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ADMINISTRATIVE SURVEY OF THE TERRITORY OF HAWAII

Preliminary Report Number 1

DUPLICATING SERVICES

January 16, 1950  
LEGISLATIVE REFERENCE BUREAU  
University of Hawaii

~~For Committee Use Only~~

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ADMINISTRATIVE SURVEY OF THE TERRITORY OF HAWAII,

Preliminary Report Number 1

Prepared for the Sub-Committee on Governmental Efficiency  
of the Holdover Committee of 1949

DUPLICATING SERVICES

LEGISLATIVE REFERENCE BUREAU  
TERRITORY OF HAWAII

UNIVERSITY OF HAWAII  
HONOLULU

STATE OF HAWAII

JUL 11 2019

LEGISLATIVE REFERENCE BUREAU

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January 16, 1950  
LEGISLATIVE REFERENCE BUREAU  
University of Hawaii

*Territorial government - Hawaii (Ter.)*  
*at Administration management*  
*and Hawaiian (Ter.) Legislative. Hoesover committee*  
DUPLICATING SERVICES 71949

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*no 1. Duplicating processes*

The Territory turned out approximately ten million pages of duplicated material last year at an estimated cost of \$60,000.00. This tremendous volume of work was produced by 69 duplicating machines, located in 29 departments or agencies, representing a total original cost of over \$33,000.00.<sup>1</sup> Some portion of the time of over 130 public employees, paid for at rates ranging from \$0.99 per hour to \$2.09 per hour (\$1.12 and \$2.22 per hour if bonus is included) was consumed in the process.

PRESENT PRACTICES

Utilization of Equipment

A total of 37 departments, boards, commissions and agencies made some use of duplicating processes. The four largest users of such materials, the departments of health, public instruction, the tax commission and the university, produced in excess of seven million pages; other major users were the departments of public works, welfare and the national guard. Materials most frequently reproduced by mimeograph, hectograph and multilith equipment included forms, letters, and reports.<sup>2</sup>

The 69 items of equipment include 40 mimeograph, 22 hectograph and 7 multilith machines, ranging in age from less than one to more than thirteen years,

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<sup>1</sup>Includes only those machines on Oahu, excluding those in public schools. Data for the schools will be available at a later date.

<sup>2</sup>No attempt has been made to evaluate the need for or the reason why such materials were processed, nor to determine whether more materials might have been profitably turned out. For example, only one department was found to have made consistent use of duplicating to keep staff members advised of standard procedures, through extensive use of departmental manuals. Of the many hundreds of forms produced, no effort has been made to determine whether some are unnecessary, or whether the use of more would add to the efficiency of the office.

and in cost to the Territory from \$25.00 to \$2,400.00. The university, with 16 machines has the largest number of any single department, but the greatest physical concentration is on the Palace grounds, where there are 20 machines, with, however, a total of 37 machines being located in the immediate vicinity, i.e., Territorial Office Building, Health Department, Tax Commission, etc., of Iolani Palace.

The intensity of usage of each piece of equipment varies considerably from office to office, from a high of 120 hours or more per month to usage of but one hour per month. Expressed in another way, a \$600.00 machine with a ten year life, costs \$5.00 per hour to operate if used but one hour per month, whereas the same machine, if used 120 hours per month, would cost the Territory but \$0.042 for each hour of operation. In terms of potential use, the average duplicating machine in the Territory is used but 18 percent of its capacity--less than four working days per month-- and is idle more than four days for each day of use.

In spite of this failure to utilize equipment, in 1948 and 1949 the Territory purchased 18 new duplicating machines at a cost of nearly \$11,000.00. Only two of these newly acquired machines are presently used at near capacity--the average time in use for the 18 being but 31 hours per month, less than 20 percent of their potential capacity. There is every reason to assume that in the next two or four years other new machines would be acquired with the expenditure of another \$11,000.00, with unused capacity available in machines already on hand.

