AM-30

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INTRODUCTION

The INFOTEK AM-30 Extended Memory System was developed specifi-
cally to extend the memory capacity of the Hewlett-Packard 9830A
Basic Language Programmable Calculator. The 16,096 word capacity
of the AM-30 greatly expands the applications of HP 9830A without
requiring changes in programs or interface with peripheral
equipment. All programs and diagnostics, whether basic, optional
ROM, or binary tape, will function identically with the AM-30.

Changing the HP 9830A memory system from 4K or 8K of memory to the
AM-30 16K memory is an extremely simple procedure. Two plug-in
circuit cards (three if machine has 8K of memory) are removed from
the HP 9830A and replaced with an AM-30 card which has the same
color coding and pin arrangement as the HP cards.

NOTE: The AM-30 memory board has to be placed in the slot closest
to the front of the calculator. When HP uses one slot it is
always the one closest to the back of the power supply.

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|                           CAUTION                               |
|                                                                 |
|                                                                 |
|    The INFOTEK and Hewlett-Packard memory systems               |
|    are not compatible and cannot be mixed.  Any attempt         |
|    to operate a mixed INFOTEK and Hewlett-Packard               |
|    memory systems may damage the memory circuit card            |
|    and the calculator.                                          |
|                                                                 |
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SPECIFICATIONS

AM-30 EXTENDED MEMORY SYSTEM

ADDRESS DECODER

INFOTEK Part Number	13468
Power Requirements	Supplied by calculator.
Dimensions	Compatible with Hewlett-Packard mainframe and the HP Memory Control Card.
Color Coding of Extractor Handles	Compatible with Hewlettt-Packard 9830A card slide colors and the M-Register extractor handles colors.
Plug Locations	Replaces the Hewlett-Packard M-Register card (09830-66582).

MEMORY

INFOTEK Part Number	13237-1
Memory Size	16K words (32K bytes)
Power Requirements	Supplied by calculator
Dimensions	Compatible with Hewlett-Packard mainframe and the Memory card.
Color Coding of Extractor Handles	Compatible with Hewlett-Packard 9830A card slide color for the Memory cards. NOTE: Memory slides in slot closest to front of calculator.
Plug Locations (Edge Connectors)	Replaces the Hewlett-Packard Memory cards Part No. 09830-69584 or 11275-69584.

HP Computer Museum
www.hpmuseum.net

IMPORTANT NOTICE

The first 200 Hewlett-Packard 9830's produced will not function with either the INFOTEK AM-30 or standard Hewlett-Packard Memory Systems without modification. These units are identified by serial numbers 1233A-00202 through 1233A-00300 inclusive. Unless these machines are upgraded to current configuration, they should contain a decal placard that is reproduced here for your convenience.*

<div style="border:1px solid">

CAUTION

This unit contains the original 9830A Memory configuration.

M-Register	09830-69522
T-Register	09830-69523
2K R/W Memory	98300-69524

It cannot be serviced with a standard Memory Configuration.

M-Register	09830-69582
T-Register	09830-69583
2K R/W Memory	09830-69584
4-K R/W Memory	11275-69584

To avoid extensive instrument damage, refer to Service Note 9830A-1 for serviceing instructions.

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GENERAL

Installation of the AM-30 Extended Memory system requires removal of two or three Hewlett-Packard plug-in circuit cards and replacing them with the AM-30 cards (table 1). The AM-30 circuit cards have the same color extractors and the edge connectors are keyed to fit the same sockets as the HP circuit cards.

NOTE: Memory board has to be placed in slot closest to front of calculator.

*Reference: Page 6-1, Hewlett-Packard Service Manual. Hewlett-Packard Part No. 9830-90030, dated April 1975.

Table 1.   Hewlett-Packard and INFOTEK Circuit Cards

Remove Hewlett-Packard:	Replace With:
M-Register Part No. 09830-69582	Address Decoder Part No. 13468
2K R/W Memory Part No. 09830-69584	16K Memory Part No. 13237
or	
4K R/W Memory Part No. 11275-69584	

REMOVAL OF HEWLETT-PACKARD CIRCUIT CARDS

1. Place input power switch to OFF.

2. Remove input power cord from wall outlet and power jack at the rear of the HP 9830A.

3. Lift thermal printer from the calculator (if so equipped) and place to one side.

4. Remove six screws from top cover of calculator with screwdriver supplied with the AM-30 (figure 1).

5. Slide top cover back about two-thirds of the way by using plastic handles at back of cover (figure 1).

6. Remove single screw that retains two crossed aluminum hold-down brackets (figure 2). Note location of brackets and how they are attached. Remove brackets.

