An integrated communication system for the transmission of facsimile data or binary file data is described. The system comprises a conventional facsimile machine having the components of a scanner (14), sampling device (16), transmission memory (20), compression device (22) and modem (24) connected to a telephone line (12) of a public switched telephone network all being for the transmission of facsimile data and decompression device (28), reception memory (30), recording memory (34) and recording device (36) all being for the reception of facsimile data. These components are under the control of the operations microprocessor (26) and user interface (25). The binary file data transfer components are the Tx/Rx memory (42), floppy disk controller (40) and floppy disk drive (38), again, all under the control of the operations microprocessor (26). The binary file transfer is achieved either by control codes inserted in the Non Standard Field (NSF) of a facsimile transmission conducted under the CCITT Recommendation T.30, or the proposed amendments to the DIS/DTC/DCS signals of the same T.30 Recommendation as are under consideration.
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INTEGRATED DATA COMMUNICATION SYSTEM

Technical Field

This invention relates to an integrated data communication system, and relates in particular to apparatus permitting binary file transfer, and as an option, although not exclusively, binary file transfer in conjunction with facsimile transcepcion.

Description of the Prior Art

Facsimile machines provide for speedy document transfer between locations, however they have a number of drawbacks, particularly in relation to the joint preparation of documents using word processors at different locations. This task requires that each version of a document be printed and transmitted by facsimile to one or more other parties, then retyped into a different word processor for further editing. Such a procedure is time consuming and awkward.

Other electronic communication techniques have evolved in parallel with facsimile machines, these being directed to the provision of data transfer between various locations.

A first example of this is modem to modem communications between computers, whereby each computer must support like communication software to facilitate the exchange of information, and particularly compatibility of the respective operating system, modems and the communication protocol. In addition, it is necessary to have technically skilled operators involved. Modem to modem transfers can provide interactive communications between various computers including file transfers of data or other information such as word processing files.

PC-Fax communication systems have recently been developed, whereby a PC can have a card added as hardware to facilitate a similar function to that of a
facsimile machine. The PC can take any text file or video file, as are commonly used in many current word processors, and code convert the data into a format suitable for transmission as a facsimile. The PC and the receiving facsimile machine will conduct all the call establishment and pre-message procedures in order to set up communication, but the receiving facsimile machine will believe it is communication with another facsimile machine. The received information is then processed as usual.

If the receiving machine is a PC-Fax, the incoming facsimile transmission can be viewed on a screen or optionally printed using a printer with graphics capability. However, substantial optical or pseudo-optical character recognition procedures are required in order to reproduce the original document in text form, this requiring powerful processing and substantial memory capability. Therefore, PC-Fax to PC-Fax communication is not of practical interest, rather only the PC-Fax to facsimile machine communication has practical value, in that a sender need not purchase a facsimile machine to send faxes.

Within certain of the PC-Fax cards, binary file transfers are possible between cards of a similar manufacture and design. Such binary file transfer procedures require the full facilities of a PC, and are not possible with existing facsimile machines acting as a receiver.

Some facsimile machines have the capability of connection to PC's, but the functions achieved by such connections are limited to localized image transfer and document printing operations.

In no prior art systems is it possible to combine conventional facsimile techniques with conveniently operated non-facsimile or binary file transfers.
Object and Statement of the Invention

It is therefore an object of the invention to overcome one or more of the drawbacks in the prior art, and to provide apparatus for the convenient transmission and reception of binary file data and, as an option, also facsimile data at the option of a user.

Therefore, the invention provides an integrated communication system comprising a facsimile transceiver and a data transceiver, whereby, in use, the system can optionally:

(a) transceive documents to or from said facsimile transceiver; or
(b) transceive binary file data to or from said data transceiver;

further comprising interface means which is user selectable to permit a choice of, at least, whether documents are transceived or whether binary file data is transceived.

The invention also provides a facsimile machine for the transmission of documents, said facsimile machine being operable to provide facsimile transmission or binary file data transmission and further comprising:

data storage means; and

interface means which is selectable to permit a choice of whether documents are transmitted or whether binary file data is transmitted from said data storage means or both.

