

# INDUSTRIAL DATA PROCESSING APPLICATIONS REPORT

<b>Applications</b>	Management Services for Franchised Builder-Dealers
<b>Type of Industry</b>	Producer of Manufactured Homes
<b>Name of User</b>	Crawford Corp. Baton Rouge, La.

---

<b>Equipment Used</b>	IBM 1401/1405 Data Processing System
-----------------------	--------------------------------------

---

## Synopsis

EDP permits the Crawford Corp., Baton Rouge, La., to help its builder-dealers throughout the South expand sales of Crawford manufactured homes. The firm has developed a "plan for profit" which, when implemented by an IBM 1401/1405 data processing installation, indicates to Crawford builders whether their profit goals for the upcoming year are feasible, tells them how many units they should build and schedules their activities so that they may net their predetermined returns.

The system is centered around two separate EDP operations. The first, the unit cost breakdown, is a method of arriving at a typical house, including cost, to be erected by the builder. The second, the activity and cash requirement schedule, prorates over a 12-month period all of the building activities, and income and expenditures derived from the construction, completion, loan closing and sales of each property scheduled in the report. In addition, the builder will be told whether his goals are unrealistic in view of local market conditions, whereupon the computer will automatically reschedule the number of houses to be built in line with these conditions.

Crawford Corp. has already benefited from significant labor savings and speed and efficiency benefits in its internal operations. As its activities continue to expand new EDP applications are being developed, notably for programing of an inventory, estimating and pricing system, an accounting and inventory system for a multi-state of convalescent homes, and for tax and escrow analysis of about 7,000 home mortgage loans.

"How much money do you want to make this year on the basis of capital you have to invest?" is the first question asked by Crawford Corp. , Baton Rouge, La. , of any of its franchised builders who subscribe to its computerized management service. The firm, a leading producer of manufactured homes, uses an IBM 1401/1405 data processing system not merely to back up its own activities but also to provide over 100 small builders throughout the South with the tight controls required for profitable operations. As soon as a builder's current profit goal is known, it is entered along with pertinent information into the computer which determines the figure's feasibility, tells the builder how many units he must erect and sell each month, and supplies him with an operating formula and a complete analysis of his building program on which to base his operations.

Founded in 1934 as a fledgling air-conditioning business with a total capital of \$8,400, Crawford Corp. has become one of the nation's leading housing and financing organizations. Sales of the company's line of 41 manufactured home models average about eight million dollars a year. These models which range from two bedroom structures to an apartment and town house series, with retail prices, excluding land, of from \$6,300 to \$40,000, are erected by Crawford's network of franchised builders in the South, Southeast and Washington, D. C. , areas. Crawford offers these builders all types of management and technical services and complete financing facilities.

Other Crawford activities include residential development, providing mortgage loans in connection with the erection and sale of Crawford homes, marketing of these mortgages, and international housing operations. In addition, the firm also serves as a general insurance agent, writing fire, casualty, liability and allied lines through builders qualified as sub-agents.

