Error has occurred while opening the file	mwell	0	Nov 7, 2018 7:39am

Error loading media: file could not be played	Mill Run Band	1	Nov 6, 2018 3:54pm
Re: Error loading media: file could not be played	Mill Run Band	1	Nov 8, 2018 7:07pm
Re: Error loading media: file could not be played	legacy93	0	Nov 9, 2018 9:30am
Please delete	Citizen1	0	Nov 5, 2018 1:26am
Please delete	Citizen1	1	Nov 5, 2018 1:23am
Re: Please delete	Jeff Kaplan	0	Nov 5, 2018 7:03am
Please delete	Hiroi Ochiba	1	Nov 4, 2018 2:47pm
Re: Please delete	Jeff Kaplan	0	Nov 4, 2018 3:48pm
Please delete	Super Guías	1	Nov 4, 2018 12:06pm
Re: Please delete	Jeff Kaplan	0	Nov 4, 2018 3:45pm
Need help with returning book	spacetwiga1	0	Nov 4, 2018 7:35am
Change Identifier	affycat	2	Nov 4, 2018 12:28am
Re: Change Identifier	affycat	2	Nov 4, 2018 1:30pm
Re: Change Identifier	affycat	0	Nov 4, 2018 1:31pm
Re: Change Identifier	Jeff Kaplan	0	Nov 4, 2018 3:47pm
Re: Change Identifier	Jeff Kaplan	0	Nov 4, 2018 3:48pm
Please delete	Super Guías	1	Nov 3, 2018 7:44pm
Re: Please delete	Jeff Kaplan	1	Nov 4, 2018 6:42am
Re: Please delete	Super Guías	0	Nov 4, 2018 7:10am
Pls delete	SabineZita	0	Nov 3, 2018 3:04am
Please Delete	Samoobrona Narodu	1	Nov 2, 2018 7:16pm
Re: Please Delete	Jeff Kaplan	0	Nov 2, 2018 8:01pm

Report inappropriate content	Halit Amca	0	Nov 2, 2018 5:40pm
borrar archivo	eqmelquicio	1	Nov 2, 2018 1:21pm
Re: borrar archivo	Jeff Kaplan	0	Nov 2, 2018 7:58pm
Por favor, pueden borar este archivo?	Espacio Sonante	1	Nov 2, 2018 4:29am
Re: Por favor, pueden borar este archivo?	Jeff Kaplan	0	Nov 2, 2018 7:54pm
Upload incomplete need to delete	NanoCarrot	1	Nov 2, 2018 12:39am
Re: Upload incomplete need to delete	Jeff Kaplan	0	Nov 2, 2018 7:52pm
Borrar estos	Trooperware	1	Nov 1, 2018 11:44pm
Re: Borrar estos	Jeff Kaplan	0	Nov 2, 2018 7:50pm
Uygunsuz İçerik Bildirme	Halit Amca	0	Nov 1, 2018 9:50pm
Expired SSL Certificate for Internet Archive's https://purl.org	user20181101	0	Nov 1, 2018 6:31pm
Can you move these to a collection?	MigJmz	2	Oct 31, 2018 10:21am
Can you scan these Computer Shopper Magazines to a collection?	Scotch Plains Historical Society	0	Oct 31, 2018 5:29pm
Re: Can you move these to a collection?	Jeff Kaplan	0	Oct 31, 2018 9:14pm
remove 2 items	Lucille Stewart Beeson Law Library	1	Oct 31, 2018 6:56am
Re: remove 2 items	Jeff Kaplan	0	Oct 31, 2018 7:25pm
Please Delete	Samoobrona Narodu	1	Oct 31, 2018 3:12am
Re: Please Delete	Jeff Kaplan	0	Oct 31, 2018 7:24pm
Removal Request.	haha123456	1	Oct 30, 2018 3:54am
Re: Removal Request.	Jeff Kaplan	0	Oct 30, 2018 7:26am
Please take show down	radiate	1	Oct 29, 2018 5:12pm
Re: Please take show down	Jeff Kaplan	0	Oct 29, 2018 8:15pm

Please remove	rosden shadow	0	Oct 29, 2018 2:57pm
Please remove	darkice2	0	Oct 29, 2018 9:34am
Pls remove	Sunmon	1	Oct 29, 2018 6:35am
Re: Pls remove	Jeff Kaplan	0	Oct 29, 2018 8:12pm
Please Remove	umaxama-3938	1	Oct 28, 2018 7:12pm
Re: Please Remove	Jeff Kaplan	1	Oct 28, 2018 3:44pm
Re: Please Remove	umaxama-3938	1	Nov 4, 2018 9:14pm
Re: Please Remove	Jeff Kaplan	0	Nov 4, 2018 3:42pm
Can you delete some files please ?	Aurelief	1	Oct 28, 2018 2:43pm
Re: Can you delete some files please ?	vanark	0	May 1, 2018 1:11pm
Please Remove	Michelle Woods8335	1	Oct 27, 2018 7:06pm
Re: Please Remove	Jeff Kaplan	0	Oct 27, 2018 8:59pm
item doesn't derive	Divudì	0	Oct 27, 2018 11:59am
Is possible search a specific term in a page in a specific domain name?	unk85	1	Oct 25, 2018 7:35pm
Re: Is possible search a specific term in a page in a specific domain name?	RightSideNews	0	Oct 25, 2018 10:24pm
Flash not loading Error	DanjR1001	0	Oct 25, 2018 2:49pm
Cannot replace file	SKasperek	0	Oct 24, 2018 7:33am
Adding images from websites I've archived to favorites	KFCiscool	0	Oct 23, 2018 4:08pm
Problem with links to archive.org	AndyECT	1	Oct 23, 2018 2:11pm
Re: Problem with links to archive.org	Jeff Kaplan	1	Oct 23, 2018 3:17pm
Re: Problem with links to archive.org	AndyECT	1	Oct 24, 2018 2:09am
Re: Problem with links to archive.org	Jeff Kaplan	1	Oct 24, 2018 6:39am

Re: Problem with links to archive.org	AndyECT	1	Oct 24, 2018 9:51am
Re: Problem with links to archive.org	Jeff Kaplan	1	Oct 24, 2018 2:18pm
Re: Problem with links to archive.org	AndyECT	1	Oct 24, 2018 3:04pm
Re: Problem with links to archive.org	Jeff Kaplan	1	Oct 24, 2018 4:26pm
Re: Problem with links to archive.org	AndyECT	1	Oct 25, 2018 12:11pm
Re: Problem with links to archive.org	Jeff Kaplan	0	Oct 25, 2018 12:49pm
Cannot upload files	Anthony Mastrean	1	Oct 22, 2018 9:43am
Re: Cannot upload files	Jeff Kaplan	1	Oct 22, 2018 11:06am
Re: Cannot upload files	Anthony Mastrean	1	Oct 22, 2018 11:44am
Re: Cannot upload files	Anthony Mastrean	1	Oct 22, 2018 11:44am
Re: Cannot upload files	Jeff Kaplan	0	Oct 22, 2018 6:22pm
Warctozip Down	rmelling	0	Oct 21, 2018 1:53pm
Book cover not displayed properly- Please help	vanlalhlua	1	Oct 21, 2018 1:54am
Re: Book cover not displayed properly- Please help	vanlalhlua	0	Oct 21, 2018 2:18am
Disable Download buttons	MidachiPorSiempre	1	Oct 20, 2018 3:59pm
Re: Disable Download buttons	Jeff Kaplan	0	Oct 20, 2018 4:15pm
Your Android app appears to be malware	lincolnspector	0	Oct 19, 2018 5:16pm
Unable to favorite anything	mh3330	1	Oct 19, 2018 11:56am
Re: Unable to favorite anything	OddioOverplay	1	Nov 2, 2018 8:48am
Re: Unable to favorite anything	mh3330	0	Nov 5, 2018 7:09pm
Search Results empty	elviskline99	0	Oct 19, 2018 9:35am
Hanging during download content	ajccruz	1	Oct 19, 2018 5:41am

Re: Hanging during download content	Jeff Kaplan	1	Oct 19, 2018 7:35am
Re: Hanging during download content	ajccruz	1	Oct 19, 2018 7:42am
Re: Hanging during download content	Jeff Kaplan	1	Oct 19, 2018 7:49am
Re: Hanging during download content	ajccruz	0	Oct 19, 2018 3:34pm
Not working on my ipad	Thumbblue	1	Oct 18, 2018 5:11am
Re: Not working on my ipad	Arjaywall	1	Oct 18, 2018 2:46pm
Re: Not working on my ipad	Thumbblue	0	Oct 19, 2018 5:11pm
Flipbook won't work for me anymore	John Dorfman	0	Oct 18, 2018 4:41am
Old iMac can't play audio any more	AtticusBooks	0	Oct 18, 2018 4:30am
Request for deletion	Sunghwa	0	Oct 18, 2018 4:05am
wrong book linked	lozko-pdf	0	Oct 18, 2018 12:21am
REQ: change mediatype from audio to text	opensiddur	1	Oct 17, 2018 8:53pm
Re: REQ: change mediatype from audio to text	Jeff Kaplan	1	Oct 17, 2018 10:28pm
Re: REQ: change mediatype from audio to text	opensiddur	1	Oct 17, 2018 11:26pm
Re: REQ: change mediatype from audio to text	Jeff Kaplan	1	Oct 18, 2018 7:37am
Re: REQ: change mediatype from audio to text	opensiddur	1	Oct 18, 2018 8:07am
Re: REQ: change mediatype from audio to text	Jeff Kaplan	1	Oct 18, 2018 10:22am
Re: REQ: change mediatype from audio to text	opensiddur	0	Oct 18, 2018 10:27am
image not displaying in link	DeTrixsta	1	Oct 17, 2018 5:33pm
Re: image not displaying in link	tracey pooh	1	Oct 17, 2018 10:33pm
Re: image not displaying in link	DeTrixsta	0	Oct 18, 2018 12:12am
Possibility of Monetizing Uploads	Osho One	2	Oct 17, 2018 11:00am

Re: Possibility of Monetizing Uploads	Harry Wilson	0	Oct 17, 2018 4:21pm
.	Nomed70	1	Oct 18, 2018 2:48am
Re: Possibility of Monetizing Uploads	Osho One	0	Oct 17, 2018 8:07pm
no player in IE	rebelradio	4	Oct 16, 2018 9:49pm
Re: no player in IE - Me Neither	Harry Wilson	2	Oct 17, 2018 1:28am
Re: no player in IE - Me Neither	rebelradio	0	Oct 17, 2018 7:40am
Re: no player in IE - Me Neither	Peterfin	1	Oct 17, 2018 11:38pm
Re: no player in IE - Me Neither	charlesb8221954	0	Oct 18, 2018 10:29am
Re: no player in IE	Mh63	0	Oct 17, 2018 5:02pm
Re: no player in IE	rebelradio	1	Oct 17, 2018 7:28pm
Re: no player in IE	rebelradio	1	Oct 18, 2018 9:37pm
Re: no player in IE	rebelradio	0	Oct 21, 2018 7:26am
Re: no player in IE	DeTrixsta	0	Oct 19, 2018 10:22pm
Small Item ID Change Request	CheatFreak47	0	Oct 16, 2018 1:41am
Please delete	ambor	0	Oct 15, 2018 9:48pm
Can this file be moved?	zeejay21	1	Oct 14, 2018 4:00pm
Re: Can this file be moved?	Jeff Kaplan	0	Oct 14, 2018 9:51pm
Problem Adding Favorites	sab2315	1	Oct 14, 2018 2:54pm
Re: Problem Adding Favorites	VULTRIII	0	Oct 18, 2018 9:31pm
When a "network problem" is just being blocked ...	israelites.de	1	Oct 13, 2018 3:31pm
Re: When a 'network problem' is just being blocked ...	Jeff Kaplan	0	Oct 13, 2018 3:39pm
Move mediatype?	otterssey	1	Oct 13, 2018 5:43am

Re: Move mediatype?	Jeff Kaplan	0	Oct 13, 2018 12:24pm
.	livriver	1	Oct 12, 2018 9:26pm
Re: Copyright Issue. please remove	ola_norsk	0	Oct 12, 2018 4:40pm
Please remove	mwrench	1	Oct 12, 2018 9:55am
Re: Please remove	Jeff Kaplan	0	Oct 12, 2018 2:33pm
Account content disappeared after changing email	krasenk	1	Oct 12, 2018 4:33am
Re: Account content disappeared after changing email	Jeff Kaplan	1	Oct 12, 2018 2:31pm
Re: Account content disappeared after changing email	krasenk	0	Oct 12, 2018 10:21pm
Please remove	Tim the Teacher	1	Oct 12, 2018 1:01am
Re: Please remove	Jeff Kaplan	0	Oct 12, 2018 2:32pm
I can not upload audio files	larazondelavoz	0	Oct 11, 2018 8:24pm

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Standards

Specifications

Guidelines

IrDA Serial Infrared Data Link Standard Specifications

Notice: The following documents are available at no charge both here and on the IrDA FTP site.

*By downloading these specifications, you acknowledge and agree that you or your organization will use the IrDA specifications for your own purposes only and will not copy, resell or otherwise distribute or make commercial use of IrDA Standard Specifications. IrDA Standard Specifications are protected by United States Copyright Law and no part of the standards may be reproduced or distributed without the prior written consent of the Infrared Data Association.

Each document is a separate file and must be downloaded. The documents are formatted in Adobe Acrobat (.PDF). You will need the appropriate viewer to process the documents. The documents are offered on a "as is basis" and comments are welcome. Please e-mail your comments to info@irda.org.

PUBLICATION CONTENTS

✦ *- UPDATED*

NAME	DESCRIPTION
✦ IrDA SIR Data Specification	IrDA Serial Infrared Physical Layer Link Specification, IrDA Serial Infrared Link Access Protocol (IrLAP) and IrDA Serial Infrared Link Management Protocol (IrLMP), IrDA Tiny TP (1,331KB). Get specification.
IrDA Control Specification	IrDA Command and Control Ir Standard (Formerly IrBUS) (701KB). Get specification.
IrCOMM 1.0	IrDA Infrared Communications Protocol (641KB). Get specification.
IrTinyTP 1.1	IrDA Infrared Tiny Transport Protocol (82KB). Get specification.
IrLAN 1.0	IrDA Infrared LAN Access Extensions for Link Management Protocol (92KB). Get specification.
✦ IrOBEX 1.2	IrDA Object Exchange Protocol (362KB). Get specification.

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IrDA Lite	IrDA Minimal IrDA Protocol Implementation (110KB). Get specification.
IrDA Plug and Play	IrDA Plug & Play Extensions to LMP 1.0 (80KB). Get specification.
IrMC	IrDA Infrared Mobile Communications (1,020KB) See Press release. Get specification.
IrTran-P	IrDA Infrared Transfer Picture Specifications (240KB). IrTranP provides image exchange protocol used in Digital Image capture devices/cameras. To see more about IrTran-P visit the IrTran-P website. Get specification.
IrDA Dongle Interface	IrDA Dongle Interface specifications (85KB). Get specification.
Jetsend™ Over IrDA Protocols	Information for using Jetsend over IrDA Protocols (49KB). Get application note.

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Infrared Data Association.