It is estimated that four machines--two mimeograph, one hectograph and one multilith--could have produced the same quantity of materials turned out by these 18 new machines, giving the same variety of process, if the needs could have been met as a unity instead of departmentally. By purchasing these four machines for the work, instead of 18, a saving of \$6,000.00 could have been effected. This

takes no account of the fact that the machines then on hand, if properly utilized, might well have obviated the necessity for any new purchases, except as might have been necessary to replace obsolete equipment.

#### Utilization of Space

To the consideration of the effective use of physical equipment must be added the problem of fully utilizing the physical plant owned by the Territory. The call for additional government services has placed and will continue to place a serious strain on the existing territorial office buildings as regards the availability of adequate office space to meet requirements. No attempt has been made to precisely compute the number of square feet of such space at present occupied by the duplicating equipment owned by the Territory, yet undeniably that space is not being effectively utilized if it is used but a few hours each month. When space requirements for the storage of supplies is added to that demanded of the equipment itself, it would appear to be a problem worthy of further consideration.

#### Utilization of Personnel

As earlier pointed out, at least 130 public employees spend a part of each month in operating the various departments' duplicating machines. Where a department uses a machine but a few hours per month, not only is the per hour cost of the equipment disproportionate to the task, but the cost in terms of wages and salaries is equally high. For example, in one department, where the mimeograph machine is used but about five hours a month, a CAF-8 (approximately \$1.80 per hour, including bonus) is called upon to do the operating. In still another office, where the equipment is used on the average only five hours monthly, a CAF-9 (\$2.05 per hour at the second increment, including bonus) operates the machine. In contrast, two departments whose machines are in use

over 120 hours per month, both utilize the services of a CAF-2, with an approximate hourly personnel cost of but \$1.17, bonus included.

The above data represents only the time consumed in the actual operation of the equipment, still to be considered is the time of other personnel called upon to assemble the materials when processed. Frequently, when multi-page reports are prepared, the entire staff of an office may be enlisted to help with the task of assembling the copy. Although equipment designed to accomplish this step with a minimum of personnel cost is available on the market, none is presently in use in any of the territorial offices.<sup>3</sup>

Although the particular skills required of employees engaged in the operation of duplicating equipment varies from the relatively simple to the fairly technical, certain basic training is necessarily required of all operators. Any such training consumes the time of additional employees, and proficiency, and consequently efficiency, in the operation of the machines comes only with practice. At the present time, at least 130 employees have been trained in at least the fundamentals of duplicating machine operation. As indicated, some of these employees, after training, devote only a fraction of their time to applying these skills.

#### Present Organization

A few departments have centralized and closely supervise all duplicating of their several divisions. In one department, all requests and work orders are channeled through a central office, where it is handled by one employee (CAF-2)

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<sup>3</sup>As an example, when the Legislative Reference Bureau was preparing the 102 page Index and Digest of Bills Enacted, Regular Session, the director, two research associates, a research librarian, a graduate assistant, and three members of the clerical force each devoted several hours to the job, at an estimated hourly cost of \$15.00.

and reproduced on either a hectograph or multilith machine. In another department, one employee (CAF-2) is responsible for all work duplicated; in another department, duplicating is one function of its central stenographic pool. Partial centralization is found in the main office of yet another department, and plans are underway to centralize all duplicating in another. Each of these departments make effective use of both equipment and personnel.

The pattern is not followed, however, in other departments, and in the vast majority of cases, the work is handled alternately by several employees.<sup>4</sup> It appears not unusual for the equipment to be available for use by anyone needing duplicating done. It is in these departments that machines are used at far less than their potential capacity.<sup>5</sup> The inadequacies of the control over duplicated materials results in lack of adequate cost records, production data, and the amount of supervisory time consumed in the process. No estimate is possible of the waste which occurs in paper, nor of the stencils that must be re-typed because of improper care in filing.

#### RECOMMENDATIONS

The Territory can ill afford to have its capital invested in idle equipment. Machines should be purchased only when their potential capacity is possible of being achieved. Money spent for machines which are used but one hour in each thirty days is analogous to paying an employee a month's wages for an hour's work.

