The panel meeting objectives were threefold: (1) to cover usual panel business; (2) to visit the ship laboratories for a detailed review of procedures and equipment; and (3) to meet jointly with DMP to discuss and provide recommendations for shipboard integration of core and log data. Usual panel business covered four topics: **equipment** needs and priorities; **index properties**; **PCOM requests**; **upcoming legs**; and **technical staff.**

The following recommendations defined some additional **equipment needs**:

The panel discussed and agreed that the magnetic susceptibility probe attachment should be included as part of the paleomagnetics shipboard equipment (90-11).

SMP recommends the purchase of additional microcomputers for computerization of the micropaleontological laboratory (90-12).

The panel recommended that a second Rock Eval system be purchased for shipboard use (90-13).

SMP recommends the acquisition of a digital p-wave velocimeter specifically for sediment measurements. The system should be compatible with the existing Hamilton frame (90-16).

SMP recommends the addition of an automated carbonate bombe system which uses a pressure calcimeter method for measurement of up to 50 samples at one time (90-17).

The panel discussed priorities for equipment purchase. The following list is in priority order. Please note that some equipment needs were defined in previous meetings. The digital velocimeter is not included in the list because ODP/TAMU informed the panel that purchase will be completed in FY '90.

1. Rock Eval (SMP/PPSP recommendation)
2. Natural gamma for MST (Joint DMP/SMP recommendation)
3. Computerized Paleo Lab (SMP recommendation)
4. MacII (or PC w/ Windows) for PP and Paleomag labs (Joint DMP/SMP)
5. Automated carbonate bombe system (SMP recommendation)
6. Xerox for whole core hardrock imaging (SMP recommendation)
7. Magnetic susceptibility probe attachment (SMP recommendation)
8. Magnetometer (ODP/TAMU recommendation)

The panel discussed the questions/**requests from PCOM.** The responses and action items are listed on pages 5-6 of the minutes. One recommendation was made as part of the evaluation of routine OG sampling as follows:

SMP recommends that a geriatric study on selected OG samples be done by ODP/TAMU (90-14).

Over a number of recent legs, the measurement of **index properties** has been questioned by sailing physical property specialists. In March, a special physical properties group met and discussed the problems. The result of the meeting is a methods document for shipboard use. The panel agreed on the following recommendation:

SMP recommends that the manual, *Recommended Methods for the Discrete Measurement of Index Properties on the JOIDES RESOLUTION: Water Content, Bulk Density, and Grain Density* be used for shipboard index property measurements (90-20).

After reviewing requirements for **upcoming legs**:

The panel recommends that an additional sulfur standard be purchased for the XRF laboratory for use on Leg 139 (90-15).

After a very detailed discussion of the status of **technical staff**, the panel made the following two recommendations:

The panel recommends an additional 8 technical support positions of which 4 are directly supported by ODP/TAMU as FTE and 4 are supported on a one to two year basis by outside sources (90-18).

SMP recommends that technical staff be assigned to a laboratory over an extended period (e.g. > 6 Legs) and that staff work on tasks associated with their assigned lab while working onshore (90-19).

The panel had a very successful **visit to the ship**. All members viewed the visit as beneficial for the program. Many suggested changes were made and ideas brought forward. Each lab was viewed in a very detailed manner and, as such, most suggested changes do not warrant full recommendations. A summary of the suggested changes are listed on pages 13 to 16 of the minutes. One full recommendation (as listed below) was made after a potentially serious measurement error method was identified.

SMP recommends that all cores be equilibrated to lab temperature prior to running them through the MST (90-22).

The **joint SMP/DMP meeting** was both productive and successful. The panels reviewed the JOI Workshop defined user needs for core-log integration and made some modifications. After agreement on the modification, both panels endorsed the 'plan'. SMP and DMP agree on this recommendation. In addition, SMP discussed actual implementation and suggested that milestones should be defined starting with the Oahu Leg.

SMP recommends implementation of the user needs for ODP shipboard integration of core and log data as defined at the JOI Workshop on ODP Shipboard Integration of Core and Log Data (90-21).

Shipboard Measurements Panel
Fourth Meeting
9-10 October 1990
11 October Joint SMP/DMP Meeting
12 October SMP Visit to JOIDES Resolution

I Introduction

Members, liaison, guests, and observers were introduced. Ellen Thomas was unable to attend and sent regrets. The following attended the meeting:

J. Baldauf (ODP/TAMU liaison)
H. Crocker (observer)
I. Gibson (member)
D. Graham (ODP/TAMU liaison)
J. King (member)
M. Leinen (PCOM liaison)
P. Lysne (observer)
K. Moran (member, chair)
M. Mottl (member)
T. Pyle (guest, JOI)
M. Rhodes (member)
A. Richards (member)
H. Tokuyama (member)
J.P. Valet (member)
R. Whitmarsh (member)

II Minutes from the third meeting were approved with no changes. The Chair proposed changes to the agenda. The revised agenda was approved.

III Business Arising

Paleomagnetics

J. Baldauf reported that an ARM coil will be on the vessel in February. Action: J. Baldauf to report on status of ARM at next SMP meeting.

D. Graham reported on the status of the magnetization problem associated with the core rack. The core rack has been de-magnetized. J. King noted that the problem as initially stated was not very severe. However, it was agreed that a routine de-magnetizing program should be performed shipboard as part of preventative maintenance. This information should be included in the Paleomagnetics Handbook. **Action: J. King and J.P. Valet report the status of recommended changes to the Paleomagnetics Handbook.**

J. King reported on a core contamination study done by S. Robinson from Leg 115. The magnetic susceptibility data shows high, anomalous values (for carbonates) in the upper few metres of APC and XCB cores. These anomalous values occur at the top of each core interval except within the top 4-5 cores in the hole. These values are attributed to core contamination from rust. Because the contamination does not begin until the 4th to 5th core, the contamination is attributed to rust from the outside of the drillstring, after the BHA is "set". J. King took samples from both the inside and outside of the drill pipe and will

continue his evaluation of the problem. ODP/TAMU will look at the pipe during Leg 138 in light of the contamination problem. J. King also recommended that a magnetic susceptibility probe be purchased so that spot measurements can be made at the centre of the upper zones of cores and on XCB/RCB biscuited material. **The panel discussed and agreed that the magnetic susceptibility probe attachment should be included as part of the paleomagnetics shipboard equipment (90-11). Action: J. King to report on results for the drillstring 'rust' samples. J. Baldauf/D. Graham prepare a report on the drillstring test plan for Leg 138.**

Micropaleontology

Reference Slide Collection

J. Baldauf reported that he and E. Thomas have been in communication and have contacted several scientists specializing in benthic and planktonic foraminifera. Many have agreed to participate in preparation of an ODP reference slide collection by donating material and time for preparation of taxonomy and zonations. It was agreed that JOI/USSAC should be approached for funds for travel of US participants to a short meeting at the Smithsonian in order to begin this much needed reference slide collection. Member country participants would be invited and asked to request funds from their member funding organizations. This effort should include coordination with the existing Reference Centres. Once the foraminifera referenced slide collection is complete, Radiolaria, diatoms and nannofossils should then be completed in a similar manner.

Micropaleontological Computerization

E. Thomas reported via fax to the meeting regarding computerization of this lab. She emphasized that our previous recommendations (89-29,89-30) still hold, specifically that "micropaleo data input must be changed to direct computer entry" and "shipboard software must be available for plotting range charts". At present, the micropaleo data is still entered by hand onto carbon copy data forms. J. Baldauf reported that the ODP plan for computerization if this lab is broken into three phases. Phase I (now complete) is an upgraded version of Checklist which fulfills the software requirement for plotting range charts. These range charts can now be prepared shipboard as camera ready plots. Phase II is computerization of data entry. ODP have prepared a scope of work document which will be finalized and sent out as an RFQ. E. Thomas and N. Shackleton (OHP chair) have reviewed this document. Ellen's main comment is that the software for data entry must be completely compatible with the current software used by the micropaleo community (e.g. CHECKLIST). **Action: ODP/TAMU modify scope of work for Phase II to include the requirement that all software development be completely compatible with CHECKLIST.**

Phase III will be development of software so that zonation charts can be plotted directly on computer screens. The panel agreed with the general phased approach for computerization of this lab. However, this development will require purchase of additional microcomputers for computerization of the micropaleontological laboratory. **SMP recommends the purchase of additional microcomputers for computerization of the micropaleontological laboratory (90-12).**

Petrology

Shatterbox/Grinding Vessels

M. Rhodes reported that he had actually ground and measured a Tungsten carbide (WC) grinding vessel and found that for the elements analyzed shipboard, there was no contamination problem. He also discussed with the manufacturer the specified procedures for using the agate grinding vessel. Agate grinding is required when scientists request powders to take back to their labs for additional elemental analyses which may be contaminated by WC grinding. Mike reported that all samples ground in the agate vessel were too small and therefore a larger sample size is required. It was agreed that the best solution to the problem is to grind a large sample and then distribute from that sample, powders for each requesting scientist to take back to his/her lab. Powder from this large sample should also be analyzed shipboard. IHP should discuss and provide guidance on procedures for implementing this larger sampling requirement.

XRF

Over the past 12 legs, the XRF has been down during 4. At the last SMP meeting, we encouraged ODP/TAMU to send ET's on a training repair course at ARL, the manufacturer. D. Graham reported that they had made arrangements with ARL for training, but ARL cancelled at the last minute. Based on this, the panel agreed that ARL is not supporting the requirements of the program. SMP suggests that the program's requirements for reliable XRF be communicated to ARL via the JOIDES structure and from the European scientific community. **Action: Moran to report the problem and proposed solution to PCOM. Richards to discuss the problem and proposed solution to ESF.**

Computers

An update on shipboard hardware/software was reported by D. Graham and J. Baldauf and included in their summary package to the panel. The discussion of shipboard computer upgrades was put off until after the panel members visited the ship (see shipboard visit - page 15).