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- Aicon
- Alcatel
- **Alps Electric**
- **AMP**
- AMSKAN
- Anritsu
- **Apple Computer**
- Assn Interactive Media
- **Avalon**
- Avio Digital
- **Calibre**
- **California Eastern Labs**
- **CANAL+**
- **Canon**
- **Canon Systems Globalization**
- **Casio Computer**
- **CGP Electronics**
- **Citizen America**
- Citizen Electronics
- CITIZEN WATCH
- **Clarinet Systems**
- CMD Technologies
- **Compaq Computer**
- **Counterpoint Systems**

- **Matsushita Electronic Works**
- **Matsushita/Panasonic**
- **Microsoft**
- Minolta
- **Mitsubishi**
- **Motorola**
- **National Semiconductor**
- **NEC**
- **NetSchools**
- New Japan Radio
- Niigata Canotec
- **Nokia Mobile Phones**
- **Norand**
- **Novalog**
- **NTT DoCoMo**
- **NTT/Nippon Tel & Tel**
- **Okaya Systemware**
- **OKI Electric**
- Olivetti
- **Olympus**
- O'Neil Software
- **Open Interface**
- **OPTi Inc.**
- Oracle
- **Parallax Research**
- PDAia
- Peerless Systems
- **Pentax Systems**
- Performance Design
- Personal Solutions
- **PFU Ltd**

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- Credicom Technologies
- Cypress Semiconductor
- Datalogic
- Dell Computer
- DENSO
- Digital Print Corporation
- DOWA
- Eastman Kodak
- Elmic Systems
- EMBEDnet Inc.
- Ericsson
- Excellent Design
- Extended Systems
- FFC Limited
- Fuji Electric
- Fuji Photo Film
- Fuji Xerox
- Fujitsu
- Funai Electric
- Gentex Corporation
- Geoworks
- Glenayre
- Helmig Engineering
- Hewlett-Packard
- Hitachi
- Holtek
- Hosiden
- IBM
- IC Works
- InFocus
- Integrated Systems Inc
- Intel
- Interlink Electronics
- IR Data Corporation
- ITE
- Inventec
- Iwasaki
- JVC
- Kawasaki Steel
- Kent Ridge Digital Labs
- Kenwood
- Key Tronic
- Kobe Steel
- Kodenshi Korea
- Konica

- Philips
- Phoenix Technologies
- Puma Technology
- Questra Consulting
- REUDO
- Ricoh
- ROHM
- Ryoyo Electro Co.
- Samsung
- Sanyo
- Scientific Atlanta
- Seiko Epson
- Seiko Instruments
- Sejin
- Selectech
- Sharp Electronics
- SiCore Systems
- Siemens
- Sigmatel
- Silitek
- SMK Manufacturing
- Sony
- Spanworks
- Spectrix
- Standard Microsystems - SMSC
- Stanley Electric
- SteelCase
- Strategies Unlimited
- Tekram Technology
- Texas Instruments
- Tokyo Electron
- Toshiba
- Toshiba AITC
- Trace Research Center
- TUKA Phone Kansai
- Umax Data Systems
- Unitrode
- Unity Opto Technology
- Universal Electronics
- USB
- VISA International
- Vishay-Telefunken
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- **AMP**
- **AMSKAN**
- Anritsu
- **Apple Computer**
- Assn Interactive Media
- Avio Digital
- **Calibre**
- **California Eastern Labs**
- **CANAL+**
- **Canon**
- **Canon Systems Globalization**
- **Casio Computer**
- Citizen Electronics
- CITIZEN WATCH
- **Clarinet Systems**
- CMD Technologies
- **Compaq Computer**
- Confinity
- **Counterpoint Systems**
- **Credicom Technologies**
- CrossCheck
- Cypress Semiconductor

- **Matsushita Electronic Works**
- **Matsushita/Panasonic**
- Maxim Integrated Products
- **Microsoft**
- **Minciu Sodas Laboratory**
- Minolta
- **MKNet Corporation**
- **Motorola**
- **National Semiconductor**
- **NEC**
- **NetSchools**
- New Japan Radio
- Niigata Canotec
- **Nokia Mobile Phones**
- **Nova Crystals**
- **Novalog**
- **NTT DoCoMo**
- **NTT/Nippon Tel & Tel**
- **Okaya Systemware**
- **Olympus**
- **Open Interface**
- **Parallax Research**
- PDAia
- **Pentax Systems**
- Personal Solutions
- **PFU Ltd**
- **Philips**
- **Phoenix Technologies**
- **Puma Technology**

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- Datalogic
- **Dell Computer**
- **DOWA**
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- Elmic Systems
- **EMBEDnet Inc.**
- **Ericsson**
- **Extended Systems**
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- **Fuji Photo Film**
- Fuji Xerox
- **Fujitsu**
- **Funai Electric**
- Glenayre
- **Helmig Engineering**
- **Hewlett-Packard**
- **Hitachi**
- Holtek
- **IBM**
- **Infineon Technologies**
- InFocus
- Integrated Systems Inc
- **Intel**
- **Interlink Electronics**
- **IR DATA Corporation**
- **ITE**
- **Inventec**
- **JVC**
- **KC Technology**
- Kent Ridge Digital Labs
- Kobe Steel
- Kodenshi Korea
- **Linux-IrDA Project**
- **Logitech**

- **Questra Consulting**
- **REJDO**
- **Ricoh**
- ROHM
- Ryoyo Electro Co.
- **Salutation Consortium**
- Sanyo
- Scientific Atlanta
- **Seiko Epson**
- **Seiko Instruments**
- **Sejin**
- **Selectech**
- **Sharp Electronics**
- **Sigmatel**
- **Silitek**
- SMK Manufacturing
- **Sony**
- **Stanley Electric**
- SteelCase
- **Strategies Unlimited**
- SunPower
- **Tekram Technology**
- **Texas Instruments**
- Toshiba AITC
- Unity Opto Technology
- Universal Electronics
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- **Vishay-Telefunken**
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- **ZiLOG**

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22 Sep 1999 - 9 Apr 2004

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Application

Infrared Data Association (IRDA) Membership Application

Statement of Purpose:

The Infrared Data Association is a non-profit mutual benefit corporation whose members are committed to the development and maintenance of a worldwide industry standard(s) for interoperable and cordless infrared (IR) digital information transmission.

Membership Levels:

1. Executive Member: entitled to vote for IrDA Directors and on each matter submitted to the Members, and to participate in the deliberations and voting of the Advisory Committee of the Members, as set forth fully in the IrDA Bylaws.
2. Affiliate Member: entitled to participate in deliberations and voting of the Advisory Committee of the Members, as set forth fully in the IrDA Bylaws.

The Benefits of IrDA Membership:

1. Participation/Communication/Cooperation in setting and maintaining the IR standard(s).
2. Access to IrDA committee and workgroup activities/communications via IrDA Internet e-mail reflector, phone conferences and in-person meetings.
3. Cost savings for IrDA certification of IR device interoperability.
4. Cost savings for IrDA services and/or documents.
5. Certification and Standard Information/Education/Promotional activities.

Committee Participation:

1. Technical Committee.
2. Marketing Committee.
3. Membership and Administration Committee.

IrDA Application Procedure:

1. Please review the Compliance with IrDA Rules and Regulations before submitting your application for membership.

2. Complete the attached application form;

3. Once you have completed and submitted the form you will be assigned a tracking number, please record this number, you will need to reference it when you submit you membership dues.

4. Submit payment to IrDA upon successful completion of the Application form. You will be notified via e-mail once your application has been processed.

APPLICATION FORM

All fields marked with a * are required

Membership Level and Annual Dues
(Check desired level of Membership)

◯ Executive Member: $8,000

Affiliate Member (Check applicable level of dues):

◯ $4,000
(if Applicant's gross annual revenue is equal or greater than $250,000)

◯ $1,500
(if Applicant's gross annual revenue is less than $250,000 in previous year)

* Company Name:

* Name of Primary Business Contact:

* Title:

* Address:

* Telephone:

* Fax:

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APPENDIX 10JJ

(12) **United States Patent**　　　　(10) **Patent No.:**　　**US 6,600,902 B1**

Bell　　　　　　　　　　　　　　　　　(45) **Date of Patent:**　　　　**Jul. 29, 2003**

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(54) **MULTIPLE LINK DATA OBJECT CONVEYING METHOD FOR CONVEYING DATA OBJECTS TO WIRELESS STATIONS**

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(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

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(51) Int. Cl.^{7} **H04B 5/00**; H04M 1/68

(52) U.S. Cl. **455/41**; 455/411; 455/517

(58) Field of Search 455/41, 411, 566, 455/567, 410, 517; 380/247, 270

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(57)　　　　　　**ABSTRACT**

A wireless system comprises a number of wireless stations for communication with each other through short-range wireless links. In a multiple link data object conveying method, in a data conveying session, a first short-range wireless link is set up between a first and a second wireless station of the wireless system. Upon setting up of the first short-range wireless link, first and second personal identification codes are respectively entered in the first and second wireless stations. Thereafter, a data connection through the first wireless link is only set up if the first and second entered personal identification codes are the same. If the data connection is set up the first personal identification code is stored for later use in the session, and the data object is conveyed through the first wireless link. Then, while using the stored first personal identification code, at least a subsequent short-range wireless link is set up from the first wireless station to a third wireless station. After checking whether the third wireless station returned the same personal identification code as the re-used first personal identification code, the same type of data object is conveyed through the subsequent wireless link.

18 Claims, 2 Drawing Sheets

FIG. 1

FIG. 2

30 — START

31 — INITIALIZE BLUETOOTH

32 — USER COMMAND? — NO

YES

33 — SWAP BUSINESS CARDS? — (vCARD) — NO — (vCALENDAR) — OTHER FUNCTION — 34

35 — SEARCH FOR REMOTE DEVICES

36 — REMOTE DEVICE FOUND? — NO — 37 — BEEN SEARCHING TOO LONG? — NO / YES

YES

38A — SWAPPED CARDS ALREADY? — YES / NO — NO — 38 — REMOTE DEVICE NEW?

YES

39 — INITIALIZE LINK

40 — RECENT PREVIOUS LINK? — YES (USE PREVIOUS PIN)

AND STORE PIN1

NO

41 — OBTAIN PIN 1 FROM USER

42 — AUTHENTICATE LINK

43 — LINKS AUTHENTICATED? (PINs THE SAME?) — NO — PIN2, PIN3, PIN4

YES

44 — SERVICE DISCOVERY: OBTAIN BUSINESS CARD CAPABILITY FROM REMOTE DEVICE

45 — REMOTE DEVICE ABLE TO SWAP BUSINESS CARDS? — NO

YES

46 — SWAP CARDS — OR SEND, OR RECEIVE

FIG. 3

MULTIPLE LINK DATA OBJECT CONVEYING METHOD FOR CONVEYING DATA OBJECTS TO WIRELESS STATIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a method of conveying data objects to wireless stations through short-range wireless links such as radio links, infra-red links, or any other suitable wireless links or combinations of different types of wireless links. The short-range wireless links can be wireless links in accordance with the so-called Bluetooth Specification, or any other suitable short-range wireless link. The wireless stations can be cellular or cordless phones, personal computers, PDAs, laptops, palm pilots, or any other suitable portable devices.

The present invention further relates to a wireless system and to wireless stations for implementing the method.

2. Description of the Related Art

The well-known OSI, Open System Reference model of layers distinguishes seven layers, a physical layer, a data link layer, a network layer, a transport layer, a session layer, a presentation layer and an application layer. Depending on a particular application, several layers may be combined as a single layer. In accordance with the OSI reference model, the physical data flow between system entities occurs through all layers between entities, whereas the logical data flow is defined as a peer to peer communication between corresponding layers of the entities.

The Bluetooth Specification, "Specification of the Bluetooth System—Core", v1.0A, Jul. 26th, 1999, pp. 41–45 and 47, describes a short-range wireless system. In Bluetooth, the range of a wireless link is typically in the order of a few meters. On page 41, a general description of BT, Bluetooth, a short-range radio link, is given. On page 42, a BT piconet with masters and slaves is shown. On pages 43–45, the BT physical channel, with time slots, is shown. Page 45 describes types of links between masters and slaves, a master being a link initiator, and a slave being the device accessed by the master. In this respect, a master/slave relationship exists between devices when a Bluetooth link is established. Once a link has been established, a communication can be initiated by a client or by a server, a client/server relationship existing between applications of the devices involved in a link. In terms of Bluetooth, depending on the device initiating a Bluetooth link, either the server or the client is a master, the other one of the server/client then being a slave. In the server/client relationship, the client sends requests to the server, and the server responds to such requests. As described on page 47, information is exchanged through packets, e.g., using a serial port profile or a more complex object exchange profile as defined in Bluetooth.

The Bluetooth Specification, "Specification of the Bluetooth System—Profiles", v1.0A, Jul. 26th, 1999, pp., describes protocol profiles in Bluetooth. On page 26, a PIN, i.e., a passkey is described that is used to authenticate two BT devices to each other. The PIN is used in a so-called pairing procedure. Pairing is described on page 28. In a pairing procedure bo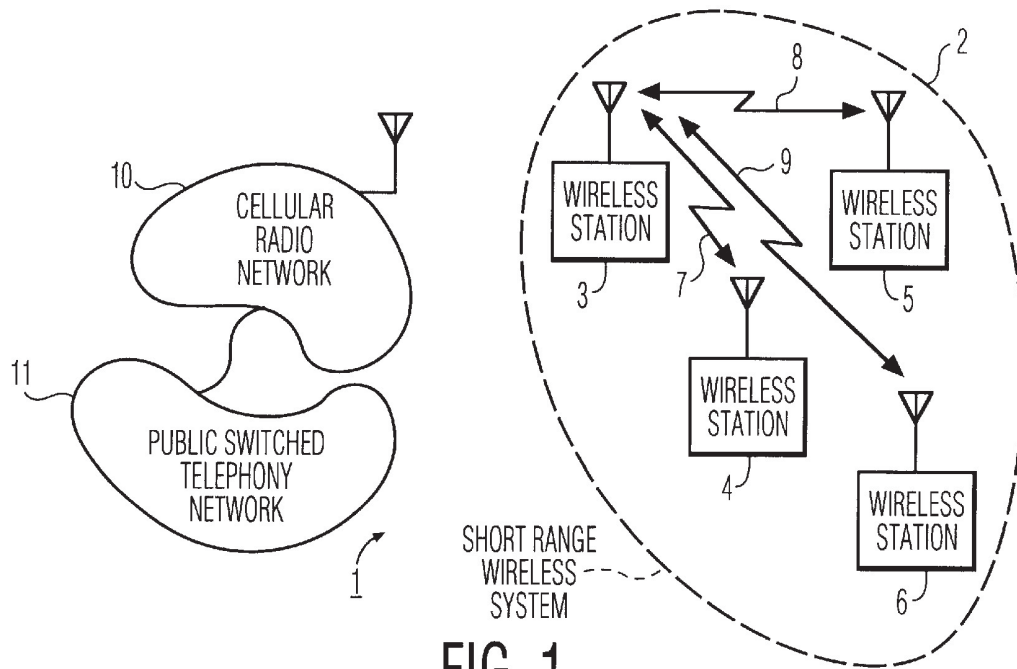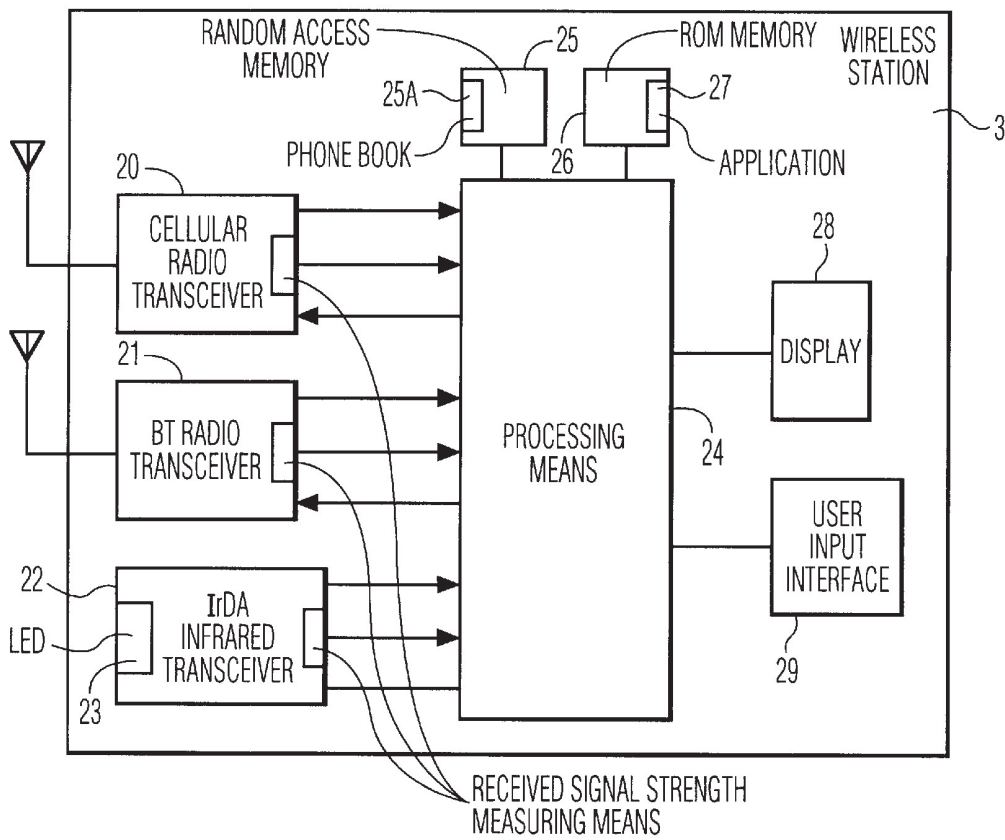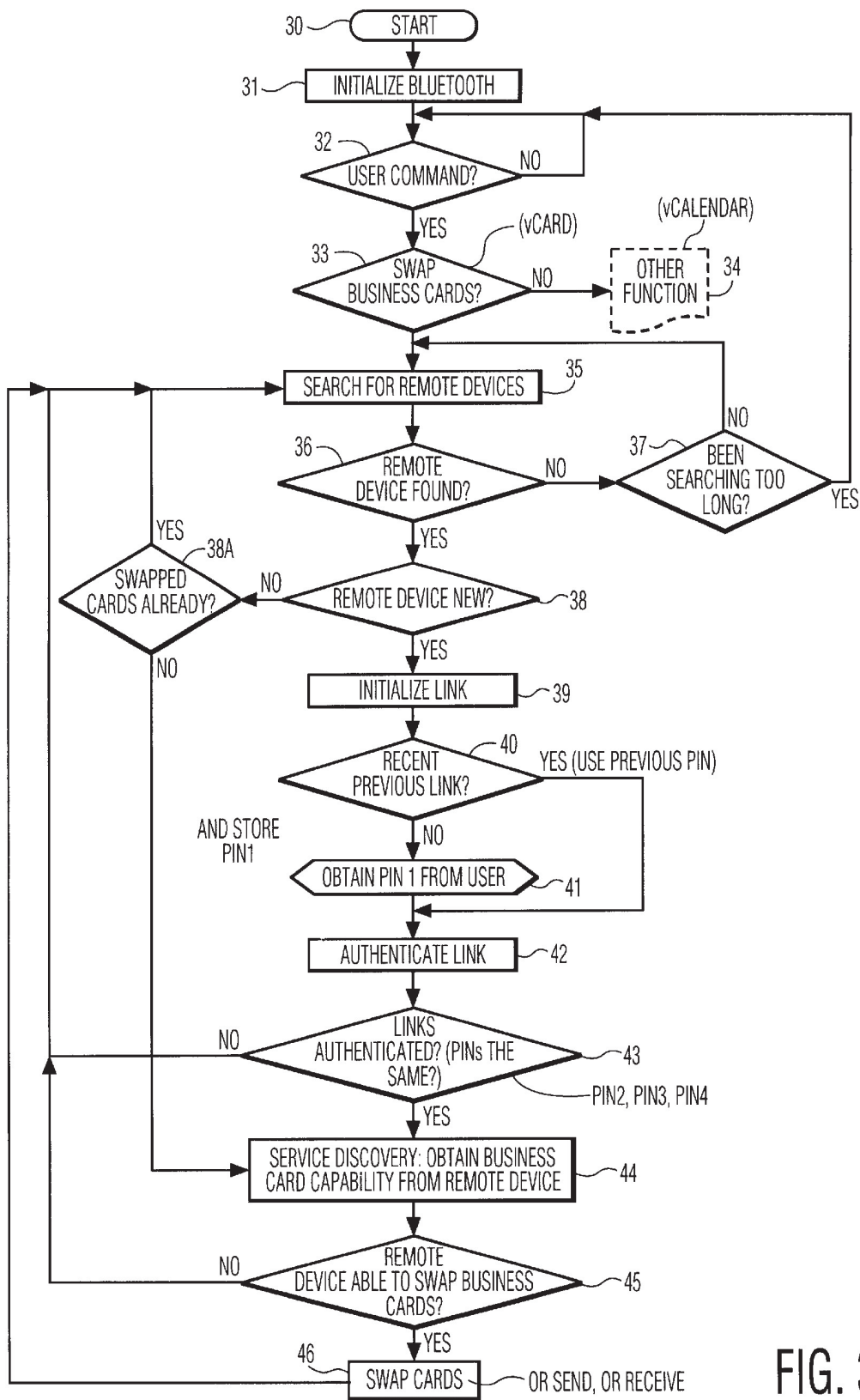th users involved in a wireless link should enter the same PIN in the respective devices of the link. A Service Discovery Protocol is started to find the other one of the client/server pair. Upon the service discovery procedure, as defined on page 66, that is used to locate services that are available on or via devices in the vicinity of a BT enabled device, establishment procedures as defined on

