The VISUAL TELEFACILITATION PROJECT at PGC

Increasing the effectiveness of teleconferencing through graphic meeting recording

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SUMMARY

Teleconferencing is becoming extremely important to business in the 90's. Rising travel costs and a wide-spread emphasis on telecommuting will result in a dramatic increase in the number of teleconferences each day.

Yet, unfortunately, the effectiveness of teleconferencing often fails to meet needs and expectations of telecommuters.

Meetings are an essential part of business and telecom-muters still need to "meet". If they are meeting electron-ically, then we need to develop a methodology for facili-tating distributed meetings. Running effective face-to-face meetings is difficult enough; managing effective telemeetings requires special training and tools.

The **Visual Telefacilitation Project** at the Performing Graphics Company is researching ways that visual repre-sentation can increase the effectiveness of teleconferencing. The technique being developed is the use of recorders for distributed meetings—*visual telefaciltators*—to provide a continuously updated record of the meeting discussion for all of the distributed participants.

When a teleconference is held, an additional person is in attendance—not as a participant, but as a text-graphic meeting recorder. It is this person's job to accurately and continuously make a record of the meeting as it happens, and to provide access to that record as a **live distributed meeting map** for all participants.

Visual Telefacilitation combines three ideas: first, there is the idea of a *facilitator*, a person whose explicit social role is to help the group process. Next the *visual* element is added, an explicit text-graphic record of the meeting generated in real time by the facilitator to help the task group keep track of the discussion content. And then, finally, the visual facilitation technique is applied to distrib-uted groups engaged in *tele*conferencing. Taken all to-gether, the result is *Visual Telefacilitation*, or *VTF* for short.

Note that the term "facilitation" as used here is meant to include the whole recording–facilitation continuum. In this way of thinking, pure recording is silent facilitation. And, actually, there is no such thing as "pure recording;" to transcribe is to interpret.

Finally, it should be made clear that the purpose of the VTF project is *not* to promote a particular equipment system or social system, but rather to outline a framework within which many different approaches to VTF can evolve and prosper. The goal is to establish for VTF activity the minimal context for maximum communication and diversity, both now and in the long term—i.e., an open system like the Web or the Internet itself.
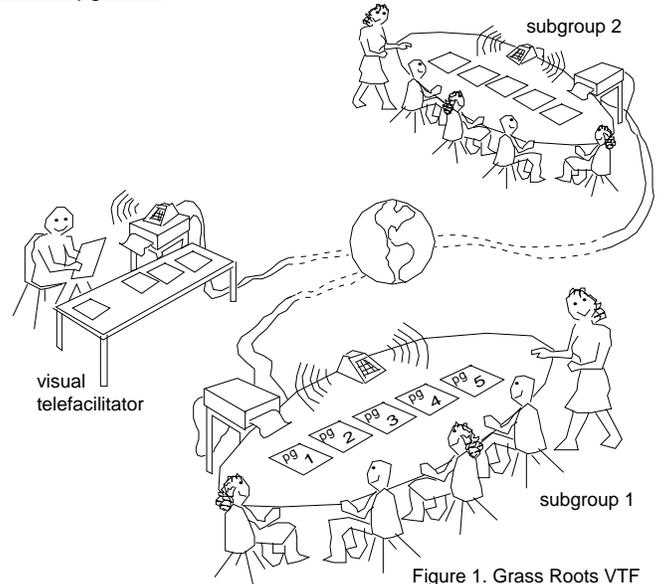
Figure 1. Grass Roots VTF

GRASS ROOTS VTF

... is just FAXes and phones: *up-to-the-minute FAXes spread out on a table during audio-only teleconferencing can serve as "slow windows on a big desktop"* [figure1].

The technology at the grass roots level of Visual Tele-facilitation is fairly primitive, but including it serves two important purposes. First, it is a good test of the openness and flexibility of the VTF framework. And second, grass roots VTF based on FAXcasting may well be the most significant form of VTF for years to come. Worldwide, people who can participate at this level of VTF right now – *today* – number in the *hundreds of millions*, while people having access to all other teleconferencing media combined number only in the low millions (at best).

