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(54) Title: GLOBAL COMMUNICATIONS NETWORK MAPPING PROTOCOL

(54) Abstract: A computerized method and system of compressing, organizing and displaying information in a dynamic interactive map format is presented. Information may be compressed into units of information or bundles of data called process packets formed of information presented in a consistent format in a database throughout a web site covering a given industry. An information landscape is created on a computer system (item 10) the landscape is divided into sectors or neighborhoods of related information (item 12), information is collected (item 14), entered and assigned unique coordinates in the system (item 16), thereby relating and locating the information in a relevant sector or neighborhood. Paths are created through the neighborhoods to connect the various information (item 20). Means are provided for a user to query the information presented in the form of a road map of the landscape (item 24).
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.
GLOBAL COMMUNICATIONS NETWORK MAPPING, INFORMATION SEARCH, 
AND PRESENTATION PROTOCOL

This application claims priority to U.S. Provisional Application Serial No. 60/152,880 
filed Sept. 8, 1999, and U.S. Provisional Application Serial No. 60/109,904 filed Nov. 25, 1998.

Field of the Invention:

This invention most generally relates to information a user seeks and receives from the 
Internet. More particularly the invention relates to the form of information searched and received 
by a user, and the process by which the information is displayed for searching and receipt by the 
user. Most particularly the invention relates to a new system of packaging, storing, and 
displaying information to be searched and received by a user. The information may be packaged 
as a process, or in simple text, and presented in a form analogous to an information source and 
format with which essentially every user is familiar - a standard map.

Background of the Invention:

Presently there are many World Wide Web (web) sites that offer information on a wide 
variety of subjects. A user searches the Internet by topic or key word and receives a great volume 
of information and data which is often difficult to distill in order to find the exact piece of 
information useful to the user. Current web sites do not address the fundamental issue that users 
of the sites need a more efficient approach to gaining and understanding information, not just 
more information. The trend of more data at a higher bandwidth is not the solution because the 
human capacity for data comprehension is limited. More data at higher delivery rates 
(bandwidth) only exacerbates the time/attention span problem of Internet users. Although the 
Internet has great potential to deliver information, many of today's Internet information services 
only deliver more data which ends up being less and less useful. Thus current web sites only
tend to add to the information overload of their intended viewers, viewers who increasingly have
less time and attention for more data.

With the advent of Internet communication, many potential new forms of superior
communication are possible. The Internet is increasingly allowing direct connections between
providers of information and the users of the information. Although the Internet has huge
potential to deliver useful information, many of today's Internet information services only deliver
more data. It is a problem of more data against the reality of a fixed or shrinking amount of
target customer time.

For example, industrial communications traditionally relied on the following: direct
sales, representative sales, distributors, trade publications, trade shows, and direct mail. In all,
these communication channels from selling company to potential buying organization consumed
approximately 10 to 15% of a selling company's revenue, a significant proportion thereof. The
efficiencies of these communication channels has always been difficult to measure. In many
ways the efficiencies of these channels was summarized by the old maxim: "I know that half of
my advertising budget is wasted. The problem is that I do not know which half." The question
of "which half is wasted" is derived from the fact that promotional communication, such as
advertisements and trade shows, rely on fortuitous combination of a salient message and a pair of
receptive attentive eyes. As people get busier and busier, there is less and less time form an
advertiser or supplier of information to reach a target pair of eyes.

Therefore, there is a need for information to be compressed and distilled into a format
that is standardized, simple to search, read, and understand. With such a system, a user would be
able to quickly and efficiently find exactly the right information, and be satisfied knowing that
the information received is indeed the appropriate information. Likewise a supplier of
information would be quickly and efficiently connected to a target user.

**Summary of the Invention:**

In a most basic embodiment, the invention is a method for organizing and displaying
information in a map format that is easy to search, view and comprehend. The information may
be received as compressed process packets. With the information map and process packets of the
invention, an Internet gateway or "portal" is created for users (potential buyers) to connect with
information from content providers or suppliers (potential sellers). The mapping protocol of the
invention shows any user or supplier the landscape of a particular industry's products, services,
consultants, organizations, process solutions, geographic support, people, trade organizations,
etc. Industrial sellers purchase "cyber real estate" so that they can be prominently displayed on
the maps. The software and processes that enable this first industrial portal which will be called
the Electronics Universe, are scalable and applicable to other industries.

In one embodiment, the process packet, or simple text format, and mapping protocol
contain and present information for the entire industry that produces electronic devices. This
industry is referred to as the Electronics Universe, or Universe throughout this Application and
will be described in more detail below. The processes and protocols described by way of
example with the Electronics Universe are applicable to any Universe in which end users need
information on how to make something happen, or information-intensive decision processes
where users need to consider many sources of information prior to their decisions. For example,
another industry or universe easily presented with the invention could be the music production
industry where users need to know the process of making and marketing a song or record, and
need experts in recording, sound, engineering, and producing, etc. Another good example would be the health care industry.

The process packets, or simple text form, and mapping protocol of the present invention use unique information compression, connection, and display technologies in combination with the Internet. The invention provides significant communication time savings for both vendors or suppliers (who are the advertisers in the Universe), and decision makers (who are the end users and buyers in the Universe), who wish to communicate and learn about electronic products and services. The process packet protocol, and the mapping protocol (with or without the process packet format), of the present invention may be displayed with advanced graphical user interfaces (GUI) on a www Internet site using a visual display unit. The invention's aim is at two fundamental customer oriented values: information compression (time saving) and connection (relating and validating information). The process packet format, and the map protocol format, by effectively compressing information into a uniform, standardized format that is easy to comprehend and search, enable a user to find information much more quickly, and avoid needless searches through large text and list files. The values of connection and compression are intrinsically part of any good map! The map sites, using process packets or simple text, and process packets are stored in a database that can be searched using a variety of methods, including visually and by word searches. The cyber real estate sites are also connected to information sources that add validity and thoroughness to a user's information search.

One process of compressing and presenting information, as embodied in the present invention, is called the packet protocol. The packets are information pieces, or bundles of data, presented in a consistent format throughout the web site containing the Electronic, or other, Universe. The packet protocol uses an innovative convention of converting every piece of
information into a “process” format and presenting the information as compressed packets of information to allow single screen viewing of the information and the uses, and sources of that information. One of the ways of displaying the information contained in a packet protocol is via the mapping protocol of the invention.

The map format, with its “cyber real estate” sites, presents a basic and fundamental unit of communication according to the invention, just as molecules are composed of basic atoms. In order to make something happen, a user needs large amounts of interrelated information in a concise format. The packet protocol, and the mapping format shows users how to find his/her way in order to find out how to accomplish goals, as opposed to throwing volumes of material at the user and making him sort and group the information. The information is already sorted and packaged and displayed in a standardized, usable format, for example a road map, with which essentially every user is already familiar. The unique compression of the process packets, and the presentation of the data in a map format provides less total information while providing more useful information.

