VIDEODISC-BASED SIMULATIONS FOR LANGUAGE LEARNING

by

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ABSTRACT

This thesis illustrates a particular approach to the design of an "interactive fiction movie". The movie is designed for use, as a comprehension exercise, by MIT French language students. The piece, entitled "En Quête d'Un Appartement", was shot on location in France, using native speakers of French. The viewer is invited to become an active participant in the fictional world of the characters and can make decisions that change the outcome of the plot.

Such interaction is enabled by the use of a computer, connected to a videodisc player. Viewer decisions translate into appropriate branching of the movie. Therefore, there are a number of possible paths through this material.

The goal of the project and final design solutions are discussed in detail. Furthermore, the addition of the computer to the movie viewing experience is examined within the context of other technological developments which have affected the language of narative film.

The thesis is comprised of a written text and a 30-minute copy of my thesis movie, "En Quête d'Un Appartement".

Thesis Supervisor: Richard Leacock
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I. INTRODUCTION

A goal of this project is to demonstrate the effectiveness of using interactive video as an aid in language learning. However, my main interest lies in designing and producing an "interactive fiction movie": a movie that involves the viewer as an active participant, who can effectively shape the unfolding of the plot.

In close collaboration with the Athena Language Learning Project, I have completed "En Quête d'Un Appartement" ("Apartment Search"), to be used as a comprehension exercise by M.I.T. French Language students. The premise is simple: the viewer's goal is to help the main character - Philippe - find an apartment, as it appears that his girlfriend, Elisabeth, has had enough of him. The viewer's decisions will lead to one of six possible endings for the movie, with ample surprises along the way! The elements of humour and surprise contribute greatly to the effectiveness of this exercise.

The project is a simulation, in that it enables the viewer to enter the fictional world of the movie and use a number of tools and resources to alter the course of the main character's fate. A more detailed description of the project follows. For now, it is sufficient to envision the role of the viewer as an invisible companion to Philippe, who is called upon for opinions and

advice. Moreover, at two different points in the course of the program, the viewer is able to branch out of the movie and explore various options independently. Clues and information gained in these instances can be instrumental in directing the course of action to be taken. In these cases, a combination of stored pictures and audio (maps of Paris, newspaper listings, photographs of apartments for rent, and phone messages) is used to complement the movie sequences, in forming the basis for this simulation.

The underlying assumptions and final design of this project are discussed in the following pages. Also, the effect of "interactivity" on the structure of narrative film is explored in an effort to define some of the advantages and drawbacks it presents to both filmmaker and viewer. As David Cook has pointed out in A History of Narrative Film, "film is a technological art form and every revolution in its technology has produced and will continue to produce an essential change in the form itself."[1] Certainly the addition of computer control to the movie viewing experience is a radical departure from the past. The fact that this can encourage the development of a new type of narrative film is obvious. However, whether "interactive fiction movies" can be sustained beyond the status of novelties depends on a number of factors, which are not technological or aesthetic, but relate directly to the economics of film production and distribution.

II. INTERACTIVE VIDEO FOR LANGUAGE LEARNING

Interactive video is one of a number of teaching materials being developed by the Athena Language Learning Project. Other areas include the use of interactive audio and artificial intelligence in natural language processing. These materials will supplement a normal course sequence in each of the five languages taught at M.I.T.: French, Spanish, Russian, German, and English as a Second Language. They are meant to replace time spent with a textbook or with an audio tape, but not to replace classroom time.[2] Eventually, a new Language Resource Center will be designed where students can work singly or in small groups on exercises which are followed by classroom interaction. The development of these materials is being supported by the resources of Project Athena, as well as a supplementary five-year grant (begun in January 1985) from the Annenberg/CPB Project.

A different approach to language learning has been undertaken which is reflected in the nature of the exercises being developed. This approach is based on theory espoused by linguists such as Vygotsky (1962), Widdowson (1978), and Candlin (1980), who believe that:

> linguistic competence, i.e. the ability to use correctly the grammatical and lexical structures of a foreign language, is a subset of a more general discourse competence that includes the ability to express, interpret,

and negotiate meanings within the social context of interpersonal interactions.[3]

This leads to the development of exercises which favour an "interactional" process where the student is encouraged to reflect on more than the grammatical forms of the language. Indeed, the emphasis is on the personal, social, and cultural communication strategies of the language being used. The activities developed are based on the following principles: they are dialogue based, activate the student's initiative, and are 'immersed' in the foreign cultural perspective. As Janet Murray has pointed out, "if learning a language is acquiring a new set of tools to express the world around us, it is essential that learners operate within the reality created by those tools, without reference to the mother tongue or the mother culture."[4] Within this framework, interactive video can offer the language learner an excellent means of immersion in the foreign culture.

The work of Seymour Papert, which criticizes the dissociated learning in modern classrooms, has also contributed greatly to the above formulations. In his work with children and LOGO,[5] Papert has concluded that children learn best when they are active participants in the learning process. His aim is to create conducive environments, where children can construct meaningful products based on scientific ideas. In this way, they learn not facts and techniques but problem solving. What they

learn is not completely abstract but rather embedded in natural, everyday activities.[6] In its emphasis on active exploration and problem solving, the design of "En Quête d'Un Appartement", is a clear illustration of some of the previously-stated beliefs and principles.

Aside from interacting within the fictional 'microworld' of the story, there are other advantages in using movie sequences for language learning. For example, the student can focus on the relation of the text to the image and compare what is said to what is apparent from the image, in terms of gesture, facial expressions, or other visual detail. In its presentation of dialogue in context, the movie can draw attention to different forms of address: for example, the use of formal as opposed to informal language in different situations can be observed. Also, because of the emotional involvement in the story, there is increased motivation and incentive on the part of the student. It has been shown that the dialogue and discussion surrounding the actual program ultimately determines the effectiveness and power of an educational medium. With its richness of visual and aural information, a video document enables students and teachers to explore it in a number of different ways, all of which can form the basis for class discussions.

III. GOALS OF THE FRENCH LANGUAGE DISC

The over-all title of the French Language Disc is **ENTREZ DANS PARIS!**, which consists of two separate parts: "En Quête d'Un Appartement", and "Dans le Quartier St. Gervais". Although each part is independent, a number of factors relate the two exercises. As a result, students who move from one to the other will benefit from their experience. Apart from superficial similarities like the types of icons, menu buttons, and help functions used, they are connected in terms of content.

The idea for the French disc grew out of initial plans for a "document investigation" exercise. Gilberte Furstenberg, Lecturer in French at M.I.T., had designed a simple exercise using a page of newspaper listings for apartments. The task of the student was to explore this piece of "realia", learning the special vocabulary and abbreviations of apartment listings, in order to find a suitable apartment for a fictional character. A slide library consisting of photographs of available apartments would be used by the student, who would then defend his/her choices in class. This initial idea has been reformulated as part of an expanded and more complex design for the two exercises.

In general, the goal of the disc is to present the French language in its proper cultural context, as spoken by native speakers. Every effort has been made to collect and provide authentic materials with very little mediation between the learner and the culture. Even in the case of "En Quête d'Un Appartement", which is a simulation with scripted dialogue, the authenticity of the language and performance has been an important priority. A French writer translated my detailed English script into French, developing suitable dialogue for the different characters. Also, the direction of the actors was undertaken by Sophie Tatischeff who, as a native speaker, was more sensitive to subtle changes in their performance. Likewise, the choice of locations in Paris was predicated by the degree to which they represented the culture in terms of decor, architecture, or socio-historical significance. The principal location used in both parts of the French disc is the area in the Marais called: Le Quartier St. Gervais (4ième arrondissement).

