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ESP Economics of Shipyard Painting Bid Estimating Transfer Study Final Report

**U.S. DEPARTMENT OF THE NAVY
CARDEROCK DIVISION,
NAVAL SURFACE WARFARE CENTER**

in cooperation with
Peterson Builders, Inc.

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ESP

Economics of Shipyard Painting

Bid Estimating Transfer Study

Final Report

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under:

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FOREWORD

This research project is being performed under the National Shipbuilding Research Program, specifically under the purview of Panel SP-3, Surface Preparation and Coating, of the Ship Production Committee of SNAME. The report covers the Bid Estimating Transfer Study of The Economics of Shipyard Painting.

Mr. Daryl George and his staff of Insight Industries, Inc. served as the project development team. Mr. Jim Rogness and Mr. John Meacham both served as Research and Development Program Managers. Peterson Builders Inc. had responsibility of technical direction of the project and publication of the final report.

We appreciate the support that Peterson Builders Inc. has given toward this project. We also wish to express special thanks the transfer shipyards that were involved in the study. Appendix A provides a listing of the companies who contributed to the development of this project.

EXECUTIVE SUMMARY

During Phase I of the “Economics of Shipyard Painting” project, it became evident that detail labor data can play a key role in controlling costs in shipyard painting practices. The data collected was at a level of detail never before available to paint department supervision. The information was used in many ways including reporting on job progress, process improvement, material usage, etc. It was quickly realized that the same information if properly summarized could also be used to develop bid-stage estimates. This conclusion resulted in an SP-3 panel directive to establish a 2nd phase of the “Economics of Shipyard Painting” focussed on applying the detailed data collected in Phase I to bid-stage estimating.

During Phase II, a program was developed that worked in tandem with the detailed data collection effort laid out in Phase I. The program generated a bid estimate based on historical data which accounted for labor and material. The resulting computer-generated estimate could then be scrutinized by the bid team. Contrary to past practices, the bid team no longer had to waste time searching for historical data, but could concentrate on fine tuning the estimate.

The program was extensively tested at the shipyard where it was developed, and it was felt that the lessons learned should be transferred to other shipyards.

The Bid Estimating Transfer study consisted of transferring the Bid Estimating Program and the technologies learned during the Economics of Shipyard Painting research efforts to three volunteer shipyards. The three shipyards were to act as beta test sites for the bid-stage estimating software. In order to maintain a good cross section of the various types of shipyards, it was suggested that the three volunteer shipyards be a naval shipyard, a private new construction shipyard and a private repair shipyard.

The transfer study revealed many hazards to look out for when implementing a bid estimating system. Among the most important lessons learned was that acknowledgment that indeed the original success of the program at PBI could be repeated at another shipyard of different makeup.

Some of the biggest implementation concerns noted by other panel members including the author, such as union versus non-union, private shipyard versus public, a large shipyard versus a small shipyard, etc. proved to be lesser problems. The challenges due to these differences were overcome by policy changes, form changes, software enhancements, etc. Out of all the problems faced during the research effort, the most difficult problem to overcome was the reluctance to change. The reluctance to change coupled with very busy shipyard schedules, sometimes proved to be insurmountable. Note the author has used the term, “reluctance” versus “resistance”. Not once did the author experience any resistance to the program. On the other hand, reluctance played a key role in that several personnel were unsure of the results. Consequently, the short duration of the research project which

demanded acceptance to go forward at a record pace, was not always an attainable goal. The range of implementations varied. Some shipyards implemented the entire system and some shipyards implemented pieces of it.

The final report discusses the transfer process for the three shipyards involved. Successes and failures are analyzed. A demo version of the software is included. The software demo disk should provide an excellent tool to gain insight as to how a shipyard actually implemented the software.

It is hoped that the experiences learned during the transfer study will aid other shipyards attempting to implement a detailed bid estimating system and thus, the goal of this project will have been realized.

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INTRODUCTION

During the 80's a series of research studies were conducted aimed at analyzing the detailed costs associated with surface preparation and coating application. The studies primarily targeted controlling labor expenditures. Specifically, the three research efforts consisted of identifying detailed costs, analyzing bid estimating strategies and developing a bid estimating program, and recognizing early costs variances. This study entails attempting to transfer the technologies learned throughout the earlier phases, concentrating on the transfer of the bid estimating program to three shipyards of dissimilar makeup.

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BACKGROUND

It was decided by the research panel SP-3 that the transfer process would involve three key areas of shipbuilding, private new construction and repair, and public shipbuilding. It was anticipated that the unique mix of shipbuilding and repair would provide a thorough test environment for the software.

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ORIGINAL BID ESTIMATING PROGRAM

Overview

The original bid estimating software was developed during phase two of the Economics of Shipyard Painting. The program was developed in compiled basic. The program had basically one purpose, to generate a detailed cost estimate based on the comparable and bid ship data that was loaded into the software.

Link With Detailed Cost Collection System

The original bid estimating program was developed to parallel the bid estimating data resulting from the Economics of Shipyard Painting studies, mins/sqft (sqft/hr), types of compartment, paint usage, etc. The detailed cost collection provided the ability to perform analysis of the data in determining the performance rates.

Problems

Over time, the original software has been surpassed more advanced database systems that provide superior searching, reporting, importing/exporting, hardware/software interfacing, and preferred development environments. Most importantly, it was understood that if detailed data collection would actually become a reality in the Paint Department, the software would have to support multi-user access.

Although the original development in compiled basic seemed right at the time, it no longer provided the user the tools necessary to implement a detailed cost collection system that would support the bid estimating transfer study.

Lessons Learned

It was evident that the existing bid estimating software needed to be updated in a more robust software that answered the above shortcomings. Luckily, the overall strategy of the software was sound and thus, very little of the original bid estimating software structure required changes.

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BID ESTIMATING PROGRAM UPDATE

Database Chosen

One of the major problems of the original bid estimating software was that it required a great deal of maintenance due to the fact that every procedure needed to be built from scratch. This tended to be a very time consuming task. Consequently, during the update and enhancement of the bid estimating software, it was decided that an over the counter database package would be purchased. Thus, the task of software development would be enhanced with report writers, built-in searching, etc.

It was not the intent of the research project to spend a great deal of time investigating all the plus's and minus's of all the commercially available databases. There existed several criteria for the database and as long as the criteria was met, the search for the database would be considered complete.

The major criteria that was used for the database selection was as follows:

1. Operates as single user or Multi-User on LAN environment.
2. Provides user friendly searching ability, GT,LT,GE,LE,NE,MP,NL,NN.
3. Includes a thorough security system including audit trails.
4. Contains ability to import and export data.
5. Boasts reasonably fast speed of accessing data.
6. Is capable of interfacing with hardware.
7. Can handle over 1 million records per application.

The database chosen for the system was TEAM-UP by Unlimited Processing. Although, there are other databases on the market that may meet the above criteria, TEAM-UP's attention to security was a feature that was of extreme importance to the research effort and thus the choice for TEAM-UP was made.

Combined Detailed Cost System and Bid Estimating

During the original studies performed at Peterson Builders, Inc., the detailed cost collection system was implemented on a mini-frame computer. The ability to collect detailed data and manipulate it was critical to the bid estimating transfer study.

Since it was believed that most shipyards would not alter their data collection for the research study due to the significant costs involved, TEAM-UP provided the bid estimating study the ability to provide the transfer shipyard the ability to collect large amounts of data and alter the data collection format without impacting the shipyard's existing software. Lessons could be learned with minimal impact to the shipyard.

Since it is preferred that bid estimates be determined, only after collecting statistically sound amounts of data, it was imperative that TEAM-UP provide the storage area until the analysis could be done.

While the data was being collected, it was important for the data to begin to pay for itself. This entailed making use of TEAM-UP's report writer to generate reports that assisted the Paint Department in many of their daily tasks.

One of the most important lessons learned during the Economics of Shipyard Painting was the fact that detailed collection will surely die a slow death if collection is constantly stressed without use. In other words, feedback to the department on a timely manner keeps the ball rolling. Eventually, the data collection becomes a minor inconvenience contrary to a headache. Whenever data is collected it must be used, the same day if possible. Data in a system has a very short life. Soon after being loaded, a week, two weeks, a month, it becomes unimportant and no longer is meaningful with one exception. After a project has been completed, the data once again becomes important and in most cases much more important than the day it was generated. This period is when the data is organized, analyzed and shaped into bid estimating factors.

Due to the reasons mentioned above, it was decided that the detailed costs collection system would be provided as companion software to the bid estimating software.

Consequently, a detailed cost collection system was developed to support the bid estimating software. The detailed cost collection system contains all the necessary applications to maintain daily labor data for a Paint Department. The system contains work order data, compartment information, employee data, etc. As mentioned before, the bid estimating applications were re-written in the database software. Few fields were added to the bid estimating portion but usage was greatly enhanced.

User Friendly Searching

User friendliness was a key shortcoming in the outdated, original bid estimating software. This topic was seriously addressed in the upgrade. The system allows the user to search in all fields. Large applications can still be searched in non-key fields but speed will be reduced unless identified as a key. Key fields take more memory so there is a trade off. With the help of the transfer shipyards, the developer of the software has anticipated the fields most often searched and has identified them as keys. In addition, pop-up windows have been added to assist in validating data. Data can also be searched based on null, not null, or match phrase characteristics. Users can also build user defined screen reports with totals. The results can easily be sent to a printer. As in most systems, pre-defined reports can be built whenever the screen reporting capabilities are not sufficient.

Enhanced Maintenance

As mentioned before, the original software was required to be built from scratch. This greatly limited the functionality of the software since only a limited amount of features could be addressed. By utilizing a commercially available database, many of the low level features that had to be developed and maintained in the first program no longer required attention. Thus, more time could be spent on user specific requests from the transfer shipyards.

Increased Amount of Information That Can Be Handled

TEAM-UP can handle up to 4 billion records. Currently, one of the transfer shipyards is reporting several hundred thousand records in the system and reporting very little speed degradation. Due to the fully relational tactics utilized during the development, memory usage has been very efficient.

Added Security

Throughout the study, security became increasingly important. Several meetings were held at the transfer shipyards addressing this issue. The personnel involved addressing this issue were from Management Information Systems, Cost Accounting, and Labor and Budgeting. In all cases, one of the most repeated questions was, What was the level of security of the system? Fortunately, TEAM-UP provides several levels of security including record, user, group, function, and application security. In addition, special security can be added for very unique database management tasks such as running batches, submitting reports to a queue, etc. Although, security is often a second thought in picking a database, TEAM-UP's security features played a critical role in the acceptance of the software by the transfer shipyards.

Audit Trails

As in most accounting systems, audit trails can play an important role in maintaining data integrity. The re-designed bid estimating system now contains audit trails on all applications. In the event that a discrepancy arises in one of ESP'S applications, a programmer with supervisor privileges can now retrieve audit records that will show how data looked prior to updates or deletes.

