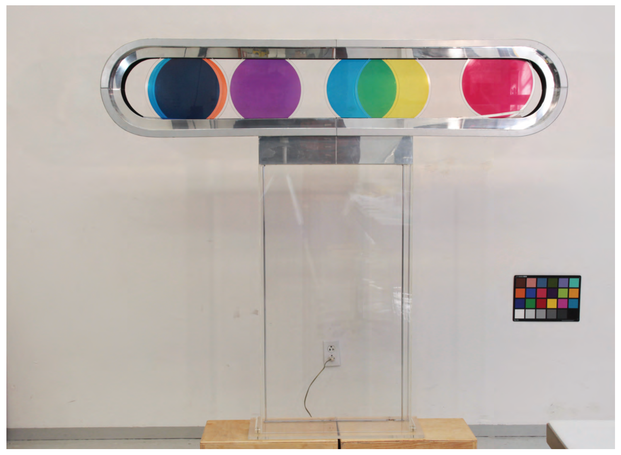
A Lucky Break: Treatment of a Kinetic Sculpture by Fletcher Benton

Amy Brost
Conservation Center, Institute of Fine Arts, New York University, New York, USA



R-1013 (1969)
Fletcher Benton, American (b. 1931)

Aluminum, acrylic on Plexiglas, and electrical apparatus
55 3/8 in. x 66 in. x 7 7/8 in. (140.65 cm x 167.64 cm x 20 cm)
Collection of Sumner Freeman

Photos: Bek & Frohnert, LLC

A kinetic sculpture requires unique forms of documentation for its preservation.

***R-1013* (1969) was inoperable and partially disassembled:**
- The motor would not turn on
- The six discs that rolled back and forth in the upper portion of the sculpture were dislodged—which disc belonged in each track and in what orientation?
- There was no documentation of the original arrangement or movement of the kinetic elements when the piece functioned normally—what was the proper motion, speed, and sound?

R-1013 has two states: one in motion and one at rest. Each state is an essential part of the identity of the work.

> "A technology-based work of art has a physical component as well as a time-based component. The physical aspect comprises all parts of the artwork that define its external form. The time-based element, on the other hand, emerges from the performance of the functioning devices in the artwork." — Reinhard Bek

Bek also observes that the time-based component of a kinetic work must be documented from two perspectives:
- An **outside observer**, who experiences the effects of the movement
- An **engineer**, who records the mechanisms creating the movement

Kinetic sculpture requires the following documentation:

1. Sculptural documentation
Still photographs, dimensions, materials, and other details of its static state

2. Mechanical and electrical documentation
e.g., manufacturers, schematics, 3D renderings, wiring diagrams, and documentation of artist-created components

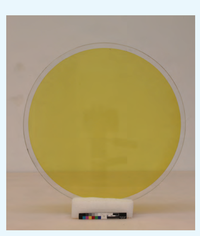
3. Behavior documentation
e.g., subjective descriptions, storyboard, drawings, timing data, and videos

1. Sculptural documentation

Material construction: Shaped sheet metal, wood form, and adhesive

"I didn't start doing three-dimensional sculpture seriously till 1978…I bought my first welding machine in 1978. I did kinetic sculpture, but no welding; it was all glued together. They were considered to be wall pieces, two-dimensional."
— Fletcher Benton, 1989

Kinetic elements: Plexiglas discs
- Six discs sprayed with transparent acrylic lacquer
- Painted side faces the back of the sculpture (paint edge is discernible)
- Proper order for placing the discs in the tracks, specified by Benton's studio (front to back): *Blue, Yellow, Red, Orange, Purple, Blue*



2. Mechanical and electrical documentation

The motor, timer and mechanical assembly are housed in the box beneath the frame.

Timer
- Dayton Time Switch (model #2E130)
- Trippers are set to run the motor 5 minutes on, 5 minutes off

Motor
- *Type/Voltage:* AC shaded pole motor, 110-130V
- *Manufacturer:* New England Gear Works, Inc.
- *Speed:* 5 rpm at the shaft (diameter 5/16 in.)
- *Direction:* Clockwise when facing the shaft

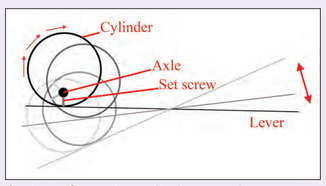
Artist-created mechanical assembly

1. The shaft turns the axle by means of a chain. There are six cylinders on the axle.

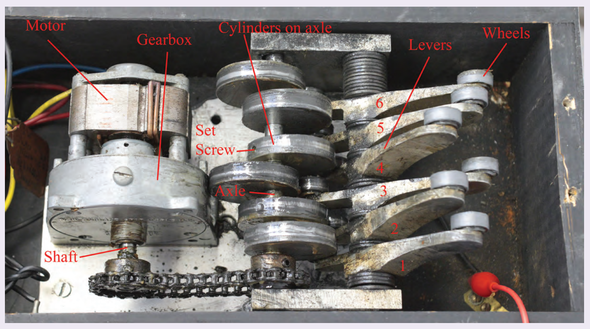
2. The cylinders are identical, but their placement on the axle varies. The position of each cylinder on the axle is fixed by a set screw.

3. As the axle turns, each rotating cylinder presses a lever, which in turn raises or lowers a track. One disc rolls on each track. The tracks rest on the wheels at the ends of the levers.

4. Each track has a spring to help it go back down after the lever pushes it up.



Action of rotating cylinder on a lever
Diagram: Amy Brost



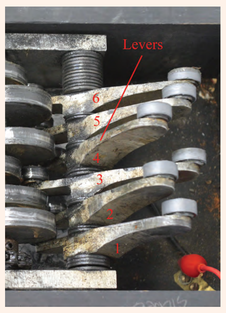
3. Behavior documentation

Timing data
- The tracks are raised and lowered in a mechanically determined non-random sequence
- The cycle repeats every 11.8 seconds—this is the time it takes for a cylinder to make one revolution
- The cycle is interrupted during the 5-minute "off" cycles, so the static position of the sculpture varies
- The below data was collected from a video of the levers in motion, examined frame by frame to determine timing

Position of the levers during operation

^ = maximum height; v = minimum height

	Lever # and color of disc in corresponding track					
Seconds	**1-Blue (back)**	**2-Purple**	**3-Orange**	**4-Red**	**5-Yellow**	**6-Blue (front)**
0.0	^					
1.2					^	
3.8		v				^
4.3				v		
5.3			^			
5.9	v					
7.1					v	
9.7		^				v
10.2				^		
11.2			v			
11.8	^					



The artist's perspective on variation of motion
- The motion is *not* random, but it should feel random
- Variation in the movement due to age and wear of mechanical components is acceptable
- Discs should not be allowed to become stuck while in motion and stall the piece—they should roll freely

The artist's perspective on the sound of the work
- Benton used the quietest motors he could find, but the sound of the work was never a problem for him
- Achieving the desired motion was the priority—he accepted the sound of the discs striking the bumpers and the whir of the mechanical parts

CONCLUSION

In the case of kinetic sculpture, comprehensive documentation = preventive conservation.
The placement of the rolling discs and the behavior of *R-1013* while functioning normally were unknown. Being able to contact the artist and his studio for guidance was a lucky break. It is critical to have 1) sculptural documentation, 2) mechanical and electrical documentation, and 3) behavior documentation *before* conservation treatment is needed.

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