

28 March 2002

Monaco/Interformat
Mr. Jim Moye, Contact Officer
234 Ninth Street
San Francisco, CA 94503
(415) 864-5350

•

National Archives and Records Administration
Mr. Charles Mayn • [COR]
Supervisory Dynamic Media Preservation Specialist
8601 Adelphi Road
College Park, MD 20740-6001
(301) 713-7410

•

Contract Number: NAMA-01-C-0007 • Project Number: NW-01-640
Re: Inspection and Duplication of Regular 8mm 541-ARRP-1 and 87.010

•

Contents
Record of Film Repairs
Inspection Report
Duplication Processes
Certification of Copies Made
Environment Report

7 pages to follow

28 March 2002

National Archives and Records Administration
Mr. Charles Mayn • [COR] (301) 713-7410
Supervisory Dynamic Media Preservation Specialist
8601 Adelphi Road
College Park, MD 20740-6001

Contract Number: NAMA-01-C-0007 • Project Number: NW-01-640

Re: Inspection and Duplication of Regular 8mm 541-ARRP-1 and 87.010

GENERAL OVERVIEW

The work was performed only by the technical team of Michael Hinton, Bruce Miller, Jim Moye, and Scott Smerdon (Monaco/Interformat Team). Entire process observed by Charles Mayn and Alan Lewis of the National Archives. All elements (original or duplicated elements) were handled or escorted personally through any cleaning, printing, or processing by the team. 87.010 Copy #1 was the first roll to be inspected. All rolls were received on a 7" diameter quarter-inch audio reel with a 4" hub. The inspection done by Bruce Miller and Jim Moye. The approach when handling was to document the condition of the film for duplication with as little handling as possible. Film was wound on Moviola 8mm rewinds with no synchronizer. The only tool for measurement of frame counts was marked graph paper under glass surface, therefore frame count documentation is not 100% accurate. Other than repair of selected perforations that were damaged, the only equipment to come in contact with the film was the *shrinkage measurement device* (2 pins), the *optical printer 8mm projector movement* (2 pull down pins and 2 registration pins) *8mm split reels*, and *8mm guide rollers* above and below the optical printer movement (2 rollers). Included in the inspection report is the "Documenting Film Repairs." All repairs are shown in bold.

INSPECTION REPORT 02/25/2002, 87.010

COPY #1

This roll is known as "Secret Service Copy #1" that was duplicated one stop brighter than the original. The table was cleaned prior to start of inspection. Quartz table light on flex arm, 6" magnifying glass on flex arm and two lupes (8x and 22x) were used on the workbench. Bruce and Jim doing inspection with lab coats, cotton gloves, and cotton mouth/nose mask. The SS Copy #1 roll was wound from left to right, top to top onto 8mm-split reel for inspection. Film is a Kodachrome IIA copy from a Kodachrome IIA original. This copy was most likely duplicated on a contact printer prior to being slit because some of the image between the perforations was copied through on the second half of the roll (home movie portion), however no image was duplicated between the perforations on the first half, making this the sprocket side of the printer when the copy was made. Note that this is not necessarily the order in which the original was shot. The laboratory in Dallas may have spliced the two halves out of order after slitting. The roll when received was base out A-Wind, wound for projection. Below is a log of inspection (*note that because the film is not going through a synchronizer the frame counts are from visual points of reference to the next point of reference*):