NOTE

Figure 3 identifies the Hewlett-Packard circuit cards that are to be removed

7. Locate the M-Register circuit card in figure 3 and in the calculator. The circuit card is identified by a red handle on the left side and a gray handle on the right side.

8. Raise extractor handles and position as shown in figure 3. Press outward on both handles with even pressure (figure 4 and 5). The card will resist for the first $1/4$ inch of travel. Lift card from slot (figure 6) and place to one side.

9. Locate the Hewlett-Packard Memory circuit card in figure 3
    and on the calculator. The circuit card is identified by a
    yellow handle on the left side and a gray handle on the right
    side.

10. Remove the Memory circuit card using same procedure described
    in step (8). If a second Memory card is installed as shown
    in figure 3, remove in the same manner. This completes the
    removal of the Hewlett-Packard circuit cards.

INSTALLATION OF INFOTEK AM-30 CIRCUIT CARDS

1. Install the AM-30 Address Decoder circuit card, indentified by
    a red handle on the left side and a gray handle on the right
    side, in the slot vacated by the HP M-Register circuit card.
    The color of the guide in the calculator must match the color
    of the card handles.

    a. Position circuit card over card guide with component side
       of the card facing to the rear of the calculator. Confirm
       by matching guides and handle colors.

    b. Carefully lower circuit card down the guides and into con-
       nector well until contact is made.

    c. Apply even pressure with thumbs to the top of the handles
       to seat the circuit card in the connector. The card is
       fully seated when the top is approximately even with the
       circuit cards in front and in back.

2. Install AM-30 Memory Circuit card as follows:

    a. Install an AM-30 Memory Circuit Card, identified by a
       yellow handle on the left side and a gray handle on the
       right side, IN THE SLOT CLOSEST TO THE FRONT OF THE
       CALCULATOR. Use the same technique to install the
       Address Decoder card. Confirm that the colors of the
       handles match the color of the guides.

CAUTION

When power is first applied to the HP 9830A after
installation of the AM-30, watch for the lazy T
on the display. If it does not appear when the
ON/OFF switch is placed in the ON position, imme-
diately place switch to the OFF position and
refer to the Troubleshooting procedure.

PROGRAMMING

The AM-30 does not require modification of HP 9830A programs or peripheral interface. All programs which previously functioned with a smaller memory will function exactly as before, the only difference being that the memory available for additional program material will be commensurately larger.

DIAGNOSTICS

All Hewlett-Packard diagnostic tapes and binary tapes will load and function exactly as with Hewlett-Packard memory. The system diagnostic tape will function normally and will state the system operational status as though the system was operating with Hewlett-Packard memory.

TAKING ADVANTAGE OF LARGER MEMORY

The scope of practical applications of the HP-9830A has, of course, been very substantially broadened by the AM-30 Extended Memory System. The effective execution speed of programs can also be increased with the Extended Memory by restructuring programs such that cassette tape motion is held to an absolute minimum. The HP-9830A can do substantial work in the time it takes the tape transport to load or store information. For example, given sequential data access, the tape transport (averaging search time with data rate) has a throughput of approximately 40 words per second. Given a program requiring a data base of 6,000 words, the processor can access the required word stored in array, many thousands of times faster than the tape transport can access the same information by any possible combination of program and data file structure combinations.

The second opportunity for speeding execution arises from the fact that while the processor of the HP-9830A is serial, arithmetic functions are executed in 4-bit BCD. Programs which perform extensive calculations on array variables will run faster if the arrays are full-precision. Of course, the accuracy of the data will also increase.