The invention further provides an integrated facsimile and binary file data transceiver comprising:

optical means for scanning a document to be transmitted or recording a document to be reproduced;

memory means for reading binary file data contained thereon or writing binary file data thereto;

a controller in communication with the optical means and the memory means;

a transceiver means in communication with the memory controller for the transception of facsimile
information or binary file data; and a user interface in communication with the controller for selecting facsimile transcepcion and/or binary file data transcepcion or both.

The invention further provides a binary file transceiver adapted for connection to a facsimile machine and comprising:

memory means for reading binary file data contained thereon or writing binary file data thereto; and a controller in communication with the memory means and adapted for connection to a modem in facsimile machine;

wherein the binary file data transceiver is operable to transceive binary file data by either control codes inserted in the Non Standard Field of a facsimile transmission conducted under the CCITT T.30 Recommendation or the modified DIS/DTC/DCS signals of the CCITT T.30 proposals as described herein.

The invention further provides a binary file data transceiver adapted for connection to public switched telephone network and comprising:

a modem connectable to the said public switched telephone network;

memory means for reading binary file data contained thereon or writing binary file data thereto; and a controller in communication with the memory means and the modem;

wherein the binary file data transceiver is operable to transceive binary file data by either control codes inserted in the Non Standard Field of a facsimile transmission conducted under the CCITT T.30 Recommendation or the modified DIS/DTC/DCS signals of the CCITT T.30 proposals as described herein.

The invention further provides a binary file transceiver, adapted to be interposed between a telephone line and a facsimile machine so as to be transparent to any transceived facsimile data, comprising:
memory means for reading binary file data contained thereon or writing binary file data thereto;
modem means adapted for connection both to a public switched telephone network and a facsimile machine;
processor means having control over the transcepcion of binary file data;
switch means for providing a connection between the public switched telephone network and the facsimile machine under control of the processor means in the event of the facsimile data transmissions, or connecting the public switched telephone network only to the processor means in the event of binary data file transfer;
interface means to provide for selectable transcepcion of binary file data.

Brief Description of the Drawings

In order that the invention may be more fully understood, examples of embodiments will be described in some detail with reference to the accompanying drawings, in which:

Figure 1 shows an integrated communication system constructed in accordance with the invention;
Figure 2 shows the four phases in a facsimile transmission for Group 3 facsimile machines;
Figure 3 shows the code exchange sequence between transmitting and receiving facsimile machines in accordance with the proposed amendments to the CCITT T.30 Recommendation;
Figure 4 shows the code exchange sequence between transmitting and receiving facsimile machines in accordance with the existing CCITT T.30 Recommendation;
Figure 5 shows another integrated communication system constructed in accordance with the invention;
Figure 6 shows detail of a circuit which can be connected to the system of Figure 5;
Figure 7 shows circuit detail of the elements within the systems of Figures 1 and 5 at a system
architectural level; and

Figure 8 shows a stand-alone system constructed in accordance with the invention.

Figures 2 and 4 have been extracted from Recommendation T.30 of the CCITT, Vol. VII.

Figure 3 is extracted from a proposal of the CCITT Study Group VIII - Contribution 43 of August, 1989 (COM VIII-43-E).

Detailed Description of Preferred Embodiments

Figure 1 illustrates functional components of an integrated communications device. As such, the device is suitable for connection to any other fax machine, whether or not of the same type, by a telephone line on a public switched telephone network.

It is convenient to firstly describe the conventional facsimile components of the device, which in this example is a Group 3 type.

A document to be transmitted to another facsimile machine is initially read by the optical scanner. The scanner is under control of the sampling device which generates 1728 pels per line scanned (viz; were each pixel can only have a logic value of "1" or "0" corresponding to either black or white respectively) for each page of the document being read. Typically, the page is scanned and sampled with a resolution of optionally 100 or 200 lines per inch (approximately) in the feed direction, and 200 lines per inch (approximately) in the scan direction.

The sampled information, now in the form of rows, is provided to the transmission memory. The data stored in the transmission memory is ready for transmission. The device sets up the facsimile call with a receiving machine in accordance with Phases A and B as set down in the CCITT Recommendation T.30 (shown in Figure 2). This operation is under the control of operations microprocessor, and will be described in
more detail presently. Once this occurred and the connection is made, data is fed to compression device 22.

