

709	219	Subclass	ISSUE CLASSIFICATION
Class			

PATENT NUMBER

U.S. UTILITY PATENT APPLICATION

O.I.P.E. SCANNED <i>CK-1</i> Q.A. <i>KLLI</i>	PATENT DATE JAN 30 2000
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SECTOR	CLASS <i>3809</i>	SUBCLASS <i>3819</i>	ART UNIT <i>2711</i>	EXAMINER <i>MILLER</i> <i>BANGI</i>
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PREPARED AND APPROVED FOR ISSUE

ISSUING CLASSIFICATION

ORIGINAL	CROSS REFERENCE(S)			
SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)		
<i>219</i>	<i>348</i>	<i>7</i>	<i>12</i>	
ORIGINAL CLASSIFICATION	<i>455</i>	<i>5.1</i>		
<i>15/16</i>				
<i>7/173</i>				
<i>1/02</i>				
<i>1/1</i>				

☐ Continued on Issue Slip Inside File Jacket

TERMINAL DISCLAIMER	DRAWINGS			CLAIMS ALLOWED	
	Sheets Drwg. <i>3</i>	Figs. Drwg. <i>3</i>	Print Fig. <i>1</i>	Total Claims <i>17</i>	Print Claim for O.G. <i>1</i>
☐ a) The term of this patent subsequent to _____ (date) has been disclaimed.	_____ (Assistant Examiner) (Date)			NOTICE OF ALLOWANCE MAILED <i>9/29/00</i>	
☐ b) The term of this patent shall not extend beyond the expiration date of U.S. Patent No. _____.	JOHN W. MILLER ASSISTANT EXAMINER <i>[Signature]</i> (Primary Examiner) <i>9/25/00</i> (Date)			ISSUE FEE <i>Ch</i> Amount Due <i>\$ 605.00</i> Date Paid <i>11-13-00</i>	
☐ c) The terminal _____ months of this patent have been disclaimed.	<i>Angela White</i> (Legal Instruments Examiner) <i>10/6/00</i> (Date)			ISSUE BATCH NUMBER <i>299</i>	

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Form PTO-436A
(Rev. 10/97)

ISSUE FEE IN FILE

Formal Drawings (____ snts) set _____
(LABEL AREA)

(FACE)

PATENT APPLICATION



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INITIALS

CONTENTS

	Date received (Incl. C. of M.) or Date Mailed	Date received (Incl. C. of M.) or Date Mailed
1. Application _____ papers.		42. _____
2. <u>IDS w/Ref</u>	<u>6-30-98</u>	43. _____
3. <u>Petition to MK Special</u>	<u>2-18-99 sh</u>	44. _____
4. <u>Petition Granted</u>	<u>3-4-99 sh</u>	45. _____
5. <u>Rej. 3 mos.</u>	<u>4/5/99</u>	46. _____
6. <u>Amndt A</u>	<u>06-05-99</u>	47. _____
7. <u>FINAL Rejection 3ms</u>	<u>8/26/99</u>	48. _____
8. <u>Ex. Interview Summary</u>	<u>12/22/99</u>	49. _____
9. <u>Ext. of Time (1mo.)</u>	<u>12/29/99</u>	50. _____
10. <u>Amndt B w/Ref</u>	<u>12/30/99</u>	51. _____
11. <u>Assoc PA</u>	<u>12/22/99</u>	52. _____
12. <u>Advisory Action</u>	<u>1-31-00</u>	53. _____
13. <u>Req. for CPA</u>	<u>2/16/00</u>	54. _____
14. <u>Ext. of Time (2mos.)</u>	<u>2/22/00</u>	55. _____
15. <u>Rejection (3mos.)</u>	<u>5-10-00</u>	56. _____
16. <u>Response</u>	<u>9/18/00</u>	57. _____
17. <u>Allowance</u>	<u>9/29/00</u>	58. _____
18. <u>Final Office Action (3 mos)</u>	<u>11-24-00</u>	59. _____
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SEARCHED

Class	Sub.	Date	Exmr.
348	6 7 12 13	3/24/99	H.B.
455	3.1 4.2 5.1 6.1 6.3		
Hd4N	7/16 7/173		
709	217		
Above Search Updated 8/9/99			H.B.
709	219	4/25/00	H.B.
UPDATED ABOVE		9/00	JM

SEARCH NOTES
(INCLUDING SEARCH STRATEGY)

	Date	Exmr.
Vick Kostak class 455	3/24/99	H.B.
Chris Grant class 348	3/24/99	H.B.
Nate Flynn	4/25/00	H.B.

INTERFERENCE SEARCHED

Class	Sub.	Date	Exmr.
348	6, 7, 12, 13	9/00	JM
455	3.1, 4.2, 5.1, 6.1, 6.3		
709	217, 219		

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ISSUE SLIP STAPLE AREA (for additional cross references)

POSITION	INITIALS	ID NO.	DATE
FEE DETERMINATION	<i>PH</i>	<i>70911</i>	<i>3/11/88</i>
O.I.P.E. CLASSIFIER		<i>8</i>	<i>3-16-88</i>
FORMALITY REVIEW	<i>QB</i>	<i>82784</i>	<i>5-19-88</i>

INDEX OF CLAIMS

✓	 Rejected	N	 Non-elected
=	 Allowed	I	 Interference
-	(Through numeral) Canceled	A	 Appeal
÷	 Restricted	O	 Objected

Claim	Date			
Final	Original			
1	1	✓	3/24/88	
2	2	✓	8/14/89	
3	3	✓	5/5/89	
4	4	✓		
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US006182128B1

(12) **United States Patent**
Kelkar et al.

(10) **Patent No.: US 6,182,128 B1**
(45) **Date of Patent: Jan. 30, 2001**

(54) **REAL-TIME MUSIC DISTRIBUTION SYSTEMS**

(75) Inventors: **Anand Kelkar**, Calabasas; **Loren C. Johnson**, Los Angeles, both of CA (US)

(73) Assignee: **Touchmusic Entertainment LLC**, Los Angeles, CA (US)

(*) Notice: Under 35 U.S.C. 154(b), the term of this patent shall be extended for 0 days.

(21) Appl. No.: **09/035,194**

(22) Filed: **Mar. 5, 1998**

(51) Int. Cl.⁷ **G06F 15/16; H04N 7/173; H04H 1/02**

(52) U.S. Cl. **709/219; 348/7; 348/12; 455/5.1**

(58) Field of Search **348/6, 7, 12, 13; 455/3.1, 4.2, 5.1, 6.1, 6.3; 709/217, 219; H04N 7/16, 7/173**

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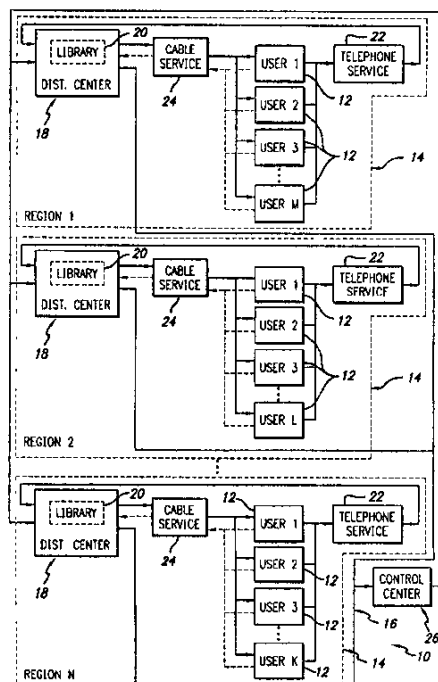
Primary Examiner—John W. Miller

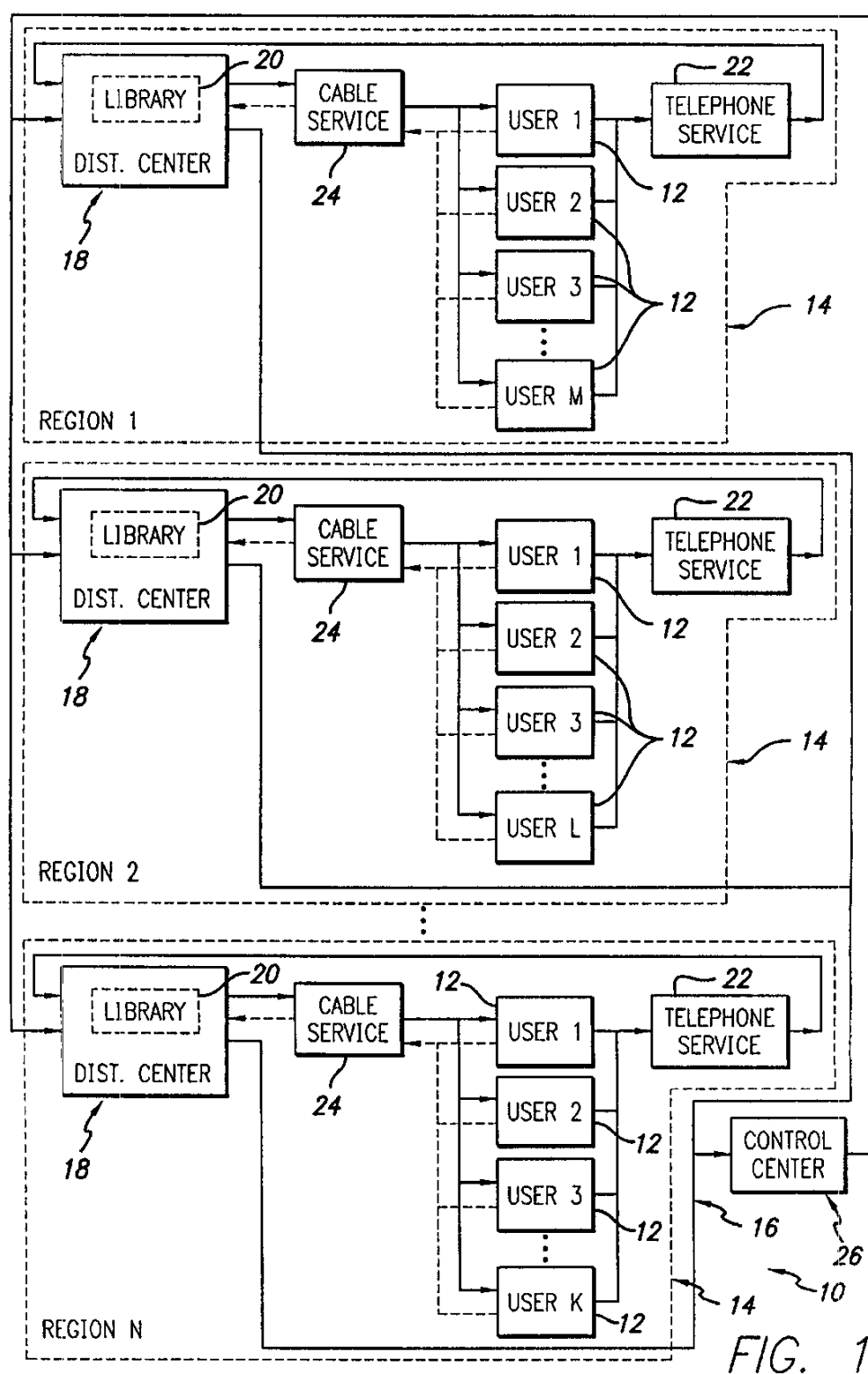
(74) Attorney, Agent, or Firm—Oppenheimer Wolff & Donnelly LLP

(57) **ABSTRACT**

A music distribution system is divided into a plurality of regional networks each including a plurality of users. Each of the regional networks includes a distribution center to which the users of that region are connected. Each distribution center is provided with a library in which is stored a plurality of music titles. A user sends a request to the distribution center via an existing telephone network or cable network. Upon receiving the user's request, the distribution center locates and retrieves the requested data file stored in the regional library, and then transmits the requested file to the user via the existing cable service. At the user's destination, electronic equipment such as a television or a stereo receiver system may provide an audio/visual output of the requested data track.

17 Claims, 3 Drawing Sheets





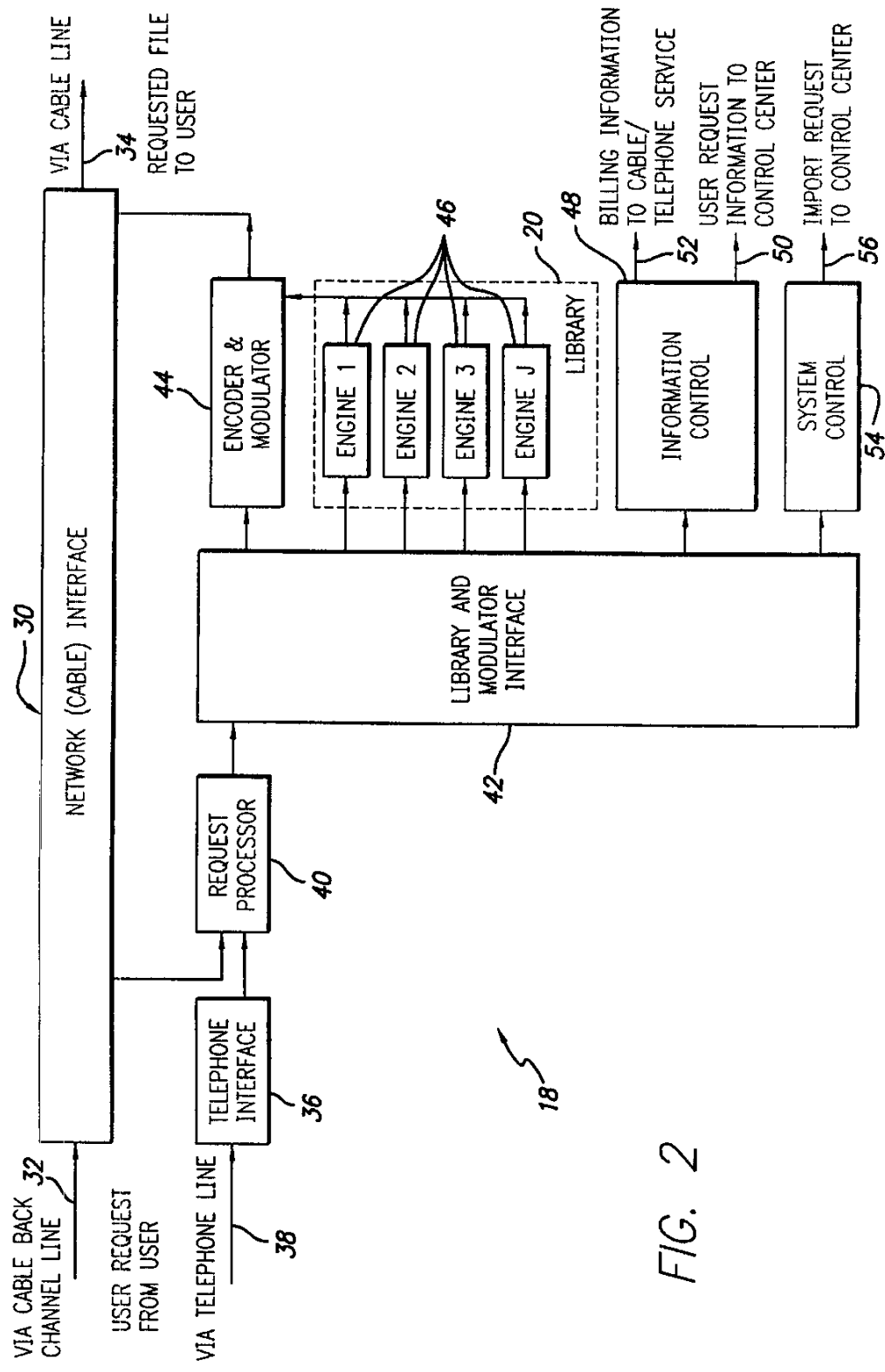
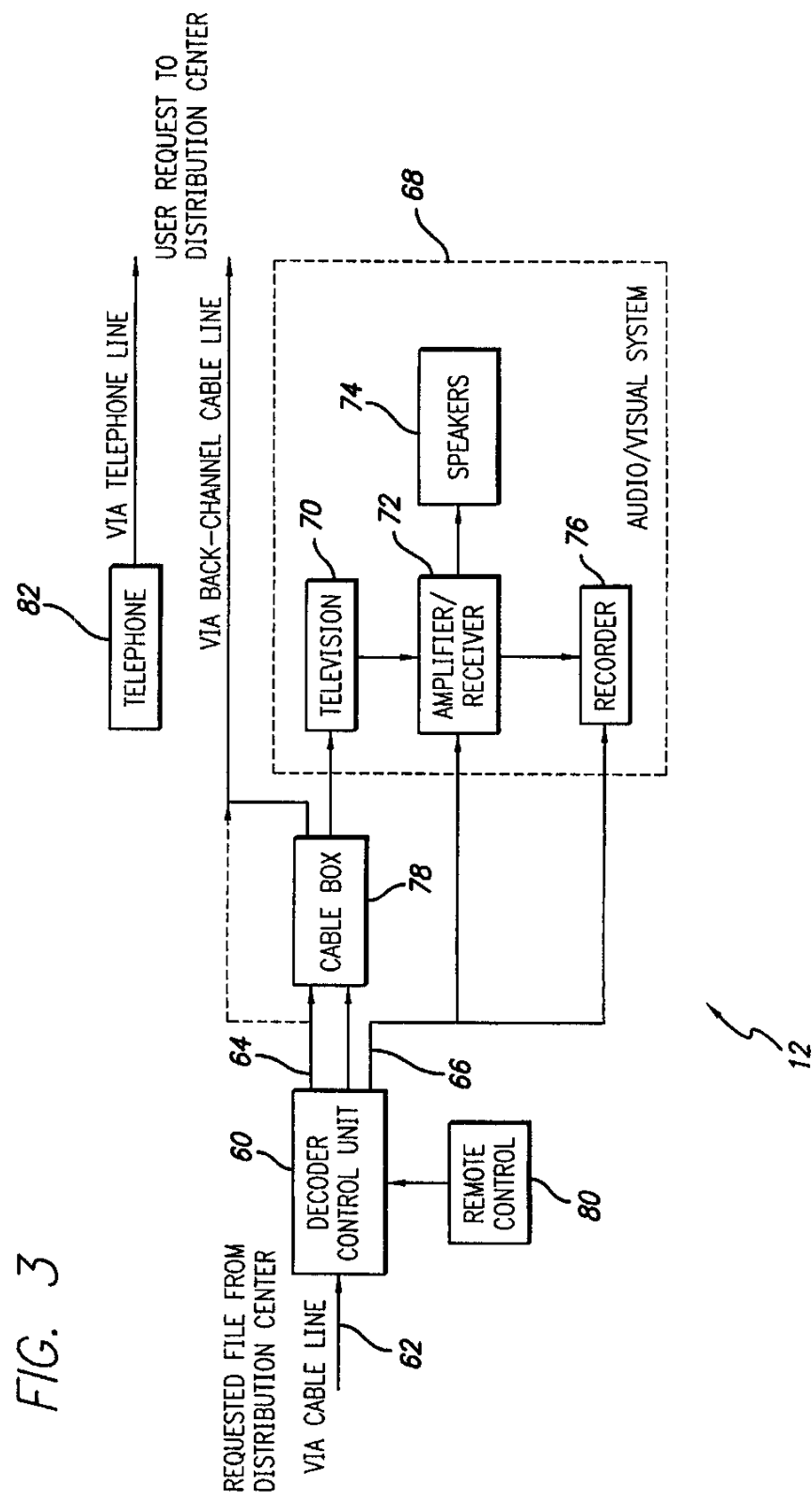


FIG. 2



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REAL-TIME MUSIC DISTRIBUTION SYSTEMS

FIELD OF THE INVENTION

The present invention relates to systems connected in a network, such as cable television and telephone systems. More particularly, the present invention relates to systems for distributing information, such as video-on-demand or pay-per-view systems. The invention also relates to methods and apparatus for distributing data files, such as music tracks, over existing telecommunication (e.g., cable, telephone, or satellite) networks to subscribers in response to user requests. The methods and apparatus of the present invention also record information on user requests to marketing purposes.

BACKGROUND OF THE INVENTION

Music is conventionally sold to consumers through either retail outlets or mail order houses. Retail outlets, such as department stores or specialty music stores, sell music directly to consumers on "tangible" media, including compact discs (CDs), magnetic cassette tapes, digital tapes, and vinyl record albums. Mail order houses send catalogs to subscribers who may then order music on the tangible media, which are then mailed to the subscribers through the postal service. A number of costs are involved in the retail sale of music. First of all, the tangible media must be packaged. The packaging typically includes theft-deterrent devices, and warehouses are needed to store the tangible media. Other costs associated with the retail sale of music include inventory control, retail floor space, commercial real estate, merchandise returns, and so on.

One approach at circumventing the conventional retail sale of music is through the Internet. The Internet approach requires the user to have a computer with a powerful processor, an added-on sound card, and a high-speed modem. In order to listen to a desired selection, the user needs to access a web page typically dedicated to a single artist. Because of the limited bandwidth of telephone lines, the user then needs to decide on a tradeoff: real-time listening or high-fidelity listening. If the user wants to listen to the selection in real time, then the computer will play back the selection as a monophonic and heavily filtered 8-bit translation of the original selection. If the user wants to listen to the selection in its original high-fidelity form, then the user needs to download the selection; after the downloading is complete, the user may listen to the selection by playing it back through a home stereo system. A number of disadvantages plague the Internet approach to listening to high-fidelity music in real time: it requires specialized hardware and software; it is inconvenient and complicated; and it is frustratingly slow.

The music industry is highly segmented into a multitude of categories or niches. One only needs to watch a music awards show to see all of the different categories of music. For example, commercial music may be divided into the following categories: classical, popular or "pop" music (often regarded as "Top 40"), country western, rock and roll, heavy metal, jazz, hip hop, rap, urban, adult contemporary, easy listening, new age, punk, soul, funk, Latin, folk, international. Each of these general categories may be further divided into sub-categories. For example, rock and roll is often considered to include heavy metal, punk, alternative, "classic" rock, and even rhythm and blues; classical may include opera, chamber, recital, symphonies, and choral. The classification of music is essentially endless.

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One of the advantages of dividing music into categories is that retailers can determine niche markets from the people who buy certain types of music. Typically speaking, heavy metal music is listened to by male teenagers; classical music is listened to by people belonging to an educated, professional, or high-income class; and rap and hip hop are heavily followed by urban youths and young adults. Knowing the demographics of a particular geographic region, retailers may focus on the type of music endemic for the region. In regard to the above example, a retail specialty music store located in an urban setting will carry a wide selection of rap and hip hop but will not carry (or only have a very limited selection) of country western music. Marketing experts have determined that a particular demographic group who listens to a certain type of music typically purchases similar other products en masse. A blatant example of this situation would be that classical music listeners are more likely to purchase a luxury automobile than a pickup truck or compact car and more likely to read *The New Yorker* than *Rolling Stone* magazine than heavy metal listeners.

In view of the foregoing, it is an object of the present invention to provide a distribution system which overcomes the disadvantages and drawbacks associated with conventional approaches of distributing music.

It is another object of the present invention to provide a distribution system which plays back music to subscribers in either real time or at a predetermined time in the future in high-fidelity bandwidth.

It is another object of the invention to provide a music distribution system which records information relevant to consumer behavior based on musical selections to be used for marketing and promotional purposes.

SUMMARY OF THE INVENTION

These and other objects are achieved by the apparatus of the present invention which provides a system for distributing data files. The system is divided into a plurality of regional networks each including a plurality of users. Each of the regional networks includes a distribution center to which the users of that region are connected. Each distribution center includes a library for storing a plurality of data files, such as music tracks.

If a user desires to listen to one or more music tracks stored in the library of a particular region, then the user may send a request to the distribution center via an existing telephone network or cable network. Upon receiving the user's request, the distribution center locates and retrieves the requested data file stored in the regional library, and then transmits the requested file to the user via, for example, the existing cable service. At the user's destination, electronic equipment such as a television and/or a stereo receiver system may provide an audio/visual output of the requested data track.

If the regional library to which a particular user is connected does not have a requested data file, then the distribution center routes the user request to a control center. The control center in turn determines whether the requested data file is located in the libraries in the other regional networks and, if so, retrieves and routes the requested file to the user.

The advantages of the distribution system of present invention are numerous. First of all, existing cable and telephone systems may be utilized, as well as existing home entertainment centers, thereby eliminating the need to install extensive hardware systems. Because of the relatively high

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bandwidth of existing cable systems, consumers may listen to music in full high fidelity and at real time. Consumers also have immediate access to a large library of music without having to leave their homes, thereby eliminating the need to travel to a retail outlet with a limited selection of music to purchase music, and the need to wait for the arrival of a mail order of music. In addition, record companies benefit as no warehousing facilities are required for storing packaged music awaiting shipping, and as no retail space is required to sell the music.

Other aspects, features, and advantages of the present invention will become apparent to those persons having ordinary skill in the art to which the present invention pertains from the following description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a system for distributing data files, such as digitized music tracks, in accordance with an exemplary embodiment of the present invention;

FIG. 2 is a schematic view of an exemplary embodiment of a distribution center of the distribution system of the invention; and

FIG. 3 is a schematic view of an exemplary embodiment of a user system of the distribution system of the present invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

Referring to the drawings, a system 10 for distributing data files in accordance with the present invention is illustrated in FIG. 1. Exemplary system 10 includes a plurality of users 12 connected into a plurality of regional networks 14 by communication media 16. Each of the regional networks 14 includes a distribution center 18 to which the users 12 of that region are connected. Each of the distribution centers 18 includes a library 20 which stores a plurality of data files, such as music tracks.

In accordance a preferred embodiment of the distribution system 10 of the present invention, if a user 12 desires to listen to one or more music tracks stored in the library 20 of a particular region, then the user 12 may send a request to the distribution center 18 via, for example, existing telephone service 22 or cable service 24 (which services may be included as components of the communication media 16). Upon receiving the user's request, the distribution center 18 locates and retrieves the requested data file (i.e., music track) stored in the regional library 20, and then transmits the requested file to the user 12 via, for example, the existing cable service 24. At the user's destination, electronic equipment such as a television or a stereo receiver system may provide an audio/visual output of the requested data track. If the regional library 20 to which a particular user 12 is connected does not have a requested data file, then the distribution center 18 routes the user request to a control center 26. The control center 26 in turn determines whether the requested data file is located in the libraries 20 in the other regional networks 14 and, if so, retrieves and routes the requested file to the user, which will be discussed in more detail below.

Exemplary distribution system 10 of the present invention is particularly useful in marketing goods and services according to regional demographics. In this regard, each of the regional networks 14 may be defined and connected to include users primarily from substantially the same demo-

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graphic group. For example, Region 1 define a rural agricultural area; Region 2 may define an urban setting, and Region N may define an area inhabited predominantly by a single ethnic minority. If the system 10 is configured to distribute music tracks, then the library 20 in each regional network 14 may store music appealing to the demographic group endemic to the respective region, because this music would be the most commonly requested music. To utilize the regional configuration of the system 10, each of the distribution centers 18 records information relevant to each of the user requests, including information on the particular user and on the requested data file. This recorded information may then be analyzed to determine trends in the requested music selections and, accordingly, to maximize statistically an ideal local regional music library. In addition, the record information may be used for marketing or promotional purposes by retailers.

An exemplary embodiment of the distribution center 18 is illustrated in FIG. 2. Exemplary distribution center 18 includes a network interface such as a cable interface 30 connected to a network, for example, the existing cable television system 24 shown in FIG. 1, with a plurality of subscribers or users 12. The cable interface 30 includes an input 32 connected to a back-channel line of the cable system 24 for receiving a user request, and an output 34 for transmitting a requested file in response to the user request. Although a cable network is used to illustrate an exemplary embodiment of the distribution system 10, because of the high bandwidth of coaxial cable, other high-bandwidth transmission media may be used, including optical fibers, satellites, microwaves, and so on.

Exemplary distribution center 18 may also include a telephone interface 36 connected to an existing telephone system 22. The telephone interface 36 includes an input 38 for receiving a user request. It is preferable for the distribution center 18 to include both the cable interface 30 and the telephone interface 36 for receiving user requests, because some cable systems do not provide a back-channel line, which is typically a narrow bandwidth built-in channel. If a back-channel line is not available, users may send user requests to the distribution center 18 via existing telephone lines.

Exemplary distribution center 18 includes a request processor 40 which is connected to interfaces 30 and 36 and which processes user requests received by the center 18. The user requests include information regarding the user address, requested data file, and so on. The request processor 40 analyzes this information and provides instructions to a distribution interface or, more specifically, a library and modulator interface 42. The library 20 and an encoder/modulator 44 are connected to an output of interface 42. The library and modulator interface 42 correlates the requested file or files of each user request with data files stored in the library 20.

As illustrated in FIG. 2, exemplary library 20 includes a plurality of engines 46. Each of the engines 46 is connected to the encoder/modulator 44 and includes storage for a plurality of data files and hardware for reading the data files. For example, if exemplary system 10 is configured to distribute music tracks, each engine 46 may include a plurality of compact discs (CDs) (with each track on the CD defined as a data file) and a compact disc player for reading the digitized musical tracks stored on the CDs. Alternatively, each engine 46 may include a disc drive for reading digital data files stored in memory. In a preferred embodiment of the invention, each library 20 includes about 1,000 of the engines 46 each capable of storing about 10 compact discs,

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each of which in turn may contain approximately 10 music tracks (i.e., data files). Accordingly, each of the distribution centers 18 is capable of providing users with over 100,000 data files from which to choose.

Upon receiving a user request, the request processor 40 5 determines whether the requested file is located in the library 20. If so, the request processor 40 sends an instruction to interface 42 to retrieve the requested file from the engine 46 at which it is stored, and then to deliver the retrieved requested file to the encoder/modulator 44. The request processor 40 also sends transmission information to the encoder/modulator 44 indicative of the user destination, e.g., the user address. The encoder/modulator 44 modulates and transmits the requested file to the user via the output 34 of the cable interface 30. The requested file may be modulated in accordance to procedures known in the art. For example, if the requested file is an analog file, then the encoder/modulator 44 may use frequency modulation (FM). If the requested file is a digital file, then the encoder/modulator 44 may use differential quadrature-amplitude modulation (QAM). 10 15 20

Information indicative of the requested file, the user, and so on, for each received request is provided to information control circuitry such as a processor 48 connected to interface 42. Processor 48 includes an output 50 which is connected to the control center 26 for providing such user request information to the control center 26. Circuitry 48 may also include an output 52 which is connected to the existing cable television service provider 24 and/or the existing telephone service provider 22, for providing billing information to these providers, which will be discussed in more detail below. 25 30

Referencing FIGS. 1 and 2, if the requested file is not located in the local library 20, then the request processor 40 sends import instructions to system control circuitry such as a processor 54 which has an output 56 connected to the control center 26. In response to the import instructions, the control center 26 searches the libraries 20 located in other regional networks 14 for the requested file. If the requested file is found, the control center 26 instructs the respective distribution center 18 to retrieve and transmit the requested file to the requesting user in accordance with the above description. In this regard, although there may be on the order of 100,000 data files located available to the users 12 in each regional network 14, through the use of the control center 26, users actually have available to them as many files as are located in all of the regional networks 14 combined. 35 40 45

An exemplary embodiment of the user 12 in accordance with the present invention is illustrated in FIG. 3. Exemplary user 12 is shown schematically as a system including a decoder and control unit 60. Exemplary control unit 60 includes an input 62 and a request output 64 connected to the existing cable service 24 (via cable box 78), and further includes a file output 66 connected to an audio/visual system 68. The audio/visual system 68 may include a television 70, a receiver and/or amplifier 72 connected to speakers 74, and a recording device 76 such as a cassette tape recorder. In certain cable services 24, an existing cable box 78 may be connected between the control unit 60 and the television 70, although the cable box 78 is optional in the present invention. Exemplary user system 12 may also include a remote control 80 for use with the control unit 60 and a telephone 82 connected to the existing telephone service 22, which will be discussed in more detail below. Each of the components of the audio/visual system 68, as well as the telephone 82, may be existing equipment to which the control unit 60 is connectable. 50 55 60 65

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To place a user request, the user activates the control unit 60 to display on the television 70 information related to data files available in any of the libraries 20 of the music distribution system 10. For example, in a music distribution system, the displayed information may include the name of the artist, the title, the producer, the record label, and so on. The user may browse the displayed information (e.g., by scrolling) and may then select one or more of the displayed data files (e.g., music tracks). Information relevant to the selected data files is included in a user request which is sent to the distribution center 18 from the request output 64 via the back-channel cable line. Additional information, such as the address of the user, is also included in each user request. If the back-channel cable line is not available, the user may place a user request on the telephone 82, entering information relevant to the selected data files on the numeric key pad. In a preferred embodiment of the distribution system 10, the existing cable service 24 allocates a dedicated channel which is used to control the equipment of the user systems 12 of each regional network 14. The dedicated channel may also carry information relevant to the titles available in the music distribution system 10.

As discussed above, the distribution center 18 sends the requested files to the user system 12. The decoder and control unit 60 receives and decodes the requested files, and then provides the decoded files to, for example, the stereo receiver 72 for an immediate audio playback on the speakers 74. Alternatively, the decoded files may be provided to the recorder 76 for recording for playback in the future. The decoded files may include both an audio and video signals, with the receiver 72 playing the audio portion and the television 70 playing the video portion (e.g., a music video). Because of the relatively high bandwidth of the existing cable system 24, the requested audio file may be played back in real time in full high-fidelity bandwidth.

The user requests generated by each of the user systems 12 may include information to customize the requests. For example, as discussed above, in a music-distribution implementation of the present invention, any number of selected music tracks in any desired playing order may be included in a user request. The request may indicate whether the play back should take place immediately or a predetermined time in the future. In addition, rather than requesting the music tracks to be played back at the user system 12 placing the request (e.g., User 2), the user request may include instructions for the distribution center 18 to send the requested files to another one of the user systems 12 (e.g., User 3) in any one of the other regional networks 14.

The advantages of the present invention are numerous. For example, existing cable and telephone systems may be utilized, as well as existing home entertainment centers. Consumers also have immediate access to a large library of files without having to leave their homes. This feature of the invention eliminates the need to travel to a retail outlet with a limited selection of music, or to wait for the arrival of a mail order of music. In addition, no warehouse is required for storing packaged music awaiting shipping, which also eliminates inventory control. Billing is essentially automatically accomplished as the distribution center 18 records all of the necessary information regarding each of the user requests.

As mentioned above, information relevant to each user request is recorded and processed by the information control processor 48 shown in FIG. 2. The recorded user-request information is indicative of each of the user's consumer behavior based on his or her musical tastes and may be used for marketing and promotional purposes accordingly. For

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example, advertising messages may be sent to the user systems 12 to be displayed on the television 70. In addition, the recorded information may contain data on the number of times each track is requested so that appropriate royalties may be paid to the artists. Furthermore, the recorded information may be used for billing purposes either directly or through the service provider, be it cable, satellite, telephone, optical fiber, or as appropriate.

Those skilled in the art will understand that the embodiments of the present invention described above exemplify the present invention and do not limit the scope of the invention to these specifically illustrated and described embodiments. The scope of the invention is determined by the terms of the appended claims and their legal equivalents, rather than by the described examples. In addition, the exemplary embodiments provide a foundation from which numerous alternatives and modifications may be made, which alternatives and modifications are also within the scope of the present invention as defined in the appended claims.

What is claimed is:

1. A system for distributing digital audio files in substantially real time to users connected to a plurality of satellite or cable TV networks, said system comprising:

- a) a plurality of private distribution centers, each including:
 - 1) a network interface including an input and an output for connecting to one of the satellite or cable TV networks;
 - 2) a library including a plurality of digital audio files;
 - 3) a library interface including an input and an output connected to said library; and
 - 4) a processor connected to said network interface and said library interface, said processor for:
 - (a) displaying to a user a menu of said audio files;
 - (b) receiving requests from a user for a plurality of said digital audio files and a user address;
 - (c) retrieving said requested digital audio files from said library via said library interface;
 - (d) sequentially transmitting said requested digital audio files in substantially real time to said user through one of the satellite or cable TV networks via said output of said network interface; and
 - (e) recording the digital audio files requested by said user and said user address in a data base; and
- b) a central controller connected to said network interface of each of said distribution centers for routing digital audio data files between said distribution centers.

2. A system for distributing data files to users connected in a plurality of independent networks, said system comprising:

- a) a plurality of distribution centers, each including:
 - 1) a network interface including an input and an output for connecting to a single one of the networks;
 - 2) a library including a plurality of data files;
 - 3) a library interface including an input and an output connected to said library; and
 - 4) a processor connected to said network interface and said library interface, said processor for:
 - (a) receiving a request from a user via said input of said network interface, said request including information on one or more data files and a user address;
 - (b) determining which of said requested data files are available in said library ("available requested data files"), and which of said requested data files are unavailable in said library ("unavailable requested

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data files") and for each of said available requested data files, retrieving said available requested data file from said library via said library interface; and for each of said unavailable requested data files, sending a file import request to a central controller requesting said unavailable requested data files and receiving said unavailable requested data files through said network interface;

- (c) transmitting said requested data files to said single one of the networks via said output of said network interface; and
- (d) recording request information indicative of said requested data file and said user address; and

b) a central controller directly connected to said network interface of each of said distribution centers for:

- 1) receiving file import requests from a requesting distribution center, said file import requests including information relating to requested data files;
- 2) searching the library within at least one other of said distribution centers to locate at least one requested data file of said requested data files; and
- 3) instructing said other distribution center to retrieve and transmit the requested data file that was located therein to said requesting distribution center.

3. A system as claimed in claim 2, wherein said network interface is a cable television interface.

4. A system as claimed in claim 2, wherein said data files include digitized music tracks.

5. A system as claimed in claim 2, wherein each of said libraries includes a plurality of compact discs (CDs).

6. A system as claimed in claim 2 further comprising a plurality of control units each having a user address and including:

- a user input for connecting to one of the networks;
- a user output for connecting to an output device; and
- decoding circuitry connected to said user input and output for receiving said requested data file via said user input and providing said requested data file to the output device via said user output.

7. A system as claimed in claim 5 wherein each of said output devices includes an audio/visual system.

8. A system as claimed in claim 7 wherein each of said control units includes a remote control for activating said control unit to display information relevant to said data files of said library.

9. A system as claimed in claim 6 further comprising a storage device for recording the requested data file.

10. A system as claimed in claim 6 further comprising a telephone for sending a request from the user.

11. A system as claimed in claim 2 further comprising a modulator connected to said library and said processor for modulating said requested data file.

12. A method for distributing music, comprising the steps of:

- providing the system of claim 2
- generating at a user system a user request including information on a requested data file and a user address;
- receiving said user request at said network interface;
- processing said information of said user request;
- retrieving said requested data file from said library; and
- transmitting said requested data file to said user system.

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13. A method as claimed in claim 12 further comprising the step of:
recording request information indicative of said requested data file and said user address.
14. A method as claimed in claim 13 further comprising a step of using the recorded request information for marketing statistics and billing information.
15. A method as claimed in claim 12 wherein the user requesting transmittal of the requested data file to another

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- user, and said transmitting step transmitting said requested data file to another user system.
16. A method as claimed in claim 12 wherein the user system having the control unit of claim 5, further comprising a step of recording the data file at a storage device of the control unit.
17. A system as claimed in claim 2 wherein said data files include digitized video files
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REAL-TIME MUSIC DISTRIBUTION SYSTEMS

ABSTRACT OF THE DISCLOSURE

A music distribution system is divided into a plurality of regional networks each including a plurality of users. Each of the regional networks includes a distribution center to which the users of that region are connected. Each distribution center is provided with a library in which is stored a plurality of music titles. A user sends a request to the distribution center via an existing telephone
5 network or cable network. Upon receiving the user's request, the distribution center locates and retrieves the requested data file stored in the regional library, and then transmits the requested file to the user via the existing cable service. At the user's destination, electronic equipment such as a television or a stereo receiver system may provide an audio/visual output of the requested data track.

