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08/737,869 July 7, 1998

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THIS ASSIGNMENT is made the 1ST day of JAN 1994 BETWEEN

Vibrant

1. PAUL GRACE of c/o.

"the Inventor")

VIBRANT,

2. VIBRANT The

*Skeleton House, Walswell
Company
Lake Dinkbury*

AND

3. PANDORA INTERNATIONAL LIMITED of "The Whitehouse", Mile End Green,
Dartford, Kent DA2 8ED ("Pandora").

WHEREAS

A) The Inventor has made an invention relating to a creative grading environment as set out
in the specification attached hereto ("the Invention").

B) The Inventor is employed by the Company.

C) The Inventor and the Company have agreed that all rights in the invention should be
transferred to Pandora.

NOW THEREFORE

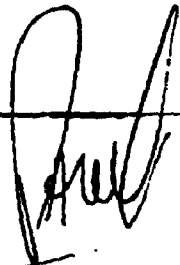
IN CONSIDERATION OF the sum of one pound paid to the Inventor by Pandora (receipt of
which is acknowledged by the Inventor) and of the sum of one pound paid to the Company by
Pandora (receipt of which is acknowledged by the Company) the Inventor and the Company
HEREBY ASSIGN to Pandora all such right title and interest in the Invention as they may have
including the right to file patent applications for the Invention in any country of the world and all
copyright design rights and any other intellectual property rights in respect of the Invention TO
HOLD unto Pandora absolutely.

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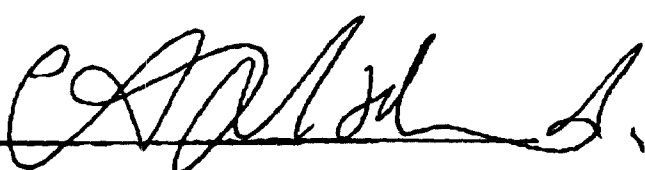


The Inventor and the Company **HEREBY UNDERTAKE** that at the request and expense of Pandora they shall sign all such further documents and do all such further acts as may be necessary for Pandora to enjoy the full benefit of the rights assigned. Without prejudice to the generality of the foregoing the Inventor agrees that he shall sign any document that may be necessary for an application to be filed in the name of the Inventor in the United States of America or any other country of the world and further agrees that any such application shall be held in trust for Pandora and shall be assigned to Pandora.

IN WITNESS WHEREOF the parties have executed this Assignment as of the day and year first above written.



PAUL GRACE

Vibrant 

PANDORA INTERNATIONAL LIMITED



**'CREATIVE GRADING ENVIRONMENT - PATENT APPLICATION
FROM PAUL GRACE**

Introduction

These ideas relate to the improving of the efficiency or facilities offered in the creative process of transferring film originated material into a TV or Video medium.

Previous 'State of the art'

Conventionally, the process of film to video transfer is accomplished on a 'Telecine' machine, and a number of additional control and editing systems. Examples of such telecine machines are the Rank Cintel URSA machine, or the BTS FDL 90 machine. Such machines transfer the film to video in 'real time' (This meaning that a film that has a one hour viewing duration takes one hour to transfer to video.) Telecine machines are inevitable very expensive, and are unlikely to be able to be 'cost reduced' by forthcoming technology. This is because of a large amount of precision mechanics necessary to transport film with great stability and without putting undue stress on the film, or damaging it. Making editorial decisions on the reproduction cannot be accomplished in real time, and thus there exists a number of 'programmer' machines, which allow decisions to be made in non real time, stored, and 'replayed' in real time. Examples of such programming systems are the POGLE, available from Pandora International, or the DA VINCI, from Colorgraphics in Fort Lauderdale, Florida. The technique of 'scene by scene programming' is disclosed in US patent 4,096,523, held by Corporate Communication Consultants. Both of the example programming systems detailed above licence the Corporate patent.

Such telecine systems usually have a 'reference' store. This allows the comparison (quite often on a 'split screen' basis) between one image and another. Such facilities are quite often used to compare the colour consistency of a given object between several scenes.