The compression device 22 has the function of converting the data into modified Huffman code for a one-dimensional code, or modified READ (relative element address designate) code for two-dimensional codes, which are compression techniques designed to reduce the time taken to transmit any one page of the document. The two-dimensional code technique may also provide for skipping white sections of the scanned document, given that approximately 85% of any page is white.

Some facsimile machines provide for gray scale encoding of a scanned document, in which case, the number of bits (say 2) may represent one pixel of the document. Each pixel can then be represented as one of a possible number of intensities.

The output from the compression device 22 is provided to modem 24, being already connected to the telephone line 12, which performs the transmission along the public switched telephone network to the receiving facsimile machine in accordance with CCITT V.27ter or V.29 standards.

The interaction of an operator of the device 10 is provided by user interface 25 which communicates with operations microprocessor 26. The user interface 25 typically includes a telephone handset, dialling pushbuttons, and operational facilities for any other functions supported by the facsimile machine, such as half tone, redial, polling and such. The operations microprocessor 26 receives any instructions issued by a user through the user interface 25 and also may provide an indication to the user interface 25 of the status of the transmission, typically including the page number being transmitted, the number of the receiving facsimile, its type and such. The operations microprocessor 26 also provides the various control functions to the modem 24, the transmission memory 20 and receiving memory 30 and
floppy disk controller 40 as illustrated in Figure 1.

When receiving a facsimile, the receiving functions of the device 10 are implemented. The received data arrives on telephone line 12 at modem 24, where it is passed to the decompression device 28, which will insert all the blank spaces and remove any timing or framing information which was required to institute the communication between the modem of the transmitting facsimile machine and the modem 24. The decompressed data is then passed to receiving memory 30, where it is stored until able to be processed.

The received information is routed to recording memory 34 under control of the operations microprocessor 26, which then provides the information line by line to recording device 36 which reproduces the original document on the recording medium.

In any transaction to or from device 10, a telephone call set up must be performed. This set up commences in accordance with CCITT Recommendation T.30 for Group 3 facsimile machines. Figure 2 shows the the five Phases A-E in a facsimile transmission. Phase A is the call establishment phase in which the telephone call is placed. Phase B follows, where the called station (acting in identifying mode) responds with signals indicating its capability in terms of group type, speed, resolution, special capability such as half tone, and such. There is a training sequence relating to synchronization, equalisation and other functions.

When the two machines have been trained and are in effective connection, the transmission of the encoded and compressed facsimile information takes place as Phase C. Once the complete document has been transmitted, Phase D is entered. If the information has been received without error control may return to Phase B, otherwise Phase E is entered, which places both the transmitting and receiving machines on-hook.

The function of the facsimile components and
tranception as described are well known and understood.

In accordance with one embodiment of the invention, it is considered advantageous to be able to transfer information stored on a floppy disk directly to another floppy disk utilizing the existing facility of a facsimile machine. The transmission of the data may take place under the existing T.30 Recommendation utilising the non-standard file (NSF) function in phase C, or by modification of the digital command signal (DCS), digital identification signal (DIS) and digital transmit command (DTC) as proposed for binary file transfer by Study Group VIII of the CCITT. However, unlike the operations utilized by PC-Fax cards, no file names will be specified. All files residing on a source disk will be transmitted and copied to a target disk.

In regard of both proposals for the tranception of binary files, the functions specified in the T.30 Recommendation and the recent proposal by Study Group VIII as referred to earlier are incorporated herein by reference.

In an example of a typical operation sequence using the machine 10 for transmission and a like machine for reception, the operator would prepare a document indicating that a disk transmission was to follow. The transmission then takes place as is usual with the document being transmitted, and following completion of that documentary transmission, the operator must activate a disk transfer pushbutton on the user interface 25, having already installed the floppy disk containing the files to be transferred in the floppy disk drive 38. The files in the form of binary file data are then passed to the data tranception memory 42 via the floppy disk controller 40. From the tranception memory 42, the binary file data is passed to the modem 12, and thence to the receiving machine. The converse order applies equally for reception.

This operation again takes place under the
control of the operations microprocessor 26. The precise interaction between the facsimile procedure and the data transfer procedure will be described presently.

The proposed binary file transfer (BFT) procedure encodes a file including its attribute, in the form of a binary page, which is logically equivalent to a facsimile page. This is transmitted, preferably using Error Correction Mode (ECM).

