PSC Paper No. 14

THE COST OF 16 mm FILM-MAKING IN EASTERN AND SOUTHERN AFRICA

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by Greg Lanning
Assistant PSC Officer
UNICEF Nairobi

Prepared in response to various requests
from Swaziland, Lesotho and Kenya

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Assistant Project Support Communication Officer
UNICEF Office for Eastern Africa, Nairobi.

Introduction

We have had several requests from government agencies and individuals in Eastern and Southern Africa for detailed information of the cost of producing 16 mm colour films such as the ones made by the UNICEF PSC UNIT. In this paper we have tried to detail the costly and lengthy process of making a 16 mm film. We have not here tried to evaluate when a 16 mm film is useful in project support communication campaigns, nor whether, if a film is desired, it should be in 16 mm or Super 8 format. For these and other related questions see PSC Papers No. 17 and No. 18.

The costs given for equipment, and for processing and printing charges, are those available to us at April 20th, 1974. We cannot, of course, guarantee their accuracy in view of the rapidity with which they change. As a rough guide, we would suggest that readers allow approximately for a ten percent increase in prices for each twelve months after April 1974. Even this may be conservative, however, in view of frequent currency realignments. The figures quoted do not take into account freight charges from the factory to destinations in this region. For more up to date and accurate charges readers should contact the factories at the addresses listed.

PART I

The Stages in Making a 16 mm Film

One of the main reasons why 16 mm film-making is such a lengthy and costly process is because there are so many stages in the production of a film. We have listed the most important stages and given an indication of the amount of time that should be allowed for each stage. This will, we hope, enable readers to make realistic projections of how long it will take to make a 16 mm film and distribute it. The times given are times that should be allowed. It is quite possible to improve on many of them on individual occasions, but equally it frequently happens that it takes longer; however, these are the minimum times in our experience that should be allowed. The timings assume that only one film is being made at a time. If a film unit is working on several films at once, as is often the case, unless it is a very large unit, it will usually mean that although the working time will be the same, it will in fact take much longer to finish any particular film.

Preliminary Preparations	Allow this number of working days
1. Selection of project	
2. Research on project, collect information from government and project personnel on the project and its problems.	One week
3. Design a Project Support Communication package considering carefully the communication needs of project, the target audience and the availability of audio visual equipment to exploit finished materials.	One week
4. If film is part of the PSC package, further research will be necessary on local weather conditions, the availability of local transport, and electricity (for charging batteries).	One week
5. Preparation of film treatment and shooting script.	One week
6. Prepare accurate budget, costing proposed film in detail, from research to release prints.	One week
7. Complete all the financial arrangements	One - two weeks
8. Order film, tape and editing supplies, dry batteries, spare flood light bulbs.	One week
Pre-Production Planning	
9. Visit projectagain, discuss treatment with ministry and local project officials.	
10. If treatment acceptable, proceed to make final arrangements for shooting schedule, in consultation with location liaison man, based on shooting script.	One week
11. If treatment not acceptable, whole process may have to be repeated, with more research, and more visits to the area. It is essential that the project likes the film treatment otherwise they won't use the finished product.	One - two weeks

12.	If treatment accepted, make transport arrangements and book hotels	One day
13.	Back at Film Unit, check all the equipment, clean camera and run a test 100 ft. through the camera, clean tape heads and check all microphone leads and all other cables. Charge all the batteries.	Two days

Production Stage

14.	Travel to the location	Two days
15.	Shoot the film on location, usually with three or four man team.	Two - three weeks
16.	Return travel to base.	Two days

Processing

17.	Shipment to film processing laboratory	One week
18.	Process film and make one-lite colour or black and white workprint and transfer of $\frac{1}{4}$" tape onto 16 mm perforated magnetic stock.	Two - three weeks
19.	Return of film	One week

Editing

20.	View workprint	One - two days
21.	Check and assemble footage and synchronise sound.	One week
22.	Rough editing and preparing commentary	Two weeks
23.	Fine cut and finalise narration	One week
24.	Mix soundtracks to one effects (or "international") track	One day

