

Harvest (file)

MPRO-3

JPC

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THE FOLLOWING IS A VERY BRIEF INTRODUCTION TO THE SYSTEM MOST COMMONLY REFERRED TO AS HARVEST. IT IS MEANT TO GIVE SOME KNOWLEDGE TO THE READER SUCH THAT WHEN THE WORD HARVEST IS MENTIONED, "AWE" OR "BLANK EXPRESSIONS" ARE NOT PREDOMINATE AMONG THE LISTNERS. ALSO THE IDEA OF THE AUTHOR IS TO CONTINUE THESE PAPERS, BECOMING MORE DETAILED AS TIME GOES ON, SUCH THAT EVERYONE INTERESTED CAN ACQUIRE A MEANINGFUL KNOWLEDGE OF THE SYSTEM AND THUS PREPARE MPRO 4 FOR MAINTENANCE OF THE EQUIPMENT. CONTINUATION OF THESE PAPERS WILL DEPEND UPON THE COMMENTS AND INTEREST WHICH ARE HERE IN SOLICITED.

IT SHOULD BE REMEMBERED THAT THE MAJORITY OF THIS INFORMATION IS IBM COMPANY CONFIDENTIAL AND SHOULD BE TREATED AS SUCH. FOR THAT REASON AND OTHERS THE DOCUMENTS WILL BE MARKED AS SUCH AND IF AGENCY CLASSIFICATION APPLYS IT WILL BE SO INDICATED.

ALSO DOCUMENTS SHOULD NOT BE ACCEPTED AS BEING "FINAL FACT" OR BEING AN OFFICIAL STATEMENT OF FACT BY MPRO 4 OR THE AUTHOR. THE INFORMATION CONTAINED IS A RESULT OF CONVERSATION, DISCUSSION, MEMOS, AND TEXTS. THE CONVERSATION AND DISCUSSION INFORMATION IS INCLUDED ONLY AS A SOURCE OF INTEREST TO THE READERS (SEE COMMENTS SECTION).

COMMENTS ANYONE?

