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Subj: For C.R.A.I. design group

The image processing room(s) in the new Socorro building.

AIPS users in Charlottesville have recently lived with two different styles of image processing environment. The first was in a room on a different floor from the computer machine room. The second is a room (the former VLBI processor area) close to the machine room but separated from it by a mainly-glass wall through which most of the peripherals and indicator lights of the Convex and Vax are visible. As both styles of operation are being considered in Socorro, the reaction of the users here may be useful additional input to the planning for the imaging center in Socorro.

With few exceptions, people prefer the "nearby through glass" style because it provides a quiet environment while facilitating tape operations and giving users a good overview of the hardware status of the machines. You can see whether or how fast a tape is moving, how much tape is left on a reel, whether drives are about to become free or to become tied up (software does not detect users lurking in the vicinity of tape drives !). You can also see whether technicians or servicemen are working on the hardware, and where. All of this promotes user efficiency by increasing user awareness of the state of the machines and of the activities of systems programmers and service personnel. When users were a floor away and running "blind" from a remote room, we experienced many minor inefficiencies, and MAJOR ones associated with tape work on the remote drive.

We tried the "through a glass darkly" mode of operation because we saw some advantages of the arrangement used in the VLA S.L.O.B. building. Once we had moved into the new quarters here, we realised that the designers of the Edgemont Road building had provided a further advantage -- unlike those in the S.L.O.B., the computer user rooms on our ground floor are not required to be thruways. Traffic in and out of our machine room is through a corridor between the user rooms, not through the user terminal area itself. So we have a view of the machines without the drawback of machine service traffic going through the user area. We have now stumbled on an arrangement that is good in several respects -- the two user areas are relatively quiet, uncongested environments in which users can concentrate on their work with minimal interruptions while still having a good view of, and good access to, the parts of the machine they most need to interact with. I can strongly recommend this general layout for the image processing area in the new building in Socorro.

Now to some small, but important, details. A bare "glass wall" arrangement would allow stray light from the computer room to interfere with viewing of images on the user displays. This problem is solved well by good-quality venetian blinds. Our users normally opt for very low general light levels in the image processing rooms, but use individual reading lamps near their terminals. Tight-fitting, dark, venetian blinds on the glass windows are adjusted so that users can normally view the tape drives, etc. in the machine room without letting much light into the image processing room. The blinds can be closed tightly if users need complete light isolation in

the display room, e.g. for viewing high dynamic range images or for screen photography. Users can choose any lighting from dark to bright while retaining the benefits of a view of the computers. Dark matt wall covering would improve the environment even further.

Sound deadening is important, especially next to a machine room. A quiet environment is needed in a room where interactive users spend many hours at a time. The Edgemont Road building has walls that seem to have been designed to resist direct nuclear attacks, so the basic soundproofing is very good; but odd ducts and vents installed as afterthoughts are now the main source of noise pollution from the adjacent machine room. We are gradually plugging these up wherever possible, resulting in a quiet environment that users appreciate greatly. When starting from scratch in Socorro, there will be a chance to do this really well. The glass should be as far as possible from primary air-conditioning plant in the machine room, to minimize acoustic rumble in the user room. User workstations should not be directly over air conditioning vents (don't laugh, this has happened so many times at NRAO that I feel obliged to mention it !) A dark acoustic tile should be considered as a good wall liner for the imaging rooms. Direct air flow between the user room and the machine room should be minimised. The new Charlottesville arrangement, although far from perfect, shows that it must be possible to plan a quiet environment next to a machine room. User reaction to it has been very positive, and it would be nice to do even better in NRAO's "flagship" imaging center.

Table and seating arrangements in all of our present image processing rooms, both in New Mexico and in Charlottesville, are atrocious. AIPS users will be keeping generations of physical therapists in business with their back problems as the community ages unless we give some thought to this ! Tilting chairs with good lower back support are important, but a key factor may be adjustable keyboard heights and angles. People are not all the same height and shape, and a well-planned imaging room would allow for this. Placing keyboards on randomly sized office desks and surrounding them with cheap office chairs is a poor way to design a room in which many people will sit and look at screens for hours on end, yet this is what NRAO has always done until now. The new control room at the 300-foot has proper computer consoles with adjustable keyboard trays; these are probably a good investment. But a still better one may be to have one of the local occupational or physical therapists take a look at the planned layout and comment on it before purchasing furniture for the Socorro imaging rooms. (Might Sue Gibson be interested in advising on this ?) People in these professions actually understand work height requirements and human anatomy, and there may be a golden opportunity to do it properly when starting from scratch !

In general, it seems that multiple TV displays are better placed in different rooms, or in isolated cubicles, than out in the open in a communal room. Someone trying to get a good look at a high dynamic range image display wants darkness, while their neighbors may need light to see by. But each display room should have several terminal workstations, so that several users can access the display in each room. It is better to keep these workstations well separated than to cluster them close to the display and its trackball or mouse. Some short-term congestion is inevitable whenever a display has multiple users, but it's better not to turn this into long-term congestion by

clustering keyboards. Requiring the "secondary" users of a TV have to move across a room occasionally in order to control it seems to work better than jamming everyone's permanent workstation as close to the display as possible.

I am sure that many of these issues will already have come up in the planning for the new center, but I hope these additional comments are not too late to be of use.