The Internet is an ideal means or media venue for publishing and organizing information into maps for end users and advertising entities. Thus the invention uses a fundamental summary method of compressing information, then makes it more useful by presenting it in a data base/website, in the form of a dynamic, moving map format to enable a user to quickly and easily research how to make something happen. The invention takes advantage of the fact that the Internet is being adopted at an exponential rate by business organizations and individuals. Due to the fact that most personnel in the electronics universe are computer literate, a large majority of the target users of Applicant’s invention have computer and Internet access. Many previously separate segments of the Electronics Universe (and other universes) are merging, thus
increasing the need for the closer information connections Applicant can produce with the invention. For example, both semiconductor manufacturers and circuit board assemblers are merging toward integrated circuit packaging. There is a trend toward contract electronics assembly and semiconductor foundries, and a corresponding trend away from original equipment manufacturing of circuit assemblies and semiconductors. This trend will increase the utility of Applicant's invention's connections by showing the relationships of these emerging value chains quickly and simply to potential users. There is a trend to distributing computing, or in the jargon of the business, information appliances. In this trend, logic devices are being embedded in the simplest of electronic appliances like toasters and weather gauges. This integration of distributed logic will make Applicant's electronic City a useful site for new members of the Electronics Universe to see their relationships to traditional electronics (data and logic) companies.

In order to input information into the packet format, the input may be in the form of a process following the packet protocol wherein information may be described as inputs, outputs and general descriptions, thereby giving users of the information concise information described in terms of how to make something happen. The presentation of information as packets of inputs and outputs allows connection of the packets to occur in a computer database. An entity wishing to publish or post a packet enters information into the web site, by way of an input screen which may be standardized as to form. The input format forces the authors to follow the packet protocol rules. The packet protocol can be looked at as a filter in the overall process. The entry fields can be set up so that only certain information is permitted initially to be entered. The information that is permitted and entered is then made much more useful by way of the input output format of presentation and logical rational connecting to other packets. The connections
between information are performed by the database of the hosting web site, and displayable in the form of a map using the mapping protocol.

Using the mapping protocol, a user may move through the Electronic Universe, to reach individual "cyber real estate" sites on the maps, where information packets, or simple text descriptions, may be found, via a traditional database search, or with the aid of an innovative connecting technology (GUI or Graphical User Interface), that visually shows the relationships of individual data and advertising customers to users of the Electronic Universe. This visual connecting aids in understanding the relationships between the information in the Universe, and also provides a measure of legitimacy to the particular piece of information by enabling a user to see the number of connections to the particular cyber real estate site to see if others in the industry or Universe are also citing, referencing, or using the particular information at the particular site. The end user receives unique industry relationships through the web site connections displayed by the invention. The user receives unique information for quick understanding, and the user also has the ability to establish his or her own "cyber real estate" site on the map for a particular Universe to use.

There are two customer groups who will use the Electronic Universe web site, those who will be on the map, and those who will use the map format. The first users are the vendors or suppliers who buy promotion, advertising and various other services from the Information Service Provider who creates the "cyber real estate," maps the information on the Internet site, and maintains the Universe web site. The second users are the end users or buyers who use the web site to acquire and post information. The Electronic Universe, as defined above, with its packet protocol and mapping connection system connects all of the segments of the electronics industry.
An example of the use of the packet protocol, and mapping protocol of the invention is a link based in one embodiment on a manufacturing or production sequence. For example, if a user knows that sand is turned into silica, which is turned into integrated circuits, which are part of a circuit board, he or she can link, through a series of inputs and outputs, the circuit board to the sand and obtain information on the whole process. The computer database does the linking. There is nearly unlimited linking of one piece of information to another in the map of the Universe. The only links that will not happen are those that serve no purpose or those that show no relationship. For example, it would not be useful to connect a circuit to a drinking glass even though the glass is also derived from sand.

Making something happen is the reason the Electronic Universe exists. Packets of the packet protocol are the basic and fundamental unit of communication according to the packet protocol. In order to make something happen, a user needs large amounts of interrelated information in a concise format. An analogy could be drawn to the old adage that “if you give someone a fish, you feed him for a meal, but if you teach him how to fish, you feed him for a lifetime.” The packets present information that teaches users “how to fish,” and enables users to find out how to accomplish their goals, as opposed to throwing volumes of material at the user and making him sort and group the information. The information presented by the invention is already sorted and packaged in a standard useable, and familiar format. Any process or desired task can be completely described by a grouping of related process packets displayed in a related location on a map. In this way, complicated manufacturing processes can be simplified by being broken down into, and composed of, many packets. The protocol and packets of the invention, described as processes with inputs and outputs, help to validate the information in each packet because the output of one packet may relate to the input, or may be the input, of a related packet.
The unique compression and presentation of the data in the process packets and the map format provides less total information while providing more useful information.

As a product, process packets may be free, as enticements to those having information, to post useful information in the Electronic Universe. Secondly, packets will be sold to advertisers who wish to promote their products. Information may also be presented in the map format as simple text, using a few words or a logo and providing a link to an external website where the user can obtain more information.

A user may move through the Electronic Universe to reach packets via a traditional database search, or with the aid of an innovative connecting technology such as the map protocol, that will visually show the relationships of individual packets and advertisers to users of the Electronic Universe. The end user receives unique industry relationships through the cyber real estate site connections displayed through the innovative mapping protocol connection and searching software. The user may receive information that is compressed into packets for quick understanding, and the user also has the ability to publish his or her own packets of information at his or her own "cyber real estate" on the map for the Universe to use.

Applicant's invention makes unique information packets as a packet protocol for storing and presenting information, and unique information maps for displaying the information contained in packets or simple text descriptions, on the Internet. This unique method of displaying information in the form of a map is a format which is currently missing from the Internet landscape.

The packet protocol, and mapping protocol of the invention are unique relative to typical keyword searches for two reasons: 1) the determined process of conveying all information, as packets of information, and/or as locations on a map, provides a fast and comfortable and natural
method of linking one piece of information with another, and linking occurs naturally because all 
of the information may be standardized and is easily connectable; 2) in traditional searching, key 
words are often linking words to long text publications, whereas with the process packet and 
map protocols of the invention, there is no long text of undefined length or format, because all 
information is of the same style and conciseness, therefore being much easier to present, 
manipulate, link and comprehend.

Thus, one aspect of the invention is to provide a method and system for compressing data 
and presenting it as discrete bundles of information as a process packet.

A second aspect of the invention is to provide a method and system for presenting data in 
an easily understood map format.

Another aspect of the invention is to provide an easily searchable database of 
information.

A further aspect of the invention is to provide a system of packaging and presenting 
information as discrete compressed processes that are naturally linkable via way of their 
presentation as process protocols having related inputs and outputs.

Yet another aspect of the invention is to create a coordinate system that assigns 
information bundles coordinates that are used to create a map that displays the individual 
information sources as part of the totality of information sources, thus creating a unique 
graphical information interface.

