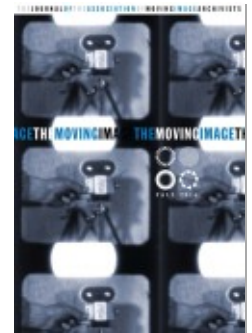The Beginnings and the Ends of Film: Leader Standardization in the United States and Canada (1930–1999)

Matthew Soar

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THE BEGINNINGS AND THE ENDS OF FILM

MATTHEW SOAR

Leader Standardization in

the United States and

Canada (1930–1999)

Leaders *are* content.
MICHAEL HINTON
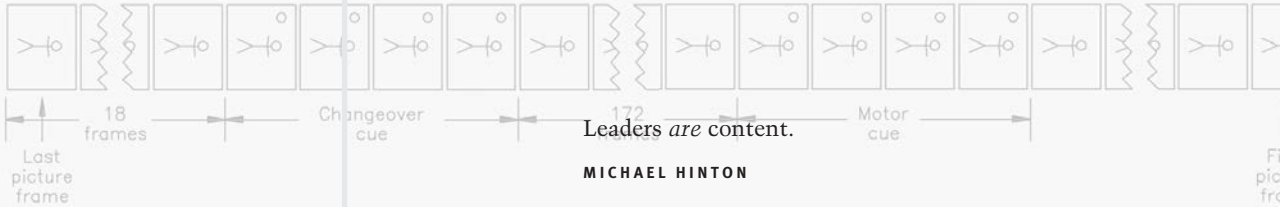
Any new thing is strange at first,
inevitably.
CHARLES TOWNSEND, "NEW ALL-PURPOSE FILM LEADER"

Those 15 or 20 feet of leader footage
that *the audience never sees* are the
most important of the entire show!
ROBERT A. MITCHELL, "THAT VITAL LEADER FOOTAGE"

Figure 5 – Picture and trailer leader

Guy Sherwin's *At the Academy* (1974) is an outstanding example of a subgenre of experimental short films deploying countdown leaders as found footage. Other notable films include *A Movie* (Bruce Conner, 1958), *Color Film* (Standish Lawder, 1972), *Material Film* (Birgit and Wilhelm Hein, 1976), *Girls on Film* (Karin Segal and Julie Buck, 2005), *Academy Leader Variations* (David Ehrlich and collaborators, 1987), and *Standard Gauge* (Morgan Fisher, 1984). Despite their respective titles, Sherwin's and Ehrlich's films don't actually reference or utilize Academy leader per se. In Sherwin's case, his found footage is standard BBC leader;[1] Ehrlich and company's wonderful animations have much more in common with Universal leader than with Academy leader. These anomalies serve to underscore the surprisingly common tendency among filmmakers, archivists, and scholars to use "academy leader" as a generic term for *any* leader featuring a visual countdown. Misinformation about these wonderful analog film artifacts is more the rule than the exception, from a Wikipedia entry about film leader littered with errors to the dubious descriptions accompanying numerous countdown videos on YouTube. Given the ubiquity of leaders at the heads and tails of most film prints intended for distribution and screening, and my contention that they matter now more than ever, it seems timely to correct this muddled historical record.

Leaders have been almost completely overlooked in the literature on film and cinema. As already suggested, their signature traces are much more likely to be encountered in the work, and associated critiques, of experimental filmmakers. Pop culture references are numerous, too, but tend to be arbitrary, incongruous, or anachronistic: album covers for Foreigner (*Foreigner 4,* 1981) and Tony Banks (*Soundtracks,* 1986) (both use frames of Universal leader countdown); music videos, for example, *Fall On Me* (1986) by REM and *Blow at High Dough* (1989) by the Tragically Hip (Society leader countdown); and television motion graphics for titles, promos, and bumpers. The documentary *Going Clear* (Alex Gibney, 2014) uses fleeting excerpts of Academy, Society, *and* Universal leader to introduce or "bookend" archival footage. *The Artist* (2011), meanwhile, a delightfully observed homage to the silent era and the coming of sound films, gets it very wrong: set in 1929, when there were no published leader standards, a screen test at the studio begins with fragments of the Society leader, which would be designed twenty-two years in the future.[2] Other issues are apparent: a conspicuous "Picture Start" frame appears toward the *end* of this countdown, whereas it should actually be about 140 frames earlier; the sound test, beginning with a title card describing the purpose of the short film, the name of the actor, and the date, appears immediately after the 3, rather than at, or after, the implied zero. The countdown in *The Artist,* therefore, isn't actually performing its supposed job at all, which is to allow the projectionist to cue up a separate

sound source and synchronize it with the picture, beginning at the implied zero frame. No matter: in pop culture, the shared creative conceit seems to be one of anticipation, "authenticity," and "here comes some film-as-film," but of course this does very little, if anything, to elucidate the actual origins and purposes of leaders.

It's entirely possible that the same evocative factors making leaders so ripe for creative appropriation (ease of access, striking graphics, flickering type, illegible hand lettering, esoteric annotations, animated countdowns) have also rendered them a priori banal and clichéd to researchers. There is one important exception to this general omission, however, in terms of the content typically found on leaders: feminist media scholars have rightly pointed out the dubious representations of gender and race to be found in the color calibration models known variously as China Girls, Color Girls, Shirley, Lili, or Lady Wedge.[3]

I will identify and describe four major stages in the development of film leader standards in the United States and Canada[4] and their effects on lab and studio protocols and practices internationally, though not globally. These leaders are Academy (1930); Society, aka All-Purpose (1951); Universal, aka Television (1965); and Projection (1999).[5] As its name suggests, the first standard was initiated by the Academy of Motion Picture Arts and Sciences (AMPAS); the other three originated with the Society of Motion Picture and Television Engineers (SMPTE, often pronounced "simp-tee"; originally SMPE).

A NOTE ON METHODOLOGY

My approach to this research is rooted in my training in media and cultural studies but also in my prior professional experience as a graphic designer and my ongoing practice as an experimental filmmaker inclined toward camera-less techniques. As a consequence, I'm primarily interested in leaders as *designed objects* tasked with fulfilling a surprisingly wide range of functions, chiefly, protection, identification, and synchronization, but also threading, alignment, framing, classification, and instruction. My research is ongoing, but my review of AMPAS and SMPE/SMPTE publications, augmented with initial forays into two major film archives and informal interviews with archivists, scholars, and filmmakers, has been fruitful indeed. While the full significance of leaders can only be hinted at in this preliminary essay, it is hoped that the findings presented here will provide a tentative benchmark for future research and practice, in terms of scholarship, archiving, and preservation.