Extensions to the reference store can be accomplished by techniques disclosed in US application US 4,857,994 (often referred to as the 'Call-a-Picture' patent). This discloses a method for adding an additional 'still store' to the telecine grading system, and controlling the available images on this still store from the programming system. Examples of such systems are the 'Matchbox' system from Rank Cintel Ltd., or the still store from ACCOM, in Menlo Park, California, USA.

In a separate series of developments, there now exist a number of systems for the 'non-linear' editing of video material. Typically, video material (normally shot as video, although they do not preclude the use of film originated material converted to video on a telecine type system) is 'digitised' (Meaning captured into a digital computer type disc file) 'compressed' (meaning data compressed, by such techniques as the ISO standard JPEG system) and displayed on a low cost video workstation for the purpose of making 'cut' decisions. These decisions are stored in a 'cut list' which is eventually applied to the original high quality (non-compressed) material in a process often referred to as 'conforming'. Such non-linear editing systems are available from Lightworks Editing systems Ltd. of London, or AVID Inc., of Massachusetts USA.

As can be seen from the above, the artistic process entails the use of a number of components, which have evolved over a period of time. Therefore the interfacing of such boxes are non-ideal, and some functions are repeated between systems, whilst other desirable features are missing.

The Proposed Invention

Currently available systems have a 'close coupling' of video around the telecine machine. The programmer to telecine link is a 'control' link, meaning that control data only passes down this link. No true video information is available at the programmer (and even if it were, the programmer would not know what to do with it!) - See FIG 1.

Even for systems where a 'Matchbox' system is employed, there has to be a 'close coupling' between the Telecine and Matchbox. - See FIG 2.

High speed communication protocols, such as the 'HIPPI' protocol allow data communication at a very high data rate. (Typically at data rates of up to 120 Megabytes per second)

Thus one aspect of this invention is a combined video editing and grading terminal 'served' by a telecine machine. Thus whilst in a conventional telecine the grading system gives 'command' data to the telecine for the execution at the telecine, the proposed novel architecture here actually transfers the video data to the video workstation for modifying of the data, which is eventually returned back to the telecine 'server'. This server would consist of a control computer, together with storage facilities in the form of Large computer discs, and RAM store. These would be filled with 'clips' from the telecine as the telecine transfers data from film into the digital domain. when it is

necessary to view a scene again later, this scene will be recalled from the server's store instead of from film. This will create two benefits. The first of these is to minimise film wear. This is important as it is often desired to transfer film that is the 'Camera original' material, as this can yield the highest possible quality. It is however, irreplaceable unless it is possible to re-film the original action!. The second of these benefits is to get maximum utilisation from the expensive film scanning part of the telecine, rather than using it to scan the same piece of film again and again.

Physically this 'server' could be a part of the telecine assembly, or could be in a separate room

A further aspect of this feature is the use of more than one video editing terminal to the telecine 'server'. Thus with the proposed invention it is possible to get much more efficiency of use from the expensive mechanical transport sections of the telecine system.

Another aspect of this invention would be to be able to load the video server with picture data from other sources. For example, it may be desirable to store on the telecine 'server' image data, say, from a 3-D rendering system, or from a caption generator. Then the video editing terminal can have access to telecine imagery and also to captions and 3-D data for combining with the telecine images.

In yet another aspect of the proposed invention, it is possible to use the video editing terminal to perform 'non linear' editing functions. Compression techniques as used in Non-Linear editing can be incorporated for cost reduction, although this is not a compulsory feature of the proposed system, as it is in true non-linear editing systems. One inherent disadvantage of conventional non-linear editing is the necessary stage of 'digitising'. This however can be carried out in a novel 'intelligent' manner. Normally digitising is done as a 'dumb' process. This typically involves conversion from an existing tape format to a 'computer' file format, to which compression algorithms are applied. In the proposed system, the conversion to a computer file format takes place anyway as part of the overall process. The rest of the preparation stage for non-linear editing is to apply the compression stage. This will take place in the creative grading environment as a 'background process'. The system controlling computer will keep a record of all of the scenes of the film (This is readily available from the Telecine controller, such as Pandora's POGLE.) As each scene is viewed on the telecine (no matter in which order it is viewed) the background conversion will take place, and the system controller will mark that scene as available for 'editing'. As all of the scenes will eventually be viewed (and if they are not viewed, they will obviously not be required for the

to use the artist that they desire, and then have the rest of the processes necessary to produce a finished work carried out in another country which either offers the required range of equipment, or can offer the facilities at the right price. All of the above travelling is rendered unnecessary by the proposed invention.

