

**HP 1000 A/E/F-Series  
Upgrade Manual**

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**This is a living document. Please send any comments or questions by HPDESK, Fax, or mail to:**

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**Price Applicability**

**All product and service prices in this upgrade manual are U.S. List and apply only in the United States (services prices higher in Alaska) and are subject to change without notice. Quotations will be based on the current HP Corporate Price List and the current HP Service Price Book.**

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# I. Introduction

Today customers are in a very cost-conscious frame of mind. They are looking for ways to increase their computing capabilities and performance without incurring large re-engineering costs. Their desire is to enhance and improve their systems through evolution. Therefore, the over 150,000 HP 1000s already sold, 1/3 of which are A-Series systems, are all potential customers for the plug compatible A990 single-board upgrade.

The HP 1000 Upgrade Program is one of many ways Hewlett-Packard assures its customers that their investment in the HP 1000 application development will be protected and highly leverageable into the future.

Now is the time for our customers to take advantage of Hewlett-Packard's tremendous upgrade opportunities for the HP1000 product family. By upgrading their existing HP1000 system, our customers can

*Leverage* their hardware investments and avoid excessive added cost.

*Preserve* their software investments and avoid conversion time and costs.

*Extend* their capabilities by interfacing new applications with existing applications.

*Maximize* system performance with minimum downtime through new technology.

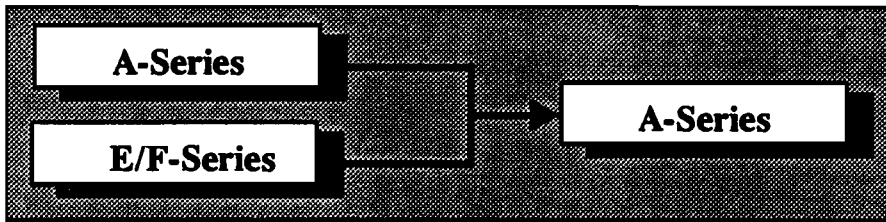
As customer requirements for processing power or configurability increase, this program can provide a cost-effective opportunity for customers to upgrade their computers while protecting part or all of their original investment.

Hewlett-Packard is committed to the HP 1000 computer family.

*"We have redoubled our efforts to ensure the long-term strength of our HP 1000 computer family. We want to continue serving the large installed base of customers who have found the HP 1000 an ideal engine for real-time applications. Our sales force can sell it with renewed enthusiasm, and our customers may purchase it with confidence."*

John Young  
President and CEO  
Hewlett-Packard Company

There are currently two upgrade paths for our HP1000 customers:



## A. A-Series to A-Series upgrade

A-Series owners who have A900s that need increased processing power can get at least double the A900 CPU performance with the new A990 single-board processor upgrade using all of their existing hardware (memory and I/O) and software.

**Buy now and save!!** Purchasing an A900 now for current needs and upgrading to the A990 later can be very profitable for the customer. Hewlett-Packard is offering an “incentive” program which allows the customer to take shipment of an A900 after May 1, 1990 and before the A990 ships in early 1991, and receive an additional \$5000 credit when the customer upgrades to the A990!

A400/A600 + /A700 owners who need more performance can get up to six (6) times the CPU performance with their existing 14 and 20 slot boxes and systems while still using their existing I/O cards and software.

## B. E/F-Series to A-Series upgrade

E/F-Series customers who move to the A-Series can take advantage of the tremendous increase in processor power and I/O performance as well as lower maintenance costs. They will also benefit from the latest software and hardware products such as:

- SCSI Interface card and supported peripherals
- Newest HP-IB peripherals
- I/O cards with DMA per channel
- Higher-Capacity memory arrays
- LAN and NS-ARPA/1000 services
- Memory-Based Functionality
- Code and Data Separation (CDS)