Approval

25.	Submit film with separate sound to government and project officials for approval	Four - six weeks

Preparation of Final Version

26.	If necessary, translate approved script	One - two weeks weeks
27.	Prepare widely spaced reading copy of narration for narrator.	One day
28.	Order titles and credits for film	One day
29.	Make any necessary changes in film or soundtrack resulting from comments of government and project personnel	Two - three days
30.	Record final narration	
31.	Transfer narration recording onto 16 mm perforated magnetic stock	One day
32.	Space narration to the picture and sync up with effects track	One day
33.	Check picture for flash frames, bad splices, etc.	One day
34.	Check picture and tracks for sync, and mistakes	One day
35.	Prepare instructions for master sound mix	One day
36.	Do master mix (combine narration and sync effects tracks)	One day
37.	Check titles and prepare instructions for lab giving footage and frame counts to indicate where each title and credit is to go	One day
38.	Prepare instructions for negative matcher (who will match negative or original footage to your workprint). Instructions should include detailed list of dissolves, fades and freeze frames, etc. that you wish the lab to put into film. Always quote footage and frame number.	One day
39.	Send film to matcher for making A and B rolls	One week
40.	If matcher in different place, forward A and B rolls to processing lab for answerprint	One day

Preparation of Release Prints

41.	The lab makes answerprint from A and B rolls	Ten days
42.	Answerprint shipped to customer	One week
43.	Check answerprint for sync, colour grading and any other imperfections	One day
44.	If necessary, order corrected answerprint from the lab	One day
45.	When acceptable answerprint is produced, go ahead with ordering as many prints as are necessary. If, however, more than ten or twelve prints are needed, then it is generally advised that an internegative (i.e. a copy of the negative or original master A and B roll) be made	One day
46.	Order internegative and one check print from the lab	One day
47.	Answerprint produced and despatched by lab	three weeks
48.	Check answerprint for sync, colour grading and any other imperfections	One day
49.	If first answerprint from internegative O.K., then order required number of release prints	One day

Distribution and Evaluation

50.	Special showing of print to government and project officials	One day
51.	Distribute release prints	Two weeks.
52.	After a reasonable period, evaluate effectiveness of film and amount of use it is getting. If necessary, make recommendations for improving usage and distribution. Incorporate lessons learned in next film production	Two weeks

TOTAL AMOUNT OF TIME ALLOWED IS 303 WORKING DAYS
(60 working weeks and 3 days)

PART II

Minimum Equipment for 16 mm Film-making

Because Eastern Africa is far from the main centres of film-making, it is not generally possible to hire the necessary equipment. It has to be bought. By the same token, the relative lack of servicing facilities means that the cheapest policy, in the long run, is to buy the best equipment that you can afford. The equipment listed over is recommended on the basis that in African conditions, far from servicing facilities, it is likely to give very good service, with a minimum of unnecessary downtime. We do not, however, believe that this standard of equipment is necessary in each and every situation, and we would be happy to discuss particular cases and recommend equipment accordingly.

The technical details were compiled and the note on page 11 was written by Mr. Philip Vincent, Assistant PSC Officer, UNICEF, Nairobi.

CAMERA EQUIPMENT

ARNOLD & RICHTER K.G., 89 Turkenstrasse, 8 Munchen 13, W. Germany

Arriflex Camera and Accessories

1600 Camera 16 mm.BL. 25 fps. 50 cycles (Arriflex) with footage counter

1710 Behind the lens Exposure Control, for Arri BL

1673 12-120 mm. Zoom for BL, Angenieux 1:2.2

1602 Matte Box for 12-120 Angenieux

1604 Camera magazines, ft.

1692 Loop protectors

LA-3 Collapsible bobbies (adaptors)

