HONEYWELL

NEW DIMENSIONS OF PROVEN COMPUTER PERFORMANCE WITH EXCEPTIONAL ABILITY TO MATCH THE EXACT DIMENSIONS OF YOUR BUSINESS

DATA PROCESSING SERVICE CENTERS

Job Estimating and Control System

This brochure highlights one of the reasons why more and more data processing Service Centers are switching to Honeywell's Series 200. There are others that will be apparent when you discuss your needs with a Honeywell representative. Still others are being generated every day. Whatever your data processing needs — large or small, general or specialized — Honeywell has the computers, the software, the know-how and the desire to help you help your customers more efficiently and more economically than ever before.

JOB ESTIMATING AND CONTROL SYSTEM

Honeywell's Job Estimating and Control System is a computerized tool designed to help Service Center management plan and control its business more effectively. The system permits an accurate assessment of costs involved for each job, allowing management to enter realistic bids on a highly competitive basis. Precise determination of job costs helps management maximize profits through effective use of all its resources. Honeywell's Job Estimating and Control System consists of Manage, a critical path network modeling program for planning and monitoring systems and programming efforts; Autotimer SC, a machine-use estimating program; Autolog, a comprehensive systems use and performance reporting program. System generated output is data on which to base accurate cost estimation; to plan and control operations; to record job performance for management and client evaluation. Input to the system is information readily available in each Service Center.

Electronic Data Processing Division
Wellesley Hills, Massachusetts 02181

PAVING A PATH TO PROFIT

A SYSTEMATIC COMPUTERIZED APPROACH

Honeywell's Job Estimating and Control System for the data processing Service Center paves a logical, step-by-step computerized approach to the solution of job cost estimation and control problems.

Utilizing the computer as a management tool for the operation of the Service Center, it provides:

- Increased capabilities for the evaluation and bidding of new jobs leading to increased business and greater profits.
- More accurate and realistic estimating and bidding of jobs reducing the probability of unprofitable or marginal business.
- Greater management delegation of the job estimating process allowing management to devote more time to other aspects of the business.
- More effective management planning and control through continuing evaluation of work performance and individual job profitability.

RESULTING BENEFITS TO THE SERVICE CENTER

Encourages systematic thinking in the estimating process assuring that various necessary factors are not deferred or completely overlooked thereby resulting in realistic job bidding.

Establishes more realistic schedules because it is based on the resources available and indicates when additional resources are necessary to meet specific job requirements.

Enables simulation of alternate plans; therefore, problems are not as frequent because they have been anticipated and, in many cases, solved, thereby assuring the meeting of customer deadlines.

Reports current job status measuring personnel productivity and equipment utilization leading to a more efficient and profitable business operation.

Provides actual performance records indicating the time span and the actual man-hours expended on each job for customer billing purposes as well as for refinement of future estimating efforts.

Cuts management report compiling time by providing a simple, easy-to-use method for summarizing personnel and equipment performance enabling immediate management action as well as reducing the resources necessary for compilation.

MANAGE

Honeywell has designed the network modeling program Manage utilizing proven PERT techniques and concepts for planning and scheduling computer application systems. This program determines time relationships among EDP project activities, producing data which can be interpreted in terms of cost. Manage assists in planning customer jobs, evaluating alternative approaches to job objectives, and scheduling project activities, while providing current job status data to facilitate management control.

OUTPUT

The Application Status Report is generated as program output. Manage schedules a start date if given an end date; schedules a finish date if given a start date. The job status is computed in terms of days ahead of or behind the projected finish date. A report interval is established by Service Center management according to its own requirements.

The sample Application Status Report illustrates the initial output obtained using Manage for planning and estimating purposes. In utilizing Manage during the implementation and control stages, the output covers all columns of the report providing a complete current status of each job.