page 45 are performed. First a link establishment procedure is performed to establish a physical link between two BT devices. Then, a channel establishment procedure is performed to establish a BT channel, i.e., a logical link, between the two BT devices is established. Thereafter, a connection establishment procedure is performed to establish a connection between applications on the two BT devices. Between a connection request from one of the BT devices and a connection acknowledgement of the other BT device, an authentication procedure may be performed. On pages 336–348 Object Exchange profiles are described to be used by applications running on BT devices, such as Object Push and Object Pull devices. An object push profile can be used by a BT enabled mobile phone to push an object to another BT device. An object pull profile can be used by a mobile phone to pull an object from another mobile phone. With the object profiles push and pull, information such as business card information, calendar information, or any other useful information can be sent to, received from a BT device, or can be exchanged between BT devices, exchange being defined as a push of a business card followed by a pull of a business card. On page 346, object push features are described, such a phone book applications should support vCard, calendar applications that should support vCalendar, messaging applications that should support vMessage, and notes applications that should support vNote.

Instead of a short-range radio link, also other short-range links such as an infra-red link are known, e.g., the IrDA Standard as described in the IrOBEX Specification "IrDA Object Exchange Protocol", Version 1.2, Counterpoint Systems Foundry, Inc and Microsoft Corporation, Mar. 18, 1999. In the IrOBEX specification four OBEX commands are described that can be used to exchange data in a short-range infra red link, the so-called CONNECT, PUT, GET, and DISCONNECT operations. In Section 3.3 OBEX operations and opcode definitions are given, and more particularly Section 3.3.1 on page 23 describes the CONNECT operation, Section 3.3.2 on page 26 describes the DISCONNECT operation, Section 3.3.3 on pages 26 and 27 describes the PUT operation, and Section 3.3.4 on page 29 describes the GET operation. IrDA has been adapted to Bluetooth. In Bluetooth, corresponding commands are described, PUSH corresponding to PUT, and PULL corresponding to GET of the IrOBEX specification. On page 45 of the IrOBEX specification, examples are given of CONNECT, PUT, and GET client requests and server responses. A so-called vCard object in IrOBEX is defining a format of a business card that may include a name, telephone and fax numbers, e-mail addresses, and other types of information. On page 337 of said Bluetooth Specification—Profiles, referred is to the BT IrDA Interoperability Specification.

In the PCT patent application WO 99/29127, a method is disclosed for sending tagged information to a cellular telephone through a short message in a short message service. As described from page7, line 24 to page 8, line 18 of WO 99/29127, one type of short message is tagged with a header identifying the message as a standardized electronic business card. Such standardized electronic business cards are known as vCards as indicated above, and are described in more detail by Internet Mail Consortium.

vCard and vCalendar are further described on the website of the Internet Mail Consortium. vCard and vCalendar are registered trademarks of the Internet Mail Consortium.

In the PCT patent application WO 97/04602 a method for use in a cellular telephone is disclosed in which PIN, Personal Identification Number, usage is reduced in order to

reduce the chance to intercept PINs on an air interface between the cellular telephone and a cellular telephony network. In this method, a user or subscriber of the cellular telephone is only required to enter a PIN when a call is made to a telephone number not previously stored in a separate calling or contact list of the cellular telephone, i.e., a call setup routine of the cellular telephone then bypasses the PIN request and connects such calls. See WO 97/04602, page 2, lines 5–25.

SUMMARY OF THE INVENTION

It is an object of the invention to provide a simple multiple link data object conveying method for use in a wireless system of a type in which wireless links are authorized through matching personal identification codes, without tedious and repetitious entering of personal identification codes for individual links.

It is another object of the invention to provide such a method wherein for all wireless links the same data object conveying task is performed.

It is still another object of the invention to perform the data object conveying task for all involved wireless links within a predetermined time, particularly within a time period in the order of minutes or less.

It is still another object of the invention to use an agreed personal identification code for all wireless links involved in a data object conveying task as agreed upon by users of the wireless stations involved in the wireless links.

It is still another object of the invention to convey, i.e., receive, transmit, or exchange, data objects of different types such as virtual business cards, virtual calendars, virtual notes, or any other suitable data objects.

In accordance with the invention, an application driven multiple link data object conveying method is provided, for use in a wireless system comprising a plurality of wireless stations for communicating with each other through short-range wireless links, said method comprising:

setting up a first short-range wireless link between a first and a second wireless station, while entering a first personal identification code in said first wireless station and a second identification code in said second wireless station, and only establishing a data connection through said first short-range wireless link between said first and second wireless stations when said first and second personal identification codes are the same;

upon a successful establishment of said data connection, running an application in one of said first and second wireless devices, said application initiating a first data object conveying task between said first and second wireless station;

through said application at least setting up a subsequent short-range wireless link to a third wireless station, while, using a stored personal identification code that is the same as said first and second personal identification code, and, after checking whether said third wireless station returns a personal identification code that is the same as said stored personal identification code, initiating performance of a further data object conveying task between said first and third wireless stations.

In a preferred embodiment, the same data object conveying task is performed for all wireless links involved in a conveying session, a data object being a virtual business card, for instance. In such a data object conveying task, some wireless stations may only receive or transmit business card information, and other wireless stations may exchange business card information.

Typically, a data object conveying task is ended, either manually or automatically in the order of thirty seconds after the last session between the wireless stations involved.

The method can be initiated manually, but also automatically, when two or more wireless stations to become involved in a data object conveying session make requests for such a session within a short period of time, within thirty seconds, for instance.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a wireless system with a number of wireless stations in accordance with the present invention.

FIG. 2 shows a functional block diagram of a wireless station in accordance with the present invention.

FIG. 3 shows a flow chart to illustrate a method in accordance with the present invention.

Throughout the figures the same reference numerals are used for the same features.

DESCRIPTION OF THE PREFERRED EMBODIMENT

FIG. 1 shows a wireless system 1 including a short-range wireless system 2 with a number of wireless stations 3, 4, 5, and 6. Shown is the wireless station 3 communicating with the wireless stations 4, 5, and 6 through respective short-range multiple wireless links 7, 8, and 9. In addition thereto, the wireless station can be configured to communicate with a cellular radio network 10, or any other suitable network. The shown cellular radio network 10 may be coupled to a public switched telephony network 11. The wireless stations 3, 4, 5, and 6 can also be configured for short-range wireless communication only. Preferably, through the wireless links 7, 8, and 9 air interface protocols are performed in accordance with said Bluetooth Specification. Alternatively, other suitable short-range wireless link protocols may be used such as according to the so-called HomeRF Standard. The short-range wireless links 7, 8, and 9 can be radio links, infrared links, or any other suitable wireless links, or combinations thereof.

FIG 2. shows a functional block diagram of the wireless station 3 in accordance with the present invention. The wireless stations 4, 5, and 6 are similar in construction and operation. The wireless stations can be cellular phones, personal computers, PDAs, or any other suitable portable device configured and programmed to implement the present invention. The wireless station 3 comprises a cellular radio transceiver 20, a Bluetooth (BT) radio transceiver 21, and an IrDA infrared transceiver 22 with a Light Emitting Diode (LED) 23 for transmitting and receiving modulated infrared signals. The transceivers 20, 21 and 22 comprise receive and transmit circuitry, including mixers, modulators, demodulators, analog-to-digital converters, and digital-to-analog converters so that the transceivers can transmit digital signals generated by processing means 24 and can provide digital signals to the processing means 24. Such transceiver circuitry is well known and is not shown in detail here. The BT transceiver 21 is configured to operate in accordance with said Bluetooth Specification and the IrDA transceiver 22 is configured to operate in accordance with said IrDA Specification. The wireless station 3 further comprises a random access memory (RAM) 25 for storing volatile data with a memory part 25A for storing non-volatile data, a ROM-memory 26 comprising an application 27, a display 28, and a user input interface 29 such as a keyboard or other suitable input means and display control

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means, the RAM **25**, the ROM **26**, the display **28**, and the user input interface **29** being coupled to the processing means **24**. The non-volatile memory **25A** may comprise a phone book. The transceivers **20**, **21**, and **22** respectively comprise receive signal strength measurement means. The application **27**, that is distributed over the wireless stations **3**, **4**, **5**, and **6** involved in the multiple link, is a computer program implementing a multiple link data object conveying method according to the invention.

FIG. **3** shows a flow chart to illustrate a method in according to the present invention, implemented as a programmed application distributed over the wireless stations involved in a multiple wireless link formed by the wireless links **7**, **8**, and **9**. In the example given all individual wireless station searches, discoveries, link set-ups, data connection establishments, and authentication procedures are in accordance with said Bluetooth Specification. In accordance with the invention, a data object to be conveyed can be a virtual business card vCard, or also virtual calendar information vCalendar, as shown, or any other suitable virtual information. The data format of vCard and vCalendar as such is known from said Internet Mail Consortium. In block **30**, the wireless station **3** is switched on, e.g., to perform a data object conveying task, in the example given, to swap, receive, or transmit virtual business cards or virtual calendar information. In accordance with the invention, a typical situation is multiple conveyance, i.e., sending, receiving, or swapping of such business card or calendar information among multiple wireless stations, by users involved in a business meeting or the like. In block **31**, Bluetooth is initialized in the wireless station **3**. In block **32** it is tested whether an event occurred, such as the user of the wireless station **3** interacting with the user input interface **29**. In block **33** the event is tested, e.g., the user desiring to convey virtual business cards. If this is not the case, in block **34** another task is performed, such as displaying another screen on the display **28**, making a phone call, or performing another data conveyance task such as conveying virtual calendar information. If the selected task is conveying virtual business cards, in block **35**, the wireless station searches for all remote wireless stations. In block **36** it is tested whether a remote wireless station is found. If not, in block **37** it is tested whether a search for wireless stations takes too long. Such a situation arises when no other wireless stations are in-range of the wireless station **3**. If the search takes too long, the block **37** returns to the block **32** to wait for a user action. In block **38** it is tested whether the found remote wireless station is new, where a new wireless station does not concurrently have a link with the wireless station **3**. If the found remote wireless station or device is not new, in block **38A** it is tested whether the device already swapped cards. If so, the search returns to the block **35** in order to search for other remote devices. If this is not the case, a service discovery procedure is performed as will be described later on. If a new remote wireless station has been found, say the wireless station **4**, in block **39** the wireless link **7** between the wireless stations **3** and **4** is initialized. Thereafter, in block **40** it is tested if a recent previous link has been established, within the last thirty seconds or so. This is because in a typical situation of exchanging business cards in a meeting, the users first agree on a common personal identification code to be used in the multiple link data conveying method according to the invention, and then start exchanging business card information. The whole process of electronically exchanging is a relatively quick process. So, if the previous link has not been set up recently, it was most likely used for other purposes. If there had not been established a recent

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previous link, the actual situation up till now, in block **41** the user of the wireless station **3** is prompted to enter a personal identification code PIN1. Upon entering the PIN-code PIN1, the code PIN1 is stored in the memory **25**. If there was a recent previous link capable of conveying business card information, the PIN-code PIN1 stored with the recent previous link is used in a process to authenticate a currently found new and business card conveying capable link. In block **42** the currently found business card capable link is authenticated. In this authentication process, the user of the found wireless station is prompted to enter a PIN-code. In the example given, it is assumed that all remote wireless stations are capable of conveying business card information and that respective users of the wireless stations **4**, **5** and **6** enter PIN-codes PIN2, PIN3, and PIN4. It is further assumed that, first, the wireless station **4** was found and thereafter the wireless stations **6** and **5**, in that order. In block **43** it is successively tested with each found remote wireless station whether the PIN-code entered by the user of the wireless station **3**, the PIN-code PIN1, is the same as the PIN-code entered by the users of the remote wireless stations **4**, **6**, and **5**. Assume the user of the wireless stations **4** and **5** shortly after another entered the same PIN-code as the PIN-code PIN1, and the user of the wireless station **6** entered a different PIN-code. Then, initially the wireless stations **3**, **4**, and,**5** are involved in the business card conveying task. If shortly after the last data conveyance task, within a period of thirty seconds, the user of the wireless station **6** re-enters a then same PIN-code, the wireless station **6** is eventually involved in the business card conveying session. Thus, if in a data object conveying process links are made shortly after another, for the same service, so that a succession of links forms a data object exchange session, the user of the wireless station **3** only has to enter a single PIN-code that is automatically used to authenticate links succeeding a recent previous link. The application proceeds in block **44** with a so-called Bluetooth Service Discovery Procedure as described on page 66 of said Bluetooth Specification— Profiles. In the Service Discovery Procedure, in an in itself known manner, services on or via the wireless station **4** are located. In the example given, in block **45**, it is checked whether the wireless station **4** is capable of performing the virtual business card conveying service or task. If not, the block **45** returns to the block **35** in order to search for another remote wireless station. If the wireless station **4** is capable of performing the business card conveying service or task, in block **46** the actual data conveying task is performed. In the example given, the data conveying task can be swapping business card information, i.e., exchanging information, between two wireless stations, using the Bluetooth Object Push followed by the BT Object Pull, or can be a receiving only task using the BT Object Pull, or can be a sending only task using the BT Object Push, or any combination of data conveying tasks, depending on the particular needs of the users in a given session. In IrDA, the commands PUT and GET are defined that are similar to the BT Objects PUSH and PULL. Preferably, within one session, all data conveying tasks are the same. This is important to prevent links being made for other unauthorized purposes. For example it should not be possible for the wireless station **3** to swap business cards with one remote wireless station and receive calendar information from another wireless station, in one session. Service discovery and card swapping is also performed for a device that was found not to be new in the block **38** and that had not already swapped cards, provided that such a device is capable of swapping cards.

In accordance with the invention, a data conveying session can be initiated manually by the user of the wireless

station **3**. In this embodiment, guest book application software included in the application stored in the memory **27** has a special business card exchange option selectable by the user through the user input interface of the wireless station **3**. After the user enters a PIN-code, the application automatically performs the complete session. In another embodiment a data conveying session is initiated. In this embodiment, a session is automatically started after two or more link requests made within a short period of time, within thirty seconds, for instance. Requests can be made by the user of the wireless station **3** or by users of the remote wireless stations **4**, **5**, and **6**. In an embodiment, the session can be ended manually, by the user of the wireless station **3** ending the session through the user input interface. In another embodiment, the session can be ended automatically by the application, for example a short period in the order of thirty seconds after the last data conveying task in the session. In Bluetooth, the multiple link data object conveying method applies to new so-called temporary links only, not to so-called semi-permanent links. The application is programmed such that currently active links need not be interrupted or effected in any way. A wireless station could have a link to a PC to access the Internet at the same time business cards are exchanged with other wireless stations.

In view of the foregoing it will be evident to a person skilled in the art that various modifications may be made within the spirit and the scope of the invention as hereinafter defined by the appended claims and that the invention is thus not limited to the examples provided. The word "comprising" does not exclude the presence of other elements or steps than those listed in a claim.

What is claimed is:

1. In a wireless system comprising a plurality of wireless stations for communication with each other through short-range wireless links, an application driven multiple link data object conveying method, said method comprising:

setting up a first short-range wireless link between a first and a second wireless station, while entering a first personal identification code in said first wireless station and a second identification code in said second wireless station, and only establishing a data connection through said first short-range wireless link between said first and second wireless stations when said first and second personal identification codes are the same;

upon successful establishment of said data connection, running an application in one of said first and second wireless devices, said application initiating a first data object conveying task between said first and second wireless stations;

through said application at least setting up a subsequent short-range wireless link to a third wireless station, while using a stored personal identification code that is the same as said first and second personal identification code, and, after checking whether said third wireless station returns a personal identification code that is the same as said stored personal identification code, initiating performance of a further data object conveying task between said first and third wireless stations; and

before setting up said subsequent short-range wireless link, checking whether a predetermined time has elapsed after said setting up of said first short-range wireless link, and presenting a user of said application with said stored personal identification code if said predetermined time has not elapsed.