REAL-TIME MUSIC DISTRIBUTION SYSTEMS

FIELD OF THE INVENTION

The present invention relates to systems connected in a network, such as cable television and telephone systems. More particularly, the present invention relates to systems for
5 distributing information, such as video-on-demand or pay-per-view systems. The invention also relates to methods and apparatus for distributing data files, such as music tracks, over existing telecommunication (e.g., cable, telephone, or satellite) networks to subscribers in response to user requests. The methods and apparatus of the present invention also record information on user requests to marketing purposes.

BACKGROUND OF THE INVENTION

Music is conventionally sold to consumers through either retail outlets or mail order houses. Retail outlets, such as department stores or specialty music stores, sell music directly to consumers on "tangible" media, including compact discs (CDs), magnetic cassette tapes, digital
10 tapes, and vinyl record albums. Mail order houses send catalogs to subscribers who may then order music on the tangible media, which are then mailed to the subscribers through the postal service. A number of costs are involved in the retail sale of music. First of all, the tangible media must be packaged. The packaging typically includes theft-deterrent devices, and warehouses are needed to store the tangible media. Other costs associated with the retail sale of music include inventory control, retail floor space, commercial real estate, merchandise returns,
15 and so on.

One approach at circumventing the conventional retail sale of music is through the Internet. The Internet approach requires the user to have a computer with a powerful processor, an added-on sound card, and a high-speed modem. In order to listen to a desired selection, the user needs to access a web page typically dedicated to a single artist. Because of the limited
20 bandwidth of telephone lines, the user then needs to decide on a tradeoff: real-time listening or high-fidelity listening. If the user wants to listen to the selection in real time, then the computer will play back the selection as a monophonic and heavily filtered 8-bit translation of the original selection. If the user wants to listen to the selection in its original high-fidelity form, then the

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user needs to download the selection; after the downloading is complete, the user may listen to the selection by playing it back through a home stereo system. A number of disadvantages plague the Internet approach to listening to high-fidelity music in real time: it requires specialized hardware and software; it is inconvenient and complicated; and it is frustratingly
5 slow.

The music industry is highly segmented into a multitude of categories or niches. One only needs to watch a music awards show to see all of the different categories of music. For example, commercial music may be divided into the following categories: classical, popular or “pop” music (often regarded as “Top 40”), country western, rock and roll, heavy metal, jazz, hip
10 hop, rap, urban, adult contemporary, easy listening, new age, punk, soul, funk, Latin, folk, international. Each of these general categories may be further divided into sub-categories. For example, rock and roll is often considered to include heavy metal, punk, alternative, “classic” rock, and even rhythm and blues; classical may include opera, chamber, recital, symphonies, and choral. The classification of music is essentially endless.

One of the advantages of dividing music into categories is that retailers can determine niche markets from the people who buy certain types of music. Typically speaking, heavy metal music is listened to by male teenagers; classical music is listened to by people belonging to an educated, professional, or high-income class; and rap and hip hop are heavily followed by urban youths and young adults. Knowing the demographics of a particular geographic region, retailers
15 may focus on the type of music endemic for the region. In regard to the above example, a retail specialty music store located in an urban setting will carry a wide selection of rap and hip hop but will not carry (or only have a very limited selection) of country western music. Marketing experts have determined that a particular demographic group who listens to a certain type of music typically purchases similar other products en masse. A blatant example of this situation
20 would be that classical music listeners are more likely to purchase a luxury automobile than a pickup truck or compact car and more likely to read *The New Yorker* than *Rolling Stone* magazine than heavy metal listeners.

In view of the foregoing, it is an object of the present invention to provide a distribution system which overcomes the disadvantages and drawbacks associated with conventional
25 approaches of distributing music.

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It is another object of the present invention to provide a distribution system which plays back music to subscribers in either real time or at a predetermined time in the future in high-fidelity bandwidth.

It is another object of the invention to provide a music distribution system which records
5 information relevant to consumer behavior based on musical selections to be used for marketing and promotional purposes.

SUMMARY OF THE INVENTION

These and other objects are achieved by the apparatus of the present invention which provides a system for distributing data files. The system is divided into a plurality of regional
10 networks each including a plurality of users. Each of the regional networks includes a distribution center to which the users of that region are connected. Each distribution center includes a library for storing a plurality of data files, such as music tracks.

If a user desires to listen to one or more music tracks stored in the library of a particular region, then the user may send a request to the distribution center via an existing telephone network or cable network. Upon receiving the user's request, the distribution center locates and retrieves the
15 requested data file stored in the regional library, and then transmits the requested file to the user via, for example, the existing cable service. At the user's destination, electronic equipment such as a television and/or a stereo receiver system may provide an audio/visual output of the requested data track.

If the regional library to which a particular user is connected does not have a requested data
20 file, then the distribution center routes the user request to a control center. The control center in turn determines whether the requested data file is located in the libraries in the other regional networks and, if so, retrieves and routes the requested file to the user.

The advantages of the distribution system of present invention are numerous. First of all,
25 existing cable and telephone systems may be utilized, as well as existing home entertainment centers, thereby eliminating the need to install extensive hardware systems. Because of the relatively high bandwidth of existing cable systems, consumers may listen to music in full high fidelity and at real time. Consumers also have immediate access to a large library of music without having to leave their homes, thereby eliminating the need to travel to a retail outlet with a limited

selection of music to purchase music, and the need to wait for the arrival of a mail order of music. In addition, record companies benefit as no warehousing facilities are required for storing packaged music awaiting shipping, and as no retail space is required to sell the music.

Other aspects, features, and advantages of the present invention will become apparent to those persons having ordinary skill in the art to which the present invention pertains from the following description taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a system for distributing data files, such as digitized music tracks, in accordance with an exemplary embodiment of the present invention;

FIG. 2 is a schematic view of an exemplary embodiment of a distribution center of the distribution system of the invention; and

FIG. 3 is a schematic view of an exemplary embodiment of a user system of the distribution system of the present invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

Referring to the drawings, a system 10 for distributing data files in accordance with the present invention is illustrated in FIG. 1. Exemplary system 10 includes a plurality of users 12 connected into a plurality of regional networks 14 by communication media 16. Each of the regional networks 14 includes a distribution center 18 to which the users 12 of that region are connected. Each of the distribution centers 18 includes a library 20 which stores a plurality of data files, such as music tracks.

In accordance a preferred embodiment of the distribution system 10 of the present invention, if a user 12 desires to listen to one or more music tracks stored in the library 20 of a particular region, then the user 12 may send a request to the distribution center 18 via, for example, existing telephone service 22 or cable service 24 (which services may be included as components of the communication media 16). Upon receiving the user's request, the distribution center 18 locates and retrieves the requested data file (i.e., music track) stored in the regional library 20, and then transmits the requested file to the user 12 via, for example, the existing cable service 24. At the user's destination, electronic equipment such as a television or a stereo receiver system may

provide an audio/visual output of the requested data track. If the regional library 20 to which a particular user 12 is connected does not have a requested data file, then the distribution center 18 routes the user request to a control center 26. The control center 26 in turn determines whether the requested data file is located in the libraries 20 in the other regional networks 14 and, if so, retrieves and routes the requested file to the user, which will be discussed in more detail below.

Exemplary distribution system 10 of the present invention is particularly useful in marketing goods and services according to regional demographics. In this regard, each of the regional networks 14 may be defined and connected to include users primarily from substantially the same demographic group. For example, Region 1 define a rural agricultural area; Region 2 may define an urban setting; and Region N may define an area inhabited predominantly by a single ethnic minority. If the system 10 is configured to distribute music tracks, then the library 20 in each regional network 14 may store music appealing to the demographic group endemic to the respective region, because this music would be the most commonly requested music. To utilize the regional configuration of the system 10, each of the distribution centers 18 records information relevant to each of the user requests, including information on the particular user and on the requested data file. This recorded information may then be analyzed to determine trends in the requested music selections and, accordingly, to maximize statistically an ideal local regional music library. In addition, the record information may be used for marketing or promotional purposes by retailers.

An exemplary embodiment of the distribution center 18 is illustrated in FIG. 2. Exemplary distribution center 18 includes a network interface such as a cable interface 30 connected to a network, for example, the existing cable television system 24 shown in FIG. 1, with a plurality of subscribers or users 12. The cable interface 30 includes an input 32 connected to a back-channel line of the cable system 24 for receiving a user request, and an output 34 for transmitting a requested file in response to the user request. Although a cable network is used to illustrate an exemplary embodiment of the distribution system 10 because of the high bandwidth of coaxial cable, other high-bandwidth transmission media may be used, including optical fibers, satellites, microwaves, and so on.

Exemplary distribution center 18 may also include a telephone interface 36 connected to an existing telephone system 22. The telephone interface 36 includes an input 38 for receiving a user

request. It is preferable for the distribution center 18 to include both the cable interface 30 and the telephone interface 36 for receiving user requests, because some cable systems do not provide a back-channel line, which is typically a narrow bandwidth built-in channel. If a back-channel line is not available, users may send user requests to the distribution center 18 via existing telephone lines.

5 Exemplary distribution center 18 includes a request processor 40 which is connected to interfaces 30 and 36 and which processes user requests received by the center 18. The user requests include information regarding the user address, requested data file, and so on. The request processor 40 analyzes this information and provides instructions to a distribution interface or, more specifically, a library and modulator interface 42. The library 20 and an encoder/modulator 44 are
10 connected to an output of interface 42. The library and modulator interface 42 correlates the requested file or files of each user request with data files stored in the library 20.

As illustrated in FIG. 2, exemplary library 20 includes a plurality of engines 46. Each of the engines 46 is connected to the encoder/modulator 44 and includes storage for a plurality of data files and hardware for reading the data files. For example, if exemplary system 10 is configured to
15 distribute music tracks, each engine 46 may include a plurality of compact discs (CDs) (with each track on the CD defined as a data file) and a compact disc player for reading the digitized musical tracks stored on the CDs. Alternatively, each engine 46 may include a disc drive for reading digital data files stored in memory. In a preferred embodiment of the invention, each library 20 includes about 1,000 of the engines 46 each capable of storing about 10 compact discs, each of which in turn
20 may contain approximately 10 music tracks (i.e., data files). Accordingly, each of the distribution centers 18 is capable of providing users with over 100,000 data files from which to choose.

Upon receiving a user request, the request processor 40 determines whether the requested file is located in the library 20. If so, the request processor 40 sends an instruction to interface 42 to retrieve the requested file from the engine 46 at which it is stored, and then to deliver the retrieved
25 requested file to the encoder/modulator 44. The request processor 40 also sends transmission information to the encoder/modulator 44 indicative of the user destination, e.g., the user address. The encoder/modulator 44 modulates and transmits the requested file to the user via the output 34 of the cable interface 30. The requested file may be modulated in accordance to procedures known in the art. For example, if the requested file is an analog file, then the encoder/modulator 44 may
30 use frequency modulation (FM). If the requested file is a digital file, then the encoder/modulator 44

may use differential quadrature-amplitude modulation (QAM).

Information indicative of the requested file, the user, and so on, for each received request is provided to information control circuitry such as a processor 48 connected to interface 42.

Processor 48 includes an output 50 which is connected to the control center 26 for providing such user request information to the control center 26. Circuitry 48 may also include an output 52 which is connected to the existing cable television service provider 24 and/or the existing telephone service provider 22, for providing billing information to these providers, which will be discussed in more detail below.

Referencing FIGS. 1 and 2, if the requested file is not located in the local library 20, then the request processor 40 sends import instructions to system control circuitry such as a processor 54 which has an output 56 connected to the control center 26. In response to the import instructions, the control center 26 searches the libraries 20 located in other regional networks 14 for the requested file. If the requested file is found, the control center 26 instructs the respective distribution center 18 to retrieve and transmit the requested file to the requesting user in accordance with the above description. In this regard, although there may be on the order of 100,000 data files located available to the users 12 in each regional network 14, through the use of the control center 26, users actually have available to them as many files as are located in all of the regional networks 14 combined.

An exemplary embodiment of the user 12 in accordance with the present invention is illustrated in FIG. 3. Exemplary user 12 is shown schematically as a system including a decoder and control unit 60. Exemplary control unit 60 includes an input 62 and a request output 64 connected to the existing cable service 24 (via cable box 78), and further includes a file output 66 connected to an audio/visual system 68. The audio/visual system 68 may include a television 70, a receiver and/or amplifier 72 connected to speakers 74, and a recording device 76 such as a cassette tape recorder. In certain cable services 24, an existing cable box 78 may be connected between the control unit 60 and the television 70, although the cable box 78 is optional in the present invention. Exemplary user system 12 may also include a remote control 80 for use with the control unit 60 and a telephone 82 connected to the existing telephone service 22, which will be discussed in more detail below. Each of the components of the audio/visual system 68, as well as the telephone 82, may be existing equipment to which the control unit 60 is connectable.

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To place a user request, the user activates the control unit 60 to display on the television 70 information related to data files available in any of the libraries 20 of the music distribution system 10. For example, in a music distribution system, the displayed information may include the name of the artist, the title, the producer, the record label, and so on. The user may browse the displayed information (e.g., by scrolling) and may then select one or more of the displayed data files (e.g., music tracks). Information relevant to the selected data files is included in a user request which is sent to the distribution center 18 from the request output 64 via the back-channel cable line. Additional information, such as the address of the user, is also included in each user request. If the back-channel cable line is not available, the user may place a user request on the telephone 82, entering information relevant to the selected data files on the numeric key pad. In a preferred embodiment of the distribution system 10, the existing cable service 24 allocates a dedicated channel which is used to control the equipment of the user systems 12 of each regional network 14. The dedicated channel may also carry information relevant to the titles available in the music distribution system 10.

As discussed above, the distribution center 18 sends the requested files to the user system 12. The decoder and control unit 60 receives and decodes the requested files, and then provides the decoded files to, for example, the stereo receiver 72 for an immediate audio playback on the speakers 74. Alternatively, the decoded files may be provided to the recorder 76 for recording for playback in the future. The decoded files may include both an audio and video signals, with the receiver 72 playing the audio portion and the television 70 playing the video portion (e.g., a music video). Because of the relatively high bandwidth of the existing cable system 24, the requested audio file may be played back in real time in full high-fidelity bandwidth.

The user requests generated by each of the user systems 12 may include information to customize the requests. For example, as discussed above, in a music-distribution implementation of the present invention, any number of selected music tracks in any desired playing order may be included in a user request. The request may indicate whether the play back should take place immediately or a predetermined time in the future. In addition, rather than requesting the music tracks to be played back at the user system 12 placing the request (e.g., User 2), the user request may include instructions for the distribution center 18 to send the requested files to another one of the user systems 12 (e.g., User 3) in any one of the other regional networks 14.

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The advantages of the present invention are numerous. For example, existing cable and telephone systems may be utilized, as well as existing home entertainment centers. Consumers also have immediate access to a large library of files without having to leave their homes. This feature of the invention eliminates the need to travel to a retail outlet with a limited selection of music, or to wait for the arrival of a mail order of music. In addition, no warehouse is required for storing packaged music awaiting shipping, which also eliminate inventory control. Billing is essentially automatically accomplished as the distribution center 18 records all of the necessary information regarding each of the user requests.

As mentioned above, information relevant to each user request is recorded and processed by the information control processor 48 shown in FIG. 2. The recorded user-request information is indicative of each of the user's consumer behavior based on his or her musical tastes and may be used for marketing and promotional purposes accordingly. For example, advertising messages may be sent to the user systems 12 to be displayed on the television 70. In addition, the recorded information may contain data on the number of times each track is requested so that appropriate royalties may be paid to the artists. Furthermore, the recorded information may be used for billing purposes either directly or through the service provider, be it cable, satellite, telephone, optical fiber, or as appropriate.

Those skilled in the art will understand that the embodiments of the present invention described above exemplify the present invention and do not limit the scope of the invention to these specifically illustrated and described embodiments. The scope of the invention is determined by the terms of the appended claims and their legal equivalents, rather than by the described examples. In addition, the exemplary embodiments provide a foundation from which numerous alternatives and modifications may be made, which alternatives and modifications are also within the scope of the present invention as defined in the appended claims.

CLAIMS

What is claimed is:

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- 1 1. A system for distributing data files to users connected in a plurality of ^{*independent*} networks, said
2 system comprising:
3 a) a plurality of distribution centers each including:
4 1) a network interface including an input and an output for connecting to ^{*a single*} one of the
5 networks;
6 2) a library including a plurality of data files;
7 3) a library interface including an input and an output connected to said library; and
8 ~~4~~ b) a processor connected to said network interface and said library interface, said
9 processor for:
10 (a) receiving a request from a user via said input of said network interface, said
11 request including information on a requested data file and a user address;
12 (b) retrieving said requested data file from said library via said library interface;
13 (c) transmitting said requested data file to ^{*single*} said one of the networks via said
14 output of said network interface; and
15 (d) recording request information indicative of said requested data file and said
16 user address; and
17 ^{*directly*} b) a central controller ^{*network*} connected to said ~~distribution~~ interface of each of said distribution
18 centers for routing information between said distribution centers.

1 3 ~~2~~ A system as claimed in claim ^{*2*} 1, wherein said network interface is a cable television
2 interface.

1 4 ~~3~~ A system as claimed in claim ^{*2*} 1, wherein said data files include digitized music tracks.

1 5 ~~4~~ A system as claimed in claim ^{*2*} 1, wherein each of said libraries includes a plurality of
2 compact discs (CDs).

1 ⁶ 8. A system as claimed in claim ² further comprising a plurality of control units each
2 having a user address and including:
3 a user input for connecting to one of the networks;
a 4 a user output for connecting to an output device; ^u and
5 decoding circuitry connected to said user input and output for receiving said requested
6 data file via said user input and providing said requested data file to the output device via said
7 user output.

a 1 ¹ 9. A system as claimed in claim ⁵ wherein each of said output devices includes an
2 audio/visual system.

1 ⁸ 10. A system as claimed in claim ¹ wherein each of said control units includes a remote
2 control for activating said control unit to display information relevant to said data files of said
3 library.

1 ¹¹ 11. A system as claimed in claim ¹ further comprising a modulator connected to said
2 library and said processor for modulating said requested data file.

1 ¹² 12. A method for distributing music, comprising the steps of:
2 providing the system of claim ¹
3 generating at a user system a user request including information on a requested data file
4 and a user address;
5 receiving said user request at said network interface;
6 processing said information of said user request;
7 retrieving said requested data file from said library; and
8 transmitting said requested data to file to said user system.

1 ¹³ 13. A method as claimed in claim ¹² further comprising the step of:
2 recording request information indicative of said requested data file and said user address.

Add
a1

COMBINED DECLARATION, POWER OF ATTORNEY AND PETITION

As a below named inventor, I hereby declare that:

This declaration is of the following type:

- ☒ original
- ☐ design
- ☐ supplemental
- ☐ national stage of PCT
- ☐ divisional
- ☐ continuation
- ☐ continuation-in-part

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled REAL-TIME MUSIC DISTRIBUTION SYSTEMS, the specification of which:

- (a) ☒ is attached hereto
- (b) ☐ was filed on _____ as Application Serial No. _____ and was amended on _____ (if applicable).
- (c) ☐ was described and claimed in PCT International Application No. _____, filed on _____ and as amended under PCT Article 19 on _____ (if any).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, § 1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, § 119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application of which priority is claimed.

- (d) ☐ no such applications have been filed
- (e) ☐ such application have been filed as follows:

Prior Foreign Application(s)

Country (or indicate if PCT)	Application Number	Date of Filing (day, month, year)	Priority Claims Under 37 USC 119
			☐ Yes ☐ No
			☐ Yes ☐ No

I hereby claim the benefit under Title 35, United States Code, § 120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, § 112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, § 1.56(a), regarding events which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

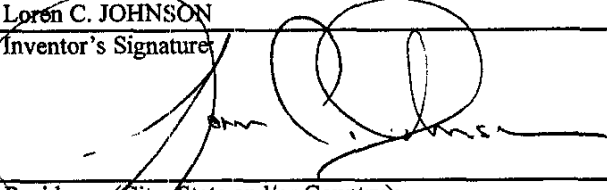
Application Serial No.	Filing Date	Status-patented, pending, abandoned

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 with 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 and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

I hereby appoint the following attorneys and/or agents to prosecute this application and transact all business in the Patent and Trademark Office connected therewith:
W. POMS, Reg. 18,782; G.P. SMITH, Reg. 20,142; G.E. LANDE, Reg. 22,222; A.C. ROSE, Reg. 17,047; L.J. BOVASSO, Reg. 24,075; D.J. OLDENKAMP, Reg. 29,421; C. DARROW, Reg. 30,166; M.E. HARRIS, Reg. 26,690; K.A. MACLEAN, Reg. 31,118; C. ROSENBERG, Reg. 31,464; M.E. BROWN, Reg. 28,590; E.F. O'CONNOR, Reg. 25,903; J.A. HENRICKS, Reg. 31,168; R.L. GAUSEWITZ, Reg. 16,960; M.A. KONDZELLA, Reg. 18,013; A.P. BLOCK, Reg. 35,450; S.R. HANSEN, Reg. 38,486; D. LARSON, Reg. 29,401; J. INSKEEP, Reg. 33,910; C.A. SLAVIN, Reg. 35,362; P.L. HOLMES, Reg. 37,353; J.D. VOELZKE, Reg. 37,957; and E.K. SATERMO, Reg. 40,159, whose address is OPPENHEIMER WOLFF & DONNELLY LLP, 2029 Century Park East, 38th Floor, Los Angeles, California 90067-3024, Telephone (310) 788-5000.

Please send all correspondence to:
OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Floor
Los Angeles, California 90067-3024
Attn: LOUIS J. BOVASSO
Tel: (310) 788-5000

Wherefore I pray that Letters Patent be granted to me for the invention or discovery described and claimed in the foregoing specification and claims, and I hereby subscribe my name to the foregoing specification and claims, declaration, power of attorney, and this petition.

Full Name of Sole or First Inventor: Anand KELKAR	
Inventor's Signature: 	Date Signed: Feb 27, 1998
Residence (City, State and/or Country): Calabasas, California	Citizenship: U.S.A.
Post Office Address(Street, City, State, Zip Code, Country): 5487 Ruthwood, Calabasas, California 91302	
Full Name of Second Inventor: Loren C. JOHNSON	
Inventor's Signature: 	Date Signed: 2/27/98
Residence (City, State and/or Country): Los Angeles, California	Citizenship: U.S.A.
Post Office Address(Street, City, State, Zip Code, Country): 2737 Outpost Drive, Los Angeles, California 90068	

**VERIFIED STATEMENT (DECLARATION) CLAIMING SMALL ENTITY
STATUS [37 C.F.R. §§ 1.9(f) and 1.27(b)] — SMALL BUSINESS CONCERN**

I hereby declare that I am

- ☐ the owner of the small business concern identified below:
☒ an official of the small business concern empowered to act on behalf of the concern identified below:

Name of Small Business Concern: Touchmusic Entertainment, LLC c/o Diamond and Wilson
 Address of Small Business Concern: 12304 Santa Monica Blvd, 3rd Floor, California 90025
Los Angeles

I hereby declare that the above identified small business concern qualifies as a small business concern, as defined in 37 C.F.R. § 121.12 and reproduced in 37 CFR 1.9(d) for purposes of paying reduced fees under Section 41(a) and (b) of Title 35, United States Code, in that the number of employees of the concern, including those of its affiliates, does not exceed 500 person. For purposes of this statement, (1) the number of employees of the business concern is the average over the previous fiscal year of the concern of the person employed on a full-time, part-time or temporary basis during each of the pay periods of the fiscal year, and (2) concerns are affiliates of each other when either, directly or indirectly, one concern controls or has the power to control the other, or a third-party or parties controls or has the power to control both.

I hereby declare that rights under contract or law have been conveyed to, and remain with, the small business concern identified above, with regard to the invention described in REAL-TIME MUSIC DISTRIBUTION SYSTEMS, the specification of which is filed herewith.

If the rights held by the above identified small business concern are not exclusive, each individual, concern or organization having right in the invention is listed below and no rights to the invention are held by any person, other than the inventor, who would not qualify as an independent inventor under 37 CFR 1.9(c), if that person made the invention, or by any concern which would not qualify as a small business concern under 37 CFR 1.9(d) or a nonprofit organization under 37 C.F.R. § 1.9(e).

Each person, concern or organization having any rights in the invention is listed below:

- ☒ no such person, concern or organization
☐ persons, concerns or organizations listed below*

FULL NAME _____

ADDRESS _____

☐ INDIVIDUAL ☐ SMALL BUSINESS CONCERN ☐ NON-PROFIT ORGANIZATION

I acknowledge the duty to file, in this application or patent, notification of any change in status resulting in loss of entitlement to small entity status prior to paying, or at the time of paying, the earliest of the issue fee or any maintenance fee due after the date on which status as a small entity is no longer appropriate. (37 C.F.R. § 1.28(b))

I hereby declare that all statements made herein of my own knowledge are true and that all statement made on information and belief are believed to be true; and further that these statements were made with 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, and that such willful false statements may jeopardize the validity of the application, any patent issuing thereon, or any patent to which this verified statement is directed.

Name of Person Signing LOREN C. JOHNSON

Title of Person if Other Than Owner _____

Address of Person Signing 2737 OUTPOST DR., LOS ANGELES, CA 90068

Dated: 2/27/98

Signature

Assignment Document

While copying your file we noticed that the Application Transmittal letter states that an assignment document was originally filed with this case.

At your request, we will attempt to obtain the assignment documents from the assignment branch located within the USPTO. Please note that additional charges will apply to this service.