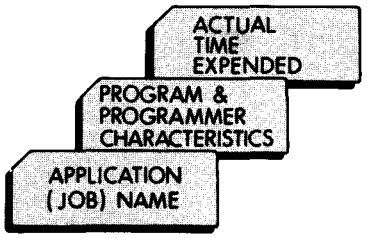
INPUT

For initial scheduling, jobs are analyzed and broken into specific tasks which are assigned to individual systems or programming personnel. Information to be entered into the Manage system includes: customer identification; application name and description; program number and description; additional data covering program complexity and personnel efficiency. In order to produce the complete current status report, data covering the percentage of individual tasks completed, with the time elapsed for work on these tasks, is entered into the system.

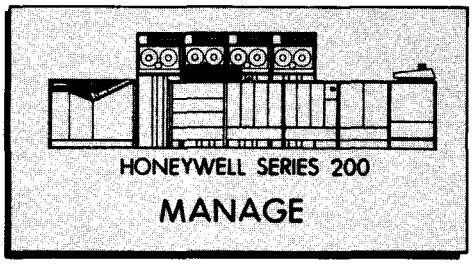
HARDWARE CONFIGURATION

The program requires a central processor with 12K memory, three magnetic tape drives, a card reader and a printer.

INPUT



PROCESSING



OUTPUT

FEBRUARY 15 1965 — APPLICATION STATUS REPORT — PAGE 1

HONEYWELL E. D. P.

MANAGE 110000
COMPUTER PLANNING & CONTROL

		SCHED START DATE	SCHED FINISH DATE	TOTAL MAN-DAYS	ELAPSED MAN-DAYS	REPORTED MAN-DAYS	COMPUTED % COMPLETE	REPORTED % COMPLETE	STATUS +/- DAYS
MANAG1 110001									
#OF ORDERS 2000									
BLACK PEI 14									
PCI 6 PI 2.0	DESIGN 25%	03/01/65	03/18/65	25					
WI 5	PROG. 35%	03/19/65	04/13/65	35					
	TEST 20%	04/14/65	04/28/65	20					
	SUMMARY	03/01/65	04/28/65	80					
MANAG2 110002									
#OF ORDERS 1080									
BOUCHER PEI 14									
PCI 4 PI 1.5	DESIGN 45%	03/01/65	03/24/65	27					
WI 5	PROG. 35%	03/25/65	04/13/65	21					
	TEST 20%	04/14/65	04/26/65	12					
	SUMMARY	03/01/65	04/26/65	60					
APPLICATION SUMMARY		03/01/65	04/28/65	140					
TOTAL # PROGRAMS 2									
TOTAL # ORDERS 3080									

LEGEND:
PEI - PROGRAMMER EFFICIENCY INDEX
PCI - PROGRAM COMPLEXITY INDEX
WI - NO. DAYS PER WORK WEEK
PI - NO. PROGRAMMERS ASSIGNED
% - AMT. OF TOT. TIME ALLOCATED TO EACH PHASE

Manage schedules and reports on three sequential Job Event Levels covering Project Events, for each application system to be developed.

Systems Design

- Program Narrative
- System Flow Chart
- Input/Output Chart
- Control Technique
- Volume and Time Estimate

Programming

- Detailed Flow Chart
- Allocation of Memory and Peripheral Storage
- Coding
- Keypunching
- Assembly
- List Subroutines, etc.

Testing

- Prepare Sample Test
- Desk Check
- Machine Test
- Operating Instructions
- Procedures Write-Up
- Volume Test, Prepare, Checkout
- Maintenance Procedures

AUTOTIMER SC

Autotimer SC performs job run time determinations for Service Center management. This program eliminates tedious, time-consuming manual calculations normally required when timing estimates are needed. Detailed information, presented as Autotimer SC output, is essential for production of accurate time estimates for jobs to be run. Accurate cost assessments, in turn, are required and can be developed for effective job bidding and control efforts.

OUTPUT

Autotimer SC produces detailed timing information including the following as shown in the accompanying chart:

Individual Run Times — Permit a detailed review and comparison of actual versus estimated running time for the validation and improvement of the estimating process.

Applications Run Times — Permit an advance simulation and analysis of the throughput efficiency of planned application systems, allowing system design modifications prior to actual implementation.

Total Job Run Time — Permits the planning and scheduling of computer workload on a daily, weekly, or monthly basis.

