TABLE 6

DIRECT-RATIO METHOD: ANNUAL (NOMINAL) INTEREST RATES ACCORDING TO (1) NUMBER OF TIMES SERVICE CHARGE IS CONTAINED IN AMOUNT BORROWED, AND (2) NUMBER OF MONTHS IN INSTALLMENT PERIOD[1]

Months in installment period	*Ratio*[2] $\frac{C-D}{I}$												
	6	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*	*18*	*24*
	Annual (nominal) interest rate (per cent)												
2								61.0	56.7	52.9	49.7	44.2	33.2
3					59.1	53.7	49.3	45.6	42.9	39.6	37.1	33.0	24.8
4			58.5	52.2	47.1	42.9	39.3	36.4	33.8	31.6	29.6	26.4	19.8
5			48.6	43.4	39.1	35.6	32.7	30.3	28.1	26.3	24.7	22.0	16.5
6	55.0	47.4	41.6	37.1	33.5	30.5	28.0	25.9	24.1	22.5	21.1	18.8	14.1
7	48.0	41.4	36.4	32.4	29.3	26.7	24.5	22.6	21.1	19.7	18.5	16.4	12.4
8	42.6	36.7	32.7	28.8	26.0	23.7	21.8	20.1	18.7	17.5	16.4	14.6	11.0
9	38.3	33.0	29.0	25.9	23.4	21.3	19.6	18.1	16.8	15.7	14.8	13.1	9.9
10	34.8	30.0	26.4	23.7	21.2	19.4	17.8	16.4	15.3	14.3	13.4	11.9	9.0
11	31.9	27.5	24.2	21.6	19.5	17.7	16.3	15.1	14.0	13.1	12.3	10.9	8.2
12	29.4	25.4	22.3	19.9	18.0	16.4	15.0	13.9	12.9	12.1	11.3	10.1	7.6
13	27.3	23.5	20.7	18.5	16.7	15.2	14.0	12.9	12.0	11.2	10.5	9.4	7.0
14	25.4	22.0	19.3	17.2	15.6	14.2	13.0	12.0	11.2	10.5	9.8	8.7	6.6
15	23.8	20.6	18.1	16.1	14.6	13.3	12.2	11.3	10.5	9.8	9.2	8.2	6.2
16	22.4	19.4	17.0	15.2	13.7	12.5	11.5	10.6	9.9	9.2	8.7	7.7	5.8
18	20.1	17.3	15.2	13.6	12.3	11.2	10.3	9.5	8.8	8.3	7.8	6.9	5.2
24	15.2	13.1	11.6	10.3	9.3	8.5	7.8	7.2	6.7	6.3	5.9		

[1] Computed from formula

$$j_{(n)} = \frac{72}{3(n+1)\frac{C-D}{I}+(n-1)}.$$

This particular table can be used only when payments are to be made monthly.

[2] Number of times the amount borrowed is of the service charge.

over from previous months. The monthly rate computed by these methods will exactly amortize the debt in the allotted time.

DIRECT-RATIO METHOD

The formula shown in table 3 for the direct-ratio method can be derived either by simple-discount (linear) methods or by compound-interest methods.[12] In the former case, only the part of each periodic payment that is applied toward reduction of principal is discounted; the part of the service charge contained in each payment is not discounted.[13] Having a linear derivation, direct-ratio rates applicable to many types of contracts can be presented in forms such as table 6, from which a purchaser can read directly, or easily compute, the correct (nominal) rate for a particular contract. It is not necessary to use compound-interest or annuity tables. One must first find the number of times the service charge is contained in the difference between the cash price C and the down payment D. In the example, the balance $C-D$ is \$150 and the service charge I is \$10, so $(C-D)\div I=15$. Reading across the columns for 15, opposite 8 installments, it is seen that the direct-

[12] For a simple-discount derivation, see M. R. Neifeld's *Guide to Installment Computations*. For a derivation from the annuity formula, see H. E. Stelson's article, "The Interest Rate in Installment Payment Plans," *American Mathematical Monthly*, April, 1949; also see his articles in the May and December, 1953, issues of the same publication.

[13] See earlier discussion of direct-ratio method, under "Accounting Approach."