Another aspect of the invention is to organize information by coordinates that are 
specifically designed to create a meaningful map representation of the information once the 
information is rendered as a map.
A further aspect of the invention is to provide a system of packaging and presenting information in a map format that is naturally linkable by way of its presentation as "cyber real estate" sites.

Yet another aspect of the invention is to provide a system for compressing, presenting, searching and linking information that is easy to search and link such that a user can easily visually see the connections used to arrive at the information.

A still further aspect is to provide a system that links an entire industry, such as the Electronic Universe, presents the industry as a visually searchable database of process packets, or simple text, discretely displayed using coordinates to present a map of locations or sites linked to each other and to outside web sites for further information.

A further aspect of the mapping protocol of the invention is to visually display information on large and small scales, thus giving a user the benefit of seeing the "big picture," as in a national road map, in combination with greater detail as "zoom ins" to smaller scale for greater detail, as with city road maps.

A still further aspect is to implement a superior user interface for finding electronic and semiconductor industrial information on the Internet based on the simple concept of a map.

Another aspect is to create an Internet gateway or "portal" for users (potential buyers) to connect with information from content or information providers (potential sellers).

Still a further aspect is to enable the mapping presentation software, and processes of the invention to be scalable and applicable to other industries.

These and other aspects and features of the invention will be apparent from the following non-limiting description, when taken in conjunction with the accompanying drawings and appended claims.
Brief Description of the Drawings:

Figure 1 is a schematic illustration of the map display method of the invention as would be used in a software routine. At each end destination on the map a user could view a bundle of information as a process packet as shown in Figures 3 through 7, as a simple text description or logo, as shown in Figure 2.

Figure 2 is an illustration of a particular display format of a map embodied by the present invention.

Figure 3 is an example of a process packet for a wave soldering process in the printed circuit assembly industry.

Figure 4 is an example of a process packet for a VOC free wave soldering process in the printed circuit assembly industry.

Figure 5 is an example of a process packet for an individual with particular expertise useful to the Electronic Universe.

Figure 6 is a process packet presented in a different visual layout. This particular process packet describes a production process with a particular type of machine.

Figure 7 shows a process packet for a five page technical paper that was compressed into the single screen process packet format.

Detailed Description of the Invention:

Referring now to the figures in which like elements correspond to like reference numerals throughout, an embodiment of the computerized method of the invention creates maps by creating an information landscape as a two dimensional or three dimensional surface. The invention subdivides the landscape information into sectors of information (neighborhoods) where similar information is located and mapped in the same sectors. Information is collected
from industry or other sources (these sources may or may not have attendant Internet hyperlinks), and the system creates and assigns unique, discrete, coordinates to the information, relating the information and its sources to their relative information sectors. Additional information and sources may be added over time. There may be information paths through the sectors of information wherein these paths may also have coordinates (starting and stopping coordinates) to orient users in the map. All of the coordinates are then processed and the system renders a map as a surface interface displayable on a visual display unit showing lateral and vertical relationships among the information. A means is provided for a user to query the map, and the system then displays the desired information landscape or location to the user.

Conventional web sites do not address the fundamental issue that users of the sites need a more efficient approach to gaining and understanding information. To change this situation and take advantage of the huge reach of the Internet, the invention provides a unique information distribution process based on small units of information displayed, either as process packets or simple text, on dynamic maps that allow a user to interact with the information he or she seeks.

A basic embodiment of the invention is now deployed at the Internet site of www.metrocity.com. Part of the software that the Company has developed uses a licensed technology from Inxight Software®, a Xerox New Enterprise Company which has its roots back to the PARC organization. The operation of the Metro City web site is split between a public web hosting company and Metro City's data base development partner.

For purposes of definition, the industry used as an example will be known as the Electronics Universe. Included in this Universe are semiconductor manufacturers, electronic circuit board manufacturers, computer manufacturers, telecommunications companies and the whole industry of companies that supply materials, machines and know-how for electronic
device manufacturing. The entities included are those companies that communicate information or produce devices that communicate information. With this definition companies like Intel, Motorola, Lucent, Solectron and SCI are included while companies that make power, motor, high voltage, or other non-information electrical machinery are excluded. That is not to say a different universe using the same techniques could not be created for the excluded companies, however, for purposes of example this application will discuss what has been defined as the Electronic Universe.

The present invention uses the speed and breadth of the Internet in combination with a unique communication interface of dynamic maps to make the Internet more useful for senders (or sellers) and receivers (or buyers) of industrial content messages, thus allowing buyers and sellers in electronics manufacturing to save significant resources from traditional communication expenses. The mapping and packet protocol create value by enabling users to quickly and efficiently locate relevant information.

The information maps of the present invention provide: content compression by way of simple text descriptions with simple labels or a packet protocol creating process packets of information, dynamic navigation, advanced user interface with an interactive data base of the Electronics Universe, inclusion of links to competition, semiconductor connections, circuit manufacturer connections, company directory searches, product directory searches, process directory searches, people searches, geographic searches, automated requests for information, self-mapping or profiling of users, and references.

Thus the present invention offers a currently non-existent, interface for conveying information. For example, a typical search engine and typical industry site provide lists of information links. Beyond these lists, there is no context to the information. We, as the humans
using their interfaces, must read and decode the meaning of the words on the list. In contrast, a map interface such as the one presented by the invention provides a rich information display with very little written text wherein the written text is put into context and enhanced by visual displays. Similar ideas can be linked by lines and grouped in the same visual spacial area. The maps can also dynamically move at the direction of the user, thus conveying thousands of information sources in seconds without multiple displays of successive nested lists as is common Internet practice. The user can see where he or she has been, where he or she is going and have an overview of the particular industry or Universe as a whole.

The maps of the present invention are known as "Electro Express™ maps or "Netro Maps"™ and have the following characteristics. The information is spatially organized, in order to increase the speed of human interpretation and understanding. Information sources of similar value to a user are assigned location coordinates that are part of the invention's data collection, compression and organization process. The coordinates are assigned so as to maximize the visual effect of the rendered information on the map. The mapping process is unlike list organizations of information. Similar types of information are organized into Sectors or neighborhoods of "cyber real estate," thus creating the user interface of a map. The maps dynamically interact with the user, thus increasing the attention value for the user. Information may be hyper-linked to information in the Netro City database or other external Internet websites.

Finally, the system is supported financially by suppliers of industry information who lease "cyber real estate" on the system to better position their organizations to be found by users or potential customers’ searches.

The concept of maps as navigation tools for the Internet or other global communications networks may also be used to produce navigation tools similar to the Electro Express™ and
Netro Maps™ which link back to a host web site, for example, www.netrocity.com. Although the Xerox® Inxight Software® is not exclusive, Applicant has uniquely packaged its own software methods with the Inxight® Software to create a new and unique dynamic mapping and navigation tool embodying the invention. The Inxight® tool is simply one option to render the mapped information that this invention creates as one of the first steps.