THE TWO DIMENSIONS OF VTF

When Visual Telefacilitation is introduced into telecon-ferencing groups, the resulting changes can be seen as taking place in two separate dimensions—that of the Equipment System and the Social System [figure 2]. The units for these axes are equipment cost and social change.
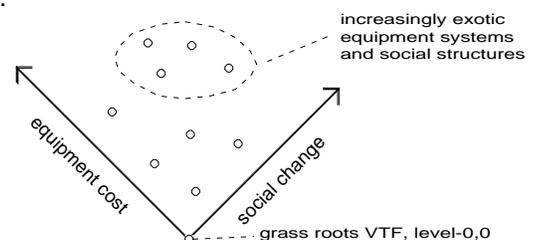

Figure 2. The two dimensions of Visual Telefacilitation

Note: "**Visual Telefacilitation**," "**VTF**," and "**Meeting Maps**" are trademarks of PGC

Different places on these two axes will define different points and resulting styles of Visual Telefacilitation. The VTF project is particularly focused on two areas:

1. The style of VTF that can be done with the least expensive (and thus most readily available) equipment, and with the least social change. This is "**grass roots VTF**," the level-0,0 style portrayed in figure 1.

2. The smooth upward compatibility of grass roots VTF with styles requiring more exotic quipment and/or more social change in the teleconferencing group.

THE EQUIPMENT SYSTEM AND THE SOCIAL SYSTEM

The equipment system is the hardware and the software necessary to support teleconferencing augmented by Visual Telefacilitation. For example, the FAX machines and audio conference calls used in grass roots VTF constitute the most readily available equipment system; whereas full video teleconferencing with shared computer applications is a more exotic and expensive system.

The social system is the group dynamics and social roles which take place during the teleconference. For instance, the traditional teleconferencing group plus one recorder used in grass roots VTF is the simplest, most non-disruptive Visual Telefacilitation situation; tag-team discussion leaders with all group members recording their own text-graphic inputs is more socially radical.

THE EQUIPMENT SYSTEM DIMENSION OF VISUAL TELEFACILITATION

The Visual Telefacilitation project advocates an open system, equipment independent approach. Facilitation techniques will be developed that do not depend on one particular hardware and/or software system, but which can work with any of them. In this way VTF will allow telegroups to make maximum use of the equipment they have *right now*, and then enable them to take advantage of higher bandwidth when it becomes available.

For instance, if a telegroup has only audio conferencing and paper FAXes, that's fine. Grass roots VTF can help the members communicate with each other. Then later, if they get more money and can add video to the audio, Visual Telefaciliation will still be adding value when they can see each other too. In each case the visual telefacilitator is making a text-graphic record of the detailed ideas and context, and continuously distributing updated copies to all members of the telegroup, thus freeing up the audio and/or video channels for live discussion, interpersonal management of group dynamics, auxilliary information display, etc.

In the VTF project, the phrase "slow windows on a big desktop" is used to describe the level-0 equipment system used in grass roots VTF. Equipment at this level is paper FAXes plus phones (audio conferencing) —the simplest, most readily available equipment— and the visual telefacilitation methodology must work for it. The graphic record of the meeting is one or more pages, and the group uses this shared record in focusing their discussion by saying things like "as Jane said on page 2" or "in the diagram on page 4" [see figure 1]. For additional viewing convenience, the FAX content can be put on acetate and displayed for the subgroup using multiple overhead projectors, one per page.