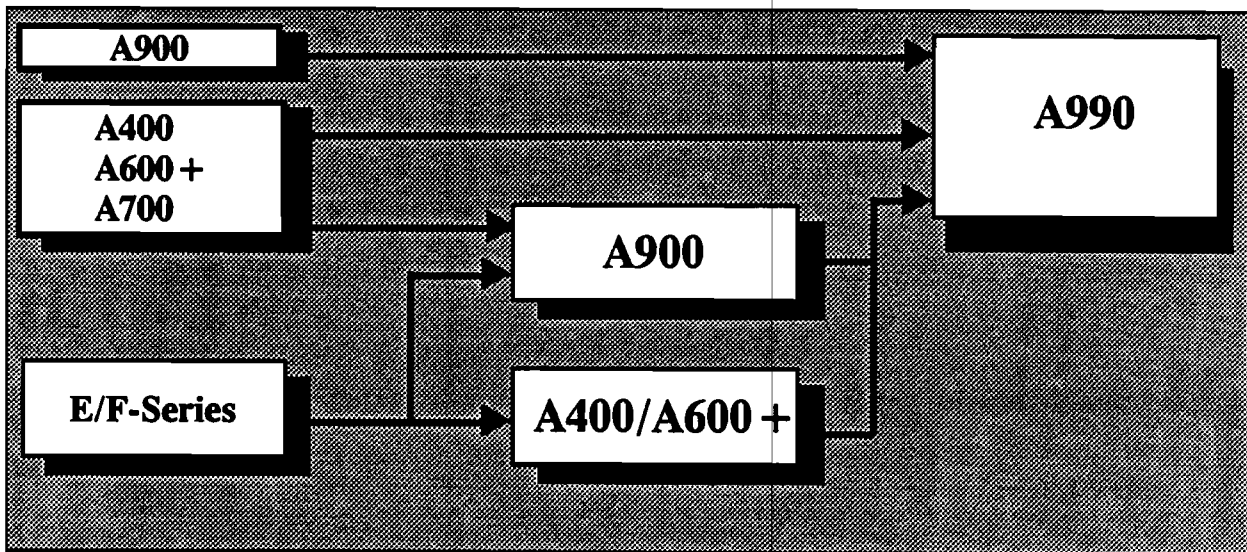
With renewed emphasis on the A-Series and the fact that RTE-6 is now in its 10 year support life (Sept 1, 1989), this is a great time to move from RTE-6 to RTE-A. Due to the ease of moving from RTE-6 to RTE-A, as compared to moving to another operating system such as VMS, the customer will benefit from the valuable time and resources saved during this process. Finally, E/F-Series customers can also move to the A-Series products with “guaranteed” manufacturing of the A-Series to at least the year 2000 and with support until the year 2010.

**HP Computer Museum**  
**[www.hpmuseum.net](http://www.hpmuseum.net)**

**For research and education purposes only.**

The HP 1000 Upgrade Program provides the above benefits not only to customers considering a commitment to the HP 1000, but also to our existing customers who may be ready to move to larger, more powerful computers, or into current, more economical computers.

## II. Overview



*Upgrade Paths for HP1000 Customers*

Although the two upgrade processes are similar, there are enough differences to warrant describing them separately.



## **A. A-Series to A-Series upgrade**

To leverage their hardware and software investments already made in the HP1000 A-Series, and to get more CPU performance out of their current A-Series computer, a customer should take advantage of the fantastic upgrade programs available for the A-Series product line.

When the new A990 processor was added to the A-Series family on October 1, 1990, we added a new upgrade program. The program for upgrading to the A990 has significant differences from the program for upgrading to the A900. The previous A-Series upgrade program to the A900 has not changed.

### **Upgrade to A990 - Hardware**

The new upgrade product - the 12990C (A990 processor upgrade product) - replaces any current A-Series processor board or board set with a single-board processor which employs state-of-the-art ASICs (Application Specific Integrated Circuits) and combines the latest surface-mount manufacturing processes.

This combination of modern technology and optimized design provides a high-performance, compact, plug-compatible, and highly reliable single-board processor that is functionally compatible with the current A-Series family.

The 12990C product is available with very generous return credits for the current processors as customers move up to the A990. For returned processors when upgrading from an A400/A600 + /A700 or A900 to the A990, the customer will receive a credit from \$1000 to \$14000 toward the purchase of the A990 upgrade. Returned A400/A600 + /A700 memory receives a credit from \$750 to \$2000 toward the purchase of A990 memory. In order to preserve the customer's investment in A900 memory, the A990 was designed to use the same type of memory arrays. Therefore, when upgrading from the A900 to the A990, the customer can utilize their existing A900 memory arrays.

### **Upgrade to A990 - Software**

'E' and 'R' license software upgrades are included in the purchase of the A990 upgrade product (12990C) for most\* software, as are 'A' License software upgrades for most\* A900 software. When upgrading 'A' license software from an A400/A600 + /A700, you must order option 100.

*\* Does not include HP 1000 networking software and microprogramming software.*

### Upgrade to A900

Returned A400/A600 + /A700 processors when upgrading to A900s receive from \$2500 to \$3250 credit for each returned CPU, \$750 to \$2000 credit for returned memory, and 100% credit (based on current U.S. List prices) for all software license upgrades. 100% software upgrade credit means that the customer pays only the incremental difference between the level they are at now and the level to which they upgrade.

## **B. E/F-Series to A-Series upgrade**

The E/F-Series to A-Series upgrade program is unchanged.

### Upgrade to A400/A600 + /A900

Upgrades from E/F-Series to A900s include \$2000 credit for any E/F-Series CPU, and 100% credit for "common" subsystem software license upgrades.

Upgrades from E/F-Series to A600 + SPUs include \$500 credit for any E/F-Series CPU and no cost upgrades for common subsystem software upgrades.

Upgrades from E/F-Series to A400s include \$200 credit for any E/F-Series CPU and no cost upgrades for common subsystem software upgrades.