Confidence in the system is key. Naturally, as the data collection scheme is begun, there will be a lag between the time the first data is collected until the point in time that the data collection process becomes routine. In the mean time, it is critical that the system guardians be able to answer all questions about how data was changed. As transactions occur, each record is date, time, and user stamped. Consequently, a complete record of how data was changed is available.

Several times during the research study this capability was utilized. Although the problems were initially labeled as software problems, it was further determined through the audit trails that data entry had been the culprit. Consequently, confidence in the system was not lost.

IDENTIFYING TRANSFER SHIPYARDS

Requirements

As mentioned earlier, three shipyards were targeted for the transfer of the bid estimating software. In order to properly test the software, it was decided that the three shipyards would represent new construction, repair at private shipyards, and repair at public shipyards. The different shipyard work would provide a mixture of problems that the software would need to address. In providing for the different types of shipbuilding, the software would become more robust.

In addition to the different shipyard missions, it was desired to have a varying employment level. Since the program was first used at Peterson Builders, Inc.(PBI), it was hoped that the transfer shipyards would employ greater than PBI's employment during the initial study, approximately 1000.

Shipyards Identified

The three shipyards that volunteered for the transfer project were Bath Iron Work(BIW), Charleston Naval Shipyard(CNS), and NASSCO. Both NASSCO and BIW provided new construction and repair information with CNS providing the public shipyard input.

Since the study did not include a "repair only" private shipyard, it was decided mid point of the project to include one more shipyard on a limited basis. Atlantic Marine of Mayport Florida expressed interest in testing the software and, thus were added as a transfer shipyard.

Finally, several shipyards requested copies of the program throughout the study. Copies of the program were mailed to the additional shipyards although interaction/support with the additional shipyards had to be limited due to budget constraints.

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SHIPYARD TRANSFER

The following paragraphs describe the approach that was taken in introducing the software to the transfer shipyards. Successes and failures are discussed. Specific ties to a particular shipyard have been purposely avoided.

Trip One - Overview

The goal of the first visit was to introduce the project approach, assess the state of the existing labor data collection system as far as compatibility with ESP, and to install the software.

Preparation

Prior to the first meeting at each shipyard, a significant effort was put forth in identifying key personnel that would need to be involved in the transfer process.

In general the software was complete before the first shipyard visit. It was anticipated that the shipyards would request additional reports and possibly minor application changes.

ESP Introduction

It was important at the first meeting to make sure that all key players that would be involved with the transfer process understood how they may be affected by the transfer. Consequently, a kickoff meeting was held at each shipyard. Typical departments represented were

- Paint Department
- Planning and Scheduling
- Management Information Systems
- Production Engineering
- Labor and Budgeting
- Ship Management
- Design Engineering, and
- Accounting

During the kickoff meeting an overview was given on the three previous research efforts of the Economics of Shipyard Painting. At each shipyard, the kickoff meeting spurred several spinoff meetings. The meetings ranged from discussions about the layout of the data collection card, to the cost benefits one could anticipate by using the system.

ue to the fact that the system would be collecting labor data at levels far more detailed than ever before, there were a lot of questions that needed to be answered. The following is a list of the most common questions that were asked followed by the answers that were provided.

How expensive would it be to accomplish the additional data entry?

It is estimated that one hour of data entry is required each day for 100 workers. The data entry would be far more detailed than most shipyards had experienced in the past, but through the use of program features, mass entry would be streamlined as much as possible. Shipyards already collect labor data one way or another, all that was being proposed was that a few additional pieces of data be collected that aided production. Thus, labor data could then not only satisfy payroll, but would begin to help production. This question points out the reason why data must pay for itself, because it is expensive.

Will the system be secure?

Yes, TEAM-UP comes with an extensive security system that the supervisor of the software controls. Access can be controlled through record, field, application, and function security. In addition report security is provided as well as a complete audit trail system. Finally, application data can be encrypted while stored on the disk drives, thus preventing any accidental viewing of the data by typing the raw data fdes to the screen or printer.

How would we load existing information?

TEAM-UP provides for uploading and downloading data in most formats.

How can we get good data in the system?

Every piece of data going in the system is checked for proper format and validity. In general if the data is not good, it doesn't get in until it is fixed. Getting the data in the system is far less a problem than getting "Good" data. Getting good data depends on how well supervisors are trained and motivated. Consequently, it is important that management be part of the system from the beginning. Keeping the first line supervisor interested is the next most important point and the way to do this is to provide feedback. The data must be organized in the way that makes the most sense for each level of management. Count on the Superintendent having different needs than the Leadman. The data must be timely, preferably the next day but

no later than a week. As supervision begins to rely on the information for planning, scheduling, “heads-up”, data integrity will improve. A major milestone on the road to “Good” data is the first time that someone points out a problem with the system. Rather than ducking the problem, it must be addressed immediately. It is important that the cause of the problem be found and that a band-aid solution is not made. Fixing the cause will not let the same error happen again and thus more time will be available for system enhancements. “Good” data is a necessity for bid estimating.

Named Key Players

Solidifying key contacts during the first visit was essential since in most cases shipyard personnel would be carrying the ball between visits and after the project was complete.

Installed System

At each site the program was installed on a PC in the Paint Department. At one of the transfer shipyards an additional copy of the program was requested so that Shipyard Planning could also review the software.

Roadblocks

As in any project where new technology is being introduced, there will always be doubters. This project was no different. To counter this problem, the significant amount of preparation prior to the first trip paid dividends.

The most significant problem faced was time. Although several trips to each shipyard were part of the project, a great deal of the success of the effort relied on follow through with the plan once the visit was complete. Since the first trip contained so much information, the review of the first three phases, the introduction to the transfer project and its requirements, and the analysis of current labor collection system, most shipyards were skeptical of the project duration.

During the first trip it was necessary to determine how the software would be tested, there were two choices.

1. Use the software on a stand-alone PC and utilize only the bid estimating software. In this situation, estimating factors would need to be derived from historical company records.

2. Use the software on a PC based local area network utilizing both the detailed cost collection and the bid estimating software. In this situation, estimating factors would be derived from the detailed cost collection system.

Two of the shipyards chose option one and one shipyard chose option two. The detailed cost collection system was also chosen by the additional repair shipyard. The shipyards that chose the first option determined that the historical data needed for the project would need to come from their archives.

Due to the different levels of support required for the varying implementation approaches, the number of trips were adjusted appropriately.

Trip Two - Comparable Ship Data

The second trip had several very important areas to cover, addressing data entry, training the users of the system, and discussing how and what needed to be collected to develop the comparable ship data.

Addressing Logistics Of Support

One of the objectives of this project was to test whether the bid estimating strategy would work in a shipyard significantly larger in employment versus where the program was originally developed.

The shipyard that chose to implement the detailed costs collection portion of the software employed approximately 1000 workers in the Paint Department. Entry of approximately 1000 records a day meant the system would need to be on a LAN so that multiple access would be allowed. Consequently, a portion of the second trip was spent explaining how ESP would operate in a multi-user environment. Meetings were held with Systems people to cover system requirements.

In addition to the logistics of installing a LAN in the Paint Department with several work stations, several meetings were held discussing special mass entry screens to reduce the time spent on data entry.

Making Shipyard Specific

Even though Paint Departments in shipyards perform very similar work, the way in which the data is collected differs quite drastically. On the contrary, the data collected, was quite similar.

Between the first and second visit, the majority of shipyard specific changes to the software were performed. The changes ranged from changing field lengths to writing batch update routines.

Training Of System Use

Training was also a key objective of the second trip. Representatives from the Paint Department attended general user training as well as an introduction to report writing. Two classes were held covering these issues in the respective shipyard computer training centers.

Searching For Historical Information

ESP is extremely flexible as far as the quality of data that is loaded into the system. It is just as easy to load comparable ship data that were merely guesses versus loading data that is the culmination of several years of detailed data collection. It is entirely up to the user to choose the level of sophistication desired in developing the core estimating factors.

Techniques in deriving estimating factors, mins/sqft, hours/sqft, etc. were discussed. Lessons learned during data collection at PBI were passed on to the transfer shipyards.

The following is a list of the more frequently asked questions about the historical data collection process:

If a shipyard does not have a detailed cost collection system, how would they go about deriving bid estimating factors?

The fact that this question is being asked assumes that the present labor collection system is not supplying production the data it requires, namely detailed daily actuals and long term manning, scheduling, and estimating information. It is also assumed that the shipyard will need to prove that a detailed cost collection system can help their department.

In most cases, this would be very costly if not impossible to prove. ESP can help in this situation by providing the department a method in which they can prove or disprove that detailed cost collection works for their shipyard. It is suggested that the Department run several months of data through the system (6 months), review the types of reports that can be generated and then determine if they wish to take it further. Possibly the result of the pilot study will be the expansion to a full blown detailed cost collection system. The strategies

employed by ESP follow most labor collection efforts and thus integration with an existing system could result.

If indeed labor data is not being collected at a detailed level and is not planned to be in the future or in a pilot mode, the estimating portion of the system can still be used with the existing data. ESP is a process. The closer the guidelines are followed, the better the confidence in the resulting estimate. In other words, if sqft/hour rates are entered for each type of compartment, based on the total hours spent by the Paint Department divided by the total sqft of the ship, it is a start. Possibly the next step would be to break down the ship by machinery spaces versus living spaces, and then possibly machinery spaces, living spaces and stores, etc. As the process is followed more closely, the more refined the estimating factors will become.

Roadblocks

In general most fields in the system were acceptable to the different shipyards with two exceptions, the compartment number and the work order. The work order varied in each shipyard.

Although the compartment follows a standard format, problems came in how to properly justify the identifier. The compartment number tends to be very difficult to enter due to the numbers/dashes/and letters. A software conversion tool was utilized to address this problem.

Training went very smooth but as mentioned before, time was the greatest enemy. It was difficult to train the users of the system everything they needed to know in 1 day of training. Much of the responsibility fell on the shoulders of the shipyard personnel to follow up on studying the software nuances until the next visit.

As found during the initial research effort, finding historical information was very difficult. Past contract data was in every format and often contained very little detailed facts. This fact strongly argued for the development of ESP.

One of the biggest problems with historical data is that it is often found summarized at a work order level. Most labor systems have been developed to satisfy accounting requirements, payroll, invoicing, general ledgers, etc. A work order number can be an estimator's worst enemy. Without proper definition, summarizing at this level becomes useless. An estimator must be able to correlate the labor summary with quantifiable measures. As found in

the past, historical information was difficult to obtain and in most cases was not tied to quantifiable measures.

Trip Three - Bid Ship Data

The main objective of the third trip was to assist the transfer shipyard with help in loading the bid ship data.