Leaders are often extraordinarily beautiful, as designed, liminal artifacts brimming with frame-by-frame information and anomalies. They are intended to be

read partly at rest (identification) and partly in motion (synchronization). They are the outcome of what Lisa Gitelman calls "imposed protocols": "a vast clutter of normative rules and default conditions, which gather and adhere like a nebulous array around a technological nucleus."[6] If successive leader standards, with all their high-minded authority, suggest a certain "formal materiality"[7] as a key factor in the organization of film distribution and screening, then individual, extant leaders attached to specific film prints nestled in particular canisters are themselves—each and every one—unique examples of leaders' "forensic materiality."[8]

Like movie trailers, movie posters, and movie DVD covers, leaders are also "paratextual,"[9] meaning they are routinely considered to be outside of the actual "text" that constitutes "the movie" (that is, the thing that directors direct, editors edit, audiences watch, and critics critique). Put another way, if opening title sequences and end credits rarely make it into popular and critical discourses about movies because they're somehow *beside the point,* then leaders are doubly so.[10]

My overarching *method* is research creation,[11] an emergent, flourishing approach in Canadian humanities and fine arts combining scholarship and media making. Chapman and Sawchuk identify three key approaches (four, if you include "creative presentations of research"): research for creation, research from creation (comparable to the British term "practice-led research"), and creation as research. However, instead of thinking in terms of the melding of two related but distinct modes of knowledge production ("research" and "creation"), I prefer the idea of a "dual consciousness"[12] located at the "pressure-points between theory and practice"[13]—a kind of hybrid knowledge production "that often develops in the experimental and iterative practices deployed by artists."[14] So, while this article strives for a formal, scholarly tone, it is also part of a larger body of work called Lost Leaders, involving, to date photomontage, microvideography, camera-less animation, interactive nonlinear "sketch" films, light painting, and stained glass.[15] In short, I think critically by writing *and* making stuff, just not necessarily in that order.

PRESTANDARDIZATION: EMERGENT TERMS AND THE PROBLEM OF "MUTILATION"

A classified ad in *The Moving Picture World* suggests that the term *film leader* was already in casual use in 1912.[16] The earliest formal mention of the term *leader* in the *Transactions of the Society of Motion Picture Engineers* (hereafter *Transactions*) is likely from 1917, barely a year after the SMPE's founding. In a half-page committee report on

"Motion Picture Nomenclature" is this single sentence: "Leaders—That piece of blank film attached to the beginning of the picture series." The AMPAS publication *A Selected Glossary for the Motion Picture Technician* (1930) is equally banal, defining *leader* as "that part of the print from the beginning to the first frame of picture." Note how, at this early point, *leader* refers only to the "beginning"; no mention has yet been made of the need for leaders at the *end* of a "picture series."[17]

As the archival record shows, many of the leaders produced pre-1930 were of course anything but "blank." The extra length set aside for protection and threading also served as a convenient location for statements of identification and ownership. Two examples from the Library of Congress nitrate film archives suffice to illustrate this point: a surviving positive print of *Palais des mille et une nuits* carries several identical frames (one at the head; one and a half at the tail, in reverse) bearing the legend "COPYRIGHT, 1905 BY GEO. MÉLIÈS PARIS NEW-YORK."[18] A print of *L'homme mouche* (Méliès, 1902, distributed in the United States as *The Human Fly*) includes thirteen consecutive frames featuring a patent statement concerning unlawful copying of the film, dated March 14, 1893, and September 30, 1902, and a reproduction of Thomas A. Edison's signature. These frames are too text heavy and too few to be legible to theatrical audiences during projection. Assuming they haven't simply been trimmed too zealously in the ensuing century, they were, like all of the content in poststandardization leaders (that is, 1930 onward), most likely intended to be seen only by lab technicians, exchanges, projectionists—and competitors.

It's worth pausing here to note the ways in which these metadata (analogous to the hidden file information—date, camera setting, location—often located inside digital media files) have, during the historical development of cinema, settled on one side or the other of the threshold (literally the width of a frame line) between what we might call the "producerly" paratext, visible to everyone *except* the audience (lab logos, color tests, sound-level directions, China Girls, countdowns), and the visible "consumerly" paratext: all the legally and contractually required information appearing in opening title and end credit sequences. As the Edison and Méliès examples remind us, the "legalese" that was once routinely hidden from the audience would ultimately migrate across this paratextual threshold to become part of the titles and/or credits, hence visible to everyone, producers and consumers, in the circuit of culture.[19]

The problems associated with a lack of standards for leaders are vividly described in an article from the September 1926 issue of *Transactions* titled "Problems of a Projectionist."[20] The author, Lewis M. Townsend, projection engineer at the Eastman Theatre and Eastman School of Music at the University of Rochester, addresses

a variety of problems associated with damage to film prints in circulation, including the excessive application of wax to the film perforations; "cheap, wobbly, or worn out reels"; and buckling of film due to heat from projector bulbs. Townsend complains that, while the "punch mark nuisance has abated somewhat," "we also have stickers of all shapes, sizes, and description placed not only by *operators* but also by exchanges themselves."[21] He continues:

> I believe the only way to eliminate this nuisance and waste of film is for the producers themselves to get together and adopt some safe and sane method of ending their reels so there will be no doubt as to when the end is coming. . . . Going further, I can see no reason at present for making leaders which will project "End of Part One," "Reel Two," etc., on the screen. Why not use opaque film for leaders and print this information in such a way that it can be read by the projectionist but will not be projected? Several feet of film and, what is more important, several feet of action are wasted daily by the cutting off and replacing of these leaders.[22]

Note how Townsend invokes the threshold between producerly paratext and consumerly paratext in terms of what is to be seen—or not seen—by the audience. Alas, the authoritative tone of his argument is rather undermined as he later describes his own habit of editing down features to suit his theater's programming, restricting his cutting to "only minor incidents which do not have a direct bearing on the story and unnecessary detail or padding, of which there is usually a great sufficiency."[23] While declaring at the outset that he does not speak for all projectionists (no doubt to the considerable relief of directors and studios everywhere), ensuing developments suggest that the leader problems described by Townsend were indeed widespread.

In reference to the need for action, a report in the *Transactions* from November 1926, titled simply "Film Mutilation,"[24] provides vivid examples of the kinds of damage sustained by film prints in distribution, including tears caused by sprockets, continual vertical scratches ("rain"), incompetent splices ("pinned together, stuck together with gum, pinned with safety pins, and . . . tied together with wire"[25]), and "mutilation of the end of the film for signal purposes."[26] This last issue took various forms, including the local placement of strips of tinfoil over the sprocket holes ("the film reaches a certain point and . . . rings an electric bell"). Meanwhile, "some projectionists punch holes in the film," and "others scratch a number of crosses on the film."[27]

The 1930 AMPAS *Annual Report* mentions "a survey which indicated that no two studios were making up release prints in the same way and that *mutilation* of reel ends

through inadequate change-over methods was costing the industry many thousands of dollars a year."[28] Furthermore, according to a key AMPAS document, "the confusion and complete lack of uniformity among studios was one of the by-products of the abrupt introduction of sound."[29]

## INITIAL STANDARDIZATION: THE ACADEMY LEADER (1930)

The year 1930 was pivotal in the development of the first US–Canadian standard for film leaders. Only the year before, a leader was still being defined in the *Transactions* as it had been in 1917, as "that piece of blank film attached to the beginning of the picture series." However, the May 1930 renamed *Journal of the Society of Motion Picture Engineers (JSMPE)* announced an adopted standard for "leaders and trailers" (head leaders and tail/foot/run-out leaders) that indicates modest progress: leaders and "trailers" are to be "opaque with markings embossed on them. In a multiple reel story each trailer and the leader immediately following should be marked with the same title."