It was noted that PC upgrades as a minimum should include 2 Mbytes memory (4 is preferred), 386 microprocessor, 25 MHz clock speed and 25 msec disk access time. PC's for data acquisition (via ASCII or IEEE) do not necessarily require these minimum standards. The panel briefly discussed the PC-MAC debate. Although the panel feels that future microcomputer software and hardware developments will eliminate this debate, it was recommended that a question be added to the cruise evaluation form regarding user hardware/software preferences. The panel suggests that, considering some recent oil company decisions for microcomputer upgrades, ODP/TAMU should investigate possible acquisition of such equipment.

Sedimentology/Visual Core Descriptions

The new computerized barrel sheets program is onboard the ship on a trial basis for Leg 134. The final format for this sheet required discussion by the panel. This discussion was deferred until the joint SMP/DMP meeting because the format was directly linked to the topic

of the joint meeting, core-log data integration (page 12).

J. Baldauf reported that the digital core scanner (DISC) was onboard for Leg 133, but could not be evaluated due to the amount of core coming up. Evaluation will continue on Leg 134. The panel identified Leg 136 as one which would be useful for evaluation of this new technology because of the dispersed ash intervals.

A. Richards investigated the possibility of applying image analysis systems to suspensions. Attachment A includes his report to the panel. In summary, the hardware required for this application exists. The software for identification of fossils, for examples, does not yet exist. The report was tabled for further discussion at the March meeting.

M. Rhodes reported on the application of infrared spectrometry for analysis of bulk mineralogy. After pursuing some dead ends, Mike reported that CORE LABS provides this type of service. More information is required from CORE LABS for the next meeting. In addition, Mike reported that Alan Mix will be taking his color spectra analyzer on Leg 138 which includes infrared wavelengths. **Action: Moran to report on CORE LABS service. Rhodes to report on results of Mix's equipment at the SMP fall meeting.**

K. Moran reported that the AGC colour scanner was used on Leg 130. The sedimentologists onboard did not include the data as part of Volume A:, but intend to follow up as part of the science results. H. Tokuyama reported on a new colour scanner built by Minolta. This system can output data in both the CIE standard and in Munsell. **Action: H. Tokuyama to provide a brochure for the next SMP meeting.**

J. King reported that both the NMR and the CATSCAN are not practical for shipboard use. The NMR is too slow and also passes the core through an undesirable high magnetic field. The CATSCAN requires a lot of space, a lot of money and also is a technically difficult piece of equipment to maintain.

Smear slides were once again discussed because of SMP's apparent conflict with IHP as noted in the memo from TAMU (Attachment B). The panel discussed the issue again and agreed that the wording of our first recommendation was not clear. The panel discussed a modified recommendation and agreed that a small group consisting of a representative from each of SMP, SGPP, and IHP should meet before our next meeting, discuss the apparent conflict on this issue, and draft a recommendation for approval by IHP and SMP. **Action: K. Moran to organize special group meeting.**

Geochemistry

M. Mottl reported on the Ti squeezers. The ship now has 5 Ti squeezers. Temperature control is not required because insulation of the squeezers after chilling or warming will be enough to maintain close to in situ temperatures during squeezing.

The panel discussed the Rock-Eval system which has not been consistently operational onboard the vessel. PPSP expressed concern for safety reasons. D. Graham presented the options (Attachment C) available for upgrading/maintaining this equipment. **The panel recommended that a second system be purchased for shipboard use and that ODP/TAMU consult with Barry Katz on the choice of equipment (90-13).**

Underway Geophysics

The high speed streamer which had been on loan to ODP/TAMU is now on the Ewing and not available for further JOIDES Resolution trials. HIG has recently purchased a high speed streamer. **Action: D. Graham to investigate possible loan of HIG streamer for further tests during Oahu leg.**

The RFP for the new navigation system has been rewritten for distribution in October.

IV PCOM Report

M. Leinen reported on the spring and summer meetings of PCOM. A major decision in the spring was that the ship will be in the N. Atlantic after October '92. A large part of PCOM's discussions are now focussed on renewal of the program. In the summer meeting, implementation of the long range plan was discussed and a matrix showing the achievements of the program as they relate to COSOD objectives. Panel members were asked to review and comment on the matrix. This matrix was intended to go to policy makers in member countries to use as a tool for renewal. An additional leg was added to the schedule in the summer. The Oahu pilot hole will be a 17 day leg. The site drilled will be double APC, one reentry hole and drilled 200m into basement. In addition, the site will be used to seal test the new hole "stopper". Additional time was added to engineering leg 137 (3A) because of the concern regarding milling/clearing 504B. A number of questions/requests addressed to SMP were reported:

1 PCOM requested clarification specifically on how exceptions are handled for requests to use radioactive and stable isotope onboard.

SMP cannot presently envision any possible exception to the ban on radioactive or stable isotopes. Neither cost nor convenience are considered as legitimate exceptions to this ban. If, however, a valid exception to this ban is proposed, the request should come to SMP through the normal proposal channels for consideration. For example, if a proposal which is routed to a specific thematic panel includes the use of such substances on the vessel, the proposal should be forwarded to SMP with the thematic panel's comments on the relative scientific importance of the isotope experiment.

2 Should we routinely X-Ray sediment sections onboard?

SMP agrees that a radiography system should be available onboard for use by shipboard scientists, but should not be performed routinely. The panel reviewed the equipment suggested by U. von Rad. A. Richards reported that the current X-Ray system available onboard could be modified so that good quality radiographs could be done on whole round samples. These modifications could be done by ODP/TAMU at a relatively low cost. **Action: A. Richards to forward modification requirements/literature to D. Graham at ODP/TAMU.**

3 Should OG sampling continue as a routine policy?

The panel discussed the question and does not have enough information from the organic geochemistry community to confidently answer. M. Mottl volunteered to prepare a

questionnaire for the community which will include this and related questions. **Action: M.Mottl to liaise with ODP/TAMU on preparation and distribution of the geochemistry questionnaire.** The panel also discussed whether or not the frozen samples are useful or do they degrade significantly with time? **SMP recommends that a geriatric study on selected OG samples be done by ODP/TAMU (90-14).** For example, old samples collected at the same site as more recent material should be compared using geochemical measurements. Finally, the panel discussed the possibility of transferring the collection to a more suitable facility , e.g. an ice core archive facility. If the geriatric study results show that the frozen sample collection is not degraded with time, IHP should consider the possible transfer of the collection to a more cost effective facility.

4 CHNS has been replaced with CNS; why and should this be reconsidered?

With the current shipboard equipment (Carlo Erba CNS Analyzer 1500), it is not possible to measure Hydrogen. However, there may be alternative methods which would not require the purchase of additional equipment. M. Rhodes will prepare a summary for the next meeting. **Action: M. Rhodes to summarize alternative methods and evaluate the need to perform this onboard.**

5 What does the panel require for membership/liaison with other panels?

The panel lacks sedimentological expertise. SMP discussed the nomination of two individuals and the chair will present the nominations to PCOM in December. The panel requires liaison with DMP specifically for physical properties. SMP requests that DMP nominate a physical properties specialist as liaison to SMP.

V ODP Sampling/Downhole Tools

The hardrock core orientation tool will be tested on Leg 134. The new APC temperature tool will also be tested on Leg 134. The WSTP is being rebuilt. Three changes will be made to the WSTP tool: (1) a longer nose design will reduce formation cracking; (2) the pore water ports will be moved closer to the end of the probe; and (3) pore water piping will be changed to Titanium. All changes will be made and tested prior to Leg 138. LAST-I was successfully used on Leg 131. LAST-II is complete and has been tested onshore; the tool is ready for offshore tests. Geoprops will begin onshore tests in a few weeks. **Action: ODP/TAMU report on the status of all sampling/downhole tools at SMP's spring meeting.**

The panel discussed core liner handling during the ship visit (see Ship Visit - page 14).

VI Upcoming Legs

Sedimented Ridges

The panel discussed potential measurement problems associated with sampling sulfide rich formations. First, there may be a problem measuring H_2S using the natural gas analyzer on one of the two HP gas chromatographs. **Action: D. Graham evaluate the NGA/GC and report to the next SMP meeting.** Second, sulphides were discussed at the last meeting as a potential problem for the XRF. M. Rhodes reported that he had successfully

run some samples for sulphides using two standards (2.1% sulfur and 4% sulfur). He recommended that a higher sulfur content standard be acquired prior to this leg. **The panel recommends that the Canadian standard at 10-20% sulfur be purchased for the XRF laboratory for use on Leg 139 (90-15).**

Eastern Equatorial Pacific

This paleoceanographic leg requires detailed physical property measurements in soft to very stiff sediment. Additional equipment for the discrete measurement of p-wave velocity is required. Digital velocimeter equipment was successfully used on Legs 130 and 131. A similar system would meet the needs for this and other paleoceanographic legs. **SMP recommends the acquisition of a digital p-wave velocimeter specifically for sediment measurements. The system should be compatible with the existing Hamilton frame (90-16).** This Leg will also require high resolution carbonate analyses. The present system onboard is very labour intensive. **SMP recommends the addition of an automated carbonate bombe system which uses a pressure calcimeter method for measurement of up to 50 samples at one time (90-17).**

VII JOI Geochemistry Workshop

The panel received a memo from B. Katz summarizing some of the shipboard measurement recommendations from this workshop. The panel reviewed the recommendations which could be accommodated following current ODP policy. **Action: M. Mottl to respond to Katz memo from the panel.**

VIII SGPP Report

A member from SGPP did not attend, so a report was not made.

