



# An Overview of the AAVSO's IT Infrastructure: 1967-1997

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We trace the history and usage of computers and data processing equipment at the AAVSO HQ from its beginnings in 1967 to 1997. We focus on equipment, people, and the purpose to which such computational power was put. We examine how, as technology evolved, the AAVSO evolved its use of computing and data processing resources in order to further its mission.

## Timeline

### With a Little Help From Our Friends: The CfA Years

**1967** - Computer processing starts for the AAVSO using Harvard-Smithsonian Center for Astrophysics (CfA) facilities to put data on IBM punch cards. (Keypunching done at HQ.) Dr. Owen Gingerich & Barbara Welther at CfA give critical support in both the 60s and 70s donating time & programming on CfA computers.

**1972** - Charles Scovil makes arrangement with Darien High School to use its key punch machine in off hours. With that help, the HQ staff is working on keypunching incoming observations and working on starting work on reports from 1911 and later.

**1973** - The AAVSO membership list information is now put on IBM punch cards. The main data processing thrust at this point is using keypunched data in preparing the Reports. At this point *Report 30* is being compiled. The published data for *Reports 28 & 29* - 130k observations - are being put into four copies of magnetic tape.

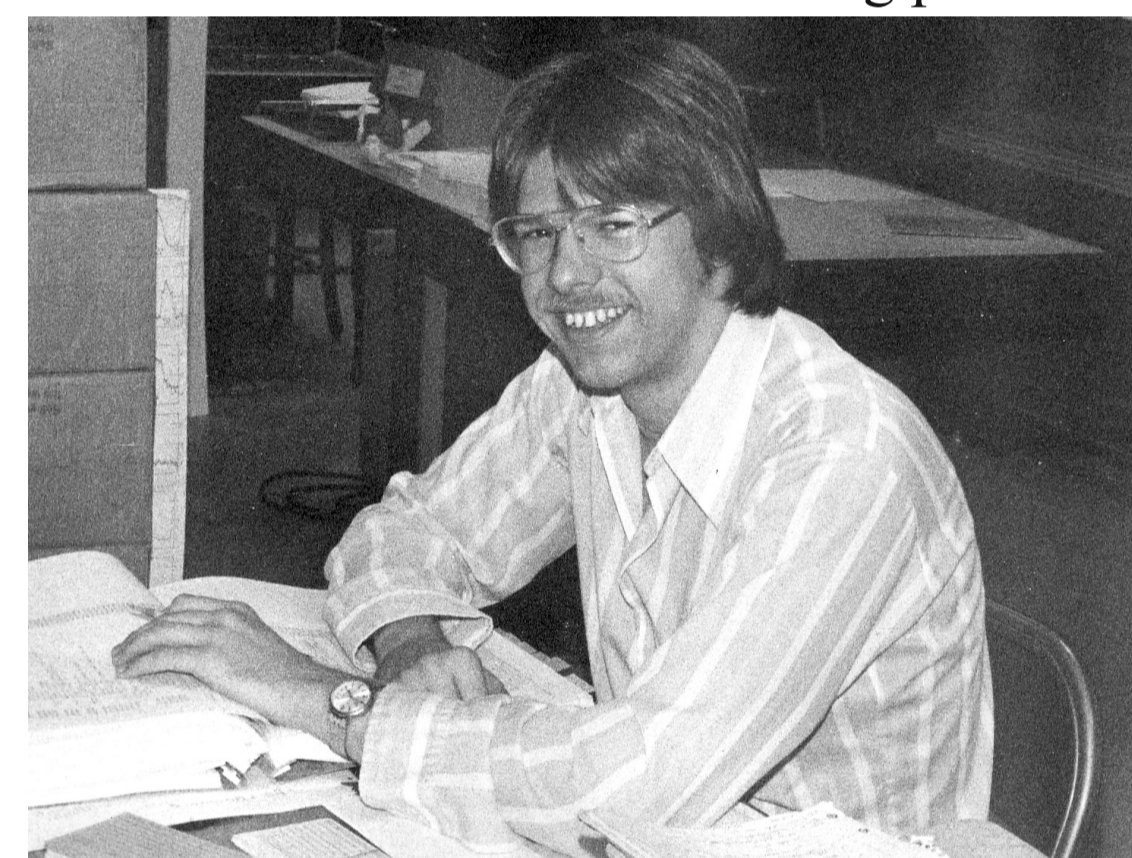


Fig 2: Richard Strazdas, one of the first AAVSO programmers.