2. A wireless system comprising:

a plurality of wireless stations for communicating with each other through short-range wireless links;

means for setting up a first short-range wireless link between a first and a second wireless station of said plurality of wireless stations;

means for checking whether a predetermined time has elapsed after said setting up of said first short-range wireless link;

means for setting up at least a subsequent short-range wireless link between said first wireless station and a third wireless station of said plurality of wireless stations, and wherein:

said first and second wireless stations comprising means for entering a first and a second personal identification code, respectively, said first wireless station comprising means for only establishing a data connection through said first short-range wireless link when said entered first and second personal identification codes are the same, and, upon successful establishment of said data connection, means for running an application for conveying a data object between said first and second wireless stations, and means for storing a stored personal identification code that is the same as said first and second identification codes, and

said application being configured to automatically initiate said means for said setting up said at least said subsequent short-range wireless link between said first and third wireless stations, while using said stored personal identification code, if said predetermined time has not elapsed.

3. In a wireless system comprising a plurality of wireless stations for communication with each other through short-range wireless links, an application driven multiple link data object conveying method, said method comprising:

setting up a first short-range wireless link between a first and a second wireless station, while entering a first personal identification code in said first wireless station and a second personal identification code in said second wireless station, and only establishing a data connection through said first short-range wireless link between said first and second wireless stations when said first and second personal identification codes are the same;

upon successful establishment of said data connection, running an application in one of said first and second wireless devices, said application initiating a first data object conveying task between said first and second wireless stations;

through said application at least setting up a subsequent short-range wireless link to a third wireless station, while using a stored personal identification code that is the same as said first and second personal identification code, and, after checking whether said third wireless station returns a personal identification code that is the same as said stored personal identification code, initiating performance of a further data object conveying task between said first and third wireless stations; and

wherein said multiple link data object conveying method is ended automatically, after a period of time has elapsed after a last performed data object conveying task through said at least set up subsequent short-range wireless link.

4. In a wireless system comprising a plurality of wireless stations for communication with each other through short-range wireless links, an application driven multiple link data object conveying method, said method comprising:

setting up a first short-range wireless link between a first and a second wireless station, while entering a first

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personal identification code in said first wireless station and a second personal identification code in said second wireless station, and only establishing a data connection through said first short-range wireless link between said first and second wireless stations when said first and second personal identification codes are the same;

upon successful establishment of said data connection, running an application in one of said first and second wireless devices, said application initiating a first data object conveying task between said first and second wireless stations;

checking whether a predetermined time has elapsed after said setting up of said first short-range wireless link; and

if said predetermined time has not elapsed, through said application at least automatically setting up a subsequent short-range wireless link to a third wireless station, while using a stored personal identification code that is the same as said first and second personal identification code, and, after checking whether said third wireless station returns a personal identification code that is the same as said stored personal identification code, initiating performance of a further data object conveying task between said first and third wireless stations.

5. A method as claimed in claim **4**, comprising establishing of said first short-range wireless link upon discovery by one of said first and second wireless stations of another one of said first and second wireless stations, and of said subsequent short-range wireless link upon discovering of said third wireless station.

6. A method as claimed in claim **4**, wherein said multiple link data object conveying method is ended automatically, after a period of time has elapsed after a last performed data object conveying task through said at least set up subsequent short-range wireless link.

7. A method as claimed in claim **4**, wherein before said setting up of said first and subsequent short-range wireless links, users of said first, second and at least third wireless station agree upon using the same personal identification code at said setting up.

8. A method as claimed in claim **4**, wherein said multiple link data object conveying method is initiated automatically, upon making at least two link requests within a predetermined time.

9. A method as claimed in claim **4**, wherein said application checks whether said third wireless station is enabled to perform said first or said further data object conveying task.

10. A method as claimed in claim **4**, wherein said further data object conveying task is the same as said first data object conveying task.

11. A method as claimed in claim **4**, wherein said multiple link data object conveying method is initiated manually by a user.

12. A method as claimed in claim **4**, wherein said first data object conveying task conveys business card information.

13. A method as claimed in claim **12**, wherein said business card information is conveyed in the form of a standard virtual business card.

14. A method as claimed in claim **13**, wherein said business card information contains phone numbers for storage in a phone book that is accessible through said application.

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15. A method as claimed in claim **4**, wherein said first data object conveying task conveys calendar information.

16. A method as claimed in claim **4**, wherein said multiple link data object conveying method is ended manually.

17. In a wireless system comprising a plurality of wireless stations for communication with each other through short-range wireless links, an application driven multiple link data object conveying method, said method comprising:

setting up a first short-range wireless link between a first and a second wireless station, while entering a first personal identification code in said first wireless station and a second personal identification code in said second wireless station, and only establishing a data connection through said first short-range wireless link between said first and second wireless stations when said first and second personal identification codes are the same;

upon successful establishment of said data connection, running an application in one of said first and second wireless devices, said application initiating a first data object conveying task between said first and second wireless stations;

through said application at least setting up a subsequent short-range wireless link to a third wireless station, while using a stored personal identification code that is the same as said first and second personal identification code, and, after checking whether said third wireless station returns a personal identification code that is the same as said stored personal identification code, initiating performance of a further data object conveying task between said first and third wireless stations; and

wherein said multiple link data object conveying method is initiated automatically, upon making at least two link requests within a predetermined time.

18. A first wireless station for use in a wireless system comprising said first wireless station and at least a second and a third wireless station, said wireless stations being configured to communicate with each other through short-range wireless links, and said wireless system further comprising means for setting up a first short-range wireless link between said first and second wireless stations and means for setting up a subsequent short-range wireless link between said first and third wireless stations, said first wireless station comprising:

means for entering a first personal identification code;

means for only establishing a data connection through said first short-range wireless link when said entered first personal identification code is the same as a second personal identification code entered in and received from said second wireless station;

upon successful establishment of said data connection, mean for running an application for conveying a data object between said first and second wireless stations;

means for storing said first personal identification code;

means for checking whether a predetermined time has elapsed after said setting up of said first short-range wireless link; and

wherein said application is configured to automatically initiate said means for said setting up said at least said subsequent short-range wireless link between said first and third wireless stations, while using said stored first personal identification code, if said predetermined time has not elapsed.

* * * * *

APPENDIX 10KK

US006882659B1

(12) **United States Patent**
Novak et al.

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(45) **Date of Patent:** **Apr. 19, 2005**

(54) **WIDE AREA NETWORK SYNCHRONIZATION**

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(51) **Int. Cl.**[7] **H04J 3/22**
(52) **U.S. Cl.** **370/466**; 370/353
(58) **Field of Search** 370/352, 353, 370/466, 465, 201, 252, 338, 313, 401; 707/201

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Assistant Examiner—Donald L Mills
(74) *Attorney, Agent, or Firm*—Potomac Patent Group, PLLC

(57) **ABSTRACT**

A mobile application running in a mobile device may be coordinated or synchronized with a non-mobile application running in a non-mobile device. The mobile and non-mobile applications may be, for example, calendar applications. To permit the use of a session-oriented (connection-oriented) protocol stack when the transmission medium between the mobile and non-mobile devices is connectionless, the mobile device sends an initial communication to the non-mobile device. In response to receipt of the initial communication, a session identifier is generated. A first connection-oriented protocol frame is then formed that includes an initial response and the session identifier. The first connection-oriented protocol frame is embedded in a first connectionless protocol frame, and the first connectionless protocol frame is sent to the mobile device. Although the mobile device initiates the session, the session is controlled by the non-mobile device.

5 Claims, 6 Drawing Sheets
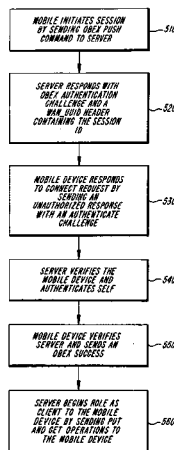
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Fig. 1
PRIOR ART

CLIENT 210   SERVER 220

INITIATE SESSION 230

WAP
REQUEST/RESPONSE
PAIR

SESSION INITIATED 235

REQUEST INFORMATION 240

WAP
REQUEST/RESPONSE
PAIR

INFORMATION RESPONSE 245

END SESSION 250

WAP
REQUEST/RESPONSE
PAIR

SESSION END 255

Fig. 2
PRIOR ART

Fig. 3

310 —   *IrMC*
320 —   *APPLICATION LEVEL PROTOCOL*
330 —   *SESSION LEVEL PROTOCOL*
350 —   *WAP*

OBEX LAYER PROTOCOL 340

Fig. 4

Fig. 5

```
┌─────────────────────────────┐
│  MOBILE INITIATES SESSION   │
│  BY SENDING OBEX PUSH       │──510
│  COMMAND TO SERVER          │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  SERVER RESPONDS WITH       │
│  OBEX AUTHENTICATION        │
│  CHALLENGE AND A            │
│  WAN_UUID HEADER            │──520
│  CONTAINING THE SESSION     │
│  ID                         │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  MOBILE DEVICE RESPONDS     │
│  TO CONNECT REQUEST BY      │
│  SENDING AN                 │
│  UNAUTHORIZED RESPONSE      │──530
│  WITH AN AUTHENTICATE       │
│  CHALLENGE                  │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  SERVER VERIFIES THE        │
│  MOBILE DEVICE AND          │──540
│  AUTHENTICATES SELF         │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  MOBILE DEVICE VERIFIES     │
│  SERVER AND SENDS AN        │──550
│  OBEX SUCCESS               │
└─────────────────────────────┘
              │
              ▼
┌─────────────────────────────┐
│  SERVER BEGINS ROLE AS      │
│  CLIENT TO THE MOBILE       │
│  DEVICE BY SENDING PUT      │──560
│  AND GET OPERATIONS TO      │
│  THE MOBILE DEVICE          │
└─────────────────────────────┘
```

Fig. 6

605 — MOBILE DEVICE SENDS QUERY INCLUDING SESSION ID TO SERVER

607 — MOBILE DEVICE WAITS FOR RESPONSE

610 — MOBILE DEVICE RECEIVES RESPONSE FROM SERVER

615 — RESPONSE = DISCONNECT?

YES → 620 — MOBILE DEVICE DISCONNECTS

NO

625 — RESPONSE = PUT?

YES → 630 — MOBILE DEVICE PERFORMS PUT OPERATION AND RESPONDS WITH RESULTING DATA

NO

635 — RESPONSE = GET?

YES → MOBILE DEVICE PERFORMS GET OPERATION AND RESPONDS WITH RESULTING DATA — 640

NO

645 — IGNORE RESPONSE AS INVALID AND SENDS A REQUEST FOR RETRANSMISSION

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WIDE AREA NETWORK SYNCHRONIZATION

This application claims priority under 35 U.S.C. §§119 and/or 365 to Provisional Application Ser. No. 60/154,782 filed in United States on Sep. 20, 1999; the entire content of which is hereby incorporated by reference.

BACKGROUND

The present invention relates to the synchronization of devices, and more particularly to the synchronization of data stored in devices over a network.

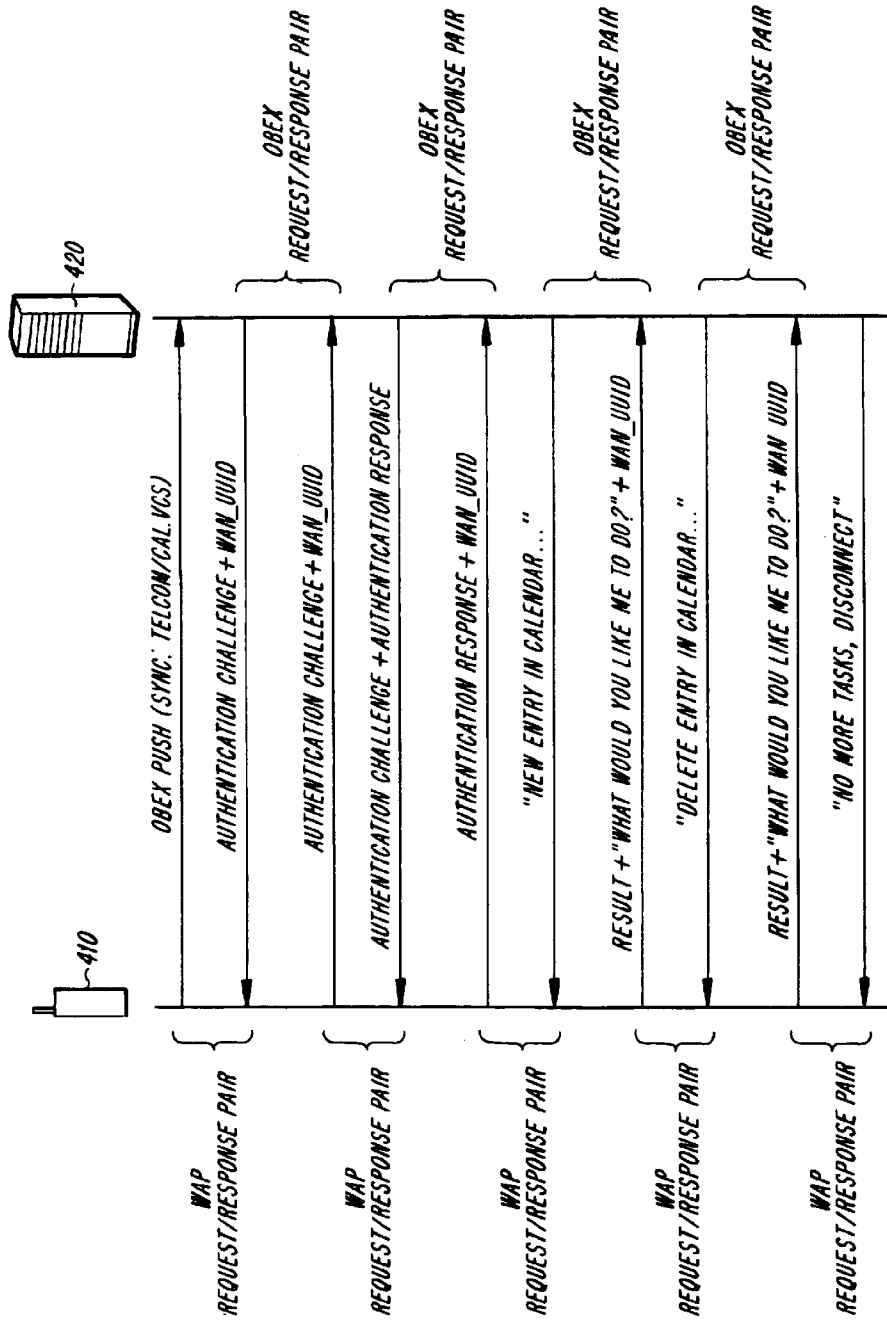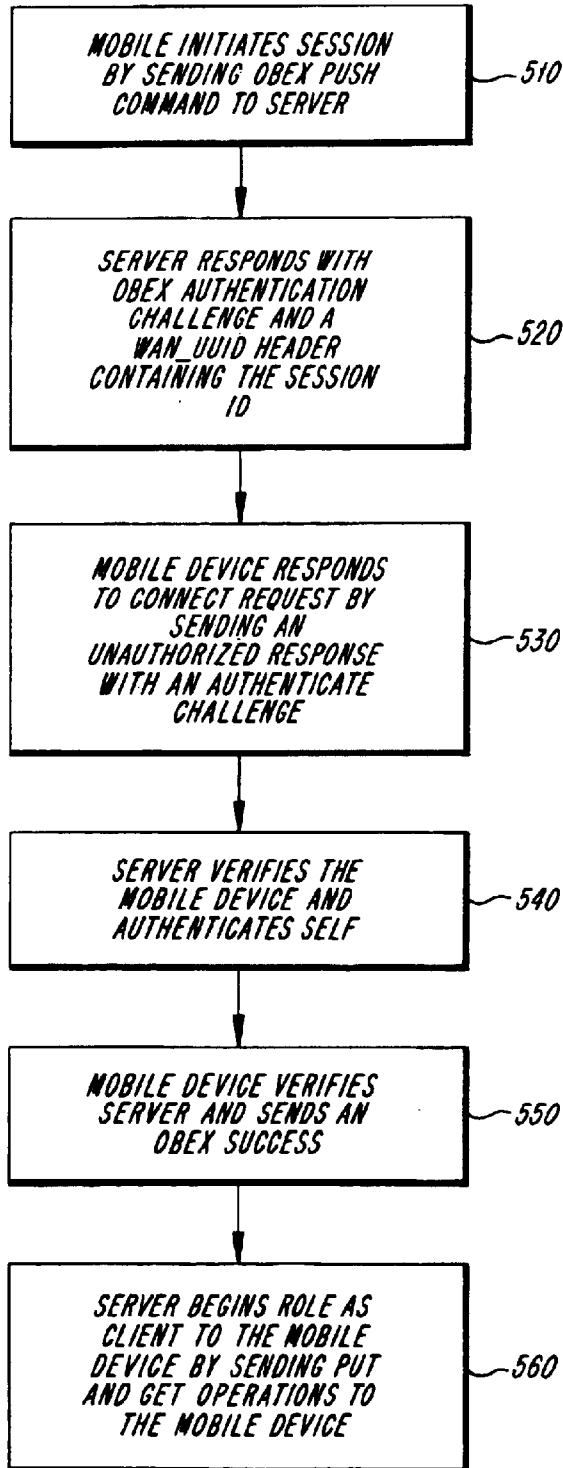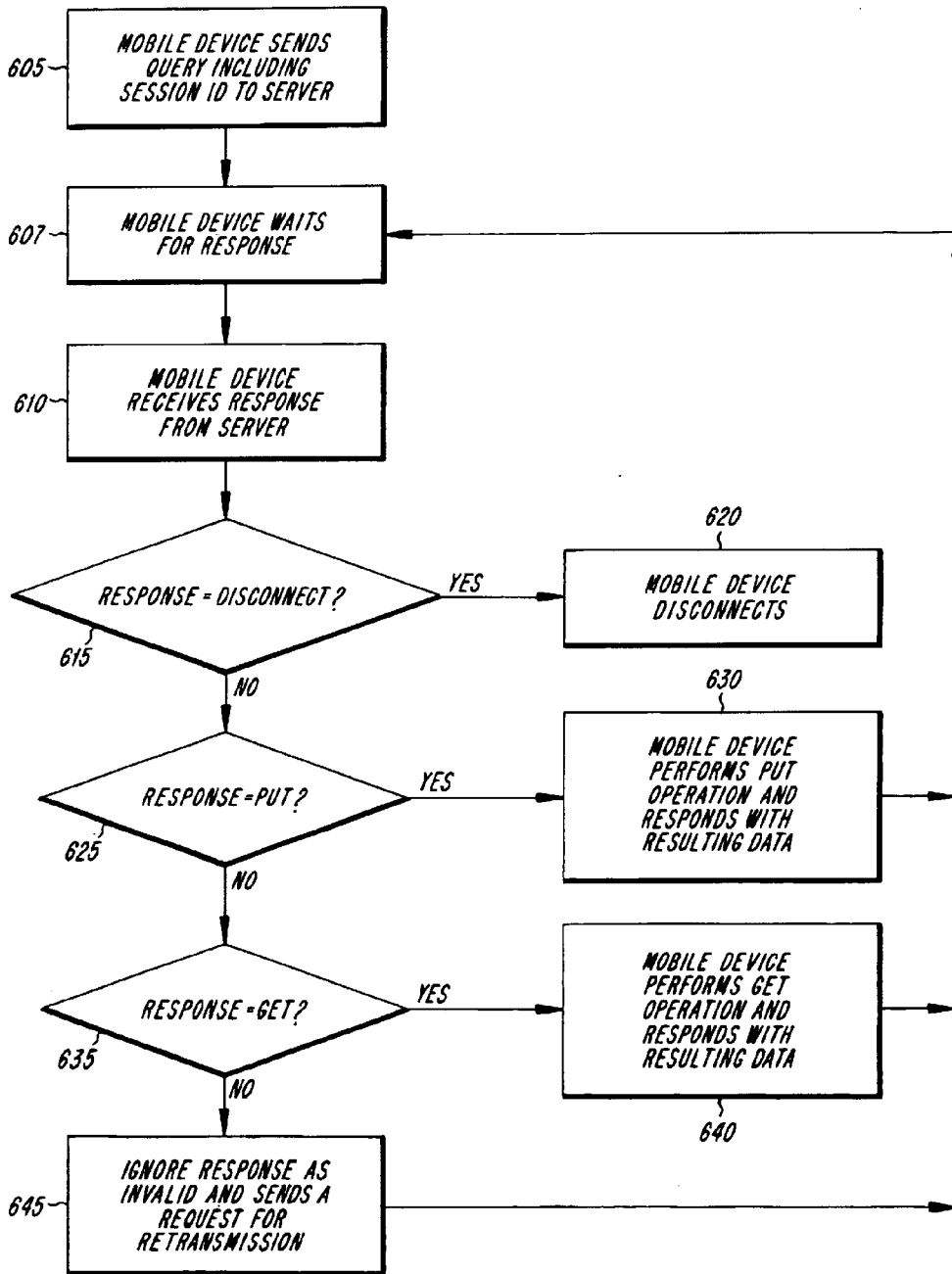In recent years, users of mobile devices have often faced the problem of having the same data stored in the mobile devices as in their stationary computers, such as a server or desktop computer. These mobile devices, such as personal digital assistants (PDA), mobile telephones and portable computers, store a variety of information including calendar entries, contact entries, task lists, and the like. To avoid having to enter information on both the mobile device and on the server, it is desirable to allow the data stored on these devices to be synchronized with each other. Synchronization of data between mobile devices also avoids scheduling conflicting appointments. Further, by synchronizing the data stored in a mobile device the user can be confident that if the data is accidentally erased from the mobile device, the data can be recovered from the server.