- 3 feet of Monaco white leader tape spliced to the print-through leader.
- No leader spliced to head of the original roll, only printed through leader from the original "Processed by Kodak."
- Edge code information in black letters reading "Kodachrome IIA" with a code of vertical bar /circle/triangle which is probably the code for year of manufacture of the film.
- Frame 1 from Monaco leader splice is a *burnt frame*. OK.
- Frame 93 from Monaco leader splice has from the edge to the *perf torn out*. This is print through leader and *the frame was repaired to remove the rough outside corners of the perfs. They were cut on a 45-degree angle from the horizontal outside edge of each side of the perf, out to the edge of the film.*
- Frame 100 from Monaco leader splice is a *burnt frame*. OK.
- Frame 107 from the Monaco leader splice is the print through splice from the print through leader to the Kodachrome IIA film.
- The first 95 frames from print through splice is fogged film. Frame 96 is the first frame of picture that is not fogged.
- First scene is sidewalk at Dealey Plaza.
- Frame 43 from first frame of picture is the first frame of the second scene.
- Second scene is the beginning of the motorcade.
- Shrinkage measured on first scene .45%.
- Frame 111 from first frame of second scene is a *cement splice*. Good.
- Frame 99 from cement splice has the *4 following perfs that film is torn out between the perfs and 8 frames before have a slight crease running vertically through the perfs*. No repair made.
- Frame 3 after last torn perf is a *burnt frame*. OK.
- Frames 16 and 17 from previous burnt frame have a *slight tear on the lower inside edge of perfs*. No repair made.
- Frame 20 from previous burnt frame is a *burnt frame*. OK.
- Frames 5 through 8 from previous burnt frame is *4 frames of scotch tape on base side of film that look like it was perforated by a projector. Tape had a rough edge beyond the edge of film and was trimmed.*
- Frame 23 from scotch tape has a *burnt frame*. OK.
- Frame 111 from previous burnt frame has a *burnt frame*. OK.
- Frame 188 from previous from burnt frame has a *burnt frame*. OK.
- Frame 4 from previous burnt frame has a *burnt frame*. OK.
- Frame 37 from previous burnt frame goes to black.
- Frame 113 from first frame of black has a *cement splice*. Good.
- After long black unexposed section there is a *cement splice* to second half of roll, which is a scene of a child, playing on the lawn. Good.
- This second half of roll has some image between perfs.
- Approx. 20 feet from start of second half of roll, scene change from boy playing to interior of woman in office.
- Shrinkage at the scene change is *0.48%*.
- 45 frames of fog at end of interior scene.
- Frame 59 from fog is a print-through splice.
- Frame 95 from print through splice is unexposed print.
- Frame 149 from print through splice is a *cement splice* to original white leader. Good.
- The end of white leader is labeled "HEAD" at the end of roll.
- 3 feet of Monaco white leader tape spliced to original white leader.

Other than the damage logged above I noted many scratches running vertically through the image in Copy #1. The scratches are heaviest in the Kennedy footage which has as many as 13 scratches running continuously through the frames with many more random short (less than frame height) cinch marks throughout roll. Approximately 95% of all scratches are on base side of film. The amount of scratching in the "home movie" section of the roll is about 50% less. The roll was wound back to heads through a black velvet winding it from bottom to top to flip the roll emulsion out so that we would have the correct position to provide a B-Wind negative from the A-Wind original. The velvet showed a lot of debris from the roll. The roll was wound to tail and back to heads through the velvet a second time. Monaco control footage and reference images were then tape spliced to the head of our leader at the head of SS Copy #1. The Monaco control had to be spliced head to head to keep the emulsion position toward the lens in the optical printer because our control is B-Wind original and the SS Copy #1 is A-Wind. The roll was then given back to Charles Mayn on a 400' split reel for holding so that inspection of SS Copy #2 could begin.

INSPECTION REPORT 02/25/2002, 87.010
COPY #2

This roll is known as "Secret Service Copy #2" that was duplicated one stop darker than the original. The table was cleaned again prior to start of inspection of SS Copy #2. All other set-up procedures are the same as SS Copy #1 (refer to first paragraph of SS Copy #1). Below is a log of inspection (*note that because the film is not going through a synchronizer the frame counts are from visual points of reference to the next point of reference*):

