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# EVLA Data Processing PDR

## E2E Data Archive System

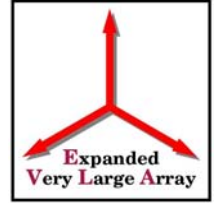
*John Benson, NRAO*

July 18, 2002

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# Overall Goals



- 
- Archive all astronomy data from all NRAO telescopes
    - EVLA, GBT, VLA, VLBA
    - Raw telescope data, calibration and ancillary data
    - Primary archive storage sites : GB, VLA or AOC
    - Mirror sites : CV, NCSA, (NMT)
  - Archive data products
    - Calibrated data and reference images produced by AIPS++ image pipeline
    - Surveys and catalogs
  - Improve access to archive data
    - NRAO web-sites, NVO access : support downloading data
    - Support mining scientific and technical data



# Development Cycle I



- Archive Storage Media
  - Acquired hard disk array (Storage Area Network) – AOC server room
  - Currently 2 TB - upgrade to 4 TB soon
  - IBM x370 – 4 processor – Linux : pipeline and disk array server
- Loading Archive Data
  - Copying VLA Export format files from archive tape library, in descending time order
  - Copying new tapes as they arrive from VLA
  - 80 library tapes copied, ~ 900 ModComp tapes
  - Will hire new part-time employee to load tapes



# Development Cycle I



- Loading Archive Data (Cont.)
  - VLBA : correlator operators will begin loading new tapes and library tapes as their time permits
  - GBT : a few GBT FITS files for testing and development
  - Surveys loaded (image files) :
    - NVSS
    - VLBA Calibrator Survey
    - FIRST



# Development Cycle I



- Archive Catalog Tables
  - Loads *entirely* from meta-data in the archive data files.
  - Uses existing AIPS++ fillers to build Measurement Sets and AIPS++ image files, retrieve meta-data from the AIPS++ MS and images.
    - VLA Export format files,
    - VLBA FITS files
    - GBT FITS files
    - AIPS FITS files (uv data and images).
    - EVLA Measurement Sets
  - Catalog tables are AIPS++/Glish tables.
    - Allows the AIPS++ image pipeline easy access to the catalogs
    - Glish has a nice tables toolkit
    - Table indexing for speed.



# Development Cycle I



- User Interfaces to Catalog Tables
  - Web-pages : HTML pages supporting queries through familiar forms
  - Web-pages : query reply lists
    - By observing projects
    - By observing scans
    - By archive data files
    - Lists of images
  - Web-pages – pl cgi – Boyd's chrome pipe – Glish query server - TaQL
  - Copy data selected by query to ftp accessible location
  - Rudimentary response to NVO URL cone-search queries
- Manual Mode Access
  - Sensible directory hierarchy, archive file links by project



# Development Cycle II



- Complete loading of the VLA Archive
- Mirror site(s).
- Turn our attention to the GBT.
- Continue loading VLBA Archive.
- Begin loading/cataloging various calibration data.
- Advance catalogs and queries :
  - User authentication, data propriety protections
  - Support ftp downloads by outside users
  - Design generalized query-tool for scientific mining
  - Source-type tags : solar system bodies
  - Deliver XML VO tables in reply to NVO cone search queries



# Development Cycle II



- Specific EVLA Goals :
  - Accept EVLA M&C monitor data – target date Q1 2003
    - Storage
    - Cataloging
    - Display
  - Accept EVLA Correlator simulator output (MS)– target date 2003
    - Display



**Netscape: NRAO Data Archive System**

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Bookmarks Location: [http://bernoulli.aoc.nrao.edu/E2E/jmbtest/summaries/proj\\_AH784.html](http://bernoulli.aoc.nrao.edu/E2E/jmbtest/summaries/proj_AH784.html)

Members WebMail Connections BizJournal SmartUpdate Mktplace

**NRAO Archi**

Version : e2equery.g v

You are here : [Main](#)

You submitted the fol

Archive Catalog :

QUERY\_MODE = Brov

SORT\_PARM = Progr

SORT\_ORDER = Asc

SUBMIT = Submit C

QUERYTYPE = PROJE

USER\_ID = 1234

QUERY\_ID = 9999

CATALOG = NRAO/MS

TIMERANGE1 = 1may

TIMERANGE2 = 15ju

N Rows Found : 8

Project.....Proj

[AA270](#) 2002

[AB1031](#) 2002

[AB950](#) 2002

[AC648](#) 2002

[AF387](#) 2002

[AH784](#) 2002

[AP441](#) 2002

[AR478](#) 2002

Please direct feedback and/or ques search engine to [NRAO DAS contact](#)