HELPFUL TIPS

Now that there is more memory available, it may be convenient to merge a number of programs which have been previously linked to reduce tape motion. This will result in more efficient programs, as duplication of routines occasioned by the "piece-meal" operations is no longer necessary.
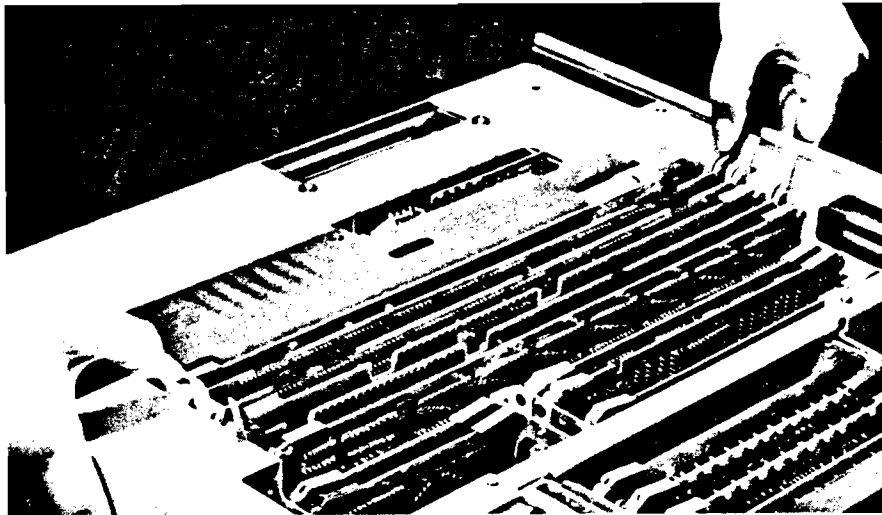
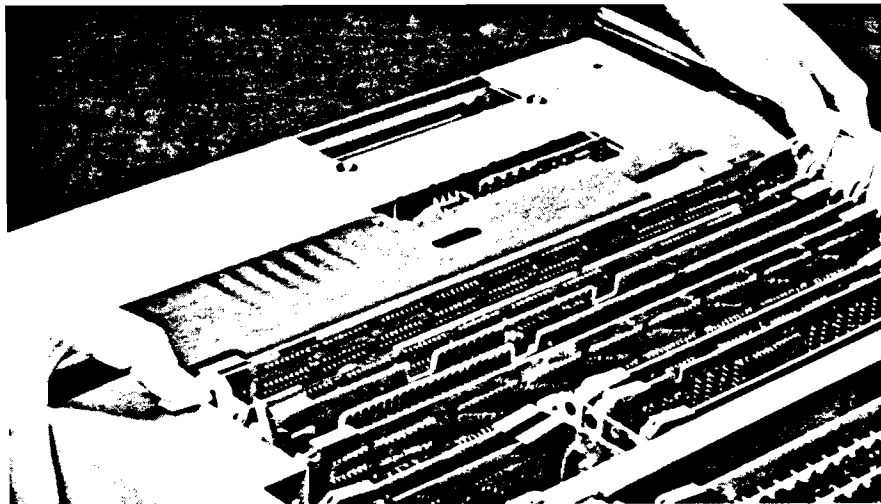**Figure 4.**
Applying Pressure to
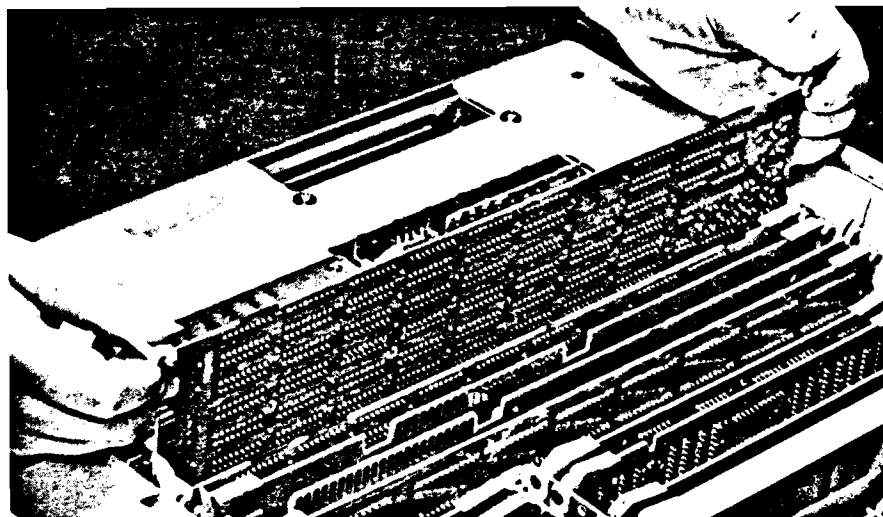**Extractor Handles**

Figure 5.
Circuit Card Raised
By Extractor Handles

Figure 6.
Removal of
Circuit Card