#### EDP at Crawford Corp.

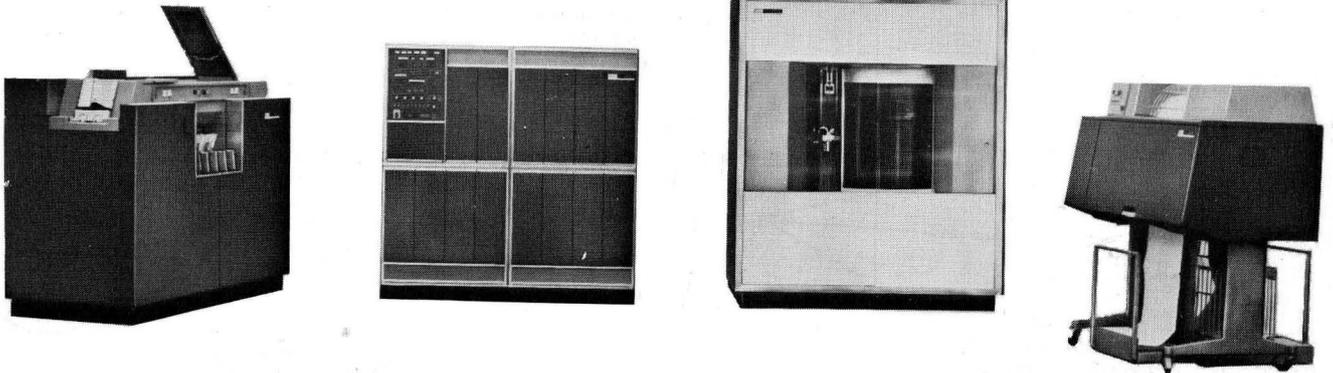
It formerly took 12 people a full week to accomplish the work which is now done in an hour by the IBM 1401/1405 computer system in operation at Crawford's Baton Rouge headquarters. The 1401, successor to an IBM 305/1405 system, has 4,000 positions of alphanumeric core storage. Its system configuration includes an IBM 1402 card read-punch, an IBM 1405 printer, an IBM 1407 console inquiry station, and an IBM 1405 disc storage unit with a storage capacity of 10 million alphanumeric characters on 25 discs.

This system fulfills all in-house EDP requirements and serves to implement Crawford's "total housing" concept. This concept states that individual builders, no matter how small, must achieve standardization of management controls and techniques if they are to reap the full benefits of technical advances and the mass production of housing components. Accordingly, Oley Cross, Crawford's planning expert has developed a computer program partly based on the IBM LESS (Least Cost Estimation and Scheduling) concept. It operates on the principle that a builder has a set number of operations requiring a set amount of time, material, labor and money, and that he should be able to plan them, figure total cost, and then control the operations during the building process to ensure a fair profit.

Franchised Crawford builders are provided with this master "plan for profit" for a year's operation free of charge. Under it, each may predetermine the profit he wishes to make in a given year. The plan informs him how many units he must erect and sell each month, and gives him a computer-produced operating formula. The builder is provided with a complete analysis

of his building program, including capital requirements, cash flow charts, overhead and construction costs, net profit projections, and periodic reports on inventory levels and FHA and VA commitments.

For an extra fee, Crawford builders can buy a standard computerized accounting service. This service is designed to show them, through monthly reports, exactly where they stand by subdivision, by house, by operation, and by workman or subcontractor performance. If a condition develops which threatens to endanger preestablished profit goals, it is pointed out to the builder before the problem becomes critical.



