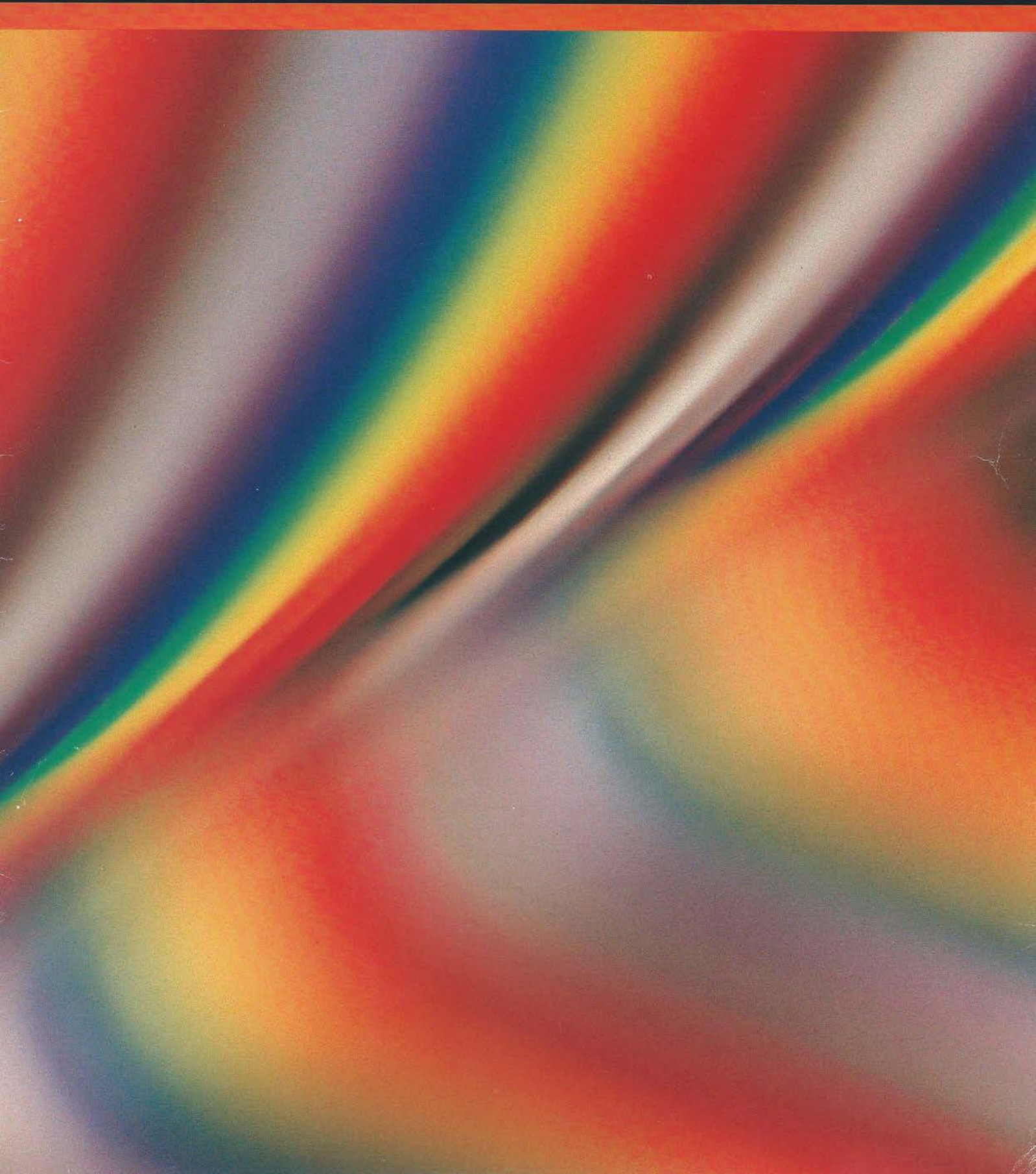