This invention is unique for the following reasons. Applicant’s is the first system to combine into one "Electronic Universe" any manufacturer who produces a device that processes a bit, an electron or photon. With this invention, Applicant is the first to create a searchable and interactive industry map of useful information displayable on a computer network. Applicant is the first to create the coordinate system that ultimately plots information and information sources into a useful map interface. The map system combines many types of information that would normally not be part of the same list search result, for example, the commingling of product, process, people, technical documents and geography information as part of the same information interface. Applicant’s map interfaces allow a promoter of products and services to purchase or lease "cyber real estate" as a location on a map as part of marketing and promotion. Applicant’s maps also allow users and experts to profile and map themselves as part of the shared industry map interface. The user inputs to the system administrator or city manager the locations in which he/she is interested, the user’s name and e-mail address. The user is then automatically sent e-mail, messages, and information related only to the specific neighborhoods in which the user is interested, thus further increasing the efficiency and value of the system to the user. The user can update and change, at any time, the profile of information being requested.

Applicant’s database is intended to be rendered as a type of two dimensional or three dimensional map format. Information sources as "landmarks," images and references that would
not be part of any database search result but which increase the efficiency of a user search by giving a visual spacial frame of reference are added.

Thus, an embodiment of the invention is a method of sharing information and promotion by means of a global communications network by assigning coordinates to a unit of information or data, and communicating that unit of information or data into a computer program which then renders and displays the information in the form of a two or three dimensional map. A flow chart illustration of the method of the invention is shown in Figure 1.

A software program would perform the steps shown in Figure 1, starting in block 10 wherein an information landscape is created as a two dimensional or three dimensional surface. The system then moves to block 12 wherein the landscape information topics are subdivided into sectors of information for similar information to be located or mapped in the same sectors or neighborhoods. In block 14, information and information sources are collected and entered from an industry, or other sources, that may or may not have attendant Internet hyperlinks. In block 16, unique, discrete coordinates are assigned to the information and information sources entered from block 14, relating the sources to their relative information sectors developed in block 12. Additional information and information sources may be entered at any time, as shown in block 18. In block 20, information paths are added through the sectors of information. These paths also have assigned coordinates, or starting and stopping reference coordinates. Once information is entered and assigned coordinates in the appropriate sectors, the system, as shown in block 22 renders a map display as a surface graphical user interface displayable on a visual display unit showing lateral and vertical relationships among the information and information sources. In block 24 a user may query the map. In block 26, the system displays the desired information landscape or map to the user. The information entered into and displayed by the system may
comprise a compressed form of information as a process packet, or may be a simple text
description with a label or logo. The process packet contains a unit of information in a
compressed, uniform format that is quickly and easily readable by a user. The information is
compressed to adhere to the input/output protocol form, and is then displayed as a discrete
packet, with the information being presented as process steps. The input forms may be
“intelligent,” in that they logically evaluate the appropriateness of the entries from the authors.
Ideas from longer manuscripts are forced into smaller representations - overview, inputs and
outputs, etc. The input/output form describes a process. The process protocol is basically a set
of rules for condensing information into a common format, like a programming language or
language code. The first act of compression is the fact that the system input mechanism only
allows certain information to be entered. The packets are thus presentable as a form of
searchable or data relational text that is easily manipulated and linked in the database. Without
the packet code, there would be no useful linking of information in the packets. Without the
compression or small packages of information, a web site would bog down with too much
information and no algorithms for linking. The fact that the packets have inputs and outputs
allows connecting and linking to occur in a computer database, in that the output fields in one
packet may be the input fields of a logically related and connected packet, thus enabling a user to
move quickly and easily among relevant related information.

An example of particular information that may be found at a particular information
source or location of "cyber real estate," once a user arrives, is shown as a simple text or logo
description at various locations on the map shown in Figure 2. An example of particular
information that may be found at a particular information source or location of "cyber real
estate," once a user arrives, is shown as a process packet 28 in Figure 3. The particular example
shown in Figure 3, comprising packets 28, for a wave soldering process, shows a unit of information presented to the user in a compressed uniform process format called the packet protocol. As shown in Figures 2, and 3, the information found at a particular cyber real estate location may be presented in the form of a simple text description, label or logo, process packet, or link to an external web site.

Packet 28 presented according to the packet protocol, is comprised of eight major sections: the title and heading section 30, key word section 32, package description section 34, illustration section 36, input section 38, output section 40, notes section 42 and links section 44.

Title and heading section 30 provides the user with important initial information including the title of the process of the packet, the author of the information, the source or organization posting the packet (if there is one, for example a company name), the industry, any sub-industry or particular segments of the industry, and any references. The exact information posted is optional, but helps the user to locate the packet and helps the system to assign coordinates and a particular "cyber real estate" location to the packet of information, and enables the user to very quickly decide if the information is applicable. Key word section 32 lists synonyms or words important to the particular process, and therefore provides information about how the particular packet was found, and how other packets may be related or how related packets may be found by searching common key words or spatially nearby locations. Packet description 34 is a very short summary of the type of information provided in a particular packet. In this particular example, the description section describes in one short paragraph a wave soldering process. Illustration section 36 may be a photograph, schematic or representative illustration of the information provided in a packet. In this particular embodiment, a graphic illustration of the wave soldering process described in the packet 28 is shown. The main body
visually of the packet 28 comprises the input and output sections 38 and 40 respectively. Inputs 38 may list available experience of an individual, or characteristics of a product that the posting author or organization can provide to a user who wants to accomplish a particular process. Outputs 40 may list the results or benefits of using the process described in the packet. For example, the performance characteristics expected from a product made by the process organization or author of the packet may be listed as outputs 40. The schooling and work experience of an expert may be represented as inputs 38 and his or her available areas of consulting could be presented as outputs 40 in a packet.

Because of, and to aid in the linking of related packets, elements which may be an output of one packet may be an input to another related packet. The inputs and outputs form natural linking points to allow the system to locate related information in related sectors or neighborhoods. In the embodiment of a packet shown in Figure 3 a solder bridge defect rate, listed as an output, and the parts per million range is achieved using the offered products, processes and services (inputs) of the organization or author posting the packet 28. The input/output format also provides a user a rapid way to assess the validity or usefulness of particular information. Credibility of information in a packet comes from inputs matching outputs. If inputs and outputs of a packet do not match or make sense, a user can very quickly assess the need to find another source of the design information. For example, if the input of a particular packet on producing circuit boards is one (1) gram of paste per day, yet the list of output per day is 20,000 circuit boards, a user can quickly assess the credibility of the packet. There is either an error in the packet presentation, or the company claiming the input and output may not be credible because they are making a claim (for X amount of product producers) that does not make sense (based on amount of ingredients used) or is not practically possible. A user
may therefore spend 30 seconds moving through the map display, locating a potential source of information, assessing the potential source of information and making a decision, as opposed to spending minutes or hours sorting through lists of text of various companies or suppliers and then sorting through vast amounts of text describing the company’s sales and promotion materials.