**1975** - MIT student Richard Strazdas develops, based on an existing program, a method whereby light curves are obtained as density curves in which the numbers of observations at specific magnitudes are printed at each date. The program then plots the light curve. This allows the study of plots and the detection of anomalous observations.

Observational data from 1960 to May 1968 is processed. June 1968-November 1974 is not processed or must be reprocessed due to error. This becomes known as "The Gap."

Membership database and mailing labels have been computerized for mailings which are done using CfA computers & printers.

**1978** - All data & programs are converted to DEC VAX computer in use at CfA. The CfA CDC 6500 computer is upgraded to VAX 11/780. The PDP 11/60 is still in use as a data reader. Richard Strazdas does a good portion of the program conversion between the CDC 6500 and the VAX 11/780.

**1979** - All data from 1960, sorted by star and date, is now on magnetic tape and machine readable. E. Waagen becomes responsible for data management & processing at this time.

**1980** - The "Gap Data" is finally processed. The AAVSO starts to computerize data from 1911 to 1960. This is a multi-year project. HQ is taken over by punch cards and it is determined that something needs to be done with their storage. Research is done to allow AAVSO to buy its own computer system using 8" floppy diskettes as storage media. An in-house system needed to maintain rate of data publication. The system needs to have a graphics terminal, plotter, & printers and be compatible with the DEC VAX of CfA.



Fig 1: E. Waagen with stored AAVSO IBM punchcards.



Fig 3: Cardpunches in use at Concord Ave, early 70s.

### The Transitional Decade



Fig 4: The AAVSO's first computer system. The 584K RAM Ithaca Intersystem CP/M machine

**1981** - Via the Charles M. Townes Fund, the AAVSO buys two Ithaca Intersystems microcomputers with the CP/M OS. One is a single-user system comprised of a computer, terminal, graphics terminal & plotter which is used to plot data on screen, check, edit, and plot the data to paper. The other is a multi-user system with three terminals, two for data entry, and one for word processing for *JAAVSO*, correspondence, mailing list, and other office work.

Incoming observations are now keyed onto 8" diskettes and processed using the CfA VAX.

**1982** - Theodore Wales bought a terminal and a pair of disk drives for the new HQ computer system. The monthly inflow of observations attains the 15-20k level - too big for Intersystem to handle. This data is still processed at CfA.

**1984** - The CfA decommissions the PDP 11/60. Disk readers are put on the VAX, allowing AAVSO data to be read in directly. MIT student Charles Jones writes a data editing program for the Intersystems computer allowing editing to be done in-house.

A Computer Workshop held by AAVSO as part of the 73rd Spring Meeting.

**1985** - 25% of archival data from 1911 to 1960 is transcribed to tape. Computers are being used to produce the *AAVSO Monographs*.

**1986** - The AAVSO moves to Birch St. It begins exploring the possibility of observers submitting data on diskettes or via modem. There is a near complete turnover in AAVSO data processing and programming staff. Waagen remains responsible for data management & processing.

**1987** - A new IBM PC connects AAVSO HQ with the DEC VAX at CfA via modem. The PC has a 40MB HD. The Kenilworth Fund buys HQ a laser printer and scanner for the PC clone.

**1988** - Observers increasingly submit data using diskettes and email. Observations are reformatted to the proper data format using in-house software. The AAVSO hosts workshop on Computers and Variable Star Research.

**1989** - The first *JAAVSO* articles detailing computer use in amateur variable star observation and research begin appearing. VAX FORTRAN programs are re-written to run on PC Clone. Data processing is now done at HQ, not CfA, but CfA still used for tape storage. AAVSO researches large data storage solution to bring all data stored at the CfA in-house. AAVSO begins supporting the HIPPARCOS data mission.

The Archive project 77% done.

Grant Foster writes a new light curve plotting program making scale compatible with existing light curves.

### On Our Own: The AAVSO Years



Figure 5: Grant Foster, AAVSO Programmer and Systems Administrator in the early 90s.

**1990** - Hard drives added to bring in-house storage to a total of 600MB. All data from the CfA - 4.5M observations from 1960 onward - is brought in-house, and is now stored on magnetic cartridge tapes.

**1991** - NASA grants provide a terminal or stand-alone computer system (IBM clone 286, 386, 486) for each staff member (10 in total). All workstations are networked via LANtastic LAN to the main computer for file access. First reported data problem: bad sectors on a disk causes a data loss that needs to be recovered.

Archive data project 97% done.

**1992** - Programs written by Grant Foster to plot light curves on-screen for any star, expand any portion of the light curve, identify observations of observers on the light curve, evaluate an observation and change its status.