The fictional character, Philippe, is currently living with his girlfriend, whose apartment is situated in this area of Paris. Through the story for "En Quête d'Un Appartement", we learn that Philippe is under pressure, not only from Elisabeth who wants him to move out, but also as a result of a deadline for his part-time writing job. He is writing a guide to the various shops, restaurants, and other establishments in this particular

'quartier' (neighbourhood). In the simulation, the first question Philippe asks is whether the student wants to help him with the guide or to find an apartment. The choice of 'guide' leads to "Dans le Quartier St. Gervais", whereas 'apartment' signals the continuation of "En Quête d'Un Appartement".

"Dans le Quartier St. Gervais" consists of documentary footage of Philippe's neighbourhood, including interviews with merchants, pedestrians, and residents about the 'quartier'. The changing definitions and boundaries of the neighbourhood are explored through various comments. The program also includes a detailed library of successive still-photographs, or movie-map, of the area which enable the student to 'walk' around and explore the quartier. The photographs provide one of a number of paths to the interviews. For example, the student can 'walk' to a particular store. A menu will inform him/her of available topics such as "Interview with Shopkeeper", which when picked will play that particular segment. Unlike "En Quête d'Un Appartement", this exercise is completely non-scripted and, except for the library of stills, was shot entirely on video.

Both parts of the French language disc have been produced for intermediate and advanced students of French, at M.I.T.. A distinguishing characteristic of the project is its emphasis on presenting the language, as it is currently spoken in France. No

attempt has been made to filter or simplify the language. The reasoning behind this approach is simple: if the program is interesting and authentic, the student will have more incentive to learn what is being said. Therefore, subtitles, glossaries, and explications of the material, which are stored in the computer, will be available for the student's use.

IV. DESIGNING AN INTERACTIVE FICTION MOVIE

The most important question that confronts the designer of an interactive program is that of motivation. Why should the viewer feel compelled to interact with the material? In the case of a fiction film, an adequate response to this question becomes even more difficult. We have been trained, and gain pleasure, from assuming a passive role in relation to fiction movies. They are, for the most part, no more than a mass entertainment medium and, as such, rarely require the audience to perform any 'work'. In one sense, "En Quête d'Un Appartement" circumvents this category simply because it is produced for a language learning class. However, the fact that it is required work for the students does not justify or guarantee its success as an interactive movie. The effectiveness of its design will only be apparent if students, and other viewers, respond by wanting to use the program and become involved in the story beyond a superficial level. To insure a certain amount of involvement, there are a number of factors beyond the actual story, or plot, of the movie, which can enhance the design of an interactive fiction film.

When the viewer becomes an active participant in the communication process, a new set of relationships is formed. In many ways, the selective choices and decisions of the viewer are

actually "editing" decisions. Therefore, as an 'editor', the viewer must have an adequate sense of control over the material at hand. An intuitive understanding of the structure of the program and the tools available for its manipulation must exist to enable a dynamic interaction. Specifically, viewer commands and requests should translate into appropriate branching in a smooth and comprehensible manner. In this way, the impression of a dialogue or conversation will result which is essential in maintaining the flow and continuity of a fictional narrative. The challenge for the designer is to allow this conversation to proceed on a number of interconnected paths in response to different viewer decisions. In an interview published in Videography, Nicholas Negroponte pointed out that:

> Today, people who write books and make movies, have been trained to produce well-formed monologues that have beginnings, middles, and ends. They are going to find it difficult to grasp that the authors of the next few decades are going to be asked to script conversations, basically, that don't have well-formed beginnings, middles, and ends.[7]

In the case of "En Quête d'Un Appartement", there is one beginning followed by a number of possible middles and ends. It consists of different variations of a story, which are all plausible outcomes of viewer decisions made at different times, in the course of the film.

The difficulty in writing such scripts arises from the 'domino effect' introduced by any revisions and changes in the work. When a new piece of information is added to a part of the story, all possible paths leading to that point have to be reviewed and adjustments made to accommodate the new detail. It is advisable to think of the different sequences as links in an interconnected chain, forming the possible stories in the scenario. Visualization of the script, through a flowchart, is indispensable in all stages of production: from the initial design to shooting and final editing phase. For better or worse, the flowchart used in shooting is the final movie on the disc, since it is nearly impossible to change or reposition scenes in the editing stage and maintain the necessary links in the story. Therefore, much more time needs to be spent on finalization of the script for an interactive movie than one written for a traditional linear film.

Other considerations include efficient use of valuable disc real estate. It is important to define what is essential to the story and plan the layout of the material, in order to take advantage of common transition sequences. For example, an exterior shot of Philippe going home in "En Quête d'Un Appartement" needs to be used by two different paths in the movie. It is recorded only once on the disc, but its proximity to the two paths and the use of a fade-to-black allow both

sequences to fade-up to this shot. In addressing a Conference of the American Video Institute, Jim Hoekema pointed out that the videodisc argues for a new kind of filmmaking style which is terse and economic in its use of time. The single frame addressability and computer control in interactive programs favour short, interconnected sequences rather than long, building scenes.[8] Although one cannot argue against the logic of these assertions, it is important to bear in mind that the 30-minute length of one disc side is only a current technological a reality. As research continues towards the development of more compact media, and possibilities for data compression become a reality, these time limitations will naturally become less important.

Finally, the design should be constantly judged against the technical and aesthetic standards that viewers have come to expect from traditional movies. Even 'short, interconnected sequences' need to work as well-executed moments of an intriguing film. This requires careful planning of the production and attention to details such as lighting, sound quality, camera movement, and character development. Ideally, each complete path should work as an independent and coherent movie from beginning to end. Often, experimental work in new media arises from a fascination with the potential of the tools rather than a desire to make the tools tell a new story. The latter case can lead to

more discriminating use of the new medium, while taking advantage of the acquired language of narrative film.

V. THE DESIGN OF "EN QUÊTE D'UN APPARTEMENT"

1. Problems and Solutions

The goal of the viewer, as defined by the original "document investigation" exercise, is to use the simulation in an effort to find an apartment for a fictional character. Early designs emphasized the functional aspects of this task. This meant looking through newspaper listings and photographs of apartments, listening to real estate agents, and inhabitants of the neighbourhood, at the expense of narrative development. Efficient use of the extensive data-basing capabilities of videodisc was being made. However, this was not a very challenging or motivating exercise.

I redefined the project to stress the dramatic relationship between the viewer and the fictional character. In the final script, finding an apartment for Philippe becomes a natural and necessary task, as a result of the viewers identification with the character's predicament. The viewer enters the world of simulation with some knowledge of its rules. Like any game, unpredictable events and the element of chance make the interaction more involving and enjoyable. An example of the above is the inclusion of peripheral characters, like Morel the plumber, who introduce special problems of their own that

Philippe and the viewer have to solve. In this case, Philippe is surprised by the sudden arrival of Morel, who has come to repair the kitchen sink. He asks Philippe for his check, which he assumes is ready. Only the viewer can possibly tell Philippe where it is, since Philippe has no information about this. If the viewer successfully points out where the check is, the plumber will happily perform his work; otherwise, we witness the exit of a very angry French plumber! This incident illustrates that the viewer can have access to information that the main character is lacking and knowingly influence the outcome of certain situations. Even though this is a minor incident, it serves to enliven the story by adding humour to an otherwise narrow plot.

Knowledge of the check, like other helpful clues and information, can be gleaned from the viewer's independent exploration of the program material. As mentioned earlier, a combination of stored pictures and audio information is used in these cases (for more information, refer to Section 2). As a film the problem is: How can the viewer exit and re-enter the movie sequences without losing the immediacy of the fictional narrative? The solution to this problem lies in introducing these independent explorations at appropriate intervals in the movie, where they can become natural extensions of the plot. In the case of "En Quête d'Un Appartement", Philippe's role in

announcing the tasks to be performed is crucial. For example, at the end of the first scene ("Café Scene"), where we have already been exposed to Philippe's dilemma, he turns to the camera (the viewer) and announces the following [translated from French]:

> Well...if you want to help me, why don't you go to Elisabeth's and see if there are any news (messages, calls, etc.). Then, you can meet me later, at 11:00 o'clock, to visit an apartment with this agent. The address is #11, Rue St. Martin...OK....See you later...

