STORYBOARDING

For Animation and Non-Linear Media

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Storyboarding is a key organizational tool for planning, preparing, presenting and proposing animation concepts to clients, investors and production team members. It allows the Animator to predetermine shots, camera moves, framing requirements, action, inclusion (or exclusion) of character or scene elements, staging, and style and pace. Without the implementation of at least rudimentary storyboarding techniques, the end result of hours spent modeling planning and rendering may result in an unpleasant or unintended footage, sending the Animator back to the beginning.

Storyboarding is the intermediate step between scripting and editing. It is, in fact, pre-editing. Using the pictorial method of communicating supplemented with succinct commands, this visual tool bridges the creative concept with the technical and artistic application of that concept. It allows a range of detail and accuracy not available in the oral or written communication.

It is, in essence, low-tech prototyping. Designing a production "on-the-fly", making up the visuals as you program or direct a cast is perilous and ultimately costly in both time and money. By determining the shot in prototype, you avoid "artistic experimentation" when on deadline, and when the resulting cinema must match the client's image. Discipline is essential if a project is to remain on budget, and storyboarding ensures a degree of discipline.

Effectively realized storyboards can be the backbone of a production. They can shortcut production schedules, prevent undesired footage from being created, and communicate exactly what a client, a Director or other decision-makers visualize.

In a non-linear environment, such as the planning and design for the creation of interactive presentations for CD-ROM, Web or DVD productions, storyboarding is one of the few practical organizational tools. Tracking the myriad screens, pathways, links, movies, sound effects and relationships of the many different elements making up a multi-media production can only be accomplished diagrammatically. Without a flow chart of boxes, diagrams, illustrations and descriptions, important parts can be misdirected, misinterpreted or missed entirely.

In this paper and my presentation, I will use the title "Director" to mean the originator of the production. In desk-top animation, the person who conceives of the animation, creates or imports the 3D models, textures and other objects to make up the presentation, then decides on the camera movements, the action and final result is, in essence, the "Director".

Classical Storyboarding is typical of the sketches Directors make to outline a story element for a film. It is the simplest and least costly method, consisting of quick sketches in boxes on paper, usually black & white with a marker or pencil. This method allows the Director to convert written script into a visual script, begins to define the "look" of the production, and introduces a new "character" into the mix – the Camera Point-of-View. This viewpoint can come from many different sources – inside the eyes of an actor/character, as an objective viewer, or sitting next to a protagonist as a friend.

In computer-generated animation of a scene or an object – that is, without live actors - the camera view allows movement to dramaticize an otherwise static shot. The audience may look at interesting elements, focus on important aspects in an orderly fashion, and come away with the most information provided by the Director. Being able to describe that camera view assists the Director, client or other team members to replicate the mind's eye conceptualization of the production designer. When the production calls for combining animated elements with a live footage shot, for example, against a blue screen, the storyboard is critical to frame the two divergent elements for seamless integration later in post production.

The storyboard, then, scripts out how the camera will see the action, by defining the frame view, the angle, camera movements such as pan, zoom, tilt (defined in the appendix), and the organization of the unfolding story.

As the storyboarding techniques became widely used in cinema as a Director's visualization tool, the product also became critical in describing visually to the camera crew, lighting technicians, actors and other cast and crew members what they were to do and what it was to look like.

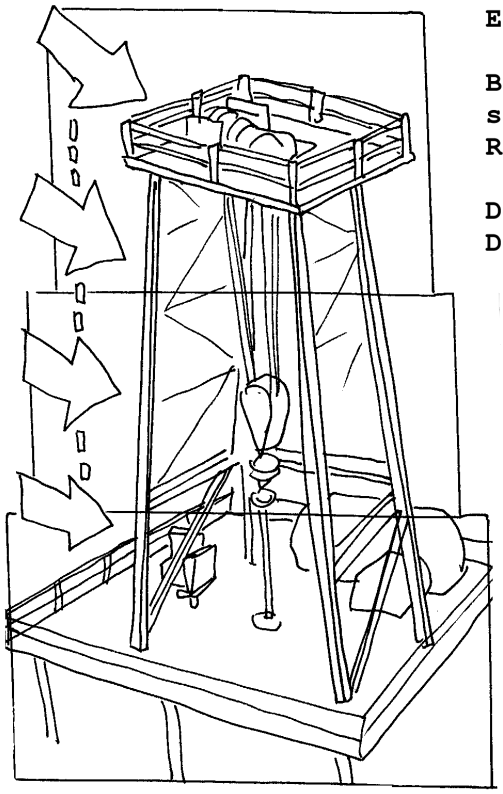
The English language allows many variations in interpretation and meaning of the written and spoken word. Without body language, intonation, facial expression and other visual cues, written words are open to a wide range of interpretation. Without pictorial representations, even the most succinct language can be misheard. While reading a text script, hundreds of variations can be produced from a simple phrase:

> *"Opening Shot is from a high angle, looking down on the crow's nest of the drilling rig. Boom down following cables to rig platform and dolly around to the driller's console, ending in another high angle. As the camera descends, pull back a little and tilt down slightly."*

This simple set of instructions might define a smooth camera movement in a Director's mind. It may not, however, match what a camera operator decides to do, based on how he/she envisions it, past experience, tools on hand, personal style, cultural influences, training . . .. By reading a storyboard that maps the camera view, motion, angle and pace, the camera operator will understand the Director's concept and make decisions that will stay within those parameters.

From an Animator's standpoint, after the 3D model is created, a pathway to describe this same motion can be prototyped prior to rendering by using wireframe or still frame animations. These can be linked to represent the intended motion.

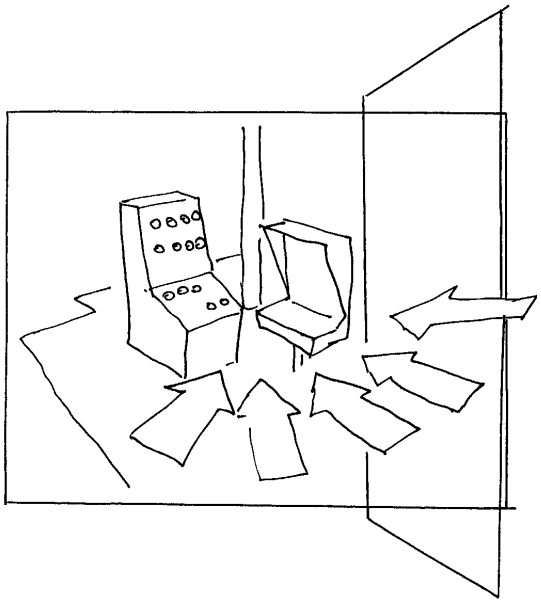
The same script in a storyboard format might look like this:



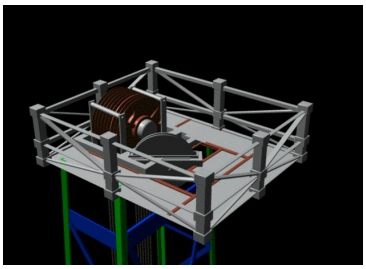
Establish High Angle Crows Nest

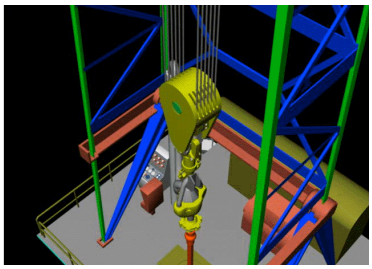
Boom Down along Cable, Zoom out slightly and tilt down above Rig Platform

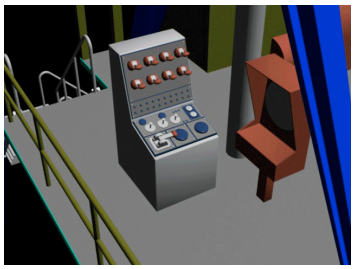
Dolly around to finish on Driller's Console



Now that the Point of View has been exactly defined, and the Director and Animator have collaborated on textures, the movement and the look of the production, the animated sequences would match as follows:







Drafting a Storyboard
If one thinks of this technique as a pre-visualization tool, then the Director/Animator can quickly sketch out ideas in draft format. Remember that "draft" means that, if a motion or action is not successful, it can be altered or re-drafted until it looks right. When using the sketch format, this effort is easily superceded as part of the creative process. Once a storyboard is more highly rendered, it is much harder to decide to make alterations and incorporate minor adjustments and aesthetic nuances.