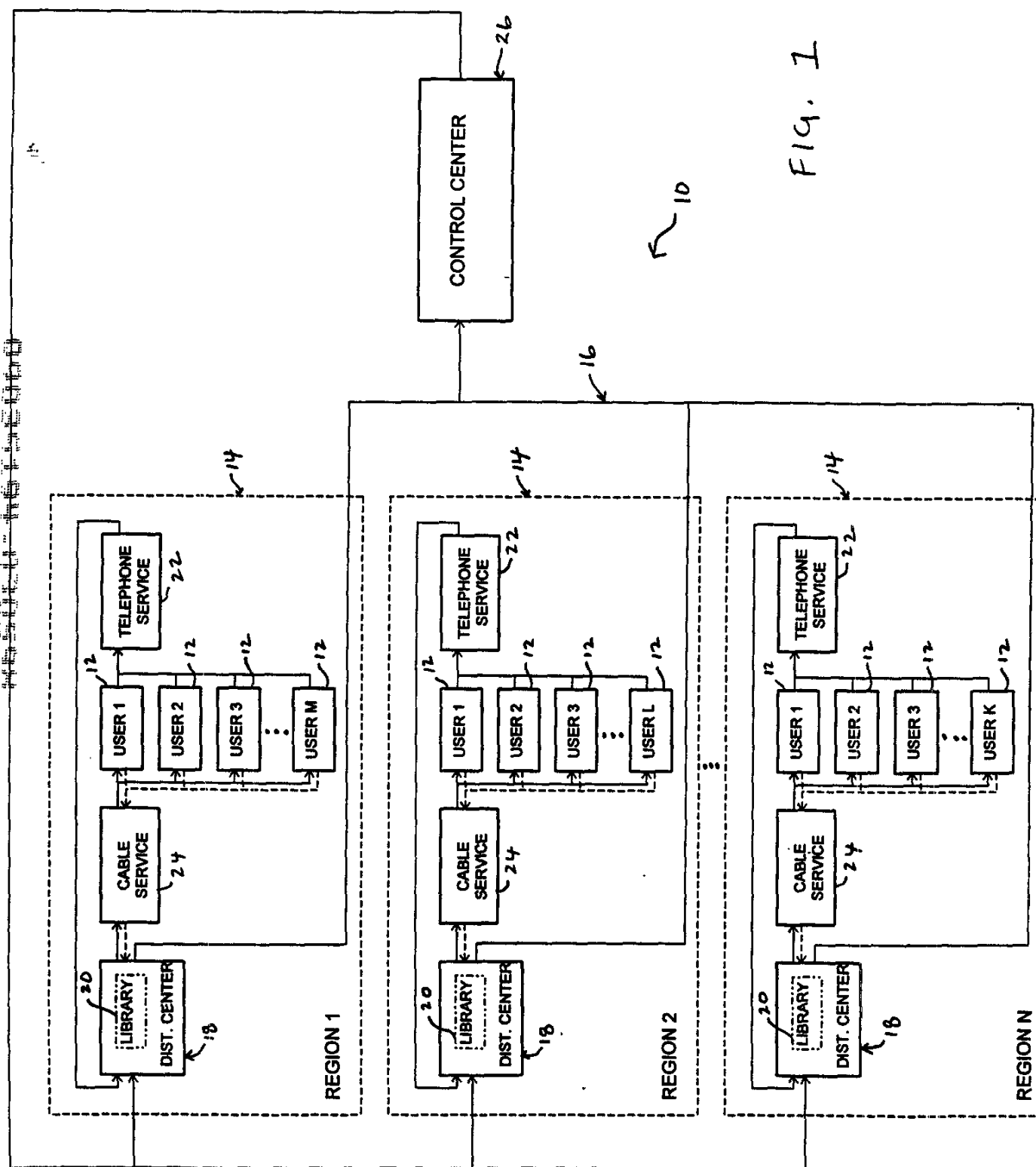


FIG. 2

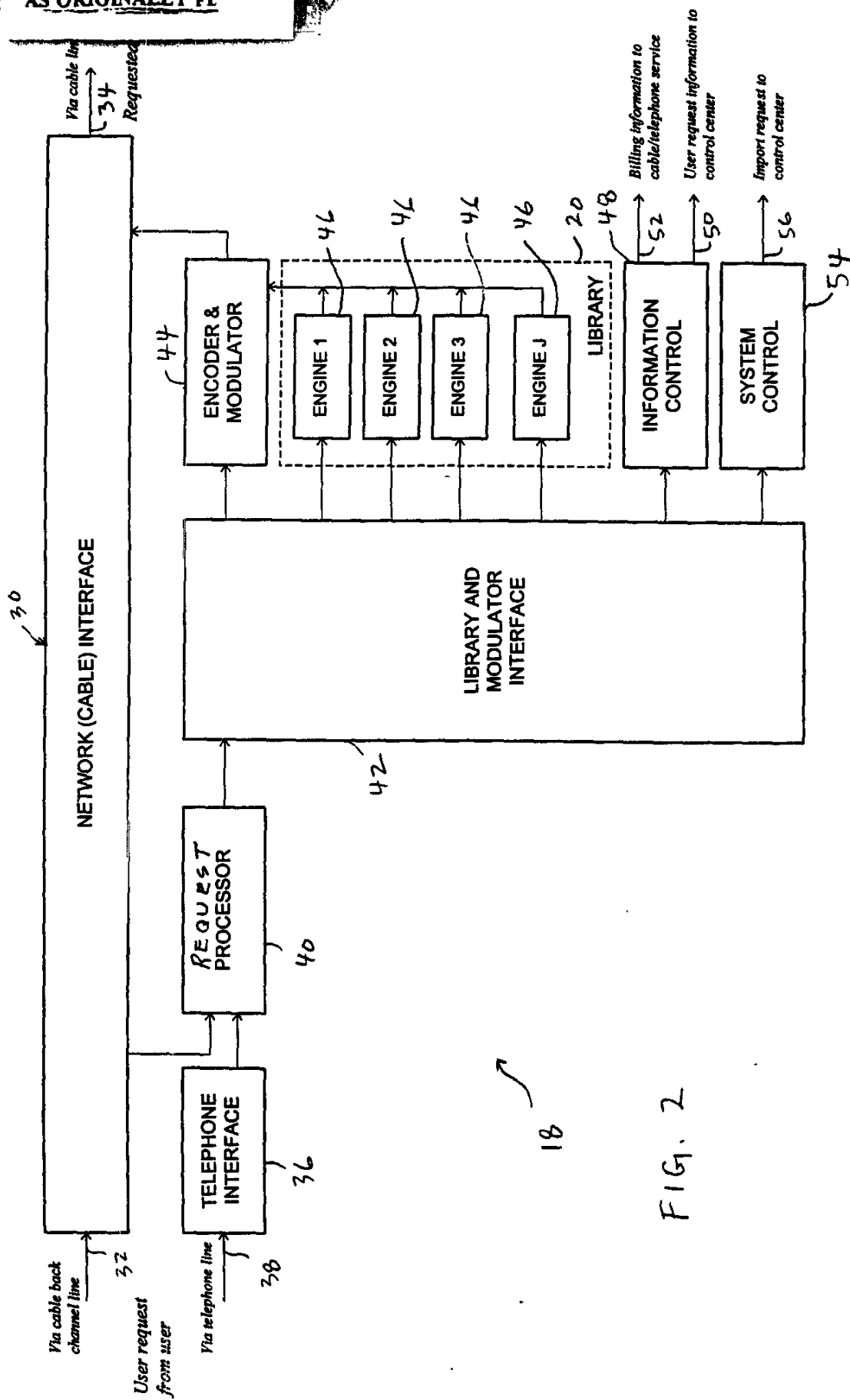


FIG. 2

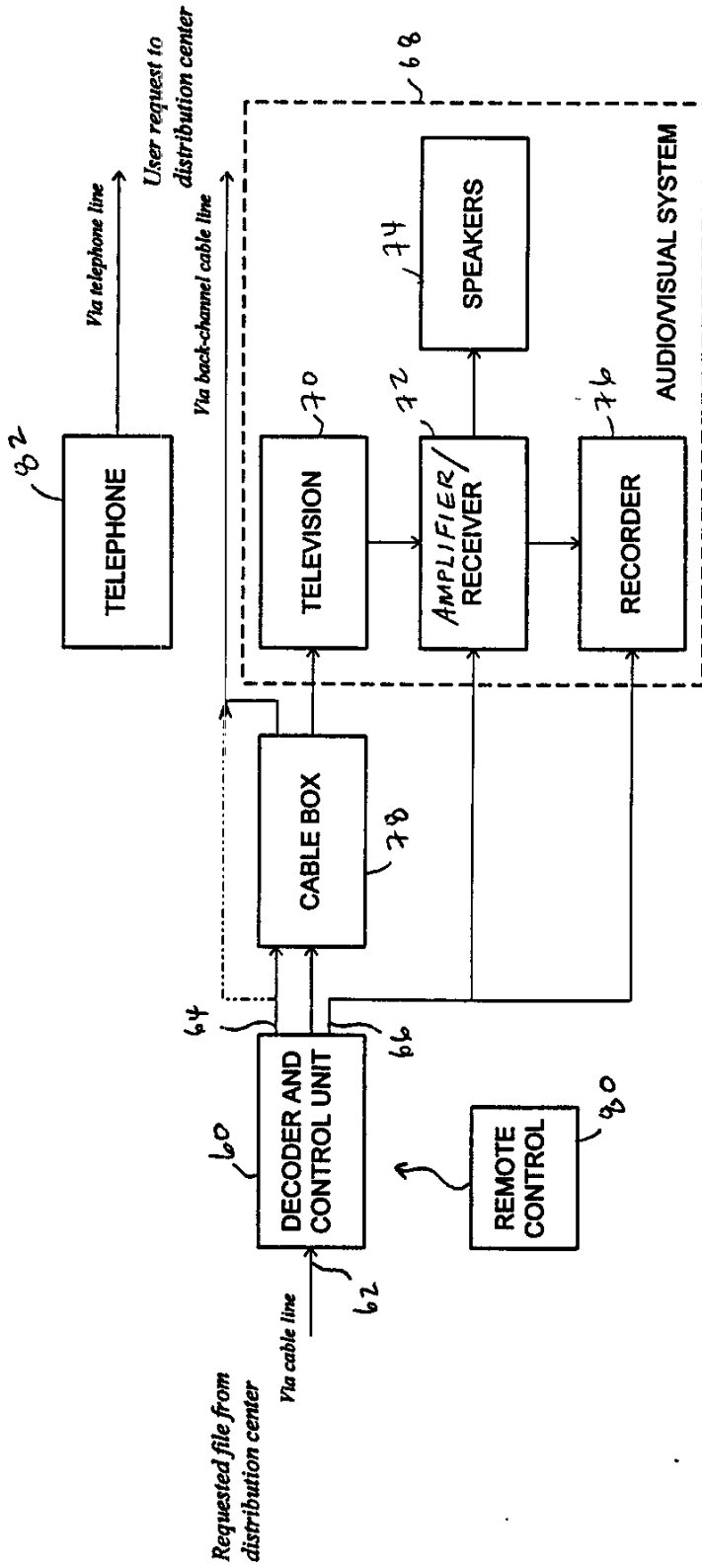


FIG. 3

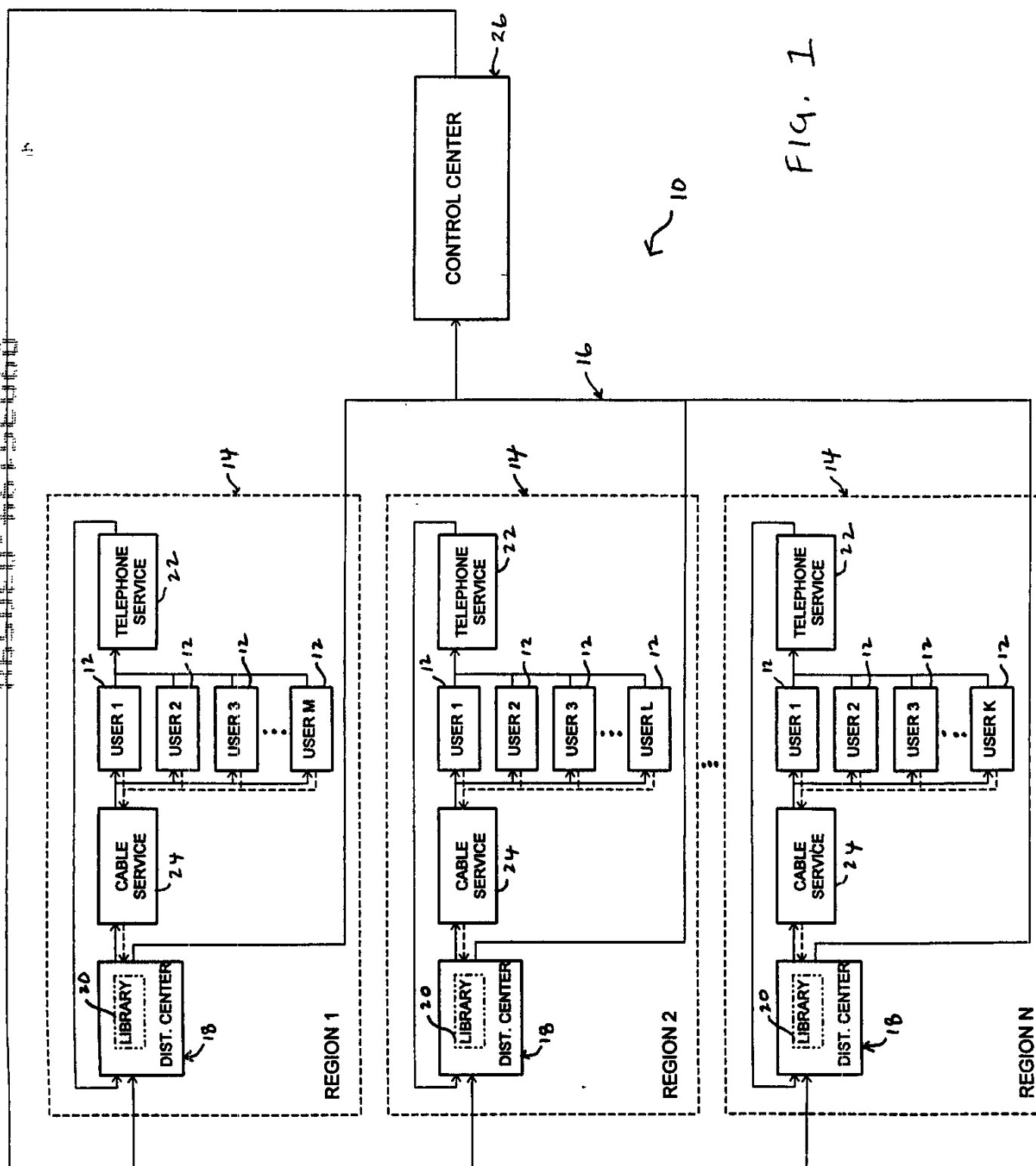


Fig. 1

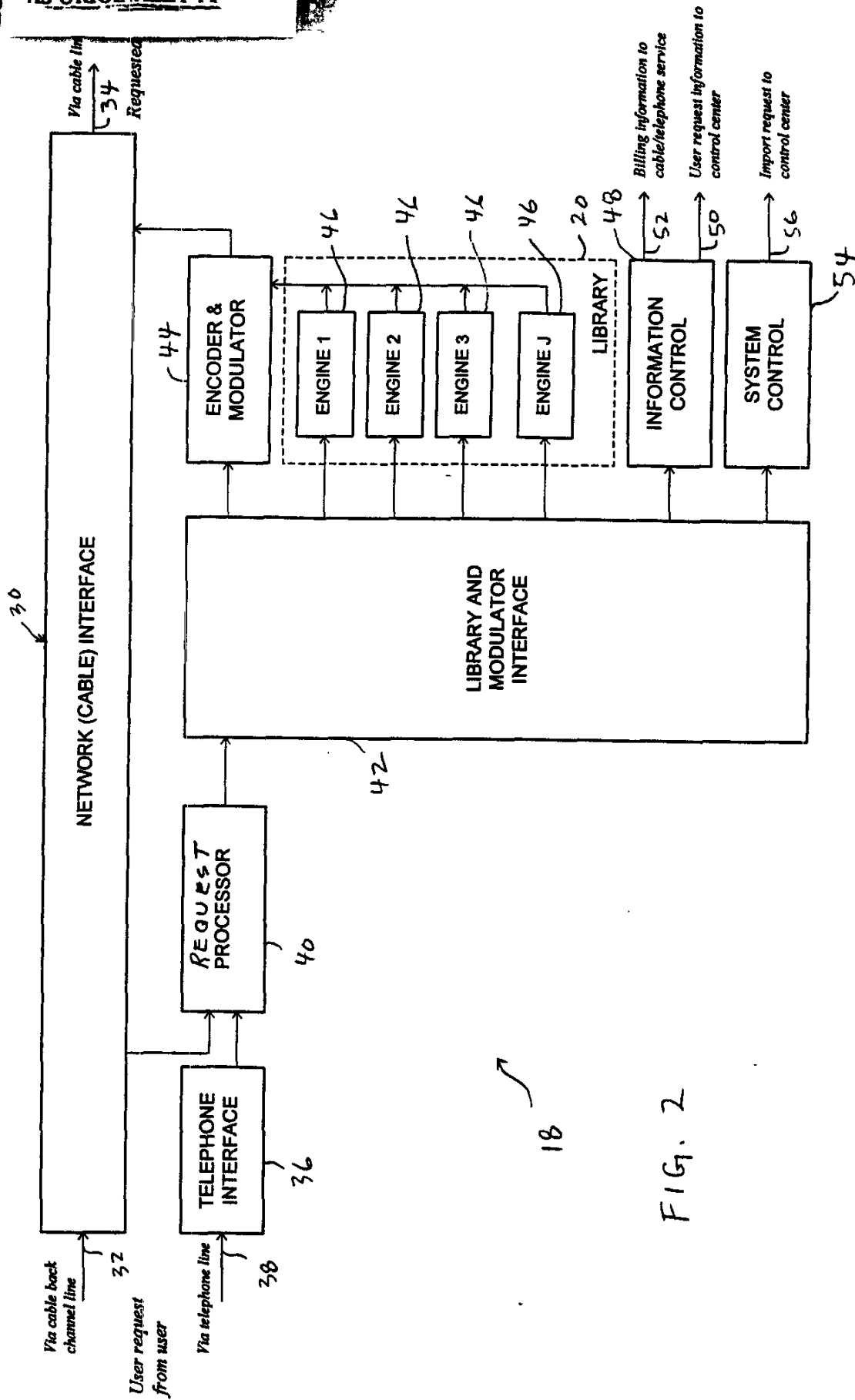


FIG. 2

FIG. 3

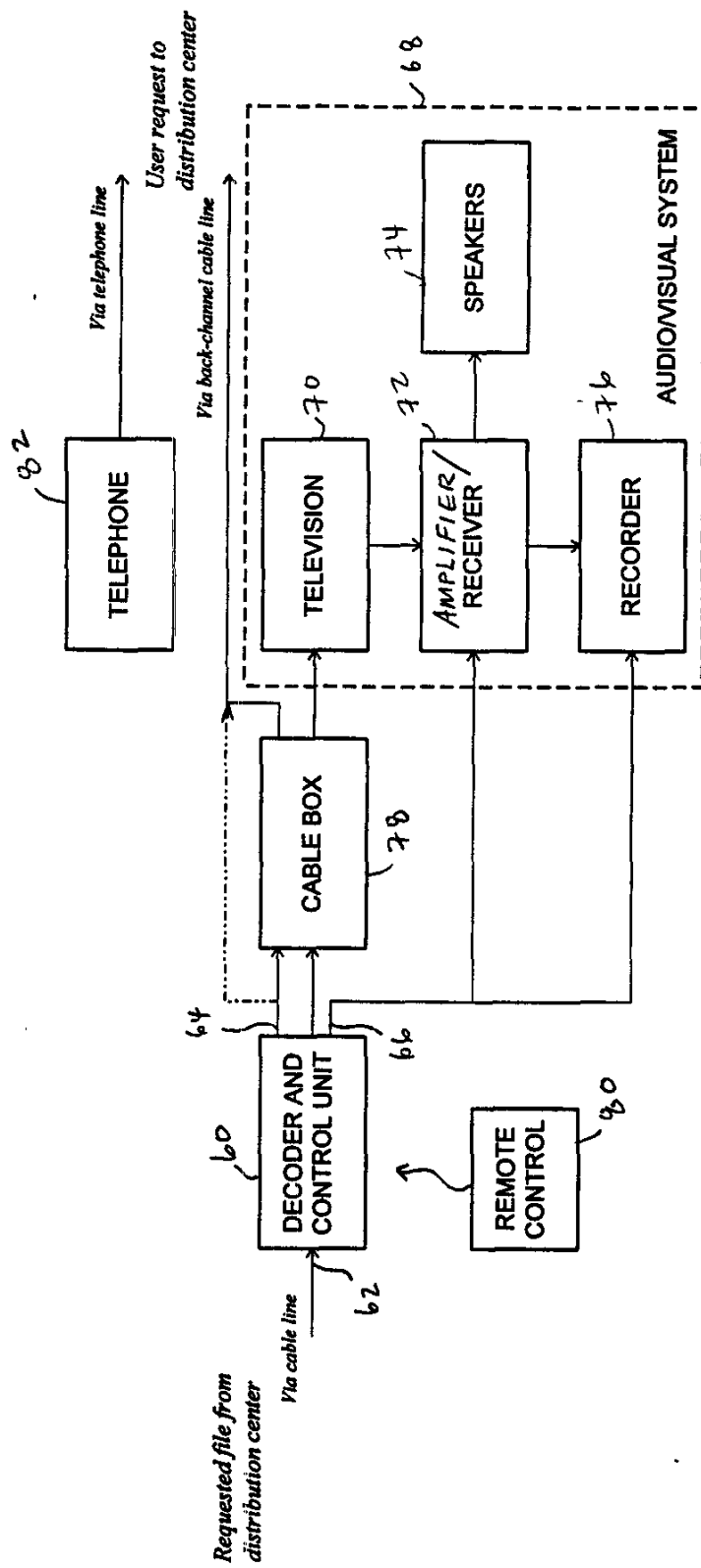


FIG. 3

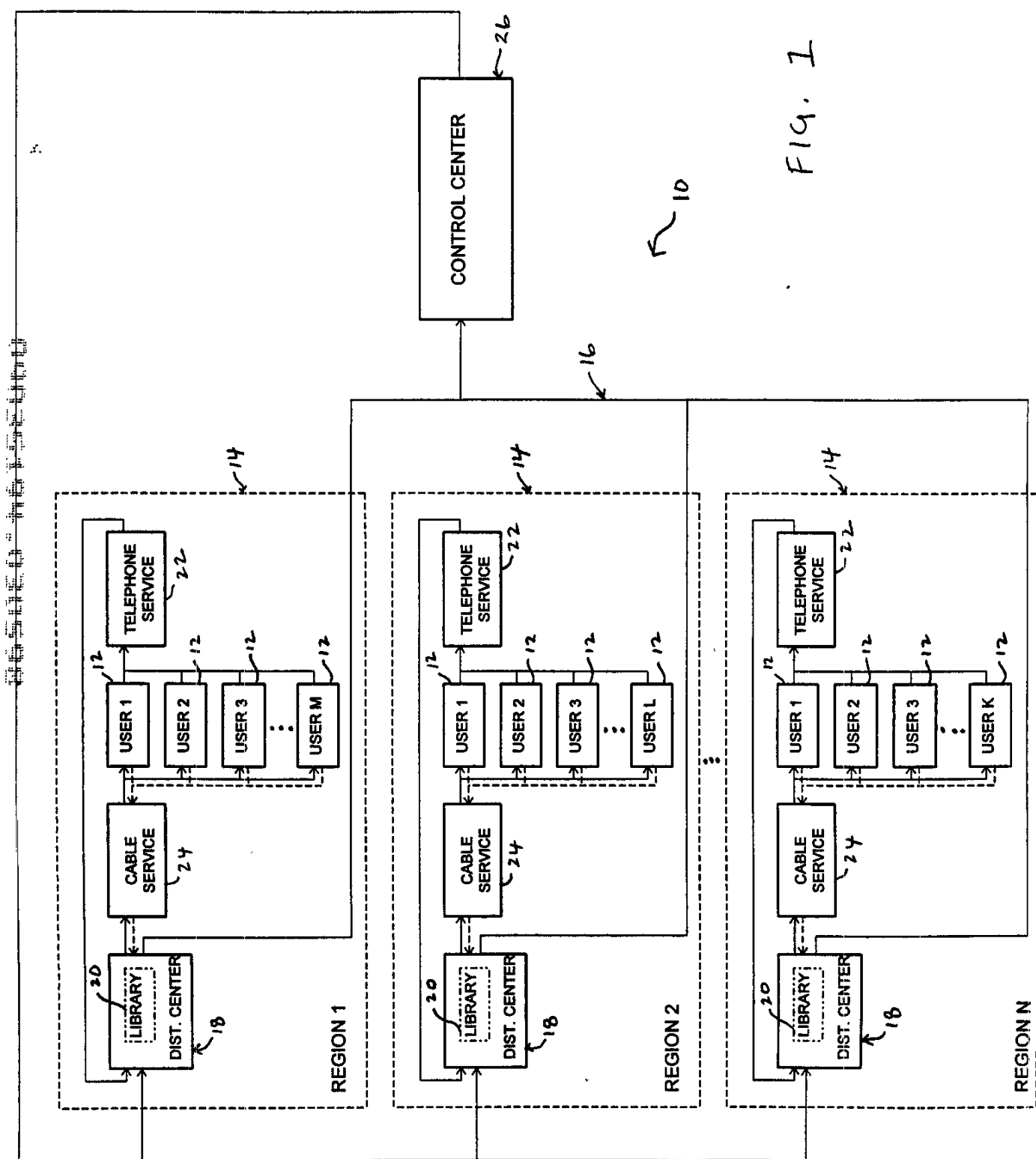


FIG. 1

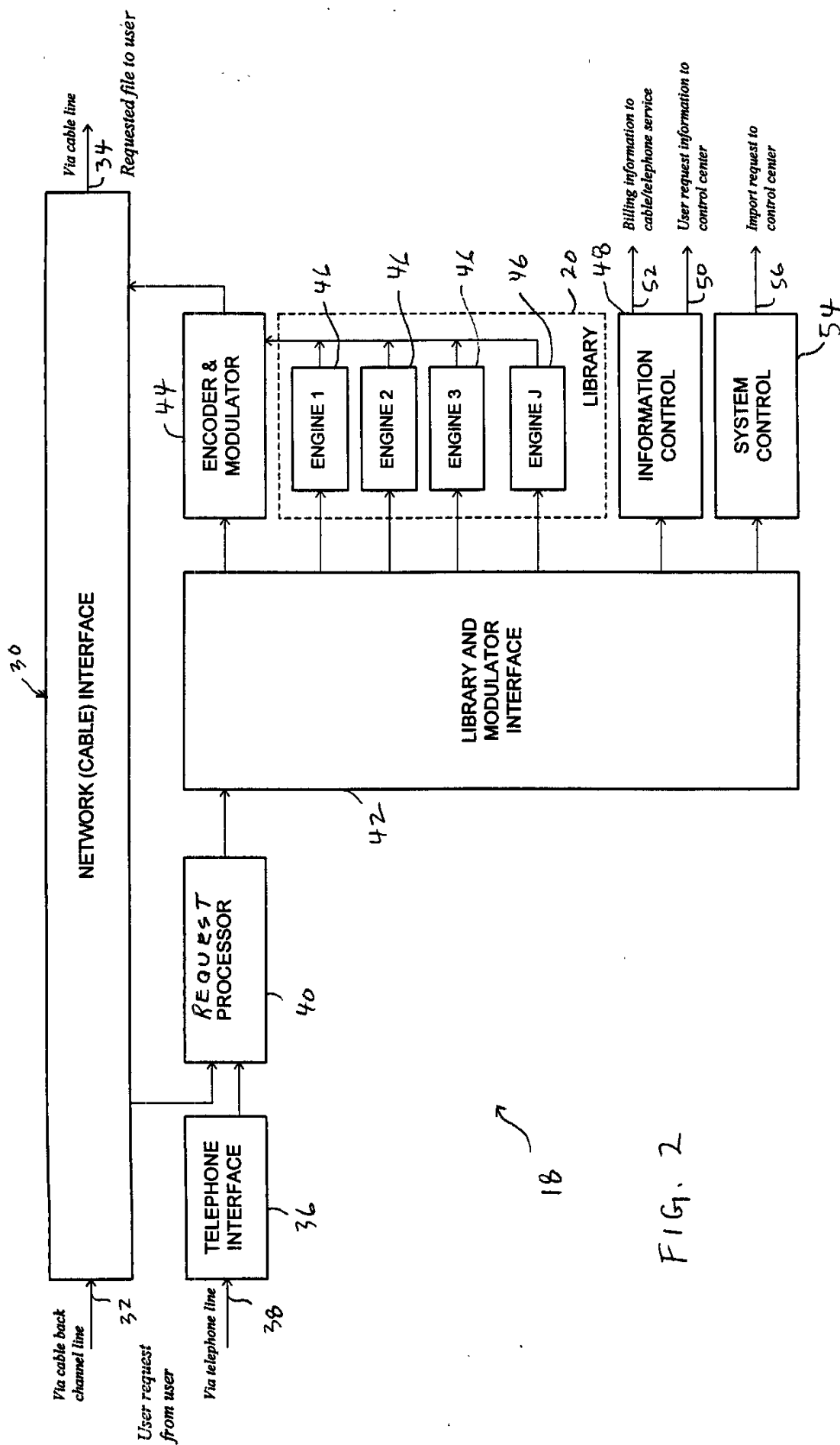


FIG. 2

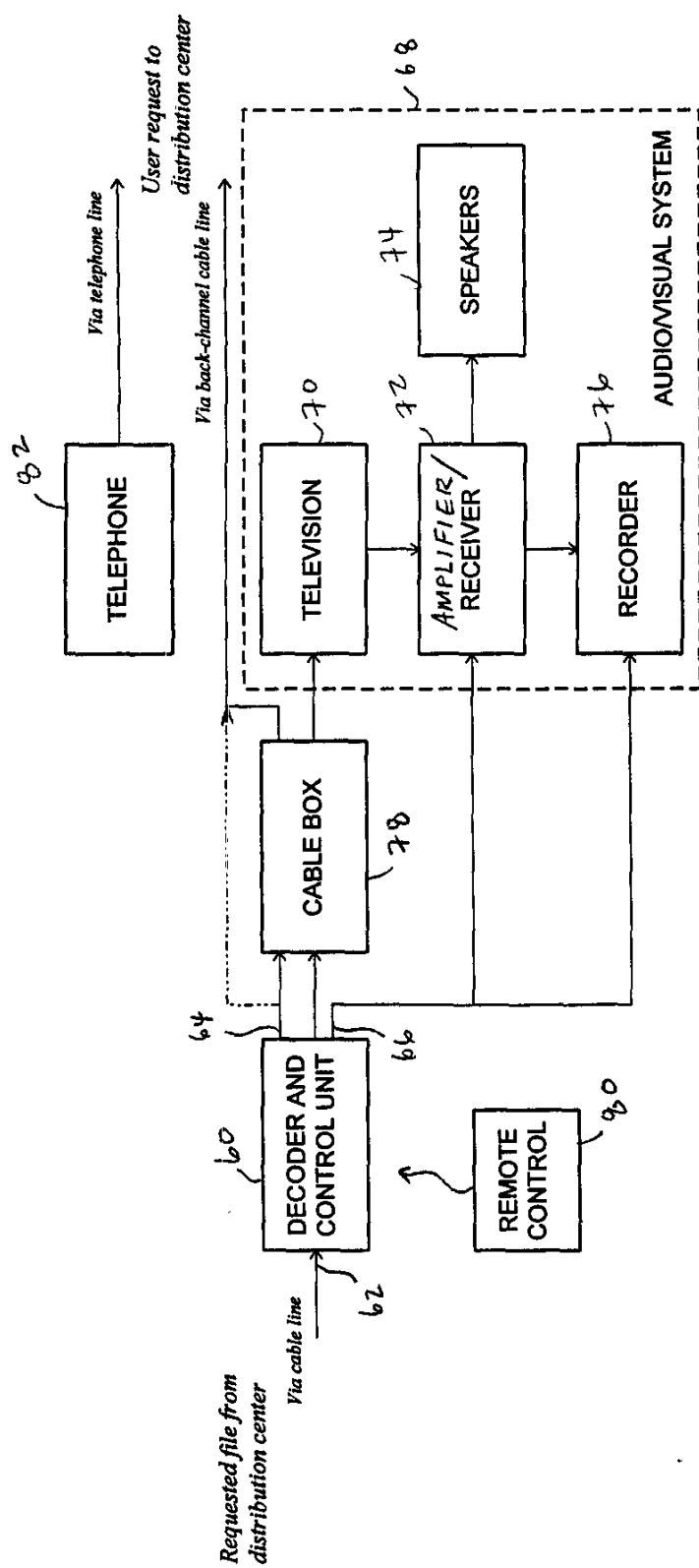


FIG. 3

CERTIFICATE OF MAILING

I hereby certify that on March 5, 1998, this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service with sufficient postage in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231.

37 C.F.R. § 1.8(a)
☐ with sufficient postage as first class mail

37 C.F.R. § 1.10
☒ as "Express Mail Post Office to Addressee" Mailing Label No. TB59741450XUS

Angela Wendel
Angela Wendel

PATENT
Docket No. 16089-14

JCS57 U.S. PTO
09/035194
03/05/98

PATENT TRANSMITTAL

Commissioner of Patents and Trademarks
Box Patent Application
Washington, D.C. 20231

Sir:

Transmitted herewith for filing is the patent application of inventors:
Anand Kelkar and Loren C. Johnson
For: **REAL-TIME MUSIC DISTRIBUTION SYSTEMS**

Enclosed are:

- ☒ Specification, claims and abstract, totaling 12 pages.
- ☒ 3 Sheets of Drawings
- ☒ Combined Declaration, Power of Attorney and Petition
- ☒ Assignment of the invention to Touchmusic Entertainment LLC; including Assignment Cover sheet and Check
- ☐ A Power of Attorney
- ☒ A Verified Statement Claiming Small Entity Status

The filing fee has been calculated as shown below:

	Col 1	Col. 2	Small Entity		Other Than a Small Entity	
	No. Filed	No. Extra	Rate	Fee	Rate	Fee
Basic Fee				\$395.00		\$790.00
TOTAL	10-20=	14	14 x \$11		x \$22	
INDEP.	2-3=	4	4 x \$41		x \$82	
☐ Multiple Dependent Claims Presented			= \$135.00		+ \$270	
			Total	\$395.00	Total	

- ☐ Please charge my Deposit Account No. 16-2230 the amount of \$____. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of \$395.00 to cover the fee for additional claims is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 16-2230. A duplicate copy of this sheet is enclosed.
 - ☒ Any additional filing fees required under 37 C.F.R. 1.16.
 - ☒ Any patent application processing fees under 37 C.F.R. 1.17.

Respectfully submitted,

Eric K. Satermo

Eric K. Satermo
Reg. No. 40,159

Dated: March 5, 1998

OPPENHEIMER WOLFF & DONNELLY, LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067-3024
Telephone: (714) 263-8250
Facsimile: (714) 263-8260

A

CERTIFICATE OF MAILING

I hereby certify that on March 5, 1998, this paper (along with any paper referred to as being attached or enclosed) being deposited with the United States Postal Service with sufficient postage in an envelope addressed to: Commissioner of Patents and Trademarks, Washington, DC 20231.

☒ 37 C.F.R. § 1.8(a)
☐ with sufficient postage as first class mail

37 C.F.R. § 1.10
☒ as "Express Mail Post Office to Addressee" Mailing Label No. TB59741450XUS

Angela Wendel
Angela Wendel

PATENT
Docket No. 16089-14

PATENT TRANSMITTAL

Commissioner of Patents and Trademarks
Box Patent Application
Washington, D.C. 20231

Sir:
Transmitted herewith for filing is the patent application of inventors:
Anand Kelkar and Loren C. Johnson
For: **REAL-TIME MUSIC DISTRIBUTION SYSTEMS**

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- ☒ Specification, claims and abstract, totaling 12 pages.
- ☒ 3 Sheets of Drawings
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- ☒ Assignment of the invention to Touchmusic Entertainment LLC; including Assignment Cover sheet and Check
- ☐ A Power of Attorney
- ☒ A Verified Statement Claiming Small Entity Status

The filing fee has been calculated as shown below:

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☐ Multiple Dependent Claims Presented			= \$135.00		+ \$270	
			Total	\$395.00	Total	

- ☐ Please charge my Deposit Account No. 16-2230 the amount of \$____. A duplicate copy of this sheet is enclosed.
- ☒ A check in the amount of **\$395.00** to cover the fee for additional claims is enclosed.
- ☒ The Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 16-2230. A duplicate copy of this sheet is enclosed.
 - ☒ Any additional filing fees required under 37 C.F.R. 1.16.
 - ☒ Any patent application processing fees under 37 C.F.R. 1.17.

Respectfully submitted,

Eric K. Satermo

Eric K. Satermo
Reg. No. 40,159

Dated: March 5, 1998

OPPENHEIMER WOLFF & DONNELLY, LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067-3024
Telephone: (714) 263-8250
Facsimile: (714) 263-8260

0500 #88
7-6-98
Pgs 8

CERTIFICATE OF MAILING

I hereby certify that on June 26, 1998, this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, DC 20231.


Trudi Thompson

PATENT

Applicant: **Touchmusic
Entertainment LLC**

Serial No.: **09/035,194**

Filed: **March 5, 1998**

Title: **REAL-TIME MUSIC
DISTRIBUTION
SYSTEM**

Docket No.: **16089-14**



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

INFORMATION DISCLOSURE STATEMENT

Assistant Commissioner for Patents
Washington, DC 20231

Sir:

In accordance with 37 C.F.R. § 1.56, Applicant submit herewith patents, publications, or other information of which they are aware that may be considered in connection with the above-referenced patent application. Submission of this Information Disclosure Statement is not intended to constitute an admission that any patent, publication or other information referred to herein is "material" to Applicants' invention as that term is currently defined in 37 C.F.R. § 1.56.

07/07/1998 SLUANE 00000074 162230 09035184
01 FC:120 240.00 CH

In accordance with 37 C.F.R. § 1.97(b), the filing of this Information Disclosure Statement shall not be construed to mean that a search has been made or that no other relevant information exists.

A Patent and Trademark Office Form 1449 listing each of these informational items is enclosed along with a copy of each item.

This Information Disclosure Statement is being filed before the mailing date of the first Office Action issued on the merits of the subject application in accordance with 37 C.F.R. §1.97(b)(3). In the event that a first Office Action has been mailed to the undersigned prior to the

mailing of this Information Disclosure Statement, the Commissioner is hereby authorized to charge payment of the applicable fee pursuant to 37 C.F.R. § 1.17(p) to Deposit Account No. 16-2230. A duplicate copy of this document is enclosed.

Respectfully submitted,

June 26, 1998



Eric K. Satermo
Registration No. 40,159

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067-3024
Telephone: (949) 263-8250
Facsimile: (949) 263-8260

2

FORM PTO-1449 (MODIFIED)				ATTY. I ET NO. 16089-1		SERIAL NO. 09/035,194	
LIST OF PATENTS AND PUBLICATIONS FOR APPLICANT'S INFORMATION DISCLOSURE STATEMENT (USE SEVERAL SHEETS IF NECESSARY)				APPLICANT ANAND KELKAR ET AL.			
				FILING DATE MARCH 5, 1998		GROUP 2711	

O I P E J C A S
 JUN 30 1998
 PATENT & TRADEMARK OFFICE

U.S. PATENT DOCUMENTS							
EXAMINER INITIALS	DOCKET NUMBER	DATE	NAME	CLASS	SUB- CLASS	FILING DATE IF APPRO- PRIATE	
H.B.	AA	5,636,276	BRUGGER	380	4		
H.B.	AB	5,191,410	MCCALLEY ET AL.	348	13		
H.B.	AC	5,418,713	ALLEN	705	32		
H.B.	AD	5,619,247	RUSO	348	3		
H.B.	AE	5,423,003	BERTEAU	370	254		
H.B.	AF	4,956,768	SIDI ET AL.	710	53		
H.B.	AG	5,583,763	ATCHESON ET AL.	707	3		
H.B.	AH	5,113,496	MCCALLEY ET AL.	710	126		
H.B.	AI	5,590,282	CLYNES	395	200.49		
H.B.	AJ	5,560,038	HADDOCK	395	200.66		
H.B.	AK	5,195,092	WILSON ET AL.	348	13		
FOREIGN PATENT DOCUMENTS							
	DOCKET NUMBER	DATE	COUNTRY	CLASS	SUB- CLASS	TRAN- SLATION	
						YES	NO
	AL						
	AM						
	AN						

OTHER ART (INCLUDING AUTHOR, TITLE, DATE, PERTINENT PAGES, ETC.)

EXAMINER HABTE K. BAHGI	DATE CONSIDERED 3/24/99
-----------------------------------	-----------------------------------

EXAMINER: INITIAL IF REFERENCE CONSIDERED, WHETHER OR NOT CITATION IS IN CONFORMANCE WITH MPEP 609; DRAW LINE THROUGH CITATION IF NOT IN CONFORMANCE AND NOT CONSIDERED. INCLUDE COPY OF THIS FORM WITH NEXT COMMUNICATION TO APPLICANT.

GP2711 B

PATENT
Atty Docket No. 16089-14

#3
2-26-99 shw

I hereby certify that this correspondence and identified enclosures is being deposited February 11, 1999, with the United States Postal Service, first class mail, postage prepaid, under 37 C.F.R. § 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.


Amber Stewart



RECEIVED
FEB 25 1999
Group 2700

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application Of:

Group Art Unit: 2711

Applicant: Anand Kelkar and Loren C. Johnson

Examiner:

Serial No. 09/035,194

Filing Date: March 5, 1998

Title: REAL-TIME MUSIC DISTRIBUTION
SYSTEMS

Assistant Commissioner for Patents
Washington, D.C. 20231

PETITION TO MAKE SPECIAL

Sir:

Applicant hereby petitions to make special the subject application under the provisions of 37 C.F.R. 1.102, and MPEP 708.02 (VIII).

A. A check in the amount of \$130.00 for the petition fee required by 37 C.F.R.

1.17(i) is enclosed.

02/23/1999 AMDHAMME 00000092 09035194

01 FC:122

130.00 OP

B. The following classes and subclasses were searched:

Class	Subclasses
348	3, 10, 12, 13, 17, 461, 465, 467, 468, 478CC
395	105, 200.02, 200.17, 200.18, 210, 232, 239, 306, 500CC, 551.01, 603, 800, 873
364	236.2, 238.6, 239, 239.5, 238.9, 240, 241.0, 240.8, 242.3, 242.94, 260, 260.3, 939.1
379	230
84	477R, 600, 609
381	77, 81

Class	Classification Titles
348	Television
395	Information Processing Systems Organization
364	Electrical Computers And Data Processing Systems
84	Music

C. Copies of the most pertinent references have been previously disclosed in information disclosure statement filed on June 26, 1998 in connection with the instant application.

D. References

5,423,003: Discloses a system for managing distributed information applications employing an advanced intelligent network telecommunications network based upon the Signalling System 7 (SS7) Standard.

4,956,786: Discloses a wideband server, in particular for transmitting music or images.

5,583,763: Discloses a method and apparatus for recommending selections based on preferences in a multi-user system.

5,636,276: Discloses a device for the distribution of music information in digital form.

5,113,496: Discloses a bus interconnection structure with redundancy linking plurality of groups of processors, with servers for each group mounted on chassis.

5,195,092: Discloses an interactive multimedia presentation and communication system.

The above references do not disclose the claimed invention of a system for distributing data files to users connected in a plurality of networks. The system of the invention comprises a plurality of distribution centers each including a network interface including an input and an output for connecting to one of the networks, a library including a plurality of data files, a library interface including an input and an output connected to said library, and a processor connected to said network interface and said library interface. The processor receives a request from a user via said input of said network interface. The request includes information on a requested data file and a user address. The processor also retrieves said requested data file from said library via said library interface, transmits said requested data file to said one of the networks via said output of said network interface, and records request information indicative of said requested data file and said user address. The system of the invention further comprises a central controller connected to said distribution interface of each of said distribution centers for routing information between said distribution centers.

Grant of this petition is respectfully requested.



Respectfully submitted,

Dated: 2/11/99

George L. Fountain
George L. Fountain
Reg. No. 36,374

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067-3024
Telephone: (310) 788-5000
Facsimile: (310) 277-1297

RECEIVED
FEB 25 1999
Group 2700

◆CAL: 170012 v01 2/11/99



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
ASSISTANT SECRETARY AND COMMISSIONER OF
PATENTS AND TRADEMARKS
Washington, D C. 20231

Paper No. 4

George L. Fountain
Oppenheimer Wolff & Donnelly
2029 Century Park East
38th Floor
Los Angeles CA 90067-3024

Mailed

MAR 4 1999

**Director's Office
Group 2700**

In re Application of	:	
Anand Kelker et al.	:	
Application No. 09/035,194	:	DECISION ON PETITION
Filed: March 5, 1998,	:	TO MAKE SPECIAL
For REAL-TIME MUSIC DISTRIBUTION:	:	
SYSTEM	:	

This is a decision on the petition under 37 C.F.R. § 1.102(d), filed February 18, 1999, to make the above-identified application special.

Petitioner requests that the above-identified application be made special under the accelerated examination procedure set forth in M.P.E.P. § 708.02, Item VIII.

A grantable petition to make special under 37 C.F.R. § 1.102 and in accordance with M.P.E.P. § 708.02, Item VIII, must be accompanied by (a) the fee set forth in 37 C.F.R. § 1.17(I), (b) a statement that all claims are directed to a single invention or an offer to make an oral election without traverse should the Patent and Trademark Office hold that the claims are not directed to a single invention, (c) a statement that a pre-examination search has been made by the inventor, attorney, agent, professional searcher, etc., and a listing of the field of search by class and subclass, (d) one copy of each of the references deemed most closely related to the subject matter encompassed by the claims, and (e) a detailed description of the submitted references and discussions pointing out how the claimed subject matter is distinguishable over these references.

The petition lacks a statement that all claims are directed to a single invention or an offer to make an oral election without traverse should the Patent and Trademark Office hold that the claims are not directed to a single invention as required by item (b) above. However, the petitioner has agreed to the special examining procedures outlined in MPEP §708.02 VIII. Therefore, it is presumed that all claims are directed to a single invention, or if the Office determines that all claims are not obviously directed to a single invention, the applicant will make an election without

traverse. If this is not the case, the applicant should notify the Office immediately and the special status will be withdrawn.

For the above stated reasons, the petition is **GRANTED**.

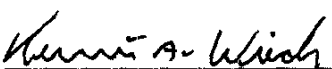
The application file is being forwarded to the examiner for expedited prosecution.

If the examiner can make this application special without prejudice to any possible interfering applications, and he/she should make a rigid search for such, he/she is authorized to do so for the next action. Should the application be rejected, the application will not be considered special for the subsequent action unless the applicant promptly makes a bona fide effort to place the application in condition for allowance, even if it is necessary to have an interview with the examiner to accomplish this purpose.

If the examiner finds any interfering application for the same subject matter, he/she should consider such application simultaneously with this application and should state in the official letter of such application that he/she is taking it out of its turn because of possible interference.

Should an appeal be taken in this application or should this application become involved in an interference, consideration of the appeal and the interference will be expedited by all Patent and Trademark Office officials concerned, contingent likewise upon diligent prosecution by the applicant.

After allowance, this application will be given priority for printing. See M.P.E.P. § 1309.



Kenneth A. Wieder
Special Program Examiner
Technology Center 2700
Communications and Information Processing



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/035,194 03/05/98 BELKAR

A 16089-14

LM02/0405
OPPENHEIMER WOLFF & DONNELLY
2029 CENTURY PARK EAST
38TH FLOOR
LOS ANGELES CA 90067-3024

EXAMINER

BAHSL, H

ART UNIT

PAPER NUMBER

2711

DATE MAILED:

04/05/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/035,194	Applicant(s) ANAND KELKAR	
	Examiner Habte Bahgi	Group Art Unit 2711	

☐ Responsive to communication(s) filed on _____.

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-10 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-10 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 1

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2711

DETAILED ACTION

Drawings

1. The drawings are objected to ~~because~~ (see PTO-948). Correction is required.

Specification

2. Claim 1 is objected to because of the following informalities:
 - a. In claim 1, line 8, "3" should read "4".

Appropriate correction is required.

Claim Rejections - 35 USC § 112

3. Claim ^{1-10 are} ~~4~~ rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, line 17, it is unclear to what distribution interface "said distribution interface" refers. It appears applicant is referring to "library interface" as recited in line 7, however, this has not been clearly recited.

4. Claims 6 and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Art Unit: 2711

- a . Claim 6 can not depend from itself.

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 1-5, and 8-10 are rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. (US Pat. 5,550,577).

Regarding claim 1, Verbiest shows a video on demand network in figure 1, where the claimed plurality of distribution centers is shown as CS, AUX, DS1 and DS2 are connected to the back bone switch BBN, and the claimed network interface, library, library interface and a processor are shown as an access networks AN1 and AN2 are coupled to switching networks BBS5 and BBS3, video library constituted by two warehouses CWH and DWH for storing Digital Audio Tapes DAT and CD-ROMs, BBS1 for access switching (See Fig. 3), as for a processor the DSC activates the program control PCM1/PCMN, corresponding to the program unit PU1/PUN in which the selected video signal is stored, to produce an instance of the requested video signal together with routing control information indicative of the user station US13 and the routing

Art Unit: 2711

control information is used by BBS5 and AN1 to switch the video signal to the correct user station (See column 8, lines 8-14).

Regarding the central controller connected to the library interface is shown as the backbone network BBN is itself constituted by broadband packet switching networks BBS1 to BBS5 which are interconnected as shown in figure 1.

Regarding claim 2, wherein the network interface is a cable television interface is shown in Fig. 2 as the TV is accessing the network.

Regarding claim 3, wherein the data files include digitized music tracks See Fig. 3 Digital Audio Tapes DAT.

Regarding claim 4, wherein each of the libraries includes a plurality of compact discs (CDS) See Fig. 3 CD-ROM.

Regarding claim 5, a plurality of control units each having a user address and including a user input, output and a decoding circuitry is taught by Verbiest as the latter server controller DSC identifies the user station US13 and issues the received frame and transmits corresponding teletext information to US13 via AN1 for instance by expanding an existing multicast tree in BBS5. In ANT of US13 the latter teletext information is converted in the decoder video signal VS which displayed on the television set TV (See column 8, lines 38-45).

Regarding claim 8, the claimed "modulator" is inherent to Verbiest since an instance of the requested video signal together with routing control information indicative of the user station

Art Unit: 2711

US13 and the routing control information is used by BBS5 and AN1 to switch the video signal to the correct user station (See column 8, lines 11-14).

Regarding claim 9, generating at a user system a user request, receiving the user request, processing, retrieving and transmitting the requested data to the user is taught by Verbiest as user stations US11/US1N which comprise a conventional set TV, an access network termination unit ANT coupled to an access network generally indicated by AN, a remote control unit RC and a set up unit STU. When the remote control unit RC operated by the user communicates with the set up unit STU, the latter generates a control signal CSI based on the instruction used by the user via RC and applies it to access network termination ANT (See column 6, lines 7-15). Furthermore, Verbiest teaches that DSC activates the program control PCM1/PCMN, corresponding to the program unit PU1/PUN in which the selected video signal is stored, to produce an instance of the requested video signal together with routing control information indicative of the user station US13 and the routing control information is used by BBS5 and AN1 to switch the video signal to the correct user station (See column 8, lines 8-14).

Regarding claim 10, the step of recording request information indicative of the requested data file and user address is inherent to Verbiest since the latter server controller identifies the user station US13 which issued the received frame and transmits corresponding teletext information to US13 via AN1 for instance by expanding an existing multicast tree BBS5 (See column 7, lines 38-42).

Art Unit: 2711

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

- a. Lau et al. - Interactive audio transmission receiving and playback system.
- b. Utsumi et al. - CATV system in which channel selection signal is transmitted from the subscriber location.
- c. Haddad - Interactive audiovisual distribution system.
- d. Soora et al. - Multimedia distribution network including video switch.

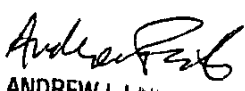
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Bahgi whose telephone number is (703) 308-8208. The examiner can normally be reached on Monday-Friday from 8:30A.M. to 6:00P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Faile, can be reached on (703) 305-4380. The fax phone number for this Group is (703) 308-5359.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-9000.