The limited usefulness of this standard is underscored by two associated developments. First, a new AMPAS subcommittee had been assembled in late 1929, tasked with formulating the first ever American standard for 35mm film leaders. The Release Prints Standards Committee (RPSC) was a subcommittee of the Producers-Technicians Committee. With representation from the Academy Technicians' Branch, the Pacific Coast Section of SMPE, Chapter 7 of the American Projection Society, and the American Society of Cinematographers, the RPSC set about developing "a set of tentative specifications for a standard release print," a "detailed blueprint" (Figure 1) and "two sample reels to demonstrate them." Feedback from fourteen out of an estimated eighteen movie studios proved to be "favorable," aside from some "minor issues."

Second, at a SMPE meeting in mid-1930, Irving Thalberg of Metro-Goldwyn-Mayer echoed Townsend's views from four years earlier:

> As there are at present no standards for the makeup of release prints, the length and divisions of leaders vary with every studio. Exchanges report that theater operators are cutting off leaders, substituting leaders of their own, marking crude visible signals for changeover, etc., the resulting waste of film and *mutilation* of prints constituting a serious problem.[30]

SMPE's President Crabtree responded in the ensuing discussion, "It is very important that there should be the closest coöperation between our Society and the Academy, especially with regard to standardization."
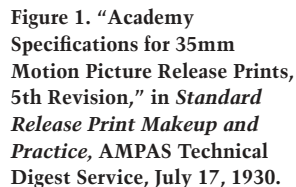
Figure 1. "Academy Specifications for 35mm Motion Picture Release Prints, 5th Revision," in *Standard Release Print Makeup and Practice,* **AMPAS Technical Digest Service, July 17, 1930.**

The SMPE's own Standards and Nomenclature Committee, meanwhile, created a small subcommittee on Standard Practice. As reported in the *JSMPE* in December 1930, they resoundingly endorsed the RPSC's work:

> This committee has been in close touch, through interlocking memberships, with the work of the Technician's [*sic*] Branch of the Academy of Motion Picture Arts and Sciences. We are very pleased to recommend the adoption by this Society of the Academy's specifications for standard leaders to be used with 35 mm. motion picture release prints. . . . It is felt by this committee that the general adoption of these recommendations will avoid much of the mutilation of release prints that is now current.[31]

The report includes an annotated diagram showing the defining features of the proposed specification: a standardized section of the leader for protection and identification at each end, image–sound synchronization, motor cue, and changeover cue. According to the AMPAS *Annual Report* for 1930,

> with practically all the Hollywood studios releasing on the standard, the 1931 prints to reach the theaters will, for the first time since sound, be made up according to uniform specifications designed to facilitate threading up, precision change-over and exact synchronism. An educational campaign to reach every person handling prints will be continued during the coming year. More than 30,000 instruction booklets and 25,000 instruction cards are being distributed.[32]

The AMPAS publication *Standard Release Print Makeup and Practice* (1930) certainly fits the description of an "instruction booklet," being written in a declarative and didactic tone that addresses projectionists directly. It also includes a blueprint illustrating the main features of the new standard: distinct sections for protection, identification, and synchronization. The latter consists of inverted, bold numerals, counting down from 11 to 3, one figure per foot, that is, 16 frames. Twenty frames before each number is a diamond mark for cuing sound (the sound track being that standardized distance out of sync with the image); the repetition relates to variations in the take-up speeds of different projectors—projectionists were expected to choose the cue most suited to their particular technical setup. This is substantially similar to the final Academy standard, which was ultimately enshrined as a key section of the American Standards Association's

American Standard

Specification for 35-Millimeter
Sound Motion Picture Release Prints in Standard 2000-Foot Lengths

1. Protective Head Leader

1.1 The protective leader shall be either transparent or raw stock. When the protective leader has been reduced to a length of 6 feet, it is to be restored to a length of 8 feet.

2. Identification Head Leader (Part Title)

2.1 The identification leader shall contain 24 frames as specified below:
   (a) 6 frames on which are plainly printed, lengthwise on the film, in white letters on a black background: (a) reel number, (b) picture title.
   (b) 18 frames on each of which are plainly printed in black letters on white background: (a) type of print, (b) reel number (Arabic numeral not less than 1/4 of frame height), and (c) picture title.

3. Synchronizing Leader

3.1 The synchronizing leader shall consist of 20 frames ahead of PICTURE START mark, then 12 feet, including picture start mark, to picture. This leader shall be opaque except as specified below:
In the center of the first frame there shall be printed across the picture and sound track area a white line 1/32 inch wide upon which is superimposed a diamond 1/8 inch high. In this same frame shall be printed "SOUND START," in white letters on a black background.
The next 15 frames may be used by the studio for sensitometric or other information. If not so used, this leader shall be opaque.
The picture start mark shall be the 21st frame, on which is printed "PICTURE START" (inverted) in black letters on white background. The standard camera aperture height (American Standard Z22.59-1947) of 0.631 ±0.002 inch shall be used in the photography of this frame and all others between PICTURE START mark and beginning of picture.
From picture start mark to picture, leader shall contain frame lines which do not cross sound track area. Beginning 3 feet from the first frame of picture, each foot is to be plainly marked by a transparent frame containing an inverted black numeral at least 1/2 frame height. Footage indicator numerals shall run consecutively from 3 to 11, inclusive. In the frames in which the numerals "6" and "9" appear, the words "six" and "nine" (also inverted) shall be placed immediately below the figure, to eliminate the possibility of misreading in the projection room due to the similarity between the inverted numerals. At a point exactly 20 frames ahead of the center of each footage numeral frame, there shall be a diamond (white on black background) 1/8 inch high by 3/8 inch wide.

4. Picture Section

4.1 Picture. It is recommended that picture action start and finish on fades wherever possible, otherwise significant sound should be kept at least 5 feet from the start and finish of the picture. The length of a standard reel shall be between 1750 feet minimum (except when absolutely unavoidable) and 2000 feet maximum.

4.2 Motor Cue. The motor cue shall be circular opaque marks with transparent outline* printed from the negative which has had 4 consecutive frames punched with a die 0.094 inch in diameter. The center of these holes is to be halfway between the top and second sprocket holes 0.281 inch from the right-hand edge of the film with heads up and emulsion toward the observer. Following the 4 frames containing the circular opaque marks there shall be 10 feet and 12 frames to the beginning of the changeover cue.

4.3 Changeover Cue. The changeover cue shall consist of 4 frames containing circular opaque marks punched similarly to and of the same dimensions and position on the frame as the motor cue. Following the changeover cue marks there shall be 18 frames to the beginning of the runout trailer.

5. Runout Leader

5.1 The runout leader shall be opaque and 3 feet in length.

6. Identification Tail Leader (End-of-Part Title)

6.1 The identification tail leader shall contain 24 frames as specified below:
   (a) 18 frames on each of which are plainly printed in black letters on white background: (a) end of reel, (b) reel number (Arabic numeral not less than 1/4 of frame height), and (c) picture title.
   (b) 6 frames on which are plainly printed, lengthwise with the film, in white letters on black background: (a) end of reel, and (b) picture title.