The basic premise of VTF is that a real-time, text-graphic record of a meeting divided into pages will work effectively to support all levels of teleconferencing hardware and software. This general idea we call the "windows on a desktop" model; and, as noted, at the grass roots equipment level they are slow windows. The goal of the VTF methodology is that it must not only work now with paper FAXes and phones, but that it must also be upward compatible with the more expensive emerging technologies when and if they become cost-effective. For example, it seems inevitable that soon, for some groups, "fast windows on a desktop" via computer screens will be a practical and affordable equipment system [figure 3].
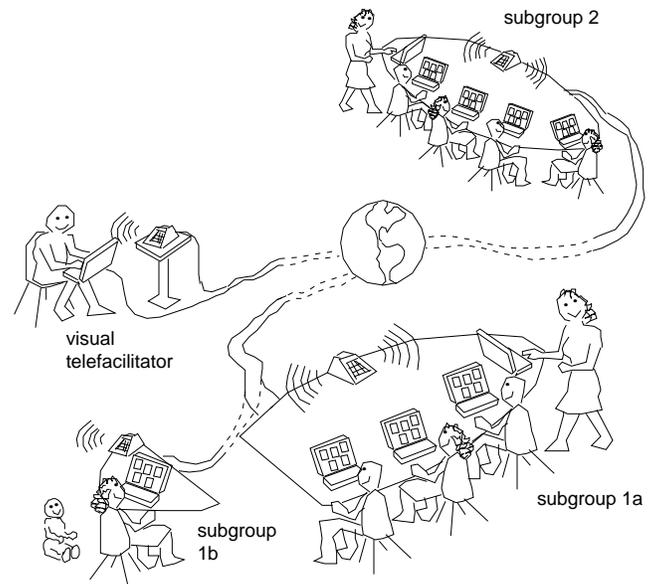

Figure 3. Fast windows on a desktop model

THE "WINDOWS ON A DESKTOP" VTF MODEL

Visual Telefacilitation on all levels of equipment and social structure shares these features:

1. The group can be physically distributed.

2. The visual telefacilitator is continuously generating and distributing a live text-graphic record of the meeting to all participants.

3. All members of the telegroup, although physically separated, are simultaneously looking at identical pages or *windows* of the text-graphic meeting record.

4. The telegroup can establish a common framework for precise communication by referring to particular pages of the text-graphic record while conferencing via audio and/or video and/or computer links. This will allow group members to all be "on the same page."

5. The visual telefacilitator can be at a different physcial site from any of the group members.

THE VISUAL TELEFACILITATION SERVER

Point 5 in the previous section brings up an interesting notion, the idea of a service accessed by dialing "900-VTFACIL" or filling out a request form on the VTF Web page—eg. a facilitation *server* (or pool). The people making up the facilitation pool used by an organization, either in-house or outside consultants, need not be physically present at the site of any of the participating subgroups. Of course, there are many advantages if the facilitator is in the same room with one of the subgroups, but the fact that he or she *does not have to be* creates a great deal of freedom in the use of Visual Telefacilitation. This freedom means that half way through a meeting the teleconferencing group can suddenly realize they need a telefacilitator and put out a message to find one who is available [figure 4]. Then the facilitator who answers the call links up to the meeting in progress and starts providing service.
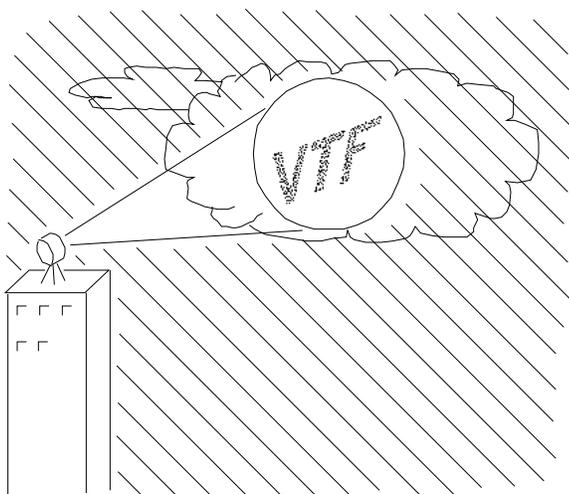

Figure 4. A telegroup in needs sends out a call for a Visual Telefacilitator

THE SOCIAL DIMENSION OF VISUAL TELEFACILITATION

Groups resist social change. The changes wrought by teleconferencing are drastic enough in and of themselves, so the introduction of VTF into the work setting must initially create the smallest possible disturbance in group dynamics. The style called the "meeting recorder" [Straus76] is this grass roots, level-0, least social change method for VTF. In the meeting recorder style, the teleconferencing group does everything in exactly the same way as they did before, without VTF. All social roles and behaviors are exactly the same. The only difference is that there is now a text-graphic record of the meeting available to look at and refer to if any of the group members so choose. At social level-0 VTF, it is important that the meeting recorder *not* be a member of the group. Remember, no changes in behavior for any group member. Instead, at social level-0, the telefacilitator is an objective and friendly outsider "attached" or linked to the meeting for the express purpose of being the recorder.