The detail of the server and its associated system is shown in FIG 5.

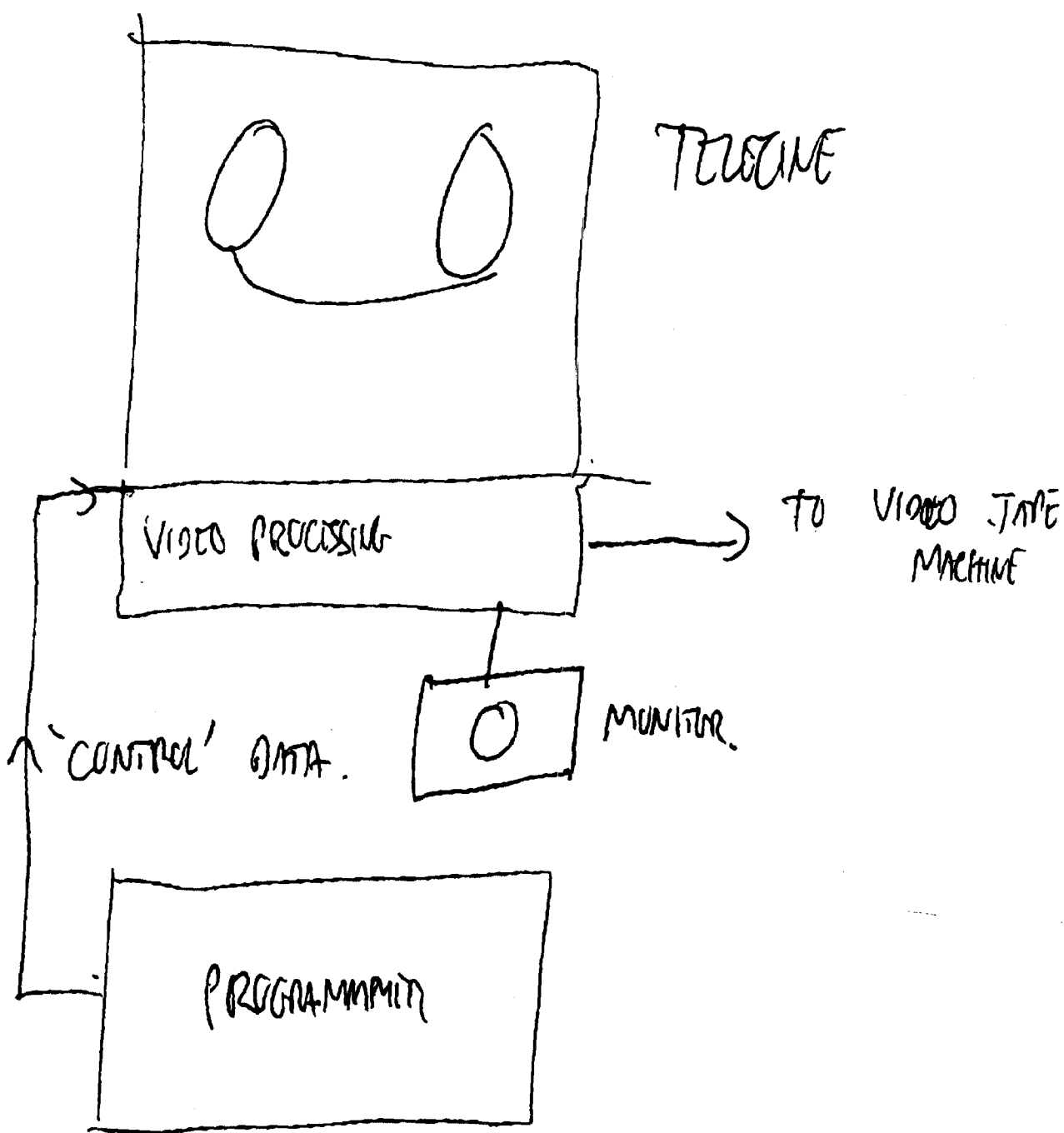


FIG 1 - CONVENTIONAL TELEVISION SYSTEM