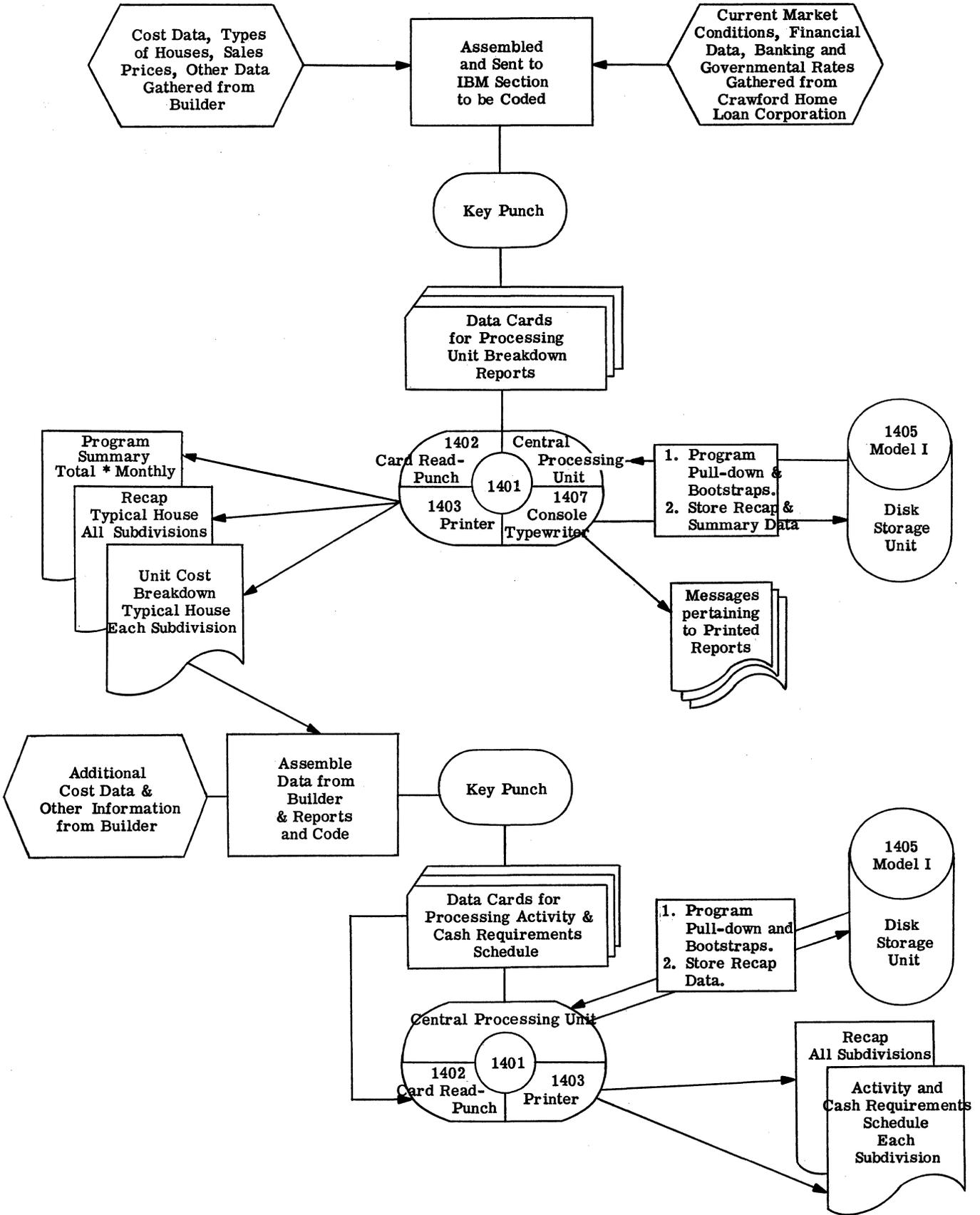
IBM 1401 PUNCHED TAPE/MAGNETIC DISC SYSTEM implements Crawford's "total housing" concept for profitable builder-dealer operations.

Builders subscribing to this service receive the following computer-produced reports and schedules:

1. Labor cost distribution.
2. Monthly balance sheet.
3. Profit and loss statements.
4. Schedules of expenses compared to budgets.
5. Payroll and sales tax returns.
6. Workmen's compensation reports.
7. Disbursement of funds.
8. Tabulation of subcontracting details.
9. Accounting for receipts.
10. Sales analysis.
11. Salemen's commissions.
12. Complete purchasing tabulation.

The purchasing tabulation run involves the use of an IBM 826 check writer which as it automatically writes checks for accounts payable simultaneously produces punched card input for computer processing. Such information as employe badge numbers, wage scales and project number provide input for 1401 processing of a payroll for over 500 Crawford employes and builders' personnel. This application requires the services of only one clerk instead of the eight previously needed.

CRAWFORD CORP.



CRAWFORD CORP. - Profit Planning and Control System Flow Chart.

Other Crawford computer applications include:

Mortgage Loan Services - Computer processing of over 7,000 mortgage loans handled by the subsidiary Crawford Home Loan Corp. requires only one quarter of personnel previously needed to perform the following functions:

1. Record all payments; distribute according to interest, principal, and escrow accounts.
2. Control delinquent accounts and initiate production of delinquent notices.
3. Process and direct deposits to separate investor and escrow accounts.
4. Produce monthly trial balances, delinquent lists and reconciliation statements.
5. Produce an annual amortization schedule for each investor, indicating application of each payment to principal, interest, taxes and other escrow.



IBM 1405 DISC STORAGE UNIT retains all corporate data and programs in its 25 magnetic discs.

Preparation of Financial Statements - These detailed statements provide each builder with figures and averages for a given period covering projected profit and loss, cash flow, cash requirements and other data affecting profit goals and management controls.