Upgrades common to the A400, A600 + , and A900 can generate return credits for I/O from \$75 to \$300 per card and return credits for memory from \$100 to \$750 per card. No upgrade credit for RTE-6 to RTE-A is available; we recommend consideration of the system-level A-Series products as the upgrade target systems, 2199E, 2489B, 2196G, 2196H, or 2484B, which include RTE-A.

*Common software:* Compatible common software products such as FORTRAN 77 have the *same* product number for E/F-Series (RTE-6) or A-Series (RTE-A) systems. Use the products numbers on page 17 to order. 100% software upgrade credit means that the customer pays only the incremental difference between the level they are at now and the level to which they upgrade.

Incompatible common software products like FORMS/1000 have *different* product numbers. These upgrades will be implemented individually. Contact your Sales Center Engineer for assistance.

### Upgrade to A990

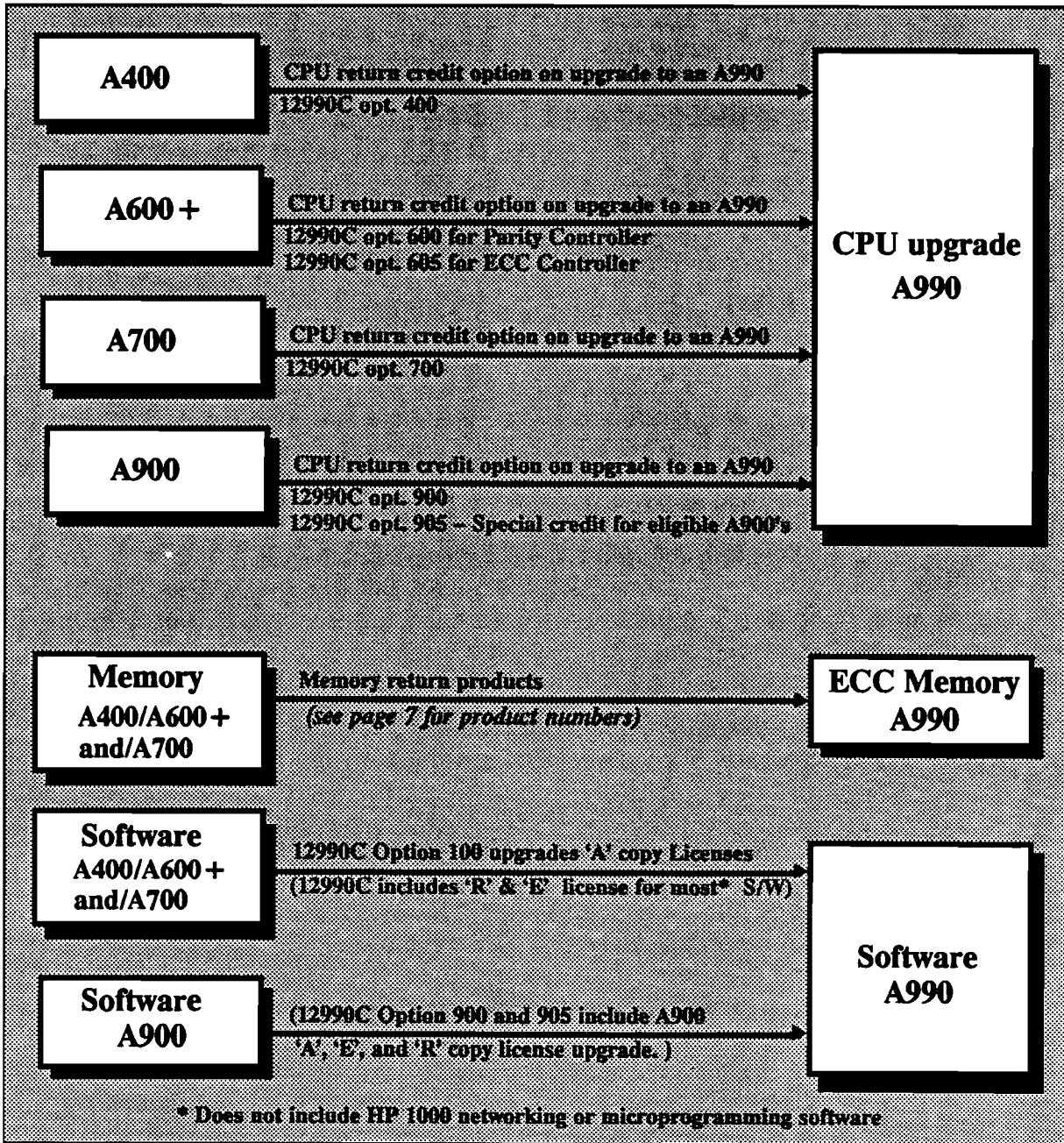
Currently there is no direct upgrade path from an E/F-Series computer or SPU to an A990. However, the customer can easily take advantage of the upgrade program from E/F-Series to A900 and then move from the A900 to the A990, once again taking advantage of all the tremendous return credits and the incentive program (see qualifications on page 7).