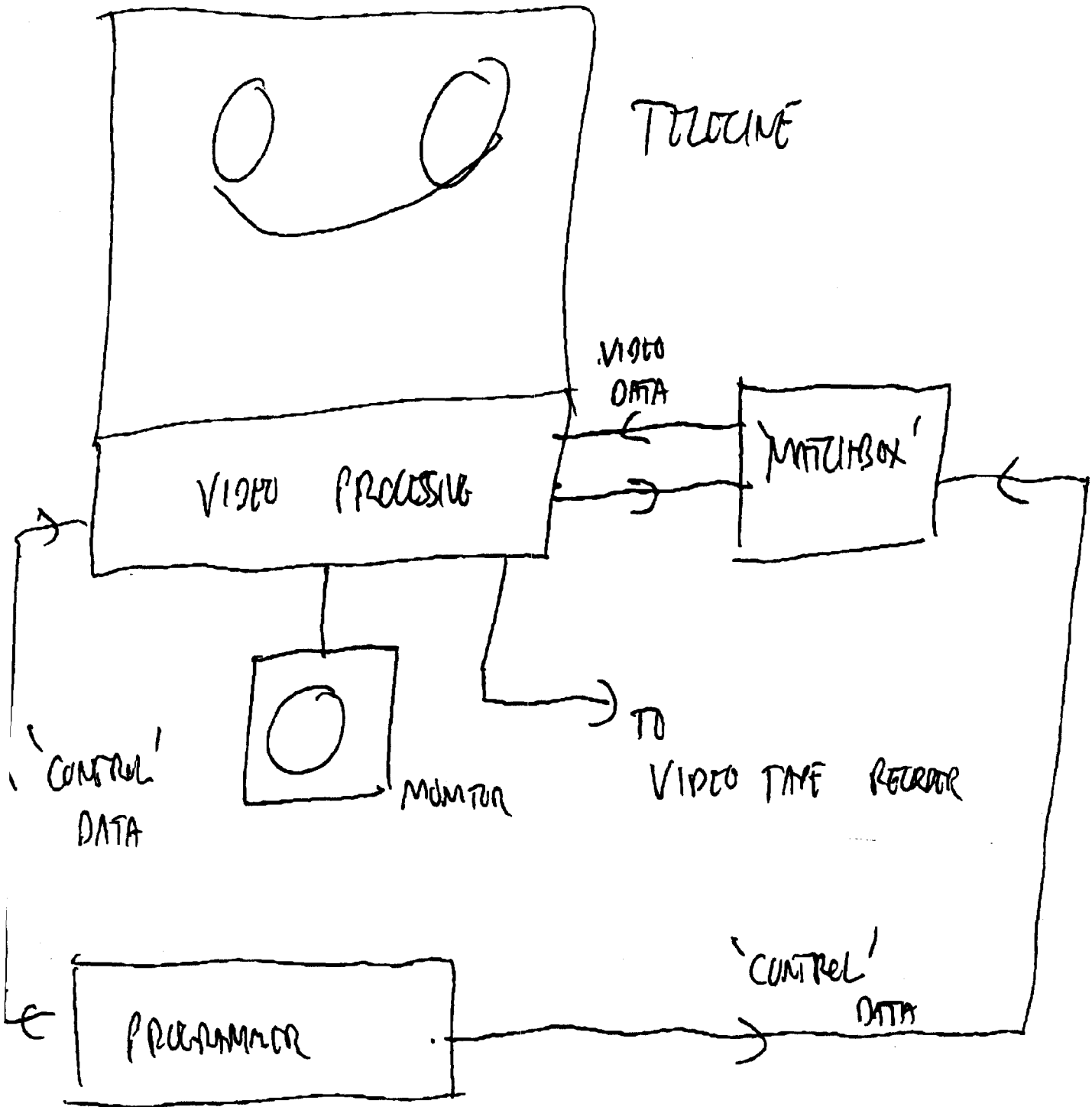
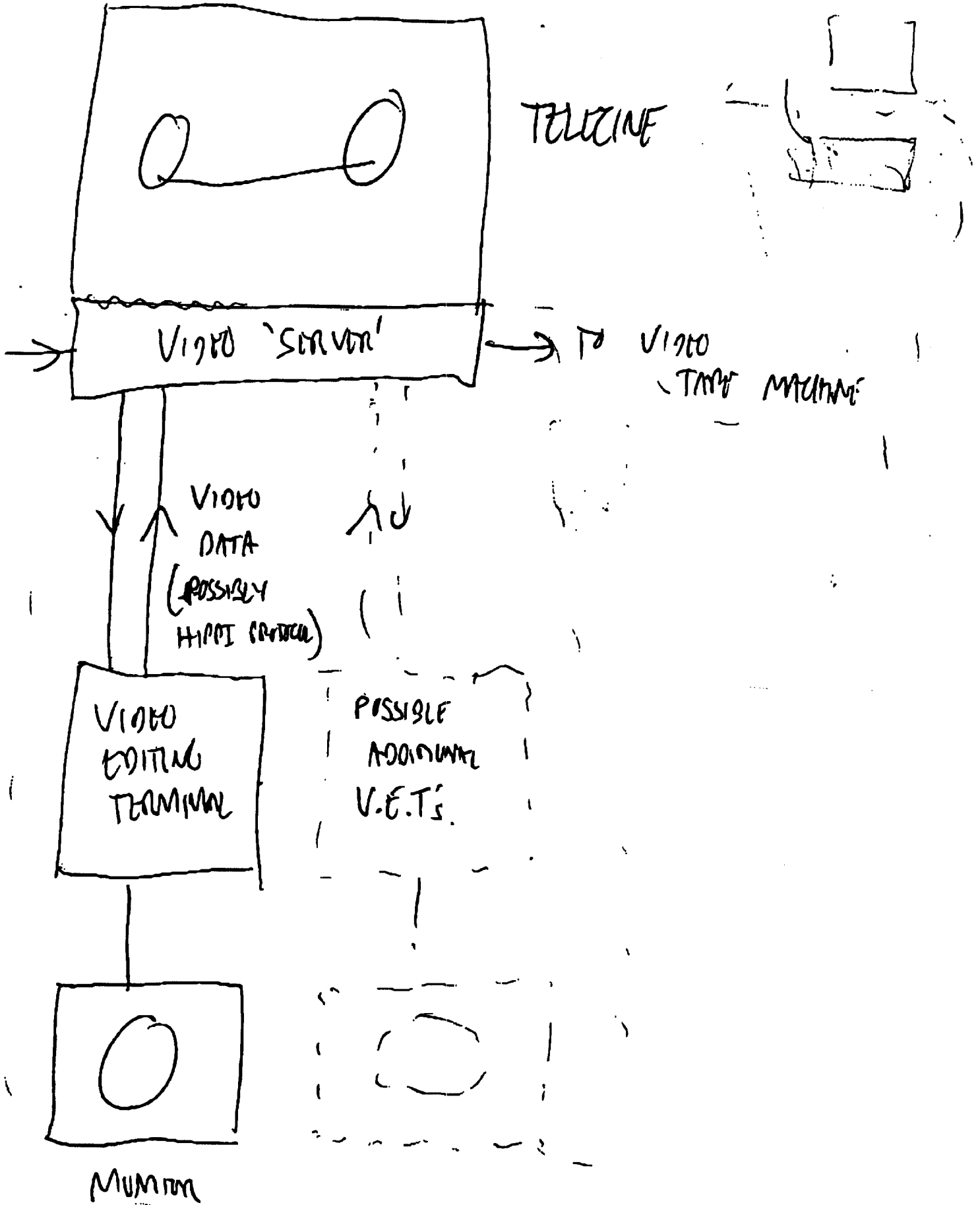