7. Protective Tail Leader

7.1 The protective tail leader shall be the same as the protective head leader.

*NOTE: To obtain the transparent outline, the use of a serrated die has been recommended. However, the following alternate method may be used: Insert in the base side of the cue mark hole in the negative a skewer of hard rubber or hard wood which has been dipped in coding ink, and rotate the skewer slightly in the film in order that the ink will form a thin ring around the edge of the hole. Only a very small amount of ink is necessary.
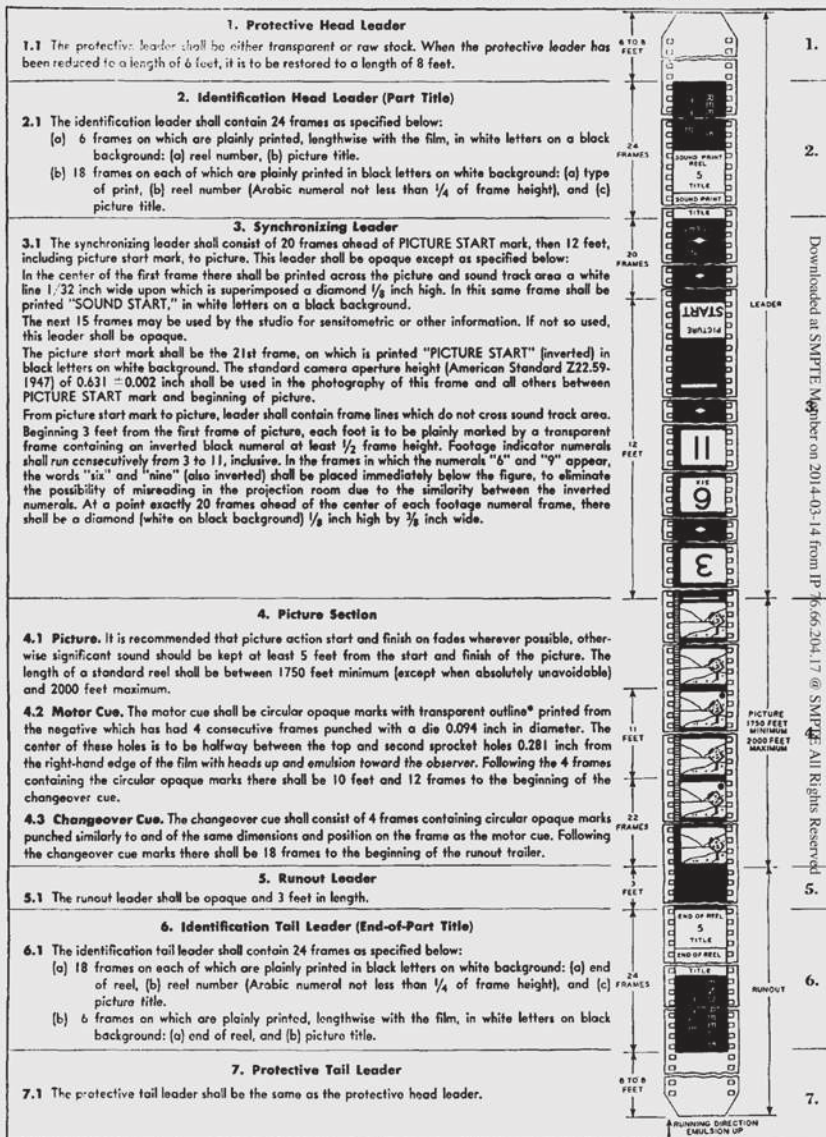
Figure 2. American Standard Specification for 35-Millimeter Sound Motion Picture Release Prints in Standard 2000-Foot Lengths. From "Five Recent American Standards on Motion Pictures," *J SMPE* (March 1948), page immediately after 284. Courtesy of the Society of Motion Picture and Television Engineers. Permission conveyed through Copyright Clearance Center, Inc.

designated standard ASA Z22.55-1947 (Specification for 35-Millimeter Sound Motion Picture Release Prints in Standard 2000-Foot Lengths) (Figure 2).[33]

There are two matters of note in the short report from the following year, titled *Five Recent American Standards on Motion Pictures*. First, it is apparent that "several modifications" were made prior to ratification, at the request of the British Standards Institution, "because of the vast quantities of release material that had been exchanged between Great Britain and the United States."[34] Second, the entire committee endorsed the suggestion, offered by a representative from Technicolor, to use the term *tail leader* instead of *trailer*. Regardless, there is evidence that *trailer* was still in use to describe tail leader as late as the 1970s.[35]

ADAPTING TO THE NEEDS OF TELEVISION: THE SOCIETY LEADER (1951)

Issues of the *Transactions* from the 1920s and 1930s dealt with a cornucopia of techno-logical innovations: sound; safety film; aerial, underwater, and trick photography; and, at least as early as 1929, television.[36] It would be another twenty years before a revised standard for film *and* television leaders was formally proposed, around the same time that the SMPE changed its name to the more inclusive Society of Motion Picture and Television Engineers.

A "status report," "New All-Purpose Film Leader," appeared in the May 1951 *JSMPTE*. The author, Charles L. Townsend (not to be confused with University of Rochester projectionist Lewis M. Townsend, mentioned previously), chair of the Subcommittee on Leaders for Films and Television, explained that the recommendations' aim was to keep "all the excellent features of the Academy Leader" while "providing some features which are highly desirable from the viewpoint of a new and growing user of film produc-tions—television"[37] (Figure 3). Initially, the committee seriously considered developing a separate leader standard for television, but "after long debate by representatives of laboratories and projectionists, it was decided that the . . . confusion always resulting from dual standards could be avoided by a proper common-use leader design."[38]

The Townsend committee had been active since early 1950. "From the begin-ning," he reported, "excellent cooperation was obtained from producers, laboratories, projectionists and broadcasters, resulting in the issuance on April 19, 1950, of the first sample leader (in card form) for limited comment and criticism."[39] By late June, they had created "the first sample leader film intended for actual test use."[40] When Townsend had completed his report, in late April 1951, he was able to state that "the New York of-fices of several television companies have been using the new leader on their television
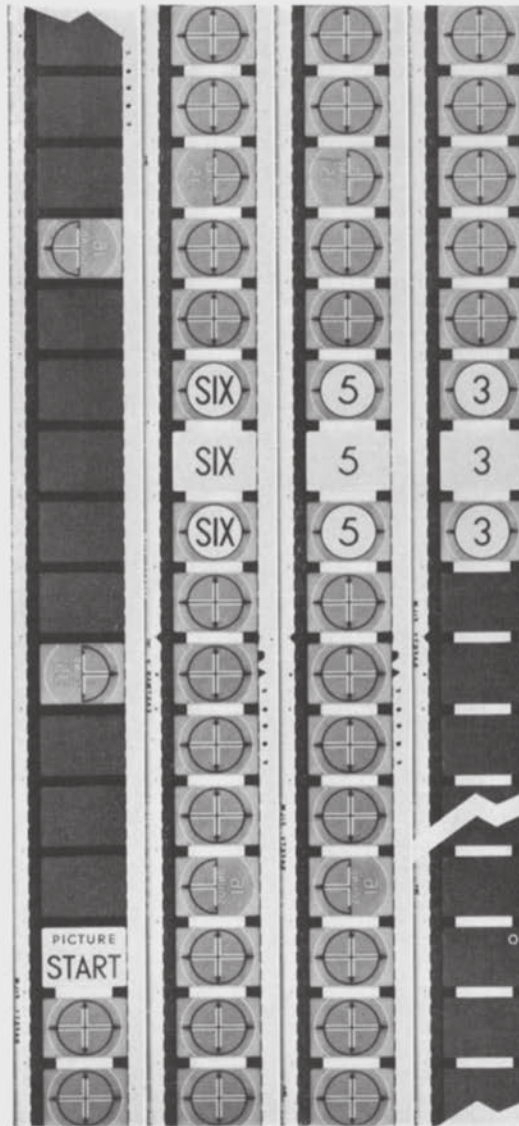
Sample Footage From Proposed Leader.
Read from the upper left to the lower right; broken edges indicate duplicate frames deleted.