LA-3 Metal bobbies

1619 Magazine covers (white), leather, 400 ft. magazines

1727 Heavy duty batteries, Ni-Cd, Type NC 12/5, 12V, 5Ah

1639 Universal battery chargers, NCL/0,6

1719 Camera cables (standard), KC 16 BLESp (spiral)

2424 Wrattenfilter 85 3" x 3"

2425 Wrattenfilter 85 B 3" x 3"

2227 Medium yellow filter for B&W, GG 7

2223 Orange filter for B&W, OG 2/3

1728)
1729) Ancillary close up lenses for above Zoom

1401 Arri Gyro Tripod

1403 with Boot

2217 Changing bag

2016 Lunasix lightmeter

2014 Directors' viewfinder 16 mm, model III

1157 Body brace with pistol grip for Arriflex BL

1632 Periscopic view finder

Halliburton Case for Arriflex
(Kling Photo Company, P.O. Box 1060, Woodside, N.Y.11377)

$10,000.00

SOUND AND EDITING EQUIPMENT

	US $
Nagra and interconnecting cables - see attached list (Kudelski, S.A., CH 1033, Cheseaux/Lausanne, Switzerland)	2,500
Microphone Beyer M88n (Beyer Elektrotechnishe Fabrik, 71 Heilbron/Neckar, Theresienstrasse 8, Postfach 170)	100
Crystalok Camera speed controller, model CRBL-5 (Cinema Products, 2044 Cotner Avenue, Los Angeles, Calif. 90025, U.S.A.)	750
Spectra Lightmeter Model P250 (Photo Research Corp., 3000 No. Hollywood Way, Burbana, Calif. 91502, U.S.A.)	120
Steenbeck Editing Machine (6 plate) (W. Steenbeck & Co., 200 Hamburg 22, Hammer Steindamm 27/29, West Germany)	6,000
Bauer Double-system 16 mm. Projector (Allied Impex Corp, 168 Glen Cove Road, Carle Place, NY.11514, U.S.A.)	4,000
Editing Bench (locally made)	150
2 Guillotine splicers SOS-EAZ-40398 (SOS Photo Cine Optics, Inc., 315, West 43rd St., New York NY.10036, USA)	360
Large screen for viewing theatre - Radiant Classmaster (Graflex division, The Singer Company, 3750 Monroe Avenue, Rochester, N.Y.14603, USA)	50
Projection booth (locally made)	200
Monitor Speaker/Amplifier, Klein and Hummel Type O (Klein and Hummel, 7301 Kemnat, Postfach 2, West Germany)	400

PARTS LIST FOR NAGRA TAPE RECORDER SERIAL 6349

Quantity	Article No.	Description	
1	04100	NQL	Tape Recorder NAGRA IV.21.CCIR
1	05410	QPSE-200 XOYO	Preamplifier
1	05405	QPM 3-5	Preamplifier
1	05500	QFM-50	Frequency Meter
1	05520	QSLI	Synchronization
1	05530	QGX-50	Crystal pilot Generator
1	05402	QPLE-200	Advanced preamplifier
1	03310	PAR	Charger for accumulators
1	03100	CR	Micro cable
1	03101	CD	Micro cable
2	11350	MB 110	Microphones
1	10160	KS 805	Microphone Sennheiser
1	10122	VS 804	Windshield
1	10121	GS 805	Shock absorber
1	03300	ATN	Power supply unit
1	05200	QHT	Carrying case
1	14400	PA	Set of 12 accumulators
1	11200	GA200	Floor stand
1	12339	QEB 48S	Headphone
1	03440	BHT	Mixer
1	05151	QCD	Cable adaptor BMT-NAGRA IV
3	03100	CR	Cables
2	05121	QCI	Synchronization cables Arri
3	03102	CC	Extension cables
1	05210	OJT	Special packing

SOUND TRANSFER EQUIPMENT

Magnasync Series 2200 type 3 (to be bought later, see below)
(Magnasync/Moviola Corporation, 5539 Riverton Avenue, North Hollywood, Calif. 91601, U.S.A.) $2,500

The question of whether or not to purchase a studio transfer machine should be considered under the following conditions.