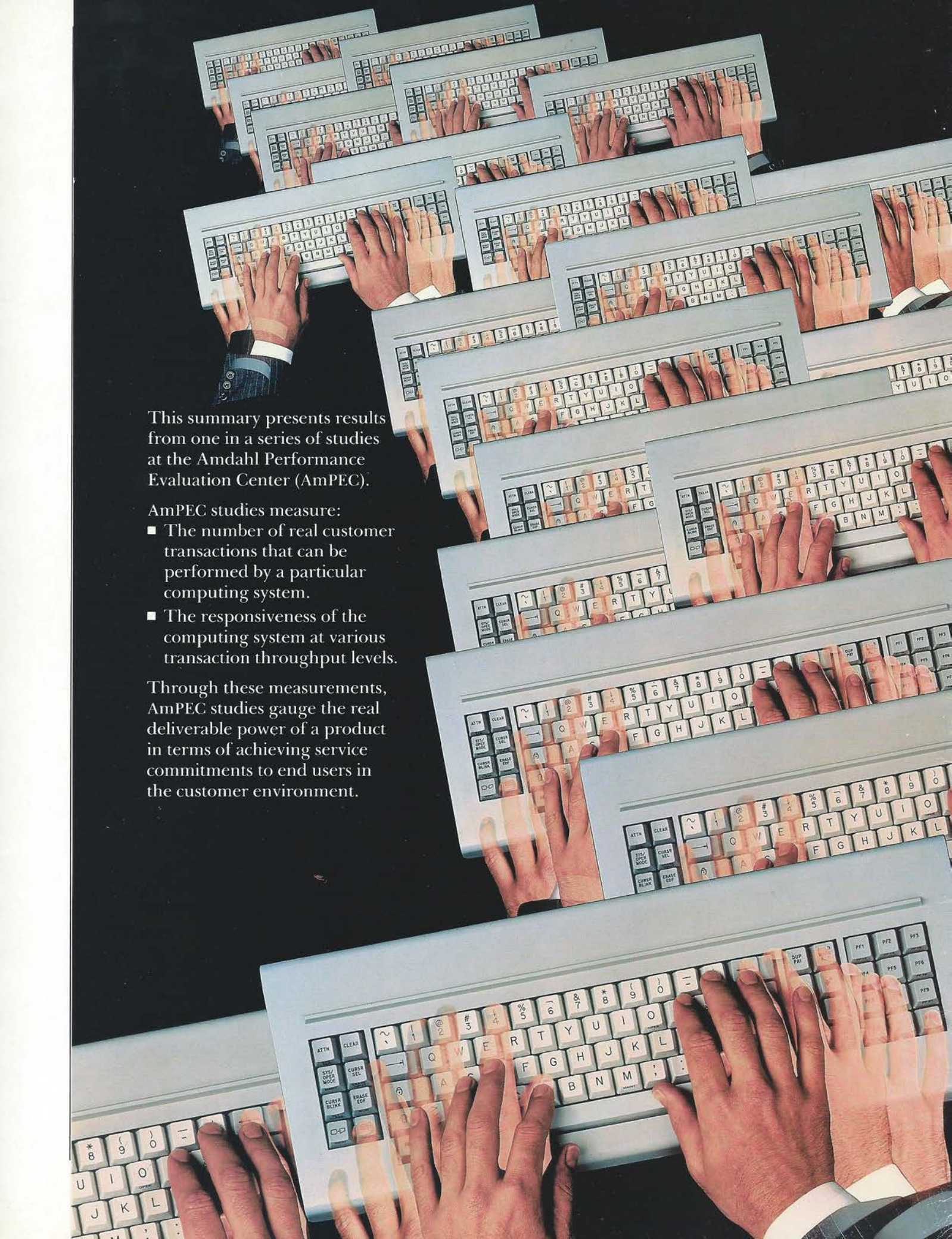