C. L. Townsend: All-Purpose Film Leader   565

Figure 3. "New All-Purpose Film Leader: A Status Report, April 1, 1951, of the Subcommittee on Film Leaders of the Films for Television Committee" (Charles Townsend, 1951). Courtesy of the Society of Motion Picture and Television Engineers. Permission conveyed through Copyright Clearance Center, Inc.

recording releases and on certain other television films. More than 10,000 prints have been so made and used with excellent results."[41]

The Society leader is a substantial advance over the original Academy version in terms of complexity and sheer graphic impact and is a truly distinctive development in the visual design of standardized leaders. Whereas over 85 percent of the frames in the Academy leader countdown are actually completely blank, every single frame in the Society countdown incorporates one graphical element or another, including the innovative addition of a fixed-density gray background. The main illustration in the article shows typical sections from the "proposed leader" laid out in four strips of sixteen frames each. These appear to have been photographed rather than drawn, as edge code is visible, if largely illegible, on each strip. The numbers (11 through 3) are now right side up; the SIX and NINE are in words only; and the countdown frames are characterized by two concentric circles, with vertical arrows pointing to the edges of the inner circle and horizontal arrows pointing to the edges of the outer circle. These elements are semi-obscured in each set of 16mm and 35mm sound cues. Because every countdown number appears on three consecutive frames, with the middle of these three frames blank, except for the number, they exhibit a dilating, visual "pop" when projected. This feature was added only after testing of the very first film version of the new design, wherein it was "discovered that the projected visual impact of the footage cues [i.e., using a single frame] was insufficient to permit good cuing."[42]

The 1951 report states the committee's intention to substantially expand the field-testing of the new leader design with a view to "writing . . . an official standard." With this goal in mind, Townsend declared that the committee would "canvass by letter the television film producers and advertising agencies." He adds, belatedly, "It is hoped, also, that the major feature film producers will cooperate in the test."[43] Although examples of the Society leader are now plentiful in film collections and archives, oddly lacking is any accessible documentation relating to this promised further testing and/or final endorsement. Aside from the briefest intimations of progress—or lack of it—in later issues of the *Journal,* it wasn't until 1956 that a flaw in the original Society leader ("a rather dense bar running horizontally through the center of the frames which follow No. 3") prompted a succinct one-page update on its progress: "Since its introduction by the Society early in 1951, the film leader shown here has become a trusted friend of television projectionists in all stations in the United States. It is familiar to all producers of commercial films and to all laboratories."[44] Perhaps "familiarity," in this context, implies *knowing about,* but not necessarily *deploying.* The same visual guide is used again, with minor differences: it appears to have been rephotographed, as the edge codes and their

positions have changed, and all frame lines after the 3 are now solid black; furthermore, seven frames before Picture Start is a new frame with text reading SMPTE SOCIETY LEADER ISSUE 2 1953. It is unclear why it took three years to formally report this correction, but the evident lack of momentum in terms of ratifying this de facto leader standard might possibly be attributed to the gradual transition from film to video in television production and/or widespread apathy on the part of the film studios, because the new leader apparently offered little in terms of design features specifically conceived to improve theater projection. In an article in *International Projectionist,* "That Vital Leader Footage," the author draws a sharp distinction between film and television: "Unlike the operators of television stations, we can't excuse our faults by announcing that we are 'experiencing slight technical difficulties'! Moviegoers expect perfect, uninterrupted projection on the theatre screen."[45] The leader he describes is clearly the Academy leader. Without further explanation, he then adds, "Television leaders containing image adjustment patterns and focusing targets should not be used on theatre-release prints"[46]—an outright rejection of Townsend's Society leader.

THE UNIVERSAL (AKA TELEVISION) LEADER

It would be another nine years before the Society leader was superseded by the much more widely recognized Universal "clock-sweep" leader.[47] But work began on the new design as early as 1959, according to a short announcement in the Engineering Activities section of the January issue of the *JSMPTE*: "A new subcommittee under the chairmanship of N. R. Olding, CBC [Canadian Broadcasting Company], was assigned the study of TV cue-mark placement and the development of a new TV film leader. John Ballinger of Screen Gems, who has conducted extensive surveys on this subject, will assist Mr. Olding in this work."[48]

Another innovation of SMPTE, the Universal leader (1965) is in fact the first one to be identified from the outset by name—on the leader itself (Figure 4). If any of the successive leader designs since 1930 can be said to be ubiquitous, it is this one. In graphical terms, it represents another major departure from existing practice, deploying a design aesthetic far removed from the Academy and Society leaders preceding it. The design is also quite utilitarian, having none of the subtle expressive flourishes of the Society leader. Incongruously, when it was launched as the new American standard, the Universal leader was described as a mere "revision" of the 1947 Standard (i.e., the Academy leader), that is, without any reference at all to the interceding Society leader, with which it shares a clear affinity.[49]
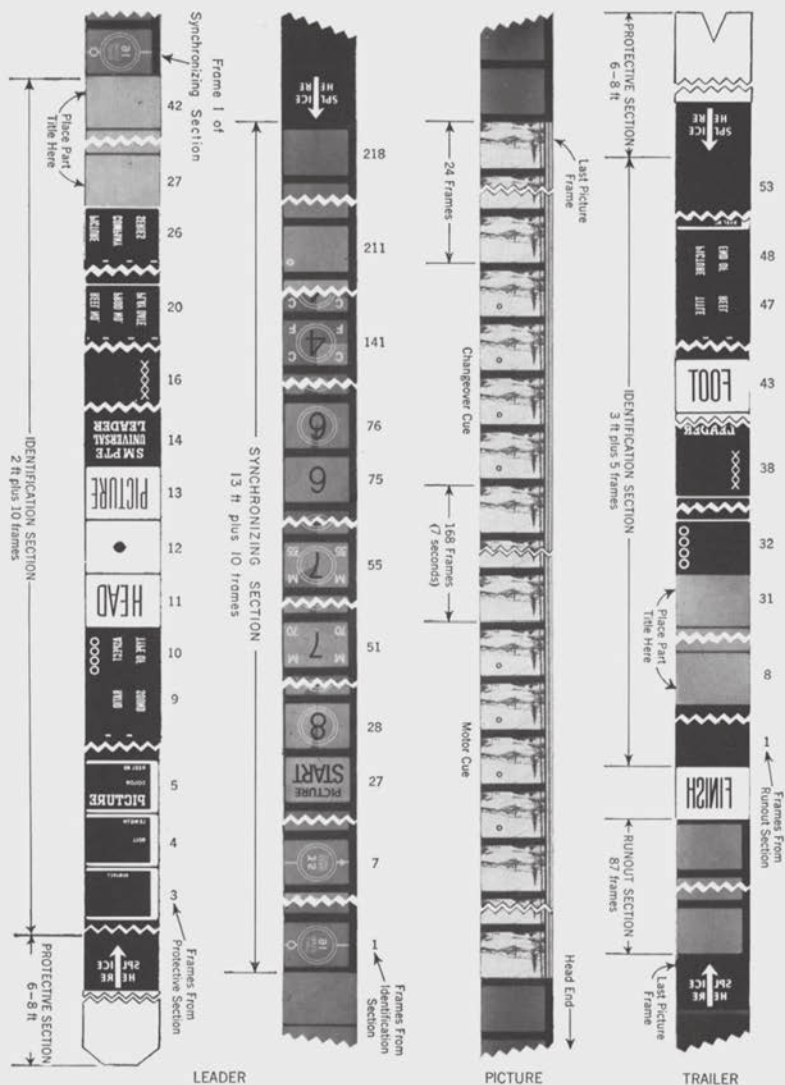
Fig. 1. Figure shows 35mm film with sound track on right edge as seen from the light source in the projector. The sound track is on the left edge of 16mm film.