IX Shipboard Technical Staff

Staffing Requirements

D. Graham reported on the current shipboard compliment. A total of eighteen technical staff are required per leg to just maintain and operate existing facilities. The compliment is as follows:

- Laboratory Officer (1)
- Assistant Lab Officer (1)
- Chemistry Tech (2)
- Computer System Manager (1)
- Curatorial Representative (1)
- Electronics Tech (3)
- Photographer (1)
- Yeoperson (1)
- Core Lab Tech (7)

The current ODP/TAMU staff includes 32 FTE positions. The remaining four positions are funded for FY '91 only. The panel reviewed the needs of each laboratory and agreed that the total staff compliment of 18/leg is below the minimum required. As noted in a previous meeting, the ratio of technical staff to science staff has decreased since DSDP while the technical complexity of the shipboard equipment has increased. This number of staff means

that improvements, changes, or upgrades to the labs cannot be readily achieved. For example, upgrades to the paleomagnetics and physical properties laboratories are needed now, but will not be achieved in a reasonable time frame. **The panel recommends an additional 8 technical support positions of which 4 are directly supported by ODP/TAMU as FTE and 4 are supported on a one to two year basis by outside sources (90-18).** Two sources discussed by the panel were: (1) NSF supported graduate students or graduate students supported by member country funding and (2) visiting technical staff from other US institutions or member country institutions.

Staff Training

The panel agrees that some problems in individual laboratories have occurred because staff have not had adequate training. In addition, because of a shortage of staff, ODP/TAMU management have opted to rotate and cross-train technical personnel rapidly through laboratories in order to get a more versatile staff. This type of rotation limits the learning/training in each lab. Also, when staff are onshore, they do not normally work on tasks associated with their current shipboard laboratory assignment. **SMP recommends that technical staff be assigned to a laboratory over an extended period (e.g. > 6 Legs) and that staff work on tasks associated with their assigned lab while working onshore (90-19).** Additional outside training is also required. Four laboratories offer their facilities for training of ODP/TAMU technical staff: J. Gieskes (Scripps - Geochemistry); J. King (URI - Paleomagnetics); K. Moran (BIO - Physical Properties); and M. Rhodes (UMASS - XRF). All of these labs have priority work associated with their own funding sources, but can accommodate training with enough notice and flexible scheduling. The panel also suggested that engineering legs should be used for training of staff.

Other problems

D. Graham was asked to report on the most common staff complaints. The most common is that staff are required to work at College Station for 5 weeks between Legs and that the work done while onshore is usually not associated with their shipboard work. The staff get compensation time of 16 hrs. for every 10 days worked at sea. It was noted that this is barely equivalent to compensation for weekends of time off lost while at sea.

X Physical Properties

K. Moran reported on the history of problems associated with index property measurements. Problems were first identified on Leg 110 which were associated with (1) the method of drying samples was not standard and (2) some of the wet volume determinations were questioned. The recommended drying method was changed from freeze drying to oven drying following the ASTM procedures. However, this change did not consistently occur until Leg 131 when the freeze-dryer was removed from the lab. The penta-pycnometer has been checked for accuracy in wet volume determinations using distilled water. If calibrated and operated properly, the penta-pycnometer results for wet volume are accurate and repeatable. Some of the operational problems associated with the penta-pycnometer are: (1) the volumes of sample are too small; (2) chamber calibrations are not repeated and checked (V_c); (3) this method is not applicable for basalt because the measurement accuracy is of the same order as basalt porosity; and (4) machine calibrations for the reference volume chamber were frequently performed. A group of physical property specialists met prior to the last SMP meeting and discussed the index property problem. Since that meeting, they prepared a

methods manual for discrete measurement of index properties. A summary of the manual was presented to the panel. **SMP recommends that the manual, *Recommended Methods for the Discrete Measurement of Index Properties on the JOIDES RESOLUTION: Water Content, Bulk Density, and Grain Density* be used for shipboard index property measurements (90-20).**

XI Lab Equipment

The panel discussed the required new and replacement lab equipment in terms of priorities. The following is an equipment summary in priority order:

1. Rock Eval (SMP/PPSP recommendation)
2. Natural gamma for MST (Joint DMP/SMP recommendation)
3. Computerized Paleo Lab (SMP recommendation)
4. MacII (or PC w/ Windows) for PP and Paleomag labs(SMP and Joint DMP/SMP)
5. Automated carbonate bomb system (SMP recommendation)
6. Xerox for whole core hardrock imaging (SMP recommendation)
7. Magnetic susceptibility probe attachment (SMP recommendation)
8. Magnetometer (ODP/TAMU recommendation)

Equipment which requires additional evaluation includes: X-ray; luminoscope; microwave drying for physical properties and geochemistry; colour spectrum analyzer; and split core MST. The panel agreed that a viscometer is not required as standard shipboard equipment, but scientists interested in this measurement are encouraged to bring their own equipment onboard. The digital velocimeter was not included in the priority listing because D. Graham informed the panel that purchase was already underway.

XII AOB

A. Richards discussed the inconsistency of units used in the program and, in many cases, a total disregard for proper use of significant figures . He recommended that all measurements be reported in the SI system using significant figures. **Action: All members review their respective lab and report on the SI system/significant figures at the next meeting.**

XIII Next Meetings

A. Richards requested that the March meeting be moved toward the end of the month. I. Gibson again requested that we overlap with IHP. Based on these requests, the next meeting is now scheduled for 19-21 March in College Station, Texas. SMP will meet with IHP for one half day on 20 March. The meeting will adjourn at noon on 21 March.

The fall meeting '91 was originally scheduled for Halifax. Because the ship will be in Victoria at that time, it was decided to move the meeting to Victoria in order to visit the ship again. The panel agreed that the ship visit was late in coming and most beneficial. In addition, the joint meeting with DMP was very successful and should be repeated on a regular basis. Panel members were reminded that the dates for this meeting may slip due to changes in the ship schedule. The tentative program is as follows:

13 Sept.....ship visit
14-15 Sept...SMP meeting
16 Sept.....joint meeting with DMP to review core-log integration

Joint SMP/DMP Meeting
11 October 1990

SMP and DMP met to review and discuss the results of the JOI Workshop on ODP shipboard Integration of Core and Log Data which was held 29-30 August 1990. The report was presented to the joint panels. Discussions followed which resulted in some revision of the workshop specification of user needs.

SMP recommends the implementation of the user needs for ODP shipboard integration of core and log data (90-21) which are listed below. This is a joint recommendation with DMP.

a) General Observations

i) Core and log data are the products of complementary measurements. Logs help to put core data in perspective; core data can be used to calibrate logs.

ii) Earth scientists are increasingly required to work with data measured at different scales and rooted in different subdisciplines. The integration of core and log data is an important component of the broader process of scale and subdiscipline integration in contemporary earth science.

iii) Computerized barrel sheets constitute a useful tool for integration and display of core and log data.

b) General Requirements

i) Standard procedures are needed for the integration of core and log data.

ii) Integration procedures should be compatible with methods for subsequent correlation with seismic data.

iii) It is expected that a major part of the core-log correlation and definition of reference depth will occur shipboard. The procedures, however, should be sufficiently flexible to allow for review and changes at the first post-cruise meeting.

c) Specific Requirements

Reference depth

- All core and log data should be referred and tied in to a common depth scale. These depths are to be known as the reference depth.

- Software which runs on Macintosh and IBM-PC compatible computers for calculating reference depth, and the core parameter file should be available on the file server on board ship. This software can then be accessed by shipboard scientists for including the reference depth in their core data files.

- The LDGO logging scientist should be responsible for copying the REFERENCE DEPTH logs to the file server. This does not include the FMS data which will be available only on the Vax station (in mbsf).

- Bottom of pipe should be used for tying logs to pipe depths.

Data Acquisition

- Standard, compatible ASCII tabular formats should be adopted for all core and log data. Drilling parameter data files should also be available in ASCII tabular formats.

- All discrete laboratory measurements should be accompanied by comments on lithology. Provision should be made in spreadsheets for a lithology comment column.

- Spreadsheet templates for laboratory data entry should be available for both MacIntosh and PCs. Data should be downloaded to the VAX at the end of each hole as a minimum so that error checks can be performed onboard in cooperation with the shipboard scientists.

- In order to achieve adequate spatial resolution, the recommended frequency of discrete laboratory physical properties measurements should be increased to a minimum of two measurement per section. Legs should be appropriately staffed in order to meet this requirement. Drilling in hard rock may necessitate an exception to this sampling frequency. In such cases, the number of samples taken can be reduced.

- To improve core data correlation, discrete physical property measurements should be selected at the same reference depths as all other core measurements.

- The physical properties laboratory should be upgraded; the mass and volume measurement devices should be connected to a PC.

- Natural gamma should be added to the MST for direct core-log integration.

- Magnetic susceptibility log acquisition (in the resolution range for sediment) should be added as part of the standard logging suite for direct core-log integration.

Data analysis

- Processing/integration/interpolation software is needed (e.g. a modified version of CORPAC).

- Upgrades to graphics software/hardware should continue for shipboard labs. (To facilitate this and related recommendations, an additional computer person-year is recommended for science operations requirements).

- A core-log data correlation specialist should be identified within the scientific

party of each leg. A key responsibility of this position is determine the common reference depth. If necessary, additional persons to carry out physical properties measurements should be sailed to free a key staff member for this function.

- Core-log correlation involving FMS and/or BHTV data should be undertaken onboard where possible. If this cannot be achieved, then the task should be completed as part of the scientific investigations post cruise.