Sales Analysis - Computer processing provides management with itemized and global reports of sales of Crawford homes by builders. These reports include references to original entries on home costs, thus providing the firm with information on income from sales, commissions due salesmen and analyses for sales tax reporting purposes. Information stored on 1405 discs also provides comparisons of projected and actual sales, broken down by builder and salesman in terms of dollars and units.

Mortgage Operation Analysis - In this completely computerized operation, every one of the more than 100 individual steps required from the time a loan application is made until the loan is closed is registered in disc storage. From the time when a builder files on a new sub-

division, the 1401 can draw on 1405 data to project when houses should be shipped; when "x" number of loans will be closed out; whether a commitment to an investor will be met or when; and many similar analyses.

Profit Planning and Control Program - implements Crawford's master plan for enabling its franchised builders to meet a predetermined profit level. Computer processing provides each builder with a detailed plan of operation and, on a continuing basis, calls attention to weaknesses in his operations.

Construction Loan Accounting - Disbursement of construction loan funds to builders is a computer-controlled operation. As construction progresses, payments are made to builders and their contractors as the builder completes certain phases of erection, and after a check to ascertain that this step toward completion is free of liens.

Miscellaneous - Crawford management can instantaneously obtain special analyses or information for accounts recorded in the 1401/1405 system through the system's 1407 console inquiry station.

CRAWFORD CORPORATION				
HOUSING - HOME FINANCING				
BAYTON BOUGH   ATLANTA   NEW ORLEANS   NEW YORK   WASHINGTON, D. C.				
PROFIT PLANNING				
UNIT COST BREAKDOWN			AUGUST 12, 1963	
NEW TOWN S/D				
AVERAGE SALES PRICE- HOUSE				\$10,595
- LOT				2,380
- TOTAL				\$12,975
COST OF SALES				
	PERCENT	HOUSE ONLY AMOUNT	LOT AMOUNT	
AVERAGE LOT COST			2,180	
DIRECT CONSTN. COST	70.92	7,514		
DIRECT OVERHEAD	3.67	383		
MORTGAGE DISCOUNT	1.97	208	46	
VARIABLE CONSTN. EXP.	3.30	349		
CONSTN. SUPERVISION	3.19	338		
SALES EXPENSE	4.90	519		
GENERAL EXPENSE	3.30	350		
TOTALS	91.25	9,661	2,226	11,087
PROFIT- BEFORE TAXES & OFFICERS SALARIES	8.75	934	154	\$ 1,088
MARKUP ON SALES	29.08			
ESTIMATED OB AMOUNT	\$10,450			
EXPOSURE PER UNIT	\$ 1.196			
TOTAL PROFIT-HSE & LOT BEFORE TAXES & OFFICERS SALARIES	8.30 PERCENT			

**UNIT COST BREAKDOWN**

REPORT presents an analysis of costs incurred for each typical house to be erected by a builder.

Results and Future Plans

Corporation head W. Hamilton Crawford is firm in his belief that most builders can profit substantially from the mechanization of paperwork. Even though most could not justify the installation of a powerful computer system, they could, he says, get around this by installing small data processing equipment or by hiring data processing services to plan and process this work. Another possibility is for several builders to pool their resources to support an adequate data processing installation available to all participants.

This is, in effect, what Crawford is doing and the results have been clearly apparent. Reliance on EDP has brought significant labor savings and speed and efficiency benefits to the firm's internal operations. But, as important, the company's franchised builder-dealers, its sales force in the field, are better able to spur and expand sales of Crawford homes, because they can count on assured profits.

As Crawford's operations are being continuously expanded, both in services to its builders and introduction of new manufactured home lines, new computer applications are being planned to benefit the firm, its affiliates, and its builders. The aims of three major applications on which work is presently underway are:

1. Programing an inventory, estimating and pricing system from the manufacturer's end to provide users with immediate price quotations and packing lists on regular line house and materials packages. The ultimate results of this program would be to relieve inventory by material classification and, at a later date, to provide for a perpetual inventory system.
2. Programing an accounting system for a chain of 20 prefabricated convalescent homes to be built by Crawford in multiples of 50-bed units over a multi-state area. The system will include payroll, cost accounting, general ledger, and financial statement applications, as well as an inventory system to maintain and control drugs, linens, food, equipment and miscellaneous supplies.
3. Programing tax and insurance escrow analysis for each of the about 7,000 mortgage loan accounts handled by the Crawford Home Loan Corp. Through this program, it will be possible to perform escrow analyses oftener than the once-a-year per account frequency which is presently achieved by using the full-time services of two employes.