FIG 2 - CONVENTIONAL TELEVISION WITH

MATCHBOX

10.00



MUMMUM

FIG 3

PROPOSED ARCHITECTURE PATENT

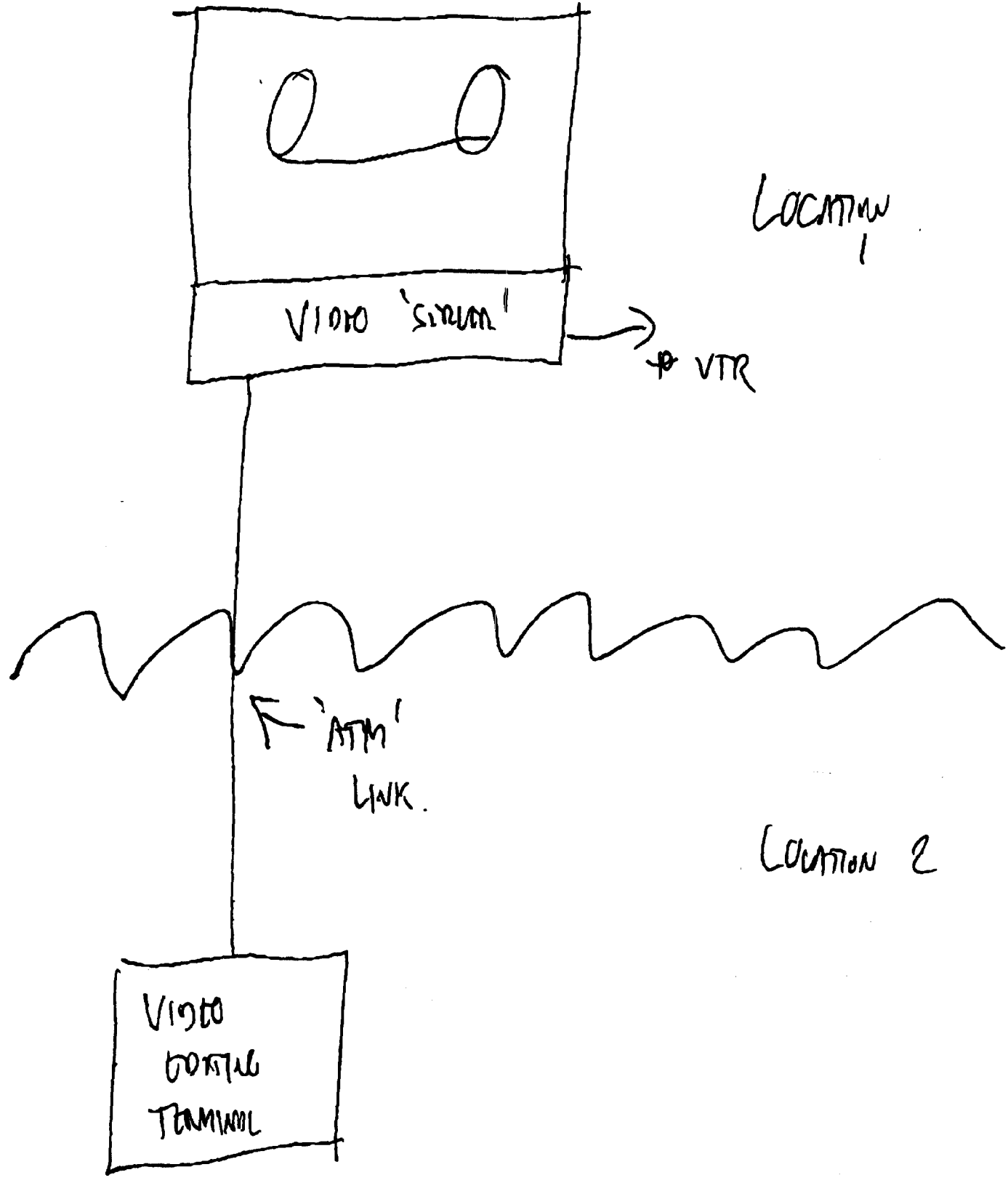