HB: hb

3/26/99


ANDREW I. FAILE
SUPERVISORY PATENT EXAMINER
GROUP 2700

Notice of References Cited				Application No. 09/035,194		Applicant(s) ANAND KELKAR	
				Examiner Habte Bahgi		Group Art Unit 2711	
						Page 1 of 1	
U.S. PATENT DOCUMENTS							
		DOCUMENT NO.	DATE	NAME		CLASS	SUBCLASS
	A	5,790,423	7/4/98	Lau et al.		364	514
	B	5,729,281	3/17/98	Utsumi et al.		348	12
	C	5,555,441	9/10/96	Haddad		455	4.2
	D	5,756,280	5/26/98	Soora et al.		455	4.2
	E	5,550,577	8/27/96	Verbiest et al.		348	7
	F						
	G						
	H						
	I						
	J						
	K						
	L						
	M						
FOREIGN PATENT DOCUMENTS							
		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS	SUBCLASS
	N						
	O						
	P						
	Q						
	R						
	S						
	T						
NON-PATENT DOCUMENTS							
		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)					DATE
	U						
	V						
	W						
	X						

09/035194

NOTICE OF DRAFTPERSON'S
PATENT DRAWING REVIEWThe drawing filed (insert date) 3/5/98 are:A. ☐ not objected to by the Draftperson under 37 CFR 1.84 or 1.152.B. ☒ objected to by the Draftperson under 37 CFR 1.84 or 1.152 as indicated below. The Examiner will require submission of new, corrected drawings where necessary. Corrected drawings must be submitted according to the instructions on the back of this notice.1. DRAWINGS. 37 CFR 1.84(a): Acceptable categories of drawings:
Black ink. Color.☐ Color drawing are not acceptable until petition is granted.

Fig.(s) _____

☐ Pencil and non black ink is not permitted. Fig(s) _____

2. PHOTOGRAPHS. 37 CFR 1.84(b)

☐ Photographs are not acceptable until petition is granted,☐ 3 full-tone sets are required. Fig(s) _____☐ Photographs not properly mounted (must bristol board or photographic double-weight paper). Fig(s) _____☐ Poor quality (half-tone). Fig(s) _____

3. TYPE OF PAPER. 37 CFR 1.84(c)

☐ Paper not flexible, strong, white and durable.

Fig.(s) _____

☐ Erasures, alterations, overwritings, interlineations, folds, copy machine marks not acceptable. (too thin)☐ Mylar, vellum paper is not acceptable (too thin).

Fig(s) _____

4. SIZE OF PAPER. 37 CFR 1.84(F): Acceptable sizes:

☐ 21.0 cm by 29.7 cm (DIN size A4)☐ 21.6 cm by 27.9 cm (8 1/2 x 11 inches)☐ All drawings sheets not the same size.

Sheet(s) _____

5. MARGINS. 37 CFR 1.84(g): Acceptable margins:

Top 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: A4 SizeTop 2.5 cm Left 2.5 cm Right 1.5 cm Bottom 1.0 cm
SIZE: 8 1/2 x 11☒ Margins not acceptable. Fig(s) 112☒ Top (T) ☒ Left (L)☒ Right (R) ☐ Bottom (B)

6. VIEWS. CFR 1.84(h)

REMINDER: Specification may require revision to correspond to drawing changes.

☐ Views connected by projection lines or lead lines.

Fig.(s) _____

Partial views. 37 CFR 1.84(h)(2)

☐ Brackets needed to show figure as one entity.

Fig.(s) _____

☐ Views not labeled separately or properly.

Fig.(s) _____

☐ Enlarged view not labeled separately or properly.

Fig.(s) _____

7. SECTIONAL VIEWS. 37 CFR 1.84(h)(3)

☐ Hatching not indicated for sectional portions of an object.

Fig.(s) _____

☐ Sectional designation should be noted with Arabic or

Roman numbers. Fig.(s) _____

8. ARRANGEMENT OF VIEWS. 37 CFR 1.84(i)

☐ Words do not appear on a horizontal, left-to-right fashion when page is either upright or turned, so that the top becomes the right side, except for graphs. Fig.(s) _____☐ Views not on the same plane on drawing sheet. Fig.(s) _____

9. SCALE. 37 CFR 1.84(k)

☐ Scale not large enough to show mechanism without crowding when drawing is reduced in size to two-thirds in reproduction.

Fig.(s) _____

10. CHARACTER OF LINES, NUMBERS, & LETTERS. 37 CFR 1.84(l)

☒ Lines, numbers & letters not uniformly thick and well defined, clean, durable and black (poor line quality).Fig.(s) 1-3

11. SHADING. 37 CFR 1.84(m)

☐ Solid black areas pale. Fig.(s) _____☐ Solid black shading not permitted. Fig.(s) _____☐ Shade lines, pale, rough and blurred. Fig.(s) _____

12. NUMBERS, LETTERS, & REFERENCE CHARACTERS.

37 CFR 1.48(p)

☐ Numbers and reference characters not plain and legible.

Fig.(s) _____

☐ Figure legends are poor. Fig.(s) _____☐ Numbers and reference characters not oriented in the same direction as the view. 37 CFR 1.84(p)(3) Fig.(s) _____☒ English alphabet not used. 37 CFR 1.84(p)(3) Fig.(s) _____☒ Numbers, letters and reference characters must be at least .32 cm (1/8 inch) in height. 37 CFR 1.84(p)(3) Fig.(s) 1-3

13. LEAD LINES. 37 CFR 1.84(q)

☐ Lead lines cross each other. Fig.(s) _____☐ Lead lines missing. Fig.(s) _____

14. NUMBERING OF SHEETS OF DRAWINGS. 37 CFR 1.48(t)

☐ Sheets not numbered consecutively, and in Arabic numerals beginning with number 1. Fig.(s) _____

15. NUMBERING OF VIEWS. 37 CFR 1.84(u)

☐ Views not numbered consecutively, and in Arabic numerals, beginning with number 1. Fig.(s) _____

16. CORRECTIONS. 37 CFR 1.84(w)

☐ Corrections not made from PTO-948 dated _____

17. DESIGN DRAWINGS. 37 CFR 1.152

☐ Surface shading shown not appropriate. Fig.(s) _____☐ Solid black shading not used for color contrast.

Fig.(s) _____

COMMENTS

REVIEWER

A. D.

DATE

10/8/98

TELEPHONE NO.

ATTACHMENT TO PAPER NO.

PTO CO

OFFICIAL**PATENT****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant:	Anand Kelkar	Examiner:	Habte, B.	FAX RECEIVED
Serial No.	09/035,194	Group Art Unit:	2711	JUN 09 1999
Filed:	March 5, 1998	Docket No.	16089-14	Group 2700
Title:	REAL-TIME MUSIC DISTRIBUTION SYSTEM			

I hereby certify that this correspondence is being transmitted by telecopier, telephone number 703/308-5359, and is addressed to the Examiner Habte Bahgi, on June 9, 1999.

[Signature]
Sandra M. Parker, Esq.

PROPOSED AMENDMENT

BOX: Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

Do not enter!

Sir:

Responsive to the Office Action mailed April 5, 1999, kindly enter the following amendments:

IN THE CLAIMS

Please amend claims 1, 5, and 6 as follows, and add new claims 11, 12, 13, 14, 15 and 16:

- claim 1, line 8, please replace "3" with --4--;
- claim 1, line 17, please replace "distribution" with --network--;
- claim 5, line 4, please add at end of line --and--;
- claim 6, line 1, please replace "claim 6" with --claim 5--.

11. (New Claim) A system as claimed in claim 1 wherein said data files include digitized video files.

*al
cont*

A

Serial No. 09/052,038

12. (New Claim) A system as claimed in claim 5 further comprising a storage device for recording the requested data file.

13. (New Claim) A system as claimed in claim 5 further comprising a telephone for sending a request from the user.

14. (New Claim) A method as claimed in claim 9 wherein the user requesting transmittal of the requested data file to another user, and said transmitting step transmitting said requested data file to another user system.

15. (New Claim) A method as claimed in claim 9 wherein the user system having the control unit of claim 5, further comprising a step of recording the data file at a storage device of the control unit.

16. (New Claim) A method as claimed in claim 10 further comprising a step of using the recorded request information for marketing statistics and billing information.

REMARKS

Applicant has responded quickly in order to keep his special status. Reconsideration of the above application is respectfully requested.

The drawings will be corrected after the allowance of the application.

Specification has been checked and minor errors have been corrected.

Claims 1, 5, and 6 are amended, and new claims 11, 12, 13, 14, 15 and 16 are added. No new matter has been introduced. Claims 1-16 are pending in the application.

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. The Examiner stated that the Verbiest et al. reference discloses a video on demand network in Figure 1, where a plurality of distribution centers are shown as CS, AUX, DS1, DS2, and are connected to the back bone switch BBN. He also stated that the network interface, library & its interface,

Serial No. 09/052,038

and a processor are shown as an access network AN1, AN2, coupled to switching networks BBS5 and BBS3. The Examiner also stated that video library in two warehouses CWH and DWH store audio tapes and CD-ROMs, and BBS1 is used for access switching (Fig. 3). He also stated that a processor DSC activates the program control PCM1/PCMN for program unit PU1/PUN in which a selected video is stored, to produce an instance of the requested video signal and routing control information, indicative of the user station US13, to be used by BBS5 and AN1 to switch the video signal to the correct user station (col. 8, li. 8-14).

Verbiest et al. reference shows that central server has its own video library (col. 8, li. 36) and readers, and may transmit to users directly (col. 8, li. 64). Also, the central server has a central library with all videos of the system, and sends updates to distribution centers offline (col. 8, li. 54). Moreover, there is more than one central server: CS-central server and CCC - central control (col. 9, li. 36-47) and also an AUX unit. There are also multiple networks connecting these central units, such as a central network (col. 5, li. 62), and numerous other networks, some of which are mentioned by the Examiner, such as a back bone switch BBN, access networks AN1, AN2, coupled to switching networks BBS5 and BBS3, BBS1 which is used for access switching, etc. This is necessary because this reference describes a backbone broadband network, on which all **distributed servers are interconnected among themselves** (col. 5, li. 30) or **cross-connected** (col. 5, li. 42), in form of **multicast trees** (col. 8, li 21), with **multipath self-routing** (col. 5, li. 31). This prior art does not disclose the system, as claimed in claim 1 of the present invention and supported by the specification.

The present invention, as claimed in claim 1 and shown in Fig. 1 and specification, has only one control center 26 connected via line 16 with all independent regional networks 14. Each independent network 14 has its own distribution center 18 with a data file library. In the present invention each network 14 is an **independent** network, and these networks are **not interconnected** among themselves; each network is only connected with the control center 26. The control center 26 does **not store any data files**, thus no warehouse is required; it only forwards data files from one independent network to another. Moreover, the control center 26 **neither communicates nor supplies the user stations directly**. This is clearly stated in claim 1, which teaches that **each network interface** connects to **one of the networks**, a processor transmitting the data file to **one of the networks** and a **central controller** (control center 26)

Serial No. 09/052,038

connected to the network interface of each distribution center for **routing information between the distribution centers.**

This distinction is also supported by the Examiner's own statement, when he states that the central controller, connected to the library interface, is shown as the backbone network BBN, itself constituted by broadband packet switching networks BBS1-BBS5, which are interconnected as shown in Fig. 1. In the present invention, as claimed in claim 1, the central controller is not connected to the library interface, since it does not have a library. Moreover, no packet switching is used, there are no interconnected networks, and no elements corresponding to broadband packet switching networks BBS1-BBS5 connected to the backbone network BBN.

Further, the present invention, as claimed in claim 1, is distinguished and not taught by Verbiest et al. reference, because the Verbiest et al. reference teaches that a video file cannot be sent in real time, due to bandwidth problems, and it has to be sent in advance and stored or recorded. Therefore, the reference needs storage devices such as CD recorders and/or DAT tapes. In the present invention, as claimed in claim 1, a storage device is not necessary, since a data file can be transferred and presented live, in real-time. This precludes need for time stamps and other synchronization tools needed in Verbiest et al. reference.

Thus, claim 1 is distinguished over Verbiest et al., which neither describes nor suggests its features. Therefore, this rejection is traversed in view of claim 1, and claim 1 is respectfully submitted as being in condition for allowance.

Claims 2, 3, and 4 were rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al.

Because claim 1 is distinguishable from the Verbiest et al. reference, as discussed herein, claims 2, 3, and 4 of Applicant's disclosure (which are dependent on claim 1) are also patentably distinct from Verbiest et al. Therefore, claims 2, 3, and 4 are respectfully submitted as being in condition for allowance.

Claims 5 and 8 were rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al.

It was noted above that in the present invention there is no multicast tree. Also, because claim 1 is distinguishable from the Verbiest et al. reference, as discussed herein, claims 5 and 8 of Applicant's disclosure (which are dependent on claim 1) are also patentably distinct from

Serial No. 09/052,038

Verbiest et al. Therefore, claims 5 and 8 are respectfully submitted as being in condition for allowance.

Claim 9 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. The Examiner stated that generating and receiving a user request, processing, retrieving and transmitting the data to the user is taught by Verbiest et al., and that an instance of the video is produced and sent via switching network to the user station.

However, claim 9 includes the system of claim 1, which neither describes nor suggests the features of Verbiest et al. reference. Verbiest et al. reference lacks a disclosure or suggestion of a system in which each network 14 is an **independent** network, where networks are **not interconnected** among themselves and each network is only connected with the control center 26, where the control center 26 does **not store any data files** and it **neither communicates nor supplies the user stations directly**.

Because claim 1 is distinguishable from the Verbiest et al. reference, as discussed above, claim 9 of Applicant's disclosure (which includes the system of claim 1) is also patentably distinct from Verbiest et al. Therefore, this rejection is traversed in view of claim 9, and claim 9 is respectfully submitted as being in condition for allowance.

Claim 10 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. which, as it was stated by the Examiner, expands an existing multicast tree.

It was noted above that in the present invention there is no multicast tree. Also, because claim 9 is distinguishable from the Verbiest et al. reference, as discussed herein, claim 10 of Applicant's disclosure (which is dependent on claim 9) is also patentably distinct from Verbiest et al. Therefore, claim 10 is respectfully submitted as being in condition for allowance.

The references cited but not applied in any rejection have been considered. However, it is submitted that the presently claimed invention is patentably distinguished over the references of record for reasons discussed above and for reasons apparent from the claims themselves.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

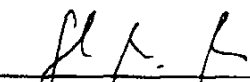
If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (310) 788-5070, to discuss the steps necessary for placing the application in condition for allowance.

Serial No. 09/052,038

Any additional fees required in connection with this communication which are not specifically provided herewith are authorized to be charged to Deposit Account Number **16-2230** in the name of Oppenheimer Wolff & Donnelly LLP. Any overpayments are also authorized to be credited to this account.

Respectfully submitted,

Date: June 9, 1999



Sandra M. Parker
Reg. No. 36233

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East
38th Floor
Los Angeles, CA 90067-3024
Phone: (310) 788-5000
FAX: (310) 788-5100

A

OPPENHEIMER WOLFF & DONNELLY LLP**FACSIMILE TRANSMITTAL SHEET****OFFICIAL****FAX RECEIVED****2029 CENTURY PARK EAST, 38TH FLOOR
LOS ANGELES, CALIFORNIA 90067-3024****JUN 09 1999****TELEPHONE: (310) 788-5000****Group 2700****FACSIMILE: (310) 788-5100****TO:** EXAMINER HABTE BAHGI**COMPANY:** ASSISTANT COMMISSIONER FOR PATENTS**FAX NO:** 703/308-5359 **COUNTRY:** _____**FROM:** SANDRA PARKER**NO. OF PAGES:** 7 **DATE:** 6/9/99
(Including this page)**RETURN FAX TO:** SANDRA PARKER**IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL (310) 788-5000.****COMMENTS:**

DOCKET NUMBER: 16089-14 **CLIENT NAME:** ARJUN KELKAR

PRIVACY AND CONFIDENTIALITY NOTICE: The information contained in this communication is confidential and may be legally privileged. It is intended solely for the use of the individual or entity to whom it is addressed and others authorized to receive it. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or taking of any action in reliance on the contents of this information is strictly prohibited. If you receive this communication in error, please immediately notify us collect by telephone at (310) 788-5000, and return the original document(s) at the above-referenced address via the United States Postal Service.

OFFICIAL
PATENTIN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant:	Anand Kelkar	Examiner:	Habte, B.
Serial No.	09/035,194	Group Art Unit:	2711
Filed:	March 5, 1998	Docket No.	16089-14
Title:	REAL-TIME MUSIC DISTRIBUTION SYSTEM		

FAX RECEIVED

JUN 16 1999

Group 2700

I hereby certify that this correspondence is being transmitted by telecopier, telephone number 703/308-5359, and is addressed to the Examiner Habte Bahgi, on June 15, 1999.

Sandra M. Parker
Sandra M. Parker, Esq.

AMENDMENT

BOX: Non-Fee Amendment
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Responsive to the Office Action mailed April 5, 1999, kindly enter the following amendments:

IN THE CLAIMS

Please amend claims 1, 5, and 6 as follows, and add new claims 11, 12, 13, 14, 15 and 16:

in claim 1, line 1, please add before "networks" the word --independent--;

in claim 1, line 4, please add before "one" --a single--;

in claim 1, line 8, please replace "3" with --4--;

in claim 1, line 13, please add before "one" the word --single--;

in claim 1, line 17, please replace "connected to said distribution" with --directly connected to said network--;

in claim 5, line 4, please add at the end of line --and--;

in claim 6, line 1, please replace "claim 6" with --claim 5--.

A

Serial No. 09/052,038

17 ²11. (New Claim) A system as claimed in claim ²1 wherein said data files include digitized video files.

9 ⁶12. (New Claim) A system as claimed in claim ⁶1 further comprising a storage device for recording the requested data file.

10 ⁶13. (New Claim) A system as claimed in claim ⁶1 further comprising a telephone for sending a request from the user.

Q1 15 ¹²14. (New Claim) A method as claimed in claim ¹²9 wherein the user requesting transmittal of the requested data file to another user, and said transmitting step transmitting said requested data file to another user system.

16 ¹²15. (New Claim) A method as claimed in claim ¹²9 wherein the user system having the control unit of claim 5, further comprising a step of recording the data file at a storage device of the control unit.

14 ¹³16. (New Claim) A method as claimed in claim ¹³10 further comprising a step of using the recorded request information for marketing statistics and billing information.

REMARKS

Applicant has responded quickly in order to keep his special status, which has been kept, according to the today's telephone interview with the Examiner and his Supervisory Examiner. All the amendments proposed in today's interview have been made, as well as the additional amendment of adding the term "directly", in claim 1, line 17, to state "directly connected to said network". Examiners' suggestions and comments were received with gratitude. Reconsideration of the above application is respectfully requested.

The drawings will be corrected after the allowance of the application.

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Serial No. 09/052,038

Specification has been checked and minor errors have been corrected.

Claims 1, 5, and 6 are amended, and new claims 11, 12, 13, 14, 15 and 16 are added. No new matter has been introduced. Claims 1-16 are pending in the application.

Claim 1 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. The Examiner stated that the Verbiest et al. reference discloses a video on demand network in Figure 1, where a plurality of distribution centers are shown as CS, AUX, DS1, DS2, and are connected to the back bone switch BBN. He also stated that the network interface, library & its interface, and a processor are shown as an access network AN1, AN2, coupled to switching networks BBS5 and BBS3. The Examiner also stated that video library in two warehouses CWH and DWH store audio tapes and CD-ROMs, and BBS1 is used for access switching (Fig. 3). He also stated that a processor DSC activates the program control PCM1/PCM2 for program unit PU1/PUN in which a selected video is stored, to produce an instance of the requested video signal and routing control information, indicative of the user station US13, to be used by BBS5 and AN1 to switch the video signal to the correct user station (col. 8, li. 8-14).

Verbiest et al. reference shows that central server has its own video library and readers (col. 8, li. 36), and may transmit to users directly (col. 8, li. 64). Also, the central server has a central library with all videos of the system, and sends updates to distribution centers offline (col. 8, li. 54). Moreover, there is more than one central server: CS-central server and CCC - central control (col. 9, li. 36-47) and also an AUX unit. There are also multiple networks connecting these central units, such as a central network (col. 5, li. 62), and numerous other networks, some of which are mentioned by the Examiner, such as a backbone switch BBN, access networks AN1, AN2, coupled to switching networks BBS5 and BBS3, and BBS1 which is used for access switching, etc. This is necessary because this reference describes a backbone broadband network, on which all **distributed servers are interconnected among themselves** (col. 5, li. 30) or **cross-connected** (col. 5, li. 42), in form of **multicast trees** (col. 8, li. 21), with **multipath self-routing** (col. 5, li. 31). This prior art does not disclose the system, as claimed in claim 1 of the present invention and supported by the specification.

The present invention, as claimed in claim 1 and shown in Fig. 1 and specification, has only one control center 26 **directly connected** via line 16 with all independent regional networks

Serial No. 09/052,038

14. Each independent network 14 has its own distribution center 18 with a data file library. In the present invention each network 14 is an **independent** network, and these networks are **not interconnected** among themselves; each network is only connected with the control center 26. The control center 26 does **not store any data files**, thus no warehouse is required; it only forwards data files from one independent network to another. Moreover, the control center 26 **neither communicates nor supplies the user stations directly**. This is clearly stated in claim 1, which teaches that **each network interface connects to a single one of the networks**, a processor transmitting the data file to **the single one** of the networks and a **central controller** (control center 26) is directly connected to the network interface of each distribution center for **routing information between the distribution centers**.

This distinction is also supported by the Examiner's own statement, when he states that the central controller, connected to the library interface, is shown as the backbone network BBN, itself constituted by broadband packet switching networks BBS1-BBS5, which are interconnected as shown in Fig. 1. In the present invention, as claimed in claim 1, the central controller is not connected to the library interface, since it does not have a library. Moreover, there are no packet switching interconnected networks, and no elements corresponding to broadband packet switching networks BBS1-BBS5 connected to the backbone network BBN.

Further, the present invention, as claimed in claim 1, is distinguished and not taught by Verbiest et al. reference, because the Verbiest et al. reference teaches that a video file cannot be sent in real time, due to bandwidth problems, and thus it has to be sent in advance and stored or recorded. Therefore, the reference needs storage devices such as CD recorders and/or DAT tapes. In the present invention, as claimed in claim 1, a storage device is not necessary, since a data file can be transferred and presented live, in real-time. This precludes need for time stamps and other synchronization tools needed in Verbiest et al. reference.

Thus, claim 1 is distinguished over Verbiest et al., which neither describes nor suggests its features. Therefore, this rejection is traversed in view of claim 1, and claim 1 is respectfully submitted as being in condition for allowance.

Claims 2, 3, and 4 were rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al.

Serial No. 09/052,038

Because claim 1 is distinguishable from the Verbiest et al. reference, as discussed herein, claims 2, 3, and 4 of Applicant's disclosure (which are dependent on claim 1) are also patentably distinct from Verbiest et al. Therefore, claims 2, 3, and 4 are respectfully submitted as being in condition for allowance.

Claims 5 and 8 were rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al.

It was noted above that in the present invention there is no multicast tree. Also, because claim 1 is distinguishable from the Verbiest et al. reference, as discussed herein, claims 5 and 8 of Applicant's disclosure (which are dependent on claim 1) are also patentably distinct from Verbiest et al. Therefore, claims 5 and 8 are respectfully submitted as being in condition for allowance.

Claim 9 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. The Examiner stated that generating and receiving a user request, processing, retrieving and transmitting the data to the user is taught by Verbiest et al., and that an instance of the video is produced and sent via switching network to the user station.

However, claim 9 includes the system of claim 1, which neither describes nor suggests the features of Verbiest et al. reference. Verbiest et al. reference lacks a disclosure or suggestion of a system in which each network 14 is an **independent** network, where networks are **not interconnected** among themselves and each network is only connected with the control center 26, where the control center 26 does **not store any data files** and it **neither communicates nor supplies the user stations directly**.

Because claim 1 is distinguishable from the Verbiest et al. reference, as discussed above, claim 9 of Applicant's disclosure (which includes the system of claim 1) is also patentably distinct from Verbiest et al. Therefore, this rejection is traversed in view of claim 9, and claim 9 is respectfully submitted as being in condition for allowance.

Claim 10 was rejected under 35 U.S.C. 102(b) as being anticipated by Verbiest et al. which, as it was stated by the Examiner, expands an existing multicast tree.

It was noted above that in the present invention there is no multicast tree. Also, because claim 9 is distinguishable from the Verbiest et al. reference, as discussed herein, claim 10 of

Serial No. 09/052,038

Applicant's disclosure (which is dependent on claim 9) is also patentably distinct from Verbiest et al. Therefore, claim 10 is respectfully submitted as being in condition for allowance.

The references cited but not applied in any rejection have been considered. However, it is submitted that the presently claimed invention is patentably distinguished over the references of record for reasons discussed above and for reasons apparent from the claims themselves.

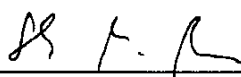
In view of the foregoing, it is respectfully submitted that the application is in condition for allowance. Reexamination and reconsideration of the application, as amended, are requested.

If for any reason the Examiner finds the application other than in condition for allowance, the Examiner is requested to call the undersigned attorney at (310) 788-5070, to discuss the steps necessary for placing the application in condition for allowance.

Any additional fees required in connection with this communication which are not specifically provided herewith are authorized to be charged to Deposit Account Number 16-2230 in the name of Oppenheimer Wolff & Donnelly LLP. Any overpayments are also authorized to be credited to this account.

Respectfully submitted,

Date: June 15, 1999



Sandra M. Parker
Reg. No. 36233

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2029 Century Park East
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Los Angeles, CA 90067-3024
Phone: (310) 788-5000
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- 6 -

◆CAL: 185482 v03 6/15/99

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OPPENHEIMER WOLFF & DONNELLY LLP

FACSIMILE TRANSMITTAL SHEET

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**2029 CENTURY PARK EAST, 38TH FLOOR
LOS ANGELES, CALIFORNIA 90067-3024
TELEPHONE: (310) 788-5000
FACSIMILE: (310) 788-5100**

JUN 16 1999

Group 2700

TO: Examiner Habte Baghi
COMPANY: Assistant Commissioner for Patents
FAX NO: (103) 308-5359 COUNTRY: _____
FROM: Sandra Parker
NO. OF PAGES: 7 DATE: 6/15/99
(Including this page)
RETURN FAX TO: Amber Stewart

IF YOU HAVE ANY PROBLEMS WITH THIS TRANSMISSION, PLEASE CALL (310) 788-5000.

COMMENTS:

DOCKET NUMBER: 16089-14 CLIENT NAME: Touchmusic

PRIVACY AND CONFIDENTIALITY NOTICE: The information contained in this communication is confidential and may be legally privileged. It is intended solely for the use of the individual or entity to whom it is addressed and others authorized to receive it. If you are not the intended recipient, you are hereby notified that any disclosure, copying, distribution or taking of any action in reliance on the contents of this information is strictly prohibited. If you receive this communication in error, please immediately notify us collect by telephone at (310) 788-5000, and return the original document(s) at the above-referenced address via the United States Postal Service.

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Patent and Trademark Office

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Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/035,124	03/05/98	KELKAR	A 16029-1d
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LM02/0826
OPPENHEIMER WOLF & DONNELLY
2029 CENTURY PARK EAST
38TH FLOOR
LOS ANGELES CA 90067-3024

EXAMINER

BOHGL, P

ART UNIT	PAPER NUMBER
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2/11

DATE MAILED: 03/26/99

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/035,194	Applicant(s) ANAND KELKAR	
	Examiner Habte Bahgi	Group Art Unit 2711	

☒ Responsive to communication(s) filed on Jun 9, 1999.

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-16 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-16 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____.

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____.

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

Art Unit: 2711

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-10 and 12-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Verbiest et al. (US Pat. 5,550,577) in view of McCalley et al. (US Pat. 5,113,496).

Regarding claim 1, Verbiest shows a video on demand network in figure 1, where the claimed plurality of distribution centers is shown as CS, AUX, DS1 and DS2 are connected to the back bone switch BBN, and the claimed network interface, library, library interface and a processor are shown as an access networks AN1 and AN2 are coupled to switching networks BBS5 and BBS3, video library constituted by two warehouses CWH and DWH for storing Digital Audio Tapes DAT and CD-ROMs, BBS1 for access switching (See Fig. 3), as for a processor the DSC activates the program control PCM1/PCMN, corresponding to the program unit PU1/PUN in which the selected video signal is stored, to produce an instance of the requested video signal together with routing control information indicative of the user station US13 and the routing control information is used by BBS5 and AN1 to switch the video signal to the correct user

Art Unit: 2711

station (See column 8, lines 8-14). However, Verbiest fails to mention that a central controller connected the network interface of each of the distribution centers for routing information between the distribution centers.

McCalley discloses local operating center (LOC) 24 serves a particular geographical area and regional operating center (ROC) 28 to which multiplicity operating centers are connected (See column 13, lines 1-9). Furthermore, McCalley discloses that the local operating centers 24 and regional operating centers 28 are interconnected by high speed data transmission gateways so that presentations not available within a particular LOC 24 can be imported from another LOC 24 or ROC 28 and stored in the local operating system without significant transmission delay (See column 13, lines 1-9). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the video on demand network as taught by Verbiest into a regional operating center as taught by McCalley in order to allow a connection between two or more local operating centers for the purpose of transmission a presentations not available within a particular local operating center can be imported from another local operating center.

Regarding claim 2, wherein the network interface is a cable television interface is shown in Fig. 2 as the TV is accessing the network.

Regarding claim 3, wherein the data files include digitized music tracks See Fig. 3 Digital Audio Tapes DAT.

Regarding claim 4, wherein each of the libraries includes a plurality of compact discs (CDS) See Fig. 3 CD-ROM.

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Regarding claim 5, a plurality of control units each having a user address and including a user input, output and a decoding circuitry is taught by Verbiest as the latter server controller DSC identifies the user station US13 and issues the received frame and transmits corresponding teletext information to US13 via AN1 for instance by expanding an existing multicast tree in BBS5. In ANT of US13 the latter teletext information is converted in the decoder video signal VS which displayed on the television set TV (See column 8, lines 38-45). Furthermore, Verbiest shows on Fig. 2 a remote control unit RC, a television set TV, set top unit STU, and US able to decode the video signal applied to it by AN (See column 6, lines 7-23) as for the claimed "user input; user output; and decoding circuitry".

Regarding claim 6, Verbiest shows on Fig. 2 a TV as for the claimed "wherein each of the output devices includes an audio/visual system".

Regarding claim 7, Verbiest shows on Fig. 2 a remote control unit RC for the claimed "remote control for activating the control unit".

Regarding claim 8, the claimed "modulator" is inherent to Verbiest since an instance of the requested video signal together with routing control information indicative of the user station US13 and the routing control information is used by BBS5 and AN1 to switch the video signal to the correct user station (See column 8, lines 11-14).

Regarding claim 9, generating at a user system a user request, receiving the user request, processing, retrieving and transmitting the requested data to the user is taught by Verbiest as user stations US11/US1N which comprise a conventional set TV, an access network termination unit

Art Unit: 2711

ANT coupled to an access network generally indicated by AN, a remote control unit RC and a set up unit STU. When the remote control unit RC operated by the user communicates with the set up unit STU, the latter generates a control signal CSI based on the instruction used by the user via RC and applies it to access network termination ANT (See column 6, lines 7-15). Furthermore, Verbiest teaches that DSC activates the program control PCM1/PCM_N, corresponding to the program unit PU1/PUN in which the selected video signal is stored, to produce an instance of the requested video signal together with routing control information indicative of the user station US13 and the routing control information is used by BBS5 and AN1 to switch the video signal to the correct user station (See column 8, lines 8-14).

Regarding claim 10, the step of recording request information indicative of the requested data file and user address is inherent to Verbiest since the latter server controller identifies the user station US13 which issued the received frame and transmits corresponding teletext information to US13 via AN1 for instance by expanding an existing multicast tree BBS5 (See column 7, lines 38-42).

Regarding claims 12 and 15, Official Notice is taken that it well known a storage device for recording the requested data file and the method step of recording the data file. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the user unit with a recorder and a storage device in order to make the user's ability being capable of recording and storing at any instant a desired event.

Art Unit: 2711

Regarding claim 13, the claimed "telephone for sending a request fro the user" is met by McCalley (See column 19, lines 41-45).

Regarding claim 14, neither Verbiest nor McCalley fails to mention the transmittal of the requested data file to another user. Official Notice is taken of the use of user requesting transmittal of the requested data file to another user. Therefore, it would have been obvious once a user requests a data file to be transmitted should be transmitted to the requester or different location other than the requester as requested by the user for the purpose of its privacy according to the user.

Regarding claim 16, the claimed step of using the recorded request information for marketing statistics and billing information is met by McCalley (See column 22, lines 39-51).

3. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Verbiest et a. (US Pat. 5,550,577) in view of McCalley et al. (US Pat. 5,113,496) and Shaw et al. (US Pat 5,870,553).

Regarding claim 11, neither Verbiest nor McCalley fails to mention that the data files include digitized video files. Shaw in a system and method for on-demand video serving from magnetic tape using disk leader files discloses on-demand display of motion picture data has generally been effected by storage of the associated digitized video files on magnetic disks (See column 1, lines 26-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the video on demand network as taught by Verbiest in

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view of McCalley by using a digitized video files on magnetic disks as taught by Shaw in order to take the advantage of the digitized video files for the purpose of selecting desired video for viewing.

Response to Amendment

4. Applicant's arguments with respect to claims 1-10 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

Application/Control Number: 09/035,194

Page 8

Art Unit: 2711

however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Bahgi whose telephone number is (703) 308-8208. The examiner can normally be reached on Monday-Friday from 8:30A.M. to 6:00P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Faile, can be reached on (703) 305-4380. The fax phone number for this Group is (703) 308-5359.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-9000.

HB: hb


8/16/99



JOHN W. MILLER
PATENT EXAMINER

Notice of References Cited			Application No. 09/035,194		Applicant(s) ANAND KELKAR		
			Examiner Habte Bahgi		Group Art Unit 2711	Page 1 of 1	
U.S. PATENT DOCUMENTS							
		DOCUMENT NO.	DATE	NAME		CLASS	SUBCLASS
	A	5,870,553	2/9/99	Shaw et al.		395	200.49
	B						
	C						
	D						
	E						
	F						
	G						
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	I						
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NON-PATENT DOCUMENTS							
		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)					DATE
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Washington, D.C. 20231

APPLICATION NUMBER	FILING DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NO
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EXAMINER	
BAHGI	
ART UNIT	PAPER NUMBER
2711	8

DATE MAILED:

INTERVIEW SUMMARY

All participants (applicant, applicant's representative, PTO personnel):

- (1) Ken Gural #36,152 (3) _____
(2) HABTE BAHGI (4) _____

Date of Interview 12/22/99

Type: ☒ Telephonic ☐ Televideo Conference ☐ Personal (copy is given to ☐ applicant ☒ applicant's representative).

Exhibit shown or demonstration conducted: ☐ Yes ☒ No If yes, brief description: _____

Agreement ☐ was reached. ☒ was not reached.

Claim(s) discussed: 1

Identification of prior art discussed: Verbiest and McCally, both of record

Description of the general nature of what was agreed to if an agreement was reached, or any other comments: Applicant's representative presenting two amended versions of claim 1.
Examiner to re-consider claim 1 rejection in view of applicant's proposed amended claim.

(A fuller description, if necessary, and a copy of the amendments, if available, which the examiner agreed would render the claims allowable must be attached. Also, where no copy of the amendments which would render the claims allowable is available, a summary thereof must be attached.)

☒ It is not necessary for applicant to provide a separate record of the substance of the interview.

Unless the paragraph above has been checked to indicate to the contrary. A FORMAL WRITTEN REPLY TO THE LAST OFFICE ACTION IS NOT WAIVED AND MUST INCLUDE THE SUBSTANCE OF THE INTERVIEW. (See MPEP Section 713.04). If a reply to the last Office action has already been filed, APPLICANT IS GIVEN ONE MONTH FROM THIS INTERVIEW DATE TO FILE A STATEMENT OF THE SUBSTANCE OF THE INTERVIEW.

Examiner Note: You must sign this form unless it is an attachment to another form.

FORM PTOL-413 (REV. 2-98)

ANDREW I. FAILE
SUPERVISORY PATENT EXAMINER
GROUP 2700

CLAIMS

What is claimed is:

1. (Second Amended) A system for distributing data files to users connected in a plurality of independent networks, said system comprising:
 - a) a plurality of distribution centers each including:
 - 1) a network interface including an input and an output for connecting to a single one of the networks;
 - 2) a library including a plurality of data files;
 - 3) a library interface including an input and an output connected to said library; and
 - 4) a processor connected to said network interface and said library interface, said processor for:
 - (a) receiving a request from a user via said input of said network interface, said request including information on one or more [a] requested data [file] files and a user address;
 - (b) determining which of said requested data files are available in said library, and which of said requested data files are unavailable in said library and for each of said available data files, retrieving said available requested data file from said library via said library interface; and for each unavailable of said data files, sending a file import request to a central controller requesting said unavailable data files and receiving said unavailable data files through said network interface;
 - (c) transmitting said requested data files to said single one of the networks via said output of said network interface; and
 - (d) recording request information indicative of said requested data file and said user address and
 - b) a central controller directly connected to said network interface of each of said distribution centers for
 - 1) receiving file import requests from a requesting distribution center, said file import requests including information relating to requested data files;
 - 2) searching the library within at least one other of said distribution centers to locate at least one requested data file of said requested data files; and
 - 3) instructing said other distribution center to retrieve and transmit the requested data file that was located therein to said requesting distribution center.

[routing information between said distribution centers.]

all
new

1 (second amended). A system for distributing digital audio [data] files in substantially real time to users connected [in] to a plurality of satellite or cable TV networks, said system comprising:

a) a plurality of private distribution centers, each including:

- 1) a network interface including an input and an output for connecting to one of the satellite or cable TV networks;
- 2) a library including a plurality of digital audio [data] files;
- 3) a library interface including an input and an output connected to said library; and
- 4) a processor connected to said network interface and said library interface, said processor for:

(a) displaying to a user a menu of said digital audio files;

[(a)] (b) receiving [a] requests from a user [via said input of said network interface] for a plurality of said [, said request including information on a requested] digital audio [data] files and a user address;

[(b)] (c) retrieving said requested digital audio [data] files from said library via said library interface;

(c) sequentially transmitting said requested digital audio [data] files in substantially real time to said user through one of the satellite or cable TV networks via said output of said network interface; and

(d) recording [request information indicative of said requested] the digital audio [data] files requested by said user and said user address in a database; and

b) a central controller connected to said network interface of each of said distribution centers for routing [information] digital audio data files between said distribution centers.

#9
PATENT
Client/Matter No. 016089/14
1/11/00
W. Lawson

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: ANAND KELKAR
EXAMINER: HABTE, B.
SERIAL NO. 09/035,194
GROUP ART 2711
UNIT:
FILED: MARCH 5, 1998
DOCKET NO. 16089-14
TITLE: REAL-TIME MUSIC DISTRIBUTION SYSTEM

Received
DEC 2 2 1999
Group 2700

PETITION FOR EXTENSION OF TIME TO RESPOND

Assistant Commissioner for Patents
Washington, D.C. 20231
Sir:

Applicant hereby petitions the Commissioner of Patents and Trademarks for a one-month extension of time to respond to the Examiner's Final Rejection dated August 26, 1999. The new due date will be December 26, 1999.

Applicant is a large entity; accordingly submitted herewith is an Oppenheimer Wolff & Donnelly LLP check in the amount of \$55.

Please charge any additional fee that may be due or credit any overpayment to our Deposit Account No. 16-2230. A duplicate copy of this Petition is enclosed.

Respectfully submitted,



Louis J. Bovasso, Reg. 24,075
OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Fl.
Los Angeles, CA 90067-3024
310/788-5000

01/12/2000 WILAMSON 00000001 09035194
LJB/dg
01 FC:215 Enc. Duplicate copy of petition
Check 55.00 DP

LA: 208528 v01 11/05/1999

Serial No. 09/035,194

Docket No. 16089-14

I hereby certify that this correspondence is being deposited on December 27, 1999 with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

Diane Gilden



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of : Group Art Unit: 2711
Anand Kelker, et al. : Examiner: H. Bahgi
Title: Real-Time Music Distribution :
Systems :
Serial No.: 09/035,194 :
Filed: March 5, 1998 :

RECEIVED
DEC 5 2001
MAIL ROOM

PETITION FOR EXTENSION OF TIME

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant hereby petitions the Commissioner of Patents and Trademarks for a one-month extension of time to respond to the Response to the Office Action dated August 26, 1999. The new due date will be December 26, 1999.