Assuming that the receiving machine is of the same type as the transmitting device 10, it will receive the information into modem 24, whereupon the data is passed by the reverse procedure to a floppy disk within the floppy disk drive 38.

If there has not been a floppy disk provided in floppy disk drive 38 of the receiving machine after a transmission of binary file data has been instigated, the floppy disk controller 40 will signal the user by operations microprocessor 26, and in turn the user facility 24 that such is required. Typically, this will include an audible and/or visual warning, and avail an operator some limited time in which to insert a disk, else the reception will be terminated.

Similarly, if the receiving machine does not have the facility for reception of data, as would be the case for normal facsimile machines, the sending machine will have some time-out period before the transmission is terminated.

The binary file transfer as discussed results in all files being transferred automatically. This, therefore, allows ease of transfer of data without the requirements of operators or technicians or compatible communication software and expensive hardware such as a PC.

If the receiving machine is not compatible, this will be detected by the digital handshaking procedure in Phase B and will be indicated to the operator, in which case no data transmission will take place.
Once the binary file data transfer is completed, the operator has a further opportunity to transmit another facsimile or data files contained on another floppy disk.

The process of providing binary file data transfer in addition to or in place of conventional facsimile transmission will now be described in detail, and particularly firstly with reference to Figure 3.

In order to initiate a binary file transfer, Phase B is entered or re-entered using the proposed modified DIS/DTC/DCS signals. The binary file may be coded as a binary page, which can then be transferred by ECM, as the equivalent of a facsimile page, using the same pre-message and post-message procedures.

Specifically, binary file data transfer capability will be indicated by the appropriate code in the DIS/DTC frame. The appropriate code when set in the DCS frame indicates that the transmitter has a binary file to transmit.

If the receiving machine is not compatible this will be detected by the digital handshaking procedure and will be indicated to the operator. No data transmission will take place.

If the binary file data is received correctly a message confirmation (MCF) is sent according to the usual protocol procedure. Otherwise the file diagnostic message (FDM) signal, as proposed by Study Group VIII of the CCITT, will be sent. Specific error types relating to the status of the receiving disk may be defined.

Following this procedure, control may then transfer to Phase B and continue with the next binary file data transfer or facsimile. In the present case, the process will continue until all the files in the source disk have been transmitted.

Because of the binary coded nature of the file and its attributes, the binary file data transfer procedure is not restricted to any particular disk format. Although IBM compatible disk formats would normally be provided,
according to an alternative aspect, any disk drive and
ccontroller, compatible with the user's requirements, may
be provided.

Once all the data has been transferred from the
transmitting machine to the receiving machine, the
transcription memory 42 will empty. In one instance,
assuming no further data or facsimiles are to be sent,
Phase D is effected. In the other instance, Phase E is
entered immediately, thus not providing an opportunity to
transmit further data or facsimiles.

The binary file data transfer under the modified
DIS/DTC/DCS proposal can equally take place from either
Phase D or Phase B to commence Phase C.

As an alternative to the procedure for binary
file transfer as described above, the use of the NSF frame
to indicate a non standard procedure could also be adopted
for the purpose of initiating the disk data transfer.
This is in accordance with the current T.30
Recommendation.

Figure 4 shows an example of the codes exchanged
between a transmitting machine (calling unit) and a
receiving machine (called unit) in a non-standard
operation sequence.

The sequence shown represents the start of Phase
B and the respective signals transferred between the
calling unit and the called unit.

Non-standard facilities are available as shown,
and if this is to be implemented, a jump to the NSS
(non-standard setup) code is made, whereafter, the
operations microprocessor 26 assumes control to commence
the binary file data transfer.

The NSF/NSS procedure as described has identical
effect as the modified DIS/DTC/DCS are described
earlier.

The embodiment described has the advantages of
providing an integrated data and document facsimile
transmission system, which provides ease of use for an
operator. Further, the operator need not have particular technical ability nor expertise, merely being required to place a floppy disk in a floppy disk drive 38, and activating the correct pushbutton sequence to affect optionally a facsimile document transmission or a binary data file transmission, or indeed a combination of both.