Time spent in training employees for tasks to be performed by them only rarely is to a very large extent wasted. It takes as long to train an employee to

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<sup>4</sup>See Table III, infra. p. 16

<sup>5</sup>See Table II, infra. p. 11

operate a machine one hour a month as it does to train one to operate a machine 150 hours per month. Personnel employed because of their ability to carry out assignments in an independent manner and without supervision, and because of their higher qualifications for administrative duties, should not be required to use their superior skills and training to do a job that can adequately be handled by less qualified persons. It is inefficient to pay more and receive sub-standard returns. No employee can achieve proficiency in his work if he devotes but a fraction of his time to a particular task, and the quality of the production suffers thereby.

It is therefore respectfully recommended that:

1. A central duplicating service be established under the control and direction of the Bureau of the Budget to provide duplicating services as follows:

a. One unit of the central service for the departments and agencies that will occupy the new territorial building on Miller and Vineyard streets, to be located in that building;

b. One unit of the central service for such departments and agencies as may be situated in the territorial office building, the judiciary building, the board of health building, the tax office building, the tax office extension, the new department of labor building, the library of Hawaii, those located on the Iolani Palace grounds, and such offices as may later occupy Iolani Barracks.

2. There be transferred to such central services items of duplicating equipment now under the control of the departments and agencies affected as may be necessary to adequately answer the needs of such departments and agencies for duplicated materials.<sup>6</sup>

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<sup>6</sup>The equipment presently in use by the Hawaii Aeronautics Commission; by the Board of Agriculture and Forestry; by the outlying institutions under the control of the Department of Institutions; by the Manoa and Halawa housing offices of the Hawaii Housing Authority; by the Kapahulu Health Center and the Lanakila Health Center, under the Board of Health; by the several schools under the Department of Public Instruction; and by the University of Hawaii, would be retained in their present locations for the reason that the geographic location of such agencies and departments would appear to preclude efficient centralization with other departments.



3. A thorough survey of all remaining equipment be made and where deemed advisable, excess items in good condition be used to replace obsolete items which are to remain at their present location.

4. Equipment remaining after transfers to the central service and to outlying agencies and departments noted above has been made, be disposed of through proper channels.

5. A system of service charges be established by the central service, whereby each department would be charged with an amount for each job order consistent with cost records to be maintained by the central services, and that to accomplish this end, there be created a revolving fund against which would be charged all expenses of the services and to which would be credited all department charges.

6. Each department and agency from which equipment is transferred to the central services be credited with the appraised value of the equipment so transferred, to be used to the extent of the credit for future work orders.

7. The purchase of all supplies and equipment necessary to the service be the responsibility of the central service.

8. Consideration be given to the establishment of a similar centralized service at the University of Hawaii, and that excess equipment after transferring to that central service be disposed of through proper channels.

The following advantages would accrue from centralizing duplicating services

as recommended above:

1. Reduction of duplicating equipment to an amount necessary to meet needs on a territorial rather than a departmental basis.

2. Optimum utilization of equipment.

3. Optimum utilization of personnel.

4. Control and centralization of duplicating services so that--

a. Exact costs of duplication will be known;

b. Personnel can be trained and constantly increase their skill in duplicating work;

c. The most efficient process can be used for each individual job; and

d. Cost of supplies can be reduced through standardization and centralized purchasing.

5. The most effective utilization of existing space can be achieved.

The responsibilities of the central service would be as follows:

1. Produce duplicated material at the request of, by the process and within the time limits specified by all territorial departments and agencies;
2. Care for and maintain all equipment under its supervision;
3. Advance its knowledge concerning techniques, advancements and improvements in the duplicating field;
4. Disseminate such information among the users of its services;
5. Standardize duplicating supplies, and procure all necessary supplies through the Budget Bureau;
6. Train personnel assigned to its office;
7. Maintain adequate and complete records to show all duplicating costs;
8. Establish a system of service charges by which the central service will be reimbursed for actual operating expenses, including depreciation, from the using agencies; and
9. Develop charts showing the most effective and efficient duplicating process to be used for each particular job.