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**Netscape: E2E ARCHIVE DB PROJECT SUMMARY**

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Bookmarks Location: [http://bernoulli.aoc.nrao.edu/E2E/jmbtest/summaries/proj\\_AH784.html](http://bernoulli.aoc.nrao.edu/E2E/jmbtest/summaries/proj_AH784.html)

Members WebMail Connections BizJournal SmartUpdate Mktplace

**NRAO Data Archive - Project Summary -(AH784)**

Archive Catalog : /home/archive/e2e/archive/catalogs/NRAO/MSCATALOG3

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project : AH784 observer name : Gross, Carl

telescope : VLA telescope\_config : AB

observing bands : 4

observing bands : P

time range : 25-May-2002 23:28:24 GMT - 26-May-2002 07:55:38 GMT

total time on source (hrs) : 7.8000

project segments : 1

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number of observing scans : 28

number of archived files : 7

... archive file : data/VLA/tapes/XH02062/file\_1

... archive file : data/VLA/tapes/XH02061/file\_10

... archive file : data/VLA/tapes/XH02061/file\_11

... archive file : data/VLA/tapes/XH02061/file\_12

... archive file : data/VLA/tapes/XH02061/file\_7

... archive file : data/VLA/tapes/XH02061/file\_8

... archive file : data/VLA/tapes/XH02061/file\_9

number of spectral windows : 14

... obs\_freq, bandwidth : 73.8000 1.5381 (MHz) nspect : 63 polar = 5

... obs\_freq, bandwidth : 328.5000 5.8594 (MHz) nspect : 15 polar = 5

number of sources : 5

... source\_id : 1 0542+498 05:42:36.1379 +049.51.07.233 J2000

... source\_id : 2 1230+123 12:30:49.4233 +012.23.28.043 J2000

... source\_id : 3 1308-098 13:08:39.1690 -009.50.32.680 J2000

... source\_id : 4 CYG A 19:59:28.3550 +040.44.01.890 J2000

... source\_id : 5 HCG 12:53:08.0000 -009.13.27.000 J2000

**NRAO Archive DB - Download Data Page**

Version : e2equ...  
 You are here : [Main Page](#) > [NYI Query](#) > Download Page  
 Submitted Glish Table Queries via ( e2equery.g version 2.4.8 ) :

**Archive Root : /users/e2emgr/e2e**  
**Archive Catalog : NRAO/MSCATALOG3**  
**Query Type : ERROR**

Query Mode :

Primary search fields :

[Catalog Name](#)   
[Program ID](#)   
[Dates From](#)   
[Source Name](#)   
[Telescope](#)   
[Observing Bands](#)

Please direct feedback search engine to [NRAO](#)

Select Output File Format :

Archive file list table : /users/e2emgr/e2e/archive/catalogs/ftp/ftpfiles\_9999.lis

Archive File	Program	File Start	File Stop	Telescope	Format
<input type="checkbox"/> data/VLA/tapes/XH02028/file_1	AB1028	19-Mar-2002 04:40:33 GMT	19-Mar-2002 06:12:08 GMT	VLA:A	VLA Exp
<input type="checkbox"/> data/VLA/tapes/XH02028/file_10	AB1028	19-Mar-2002 18:10:53 GMT	19-Mar-2002 19:30:33 GMT	VLA:A	VLA Exp
<input type="checkbox"/> data/VLA/tapes/XH02028/file_11	AB1028	19-Mar-2002 19:30:38 GMT	19-Mar-2002 20:22:28 GMT	VLA:A	VLA Exp
<input type="checkbox"/> data/VLA/tapes/XH02028/file_2	AB1028	19-Mar-2002 06:12:13 GMT	19-Mar-2002 07:38:23 GMT	VLA:A	VLA Exp

Project : [AB1028](#)

Please direct feedback and/or question search engine to [NRAO DAS contact](#).

**Netscape: NRAO Data Archive System**

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Bookmarks

Members Web

The NRAO Data construction as GBT, EVLA, VLA information will be available soon.

