The ESO Archives and the ST–ECF Archives have been closely integrated within the framework of the DMD, resulting in increased coherence and efficiency.

There is joint operation of the ESO and ST–ECF Archive while the development – which is necessarily instrument specific – is separate. In numerous instances, however, the procedure and software developed for space data can be adapted to ground-based data and reciprocally (e.g. OTF or Associations).

This series of articles reports on recent advances.

ESO and ST-ECF Archive News

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During the past year, many changes took place at all levels in the area of data archive. A major structural re-organisation, many new achievements in the area of VLT readiness and quite a few important and interesting features for HST archival data users have been implemented.

1 Preparing for the VLT

1.1 Re-organisation

A tighter integration of the operational side of the ESO and ST-ECF archives has now been officialised even though the hard- and software systems used were already common to both before. Now both groups take part in the HST and ESO NTT and VLT archive operations. ESO continues to invest in manpower and systems benefiting both HST and ESO archives. The ST-ECF does the same. The new Science Archive Operations group (SAO) is formally integrated into the ESO Data Management Division, Data Flow Operation group. This group is headed (since July 1) by Bruno Leibundgut. Besides run-

ning the archive, this group will bear responsibility for running the Quality Control of the VLT data. The re-organisation affected the entire DMD and the global strategy was described in the March 1997 issue of *The Messenger*, p. 12, by D. Silva and P. Quinn.

2. New HST Archive Developments

In accordance with the new orientation of ST-ECF decided in 1996 at the mid-term review, we have embarked in many large projects aimed at adding value to HST data, improving its access and helping the HST users community. Some of these activities are described in the papers by Alberto Micol and Markus Dolenski in this issue of *The Messenger* ("HST Archive News: WFPC2 Associations", "HST Archive News: On-the-Fly Recalibration of NICMOS and STIS Data").

Most important of all, the "WFPC2 Associations" project results have now been released. Thanks to the logical grouping of WFPC2 exposures, we can

offer our users not only a more meaningful catalogue browse response, but also automatic cosmic-ray rejection, drizzling and assembling of multiple exposures upon retrieval of the data.

This new service complements the now standard on-the-fly re-calibration (OTF), presented in previous issues of the ST-ECF Newsletter. Improvements in this area now include STIS and NICMOS, which are available as presented in Table 1.

The completion of the WFPC2 associations' project required an additional development and operational effort, which has now reached completion: the generation of the missing jitter files. They represent the basic building block for our classification of the WFPC2 exposures, but unfortunately, 10 months of such data were missing, which we have been able to regenerate thanks to a fruitful collaboration with the STScI.

Presentation of information has also received some attention: New Java "applets" to access the "PreView" images of our archives from a web browser have been made available. They are described

TABLE 1: Services available and their pointers.

Service Name	Type of service	Description	URL
GSC-I	Catalogue	The 20-million objects Guide Star Catalogue	`http://archive.eso.org/gsc/gsc`
USNO	Catalogue	US Naval Observatory Catalogue (500 million objects)	`http://archive.eso.org/sky cat/servers/usnoa/`
DSS-1	Survey	1st generation Digital Sky Survey	`http://archive.eso.org/dss/dss`
DSS-2	Survey	2d generation DSS (higher/res). Not yet complete	`http://archive.eso.org/dss/dss`
HST	Data Archive	Hubble Space Telescope archive (with PreView, on-the-fly re-calibration and WFPC2 associations' capabilities).	`http://archive.eso.org/wdb/ wdb/hst/science/form`
NTT-old	Data Archive	Pre-Big bang NTT data archive and catalogue. Should be integrated in the new NTT/VLT archive soon	`http://archive.eso.org/wdb/ wdb/eso/eso_archive/form`
VLT/NTT	Data Archive	New VLT and post-Big Bang. NTT archive and catalogue	`http://archive.eso.org/wdb/ wdb/eso/observations/form`

in more details in Markus Dolensky's article on "HST archive services implemented in Java" in this issue.

3. Other Archive Developments

3.1 GSC-II participation

In the framework of the ESA-NASA MOU renewal on HST, ESA is contributing to the completion of the Guide Star Catalogue II planned as a 2-billion object, fully homogeneous (both photometrically and astrometrically), all-sky, multicolour catalogue. The ST-ECF is involved in this major scientific endeavour by operating a pipeline that extracts the objects and by doing the quality control of about half of the 6000 photographic plates used for the generation of the catalogue. More details concerning the participation of the ST-ECF in this project are given in the article entitled "ST-ECF Participation in the GSC-II Generation Project" in this issue.