TABLE I

DUPLICATED MATERIAL PRODUCED DURING 1949\*I. ADMINISTRATIVE AND EXECUTIVE

Department	Mimeograph Pages	Hectograph Pages	Multilith Pages	Totals
Aeronautics	20,000			20,000
Agriculture & Forestry		100,000		100,000
Attorney General				no estimate
Auditor		2,400		2,400
Budget Bureau	30,000			30,000
Civil Service	94,750			94,750
Employees' Retirement System	16,650			16,650
Harbor Commission**				
Hawaii Statehood Committee	5,500			5,500
Hawaiian Homes Commission	9,000			9,000
Health	83,000		1,500,000	1,583,000
Housing Authority	59,000	18,000		77,000
Institutions	42,000	120,000		162,000
Labor & Industrial Relations	44,000	800		44,800
Library of Hawaii	37,000			37,000
Military	547,000			547,000
Public Instruction	1,500,000		223,000	1,723,000
Public Lands		1,500		1,500
Public Utilities Commission		65,000		65,000
Public Welfare	86,450	35,300	207,000	328,750
Public Works	500,000			500,000
Secretary of Hawaii (Incomplete)				
Sight Conservation	86,490			86,490
Tax Commissioner			952,950	952,950
Treasurer		12,500		12,500
University of Hawaii	1,700,000	525,000	400,000	2,625,000
Veterans Affairs	15,000			15,000

\*These figures are estimates of the department themselves except for the Tax Commission and Public Welfare, who keep an exact record of work done.

\*\*Sends work to a commercial establishment. Cost approximately \$1,380 during 1949.

II. COURTS

Department	Mimeograph Pages	Hectograph Pages	Multilith Pages	Totals
Circuit Court		7,000		7,000
Supreme Court		1,000		1,000

### III. REGULATORY BOARDS

Department	Mimeograph Pages	Hectograph Pages	Multilith Pages	Totals
Barbers Board	1,000			1,000
Boxing Commission		18,270		18,270
Hairdressers Board	3,150			3,150
Massage Board		1,000		1,000
Nurses Board	1,000			1,000
Real Estate License Board		62,000		62,000

### IV. LEGISLATIVE

Department	Mimeograph Pages	Hectograph Pages	Multilith Pages	Totals
House				no estimate
Senate				no estimate

Grand Total      1,647,990      1,944,770      2,882,950      9,100,710

Table II

INVENTORY OF DUPLICATING MATERIAL

## I. Administrative and Executive Agencies

Department	Location	Trade Name	Model	Serial No	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
Aeronautics Commission	Airport 2nd floor	Niagara	125	690	mimeo-graph	9 x 14	electric	1948	539.33	12
Agriculture & Forestry	Agriculture & Forestry Building	Standard F. P.	Master Model	17430	hecto-liquid	9 x 14	electric	1947	520.00	22
Attorney General	3rd floor Palace	Niagara	K-2	5255	mimeo-graph	9 x 14	electric	1946	667.80	less than 1
	Basement Kawaihau church	Standard	SW	23986	hecto-liquid	9 x 14	hand		90.00	2
Auditor	Terr. Building 2nd floor	Ditto Direct Process	D-43		mimeo-graph	14 x 17	hand	1949	515.00	3
Budget Bureau	Palace Basement	Niagara	K-2	4968	mimeo-graph	9 x 14	electric	1946	737.40	5
Civil Service	Tax Office Bldg. 3rd floor	Niagara	150	1699	mimeo-graph	9 x 14	electric	1947	550.00	77
Hawaiian Homes	Palace Basement	Standard New Process		54425	hecto-liquid	9 x 14	hand	1937	185.00	12
Health	Kapuaia Building	Niagara	150	2849	mimeo-graph	9 x 14	electric	1948	950.00	18
	Kepahulu Health Center	A. B. Dick	90	52233	mimeo-graph	9 x 14	hand	1948	148.70	6
	Kapuaia Building	Multigraph	1440	866288	multilith	9 x 14	electric	1946	2,100.00	150
	Lanakila	Harr	E	1029	mimeograph	9 x 14	electric	1946	550.00	12
Housing	Manoa Hsg.				mimeograph	9 x 14	hand		39.50	2
		Walker Macter		6175	hecto-liq.	9 x 14	hand		165.64	4
	Malawa Hsg.	Ditto			hecto-liq.	9 x 14	electric		35.00	20
	Palolo Hsg.				mimeograph	9 x 14	hand	1948	39.50	10
	Palace Grds. Hsg. Authority Building	A. B. Dick	92	17175	mimeograph	9 x 14	electric		505.17 <sup>a</sup>	20