A further embodiment is related to a modified PC-Fax card, which utilizes the signalling relevant to the proposed disk transfer protocol. In this case the PC will seek to operate in conjunction with an existing stand-alone fax machine. The PC will only intervene when binary file transfer signalling is detected, at which point it will prompt the user to insert a disk for either transmission or reception of the binary file data. This function could possibly be obtained by a modification of operational software.

Two further embodiments are:

(1) a standalone device, capable of sending and receiving files on disk, which operates as described above, using fax protocol for binary file data transfer, but which contains only a disk drive, modem and controller with no scanner or printer, and does not operate in association with an existing fax machine. This machine would be used solely for the purpose of disk transfers in a manner compatible with fax machines, with disk transfer capability, and PC-Fax cards which utilize the propose standard binary file data transfer procedure.

(2) a standalone device with the sole purpose of automatic disk transfer functions, as just described but with the additional capability of utilizing alternative file transfer protocols, in a manner compatible with existing PC-modem file transfer operations and with similar machines.

As a basis for all these two embodiments, reference is made to Figures 5, 6 and 7.

Figure 5 shows an alternate configuration to the device 10 of Figure 1. Like elements have been referred
to by the same reference numerals. However, the elements associated with the floppy disk control and binary file transcepcion are remote, and provided on lines 44 (TXD) and 46 (RXD). These lines 44, 46 are connected by the switches 48, 50 which are under the control of the operations microprocessor 26.

Figure 6 shows the connection for the RXD and TXD lines to a subsystem 60 which could be as a remote unit attached to a facsimile machine, in which case a control line 52 between the operations microprocessor and the subsystem processor 62 would be required, or if provided with a fax modem as per modem 24, could be truely stand-alone, connecting to the public switched telephone network and transceiving only binary file data.

In Figure 6, the lines RXD and TXD are provided to the subsystem processor 62. The subsystem processor 62 has control over the reading or writing of binary file data from or to a floppy disk contained within the floppy disk drive 38, and also over the operator related functions of the user interface formed by the status display 46 and user keypad 66.

The program memory 68 provides software which is required during processing of received binary file data. It is important to note that when the subsystem 60 is connected to the device of Figure 5, the operations microprocessor 26 as shown in Figure 5 still retains overall control of the transcepcion of either facsimile data or binary file data.

The function of the data transcepcion memory 42, the disk drive controller 40 and floppy disk drive 38 is equivalent to that discussed in relation to Figure 1. The appropriate control lines and data lines are also shown connecting all elements within the subsystem 60.

In the stand-alone option, of course, only the elements shown in the subsystem 60 would be provided, and allows transmission or reception of binary file data only. As noted, a facsimile modem would have to be incorporated
with lines TXD and RXD, and furthermore, the subsystem processor 62 would need to be able to perform the normal facsimile phases as detailed in Figure 2, although could not provide for reception of conventional facsimile data.

If a normal facsimile machine where to attempt to transmit facsimile data to such stand-alone device, the sequence of events described in relation to such a regular transfer could not take place, and the subsystem processor 62 would pass signals to the facsimile machine to indicate that data transmission is required, and possibly place the facsimile machine on-hook.

Figure 7 gives further detail of the elements shown in Figure 6 at a system architectural level. Where appropriate, like numerals have been used.

Three buses are shown, being for data 86, addressing 84 and control 82.

Connection to the public switched telephone network is via the telephone line 12, which terminates at the line interface 80. The line interface 80 has connection to the control bus 82, and to the facsimile modem 24.

The figure does not show the associated facsimile elements 14, 16, 20, 22, 28, 30, 34 and 36 as in Figures 1 and 5, however, the user keypad 66 and display 68 are shown as is the subsystem processor 62 and program memory 68. The disk drive controller 40 and floppy disk drive 38 are also shown, together with data transcepción memory 42.

The subsystem processor 62 is shown, as is buffering by address latch 90. The only other additional element is a read-only memory 88, in which can reside other software relating specifically to the binary file data transfer.

The functioning of the various system buses in relation to binary file transfer in association with the elements shown would be readily apparent to those skilled in the art.
A further embodiment relates to a stand-alone device 100 as shown in Figure 8, which is interposed between the telephone line 10 and a conventional facsimile machine 95. In the course of simple facsimile transcription, the device is effectively transparent.