- Graphics must be sufficiently flexible to allow display in either leg-specific or topic-specific mode. The spreadsheet/graphics/correlation system should be sufficiently versatile to allow additional utilities to be incorporated as needed

- A more substantial database of logs measured through pipe should be acquired and incorporated into an integrated data set for better interpretation of this data type. A calibration study of through pipe logs should be initiated for a wide range of lithologies.

- An ad hoc specialist group should be inaugurated to review progress and to provide a forum for ongoing discussion of issues related to core-log data integration.

Data availability

- All data must be copied to the file server for availability to all shipboard scientists. The logging scientists should be responsible for copying all standard log files in ASCII standard format and individual core laboratory scientists should be responsible for each respective core data set (physical properties, geochemistry, etc.).

Following agreement of the user requirements, D. Graham presented the equipment/software which will be required for implementation of these needs. The SMP related requirements are included in the equipment priority list (page 9). **In addition, the panels discussed the format of the new computerized barrel sheet as a tool for core-log data integration. A proposed format was agreed. The lithologic description and core photo will be shown in the nominal depth format and all other data will be presented in the reference depth format.**

The meeting closed with agreement that the joint session was a great success, partly due to the ground work done at the Miami workshop. Future joint meetings are recommended.

SMP Ship Visit to JOIDES Resolution
12 October 1990

The panel visited the ship on 12 October for the full day. Some members returned on the morning of 13 October. The visit began with an overview of the computing system presented by Bill Meyer. Individual panel members then went to their respective labs and "dove-in". In mid-afternoon, panel members who had not been on the ship before participated in a general tour. To close the day, SMP met together to review each lab. A list of comments from each lab is compiled here:

Paleomagnetics (Valet and King)

- The magnetic susceptibility measurement is temperature dependant and the dependance is non-linear. **SMP recommends that all cores be equilibrated to lab temperature prior to running them through the MST (90-22).**
- The magnetic susceptibility meter on the MST is being misused. There are two integration settings on the meter (2 sec and 9 sec). This meter should be used in the 9 sec integration mode for low susceptibility material (e.g. carbonates). Bartington may be able to supply an intermediate integration, if the 9 sec mode is too slow.
- Definitely requires a Mac II for data integration. The lab needs to be able to quickly look at the magnetic susceptibility data.
- Tech reports for the last leg were not in the lab.
- Fields associated with the core rack are not a problem. J. King noted that the core rack is made of galvanized steel.
- Field in the cryomag is not high.
- 2G screwed up the polarity during an upgrade. The software used has been band-aided severely. New software should be acquired, perhaps from Lisa Tauxe at Scripps.
- Tune-ups should be handled by the ET. Suggest Goodman (2G) talk with ET's about this.
- The handbook needs to be updated. **Action: J.P. Valet and J. King will review for the next meeting.**

Geochemistry (Mottl)

- Dionex IC should be replaced with a smaller unit.
- Titrator had problems on the last leg (133).
- Colorimeter (B&L Spectrophotometer) should be replaced with an electrochemical method device. This will be tested on Leg 136.

- **Action: M. Mottl will expand the geochemistry questionnaire to include questions concerning the colorimeter and the second GC.**

Downhole Tools (Whitmarsh)

- The multi-shot tool is very labour-intensive. When it is being run, one tech is required full-time to operate and get the data. A digital tool is now available. Given the shipboard labour problem, the purchase of a digital tool may free up one technician during APC. **Action: D. Graham will investigate the feasibility/cost of this tool and report at the next SMP meeting.**

- The sonic core monitor looks to be a very promising tool.

- A core liner handling system must be implemented soon. The core liner is severely deformed between the time it is removed from the core barrel until it arrives on the catwalk. D. Huey will evaluate the problem on Leg 134 and propose a solution. It was agreed that deformations should not exceed those already experienced by the sample during recovery of the core barrel. **Action: ODP/TAMU to report on core liner handling at the next SMP meeting.**

Physical Properties (Richards/Moran)

- Radiation check should be done in additional places near the GRAPE or move the detector. The lead shield should be in place when core is not being measured (and particularly when tours are going through the ship!).

- Since the manual was written for the GRAPE, the source has been changed from Barium to Cesium 137. Has it been appropriately calibrated? If not, it must be done; if so, it must be documented.

- The Wykham-Farrance vane should be upgraded with torque transducers.

- Almost all of the vanes were damaged. The vanes which could not be repaired were removed and given to the lab officer; they should be discarded. The vanes that could be repaired were marked as such and given to the lab officer.

- The X-Y plotter should be replaced. The vane output should go to a microcomputer.

- Data from the Scitech balance and the penta-pycnometer should be output to a microcomputer.

- P. Jackson's resistivity equipment was evaluated. The prototype is excellent and provides a direct correlation with the FMS. If a version appropriate for ODP is built, this measurement would provide the most direct link for core/log integration because measurements are made at approximately the same scale. Action: K. Moran to present status of resistivity to PCOM.

- The X-Ray system should not be replaced. If scientists wish to use it for whole rounds, modifications are needed as discussed in the meeting.

XRF (Rhodes)

- Overall, very pleased with the lab. The history of problems with this XRF is not different from other labs.
- Sample size for agate grinding is far too small. Sample size needed is > 30g and 50g is ideal. Action: M. Rhodes will confirm these sample sizes.
- Should buy a four-at-a-time rack for WC grinding.
- Weighing is very slow. Perhaps a weightless method could be used; e.g. weigh the flux onshore (which contains lanthanum), then monitor the lanthanum peak and make corrections based on this. M. Rhodes will pursue this idea further, if time permits.
- Software is antiquated. One program runs the machine and stores raw data on disk then another program converts the data. You should be able to do both simultaneously. Also, there is no way to make matrix corrections so if you are analyzing rocks that depart from the 'norm', there will be problems.

Computers (I. Gibson)

- Network is very good, the missing link now is the Masscomp, it should be on the network.
- Public folder on the Mac looks different than on the PC.
- Document the file structure on the file server.
- PC upgrades should, as a minimum, have VGA colour, 4 Mbytes RAM, memory cache, 25 MHz clockspeed and a fast processing speed.
- Software should be the same on all machines. Need Windows 3.0 on all PC's. Need a drawing package for the PC. Harvard Graphics is a good presentation package for the PC.
- Core-log data integration software will be required for incorporation of the sonic core monitor data into the determination of core depth.
- Replace the Pro 350's.
- The priorities for computer upgrades are (1) replace the printers; and (2) upgrade the PC's.

Geophysics (Tokuyama)

- At present, the streamer used is a "mini" streamer with a small diameter, originally designed for multi-channel seismics. This type of streamer is highly

susceptible to towing noise because the hydrophones are close to the outer PVC wall. Suggest that ODP/TAMU make a replacement, single large diameter streamer cable.

- ODP/TAMU technicians must replace the streamer cable within 1 year because the hydrophone sensors have been and continue to be degraded by kerosene.

- A depth controller would be most useful for maintaining the streamer cable at > 30 metres. ODP/TAMU should investigate potential acquisition of depth controller for both normal and high speed streamers.

The panel agreed that the ship visit was very beneficial. The next ship visit should be scheduled so that the meeting is held after a day is spent on the ship.

SMP meeting was officially adjourned at the end of the ship visit. SMP thanks Tony Crawford for his help, hospitality and warnings about the crocs, snakes and jellyfish.

Attachment A

3 October 1990

REPORT ON THE POSSIBILITY OF AUTOMATIC IMAGE ANALYSIS OF ODP SMEAR SLIDES

Adrian Richards, ESF Representative on the JOIDES SMP
(Adrian Richards Company & Delft University of Technology)

I. INTRODUCTION

Sediment classification using conventional smear slides aboard the JOIDES Resolution is time consuming and subjective because of variable operator knowledge, ability, and patience. At the initial meeting of the SMP, it was suggested that the smear slide sediment classification procedure could be automated. This report presents information on the possibility of smear slide automation, concludes that it appears to be feasible, and recommends future steps for implementation.

It is emphasized that a detailed examination of the possibilities has not been made. Rather, only enough information has been obtained from several knowledgeable academic researchers in two universities and from one company representative to indicate the probable feasibility of automation. Individuals and organizations contacted are listed in Appendix A.

Dr. Jack Baldauf, ODP, kindly made available three examples of smear slides that were supported by a text and graphics summary of information shown on the slides. This information was used in discussing the problem with the Dutch contacts.

II. RESULTS

A. University of South Florida

Dr. Robbins reported (Appendix B) that using an image analysis system "one could undoubtedly scan a smear slide for at least a crude classification." The system would include an artificial intelligence neural network. She guessed that about 75% of the time personal time would be minimal, while 25% of the time more operator input would be required.

B. Delft University of Technology

1. Particle Technology, Faculty of Chemical Technology and Materials Science

Prof. B. Scarlett, in taking the particle technology approach to the problem, considered that this probably would be less applicable than pattern recognition and image analysis. He referred me to Prof. Young.

2. Pattern Recognition, Faculty of Applied Physics

Prof. Young believed that while suitable image analysis hardware could be obtained from a number of vendors, the problem would be in developing appropriate software. He considered that a student could perform an examination of the numerous options and make a preliminary evaluation of the options within a M.S. thesis. A PhD student probably would be required to further the research to and including software development.

Young recommended the consideration of a number of options for ODP sediment classification. One would be to undertake an automated image analysis of an actual smear slide. Another would be to disperse a representative volume of sediment in a fluid and then image the particles as they fell in a flow cytometer. He suggested that other, unnamed, options might also be candidate solutions to the problem.