And what about the possibility of having a member of the telegroup facilitate? This is a useful option in cases where the group can tolerate the additional social discord of having one of its members play a dual social role. However, it has some distinct ***disadvantages:***

1. **Regular group members simply won't do it.** Face-to-face meetings are held in rooms with whiteboards all the time, and very rarely does someone jump up and start recording the meeting as a whole.

2. The social role of objective recorder is unfamiliar to most people, and *extremely* demanding. It is difficult to listen to everything the group says and succinctly represent it with text-and-graphics in real time—a professional facilitator has the training, experience, and aptitude to do this job effectively.

3. It will remove that group member from participating in the teleconference. Recording a meeting is a full-time job—it is almost impossible for the facilitator to also contribute content. And so if that group member's contribrutions are dispensable, why is he or she there in the first place?

4. Facilitator is *too* intimately acquainted with technical content—uses obscure terms and acronyms, assumes greater level of technical expertise for the group than may in fact be the case. An intelligent layperson's view is often a useful reflection of the issues, and helps communicate to the people in the group who are not up on the latest minutiae or jargon, but who are reluctant to admit it.

On the other hand, there are also ***advantages*** to having one or more of the group members do the facilitation:

1. Saves the time and expense of securing the services of an additional person.

2. Having a group member facilitate eliminates any possible problems of confidentiality.

3. Facilitator *is* intimately acquainted with technical content. There are times when it is a definite advantage

to have a facilitator who really knows the minute details of the meeting's technical issues.

Techniques for training group members to do visual telefacilitation will be investigated as part of the VTF project [see long-term deliverables below].

SOCIAL SYSTEM HIERARCHY

It is an open question as to how much social change a visually telefacilitated group can tolerate. Or, more important, can *usefully* tolerate and under what conditions. Figure 5 is a rough sketch of the social change dimension for such groups.
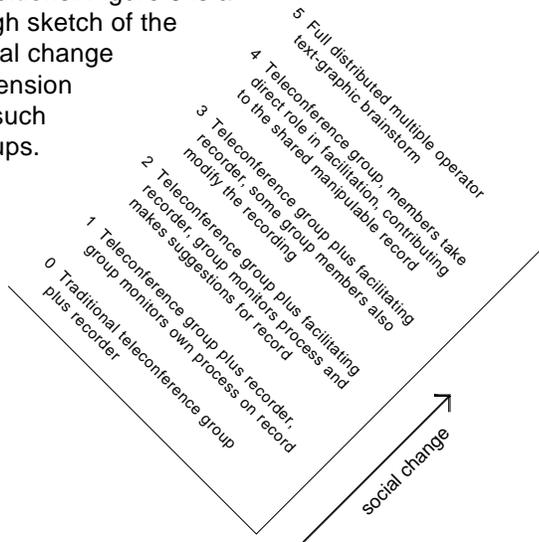
Figure 5. Dimension of increasing social change for Visually Telefacilitated groups

EQUIPMENT SYSTEM HIERARCHY

Beginning with paper FAXes and phones as level-0, here is the initial version for our visual telefacilitation media hierarchy:
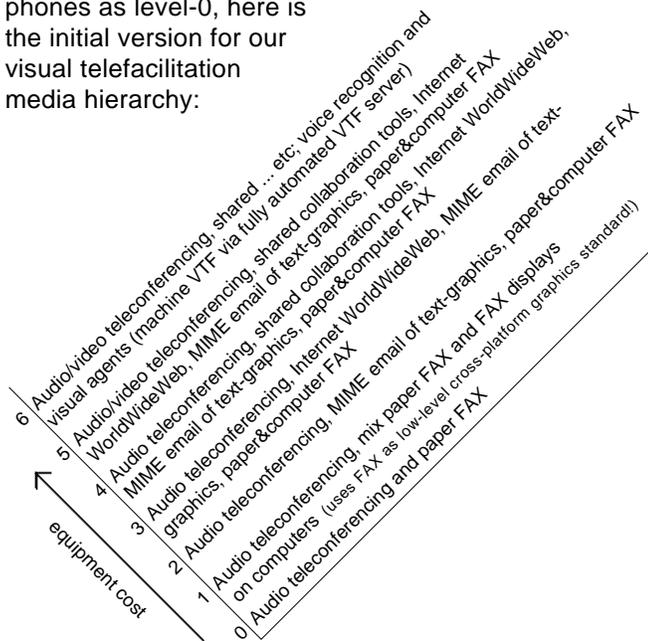
Figure 6. Highest common denominator hierarchy of equipment systems for Visual Telefacilitation