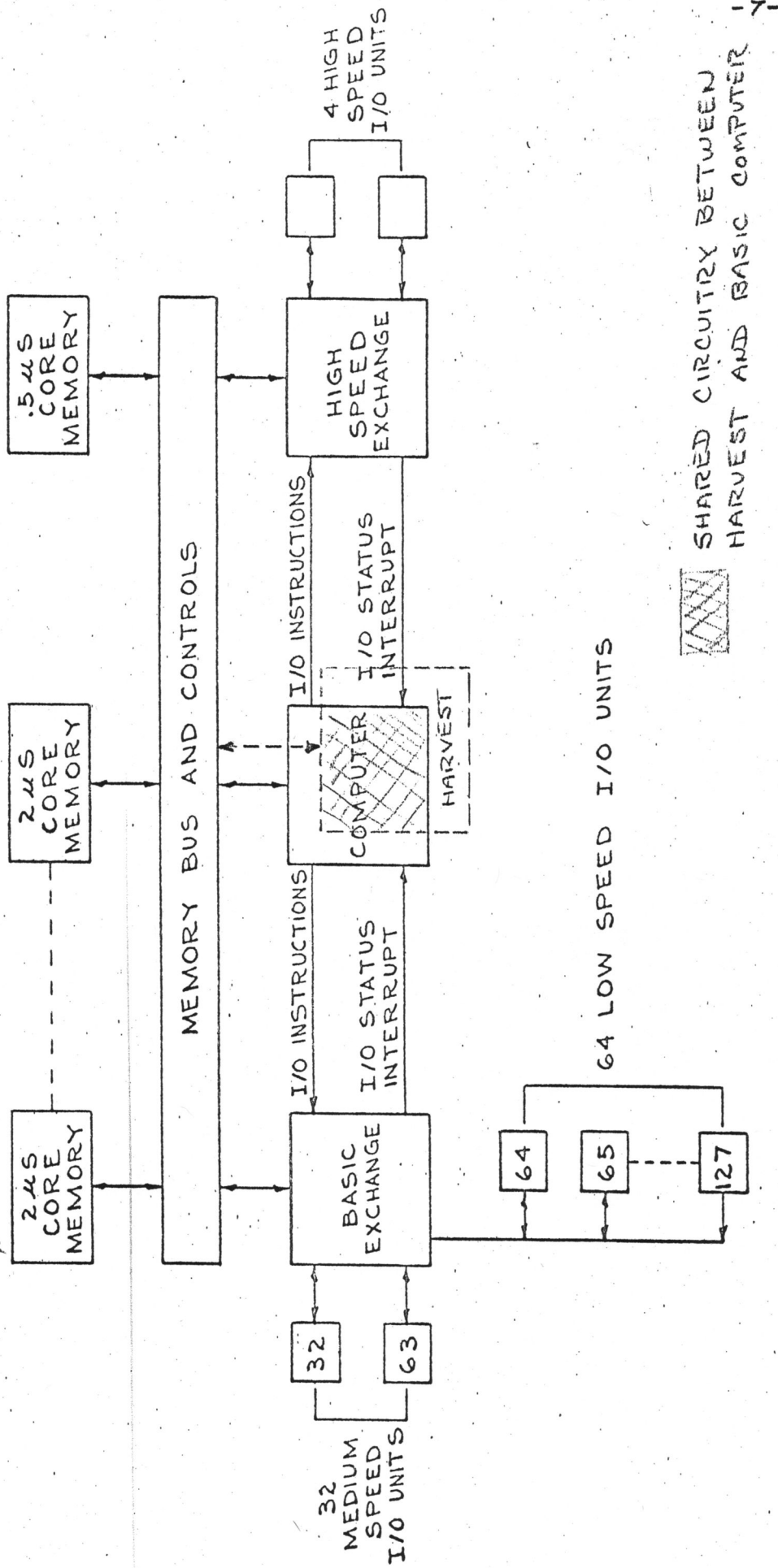


FIG. 1.1 COMPUTER SYSTEM

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COMPUTER SYSTEM INTRODUCTION

REFERRING TO FIG 1.1 A BLOCK DIAGRAM OF THE COMPUTER SYSTEM (COMMONLY REFERRED TO AS HARVEST) IS SHOWN.

THE SYSTEM WITHOUT THE HARVEST BLOCK IS A REPRESENTATION OF THE I.B.M. 7000 SERIES COMPUTERS SUCH AS THE ATOMIC ENERGY COMPUTER, THE COMPUTERS TO BE USED WITH THE "BALLASTIC MISSILE EARLY WARNING SYSTEM, ETC.

THE SYSTEM USES SOLID STATE COMPONENTS THROUGHOUT. PRIMARILY, DRIFT TRANSISTORS, ESPECIALLY DESIGNED FOR THE SYSTEM, ARE BEING USED. SOME OF THE SLOWER PERIPHERAL GEAR USES THE LOWER-SPEED ALLOY JUNCTION TRANSISTORS.

ONE OF THE OBJECTIVES IN DESIGNING THE SYSTEM WAS TO INCREASE THE OVERALL PERFORMANCE OF LARGE COMPUTING PROBLEMS OF THE ORDER OF 100 TIMES THE PERFORMANCE OF ITS PREDECESSORS. NEW COMPONENTS, HIGH DEGREE OF OVERLAP OPERATION, NEW INPUT-OUTPUT DEVICES, A POWERFUL INSTRUCTION SET, ETC ARE COMBINED TO MEET THIS OBJECTIVE.

THE MAIN MEMORY IS A COINCIDENT CURRENT CORE MEMORY WITH A READ-WRITE CYCLE OF 2 μ SEC. A MAIN MEMORY UNIT HAS A CAPACITY OF 16384 (2^{14}) WORDS AND A SYSTEM MAY HAVE 1, 2, 4, 8 OR 16 SUCH UNITS

OPTIONALLY THE SYSTEM MAY HAVE A FAST MEMORY, OF THE "3 HOLE CORE" TYPE, WITH A READ WRITE CYCLE OF .5 μ SEC. EACH FAST MEMORY UNIT HAS A CAPACITY OF 1024 (2^{10}) WORDS AND A SYSTEM MAY HAVE 0, 1, 2, OR 4 SUCH UNITS

SHOWN ON THE BLOCK DIAGRAM IS A BASIC EXCHANGE FOR HANDLING MEDIUM SPEED AND LOW SPEED INPUT-OUTPUT EQUIPMENT. THE INPUT-OUTPUT EQUIPMENT MAY CONSIST OF PUNCHED CARD READERS, AND PUNCHES, MEDIUM AND HIGH SPEED PRINTERS, MAGNETIC TAPES, OPERATORS CONSOLE, ETC. (AN IBM 727 MAGNETIC TAPE UNIT IS CONSIDERED AS A MEDIUM SPEED I/O UNIT).

THE BASIC EXCHANGE IS ACTUALLY A SMALL COMPUTER DESIGNED TO HANDLE 32 MEDIUM SPEED UNITS, AND 64 LOW SPEED UNITS, SEVERAL OF WHICH

CAN BE OPERATED AT ANY ONE TIME. THE BASIC EXCHANGE, WITH ITS OWN MEMORY CAN EXECUTE I/O INSTRUCTIONS WHILE THE BASIC COMPUTER "ROMPS" MERRILY ON ITS WAY.