It is my opinion that a research group similar to the Pattern Recognition Group at the Delft University of Technology might be ideal to pursue the problem. Intuitively, the available and interaction of optics, solid state physics, computational physics, and signal processing, in addition to pattern recognition (Appendix C), would enable a powerful approach to be made to the solution of the problem.

Young suggested the names of a number of companies producing image processors or packaging production prototypes:

Joyce Lovel	United Kingdom
Leica (ex-Cambridge Instruments)	United Kingdom
Kontron	Germany
Difa Measuring Systems	The Netherlands, & Farmington Hills, MA
Perceptive Systems, Inc.	Houston, TX

C. Difa Measuring Systems

Mr. Zijlmans corroborated what Prof. Young had told me, and that the bottom line was the problem was solvable. (This may not be surprising considering that there is a close interaction between Young and Difa.) There was uncertainty about the eventual cost of a fully operating system until their research department had the opportunity to examine a number of smear slides and had a resource person to interact with. A brochure outlining the Difa Tea Image Manager (TIM) was provided (Appendix D).

CONCLUSIONS

The probability of developing a successful automated system for sediment classification equal or better in quality to the present smear slide identification method, is unknown; however, the indicators are that an automated system probably could be developed. In addition to image analysis of an actual smear slide, other possibilities exist that may turn out to be preferable for a number of reasons. Image analysis and pattern recognition appear to be the principal methods for problem solution at this time. It probably will be necessary for a person knowledgeable about smear slides and the ultimate objectives of ODP sediment classification to interact with a pattern recognition group or with a company.

RECOMMENDATIONS

1. Dr. Baldauf, ODP representative to the SMP, should be requested by the SMP at the October 1990 meeting to visit the appropriate person(s) in the Perceptive Systems Company in Houston to obtain their input to the problem and to provide a suggested contribution from their company. An oral report of the visit should be made at the March 1991 ODP meeting in College Station. If the report is corroborative to this report, then proceed to recommendation 2. If not, then decide at the March SMP meeting the future course of action to be followed.

2. The SMP chairperson should encourage, through personal contacts and the JOIDES/JOI/ODP structure, any interested person or university group to

undertake a M.S.-level examination of the problem for the purpose of indicating technical and financial feasibility and to list and evaluate candidate solutions. A report of the study or studies, if made by more than one group, should be reported to the SMP.

3. Eventually a decision to acquire prototype hardware and to develop software within a university or by industry will need to be made by the SMP and PCOM if ODP resources are likely to be required. But for the time being it probably would be preferable to encourage an academic solution somewhere within the global ODP community.

Appendix A: Persons and Organizations Contacted

Dr. Lisa L. Robbins
Assistant Professor
Department of Geology
University of South Florida
Tampa, FL 33620
Phone: 813 974-2236

Prof. Brian Scarlett
Professor of Particle Technology
Faculty of Chemical Technology and Materials Science
Julianalaan 136
2628 BL Delft, The Netherlands
Phone: 31 15-783577; fax: 31 15-784452

Prof. Dr. Ian (Ted) Young
Professor of Pattern Recognition Group
Faculty of Applied Physics
Delft University of Technology
Lorentzweg 1
2628 CJ Delft, The Netherlands
Phone: 31 15-781416; fax: 31 15-626740

Ing. A.J.S.M. Zijlmans
Sales Engineer Image Processing
Difa Measuring Systems B.V.
P.O. Box 3132
4800 DC Breda, The Netherlands
Phone: 31 76-710144; fax: 31 76-711953

Appendix B

DEPARTMENT OF GEOLOGY

USF
UNIVERSITY OF SOUTH FLORIDA

TAMPA, FLORIDA 33620-5200
PHONE (813) 974-2236

April 13, 1990

Prof. Dr. A.F. Richards
Adrian Richards Co.
Uiterweg 309
1431 AJ Aalsmeer
THE NETHERLANDS

Dear Prof. Dr. Richards:

I received your letter inquiring about automatic sediment classification, with much interest. As Chris Harrison advised you, I was involved with image analysis while at RSMAS. At that time I was looking at the morphology of foraminifera to establish taxonom classifications. As such I did not have the chance to apply this to other organisms or classification of sediment types. However, depending on the parameters that must be set up, one could undoubtedly scan a smear slide for at least a crude classification. All of this would be based on external shapes and sizes of objects and linked to an Artificial Intelligence neural network. I can not be certain how much time this could ultimately save, but my guess is that about 75% of the time the person hours may be minimal. The other 25% of the time one might need more operator input. I have just put in an order to purchase an image analysis system. The software that is coming with it is quite flexible and one can create custom applications. Although this may take some time initially, it may be well worth it in the long run.

If specific classifications are needed within taxon (e.g., species of Radiolaria or foraminifera) my guess is that unless a lot of effort is expended to set up the parameter - the human brain might do a better job. Dr. William Reidel, SCRIPPS, has spent a considerable amount of time trying to set up automatic classification schemes for Radiolaria - and the last time I talked to him he was somewhat frustrated about it. Dr. Nancy Healy-Williams, University of South Carolina, and I have set up identification of certain planktonic and benthic forams - however, I doubt this is the type of thing you are referring to - and if it is, I don't believe that such a tool will improve time efficiency.

I hope that I have been some help in this matter. If you have any other questions or if I can be of further help, please do not hesitate to contact me again.

Sincerely,

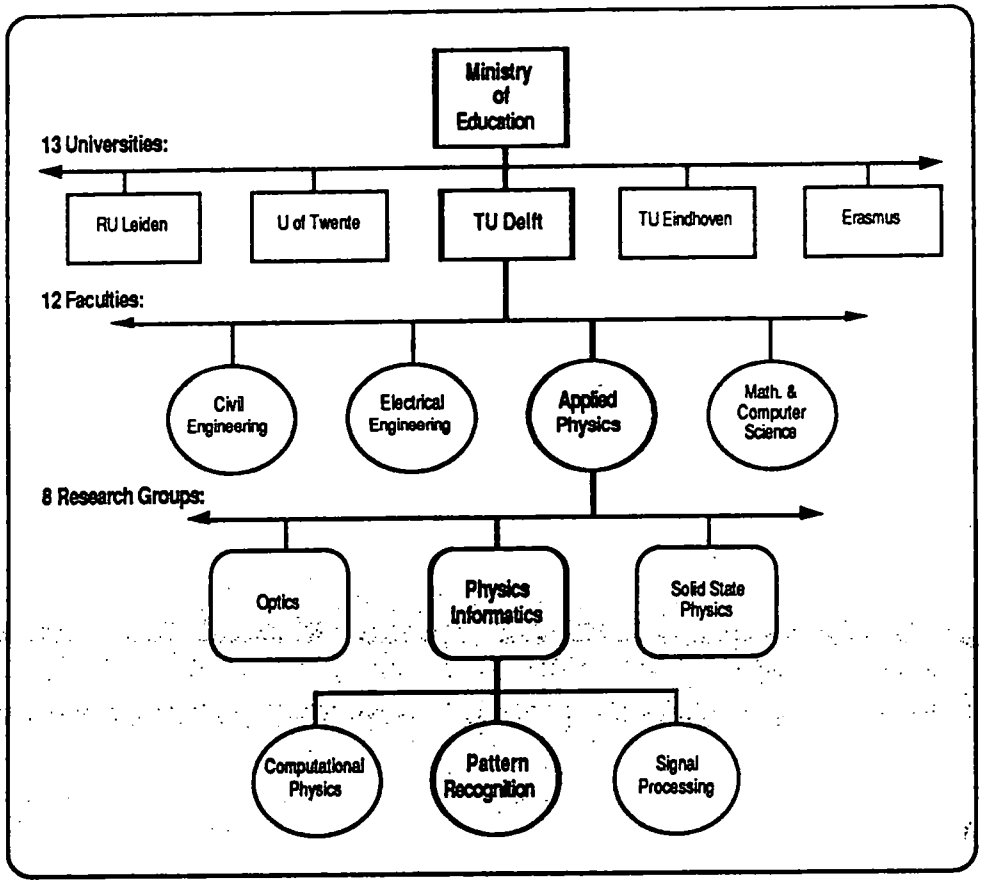
Lisa L. Robbins
Assistant Professor

LLR/bh

Appendix C

The Research Group ST-PH

The following diagram indicates the structure and position of the research group *Pattern Recognition* within the Faculty of Applied Physics of the Delft University of Technology.