One conventional method of synchronizing data between devices is through the use of the protocol standards published by the InfraRed Data Association (IrDA). These protocol standards provide methods for sending data between devices using infrared communications. One of the protocol standards published by the IrDA is OBEX. OBEX stands for "object exchange" and describes a way to send an arbitrary data object from one unit to another in a simple way. The OBEX protocol consists of two major parts, the session level protocol and the application framework. The session level protocol dictates what can be said during the conversation between the units which are exchanging data and a set of operational codes (opcodes) that define specific actions. The application framework, which is built on top of the session protocol, provides a model for representing the objects to be sent. The application framework is necessary to ensure interoperability between units using OBEX. For more information regarding OBEX, the interested reader should refer to "IrDA Object Exchange Protocol IrOBEX", Counterpoint Systems Foundry, Inc., Version 1.2, Mar. 18, 1999, which is expressly incorporated herein by reference.

Another protocol standard published by the IrDA is known as Infrared Mobile Communication (IrMC). IrMC provides a model for how to store and access data, such as calendar items, contacts, and the like. Using the IrMC model, when changes are made to a calendar item in the mobile device, the changes will be made to the calendar item in the server when the mobile device and stationary computer are subsequently synchronized. Typically, IrMC is placed in the application layer on top of the OBEX layer in an IR protocol stack. For more information regarding IrMC the interested reader should refer to "Specifications For Ir Mobile Communications (IrMC)", Version 1.1 Mar. 1, 1999, which is expressly incorporated herein by reference.

Although a combination of IrMC and OBEX provides an efficient model for synchronizing data, the medium over which these protocols are designed to communicate has many deficiencies. For example, since these protocols are designed to operate using infrared communications, devices

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which are to exchange data must have a line of sight connection between them in order to ensure that the devices can communicate. Further, these protocols are connection oriented, and hence, these protocols are not designed to operate in a connectionless environment such as the Internet.

As Internet communications continue to proliferate it is desirable to provide protocols compatible with the Internet Protocol (IP) which would allow users of various devices to access information and services stored on the Internet. One model for providing access to information and services stored on the Internet to mobile devices, such as wireless phones, is known as Wireless Applications Protocol (WAP). WAP is an open global specification which is designed to enable easy fast delivery of relevant information and services to mobile users.

FIG. 1 illustrates an exemplary network configuration for a mobile device to communicate over the Internet using WAP. Mobile device 110 communicates over air interface 120 with antenna 130. The signals received by antenna 130 are communicated to a WAP to IP Gateway 140. WAP to IP Gateway 140 is primarily responsible for converting the signals between WAP and IP protocols. After converting the signals received from antenna 130, the WAP to IP Gateway 140 forwards the signals over network 150 to server 160. Server 160 receives the signals and sends a response, if requested, back to the mobile device 110 over network 150 to WAP to IP Gateway 140. WAP to IP Gateway 140 converts the signals received from server 160 from IP to WAP and forwards the signals to antenna 130. Antenna 130 then sends the WAP signals over air interface 120 to mobile device 110. The network of FIG. 1 has been simplified for ease of understanding. One skilled in the art will recognize that the network of FIG. 1 could include base stations, mobile switching centers, and the like.

Since WAP is designed as a connectionless protocol, WAP, like IP is also stateless. Accordingly, the state of the application must be maintained by the application itself.

FIG. 2 illustrates conventional signaling between a server and client in connectionless protocols such as WAP and IP. Typically, the client 210 will initiate a session with server 220 by sending an Initiate Session message 230 to the server 220. The server 220 will respond with a Session Initiated message 235 containing the session ID for the connection between the client 210 and server 220. Now that the session has been initiated, the client 210 sends a Request for Information message 240, including the session ID, to the server 220. In response, the server 220 sends an Information Response message 245, including the session ID to the client 210. As illustrated by the broken lines, the client 210 may send more Information Request messages and the server 220 continues to reply with Information Response messages. When the client 210 desires to terminate the session with the server 220, the client 210 sends an End Session message 250. In response the server 220 sends a Session Ended message 255. Each of the messages exchanged between the client 210 and the server 220 contains the session ID so that both the client 210 and the server 220 can associate the received messages with the particular session established between the client 210 and server 220. In typical Internet communications, the client is a browser and the session ID is sent in hidden fields of forms passed between the browser and the server.

As illustrated in FIG. 2, connectionless protocols such as WAP have defined Request/Response pairs such that the client who has initiated the session will also control the session. In other words, connectionless protocols define that

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the party who initiates the session will be the party who sends the information requests and the other party will only send messages in response to information requests. When synchronizing data between a mobile device and a server, it is preferable to place the synchronization logic on the server side because the mobile device typically has limited resources in terms of memory and processing capacity. Accordingly, the synchronization process should be controlled by the server which typically has sufficient memory and processing capacity for performing the synchronization. In typical synchronization applications the mobile device initiates the synchronization process. However, as described above, connectionless protocols would require that the mobile device, and not the server, control the session.

Accordingly, it would be desirable to provide a synchronization protocol such as IrMC which avoids one or more of the deficiencies of the infrared air interface. It would also be desirable to provide a synchronization protocol that operates in a connectionless environment such as the Internet. It would further be desirable to provide a synchronization protocol where the synchronization session is initiated by the mobile device but is controlled by the server.

SUMMARY

The foregoing and other objects are achieved in synchronization methods and apparatuses for use in a connectionless protocol. In accordance with one aspect of the invention, an initial communication is sent from the mobile device to the non-mobile device. In response to receipt of the initial communication, a session identifier is generated. A first connection-oriented protocol frame that includes an initial response and the session identifier is generated. The first connection-oriented protocol frame is embedded in a first connectionless protocol frame. The first connectionless protocol frame is sent to the mobile device.

In yet another aspect of the invention, the request for service is a command for modifying the mobile application based on the non-mobile application.

In still another aspect of the invention, the mobile application and the non-mobile application are each calendar applications.

In yet another aspect of the invention, the command for modifying the mobile application based on the non-mobile application synchronizes an aspect of the mobile application and the non-mobile application.

In still another aspect of the invention, the first connection-oriented protocol frame is an OBEX frame.

In yet another aspect of the invention, the first connectionless protocol frame is a WSP frame.

In another aspect of the invention, the mobile device forms a second connection-oriented protocol frame that includes an invitation to provide service and the session identifier. The second connection-oriented frame is embedded in a second connectionless protocol frame. The second connectionless protocol frame is sent to the non-mobile device. The invitation to provide service and the session identifier is received in the non-mobile device and in response thereto a third connection-oriented protocol frame is formed that includes a request for service and the session identifier. The third connection-oriented protocol frame is embedded in a third connectionless protocol frame. The third connectionless protocol frame is sent to the mobile device. In yet another aspect of the invention, the non-mobile device controls the coordination of the mobile application with the non-mobile application.

BRIEF DESCRIPTION OF THE DRAWINGS

The objects and advantages of the invention will be understood by reading the following detailed description in conjunction with the drawings in which:

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FIG. 1 depicts a conventional wireless network for use with a wireless connectionless protocol such as WAP;

FIG. 2 depicts conventional request and response signaling between a client and server which communicate using a connectionless protocol;

FIG. 3 depicts an exemplary embodiment of a protocol stack for tunneling of OBEX and IrMC data over WAP in accordance with the invention;

FIG. 4 depicts exemplary signaling between a mobile device and a server for synchronization of data in accordance with the invention;

FIG. 5 depicts an exemplary method for establishing a session between a mobile device and server in accordance with the invention; and

FIG. 6 illustrates an exemplary method for synchronizing data between a mobile device and server in accordance with the invention.

DETAILED DESCRIPTION

The various features of the invention will now be described with respect to the figures, in which like parts are identified with the same reference characters. Although the following description is provided in the context of synchronization of data between mobile devices and servers, those skilled in the art will appreciate that the present invention is equally applicable to synchronization of data between non-mobile wireless devices and any type of storage system connected to a network as well.

FIG. 3 illustrates an exemplary protocol stack for tunneling OBEX and IrMC data over WAP. Tunneling refers to placing a protocol from a higher layer into a lower layer protocol so that the higher layer protocol can traverse a network which operates using the lower layer protocol. At the top of the protocol stack is the IrMC layer **310**. Below the IrMC layer **310** is the application level protocol layer **320** and below that is the session level protocol layer **330**. The application level protocol layer **320** and the session level protocol layer **330** together constitute the OBEX protocol layer **340**. At the bottom of the protocol stack is the WAP layer **350**. Accordingly, the connection oriented data in the IrMC layer **310** and in the OBEX layer **340** are placed in connectionless data packets at the WAP layer **350** for transmission over the air interface between the mobile device and the server. By embedding the connection oriented IrMC and OBEX data in a connectionless protocol allows the use of IrMC and OBEX for the synchronization process over a connectionless protocol such as WAP.

As discussed above, conventional connectionless protocols require the client, such as a mobile device, to control the session which would require more memory and processing power to be placed in the mobile devices. According to exemplary embodiments of the present invention, the mobile device can initiate the session with the server, and the server controls the session.

FIG. 4 illustrates exemplary signaling between a mobile device **410** and a server **420** where the server **420** controls the session with the mobile device **410**. The mobile device **410** initiates the session by sending an OBEX PUSH command to the server **420**. The OBEX PUSH command contains information about what application is to be run during the synchronization, e.g., calender synchronization. The server **420** responds with an OBEX Authentication challenge and a Wide Area Network Synchronization Universal Unique Identifier (WAN_UUID) header containing the assigned session ID. The session ID is generated by the

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server **420** and is, in the exemplary embodiment, a 128-bit globally unique identifier (GUID). The mobile device **410** responds with an OBEX Authentication Challenge, including the user name in the User Id header and a WAN_UUID header containing the assigned session ID. The server **420** sends an OBEX Authentication challenge and an OBEX Authentication Response to the mobile device **410**. The OBEX Authentication response contains information which is responsive to the OBEX Authentication challenge sent by the mobile device **410**. The mobile device **410** then sends an OBEX Authentication Response and a WAN_UUID header containing the assigned session ID to server **420**.

After the mobile device **410** and server **420** have authenticated each other the server initiates the synchronization by sending a task to the mobile device **410**. For example, the server sends a "New entry in calendar" instruction, which instructs the mobile device **410** to place a new entry in a calendar application stored in the mobile device **410**. The mobile device **410** responds with a result of the placing the new entry in the calendar, a "What would you like me to do?" message and a WAN_UUID header containing the assigned session ID. The server **420** next sends a "Delete entry in calendar" message to the mobile device **410**. The mobile device **410** deletes the entry in the calendar requested by the server **420**. The mobile device then sends a message containing the result, a "What would you like me to do?" message and a WAN_UUID header containing the assigned session ID to the server **420**. The server **420** determines that there are no more actions to be performed in the synchronization process. Accordingly, the server **420** ends the session with the mobile device **410** by sending a "No more tasks, Disconnect" message.

As illustrated in FIG. **4**, the present invention maintains the conventional WAP Request/Response pair. Similarly, the conventional OBEX Request/Response pair is maintained because the server **420**, which did not initiate the session, is controlling the synchronization process. One skilled in the art will recognize that the types of commands sent from the server **420** to the mobile device **410** in response to the "What do you want me to do?" messages are merely exemplary and any commands which are used in the synchronization process can be substituted, such as adding or deleting contact entries, adding or deleting task, and the like. Further, one skilled in the art will recognize that since the mobile device has a one-to-one relationship with the server, the server only has to pass the session ID during the initiation sequence. However, since the server has a one-to-many relationship with the mobile devices, the mobile devices need to send a session ID with every request/response sent to the server.

According to exemplary embodiments of the present invention, the communications between the mobile device and the server are performed in the WAP layer using the POST method. A "method" is the type of client request as defined by HTTP/1.1 which is typically used by a client in Wireless Session Protocol (WSP) to invoke services on the server. In addition to the POST method, HTTP and WSP define the GET method for retrieving information stored on a server. Because there is a size limit for sending data in the URL using the GET method, the present invention uses the POST method for communications between the mobile device and the server. In addition, using the POST method avoids problems that the GET method has with special characters, e.g., blank spaces and ASCII control codes.

In every message sent from the mobile device to the server except for the initial connect request, the message will contain the session ID (sid) and OBEX header (obex) parameters. The initial connect request from the mobile

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device to the server will not contain the sid because this is assigned by the server, and is therefore unknown to the mobile device at the time of the initial connect request. Table I below summarizes an exemplary embodiment of the sid and obex parameters.

TABLE I

Name	Size	Description
sid	16 bytes	This is the Global Unique Identifier (GUID) assigned by the server. The GUID should be coded as an array of 16 bytes, each byte representing a byte in the GUID (i.e., the array contains 16 bytes of data even if not all bytes are necessary to represent the GUID). The first byte in the array is the most significant bit of the GUID.
obex	Variable	This parameter contains the obex headers sent from the client to the server. The format is purely binary.

FIG. **5** illustrates a method for establishing a session between the mobile device and the server according to exemplary embodiments of the present invention. Prior to the initiation of the synchronization process, the mobile device and server establish a password for the particular mobile device, for example, by registering the mobile device with the server on a web-page. Once the password has been established, the password itself is never sent over the Internet. Instead, the password is used to generate the message digests during the authentication process described in FIG. **5**.

The mobile device initiates the session by sending an OBEX Push command to the server (step **510**). The server responds by sending an OBEX Authentication challenge and a WAN_UUID header containing the session ID (step **520**). The mobile device responds to the connect request by sending an unauthorized response with an authenticate challenge to the server (step **530**). The server verifies the mobile device and sends a message to the mobile device to authenticate itself with the mobile device (step **540**). The mobile device verifies the server and responds with an OBEX success message (step **550**). Now that the mobile device and server have verified each other's identity, the server begins its role as a client to the mobile device by sending OBEX PUT and GET commands to the mobile device (step **560**).