Altering System To Shipyard Specifics

Between the second visit and the third visit a significant amount of attention was directed at addressing shipyard peculiarities. Although the software began very generic, it became apparent that there were several fields that needed to be added that made the software shipyard specific. This is one of the strongest justifications for not getting locked into canned software that forces the shipyard to fit the software versus the software fitting the shipyard. There are dangers on both ends of the spectrum but during this project it became very clear that software must be able to fit the process. These changes may be politically driven, hardware driven, etc. Some reasons will be good and some will be bad. The key is to traverse them without losing momentum. Sometimes “bad” features must be introduced in order to gain acceptance. If indeed the “bad” feature is really incorrect it will stick out and can eventually be Corrected. In the mean time, acceptance of the system will have been achieved and the change can be made when the climate is more appropriate.

Training For System Support

Training continued during the third visit. In most cases the training classes given during this visit targeted the person(s) supervising the software. The training included details on maintaining the system from application development to procedural language. Obviously, the training just touched the surface on maintaining the software. It was suggested that the shipyards send personnel to TEAM-UP training and this was done by one of the shipyards.

Loading Bid Ship Data

Each transfer shipyard experienced loading bid ship data. In order to get the shipyards familiar with loading bid ship data, portions of new contract were loaded prior to loading entire vessels. In other words, sections or zones of vessels were loaded. This minimized the amount of data entry involved. It must be remembered that the data entry process for a bid ship is no trivial task. Compartment data must be loaded such as compartment type, compartment sqft, coating millage, number of coats, etc. It was explained to

the transfer shipyards that there are several shortcuts that can be used to reduce the time spent on this task.

As an example, if a vessel has several wing tanks of similar configuration and size, it is often easier to thoroughly investigate one tank and then multiply the sqft by the number of tanks. Consequently, when asked for a compartment, simply enter, Wing Tanks 23-45 and a total sqft. Similar cost saving measures can be used for similar wet spaces, fan rooms, etc.

For comparison purposes, loading a commercial vessel approximately 250' in length would take about 32 man hours.

Roadblocks

One of the biggest roadblocks that happens in relationship to loading bid ship data is that the process of generating a bid estimate is not an every day occurrence. Throughout the transfer project, few contracts that were suited for ESP actually were bid.

Another area of interest brought up by most of the shipyards was how level of stiffening would be addressed. The amount of stiffening definitely affects the amount of labor. Unfortunately, stiffening is a hit and miss proposition with respect to type of compartment. In order to account for stiffening, sqft/hour rates need to have built-in percentages to account for the additional work. As long as the estimator is always consistent in the way that sqft is measured, stiffening is not a problem.

Paint is a different problem since material can drastically be affected by stiffening. Consequently, each bulkhead can be identified as stiffened or not. A predetermined stiffening rate can then applied to the overall sqft value to account for the stiffening.

Addition of the Digital Camera

A critical step that must be addressed while dealing with the bid ship data is the identification of compartment types. Each bid ship compartment must be classified with respect to compartment type. This is done because the bid estimating factors have been found to be highly susceptible to the level of complexity of a compartment. In other words, the more complex an area is due to a great deal of outfitting, the more difficult it will be for the surface preparation and coating operations to be accomplished.

In the original study it was suggested that this identification process be done while comparing past outfitting levels with the anticipated level of outfitting on the bid ship.

This would require pictures to be taken of each compartment type which in turn would be stored in a picture album. It was planned that for each type of vessel that a company constructed, a picture album documenting outfitting levels would be made.

After this method was explained to the transfer shipyards, one of the shipyards suggested that storing digital images should be looked into as an alternative to the picture album. Consequently, this was done. An initial assessment of the digital camera technology showed that it did indeed exist and would provide an excellent manner in which to store the compartment type images.

The approach to integrate the digital camera was discussed with the program chairman and the research panel.

Digital Camera Selection Criteria

As in the case of the selection of the database product, criteria were generated that the camera would need to satisfy. The following selection criteria was used in selecting the digital camera:

1. The picture needed to be displayed in 3 seconds or less.
2. The capture software had to be able to be called from another program.
3. The picture needed to be clear enough when displayed on a PC monitor to clearly distinguish varying levels of outfitting.
4. *The* program could not require more than 200k of ram.

The selection of the digital camera actually involved selecting both a digital camera and a video board. A Canon RC-250 Camera was selected along with a video board by Digital Vision. The software that was used came along with the video board and was called Computer-Eyes-Pro.

Integration of Hardware with ESP

The Computer-Eyes-Pro software is called with a CTRL KEY sequence in the Mins/SQFT application. The software that is called is actually a developers version of Computer-Eyes-Pro that uses less ram than the full version. Although ESP is a multi-user database, the actual loading of pictures to the system is restricted to single user. Contrary, once a picture is loaded it can be displayed on many terminals.

Use of the Camera

The Canon camera is very similar to a standard 35mm camera. The camera can be taken directly to the production site. The camera disk will hold 50 pictures. Once the pictures have been captured they can then be attached to the appropriate database record via the video board and software. Once loaded, the disk can be erased and reused.

Camera Capabilities

The following is a list of capabilities that the camera has:

- Multiple picture feed
- Reusable disks
- Macro photography
- Timed exposure
- Single shot
- Continuous shot
- Self-timer
- Flash photography
- Exposure compensation
- Display on TV or computer monitor

Video Board and Computer Eyes Pro Capabilities

- Brightness control
- Contrast control
- Sharpness control
- Color enhancement
- Saturation

Roadblocks

Since purchasing the Canon RC-250 it has been learned that the RC-250 has been discontinued. Consequently, Canon was called in order to determine the reasoning behind the discontinuation. Canon has since upgraded the product and now calls it the RC-360. The major changes deal with the ability to delete all the pictures on the disk versus individually like the RC-250. Clarity has also been improved. Canon has provided several specification sheets of other digital cameras that they market. Please see Appendix B.

The video board selection was far more difficult than anticipated. A review found in a major personal computer journal was used to guide the selection but ended up pointing the research team toward an inferior product. The first

video board had significant problems in displaying the pictures in a full screen size with any amount of clarity. In addition the video board provided no suitable manner in which to have the software called from the relational database. After a significant amount of testing it was decided to be a lost cause and returned to the manufacturer. Digital Vision was then selected with far better end results.

Although the RC-250 lens is acceptable, the ability to attach a wide angle lenses would be extremely helpful in tight quarters. The RC-250 does not allow the deletion of pictures in a one step method. This feature is available on the Canon RC-360. Clarity of the RC-250 was acceptable but could have been better. The RC-250 and the Computer Eyes Software is an acceptable solution but if clarity is of extreme importance, more expensive models of each can be obtained.

Trip Four - Summary

The forth and final trip of the transfer study had two primary objectives, generating bid estimates with ESP and implementing the digital camera. Due to the late introduction of the digital camera it was not feasible to test the camera at any more than one of the shipyards. It was decided to implement the camera at the facility that had originally suggested the use of such a device.

Generating Bid Estimates

Several bid estimates were generated at the transfer shipyards. In each shipyard actual returns of past contracts were loaded as comparable ship data.

One of the critical issues in loading comparable ship data was the way the program handles rework. In general, by choosing a comparable ship, this dictates the rework rate experienced that will be used on the bid ship. The program assumes that the user has chosen the comparable ship to run against because the comparable ship most closely reflects the level of outfitting anticipated in the bid ship.

Playing the What If Game

As in the original program, the system allows the user to play the what-if game by choosing different comparable ships to run against. It is understood that the program is not going to generate a perfect match for every new contract based on past performance, but the program is capable of generating two bids that can serve as a lower and upper limit. Consequently, the user can narrow in on an estimate within these limits by addressing contract specifics as time permits. Since the generating of a new estimate can be

accomplished quite quickly, the what-if game of using different past contracts can be experimented to a greater extent.

Implementing and Using the Digital Camera

Installing the video board for the digital camera is very easy. It took less than 5 minutes to accomplish this task at the transfer shipyard. The camera has no installation or setup procedures and thus it also took very little time. In general the software also installs quite easily but in the case of the transfer shipyard, a LAN was involved. During the installation at the transfer shipyard the software had to be modified in order to run in a multi-user environment. It also had to be adjusted to work with the security requirements placed on the software by the LAN. These tasks were accomplished.

The digital camera was taken on board ship and several compartments were photographed. Several pictures were taken of a variety of compartments. Level of outfitting varied from machinery spaces to tanks. The camera was even tested if it would be able to distinguish between different shades of paint. Although the camera did display a difference, if the user is going to demand this type of performance from a digital camera, it is suggested by the author that a higher grade camera be utilized versus an entry level camera as was used during the research effort.

The speed at which the pictures can be integrated with the database is extremely fast. The user will spend more time traversing from the waterfront to the PC then loading the pictures.

As mentioned before, each disk holds 50 pictures. While using the camera on board ship, it became evident that more than one disk should be taken. Since it is very inexpensive to use the camera due to reusable disks, it is suggested that many shots be taken. Any photographs that are considered redundant or undesirable, can be easily discarded during the editing process.

The edition of the digital camera was a huge success. It performed admirably. The software controlling the editing of pictures is very easy to use, as is the digital camera. In most situations, it is as easy to use as point and shoot.

It was hoped that the digital camera would eliminate the need to physically maintain picture albums of past contract outfitting levels. The camera definitely met this goal. The ESP system can now be entirely maintained in software.

Current State of the System

ESP has been developed in a fully Relational Database Management System. It is available in a single or multi-user environment. The software applications developed during the research effort will be available to any shipyard that requests a copy. The base runtime versions of the database must be purchased.

The software delivered with this manual is a full version of the completed software. In order to distribute the software at no cost, it had to be distributed in a demo version. The only difference of the demo version is that it is limited in the number of records that can be entered in the applications. Consequently, the demo version can be used extensively for review purposes or demonstrations to other company personnel.

Future Upgrades

Future upgrades of the software will depend on the research panel funding. If a firm wishes to further develop ESP they can do so but would need to purchase a development version of the base database software or contact the author of the software.

Areas Requiring Further Investigation

The introduction of ESP brought to light many areas of the Paint Department management process that could be enhanced via further development of ESP. The following list contains many of the issues that were brought to the authors attention:

- Develop a timely method to monitor Paint Department material usage.
- Develop a method to quickly pole limitations.
- Develop a method to quickly pole overtime requests.
- Develop an automated manner in which to transfer detailed cost information possibly via bar coding to ESP.
- Develop the process for batching weekly report packets for distribution.
- Develop detailed department planning and scheduling.
- Develop and integrate an Electronic Paint Schedule with ESP.

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SUMMARY

Since the original bid estimating system was developed at PBI, there has been some question whether this had been a unique situation due to PBI's size and make-up. The main purpose of this research effort was to prove or disprove that notion. A lot has been learned during the transfer study, but it is clear that what happened at PBI was no oddity. Clearly other shipyards can implement a detailed cost collection system that supports daily activities as well as bid stage estimating.

One of the objectives of the transfer study was to test the program in environments different from those of PBI, public shipyards, repair shipyards, large shipyards, union shipyards, etc. Testing the program in these varying climates proved very valuable and provided further insight as far as the pitfalls to avoid. As discussed in the report, these factors definitely affect the process of implementation but are not considered show stoppers.