The *Pattern Recognition* research group consists of:

Permanent Scientific Staff
- Ted Young
- Bob Duin
- Ad Herweijer
- Pieter Jonker
- Jaap Joosten
- Piet Verbeek
- Albert Vossepoel

Graduate Students (Ph.D.)
- Hans Buurman
- Erwin Komen
- Martin Kraaijveld
- Carol Orange
- Karel Strasters
- Ben Verwer
- Henri Vrooman
- Lucas van Vliet
- Jim Mullikin
- Fons Verbeek

Permanent Support Staff
- José de Bruin
- Rob Ekkers
- Jan van der Heiden
- Tom Hoeksma
- Jan Karman
- Wim van Oel
- Jan Straver

Undergraduate Students (Ir. = M.Sc.)
- 25 students

Basic Research Topics
- Architectures and Algorithms
- Non-Linear Image Filtering
- Digital Measurement Theory
- Modern Recognition Techniques

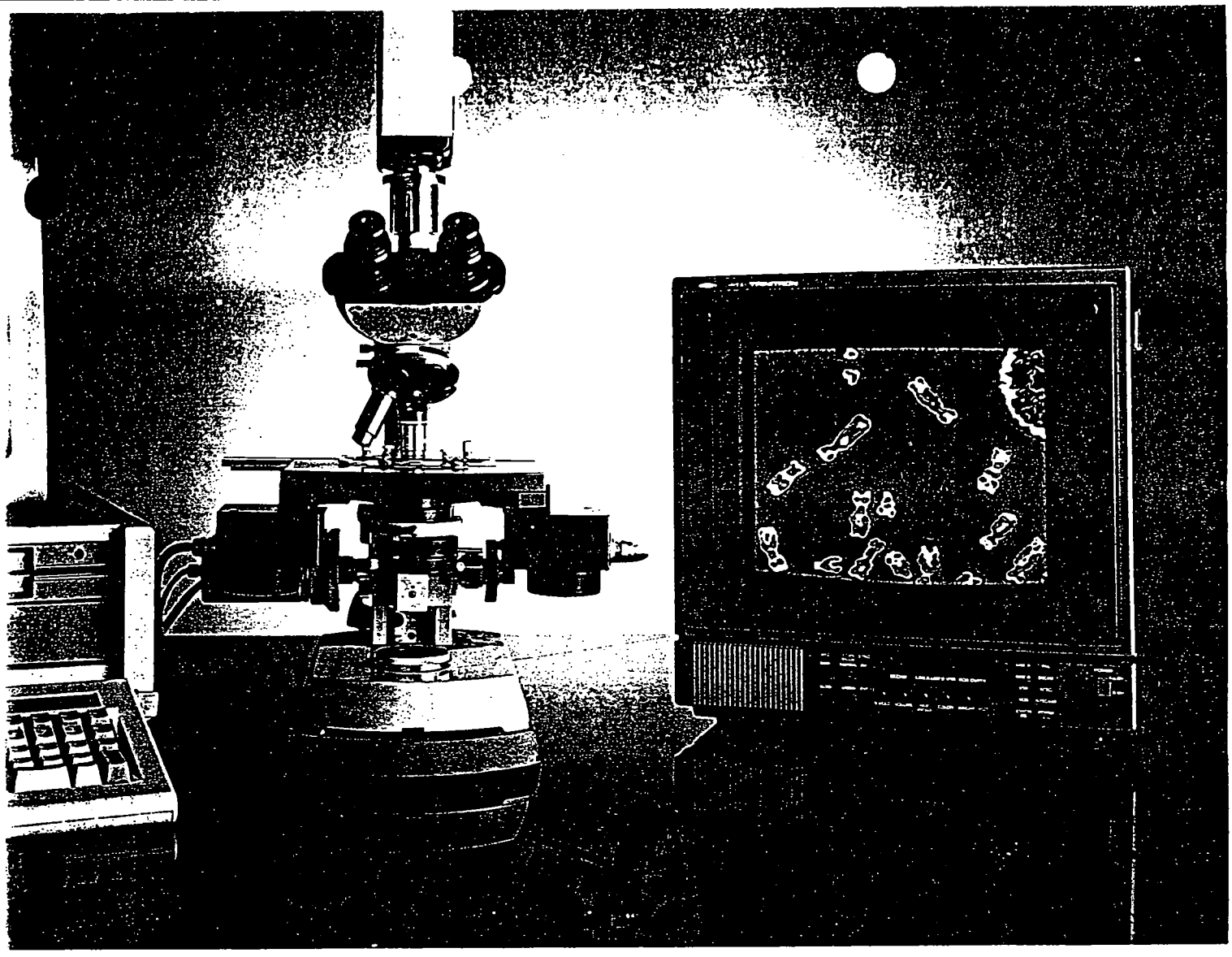
Applied Research Topics
- Robot Vision and Sensors
- Quantitative Microscopy
- Quantitative Interferometry
- Software Systems

Appendix D

TIM

TEA Image Manager
Powerful digital image processing software.

In the interests of your analysis, this eye never gets tired.

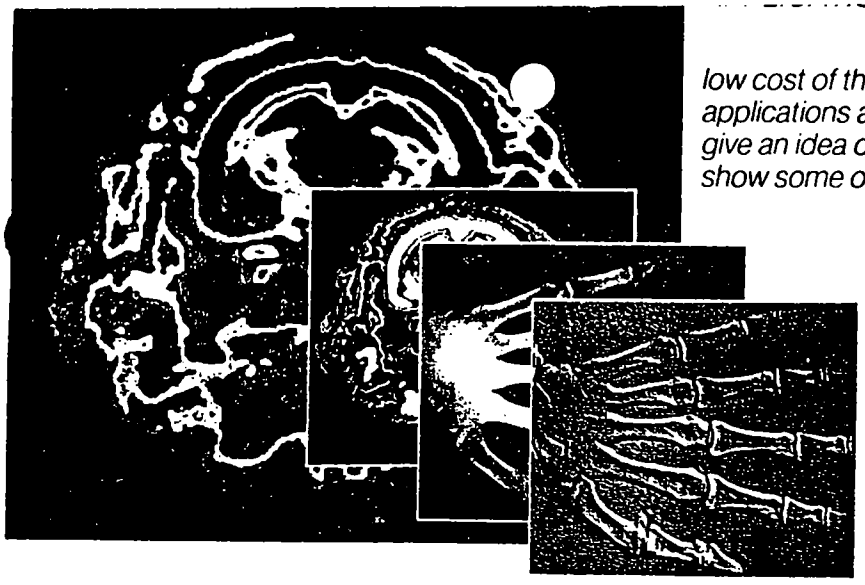


TIM can digitize, display, check and store images beyond the possibilities of the human eye

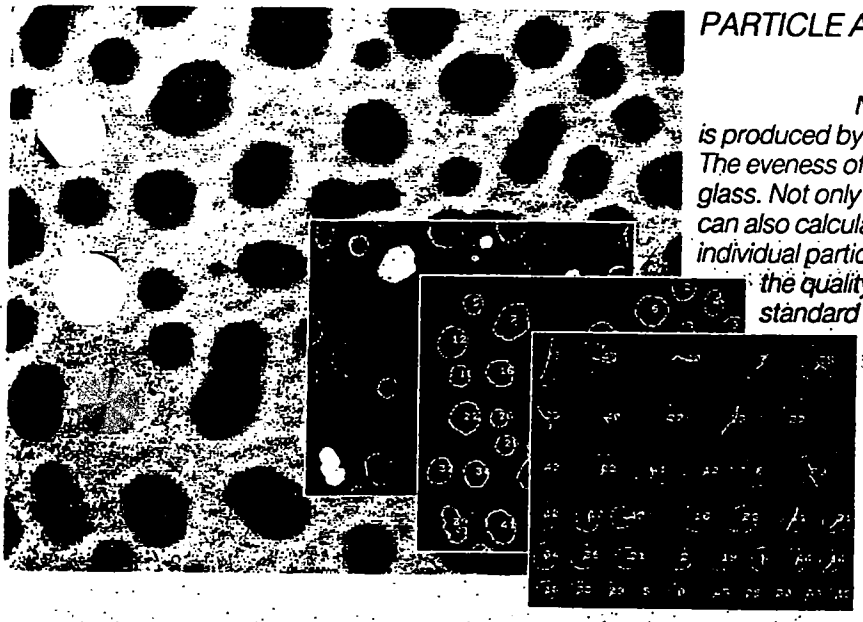
THE TEA IMAGE MANAGER (TIM) can increase the quality and the quantity of many end products.
No one has ever estimated the damage caused each year by tired eyes. You yourself and your most reliable member of staff cannot always avoid it. The eyes become heavy and the concentration begins to weaken. If you are at home or driving a car, you have options. But what happens if you are at work in a vital process? Production or quality control, data entry for company planning, sample analysis or computer image analysis, for instance.

Very often, after a period of concentration, eye-tiredness will set in and mistakes will be made before the person concerned is fully aware of it. It is a gradual process that can start to affect someone's work quite seriously. Thousands of people and hundreds of companies suffer from it every year. But it can be avoided.
In areas ranging from bottle capacity and irregular bread rolls to blood analysis and motor-block checking, thousands of eyes are straining every week to spot irregularities and mistakes. Very often these are the eyes of an expensive person who could be doing valuable work elsewhere. From now on, all these people can safely entrust the visual checking to a TIM system.

TEA IMAGE MANAGER
TIM is a software package that makes image processing simple and affordable while still being remarkably powerful. With a video camera, an IBM PC (or compatible), one extra board and TIM, the system is complete.
It is an advanced and user-friendly package that you can tailor to your own application. For analysis, reporting, percentage error calculations, exception alarms or complete process shutdown, a TIM system will provide a never-failing pair of eyes.

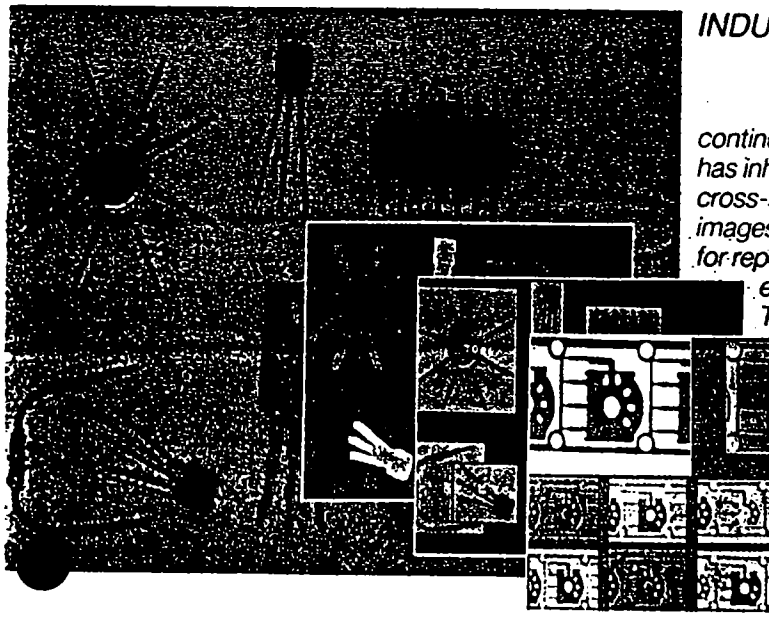


The power and friendliness of TIM and the low cost of the total system(ans that the potential applications are limited only by human imagination. To give an idea of the possibilities, the following applications show some of the properties.