I. Administrative and Executive Agencies - Continued

Department	Location	Trade Name	Model	Serial No	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
Institutions	Kawailoa Training School	A. B. Dick	77B	72405	mimeo-graph	9 x 10	hand	1937	\$ 225.00	4
	Maiale Training School	A. B. Dick	92	9563	mimeo-graph	9 x 14	hand	1945	505.17 <sup>a</sup>	5
	Bldg. F Palace Grounds	Standard	EHP-17440	2530	hecto-liquid	9 x 14	electric	1948	494.00	22
	Territorial Hospital	Niagara	150	3030	mimeo-graph	9 x 14	electric	1949	674.50	10
	Waimano Home	A. B. Dick	92	4090	mimeo-graph	9 x 14	electric	1944	505.17	4
	Bldg. A	Ditto	H-3	17768	hecto-gelatin	9 x 14	hand	1942	45.00	1
Labor	Bldg. A	A. B. Dick	92	14099	mimeo-graph	9 x 14	electric	1944	505.17	6
	Bldg. A	Ditto	H-3	17767	hecto-gelatin	9 x 14	hand	1942	45.00	1
	Library	Niagara	Cx2-R	7650	mimeo-graph	9 x 14	electric	1941	285.00	20
Military	Armory	Niagara	AF-4	12715	mimeo-graph	9 x 14	electric	1939	157.50	3
	Armory	A. B. Dick		001691	mimeo-graph	9 x 14	electric	1949	500.00	60
	3rd floor Terr. Office Bldg.	Ditto	14-d-44	50815	hecto-liquid	14 x 17	electric	1947	701.50	6
Public Instruction		A. B. Dick	92	3044-92	mimeo-graph	9 x 14	electric	1941	475.00	22
		A. B. Dick	92	17162	mimeo-graph	9 x 14	electric	1946	505.17	
	Bldg. I Palace Grounds	MARR	E	1199	mimeo-graph	9 x 14	electric	1947	707.75	5
	1252-A Young St.	Multi-graph			multi-lith	9 x 14	electric	1941	2,385.00	