Applicant is a small entity; accordingly submitted herewith is an Oppenheimer Wolff & Donnelly LLP check in the amount of \$55.

This Petition is being filed simultaneously with a Renewed Petition Under 37 C.F.R. 1.48(a)..

01/04/2000 AMOHAME 00000095 09035194

01 FC:215

55.00 OP

Adjustment date: 01/12/2000 WLAWSON
01/04/2000 AMOHAME 00000095 09035194
01 FC:215 -55.00 OP

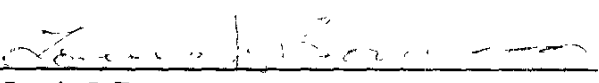
Repln. Ref: 01/12/2000 WLAWSON 001706180
DAM: 162230 Name/Number: 09035194
FC: 704 \$55.00 CR

Serial No. 09/035,194

Docket No. 16089-14

Please charge any additional fee that may be due or credit any overpayment to our Deposit Account No. 16-2230. A duplicate copy of this Petition is enclosed.

Respectfully submitted,

By 

Louis J. Bovasso

Reg. No. 24,075

Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP

2029 Century Park East, 38th Floor

Los Angeles, CA 90067-3024

Telephone: (310) 788-5000

Facsimile: (310) 788-5100

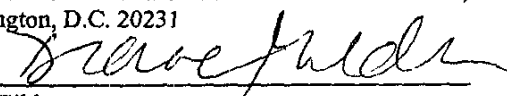
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Serial No. 09/035,194

Docket No. 16089-14

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Diane Gilden

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2711
Anand Kelker, et al.	:	Examiner: H. Bahgi
Title: Real-Time Music Distribution Systems	:	
Serial No.: 09/035,194	:	
Filed: March 5, 1998	:	

RECEIVED
DEC 30 1999
MAIL ROOM

PETITION FOR EXTENSION OF TIME

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant hereby petitions the Commissioner of Patents and Trademarks for a one-month extension of time to respond to the Response to the Office Action dated August 26, 1999. The new due date will be December 26, 1999.

Applicant is a small entity; accordingly submitted herewith is an Oppenheimer Wolff & Donnelly LLP check in the amount of \$55.

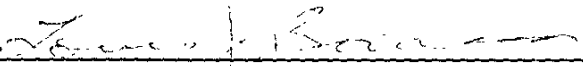
This Petition is being filed simultaneously with a Renewed Petition Under 37 C.F.R. 1.48(a)..

Serial No. 09/035,194

Docket No. 16089-14

Please charge any additional fee that may be due or credit any overpayment to our Deposit Account No. 16-2230. A duplicate copy of this Petition is enclosed.

Respectfully submitted,

By: 

Louis J. Bovasso

Reg. No. 24,075

Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP

2029 Century Park East, 38th Floor

Los Angeles, CA 90067-3024

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Facsimile: (310)788-5100

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285639	11-04-99	016089.14	PETITION FOR ONE MONTH EXT.	018783	55.00

Serial No. 09/035,194

Docket No. 16089-14

I hereby certify that this correspondence is being deposited on December 27, 1999 with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231

Diane Gilden
Diane Gilden



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W. Layson
1/11/00
W. Layson
2/23/00
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1-5-2000
ROOM

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Group Art Unit: 2711

Anand Kelker, et al.

Examiner: H. Bahgi

Title: Real-Time Music Distribution Systems

Serial No.: 09/035,194

Filed: March 5, 1998

→ AFTER FINAL 1.11.6

RESPONSE TO OFFICE ACTION DATED AUGUST 26, 1999

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Responsive to the final rejection mailed August 26, 1999, as extended by the enclosed Petition, please amend this application as follows.

In the Claims:

Please amend Claim 1 as follows:

2. X. (Twice Amended) A system for distributing data files to users connected in a plurality of independent networks, said system comprising:

a) a plurality of distribution centers, each including:

- 1) a network interface including an input and an output for connecting to a single one of the networks;
- 2) a library including a plurality of data files;
- 3) a library interface including an input and an output connected to said library; and
- 4) a processor connected to said network interface and said library interface, said processor for:

(a) receiving a request from a user via said input of said network interface, said request including information on one or more [a] requested data [file] files and a user address;

(b) determining which of said requested data files are available in said library ("available requested data files"), and which of said requested data files are unavailable in said library ("unavailable requested data files") and for each of said available requested data files, retrieving said available requested data file from said library via said library interface; and for each of said unavailable requested data files, sending a file import request to a central controller requesting said unavailable requested data files and receiving said unavailable requested data files through said network interface;

(c) transmitting said requested data files to said single one of the networks via said output of said network interface; and

(d) recording request information indicative of said requested data file and said user address; and

b) a central controller directly connected to said network interface of each of said distribution centers for:

1) receiving file import requests from a requesting distribution center, said file import requests including information relating to requested data files;

2) searching the library within at least one other of said distribution centers to locate at least one requested data file of said requested data files; and

3) instructing said other distribution center to retrieve and transmit the requested data file that was located therein to said requesting distribution center.

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A

Please add the following claim:

1. 17. A system for distributing digital audio files in substantially real time to users connected to a plurality of satellite or cable TV networks, said system comprising:
- a) a plurality of private distribution centers, each including:
 - 1) a network interface including an input and an output for connecting to one of the satellite or cable TV networks;
 - 2) a library including a plurality of digital audio files;
 - 3) a library interface including an input and an output connected to said library; and
 - 4) a processor connected to said network interface and said library interface, said processor for:
 - (a) displaying to a user a menu of said audio files;
 - (b) receiving requests from a user for a plurality of said digital audio files and a user address;
 - (c) retrieving said requested digital audio files from said library via said library interface;
 - (d) sequentially transmitting said requested digital audio files in substantially real time to said user through one of the satellite or cable TV networks via said output of said network interface; and
 - (e) recording the digital audio files requested by said user and said user address in a data base; and
 - b) a central controller connected to said network interface of each of said distribution centers for routing digital audio data files between said distribution centers.

REMARKS

The interview with the Examiner on December 22, 1999 is greatly appreciated. At that interview, the two proposed amended independent claims were discussed. The Examiner made no commitment, but agreed to reconsider his rejection of Claim 1 prior to amendment if these claims were formally presented.

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B

Accordingly, by this amendment, applicant has amended original Claim 1, as discussed at the interview, to include further information relating to the manner in which the central controller performs the routing function between the distribution centers. It is believed that these limitations distinguish over the art of record.

In particular, McCalley has a hierarchy of LOCs, all feeding from an ROC. In none of the higher LOCs or ROCs is it possible to identify a "central controller" that searches the libraries of lower LOCs upon request of another LOC and initiates a file transfer to the requesting distribution center and thence to the user. Verbiest also teaches a system that is distinguished from the present system, first in that the topology of the overall system has a complex switching network connecting the users and the plurality of distribution centers rather than a plurality of independent networks as in the instant invention, and second in that the central controller provides files to the distributed servers, also without a step of searching the local libraries.

In summary, newly amended Claim 1 and dependent claims 2-16 are now believed to be in a condition for allowance, and early and favorable reconsideration thereof is respectfully requested.

New Claim 17 is the same as the other of the two amended claims discussed at the interview. New Claim 17 should also be allowed since neither Verbiest, et al. nor McCalley, et al. distributes files in substantially real time. There is no sequential transmission of the requested files in substantially real time to the user. This is not shown or suggested in Verbiest, et al. nor McCalley, et al., nor is it obvious to so modify either reference to reach applicant's claimed system. Thus, Claim 17 should also be allowed.

The amendments to Claim 1 and the subject matter of new Claim 17 were not presented earlier since applicant has been making a sincere effort to amend the claims to avoid the prior art cited. The McCalley, et al. patent was applied against the claims for the first time in the final rejection. The Examiner can appreciate the fact that the subject matter in this application is rather complex and the differences over the prior art, albeit slight, may be extremely significant in having a viable and commercial product. These differences are brought out in amended Claim 1 and new Claim 17.

B

However, if the Examiner does not believe these amendments place the case in condition for allowance, he is respectfully requested to enter them for purposes of appeal.

Respectfully submitted,

By 
Louis J. Bovasso
Reg. No. 24,078
Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Floor
Los Angeles, CA 90067-3024
Telephone: (310) 788-5000
Facsimile: (310) 788-5100



#11
W. Lauer
PATENT 1/11/00
Client/Matter No. 016089/14

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICANT: ANAND KELKAR EXAMINER: HABTE, B.
SERIAL NO. 09/035,194 GROUP ART 2711
UNIT:
FILED: MARCH 5, 1998 DOCKET NO. 16089-14
TITLE: REAL-TIME MUSIC DISTRIBUTION SYSTEM

Received
DEC 22 1999
Group 2700

ASSOCIATE POWER OF ATTORNEY (37 C.F.R. § 1.34)

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Please recognize as Associate Practitioner in this case:

Name of Practitioner: Ken Gural
Address: 2001 Jefferson Davis Highway
Suite 301
Arlington, VA 22202
Tel. 703/418-2777

Reg. No.: 36,152

NOTE: Correspondence will be held with the associate attorney, unless the principal attorney directs otherwise. MPEP § 403.01. NOTE: An associate attorney may not appoint another attorney. MPEP § 402.02, 6th ed.

Please direct all correspondence to the undersigned.

Respectfully submitted,

OPPENHEIMER WOLFF & DONNELLY LLP

Dated: Nov 5, 1999

By Louis J. Bovasso

Louis J. Bovasso, Reg. 24,075
Customer No.: 001346
Tel. No.: 310/788-5000

LA: 208533 v01 11/05/1999



**UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office**

Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/23/94	03/25/95	KELKAR	15039-14

LM61/0131

OFFENHEIMER WOLFF & DONNELLY
2029 CENTURY PARK EAST
38TH FLOOR
LOS ANGELES CA 90067-3024

EXAMINER
BAHSL, H

ART. UNIT
2711

PAPER NUMBER

DATE MAILED: 01/31/00

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Advisory Action	Application No. 09/035,194	Applicant(s) ANAND KELKAR	
	Examiner Habte Bahgi	Group Art Unit 2711	[Barcode]

THE PERIOD FOR RESPONSE: [check only a) or b)]

a) ☐ expires _____ months from the mailing date of the final rejection.

b) ☒ expires either three months from the mailing date of the final rejection, or on the mailing date of this Advisory Action, whichever is later. In no event, however, will the statutory period for the response expire later than six months from the date of the final rejection.

Any extension of time must be obtained by filing a petition under 37 CFR 1.136(a), the proposed response and the appropriate fee. The date on which the response, the petition, and the fee have been filed is the date of the response and also the date for the purposes of determining the period of extension and the corresponding amount of the fee. Any extension fee pursuant to 37 CFR 1.17 will be calculated from the date of the originally set shortened statutory period for response or as set forth in b) above.

☐ Appellant's Brief is due two months from the date of the Notice of Appeal filed on _____ (or within any period for response set forth above, whichever is later). See 37 CFR 1.191(d) and 37 CFR 1.192(a).

Applicant's response to the final rejection, filed on Dec 30, 1999 has been considered with the following effect, but is NOT deemed to place the application in condition for allowance:

☒ The proposed amendment(s):

☐ will be entered upon filing of a Notice of Appeal and an Appeal Brief.

☒ will not be entered because:

☒ they raise new issues that would require further consideration and/or search. (See note below).

☐ they raise the issue of new matter. (See note below).

☐ they are not deemed to place the application in better form for appeal by materially reducing or simplifying the issues for appeal.

☐ they present additional claims without cancelling a corresponding number of finally rejected claims.

NOTE: The requested amendment to claim 1 and a newly added claim 17 would require further consideration and/or search.

☐ Applicant's response has overcome the following rejection(s):

☐ Newly proposed or amended claims _____ would be allowable if submitted in a separate, timely filed amendment cancelling the non-allowable claims.

☐ The affidavit, exhibit or request for reconsideration has been considered but does NOT place the application in condition for allowance because:

☐ The affidavit or exhibit will NOT be considered because it is not directed SOLELY to issues which were newly raised by the Examiner in the final rejection.

☒ For purposes of Appeal, the status of the claims is as follows (see attached written explanation, if any):

Claims allowed: _____

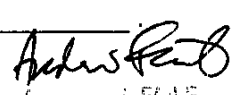
Claims objected to: _____

Claims rejected: 1-16

☐ The proposed drawing correction filed on _____ ☐ has ☐ has not been approved by the Examiner.

☐ Note the attached Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Other _____


 SUPERVISOR, APPEAL EXAMINER
 GROUP 2700



00-00-00

06A-2711

#13
W. L. Landon
2/23/00

CONTINUED PROSECUTION APPLICATION (CPA) REQUEST TRANSMITTAL

Submit an original, and a duplicate for fee processing.
(Only for Continuation or Divisional applications under 37 C.F.R. § 1.53(d))

Check Box, if applicable

☒ DUPLICATE

Address to: Assistant Commissioner for Patents Box CPA Washington, DC 20231	Attorney Docket No.	016089/14
	First Named Inventor	Anmand Keekar
	Express Mail Label No.	EL502381985US
	Total Pages	

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FEB 18 2000
TECH CENTER 2700

This is a request for a ☒ continuation or ☐ divisional application under 37 C.F.R. § 1.53(d), (continued prosecution application (CPA)) of prior application number, **09/035,194** filed on **March 5, 1998**, entitled **REAL-TIME MUSIC DISTRIBUTION SYSTEMS**

NOTES

FILING QUALIFICATIONS: The prior application identified above must be a nonprovisional application that is either: (1) complete as defined by 37 C.F.R. § 1.51(b) and filed on or after June 8, 1995, or (2) the national stage of an international application in compliance with 35 U.S.C. 371 and filed on or after June 8, 1995.

C-I-P NOT PERMITTED: A continuation-in-part application cannot be filed as a CPA under 37 C.F.R. § 1.53(d), but must be filed under 37 C.F.R. § 1.53(b).

EXPRESS ABANDONMENT OF PRIOR APPLICATION: The filing of this CPA is a request to expressly abandon the prior application as of the filing date of the request for a CPA. 37 C.F.R. § 1.53(b) must be used to file a continuation, divisional, or continuation-in-part of an application that is not to be abandoned.

ACCESS TO PRIOR APPLICATION: The filing of this CPA will be construed to include a waiver of confidentiality by the applicant under 35 U.S.C. 122 to the extent that any member of the public who is entitled under the provisions of 37 C.F.R. § 1.14 to access to, copies of, or information concerning, the prior application may be given similar access to, copies of, or similar information concerning, the other application or applications in the file jacket.

35 U.S.C. 120 STATEMENT: In a CPA, no reference to the prior application is needed in the first sentence of the specification and none should be submitted. If a sentence referencing the prior application is submitted, it will not be entered. A request for a CPA is the specific reference required by 35 U.S.C. 120 and to every application assigned the application number identified in such request, 37 C.F.R. § 1.78(a).

- ☒ Enter the unentered amendment previously filed on **December 27, 1999** under 37 C.F.R. § 1.116 in the prior nonprovisional application.
- ☐ A preliminary amendment is enclosed.
- ☐ This application is filed by fewer than all the inventors named in the prior application, 37 C.F.R. § 1.53(d)(4).
 - ☐ DELETE the following inventor(s) named in the prior non-provisional application:
 - ☐ The inventor(s) to be deleted are set forth on a separate sheet attached hereto.
- ☐ A new power of attorney or authorization of agent (PTO/SB/81) is enclosed.
- ☐ Information Disclosure Statement (IDS) is enclosed:
 - ☐ PTO-1449
 - ☐ Copies of IDS Citations

02/18/2000 DUVONG 00000100 09035194

01 FC:231 345.00 DP

Repln. Ref: 02/18/2000 DUVONG 0021292700

DA#162230 Name/Number:09035194

FC: 704 \$35.00 CR

CLAIMS	(1) FOR	(2) NUMBER FILED	(3) NUMBER EXTRA	(4) RATE	(5) CALCULATIONS
	TOTAL CLAIMS (37 C.F.R. § 1.16(c))	17 - 20	X	\$ 22	0
	INDEPENDENT CLAIMS (37 C.F.R. § 1.16(b))	2 - 3	X	\$ 82	0
	MULTIPLE DEPENDENT CLAIMS (if applicable) (37 C.F.R. § 1.16(d))			\$270	0
				BASIC FEE (37 C.F.R. § 1.16(a))	\$760
				Total of above Calculations =	\$760
	Reduction by 50% for filing by small entity (Note 37 C.F.R. §§ 1.9, 1.27, 1.28)				\$380
				TOTAL =	\$380

6. ☐ Small Entity Status
- a. ☐ A small entity statement is enclosed.
- b. ☒ A small entity statement was filed in the prior nonprovisional application and such statement is still proper and desired.
- c. ☐ Is no longer claimed.
7. ☒ We authorize the Commissioner to credit overpayments or charge the following fees to Deposit Account No. 16-2230:
- a. ☒ Fees required under 37 C.F.R. § 1.16.
- b. ☒ Fees required under 37 C.F.R. § 1.17.
- c. ☐ Fees required under 37 C.F.R. § 1.18.
8. ☒ We enclose a check in the amount of \$380.
9. ☐ Other:

NOTE: The prior application's correspondence address will carry over to this CPA UNLESS a new correspondence address is provided below.

10 NEW CORRESPONDENCE ADDRESS

☐ Customer Number or Bar Code Label

or ☒ New correspondence address below

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067
Telephone (310) 788-5000 • Fax (310) 277-1297
Attn: Louis J. Bovasso

EL502381985US

Express Mailing Label No. EL502381985US, I hereby certify that on February 16, 2000, I am depositing this correspondence and all listed attachments with the United States Postal Service "Express Mail Post Office to Addressee," service under 37 C.F.R. § 1.110, addressed to Assistant Commissioner for Patents, Box CPA, Washington, D.C. 20231.

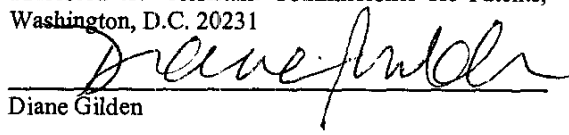
Diane Gilden

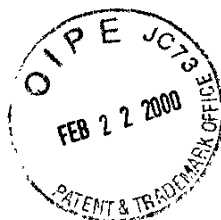
Dated: February 16, 2000

Louis J. Bovasso

Louis J. Bovasso, Registration No. 24,075

I hereby certify that this correspondence is being deposited on February 16, 2000 with the United States Postal Service as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231


Diane Gilden



Client/Matter No. 016089/14

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#14
W. Lamer
3/3/00

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2711
Anand Kelker, et al.	:	Examiner: H. Bahgi
Title: Real-Time Music Distribution Systems	:	
Serial No.: 09/035,194	:	
Filed: March 5, 1998	:	

PETITION FOR EXTENSION OF TIME TO RESPOND

Assistant Commissioner for Patents

Washington, D.C. 20231

Sir:

Applicant hereby petitions the Commissioner of Patents and Trademarks for a two-month extension of time to respond to the Office Action dated January 31, 2000. The new due date will be March 31, 2000.

Applicant is a small entity; accordingly submitted herewith is an Oppenheimer Wolff & Donnelly LLP check in the amount of \$190.

Please charge any additional fee that may be due or credit any overpayment to our Deposit Account No. 16-2230. A duplicate copy of this Petition is enclosed.

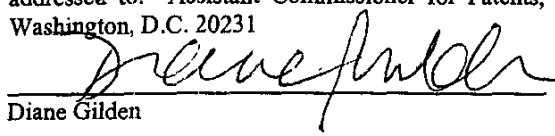
Respectfully submitted,


Louis J. Bovasso, Reg. 24,075
OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Fl.
Los Angeles, CA 90067-3024
310/788-5000

LJB/dg

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Diane Gilden



Client/Matter No. 016089/14

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of	:	Group Art Unit: 2711
Anand Kelker, et al.	:	Examiner: H. Bahgi
Title: Real-Time Music Distribution Systems	:	
Serial No.: 09/035,194	:	
Filed: March 5, 1998	:	

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Assistant Commissioner for Patents

Washington, D.C. 20231

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2029 Century Park East, 38th Fl.
Los Angeles, CA 90067-3024
310/788-5000

LJB/dg

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UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office
Address: COMMISSIONER OF PATENTS AND TRADEMARKS
Washington, D.C. 20231

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/035,194	03/05/98	FELEMAN	15035-194

15035-194
OPPENHEIMER ROBERT & DONNELLY
2029 CENTURY PARK EAST
SUITE 3000
LOS ANGELES CA 90067-3000

EXAMINER

ART UNIT PAPER NUMBER

DATE MAILED: 06/10/00 15

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.
09/035,194

Applicant(s)
ANAND KELKAR

Examiner
Habte Bahgi

Group Art Unit
2711



☒ Responsive to communication(s) filed on Feb 22, 2000

☐ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

Disposition of Claims

☒ Claim(s) 1-17 is/are pending in the application.

Of the above, claim(s) _____ is/are withdrawn from consideration.

☐ Claim(s) _____ is/are allowed.

☒ Claim(s) 1-17 is/are rejected.

☐ Claim(s) _____ is/are objected to.

☐ Claims _____ are subject to restriction or election requirement.

Application Papers

☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been

☐ received.

☐ received in Application No. (Series Code/Serial Number) _____

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

☒ Notice of References Cited, PTO-892

☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____

☐ Interview Summary, PTO-413

☐ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

--- SEE OFFICE ACTION ON THE FOLLOWING PAGES ---

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DETAILED ACTION

Claim Rejections - 35 USC § 112

1. Claim 1 recite the limitation ("available requested data files") and ("unavailable requested data files") in lines 12 and 13, on page 2. It is unclear if they are a positive resuscitation.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371© of this title before the invention thereof by the applicant for patent.

3. Claims 1,3 and 4 are rejected under 35 U.S.C. 102(b) as being anticipated by Williams (US Pat. 5,867,155).

Regarding claim 1, Williams in a large scale distributive video on demand system for the distribution of real estate properties information in Fig. 3 shows a plurality of local servers LS; display; RAM; locator; inventory file; network; and regional server RS. Furthermore, Williams teaches that when a buyer wishes to view for-sale properties which are located outside of the local market or which are not presently available at LS', these files are retrieved from LS", where LS" may be any one, or more of the other LS in the system. In order to identify which LS" may have

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specific property files, or files generally, of the types and locations desired, LS' contacts RS', its designated regional server, and identifies its need. RS' responds to LS' by looking-up, in its national locator file, the one or more LS" which potentially have the files of interest. RS' downloads the addresses of the relevant LS" to LS'. LS' then uses these addresses to contact the relevant LS" directly until it finds an LS" that has the relevant files, and these files then are downloaded (copied) to LS' for its use locally (See column 4, line 62 - column 5, line 8) as for the claimed "plurality of distribution centers each including network interface; library; library interface; processor connected to the network; receiving a request from user; retrieving the request; transmitting the request; recording request; and a central controller directly connected to the network interface of each of the distribution centers for receiving file import request; searching the library and instructing the other distribution center to retrieve and transmit the request data file".

Regarding claim 3, Williams teaches that the full-motion video information is accompanied by digitized audio sound tracks (See column 3, lines 36-37) as for the claimed "wherein the data files include digitized music tracks".

Regarding claim 4, the claimed "libraries includes a plurality of compact discs (CDS)" is taught by Williams as a CD-ROM device including reading and writing capability (See column 5, lines 16-17).

Claim Rejections - 35 USC § 103

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4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 2,5-8,12,13 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US Pat. 5,867,155).

Regarding claim 2, Williams in Fig. 3 shows a network. Therefore, the claimed network interface is a cable television interface would be obvious Williams in order of the implementation of Cable TV systems for remote areas, where an antenna for each household was impractical or prohibitively expensive.

Regarding claim 5, Williams teaches that each node in the network is assigned a unique IP address and any IP is programmed to be able to dial-up any other IP directly using the network (See column 5, 29-34). Furthermore, Williams teaches that an Ethernet network interface circuit, and input devices including a keyboard and a screen pointing device generally known as a "mouse" (See column 5, lines 19-21) as for the claimed "plurality of control units each having a user address and including a user input, output". Regarding the claimed "decoding circuitry" would be obvious Williams, since Williams mentioned that the detected information is decoded into a parallel format of video/data samples, audio samples, and recovered sample clock that are applied to a digital switch in the television receiver (See column 3, lines 16-20).

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Regarding claim 6, Williams teaches that a digital sound reproduction circuit, an Ethernet network interface circuit, and input devices including a keyboard and a screen (See column 5, lines 18-20) as for the claimed “wherein each of the output devices includes an audio/visual system”.

Regarding claim 7, the claimed “remote control” would be obvious to Williams, since Williams mentioned that by using a remote controller the viewer can position the read and write pointers to view any portion of the selected video interactively (See column , lines 6-8).

Regarding claim 8, the claimed “modulator” would be obvious to Williams in order to convert the data signals into a suitable form for transmission over a communications medium, and recover the data from the received communication link.

Regarding claim 12 and 15, Official Notice is taken that it well known a storage device for recording the requested data file and the method step of recording the data file. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the user unit with a recorder and a storage device in order to make the user’s ability being capable of recording and storing at any instant a desired event.

Regarding claim 13, Williams mention that a subscriber uses either a standard telephone instrument over the PSTN or a dedicated control device over an ISDN packet network to order video programming (See column 1, lines 58-61).

6. Claims 9,10,14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US Pat. 5,867,155) in view of Martin et al. (US Pat. 5,781,889).

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Regarding claim 9, Williams fails to mention that a method for distributing music. Martin in a computer jukebox and jukebox network teaches that in Fig. 1 shows a central management system 11 monitors and updates the available selection of music at a number of remotely located jukeboxes such as a jukebox 13, processing circuit 121, graphic library 91, and modems 17 and 19 for communication using a transmission link 15 as for the claimed "generating at a user system a user request, receiving the user request, processing, retrieving and transmitting the requested data to the user". Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the large scale distributive video on demand system for the distribution of real estate properties information as taught by Williams by using a computer jukebox and jukebox network as taught by Martin in order to include music library with video information recorded, stored, transferred, and displayed using high speed digital handling techniques by keeping track of the number times played and the number of credits awarded as taught by Martin.

Regarding claim 10, Martin teaches that the new song request data entered by a customer using the keyboard is stored and uploaded to the management system 11 to aid the system 11 in determining whether new song data should be downloaded to the jukebox (See column 6, lines 59-63) as for the claimed "recording request information indicative of the requested data file and the user address".

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Regarding claim 14, neither Williams nor Martin fails to mention the transmittal of the requested data file to another user. Official Notice is taken of the use of user requesting transmittal of the requested data file to another user. Therefore, it would have been obvious once a user requests a data file to be transmitted should be transmitted to the requester or different location other than the requester as requested by the user for the purpose of its privacy according to the user.

Regarding claim 17, Williams in Fig. 3 shows that a plurality of local servers LS; display; RAM; locator; inventory file; network; and regional server RS. Furthermore, Williams teaches that when a buyer wishes to view for-sale properties which are located outside of the local market or which are not presently available at LS', these files are retrieved from LS", where LS" may be any one, or more of the other LS in the system. In order to identify which LS" may have specific property files, or files generally, of the types and locations desired, LS' contacts RS', its designated regional server, and identifies its need. RS' responds to LS' by looking-up, in its national locator file, the one or more LS" which potentially have the files of interest. RS' downloads the addresses of the relevant LS" to LS'. LS' then uses these addresses to contact the relevant LS" directly until it finds an LS" that has the relevant files, and these files then are downloaded (copied) to LS' for its use locally (See column 4, line 62 - column 5, line 8) as for the claimed "plurality of private distribution centers each including network interface; library; library interface; processor connected to the network; receiving request from user; retrieving the requested; sequentially transmitting the requested; recording the digital audio files requested; and

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a central controller connected to the network interface of each of the distribution centers”.

Regarding the limitations of a real time and a satellite or cable TV networks is mentioned by Williams as a central offices which manages subscriber's request for service and buffers segments of information programs for delivery to subscribers in real-time under the subscriber's interactive control (See column 3, lines 15-18) and the network employs all forms of standard data transfer links including hard wire, microwave, and satellite links as needed and as available for meeting the needs of the objectives (See column 5, lines 34-37). However, Williams fails to mention that a digital audio files.

Martin in a computer jukebox and jukebox network teaches that in Fig. 1 shows a central management system 11 monitors and updates the available selection of music at a number of remotely located jukeboxes such as a jukebox 13, processing circuit 121, display 125, graphic library 91, and modems 17 and 19 for communication using a transmission link 15. Furthermore, Martin teaches that at a block 113, the central management system 11 downloads the compressed digital data of the song to the jukebox 13. At a corresponding block 147, the jukebox 13 receives and writes the data into the song library 91 (See column 6, lines 12-15). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the large scale distributive video on demand system for the distribution of real estate properties information as taught by Williams by using a computer jukebox and jukebox network as taught by Martin in order to include music library with video information recorded, stored, transferred, and

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displayed using high speed digital handling techniques by keeping track of the number times played and the number of credits awarded as taught by Martin.

7. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US Pat. 5,867,155) in view of Martin et al. (US Pat. 5,781,889) and Shaw et al. (US Pat 5,870,553).

Regarding claim 11, neither Williams nor Martin fails to mention that the data files include digitized video files. Shaw in a system and method for on-demand video serving from magnetic tape using disk leader files discloses on-demand display of motion picture data has generally been effected by storage of the associated digitized video files on magnetic disks (See column 1, lines 26-29). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the video on demand network as taught by Williams in view of Martin by using a digitized video files on magnetic disks as taught by Shaw in order to take the advantage of the digitized video files for the purpose of selecting desired video for viewing.

8. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Williams (US Pat. 5,867,155) in view of Martin et al. (US Pat. 5,781,889) and McCalley et al. (US Pat. 5,113,496).

Regarding claim 16, neither Williams nor Martin fails to mention that "the recorded request information for marketing statistics and billing information". McCalley in Bus interconnection structure with redundancy linking plurality of groups of processors, with servers for each group mounted on chassis teaches that the statistical reporting server 107 provides information required for marketing analysis. Data is captured during each subscriber's shopping session, and is used to generate logs of demographic information as to purchasing activity in

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different markets. Additional information on how subscribers navigate through the mall is also available. Reports providing statistical information generated from these logs are produced and provided to commercial clients (See column 22, lines 39-47). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the video on demand network as taught by Williams in view of Martin by using the statistical reporting as taught by McCalley in order for the production of billing reports to the clients, settlement functions for all credit card purchases, and various end of day reconciliation functions as taught by McCalley (See column 22, lines 48-51)

Response to Amendment

9. Applicant's arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Habte Bahgi whose telephone number is (703) 308-8208. The examiner can normally be reached on Monday-Friday from 8:30A.M. to 6:00P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Andrew Faile, can be reached on (703) 305-4380. The fax phone number for this Group is (703) 308-5359.

Application/Control Number: 09/035,194

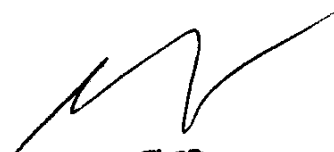
Page 11

Art Unit: 2711

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-9000.

HB: hb

5/5/00



Nathan Flynn
Primary Examiner

Notice of References Cited			Application No. 09/035,194		Applicant(s) ANAND KELKAR	
			Examiner Habte Bahgi		Group Art Unit 2711	Page 1 of 1
U.S. PATENT DOCUMENTS						
		DOCUMENT NO.	DATE	NAME	CLASS	SUBCLASS
	A	5,781,889	7/14/98	Martin et al.	705	1
	B	5,867,155	2/2/99	Williams	345	327
	C					
	D					
	E					
	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					
FOREIGN PATENT DOCUMENTS						
		DOCUMENT NO.	DATE	COUNTRY	NAME	CLASS SUBCLASS
	N					
	O					
	P					
	Q					
	R					
	S					
	T					
NON-PATENT DOCUMENTS						
		DOCUMENT (Including Author, Title, Source, and Pertinent Pages)				DATE
	U					
	V					
	W					
	X					



RECEIVED

SEP 20 2000

Attorney Docket No. 16089-14

PATENT

GP 2711
#16
W. Kumar
9/21/00

TECH CENTER 2700

Serial No. 09/035,194

Filed: March 5, 1998

Title: REAL-TIME MUSIC DISTRIBUTION SYSTEM

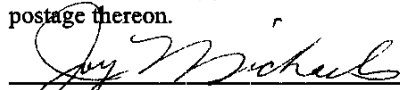
Applicant: Anand KELKAR

Group Art Unit No. 2711

Examiner: Andrew Faile

CERTIFICATE OF MAILING

I hereby certify that on September 11, 2000, this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service, addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, under 37 CFR 1.8(a) with sufficient first class postage thereon.


Joy Michaels

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner of Patents and Trademarks
Washington, D.C. 20231

RESPONSE TO OFFICE ACTION DATED 05/10/2000

Sir:

This is a response to the Office Action dated May 10, 2000, pertaining to the above referenced patent application. Applicant respectfully requests reconsideration of this case in view of the following remarks.

REMARKS

I. Preliminary Remarks

Applicant thanks the Examiner for the telephonic interview of September 8, 2000, in which the pending claims were discussed as distinguishing over Williams '155. Accordingly, Applicant respectfully traverses the rejections in the Office Action and believes that the claims are in condition for allowance for the reasons set forth below.

II. Summary of Rejections

The Examiner made the following rejections in the Office Action dated May 10, 2000: claims 1, 3 and 4 were rejected under 35 U.S.C. §102(b) as being anticipated by Williams '155; claims 2,5-8,12,13 and 15 were rejected under 35 U.S.C. §103(a) as unpatentable over Williams '155; claims 9, 10, 14 and 17 were rejected under 35 U.S.C. §103(a) as unpatentable over

Williams '155 in view of Martin '889; claim 11 was rejected under 35 U.S.C. §103(a) as unpatentable over Williams '155 in view of Martin '889 and Shaw '553; and claim 16 was rejected under 35 U.S.C. §103(a) over Williams '155 in view of Martin '889 and McCalley '496.

Applicant respectfully traverses these rejections.

III. Rejections Under 35 U.S.C. §102(b)

Applicant believes that independent claim 1, and also independent claim 17, distinguish over the art of record. Specifically, in claim 1, a central controller (RS') performs a file transfer in Applicant's invention whereas a requesting distribution center (LS') performs this task in the '155 patent. Accordingly, claim 1 does not read on the Williams '155 reference and therefore is in condition for allowance.

IV. Rejections Under 35 U.S.C. §103(a)

The Examiner rejected claims 2, 5-8, 12, 13 and 15 over the Williams '155 patent alone. Williams does not teach the distinction between discussed above between the Applicant's invention and the Williams '155 patent. Accordingly, these claims are not obvious over the Williams '155 patent and therefore are in condition for allowance.

The Examiner further rejected claims 9, 10, 14 and 17 over Williams '155 in view of Martin '889. Neither Williams nor Martin suggest the distinction between Williams and Applicant's invention discussed above. Independent claim 17 recites a plurality of private distribution centers and a central controller. Similar to independent claim 1, the central controller in claim 17, and not the distribution center, routes the data files between the distribution centers. Accordingly, the cited references do not suggest the elements of these claims and therefore they are in condition for allowance.

The Examiner also rejected claim 11 over Williams '155 in view of Martin '889 and Shaw '553. Neither Williams '155, Martin '889 nor Shaw '155 suggest the distinction between Williams and Applicant's invention discussed above. Accordingly, claim 11 is in condition for allowance.

The Examiner also rejected claim 16 over Williams '155 in view of Martin '889 and McCalley '496. Neither Williams '155, Martin '889 nor McCalley '496 suggest the distinction

S/N: 09/035,194

Docket No. 16089-14

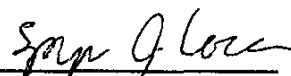
between Williams and Applicant's invention discussed above. Accordingly, claim 16 is also in condition for allowance.

CONCLUSION

In view of the foregoing, Applicant respectfully submits that the claims in the application patentably distinguish over the cited and applied references and are in condition for allowance. If for any reason the Examiner finds the application other than in condition for allowance, Applicant respectfully requests that the Examiner telephone Applicant's undersigned representative at 310-788-5055 to discuss the steps necessary for placing the application in condition for allowance.

Applicant hereby authorizes the Commissioner to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 16-2230. Should such additional fees be associated with an extension of time, applicant respectfully requests that this paper be considered a petition therefore.

Respectfully submitted,

By 
Spyros J. Lazaris
Reg. No. 45,981
Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Floor
Los Angeles, CA 90067-3024
Telephone: (310) 788-5000
Facsimile: (310) 788-5100



CERTIFICATE OF MAILING

I hereby certify that on **September 11, 2000**, this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service, addressed to **Commissioner of Patents and Trademarks, Washington, D.C. 20231**, under 37 CFR 1.8(a) with sufficient first class postage thereon.


Joy Michaels

PATENT
Attorney Docket No. 016089-14
Serial No. 09/035,194
Filed: March 5, 1998
SEP 20 2000
TECH CENTER 2700
Title: REAL-TIME MUSIC DISTRIBUTION SYSTEM
Applicant: Anand KELKAR
Group Art Unit No. 2711
Examiner: Andrew Faile

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner of Patents and Trademarks
Washington, D.C. 20231

PETITION FOR EXTENSION OF TIME TO RESPOND (37 C.F.R. § 1.136)

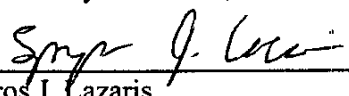
Sir:

It is requested that the period of time for response to the Office Action of May 10, 2000, expiring on August 10, 2000, be extended by one month until September 11, 2000. Applicant is a small entity.

Any fees which are required in connection with this communication and which are not specifically provided for herewith are authorized to be charged to deposit account no. 16-2230. Any overpayments are also authorized to be credited to this account.

Dated: September 11, 2000

Respectfully submitted,


Spyros J. Lazaris
Reg. No. 45,981
Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, Suite 3800
Los Angeles, California 90067-3024
(310) 788-5000 Telephone
(310) 788-5100 Facsimile



PATENT
Attorney Docket No. 016089-14

Serial No. 09/035,194

Filed: March 5, 1998

Title: REAL-TIME MUSIC DISTRIBUTION SYSTEM

Applicant: Anand KELKAR

Group Art Unit No. 2711

Examiner: Habte Bahgi

CERTIFICATE OF MAILING

I hereby certify that on September 11, 2000, this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service, addressed to Commissioner of Patents and Trademarks, Washington, D.C. 20231, under 37 CFR 1.8(a) with sufficient first class postage thereon.

Joy Michaels
Joy Michaels

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner of Patents and Trademarks
Washington, D.C. 20231

ASSOCIATE POWER OF ATTORNEY (37 C.F.R. § 1.34)

Please recognize as an Associate Practitioner in this case:

Name of practitioner: Spyros J. Lazaris
Reg. No.: 45,981
Address: Oppenheimer Wolff & Donnelly LLP
2029 Century Park East, Suite 3800
Los Angeles, CA 90067-3024
Tel. No.: (310) 788-5055
Fax No.: (310) 788-5100

Please continue to send all correspondence to the address of record.

Dated: September 11, 2000

Douglas N. Larson

Douglas N. Larson
Registration No. 29,401
Oppenheimer Wolff & Donnelly LLP
2029 Century Park East, Suite 3800
Los Angeles, CA 90067-3024
Tel. No.: (310) 788-5000
Fax No.: (310) 788-5100

LA: 235151 v02 09/11/2000

Notice of Allowability	Application No. 09/035,194	Applicant Kelkar et al	
	Examiner John W. Miller	Group Art Unit 2711	

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance and Issue Fee Due or other appropriate communication will be mailed in due course.