### III. Process

The following explains the procedure used to upgrade an existing A/E/F-Series computer or SPU to a newer, more powerful A-Series computer or SPU. It is important to remember that the customer needs to specify the type, model and serial number of the returned processor(s) so that DSO issues the appropriate return credits.

#### A. A-Series upgrades to the A990

Having ordered a 12990C upgrade product, these are the options:



## A-Series Growth Path

The HP 1000 A-Series Model A990 provides a growth path for customers who want to upgrade their A-Series computers, along with an incentive program for qualified purchases (see A990 Upgrade Incentive section below). Upgrade credits range from \$1000 to \$14000 depending on the license and returned processor or system. The CPU upgrade kit, product number 12990C, has a U.S List price of \$25025 and a Factory Base Price of \$25000.

## A900 Upgrade Incentive (Special Credit)

Any customer exchanging a current Model A900 four board processor set will receive a \$14000 credit toward the price of an upgrade, Option 900. Current Model A900s shipped after May 1, 1990 and prior to the availability of the HP 1000 A-Series Model A990 in early 1991 are eligible for option 905, an additional \$5000 credit toward the upgrade price.

## CPU Upgrade Credits

<u>Order Product</u>	<u>Upgrade option #</u>	<u>Upgrade from</u>	<u>Return Credit</u>	<u>Description</u>
12990C	400	A400	\$ 1000	Return for A400
	600	A600+	\$ 1000	Return for A600+ Parity
	605	A600+	\$ 6000	Return for A600+ ECC
	700	A700	\$ 11000	Return for A700
	900	A900	\$ 14000	Return for A900
	905	A900	\$ 5000	Special credit for A900*

*\* If an A900 was shipped after May 1, 1990 and before the first A990 shipments, an additional return credit will be authorized for this CPU when upgrading to an A990.*

## Memory Return Credits

The following return credit products may be ordered to return A400/A600+ /A700 memory array cards\* for credit toward purchase of A990 memory. Part Number 121xxAN/BN/CN/DN provides credit toward purchase of A990 memory cards of equal or greater capacity as part of an upgrade from an A400/A600+ /A700 system to an A990 system. The A990 utilizes the same memory as the A900 so there is no need to upgrade A900 memory when moving to an A990.

*\* Quantity limited to the maximum configuration of the returned computer. For example, if an A600+ was returned with four 12111B memory array cards and a 12221A 3Mb memory array card was purchased instead of the 12221B 8Mb memory array card, the customer would receive credit for only three returned 12111B memory array cards.*

<u>Product Returned</u>	<u>Order Upgrade Product #</u>	<u>Credit</u>
12103C 512kB Parity Card	12103CN	\$ 750
12103D 1MB Parity Card	12103DN	\$ 1250
12111A 512kB ECC Card	12111AN	\$ 1000
12111B 1MB ECC Card	12111BN	\$ 1250
12111C 2MB ECC Card	12111CN	\$ 2000
12220A 3/4MB ECC Card	12220AN	\$ 2000

## Software Upgrades

A400/A600+ /A700: In order to streamline the upgrade process, DSO is offering a single upgrade option to move 'A' license software from an A400/A600+ /A700 to an A990. The 12990C product includes upgrades for most\* 'E' and 'R' software licenses. Option 100 on the 12990C product is an option to upgrade most\* 'A' license software for the A400/A600+ /A700.

*\* Does not include HP 1000 networking or microprogramming software.*

A900: Since the new A990 software prices equal the old A900 prices, option 900 includes no cost license upgrades for most\* A900 'A', 'E', and 'R' software.

*\* Does not include HP 1000 networking or microprogramming software.*

## Sample Orders

### 1. Upgrade from A900 (2199E) to A990 (Comparable to 2999A)

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
12990C		A400/A600 + /A700/A900 to A990 upgrade	\$ 25,025
	900	Return credit for A900 processor	\$-14000
	905	Incentive credit for upgrading A900 CPU w/ in guidelines	\$ <u>-5000</u>
		<b>Adjusted U.S. List Price</b>	<b>\$ 6025</b>

In comparison, the 2999A SPU (A990) with a 3MB memory array card (12221A) and FORTRAN 77 (92836A) currently has a U.S List price of \$58,582. Therefore, by upgrading their existing 2199E as opposed to purchasing the 2999A SPU in this example, the customer saves approximately \$52,557. These calculations do not take into account any trade discounts.

Note: All of the customer's existing I/O cards and A900 memory array cards can be used in the upgraded computer.



### 2. Upgrade from A900 (2199E) to A990 (comparable to a 2999A)

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
12990C		A400/A600 + /A700/A900 to A990 upgrade	\$ 25025
	900	Return credit for A900 processor	\$-14000
		<b>Adjusted U.S. List Price</b>	<b>\$ 11025</b>

In comparison, the 2999A SPU (A990) with a 3MB memory array card (12221A) and FORTRAN 77 (92836A) currently has a U.S List price of \$58,582. Therefore, by upgrading their existing 2199E as opposed to purchasing the 2999A SPU in this example, the customer saves approximately \$47,557. These calculations do not take into account any trade discounts.