I. Administrative and Executive Agencies - Continued

Department	Location	Trade Name	Model	Serial No.	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
Public Instruction	1227 Pensocola St.	A. B. Dick	92	1824	mimeograph	9 x 14	electric		505.17a	40
		A. B. Dick	450	000615	mimeograph	9 x 14	electric	1949	998.50	
Public Utilities	Pier 8	Standard F. P.	ELM-1A	101094	hecto-liquid	14 x 19	electric	1949	636.50	15
Public Welfare	Bldg. E Palace Grds. (for sale)	Niagara		25824	mimeograph	9 x 14	electric	1946	527.50-	130 <sup>b</sup>
	Bldg. D	Multigraph	1215	120-551	multilith	9 x 14	electric	1949	2,116.05-	
	Bldg. D	Ditto	D - 5	25031	hecto-liquid	9 x 14	hand	1947	221.50	40
Public Works	Terr. Bldg. 5th Floor	A. B. Dick	450	000616	mimeograph	9 x 14	electric	1949	998.50	130
Secretary of Hawaii	Iolani Palace Basement	Niagara	HU-4	16324	mimeograph	9 x 14	electric	1946	87.50	some use round elec. time
Sight Conservation	Bldg. C	A. B. Dick	92	8886	mimeograph	9 x 14	electric	1943	376.50	10
Tex Com-missioner	Tex Bldg. 2nd Floor	Multilith	1250	357274	multilith	9 x 14	electric	1946	1,001.11	150
Treasurer	Terr. Bldg. 2nd Floor	Standard F. P.	Master Model		hecto-liquid	14 x 17	electric	1940	595.00	7
	Palace Bldg. L	Rex-O-Graph	101093	5340	hecto-liquid	9 x 14	hand	1948	200.00	35
University	216 Adm. Bldg.	A. B. Dick	M-92	3783	mimeograph	9 x 14	electric	1941	427.50-	145
	217 Adm. Bldg.	A. B. Dick	M-92	17280	mimeograph	9 x 14	electric		505.17a-	145
	Hawaii Hall	Davidson Duol	316	13044	multilith	9 x 14	electric	1945	1,810.44	100
	Basement	Duplicator	9D44	10363	hecto-liquid	9 x 14	electric	1947	572.50-	130
		Duplicator	9D15A	4328	hecto-liquid	9 x 14	hand	1945	250.00a-	130
	201 Gilmore Hall	A. B. Dick	M-92	22306	mimeograph	9 x 14	electric		338.95	
Teachers' College		A. B. Dick	92	1826	mimeograph	9 x 14	electric	1940	475.00	14
		A. B. Dick		62758	mimeograph	9 x 14		1941	25.00	none
		Folber-Copy-Rite	L-45	18489	hecto-liquid	9 x 14	hand	1949	170.13	44

# I. Administrative and Executive Agencies - Continued

Department	Location	Trade Name	Model	Serial No.	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
University	Teachers' College	Duplicator #78	B	53199	mimeograph	9 x 14		1939	\$ c	
	Agricultural Extension	Ditto	9D5	25762	hecto-liquid	9 x 14	hand	1947	221.50	44
		A. B. Dick	92	3049	mimeograph	9 x 14	hand	1941	427.50--	260
		A. B. Dick	92	22305	mimeograph	9 x 14	hand		505.17 <sup>a</sup>	
	Home Economics	Ditto	9D15-A	4650	hecto-liquid	9 x 14	hand	1949	261.00	25
	Social Research	Speed-O-Print	L	140331	mimeograph	9 x 14	hand	1949	85.00	3
	Industrial Relations	Victograph					hand		25.00	(just acquired)

a Estimated

b The bulk of work was switched, during 1949, from the mimeograph to the multilith machine.

c Not available

# II. Courts

Department	Location	Trade Name	Model	Serial No.	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
Juvenile Court	Judiciary 2nd floor	Standard New Process	W	5214	hecto-liquid	9 x 14	hand		Old machine has no inventory value	22
Circuit Court	Judiciary 1st floor	Ditto	D - 44	49258	hecto-liquid	14 x 17	electric		\$ 650.00	16
Supreme Court	Judiciary 2nd Floor	Standard Liquid Process	STA	28984	hecto-liquid	9 x 14	hand	1947	200.00	less than 1



### III. Regulatory Boards

Department	Location	Trade Name	Model	Serial No.	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
Boxing Commission	Bldg. I	Rex-O-Graph	F	2934	hecto-liquid	9 x 14	hand	1945	185.00	
Real Estate License	Palace Basement	A. B. Dick	440	000730	mimeograph	9 x 14	hand	1949	511.50	5

### IV. Legislative

Department	Location	Trade Name	Model	Serial No.	Process	Maximum Impression Size	Power	Year Purchased	Cost	Hours month in use
House	Palace Basement	Multigraph			multilith	9 x 14	electric	1937		
	Palace Basement	Multigraph			multilith	9 x 14	electric	1937		
Senate	Palace Basement	Niagara	K-2	5257	mimeograph	9 x 14	electric			
	Legislative Reference Bureau (rented)	Niagara	K-2	5259	mimeograph	9 x 14	electric			