AAVSO is now putting data on CompuServe.

**1993** - The Archive data project completed. Now it has to be processed!

The plan is to have this done in three years.

A Dunham Grant adds 1.8GB of storage to the main computer system, bringing its total to 2.4GB.

The AAVSO now switches its focus somewhat to writing programs to analyze data that has been and is being archived.

**1994** - The first Pentium computer and CD-ROM reader is purchased for HQ via NASA HIPPARCOS grant.

**1995** - The AAVSO is put on the World Wide Web! Bill Mackiewicz becomes first AAVSO Webmaster. The FTP site is also created. Internet services being run on PC Clone running Linux.

**1996** - Two Pentium computers are added to HQ. 114 charts placed on FTP site. Website visited ~228 times/day.

**1997** - *News Flash*, *Circular* and *Alert Notices* now being distributed via the Web site. 483 visits/day. FTP site has 2179 files downloaded/month. Database is archived on ZIP disks. 50% of monthly reports come in electronically, up from 32% last year. Archival processing completed. WWZ, a wavelet analysis program, is written by Grant Foster. All workstations running W95 and upgraded to 486 or Pentium. Vandal breaks into Linux server. Web site named one of best education-related sites on the web.

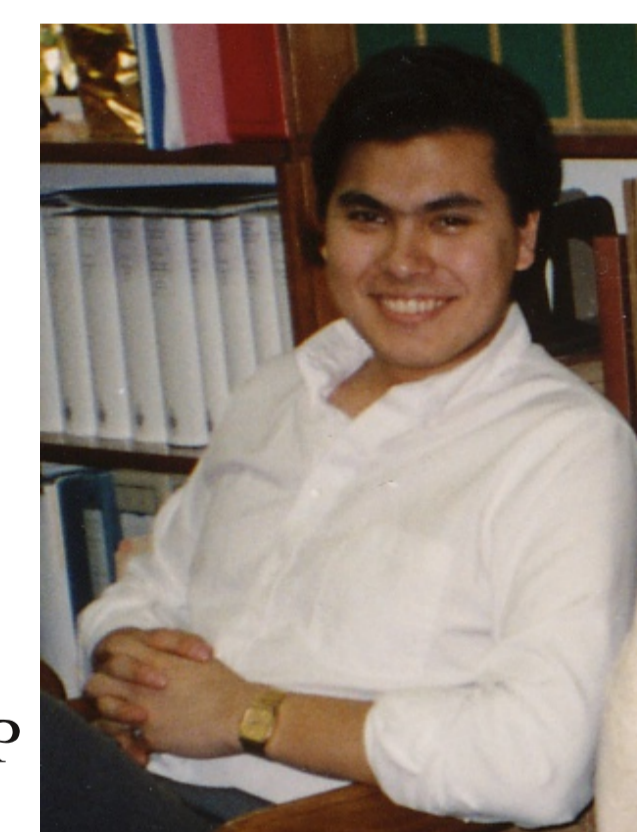


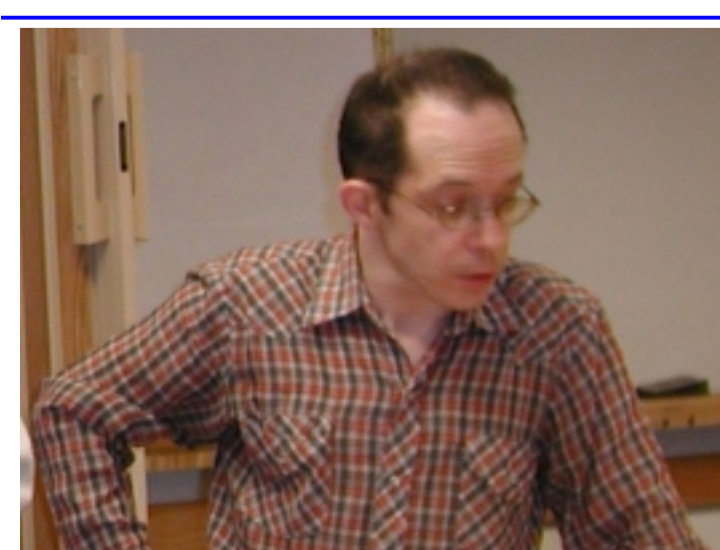
Figure 6: Bill Mackiewicz, AAVSO's first webmaster in the mid-90s

### Future Work

Work presented in this poster will be submitted to the *JAAVSO*. Work will continue in the next year bringing this history from 1997 to the present day. This will comprise the next poster and paper for the *JAAVSO* as well.

### References

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