When a facsimile call is received, the call is detected by both the stand alone device 100 and the facsimile machine 95. The circuit to the facsimile machine 95 are broken at this time by switch 102, with the device 100 routing the signals via switches 104, 106 thereby maintaining the facsimile machine 95 in the call establishment. The device 100 then decodes the hand shaking signals from the transmitting facsimile or other binary file transfer device to determine whether normal facsimile data is to follow or binary file data transfer is intended.

If normal facsimile data is to follow the switch 102 is activated to re-establish direct communication with the facsimile machine 95. This then allows the high speed transfer of Phase C to take place. If, on the other hand, binary file data transfer is intended, the subsystem processor 62 disconnects the facsimile machine by switches 102 and 106, then proceeds to receive the binary file data and write it to a floppy disk contained within the floppy disk drive 38.

The device 100 can also provided for transmission of binary file data as well as reception as just described.

Referring to the elements of Figure 8 in more detail. The telephone line 12 is terminated at connector 108, with a similar connector 108 provided for the connection to the facsimile machine 95.

The line interface units 110 perform an isolating function from the physical layer implementation of the public switched telephone network. Associated with one line interface unit 110 is ring detection section 112 and line loop detect section 114.
The other components have been described previously in relation to other embodiments, suffice to say two modems 24 are required to demodulate the data for processing by the subsystem processor 62, and subsequent modulation for passing to the facsimile machine 75.

This embodiment has the advantage of being transparent to normal facsimile transmissions, being cheap to manufacture as easy to install, whilst availing an operator a convenient means to effect binary file data transfers.
CLAIMS:

1. An integrated communication system comprising a facsimile transceiver and a data transceiver, whereby, in use, the system can optionally:
   (a) transceive documents to or from said facsimile transceiver; or
   (b) transceive binary file data to or from said data transceiver;
   further comprising interface means which is user selectable to permit a choice of, at least, whether documents are transceived or whether binary file data is transceived.

2. A system as claimed in claim 1, wherein the one or more data files are sourced from or targeted to mass data storage contained with the data transceiver.

3. A facsimile machine for the transmission of documents, said facsimile machine being operable to provide facsimile transmission or binary file data transmission and further comprising:
   data storage means; and
   interface means which is selectable to permit a choice of whether documents are transmitted or whether binary file data is transmitted from said data storage means or both.

4. A machine as claimed in claim 3, wherein said data storage means comprises a disk controller for reading binary file data stored on a disk.

5. A machine as claimed in claim 4, wherein the facsimile machine is also able to operate for reception such that received binary file data can be written to a disk.

6. A machine as claimed in claim 3, and a corresponding facsimile machine in communication therewith provided for receipt of facsimile transmissions or binary file data transmissions or both from the said transmitting machine.
7. A machine as claimed in claim 6, wherein that machine and the corresponding facsimile machine are both connected to a public switched telephone network.

8. An integrated facsimile and binary file data transceiver comprising:

 optical means for scanning a document to be transmitted or recording a document to be reproduced;
 memory means for reading binary file data contained thereon or writing binary file data thereto;
 a controller in communication with the optical means and the memory means;
 a transceiver means in communication with the memory controller for the transception of facsimile information or binary file data; and
 a user interface in communication with the controller for selecting facsimile transception and/or binary file data transception or both.

9. An integrated transceiver as claimed in claim 8, wherein the memory means comprises a floppy disk drive and floppy disk controller therefor, and the data is written to or read from a floppy disk within the floppy disk drive.

10. An integrated transceiver as claimed in claim 9, wherein the transceiver means is a facsimile modem.

11. A system, machine or transceiver as claimed in claims 1, 3 or 8, wherein the transception of binary file data can occur by either control codes inserted in the Non Standard Field of a facsimile transmission conducted under the CCITT T.30 Recommendation or the modified DIS/DTC/DCS signals of the CCITT T.30 proposals as described herein.

12. A binary file transceiver adapted for connection to a facsimile machine and comprising:

 memory means for reading binary file data contained thereon or writing binary file data thereto; and
 a controller in communication with the memory means and adapted for connection to a modem in facsimile
machine;
wherein the binary file data transceiver is operable to transceive binary file data by either control codes inserted in the Non Standard Field of a facsimile transmission conducted under the CCITT T.30 Recommendation or the modified DIS/DTC/DCS signals of the CCITT T.30 proposals as described herein.