There are three major show stoppers to look out for while implementing the system, the capabilities of the software, the availability of a person or team dedicated to improving the department's management, and the management's commitment.

Definitely the user friendliness of the software plays a barring on the success of implementation. A system that makes the shipyard change to the software versus the software changing to the shipyard will eventually breed resistance to usage.

Second most important is that the implementation person or person(s) must be committed to improving the department. If the personnel have no stake in the outcome of the project, the extra drive that will be needed during the implementation process will be missed.

Finally, the process must start from top management. There will be enough difficulties for the implementation team to address without having to worry about commitment from the top.

It is the authors opinion that with these three key factors a successful implementation of ESP can be realized at any shipyard.

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APPENDIX A: ACKNOWLEDGEMENTS

Insight Industries, Inc. would like to thank the following corporations and individuals for their assistance in the transfer of ESP:

Atlantic Marine - Mayport

Steve Cogswell

Bath Iron Works

Ron Belanger
Doug Blethen
Scott DeVinney
Donald Downs
Philip Watkins

Charleston Naval Shipyard

Sam Dorr
Howard Germroth
Greg Sheppard

National Steel and Shipbuilding Company

Carlos Canedo
Al Hamilton
Jerry Keener
Oscar Quezada

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APPENDIX B: HARDWARE AND SOFTWARE

If you have any questions, contact:

ESP support
 Insight Industries
 One Insight Drive
 Platteville, WI 53818
 (608) 348-8815

ITEM	DESCRIPTION	APPROXIMATE COST
Host Computer	286, 386, 486 IBM PC or Compatible with 640K of RAM, a VGA monitor and 130 MB Hard Disk is suggested	\$1,100-2,500
Digital Camera	Canon RC-250 or RC-360 Still Video Camera Headquarters/Eastern U.S. Still Video Systems Division One Canon Plaza Lake Success, NY 11042 (516) 488-6700	\$450-\$1665
Camera Accessories	Canon RC-360 Wide Angle and Telephoto Lens Adapters Headquarters/Eastern U.S. Still Video Systems Division One Canon Plaza Lake Success, NY 11042 (516) 488-6700	\$230
Video Monitor and Card	VGA or Super VGA, color or monochrome	\$150-750
Video Board/ Software	Computer Eyes Pro Video Digitizer (Stand-alone capture routine is required) Digital Vision Inc., 270 Bridge Street Dedham, MA 02026 (617) 329-5400	\$299.95
Packing Software	LHA Version 2.11 Copyright (C) Haruyasu Yoshizaki, 1988-91, 03/03/91	FREWARE
Host Relational Database Management System	TEAM-UP from Unlimited Processing, Inc., Insight Industries, Inc. (a Value Added Reseller), One Insight Drive, Platteville, WI 53818 (608) 348-8815 (Single User to 10-Workstation Multi-User)	\$795-1,990

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APPENDIX C: HARDWARE LITERATURE

The following hardware literature represents equipment that was used during the transfer study. Due to the fact that the Canon RC-250 is no longer manufactured, information on its replacement, the RC-360, has been provided.

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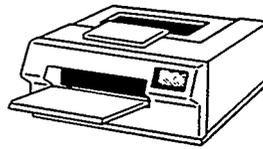
A complete system for shooting **Still Video** pictures for use in your computer.. instantly

Expand the limits of ordinary computing by incorporating "electronic photos" into desktop publishing, databases, multimedia, presentations, etc. A complete solution, the RC-250 Still Video Computer Imaging Kit combines the convenience of Still Video with a video digitizer and software for inputting images into the computer environment. Once saved as a graphics file, the image can be exported to countless applications. The RC-250 Still Video Camera utilizes a *reusable 2-inch Video Floppy Disk* to record up to 50 pictures and it's fully automatic features like built-in flash make it simple to use. The RC-250 Computer Imaging Kit is ideal for personal use as well as many business and educational applications. The kit is available in 5 different versions for IBM[®]-PC, Macintosh[™], and Apple IIGs[™] computers.

Imaging applications unlimited...that's our business!

- Kit includes the RC-250 Still Video Camera & accessories, a video digitizer for computer input and software
- Record 50 images on each reusable 2-inch Video Floppy Disk, with instant access to images
- Easy to use, software controls the process
- Automatic circuitry for easy operation
- One cable connects the video output of the RC-250 to the video digitizer
- Save the images as a graphics file for export to countless computer applications

Easy Integration



Real Estate World

Featured Homes of the Week

The beautiful Cape Codder is a newly renovated 1 1/2 story with all the modern appliances under a completely new roof. Located on 1 1/2 wooded acres in beautiful Cape Cod.

- Newly renovated kitchen
- Finished basement
- 1 1/2 bedrooms
- 2 full bathrooms
- Large front porch
- Full finished basement
- Standard garage, A/C, P.C.



For information on this, or any other home, or any property offered, call 617-329-5400 to schedule a viewing.

Images are recorded onto the Video Floppy Disk by the RC-250 camera. The images are then played into the computer by connecting the video output of the camera to the digitizer, installed in the C.P.U. The software enables you to save the image as a graphics file for export to applications such as DTP, paint programs, etc. Output via a conventional computer printer, modern, data disk, etc.

Actual image from the RC-250 Computer Imaging Kit printed at 1270 dpi



S y s t e m S p e c i f i c a t i o n s

RC-250 Still Video Camera

Type: Electronic lens-shutter camera
 Image Pickup Device: 1/2-inch CCD (786 pixels horizontally)
 Recording /Playback System: Field mode: Conforms to the High-Band format agreed upon by the Electronic Still Camera Standardization Committee
 Video Signal: NTSC color format
 Recording Medium: Still video floppy disk
 Lens Built-in, fixed-focus type with macro mechanism for extreme close-ups at 12 in.
 Focal Length/Aperture: 11 mm (equivalent to 60 mm on 35 mm cameras), 1/2.8
 Shooting Distance Range: 3.3 ft. (1 m) to infinity [12 in. (30 cm) from CCD image pickup surface in macrophotography]
 Viewfinder Read-image secondary imaging finder
 Magnification: 0.55x
 Finder Coverage: 84%
 Diopter Adjustment: -4 diopter to +2 diopter

Metering Range: EV 8 to EV 18 (equivalent to ISO 100)
 Exposure Compensation: + 1.5 EV (via exposure compensation button)
 Light Metering System Feedback AE with external photometric sensor and CCD signal
 Exposure Mode: Program AE (1/30sec., 1/2.8 to 1/500sec., f/22)
 White Balance: Automatic tracking system
 Shooting Mode: Single-image and continuous (3 images/sec.) shooting
 Self-timer 10-second delay
 Flash Built-in, light-amount adjusting type
 Flash Mode: AUTO (at EV 8 or below) ON/OFF
 Flash-coupling Range: Within approx. 10ft.(3m)
 Video Output: 1 Vp-p, 75Ω, Unbalanced (2.5mm mini-jack)
 Horizontal Resolution Recording/Playback: 300 TV lines
 Playback 400 TV lines

Playback Function: Playback single image or continuous images (approx. 4 images/sec.) by means of Forward or Reverse buttons; playback automatically cancelled when single-image display exceeds 2 minutes (when using battery pack) or 15 minutes (when using Battery Charger/AC Coupler).
 Erasure Function: single-image erasure
 Disk Initialization:
 Normal Mode: Head automatically set to the empty track next to last (highest number) recorded track.
 Insert Mode: Head manually set to a recordable track with Forward/Reverse buttons.
 Power Source: One Battery Pack BP-4P (exclusive lead-acid battery. 8V. 200mAh)
 Battery Life: (Standard BP-4P battery Pack)
 Recording: Approx. 800 images without flash use
 Approx. 200-300 images with 25% flash use (at 25° C with new fully charged Battery Pack)

Macintosh® Color Version

Computer Eyes Pro/Co/or Digitizer for Mac
System Requirements
 • Macintosh II NuBus computer (not LC compatible, Mac IIsi requires Apple's NuBus adapter)
 • 2 Mb RAM
 • 8 or 24-bit graphics display
Features
 • Captures and displays up to 24-bit. 640 x 480
 • Support 32-Bit QuickDraw™
 • Image preview and adjustments
 • Saves PICT and TIFF file formats

Macintosh® Black & White

System Requirements
 • Mac Classic, Mac Plus, SE, or any Mac II (not Quadra)
 • 1 Mb RAM
Features
 • Compact module plugs into printer or modern port
 • Resolution up to 640 x 480, 8-bit
 • Saves PICT, TIFF, MacPaint and EPS formats

PC Color Version

Computer Eyes Pro/Color Digitizer for PC
System Requirements
 • IBM PC, XT, AT, 386, 486, or Compatible (not micro-channel compatible), 640K RAM minimum
 • MCGA, VGA, or Super-VGA Graphics Capabilities
 • DOS 2.1 or higher
Features
 • Single board for 8-bit (or 16-bit slot)
 • Image preview and adjustment controls
 • Saves in various formats: PCX, IFF, TIF, TGA, GIF & others

PC Black & White

Computer Eyes S/W for PC
System Requirements
 • IBM PC, XT, AT, 386, 486, or Compatible (not micro-channel compatible), 640K RAM minimum
 • CGA, Hercules, EGA, MCGA, VGA or Super-VGA Graphics Capabilities
 • DOS 2.1 or higher
Features
 • Single board for 8-bit (or 16-bit slot)
 • Image preview and adjustment controls
 • Saves in various formats: PIC, PCX, IFF, TIF, MSP & others

Apple IIGS® Version

Computer Eyes Color for Apple IIGS
System Requirements
 • Apple IIGS with 1 Mb memory, 1 3.5 drive, composite or RGB monitor
 • GS/OS Release 4.0 or higher
Features
 • Single board plugs into any slot
 • Supports 320 and 640 graphics mode
 • Images can be saved and displayed in a variety of formats

Notes

• All camera data based on Canon's standard test method
 • Subject to change without notice

• The digitizers packaged in the RC-250 Still Video computer Imaging Kits are manufactured and under warranty by:

Digital Vision Inc.
 270 Bridge Street
 Dedham, MA 02026
 617-329-5400

canon

Headquarters/Eastern U.S.
 Canon U.S.A., Inc.
 Still Video System Division
 One Canon Plaza
 Lake Success, NY 11042

