DATA MANAGEMENT AT AAVSO HEADQUARTERS

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Abstract

The acquisition at AAVSO Headquarters of in-house Ithaca Intersystems microcomputers, as well as graphics hardware, has led to some significant changes in the manner in which incoming observations are processed and prepared for publication. Current data management procedures are discussed.

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The history of data management at the AAVSO has been summarized by Hill (1977). He described the AAVSO's computerized management of data from 1967, when the first IBM cards were introduced at Headquarters, to 1977. The data management procedures described by him in 1977 as current remained essentially unchanged until December of 1981, when in-house microcomputers were acquired by the AAVSO. Since then, significant changes have been made in the method of processing and preparing for publication incoming observations.

The single most significant change in data management is in the temporary recording medium, from punched cards to diskettes. Savings in space and improvement in efficiency as a result of this change cannot be overestimated.

The size of the monthly data base - 15,000 to 20,000 observations are received at AAVSO Headquarters each month - exceeds the memory capacity of our computers, so we must rely on the computers of the Computation Facility of the Harvard-Smithsonian Center for Astrophysics (CFA) in Cambridge for large data processing projects. Also, the AAVSO uses magnetic tape as the permanent storage medium for its data, but there are no tape drives at Headquarters. Therefore, access to our machine-readable data archives requires the CFA's computers.

At the end of the month, incoming observations are sorted by observer and are checked by eye for apparent clerical errors. Utilizing customized software, observations are entered onto diskettes using the Ithaca Intersystems microcomputers at Headquarters and are verified for entry errors. The CP/M-formatted diskettes are then converted to a DEC-compatible format, and are read onto the hard disk of the DEC PDP 11/60 at the CFA. These files are transferred from the CFA's PDP 11/60 to its DEC VAX 11/780. In a computerized, two-step process, the observations are first checked against a list of AAVSO program stars for discrepancies, and are then sorted by star and Julian date. The processed observations are copied onto magnetic tape. The unprocessed "raw" observations are also copied onto magnetic tape to insure future accessibility. Observations rejected by the computer programs are evaluated individually, and are inserted into the archives when indicated. Figure 1 is a graphic representation of the monthly data processing procedure.

Monthly files of observations are periodically merged together in order of star and Julian date, and these data for each star are added to our machine-readable archival files.

When data covering a specific time period are to be prepared for publication, pertinent observations are extracted from the archival files, transferred to the PDP 11/60, copied onto diskettes, and brought

to AAVSO Headquarters, where they are converted into a CP/M-compatible format. Using on-screen editing and graphics software, the observations are examined, conservatively edited where necessary, and plotted in a camera-ready format. The edited files are converted back to a DEC-compatible format, read onto disk via the PDP 11/60 and VAX 11/780, and copied to magnetic tape for permanent storage. Figure 2 is a graphic representation of the procedure for preparing data for publication.

Future ideas on data management include the acquisition of hard disks and a modem for the Ithaca microcomputers. The ideal data management environment for the AAVSO would include, in addition to microcomputers, at least one minicomputer with hard disks, diskette drives, tape drives, modems, a digitizer, full graphics peripherals, and line- and letter-quality printers. Present financial, staff, and floor-space limitations, however, relegate the realization of this ideal to the somewhat distant future.

REFERENCE

Hill, R. S. 1977, Journ. Amer. Assoc. Var. Star Obs. 6, 12.

Author's Note: Three significant changes in data management procedures have occurred during 1984. The first is a change in hardware: the CFA added diskette readers to the VAX 11/780 and removed the DEC PDP 11/60 entirely. This change in hardware allows us to read DEC-formatted diskettes directly onto hard disk on the VAX, and vice versa, thus simplifying the data flow considerably.

The second change is one of procedure: before the computer-processed monthly observations are added to the archives, they are checked by eye and corrected, where necessary, so that future archival corrections are minimized.

The third change is one of software: Charles M. Jones, an M.I.T. student working part-time for AAVSO as a programmer, converted from DEC format and elaborated on one of our data-editing programs, with the result that first-pass editing on data of all types of variable stars can now be done on the Headquarters computers. This added flexibility in our data-editing procedures is expected to significantly reduce the amount of time required to edit variable star data.