Note: All of the customer's existing I/O cards and A900 memory array cards can be used in the upgraded computer.

**3. Upgrade from A600+ with 'A' licence (2196H)  
to A990 (equivalent to a 2999A)**

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
12990C		A400/A600+ /A700/A900 to A990 upgrade	\$ 25025
	100	Upgrade 'A' copy S/W lic. for customer's existing S/W	\$ 3000
	605	Return credit for A600+ processor w/ ECC controller	\$ -6000
12221B		8MB memory array	\$ 14750
12111BN		Credit for 1MB ECC memory (\$-1250 ea.)*	\$ <u>-5000</u>
		<b>Adjusted U.S List Price</b>	<b>\$ 31775</b>

In comparison, the 2999A SPU (A990), purchased with the above products and with FORTRAN 77 (92836A), currently has a U.S List price of \$64,322. Therefore, by upgrading their existing 2196H as opposed to purchasing the 2999A SPU in this example, the customer saves \$32557. These calculations do not take into account any trade discounts.

Note: All of the customers existing I/O cards can be used in the upgraded computer.

\* *Quantity limited to the maximum configuration of the returned computer.. In this example, the A600+ was returned with four 12103D memory array cards.*

**4. Upgrade from A600+ with 'R' or 'E' license (2156C)  
to an A990 (equivalent to a 2959A)**

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
12990C		A400/A600+ /A700/A900 to A990 upgrade	\$ 25025
	600	Return credit for A600+ processor w/ Parity controller	\$ -1000
12221A		3MB memory array	\$ 9000
12103DN		Credit for 1MB Parity memory (\$-1250 ea.)*	\$ <u>-3750</u>
		<b>Adjusted U.S List Price</b>	<b>\$ 29275</b>

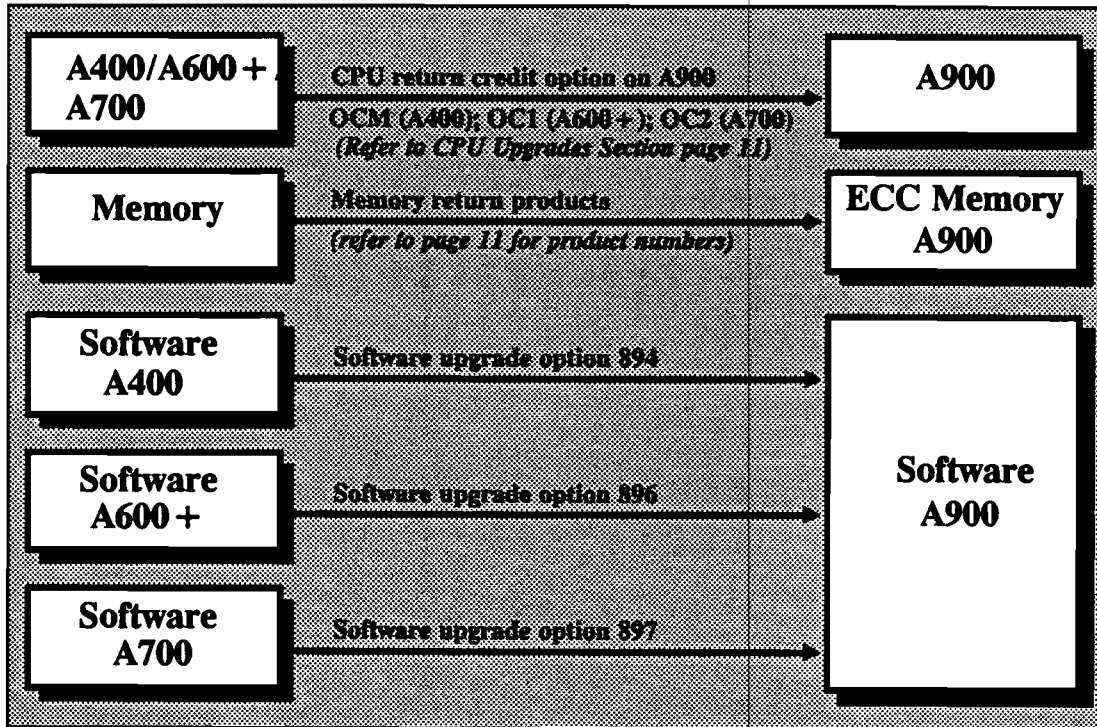
In comparison, the 2959A computer (A990), purchased with the above products and with FORTRAN 77 (92836R), currently has a U.S List price of \$50,316. Therefore, by upgrading their existing 2156C as opposed to purchasing the 2959A computer in this example, the customer saves \$21,041. These calculations do not take into account any trade discounts.

Note: All of the customers existing I/O cards can be used in the upgraded computer.