PH22.55–1966

Figure 4. "American Standard Specifications for Leaders and Cue Marks for 35mm and 16mm Sound Motion-Picture Release Prints," *Journal of the SMPTE* (March 1966). Courtesy of the Society of Motion Picture and Television Engineers. Permission conveyed through Copyright Clearance Center, Inc.

The identification section features a highly distinctive series of frames with bold slab- and sans serif typography in all caps, some reading horizontally, some vertically. The countdown, which would be endlessly quoted in pop culture, is fluidly animated, with the "clock sweep" rotating once through 360 degrees per number, 8 through 3. One additional frame appears near the end of the countdown, bearing the number 2. Because the 9 (along with 10 and 11) has been eliminated, the 6 appears as a figure only. The overall length of the countdown in terms of frames or footage remains about the same, however, because the numbers are now spaced at twenty-four-frame intervals, not sixteen, that is, one per second rather than one per foot.

The "clock-sweep" animation is reminiscent of a classic PPI (plan position indicator) radar screen, because it features a single "hand" (sweep) passing swiftly through divided quadrants rather than—as the clock analogy implies—two hands moving rather slowly past twelve numbered or similarly marked points. The "wake" of the single hand (sweep) is also tonally darker and suggestive of the trailing, slowly fading glow typical of a PPI radar screen, in that the density of the background changes (albeit dark to light) in relation to the motion of the sweep. To speculate for a moment: although the creative influences that lead to specific design solutions are of course notoriously difficult to trace, it is worth keeping in mind that, in the mid-twentieth century, many AMPAS and SMPTE committee members would likely have served in World War II and, as a result, may have been familiar with technologies such as radar (in the case of the Universal leader "clock sweep") but also gun-, bomb-, and camera sights (in the case of the Society leader "crosshairs").

DISCUSSION

Although the countdown on all four leaders (Academy, Society, Universal, and Projection) is intended ostensibly to aid in the synchronization of disparate image and sound tracks, its actual use has changed from standard to standard. For example, with the gradual shift from double systems with separate audio reels or disks to integrated sound tracks, synchronization was no longer of primary importance. The cuing of reels for changeover, however, would continue to be vital to film projectionists and television engineers. The technical needs of television led to design features in the Society leader relating to framing and consistent tonal values, but these were dropped in the Universal leader "since the[y] were extremely uneconomical and difficult to maintain at the required standards."[50] It's also possible that the needs of television became less important in leader design, with the gradual adoption of video technology and the phasing out of telecine operations.

Importantly, the Universal leader design takes into account the needs of printers, with the "provision of three successive frames, marked Head, O, and Picture, to guide the printing machine operator when threading up in the darkroom," and the "addition of a series of [four] X's and [four] O's on separate frames and on opposite sides of the film to provide print-through cues for sound."[51]

Although presented here as a distinctive chronology of successive standards, evidence suggests, unsurprisingly, that the actual adoption of each standard was partial, if not fragmentary. A published report on the activities of the Film Projection Practice Committee reads, in part, "other matters discussed during the regular meeting included the clarification of the location of motor cues on the Universal leader and Academy leader."[52] The implication is that the first and third standards were both in common use, while a report from the same committee two years later reveals "a lack of acceptance of [the Universal] Leader, as well as conflict in the format needs for motion-picture and television uses."[53]

Archival evidence of the adoption, use, and adaptation of standardized leaders can also be contradictory, if not confounding. Particular leaders—Academy, Society, and Universal—appear to have been used at various times as a simple matter of availability, familiarity, and/or convenience rather than due to an implied collective adherence to one currently accepted standard. Leaders are sometimes introduced during processing and printing (appearing on internegs, for example), sometimes spliced to positive release prints or attached by archivists. At least one archive reports having completely removed all its original leaders in favor of "fresh" ones more suited to its needs. In short, there's often no necessary correspondence between the era of the leader standard in evidence and the era of the film and/or film print to which it's attached. A good example of this contradiction between standard and practice would be the positive print of *Atanarjuat: The Fast Runner* (2001) at Library and Archives Canada, with a Universal identification section and an Academy countdown that appears to be printed rather than spliced in.

Standards developed and used internationally may echo the more familiar ones discussed in this article. For example, the Australian SAA Universal leader reproduces the SMPTE Universal leader almost exactly, while the European Broadcasting Union leader might more properly be understood as an *interpretation* of the SMPTE Universal leader: there's no tonal variation, and the sweep is marked only by a single revolving pointer/arrowhead on a black background. Meanwhile, an early Soviet leader shows a countdown from 19 to 1, with one number per frame.

Anomalies are also rife. Discoveries to date include a hand-painted countdown, based on the design of the Academy leader, on a Library and Archives Canada print (mis-)

identified as Evelyn Lambart and Norman McLaren's experimental film *Begone Dull Care* (1949); a 16mm print of *Motion/Le Mouvement* (1967) with an Academy countdown going from 11 to 3 but skipping 5 entirely; and a complete Universal leader countdown skillfully redrawn using a 1960s "computer" font.[54] Finally, there are of course multiple instances of "local" adaptations and "mutilations": punched holes of different shapes, scratched markings, and handwritten cues of various kinds.

At this point in the research, the voices and views of technicians and projectionists are entirely lacking, even though they demand further inquiry. To illustrate: while the issue of film mutilation (akin to a moral panic[55] within the industry during the late 1920s and 1930s) is consistently framed as a set of egregious failures on the part of incompetent projectionists, these crude leader improvisations might also be understood as necessary, even occasionally ingenious, responses to lack of standardization and as adaptations by workers coping with the knowledge available to them, their available tools, and their environments—long workdays and nights in cramped and hazardous booths.