☒ This communication is responsive to the response of 9/18/00

☒ The allowed claim(s) is/are 1-17 (re-numbered as 2-8, 11-13, 17, 9, 10, 15, 16, 14, and 1)

☐ The drawings filed on _____ are acceptable

☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☐ All ☐ Some* ☒ None of the CERTIFIED copies of the priority documents have been
☐ received.
☐ received in Application No. (Series Code/Serial Number) _____
☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

*Certified copies not received: _____

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

A SHORTENED STATUTORY PERIOD FOR RESPONSE to comply with the requirements noted below is set to EXPIRE THREE MONTHS FROM THE "DATE MAILED" of this Office action. Failure to timely comply will result in ABANDONMENT of this application. Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

☐ Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL APPLICATION, PTO-152, which discloses that the oath or declaration is deficient. A SUBSTITUTE OATH OR DECLARATION IS REQUIRED.

☒ Applicant MUST submit NEW FORMAL DRAWINGS

☐ because the originally filed drawings were declared by applicant to be informal.
☒ including changes required by the Notice of Draftsperson's Patent Drawing Review, PTO-948, attached hereto or to Paper No. 5.
☐ including changes required by the proposed drawing correction filed on _____, which has been approved by the examiner.
☐ including changes required by the attached Examiner's Amendment/Comment.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the reverse side of the drawings. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

☐ Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Any response to this letter should include, in the upper right hand corner, the APPLICATION NUMBER (SERIES CODE/SERIAL NUMBER). If applicant has received a Notice of Allowance and Issue Fee Due, the ISSUE BATCH NUMBER and DATE of the NOTICE OF ALLOWANCE should also be included.

Attachment(s)

☐ Notice of References Cited, PTO-892
☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). _____
☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
☐ Notice of Informal Patent Application, PTO-152
☐ Interview Summary, PTO-413
☐ Examiner's Amendment/Comment
☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
☐ Examiner's Statement of Reasons for Allowance


JOHN W. MILLER
 PRIMARY EXAMINER
 ART UNIT 2711



UNITED STATES DEPARTMENT OF COMMERCE
Patent and Trademark Office

NOTICE OF ALLOWANCE AND ISSUE FEE DUE

LM61700079
OPPENHEIMER WOLFF & CONNELLY
2022 CENTURY PARK EAST
SUITE 3800
LOS ANGELES CA 90067-3000

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/035,193	03/05/98	017	MILLER, J 7711	09/29/00
First Named Applicant	BELMAR, 35 USC 134(b) Patent Ex. 10 (b)(5).			

TITLE OF INVENTION
REAL-TIME MUSIC DISTRIBUTION SYSTEMS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
15089-14	709-219.000	299	UTILITY	YES	\$605.00	12/29/00

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT.
PROSECUTION ON THE MERITS IS CLOSED.

THE ISSUE FEE MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED.

HOW TO RESPOND TO THIS NOTICE:

- I. Review the SMALL ENTITY status shown above.
If the SMALL ENTITY is shown as YES, verify your current SMALL ENTITY status:

A. If the status is changed, pay twice the amount of the FEE DUE shown above and notify the Patent and Trademark Office of the change in status, or

B. If the status is the same, pay the FEE DUE shown above.
- If the SMALL ENTITY is shown as NO:

A. Pay FEE DUE shown above, or

B. File verified statement of Small Entity Status before, or with, payment of 1/2 the FEE DUE shown above.
- II. Part B-Issue Fee Transmittal should be completed and returned to the Patent and Trademark Office (PTO) with your ISSUE FEE. Even if the ISSUE FEE has already been paid by charge to deposit account, Part B Issue Fee Transmittal should be completed and returned. If you are charging the ISSUE FEE to your deposit account, section "4b" of Part B-Issue Fee Transmittal should be completed and an extra copy of the form should be submitted.
- III. All communications regarding this application must give application number and batch number.
Please direct all communications prior to issuance to Box ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Utility patents issuing on applications filed on or after Dec. 12, 1980 may require payment of maintenance fees. It is patentee's responsibility to ensure timely payment of maintenance fees when due.

PATENT AND TRADEMARK OFFICE COPY

PTOL-85 (REV. 10-96) Approved for use through 06/30/99. (0651-0033)

U.S. GPO: 1999-454-457/24601

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Diane Gilden (Depositor's name)

(Signature)

November 8, 2000 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/21/94	03/05/98	017	MILLER, J 2711	09/29/00
First Named Applicant	35 USC 154(b) term ext. = 0 days.			

TITLE OF INVENTION: REMOTE MUSIC DISTRIBUTION SYSTEMS

ATTY'S DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2	720-219.000	299	UTILITY	YES	\$605.00 620	12/29/00

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363). Use of PTO form(s) and Customer Number are recommended, but not required.

- ☐ Change of correspondence address (or Change of Correspondence Address form PTO/SB/122) attached.
- ☐ "Fee Address" indication (or "Fee Address" Indication form PTO/SB/47) attached.

2. For printing on the patent front page, list (1) the names of up to 3 registered patent attorneys or agents OR, alternatively, (2) the name of a single firm acting as a member a registered agent and the name of the firm. If no name will be printed.

Oppenheimer Wolff & Donnelly LLP

2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)
PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. Inclusion of assignee data is only appropriate when an assignment has been previously submitted to the PTO or is being submitted under separate cover. Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE: Touchmusic Entertainment LLC
a Limited Liability Company of California
(B) RESIDENCE: (CITY & STATE OR COUNTRY) 12304 Santa Monica Blvd.,
3rd Fl., Los Angeles, CA 90025

Please check the appropriate assignee category indicated below (will not be printed on the patent)

- ☐ Individual ☐ corporation or other private group entity ☐ government

4a. The following fees are enclosed (make check payable to Commissioner of Patents and Trademarks):

- ☒ Issue Fee
☒ Advance Order - # of Copies 10

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Diane Gilden (Depositor's name)

[Signature] (Signature)

November 8, 2000 (Date)

APPLICATION NO.	FILING DATE	TOTAL CLAIMS	EXAMINER AND GROUP ART UNIT	DATE MAILED
09/035,194	03/05/98	017	MILLER, J 2711	09/29/00
First Named Applicant	35 USC 154(b) term ext. = 0 Days.			

TITLE OF INVENTION: REAL-TIME MUSIC DISTRIBUTION SYSTEMS

ATTYS DOCKET NO.	CLASS-SUBCLASS	BATCH NO.	APPLN. TYPE	SMALL ENTITY	FEE DUE	DATE DUE
2 10069-14	709-219.000	Z99	UTILITY	YES	\$605.00 62.0	12/29/00

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Oppenheimer Wolff & Donnelly LLP

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3 _____

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(A) NAME OF ASSIGNEE: Touchmusic Entertainment LLC
a Limited Liability Company of California
(B) RESIDENCE: (CITY & STATE OR COUNTRY) 12304 Santa Monica Blvd.,
3rd Fl., Los Angeles, CA 90025
Please check the appropriate assignee category indicated below (will not be printed on the patent)

☐ individual ☐ corporation or other private group entity ☐ government

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11/14/2000 CVO222 00000095 09035194
620.00
30.00
01 FC:242
02 FC:561

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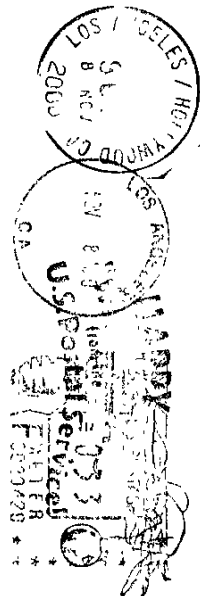
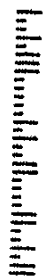
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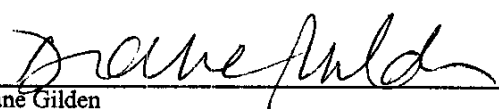
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11/18/2000

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Client/Matter No. 016089/14

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Diane Gilden

Applicant: Anand Kelkar
Serial No.: 09/035,194
Filed: March 5, 1998
Title: REAL-TIME MUSIC
DISTRIBUTION SYSTEMS
Examiner: J. Miller
Group Art Unit: 2711

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Attn: Chief Draftsperson
Asst. Commissioner for Patents
Box NON FEE AMENDMENT
Washington, D.C. 20231

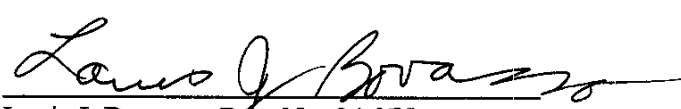
LETTER

Sir:

Submitted herewith are formal drawings.

Respectfully submitted,

November 17, 2000

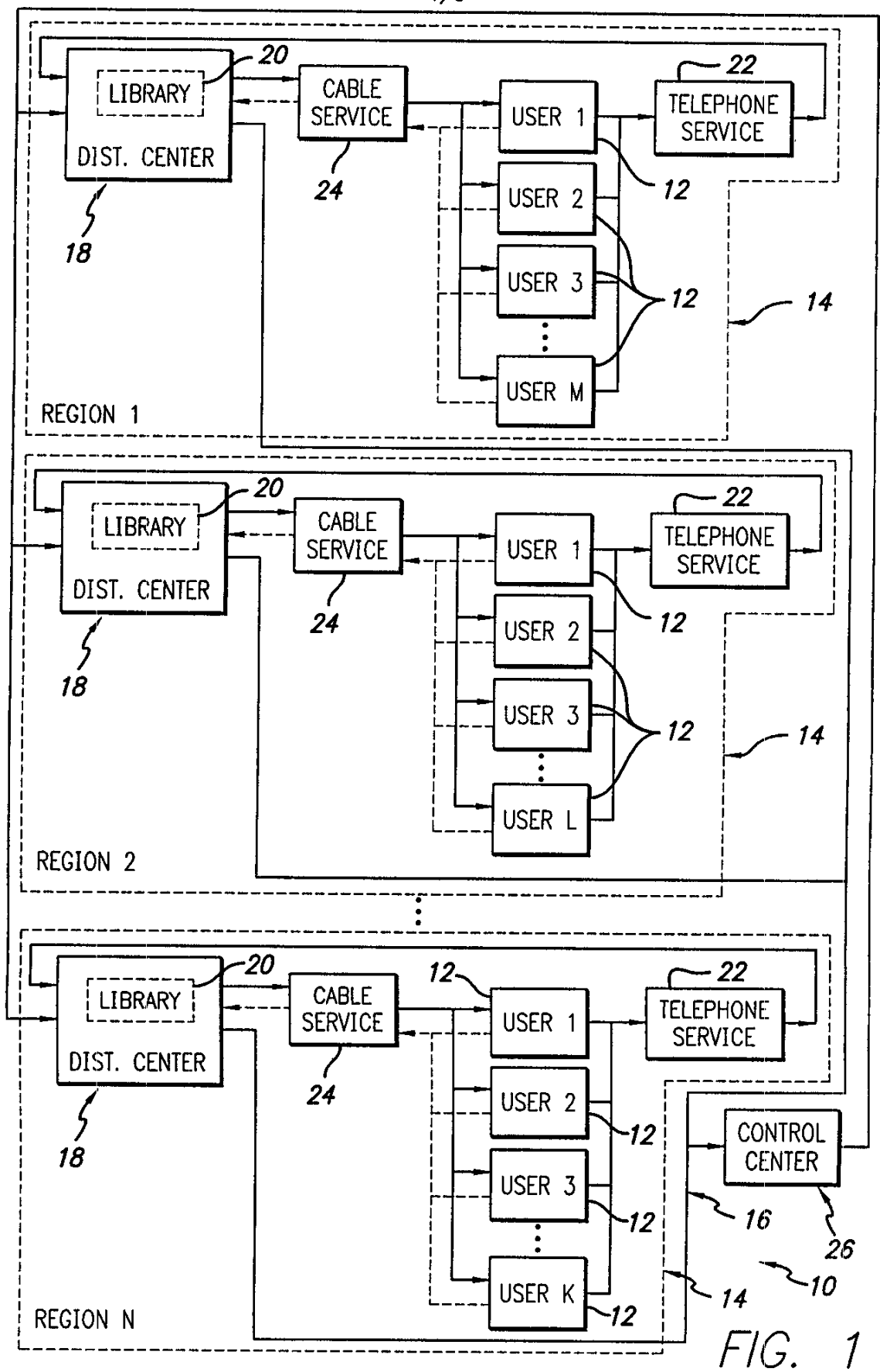

Louis J. Bovasso, Reg. No. 24,075
Attorney for Applicant

OPPENHEIMER WOLFF & DONNELLY LLP
2029 Century Park East, 38th Floor
Los Angeles, CA 90067-3024
Telephone: (310) 788-5000 • Fax: (310) 788-5100

Enc. Drawings

LA: 263564 v01 11/17/2000

1/3



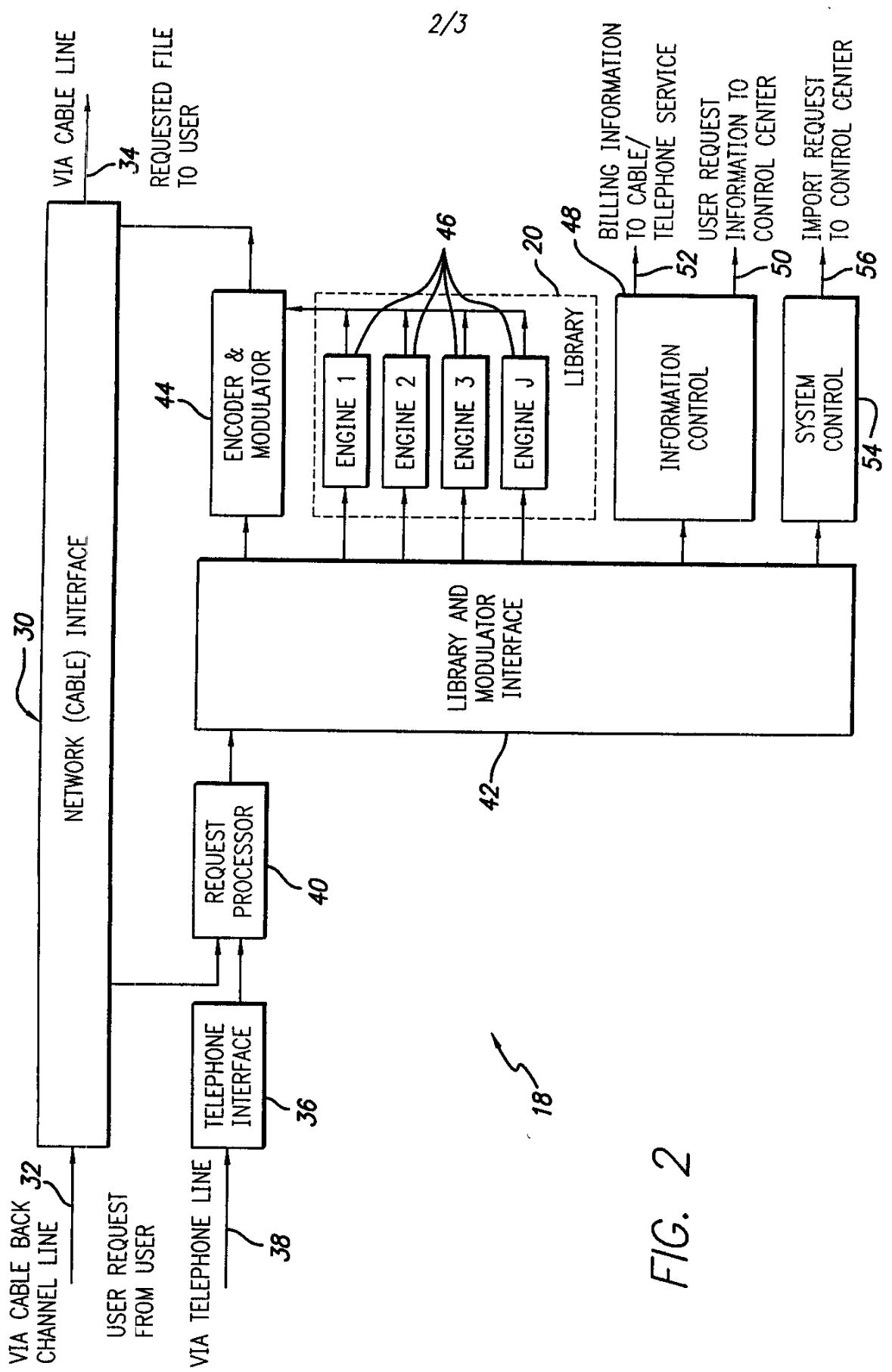
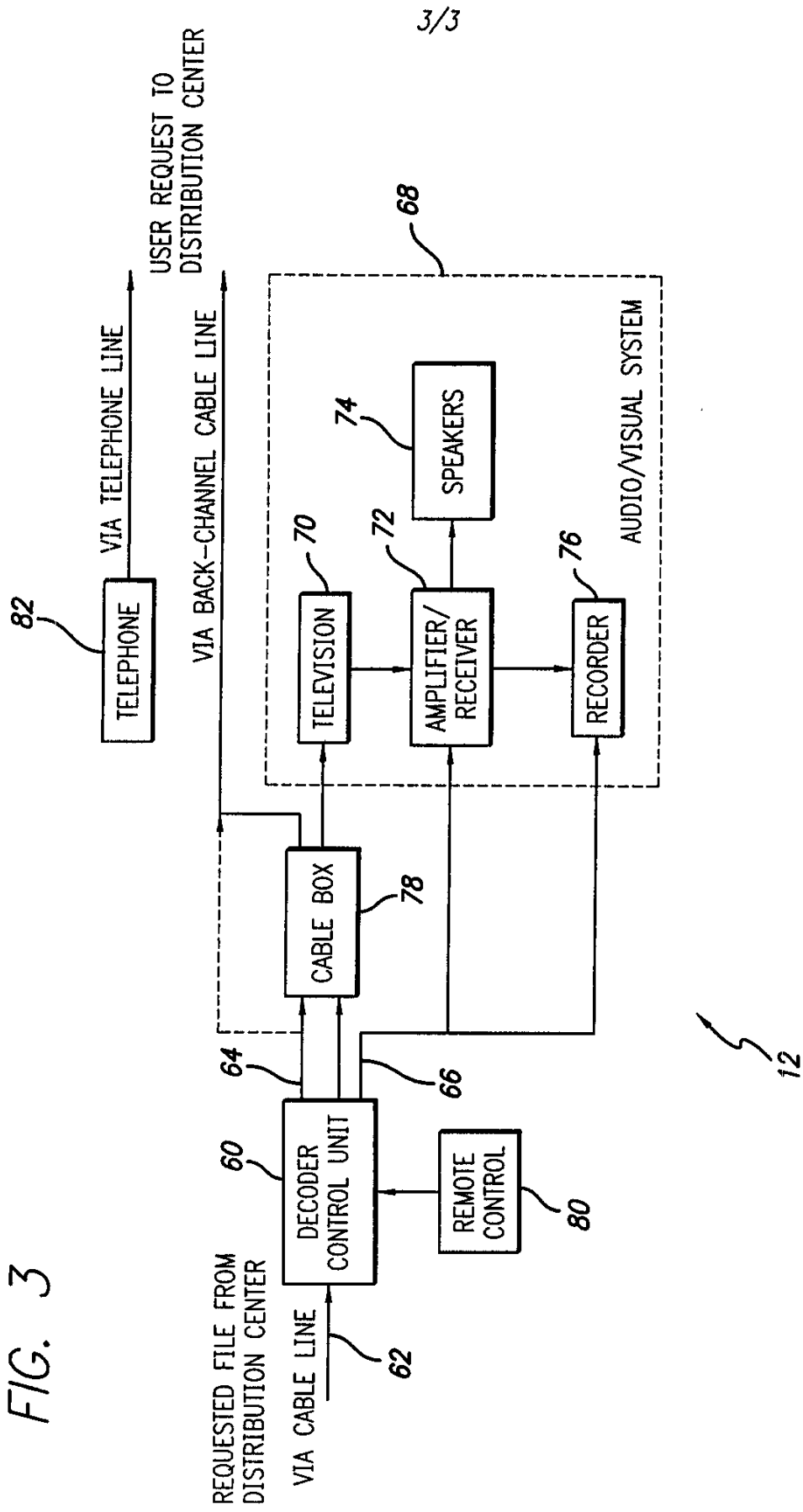
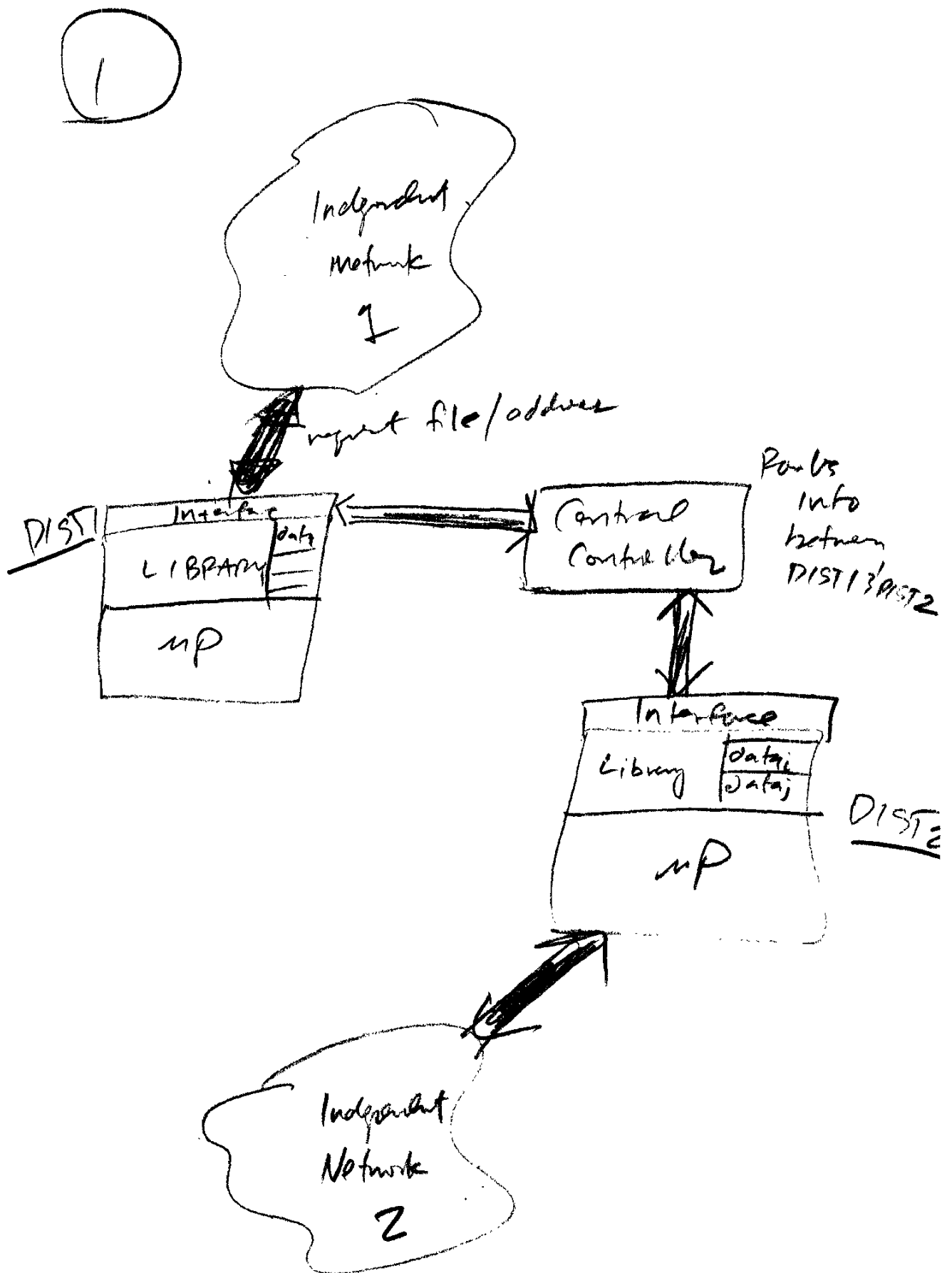
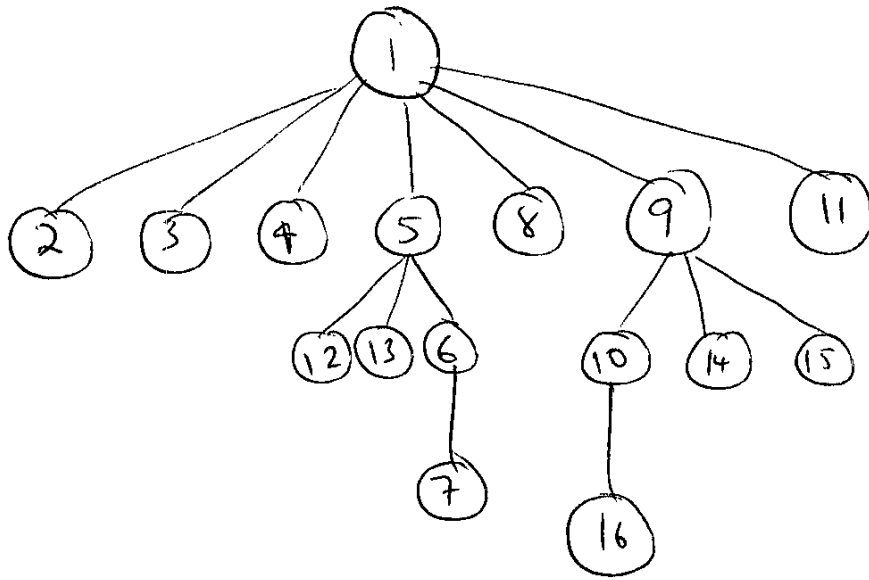


FIG. 2

FIG. 3

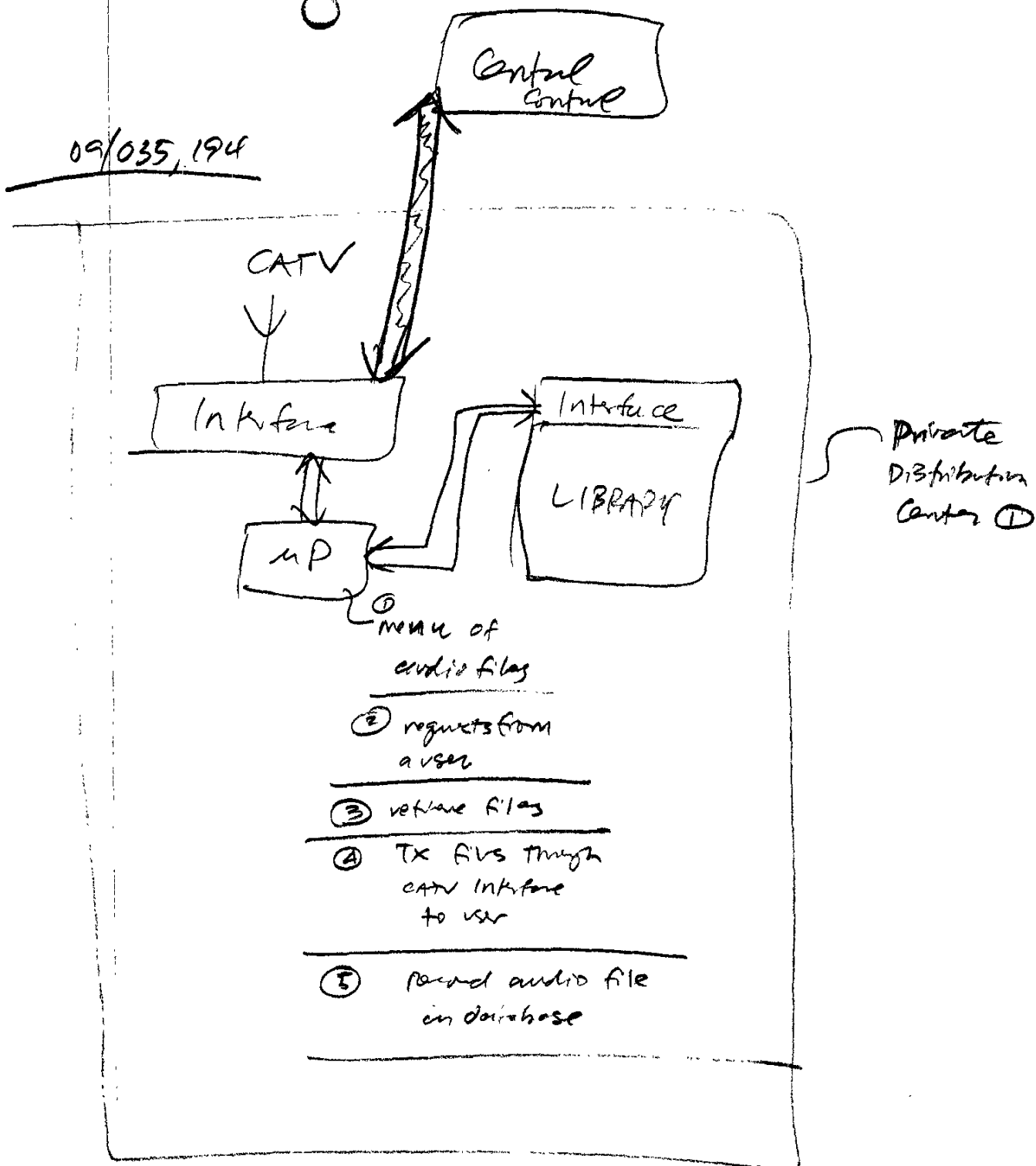






17

09/035, 194



709/219 and (audio or music)

2700 INTERNAL TRANSFER REQUEST FOR S.N.

09/095,390

DATE: <u>8/7</u>	FROM: <u>Wing Chan</u> (print name)
FORWARD TO:	REASON(S):
A. Art Unit: <u>2711</u>	A. You had Parent ☐ (check box)
B. Class: <u>348</u>	B. See Title ☒ (check box)
C Subclass: _____	C. See Abstract ☐ (check box)
	D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

program delivery ; not 348/15 conference
wt voice

DATE: _____	FROM: _____ (print name)
FORWARD TO:	REASON(S):
A. Art Unit: _____	A. You had Parent ☐ (check box)
B. Class: _____	B. See Title ☐ (check box)
C Subclass: _____	C. See Abstract ☐ (check box)
	D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

DATE: _____	FROM: _____ (print name)
FORWARD TO CLASSIFIER	REASON(S):
	A. You had Parent ☐ (check box)
	B. See Title ☐ (check box)
	C. See Abstract ☐ (check box)
	D. See Claim(s): _____

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DISPOSITION BY 2700 CLASSIFICATION

DATE: _____	CLASSIFIER: _____
FORWARD TO:	REASON(S):
A. Art Unit: _____	A. You had Parent ☐ (check box)
B. Class: _____	B. See Title ☐ (check box)
C Subclass: _____	C. See Abstract ☐ (check box)
	D. See Claim(s): _____

FURTHER EXPLANATION IF NEEDED:

PATENT APPLICATION FEE DETERMINATION RECORD

Effective December 29, 1999

Application or Docket Number

09/035,194

CLAIMS AS FILED - PART I

	(Column 1)	(Column 2)
FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	17 minus 20 = *	
INDEPENDENT CLAIMS	2 minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the difference in column 1 is less than zero, enter "0" in column 2

CLAIMS AS AMENDED - PART II

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**
Independent	*	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**
Independent	*	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

	(Column 1)	(Column 2)	(Column 3)
AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	*	Minus	**
Independent	*	Minus	***
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

- * If the entry in column 1 is less than the entry in column 2, write "0" in column 3.
 - ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."
 - *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."
- The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

SMALL ENTITY TYPE ☒ OR

OTHER THAN SMALL ENTITY

RATE	FEE	RATE	FEE
	345.00		690.00
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL	345.00	TOTAL	

SMALL ENTITY OR

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

RATE	ADDITIONAL FEE	RATE	ADDITIONAL FEE
X\$ 9=		X\$18=	
X39=		X78=	
+130=		+260=	
TOTAL ADDIT. FEE		TOTAL ADDIT. FEE	

PATENT APPLICATION FEE DETERMINATION RECORD

Effective October 1, 1997

Application or Docket Number

09035194

CLAIMS AS FILED - PART I

(Column 1)

(Column 2)

FOR	NUMBER FILED	NUMBER EXTRA
BASIC FEE		
TOTAL CLAIMS	10 minus 20 = *	
INDEPENDENT CLAIMS	1 minus 3 = *	
MULTIPLE DEPENDENT CLAIM PRESENT		

* If the difference in column 1 is less than zero, enter "0" in column 2

SMALL ENTITY TYPE ☒ **OR**

OTHER THAN SMALL ENTITY

RATE	FEE
	395.00
x\$11=	
x41=	
+135=	
TOTAL	395

RATE	FEE
	790.00
x\$22=	
x82=	
+270=	
TOTAL	

CLAIMS AS AMENDED - PART II

(Column 1)

(Column 2)

(Column 3)

AMENDMENT A	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 16 Minus ** 20 =		
Independent	* 1 Minus *** 3 =		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

SMALL ENTITY **OR**

OTHER THAN SMALL ENTITY

RATE	ADDITIONAL FEE
x\$11=	
x41=	
+135=	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x82=	
+270=	
TOTAL	
ADDIT. FEE	

AMENDMENT B	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* 17 Minus ** 20 =		
Independent	* 2 Minus *** 3 =		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

RATE	ADDITIONAL FEE
x\$11=	
x41=	
+135=	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x82=	
+270=	
TOTAL	
ADDIT. FEE	

AMENDMENT C	CLAIMS REMAINING AFTER AMENDMENT	HIGHEST NUMBER PREVIOUSLY PAID FOR	PRESENT EXTRA
Total	* Minus ** =		
Independent	* Minus *** =		
FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM			

RATE	ADDITIONAL FEE
x\$11=	
x41=	
+135=	
TOTAL	
ADDIT. FEE	

RATE	ADDITIONAL FEE
x\$22=	
x82=	
+270=	
TOTAL	
ADDIT. FEE	

* If the entry in column 1 is less than the entry in column 2, write "0" in column 3.

** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20."

*** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3."

The "Highest Number Previously Paid For" (Total or Independent) is the highest number found in the appropriate box in column 1.

[illegible][illegible]

LOUIS J BOVASSO

O	P	E	N	H	E	I	M	E	T	R	W	O	L	F	F	8	D	O	N	M	E	L	L	Y			
2	0	2	9	C	E	N	T	U	R	Y	P	A	R	K	E	A	S	T	3	8	T	H	F	L	O	O	R
2	0	S	A	N	G	E	L	E	S	C	A	9	0	0	6	7	3	0	8	4							

AUTHORITY CODE	0	0
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[illegible]

AUTHORITY CODE	0	0
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[illegible]

MORE

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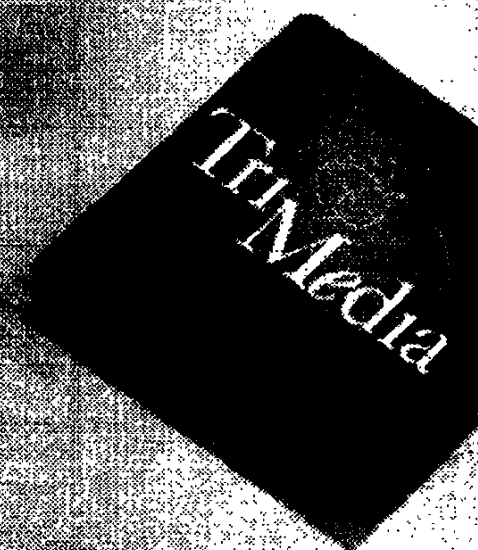
Programmable Architecture

for

DIGITAL TELEVISION

Neil Mitchell
Philips Semiconductors
TriMedia DTV Business Sector

Presented at the 1998 National Association
of Broadcasters Convention
Las Vegas, Nevada
9 April 1998



ONE CHIP. MULTIPLE MEDIA. INFINITE POSSIBILITIES.



Philips

ABSTRACT

One of the most influential events affecting change in the U.S. consumer electronics (CE) and personal computing markets is the upcoming transition to digital television (DTV) broadcasting. Digital technology brings the opportunity for cinema-quality picture and CD-quality sound on TVs in every living room.

The new ATSC DTV standard for terrestrial U.S. broadcast is established, but the choice of broadcast formats and much of the content is still undetermined. So DTV products built now must be both standard compliant and flexible enough to adapt as broadcasters establish format preferences and consumers evolve their picture-quality and data service expectations. With uncertainty in product specifications and market requirements, CE manufacturers vie for early DTV marketshare with the help of a new genre of programmable digital technologies.

After a little background on the ATSC standard, this paper will discuss the benefits and limitations of current system architectures for handling DTV functionality in CE and PC products. Existing technologies only address digital audio and video (A/V) processing, usually by using hardware that cannot be easily upgraded with software. By leveraging a programmable media processor architecture, a new Philips solution delivers full ATSC-compliant media processing and the flexibility to adapt to an unlimited variety of discretionary content and services to products as they evolve.. This paper focuses on how this programmable architecture can be used to develop digital TVs, converter boxes and similar appliances for the CE segment.

THE ATSC STANDARD

After years of study, debate, testing, and rulemaking, in the final days of 1996, the U.S. Federal Communications Commission (FCC) approved what has become known as the Advanced Television Systems Committee (ATSC) standard for DTV. The ATSC standard defines the allowable picture formats for terrestrial DTV broadcast and display in the U.S. Though some digital broadcasting is already underway, the standard was intended to guide broadcasters, technology providers, and CE and PC product manufacturers in the transition to digital-only broadcasting by the year 2006.

Combining the requirements of the broadcast, CE, and PC industries, the ATSC standard incorporates 18 different transmission and display formats. These formats include progressive and interlaced scans at resolutions ranging from SD (including 704 x 480 60I, the digital format comparable to today's NTSC standard) to 1920 x 1080 for HDTV display. An ATSC-compliant broadcast will contain a discretionary mix of high quality video, multichannel audio, and ancillary data and be transmitted over a single, 6-MHz channel.

	vertical lines	pixels	aspect ratios	picture rate
HD	1080	1920	16:9	60I, 30P, 24P
	720	1280	16:9	60P, 30P, 24P
SD	480	704	16:9, 4:3	60P, 60I, 30P, 24P
	480	640	4:3	60P, 60I, 30P, 24P

I = interlaced, P = progressive

The 18 ATSC transmission and display picture formats

Digital video and multichannel audio — The ATSC standard defines the MPEG-2 video stream syntax for video compression. By using multiplexing and digital compression, an 1920 x 1080 60I (1080I) HDTV signal will fit well within the same 6 MHz bandwidth required by today's NTSC signal. Since content programming decisions belong to the broadcaster, some may choose to broadcast a single HD media stream or multiple SD streams simultaneously.

DTV audio encoding uses the Dolby® digital audio compression (AC-3) standard, a variation of Dolby Surround Sound® used in theaters. AC-3 allows up to 5.1 audio channels: left, right, center, left surround, right surround, and a 0.1-channel low frequency enhancement (subwoofer). The standard also allows a two-channel output of Dolby Prologic®-encoded signals.

Multiple audio channels enable audio signals to be combined in real-time by the DTV receiver to produce broadcasts in multiple languages, emergency broadcasts, and services for the visually or hearing impaired. There are two main audio services and six types of associated audio services associated with each programming channel. Main audio services include a *complete main* (CM) service, a complete audio program containing dialogue, music, and effects, and a *music and effects* (ME) service containing only the music and effects of an audio program, but no dialogue. Associated audio services are included to augment the CM or ME and include one of more *dialogue, visually impaired, hearing impaired, commentary, emergency, and voice-over* services.