As another example, the output of one packet may be a particular company’s production of 10,000 widgets per day. That output would naturally link to the machine that is capable of such production, which would then be linked to the company that produces the machine that can enable the first company to produce the 10,000 widgets. Such information, the unit of information containing a particular company’s production capacity, and the unit of information containing the information on the machine that enables the other company to make 10,000 widgets per day would be located in a similar visual spacial location on a particular map. A user thus has access to a great deal of information in a very concise format and, when searching, can easily see how the information is related and linked. The user can also see what other related information is available for the particular topic being searched, in a very short period of time. Related information may be found in other nearby locations or even in other related web sites which are linked to the process packets of information located on the map display.

Notes section 42 provides an area for other pertinent information related to the inputs 38 and outputs 40, such as practical tips or general statements about for example, definition of words as used in the packet 28 or alternatives to what is described in the packet. Links section 44 provides the entity posting a packet with the opportunity to have the packet linked, for example, to other related packets or to the company or author’s web site for more detailed information about the people, products and services of the posting entity. In this particular
example, the links would be to additional information about particular steps of a wave soldering process. The links may also be to other related packets not owned by the same company, or to other Internet sites.

Figure 4 illustrates another, similar packet 28 which describes a particular wave soldering process that is VOC free (volatile organic compound-free), and performed with certain specific equipment. Input section 38 describes the capabilities of the equipment and company used in VOC free wave soldering. Output section 40 provides performance and production characteristics of products resulting from the process and equipment of the input section 38 such as a production rate of 500 articles per 8 hour shift. As can be seen in Figure 4, there may be additional sections added to the packets 28 if needed, for example, to convey important notes, warnings or other information. In this particular example, there is an important note section 46 describing things a user would need to know, but which are not process inputs or outputs.

Figure 5 shows a packet 28 prepared about an individual. Input section 38 provides the individual’s background and qualifications as input to a process a user wants to make happen. Output section 40 then details the types of results that can be obtained using the process of consulting this particular individual and his specialized knowledge. Link section 44 may link to the web site of the company posting the information. This is a particularly good example of the process packet form of presenting and linking compressed information because it uniquely describes a person as a process packet of information.

Figure 6 shows another form of presentation of information in a packet 28. Thus, information is entered, compressed and presented as process steps, and linked to other relevant packages of information by being assigned coordinates and being located in a relevant location on the map display.
Figure 7 is an example of a five (5) page technical paper, and the information it contains, reduced to a single page presentation of that information as a process packet 28. Thus, the map display format initially saves the user time in locating the information, while the compressed packet form saves the user the time of having to read an entire paper to decide if the methods and information provided in the paper are what the user is looking for. The user is able to locate and review the packet of information in a matter of seconds. The links in the packet then enable the user to go to the company's web site to read the entire paper if desired, or to quickly view related areas to decide if the information is credible and appropriate.

The map rendering of the invention, an example of which is shown in Figure 2, enables users to find and display information and see the path between related pieces of information in much the same way a geographic map enables a user to see where he or she is going, where he or she has been, and the relationship and path between the two places. The maps may be searched visually by moving throughout the map or city, and may also be searched using traditional text search terms. Thus the user can find additional related linking information as well, information that cannot be found or seen in the traditional list format in which information is currently searched and displayed on the Internet and other computer networks.

The user can also recheck and verify that he is moving in the correct direction and backtrack to take another fork in the path if the information on a certain path appears to be getting less relevant. The user can see his or her path and backtrack to find where he or she veered off the desired path and will not have to start research over again. The user can travel with a sense of origin, with a known starting or reference point and can see the context of the information sought, to see how it fits in with related information.
In other words, assigning coordinates and displaying the information in a map format provides context by showing the "big picture." Information not requested, but related, can be seen in the same neighborhood as the requested information. For example, a road map shows roads, but also shows rivers, mountains, cities and towns along the way to the desired destination, thereby providing context for the roads.

The map's format allows a user to become familiar with the whole Universe and especially with the neighborhood the user frequents. Thus the user knows roughly where to start a search, does not have to start each search "from scratch." The user just goes to the neighborhood where the desired information is likely to be and starts from there. The user saves a considerable amount of time, and each search is easier as the user becomes familiar with the Universe and the layout of the various neighborhoods and the cyber landscape. The information presentation format of a map has key differences and advantages simply not available with a traditional list. The maps present additional information not possible with a list, such as surrounding sites and landmarks that help with visual navigation and provide a great deal of information with very little text.

A supplier of information can then look at users' paths to see where they are traveling, to look for patterns, and see what information users find relevant, related and useful. By following users' paths for traffic patterns, information suppliers can better position themselves spatially to serve their target audience or buyers. By purchasing or leasing cyber real estate, the supplier can request to be cited in a particular area of the Universe and be plotted where the relevant buyers will easily find the supplier.

The system is interactive in that both users and suppliers of information can provide input to the system administrator, regarding information found in the Universe, and the location of the
information to participate in the evolution and construction of the Universe. For example, if a user believes a certain piece or type of information is located in the wrong neighborhood, the comments can be entered and applied to the system to improve the system. All users in the marketplace of the Universe, both those searching for and those supplying information, can "police" the system for the correctness and appropriateness of information and locations. The system, therefore, is interactive and dynamic, constantly being updated, and modified by the city manager or system administrator (based on user and supplier input) to ensure information is located where it belongs and will be most useful and easily found, based on actual marketplace interaction.

Assigning coordinates to information and presenting the information as a map wherein the information is located visually on a map, in a compressed form or as simple text, labels or logos, enables many types and categories of information to share the same visual space. The actual map display may be set up in a variety of ways, for example, the size of a company can be inferred by having the company located in many neighborhoods the way McDonald's franchises are, or the size of the screen display on the map can reflect the size or prominence of the company. Also, various displays such as color, or flashing displays can be used and are purchased by suppliers (promoters, advertisers) of information. Organizations can therefore promote themselves by purchasing different levels of prominence. The entity creating and maintaining a map display according to the invention receives revenue by selling promotional space or "cyber real estate" locations on the map.

The timeliness of a source of information can also be displayed with graphical highlighting. For example, if an industry trade show is occurring for one week, the map can display, in appropriate neighborhoods, information about the show in a larger format before and
while the show is occurring. A provider can be sited by products or services offered, by geographic location or both. The user, therefore, can search by a product or service, a location or both. The display may be set up with major, common search directions provided initially, such as by product, by geographic location or by topic of problem or issues to be solved, to enable the user to set out in the right direction at the beginning of a search. Users can orient the map traveling in vertical or horizontal directions, giving the user the breadth, depth and Meta information needed while always maintaining a relationship with the information landscape.