CRAWFORD CORPORATION				
HOUSING - HOME FINANCING				
BATON ROUGE   ATLANTA   NEW ORLEANS   NEW YORK   WASHINGTON, D. C.				
PROFIT PLANNING				
UNIT COST BREAKDOWN			AUGUST 32, 1963	
RECAP				
AVERAGE SALES PRICE- HOUSE				\$10,595
- LOT				2,380
- TOTAL				\$12,975
COST OF SALES				
	HOUSE ONLY PERCENT	AMOUNT	LOT AMOUNT	
AVERAGE LOT COST			2,180	
DIRECT CONSTN. COST	70.92	7,514		
DIRECT OVERHEAD	3.67	383		
MORTGAGE DISCOUNT	1.97	208	46	
VARIABLE CONSTN. EXP.	3.30	349		
CONSTN. SUPERVISION	3.16	335		
SALES EXPENSE	4.90	519		
GENERAL EXPENSE	3.30	350		
TOTALS	91.22	9,658	2,226	11,884
PROFIT- BEFORE TAXES & OFFICERS SALARIES	8.78	937	154	\$ 1,091
MARKUP ON SALES	29.08			
ESTIMATED OB AMOUNT		\$10,450		
EXPOSURE PER UNIT		\$ 1,193		
TOTAL PROFIT-HSE & LOT BEFORE TAXES & OFFICERS SALARIES	8.40 PERCENT			\$ 1,091
LESS OFFICERS SALARIES				
NET PROFIT - BEFORE TAXES				\$ 1,091
BREAKEVEN POINT	4.40 UNITS PER MONTH			

RECAP REPORT indicates break-even point of a builder's construction program.

### Profit Planning and Control Procedures

When a builder subscribes to the Crawford service, he begins by submitting information pertaining to the different types of houses he plans to build, their respective sales prices, the construction cycle, special costs, financial data, various interest and discount rates, land mortgages, all direct and administrative salaries, and other pertinent data.

At this point, one of two questions must be resolved. Does the builder know the amount of the total profit he wants to make? If so, then the number of houses that he must build can be estimated. If not, does he know approximately how many houses he intends to build? From this the profit to be made can be determined. The answer to either of these questions provides a basis for planning the builder's profit.

## CRAWFORD CORP.

The information is then coded into punched cards and fed into the computer for two separate but related operations. One, the unit cost breakdown report is actually a method of arriving at a typical house, including cost to be incurred, to be built by the builder. The second, the activity and cash requirement schedule, prorates over a 12-month period all of the building activity and income and expenditures derived from the construction, completion, loan closings and sale of each property scheduled in the report.

Both "profit planning" programs are transferred from the 1405 disc unit into 1401 core storage via a "pull down" routine. They require numerous "bootstraps" (special routines for conveyance of data into the computer from an input device) to completely fulfill their program cycles. The unit cost breakdown report program requires seven bootstraps and 12,000 core positions, and utilizes 2,000 cards in making the program deck. The activity and cash requirement schedule program needs 19 bootstraps and utilizes 6,000 cards and 34,000 positions of core storage.