CONCLUSION: BACK TO THE BEGINNING

In 2005, SMPTE introduced a revised version of its 1999 Projection leader (Figure 5). It is in many ways a return to the earliest signature features of standardized leaders. With the reintroduction of single-frame numbers from 11 to 3, the complete removal of animated graphical elements (the dilated pop; the radar sweep), and the stipulation once more of sixteen-frame (one-second) countdown intervals, the Projection leader has far more in common with the original 1930 Academy leader than with either the 1951 Society or 1965 Universal leader. Indeed, in name and design, it represents a final, decisive break with accommodations for television technology.

Overall, then, the development of leader standards in the United States and Canada since the 1930s has been an authoritative, coordinated response to a felt need for technical improvement. It is also true, however, that the standards have generally been rather idealistic. The extant historical record appears to be a wild mélange of graphical traces that once may have served their purposes effectively but often defy clear interpretation. No matter: all of the standards, understood here as protocols,[56] together with the imperfect artifacts they have spawned, constitute a graphically rich, historically fascinating set of clues—multiple instances of forensic materiality[57]—about the histories of film processing, printing, distribution, projection, and, latterly, preservation. My goal here has been to reliably trace some of those developments so we might collectively expand our research and preservation horizons, treating leaders as vital (rather than
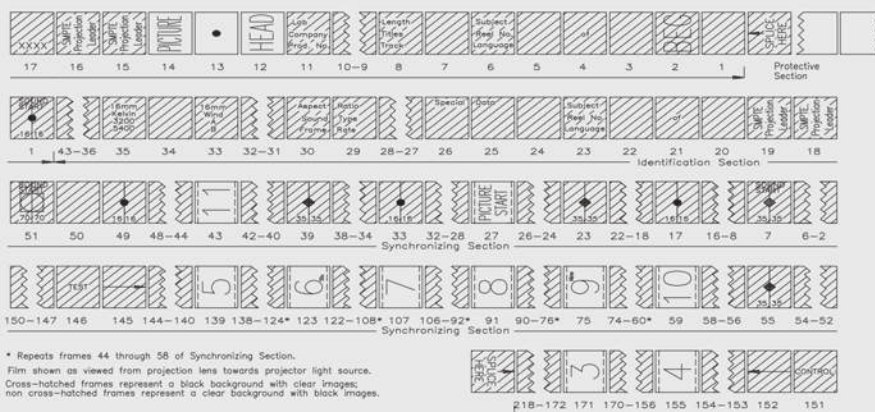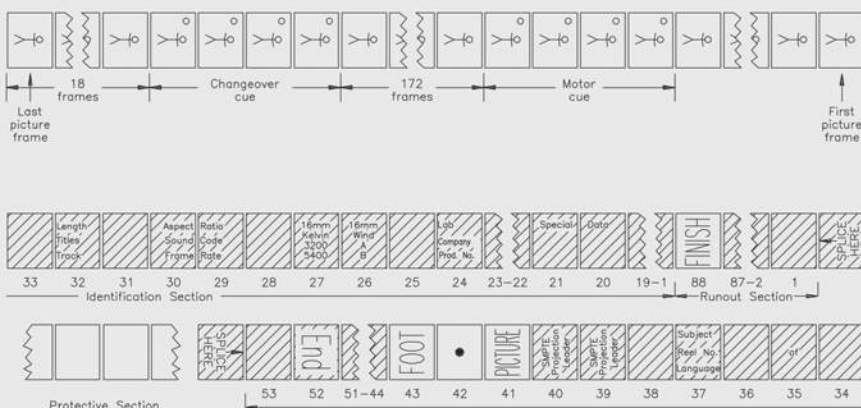
Figure 1 – Head leader

Figure 5 – Picture and trailer leader

Figure 5. "Head leader" (Figure 1, page 2) and "Picture and Trailer Leader" (Figure 5, page 7) from SMPTE 301-2005 (revision of SMPTE 301-1999), SMPTE Standard for Motion-Picture Film—Theater Projection Leader, Trailer, and Cue Marks. Courtesy of the Society of Motion Picture and Television Engineers.

merely paratextual) content of enduring technical and aesthetic importance to artists, scholars, and archivists alike.

Future research directions might include a survey of national standards across the world, some of which are clearly indebted to the Universal leader; extensive interviews with film and television technicians and projectionists to address the shortfall in knowledge between declared standards and actual practices; detailed analyses of the multiple published revisions of the Academy and Universal standards; and archival research on the AMPAS and SMPTE committees that developed each standard. For my own part, I am actively engaged in the forensic examination of the hand-drawn and typographic interpretations of the Academy standard from studio to studio, as this appears to be the only standard that was not centrally designed, printed, and circulated by its promoters. I am also conducting an applied analysis of the pop culture repurposing of leaders in movies, TV shows, and music videos, while also developing an analysis of the countdown as a pervasive cultural trope.

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Table 1. Field Guide to Identifying US Standards for Film Leaders

Name	Standard	Introduced	Countdown	Key features	Sixes: visual comparison
Academy	Academy Specifications for 35MM. Motion Picture Release Prints; ASA Z22.55-1947 (Specification for 35-Millimeter Sound Motion Picture Release Prints in Standard 2000-Foot Lengths)	1930; formalized as an American standard in 1947	11 to 3, numbered per foot, i.e., 16 frames	35mm silent and sound film: numbers upside down; "NINE" and "SIX" underneath "9" and "6"	
Society, aka All-Purpose	N/A	1951; revised 1953 as Issue 2	11 to 3, numbered per foot, i.e., 16 frames	35mm and 16mm sound film for theater projection and TV: double crosshairs design; numbers right side up; "NINE" and "SIX" in words only	
Universal, aka Television	ASA PH22.55-1966; SMPTE-55; UL35-1966	1965; formalized as an American standard in 1966; revised 1975, 1983, 1992	8 to 2, numbered per second, i.e., 24 frames	35mm and 16mm sound film for theater projection and TV: clock-sweep/radar design; numbers right side up; since "9" is eliminated, all numbers are in figures only	
Projection	SMPTE 301-1999; SMPTE 301-2005	1999, revised 2005; "reaffirmed" 2010	11 to 3, numbered per foot, i.e., 16 frames	70 mm, 35mm, and 16mm sound film for theater projection only: numbers right side up; "NINE" top right of "9"; "SIX" bottom right of "6"	

NOTES

1. Guy Sherwin, e-mail correspondence with the author, May 5, 2015.

2. I am indebted to Dick May for this insight.

3. Mary Ann Doane, "Screening the Avant-Garde Face," in *Questions of Gender,* ed. Judith Butler and Elizabeth Weed, 206–32 (Bloomington: Indiana University Press, 2011); Lorna Roth, "Looking at Shirley, the Ultimate Norm: Colour Balance, Image Technologies, and Cognitive Equity," *Canadian Journal of Communication* 34, no. 1 (2009): 111–36; Genevieve Yue, "The China Girl on the Margins of Film," *October* 153 (2015): 96–116.