FOCUS OF THE VTF PROJECT

Different places on these two axes will define different styles of Visual Telefacilitation. As mentioned earlier, the VTF project is particularly focused on styles which use inexpensive equipment and fit in with the current social structure of meetings. This area of interest is shown in Figure 7.
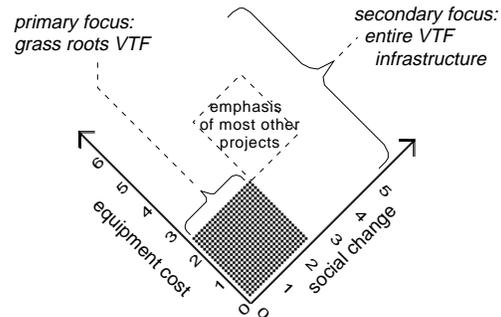
Figure 7. Research focus of VTF project

But the secondary focus is the structure of the *whole VTF space* as defined by these two axes; with special import given to smooth upward compatibility between grass roots VTF and styles requiring more costly equipment and/or more social change in the teleconferencing group.

GRASS ROOTS VTF: ADVANTAGES OF PAPER FAXES AND PHONES

The "slow windows on a desktop" of grass roots VTF has some major advantages:

1. **Testing**: FAXes and phones provides a way to test the premises of visual telefacilitation right now, without waiting for expensive hardware or software to be developed.

2. **Deployment**: FAXes and phones insures the immediate deliverability of more effective teleconferencing to the greatest number of people. This grass roots availability of visual telefacilitation is very important. Groups with access to paper FAXes and telephones number in the hundreds of millions; groups with access to all other teleconferencing media combined number only in the low millions at best.

3. **Benchmarking**: FAXes and phones will provide a very cost-effective reference point against which to measure the more sophisticated and expensive equipment systems.

4. **Upward Compatability**: FAXes and phones, when implemented using FAX modems and FAX software on PC's, utilizes FAX as a grass roots computer graphics interchange format—and it interleaves seamlessly with paper FAX technology. This means that in the same visually facilitated teleconference some of the participants can be using paper FAX windows while other participants are seeing the meeting record on faster and more flexible computer displays. It also means the telefacilitator can use any word or graphics

processor the output of which can be sent as a FAX (either directly, or printed onto paper and then scanned). Another nice upward compatibility is the optional use of overhead projectors at any site to increase viewing access of the subgroup to the pages of the meeting record (either paper FAX onto acetate, or LCD pannel for computer display of FAX contents).

HIGHER LEVEL VTF: EXOTIC EQUIPMENT SYSTEMS

The "windows on a desktop" model is upward compatible, easily describing systems which are more advanced than our early favorite, FAXes and phones. For example, the visual telefacilitator could be using one of the shared writing&drawing tools which are beginning to crop up. The way such tools work is that they are "shared" over the Internet, meaning that each person (or subgroup) sees the same image on their computer screen. Not only is visual access shared—they all see a copy of the image—but manipulation is also shared. Any person viewing the image can write&draw on their copy, and the image everyone else sees immediately changes.

So the facilitator could be using such a shared tool to generate the text-graphic record of the meeting, and the members of the telegroup would see the record in the windows (of the shared writing&drawing tool) on their computer screen desktops. And, more adventurous groups could even participate in the recording. Using shared collaboration tools is designated as level-4 in the equipmentation hierarchy in figure 6.

However, currently such tools have some grave disadvantages: they are not very common, are sometimes very expensive, and usually require a fair degree of homogeneity among the computers being linked (often the computers must all be the same brand; *almost always* they must all be running the same operating system). Shared collaboration tools will be important in the future, but for the moment we must depend on lower tech ways of getting the meeting record into the windows.