THE HIGH SPEED EXCHANGE IS ALSO ESSENTIALLY A SMALL (?) COMPUTER DESIGNED TO HANDLE A HIGH SPEED MAGNETIC TAPE SYSTEM COMMONLY REFERRED TO AS TRACTOR. THE HIGH SPEED EXCHANGE IS VERY SIMILAR TO THE BASIC EXCHANGE. FOUR HIGH SPEED TAPE UNITS ARE SERVICED BY THE EXCHANGE.

TRACTOR HAS THE ABILITY TO SELECT, UNDER PROGRAM CONTROL ANY OF A NUMBER OF MAGNETIC TAPE ~~OR~~ REELS, ~~ED~~ FETCH THEM FROM A STORAGE UNIT, LOAD THEM (AUTOMATICALLY) ON THE TAPE TRANSPORT, AFTER PROCESSING, UNLOAD THE REELS AND STORE THEM IN THE PROPER PLACE IN A STORAGE UNIT. THE SPEED OF DATA FLOW TO OR FROM THE TRACTOR TAPE UNITS IS APPROXIMATELY 100 TIMES FASTER THAN THE IBM 727 TAPE UNITS.

REFERRING TO FIG 1.1 THE BASIC COMPUTER AND THE HARVEST COMPUTER ARE SHOWN OVER LAPPING, EVEN THOUGH THEY ARE TWO DISTINCT COMPUTERS, THEY SHARE CIRCUITRY AND REGISTERS (ECONOMIC REASONS) AND OBVIOUSLY CANNOT BE OPERATED SIMULTANEOUSLY. THE ~~INFORMATION~~ BASIC COMPUTER HAS ALL THE FEATURES OF PRESENT COMPUTERS PLUS. ARITHMETIC AND LOGICAL OPERATIONS, INDEX ARITHMETIC, LOOK AHEAD FEATURES, ETC. THE LOOK AHEAD INSTRUCTION HAS THE ABILITY OF PREPARING AND/OR EXECUTING 5 INSTRUCTIONS AHEAD OF AN INSTRUCTION CURRENTLY UNDER PROCESSING. A MORE DETAILED EXPLANATION OF THE BASIC COMPUTER WILL FOLLOW AT A LATER DATE.

THE HARVEST COMPUTER IS BASICALLY A "PLUGGABLE" COMPUTER, BUT THE "PLUGGING" IS UNDER PROGRAM CONTROL. THE PROGRAMMER CAN, SO TO SPEAK, WIRE THE MACHINE IN ONE OF SEVERAL DIFFERENT WAYS, BY ~~SEA~~ CAREFUL SELECTION OF INSTRUCTIONS AND ^{THE} CONTROL BITS OF THESE INSTRUCTIONS. INFORMATION IN THE HARVEST COMPUTER "FLOWS" DOWN A STREAM OR PIPE LINE FOR PROCESSING. UP STREAM ADJUSTMENTS CAN BE MADE, A TABLE EXTRACT UNIT IS AVAILABLE AND MANY OTHER FEATURE SUCH AS AUTOMATIC INDEXING, ETC. ARE AVAILABLE TO THE PROGRAMMER.

A MORE DETAILED EXPLANATION OF THE HARVEST COMPUTER WILL ALSO BE PRESENTED AT A LATER DATE.

A MEMORY BUS IS THE LINK BETWEEN ALL THE UNITS BRIEFLY MENTIONED. (SEE COMMENTS FOR ADDITIONAL INFORMATION.)

THE WORD SIZE, BASICALLY, IS 72 BINARY BITS, 64 INFORMATION BITS AND 8 ECC BITS. THE 8 ECC BITS GIVE THE COMPUTER THE POWER ^{OF} TO DOUBLE ERROR DETECTION AND SINGLE ERROR CORRECTION (AUTOMATICALLY)

COMMENTS: THE MEMORY BUS IS NOT FIRM IN DESIGN AT THIS DATE AS A "CYCLE" IN THE 7000 SERIES SYSTEM IS 200 MILLIMICROSECONDS AND A CYCLE IN THE HARVEST COMPUTER IS APPROXIMATELY 250 MILLIMICROSECONDS. TENTATIVE PLANNING IS TO DESIGN A HARVEST "BOOSTER" BUS FOR CONNECTING HARVEST TO THE SYSTEM.

THE AEC COMPUTER DOES NOT HAVE THE HARVEST COMPUTER INCORPORATED IN ^{THEIR} ~~THE~~ SYSTEM. THE AEC IS INTERESTED(?) IN A HIGH SPEED MEMORY BUT THE AGENCY REQUIRES IT TO ENJOY THE FULL BENEFIT OF THE HARVEST COMPUTER. SOME DIFFICULTY HAS BEEN ENCOUNTERED IN DESIGNING THE HIGH SPEED MEMORY BUT ALL INDICATIONS ARE THAT THE MAJOR PROBLEMS HAVE BEEN OVERCOME