 <b>CRAWFORD CORPORATION</b> <small>HOUSING • HOME FINANCING</small> <small>BATON ROUGE   ATLANTA   NEW ORLEANS   NEW YORK   WASHINGTON, D.C.</small>			
PROFIT PLANNING			
PROGRAM SUMMARY			
YOUR CONSTRUCTION CO.			
AUGUST 12, 1963			
	TOTAL	MONTHLY	
	BUDGET	BUDGET	
NUMBER OF HOUSES SCHEDULED NEW TOWN S/D	100	8.33	
	TOTAL 100	8.33	
TOTAL SALES VOLUME	\$ 1,497,500	\$ 100,730	
LESS - LOT COST	218,000	18,268	
DIRECT CONSTN. COST	751,400	62,967	
ALLOCATION FOR OVERHEAD AND PROFIT	\$ 328,100	\$ 27,495	
DIRECT OVERHEAD	38,300	3,209	
VARIABLE CONSTN. EXP.	34,900	2,924	
CONSTN. SUPERVISION	33,500	2,807	
SALES EXPENSE	51,900	4,349	
GENERAL EXPENSE	35,000	2,933	
	SUB-TOTAL \$ 134,500	\$ 11,273	
LESS - MORTGAGE DISCOUNT	25,400	2,128	
PROFIT OBJECTIVE	\$ 109,100	\$ 9,145	
ESTIMATE OF WITHDRAWALS AS OFFICERS SALARIES			
NET PROFIT - BEFORE TAXES	\$ 109,100	\$ 9,145	

### BUILDING PROGRAM

SUMMARY REPORT provides

builder with an averaged

budget for monthly and

entire-year operations.

After the unit breakdown report program has been transferred to core storage, the input cards are processed. At the output end, a personal message to the builder is typed out automatically on the console typewriter, explaining what he may expect to find in the following reports, based on the data he has submitted. The unit breakdown report is then printed on the 1403 printer and, in the process, another message may appear indicating to the builder that in order to made "x" profit, he must sell "x" number of houses. The current market, however, indicates that he can expect to sell only a smaller amount and the computer will, therefore, re-schedule the number of units in line with the market trends and arrive at a new profit figure.

Another message which may appear indicates to the builder that, according to the information he has submitted, a loss will result on each house. If this situation occurs, Crawford specialists then review the cost estimates and sales prices with the builder, strive to correct them and rerun the program, using the revised information.

CRAWFORD CORP.



**CRAWFORD CORPORATION**  
HOUSING HOME FINANCING

BATON ROUGE | NEW ORLEANS | ATLANTA | NEW YORK | WASHINGTON, D. C.