(516) 488-6700

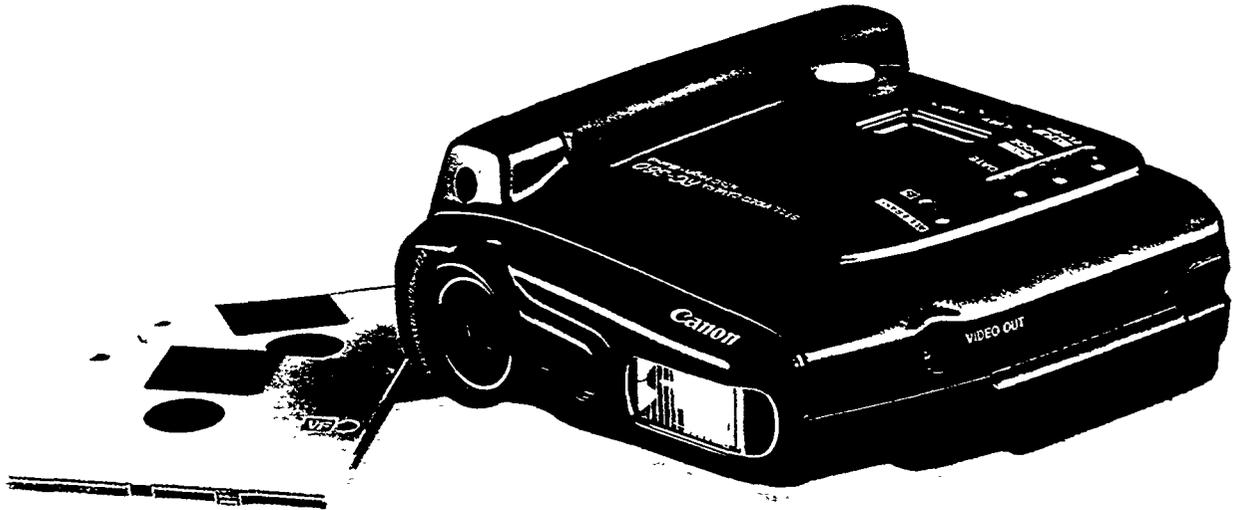
Western U.S.
 Canon U.S.A., Inc.
 Still Video System Division
 15955 Alton Pkwy.
 Irvine, CA 92713-3616

(714) 753-4322

Canon

RC-360

Still Video Camera



Enhance image related applications with Still Video technology.

Fast, convenient, portable and easy to use, the Canon RC-360 Still Video Camera easily integrates into a host of imaging applications. The RC-360 Still Video camera utilizes a reusable two inch Video Floppy Disk to record up to 50 pictures and it's fully automatic features like built-in flash make it simple to use. Immediately view the images on any TV monitor without wasting time on film and processing. For a complete imaging solution combine the RC-360 camera with either the Canon SV-Mac or SV-PC computer digitizing cards to input images into a computer. Still video images can be saved as graphic files and then exported to desktop publishing, database, and presentation applications. The RC-360 camera is ideal for personal use as well as many business and educational applications.

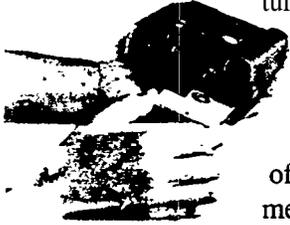
RC-360 imaging features...

- Integrates advanced recording, playback, and erasure functions
- Instantly playback directly from camera to any NTSC TV monitor
- Intelligent auto white balance and High Band circuitry
- Easy-to-operate system for inputting images into a personal computer
- Store up to 50 full-color images on a single video floppy disk
- Capture images from existing color negatives and color slides

The RC-360 is Ideal for Assembling an Extensive Library of Images.

Ease and Convenience of Still Video...

Still Video images require no developing. You can view the images immediately on a TV anywhere, anytime. With the quick turn around time for production, up to date images can easily be included in information for presentations or printed materials. Most of all, in-house production lets you control the contents of your presentations and the capability of meeting those critical deadlines.



Versatile, Compact and Lightweight Video Floppy Disk...

One video floppy can record 50 images. The disk is erasable and reusable making it an extremely economical storage media. You can also exchange video floppies anywhere, anytime. The RC-360 is small and lightweight and a video floppy disk takes up very little space. Easily carry the camera and floppies everywhere, to take photographs for business or pleasure.



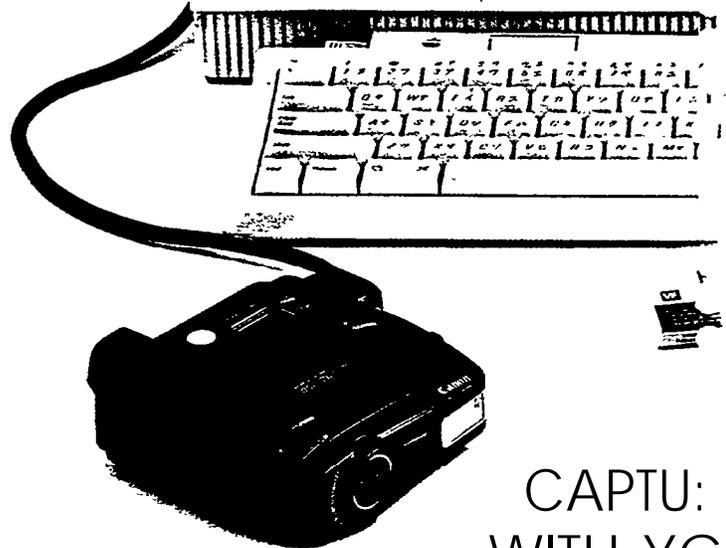
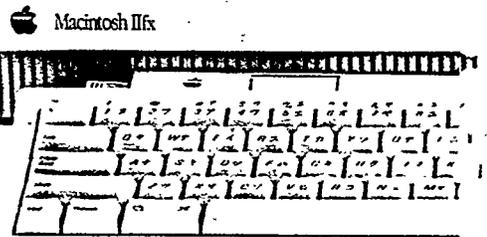
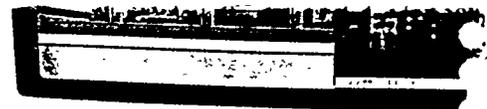
High Quality Optics for Various Photographic Situations...

The RC-360 Still Video camera incorporates traditional high quality Canon optical lenses to obtain the optimum clarity with still video images. The camera's built in lens is a fixed, single focus 9.5mm lens (equivalent to 51mm on a traditional 35mm camera). It additionally incorporates a macro setting on the camera to enable you to get extremely close to your subject matter. Optional accessory lenses are also available for wide angle and telephoto photographic situations.

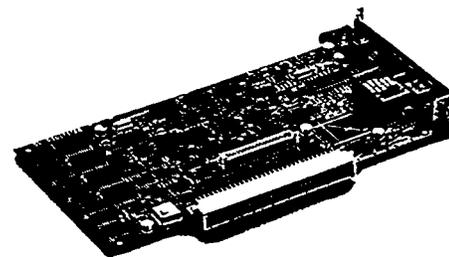


Record Waveforms from an Oscilloscope...

With the Camera Hood Kit CD-C26 attached to the RC-360, capturing waveforms displayed on an oscilloscope is simple. With the date and time recorded automatically on the image, you can easily make an accurate visual file of the results of experiments. Technical reports become easier to comprehend when oscilloscope waveform images are inputted into a personal computer via a digitizer and combined with technical data information.



CAPTURE WITH YC AND THE RC-3

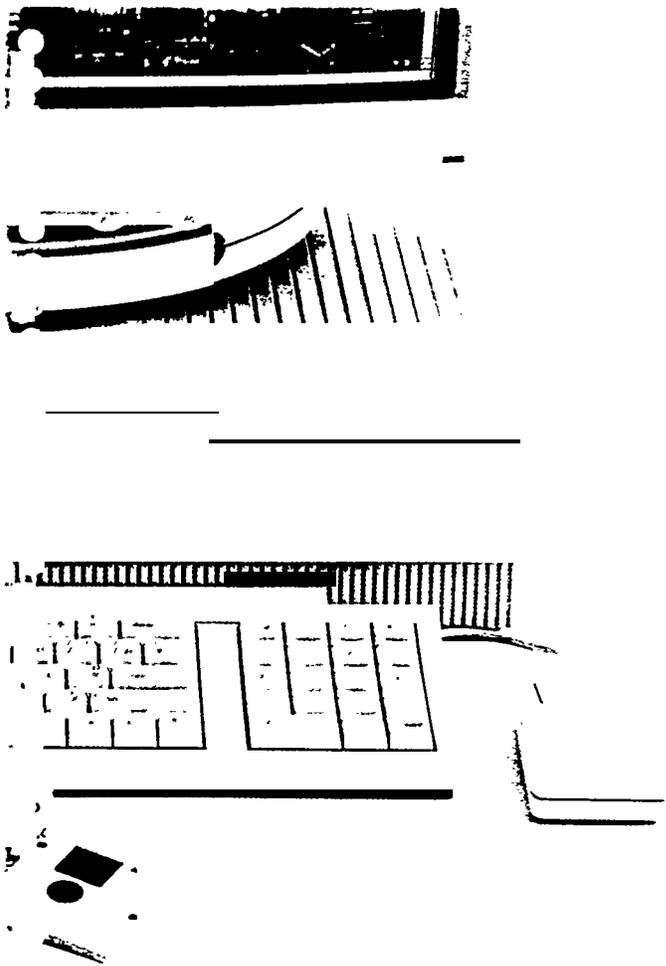


◀ *Capture u*

The optional recorded with digitizers make exposure adjustment. The images are monochromes.

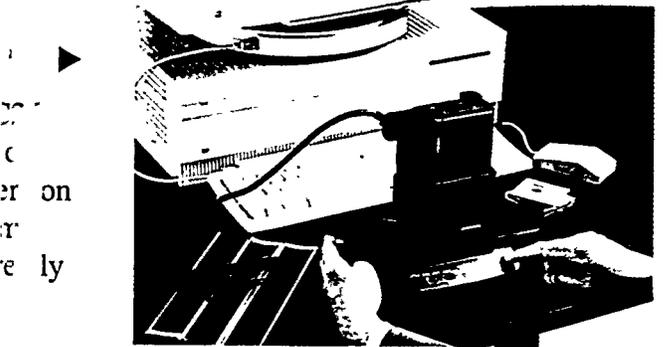
Transfer Images from Color Negatives and Color

Inserting the RC-360 on the Canon Film Adapter F.. will allow the camera to record color negatives and slides on the video floppy. The negative/positive conversion function converts negatives to positive images. The adapter can also be used to view slides or negatives on a TV monitor.

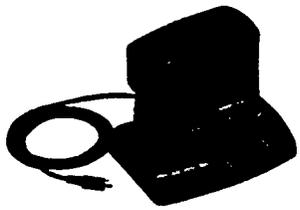
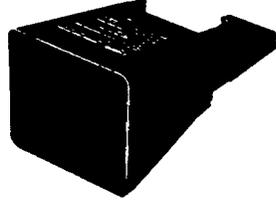
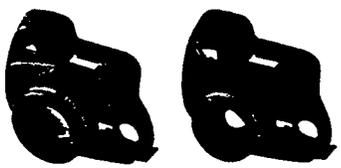


STILL VIDEO IMAGES FOR COMPUTER L SV CAMERA ISA SNAP.