- 3 feet of Monaco white leader tape spliced to the original white leader.
- Frame 1, the first frame of image from white leader is a *cement splice*. Good.
- First image is beginning of Kennedy footage that has been cut out of context from original roll.
- Shrinkage measured on first scene is 0.5%.
- Frame 46 and 47 from cement splice has from the edge to the *perfs torn out*. *The frames were repaired to remove the rough outside corners of the perfs. They were cut on a 45-degree angle from the horizontal outside edge of each side of the perf, out to the edge of the film.*
- The end of motorcade footage is *cement spliced* to original white leader. Good.
- Frames 30 from white leader cement splice is a *cement splice* to light struck black & white undeveloped leader. Good.
- Frame 250 from previous cement splice is a *cement splice* to Kodak white leader. Good.
- Frame 80 from previous cement splice is a *5 frame notch cue on perf edge*. OK.
- Frame 1 from notch cue is a *cement splice* which begins unexposed frames of original print with next 8 frames having manufacturing code holes punched. OK.
- Frame 97 from cement splice begins image of sidewalk at Dealey Plaza which is the same image that SS Copy #1 starts with. This image has diagonal *horizontal base scratches* about .002" from the slit edge that are about 20% of the width of the 8mm film.
- At end of shot of motorcycles is a *cement splice that is taped over on both sides*; this splice cuts to unexposed print. OK.
- This unexposed section has *two perfs that are completely torn out—they were repaired with perf-fix tape on both base*

and emulsion. Also there are 5 frames of fog in this black section.

- End of black has some perforation fog.
- End of unexposed is *cement spliced* to first image of second half of roll which is child playing on lawn. Good. There is a notch cue before this splice.
- Shrinkage in second half of roll 0.45%.
- Fog at end of picture roll.
- Print through cement splice to print through Kodak leader.
- From print through-leader to unexposed print (black).
- *Cement splice* to original white leader. OK
- 3 frames before cement splice is a *burnt frame*. OK.
- *Cement splice* from white leader to light struck black & white undeveloped leader with a sound stripe on the perf edge. Good.
- 3 feet of Monaco white leader tape spliced to the light struck leader.

Other than the damage logged above for SS Copy #2 I noted less scratching overall in this roll, however the same type of vertical scratches and cinch scratches appear in the roll. The roll was wound back to heads through a black velvet winding it from bottom to top to flip the roll emulsion out so that we would have the correct position to provide a B-Wind negative from the A-Wind original. The velvet showed a lot of debris from the roll. The roll was wound to tail and back to heads through the velvet a second time. The roll was left head out and returned to Charles Mayn for holding. The Monaco control footage was to be cut in after duplication of SS Copy #1. This ended the inspection and the roll was taken for holding in San Bruno.

INSPECTION REPORT 03/04/2002,
541-ARRP-1 (ORIGINAL ROLL)

This is the original 8mm Original which has a good exposure. The table was cleaned prior to start of inspection of original roll. All other set-up procedures are the same as SS Copy #1 (refer to first paragraph of SS Copy #1). Below is a log of inspection (*note that because the film is not going through a synchronizer the frame counts are from visual points of reference to the next point of reference*):

- 3 feet of Monaco white leader tape spliced to the original white leader.
- 206 frames of original white leader
- Etched in the emulsion of the white leader is "orig."
- Written on the white leader is a sync mark with an arrow "EFX START"
- Tape spliced to the film white leader is 53 frames of plastic white leader.
- Plastic white leader is *cement spliced* to the first image, 14 frames of people on steps of building at Dealey Plaza. Good.
- 2 frames have *black spots* on first image.
- The end of the first shot is a camera cut to motorcycles before the motorcade.
- Shot of motorcycles has light horizontal base scratches.
- Frame 65 from camera cut is a *cement splice that is torn out between the perf and the edge of the film*. No repair made.
- Frame 51 from cement splice has a *cement splice* that is in the middle of motorcade shot. Good.
- The slit side of film has a rough edge throughout the roll. OK.
- Long section of black unexposed after Kennedy footage.
- Shrinkage measured in black after Kennedy footage is .45%.

- There are 5 frames of fog at the end of the black section.
- Frame 46 from first frame of fog is a *cement splice* to clear fogged original.
- Clear has edge code reading “Kodachrome II 11:37 Safety Film” with a code of vertical bar/triangle/triangle which is probably a year of manufacture code.
- Clear is *cement spliced* to black which is the end of the first half of roll.
- The original roll has had the home movie footage removed.
- The second half of roll is a long section of black which has “TAIL A” etched in emulsion.
- Long section of black is *cement spliced* to white leader.
- 3 feet of Monaco white leader tape spliced to the original white leader.