Run Time versus Available CP Time — Allows the identification of surplus computing power leading to the consideration of multiprogramming use and running with other work.

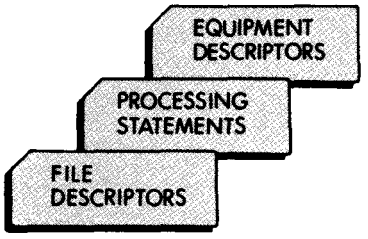
INPUT

Simple English-language statements comprise the Autotimer SC input format. File descriptors with specific information (size, blocking, etc.) for each file to be timed; equipment item descriptors; and processing descriptors for systems, applications, and single-run levels are entered into the program on punched cards or card image tape.

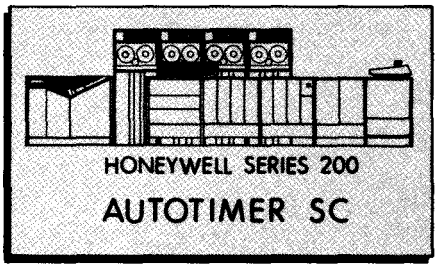
HARDWARE CONFIGURATION

Autotimer SC requires a central processor with a 16K memory, four magnetic tape drives, a card reader, and a printer.

INPUT



PROCESSING



OUTPUT

- DETAILED APPLICATION RUN TIMES

```
                                        TIMING  SUMMARY          TIMINGS REFERENCE EQUIP CONFIG A
                                        HONEYWELL  H200                              PAGE   3
                                         SECTION TOTALS


JOB GENERAL MANUFACTURING CORPORATION.
SECTION PAYROLL.

                    AVERAGE  MONTHLY  HOURS  USAGE            8.17

                    AVAILABLE CP TIME                        6.06
```

- TOTAL APPLICATION OR JOB RUN TIMES

```
                                        HONEYWELL  H200
JOB GENERAL MANUFACTURING CORPORATION.
SECTION PAYROLL.                                                                  PAGE   1

RUN ONE WEEKLY. READ CARDS 202. WRITE TAPE 203 AT 35.

OPER     INST  FILE        NAME          ITEMS  C/I   I/R   CK  NK  M  I/O TIME   CP TIME   REELS DEV

WRITE      35  203  TC-1 TAPE           28921   18     10    8   2  T      1.03       .08       .08  01
READ       50  202  TIME CARDS          28921                       C     36.15      2.92            01
TOTAL RUN TIME:    36.15 MINUTES  AVAILABLE CP TIME:    33.15 MINUTES
```

AUTOLOG

Autolog produces detailed reports on equipment utilization, accurate reports of jobs performed, specific equipment units involved, as well as causes of reruns and down time. The program reduces time required to compile operating statistics and offers data for immediate comparison and analysis with estimates produced by Autotimer SC as well as previous running times of similar jobs.

OUTPUT

Autolog produces the following reports:

Customer Job Summary — Providing periodic or cumulative time usage for each customer job for review and billing purposes.

Time Usage Report by Job Within Report Period; Summary Usage, Performance, Idle Time, Maintenance Time, Total Power-On Time.

Computer Usage Summary — Providing vital information to assure optimum scheduling and usage.

Scheduled Time; Machine Down Time; Selected Rerun Time, for specified reporting periods.

Computer Performance Report — Providing statistical summary enabling rapid analysis and correction of any noted deficiencies.

Machine Performance; Productive Time; Cause and Duration of Non-Productive Time.

Chargeable Equipment Usage Report — providing usage information for each individual component of the computer system.

Chargeable Time for each Item of Computer Equipment in Installation for specified reporting periods.

INPUT

Input to Autolog is taken directly from an easily maintained Machine Logging and Layout Form kept by the computer operator. Information from each line of the sheet is converted to a single punched card for entry into the program.

HARDWARE CONFIGURATION

Autolog requires a central processor with 4K memory, three magnetic tape drives, card reader and printer.