Planning for Capacity Multiple Domains





This summary presents results from one in a series of studies at the Amdahl Performance Evaluation Center (AmPEC).

AmPEC studies measure:

- The number of real customer transactions that can be performed by a particular computing system.
- The responsiveness of the computing system at various transaction throughput levels.

Through these measurements, AmPEC studies gauge the real deliverable power of a product in terms of achieving service commitments to end users in the customer environment.

An Overview of the Study Results

Planning for Capacity: Multiple Domains is a performance study of Amdahl's 580/Multiple Domain Feature (580/MDF) together with a 5890-300 Dual Processor running mixed IMS/TSO workloads.

As guidelines to planning for capacity, the study presents data on:

- Throughput rates. In the AmPEC study, the use of 580/MDF to run mixed IMS/TSO workloads increased the IMS throughput rate by 51% over the rate without 580/MDF.
- System tuning. 580/MDF allows independent system tuning for each workload, which uses system resources more efficiently and contributes to increased throughput.
- Overhead. In the study, 580/MDF consumed between 2.5% and 4.0% of the CPU for the measured workloads.
- Workload consolidation. 580/MDF allows workloads from two machines to run concurrently on one machine, saving the cost of duplicate software licenses and the environmental costs of maintaining two systems.

AmPEC Goals and Procedures

AmPEC, Amdahl's Performance Evaluation Center, conducted a study of multiple domains to determine (1) changes in throughput rates when mixed IMS/TSO workloads are moved from a non-580/MDF to a 580/MDF environment and (2) changes in overhead associated with multiple domains. By determining these changes, AmPEC sought to provide a basis for evaluating 580/MDF as a technical solution to a business problem: the need to consolidate multiple workloads on a single machine.

To ensure valid comparisons, AmPEC followed constant procedures and maintained constant workloads. The workloads were developed through sophisticated techniques to simulate the transactions of 1,000 IMS and 200 TSO terminal users.

580/MDF Overview

A hardware option, 580/MDF logically configures an Amdahl processor as two, three, or four separate domains. Each domain is capable of running its own system control program (SCP), or operating system. For example, 580/MDF can run MVS/370, MVS/XA, VM, and UTS/580 concurrently on one machine.

580/MDF provides screen commands to tune each domain—to allocate resources such as main storage, input/output channels, and processor time. In the case of processor time, screen commands can change the allocation *dynamically*, without interruption to service, according to target and maximum values. If one domain uses less than its target, the other domains are given more time. Or the screen commands can specify a fixed allocation of processor time among domains.

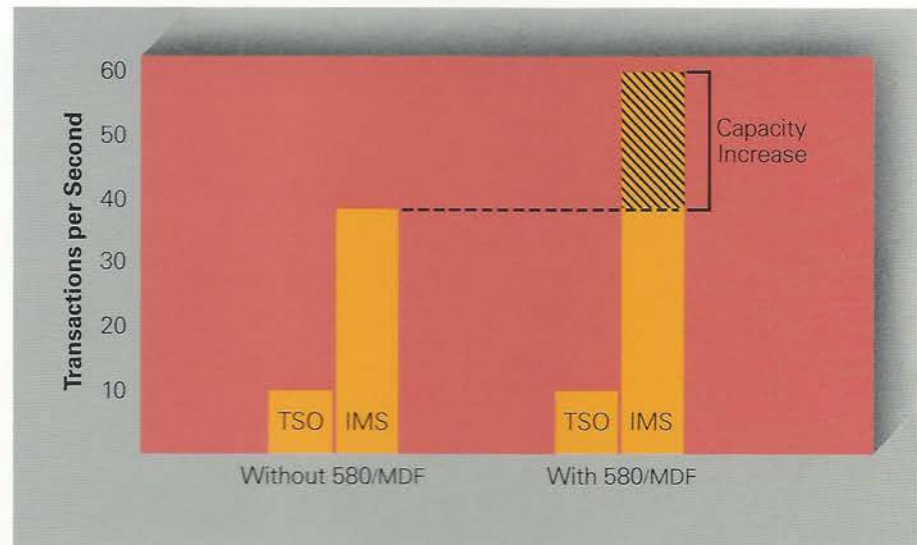
Mixed Workload Throughput

When the mixed IMS/TSO workloads moved from a non-580/MDF to a 580/MDF environment, as shown in Graph 1, the TSO throughput remained constant at about 9.85 transactions per second. The IMS throughput increased from 38.86 to 58.94 transactions per second, a gain of 51%. This gain—the result of improved tuning and storage management with 580/MDF—provides increased capacity, enabling the system to accommodate more IMS user transactions.

Transaction response times were less than 1 second in both environments.

Please note that Graph 1 represents external throughput, the number of real customer transactions per second. External throughput measures the total system's deliverable power.

Graph 1 Mixed Workload Throughput



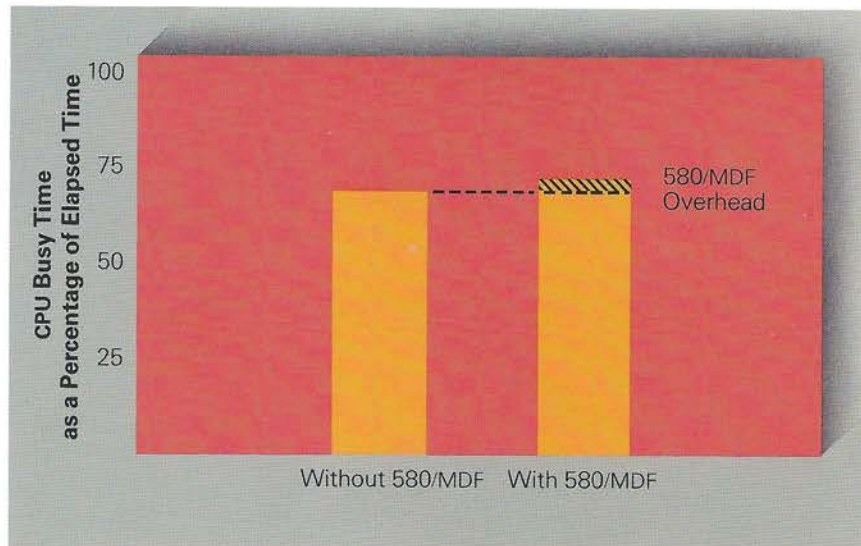
580/MDF Overhead

Graph 2 shows the overhead associated with 580/MDF.