Currently VLA is observing from 2001-Dec-31 at 12:00:00. The data archive is available for:

- VLA Expo
- VLBA FITS
- GBT FITS

Catalogs/Surveys:

**NRAO Supported**

- NVSS
- FIRST
- 2cm Survey

**NASA Supported**

- ADS
- MAST
- NED
- NSSDC

**ICRF-Source List**

- NVO
- SIMBAD
- Vizier
- Others??

Please direct feedback and/or questions to [NRAO DAS contact](#).

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**Netscape: Echo CGI Results**

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Location: <http://bernoulli.aoc.nrao.edu/cgi-bin/e2eforms.pl>

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## NRAO Archive DB Query Results - Archive File List

You are here: [Main Page](#) > [Archive File Query](#) > Archive File List

You submitted the following Glish Table Queries ( e2equery.g version 2.4.8 ):

**Archive Catalog : /users/e2emgr/e2e/archive/catalogs/NRAO/MSCATALOG3**

**QUERY\_MODE = Browse Only**

**SORT\_PARM = Archive File**

**SORT\_ORDER = Asc**

**SUBMIT = Submit Query**

**QUERYTYPE = ARCHIVEFILES**

**USER\_ID = 1234**

**QUERY\_ID = 9999**

**CATALOG = NRAO/MSCATALOG3**

**ARCHIVE\_VOLUME = XH0207\***

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Program.....Archive File Start.....Archive File Stop.....Telescope.....Archive File

AR488	13-Jun-2002	13:39:06 GMT	-	13-Jun-2002	15:00:36 GMT	VLA:B	data/VLA/tapes/XH02070/file_1
AR488	14-Jun-2002	15:15:16 GMT	-	14-Jun-2002	16:33:06 GMT	VLA:B	data/VLA/tapes/XH02071/file_1
AP441	15-Jun-2002	02:25:44 GMT	-	15-Jun-2002	03:17:31 GMT	VLA:B	data/VLA/tapes/XH02071/file_10
AP441	15-Jun-2002	03:17:38 GMT	-	15-Jun-2002	04:11:44 GMT	VLA:B	data/VLA/tapes/XH02071/file_11
AR488	14-Jun-2002	16:33:16 GMT	-	14-Jun-2002	18:02:16 GMT	VLA:B	data/VLA/tapes/XH02071/file_2
AR488	14-Jun-2002	18:02:26 GMT	-	14-Jun-2002	19:17:06 GMT	VLA:B	data/VLA/tapes/XH02071/file_3
AR488	14-Jun-2002	19:17:16 GMT	-	14-Jun-2002	20:39:16 GMT	VLA:B	data/VLA/tapes/XH02071/file_4
AP441	14-Jun-2002	22:10:18 GMT	-	14-Jun-2002	22:12:04 GMT	VLA:B	data/VLA/tapes/XH02071/file_4
AP441	14-Jun-2002	22:12:18 GMT	-	14-Jun-2002	23:05:11 GMT	VLA:B	data/VLA/tapes/XH02071/file_5
AP441	14-Jun-2002	23:05:58 GMT	-	14-Jun-2002	23:54:38 GMT	VLA:B	data/VLA/tapes/XH02071/file_6
AP441	14-Jun-2002	23:54:44 GMT	-	15-Jun-2002	00:48:38 GMT	VLA:B	data/VLA/tapes/XH02071/file_7
AP441	15-Jun-2002	00:48:44 GMT	-	15-Jun-2002	01:38:58 GMT	VLA:B	data/VLA/tapes/XH02071/file_8
AP441	15-Jun-2002	01:39:04 GMT	-	15-Jun-2002	02:25:38 GMT	VLA:B	data/VLA/tapes/XH02071/file_9
AP441	15-Jun-2002	04:11:58 GMT	-	15-Jun-2002	05:05:44 GMT	VLA:B	data/VLA/tapes/XH02072/file_1
AR489	15-Jun-2002	13:18:51 GMT	-	15-Jun-2002	13:55:58 GMT	VLA:B	data/VLA/tapes/XH02072/file_10
AR489	15-Jun-2002	13:56:04 GMT	-	15-Jun-2002	14:40:04 GMT	VLA:B	data/VLA/tapes/XH02072/file_11
AP441	15-Jun-2002	05:05:51 GMT	-	15-Jun-2002	06:05:04 GMT	VLA:B	data/VLA/tapes/XH02072/file_2
AP441	15-Jun-2002	06:05:11 GMT	-	15-Jun-2002	06:07:51 GMT	VLA:B	data/VLA/tapes/XH02072/file_3
AC628	15-Jun-2002	06:08:04 GMT	-	15-Jun-2002	07:11:11 GMT	VLA:B	data/VLA/tapes/XH02072/file_3
AC628	15-Jun-2002	07:11:18 GMT	-	15-Jun-2002	08:11:51 GMT	VLA:B	data/VLA/tapes/XH02072/file_4