13. A binary file data transceiver adapted for connection to public switched telephone network and comprising:
- a modem connectable to the said public switched telephone network;
- memory means for reading binary file data contained thereon or writing binary file data thereto; and
- a controller in communication with the memory means and the modem;

wherein the binary file data transceiver is operable to transceive binary file data by either control codes inserted in the Non Standard Field of a facsimile transmission conducted under the CCITT T.30 Recommendation or the modified DIS/DTC/DCS signals of the CCITT T.30 proposals as described herein.

14. A binary file transceiver, adapted to be interposed between a telephone line and a facsimile machine so as to be transparent to any transceived facsimile data, comprising:
- memory means for reading binary file data contained thereon or writing binary file data thereto;
- modem means adapted for connection both to a public switched telephone network and a facsimile machine;
- processor means having control over the transcepcion of binary file data;
- switch means for providing a connection between the public switched telephone network and the facsimile machine under control of the processor means in the event of the facsimile data transmissions, or connecting the public switched telephone network only to the processor.
means in the event of binary data file transfer;
interface means to provide for selectable
transception of binary file data.
15. The transceiver of claim 14 wherein the binary
file transceiver is operable to transceive binary file
data by either control codes inserted in the Non Standard
Field of a facsimile transmission conducted under the
CCITT T.30 Recommendation or the modified DIS/DTC/DSC
signals of the T.30 proposals as herein described.
FIG. 2.
FIG. 3.
I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) 6

According to International Patent Classification (IPC) or to both National Classification and IPC

Int. Cl. 5 HO4N 1/00, HO4M 11/06

II. FIELDS SEARCHED

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Documentation Searched other than Minimum Documentation to the extent that such Documents are Included in the Fields Searched 8

AIU : IPC as above

III. DOCUMENTS CONSIDERED TO BE RELEVANT 9

<table>
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<tr>
<th>Category*</th>
<th>Citation of Document, with indication, where appropriate, of the relevant passages 12</th>
<th>Relevant to Claim No 13</th>
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<td>X</td>
<td>US.A, 4816911 (KIRCH et al) 28 March 1989 (28.03.89). See figures 1 and 2; page 2 line 54 - page 3 line 20 and page 9 lines 14 - 27.</td>
<td>1 - 10, 14</td>
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<td>X</td>
<td>AU.B, 40703/85 (INTERNATIONAL COMPUTERS LTD) 3 October 1985 (03.10.85). See figure 1 page 23 - page 3 line 5 and page 5 lines 3-13.</td>
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<td>X,P</td>
<td>AU.A, 51849/90 (SPECTRAFAX CORPORATION) 20 September 1990 (20.09.90). See abstract; Figure 1 and page 2 line 9 - page 3 line 29.</td>
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(continued)

* Special categories of cited documents: 10

"A" Document defining the general state of the art which is not considered to be of particular relevance

"E" Earlier document but published on or after the international filing date

"L" Document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" Document referring to an oral disclosure, use, exhibition or other means

"P" Document published prior to the international filing date but later than the priority date claimed

"T" Later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" Document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step

"Y" Document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"Z" Document member of the same patent family

IV. CERTIFICATION

<table>
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<td>R. TOLhurst</td>
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Form PCT/ISA/210 (second sheet) (January 1985)
V. [ ] OBSERVATIONS WHERE CERTAIN CLAIMS WERE FOUND UNSEARCHABLE 1

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1.[ ] Claim numbers ..., because they relate to subject matter not required to be searched by this Authority, namely:

2.[ ] Claim numbers ..., because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3.[ ] Claim numbers ..., because they are dependent claims and are not drafted in accordance with the second and third sentences of PCT Rule 6.4 (a);

VI. [ ] OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING 2

This International Searching Authority found multiple inventions in this international application as follows:

1. [ ] As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims of the international application.

2. [ ] As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims of the international application for which fees were paid, specifically claims:

3. [ ] No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claim numbers:

4. [ ] As all searchable claims could be searched without effort justifying an additional fee, the International Searching Authority did not invite payment of any additional fee.

Remark on Protest
[ ] The additional search fees were accompanied by applicant's protest.
[ ] No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (supplemental sheet (2)) (January 1985)