On the development side, the ESO archive is also contributing a storage method for the future export catalogue: the system will allow the storage of the entire catalogue on less than 50 GB of disk space.

3.2 Archive storage media change

The ESO/ST-ECF archive is now studying the promise of the DVD-R (Digital Versatile Disk) for astronomical data storage. The new capacity needs generated by the VLT instruments and the survey telescopes are prompting us to look into new denser yet affordable storage technologies. The prospects of the DVD are presented in "Using DVD Technology for Archiving Astronomical Data" in this issue of *The Messenger*.

4. Services Available from the ESO/ST-ECF Archive

Among the new services available from our archive, it should be noted that

the post-Big Bang NTT archive data are now public. We would appreciate feedback on its usage. As a reminder, as this issue will be distributed, work on the preparation of the VLT Science Verification (SV) data will be continued. The data will be made available to astronomers from the ESO community as early as October 1. The plan is to have one set of the CD-ROM containing the SV data set sent to all the member state's astronomical institutions or university departments.

All the other services available from the ESO archive world-wide web are listed in Table 1 with their category, description and URL. For the possibility to use other, non-interactive client programmes for some of these services, please contact the authors.

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The VLT Data Volume

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The VLT will be a remarkable observing facility in many ways. Among others, the volume of data generated by its instruments will make the VLT Science Archive one of the largest data sources in astronomy. Table 1 summarises the estimated data rates (Gigabytes per night) expected from VLT instruments over the next 4 years. In estimating the data output of a given instrument, assumptions have been made on typical usage modes, e.g. infrared instruments would produce larger numbers of frames because of commonly used sky/object observing sequences. Also, for each telescope a typical mixture of usage of alternative focii has been estimated in order to obtain a total volume expected from the complete facility. MIDI and AMBER, the two first VLTI instruments (to see first light in 2001), could produce of the order of 40 GB raw

TABLE 1: Estimated data rates (GB/night) expected from VLT instruments over the next 4 years.

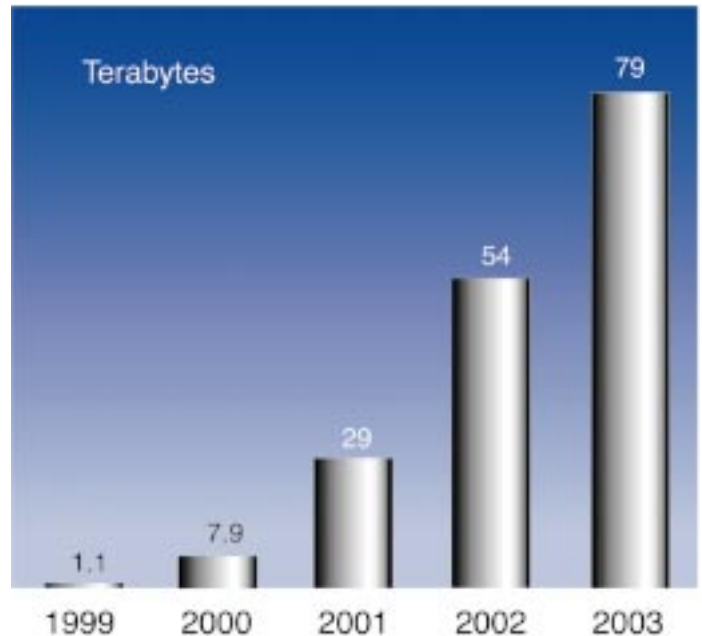|		1999	2000	2001	2002
UT1	ISAAC	4	4	4	4
	FORS1	0.5	0.5		
	SINFONI			0.5	0.5
	CONICA/NAOS		1.5	1.5	1.5
	CONICA (SPECKLE)		40	40	40
UT2	TESTCAM	0.5	0.5		
	UVES	2.5	2.5	2.5	2.5
	FORS2	0.5	0.5	0.5	0.5
	FLAMES			2	2
UT3	TESTCAM		0.5	0.5	
	VIMOS		20	20	20
	VISIR			1	1
UT4	TESTCAM		0.5	0.5	
	FORS1			0.5	0.5
	NIRMOS			48	48
	CRIRES				0.5
VST	WFI			3.8	15
	VLT TYPICAL MIX (GB/NIGHT)	**3.0**	**19.1**	**59.3**	**70.6**

Figure 1: Cumulative data volume of the VLT Science Archive over the next 5 years.