PARTICLE ANALYSIS

Non-reflecting glass (shown here enlarged 5000 ×) is produced by imposing a thin film of gold onto a sheet of glass. The eveness of the distribution determines the quality of the glass. Not only can TIM determine the particle distribution but it can also calculate the surface area and circumference of each individual particle. And once these readings are in the database, the quality of the glass can be compared with the derived standard and/or previous samples.

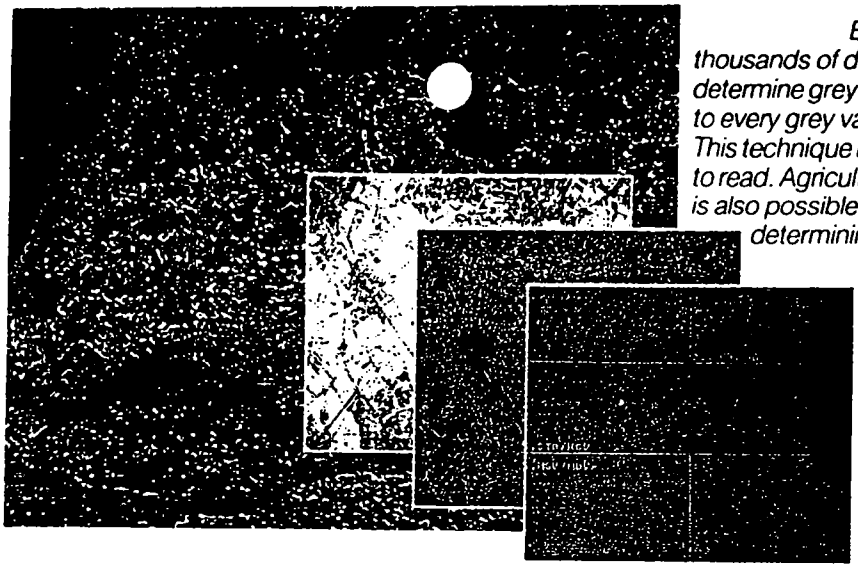


INDUSTRIAL APPLICATIONS

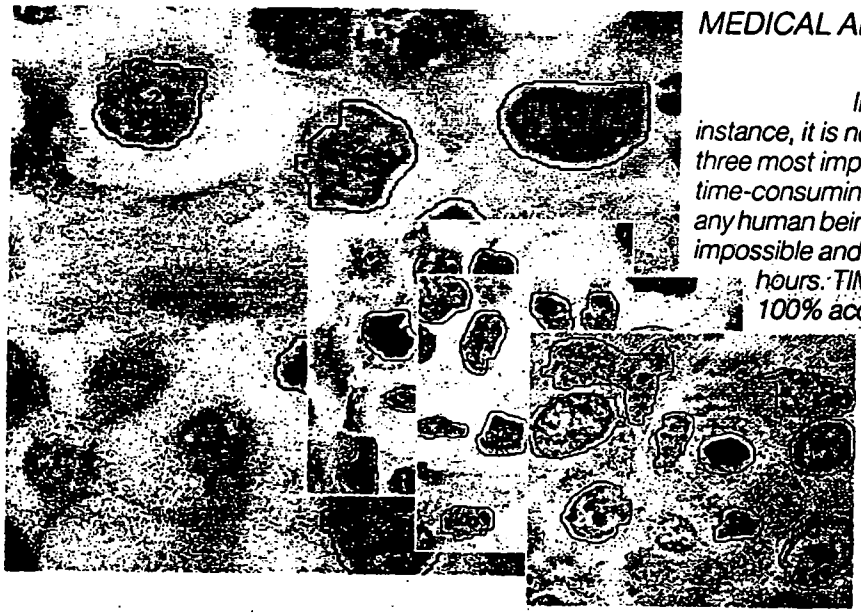
Quality control needs such a high level of continuous concentration that a human being is a poor tool. TIM has inhuman qualities. It will concentrate forever. Height, width, cross-section and shape can be measured and recorded from images, continuously and tirelessly. The data can be processed for reports and retained for statistics. It can also be used for exception alarms or even process shutdown.

This is what a transistor looks like. Regardless of the position and the angle of the legs, TIM can distinguish it from thousands of other components.

Also, when it has been told what a good switch looks like, TIM can find bad switches. Red is wrong, green is good. Try to find the fault yourself in this example. TIM will perform a complete visual analysis in a few seconds.



Even though a human eye can distinguish thousands of different colors, it is virtually useless when it has to determine grey values. TIM can help by assigning a different color to every grey value).
This technique makes Landsat images, for instance, much easier to read. Agricultural and urban activity can be clearly displayed. It is also possible to perform calculations on these images such as determining urbanization levels or predicting harvests.



MEDICAL AND BIOLOGICAL RESEARCH

In hystological and pathological research, for instance, it is necessary to determine nucleus properties. The three most important are density, shape and surface area. The time-consuming, routine screening places great demands on any human being. Accuracy for more than an hour or so is nearly impossible and yet people are expected to continue for many hours. TIM can perform parts of the analysis faster and with 100% accuracy, all day and all night, if necessary. In a few seconds, TIM can determine the properties of interest and highlight any deviations from the norm. In cancer research, for instance, human eyes might miss the distortions but TIM won't.

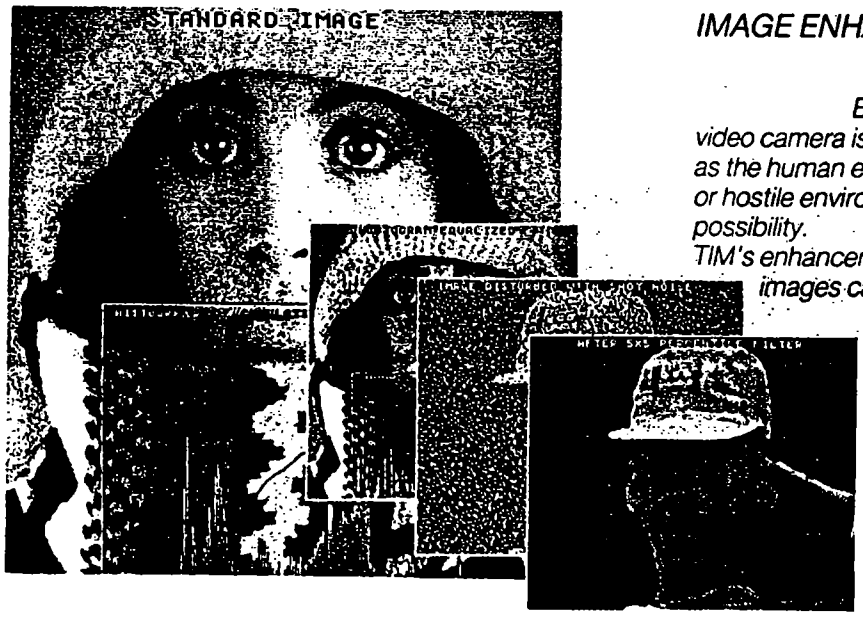


IMAGE ENHANCEMENT

Being able to digitize and analyze images from a video camera is a powerful tool. It is not as efficient or advanced as the human eye but there are several circumstances (distance or hostile environment) where such an image is the only possibility.
TIM's enhancement features are excellent for these cases. Poor images can usually be turned into usable pictures.

TIM IN YOUR OWN ENVIR(MENT

TIM's potential doesn't stop with these examples. Most applications are initiated by technical interest from potential users and TIM can nearly always offer an effective solution.
Very possibly, you are already considering some applications in your own company. If so, it is also worth us mentioning that price should no longer be a problem.
If you do not already have the necessary hardware, such as an IBM PC or compatible, DIFA MEASURING SYSTEMS will be pleased to provide you with a complete working system.

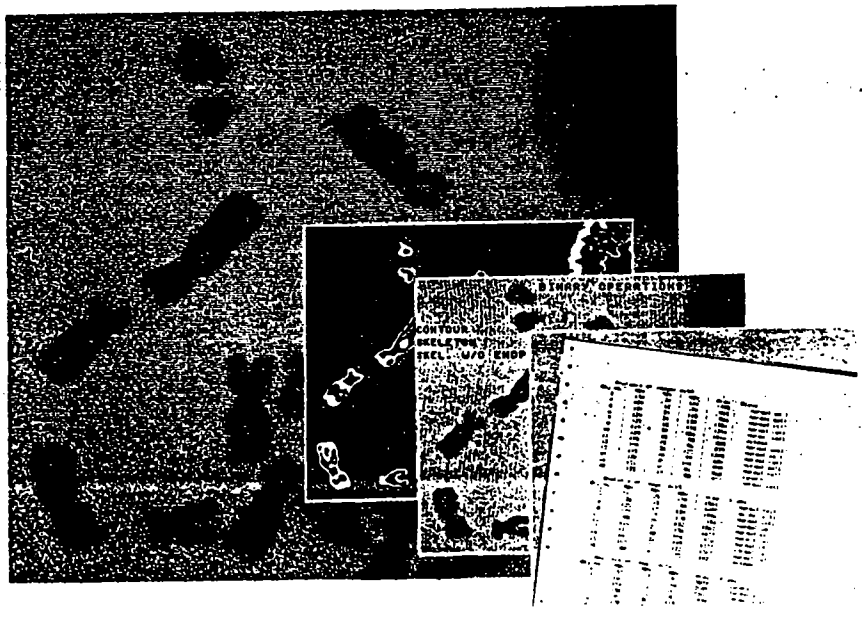
USER FRIENDLY

"Advanced", "state-of-the-art", "high-tech" is all very well but can someone operate it? In this case the answer is YES. You do not have to be a computer expert or an electronics engineer to use TIM. All you need is your professional knowledge and knowledge of working with a PC. Every effort has been made to make TIM easy to work with; demo programs, tutorial courses, an extensive manual and help menus while actually operating. Our designers started by assuming that non-computer specialists might like to program their own applications.