For example, if the record is written out as a Web document, then it can be viewed by virtually any computer on the Internet. Web-based VTF is level-3 in figure 6. Web viewers or "browsers" are free software, and run on all Unix computers as well as on Macs and PC's. However, there is a price in convenience that must be paid for this ubiquity, a disadvantage in comparison to the more esoteric shared tools. The price is this: the visual facilitator must be continually writing out new versions of the record in Web format, and the members of the telegroup must be continually refreshing the page to see the changes. But in each case this price is very small. For the facilitator, it only requires a mouse click or a keystroke every minute or so to write a new version (depending on the facilitation software used). And for the telegroup, the updating process is especially effortless. In the worst case, a mouse click at the corresponding interval, just **refresh-on-demand text-graphics** using the Web. And in the best case for viewers, refresh is automatic via "server-side push."

VTF based on "Webcasting" is a natural. There may soon be a large number of text-graphic journalists offering many diverse kinds of facilitatory services via the Web.

PREMISES OF THE VISUAL TELEFACIL-ITATION PROJECT

The visual telefacilitation project will investigate these premises:

Premise 0: **Teleconferenced meetings will tend to be more "brainstormy" than normal meetings.** Teleconferencing actually needs and should encourage participation from a larger percentage of the group's members, and thus the group communication structure will be many-to-many. This is a selection bias brought about partly by the media itself. Most times teleconferencing is not wasted on one-to-many style non-discussion meetings, where one person is simply dispensing her or his views to the group. Distribution of a memo is easier.

Premise 1: **Visual Telefacilitation is cost-effective in increasing the effectiveness of teleconferencing.** More complex many-to-many communication occurs more frequently in teleconferencing, and yet is less productive because of the lower bandwidth of teleconferenced communication compared with face-to-face meetings. The additional information on context and history provided by visual telefacilitation will give the telegroup a common frame of reference, and the increase in group productivity will be worth the increased cost.

Premise 2: **Groups for the most part will *not* want to take their own minutes, nor would they be particularly good at it.** Let the group discuss; have a specialist record.

> Contingency Corollary: A short training course can be designed to teach visual telefacilitation. It would many times be handier if one of the group members could do VTF. *"Meeting recording is like CPR—you just hope that someone in the room knows how to do it."*

Premise 3: **The "windows on a desktop" VTF system model is sufficient to describe visual telefacilitation at all social and equipment levels.** The text-graphic record of the meeting is one or more pages, and the group uses this shared record as a common framework in focusing their discussion by referring to information on particular pages.

Premise 4: **The visual telefacilitation method is equipment independent.** It will work with *any* text-graphic distribution system—from paper FAXes and phones [grass roots VTF, figure 1] to WorldWideWeb documents to shared manipulable drawing spaces to various other computer schemes with and without video [see hierarchy in figure 6].

Corollary: Visual facilitation will allow groups to use higher bandwidth systems more effectively; for instance, because the detailed meeting content is captured and communicated in the text-graphic record, a full duplex audio/video link can be freed up to support the crucial interpersonal dynamics of process.

Premise 5: **Equipment independence is crucial to the wide-spread and effective use of VTF.** Special purpose hardware and software systems should be used to increase the expressiveness of telefacilitation, but lack of such systems must not be allowed to stand in its way. *Any* distributed group with paper FAXes and phones can be visually telefacilitated; and then if more sophisticated equipment is available to all participants, fine, use it. Basically this is an "open system" approach to VTF. Utilization of the hierarchy table can assure the highest common denominator system, and also avoid blockages because of lack of expensive equipment.

Figure 8. Prototype of VTF with large screen computer display

IMMEDIATE DELIVERABLES OF THE VISUAL TELEFACILITATION PROJECT

1. Develop a visual telefacilitation methodolgy that will work for all levels of communication equipment.

2. Develop the highest common denominator communication equipment hierarchy into a form immediately usable by groups, both to guide them in getting the best use out of their current teleconferencing equipment, and to guide them in acquiring new equipment.

LONG-TERM DELIVERABLES OF THE VTF PROJECT

1. Develop measures for the effectiveness of teleconferencing: with and without visual telefacilitation, and at various levels of equipmentation.

2. Develop a simple and effective training to teach people how to do visual telefacilitation.

LOW TECH BIAS OF VTF PROJECT?