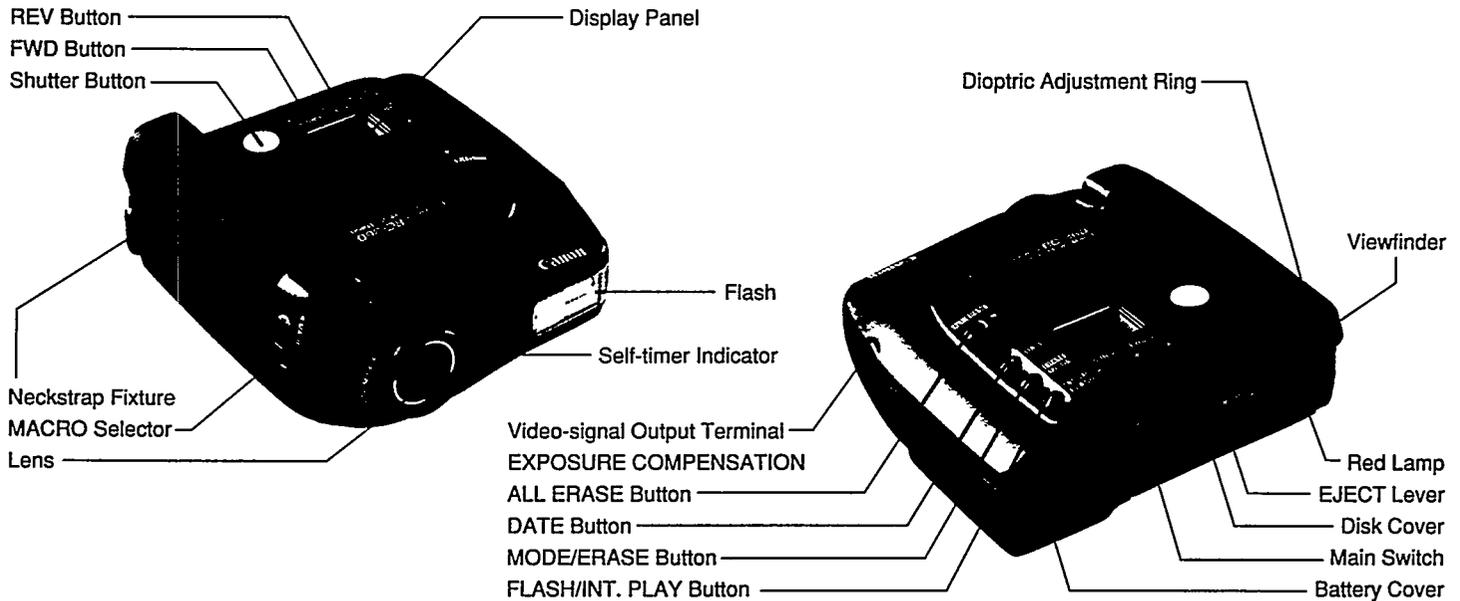
...put Images into a Personal Computer
 Mac or SV-PC digitizer boards bring images from the RC-360 into a computer via a single cable. The RC-360 provides consistent image quality by using automatic exposure control before acquiring an image from the RC-360. Images can be acquired in either 24-bit color or 8-bit grayscale. Images are stored on floppy disks and used in virtually any graphics application.



The RC-360 Incorporates many System Accessories to Ensure Versatile use.

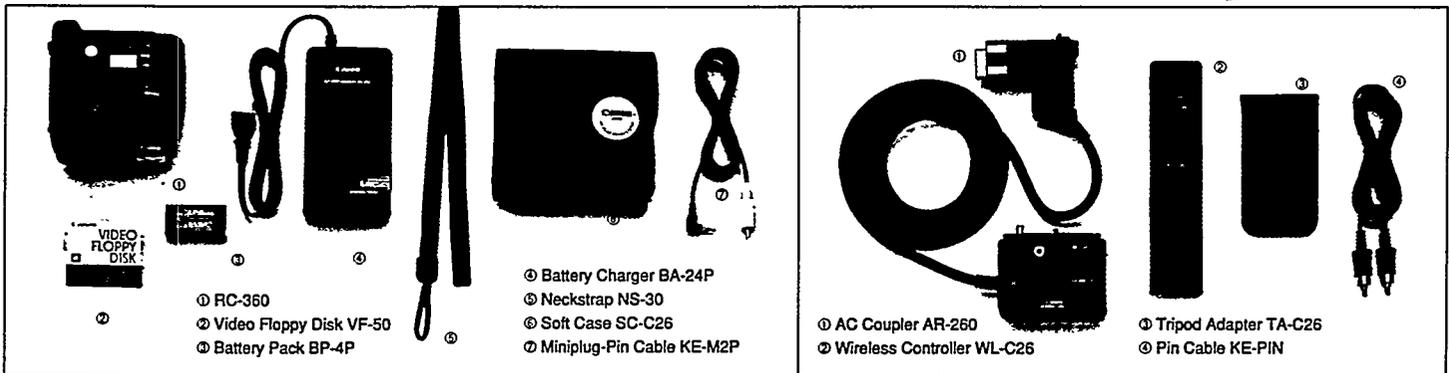
Film Adapter FA-C26	
Copy existing 35mm slides into a Permanent electronic form. Even 35 mm film negatives can be converted to positive video images using the film adapter.	
Camera Hood CD-C26	
Record oscilloscope waveforms permanently. The RC-360 and the Camera Hood allow waveform images to be captured to SV floppy. Import the images to a personal computer and use technical data reports.	
Conversion lens Set CL-C26	
The wide-angle and tele-converter lenses are options that expand your still video camera's possibilities. They're ideal to bring a distant subject in close or to shoot a tight interior or group photo.	
power Pack PP-A8	
Use the external Power Pack when you require an extended length of DC power supply. The Power Pack supplies enough battery life for an hour and a half of uninterrupted interval playback.	
Additional Accessories	
<ul style="list-style-type: none"> • System Bag <i>SB-C26</i> • Handy Bag <i>HBC26</i> • Accessory Kit <i>AK-C36</i> • RF Unit <i>RF-301</i> • Pin Cable <i>KE-PIN</i> 	<ul style="list-style-type: none"> • Battery Pack <i>BP-4P</i> • Battery Charger <i>BA-24P</i> • S-video Cable <i>KE-SS</i> • Video Floppy Disk <i>VF-50</i> • Head Cleaning Disk <i>VF-CD</i>

RC-360 Still Video Camera



RC-360 SV Camera Basic Kit

AK-C36 Accessory Kit



RC-360 Specifications

RECORDING		Date Recording	Automatic recording of track #, day, month, year, hour, and minute
Image Pickup Element	1/2-inch CCD (1026 pixels horizontally)	PLAYBACK	
Video Signal	NTSC color format	Output	Video 1Vp-p, 75Ω unbalanced (2.5mm minijack); S-video (when used with AC Coupler AR-260)
Lens	Fixed, single-focus 9.5mm (equivalent to 51mm in 35mm camera), f/2.4	Horizontal Resolution	Recording/Playback: 400 TV lines
Shooting Distance	3.3ft (1m) to ∞ (10.6in. (27cm) from lens surface in macro mode)	OTHER SPECIFICATIONS	
Light Metering System	Feedback AE	Power	
Exposure Mode	Programmed AE	Main battery	Lead-acid battery BP-4P (8V, 200mAh)
Exposure Compensation	+1.5EV	Auxiliary battery	Lithium battery CR2032 (battery life approx. 2 years)
Flash	Coupling range within 9.8ft (3m)	Dimensions	4.4(W)x1.7(H)x4.4(D) inches (111.5x42x113mm)
White Balance	TTL automatic tracking	Weight	Approx. 0.9lbs (410g) without battery

*All data is based on Canon's Standard Test Method. *Subject to change without notice.

Canon

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Canon

RC-570

Still Video Camera



Electronic imaging has come of age.

High quality photography for the electronic age is now a reality. Canon's RC-570 Still Video Camera records electronic color images on the standard two inch video floppy disk, allowing you to view images instantly on a TV instead of spending time and money on film and processing. An entire disk or a single image can be conveniently erased by the camera at any time, and new images can be recorded within the empty tracks. Use the RC-570 for a host of applications, including capturing visual images into a computer system fitted with a video interface card. Once still video images are saved within your computer, integrate them into virtually any software program that you are currently using. Still video images will bring new life to graphic presentations and desktop publishing documents that you thought was never possible before.

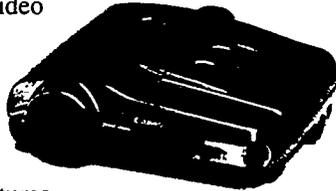
RC-570 advanced imaging features...

- 450 TV-line resolution
- 3X power zoom lens
- Fully automatic focus, white balance and exposure compensation
- . External composite and S-video inputs
- . Built-in playback and editing functions
- . Control the RC-570 via a computer to capture digitized images

Introducing the Newest Achievement in SV Camera Technology.

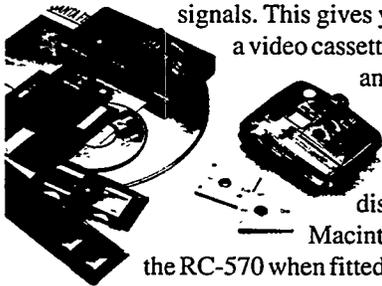
Outstanding Imaging Features...

The RC-570 boasts a 450-line frame video resolution combined with a powerful 3X power zoom lens for superior image capturing. For ease of use it incorporates automatic focus, flash and white balance. Overall, this still video camera contains the advanced features you'll need for assembling an extensive library of high quality images.



Input Images Directly From Various Sources...

What really makes the RC-570 Still Video Camera unique is that it combines external video source inputs for both composite and S-video signals. This gives you the ability to record images from a video cassette recorder, laser disk player or almost any other standard NTSC video device.



A convenient film adapter also gives it the ability to copy existing slides or negatives directly onto the floppy disk. Images created or altered on a Macintosh™ or IBM™ PC can be recorded to the RC-570 when fitted with the appropriate interface board.