TABLE III

## PERSONNEL PERFORMING DUPLICATING SERVICES

## I. ADMINISTRATIVE AND EXECUTIVE AGENCIES

DEPARTMENT	NUMBER OF EMPLOYEES	CLASSIFI- CATION	MONTHLY SALARY RATE	HOURS PER MONTH ON DUPLICATING
Aeronautics	1	CAF 2	\$212.30-\$244.17	5
	1	CAF 3	227.50- 262.50	5
	1	CAF 6	282.92- 334.58	2
Agriculture and Forestry	1	CAF 2	212.30- 244.17	22
	1	CAF 3	227.50- 262.50	
	2	CAF 4	244.17- 282.72	
	4	CAF 5	262.50- 307.50	
	2	CAF 6	282.92- 334.58	
	1	CAF 7	307.50- 365.42	
Attorney General	1	CAF 5	262.50- 307.50	Less than one
Auditor	2	CAF 4	244.17- 282.92	3
Budget Bureau	1	CAF 8	334.58- 398.75	5
Civil Service	3	CAF 3	227.50- 262.50	72
	2	CAF 4	244.17- 282.92	5
Employees' Retirement	several	do work		3
Hawaiian Homes	1	CAF 3	227.50- 262.50	3
	1	CAF 6	282.92- 334.58	2
Health	1	CAF 3	227.50- 262.50)	3
	1	CAF 5	262.50- 307.50)	
	2	CAF 3	227.50- 262.50	6
	several	do work		20
	3	CAF 2	212.50- 244.17)	10
	1	CAF 3	227.50- 262.50)	
	1	CAF 3	227.50- 262.50	160
Housing	6	CAF 2	212.50- 244.17)	37
	2	CAF 3	227.50- 262.50)	
	1	CAF 4	244.17- 282.92	10
Institutions	students	at training school		4
	4	CAF 2	212.50- 244.17)	40
	4	CAF 3	227.50-262.50 )	
	1	CAF 4	244.17- 282.92)	
	2	CAF 5	262.50- 307.50)	
Labor	1	CAF 2	212.50- 244.17	35
	1	CAF 3	227.50- 262.50	4
	2	CAF 4	244.17- 282.92	6
Library	1	CAF 3	227.50- 262.50	20
Military	1	CC 4	202.50- 232.50	60

I. ADMINISTRATIVE AND EXECUTIVE AGENCIES  
(continued)

DEPARTMENT	NUMBER OF EMPLOYEES	CLASSIFI- CATION	MONTHLY SALARY RATE	HOURS PER MONTH ON DUPLICATING
Public Instruction	2	CAF 3	227.50- 262.50	14
	1	CAF 3	227.50- 262.50	1
	1	CAF 3	227.50- 262.50	35
	1	CAF 4	244.17- 282.92	9
	1	CAF 10	398.75- 468.75	5
	several	do work		22
	several	do work		40
Public Utilities	1	CAF 2	212.50- 244.17)	15
	2	CAF 3	227.50- 262.50)	
	1	CAF 4	244.17- 282.92)	
	1	CAF 5	262.50- 307.50)	
Public Welfare	1	CAF 2	212.50- 244.17	170
Public Works	2	CAF 2	212.50- 244.17	130
Secretary of Hawaii	1	CAF 3	227.50- 262.50	Less than one
Sight Conservation	1	CAF 2	212.50- 244.17	10
Tax Commissioner	1	CAF 2	212.50- 244.17	Less than one
	1	CAF 3	227.50- 262.50	" " "
	1	CAF 4	244.17- 282.92	" " "
	1	CC 4	202.50- 232.50	150
Treasurer	2	CAF 3	227.50- 262.50	63
	1	CAF 4	244.17- 282.92	5
University	3	CAF 2	212.50- 244.17)	215
	1	CAF 3	227.50- 262.50)	
	2	CAF 4	244.17- 282.92)	
	1	CC 5	217.50- 247.50	100
	4	CAF 2	212.50- 244.17)	130
	1	CAF 3	227.50- 262.50)	
	3	CAF 2	212.50- 244.17)	no estimate
	4	CAF 3	227.50- 262.50)	
	1	CAF 4	244.17- 282.92)	
	1	CAF 2	212.50- 244.17	
	1	CAF 4	244.17- 282.92	43
	various	personnel		1
	1	CAF 2	212.50- 244.17	44
	2	CAF 2	212.50- 244.17	25
	1	CAF 2	212.50- 244.17	260
	1	CAF 2	212.50- 244.17	3
Veterans' Affairs	1	CAF 3	227.50- 262.50	Less than one
	1	CAF 4	244.17- 282.92	" " "
	1	CAF 5	262.50- 307.50	" " "