MACHINE (Col's 1-2) [ ]

DATE (Col's 3-8) [/ / / / / /] Y Y M M D D

AUTOLOG
Machine Logging and Layout Form

RUN DESCRIPTION				EQUIPMENT USE											REMARKS/MISCELLANY					
START TIME	STOP TIME	CYCLE	JOB NAME	TEST	Main Used	# PTR'S	# RDR'S	# PCH'S	# Tapes on TCU # 1 2 3 4	A	B	C	D	E	F	G	Field - 1	Field - 2	Field - 3	Field - 4	Field - 5	USE
9 12	13 14	17	18 22	24	25 26	27	28	29	30 33	34	35	36	37	38	39	40	41 46	47 52	53 58	59 64	65 70	71 72

INPUT CARD

HONEYWELL SERIES 200
AUTOLOG

CUSTOMER JOB SUMMARY

11/21/64 TO 11/29/64 MACHINE #01 PAGE 2

JOB	TOTAL	PROD	TEST	SETUP	RERUNS OPER	RERUNS PROG	RERUNS INPT	RERUNS OTHER	RERUNS HON
A	2.5	2.5		.1					
B	1.9	1.9		.6					
C	9.9	9.9		.4					
D	7.7	7.7		.2					
E	21.5	21.5		.5					
F	12.2	12.2		.3					
G	3.7	3.7		.1					
H									
I									
J									
K									

CUSTOMER JOB TOT
HONEYWELL JOB TO
IDLE T
MA
TOTAL POWER ON T

- HOW MUCH COMPUTER TIME DID EACH JOB REQUIRE ?

COMPUTER USAGE SUMMARY

	SCHEDULED TIME CUST SCHED	SCHEDULED TIME OTHER SCHED	SCHEDULED TIME TOTAL SCHED	MACHINE DOWN TIME MACH DOWN	MACHINE DOWN TIME RERUN DOWN	MACHINE DOWN TIME TOTAL DOWN	SELECTED RERUN TIME RERUN TAPE	SELECTED RERUN TIME RERUN SOFT	SELECTED RERUN TIME RERUN OTHER	SELECTED RERUN TIME TOTAL RERUN
11/23/64	15.5		15.5							
11/24/64	15.1		15.1							
11/25/64	4.8		4.8	3.9		3.9	.9			.9
SUMMARY	35									

- WAS MY COMPUTER TIME OPTIMALLY SCHEDULED?

COMPUTER PERFORMANCE REPORT

11/23/64 TO 11/25/64 MACHINE 01

DATE	CUST SCHED	HON SCHED	CUST PROD	HON PROD	PCT PROD UP	PCT UP	SETUP	IDLE	DOWN	TOTAL SCHED	TOTAL PROD	HONEYWELL MACH	HONEYWELL TAPE	HONEYWELL SOFT	HONEYWELL OTHER	TOTAL UP HONEYWELL RERUNS	USER: OPER	USER: PROG	USER: INPT	USER: OTHER	TOTAL CHARGE
11/23/64	15.5		15.5		100%	100%	.2	1.4		15.5	15.5					15.5					15.5
11/24/64	15.1																				
11/25/64	4.8																				
11/23/64 TO 11/	35.4																				

- HOW DID MY COMPUTER PERFORM?

EQUIPMENT USAGE REPORT

11/64 MACHINE # 01

DATE	MEMORY USED 4K	8K	12K	16K	20K	24K	28K	32K	PTR	RDR	PCH	TCU #1 TCU	TCU #1 TAPE	TCU #2 TCU	TCU #2 TAPE
21	12.4	11.6	10.1	8.0					12.4	10.8	12.4	11.6	69.9		
22	14.5	14.5	14.5	3.7	2.3	2.3	.4	.4	14.5	9.6	14.5	14.1	56.8	1.4	4.2
23	15.5	15.5	15.5	6.7	2.2	2.2	2.2		15.5	15.5	15.5	15.5	57.7	4.5	13.5
24	15.1	15.1	15.1	15.1	2.5				15.1	15.1	15.1	15.1	85.2	10.8	32.4
25	3.9	3.9							3.9	3.9	3.9	3.9	31.2		
26	.0														
TOTALS	61.4	60.6	55.2	33.5	7.0	4.5	2.6	.4	61.4	54.7	61.4	60.2	300.8	16.7	50.1

PREV MAINT 1.0 DOWN TIME . RERUN TIME .