According to exemplary embodiments of the present invention the authentication process described above, which is a hashing algorithm, is performed in accordance with the Message Digest 5 (MD5) algorithm. One skilled in the art will recognize that the MD5 algorithm is a hashing algorithm that produces a 16 byte digest from an arbitrary amount of data. The 16 byte digest can be used to create a check sum that is virtually unique for the original data, i.e., the digest can be considered as a virtual watermark for the data. Further, one skilled in the art will recognize that to perform the above described authentication procedure the mobile device must have access to the user name and password. The mobile device can obtain the user name and password either from memory or from user interaction.

FIG. **6** illustrates an exemplary method for synchronizing data between a server and a mobile device after a session has been established. In step **605** the mobile device sends a query including the session ID to the server. This query is the same "What would you like me to do?" query described above with respect to FIG. **4**. In step **607** the mobile device waits for the response from the server. In step **610** the mobile device receives a response from the server. The mobile device analyzes the response from the server in accordance with decision steps **615, 625** and **635**.

In step **615** the mobile device determines whether the response contains an OBEX disconnect command which indicates that the server desires to terminate the session. The server will send the disconnect command when there are no more functions to be performed by the mobile device in the synchronization process. If the response contains an OBEX disconnect command ("Yes" path out of decision step **615**) then the mobile device disconnects and sends no more request messages to the server (step **620**). Although FIG. **6** illustrates the server as controlling the disconnection process, the mobile device could terminate the session if desired. For the mobile device to terminate the session, the mobile device would send a message containing the session ID and an OBEX disconnect command to the server in response to an OBEX GET or PUT command sent from the server to the mobile device. In response to the mobile device's disconnect message, the server would destroy the session and respond with an empty response. The empty response indicates to the mobile device that the server has terminated the session.

If the response from the server does not contain an OBEX disconnect command ("No" path out of decision step **615**) the mobile device determines whether the response contains an OBEX PUT command (decision step **625**). Conventionally, an OBEX PUT command is used for sending an object from the client to the server. In accordance with the present invention, the OBEX PUT command is used to send a data object from the server to the mobile device, the mobile device being a client in this scenario. In accordance with exemplary embodiments of the present invention, the data object sent using the OBEX PUT command will be data to be added to the application running on the mobile device, for example, contacts and calendar entries being added to the mobile device or changes to contact and calendar entries already present in the mobile device. If the response from the server contains an OBEX PUT command ("Yes" path out of decision step **625**) the mobile device performs the OBEX PUT operation and responds with the resulting data from the PUT operation in a query message. The resulting data which is sent in response to a PUT command is a confirmation that the PUT operation has been performed by the mobile device. The mobile device then waits to receive the next response from the server (step **607**).

If the response from the server does not contain an OBEX PUT command ("No" path out of decision step **625**) the mobile device determines whether the response contains an OBEX GET command (decision step **635**). Conventionally, an OBEX GET command is used for requesting that the server return an object to the client. In accordance with the present invention, the OBEX GET command is used to request that the mobile device return a data object to the server, the mobile device being a client in this scenario. In accordance with exemplary embodiments of the present invention, the OBEX GET command will be used by the server to retrieve items added to the application running on the mobile device which are not present in the application running on the server, for example, contacts and calendar items added to the mobile device or changes to existing contacts and calendar entries. Accordingly, if the response contains an OBEX GET command ("YES" path out of decision step **635**) the mobile device performs the GET operation and sends the result to the server in a query message (step **640**). The mobile device then waits to receive the next response from the server (step **607**).

If the response from the server does not contain an OBEX GET command ("No" path out of decision step **635**) then the mobile device ignores the message and sends a request for retransmission in a query message sent to the server (step **645**). Since exemplary embodiments of the present invention use only OBEX disconnect, OBEX PUT and OBEX GET commands, if the response from the server does not contain one of these commands the mobile device does not recognize the response as valid. Of course, one skilled in the art will recognize that if more commands are implemented in the inventive system and method, these commands will be added as decision steps between decision step **635** and step **645**. Further, one skilled in the art will recognize that the order in which the decision steps of FIG. **6** are executed is not important and that these decision steps have been illustrated as being placed in this order merely for ease of explanation.

The synchronization of data in the method described in connection with FIG. **6** is controlled in accordance with the IrMC protocol. One skilled in the art will recognize that other synchronization protocols which are compatible with OBEX can be substituted for the IrMC protocol.

It will be recognized that since the information being synchronized may be confidential it is desirable to provide a secure connection for exchanging the information. The authentication process described with respect to FIG. **5** only guarantees that the mobile device and the server can rely on the validity each other's identity during the session. The connection that is established is not necessarily secure and could be tapped to access the information being exchanged. It is therefore, desirable to encrypt all data that is sent between the mobile device and the server. Currently, WAP does not support secure connections such as the secured socket layer (SSL) used on the Internet.

Since the present invention uses two different transports during the synchronization process, that is, from the mobile device to the WAP gateway and from the WAP gateway to the server, it is necessary to address the security of both transports to ensure a secure connection. The transport from the mobile device to the WAP gateway is performed over the air interface which in many instances (e.g., using the GSM protocols) is fairly well encrypted. However, the transport from the WAP gateway to the server is typically not protected in any way. This transport can be protected by allowing the gateway to use standard secure sockets layer (SSL) to the server.

The description has focused on the particular communications that take place between a mobile device and a non-mobile device. However, it will be readily apparent to those having ordinary skill in the art that in the preferred embodiments, these communications are mechanized. Such mechanized functions may be embodied in any of a variety of forms, including but not limited to hard-wired circuits, or a processor executing a suitable set of program instructions stored on a computer readable storage medium such as a random access memory (RAM), read only memory (ROM), magnetic storage medium (such as magnetic tape, disk or diskette) or optical storage medium (such as compact disk (CD) ROM). The invention may be embodied in any one or combination of these forms, including but not limited to a computer readable storage medium having the suitable set or program instructions stored thereon. As used herein, the term "logic" shall be used to refer to any and all such forms of embodiment, or portions of such forms of embodiment.

The invention has been described with reference to a particular embodiment. However, it will be readily apparent to those skilled in the art that it is possible to embody the invention in specific forms other than those of the preferred embodiment described above. This may be done without

departing from the spirit of the invention. The preferred embodiment is merely illustrative and should not be considered restrictive in any way. The scope of the invention is given by the appended claims, rather than the preceding description, and all variations and equivalents which fall within the range of the claims are intended to be embraced therein.

What is claimed is:

1. A method of coordinating a mobile application running in a mobile device with a non-mobile application running in a non-mobile device, the method comprising:

receiving an initial communication from the mobile device by the non-mobile device;

in response to receipt of the initial communication, generating a session identifier;

forming a first connection-oriented protocol frame that includes an initial response and the session identifier;

embedding the first connection-oriented protocol frame in a first connectionless protocol frame;

sending the first connectionless protocol frame to the mobile device, in the mobile device, forming a second connection-oriented protocol frame that includes an invitation to provide service and the session identifier;

embedding the second connection-oriented protocol frame in a second connectionless protocol frame;

sending the second connectionless protocol frame to the non-mobile device;

in the non-mobile device receiving the invitation to provide service and the session identifier and in response thereto forming a third connection-oriented protocol frame that includes a request for service and the session identifier;

embedding the third connection-oriented protocol frame in a third connectionless protocol frame;

sending the third connectionless protocol frame to the mobile device;

in the mobile device, forming a fourth connection-oriented protocol frame that includes a result, a second invitation to provide service and the session identifier;

embedding the fourth connection-oriented protocol frame in a fourth connectionless protocol frame;

sending the fourth connectionless protocol frame to the non-mobile device;

in the non-mobile device, receiving the result, the second invitation to provide service and the session identifier and in response thereto forming a fifth connection-oriented protocol frame that includes a disconnect command and the session identifier;

embedding the fifth connection-oriented protocol frame in a fifth connectionless protocol frame; and

sending the fifth connectionless protocol fine to the mobile device.

2. A method of coordinating a mobile application running in a mobile device with a non-mobile application running in a non-mobile device, the method comprising:

in the mobile device, forming a first connection-oriented protocol frame that includes an invitation to provide service and a session identifier;

embedding the first connection-oriented frame in a first connectionless protocol frame;

sending the first connectionless protocol frame to the non-mobile device;

in the non-mobile device, receiving the invitation to provide service and the session identifier and in

response thereto forming a second connection-oriented protocol frame that includes a request for service and the session identifier;

embedding the second connection-oriented protocol frame in a second connectionless protocol frame;

sending the second connectionless protocol frame to the mobile device;

in the mobile device, forming a third connection-oriented protocol frame that includes a result, a second invitation to provide service and the session identifier;

embedding the third connection-oriented protocol frame in a third connectionless protocol frame;

sending the third connectionless protocol frame to the non-mobile device;

in the non-mobile device, receiving the result, the second invitation to provide service and the session identifier and in response thereto forming a fourth connection-oriented protocol frame that includes a disconnect command and the session identifier;

embedding the fourth connection-oriented protocol frame in a fourth connectionless protocol frame; and

sending the fourth connectionless protocol frame to the mobile device.

3. A system for coordinating a mobile application running in a mobile device with a non-mobile application running in a non-mobile device, the system comprising:

logic configured to receive an initial communication from the mobile device by the non-mobile device;

in the non-mobile device, logic configured to venerate a session identifier in response to receipt of the initial communication;

logic configured to form a first connection-oriented protocol frame that includes an initial response and the session identifier;

logic configured to embed the first connection-oriented protocol frame in a first connectionless protocol frame;

logic configured to send the first connectionless protocol frame to the mobile device;

in the mobile device logic configured to form a second connection-oriented protocol frame that includes an invitation to provide service and the session identifier;

logic configured to embed the second connection-oriented frame in a second connectionless protocol frame;

logic configured to send the second connectionless protocol frame to the non-mobile device;

in the non-mobile device, logic configured to receive the invitation to provide service and the session identifier and in response thereto, to form a third connection-oriented protocol frame that includes a request for service and the session identifier;

logic configured to embed the third connection-oriented protocol frame in a third connectionless Protocol frame;

logic configured to send the third connectionless protocol frame to the mobile device;

in the mobile device, logic configured to form a fourth connection-oriented protocol frame that includes a result, a second invitation to provide service and the session identifier;

logic configured to embed the fourth connection-oriented protocol frame in a fourth connectionless protocol frame;

logic configured to send the fourth connectionless protocol frame to the non-mobile device;

in the non-mobile device, logic configured to receive the result, the second invitation to provide service and the session identifier and in response thereto, to form a fifth connection-oriented protocol frame that includes a disconnect command and the session identifier;

logic configured to embed the fifth connection-oriented protocol frame in a fifth connectionless protocol frame; and

logic configured to send the fifth connectionless protocol frame to the mobile device.

4. A system for coordinating a mobile application running in a mobile device with a non-mobile application running in a non-mobile device, the system comprising:

in the mobile device, logic configured to form a first connection-oriented protocol frame that includes an invitation to provide service and a session identifier;

logic configured to embed the first connection-oriented protocol frame in a first connectionless protocol frame;

logic configured to send the first connectionless protocol frame to the non-mobile device;

in the non-mobile device, logic configured to receive the invitation to provide service and the session identifier and in response thereto, to form a second connection-oriented protocol frame that includes a request for service and the session identifier;

logic configured to embed the second connection-oriented protocol frame in a second connectionless protocol frame;

logic configured to send the second connectionless protocol frame to the mobile device;

in the mobile device, logic configured to form a third connection-oriented protocol frame that includes a result, a second invitation to provide service and the session identifier;

logic configured to embed the third connection-oriented protocol frame in a third connectionless protocol frame;

logic configured to send the third connectionless protocol frame to the non-mobile device;

in the non-mobile device, logic configured to receive the result, the second invitation to provide service and the session identifier and in response thereto, to form a fourth connection-oriented protocol frame that includes a disconnect command and the session identifier;

logic configured to embed the fourth connection-oriented protocol frame in a fourth connectionless protocol frame; and

logic configured to send the fourth connectionless protocol frame to the mobile device.

5. A method of coordinating a mobile application running in a mobile device with a non-mobile application running in a non-mobile device, the method comprising:

initiating, by the mobile device, communication with a non-mobile device;

sending, by the non-mobile device, a first connectionless protocol frame having an embedded first connection-oriented protocol frame to the mobile device;

sending, by the mobile device, a second connectionless protocol frame having an embedded second connection-oriented protocol frame to the non-mobile device that includes an invitation to provide service;

sending, by the non-mobile device, a third connectionless protocol frame having an embedded third connection-oriented protocol frame to the mobile device that includes a request for service;

sending, by the mobile device, a fourth connectionless protocol frame having an embedded fourth connection-oriented protocol frame to the non-mobile device that includes a result and a second invitation to provide service; and

sending, by the non-mobile device, a fifth connectionless protocol frame having an embedded fifth connection-oriented protocol frame to the mobile device that includes a disconnect command.

* * * * *

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO.   : 6,882,659 B1   Page 1 of 1
DATED   : April 19, 2005
INVENTOR(S)   : Lars Novak, Björn Ekberg and Andreas Jönsson

It is certified that error appears in the above-identified patent and that said Letters Patent is
hereby corrected as shown below:

Column 9,
Line 22, change "device," (first occurrence) to -- device; --.
Line 29, change "device" to -- device, --.
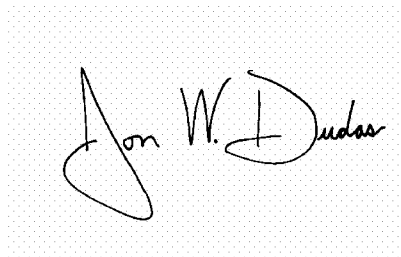Line 53, change "fine" to -- frame --.

Column 10,
Line 30, change "venerate" to -- generate --.
Line 41, change "device" to -- device, --.
Line 54, change "Protocol" to -- protocol --.

Signed and Sealed this

Thirtieth Day of August, 2005

JON W. DUDAS
Director of the United States Patent and Trademark Office

APPENDIX 10LL

(12) **United States Patent**　　(10) **Patent No.:** **US 6,810,216 B1**

Tourunen　　(45) **Date of Patent:** **Oct. 26, 2004**

(54) **FAST INFRARED TRANSCEIVER WITH REDUCED POWER CONSUMPTION**

(75) Inventor: **Ari Tourunen**, Espoo (FI)

(73) Assignee: **Nokia Corporation**, Espoo (FI)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

(21) Appl. No.: **09/347,320**

(22) Filed: **Jul. 2, 1999**

(51) **Int. Cl.^{7}** **H04B 10/00**
(52) **U.S. Cl.** **398/202**; 330/51; 398/135; 398/138; 455/343; 455/574
(58) **Field of Search** 359/152, 154, 359/168; 375/239, 377, 9, 45; 455/78, 343, 574; 330/51; 398/128, 130, 135, 138, 202

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Primary Examiner—Brent A. Swarthout
(74) *Attorney, Agent, or Firm*—Wayne M. DeMello

(57) **ABSTRACT**

A circuit and method to decrease power consumption of fast infrared links. Reduced power consumption allows continuous infrared standby in battery-powered (and other power-consumption sensitive) devices. A low speed, low power-consumption infrared receiver preamplifier is used in conjunction with a higher speed, higher power-consumption infrared receiver preamplifier. While the battery-powered device awaits an infrared transmission, the low power-consumption receiver preamplifier operates in standby mode and the high power-consumption receiver preamplifier is in shutdown mode. Because the higher power consumption receiver preamplifier is in shutdown mode, standby power consumption is reduced and time between battery recharging is increased. When the low power receiver preamplifier detects an infrared transmission, the high power receiver preamplifier can be activated if high-speed communication is needed. An alternative discloses dual receivers rather than dual preamplifiers in one receiver.