1. The film unit will probably produce at least 3 films each year. Approximate cost of sound transfers will be $250 for each film, say $ 750

2. The cost of 16 mm. perforated magnetic stock in bulk should be about 1.5 cents (US) per foot. For 3 films (4,000 ft. for each) the cost for raw stock is $ 180

Thus, for each year (3 films) the amount spent on transfers "out of house" less the expenditure which would have been incurred for the raw stock is $750 less $180 = $570. This figure represents the amount which could be set against the purchase of a transfer machine.

Given a period of five years in which to amortize the capital outlay and running costs, we have the following:

Cost of machine plus freight	$2,500
Cost of maintenance over 5 years	250
TOTAL:	$2,750

Cost comparison

Cost of transfer machine over five years	$550 p.a.
Amount which would be spent on transfers each year without machine	$570 p.a.

Saving (if machine is bought and three films a year made) is $20 a year for the first five years and $520 a year thereafter, less maintenance costs of $50 a year.

Conclusion

A film unit making 3 films (approximately 30 minutes each) a year will pay for a transfer machine in five years and make a substantial annual saving thereafter.

PART III

Costing for 16 mm Colour Film

The costing of a film production is something that can be worked out after a careful study of all the circumstances in which each film is going to be made. The cost will be affected by many factors, including where the film is to be made, how far the labs are from the film unit's base, and how experiencedthe film unit is. The more experienced the unit the more likely it is that they can improve on the times we have listed above. But we think a rough guide to the cost of a 16 mm film production is still useful. We have broken the costs down into the actual production costs, and the overhead costs of a small film unit. Once again, we stress that these figures are only a guide. There is no substitute for proper costing of each production byeach film unit.

COSTING FOR 16 mm. COLOUR FILM
(30 Minutes approximately)

	US $
Rawstock (7,000')	550.00
Colour processing 7,000 ft. @ 0.05c per ft.	350.00
Colour workprint 7,000 ft. @ 0.095c per ft.	700.00
Negative cutting 1,200 ft.	1,000.00
First Answerprint 1,200 ft. @ 0.15c per ft.	180.00
Internegative 1,200 ft. @ 0.26c per ft.	300.00
Second Answerprint 1,200 ft. @ 0.06c per ft.	80.00
Release print 1,200 ft. @ 0.07c per ft.	90.00
Narration recording, sound transfers, and mixing	1,000.00
Titles	200.00
Optical effects	100.00
Sub-total	4,550.00
Equipment charges (Depreciation)	500.00
Research before shooting (say ten days) (2 men @ $20 per day plus local travel)	500.00
Shooting on location (say two weeks) (3 men @ $20 per day plus local travel)	1,000.00
Sub-total	6,550.00
Contingency (10%)	655.00
TOTAL	7,205.00

Air fares and salary costs extra (say, $3,000 per film)

OVERHEAD COSTS OF A SMALL FILM UNIT

When estimating the overhead costs for a small (three or four man) film unit, the following items should be taken into account:

Rent of office space: The space needed will depend on the size of the unit, but the following guide may help:

1. Workshop space for editing - approximately 1,000 sq. ft. (The workshop should have storage space for outfootage, magnetic stock, tapes, scripts, publications, as well as rooms in which the editors can work undisturbed.)
2. Office space for unit head, secretary, (and possibly other members of Unit). Also space for research library.
3. Storage space for equipment.
4. Special store, air-conditioned if necessary, for perishable film tape and editing supplies.
5. Storage space for completed films.

Film Unit salary costs: (Director, cameraman, editor, sound recordist - one man may fulfil more than one function.)

Running costs for film unit:

- Consumable editing and film supplies
- Provision for regular servicing and necessary repairs
- Cost of purchasing technical magazines, publications, etc.

Secretarial services: (Cost of secretary, typewriters and other office equipment, office supplies.)

SUITABLE 16mm FILMSTOCKS

Each cameraman and director has filmstocks that he prefers, but here are some that are commonly used.