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# NRAO Archive DB Query Results - Observing Scans

You are here: [Main Page](#) > [Scan Query](#) > Observing Scan List

You submitted the following Glish Table Queries ( e2query.g version 2.4.8 ):

Archive Catalog : /users/e2emgr/e2e/archive/catalogs/NRAO/SUMCATALOG

QUERY\_MODE = Browse Only

SORT\_PARM = Starttime

SORT\_ORDER = Asc

SUBMIT = Submit Query

QUERYTYPE = SCANLIST

USER\_ID = 1234

QUERY\_ID = 9999

CATALOG = NRAO/SUMCATALOG

PROJECT\_CODE = AB973

Program	Source.Name	StartIAT	StopIAT	TOS	CMode	Freq_AC	BW_AC	Freq_BD	BW_BD	CFG	Epoch	RA
AB973	I16288+392	2000/11/14/00:09:30	2000/11/14/00:43:20	1660	...	8.44	50.00	8.49	50.00	VLA:A	2000	16:30:...
AB973	1635+381	2000/11/14/00:19:00	2000/11/14/00:45:20	430	... A	8.44	50.00	8.49	50.00	VLA:A	2000	16:35:...
AB973	I16382-061	2000/11/14/00:46:30	2000/11/14/01:16:20	1410	...	8.44	50.00	8.49	50.00	VLA:A	2000	16:40:...
AB973	1651+014	2000/11/14/00:52:10	2000/11/14/01:18:20	400	... C	8.44	50.00	8.49	50.00	VLA:A	2000	16:51:...
AB973	MRK915	2000/11/14/01:20:50	2000/11/14/01:49:10	1320	...	8.44	50.00	8.49	50.00	VLA:A	2000	22:36:...
AB973	2236-145	2000/11/14/01:24:50	2000/11/14/01:51:10	440	... A	8.44	50.00	8.49	50.00	VLA:A	2000	22:36:...
AB973	N7213	2000/11/14/01:52:30	2000/11/14/02:22:10	1380	...	8.44	50.00	8.49	50.00	VLA:A	2000	22:09:...
AB973	2230-397	2000/11/14/01:58:00	2000/11/14/02:24:10	390	... B	8.44	50.00	8.49	50.00	VLA:A	2000	22:30:...
AB973	AKN564	2000/11/14/02:27:00	2000/11/14/02:55:00	1310	...	8.44	50.00	8.49	50.00	VLA:A	2000	22:42:...
AB973	2236+284	2000/11/14/02:30:40	2000/11/14/02:57:00	440	... A	8.44	50.00	8.49	50.00	VLA:A	2000	22:36:...
AB973	I03106-025	2000/11/14/03:00:20	2000/11/14/03:28:00	1280	...	8.44	50.00	8.49	50.00	VLA:A	2000	03:13:...
AB973	0339-017	2000/11/14/03:03:30	2000/11/14/03:21:40	330	... A	8.44	50.00	8.49	50.00	VLA:A	2000	03:39:...
AB973	0339-017	2000/11/14/03:28:20	2000/11/14/03:46:20	320	... A	8.44	50.00	8.49	50.00	VLA:A	2000	03:39:...
AB973	I03125+011	2000/11/14/03:30:20	2000/11/14/04:00:50	1420	...	8.44	50.00	8.49	50.00	VLA:A	2000	03:15:...
AB973	0339-017	2000/11/14/03:53:00	2000/11/14/04:02:50	220	... A	8.44	50.00	8.49	50.00	VLA:A	2000	03:39:...