It may appear that the VTF project has a low tech bias, but this is not the case at all. We at PGC like fancy technology as much as anybody, if not more so. *Visual Telefacilitation using real-time shared text-graphic media over the Internet to support full duplex video teleconferences! Wow!* That would be really neat [see PGC prototype in figure 8].

But we must always ask ... is "really neat" alone worth the cost? The burden of proof is on the exotic equipment. When it can provide better telemeeting support *for the money* than paper FAXes and phones, then the fancier stuff will be a viable alternative.

The VTF project does not have a low tech bias; it has a **best teleconferencing to the most people at the lowest cost** bias, and let the chips fall where they may.
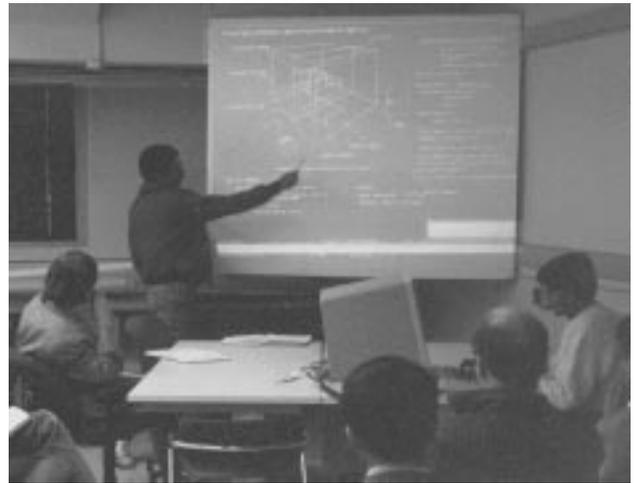
ACTION ITEMS OF THE VTF PROJECT

1. Start doing grass roots VTF immediately.
   Preliminary tests indicate that FAX-based VTF is convenient and effective.

2. Experiment with VTF methodology for telegroups with higher level equipment.
   Work is also underway using the Web to distribute Meeting Maps. See examples at:
   http://www.pgc.com/meetings

CONCLUSIONS

Visual Telefacilitation is an *open system framework* for increasing the effectiveness of teleconferences. VTF employs text-graphic meeting recording, where the detailed content of a telemeeting is continuously recorded and distribruted to all participants. VTF can be done using *any* text-graphic telecommunication medium, from FAXes to the Web to Net-shared writing&drawing tools.

The **windows on a desktop** model provides the basis for a *Visual Telefacilitation Infrastructure*. Conventions will arise out of and for the practice of VTF, developing into a social structure which will work across all levels of equipment and provide sufficient commonality for communication within the diversity.

Grass roots VTF is just FAXes and phones: paper FAXes laid out on a table during audio teleconferencing.

More exotic hardware and software can be used for VTF, but they must justify themselves against FAXes and phones.

ACKNOWLEDGEMENTS

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NOTES

The VTF Project is the focus of an SBIR proposal originating from PGC.

This paper was typeset using **Webmacs**, PGC's VTF tool.

Bonus Opinion:

THE STIGMA OF AUDIO-ONLY TELECONFERENCING

I asked a friend of mine if his company ever did teleconferencing, and he replied "Oh no, we're too small for that" [100 people work at his company]. Then much later I happened to ask if they ever made conference calls, and he said, "Oh yeah, all the time. And then afterwards someone will spend a couple of hours writing up the notes and FAXing them to all the other participants."

Two points here. First, his company was not big enough to do teleconferencing because they could not afford the two-way video and/or Internet hardware, special lines, and software that have come to mean teleconferencing. This "haves and have-nots, high stakes, on the bus or off the bus, teleconferencing club" attitude is so pervasive that lowly audio-only teleconferencing is not even thought of as teleconferencing!

And second, note that distributing text-graphic records of a meeting by FAX is already a common practice. Right now it takes place after the fact, but with the same expenditure of human time and energy, it could just as easily take place *during the meeting* instead. And if the notes were FAXed out live during the meeting, then there would be substantial added advantage: the notes would provide immediate feedback for use by the participants as on-going process check, and also serve as a shared framework of content details so that everyone would be on the same page.