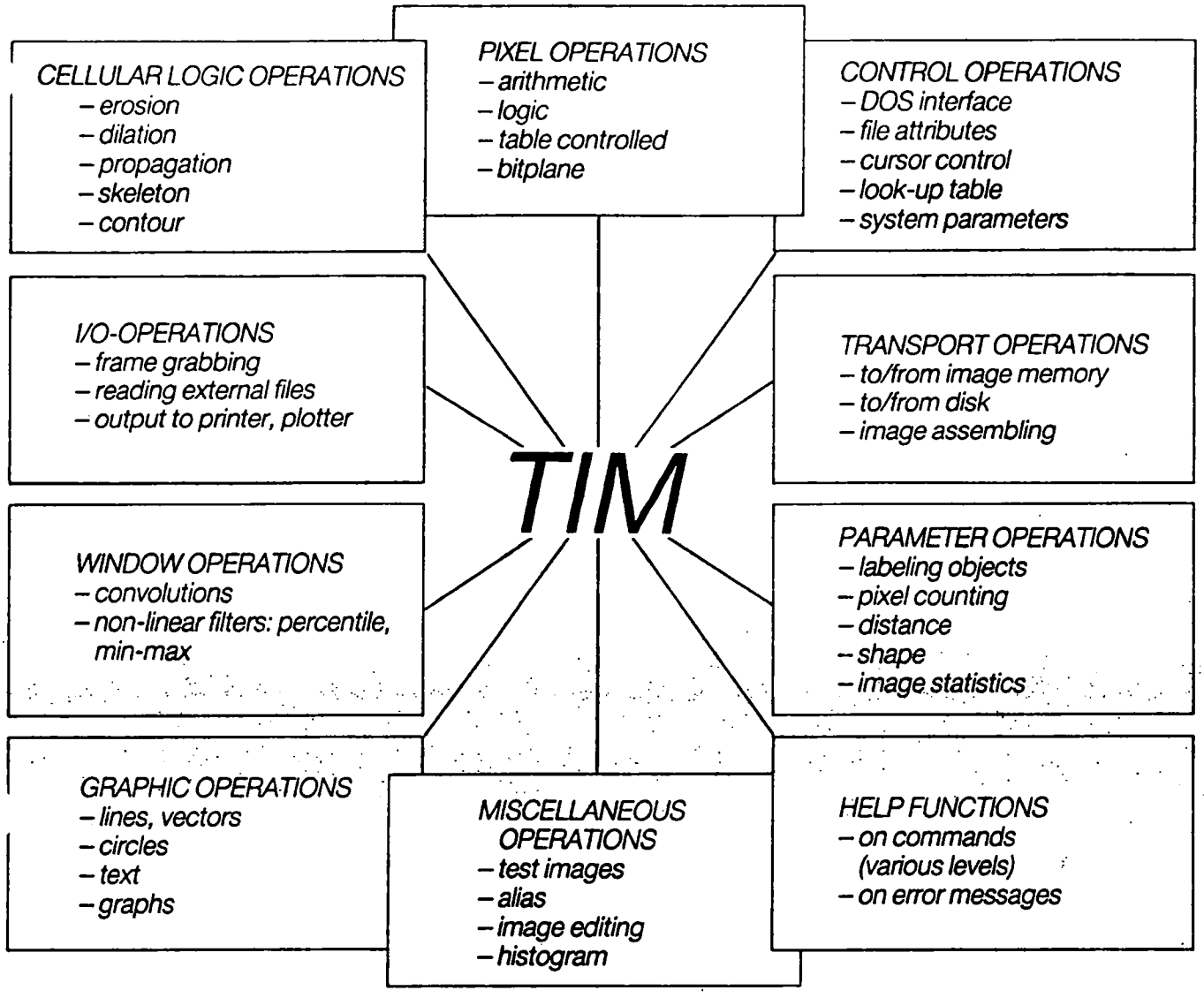
FAST RETURN ON INVESTMENT

TIM is not the only image processing package in the world. However it is the only one that offers real return on investment for small to medium sized companies or smaller applications in larger companies. It is compact, it works with commonly available equipment such as the IBM PC; it is reliable, easy to use and is not expensive. Apart from reducing errors TIM will also free specialists for other important work. The return on investment begins from the first minute.

TIM - for affordable image processing



TIM FEATURES



HARDWARE REQUIREMENTS

- IBM PC, XT, AT (or compatible)
- Minimum 640 Kb RAM
- ITI PCVISIONPLUS framegrabber or ITI Serie 100 framegrabber
- Composite monitor (RGB or monochrome)
- Monochrome video camera
- Mouse
- Optional graphics printer

Acknowledgement:
Images & algorithms courtesy Centrum voor Beeldverwerking Delft

Ask us for the TIM Quick Reference Card with the operations commands in detail.

Difa Measuring Systems BV
Druivenstraat 25
4816 KB Breda, The Netherlands
Telephone: 076-710144*
Telex: 54953; Telefax: 076-711953

Difa Measuring Systems
37620 Hills Tech Drive
Farmington Hills, MI 48331,
Telephone: (313) 489-8588
Telefax : (313) 489-8816

Attachment B

July 22, 1990

MEMORANDUM

TO: ODP Staff Scientist

FROM: Patsy Brown Patsy
Audrey Meyer Audrey

023097

SUBJECT: Using a Single Percent Value for Smearslide/Thin Section Data

This memo is a reminder that sediment smearslide/thin section data collected on the ship should be reported as a single percent value, not a range value. The single percent method has been in use throughout most DSDP cruises and -- until Leg 131 -- all ODP cruises.

On Leg 131, it was decided to use ranges to indicate the percent abundances for components found in the smearslides. The numbers 1 to 5 were entered into the SLIDES program to mean the following:

1 = <2%, 2 = 2-10%, 3 = 10-25%, 4 = 25-40%, 5 = >40%.

For example, if the abundance of quartz was between 2 and 10% the number 2 was entered into the program. On first glance this system appears workable, as it was standardized for the entire cruise and the values fit into SLIDES with only minor rewrite to the program. However, the Leg 131 data cannot be merged with the rest of the ODP smearslide data because the meaning of the abundance fields for Leg 131 is not the same as for the other ODP cruises. You are unable to search the Leg 131 data with the rest of the smearslide data. For instance, if you searched for quartz equal 30% you would never retrieve any Leg 131 data since 5 is the highest number in the abundance field. We (not just the Database Group, but anyone using the ODP SLIDES database in the future) now must remember that a second search is needed for Leg 131. In other words, using anything other than the single percent value results in many problems when we try to integrate one cruises worth of data with the rest of the ODP database.

Currently there is much heated debate as to whether using a single percent value is the best way to report these smearslide data. The Information Handling Panel believes it is; the Shipboard Measurements Panel, however, is in favor of recording the value as a range. Until these two panels can agree on how best to collect these data, and until we have time to act on their joint recommendation in a way that maintains the integrity and utility of the ODP database, we must ask that you use the single percent method for recording sediment smearslide/thin section data.

Thank you. Please feel free to talk to one of us if you've got questions, thoughts, or concerns about this issue.

pc: Ted Moore SMP
Kate Moran SMP
Russ Merrill
Jack Foster
Bill Meyer

Ocean Drilling Program
Texas A&M University
Research Park, TX 77843-3469

Attachment C

ROCK-EVAL

UNIT ONBOARD JOIDES RESOLUTION, RockEval-II:

Includes analyzer, microprocessor and printer recorder, plus a TOC analyzer module. Time required for analysis: 10-12 minutes without TOC determination (TOC approx. 25 minutes)

Introduced to the market in 1980, bought by ODP in 1984.

Manufacture improvements since 1984 include:

1) new oxidation oven (we have modified ours to include this).

2) trap past HOKE trap in line with TCD (modification currently being done).

Options:

1) Replacement cost $96,900 (see attached quotation; price reconfirmed by phone conversation with Daniel Jarvie Sept 5, 1990). With the modifications we have done, our unit is equivalent to a new system.

2) Preventive-maintenance service during a portcall was discussed with representative at DELSI (713) 847-0811. Estimated cost: $12,000

3) Buy a different unit to replace our current system or use as a backup. Our options are:

3a) **RockEval V**

Determination of S_0, S_1 and S_2. Does not do S_3.

Cannot be automated.

Expected to be easier to maintain due to simpler electronics.

Only 2 have been sold to date.

Estimated cost $39,500.

3b) **Geofina hydrocarbon meter (GHM):**

Pyrolysis/GC; simultaneous GC analysis of S_1 and S_2.

Analysis time 1-2 hours.

Needs liquid nitrogen supply (gasses from thermal (S_1) and pyrolitic (S_2) processes are trapped on $N_{2(l)}$ on capillary column.

Does not give S_3.

Estimated cost $63,500.