Finely Rendered Storyboarding
Storyboarding also has become widely used as a sales tool, for Art Directors and copy editors at advertising agencies to describe their concepts to clients and investors, which are then sent to various production houses for competitive bids. These storyboards are highly rendered, usually in color, and may incorporate some simple animation, such as VRML walkthroughs, Macromedia Director scripted animations, or other refined techniques.

Non-Linear Storyboarding
When drafting content, links and pathways through information for Web, CD-ROM- and DVD-based programs, storyboarding becomes a more critical organizing technique. In the interactive realm, choices that a user might make must be also taken into consideration, as well as methods or returning to a main pathway/storyline, or acquiring objects or information along the way to achieve a goal. These storyboards must include traditional elements, such as camera movements within a scene, but may need to take into consideration that the user may take over control of a camera operation, such as a QTVR movie, and be allowed to pan, tilt and zoom at his/her own discretion.

Organizing Questions
As a Director conceives of a project, several questions need to be asked or at least considered to define the style and the direction a production will take. Who is the audience? What will the audience expect from the production? What does the Director want the audience to achieve (to learn/or to retain, act/buy, play/have fun, be moved by emotion…)? Where will the production be viewed, and on what media? What equipment will be required to show the production? Answering these questions in the planning stage can also help control the production, and will be represented in the storyboard parameters.

Layout Criteria
In Western Society, studies have shown that viewers generally scan an image from top left to bottom right. Viewers assume that larger items, closer to the screen are more important, and watch for movement signals from the lower panel or the right of the screen. Subsequently, planning movements and action taking this information into consideration makes for a more "natural appearing" motion in an active presentation.

One of the indicators of a beginning Animator is the random fly-through of a camera through a modeled scene.

The Animator plots a movement through a wire-frame map of the model, then tracks a camera along that path. After rendering the frames, the viewer is taken on a helicopter ride at thrilling speed through a scene or object, often squeezing through windows or openings, which would cause a pilot to go apoplectic. We then spin around and pass through again.

These motions are very difficult to storyboard and describe in camera terminology. Rarely are these motions planned in features or television movies. Consequently, they add to the unnatural look of an animation. By studying classic movies and learning the proven camera commands, an animated production has a better chance of appearing more realistic, becoming more believable.

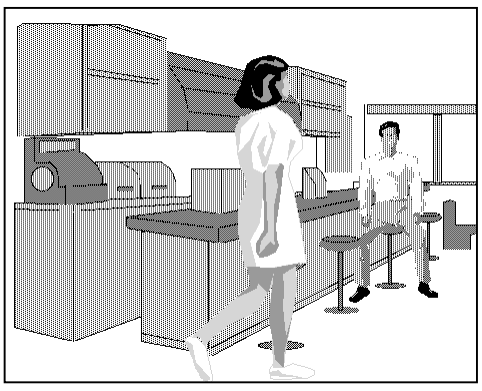
Mapping

Another important diagram is the overhead schematic of the stage, which shows location of props, actors, cameras, lights and other important elements. Usually, the storyboard artist completes this map drawing first, so that he/she can visualize what the camera will have in its field of view when it looks around a scene. The map can also incorporate paths characters follow for internal movement, which is usually described in the storyboard notations, and the subsequent following of the Camera Point of View.

Computerized Programs for Storyboarding

Several planning tools have been produced and are available for storyboarding production concepts. These programs usually are simple to learn, and the artist employing them generally can become quickly effective. They generally have a library of characters, props and scenic locations to assist the "drawing impaired", and offer different elevations, camera angles and actions to allow conventional directions to be applied.

While all allow print-outs of a series of sheets with the appropriate pictures and dialog, shot information and camera notes like a traditional storyboard, some allow presentation of the frames on a monitor, dissolving between frames in an animatic fashion to help describe action. Sound tracks and sound effects can be added, and camera movements such as zooming, panning and tilting can be depicted. A few allow non-linear boarding, which allow visualization of Web and CD-based interactive productions.