**ACTIVITY AND CASH REQUIREMENTS SCHEDULE**

ANNUAL BUILDING RATE:		100												COMPANY NAME: YOUR CONSTRUCTION CO.	
SUBDIVISION:		NEW TOWN S/D												DATE: AUGUST 14, 1963	
ITEM		SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	ANNUAL TOTALS	
1	DEVELOPED LOTS REQUIRED	31			30			39						100	
2	" " ON HAND	108			77			47			8			108	
3	FHA "I" COMMITMENTS REQUIRED	3												3	
4	" " ON HAND	3												3	
5	FHA "C" COMMITMENTS REQUIRED	3												3	
6	" " ON HAND	3												3	
7	VA COMMITMENTS REQUIRED														
8	" " ON HAND														
9	PERMANENT MTD. CON. REQUIRED	768,600						491,400						1,260,000	
10	" " AVAILABLE														
11	STARTS:														
12	SPECULATIVE - EST.	3												3	
13	" " - ACT.														
14	PRE-SOLD - EST.		14	14	14	9	7	9	14	16				97	
15	" " - ACT.														
16	COMPLETIONS:														
17	SPECULATIVE - EST.				3									3	
18	" " - ACT.														
19	PRE-SOLD - EST.					14	14	14	9	7	9	14	16	97	
20	" " - ACT.														
21	SALES:														
22	SPECULATIVE - EST.										3			3	
23	" " - ACT.														
24	PRE-SOLD - EST.	14	14	14	9	7	9	14	16					97	
25	" " - ACT.														
26	CLOSINGS:														
27	SPECULATIVE - EST.										3			3	
28	" " - ACT.														
29	PRE-SOLD - EST.					14	14	14	9	7	9	14	16	97	
30	" " - ACT.														
31	RECEIPTS FROM:														
32	CONST. LOANS - EST.	18,987	94,549	110,327	126,105	105,942	87,283	92,418	119,343	138,002	43,953	33,810	18,032	988,751	
33	" " - ACT.														
34	LOAN CLOSINGS - EST.					43,134	43,134	43,134	27,729	21,567	37,521	43,134	49,296	308,649	
35	" " - ACT.														
36	ADVERTISING ALLOW. - EST.														
37	" " - ACT.														
38	OTHER - EST.														
39	" " - ACT.														
40	TOTAL RECEIPTS - EST.	18,987	94,549	110,327	126,105	149,076	130,417	135,552	147,072	159,569	81,474	76,944	67,328	1,297,400	
41	" " - ACT.														
42	EXPENDITURES FOR:														
43	LAND - EST.	6,804	31,752	31,752	31,752	20,502	15,876	20,502	31,752	36,288				226,980	
44	" " - ACT.														
45	INTEREST-LAND - EST.														
46	" " - ACT.														
47	SITE IMPROVEMENT - EST.														
48	" " - ACT.														
49	CONST. COST-DIRECT - EST.	12,396	61,229	77,007	92,785	84,522	70,623	70,998	86,023	99,922	43,953	33,810	18,032	751,300	
50	" " - ACT.														
51	OVERHEAD-DIRECT - EST.	177	196	196	196	4,592	4,564	4,592	3,067	2,457	2,871	5,423	5,104	33,435	
52	" " - ACT.														
53	CONST. - EST.	3,363	5,620	6,348	7,076	6,693	6,051	6,069	6,764	7,406	4,818	4,350	832	65,390	
54	" " - ACT.														
55	MTG. DISC. - EST.					3,570	3,570	3,570	2,295	1,785	2,295	4,335	4,080	25,500	
56	" " - ACT.														
57	SALES - EST.	11,857	6,007	6,007	4,313	2,541	3,380	5,082	6,352	5,082	1,279			51,900	
58	" " - ACT.														
59	GENERAL - EST.	210	1,190	2,170	3,150	3,780	4,060	3,710	3,710	3,850	3,220	2,730	2,100	33,880	
60	" " - ACT.														
61	OTHER EXPENDITURES - EST.														
62	" " - ACT.														
63	INCOME TAX - EST.														
64	" " - ACT.														
65	TOTAL EXPENDITURES - EST.	34,807	105,994	123,480	139,272	126,200	108,124	114,523	139,963	156,790	58,436	50,648	30,148	1,188,385	
66	" " - ACT.														
67	MONTHLY CASH BAL. - EST.	15,820	11,445	13,153	13,167	22,876	22,293	21,029	7,109	2,779	23,038	26,296	37,180	109,015	
68	" " - ACT.														
69	CUMULATIVE CASH BAL. - EST.	15,820	27,265	40,418	53,585	30,709	8,416	12,613	19,722	22,501	45,539	71,835	109,015	109,015	
70	" " - ACT.														

ACTIVITY AND CASH REQUIREMENTS SCHEDULE prorates over a 12-month period all building activity, and income and expenditures.

As each program is run and computations are made, information is being transferred back for storage in the 1405 disc unit. In each instance, after the initial report is produced, this data is retrieved and printed out in the form of a recap report. This report is of value if more than one subdivision is being processed at the same time for the same builder. Otherwise, it is only a repeat of the initial run.

After the recap of the unit cost breakdown report program, a building program summary is printed. It provides the builder with an average monthly budget of costs and the average number of houses to be built, along with his total budget for the total operation and the profit he can expect to make if all requirements are met and acted on by the builder.

Data from preceding reports is then gathered and coded into other punched cards to provide computer input for the activity and cash requirement schedule program. This report schedules the builder's construction, completion, sale and closing activity in terms of numbers of units. All of these factors are taken into consideration, along with the number of model homes to be built, to arrive at his sources of income and expenditure. These figures are summarized to indicate a cumulative cash balance at the end of the 12-month cycle which should approximately agree with the profit shown on the previous reports.

In order to provide a control on the builder's costs, this program is then run each month to compare actual receipts and disbursement data furnished by the builder to the budgeted amounts. If the builder follows the schedule in the reports, he should expect to reach his predetermined profit, barring any unforeseen conditions or incidents which might compel him to deviate from his "plan for profits."