At this point, he holds up an envelope with Elisabeth's address. The camera moves in on a close-up of this information and we freeze-frame on this shot. Here, Philippe has made requests which are now a natural part of the simulation, and thus, the break in the movie is justified. Also, the time-frame of the program is assumed to be one day, so reference to 11:00 o'clock is understood by the viewer. Obviously, the time references are part of the game and the viewer will decide when it is 'time' to move on to the next meeting. For our purposes, it is a very helpful device in signalling an interruption in the narrative, which can then be resumed at a 'later' time.

Another type of interruption is more frequent and occurs every time Philippe addresses a question to the viewer. For example, in Scene 2, before the arrival of the real estate agent, Philippe turns to the viewer and asks: "Were there any messages

for me"? In order to respond to this question, we fade-out of the movie and fade-up to a menu with a choice of responses. For example:

- Yes, there were many...
- I didn't listen to them.
- I have no idea.

Any one of these responses will lead to a suitable remark by Philippe. At first, these responses were to appear super-imposed on a freeze-frame of Philippe. However, this sudden stopping of the film drew attention to itself and the artificiality of the conversation with the viewer. Fading out of the movie and on to the menu created a separation between the narrative and the real-time response of the viewer. This strategy clearly worked better. The addition of a small freeze-frame of Philippe (from that particular moment in the scene), to the top left-hand corner of the screen is a useful mnemonic device that completes the menu. If the freeze-frame is picked, Philippe's question to the viewer is repeated. It is important to note that the language used on the menus is casual and conversational. This also helps to convey a sense of dialogue between the viewer and Philippe, making the interruption less abrupt.

In planning the shooting of the simulation, we confronted another problem: How can Philippe address the camera in the middle of a scene with other characters? Would the other

characters also be aware of the viewer's presence and look toward the camera? This was not acceptable and would have jeopardized the development of the fiction. Hence, the script is written in a manner that allows Philippe to turn to the camera when other central characters have temporarirly exited. In Scene 4, for example, Philippe's aunt leaves to get him an extra set of keys to her apartment. The moment she is out of the room, Philippe turns to the camera to ask the viewer for advice. Thus, there is a complicity between the viewer and Philippe that does not weaken the spell of fiction. Other characters perform their roles in the usual manner and are unaware of the camera's presence.

The use of camera movements designed to replicate the viewer's arrival at a meeting place presented yet another shooting problem. For example, when the viewer decides to meet Philippe for the 11:00 o'clock meeting with the agent, a hand held point of view shot is used. On screen, we see Philippe seated in the distance and the camera actually walks towards him. When we are no more than two steps away, he looks up from his reading and acknowledges the viewer's presence by saying: "Oh. There you are. Well, the agent will be here shortly...". This moving point of view shot is only used for the viewer's arrival. The rest of the scene is shot from different angles with a fixed camera. In planning the shooting, the question was: If these types of point of view shots are used, shouldn't they be

consistent throughout the film? In other words, if the camera is replicating the viewer's physical presence by arriving at a meeting place, we cannot suddenly make this person disappear. The option is to shoot all scenes from the perspective of a third person (the viewer) who is physically present and is following the other characters. This was a cumbersome and extremely limiting proposition. All editing for the purposes of time compression and reaction shots would be impossible, if the camera functioned as a human eye. Therefore, we opted for the combination approach using the advantages of both point of view and less obtrusive shooting styles. This approach works because the language of narrative film is well-developed and understood by the viewers, and allows such creative license.

2. The Difference Between Responses and Actions

In the movie sequences, the viewer responds to Philippe's direct questions by choosing an answer from the menu screen. These are limited responses to immediate questions. In contrast, the independent explorations, using the slide and audio library, enable more open-ended action by the viewer. Here, there is freedom to move around and discover hidden clues. The inclusion of possibilities for open-ended action is important in the design of a simulation; otherwise, the interaction is narrow and stifling.

The software in this project enables the following types of actions:

1. Any clear address of a place, which includes the number and street name can be used in conjunction with the maps of the city of Paris included on the disc. Once an address has been located on the map, the viewer can choose to 'go there'. Given the address of an apartment (for example, from a newspaper listing), we can find it on the map and visit the apartment.

2. All viewable apartments are shot in the following manner. First, a plaque with the street name appears; then, the viewer can step through a series of photographs of the exterior of the building. Later, the interior of the apartment can be stepped through as well. Each apartment has a floor plan which can also be viewed. The floor plan is cross-referenced to the slides of the apartment. Picking a room on the floor plan will get its corresponding slide.

3. Elisabeth's apartment (where Philippe is staying) is extensively movie-mapped and allows the viewer to 'walk' through it using the photographs. There are objects on Philippe's desk which can be activated by the viewer. For example, the viewer can pick 'play' on the answering machine and listen to recorded phone messages. There are messages from both Morel and Elisabeth, who specifies where the plumber's check is to be found. Also, the telephone can be used to call different characters on Philippe's behalf. For example, if the viewer calls the agent Lebrec, he/she can leave a message on the answering machine at the real estate agency. Later on, this will lead to a response from the agent who will call back and reveal the address of a newly available apartment.

Viewers who take the initiative to do independent exploration work will be more effective in finding solutions to Philippe's problems. Although there are few absolute right and wrong answers, Philippe will have more options available if the student visits a number of apartments and makes certain calls. [For more detailed information about the components of the slide library

and a complete flowchart of the movie, please refer to Appendices A and B.]

3. Notes on the Production

The production of "En Quête d'Un Appartement" revealed characteristics that are peculiar to an interactive script. Talented actors contributed their skills to an often difficult task. As usual, the script is composed of a number of scenes performed at different locations. Within each scene, however, there are sequences with slight variations of detail, that depend on the viewer's previous actions. Scene 6, which is composed of the endings to the movie illustrates the problem of producing such a script (the last two pages of the flowchart in Appendix B can be used as a reference).

The difficulty confronted by the actor is the cumbersome obligation to perform these endless variations of a scene. For example, if the viewer has visited Olivier's apartment on his/her own, then the option of staying there becomes available to Philippe. Therefore, the ending has to be acted out with the addition of this option, which includes Olivier's arrival and the ensuing discussion between Philippe and him. All of the other possible options that, again, depend on the student's actions

during the simulation, also have to be acted out by Philippe. These types of short sequences, in which only small details have been changed, are tedious to perform and shoot. Furthermore, continuity problems require special attention. While the camera is being set up to shoot different sequences, the smooth editing of each possible path has to be insured. For example, Philippe is shown exiting to the left of the screen. All possible options that can follow this shot, must now show him reappear in a manner that matches, in order to insure editing continuity. Also, objects moved by the actor in one variation of the scene have to be replaced in their correct positions for all subsequent variations. The sheer number of different takes is tiresome for the actor from a dramatic standpoint, and complicates the task of keeping continuity in such films.

This project was shot at 29.97 fps (frames per second) on Kodak 16mm colour negative film. An Aaton camera, generously lent to us by Richard Leacock, was modified to conform to the NTSC video frame rate (29.97 fps). Sound was recorded on a Nagra IV running at 60 Hz. This enabled us to take advantage of 'filmic' qualities (softer, more textured appearance), and guarantee stable freeze frames. The running video can be stopped at any point and the resulting still image is completely stable. The 'inner field' jitter of some frames, which are shot with a video camera, is avoided in this process. Approximately, 2 1/2

hours of material was later transferred to video from the original negative. A liquid gate transfer, performed at DuArt Laboratory in New York City, was useful in masking scratches and dust on the negative. The sound was also transferred to 1" videotape and the synchronization process was performed in the video stage. This production strategy proved effective and is highly recommended for videodisc programs.