Computer-generated storyboard frames have a "polished" look that allows quick implementation of characters and props. In "StoryBoard Artist", sets, actors and objects are editable, to allow customized approaches once the standards become familiar.

One of the best features of the program, however, is the ability to convert the frames to an animated sequence, played back on a monitor.

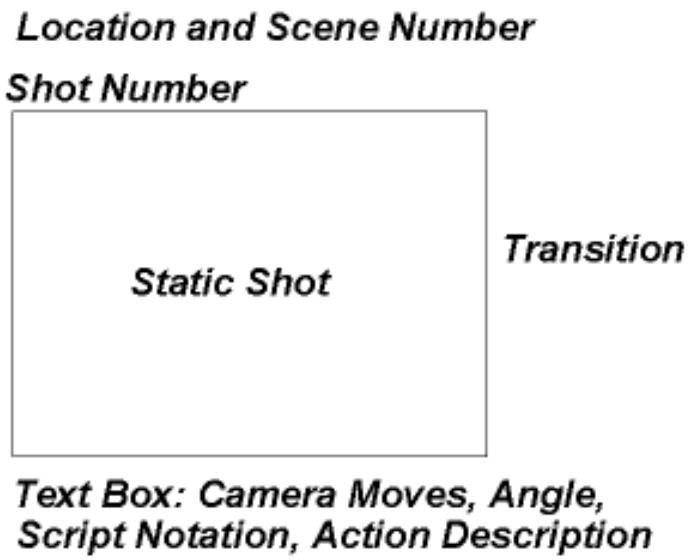
In fact, the more sophisticated tools begin to blur the line between storyboarding and actual development. For example, PowerProduction's Digital BoxOffice is a storyboard to code tool. The user creates the storyboard, then uses menus to make English-syntax scripts to link frames. The end result is a multimedia application.

Appendix: Storyboarding Requirements

When creating a storyboard, the following elements are usually required in able to communicate the Director's concepts to the crew and control how the scene will appear:

1. **Scale** – how much of a person or object will fill the frame
2. **Angle –** Where the camera looks from, to add drama, highlight or editorialize
3. **Camera Movements –** movement of the viewpoint represented by the camera
4. **Character Movements –** action by actors within a scene
5. **Script Notation –** Short notes, dialog, additional details which describe shot characteristics
6. **Illustration –** In addition, the way the scene, actors, costumes, props and other items are sketched will add countless other details which can be recreated by camera people, casting, costuming, or, in the case of an animation, can bring agreement between the Animator/Director and the client as to the look of the piece

Storyboards contain the information in standard places, so the reader doesn't need to search for directions, or assume that certain instructions were not specified. The storyboard frame depicted below shows the common location for information.

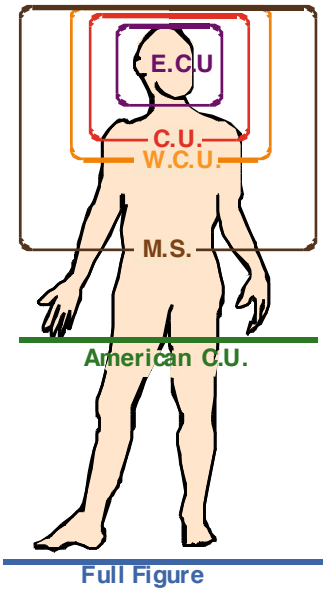


Appendix: Storyboarding Terminology

Camera Commands

A. Framing Heights for Human Figure

1. **E.C.U. – Extreme Close up,** section of a face.
2. **C.U. – Close up,** head and shoulders of actor.
3. **W.C.U. – Wide Close up,** head and shoulders including collar bones, cleavage
4. **M.S. – Medium Shot,** Actor cropped at waist
5. **American Close up,** (Hollywood, Cowboy or Knee shot) includes thighs and location of holster
6. **Full Figure,** includes entire standing human body