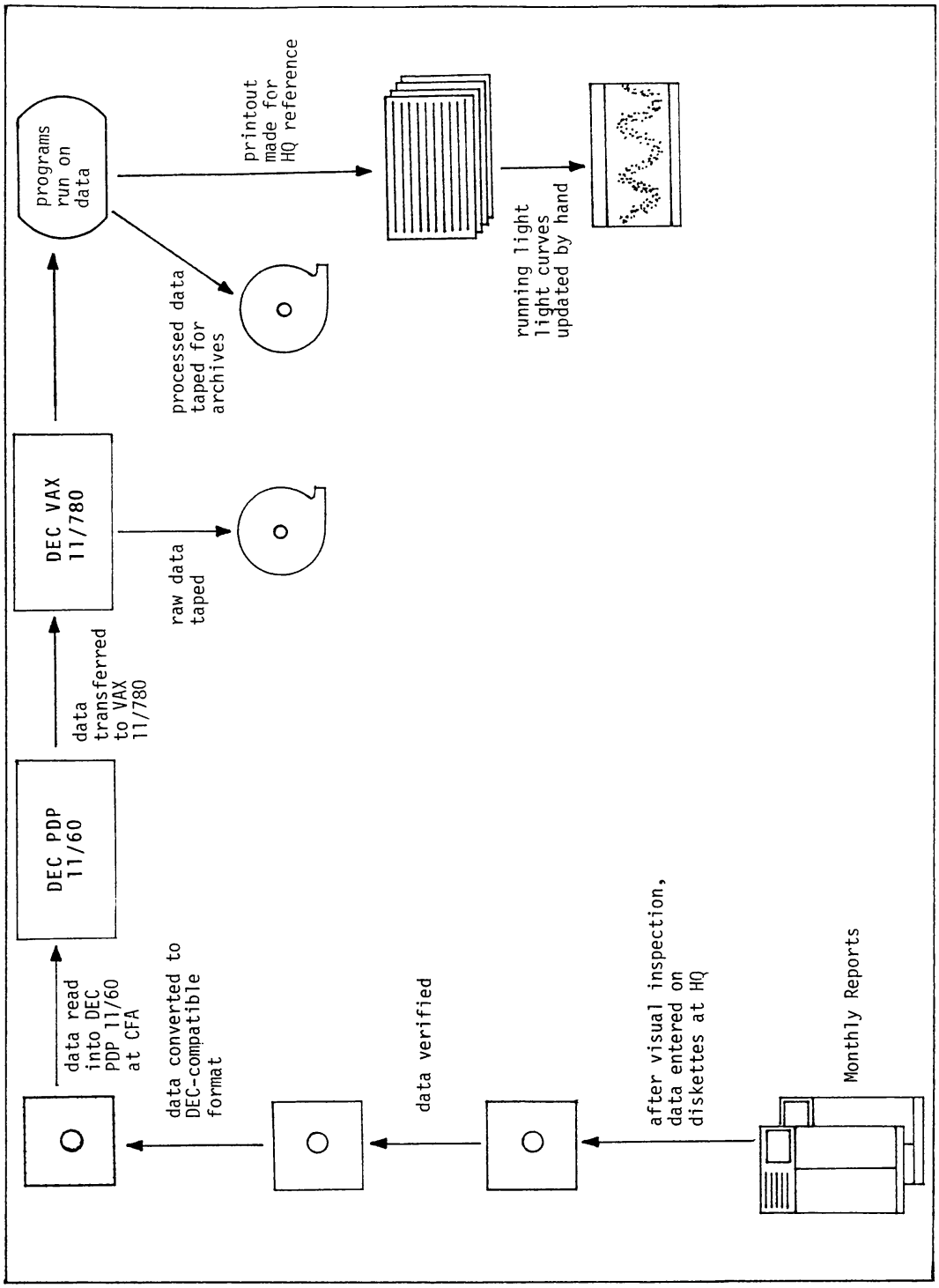

Figure 1. Graphic representation of the monthly processing procedure used on AAVSO incoming observations.