VI. TECHNOLOGY AND THE LANGUAGE OF NARRATIVE FILM

As a technological art, film is subject to constant evolution in response to technical advancements. A comprehensive discussion of the effects of technological development on the language of narrative film is not within the scope of this paper. Instead, some representative developments are examined in an effort to trace the evolution of narrative structure. In this context, the addition of the computer to the film viewing experience can be seen as yet another advancement that can lead to the production of new types of movies.

It is interesting to note that Edison's vision of cinema as a private viewing experience is closer to that proposed by "interactive movies". As David Cook has pointed out:

> ...Edison was not interested in projection. He mistakenly believed that the future of moving pictures lay in individual exhibition, so he commissioned Dickson to perfect the small viewing machine he had already designed for private use in the laboratory...True to Edison's original intention, Dickson had designed both viewer and camera so that sound and image could be synchronized and recorded simultaneously.[9]

This machine was dubbed the Kinetoscope and the moving pictures were viewed through magnifying lens by individual viewers, one at a time. The first Kinetoscope parlor opened in New York City in

1894. The fifty-foot maximum length of the film loop (approximately 16 seconds at 40 fps; 60 seconds at later standard of 16 fps for silent film) did not encourage the construction of narratives. Instead, slapstick comedy, vaudeville acts, and other brief performances were well-suited to this format. The first moving picture recorded with the Kinetograph camera is entitled Fred Ott's Sneeze (an Edison laboratory mechanic sneezing!). It was followed by such titles as Trained Bears, Bucking Broncos and Highland Dance.

Very soon after the introduction of the Kinetoscope, Auguste and Louis Lumière perfected a mechanism for projecting moving pictures. In March 1895, the Lumière Cinematographe was used to project La Sortie des Ouvriers de l'Usine Lumière (Workers Leaving the Lumière Factory) to a private audience in Paris. The success of the Cinematographe convinced Edison, and others, that the financial gains of projection were very promising. Next, an important invention, the "Latham Loop", solved the problem of film breakage by redistributing tension on the reel.[10] This enabled films to grow in length to approximately 1000 ft. or nearly 16 minutes. Edison bought the rights to a projector that incorporated the "Latham Loop" from Thomas Armat. He then proceeded to take full credit for the design of the projector and named it the Vitascope (first exhibition April 1896). However, projection of the image was no longer accompanied by synchronized

sound, because there was, as yet, no mechanism for amplifying sound for a large audience. In this way, the basis was laid for the development of silent film.

The notion that the camera might be used to tell stories did not yet exist. This led to the production of documentary rather than narrative films. The camera was simply used to record real and staged events, from beginning to end, from a single point of view. Georges Meliès, a professional magician, is given credit for exhibiting the narrative potential of film. Suddenly, film was recognized as having a separate reality with its own laws and structures. His contributions were numerous:

> By adding certain techniques of still photography, theatre spectacle, and magic lantern projection to the linear medium of the film strip, he innovated significant narrative devices like the fade-in, the fade-out, the overlapping, or lap, dissolve, and stop-motion photography.[11]

Meliès was able to produce hundreds of short narratives such as Le Voyages dans la Lune (A Trip to the Moon, 1902) that delighted audiences. Yet, he did not see the potential for camera movement or changes in point of view. Each scene was shot from the same position with the camera functioning as "the inert eye of a theatre spectator."[12]

An American filmmaker, Edwin S. Porter, took the next logical step and discovered the significance of intercutting shots. In The Life of an American Fireman (1902), Porter intercut "found" footage with staged scenes and came up with a "fiction constructed from recordings of empirically real events."[13] This film demonstrates the capability of film to denote separate but simultaneous action through the use of parallel editing. Continuous action is cut into a number of different shots and does not necessarily play from beginning to end like a theatre scene. Porter had come up with the essential fact that "cinematic narrative depends not upon the arrangement of objects or actions within a scene but upon the arrangement of shots in relation to one another."[14] This notion was later carried much further in the writings of Eisenstein, and other Soviet filmmakers, who were concerned with the potentials of "dialectical montage."

The most versatile filmmaker to contribute to the early language of narrative film was D. W. Griffith. Griffith altered the spatial and temporal length of shots and underlined the importance of visual rhythms. He also used close-ups to better reveal the expressions and feelings of actors, often cutting from these to the object of their thought. He once asserted that "you can photograph thought."[15] His numerous innovations include the use of flashbacks, subjective camera, and compositions in depth - with action in the foreground, as well as background of a shot.

From the standpoint of the image, the groundwork had been laid for the production of complex narratives. This was also partly the result of the growth in length of films, which by 1910 had approached the 2-3 hour feature length format. In the absence of synchronized sound, however, films depended on musical accompaniment and the use of titles. These static titles were a "liability to the silent cinema, since they interfered with the flow of its narratives and the rhythms of its montage."[16] Between 1928 and 1931, silent cinema gave way to the "talkies." Because of the primitive state of synch sound recording and editing, the introduction of sound forced the film image to regress to an earlier stage of development. Cameras had to be hidden in sound-proof booths, so as not to add noise to the recording. As a result, actors now had to perform within range of both the static camera and microphone. These early "100 percent talkies" were closer to talking photographs than movies. The advent of post-synchronization (dubbing) resolved many of these problems.

Today, among other developments, smaller, more mobile cameras, the addition of colour, directional microphones, and multi-channel sound mixing give the filmmaker precise control over details of both picture and sound. As a response to the introduction of television, some theatrical releases exploit the larger image size and surround-sound capabilities of movie

theatres. Television, itself, has also contributed to the development of different types of narrative films. Serials and series, for example, are forms that thrive in a television environment, which is based on predictable program material delivered in a routine fashion.

All of these technological and aesthetic developments, combined with the introduction of cheaper production technology, have made narrative filmmaking more accessible to a greater number of producers. According to James Monaco:

> It is true that access to the means of production of the media, both print and non-print, has become markedly more democratic during the last twenty years. It seems likely that access to the means of distribution will undergo a similar process of democratization during the next few years.[17]

If used intelligently, programs that change in response to viewer choices and selections (expressed through a computer) can contribute to this process. For example, a home computer connected to a central image bank or film library can enable an individual viewer to watch specific programs of interest. Within the framework of an interactive movie such as "En Quête d'Un Appartement", the limited role of the viewer can hardly be called "more democratic". Nevertheless, by stipulating a more active role for the viewer, it represents a move away from traditional

distribution process aimed at a passive audience. A differently designed scenario can enable a large number of people to interact with one movie simultaneously. However, in their most open-ended and interesting form, these movies are made for an audience of one. Thus, they are private viewing experiences that proceed at a pace determined by the current viewer.

The questions is: In what way will this change in the viewing experience of movies affect their narrative structure? The best approach in determining answers to this question is through analogies with other media. The choices of the viewer in influencing the plot can sometimes reveal their interests. In an interactive movie, these interests can enable the viewer to direct his/her attention to different facets of the work. This is analogous to the spectator of a play who can look at different parts of the action on stage. However, it is in contrast with the tightly controlled montage of some linear movies that clearly direct the viewer's gaze from beginning to end. This characteristic can lead to the development of narratives that have more than one principal character, since the viewer can choose to follow a story through the eyes of different characters. In such scenarios, each character will reveal the unfolding of the plot from their own particular point of view. As a result, a number of different perspectives on a given situation can be simultaneously available for the viewer to

select. Also, the viewer can have control of the medium in a manner analogous to the act of reading a book. The program can be started and stopped, and different parts can be reviewed or skipped in favour of other sections. Of course, these options have to be specifically designed into the work and some programs may favour this type of interaction more than others. In general, these types of movies can come closer to revealing the multi-faceted, fluid nature of reality, if they are thoughtfully produced.