As discussed above, a user can profile him or herself such that targeted information is automatically sent to the user. The profiling of the user can take the form of the user actually mapping him or herself, at various locations, with the mapping system. In addition, maps can be customized for individual users so that when the user calls his or her map from the database, a special version of the map will be displayed with information and markings particular and interesting to the user, thus saving search and information retrieval time. Thus the user can keep abreast of changes to specific targeted locations, neighborhoods and information of interest.

The invention thus provides a method for displaying information as easily, accessible, and understandable maps wherein no two pieces of information will have the same coordinates. Currently the information, located at each set of coordinates, is displayed using the Xerox® software, but the actual means of display is secondary to the concept of information being displayed in a map-like form. The coordinates may be displayed using the Xerox® map display (as shown in Figure 2) or may be displayed in some other map-like format such as a grid system as used by many cities. The display may be in the form of a city scape through which the user moves as if driving
through a city. Because each compressed unit or process packet of information has its own unique coordinates, the user can go directly and selectively to the desired piece of information.

The invention can also display maps in various scale, for example, getting finer in detail, sequentially as a user focuses in or narrows the search. It is easier to begin to choose a direction in which to narrow a search, if one can see an overview or big picture of the Universe or neighborhood to be searched and then focus in on more specific areas. This visual, wide ranging search is not possible with a list.

Information may be located on a map whether access to the particular piece of information is free or requires a fee. The various sites or pieces of "cyber real estate" can be differentiated, for example by color, with a free access location having one color and a location to be accessed with a fee having another color. The coordinates or sites in the Universe may also link to outside web sites and information.

The system will list and locate every supplier of information in a given universe by name, URL, physical address, and/or telephone number for no charge. However, also discussed briefly above, if an entity wants its logo displayed at a particular location, in a particular color, or size, etc., there would be a charge. As a result, the entity paying for the logo display can chose where the logo(s) will be sited, (in cooperation with the city manager and in relevant, appropriate neighborhoods), and may displace another entity from a location if that entity is not a paying supplier of information. Thus there is an incentive to pay for locations of cyber real estate, in that the paying supplier of information can chose where its display will be. Therefore the supplier information can influence the prominence and visibility of its information if by paying to have a
logo displayed. The analogy would be to a telephone book in which everyone is listed for no charge, but in order to have a name enlarged, or highlighted, or an advertisement displayed there is a charge. Similarly, when a user maps him or herself at various locations, and requests that selected information, and messages be sent relating to the chosen locations, such service may be offered free or for a charge, possibly based on the number of sites or neighborhoods about which the user is requesting customized information.

Thus the invention assigns unique coordinates to units information, either in process packet or simple text or logo form, thereby creating a place or space for that information, grouping information by relatedness and relationship, and displaying the information as a visually navigable map. The invention presents an entirely new way to organize, store, display and search information, to connect buyers and sellers, and information seekers and users with information providers. The method includes compressing, categorizing and grouping, and displaying information to result in an electronic space map, as opposed to simply a searchable list database.

Thus, it can be readily seen from the foregoing figures and description, that there may be variations in the style and layout of the presentation of the individual compressed information, as well as the spacial display of information locations and in the method used to present, search and view the information and the spacial layout of the location of the information without departing from the spirit and scope of the invention.
Claims:

1. An interactive computer based information system comprising:

   a computer data base;

   means to enter data into said computer database;

   a process to compress said data into small units of information;

   a process to create and assign coordinates to each said unit of information;

   a display format wherein said coordinates are spatially located and displayed such that related units of information are located spatially near each other in said display format wherein a user can interactively and visually move through said display format to a desired location where the user can then view a desired unit of information.

2. The system according to Claim 1 wherein said display format comprises a road map in a two or three dimensional display.

3. The system according to Claim 1 comprising an interactive guiding capability which guides a user through suggested paths to aid a user toward desired information.

4. The system according to Claim 1 comprising a plurality of landmarks located throughout said display format to aid a user in maintaining his orientation within said display format.

5. The system according to Claim 1 comprising a process whereby a user may purchase or lease a location of cyber real estate at which to provide information about the products and services, of said user wherein said system will locate the user’s information near relevant related information.
6. The system according to Claim 1 comprising a means for performing traditional word searches as well as visual spacial searches of said database.

7. A method of providing information to link an industry’s buyers and sellers comprising the steps of:
   - leasing visual space to a seller in an interactive graphical information interface;
   - entering information provided by said seller into a computer database;
   - organizing said information using computer software, into compressed or small units of information;
   - creating a coordinate system and assigning coordinates to said units of information;
   - and
   - graphically rendering said units of information to a user in a searchable display format.

8. The method according to Claim 7 comprising displaying said units of information in an interactive map, as cyber real estate locations.

9. The method according to Claim 8 comprising using said map as an interactive search engine in a two dimensional or three dimensional spatially based context wherein a user travels through said map, gradually focusing in to a desired location.

10. The method according to Claim 9 wherein said map displays said location, wherein said location is enterable by said user to view specific, desired units of information, wherein said information is presentable in simple text, label or logo format, or as a compressed process format.
11. The method of Claim 7 wherein said searchable display format interactively guides a user down paths during research, and provides specific units of information as suggested solutions at the end of said paths.

12. The method according to Claim 7 comprising allowing users to add, edit, or suggest changes to said method, thereby allowing interactive upkeep and maintenance of said interactive graphical information interface based on user input.

13. A graphical information interface method comprising:

- entering information into a computer database;
- organizing said information using computer software, into compressed or small units of information;
- creating a coordinate system;
- assigning coordinates to said units of information;
- displaying said units of information to a user in the form of a moveable, searchable display format, wherein similar information is visually grouped together in the same area of a viewing device, and linked visually to relevant related information.

14. The method according to Claim 13 wherein said entering of information and organizing said information comprises a user entering information in a uniform, compressed process format comprised of at least 8 sections consisting of: a title and section heading, a keyword section, a description section, an illustration section, an input section, an output section, a notes section, and a links section, whereby said units of information are presented in a compressed form as process.
15. The method according to Claim 13 wherein said database is searchable by traditional keyword searches, or visually.

16. The method according to Claim 13 wherein said display format creates an information landscape as a two dimensional or three dimensional map surface.

17. The method according to Claim 16 wherein said two or three dimensional surface is divided into sectors or neighborhoods of information wherein related information is located.

18. The method according to Claim 17 wherein said display format is a map.

19. The method according to Claim 13 comprising a user interacting with said method such that information is added, edited or suggested, thereby creating an open system for upkeep and maintenance aided by users.

20. The method according to Claim 18 wherein said map format displays information locations without associated information content.

21. The method according to Claim 20 comprising providing access to information content once said information is located.

22. The method according to Claim 13 wherein said display format displays an overview of all available locations and sources of information as part of an industry or universe of interest, and also displays focused-in views of greater detail to enable a user to efficiently locate information.