Other than the damage logged above I noted many scratches running vertically through the image in the original roll. In addition to the horizontal scratches noted above the roll has as many as 17 scratches running continuously through the frames with many more random short (less than frame height) cinch marks throughout roll. Approximately 60% of all scratches are on base side of film. The roll was wound back to heads through a black velvet winding it from top to top leaving the roll emulsion in so that we would have the correct position to provide a B-Wind negative from the B-Wind original. The velvet showed a lot of debris from the roll. The roll was wound to tail and back to heads through the velvet a second time. Monaco control footage and reference images were then tape spliced to the head of our leader at the head of the original.

DUPLICATION PROCESSES

Research Products Model 2102 optical printer was selected because of its simplicity, delicate handling of film and its Bell & Howell additive light control. For this priceless 1963-vintage 8mm Kodachrome original we decided to have a film shuttle manufactured to our specifications.

Since the area between the large 8mm perforations on the Zapruder film contains important extended photographic images and other visual information including dates of manufacture and processing, the aperture plate on the new shuttle would have to reveal the entire width of 8mm film past the left and right edges and beyond the frame lines. This oversized picture was placed within the Academy aperture on the 35mm internegative. With the extra width generated primarily by the left-hand area, as a bonus the entire picture fit neatly within a 1.85 viewing aspect.

After extensive surrogate testing, 2272 estar internegative stock was exposed with a 15% pre-flash in order to yield positive prints that would show contrast and tonal range identical to the original, or as near as possible. Several lenses were tested for resolution at the required magnification including Nikkors, an Ektar and a Zeiss. The sharpest was the 105mm *f*2.8 Printing Nikkor which was then used in the blow up.

To reduce handling of the original we removed the projector sprocket drives from the optical printer and turned the feed and takeup tensions to zero. This meant the only mechanism moving the film was the shuttle’s pull-down pins. Therefore two assistants managed feed and takeup duties on the printer’s split-reel flanges. The machine was run at 120 frames per

minute. Depending on the condition of the section being transported, the projector was run either synchronously, one frame at a time, or in some cases where original perforations were missing or severely damaged, manually. To back up the new archival internegatives, the following elements were produced:

- RGB Color Separations from blow up negs
- Recombined Color Dupe Neg from separations
- Registered Interpositives
- Registered Duplicate Negatives

Blow up internegatives from the “Secret Service copies #1 and #2” were generated in a similar fashion. A 2242 Interpositive and 2242 Duplicate Negative was made from the Internegatives (version A and B) of the original roll as an option for making additional duplicate negatives without having to recombine them from the RGB Separations. For a complete, detailed list of all elements and prints produced, see *Certification of Copies Made*, below.

The enlargement internegatives were color separated using the optical printer and 2238 estar separation film. Additive light was used for the seps and for the recombined negs starting with Eastman Kodak’s latest recommendations. The

color IPs were produced with pin-registered contact printing onto 2242 estar intermediate stock, as were the dupe negs.

NARA specifications, in honoring the tradition of preserving the original images as they presently exist without the use of enhancement techniques or digital processing, did not allow for liquid gate printing and so the print from the blow up negative, although very sharp and displaying the desired tonal range, did reveal evidence of deep surface scratches and topographical damage present in the original. It was decided that we should make a second blow up internegative using a translucent plastic diffusion plate placed close to the film plane. Since the diffuser absorbed and scattered light before it reached the original, we needed to streamline the optical system to come up with an extra three stops of light.

The print from the new negative showed about 85% less scratches, with overall contrast and sharpness similar to that of the first negative, providing a choice for future viewers (The second duplication of the original roll is known as “Version B.”) Abraham Zapruder had managed to capture a well-exposed, very sharp 8mm original, and the prints from these new critically controlled 35mm internegatives display image characteristics comparable to the original material.