VII. CONCLUSION

The advantage of an "interactive movie" lies in its inherent ability to simulate a limited conversation between the work and the viewer. The ability to direct attention to areas of interest and observe the results of decisions on the plot of a story can be very involving. Language learning applications can benefit from the increased incentive and motivation of students who have to act on information rather than absorb it passively. "En Quête d'Un Appartement" illustrates a particular approach to the design of an "interactive fiction movie", while satisfying the pedagogical requirements of the French language project. It is an experimental project, produced with the aid of institutional funding.

Given the current state of technology, the cost of producing these types of programs, along with their necessary software environment, cannot be supported outside of large institutions. Thus, within the current movie distribution system, movies for an audience of one are, indeed, economically infeasible. Therefore, work in this area will have to continue as research by a small group of interested filmmakers. As a result of the addition of the computer to the movie viewing equation, the potential for producing new types of narrative films clearly exists. At this time, production costs are prohibitive and cannot support extensive development of this new form.

FOOTNOTES

1 David Cook, A History of Narrative Film (New York: W. W. Norton and Company, 1981), p. 645.

2 Claire Kramsch, Douglas Morgenstern, Janet Murray, "An Overview of the M.I.T. Athena Language Learning Project'" Calico Journal, (June 1985), p. 31.

3 Ibid., p. 32.

4 Ibid., p. 33.

5 Seymour Papert, Mindstorms: Children, Computers and Powerful Ideas (New York: Basic Books, 1980).

6 Mitchel Resnick and Stephen Ocko, "LEGO/LOGO and Science Education"' unpublished paper, M.I.T., 1986.

7 Nicholas Negroponte, "Conversation with Nicholas Negroponte", Videography, (October 1981), p. 48.

8 Jim Hoekema, "Designing for Intelligent Videodisc", Report of the American Video Institute on Interactive Videodisc Applications Conference, (May 1980), p. 12.

9 David Cook, A History of Narrative Film, p. 6.

10 Ibid., p. 13.

11 Ibid., p. 14.

12 Ibid., p. 18.

13 Ibid., p. 20.

14 Ibid., p. 27.

15 Ibid., p. 87.

16 Ibid., p. 252.

17 James Monaco, How to Read a Film (New York: Oxford University Press, 1981), p.415.

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14 Mohl, Robert F. "The Interactive Movie Map: Surrogate Travel with the Aid of Dynamic Aerial Overviews", M.I.T. Architecture Machine Group, 1980.

15 Monaco, James. How to Read a Film. New York: Oxford University Press, 1981.

16 Monaco, James. American Film Now. New York: Zoetrope Book, 1984.

17 Morgenstern, Douglas. "The Athena Language Learning Project", Hispania 69, (September, 1986).

18 Murray, Janet. "M.I.T.'s Athena Language Learning Project: Finding the Right Methodology For the New Technology", Newsletter, 18.

19 Papert, Seymour. Mindstorms: Children, Computers and Powerful Ideas. New York, Basic Books, 1980.

20 Vogel, Amos. Film as a Subversive Art. New York: Random House, 1974.

21 Wollen, Peter. Signs and Meaning in the Cinema. Bloomington, Indiana: Indiana University Press, 1972.

APPENDIX A: BRIEF DESCRIPTION OF DISC

ENTREZ DANS PARIS!

Part 1: En Quête d'Un Appartement...

Produced by: Ayshe Farman-Farmaian
MIT Film Video Section

This is an "interactive fiction movie" designed to be used as a comprehension exercise by MIT French language students.

The premise is simple: the viewer's goal is to help the main character -- Philippe -- find an apartment, as it appears that Elisabeth has had enough of him. The viewer's decisions will lead to one of six possible endings for the movie, with ample surprises along the way!

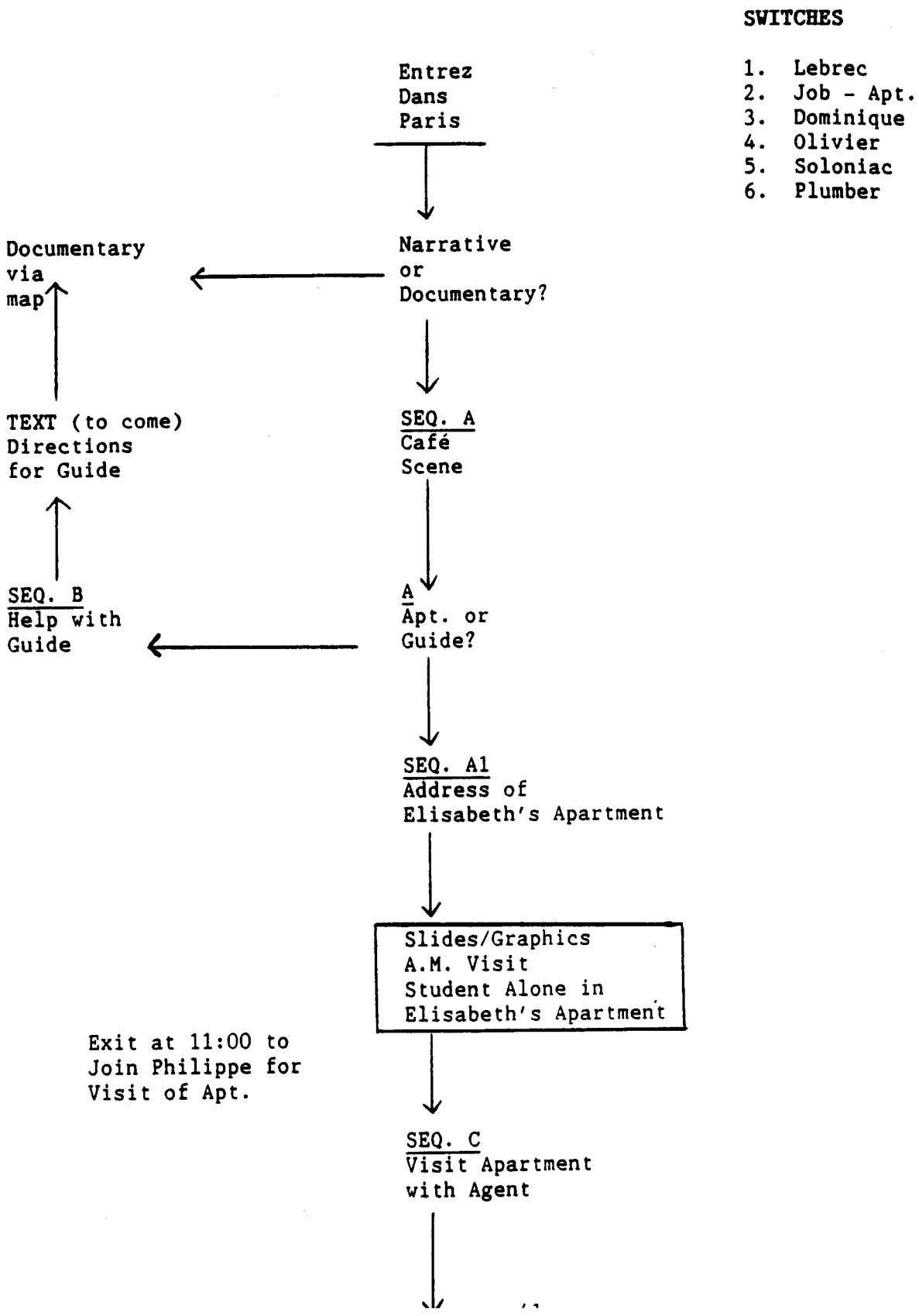
The disc consists of the following elements:

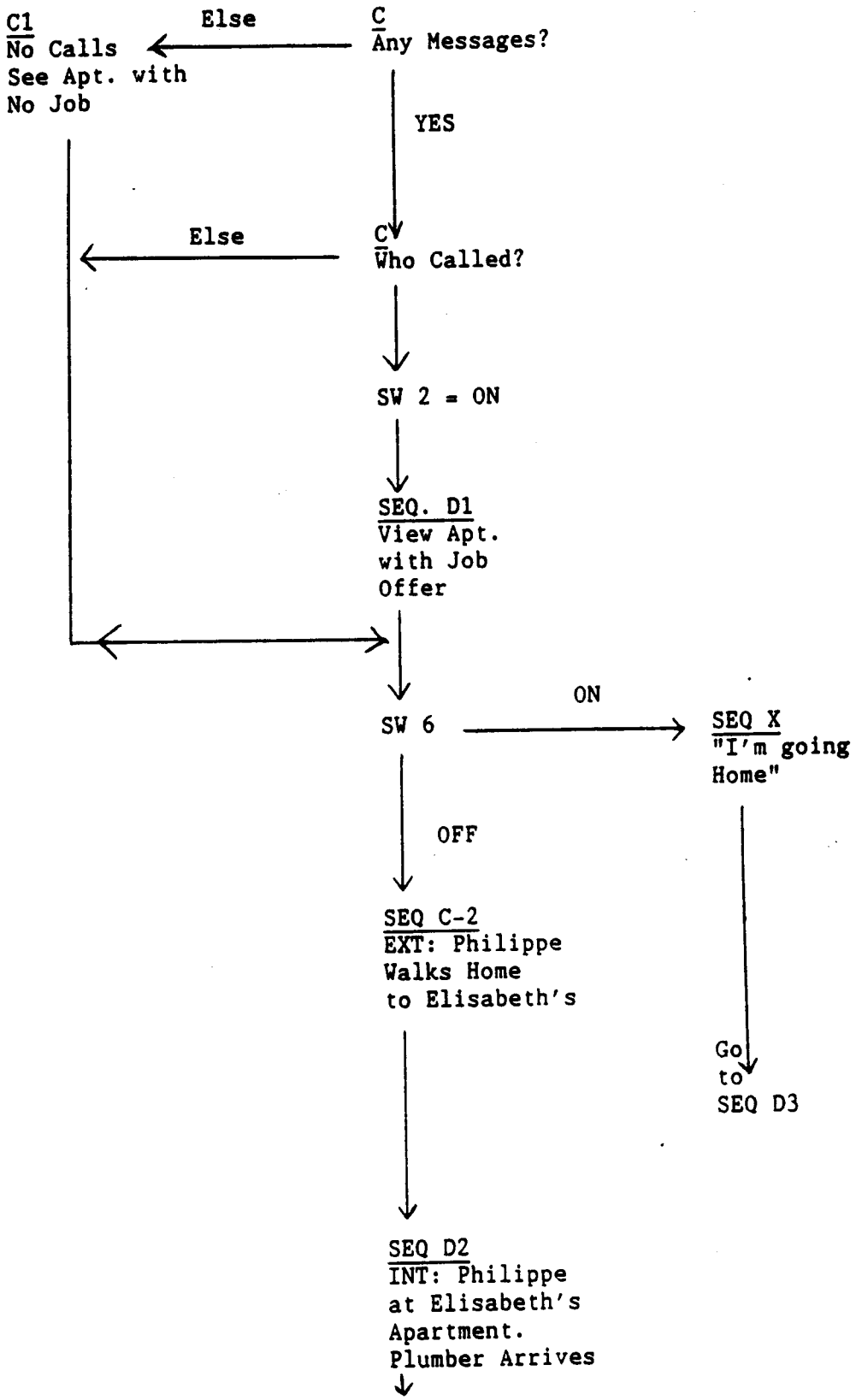
Video Scenes:
- Scene 1: Café scene
- Scene 2: Visit Apartment with Agent
- Scene 3: Philippe at Elisabeth's
- Scene 4: Philippe Visits his Aunt
- Scene 5: Elisabeth and Dominique's Meeting
- Scene 6: Various Endings

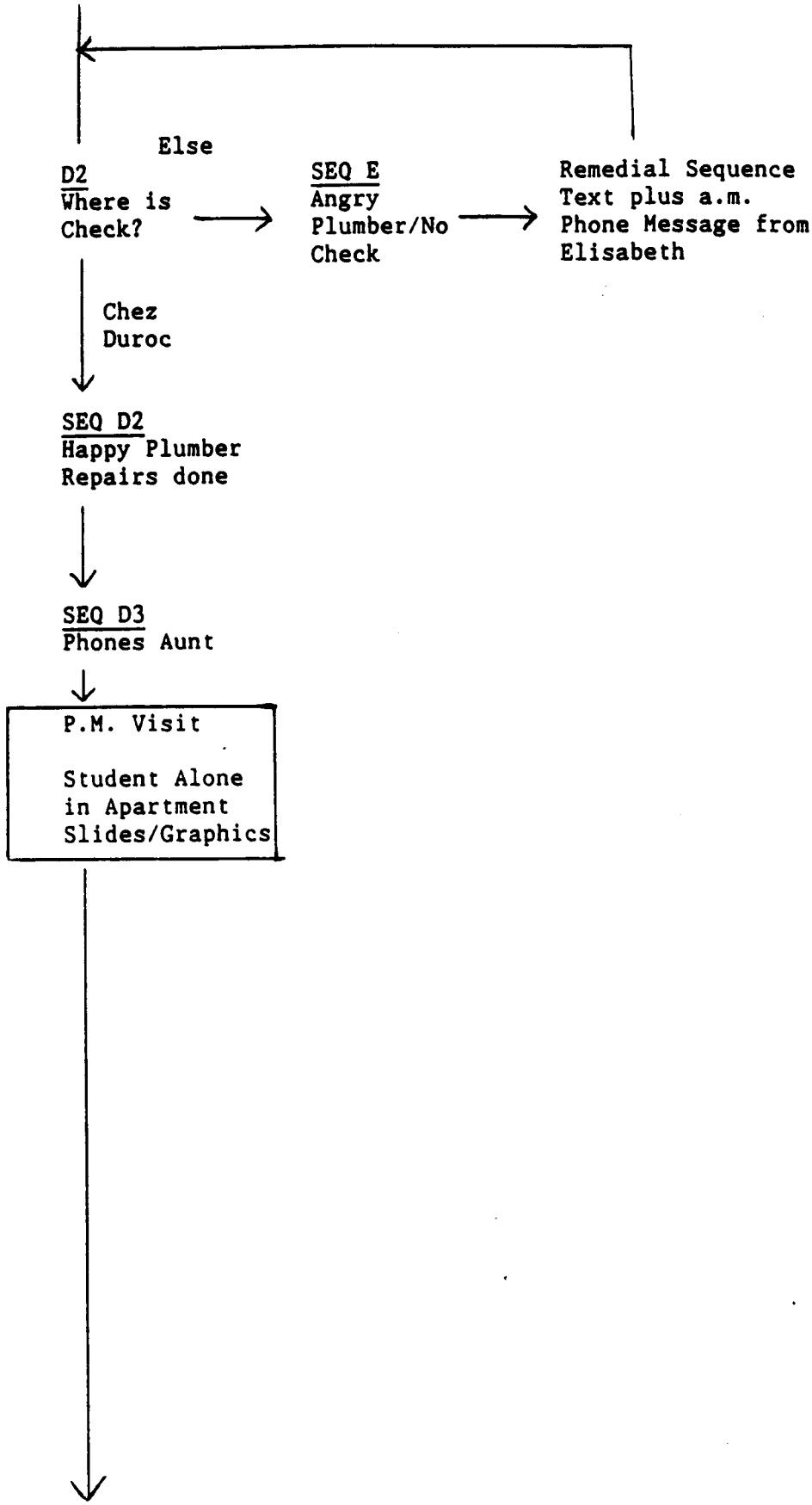
Slide Library:
1. Maps of Paris
2. Movie map of Elisabeth's apartment with detailed shots of tools that can be used: answering machine, phone, etc.
3. Floor plans and slides of apartments that can be visited.
4. Slides of agencies and Boulangeries with listings of apartments for rent.
5. Additional library of slides: old maps of the city, paintings of Paris, stamps, currency.