\* *Quantity limited to the maximum configuration of the returned computer. In this example, the A600+ was returned with three 12103D memory array cards.*

## B. A-Series upgrades to the A900

The following outlines the process to upgrade an A400/A600+/A700 to an A900:





## **CPU Upgrade Credits**

<b>CPU</b>	<b>Order Upgrade option #</b>	<b>Upgrade from</b>	<b>return credit</b>
2139B	0CM	A400	\$ 2500
	0C1	A600+	\$ 2500
	0C2	A700	\$ 3250
2439B	0CM	A400	\$ 2500
	0C1	A600+	\$ 2500
	0C2	A700	\$ 3250
2489B	0CM	A400	\$ 2500
	0C1	A600+	\$ 2500
	0C2	A700	\$ 3250
2199E	0CM	A400	\$ 2500
	0C1	A600+	\$ 2500
	0C2	A700	\$ 3250

Returned computer includes CPU and memory controller (e.g. 2156C).

Returned 219x SPUs includes CPU and memory controller (e.g. 2196G).

Returned Micro SPUs includes CPU and memory controller (e.g. 2436G).

CPU board level products are not eligible for return credits (e.g. 2106CK).

*Refer to the HP1000 A-Series Ordering Guide Nov 1990 (p/n 5952-1745) for product definitions.*

## Memory Return Credits

The following return credit products may be ordered to return A400/A600+/A700 memory array cards\* for credit toward purchase of A900 memory. Part Number 121xxAN/BN/CN/DN provides credit towards the purchase of A900 memory cards of equal or greater capacity as part of an upgrade from an A400/A600+/A700 system to an A900 system. Currently we do not offer a return credit for the high-density memory array cards (12103K/L/M). We are investigating these return credits and will notify you as changes are made.

\* *Quantity limited to the maximum configuration of the returned computer. For example, if an A600+ was returned with four 12111B memory array cards and a 12221A 3Mb memory array card was purchased instead of the 12221B 8Mb memory array card, the customer would receive credit for only three returned 12111B memory array cards.*

<u>Product Returned</u>	<u>Order Upgrade Product #</u>	<u>Credit</u>
12103C 512kB Parity Card	12103CN	\$ 750
12103D 1MB Parity Card	12103DN	\$ 1250
12111A 512kB ECC Card	12111AN	\$ 1000
12111B 1MB ECC Card	12111BN	\$ 1250
12111C 2MB ECC Card	12111CN	\$ 2000
12220A 3/4MB ECC Card	12220AN	\$ 2000

## Software Upgrades

When a customer upgrades from an A400/A600+/A700 to an A900, they receive 100% credit (based on current U.S. List prices) for existing software toward the purchase of A900 software. 100% software upgrade credit means that the customer pays only the incremental difference between the level they are at now (A400/600+/A700) and the level to which they upgrade (A900). Special options are available under each software product to account for the 100% software upgrade credit. For example, FORTRAN 77 (92836A) has a U.S. List Price of \$1,607 for use with an A400 and \$4,820 for use with an A900. To upgrade FORTRAN 77 from an A400 to an A900, the customer must order 92836A option 894 which has a U.S. List Price of \$3213, the difference between the list price of the A900 FORTRAN 77 and the A400 FORTRAN 77.

## Sample Order

### Upgrade from A600+ (2156C) to A900 (2139B)

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
2139B		A900 20-slot box	\$ 22360
	0C1	Return credit for A600+	\$ -2500
12221A		3MB memory card	\$ 9000
12103DN		Credit for 1MB parity memory (\$-1250 ea.) *	\$ -3750
12222A		Connector	\$ 104
92077A	896	RTE-A upgrade from A600+	\$ 2142
92078A	896	VC+ upgrade from A600+	\$ 1605
92836A	896	FORTTRAN upgrade from A600+	\$ <u>1607</u>
		<b>Adjusted U.S. List Price</b>	<b>\$ 30568</b>