24 Claims, 4 Drawing Sheets
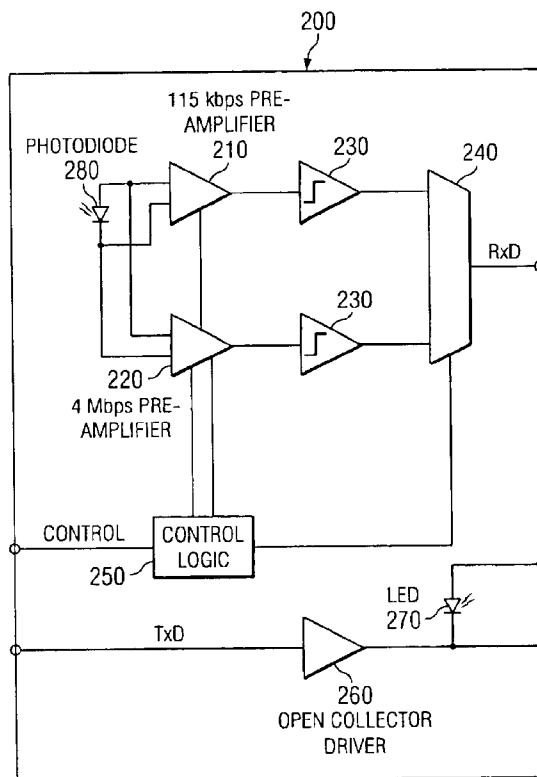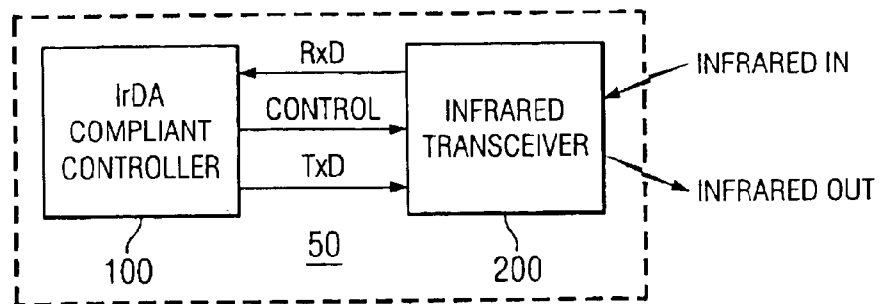
FIG. 1
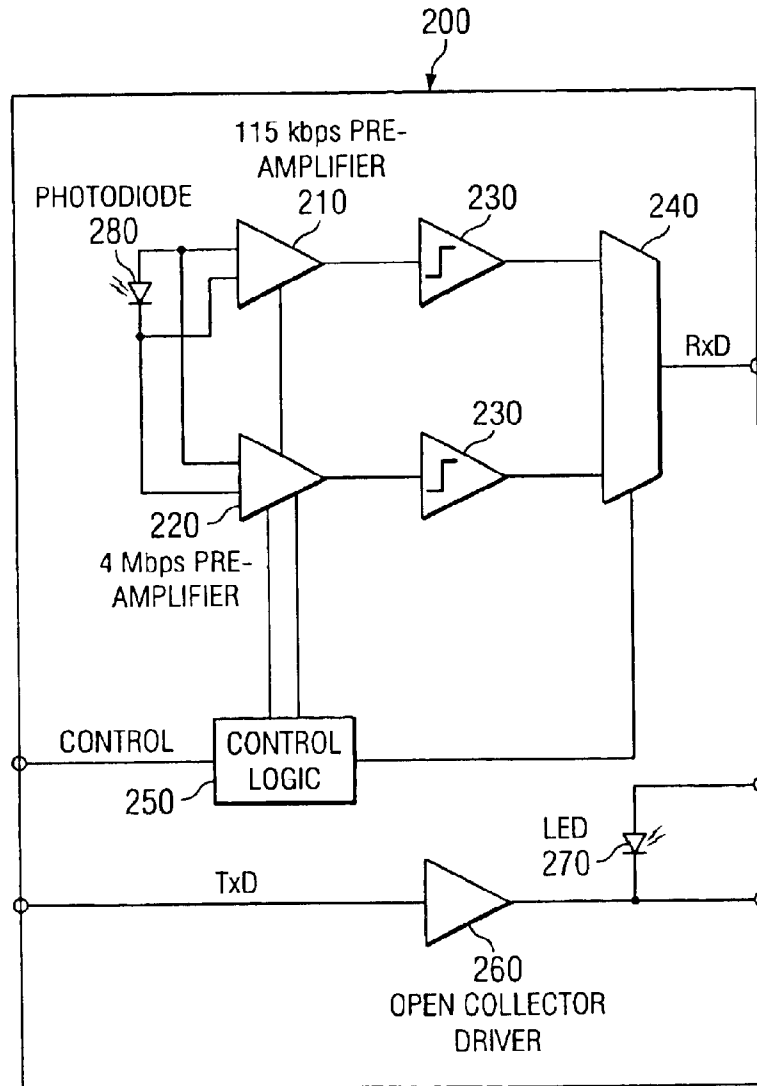
FIG. 2

FIG. 3

POSSIBLE MODES
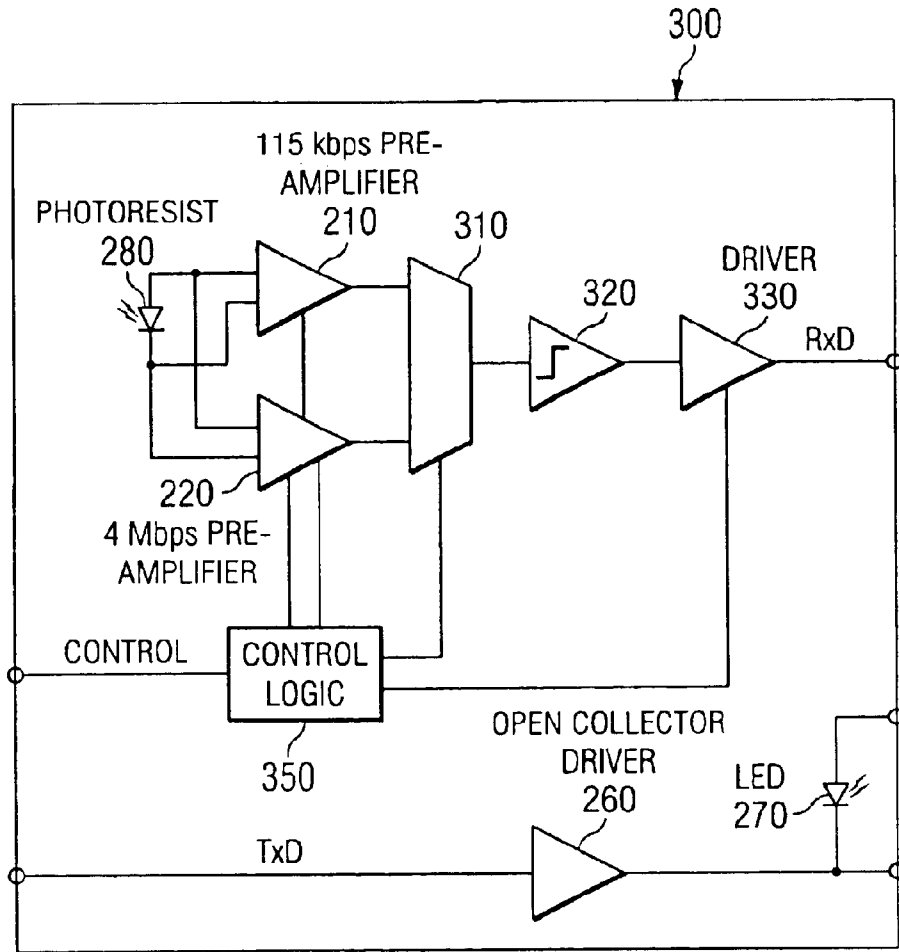
	RECEIVE	STANDBY	SHUTDOWN
PREAMPLIFIER 210	RECEIVE	STANDBY	SHUTDOWN
PREAMPLIFIER 220	SHUTDOWN	RECEIVE, STANDBY, OR SHUTDOWN	RECEIVE, STANDBY, OR SHUTDOWN

FIG. 4

5200

5000

5010   5060

RxD1   RxD

INFRARED
IN

5050

CONTROL1   CONTROL

5020

INFRARED
OUT

5040

TxD1   TxD

5030

IrDA
COMPLIANT
CONTROLLER

5800

5510   5560

RxD2   RxD

INFRARED
IN

5550

CONTROL2   CONTROL

5520

INFRARED
OUT

5540

TxD2   TxD

5530

5500

FIG. 5

600

610   620   640   650

CONTROL

660

TxD   670   680

RxD

690   630

FIG. 6

700

710   720   740   RxD (SLOW)

730   750   RxD (FAST)

CONTROL

760

TxD   770   780

FIG. 7

FAST INFRARED TRANSCEIVER WITH REDUCED POWER CONSUMPTION

FIELD OF THE INVENTION

This invention relates to infrared communications and, more particularly, to fast infrared transceivers having low standby power consumption.

BACKGROUND OF THE INVENTION
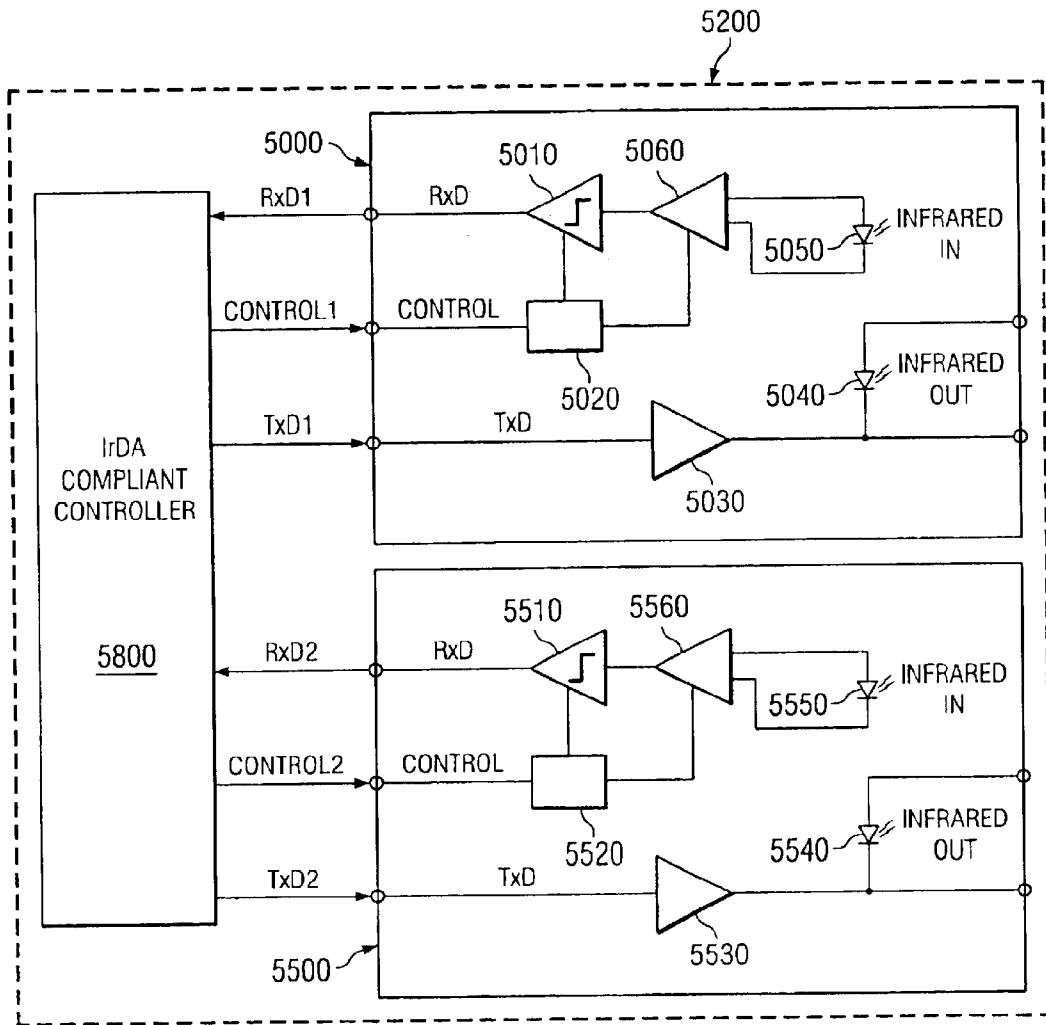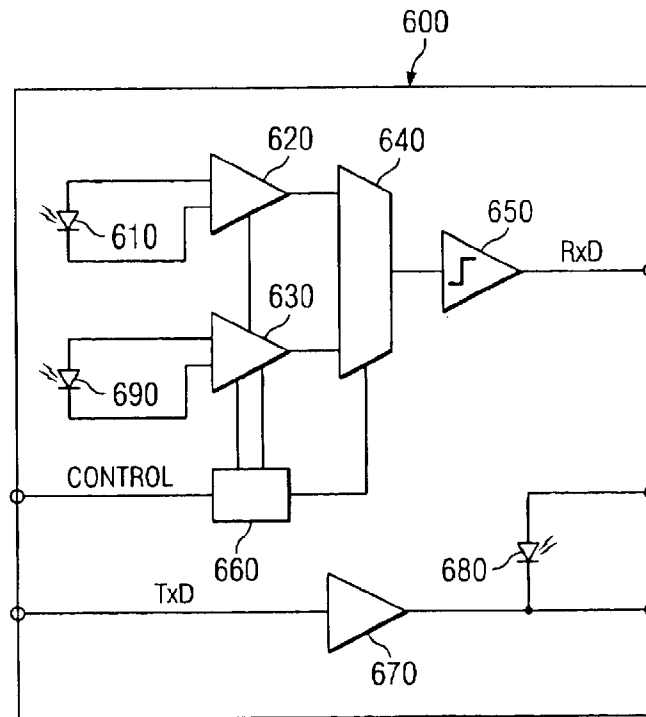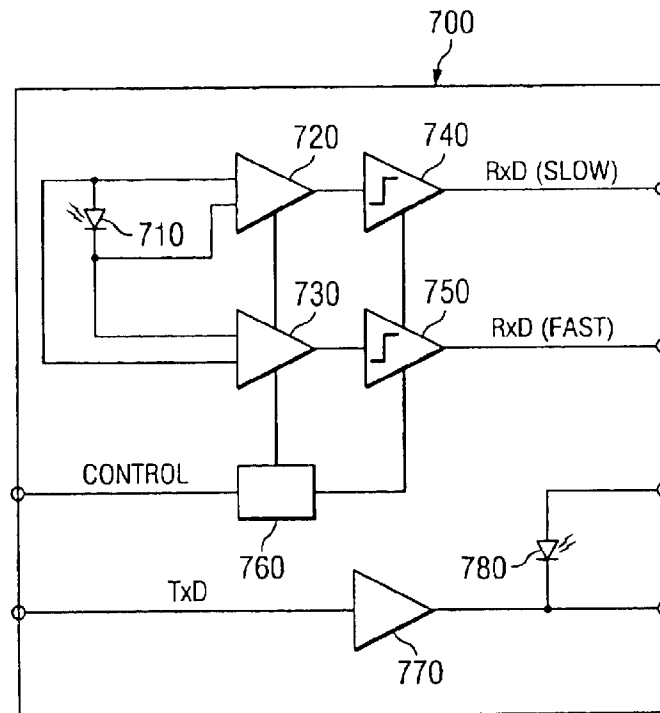
Electronic devices such as portable computers, electronic organizers, personal digital assistants, and cellular telephones, use infrared communications. The devices typically adhere to one of the Infrared Data Association (IrDA) infrared communication standards. The IrDA standards are based on the OSI seven-layer model. Presently, there are two generations of standards in the IrDA family: the 1.0 generation and the 1.1 generation. IrDA 1.0 sets a maximum data rate (aka signaling rate) of 115,000 bits per second (115 kbps) over a communications link. IrDA 1.1 sets a maximum data rate of 4,000,000 bits per second (4 Mbps) over the communications link. When using current technology, data rates over 200 kbps can be considered high-speed.

An infrared communications link usually incorporates a combination infrared transmitter and receiver, known as a transceiver. The transceiver transmits a modulated infrared signal and receives modulated infrared signals. An IR transceiver always operates in one of four modes: shutdown, standby, receive, or transmit.

In shutdown mode, the transceiver consumes almost no power. It is not capable of receiving or transmitting while in shutdown mode. Thus the transceiver cannot detect when another device attempts to establish an infrared communication link. The user generally must manually "wakeup" the transceiver from shutdown mode.

In standby mode, the transceiver consumes more power than when in shutdown mode but less than when in transmit or receive mode. The transceiver may detect infrared transmissions when in standby mode but may not receive or transmit. This ability to detect infrared transmissions is an important functional difference between standby mode and shutdown mode.

The "active" modes of a transceiver are receive mode and transmit mode. During reception, the transceiver operates in receive mode. During transmission it operates in transmit mode. Active modes consume more power than standby or shutdown modes.

High power consumption in transceivers for fast infrared links (for example the 4 Mbps IrDA 1.1 implementation) is at least partially due to the power required by the receiver stage. High-speed receivers generally consume more power than low-speed receivers do, even when operated in standby or shutdown mode. In active mode, a 4 Mbps capable receiver consumes more power than the slower 115 kbps receiver, regardless of the speed at which the 4 Mbps receiver is actually receiving data. In other words, even if both are operated at 115 kbps, a 4 Mbps receiver consumes much more power than a 115 kbps receiver.

Additional general background, which helps to show the knowledge of those skilled in the art regarding the system context, and of variations and options for implementations, may be found in the following from the IrDA 1.0 and 1.1 families of standards: IrDA Serial Infrared Physical Layer Link Specification; IrDA Serial Infrared Link Access Protocol (IrLAP); IrDA Serial Infrared Link Management Protocol (IrLMP); IrDA Tiny TP; IrDA Command and Control Ir Standard (formerly known as IrBus); IrDA Infrared Communications Protocol 1.0; IrDA Infrared Tiny Transport Protocol 1.1; IrDA Infrared LAN Access Extensions for Link Management Protocol 1.0; IrDA Object Exchange Protocol 1.2; IrDA Minimal IrDA Protocol Implementation; IrDA Plug and Play Extensions; IrDA Infrared Mobile Communications; and IrDA Infrared Transfer Picture Specifications; all of which are hereby incorporated by reference. IrDA standards and protocols are available over the internet from the Infrared Data Association at www.irda.org.

SUMMARY OF THE INVENTION

Disclosed is a circuit and method to dramatically reduce power consumption of fast infrared links without putting the link in shutdown mode. A low speed, low power-consumption infrared receiver preamplifier is used in conjunction with a higher speed, higher power-consumption infrared receiver preamplifier. While waiting for an IR link to be initiated, the low-power preamplifier operates in standby mode and the high-power preamplifier is shutdown to reduce power consumption. When the low power receiver preamplifier detects an infrared transmission, the high power receiver preamplifier can be activated if high-speed communication is needed. Unlike power-saving schemes that put the link in shutdown mode, infrared communications are continuously available by use of the disclosed innovations. Thus a user does not have to manually "wake up" the infrared receiver to receive a message.

At the system level in a disclosed embodiment, a communications link between two devices using IrDA standards is initiated with a simple 9.6 kbps modulation. After the communications link is initiated at 9.6 kbps, a communication speed for further communication over the link is negotiated between the two devices. Bit rate negotiations and link control are discussed in IrDA Serial Infrared Link Access Protocol.