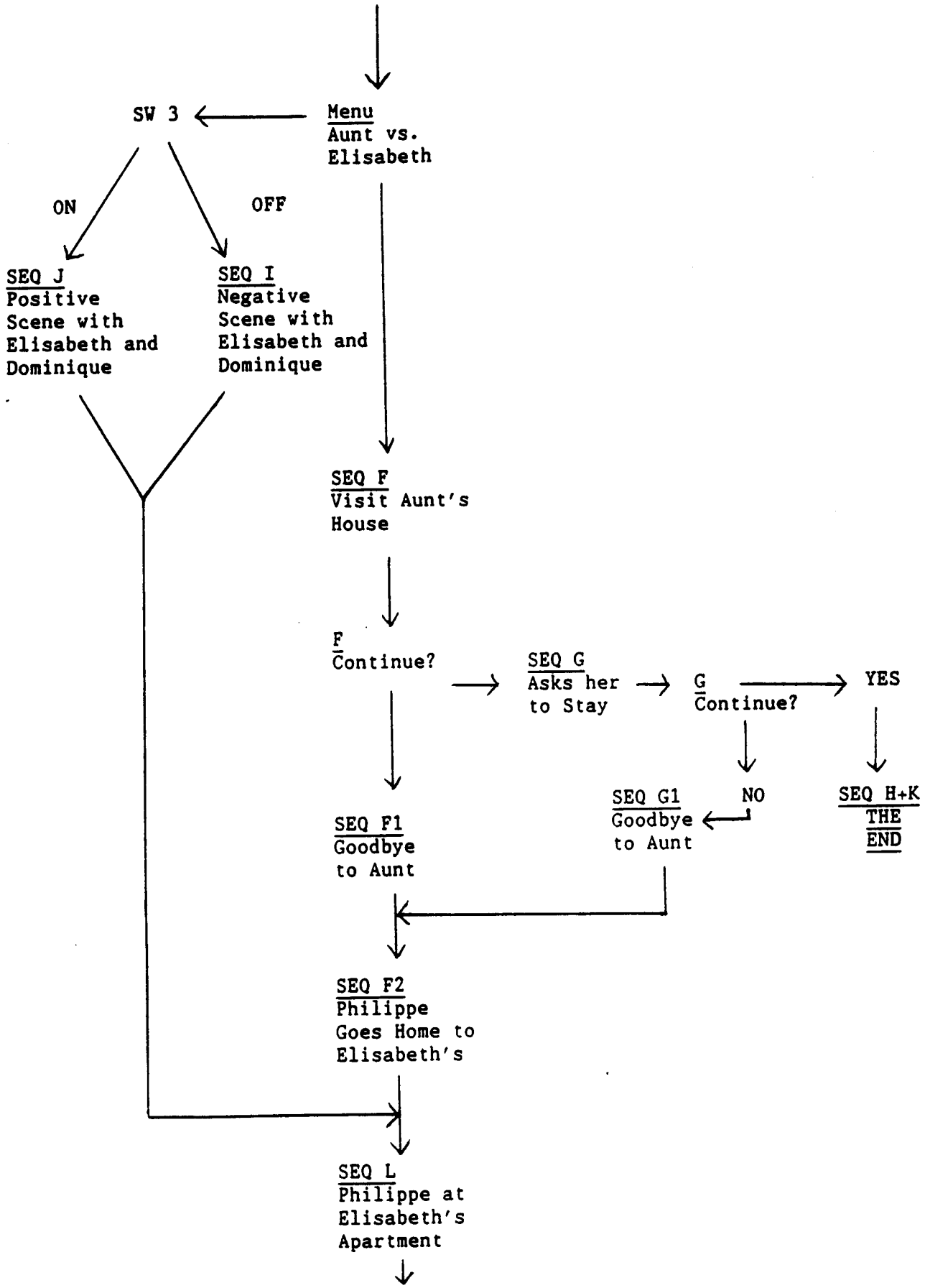
There are over 30 video sequences and more than 1,000 slides on this videodisc.