Both MPEG-2 compression and AC-3 coding techniques are already in use in other consumer and PC products today. MPEG-2 is used by satellite TV providers. Dolby digitally encoded audio is currently used in DVD products.

Ancillary data services — In addition to specifying the basic TV video and audio services, the standard also provides for broadcast of discretionary or ancillary data such as control data, conditional access control data, a program guide, and text-based services analogous to the closed caption service and emergency messages transmitted in today's NTSC. But in addition to these known data types, the discretionary data enables virtually unlimited possibilities for interactive program and data services. It is unclear how broadcasters will use this feature, and what programs and data services will be developed for transmission, but some ideas include data associated with media programs, interactive advertising, subscription services, web browsing, e-mail, and more.

Picture resolution — In the past, competition in the TV marketplace was based on the same general technical quality: NTSC from the camera to receivers in the home. Depending on the resolution of the broadcast source, a digital video source may contain over twice the horizontal and twice the vertical resolution of standard NTSC. To accommodate requirements for NTSC compatibility, HD display, film production, and PC display, the ATSC standard incorporates 18 picture formats, with four different horizontal x vertical resolutions:

- 1920 x 1080 - the TV industry's preference for producing an HD picture
- 1280 x 720 - the PC industry's recommendation for producing an HD picture
- 704 x 480 - the digital equivalent of today's NTSC signal
- 640 x 480 - VGA resolution of low-end PC displays

Aspect ratio — Current NTSC and PAL broadcasts are displayed on a screen with a 4:3 picture aspect ratio. In addition to support for 4:3 at SD picture resolutions, the ATSC standard includes a wide-screen 16:9 aspect ratio, similar to that used in theaters today for all but the lowest picture resolution in the standard. The result — HDTV pictures contain approximately six times the spatial resolution of today's NTSC TVs.

Frame rates — There are 6 HD and 12 SD formats defined in the ATSC standard, all broadcast, or displayed in one of three frame rates. By incorporating these three rates, the standard allows for maximum compatibility between broadcast source and transmission: 60 frames per second for video, and 24 and 30 frames per second for material originally produced in film.

Data transport — The standard identifies a packetized data transport system to facilitate interoperability with other delivery and imaging systems. Data packets are 188 bytes long: four bytes of header/descriptor and 184 bytes of payload. Terrestrial transmissions will use VSB (vestigial sideband) to minimize potential interference with other services, especially NTSC transmissions while they exist, and will deliver an effective payload of approx. 19.28 megabits per second (Mbps). Extensive error correction will be employed to counteract the harsh operating conditions encountered in terrestrial broadcasting.

A little background

HDTV is not an invention of the 90s. It has been in use for years in the U.S. for select, high-end applications, and in Japan for widespread consumer broadcasts and receiver production. But in the late 80s, U.S. industrial, government, military, educational, and research organizations began to take notice of Japan's lead in the analog HDTV marketplace. Realizing the improved quality and potential benefits of the higher resolution technology and not wanting to be left behind, U.S. economic, political, and business interests joined forces to strategize how the U.S. should enter the worldwide HDTV marketplace and transitioning from NTSC to what was then known as advanced TV (ATV).

Various transition scenarios were debated — from leapfrogging to full HDTV to introducing limited, NTSC-compatible ATV improvements. At the request of broadcasters concerned about transitioning their legacy of analog technologies, in 1987 the FCC formed the Advisory Committee on Advanced Television Service (ACATS) to spearhead activities. After a decision was made to maintain (at least initially) NTSC compatibility through simulcasting of NTSC and HD channels, ACATS set up a testing schedule for several analog NTSC-compatible ATV systems being considered for approval. Participants in the initial rounds of testing included the Advanced Television Research Consortium (ATRC), composed of the David Sarnoff Research Center, NBC, Thomson Consumer Electronics, and the North American Philips Corporation; Zenith Electronics Corporation and AT&T, Japan Broadcasting Corporation (NHK); and the American Television Alliance (ATA) (composed of two formerly separate proponents: the Massachusetts Institute of Technology (MIT) and General Instruments Corporation). The four proponents submitted six different systems for consideration.

Initially, testing was to be completed by fall 1991. However, in June 1990, General Instruments' HDTV proposal for the first all-digital system generated considerable interest, and in quick succession the ATRC and Zenith-AT&T constituents converted to an all-digital approach. As the only remaining proponent of analog transmission technology, NHK pulled out shortly thereafter.

After initial testing was complete, the FCC determined that elements in each proposal were worth preserving and recommended that the proponents join forces to develop a unified HDTV transmission system proposal.

Meanwhile, to enable broadcasters to begin digital simulcast, the FCC announced their intention to recycle currently unused and taboo channels and assign each NTSC broadcaster a second 6 MHz channel for their new ATV service.

Primarily representing interests of the CE industry, the FCC-proposed Grand Alliance was formed in May 1993 by seven organizations: AT&T Corporation, General Instrument Corporation, MIT, Philips Consumer Electronics, David Sarnoff Research Center, Thomson Consumer Electronics, and Zenith Electronics Corporation. After evaluating technologies and key elements needed to deliver the best HDTV system for the U.S. market, the Grand Alliance drafted a proposal to the FCC that included several combinations of picture resolution and scanning rates. The scanning formats selected by the Grand Alliance included computer-friendly progressive scanning in addition to the interlaced mode important for broadcasters.

In the summer of 1995, broadcast and cable carriage of digital HDTV signals were tested, documented by the American Television Systems Committee (ATSC), and recommended to the FCC by ACATS in November 1995. The ATSC standard, as it came to be known, was approved by the FCC and mandated for terrestrial broadcasting in December 1996. In April 1997, the FCC adopted a digital channel assignment plan and the DTV service rules.

Although broadcasters are encouraged to begin immediate transmission of digital programs from SD to HDTV, they are all expected to broadcast all digital signals by 2006. At that time, analog bandwidth will be returned to the FCC for reassignment.

DEBATING PICTURE QUALITY

The ATSC standard was mandated for US broadcast and display, but some aspects of the standard are still the subject of some debate. Quick to see the potential for incorporating PC technologies and features into DTV appliances (and visa versa), the PC industry began to voice its requirements rather late in the standard-making process. Some, including the PC industry, claim that because the standard is a compromise designed to take into account the needs of all industries, it still does not satisfying all the players. Naturally, each contributing industry favors formats in which it has the most experience and investment. This is particularly true in the debate about progressive vs. interlaced scan display formats.

Scan rates: progressive vs. interlaced

The ATSC standard defines both *progressive* and *interlaced* scan formats at all defined resolutions. The technology choice for the CE industry, interlaced scan is the current analog camera standard, analog broadcast standard, and is used in TV systems worldwide, including NTSC.

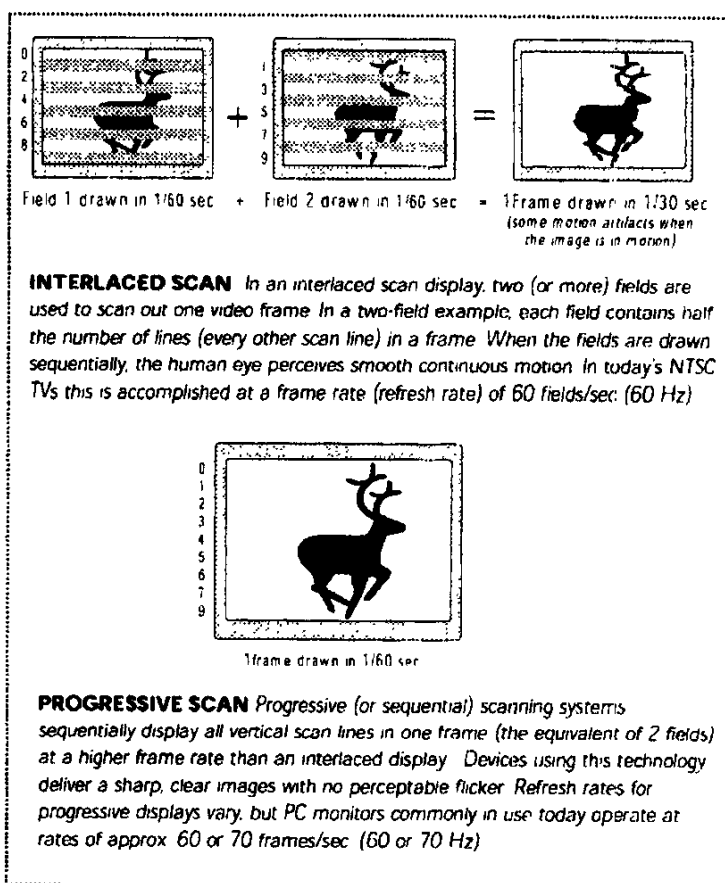
At the higher resolutions in the ATSC standard, *interlaced* formats produce crystal sharp images. The lines are so fine that interlacing shimmering effects normally seen with regular NTSC TV are undetectable to the human eye. At lower resolutions, however, perceived flicker can interfere with enjoyment, especially at close viewing distances.

Favored by the computer industry, *progressive* scan delivers sharp, clean images at lower picture resolutions than interlaced scan. Lack of noticable refresh flicker in progressive displays helps reduce fatigue when PC users sit close to their monitors.

Most people agree that progressive scans can produce high-quality pictures without flicker. Broadcasters agree that progressive scanning is fine for their film and computer-generated programming. Progressive scanning more accurately approximates the motion picture imaging process and improves the dynamic (moving) and temporal (static) resolution over interlaced systems. The PC industry argues that incorporating

interlaced formats in the standard perpetuates outmoded technology unsuitable for any PC-like functionality that DTV appliances may come to have and that issues of bandwidth requirements for progressive scan have been solved, in part, by compression technology

But the remaining issues regarding scan format revolve primarily around the cost and effort for broadcasters to make the transition to all-progressive production and distribution methods. Broadcasters have libraries of legacy interlaced programming and an enormous investment in analog equipment used to produce and deliver source materials in interlaced format. Building new digital broadcasting facilities and abandoning the interlaced format now, say broadcasters, would require a billion dollars or more in development costs and take more time than is allowed by the FCC deadline.



In addition, despite the PC industry's recommendations against interlaced displays, TV display manufacturers will still want to sell low-cost, interlaced-display receivers for as long as there is a market. Progressive broadcasts can be readily converted to interlaced formats for display with nothing more than a low-cost chip in the receiver.

Is 720P enough?

Another argument about interlaced technology centers on high-resolution picture quality differences. In the DTV appliance the amount of processing required for 1280 x 720 60P (720P) is similar to that required for full 1080I. Some argue that HD display quality is better with 1080I pictures than with the 720P, especially if the picture is static or motionless. In this comparison, the vertical resolution in both is close to equal on a resolution chart, but 1920 pixels produces higher horizontal resolution, thus higher quality picture than 1280. In static images, the 1080I will have no motion artifacts and a minimum of interline distortions. This makes high-resolution interlaced displays a good fit for still cameras and other images where motion is not a consideration

Factoring in motion, however, brings up other issues. Measured on a resolution chart, an interlaced image is two thirds the vertical resolution of an equal number of progressive scan lines. Technically, this difference results from what is labeled the Kell Factor. Error in the interleaving of lines and motion artifacts created from interline flicker from motion is absent in progressive pictures. Progressive scans look cleaner, especially up-close and are well suited to small details, such as line graphics and small text.

Represented by a collection of leading computer hardware and software companies (a.k.a. the DTV Team), the computer industry claims that comparisons of 1080I vs. 720P show little difference in perceived picture quality. Further they claim that most TVs will not be able to display 1080I for years to come. Instead, set-top or converter boxes will receive and down-convert the transmission for display on lower-resolution digital and existing analog TVs. And since hardware required to build 720P can be provided at a lower cost (due to lower memory requirements), they question whether broadcasters should even transmit 1080I if 720P will do in most cases.

The DTV Team is pushing broadcasters to accept a subselection of the 18 ATSC formats, known as HD0². One of the main reasons for the computer industry to convince broadcasters to transmit 720P as the highest resolution format is to free more bandwidth for transmission of other discretionary content, such as data or data services, and to support more computer-like features such as web browsers or e mail.

vertical lines	pixels	aspect ratios	picture rates
720	1280	16:9	24P
480	720	16:9, 4:3	60P, 30P, 24P
480	640	16:9, 4:3	60P, 30P, 24P

The DTV Team's HD0 proposal

Though proponents also contend that 720P uses less memory than 1080I, new memory compression algorithms introduced by companies such as Philips Semiconductors are now being used to reduced the amount of memory required in MP@HL video decoding. A full 1080I video decode can be done in half the memory normally required for a HDTV high-level video decode. So reducing memory requirements becomes a less compelling reason to redefine the standard.

THE IMPACT TO . . .

The move to full digital broadcasting will have an broad reaching impact on everyone from technology providers to product manufacturers, broadcast companies, cable and satellite companies, and consumers. Consumers --- For the consumer, the impact of these changes is potentially dramatic. Digital technology brings the opportunity for tremendous improvement in both picture and sound quality on TVs in every living room. The home-theatre enthusiast equipped with a new big-screen HDTV, a multi-speaker surround audio environment and fresh popcorn can achieve a cinema-quality experience. Even the more budget-conscious consumer who purchases only a converter box can enjoy image quality higher than today's analog NTSC broadcasts.

But one of the most significant changes to be realized by the consumer is the result of a host of new data and interactive services made possible by the ATSC standard's provision to support ancillary data in the broadcast stream. Whether data bandwidth is used for interactive advertising, home education, web browsing, or downloading new features to the DTV appliance, it will be these services that truly redefine how viewers use their televisions.

CE manufacturers — Virtually every TV and set-top box manufacturer is scrambling to be the first to build products for the home. CE appliances must be equipped to receive all 18 ATSC formats and display a format compatible with the receiver's display device. If that isn't enough, these appliances must be able to deal with as yet unknown data services.

Broadcasters — The move to digital broadcasting gives broadcasters enormous new challenges. Except for film, production equipment and facilities must be converted to digital. Content programming for one channel has never been easy, but now the complexity is multiplied by the number of streams and data content they wish to send in their broadcast signal. Though the initial ATSC standards only apply to conventional over-the-air terrestrial broadcasts, it is likely that cable and satellite TV delivery systems will also support these same standards.

Beyond consumer — Higher resolution, better color reproduction, separate color and luminance signals, a wider and perhaps larger screen, and life-like audio will all be combined to make the HDTV experience larger than life. According to CCIR Report 801, HDTV is described as able to replicate reality when the viewer is seated three screen heights away from the display. With increased product and broadcast availability driven by the CE market, it is hard to ignore the potential HDTV has beyond TV entertainment in professional and even small business applications.

SO WHAT WILL BE BROADCAST?

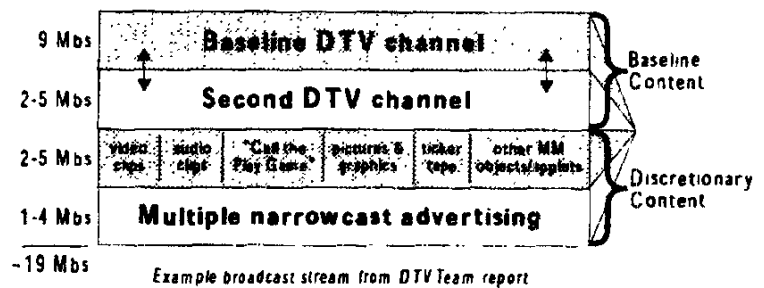
According to the FCC, the purpose of establishing the standard was to facilitate the success of free, local digital broadcast television. To bolster DTV's chance for success, the Commission's decisions allow broadcasters (with certain provisions) to use their channels according to their best business judgement.

In the U.S., HDTV programs are readily available in quantity and have been for many years. Up to 80 percent of all commercial primetime programs are regularly produced in high definition, namely 35mm film. If they are not already, they can easily be converted to digital format. Until individual broadcasters make decisions to move to full digital production, TV programs slated for digital broadcast can be shot in wide screen format, on the same film, using the same cameras used to shoot normal TV programs today.

However, there is still an immediate need for much new studio equipment. Most of the equipment becoming available now is for 1080i production, but some 720P equipment is planned. Regardless of the source of broadcast material, digital equipment such as MPEG stream slicers for local content insertion and devices for overlaying graphics and logos on an existing MPEG stream are needed now.

Many broadcasters have already committed to some forms of DTV video and audio transmissions. In addition, they are also expected to slowly initiate transmission of other data or data services in the remaining bandwidth. Immense amounts of data can be transmitted over the channel, either by dedicating some portion of the channel capacity, or by using the channel opportunistically. Thus, a challenge for broadcasters is determining which data services consumers will desire and how to leverage this potential into an important revenue source, whether services are provided free, by subscription, pay-per-use, or some other fee model.

Combined, all these services will make DTV receivers more valuable to the consumer and speed up the sale and penetration of digital sets. But how do CE appliance designers and manufacturers anticipate the requirements of products that will process this data and services if they don't know what the services are?



There will no doubt be content-specific material transmitted as data along with the audio and video streams. For example, during sports broadcast, a viewer may click on a button to obtain profile or background information, such as player's statistics. For highly-targeted advertising, the DTV receiver may query a viewer profile to determine which of several ads being simultaneously transmitted is the most appropriate to show the viewer. The expensive car ad, the beer ad, or the one for ladies' perfume? Advanced data services may combine nationally broadcast data with locally inserted data such as local car dealer locations.

DTV products that incorporate Internet addresses could enable viewers to be immediately connected to a local dealer's Internet site to view the car, check stock, even price a particular model with specific options and add-ons. A feature of PCs and set-top browsers today, Internet browsing can easily be performed in the DTV appliances of tomorrow. In addition, products equipped with a reverse communications channels can drive interactive applications like educational programs, games, personal telecommunications services, and much more.

How much content broadcasters can transmit in their 6-MHz channel is frequently misunderstood and misstated. It depends entirely on the type of program material being sent. The flexibility of the ATSC DTV standard allows for dynamic scalability, i.e. broadcasters can offer HD service for some programs or during certain times of the day then switch to multiple SD signals or a mix of media programs and data services at other times. With digital compression, one 6 MHz channel could be used for one 1080i broadcast or for as many as four or five digital SD television signals. For the toughest live video, e.g. fast-action basketball, most of the channel is required to send a single HDTV program. However, for more typical game shows, one HD and one SDTV programs could be sent concurrently.

Using the channel opportunistically, the amount and formats of information transmitted could even vary within a program unit. For example, during a high-action sequence of an HD advertisement, no or minimal data would be transferred. Switching to SD to transmit the still or slow-moving sequences, such as logo display, frees extra bandwidth that can be used to download tremendous amounts of data or services related to the product being advertised.

DTV ROLLOUT

"The Commission requires the affiliates of the top four networks (ABC, CBS, Fox, and NBC) in the top 10 markets to be on-the-air with a digital signal by May 1, 1999. Affiliates of the top four networks in markets 11 - 30 must be on-the air by November 1, 1999."

In her April 1997 speech³, Susan Ness, FCC Commissioner, discussed the commitments from broadcasters. "On the commercial side, 24 network affiliates in the top ten markets have volunteered to do everything within their power to be on the air in digital by Christmas 1998. These commitments — which include multiple stations in nine of the top ten markets — evidence the strong desire of broadcasters to go digital." Ness went on to add, "Although the 18-month commitments were voluntary, the four major commercial network O & O's and affiliates are required by rule to commence digital broadcasting in the top ten markets within 24 months, and in the top 30 markets within 2½

years, in time for the 1999 Christmas shopping season " Thus, by the end of the 1990s, over fifty percent of U.S. households will have access to digital broadcasting if they so desire

Broadcasters

Two experimental HDTV stations are already on the air. The first public TV station to broadcast in the FCC's digital transmission standard — KCTS in Seattle — turned on its experimental transmitter in January 1997. The experimental HDTV station in Wash. DC is operated by the NBC-owned station. CBS and NBC have announced they will begin DTV broadcasts in 1998 and support 60i HD. NBC and CBS affiliates should have their HDTV broadcast capabilities in place to transmit HDTV by the end of 1998 for the ten largest U.S. market areas (e.g., New York, Washington, LA, etc.). This is expected to grow to 25+ market areas by the end of 1999. ABC currently plans to broadcast 720P and SD formats.

In addition, despite the intentions of the major broadcasters, a shortage of broadcast equipment, including transmitters for DTV stations, may inhibit the nationwide availability of broadcast DTV services to consumers. However, recently Cowles/SIMBA⁴ reported "We're very encouraged that things are on schedule," said Bruce Allan, VP/GM of Harris Broadcast Division. "We do not foresee any major issues that would preclude a timely rollout of digital television."

On the cable and satellite fronts, several significant announcements expected to increase the momentum behind HD transmissions are DirectTV's news that they will offer two dedicated channels of HDTV in 1998 throughout the U.S.⁵ (probably for pay-per-view movies), and HBO's announcement to begin U.S. HDTV transmissions during the summer of 1998. This immediately expands the markets served from those Susan Ness discussed to the whole country this year rather than waiting until 1999.

CE manufacturers

Several TV manufacturers including Philips, Samsung, Zenith, and Sharp, are demonstrating consumer HDTV products for sale in 1998. One approach being taken by some HDTV manufacturers is to display all DTV programs in the 1080i and digitally upconvert (e.g., line double) the lower resolution transmissions, either standard resolution DTV or convention NTSC broadcasts, to display resolution. Several manufacturers have also announced plans for DTV receiver boxes that will permit the reception and display of DTV signals on conventional analog TV sets. Picture quality should be similar to that from digital satellite systems displayed on the same TV set.

BUILDING THE HOME DTV APPLIANCE

There is huge debate about what form a home DTV appliance will take — a TV, a converter box, a PC, a network computer or perhaps something new. What is clear is that these appliances must process all 18 ATSC formats and be equipped to deliver as yet undefined data services. So how can CE product designers and manufacturers create such a device?

A cost-effective, flexible open architecture

Just as PCs have an open architecture, it is vital for the consumer devices to have an open architecture that allows any company to develop software for it easily and effectively. Ideally a small number of operating systems would play a role, including Microsoft Windows CE[®] and possibly other operating systems from companies such as ISI (pSOS[™]) and VRTX. Concerned that WinCE requires excess overhead and comes with unneeded features that may drive up product costs, consumer companies prefer a choice of operating systems. This minimizes dependency on the features and reliability of a single operating system and allows them to evaluate various open solutions that best fit the design requirements of their DTV appliances. It also reduces the risk of market domination by a single operating system controlled by one company.

Core functionality

Regardless of their form, DTV appliances will have a set of core functions, such as tuning, channel decoding, source decoding, etc., plus optional features depending on the style of interaction and viewing. There are several distinct approaches to implementing core functions, the differences in functionality and flexibility of each approach is important to the broadcast, CE, content, and distribution industries. All are viable implementations for supporting audio and video features, but some have distinct advantages for managing change in the DTV market.

- All in hardware (controlled by a small microprocessor)
- All in software on a PC (e.g. x86 and/or media processor)
- All in software on a standalone media processor

All hardware

Once functionality for a particular appliance is determined and the content it must process is well defined and stable, an all-hardware implementation can be produced very cost effectively. One example of a mostly hardware DTV solution is the satellite dish systems installed in homes today. To minimize cost, most are implemented with a conventional microprocessor and hardwired components for audio and video decode and services such as an program guide.

But hardwired solutions, by definition, are not flexible. Without hardware upgrades or redesigns, all-hardware systems are limited to the functions for which they were originally designed. With an unlimited choice of discretionary content, there is great uncertainty about what the video, audio, graphics, communications, and data processing requirements for a device will be. With uncertainty and flexibility the orders of the day, hardwired devices — both today's models and those developed quickly to capture the first DTV sales — run the risk of becoming obsolete as broadcast services and new media features evolve.

Software — on a PC

An all-software DTV solution would allow maximum flexibility. On a PC or similar host, developers can implement software-only systems with all the functionality of a hardwired system described above.

The favorite of PC vendors, for obvious reasons, a software-only solution takes advantage of the expandable nature of the PC to add the A/V interfaces for DTV processing, often by a plug-in PCI card. The majority of the A/V decoding then takes place on the host microprocessor (x86, Pentium, Pentium II, etc.) Unfortunately in this scenario, the host processor is rarely fast or powerful enough to provide even SD video decoding without compromising picture quality and dropping frames. An unassisted 200 MHz Pentium processor is barely capable of real-time MPEG-1 decoding, and a 266-MHz Pentium II barely keeps up with MPEG-2 MP@ML decoding. How these or even higher performance PCs will support other ATSC resolutions is unclear. The jump in performance required from MPEG 2 MP@ML video decoding to full resolution MPEG-2 MP@HL is a factor of six.

In current PCs, multifunctional by design, it is also questionable whether there is any remaining bandwidth after video processing for simultaneous decode of multi-channel audio data or for running normal PC tasks like editing documents or playing games. Adding specialized hardware such as an MPEG-2 decoder can offload the host processor, but this adds cost and increases complexity.

PC bandwidth constraints can also be addressed using a new class of programmable processor called a media processor. Augmenting a PC with a programmable media processor either on a PCI card or on the motherboard also offloads the host processor. But in addition to accelerating a single function, a media processor can provide other functions — such as data service processing. One example of this is the Philips Semiconductors single-chip TriMedia™ media processor. Unlike dedicated hardware decoders, a media processor is programmable and designed to handle media streams, communications, and control functions.

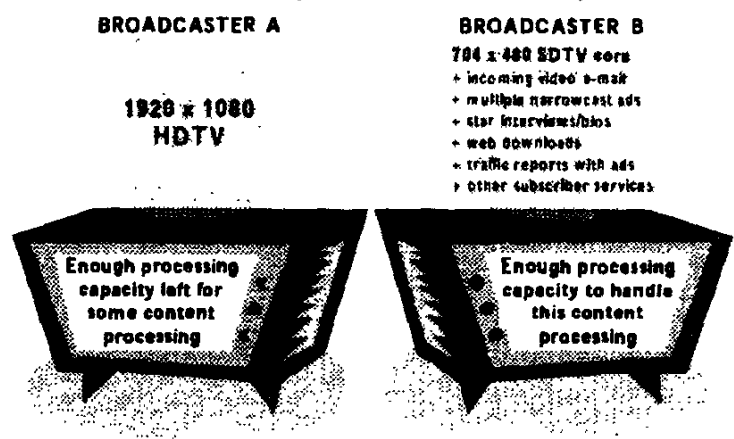
Major advantages of a PC approach include flexibility and versatility. But not all of a PC's multifunctional talents are appropriate or necessary in the living room. PCs capable of consumer-quality ATSC audio and video performance are not yet available on the market. They will eventually be able to handle a variety of DTV media and content but at a price not expected to be competitive with other living room DTV options.

Reliability is another concern about PCs. As PC products have evolved, PC users have been more willing to put up with a few system crashes, dropped video frames, and audio artifacts. But this is not the case for a consumer device intended for use as the main TV entertainment platform in the home.

Software — on a standalone media processor

Another programmable approach is made possible by a standalone media processor. Fully functional in a standalone configuration, a new generation of media processors, such as the TriMedia processor, can handle multiple media stream processing and overhead, control, and communications functions on a single chip. Since a host processor is not required, it can be easily used to provide digital TV functions in standalone consumer devices such as converter boxes, digital TVs, or network computers.

Programmable, standalone media processor solutions bring the benefits of software flexibility to a traditionally hardware-only market at a price only slightly more than a hardwired solution. Why is this level of flexibility worth the cost? As defined by the standard, there is a wide range of formats and possible types of video, audio, and data signals that could be broadcast. Thus the DTV appliance must receive and process HDTV on one channel, then switch seamlessly to process potentially different formats and content every time the viewer changes the channel. A programmable media processor allows CE products to support known formats and data services and can be easily upgraded to provide new features and support new data services as simply as downloading new software modules.



New DTV appliances must be able to receive and process HD broadcasts on one channel then switch seamlessly to process potentially different formats and content every time the viewer changes the channel

EXAMPLE OF A DTV REFERENCE PLATFORM

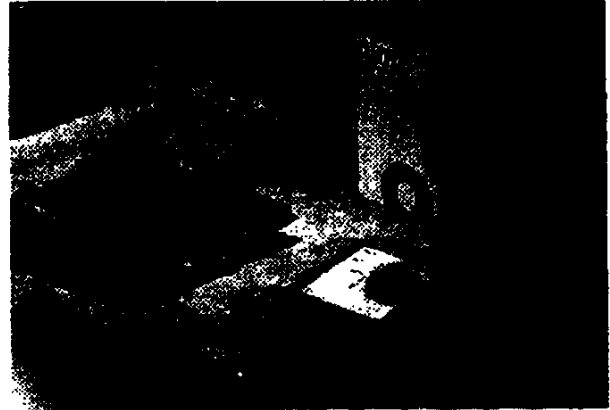
One method of jumpstarting consumer DTV product development without concern for how data services will evolve is made possible through a programmable DTV reference design. The Philips TriMedia DTV Reference Platform takes advantage of standalone media processing technology and the media processor's C programmability to help CE manufacturers develop products that conform to the ATSC standard and support a variety of advanced interactivity, communications, and data service processing features.

The TriMedia DTV Reference Platform

Based on the TriMedia processor architecture, the Philips TriMedia Reference Design Kit consists of a reference board applicable for TV, converter box, or PC-based DTV products, an ATSC-compliant DTV software application, and a comprehensive software development toolkit for creating new modules or customizing DTV products for different price points and markets.

Reference board — The TriMedia DTV reference board provides all DTV receiver functions from channel through source decoding. Its modular design incorporates pluggable components to adapt the

board for alternate broadcast sources (e.g. cable or satellite) or DTV standards. The network interface module (NIM) contains a tuner, IF, and the demodulation required for the particular system concerned. Support for satellite (QPSK), cable (QAM & others), and ATSC terrestrial broadcast reception (8-VSB) is provided through separate NIMs. Initially designed for U.S. terrestrial broadcasts, the TriMedia ATSC DTV Reference Platform uses a NIM based on Philips Semiconductors' single-chip VSB demodulator that takes in a modulated stream direct from the IF and outputs a transport stream suitable for streaming directly into the TriMedia processor.



Philips TriMedia ATSC DTV Reference Platform

TriMedia processors achieve their tremendous processing potential through a very-long instruction word (VLIW), fine-grain parallel architecture. The first generation TriMedia processor delivers performance of 4 billions of operation per second by executing up to 5 operations in a single clock cycle on a 100 MHz CPU. Similar to general-purpose CPUs, applications for the TriMedia processor can be developed entirely in the C/C++ programming languages. Future TriMedia generations will operate at faster clock speeds and provide even more advanced media and data processing capabilities for DTV

DTV software — The kit also includes a DTV software application required for a standalone ATSC compliant DTV appliance. Several extra software modules can be swapped in to provide optional functionality. Based on the upcoming TM-2xxx series media processors, the TriMedia ATSC DTV Reference Platform provides media datastream processing in software.

High-level software development tools — The TriMedia software development environment, a comprehensive application development toolkit, allows customers to write and tune their own modules in C or C++ programming languages or customize the application modules provided. Software modularity facilitates easy adaptation of the reference design for other DTV markets or applications. For example, the ATSC demux and/or AC-3 audio modules could be replaced modules to provides DTV functionality for a different set of audio or video formats, e.g. DVB demux for European satellite, program stream demux for DVD, BS-Digital demux and audio for Japan, and MPEG-2 multichannel audio for European markets.

Programmability enables . . .

Manufacturers can achieve this product shape shifting not only during a product's development but also after it is in use in a consumer's home. Through high-level programmability and the TriMedia processor's ability to support a reverse communications channel, new software modules may be available by download over the broadcast medium, across the Internet, or across other networks. They may include Java applets (for some architectures), Internet browsers, video/audio e-mail, videoconferencing, new MPEG-x decode modules, and much more.

The TriMedia processor-based DTV appliance can also be made to adapt to newly encountered types of data, even data types it does not recognize. For example, the data content of the signal may be tagged as requiring Shockwave[®] software to execute on the TV set. A programmable media processor could automatically retrieve the Shockwave software and install it without viewer assistance.

THE TRANSITIONAL MARKET

The key to DTV's success depends on a variety of factors, one of which is the ability of manufacturers to drive system cost down to the consumer level. Even before consumers are convinced to take the plunge and purchase a digital TV, there are likely to be lower-cost converter boxes available from both consumer and computer manufacturers. Some will be able to receive all 18 ATSC formats and display them on a lower-resolution digital or conventional analog TV.

Given the ability to display a digital broadcast, even existing analog TVs that are already capable of displaying better than NTSC resolution will immediately begin to display a higher quality image due to the higher resolution of the digital signal. And since ATSC signals also includes AC-3 audio, consumers can begin to take advantage of multichannel audio with the addition of only surround-equipped speakers.

Improving legacy TV

As more consumers experience the quality of DTV, their expectations even for NTSC broadcasts, are likely to increase. In the transitional years, DTV appliances that incorporate technologies to enhance the NTSC picture and sound quality may help to reduce the gap between expectations of the future and the reality of today. DSPs can deliver some of that functionality now, but, as fixed function hardware solutions, their usefulness dwindles in 2006. Media processors, which are already managing DTV media and data processing, can be also programmed to improve NTSC quality now then be reprogrammed when NTSC signals are no longer used.

Using a Philips-patented Natural Motion™ algorithm, TriMedia processors can perform de-interlacing/line doubling and frame *in-betweening* on the NTSC source. In-betweening is the creation of extra frames not in the received source by interpolating new frames from existing ones. Simpler methods duplicate the previous frame, but this results in jerky motion and provides no significant advantage over non-in-betweened sequences. By using motion-estimation/compensation on the two received frames, the new in-between frame takes into account the movement of objects from one frame to the next. The resulting frame sequences appear sharper and have smoother motion.

CLOSING COMMENTS

The ATSC standard is adopted, the digital channels are assigned, the service rules are in place, digital broadcasting equipment, studios, stations, and transmission towers are under construction, and digital broadcasting is already *on the air*. This standard has enabled all parties to shift HDTV production and product development into high gear without excluding any players. To give 50% of U.S. households access to DTV broadcasting by November 1999, CE product manufacturers have their work cut out for them.

Home DTV receivers of tomorrow are likely to include both TV-like appliances for distance viewing and PC-like devices for close-up highly interactive viewing that will evolve to incorporate features of each other. In both the new digital era and the transitional years, reference designs like the Philips TriMedia DTV Reference Platform can help CE product manufacturers bring DTV appliances to market more quickly, regardless of their form factor. Powerful programmable technologies such as TriMedia processors can provide media, data, and communications processing and deliver the flexibility and upgradability critical required to keep up with DTV roller coaster that has just left the station.

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White Paper
Interactive Data Services for Television
System Design Issues

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Introduction

There have been many rollouts and experiments designed to measure consumer interest in interactive data services for TV, some starting as early as 1994. These consumer trials have taken place all over the world and have tested various types of data services, including video, music and news on demand, interactive games, home shopping, banking and travel reservations, community information, weather and program guides. While some of the trials have been limited, such as ordering a recipe from a cooking show or playing along with a game show, others have been much more comprehensive.

One ambitious trial, conducted in the mid-1990s by Time Warner's Full Service Network in Orlando, Fla., included a broad range of services, such as video on demand, home shopping, and ordering of take-out food. Clearly one of the largest trials in terms of breadth of services and number of customers, it had limited success. Consumers were not familiar enough with interactive applications, and the available content was not appealing. The cost of software also proved to be too high. But this situation started to change after 1994, when the Internet became available to more people as a communications, information and entertainment tool. Many consumers now have a better understanding of what interactive services can provide.

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The widespread commercial success of interactive data services hinges on many factors, including the need for a method that can display both text and graphics-rich content in a satisfactory manner on existing televisions. In order for consumers to get excited about data services on television, there must be superior on-screen graphics capabilities, graceful composition of graphics and video, and approachable user interfaces. There are numerous technical challenges to overcome for these features to become a reality. In addition, TV watchers are an entirely different segment of consumers from PC users, requiring us to rethink the way data services are deployed.

In this paper, we provide an overview of the interactive data services market, including the types of services currently available or planned. We will argue that in order for such services to become commercially successful, TV display quality must improve to support graphics-rich content. At the same time, the TV experience with which consumers have become familiar must be preserved. With this objective in mind, we will then discuss the digital signal processing issues and their solutions as embodied in a well-designed graphics/display-processor in a set-top-box system.

Types of Interactive Data Services

Interactive data services are available in varying levels of complexity today, and there are a number of ways to transmit them. Recently, there has been a lot of excitement over the emergence of digital television as an enabling technology for truly compelling interactive services. But interactive services are already being successfully deployed on analog-based TVs in many markets via partnerships between interactive service companies and cable programmers and other video content providers.

Some data services that were first offered on the Internet, such as e-mail and on-line shopping and banking, made the transition to the existing TV environment with the help of TV-based Internet terminals, first introduced in 1996. These PC/TV convergence devices brought the Internet onto a standard TV with the use of an analog phone line, enabling consumers to watch a program as well as browse the Web on their TV to search for more information.

Internet-TV set-top manufacturers have long pitched their product as a cheaper way to access the Internet. But because

PCs are now much more affordable, there is greater competition between the TV and the PC. In order to compete with the PC, the TV must offer more than just the ability to browse the Internet. There is now a push to offer integrated Web content and TV programming that is developed specifically for the TV experience.

Many television studios have been working for years on integrating programming and interactive content in an effort to gain the interest of consumers and boost profits. Several media companies have been developing content that can be adapted to both television and the Web in order to create what they refer to as an "enhanced viewing experience." Disney Online has various web sites—Disney.com, Family.com, ABC.com and ESPN SportsZone—that tie its TV shows to related content on the Internet. Viewers can go to the site before or after the show for related information.

Discovery Communications has suggested that broadcasters now need to think of themselves as content service providers. The company has announced a product line called Planet Explorer, which it describes as its first attempt to unite its content platforms. It is designed to immerse people in a locale and its culture, and comprises a CD-ROM mystery game, a television show tie-in and an Internet site with background information.

Most interactive services today are displayed on analog TVs by using the extra vertical blanking interval (VBI) lines in the analog TV signal to carry data. Every U.S. broadcast or cable channel has 10 VBI lines, each comparable to a 9,600 bps data connection. In the United States, VBI lines have long been used for closed captioning, and in Europe, VBI lines are used to transmit teletext pages with news, weather or content related to a particular TV show. In Japan, the technology is being used to enhance some programs with background information and voting polls. The same VBI technique has also enabled Japanese networks to add channels on weather, news, trivia, travel, programming and the stock market

Several networks have announced plans to offer interactive services during their existing broadcasts using extra VBI lines. On Court TV, for instance, viewers will be able to get information on the trial in progress, a summary of the case and a legal dictionary. The Weather Channel will provide interactive weather information to its national signal 24 hours per day on demand. Turner Broadcasting System's CNN and CNN Headline News will offer interactive content, including

access to headlines, story details and news polls. ESPN will offer viewers interactive scoreboards, on-demand statistics, player profiles, quizzes and opinion polls. MTV Networks also has announced plans to offer interactivity as part of its regular programming on its VH-1 and Nickelodeon/Nick at Nite networks. NBC and CBS Cable also plan to add interactive services to their broadcasts.

Due to the limitations of analog broadcasts, the use of VBI lines is most likely only a short-term solution for the deployment of data services. The next generation of interactive TV products will be based on high-bandwidth digital technology, which will make it easier to deploy graphics-intensive data services that are "push"- and transaction-based. Digital formats will bring a whole new level of interactive capabilities to the market.