CERTIFICATION OF COPIES MADE

541-ARRP-1 (“Version B”)

ELEMENT	PRODUCED FROM	LIGHTS / DENSITIES
2272 Interneg 15% pre-flash	8mm original w/diffusion	25-25-25 / .80-1.20-1.65
2238 RGB Separations	2272 Interneg B, 15% pre-flash	28-27-20 / 1.01-1.40-1.49
2242 Recombo Dupe Neg	2238 Separations B	40-43-36 / 1.12-1.47-1.57
2383 1x Print (matches)	2272 Interneg B, 15% pre-flash	28-27-20 / 1.60-1.46-1.59
2242 Interpositive	2272 Interneg B, 15% pre-flash	28-27-20 / 1.34-1.75-1.83
2242 Dupe Neg	2242 Interpositive B	39-40-28 / .73-1.39-1.46
2383 4x Prints (3rd matches)	2242 Recombo Dupe Neg B	35-36-26 / 1.47-1.30-1.37
2383 2x Prints (2nd matches)	2242 Dupe Neg from IP B	31-36-20 / 1.64-1.40-1.46

541-ARRP-1 ("Version A")

ELEMENT	PRODUCED FROM	LIGHTS / DENSITIES
2272 Interneg 15% pre-flash	8mm original (no diffusion)	25-25-25 / .80-1.20-1.65
2238 RGB Separations	2272 Interneg A, 15% pre-flash	36-32-28 / 1.01-1.38-1.49
2242 Recombo Dupe Neg	2238 Separations A	40-43-36 / .91-1.48-1.54
2383 7x Prints (6th matches)	2272 Interneg A, 15% pre-flash	36-32-28 / 1.53-1.37-1.40
2242 Interpositive	2272 Interneg A, 15% pre-flash	36-32-28 / 1.34-1.74-1.80
2242 Dupe Neg	2242 Interpositive A	39-40-28 / .72-1.40-1.49
2383 2x Prints (2nd matches)	2242 Recombo Dupe Neg A	32-33-18 / 1.64-1.35-1.38
2383 2x Prints (2nd matches)	2242 Dupe Neg from IP A	31-36-20 / 1.69-1.37-1.38

87.010 COPY #1

2272 Interneg 15% pre-flash	8mm Koda. Copy #1 (no diff.)	29-29-29 / .86-1.25-1.67
2238 RGB Separations	2272 Interneg #1, 15% pre-flash	34-29-25 / 1.03-1.39-1.52
2242 Recombo Dupe Neg	2238 Separations #1	40-44-36 / .88-1.38-1.63
2383 5x Prints (4th matches)	2272 Interneg #1, 15% pre-flash	34-29-25 / 1.51-1.29-1.28
2383 4x Prints (4th matches)	2242 Recombo Dupe Neg #1	37-35-25 / 1.50-1.30-1.31

87.010 COPY #2

2272 Interneg 15% pre-flash	8mm Koda. Copy #2 (no diff.)	23-23-23 / .87-1.24-1.66
2238 RGB Separations	2272 Interneg #2, 15% pre-flash	34-29-25 / 1.03-1.39-1.52
2242 Recombo Dupe Neg	2238 Separations #2	40-44-36 / .90-1.37-1.63
2383 5x Prints (4th matches)	2272 Interneg #2, 15% pre-flash	34-29-25 / 1.49-1.33-1.29
2383 4x Prints (4th matches)	2242 Recombo Dupe Neg #2	39-34-26 / 1.63-1.25-1.33

ENVIRONMENT REPORT

541-ARRP-1 and 87.010

The environmental conditions throughout the laboratory vary and most areas are controlled by separate systems. All of the film handling areas are maintained at 70 degrees and 55 to 60 percent relative humidity. The optical printing room was the only place the three rolls of 8mm kodachrome were handled. The optical printing room is monitored by a mercury thermometer for temperature and a wet-dry mercury thermometer for humidity. The 8mm for 87.010 Copy #1 and Copy #2 were inspected on 2/25/2002, in the morning hours. Each roll was inspected for approximately 1.5 hours in the optical printing room. The following morning these first two rolls were brought back

to the optical room for duplication. Each day the room was holding at 70 to 75 degrees and 55 to 60 percent humidity.

The original roll (541-ARRP-1) was inspected on the morning of 3/4/2002 and duplicated first on the same afternoon and again on the morning of 3/5/2002, all taking place in the optical room. Each day the room was between 70-75 degrees and 55-60 percent humidity. Each roll was returned to storage with Charles Mayn or Allan Lewis after inspection or duplication and held in our client area on the second floor of our video building, which is also a temperature controlled area.