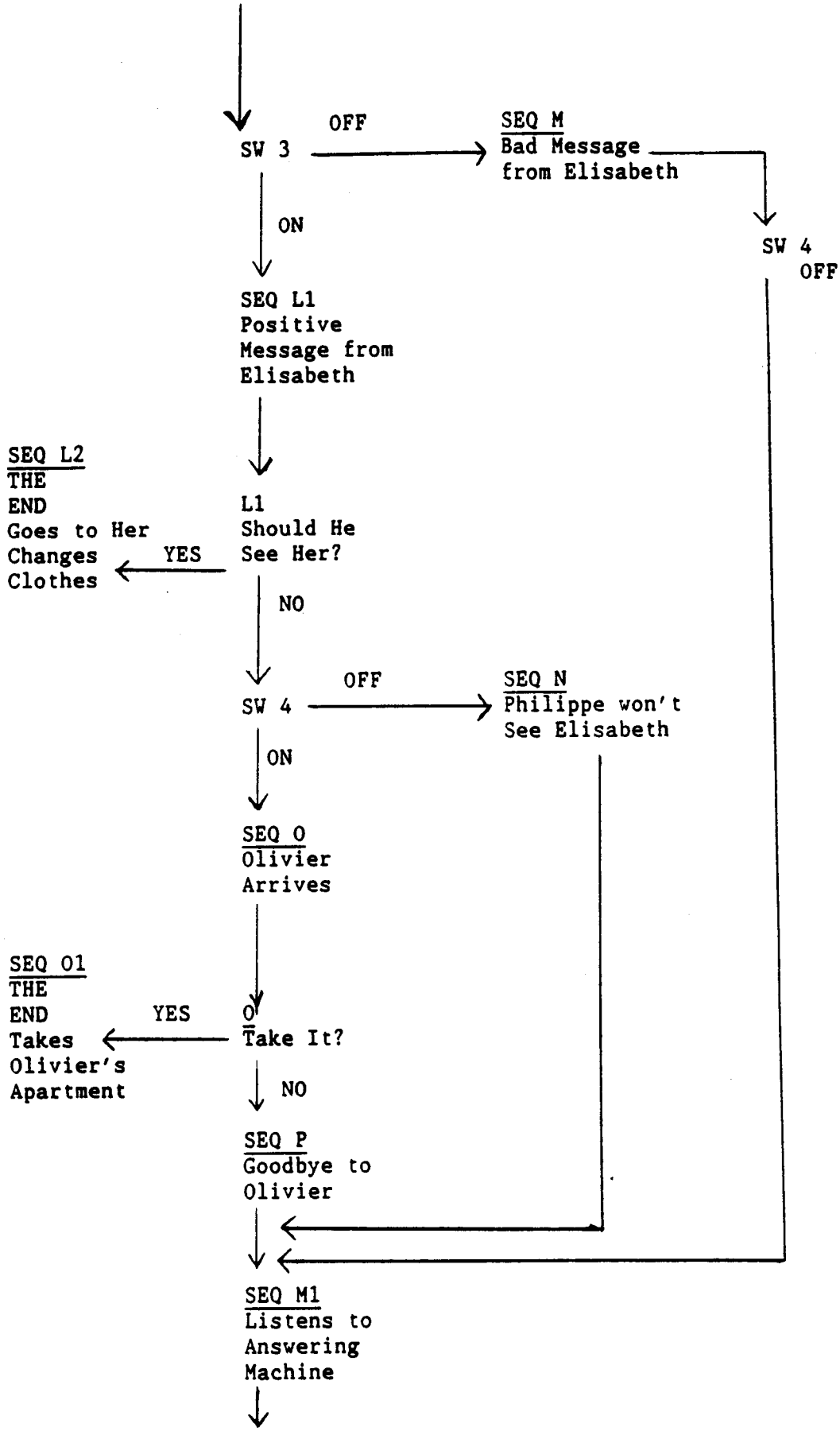
APPENDIX B: MOVIE FLOWCHART

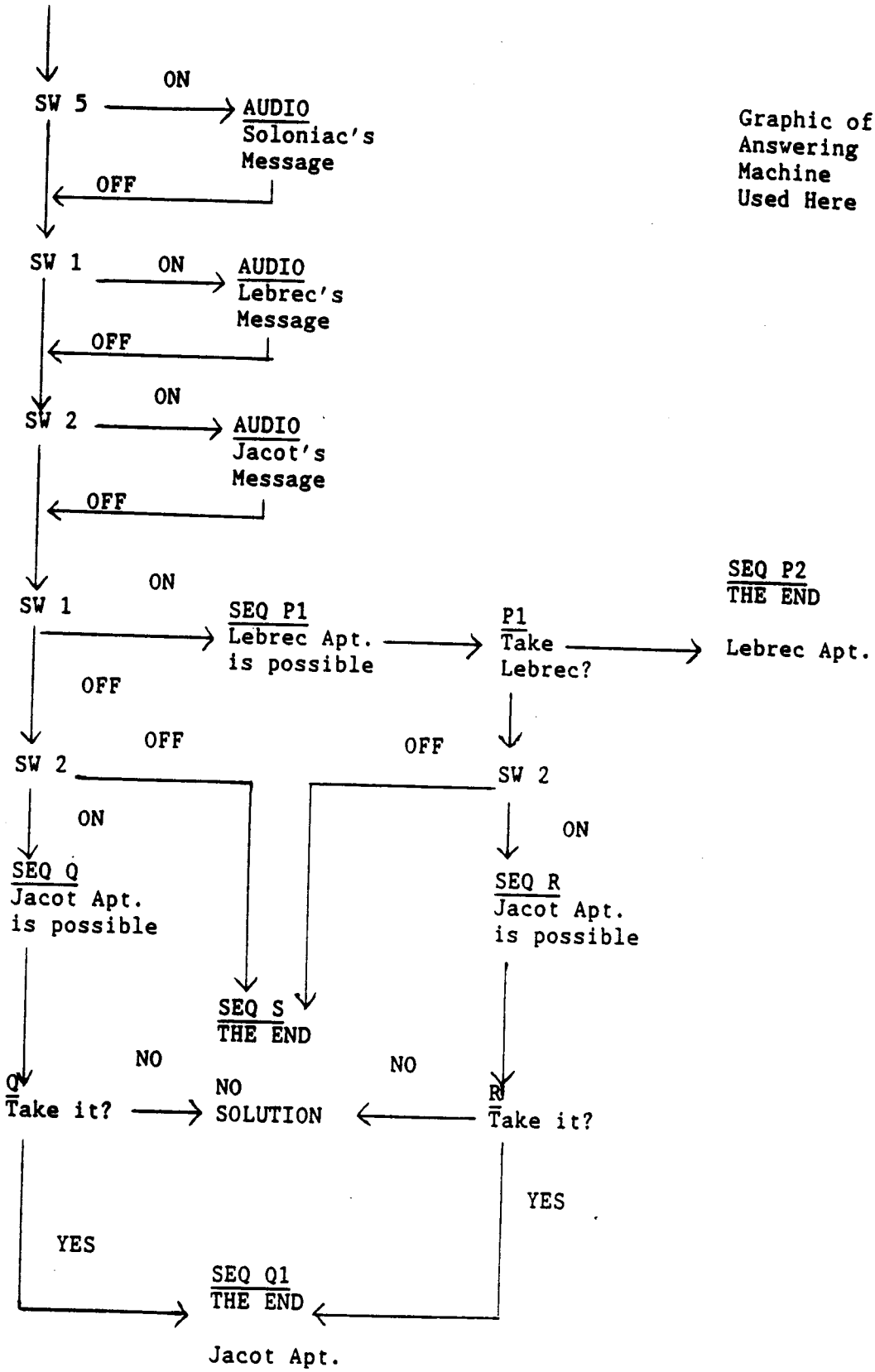



C1
No Calls
See Apt. with
No Job
Else
C
Any Messages?
YES
Else
C
Who Called?
SW 2 = ON
SEQ. D1
View Apt.
with Job
Offer
SW 6
ON
SEQ X
"I'm going
Home"
Go
to
SEQ D3
OFF
SEQ C-2
EXT: Philippe
Walks Home
to Elisabeth's
SEQ D2
INT: Philippe
at Elisabeth's
Apartment.
Plumber Arrives


Else
D2
Where is
Check?
SEQ E
Angry
Plumber/No
Check
Remedial Sequence
Text plus a.m.
Phone Message from
Elisabeth
Chez
Duroc
SEQ D2
Happy Plumber
Repairs done
SEQ D3
Phones Aunt
P.M. Visit
Student Alone
in Apartment
Slides/Graphics


Menu
Aunt vs.
Elisabeth
SW 3
ON
OFF
SEQ J
Positive
Scene with
Elisabeth and
Dominique
SEQ I
Negative
Scene with
Elisabeth and
Dominique
SEQ F
Visit Aunt's
House
F
Continue?
SEQ G
Asks her
to Stay
G
Continue?
YES
NO
SEQ G1
Goodbye
to Aunt
SEQ H+K
THE
END
SEQ F1
Goodbye
to Aunt
SEQ F2
Philippe
Goes Home to
Elisabeth's
SEQ L
Philippe at
Elisabeth's
Apartment


SW 3
OFF
SEQ M
Bad Message
from Elisabeth
SW 4
OFF
ON
SEQ L1
Positive
Message from
Elisabeth
SEQ L2
THE
END
Goes to Her
Changes
Clothes
YES
L1
Should He
See Her?
NO
SW 4
OFF
SEQ N
Philippe won't
See Elisabeth
ON
SEQ O
Olivier
Arrives
SEQ O1
THE
END
Takes
Olivier's
Apartment
YES
O
Take It?
NO
SEQ P
Goodbye to
Olivier
SEQ M1
Listens to
Answering
Machine


SW 5
ON
AUDIO
Soloniac's
Message
OFF
Graphic of
Answering
Machine
Used Here
SW 1
ON
AUDIO
Lebrec's
Message
OFF
SW 2
ON
AUDIO
Jacot's
Message
OFF
SW 1
ON
SEQ P1
Lebrec Apt.
is possible
P1
Take
Lebrec?
SEQ P2
THE END
Lebrec Apt.
OFF
SW 2
OFF
OFF
SW 2
ON
ON
SEQ Q
Jacot Apt.
is possible
SEQ R
Jacot Apt.
is possible
SEQ S
THE END
NO
NO
NO
Q
Take it?
NO
SOLUTION
R
Take it?
YES
YES
SEQ Q1
THE END
Jacot Apt.