B. Staging shots

1. **Single,** Shot with only one person
2. **Two Shot,** Framing two people in the shot
3. **Insert,** Detail shot for cut away or edit, describing details not seen by master coverage, for example, nervous wringing of hands, descriptive look at some other object being described, etc.
4. **L.S. - Long shot,** Shots looking into the distance, subjects far from camera (the z-axis)
5. **W.S. – Wide shot,** A vista, usually taking in expansive scenery

C. Camera Angles

1. **High Angle,** Camera placed to look down on subjects
2. **Aerial**, Very high angle, usually shot with a helicopter or airplane, sometimes with flying motion
3. **Low Angle,** Camera looks up at subject
4. **Profile,** Shot from a side angle, usually of the side of a face
5. **Straight on (Frontal),** Camera looks directly at an object, perpendicular and level
6. **¾ Shot,** View half way between a frontal angle and a profile, a face which is looking laterally away from the camera without looking off screen
7. **O.T.S. (Over the Shoulder),** Shot framed of an actor in conversation with another actor, for which the camera is replicating the view.
8. **Canted Frame,** Camera tilted sideways to set objects off of the vertical axis
9. **Reverse Angle,** Shot 180 degrees different from preceding shot, so that, for example, when cutting from one profile to another of two actors in conversation, the viewer will get the impression that the two are looking at each other
10. **Hand Held,** Shaky camera movements which simulate amateur home movies

D. Camera Movements

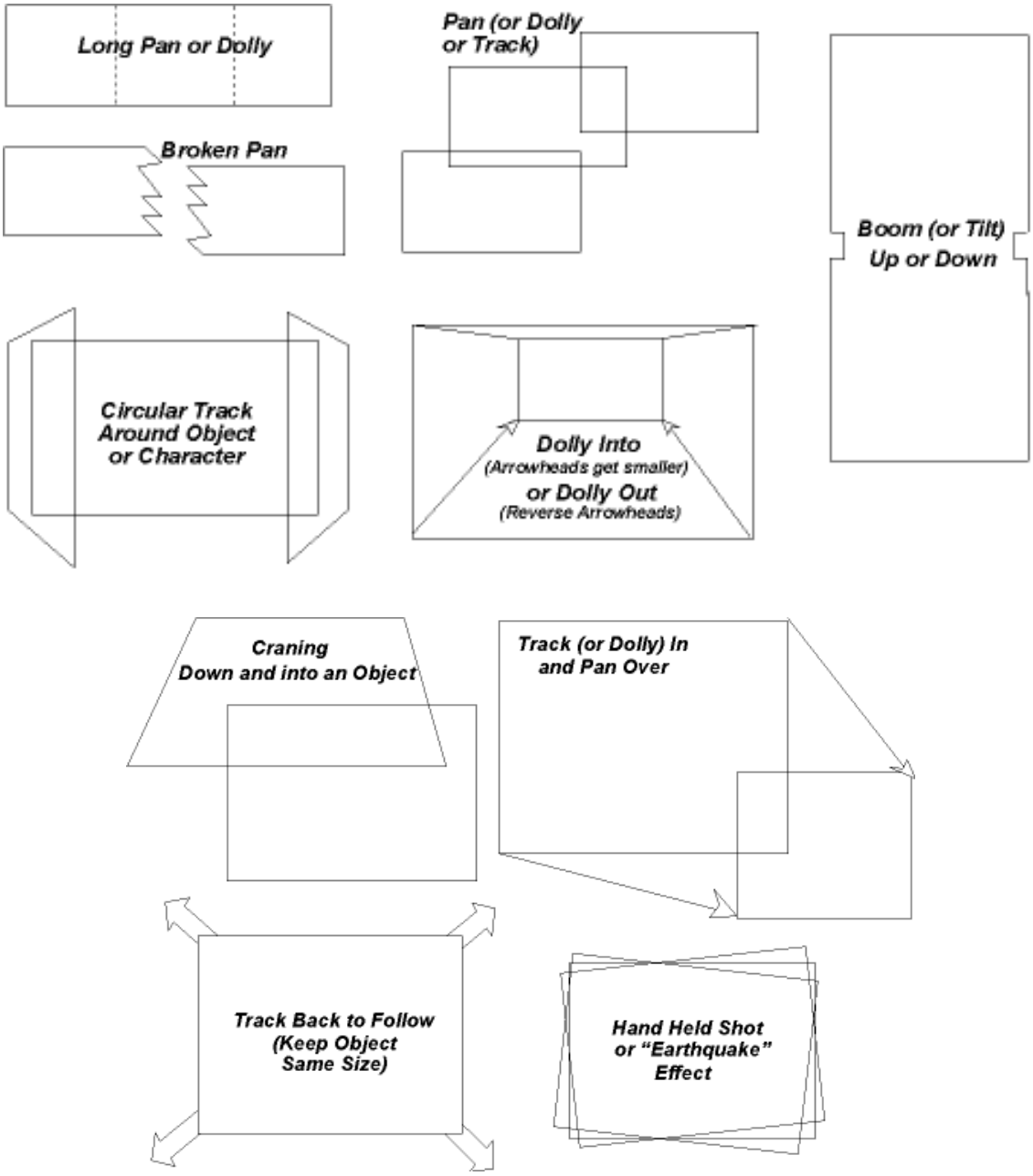
1. **Pan,** Camera which is still positioned on a tripod swivels left or right to expand the view or follow action along the horizontal (x) axis
2. **Swish Pan,** Very fast moving pan which allows blur to simulate furtive movement
3. **Tilt,** Fixed camera pivots up or down along the vertical (y) axis
4. **Zoom,** Camera changes focal length to move in or out on a subject while remaining fixed in space
5. **Dolly,** Camera travels as if on tracks without changing focal length, usually towards action or away, or alongside walking actors
6. **Zolly,** Dollying with counter zoom simultaneously to change perspective, as in Hitchcock's Vertigo
7. **Boom,** Camera is attached to a boom arm which allows it additional up and down movement
8. **Crane,** Camera is attached to a crane which allows additional up/down movement from a boom arm
9. **Follow,** Any camera movement (dolly, hand held, boom) which keeps an actor framed while moving
10. **Travel,** Any camera movement, which changes position of the camera body and film plane. A dolly would be a traveling shot. Panning from a fixed position is not a traveling shot.
11. **Car Mount,** Camera position mounted on a vehicle, looking inside, at another vehicle, or replicating the view of vehicle occupants
12. **Steadicam,** A hand held shot with the camera in a gyroscopically controlled harness to dampen movement and allow smooth tracking while in motion