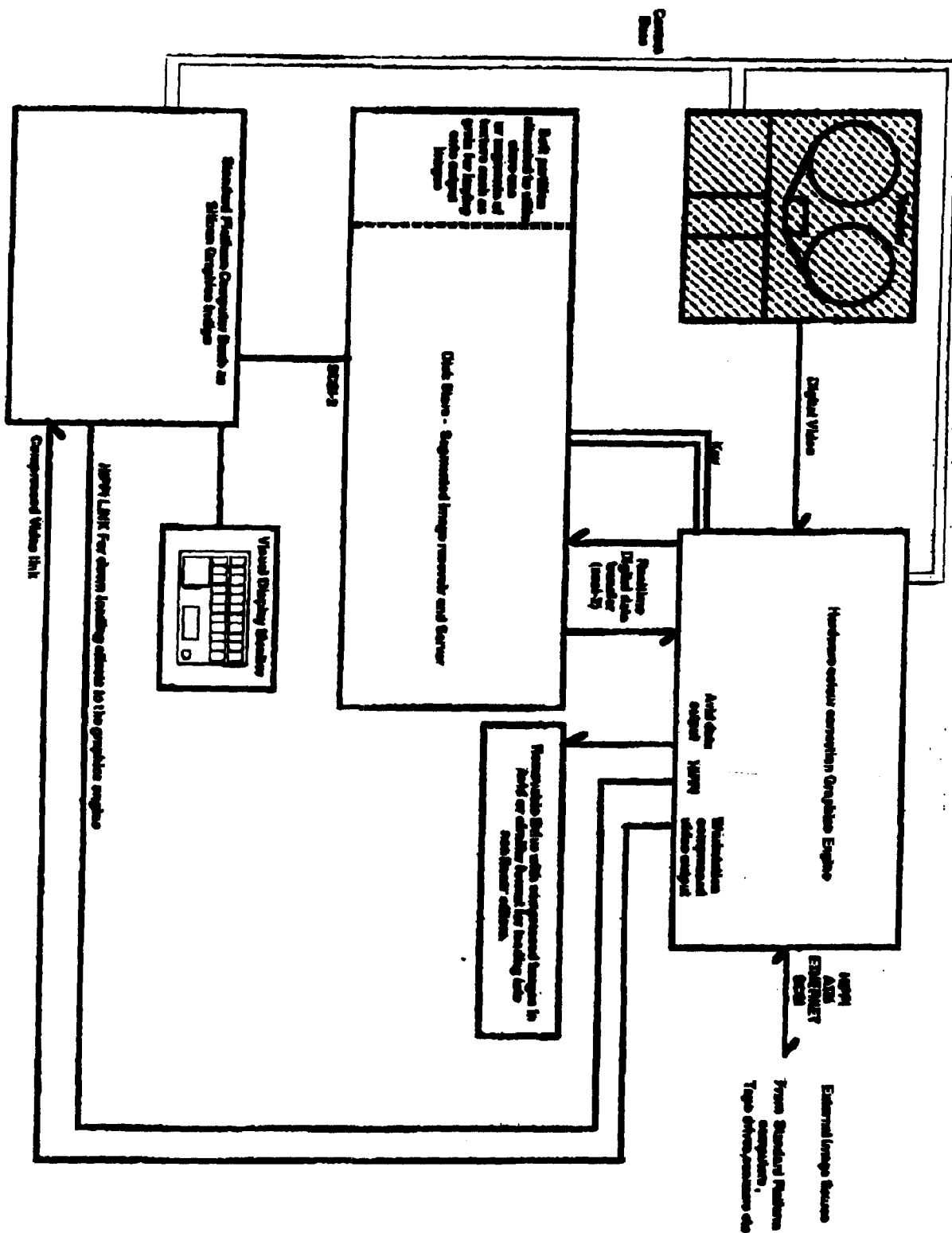


FIG 4 'REMOTE' GRADING

The Creative Grading Environment functional block diagram

LandDiagram



Paul Grace - 11th May 1994

FIG 5