Colour Reversal:

1. Kodak Ektachrome Commercial 7252

   Daylight: Filter required: Wratten 85 speed ASA16
   Tungsten: Filter required: None speed ASA25

   Comment: General all purpose, low grain, slow speed colour stock. However it needs to be supplemented by other faster stocks to deal with some of the lighting conditions found in Africa.

2. Kodak Ektachrome EF 7242

   Daylight: Filter required: Wratten 85B speed ASA 80
   Tungsten: Filter required: None speed ASA 125

   Comment: faster than 7252, useful on dark days and in bringing out the detail in deep shadow. Colours less rich than 7252, slightly grainier. Cannot be used in bright sunlight without burning out detail and saturating the colour. If it has to be used in sunlight then one needs a neutral density filter.

3. Kodak Ektachrom EF 7241

   Daylight: Filter required: None speed ASA 160
   Tungsten: Filter required: Wratten 80A speed ASA 40

   Comment: This faster film is balanced for outdoor work, useful when lighting levels are too low for 7252.

Note: If possible 7252 should not be intercut with 7242 and 7241. If it is unavoidable, then for technical reasons and to get a better print, ask your lab to post-flash the 7242 (or 7241) footage. This will lighten the unlit shadows, reduce the contrast, and produce a much better original for inter-cutting, and therefore give you a better print.

For more information: see Filmmakers Newsletter Vol 7 no. 2 December 1973, pages 54-56

or write to: Du Art Film Laboratories Inc.
245, West 55th Street
New York
N.Y. 10019
U.S.A.

Black and White Reversal Films:

If few prints are required then reversal stock is recommended. If more prints are required then negative film is recommended.

1. Kodak Plus-X Reversal Film 7276

Daylight: ASA 50 No filter required
Tungsten: ASA 40 " " "

Comment: A medium speed film with good sharpness and contrast and low grain.

2. Kodax Tri-X Reversal Film 7278

Daylight: ASA 200 No filter required
Tungsten: ASA 160 " " "

Comment: Useful for photography under difficult lighting conditions both outdoors and indoors.

Black and White Negative Films

When a large number of prints will be required then negative film should be used.

1. Eastman Plus-X Negative Film 7231

Daylight: ASA 80 No filter required
Kungsten: ASA 64

Comment: A medium speed film for general use.

2. Eastman Double-X Negative Film 7222

Daylight: ASA 250 No filter required
Tungsten: ASA 200 " " "

READING LIST

This PSC paper has been an attempt to cover some of the main points to be borne in mind when considering making 16mm films in this part of Africa, but we do not pretend that it is comprehensive. Conditions vary enormously and so do facilities. There is no substitute for experience. No one can tell you how to make films. There are some books which distil their authors' film-making experience, which can help you avoid some of the most dangerous pitfalls, and which can offer valuable tips. Here is a list of those that we have found useful:

Books

1. E. Pincus - "Guide to Film-making"
   published by: New American Library

2. W. Hugh Baddeley - "The Technique of Documentary Production"
   published by: Focal Press

3. K. Reisz & others - "The Technique of Film-Editing"
   published by: Focal Press

4. E. Walters - "The Technique of the Film-cutting Room"
   published by: Focal Press

5. J. Burder - "The Technique of editing 16mm Films"
   published by: Focal Press

6. Attic - "The Craft of Film"
   published by: Attic Publishing

7. Russel Campbell - "Practical Motion Picture Photography"
   published by: Screen Textbooks

8. T. St. John Marner - "Directing Motion Picture Photography"
   published by: Screen Textbooks

9. From Kodak - "Basic Production Techniques for Motion Pictures"
   "Solection and Use of Kodak and Eastman Motion Picture Films"

Magazines:

1. "The Film-makers Newsletter" - Annual subscription $10.00
   Available from: Film-makers Nessletter
   P.O. Box 482
   Marblehead
   Massachusetts, 01945
   U.S.A.

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Greg Lanning was Assistant PSC Officer, UNICEF, Nairobi

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