E. Camera Viewpoints

1. **(P.O.V.),** The "Point of View" of a character in a scene, with the camera looking at what the character sees. Usually edited following a shot framing a character
2. **Obj. Shot,** Objective shot looking at an angle not viewed by a character, the objective narrator's view
3. **Master Shot,** Usually the primary describing framing which allows most of the description of the scene, or a view which runs for the duration of the action
4. **Establishing Shot,** A wide shot of a location to tell the viewers where they are
5. **Coverage,** the many different shots which will be edited into sequence to add story details
6. **Set-up,** Position of camera and lighting of a shot. **New Set-up** refers to a new positioning of the camera viewpoint
7. **O.S. – Off Screen,** Action or sound effects which occur out of the view of the camera
8. **Reaction Shot,** Close up of the face of an actor who is reacting without dialog to action or conversation

F. Storyboard Graphic Symbols

When creating a storyboard, the frame you draw around your illustration conveys a message about how the camera will look at the scene and follow the action. Some commonly used diagrams for different camera movements are shown below:



F. Editing Commands

1. **Cutaway,** Changing to another piece of film not in Master Shot
2. **Jump Cut,** Successive edits to shots on same axis, with similar views and scale, or which disrupt flow of time or space, for example, jumping back to the past for a **"Flash Back"**
3. **Dissolve,** One scene which fades into another
4. **Match Cut,** Two camera views of an object which have the same shape and positioning, so that when the next one is viewed, it matches the previous, for example a spinning spoked antique wheel becomes a spinning modern tire to denote passage of time
5. **Match Dissolve,** A smoother version of a Match Cut whereby one object fades or melts into the next object
6. **Fade,** A Dissolve which fades to a solid color, usually black or white, to finish a scene

Appendix: Bibliography – suggested reading for more information

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