

**MPRO**

**3 November 1958**

**MPRO-4**

**Status Report of HARVEST as of 30 October 1958**

The attached report is made in answer to specific questions that were asked by Mr. Kirby in the Office Meeting of 24 October 1958. This report stresses the design and hardware aspects of the HARVEST project as far as MPRO-4 is concerned. MPRO-03 is making an overall operational status report.

**F. V. COSTANZA**  
Major, USMC  
Chief, MPRO-4

cc: MPRO-03  
MPRO-45

## HARVEST - STATUS REPORT - 30 OCTOBER 1958

### 1. What is the Phasing and Status of the project?

#### A. Phase I

**Basic Computer** - Detailed Engineering Studies, definitions of instructions, and routine paths of instructions are 40% complete. The Serial Arithmetic Unit is 20% complete. The Memory Bus, a synchronously controlled, time quantized (slot) switching system, is 20% complete.

**Basic Exchange** - The basic exchange is 100% complete. A continuous check-out of Memory, Switching Circuits and Logic cards is currently in progress.

**Operators Console** - This console is in the design stage. The selection and testing of components for the console has been completed.

**Inquiry Station** - Redesign of the inquiry station, necessitated by increased requirements, is 20% complete.

**Memories** - The Exchange Memory - a two dimensional memory (250 wds, 76 bits) is complete. Memory tests are being conducted continuously to test for reliability. The System and Logic Design of the Large Memory (16,384 wds, 72 bits) is complete. Four of ten panels have been wired completing 4070 words of memory. The small scale model of the High Speed Memory has been completed but has not been tested. It has been necessary to place the core drivers and some logical circuitry into the Freon refrigerator which will complicate maintenance.

**Maintenance Area** - The Event Recorder is under construction and is 25% complete. The general requirements of the maintenance Consoles have been completed. HARVEST Areas are being studied with emphasis on fault isolation, quality and accuracy. Present estimates indicate that there will be five maintenance consoles. Some functions of the maintenance consoles are ability to enter and execute any instruction at various

speeds, to load any register, to marginal test, to inject errors and evaluate error detection or error correction circuits, to load test programs, and to control the event recorder.

**B. PHASE II**

**HARVEST Addition**

**Stream Indexing** - The flow chart layout is 40% complete.

**Stream Processing** - The Detailed design of functional units has just begun.

**Table Reference Unit** - The logic of this unit has been completed and the design of the unit has been started.

**Program Control Area** - Automatic adjustments, Hybrid instructions and other micro-programming features have been decided upon and design has begun.

**Circuit Packaging** - The design of circuit packaging has been completed but the type of card to be used has not been settled upon. This is waiting approval of the components Standards group of IBM.

**Checking** - A new system for checking a parallel carry propagate adder for single errors has been designed.

**C. PHASE III**

**(TRACTOR)** - The overall design and construction of the TRACTOR system is 10% complete.

**2. When will HARVEST be delivered?**

The present delivery date is 1 October 1960. This is actually the shipping date from IBM.

**3. When will HARVEST be operational?**

It is expected to be operational by the end of 1960 after acceptance tests have been met. Contract Maintenance is to begin on the day of acceptance and continual for six months thereafter.

**4. When will rental equipment be released?**

This is to be determined by MPRO-03. Tentative plans are to discontinue

the ATLAS equipment first as the HARVEST equipments will occupy the ATLAS area. The ATLAS equipments should be discontinued approximately one month prior to the arrival of HARVEST. The rental equipments should be released some time after HARVEST is fully operational.

5. What is the personnel impact?

NPRO-4 will require about seventeen (17) billets for maintenance of HARVEST if our present maintenance functions are not reduced. The total HARVEST complex will require a total of 30 maintenance and engineering personnel. The remaining 13 men would be supplied by IBM under contract to maintain the peripheral equipment plus the TRACTOR system (less the electronic portion). The approximate contract cost would be \$370,000.00 per year. If all maintenance is to be under contract with IBM they will supply the 30 personnel. The approximate cost would be \$730,000.00 per year.

The above contract cost figures were based on IBM rates for contract maintenance listed in their catalog for present computing systems.

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