23. The method according to Claim 13 wherein said display format guides users down paths and provides suggested solutions of particular information at the end of said paths.

24. The method according to claim is wherein a user customizes a map to suit the particular needs of said user, displaying only what said user wishes to search or view.
25. The method according to claim is comprising a means to differentiate, via said display format, between entities providing information, with respect to size, geographical location, and fee based access, by using graphical highlighting methods including color, size, and flashing displays.

26. An interactive search engine system comprising:

means for entering data into a database;

means for organizing said data into units of information;

means for creating a coordinate system;

means for assigning unique coordinates to each said unit of information;

means for displaying said units of information, using said assigned coordinates, as a dynamic, interactive, multi-dimensional map display; and

means for a user to interactively search said database to display the location of desired information.

27. The system according to claim 26 comprising means for said user to provide comments and information to said system to enable said system to be continually updated and improved based on said user comments and information.

28. The system according to claim 26 wherein said means for displaying is in the form of a landscape or cityscape with said units of information located at positions on said map display.

29. A method of displaying customized information to a user comprising:

entering data into a database;

organizing said data into units of information;
creating a coordinate system;
assigning unique coordinates to said units of information;
displaying said units of information, using said assigned coordinates, as a dynamic, interactive map display;
querying said database to locate specific information at specific locations on said map display thereby creating a profile of a user based on the queries and preferences of said user and mapping said user at locations of interest to said user on said map display.

30. The method according to claim 29 comprising automatically notifying said user of changes in said locations of interest to said user.

31. The method according to claim 29 comprising automatically sending said user direct electronic mail and messages from promoting entities based on said profile of locations on said map display of interest to said user.

32. The method according to claim 29 wherein said user is charged a fee based on the amount of said customized information requested in creating said profile.

33. A method of displaying information comprising:
entering data into a database;
organizing said data into units of information;
creating a coordinate system;
assigning unique coordinates to said units of information;
displaying said units of information, using said assigned coordinates, as a dynamic, interactive map display through which a user spatially searches.
34. A method and system of advertising and delivering promotional information to users comprising:

leasing or selling visual space as cyber real estate to a seller in an interactive graphical information interface;

creating said graphical information interface by entering said advertising and promotional information into a computer database;

organizing said information into compressed units of information;

creating a coordinate system and assigning coordinates to said units of information; and

graphically rendering said units of information to users as a searchable map display format wherein said units of information are displayed at specified cyber real estate locations.

35. The method according to claim 34 wherein said coordinates and said resulting specified cyber real estate locations are chosen and assigned based upon the content of said advertising and promotional information, said content comprising: size of the advertising entity, geographic location(s), products, and services, such that related information is closely spatially displayed to enable a user to view neighborhoods of related promotional information.
Create an information landscape as a 2D or 3D surface.

Subdivide landscape information into sectors of information where similar information is located (mapped) in the same sectors.

Assign unique (discrete) coordinates to these sources, relating these sources to their relative information sectors.

Collect information sources from industry (or other sources) that may or may not have attendant Internet hyperlinks.

Add information paths through the sectors of information. These paths also have coordinates (or starting/stopping coordinates).

Additional sources can be continually added.

Render map as a surface interface displayable on a visual display unit showing lateral and vertical relationships among the information sources.

User queries map.

Map displays desired information landscape to user.

The utility of this model:
1. Users find information on a map, versus a list.
2. Users can orient the map traveling in vertical or horizontal directions, giving the user the breadth, depth and meta information needed - while always maintaining a relationship with the information landscape.
3. Organizations can promote themselves on the information landscape by purchasing different levels of prominence.
4. Organizations creating maps can receive money by selling promotional space on the map.
FIGURE 2
Process Packet: General Wave Soldering Process  
Author: James Andrus  
Meta Industry: Electronics  
Industry: Printed Circuit Assembly  
Packet Number: 980918-0E-EA-0P-03-001-A

**Keywords:** Wave Soldering, Flux, SMT, Thru-Hole

**Packet Description:**
Wave soldering process makes interlead electrical joints between pads of thru-hole or SMT components and the pads on a printed circuit board. First a conveyor system carries the circuit board through a process of heating, cleaning, and wave soldering. The connections and circuit board are then placed in the preheat subsystem at the end of which is a wave soldering bath of molten solder. Soldering is on board.

**Process Inputs:**
1. Printed circuit assemblies, unsoldered.
2. Wave soldering system.
3. Conveyor subsystem.
4. Fluxing subsystem.
5. Flux chemical material.
6. Heating subsystem.
7. Wave subsystem. width - dual #/day
8. Solder material.
9. Control subsystem.
10. Electrical utility.
11. Compresses air utility. scfm
12. N2 material. (optional) scfm
13. Ventilation utility.
14. Wear parts maintenance.
15. Operational maintenance.
16. Installation training.
17. Operational training.
19. Replacement part response.
20. Masking (optional)

**Process Outputs:**
1. Printed circuit assemblies, soldered.
2. Process yield measured in PPM. ppm
3. Production rate measured in units per hour. units/hour
4. Operational reliability measured in MTBF. hours
5. Solder bridge defect rate. ppm
6. Solder skip defect rate. ppm
7. Uniform heating profile of circuit assembly. delta T
8. Uniform application of flux chemical material.
9. Flux waste material. gal/day
11. Ventilation exhaust waste utility. scfm
12. Solder cross waste. #/day

**Process Notes:**
1) There are many types of flux: RMA, No-Clean, VOC-Free, etc.
2) There are many types of fluxers: foam, spray, ultrasonic, etc.
3) A common preheat today is forced convective.
4) Dual wave soldering is very common for SMT.

**Figure:**
VOC Free Wave Soldering Process with ACME Supra and ABC Inc. 900.

Meta Industry: Electronics
Industry: Printed Circuit Assembly
Packet Number: 980918-DE-0P-03-003-A

Keywords: Wave Soldering Flux SMT Through-Hole VOC Free

Packet Description:
VOC Free is a type of wave soldering process except that the flux material is designed to be compliant with local air regulations pertaining to the exhaust of volatile organic compounds (VOC).

In this process, an ACME wave soldering system was equipped with an ultrasonic spray fluxer to ensure even distribution of flux material, especially into the voids of the through-hole connections.

ABC Inc. 973 VOC free flux was used with good success. Hotter preheat was important to drive off water carrier of flux.

Illustration of VOC Free Wave Soldering Process

Outputs
1. Production rate of 500 PWAs per 8 hour shift.
2. Process connection defect rate of 200 ppm. (Mostly misses)
3. Operational reliability of 3000 hours MTBF.
4. Uniform distribution of flux as measured by thermal fax paper.
5. Heating profile of 1 degree C delta T.
6. Flux waste material of 0 due to the fact that ultrasonic fluxer.
7. No issues of excess heat or hot surfaces.
8. Ventilation exhaust waste utility of 1200 scfm.
9. Solder dross waste of 5 #/day.
10. Sticky solder joints.