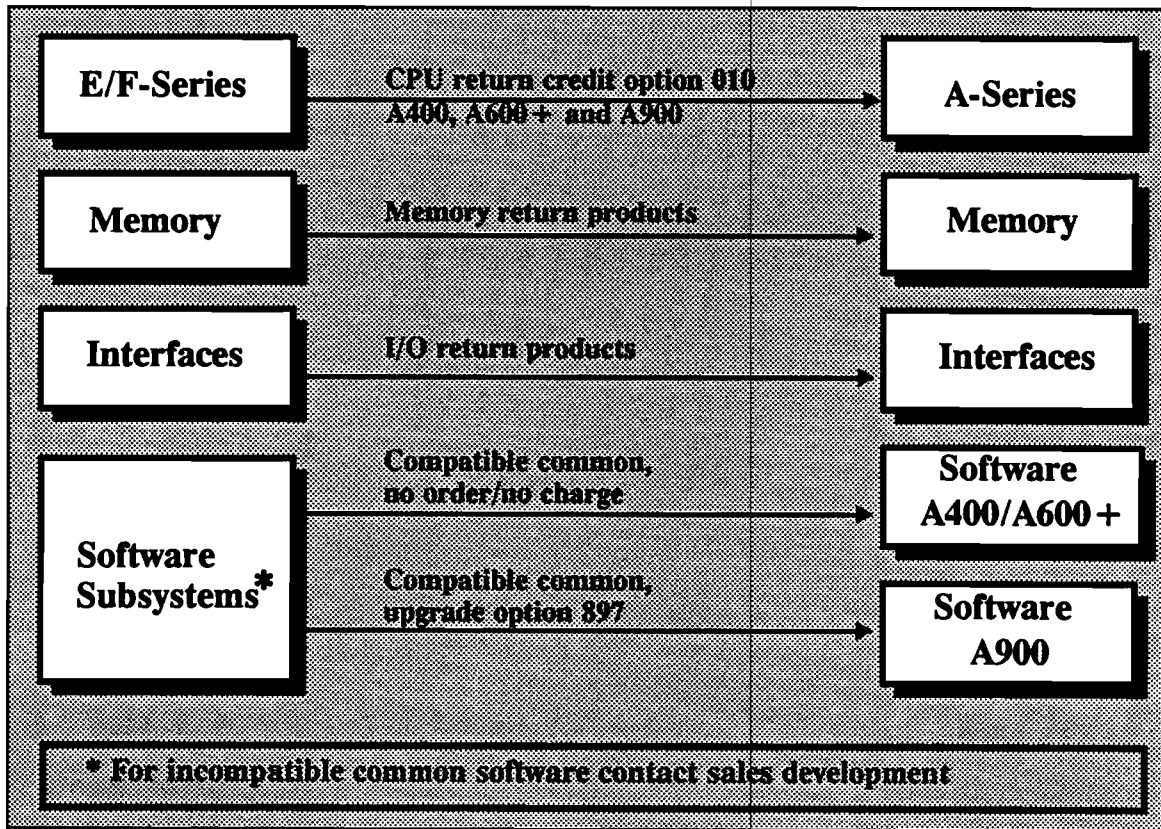
In comparison, the 2139B computer (A900), purchased with the above products, currently has a U.S List price of \$43,780. Therefore, by upgrading their existing 2156C as opposed to purchasing the 2139B computer in this example, the customer saves \$13,212. These calculations do not take into account any trade discounts.

Note: All of the customer's existing I/O cards can be used in the upgraded computer.

\* *Quantity limited to the maximum configuration of the returned computer. In this example, the A600+ was returned with three 12103D memory array cards.*

## C. E/F-Series to A-Series upgrades

The following outlines the process of upgrading an E/F-Series to an A400, A600+ or A900:



## CPU Upgrade Credits

Option 010 is a return credit for any E/F-Series computer or SPU towards the following A-Series computer or SPU:

<u>Order</u>	<u>Product #</u>	<u>with Option #</u>	<u>Credit</u>
A900's	2139B	010	\$2000
	2439B	010	\$2000
	2489B	010	\$2000
	2199E	010	\$2000
A600's	2196G	010	\$ 500
	2196H	010	\$ 500
A400's	2424A	010	\$ 200
	2434A	010	\$ 200
	2484B	010	\$ 200
	2134A	010	\$ 200

## Memory and I/O Return Credits

*All memory and interface returns must be on the same order as a computer upgrade. The number of returned memory arrays is limited to the maximum configuration of the returned computer. For example, if an E/F-Series was returned with four 12666H 1MB memory array cards and a single 12221A 3Mb memory array card was purchased instead of the 12221B 8Mb memory array card, the customer would receive credit for only three returned 12666H memory array cards. All I/O card returns are restricted to a one for one return credit.*

<u>Product Returned</u>	<u>Order Upgrade Product #</u>	<u>Credit</u>
12746H 64kB Memory Module	12746HN	\$ 100
12747H 128kB Memory Module	12747HN	\$ 250
12699H 256kB Memory Module	12699HN	\$ 350
12749H 512kB Memory Module	12749HN	\$ 750
12779H 256kB Ck Bit Array Bd	12779HN	\$ 100
12780H 512kB Ck Bit Array Bd	12780HN	\$ 250
12666H 1MB Ck Bit Array Bd	12666HN	\$ 400
12792A Multiplexer	12792AN	\$ 300
12792B Multiplexer	12792BN	\$ 300
12821A HP-IB	12821AN	\$ 75
12966A Async Card	12966AN	\$ 100

## Software Upgrades

There is no upgrade credit for migrating operating systems from RTE-6 to RTE-A. We recommend consideration of the system-level A-Series products, 2199E, 2489B, 2196G, 2196H, or 2484B, which include RTE-A.

When a customer upgrades from an E/F-Series to an A900, they receive 100% credit (based on current U.S. List prices) for existing software toward the purchase of A900 software. 100% software upgrade credit means that the customer pays only the incremental difference between the level they are at now (equivalent to an A700) and the level to which they upgrade (A900). Option 897 is available under each software product to account for the 100% software upgrade credit when moving from an E/F-Series to an A900 (option 897 is also used for A700 to A900 upgrades). This credit applies to subsystem software that is common between the RTE-6 environment and the RTE-A environment. There are two types of common software: compatible and incompatible.