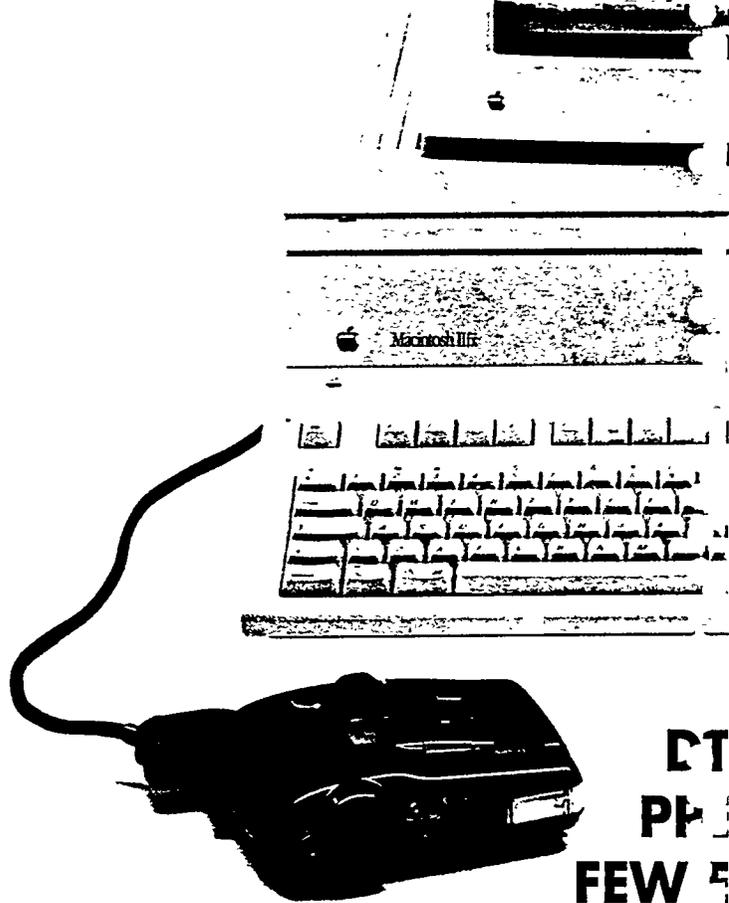
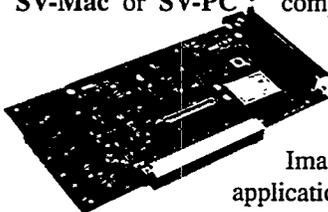
Playback and Editing...

The RC-570 includes a wide range of advanced playback and editing features. Images can be played back one at a time for user-controlled presentations, or continuously at a preset time interval. For a quick overview of a video disk's contents, 4 or 25 images can be displayed simultaneously on a TV monitor when utilizing the optional AC coupler and wireless controller. The content of a disk can also be edited by the RC-570 by erasing images or rearranging the order of which the images are played.

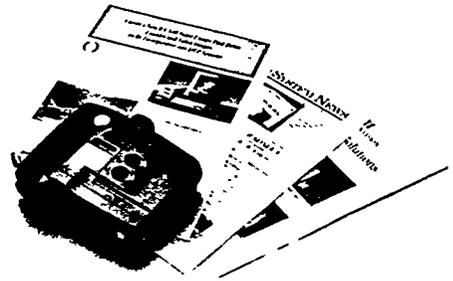


Computer Integration...

The RC-570 is so easy to operate as a computer peripheral that you'll quickly be an expert at capturing and using still video images with your personal computer. The high resolution CCD within the camera delivers superior quality images to your desktop. When the RC-570 is connected to your computer, it doubles as a still video playback device completely controlled for the importing and exporting of images. To integrate your RC-570 images with a Macintosh™ or IBM-PC compatible just add the SV-Mac or SV-PC computer board and software. These computer boards were designed specifically to work with Canon Still Video products to give you optimum control of capturing images into your computer. The RC-570 Computer Imaging System is indispensable for those applications that require visual images.



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Image Databases ▶

By exploring the many possibilities that the RC-570 offers, you can expand your way of doing work. Import images into a computer for keeping a permanent record of people or products. Ideal for taking photos of your home or office for insurance records and estate applications.



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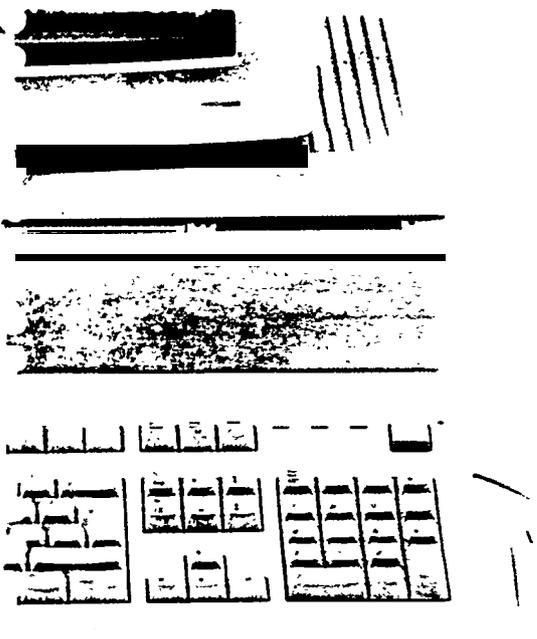


IMAGE DATABASES AND PRESENTATIONS ARE JUST A CLICKING POSSIBILITY WITH THE RC-570 AND STILL VIDEO.

...top Publishing

RC-570 makes it easy to include interesting visual information into reports, newsletters, etc., even when working with tight deadlines and tight budgets. The RC-570's high resolution, frame recording capability and clear on-screen images and sharp looking output by from a printer.



...media - Business Presentations

RC-570 still video images with text and graphics for business media presentation. Show clients exactly what you are talking about. Presentations become more professional and more convincing – with still video images. The RC-570's on-screen editing feature allows you to tailor the presentation to a particular audience.

The RC-570 Incorporates many System Accessories to Ensure Versatile use.

Wireless Controller WL-C39

The wireless remote controller lets you handle a number of functions, such as changing tracks, multi-image display functions, controlling on-screen data information, controlling interval playback, editing or dubbing of images.

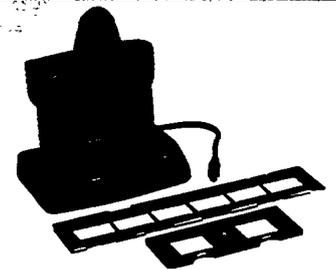


Film Adapter FA-C57

Copy existing 35mm slides into a permanent electronic form. Even 35mm film negatives can be converted to positive video



images using the film adapter.



Wide Converter WC-C5728

For those situations that require a wide view, attach the wide angle lens converter and your RC-570 camera becomes the equivalent of



a wide-angle 28mm lens.



Flash Bracket FB-C57

The Flash Bracket enables you to attach a powerful Canon EOS (420EZ or 430EZ) flash unit to the RC-570 camera for increased

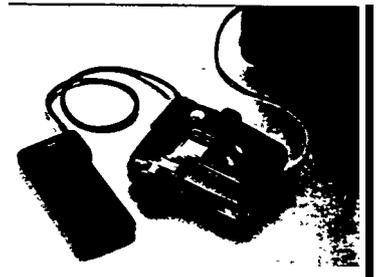


illumination.

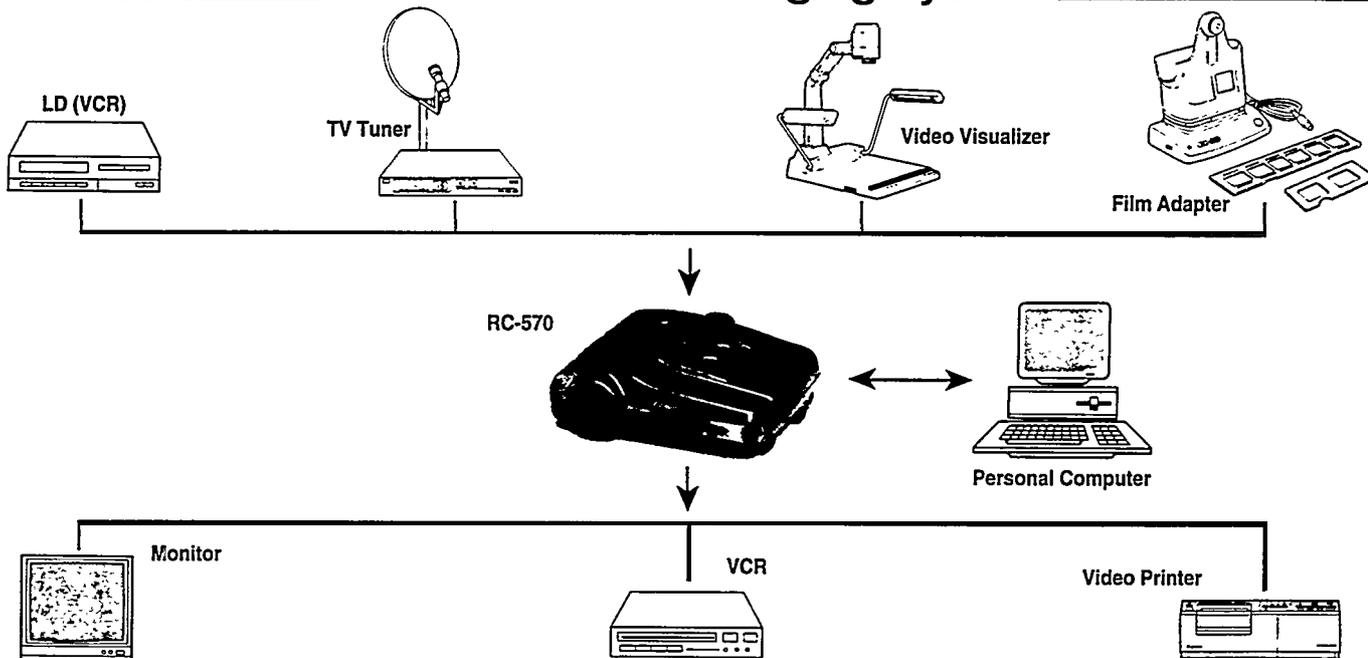


power pack PP-A8

Use the external Power Pack when you require an extended length of DC power supply. The Power Pack supplies enough battery life for an hour and a half of uninterrupted interval playback.



RC-570 Still Video Imaging System



RC-570 Camera Specifications

RECORDING		Flash	Built-in (light amount adjusting)
Recording System	Complies with Hi-Band format	Guide number	9 (at ISO 100)
Video Signal	NTSC color format	Flash coupling range	Approx. 11 .8ft at field made, 8.2ft at frame mode
Recording Medium	Video floppy disk	Mode	AUTO. ON or OFF
Image Pickup Element	1/2 inch pure color interline CCD (H:768 xV: 494 pixels)	Attachable Flash	Canon Speedlite 420EZ. 430EZ (optional flash bracket is required)
Lens	3x zoom 8-24mm (equivalent to 43-130mm conversion) 1/2.5-1/2.7. Shooting range: 1.8ft (0.55m) to ∞ (infinity)	ID Data Recording	Multiplex recording on the signal with DPSK modulation
Autofocus	Infrared projection active type	Recording data	Track number, year, month, day, hour, and minute
Viewfinder	Secondary imaging real image zoom finder	External Video Input	Composite and S-Video (Optional AC coupler is required)
Magnification	x0.46 (at 8mm)-x1.29 (at 24mm)	PLAYBACK	
Finder coverage	84%	Scanning Method	2:1 interface method
Dioptric adjustment	-4 to +3 diopters	Video Signal Output	1VP-P, 75Q (2.5mm dia. MINIJACK). S-Video with AC coupler
Shutter	Electromagnetic lens shutter	Horizontal Resolution	450 TV line
Shutter speed	1/500-1/30 sec.	Normal Playback	1 image playback, interval playback at approx. 3.5/sec.
flash sync speed	1/125 sec.	Advanced Playback	4-image multiplyback. 25-image INDEX playback (optional AC coupler and wireless controller required)
Shooting Speed		ERASING and EDITING	
Field mode	1 Single. 3 and 7 images/sec.	Erase Functions	Erase 1 image, erase continuous images. erase all images
Frame mode	Single and 3 images/sec.	Editing Functions	1 image dubbing, filling empty tracks with subsequent track images. (optional AC coupler and wireless controller required)
Light Metering System	Feedback AE with external matenng TTL finder metenng) and CCD signal	OTHER SPECIFICATIONS	
Exposure Control	Programmed AE	Power	
Metering Range		Main battery	Lead-acid battery BP-4P (8v. 200mAh)
Field mode	EV7.5-20 (at ISO 100)	Battery charge	Takes approx. 400 images without flash use Displays images for 15-20 minutes continuously
Frame mode	EV8.5-19 (at ISO 100)	Auxillary battery	Lithium battery CR2032 (battery life approx. 2 years)
Exposure Compensation	+1.5EV (Back light control)	Dimensions	5.8(W)x1.8(H)x2.7(D) inches (146x46.5x69.5 mm)
White Balance	Fully automatic TTL white balance	Weight	Approx. 1.31bs (600g) with battery
Self-timer	10 sec. delay		