- AM I GAINING SUFFICIENT USAGE FROM MY COMPUTER ?

A PROBLEM-SOLVING SYSTEM

Service Center management frequently asks: "How much will it cost to systematize and perform the various jobs we have in for bid?" and "How can we accurately estimate such costs and maximize profits?" These certainly are important questions. If management cannot estimate its costs with a high degree of accuracy, it cannot identify business which is unprofitable or returns marginal profits at best. The problem is often in evidence where the Service Center derives little or no income traceable to systems or programming work.

Honeywell, with its extensive resources and experience, developed the Job Estimating & Control System to review programming and systems planning, to estimate computer running time, and to evaluate the use-effectiveness of Series 200 computer systems. Honeywell has used and refined these programs in assisting with the installation of hundreds of general purpose and specialized EDP systems. Problems solved by Honeywell with this application system are precisely those same problems encountered regularly by Service Centers in search and service of new business.

Reports generated by the system may be included directly in job proposals. These printouts — with concise, comprehensive presentation of pertinent information — project a valuable, businesslike image, demonstrating a sophistication of operation on the part of the Service Center and assisting in building client and prospect confidence.

WELL PLANNED SUPPORT

Honeywell supplies its Job Estimating and Control System as an extension of its well planned policy of full service support for Service Center customers. In addition to this system Honeywell will supply the Service Center with its proven industry applications packages. For every major area of Service Center activity Honeywell provides the capability for high level job performance with the greatest possible profit payoff.

SERIES 200 HARDWARE AND SOFTWARE DIMENSIONS

Hardware and software components for use in Honeywell systems are summarized below. This total capability assures precise tailoring to current and future application requirements.

MODEL 120/ 200/1200/2200/4200

- Memory cycle times ranging from 3 microseconds to 188 nanoseconds per character
- Memory capacities ranging from 2,048 to 524,288 characters
- Up to 30 index registers; flexible nanosecond control memory
- A universal set of powerful instructions
- Instruction and data compatibility with 1401, 1410, 1440, 1460, and 7010 systems
- Liberator software for fast and easy program conversion
- Advanced programming and memory addressing methods, plus editing, multiply/divide, and floating-point operations
- Up to 16 peripheral operations performed simultaneously with computing
- Up to 64 peripheral control units connected to a processor; each accommodates one or several peripheral devices
- A wide variety of peripheral equipment available in a range of performance capabilities, including communication devices, card equipment, magnetic tape and paper tape units, mass storage units, high-speed printers, MICR equipment, and memory-to-memory adapter units
- Large and powerful real time capability that includes an efficient interrupt facility, single- and multi-channel communication controls (the latter accepting data from up to 63 lines simultaneously), 8-level code handling, and a range of remote terminal facilities such as Honeywell's Data Station and visual display units for a wide variety of applications
- Easy-to-use, compatible programming languages; powerful assembly and compiler systems
- Wide array of generalized data manipulation programs; sort, I/O packages, report generators, and others

MODEL 8200

- Independent facilities for word *and* variable-length-field (VLF) processing
- 750-nanosecond memory cycle rate for 8 characters
- Memory capacity of up to 1,048,576 characters (131,072 words)
- Peak input/output data transfer rate of over 2.5 million characters per second
- Eight word programs operating in parallel, simultaneously with execution of one VLF program
- Simultaneous accessing of memory by a word program, a VLF program, and input/output operations
- Up to 32 input/output operations concurrent with computing
- Time-sharing activities facilitated by a comprehensive interrupt scheme and by the ability to partition memory dynamically and to protect many memory segments
- User-proven software for both word-and VLF-processing facilities
- Complete compatibility with both the Series 200 and Honeywell's 800 and 1800 systems

Honeywell

ELECTRONIC DATA PROCESSING

SALES OFFICES AND DATA CENTERS
IN PRINCIPAL CITIES OF THE WORLD

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