**Compatible** common software upgrades are listed below and are orderable for HP 1000 A900 upgrades by ordering the product with Option 897. Customers upgrading to the HP 1000 A400 and A600+ do not need to order these products; since the customer has previously purchased this software at an equivalent level, they can port these from their old system to their new system at no charge.

<u>Description</u>	<u>Product #</u>	<u>For A900, order option #</u>
FORTRAN 77	92836A/R	897
Pascal	92833A/R	897
BASIC	92857A/R	897
Debug	92860A/R	897
IMAGE I	92069A/R	897
IMAGE II	92081A/R	897
DGL	92861A/R	897
AGP	92862A/R	897
DS	91750A/R	897
RJE	91781A/R	897

**Incompatible** common software are those products that have the same function in each environment, such as FORMS/1000, but have different product numbers. These subsystems will receive appropriate credits, licenses, manuals, and software on an individual basis. Contact your Sales Center Engineer for assistance with these software products.

## Sample Order

### **Upgrade from E/F to A900 (2199E)**

<u>Product #</u>	<u>Option #</u>	<u>Description</u>	<u>U.S List Price</u>
2199E		A900 System inc. RTE-A, VC+, HP-IB, installation	\$ 29450
	010	Credit for upgrade from E/F	\$ -2000
	061	S/W on 1600 bpi tape	\$ 0
12221A		3MB memory card	\$ 9000
12779HN		Credit for 256KB Memory for E/F (\$ -100 ea.) *	\$ -300
12222A		Connector	\$ 104
29431G		Cabinet	\$ 3600
12140D		MUX	\$ 2530
12792BN		Credit for E/F MUX*	\$ -300
92836A	897	FORTTRAN upgrade from E/F	\$ <u>1607</u>
		<b>Adjusted U.S. List Price</b>	<b>\$ 43691</b>

In comparison, the 2199E SPU (A900) purchased with the above products, currently has a U.S List price of \$49,504. Therefore, by upgrading their existing E/F-Series computer as opposed to purchasing the 2199E SPU in this example, the customer saves \$5,813. These calculations do not take into account any trade discounts.

\* *Quantity limited to the maximum configuration of the returned computer. In this example, the E/F-Series computer was returned with three 12779H memory array cards.*

## IV. Other Savings

Customers upgrading from the E/F-Series Computers to A-Series product line will be very pleased with the increased performance of the A-Series computers, access to state-of-the-art HP peripherals, and the excellent upgrade credits for their existing E/F-Series computers.

However, the benefits of upgrading to the A-Series product line will not end after the customers have upgraded their systems. The following direct and indirect savings cannot be overlooked when moving to the A-Series computers and state-of-the-art HP peripherals:

- The reduced footprint of the A-Series computer and state-of-the-art peripherals will save valuable space and, therefore, reduce the cost per square foot required to house the system.
- The lower power consumption of the A-Series computer and modern peripherals will save in energy costs and increase the reliability of the system.
- The reduced BTU output of the A-Series computer and state-of-the-art peripherals will lower cooling requirements and, again, decrease energy costs.
- The higher reliability of the A-Series computer and modern peripherals results in reduced down-time and lower cost of ownership of the system. The annual *next day response* (02C) support costs of a simple E-Series system is compared with an A-Series system with equivalent peripherals below:

<u>E-Series</u>		<u>A-Series</u>	
<u>Product Description</u>	<u>Annual Support Costs</u>	<u>Product Description</u>	<u>Annual Support Costs</u>
2178C E-Series	\$ 2136	2199E A900	\$ 984
12788H 2KB Memory	\$ 1308	12221A 3MB ECC	\$ 228
12792C 8 Channel Mux	\$ 132	12040D 8 Channel Mux	\$ 324
2624B Display terminal	\$ 216	2397A Graphics term	\$ 84
7933H 404MB disk	\$ 972	C2203A 670MB disk	\$ 240
2608A 400 LPM printer	\$ 1896	2564C 600 LPM printer	\$ 972
12821A HP-IB interface	<u>\$ 72</u>	HP-IB provided w/ 2199E	<u>n/a</u>
<b>Total Annual Support Cost</b>	<b>\$ 6732</b>	<b>Total Annual Support Cost</b>	<b>\$ 2837</b>

***Total Annual Savings of \$3895 in support costs alone!***

As illustrated above, the yearly savings are very significant for this small configuration. Therefore, one should not overlook all of the benefits associated with upgrading from the E/F-Series systems to the A-Series system. The most obvious benefits of moving to the A-Series product line are the increased performance, access to state-of-the-art HP peripherals, and the excellent upgrade credits for their existing E/F-Series computers. However, the hidden benefits are the years of savings from reduced floor space requirements, lower energy consumption, increased reliability, and reduced cost of ownership.





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