Inputs
1. PWA's, BMT mixed technology, mother boards
2. ACME Supra wave soldering system.
3. Superior blanket, nuclear hardened.
5. ABC Inc. 900 spray VOC free liquid flux at 0.5 gal/day.
6. Hotter convection preheat at 10 KW/hr at 6 feet.
7. Dual wave, chip and at 18" width.
8. ABC Ultra Low Dross solder bar at 10#/day.
9. Computer control using MS Windows NT.
10. Three phase, 480 KW @ 150 AMPS.
11. Compresses air utility of 5 scfm.
12. H2 for inerting the solder wave. Usage of 500 l scfm
13. Ventilation utility usage of 1200 scfm at 0.5′ of water.
14. Wear parts maintenance usage of $250 per month.
15. Operational maintenance of 1 daily, and 5/month.
16. Installation training of 2 days by Speedline at factory.
17. Operational training of 2 days at Speedline.
18. Service response of 6 hours. Tech located 100 miles.
19. Replacement part of 24 hours. 24/7 phone response.

Important Note: Individual results will vary depending on specific process implementations. No contributors to this packet give any assurance or warranty that other process implementations will be the same. Information for reference only, Do not even think that you can use this reference information as an excuse for a process problem that you might have.

Process Notes:
A) Be careful of ventilation around fluxer. Poor exhaust can cause excess build-up of spray flux residues.
B) Attention to maintenance around fluxer is important.
C) Vacuum connection preheat is needed to evaporate excess carrier.

Q PROCESS PACKET CAN BE FOUND ON THE RETRO CD (WWW.RETROCD.COM) WEB SITE.

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**EXAMPLE OF PACKET ABOUT A PERSON**

<table>
<thead>
<tr>
<th>Process Packet:</th>
<th>Zarrow, Phil: Expert Community</th>
<th>Author:</th>
<th>Netro Smith</th>
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<td>Meta Industry:</td>
<td>Electronics</td>
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<td>Industry:</td>
<td>Printed Circuit Assembly</td>
<td>Reference:</td>
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<tr>
<td>Affiliation:</td>
<td>ITM, Inc.</td>
<td>Packet #:</td>
<td>900819-06-EA-07-00-015-A</td>
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</table>

**Keywords:** Consulting, Reflow Soldering, Placement, BGA, DCA

**Packet Description:**

Phil Zarrow is an industry expert consultant that helps companies find the best methods to produce their products. In addition to his consulting work in his ITM company, Phil is a world-recognized author and lecturer now working on an SMT book.

**Process Outputs**

1. SMT reflow process expertise.
2. Assembly process baselining and evaluation.
3. SMT Glossary: Terms and Definitions.
4. Editorial Advisory Board for Circuits Assembly Magazine.
5. No-clean solder paste evaluation and process implementation.
6. Multi-chip Module feasibility and implementation program.
7. Conductive Epoxy feasibility and implementation program.
8. Ball Grid Array feasibility and implementation program.
10. Reflow of Through-hole feasibility, development and implement.
11. PCMCIA participation and compliance work.
12. Ongoing analysis of current assembly equipment offerings.
14. "Current Challenges and Applications in SMT Reflow Soldering".
15. Adhesive Deposition.
17. 17
18. 18
19. 19
20. 20

**ITM Incorporated**

The SMT Process Specialist.

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*Figure*
An existing screen printer is an effective tool for depositing adhesives as well as solder pastes for electronic assembly by combining a pumping process with a screen printing process on a typical screen printing system.

Packet Inputs:
1. Pumping combined with screen printing process.
2. Traditional screen printing machine.
3. Deposition of different heights are achieved by using the adhesive through stencils.
4. Optionally designed stencils are used.
5. Cycle time is independent of the needed number of "dots" to be dispensed.
6. Dot profiles are simply controlled for the stencil design.
7. A separate stencil is needed for each PWA design.

Packet Outputs:
1. Correct amount of adhesive deposited.
2. Adhesive deposited in the required spots.
3. Adhesive deposited at different heights.
4. Adhesive dot profiles controlled for different types of components on same PWA.
5. 30 second cycle time for a 18,000 dot PWA versus 27 minutes for a 40,000 dot PWA.
6. With a single stencil and a single paste, dots ranging from 0.135 to 1.5 mm were achieved.
7. Multiple placement lines can be fed from one adhesive printer.

Packet Connections:
1. DEK Printing Company.
2.
3.
4.
5.

Important Legal Information
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**Packet Information**

**Packet Title:** High Speed Space Navigation (PWA) Production with Reflow Oven Leading Way in Terms of Yield & Quality.

**Universe:** Electronics

**Meta Industry:** Circuit manufacturing

**Packet Number:** 981015-00001-P-A

**Author:** Engineer, Joe

**Organization:** NASA

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**Packet General Description**

A well running reflow oven for the heat treating of solder paste is a key part of the overall electronic production process. High yields are the result of good technology in combination with trained operator and maintenance personnel.

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**Packet Illustration**

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**Packet Inputs**

1. ACME 59 reflow soldering system.
2. ASS 2000 no-clean solder paste.
3. 121 12 inch PWA boards.
4. Quarterly operator training.
5. Monthly maintenance training.
6. Monthly maintenance of 2 hours.
7. Special programming to ensure added visual inspection steps per NASA spec.
8. Special conveyer was used for 0.25 inch thick boards.

---

**Packet Outputs**

1. Production of 800 boards per 8 hour shift.
2. MTBF of 3000 hours.
3. Production yield of 99.9999% or defect rate of 80 ppm.
4. Quality in excess of NASA space flight specification.
5. Waste fan generation of 1 pound per month.

---

**Packet Connections**

1. Input of ACME reflow sys.
2. Input of ABC solder paste.
3. Joe Engineer, Author.
4. 
5. 

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FIGURE
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

<table>
<thead>
<tr>
<th>IPC(6)</th>
<th>US CL</th>
</tr>
</thead>
<tbody>
<tr>
<td>C06F 17/60</td>
<td>705/27, 705/500</td>
</tr>
</tbody>
</table>

According to International Patent Classification (IPC) or to both national classification and IPC.

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/27, 705/500

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>US 5,963,965 A (VOGEL) 05 October 1999 (05.10.1999), abstract, column 2, lines 40-</td>
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<tr>
<td>A</td>
<td>US 5,877,775 A (THEISEN et al) 02 March 1999 (02.03.1999), abstract.</td>
<td></td>
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</table>

Date of the actual completion of the international search: 20 July 2000 (20.07.2000)

Date of mailing of the international search report: 09 AUG 2000

Name and mailing address of the ISA/US

Authorized officer: James P. Trammell

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Form PCT/ISA/210 (second sheet) (July 1998)
Continuation of Item 4 of the first sheet: The title is too long.

New title:
Global Communications Network Mapping Protocol