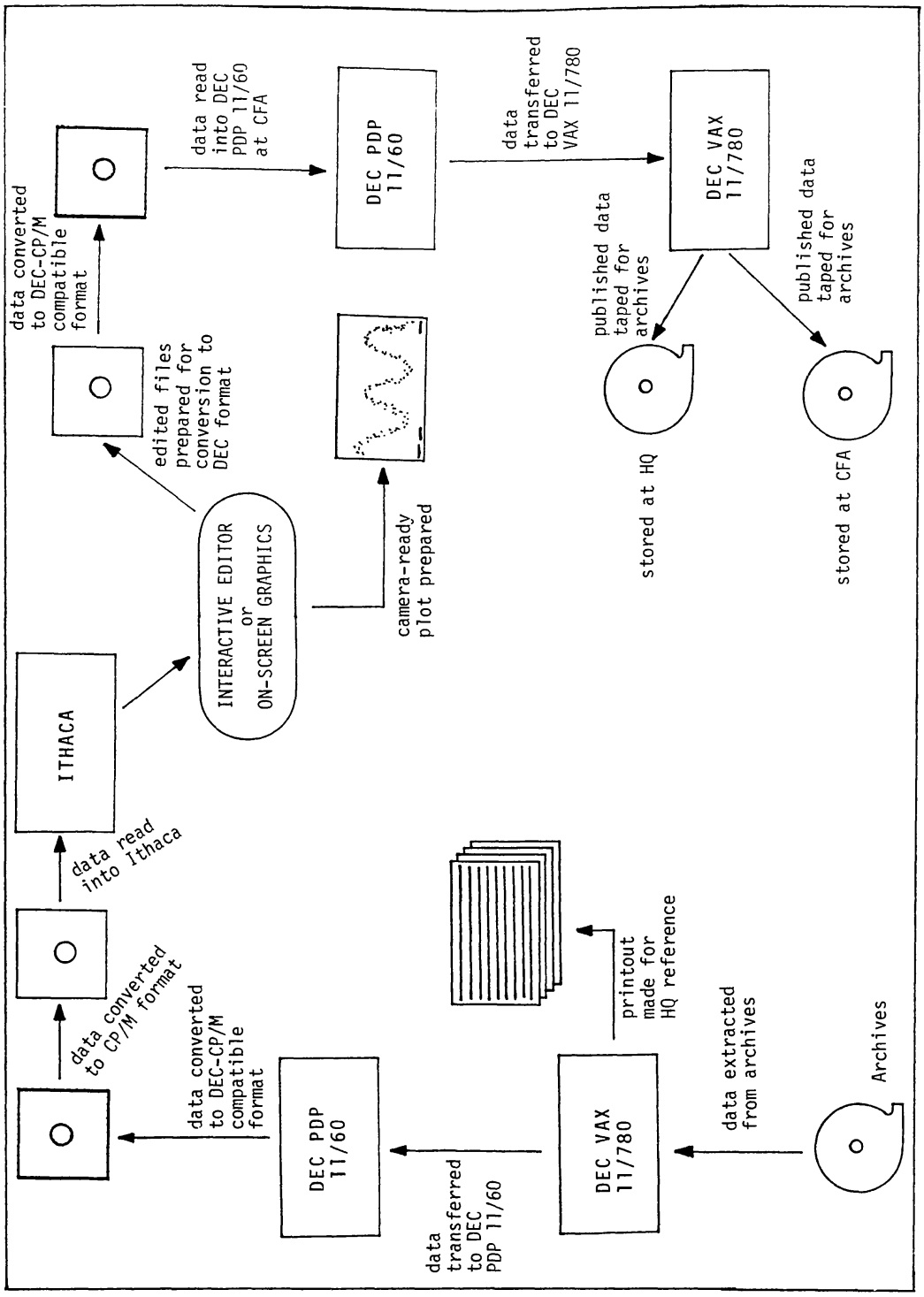

Figure 2. Graphic representation of the procedure used for preparing AAVSO data for publication.