The NRAO Data Archive System is under construction. For more information visit the NRAO Data Archive System website. Currently VLA 2001-Dec-31 VLA observing information. The data archive includes:

- VLA Experiment
- VLBA FITS
- GBT FITS

- Catalogs/Support
- NRAO Support
  - NVSS
  - FIRST
  - 2cm Survey
- NASA Support
  - ADS
  - MAST
  - NED
  - NSDCC
- ICRF-Source List
  - NVO
  - SIMBAD
  - VizieR
  - Others??

Please direct your search engine to [http://www.nrao.edu](#)

Netcape: NRAO Data Archi

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Members WebMail Connections

Members

The NRAO Da construction GBT, EVLA, VL information v

Currently VL 2001-Dec-31 VLA observing

The data arch

- VLA Exp
- VLBA FI
- GBT FIT

Catalogs/Surve

NRAO Support

- NVSS
- FIRST
- 2cm Surve

NASA Support

- ADS
- MAST
- NED
- NSSDC

ICRF-Source List

NVO

SIMBAD

Vizie

Others??

Observing

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Netcape: Echo CGI Results

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Members WebMail Connections

Members

## NRAO Archive D

You are here : [Main Page](#) > [Ima](#)

You submitted the following GI

Archive Catalog : /users

QUERY\_MODE = Browse Only

SORT\_PARM = Field\_ID

SORT\_ORDER = Asc

SUBMIT = Submit Query

QUERYTYPE = IMAGELIST

USER\_ID = 1234

QUERY\_ID = 9999

CATALOG = NRAO/NVSSCATAL

CENTER\_DIR = 6h30m 30d

SRAD = 10d

OBS\_BANDS = ALL

N image files found : 27

Field\_ID.....Prog...Tele

[C0552P28](#) [NVSS\\_GRP\\_VL](#)

[C0600P32](#) [NVSS\\_GRP\\_VL](#)

[C0600P36](#) [NVSS\\_GRP\\_VL](#)

[C0608P24](#) [NVSS\\_GRP\\_VL](#)

[C0608P28](#) [NVSS\\_GRP\\_VL](#)

[C0618P32](#) [NVSS\\_GRP\\_VL](#)

[C0618P36](#) [NVSS\\_GRP\\_VL](#)

[C0624P24](#) [NVSS\\_GRP\\_VL](#)

[C0624P28](#) [NVSS\\_GRP\\_VL](#)

[C0636P32](#) [NVSS\\_GRP\\_VL](#)

[C0636P36](#) [NVSS\\_GRP\\_VL](#)

[C0640P24](#) [NVSS\\_GRP\\_VLA](#)

[C0640P28](#) [NVSS\\_GRP\\_VLA](#)

[C0654P32](#) [NVSS\\_GRP\\_VLA](#)

15-Dec-1993 00:00:00 GMT -15360.000 - 15510.001 45.000 - 45.000 C0640P28

15-Dec-1993 00:00:00 GMT -15360.000 - 15510.001 45.000 - 45.000 C0654P32

100% Document: Done.

Netcape: E2E ARCHIVE DB IMAGE SUMMARY

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Bookmarks Location: [http://bernoulli.aoc.nrao.edu/E2E/jmbtest/summaries/im\_NVSSGRP\_C0552P28L.html]

Members WebMail Connections BizJournal SmartUpdate Mktplace

## NRAO Data Archive - Image Summary (C0552P28)

Project .... : NVSS GRP

Field\_ID : C0552P28

Telescope : VLA

Obs\_Band : L

Obs\_Date : 15-Dec-1993 00:00:00 GMT

Image\_Type : cube

Source\_Type : field

Exposure : 0.000000

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Obs\_Freq : 1400.000000 (MHz)

Band\_Width : 100.000000 (MHz)

Spect\_Chans : 1

Polarization : I Q U

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Field Center : 05:52:00.0000 +028.00.00.000 (J2000) at pixels : 512.00 513.00

Field Size : -15360.000393 x 15510.000568 (arcsec), pixels : 1024 x 1034

Pixel Increment : -1.5000e+01 x 1.5000e+01 (arcsec)

Restoring Beam : 45.000000 x 45.000000 (arcsec), pa = 0.000000 (deg)

Image Intensity : max = 0.588400, min = -0.020900, rms = 0.010361 (Jy/beam)

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Archive Catalog : /home/archive/e2e/archive/catalogs/NRAO/NVSSCATALOG.image

Directory : archive/results/surveys/NVSS

Image\_File : C0552P28

Plot\_File : NONE

Model\_File : NONE

100% Document: Done.