## II. COURTS

DEPARTMENT	NUMBER OF EMPLOYEES	CLASSIFI- CATION	MONTHLY SALARY RATE	HOURS PER MONTH ON DUPLICATING
Circuit Court	1	CAF 2	\$212.50-\$244.17	16
Juvenile Court	1	CAF 3	227.50- 262.50	22
Supreme Court	various	personnel		Less than one

## III. REGULATORY BOARDS

DEPARTMENT	NUMBER OF EMPLOYEES	CLASSIFI- CATION	MONTHLY SALARY RATE	HOURS PER MONTH ON DUPLICATING
	1	CAF 2	\$212.50-\$244.17	3
Boxing Commission	1	CAF 5	262.50- 307.50	1
Real Estate	1	CAF 9	365.42- 432.08	4
License Board	1	IN 5	307.50-365.42	1

## IV. LEGISLATIVE

DEPARTMENT	NUMBER OF EMPLOYEES	CLASSIFI- CATION	MONTHLY SALARY RATE	HOURS PER MONTH ON DUPLICATING
House	1	Not clas- sified		no estimate
Senate	1	Not clas- sified		no estimate

## APPENDIX

### TYPES OF DUPLICATING PROCESSES

The distinction between the terms "duplicating" and "printing" is not always a sharp and clear one. In this report, however, duplicating refers to processes used in a general business office as a part of the ordinary office routine, usually carried out by clerical employees. Printing, on the other hand, refers to a more professional type of work involving the use of large or complex pieces of equipment, such as relief printing presses or large offset presses. This report has been confined to a study of the most widely used duplicating processes. A brief description of each follows.

#### Stencil Process

Mimeographing, the most common type of stencil process, uses a wax covered sheet, impressed with letters or images by typewriters or stylus, which is placed on a revolving ink drum. As paper is fed under this drum ink is forced through the openings in the stencil and onto the paper, to produce a long lasting copy, usually black, although colors can be used. A good stencil, carefully prepared and used, should produce up to 8,000 - 10,000 copies. If considerably fewer copies are made in the first run, the stencil may be cleaned and preserved for a later run.

#### Hectograph Process

There are two basic types of hectograph processes - the gelatin and the liquid. The liquid is the newer of the two and is generally replacing the gelatin. In the gelatin process a master sheet is prepared by use of a special typewriter ribbon or carbon paper. The impression is transferred from the inked sheet to the duplicator and, in turn, to blank sheets of paper. In the liquid (or spirit) process typing is done on a sheet backed by a special carbon sheet which transfers the image, in negative, to the back of the paper. The master sheet is then placed

on a cylinder with the inked image outward, and paper is fed under the cylinder, picking up the image in positive. Only about 60 legible copies may be obtained with the first process, and up to 150 - 200 with the liquid process. Both types produce copies that fade over a period of time, especially if exposed to sunlight.

#### Offset Process

In multilith duplication, the type of offset lithography with which this report is concerned, impressions may be typed, written or drawn on paper or metal plates by the use of grease-base typewriter ribbon, carbon paper or ink. The plate is placed on a cylinder and the image transferred to an offset blanket and from there to sheets of paper. The same principle applies to photo - offset work which involves the burning of a photographic image on the plate, and which makes possible enlarging or reduction in size of the original material. Depending on the type of plate and other supplies used, a single plate can produce up to 25,000 - 30,000 copies.