When IMS and TSO ran without 580/MDF, the CPU was kept busy 70.03% of the time. When the same workloads ran with 580/MDF, the CPU busy time increased to 72.52%. The difference, 2.49%, is a 3.36% increase over the original time.

These measurements required special procedures. First, each workload ran standalone on a 5890-190 Uniprocessor, which has approximately half the processing power of a 5890-300 Dual Processor. Then the same workloads ran on the 5890-300, logically partitioned by 580/MDF to give each workload 100% of each CPU.

Graph 2 **580/MDF Overhead**



All the results summarized here were developed through measurements of workloads created by Amdahl personnel. AmPEC workloads approximate true production workloads. Estimation of relative performance for a given customer depends on the customer's specific application and operating environment.

To receive a copy of the complete report *Planning for Capacity: Multiple Domains* (publication number MM001335), please contact your local Amdahl representative.

AmPEC Publications

performance
Amdahl: The Choice

580/Multiple Domain Feature

*Planning for Capacity:
Multiple Domains
AmPEC Technical Report (MM001335)*
Detailed performance data on
580 Series Model 5890-300

*Planning for Capacity:
Multiple Domains
Executive Summary (MM001336)*
A summary of the technical report

TSO

*Planning for Capacity: TSO
AmPEC Technical Report (M1195)*
Detailed performance data on
580 Series Models 5850, 5860, 5867,
and 5870

*Planning for Capacity: TSO
Executive Summary (MM001213)*
A summary of the technical report

*Planning for Capacity: TSO, Volume 2
AmPEC Technical Report (MM001304)*
Detailed performance data on 580
Series Models 5870 and 5890-300

*Planning for Capacity: TSO, Volume 2
Executive Summary (MM001317)*
A summary of the technical report

VM/CMS

*Planning for Capacity: VM/CMS
AmPEC Technical Report (MM001255)*
Detailed performance data on
580 Series Models 5840, 5850, 5860,
5868, and 5880

*Planning for Capacity: VM/CMS
Executive Summary (MM001256)*
A summary of the technical report

CICS

*Planning for Capacity: CICS
AmPEC Technical Report (M1196)*
Detailed performance data on
580 Series Models 5850, 5860, 5867,
and 5870

*Planning for Capacity: CICS
Executive Summary (MM001214)*
A summary of the technical report

*Planning for Capacity: CICS, Volume 2
AmPEC Technical Report (MM001312)*
Detailed performance data on
580 Series Models 5870, 5890-200,
and 5890-300

*Planning for Capacity: CICS, Volume 2
Executive Summary (MM001325)*
A summary of the technical report

IMS

*Planning for Capacity: IMS
AmPEC Technical Report (M1197)*
Detailed performance data on
580 Series Models 5840, 5850, 5860,
5867, and 5870

*Planning for Capacity: IMS
Executive Summary (MM001215)*
A summary of the technical report

*Planning for Capacity: IMS, Volume 2
AmPEC Technical Report (MM001305)*
Detailed performance data on
580 Series Models 5870, 5890-200,
and 5890-300

*Planning for Capacity: IMS, Volume 2
Executive Summary (MM001334)*
A summary of the technical report

amdahl®

Corporate Headquarters
AMDAHL CORPORATION
1250 East Arques Avenue
P.O. Box 3470
Sunnyvale, CA 94088-3470
U.S.A.

Regional Headquarters

United States
U.S. SALES OPERATIONS
Santa Clara, CA

Canada
AMDAHL CANADA LTD
Toronto, Ontario
Canada

Europe
AMDAHL EUROPE
Dogmersfield Park, Hampshire
United Kingdom

Pacific Basin
AMDAHL AUSTRALIA PTY LTD
North Sydney
Australia

Amdahl is a registered trademark of Amdahl Corporation.

© Copyright 1987 by Amdahl Corporation
All rights reserved. Printed in U.S.A.

7K 7/87 MM001336