ACTV Entertainment, an interactive services company, has digital-based technology which enables switching between the video pictures from different cameras filming the same program—an obvious application for sports viewing. ACTV has signed a deal with the Fox Sports Network to provide its service to Fox regional channels, the first of which will be in Dallas, since it will be one of the earliest markets to receive digital set-top boxes.

Digital broadcasts are expected to begin in some U.S. markets by the end of this year. Over time, analog-based interactive cable TV systems will be able to migrate to a digital environment based on the Open Cable Standard, which defines delivery specifications that interactive TV services must use. Digital broadcasts—whether delivered by terrestrial, cable or satellite transmissions—will enable the transmission of much more information, creating enough bandwidth for an enormous amount of data to be sent.

The market potential for data-intensive services is extensive, with applications in areas such as catalog shopping (style and color selections), movie rental (video samples), real estate (property walk-throughs), photo distribution (on-demand printing), advertising (high-quality pictures, video and graphics) and publishing.

Digital TV is already being deployed in some communities around the nation. Tele-Communications Inc. (TCI) announced its plans to launch digital cable service in San Jose, Calif. in early March. TCI's San Jose-based service includes 10 channels of commercial-free music and an advanced

program guide that enables viewers to scroll through program listings and descriptions at the bottom of the TV screen while watching the channel of their choice. Reminders appear for consumers when their favorite programs are about to come on. Consumers' digital converter boxes are hooked up to their phone lines. Late at night, TCI "pushes" announcements to subscribers and retrieves records about their preferences.

These late-night transmissions are being considered by many broadcasters as a way to address the bandwidth issue, one of the major concerns surrounding interactive data services for both digital and analog systems. Consumers who are not PC users have experience only with the instantaneous reaction they get when they change channels on a television. They have limited patience for the time it takes to download a file. And the infrastructure is not ready to provide an instantaneous TV-like response. Thus, for certain interactive applications that don't require real-time Internet access, broadcasters can push relevant data via modem late at night so that it will be stored to a set-top's hard drive—ready for the next day when a user calls up a Web page during a broadcast and gets an immediate response.

But for obvious reasons, broadcasters want to discourage consumers from leaving their broadcast to launch the Internet. By linking a URL with video content—having a picture-in-picture window within the TV screen—this problem can be eliminated. In other words, the key to enabling broadcasters to retain their audiences is to give users the ability to link to a Web site without leaving the video they are watching. Several broadcasters are working with technology that enables them to embed a URL in the VBI in their video signal. When a user's set-top detects the URL in the signal, it displays a crossover link icon in the corner of the TV screen. By clicking on the box, it automatically dials the Web site and displays a page that is relevant to the current show or advertisement, enabling consumers to immediately purchase a product or read related information.

This type of technology could facilitate new types of electronic commerce. For example, an advertiser could add transaction-based applications such as requests for brochures, coupons, product samples and merchandise order forms. An example is N2K Entertainment's Music Boulevard, which broadcast a special advertisement during the 40th Annual Grammy Awards in February 1998. The broadcast enabled WebTV users to link directly from the CBS Grammy broadcast to the Music Boulevard Web site for shopping

without abandoning the TV broadcast.

Whether interactive services are deployed via digital or analog technology, the complex applications coming down the pipeline will require low-cost solutions that can display Internet and graphics content and mix video and graphics content for TV display. Any solution that requires multiple CPUs or media processors with several external DRAM memory chips will make set-top electronics too expensive for a mass market to develop. TV sets must be able to receive, display, and overlay rich interactive graphics content in an enhanced multimedia fashion with an approachable user interface in order for consumers to adopt interactive services.

Technical Issues Related to Display and User Interface for Consumers

In order to effectively deploy interactive data services in a manner that will foster mass appeal, there are numerous technical challenges to overcome. Compelling data services will require high-quality display of text and graphics, as well as a visually engaging user interface with which consumers are comfortable, including intuitive on-screen controls.

The science of graphics display had its beginnings in the context of computers, rather than in consumer appliances. Research in the area started with the pioneering work on the ALTO bitmap workstation at Xerox Corporation's Palo Alto Research Center in the early '70s, and was followed by the introduction of Apple Computer's Macintosh User Interface in 1984. It is this very fact that is at the root of the technical problems associated with integrating graphics into today's ubiquitous legacy NTSC/PAL/SECAM color TV systems permeating seemingly every household. The ability to display PC-quality graphics on a TV screen is crucial for the success of interactive data services.

Color Space and Raster Scan Models:

Work stations and computer systems have historically used RGB CRT monitors, which were optimized for reading 10-point type and static images from a distance of about two feet. The small display size of such monitors uses a low-brightness progressive (non-interlaced) scan with fast screen refresh to produce a crisp, high-resolution, high-bandwidth image. Thus, it is natural that the native color space of computer graphics is RGB with a progressive scan model.

However, legacy TV systems do not use the RGB color space. For reasons of transmission bandwidth efficiency and backward compatibility with prior black and white TVs, today's color TVs feature the native color space of YCbCr (closely related to the YUV and YIQ color spaces). Furthermore, these systems were designed to generate a relatively low-resolution, high-brightness image, suitable for viewing moving content on a large display area at distances of six feet or more. The choice of interlaced scan was dictated both by the technological constraints on refresh rates and the need for images to appear flicker-free. Each part of the screen must be refreshed at a rate sufficient for the eye to integrate the light impulses generated by each pixel. Here, each field is scanned at the rate of 60 Hz (50 Hz in PAL/SECAM), for a total frame refresh rate of 30 Hz (25 Hz in PAL/SECAM), while giving the appearance of a 60 Hz frame refresh rate.

A high-bandwidth graphics image, such as one depicting typical Web site content with characters and horizontal lines, would flicker annoyingly if not carefully preprocessed through an anti-flicker filter. Such filtering will cause the loss of some spatial acuity in the displayed image; this may be controlled by the programmability, if available, of the anti-flicker filter (e.g. altering the frequency response by reprogramming the number of taps and coefficients) or reprogramming the thresholding mechanism for applying the filter (e.g. applying the filter to the bright parts of the image or those with high spatial content).

Graphics Requirements:

A well-designed user interface for data services may borrow several features from Apple Macintosh or Microsoft Windows, even when displayed on a regular TV set. The graphics/video processor in the system may thus need to support VGA (640x480) and Super VGA (800x600) square-pixel graphics resolutions (regardless of PAL or NTSC) in order to deliver PC-type graphics on a TV screen.

The so-called BLT Engine (a term derived from "bit block transfer"; or 2-D Accelerator Engine) in a processor must be able to support all the standard multi- two/three-operand raster (boolean) operations. An example might be pull-down menu implementation requiring the saving of screen areas temporarily obscured by popped-up images, such as windows and menus. Other examples include the OR operation—which is useful for nondestructive additions to what is already there, such as realizing boldface by copying twice with a slight

horizontal offset—and the XOR operation, useful for inverting the destination, such as highlighting a button selected by the user.

The ability to suitably upscale and downscale graphical content is also important. For example, graphics content may be stored in reduced resolution to conserve system memory. But upon display, a full-resolution picture may have to be produced. For visually appealing results, careful image resizing is required, as opposed to simple pixel dropping or replication. For example, it may be desirable to underscan a 640x480 square pixel graphics image so that its composite with a 720x480 pixel video image is completely visible.

Visually engaging graphical data, especially when featuring natural pictorial content, would demand color depths of 16-bit RGB or higher. For maximum flexibility in utilizing available graphical and memory resources, an array of pixel depths (modes) must be supported (with transitions among them) both by the BLT Engine and the display compositor—including those in YCbCr (as in the case of software-decoded pictorial content, thus alleviating the need for a redundant YCbCr to RGB transformation). To this end, a reasonably sized programmable RGB color Look Up table is needed for indexed color support. These pixel modes must also include transparency through a high-resolution alpha channel (the per-pixel version of this is often referred to as local, while the region-based version is known as global). A graceful image depth reduction algorithm implemented in hardware is also needed for efficient available memory utilization and to offload the CPU. A simple linear color reduction in the latter case would result in visually annoying color contours.

Animation is another requirement of visually interesting graphical content, especially for audiences accustomed to the moving imagery of broadcast television. It is necessary to be able to execute a sequence of block transfers with no CPU intervention—other than to initiate the process. Animation may also be realized by programming the entry of a color LUT to trace the movement of an object across a raster map.

An advanced user interface would also benefit from the ability to compose multiple translucent graphical objects. This requires the implementation, in the BLT engine, of a full alpha compositing arithmetic per Porter and Duff's classical "Compositing Digital Images," ACM SIGGRAPH.

Multi-Plane Composite of Video and Graphics:

A flexible and engaging user interface design would greatly benefit from a display processor's ability to composite multiple planes that are independently controlled and placed. For example, it would be useful for graphic icons and pictorial information to be tiled, where only a single primitive is stored either on-chip (if small enough) or in off-screen memory and then repeatedly block transferred to a background plane.

It is now well accepted that the user interface for a successful consumer interactive data services provider must identify itself as much with TV as with graphical content. Effective integration of incoming TV imagery in the final composite is key. This integration should allow for the default classical TV mode by enabling an unobtrusive video mode in the background plane. Or, it should enable a separate downsized video plane that may be shown simultaneously with yet another separate graphics plane (with related or unrelated content). It is essential to maintain the basic fidelity of the downscaled video by carefully "band limiting" the incoming video prior to horizontal and vertical subsampling. The failure to do so will result in so-called anti-aliasing artifacts that, when visible, may manifest themselves through jagged edges or altered texture compared to the original. The flexibility of supporting unscaled region-of-interest (pan and scan), brightness and saturation controls, and different aspect ratios including letterboxing for display of 16:9 wide-screen content on classical 4:3 TV monitors are also highly desirable features.

The graphical content of a separate graphics plane must be seamlessly fusible into the accompanying, or underlying, background and video planes. This requires the display processor to support a high-resolution global alpha channel, which enables customized graphic icons to be juxtaposed into a discreet corner of the video to indicate the broadcaster or the availability of additional related content, such as a Web site. The display processor should also enable color keying, whereby the local alpha values of pixels falling within a certain color range are set to zero in order to allow underlying opaque video to show through. An example is the effect achieved with TV weather broadcast graphics, which have smooth and natural-looking borders.

While a BLT Engine may be used to emulate a cursor function, a separate hardware solution for a cursor is more desirable for performance reasons (note that a cursor may be thought of as a frequently moved rectangular object in

on-screen memory).

Measures for Improved Text Display:

Specifying and implementing text drawing is always complex in standard graphics because of the large number of options and attributes text can have, including: 1) the style or font of the characters (Times Roman, Helvetica, etc.); 2) the appearance of text (Roman, underlined, bold, etc.); 3) text size and width; 4) spacing between characters; and 5) spacing between lines. The simplest way to define characters in a given font is by a small rectangular bitmap. Generating a character then entails simply using a block transfer to copy the character's image from an off-screen location (called a font cache) into the display frame buffer at the desired location.

The bitmaps for the font cache are usually created by scanning enlarged pictures of characters from typesetting fonts in different sizes. Alternatively, a type designer may use a paint program to create from scratch fonts that are specially designed for a given application. Since small bitmaps do not scale well, more than one bitmap must be defined for a given character in a given font to provide standard sizes. Also, each typeface requires its own set of bitmaps. Thus, a single font in eight different point sizes and four faces (normal, bold, italic and bold italic) requires 32 font caches.

There are major difficulties associated with creating a bitmap version from a geometric drawing by a font designer (e.g. the middle leg of the letter "m" would look thinner than the outer two, or an "o" may have a small bump on top). This is because the geometry of character shapes is deeply interrelated—certain elements must have the same width, certain topological characteristics must be preserved and certain relationships among different characters in the same font must be preserved. These types of issues are studied in a special field called Digital Typography.

Now, in anti-aliased text that is implemented by a sequence of spline curves giving an outline for each character, subpixel specification of character locations is possible. This is necessary for high-quality output. In addition, such artifacts as bumps, holes, and uneven stems disappear automatically. However, precomputing the appearance of all possible characters in a font (at several subpixel locations called phases) can require a significant amount of storage. The problem is even more magnified with non-Latin alphabets such as Kanji or Arabic.

The local alpha capability can improve the font cache technique mentioned earlier to first- order approximate the performance of the prohibitively expensive anti-aliased text. This is because a high-resolution alpha channel (such as 8 bits) can generate subpixel specifications for character boundaries. Furthermore, a graphics scaling capability may reduce the need for storing all required font sizes while the BLT Engine may be used to approximate bold, italics, etc.

Finally, local alpha effectively implements a band-limiting operation on the high-bandwidth sharp-text-against-a-background signal in order to reduce or eliminate the annoying ringing effects caused by narrow-bandwidth NTSC/PAL encoders.

Audio:

A graphics/display processor should also include special signal processing for multi-input (including those from video sources), multi-output, and internal precaptured, mono and stereo audio channels. This may take the form of programmable coefficients for mixing and cross- fading for attenuation or gain control. Mixing capabilities allow for the mixing of external audio inputs with each other or the mixing of external audio inputs with internal audio. The mixing of external and internal audio is key for enabling user interface tones. The mixing of coefficients affects both of the stereo pairs simultaneously. However, with cross-fading, coefficients may be specified individually for each of the channels in the input stereo pairs. Clearly, support for multi-channel, high-quality audio input and output is key in a consumer setting.

Overall System Considerations:

In addition to the technical requirements discussed above, these systems must enable a fast and responsive user interface and on-screen graphics rendering that would not test the patience of the consumer. Thus, a high-bandwidth 32-bit CPU interface with on-chip cache and write buffers for efficient read/write access to memory is needed. The technical requirements also put heavy demands on the expected memory bandwidth and size. It is essential for the memory interface to support the higher-bandwidth Synchronous and Synchronous Graphic DRAM in 32-bit configurations. The addressable memory space must also be at least four MBytes for performance and flexibility. The implementation of a unified-

memory architecture through the CPU interface should enable the dynamic partitioning of system and graphics memory demands and thus improve memory granularity.

Finally, a graphics/display processor must support standard interfaces to commodity video and MPEG2 decoders (at input) and encoders (at output) through compliance with CCIR 601/656. Audio input and output ports must be compliant with I2S protocol. In view of the lack of a dominant CPU in the consumer set-top-box market, the CPU interface must be generic so as to allow glueless interface to a variety of RISC CPUs.

> Projecting the Television Audience in the Digital Future

[A presentation by Janice Jones, CPB's director of research, before the European Society for Opinion and Marketing Research (ESOMAR ®) at a meeting in Vienna, Austria]

Projecting the Television Audience in the Digital Future. Digital television technology is bringing opportunities and challenges to the broadcasting industry. The opportunity for public broadcasting is to enhance and expand our mission to support education, culture, and citizenship. The program genres on U.S. public television are ideal candidates for the enhancement of high definition television with clearer pictures and digital sound. Performing arts, drama and theater, science and nature documentaries, and historical documentaries will be even more compelling to viewers in high definition television.

There are many challenges in planning for the future. All the stakeholders in the digital frontier are faced with a largely unknown future. How quickly will consumers adopt the new technology? While the digital television conversion is often compared to the change from black and white television sets to color, this new technology will not be backward compatible. This will be a new experience for consumers. Various possibilities for access have been suggested in addition to digital television sets: Will new computers provide digital television access? Will most people get adapters for their analog sets? Or will cable television provide digital access?

The timetable for digital conversion in the U.S. has been set by the Federal Communications Commission. These rules require network affiliated stations in the top ten U.S. markets to begin broadcasting digital television within the next two years. Some stations are already beginning digital broadcasts so that they will be ready in time for holiday spending in December 1998. Fifty-three percent of the American public will have digital broadcasts available by December 1999. All other commercial television stations will have to begin digital broadcasts within five years -- by 2003.

The conversion to digital has high costs. Public broadcasting estimates the initial infrastructure investment required to make the transition to digital technology for the public broadcasting service at \$1.7 billion. If high-definition television is chosen, production costs will increase. But increased revenues are uncertain. Bob Wright, president and CEO of NBC pointed out that "NBC has expended more than \$55 million on the creation of digital studio facilities at our headquarters in New York ... The cost of conversion to full digital television transmission capability for each station is likely to be closer to \$10 million ... There are no immediate prospects for broadcasters to realize increased revenues to offset the enormous costs of digital conversion." If stations choose to broadcast multiple channels,

audience shares will be split even more finely. If broadcasters choose high definition pictures, there is no guarantee of larger audience shares when few consumers have yet to see a digital picture.

To determine audience reaction to this new technology, CPB commissioned Bruskin Goldring Research to survey the U.S. public. The telephone survey was conducted in October 1997 of a nationally projectable random sample of 1,007 adults. The goals of the survey were to determine if the public had preferences prior to the launch of the new technology that might shape the direction of new services. Specifically, the survey questioned respondents about the following topics: awareness of digital television, interest in purchasing digital television sets, interest in public television in digital formats, preferences for clear pictures and digital sound versus multicasting of channels, and programming preferences.

PBS has an adult audience that tends to skew older than the commercial broadcast networks' audiences in prime time. In planning this survey we were especially concerned about how our viewers would respond to the concept of digital television -- particularly older viewers who might normally be technology-averse.

The survey identified two groups of "early adopters" who might most likely be the first purchasers of digital television sets. The first group are people who own new technology items; for our definition we included people with home computers and at least one other item, such as fax or online service. We'll refer to them as technology adopters. The second group identify themselves as among the first to try new products -- we'll refer to them just as early adopters.

In these groups, about 80 percent of those who plan to purchase a new television set in the next five years said they would probably or definitely buy a digital set.

The chart shows demographic differences in the two groups. The technology adopters have the higher household income (average \$57,500), are slightly older and more likely to have a college education. The early adopters are more likely to have children under age 18. Of the total population early adopter represent only nine percent while technology adopters are 31 percent.

Other characteristics of the first digital set purchasers are those who are males, households with children, and households with incomes of \$75 thousand or more. Public television donors and viewers also fit the profile. Thirty-seven percent of donors to public television indicated that they plan to purchase a digital television set in the next five years. We were also pleased to find that people who said they planned to buy a digital set were also more likely to watch every listed genre of public television programs than the general population.

Overall, about 42 percent of the population expect to buy a new television set within the next five years, but this does not mean they plan to purchase an expensive digital set.

In fact, a sizable number of consumers are oblivious to the coming changes.

Our survey showed that 40 percent of the population was unaware that they would need adapters or a new TV set in order to receive the new digital broadcast system.

One important finding from the survey was the lack of awareness of high definition television. Fifty-eight percent of the population had never heard of high definition television. Even among early adopters and those who plan to buy a new TV set, many were unaware of HDTV.

Awareness was higher among people who currently own larger screen television sets, have computers and other electronics, who self-identify as the first to try new products, men, college graduates and high income households.

All in all, about 69 percent of the population have no plans to purchase a digital TV set in the next five years.

Clearly people will need more information if the digital revolution is going to proceed with any speed.

One of the decisions facing broadcasters is whether to use the digital spectrum for multiple channels or to broadcast high definition programs. Our survey tried to find out if people wanted better quality pictures or more channels in a digital world. We asked about the importance of a number of features that digital television could provide. Better quality pictures were given higher importance ratings among all demographics with 53 percent of the total population rating it as extremely or very important. If you look at the chart, you will notice that high income demographics alone are not indicative of higher interest in the features that digital television is likely to offer: 69 percent of early adopters and those who plan to buy a new TV said better pictures were more important.

Other features such as interactivity and the ability to access more information were less important to consumers. Surprisingly, being able to watch television on a computer was the least attractive feature, even among the technology adopters -- only six percent found this appealing. However, the survey did not describe any change in screen size for viewing on a computer. Since people with large-screen TVs had a greater interest purchasing digital sets, we might assume that computer convergence will not be a driver for early acceptance without a large screen. When and if computers with large TV screens appear in the marketplace, attitudes might change about this feature.

We asked what kinds of programs people wanted to see in high definition? As you can see from the chart, people who plan to purchase digital sets have a higher interest in HDTV across all genres. Top programs genres (extremely and very important) among the total population for broadcast in high definition were feature films, news and public affairs, nature and science documentaries. However, if we look at just the categories that people thought were *extremely* important, the top three were sports, nature and science documentaries and children's programs.

A puzzling choice is news and public affairs. Since many news programs are of a

"talking head" type of production, it is unclear why viewers would choose to see this in high definition. Perhaps they were thinking more of documentary public affairs programs. This would be another area for further research with viewers before plunging into the high cost of high definition production of news.

Least important for HDTV were situation comedies, how-to programs and daytime dramas and soaps. Since a large portion of commercial broadcast television in the U.S. consists of situation comedies in prime time, the effort and cost to broadcast these programs in high definition may not be warranted.

Strong interest in digital from families with children may indicate that this demographic group is an important driver for digital adoption. Families with children rated the importance of children's programs in HDTV above all other genres. In addition, computers have greater penetration in households with children. Educating children has been one of the major reasons people give for purchasing personal computers. A similar pattern may emerge with the new digital television sets. If so, educational applications may help drive consumer interest in the new technology.

Digital capability will expand public television's educational services. These services include (1) early childhood services; (2) technology integration in K-12 education; and (3) workforce education/training.

In addition, public television will continue to support and bring to viewers high quality children's educational programming.

Public broadcasting is committed to serving the unserved and underserved populations. Results of our survey point to higher economic and educational segments of the population as the initial consumers of digital technology. This finding presents a challenge for universal public service. However, the technology itself offers new opportunities to serve more diverse needs.

Economic, physical, cultural, or language barriers can be more easily surmounted by utilizing the new technology. Public broadcasting has pioneered the development of open and closed captioning for the deaf, descriptive video service (DVS) and radio reading services for the blind or visually impaired. Digital broadcasting will make more of these services possible.

The opportunity to multicast programs and to continue to serve all people regardless of marketplace demands has even greater potential with the new technology. As Patricia Hodgson of the BBC points out, "public service networks mobilise investment in particular kinds of programmes that are highly valued by audiences but not guaranteed by the market."

Additional data from Roper Starch Worldwide indicates that the gap between the people who have technology and the technology have-nots is becoming more pronounced. Public television services can reach out to close the gap between technology-rich and information-poor. Services offered through schools and

libraries will enable the technology to reach those who won't be first in line to receive the digital signals

Public television services will also be attractive to a wide range of the population, helping to pull the technology into more homes. Hodgson argues that the "free-to-air networks will be crucial in the drive to digital: in persuading the whole audience, not just the young or better off -- not just sports or film fans -- but the whole audience, to invest in digital receivers, sign up to the Information Society."

In conclusion, the findings of this very preliminary survey are:

-- Awareness of the digital television future is fairly low; consumers will need a lot of information.

-- The "wow factor" of the high definition picture is likely to drive interest rather than the offering of multiple channels

-- Socio-economic characteristics will be an important factor for early adoption.

16. Specific genres will attract viewers to the new technology, especially in high definition. Public television's signature genre programming in high definition has high appeal to the public and is likely to attract viewers to the new technology. Families with children are likely to be consumers of the new technology with special educational interests that public television can serve through expansion of current educational services.

Percentage of each group that finds the feature extremely or very important:

Feature	Total Pop.	Early Adopters	Tech. Adopter	Own 30-inch set	High Income	Plan to Buy Digital Set
Quality picture	52.5	68.7	51.2	51.3	46.1	68.6
More program choices	38.6	59.7	36.0	36.6	35.6	51.5
More channels	34.9	49.9	34.4	32.4	29.6	46.9
Access information	27.9	37.5	27.2	28.2	20.3	39.9
Interactive TV	24.4	44.0	20.4	23.8	21.6	32.6
Computer TV	7.4	18.0	6.3	7.0	6.3	10.7

Percentage finding it extremely or very important to broadcast in HDTV.

Program Type	Total Population	Plan to Buy Digital Set	High Income	PTV Donors	Early Adopters	Have Children
Feature films	46.4	59.2	56.9	43.6	55.6	46.2
News and public affairs	45.8	58.3	41.5	45.5	50.9	45.7
Nature and science documentaries	44.2	56.3	45.5	50.7	45.5	52.7
Sports	41.9	54.1	47.1	42.8	50.4	44.6
Historical documentaries	37.1	45.4	33.1	45.4	49.9	40.4
Children's content	36.3	46.8	27.6	30.1	46.4	57.7
Music and concerts	35.6	45.6	39.9	40.3	49.9	33.9
Dramas	25.9	35.3	27.3	28.2	35.6	21.2
Situation comedies	20.9	29.6	23.0	14.8	25.9	23.1
How-to, such as cooking, painting	20.0	25.7	16.4	19.9	26.7	21.5
Daytime dramas	12.3	13.4	6.2	4.7	14.4	13.7

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Beyond the VBI -- High-Speed Datacasting and Enhanced TV

By Steven Vedro

To most public broadcasters, "digital television" is that thousand pound gorilla sitting in the waiting room. The massive project involving new production gear, distribution and transmission investments, and in many cases new towers. But digital broadcasting's "soft issues" of content development, program rights and audience development are no longer waiting outside. Technology developments in data delivery over analog broadcast -- using the VBI, horizontal over-scan, and data in the video itself -- are creating new opportunities for enhanced television programming and the delivery of multiple program-related websites. They are also making it possible to deliver multiple, targeted, lower-resolution video streams of totally different content to totally different audiences.

As these new datacast services compete for access to the broadcast signal, questions as to the allocation of formerly under-utilized analog real estate are beginning to arise. Some are already being triggered by a new interest in PBS's existing vertical blanking interval, others relate to new ways of moving high-speed data within the main video field. These include the following: (1) How much should be set aside for program-related content as opposed to expansion of ancillary revenue opportunities? (2) Who should control and/or market these datacast streams -- each station, PBS, or the program producer? and (3) How should contention between competing data streams be handled? The growth of analog broadcast-delivered digital content means that these questions demand our attention today. They are not something that will only appear when we turn on our digital transmitters.

Keep on Pushing... Data to the Desktop

The use of the television vertical blanking interval (VBI) as a universal "push technology" delivery system appears to have finally come of age. No longer limited to closed captioning or setting the clock on VCRs, VBI datacasting is now aiming at the desktop. Wavephore Incorporated, one of PBS National Datacast's (NDI) anchor tenants, is launching a mass market service built around a video decoder card and software decoder tuned to PBS broadcasts. Its new advertiser-supported Wavetop service offers a dozen program streams updated regularly and fed free to subscribers' office and home computers. While business services such as quote.com, Fortune, and Money Magazine dominate Wavetop's lineup, consumer "channels" such as Entertainment Weekly, People, The Weather Channel Online and CBS Sportsline are part of the Wavetop package. A "KidsTop" includes pages from Sports Illustrated for Kids, and PBS Online's Kids Neighborhood.

Whether Wavetop succeeds or not, one can expect additional tenants in the wings willing to pay to ride the PBS VBI. StarSight Telecast. For example, has used NDI's network for years to reach a nationwide audience for its electronic TV program guide. At the present time there is one VBI line already equipped and available for nation-wide lease, but NDI's CEO, Jackie Weiss would like to see more lines made available to NDI for commercial resale. She is actively campaigning for those stations who have not done so to consider dedicating "at least three more lines to NDI" for such new business.

This interest in the VBI is not limited to commercial applications however. As I discussed in a related info.p@ckets article, a number of producers are testing the value of the VBI as a conduit for program-related data using Intericast technology. WGBH Boston for example, produced a number of web pages for its local broadcast of Nova last season. They were not however able to take the feed national as the PBS Digicipher system strips all VBI data (except Line 21 captions) from uplinked programs as part of the compression process. As NDI signals are carried over a different path and reinserted at each station, there is no simple way as of now to coordinate taking real-time data from a program master tape and ensuring that it is re-inserted at each station's transmitter. technical

According to Jackie Weiss, CEO of National Datacast, balancing the demand for VBI between commercial revenue contracts and program producer interests will be an important subject for station managers in the coming year. PBS, with NDI's assistance, is working with stations to find a way to dedicate at least one national line for program-related data delivery. Howard Cutler, Director of Interactive Services for WGBH, estimates that its still a year before all the hardware and the business relationships are worked out. "We don't yet have every major station with the same VBI lines dedicated to program related content. It will take that to be able to beam up an original broadcast feed from its master tape with content encoded on a particular VBI line or set of lines, and have it arrive with every station able to record and rebroadcast that data when they repeat the show." A possible solution being investigated by PBS and NDI involves the placement of additional data cache servers at each station. These devices would capture NDI feeds and schedule local insertion into the appropriate broadcast.

These contractual and technical challenges are hard enough when all that is being negotiated is access to a clearly defined portion of the broadcast signal. New technologies however, are muddying the waters. The ability to bury data in the main video field, the horizontal overscan, and all the other cracks and crevices of the old analog delivery vehicle, has added new heat to the debate of who is to manage this new capacity and who is to control what is carried. While one station manager might be quite willing to dedicate a VBI line for Nova, another may want to rent it for local revenue. Now what happens to the discussion when talking dolls are added to the mix, or when the data signal goes from a few kilobits per second carried on a segregated channel, to megabits of data carried in the main video field!

Cybercast and WebTV: A Preview of Enhanced Television?

Two new products -- one focused on PCs, the other a TV set-top device, offer a preview of some of the applications of high-speed datacasting, and of the policy questions lurking under the surface of technology change.

Last season an unusual series aired on about forty public television stations. PCTV's Internet

Cafe included a 2 minute segment where a portion of the video picture was replaced with a scene of swirling dots. This CyberBlast segment carried a 400 kb/s data stream to selected viewers who had equipped their PCs with EN Technology's TVModem data receiver boards. While few stations would want their broadcast pictures truncated to make room for rushing data dots, the idea of sending information at speeds up to 1 Mb/s (depending on picture area used and data redundancy requirements) has intrigued a number of producers and distance educators, who for different reasons are willing to trade some funny-looking pictures for a new information channel:

- The Lux WorldClass distance learning package bundles EN Technology modems in their student PC terminals. Like ACTV's eSchool Online, and ILINC's LearnLine, students are linked to their instructor via internet streaming audio and interactive "white board." They can communicate with each other via real-time chat as well as email, and in some versions, via internet telephony. Worldclass has tailored its product for instructional television applications -- assuming an existing (broadcast, cable, ITFS, satellite) one-to-many video distribution channel. Depending on the required speed, EN-based datacasts are hidden in the VBI or are visible in portions or across the entire video image (see photo below). Instructors can use this capacity to load student PCs with course materials, multimedia simulations and even streaming audio and video clips. The WorldClass system is currently being evaluated by the Archdiocese of New York, the University of Maryland and the Universal Education Foundation of Syracuse.



WorldClass student terminal during datacast feed.

- A similar arrangement, using most of the broadcast capacity of a local cable channel is being used in Somerville, Massachusetts to transfer high-resolution encrypted x-ray images between Somerville Hospital and its radiology teams at off-site clinics and home offices. En Technology hopes that there will be other markets for its full-band system, but as their data replaces the video, they are limited to ITFS, cable or other non-broadcast channels.
- WGBH Boston is currently reviewing EN Technology cybercasting in the active video field. Last summer they downloaded an entire NOVA web site to school-based receivers; they also ran a second test -- over their in-house CCTV distribution network -- during the local airing of the "American Experience."

Enter E Web-TV Plus

EN Technology's data stream requires distortion of the primary video image, a new product promises to bring the same high-speed data capacity to every television receiver at a cost of under \$250. The WebTV Plus box going on sale this winter will do more than bring data to the set -- it promises to turn the TV into an enhanced multimedia reception device. While the first generation of WebTV boxes provided a way of connecting a TV to the internet, they never caught on with most viewers, selling less than 200,000 units to date. With computer prices falling, most middle-class families it appeared, could find a low-cost computer to get on the net if they were so interested. Turning their TVs into an internet access device apparently didn't intrigue them.

While the broadcast industry waits for digital sets (at whatever refresh rate and scanning mode), WebTV plans to squeeze as much digital data into today's existing analog channels as it can. And by adding a hard disk and PIP display, it has cobbled together a pretty cheap and pretty powerful prototype of an interactive television receiver. The decoders, built by Sony, Phillips, and Mitsubishi, contain a powerful set of processors and communications interfaces, including:

- a cable-ready stereo tuner and studio-quality video digitizer
- its "Solo" ASIC, for handling on-the-fly video decompression, 3-D transformation, graphics overlay, anti-aliasing and anti-flicker processing, and multiple screen displays, including Picture-in-Picture;
- an integrated VBI decoder and proprietary in-band (1 Mb/s) video modem;
- a K56flex Rockwell telephone modem;
- a 1.1Gb hard-drive for buffering downloaded multimedia clips and/or "TVML" web screens; and
- a parallel printer port, video capture port, and an integrated SmartCard reader.

With all this hardware investment, it is clear that Web-TV Networks is acting less like an ISP who happens to use a TV display, than as enhanced TV content development and program-linked transaction services company. This product is not about surfing the net from your TV, but it is about bringing a specific set of net-like features to television. Its not about making your TV a PC screen, or playing along with Jeopardy. It is however, about adding additional program streams, new transaction capability and direct marketing power to mass entertainment.

The box's VBI decoder will decode (EIA-746 standard) Line 21 Extended Data Set signals embedded in the broadcast program. Once triggered it will generate an on-screen icon alerting the viewer that a "TV Cross-Over Link" is available. Clicking on the link, the viewer can be sent out via the modem to a producer's or advertiser's web site for real-time viewing in a PIP video window, or the site's url can be bookmarked for later access. PBS already knows the power of visible url link displays. Even without an integrated decoder, David Johnston, Director of Technology for PBS Online, told me that over 1 million new "hits" occurred at the Nova and Frontline sites within 24 hours of the display of the PBS Online icon within these programs.

But in the future, for many programs and advertisements, the cross-over will be immediate. The

TV image will be reduced and the viewer presented with a set of screens whose content is relayed directly from the hard disk where it has been pre-loaded either during the start of the program or, for video-intensive content (including a personalized TV listings service), in the early-morning hours while the family was asleep! WebTV plans to buy "infomercial" time and resell it at a discount to program producers who agree to let it bury its in-band signal in their broadcasts. Since this information is not in the VBI, local broadcasters and cable operators will have a hard time stripping this signal. "PBS Online," WebTV CEO Steve Perlman told me, "could wind up being downloaded hidden in an NBC late night movie." Once full-band open broadcast data transmission is approved by the FCC -- or when Microsoft negotiates its own cable channel -- this data rate will increase to 10Mbps, allowing for the "push" of video programs and/or entire multimedia web sites in a manner of minutes.

Given this focus on multimedia delivery, it should come as no surprise that Perlman told Red Herring magazine that the company's biggest content allies will not be internet sites, but TV content producers:

"Our closest partners are TV brands like Discovery Online and E! Online. They are developing new web sites that don't look like web sites, with a lot of video and a lot of sound. They look a lot more like TV -- hyper-linked TV."

Perlman has also announced that MSNBC, Nickelodeon, PBS ONLINE, Showtime, TV Guide Online, and Warner Brothers Online will also be "premiere content providers." These participants, in addition to providing cross-over urls in their programs, will have their logos appear on the WebTV homepage. Charter advertisers adding urls to their TV spots will be General Motors, Honda, AT&T and Charles Schwab.

The acquisition of WebTV Plus should be seen as one element of Microsoft's goal to define -- and hopefully dominate, the enhanced TV landscape. This set-top box is not only controlled by the viewer, but also via downloaded commands that allow WebTV to turn the box on in the late evening hours and tune to a channel carrying the datacast programs and web sites. Picture less TV-PC Convergence" and more a "responsive TV." A set with a personalized program guide, and also pre-loaded multimedia ads, coupons, and catalogs based upon your interests. Add a small transaction fee for Microsoft, and you get the revenue idea. Now add millions of set-top (cable) boxes running a Microsoft operating system, an enhanced TV module under Windows '98, and you can see one version of the transition to digital broadcasting -- all under the MS logo!

Implications for Public TV

WebTV and EN are not the only datacast technologies on the horizon. Even while we wait for full DTV, advances in digital watermarking and encoding techniques will soon make it possible to increase the "hidden" data throughput by an order of magnitude. Walt Ciciora, one of the first teletext engineers in US (I met him at Zenith Electronics back in the 1970s) and now a private datacast consultant, told Wired magazine that he expects to see digital channels of up to 300 Mb/s to be delivered hidden in analog television in the next few years. It is clear that this new datacast opportunity -- and threat -- should be taken into any DTV multicast planning scenarios. It has implications for stations, producers and for PBS -- implications that need to be considered today.

A key set of questions relate to "program-related" data -- how to define it, and how to allocate these packets within the overall stream of video and non-program-related information flowing to the home. How can we put a value on different program streams, some of which require ten times the data capacity of another? Is feeding a Nova database, which can be accessed after the program is aired, more important than sending real-time signals to activate an Actimates doll? In many ways this is a classical allocation question similar to that faced by public broadcasting with the loss of its satellite transponders -- how do we allocate limited capacity to multiple competing users:

- How much degradation is acceptable?
- What programming is in the core mission and must be protected?
- What is ancillary and can be pre-empted?

The same questions relate to digital packets -- what signal needs protection, what can be delayed? What is core and what is ancillary? The assignment of primary responsibility between the local station, PBS, and the program producer for each of these data streams is no longer a distant challenge. The growth of push delivery and the emergence of enhanced set-top decoders such as WebTV Plus means that the problems of "packet contention" will soon be faced today in the analog world of 6 Mhz broadcast channels! Policies as to who can encode hidden data into the VBI, in the horizontal edges of the screen, sandwiched in the active video itself -- or even visible in a "cyber-burst window" -- need to be developed. While commercial broadcasters may shy away from adding any new "distractions" that may take their viewers away from advertisers, public stations have multiple mandates, and are more likely to engage in multicast and datacast activities. They can serve audiences with competing data streams, and even encourage them to leave the TV and interact with a downloaded database -- or even a physical book.

The problem of balancing multiple information streams is not limited to data versus video however. Despite the enormous data capacity of the DTV signal, contention is also likely to occur between competing active program streams. "Imagine sending an HD version of Evening at Pops," asks David Liroff of WGBH, "only to find that half the stations are airing three or four standard-definition streams, and have sold off their remaining capacity to datacast entrepreneurs."

While questions over the value of station "real-estate" and the appropriate role of NDI in marketing and/or coordinating datacasting are now underway within a number of PBS forums, issues around programmer-created data content are more complicated. CPB, as one of the major funders of program production, may be a neutral party best able to call together stations large and small, PBS, and program producers to take a close look at the policy issues around enhanced television/enhanced revenue opportunities in the new datacast world.

It may turn out that the revenue stream is pretty small once every broadcaster, cable station, satellite service and wireless channel operator has gone into the data-delivery business. It may also turn out that "enhanced TV," like "interactive TV" before it, is more technology-push than viewer-pull -- that much of the downloaded content will be erased, and the icons signaling "cross-over links" will be rejected as too distracting. As Rick Schneider of WUFT-TV observes, "there is significant question as to whether television viewers will be willing to

"watch" television in this fashion, accessing material and issuing commands while trying to follow action on a screen. Its reliance on real-time interactivity with the telecast also limits its likely application in schools or other formal learning settings. Real-time online content becomes as transitory as the broadcast itself. The work involved in creating such content is not worth it for just the broadcast."

Whether enhanced TV, providing either real-time program interaction opportunities -- or supplementary content for later review and/or action, provides real added value depends totally on how it is designed and the type of program it's connected to. WGBH's Cutler concludes, "for some things it will be fun in real time, for some educational applications it will be really useful, for some shows it will just be a way to send you stuff you will probably just delete like junk mail."

The luxury of thinking about these issues "after we build our DTV towers" is probably already gone. Smart set-top boxes and video computers are closer than we think. Whether used for program enhancement, digital video multicast streaming, or non-related revenue opportunities, we'd better start figuring out how to build the relationships required to manage our digital real estate today -- even when it still part of our analog "back forty."

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