4. From its earliest days, the active membership and committees of the SMPTE (then SMPE) have included Canadian representation.

5. The dating convention I have adopted is to use the year in which a standard was formally proposed rather than, for example, the year of adoption as a Society or American standard. (Otherwise, the Academy leader would be dated 1947, not 1930; the Universal leader would be dated 1966, not 1965; and the Society leader would not figure at all, because the evidence available strongly suggests it was never formally ratified.) I have also taken the liberty of referring to the Society leader as a "standard," even though no such documentation has been found.

6. Lisa Gitelman, *Always Already New: Media, History, and the Data of Culture* (Cambridge, Mass.: MIT Press, 2008), 7–8.

7. Matthew Kirschenbaum, *Mechanisms: New Media and the Forensic Imagination* (Cambridge, Mass.: MIT Press, 2008).

8. Ibid.

9. George Stanitzek, "Texts and Paratexts in Media," *Critical Inquiry* 32, no. 1 (2005): 27–42.

10. Compare the following: Deborah Allison, "Promises in the Dark: Opening Title Sequences in American Feature Films of the Sound Period," PhD thesis, University of East Anglia, 2001; Matthew Soar, "Cinematic Shorthand: Commitment and Brevity Inform the Film Titles of Marlene McCarty," *Eye: The International Review of Graphic Design* 50 (2003): 18–29; Matthew Soar, "The Bite at the Beginning: Encoding Evil through Film Title Design," in *The Representation of Evil in Film and Television,* ed. Martin Norden, 1–18 (Amsterdam: Rodopi, 2007); William Straw, "Letters of Introduction: Film Credits and Cityscapes," *Design and Culture* 2, no. 2 (2010): 155–66.

11. Owen Chapman and Kim Sawchuk, "Research-Creation: Intervention, Analysis and 'Family Resemblances,'" *Canadian Journal of Communication* 37 (2012): 5–26.

12. Ross Gibson, "The Known World," *Text* 8 (October 2010), http://www.textjournal.com.au/.

13. Marsha Kinder, "Honoring the Past and Creating the Future in Cyberspace: New Technologies and Cultural Specificity," *The Contemporary Pacific* 15, no. 1 (2003): 93–115.

14. Gibson, "Known World."

15. These aspects of my project have already been exhibited at Orphans X (Culpeper, 2016); Poetics and Politics 2 (University of California, Santa Cruz, 2015); New Experimental Works (ATA/OtherCinema, San Francisco, 2015); Montreal Underground Film Festival (2014); FUSE #2: Mobile Interactive Microcinema (Ann Arbor, Michigan, 2014); Orphan Film Symposium (EYE Filmmuseum, Netherlands, 2014); and Black Hole Cinematheque (Oakland, California, 2012). See the project website at http://www.lostleaders.ca/.

16. Charles A. Gunby, "25 Sheets Different Colored Gelatin, Cut Slide Size 10¢," *The Moving Picture World* 13, no. 3 (1912): 274.

17. Thanks to Snowden Becker (UCLA) for this observation.

18. See Paolo Cherchi Usai, *Silent Cinema: An Introduction* (London: British Film Institute, 2000), 187–88, for further Méliès examples.

19. Compare the following: Stuart Hall, "Encoding/Decoding," in *Culture, Media, Language,* ed. Stuart Hall, Dorothy Hobson, Andrew Lowe, and Paul Willis, 128–38 (London: Hutchinson, 1980); Richard Johnson, "What Is Cultural Studies Anyway?," *Social Text* 16 (1986–87): 38–80; and Matthew Soar, "Encoding Advertisements: Ideology and Meaning in Advertising Production," *Mass Communication and Society* 3, no. 4 (2000): 415–37.

20. Lewis M. Townsend, "Problems of a Projectionist," *Transactions of the SMPE* (September 1926): 79–88.

21. Ibid., 80, emphasis original.

22. Ibid.

23. Ibid., 82.

24. John M. Joy, "Film Mutilation," *Transactions of the SMPE* (November 1926): 5–27.

25. Ibid., 18.

26. Ibid., 8.

27. Ibid., 10. For a comparable situation in the United Kingdom, see also Robert A. Rigby, "Accessory Equipment and Film Mutilation," *British Kinematography* 16, no. 4 (1950): 122–25. Rigby refers to "private change-over cues of grotesque designs and sizes" (112).

28. *Annual Report—For the Year Ending December 31, 1930* (Hollywood: AMPAS, 1930), emphasis added.

29. "Academy Specifications for 35mm Motion Picture Release Prints, 5th Revision," July 17, 1930, in *Standard Release Print Makeup and Practice* (Hollywood: Academy of Motion Pictures Arts and Sciences Technical Digest Service, 1930), 7.

30. Irving Thalberg, "Technical Activities of the Academy of Motion Picture Arts and Sciences," *JSMPE* (July 1930): 13, emphasis added.

31. "Report of Standards and Nomenclature Committee," *JSMPE* (December 1930): 819.

32. *Annual Report,* 18.

33. "Specification for 35-Millimeter Sound Motion Picture Release Prints in Standard 2000-Foot Lengths," Z22.55-1947 (Washington, D.C.: American Standards Association, 1947).

34. "Five Recent American Standards on Motion Pictures," *Journal of the Society of Motion Picture and Television Engineers (JSMPTE)* 50 (March 1948): 284.

35. "Standards and Recommended Practices," *JSMPTE* 79 (March 1970): 230.

36. Herbert Ives, "Television Demonstration," *Transactions of the SMPE* 13, no. 38 (1929): 308.

37. Charles L. Townsend, "New All-Purpose Film Leader: A Status Report, April 1, 1951, of the Subcommittee on Film Leaders of the Films for Television Committee," *JSMPTE* 56 (May 1951): 562.

38. Ibid., 566.

39. Ibid., 567.

40. Ibid.

41. Ibid., 562.

42. Ibid., 567.

43. Ibid.

44. "Threading Leaders for TV Films," *JSMPTE* 65 (August 1956): 437.

45. Robert A. Mitchell, "That Vital Leader Footage," *International Projectionist* 39, no. 2 (1964): 4.

46. Ibid.

47. See "Standards and Recommended Practices," *JSMPTE* 75 (March 1966): 222–28.

48. J. Howard Schumacher, "Engineering Activities," *JSMPTE* 68 (January 1959): 39.

49. "Standards and Recommended Practices," *JSMPTE* 75 (March 1966): 222.

50. Norman R. Olding, "The SMPTE Universal Leader for Release Prints," *JSMPTE* 74 (January 1965): 34.

51. Ibid., 35.

52. Paul H. Preo, "Film Projection Practice Committee," *JSMPTE* 80 (January 1971): 37.

53. J. G. Baer, "Film Projection Practice Committee," *JSMPTE* 82 (August 1973): 672.

54. Thanks to George Willeman at the Library of Congress (Packard Campus) for bringing this unique example to my attention. It's been tentatively identified as a Xerox Films leader.

55. Stanley Cohen, *Folk Devils and Moral Panics: The Creation of the Mods and Rockers* (London: MacGibbon and Kee, 1972).

56. Gitelman, *Always Already New.*

57. Kirschenbaum, *Mechanisms.*