A 115 kbps transceiver can receive and transmit the necessary 9.6 kbps modulation required to negotiate a communications link. Therefore, every time two IrDA systems (including the faster 4 Mbps IrDA 1.1 devices) establish a connection, they could initiate the connection with a low power 115 kbps receiver rather than a higher power consumption 4 Mbps receiver.

Disclosed is a transceiver with a single receiver having two preamplifiers. A low power consumption, low-speed infrared receiver preamplifier stage is used in combination with a higher power consumption, higher speed infrared receiver preamplifier stage. The higher speed preamplifier can be put in shutdown mode to conserve power while the lower power consumption preamplifier remains in standby. This allows a high-speed transceiver to remain in continuous standby while awaiting an infrared message, yet limit power consumption while waiting. In the presently preferred embodiment, a 115 kbps preamplifer is used in combination with a 4 Mbps preamplifier. In an alternate embodiment, dual receivers could be used instead of dual preamplifiers in one receiver. In other words the transceiver could have two receivers, perhaps one that operates at 115 kbps and one that operates at 4 Mbps. In another embodiment, the receiver(s) and transmitter could be physically separate, not together in a transceiver.

While waiting for a communication link to be initiated, the low power preamplifier stage is in standby and the fast preamplifier is in shutdown. After a high-speed connection is established, an IrDA-compliant controller switches the

transceiver from the **115** kbps preamplifier stage to the 4 Mbps preamplifier stage. Compared to prior art 4 Mbps infrared transceivers, the innovative infrared transceiver consumes very little power when in standby mode because the fast preamplifier (which consumes the more power than the slower preamplifier) is in shutdown mode when it is not needed for communication.

The method and circuit allow a continuous infrared standby because power consumption is dramatically reduced. Low power consumption preamplifiers generally are considered to be those that have a standby current of less than 3 mA. For example, standby current in the presently preferred embodiment is reduced from over 3 mA to under 100 μA at a supply voltage of 2.7V. Thus continuous infrared standby is now a viable option for battery powered devices that incorporate the disclosed innovations for fast infrared communications.

BRIEF DESCRIPTION OF THE DRAWINGS

The disclosed inventions will be described with reference to the accompanying drawings, which show important sample embodiments of the invention and which are incorporated in the specification hereof by reference, wherein:

FIG. **1** depicts an electronic device having an IrDA compliant controller and an IR transceiver.

FIG. **2** depicts an IR transceiver circuit with two receiver preamplifiers and dual comparators.

FIG. **3** depicts an IR transceiver circuit with two receiver preamplifiers and a single comparator.

FIG. **4** shows a table of possible mode relationships between the two receiver preamplifiers of FIGS. **2** and **3**.

FIG. **5** depicts a dual transceiver embodiment.

FIG. **6** depicts a dual photodiode embodiment.

FIG. **7** depicts a dual receiver embodiment.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The numerous innovative teachings of the present application will be described with particular reference to the presently preferred embodiment. However, it should be understood that this class of embodiments provides only a few examples of the many advantageous uses of the innovative teachings herein. In general, statements made in the specification of the present application do not necessarily delimit any of the various claimed inventions. Moreover, some statements may apply to some inventive features but not to others.

Definitions:

Passive Mode: Shutdown or standby mode.
Active Mode: Receive or transmit mode.

FIG. **1** is a block diagram of an electronic device **50** that uses an IrDA compliant controller **100** and an IR transceiver **200** for infrared communications. Through the transceiver **200**, the IrDA compliant controller **100** negotiates with a remote device to establish an IR communication link. When an IR signal from the remote device is received at IR transceiver **200**, it is passed via RxD to the controller **100**. The controller **100** may process the received signal or pass it on to an electronic device **50**. The controller **100** sends control signals via control line CONTROL to a control logic block (shown in FIGS. **2** and **3**) in the transceiver **200**. Data to be transmitted passes from the controller **100** to the transceiver **200** along TxD (the transmit data line).

Power consumption in fast infrared links (for example the 4 Mbps IrDA 1.1 implementation) is affected by the power

required by the receiver stage, particularly the receiver preamplifier. Generally, the higher the speed for which the preamplifier is designed, the greater its power consumption. A receiver preamplifier designed to operate at 4 Mbps consumes more power than a receiver preamplifier designed to operate at 115 kbps, regardless of the speed at which the 4 Mbps preamplifier is actually operating. In other words, even if both are operated at 115 kbps, a preamplifier designed for 4 Mbps operation consumes much more power than one designed for 115 kbps operation.

Referring to FIG. **2**, the transceiver **200** is shown in an embodiment having two receiver preamplifiers and two comparators. To save power while waiting for an IR communication, control logic **250** initially holds a low-speed preamplifier **210** in standby mode and high-speed preamplifier **220** in shutdown mode. When an IR signal is received at a photodiode **280**, the low-speed preamplifier **210** wakes from standby to active mode and amplifies the received IR signal. A comparator **230** converts the amplified signal to an appropriate digital output level. Control logic **250** selects the appropriate input to a multiplexer (MUX) **240** depending on which receiver preamplifier (**210** or **220**) is active. When initially negotiating a communications link, control logic **250** is set to select the low-speed preamplifier input to MUX **240**. The digital signal then passes through the MUX **240** and RxD (the received data line) to an IrDA compliant controller **100** (shown in FIG. **1**).

In response to the received signal, controller **100** (shown in FIG. **1**) will negotiate a communications link with the signal's sender. During this negotiation, the controller **100** will transmit data along TxD, through the transmitter stage of the transceiver. The transceiver stage typically consists of an open collector driver **260** and an IR LED **270**. If a high-speed link is negotiated, the controller **100** signals the control logic **250** to wake the high-speed receiver preamplifier **220** from shutdown mode to standby or active mode and to put low-speed receiver preamplifier **210** in shutdown or standby mode.

Referring to FIG. **3**, the transceiver **300** is shown in an embodiment having two receiver preamplifiers and a single comparator. The operation of the transceiver **300** shown in FIG. **3** is much like that of the transceiver **200** shown in FIG. **2**. The main difference between the two transceivers (**200** and **300**) is in the arrangement of comparator and multiplexer. Using a single comparator **320** that is placed after multiplexer **310** instead of before the multiplexer, as in transceiver **200**, reduces circuit complexity. This reduced complexity allows an optional driver **330** to be included in the receiver circuitry of transceiver **300**. In alternate embodiments, instead of being a separate circuit element, driver **330** could be implemented within the circuitry of MUX **240** or comparator **320**. In the embodiment shown, control logic **250** supplies an optional control signal to a driver **330**, placing the driver **330** in a reduced power mode for increased power savings.

At any given time, receiver preamplifiers **210** and **220** may be in receive, standby, or shutdown mode. FIG. **4** shows a table of the relationships possible in the disclosed embodiments. When low-speed preamplifier **210** is in receive mode, high-speed preamplifier **220** must be in shutdown mode. When low-speed preamplifier **210** is in standby or shutdown mode, high-speed preamplifier **220** may be in any of its three possible modes (shutdown, standby, or receive). A transceiver can reduce power consumption by putting high-speed preamplifier **220** in shutdown mode when low-speed preamplifier **210** is waiting in standby for a remote device to initiate communications. As shown in FIG. **4**, the relative

modes of the two preamplifiers (**210** and **220**) depend upon whether a particular embodiment of the invention has the capability to put low-speed preamplifier **210** in shutdown mode. In an embodiment of the invention that does not allow low-speed receiver preamplifier **210** to be put in shutdown mode, low-speed preamplifier **210** will be in standby mode when high-speed preamplifier **220** is receiving or in standby. In the embodiments disclosed, high-speed preamplifier **220** will only enter standby mode if a high-speed link has been established and its associated transceiver is transmitting or waiting to receive data. In an embodiment that does allow low-speed preamplifier **210** to be put in shutdown mode, low-speed preamplifier **210** will be in shutdown mode when high-speed preamplifier **220** is in receive mode or standby mode (which occurs if a high-speed link has been established). Optionally, low-speed preamplifier **210** and high-speed preamplifier **220** may be put in shutdown mode at the same time for increased power savings if the embodiment is one that allows low-speed preamplifier **210** to be put in shutdown mode.

FIG. **5** shows an alternate embodiment of the disclosed innovations. This embodiment mainly differs from the embodiment disclosed in FIG. **2** in that two transceivers are used, rather than one transceiver having two preamplifiers. An electronic device **5200** contains an IrDA compliant controller **5800**, a low power consumption transceiver **5000**, and a higher power consumption transceiver **5500**. When waiting for an IR link to be initiated, the controller **5800** places transceiver **5000** in standby and transceiver **5500** in shutdown via control signals communicated to control logic **5020** and **5520**, over control lines CTRL1 and CTRL2 respectively. IR signals are detected by photodiode **5050** and amplified by preamplifier **5060**. The detected signal then passes through the comparator **5010** to the controller **5800**. Note that, unlike the transceivers of FIGS. **2** and **3**, a MUX is not required in the transceiver. When negotiating a communication link, controller **5800** will transmit data over line TxD1 through open collector driver **5030** and LED **5040**. If a high-speed link is negotiated, controller **5800** will send a "wake" signal to control logic **5520** and transceiver **5500** will "wake" from shutdown mode. High-speed communications will take place through photodiode **5550**, preamplifier **5560**, comparator **5510**, open collector driver **5530**, and LED **5540** in the essentially the same way that they occur through the low speed transceiver **5000**.

FIG. **6** shows an alternate embodiment of the disclosed innovations having two photodiodes (**610** and **690**) instead of one photodiode as shown in the embodiment of FIG. **3**. Low-speed preamplifier **620** receives IR signals through photodiode **610** and high-speed preamplifier **630** receives IR signals through photodiode **690**. In response to control signals from an external controller, control logic **660** can change the modes of the preamplifiers (**620** and **630**) and select the appropriate input to MUX **640**. The output of MUX **640** then passes through comparator **650**. Transceiver **600** transmits data through open-collector driver **670** and LED **680**.

FIG. **7** shows an alternate embodiment of the disclosed innovations having a transceiver with two separate receivers (one slow, the other faster). The slow receiver has low speed, low power consumption preamplifier **720** and comparator **740**. The fast receiver has fast, high power consumption preamplifier **730** and comparator **750**. Both receivers share photodiode **710** in this embodiment. While waiting for a communications link to be initiated, control logic **760** holds preamplifier **720** in standby mode and preamplifier **730** in shutdown mode. If a high-speed link is negotiated, control

logic **760** will wake fast preamplifier **730** in response to control signals from a controller external to transceiver **700**. Data is transmitted through open-collector driver **770** and LED **780**.

FIGS. **2**, **3**, and **5–7** show block diagrams of transceivers **200**, **300**, **5000**, **5500**, **600**, and **700**. These block diagrams show the transceivers as a packaged integrated circuit (having pins such as RxD, TxD, etc.). However, each of these transceivers may be manufactured as an integrated circuit or from discrete components.

As will be recognized by those skilled in the art, the innovative concepts described in the present application can be modified and varied over a tremendous range of applications, and accordingly the scope of patented subject matter is not limited by any of the specific exemplary teachings given.

For example, if additional power savings are needed, the ability to put the link in shutdown mode could be retained. This could be accomplished by optionally deactivating (putting in shutdown) the 115 Kpbs receiver stage in addition to deactivating the 4 Mbps receiver stage.

For example, there are many possible arrangements of receiver components that can be used with the disclosed innovations. Although FIGS. **2**, **3**, and **5–7** show several such arrangements, other electrical arrangements of the multiplexers, comparators, and photodiodes are possible. In fact, components such as the multiplexers or comparators may be excluded entirely in some designs.

For example, there are many electronic circuit components that are freely substitutable for some of the components shown in FIGS. **2**, **3**, and **5–7**. Any suitable IR detector may be substituted for photodiodes. Any suitable components such as an analog-to-digital (A/D) converter may be substituted for the comparators shown. The invention is not restricted to controlling the mode of preamplifiers. Any suitable receiver components may be substituted for the preamplifiers shown.

For example, although IrDA standards are discussed, the inventions disclosed may be practiced without adherence to the IrDA standards. The benefits of the inventions may be had without adherence to any standards or to standards other than the IrDA standards.

What is claimed is:

1. An infrared receiver, comprising:

a first receiver preamplifier;

a second receiver preamplifier; and

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier,

wherein said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in receive mode; and

wherein said control logic is further configured to put said first receiver preamplifier in shutdown mode when said second receiver preamplifier is in receive mode.

2. The infrared receiver of claim **1**, wherein said first receiver preamplifier is a low-speed preamplifier.

3. The infrared receiver of claim **1**, wherein said second receiver preamplifier is a high-speed preamplifier.

4. An infrared receiver comprising:

a first receiver preamplifier;

a second receiver preamplifier; and

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier,

wherein said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in standby mode; and

wherein said control logic is further configured to put said first receiver preamplifier in shutdown mode when said second receiver preamplifier is in receive mode.

5. The infrared receiver of claim **4**, wherein said first receiver preamplifier consumes less than 3 milliamperes in standbys mode.

6. An infrared receiver, comprising:

a first receiver preamplifier;

a second receiver preamplifier, wherein said second receiver preamplifier consumes at least twice as much power in standby mode as said first receiver preamplifier consumes in standby mode; and control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in receive mode.

7. An infrared receiver, comprising:

a first receiver preamplifier;

a second receiver preamplifer, wherein said second receiver preamplifier can operate at a signaling rate at least double the maximum signaling rate of said first receiver preamplifier; and

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier, said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in receive mode.

8. A portable electronic device capable of infrared communication, comprising:

a portable electronic device; and

an infrared receiver electrically connected to said portable electronic device, said infrared receiver further comprising:

a first receiver preamplifier;

a second receiver preamplifier; and

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier,

wherein said control logic configured to put said second receiver preamplifier in shutdown mode when said fist receiver preamplifier is in receive mode; and

wherein said control logic is further configured to put said first receiver preamplifier in shutdown mode when said second receiver preamplifier is in receive mode.

9. The portable electronic device of claim **8**, wherein said infrared receiver is disposed within a transceiver.

10. The portable electronic device of claim **8**, wherein said first receiver preamplifier is a low-power consumption receiver preamplifier.

11. The portable electronic device of claim **8**, wherein said first receiver preamplifier is a low-speed preamplifier.

12. The portable electronic device of claim **8**, wherein said second receiver preamplifier is a high-speed preamplifier.

13. The portable electronic device of claim **8**, wherein said first receiver preamplifier consumes less than 3 milliamperes in standby mode.

14. A portable electronic device capable of infrared communication, comprising:

a portable electronic device; and

an infrared receiver electrically connected to said portable electronic device, said infrared receiver further comprising:

a first receiver preamplifier;

a second receiver preamplifier, wherein said second receiver preamplifier consumes at least twice as

much power in standby mode as said first receiver preamplifier consumes in standby mode;

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier, said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in receive mode.

15. A portable electronic device capable of infrared communication, comprising:

a portable electronic device; and

an infrared receiver electrically connected to said portable electronic device, said infrared receiver further comprising:

a first receiver preamplifier;

a second receiver preamplifier, wherein said second receiver preamplifier can operate at a signaling rate at least double the maximum signaling rate of said receiver preamplifier;

control logic electrically connected to said first receiver preamplifier and said second receiver preamplifier, said control logic configured to put said second receiver preamplifier in shutdown mode when said first receiver preamplifier is in receive mode.

16. A method of reducing power consumption in an infrared transceiver, comprising the steps of:

operating a first receiver preamplifier in stand by mode;

operating a second receiver preamplifier in shutdown mode;

waking up said second receiver preamplifier and shutting down a first receiver preamplifier when an infrared transmission is received and a high-speed infrared link is negotiated.

17. The method of claim **16**, wherein said first receiver preamplifier is a low-power consumption receiver preamplifier.

18. A method of reducing power consumption in an infrared transceiver, comprising the steps of:

operating a first receiver preamplifier in standby mode;

operating a second receiver preamplifier in shutdown mode; wherein said second receiver preamplifier consumes at least twice as much power in standby mode as said first receiver preamplifier consumes in standby mode.

19. A method of establishing a high-speed infrared link, comprising the steps of:

operating a first infrared transceiver with a low-speed receiver preamplifier in standby mode and a higher-speed receiver preamplifier in shutdown mode;

detecting an infrared transmission from a second infrared transceiver;

operating said fist infrared transceiver with said low-speed receiver preamplifier in receive mode;

negotiating a link speed between said first and second transceivers;

waking said higher-speed receiver preamplifier;

placing said low-speed receiver in a passive mode; and

operating said first transceiver with said higher-speed receiver preamplifier in receive mode.

20. The method of claim **19**, wherein said higher-speed receiver preamplifier can operate at a signaling rate a least double the maximum signaling rate of said low-speed receiver preamplifier.

21. A method of operating an infrared receiver, comprising the steps of:

operating a low-speed receiver preamplifier in standby mode;

operating a higher-speed receiver preamplifier in shutdown mode;

receiving an infrared transmission; and

waking said higher-speed receiver preamplifier.

22. A method of operating an infrared receiver, comprising the steps of:

operating a low power-consumption receiver preamplifier in standby node;

operating a higher power-consumption receiver preamplifier in shutdown mode;

receiving an infrared transmission; and

waking said higher power consumption receiver preamplifier.

23. The method of claim **22**, further comprising, between said receiving step and said waking up step, the step of:

negotiating a high-speed infrared link;

wherein said high-speed infrared link operates at signal rates greater than 200 kbps.

24. The method of claim **22**, wherein said low power consumption receiver preamplifier consumes less than 3 milliamperes in standby mode.

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