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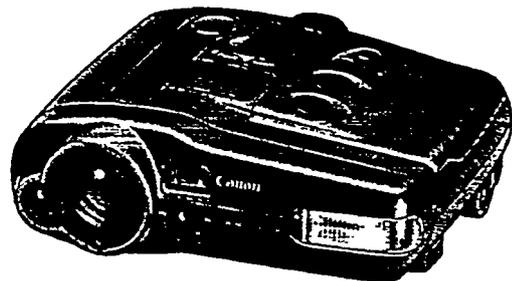
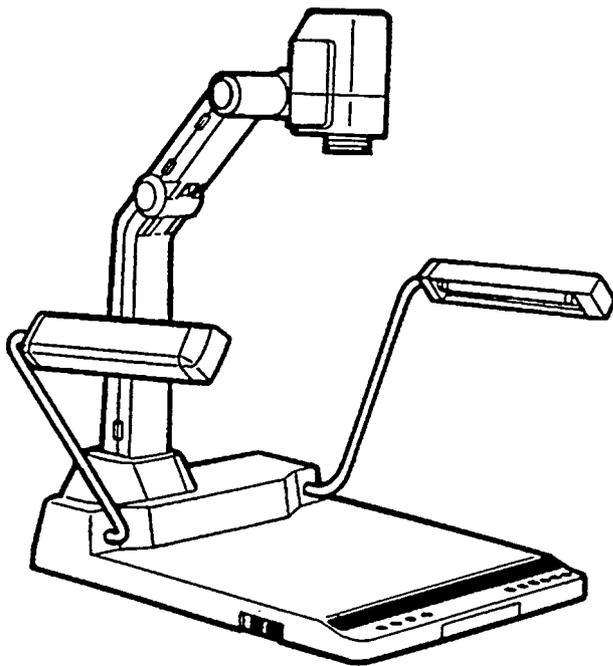
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Canon

STILL VIDEO SYSTEM

MANUFACTURER SUGGESTED LIST PRICE SCHEDULE

EFFECTIVE OCTOBER 1, 1993



SYSTEM ACCESSORIES

		L/P	COMMENT
C66-0293	VF-50 VIDEO FLOPPY DISKS	\$100.00	10 per box used in all SV cameras
C66-0311-001	VF-CD HEAD CLEANING DISK	\$15.80	Used to clean SV floppy devices
C86-0611	KE-SS S-VIDEO CABLE	\$17.50	
C86-0272	BP-4P BATTERY PACK	\$33.00	For RC-570, RC-360, RC-250
C86-0186-301	BA-24P BATTERY CHARGER	\$132.00	For RC-570, RC-360, RC-250

RC-570 CAMERA

		L/P	COMMENT
C81-0171-BAS	RC-570 SV CAMERA BASIC KIT	\$3,493.00	Camera, batt, charger, disk. soft-case, pin cable
081-0171	RC-570 SV CAMERA KIT	\$3,956.00	C81-0171-BAS + AK-057

RC-570 COMPUTER IMAGING KITS

		L/P	COMMENT
C61-0171401	RW570 NuBUS C.L KIT FOR MAC	\$4,688.00	C61-0171 + SV-Mac Digitizer
C81-0171-010	RC-570 C.L KIT FOR PC	\$4,688.00	C81-0171 + SV-PC Digitizer
C81-0171406	RC-570 NuBUS ESP KIT FOR MAC	\$5,054.00	C81-0171 + SV-Mac Digitizer + Rec Module for Mac
C81-0171-011	RC-570 ESP KIT FOR PC	\$5,054.00	C61-0171 + SV-PC Digitizer + Rec Module for PC
C81-0171-007	RC-570 SCSI C.I. KIT FOR MAC	\$6,726.00	C81-0171 + FV-540, Pro-FV, SCSI Cable
C81-0171-008	RC-570 SCSI CI. KIT FOR PC-AT	\$6,976.00	C81-0171 + FV-540, DOS FV-Scan (Software, AT-SCSI Card & Cable)
081-0171-009	RC-570 SCSI C.I. KIT FOR PC-MC	\$7,076.00	C81-0171 + FV-540, DOS FV-Scan (Software, MC-SCSI Card & Cable)

RC-570 CAMERA ACCESSORIES

		L/P	COMMENT
C66-0655-041	AK-C57 ACCESSORY KIT	\$463.00	A/C Coupler, Remote Control, S-Cable, RCA Cable
C86-0872-031	FA-C57 FILM ADAPTER	\$592.00	Transfers 35mm slides or negatives
C86-0804-001	FB-C57 FLASH BRACKET	\$294.00	For 430-EZ external Flash
C86-0852-011	WC-C57 WIDE CONVERTER	\$237.00	Attaches to front of RC-570 for 28mm
C86-0865-001	SB-C57 SYSTEM BAG	\$294.00	Hard case holds camera & accessories
C86-0891-001	PP-A8 POWER PACK	\$176.00	External power supply, uses AA batteries for extended DC operation
C50-0612	430 EZ FLASH	\$415.00	External flash unit for increased illumination

● Does not include accessory kit

RC-360 CAMERA

		UP	COMMENT
C81-0201-BAS	RC-360 SV CAMERA BASIC KIT	\$1,665.00	RC-360, VF-50, Batt, Charger, Strap, Soft-case, Mini-pin cable
C81-0201	RC-360 SV CAMERA KIT	\$1,887.00	C81-0201-BAS + AK-C36 Accessory Kit

RC-360 COMPUTER IMAGING KITS

		U P	COMMENT
C81-0201-001	RC-360 NuBUS C.I. KIT FOR MAC	\$2,600.00	081-0201 + SV-Mac Digitizer
C81-0201-002	RC-360 C.I. KIT FOR PC	\$2,600.00	081-0201 + SV-PC Digitizer

RC-360 CAMERA ACCESSORIES

		L/P	COMMENT
C86-0653-051	AK-C36 ACCESSORY KIT	\$222.00	A/C Coupler, remote control, tripod adapter RCA-Pin cable
086-0871-011	FA-C26 FILM ADAPTER	\$370.00	Transfers 35mm slides or negatives
C86-0851-021	CL-C26 CONVERSION LENS SET	\$230.00	Wide angle and telephoto lens adapters
C86-0606-001	CD-C26 CAMERA HOOD	\$197.00	For taking pictures of ocelliscope displays
C86-0891-001	PP-A8 POWER PACK	\$176.00	External power supply, uses AA batteries for extended DC operation
086-0862-301	SB-C26 SYSTEM BAG	\$230.00	Hard case holds camera & accessories
C86-0863-001	HB-C26 HANDY BAG	\$107.00	soft case holds camera and shooting accessories

SV-DIGITIZER BOARDS

		L/P	COMMENT
HWK-0009-570	SV-MAC SV DIGITIZER FOR MAC (NuBUS)	\$1,109.00	For RC-570, RC-360 & RE-650 incl. software
HWK-0012-570	SV-PC SV DIGITIZER FOR PC	\$1,109.00	For RC-570, RC-360 & RE-650 incl. software
HWK-0010-570	ESP RECORDING I/F FOR MAC	.\$554.00	Add to SV-Mac for recording to RC-570
HWK-0013-570	ESP RECORDING I/F FOR PC	\$.554.00	Add to SV-PC for recording to RC-570
CM6-0025-051	KE-DS 15S DIGITIZER CABLE	\$41.00	Used to connect a RE-650 to SV-Mac/SV-PC

FV-540 DISK DRIVE/DIGITIZER

		UP	COMMENT
C84-0052	FV-540	\$2,620.00	FV-540, SCSI terminator

SOFTWARE

SWK-0004-540	PROFESSIONAL FV FOR MAC	\$150.00	Software and SCSI system cable
SWK-0003-000	DOS FV-SCAN FOR PC-AT	\$400.00	software, PC-AT SCSI board, cable
SWK-0001-540	DOS FV-SCAN SOFTWARE	\$150.00	software only for DOS, requires compatible SCSI board and cable
SWK-001 1-540	DOS FV-SCAN FOR PC MICRO-CHAN.	\$500.00	Software, PC-MC SCSI board, cable
SWK-0012-540	WINDOWS FV-SCAN SOFTWARE	\$100.00	software only for Windows, requires compatible SCSI board and cable
SWK-0013-540	SV-ALBUM FOR NeXT COMPUTERS	\$800.00	software and SCSI system cable

RE-650 VIDEO VISUALIZER

		UP	COMMENT
C81-0192	RE-650 VIDEO VISUALIZER	\$3,925.00	Includes video cables & softcase
C86-0114	LIGHT BOX FOR RE-650	\$58.00	For transparent materials
C86-0115	FLOURESCENT BULB FOR RE-650	\$20.00	Replacement bulb for light arms and light box

VIDEO PRINTERS

		UP	COMMENT
C83-0132	RP-733 DIGITAL VIDEO PRINTER	\$3,400.00	
C88-0106-201	RP-50CB COLOR INK/ PAPER	\$55.00	50 sheets for RP-733
C83-0132-003	RP-733 PRINT APPLICATION KIT FOR DOS	\$3,500.00	RP-733 & Dos RP-Scan software for DOS
SWK-0001-733	DOS RP-SCAN SOFTWARE	\$300.00	DOS software for RP-733
C83-0092	RP-420 VIDEO PRINTER	\$1,998.00	
C88-0102	RP-100CS COLOR INK/ PAPER	\$99.00	100 sheets for RP420
C88-0111	RP-100M MONOCHROME PAPER	\$19.00	100 sheets for RP-420

RV-311 SV PLAYER

		UP	COMMENT
C82-0063	RV-311 SV PLAYER	\$1,570.00	
C86-0801	IA-V32 INTERFACE ADAPTER	\$550.00	Controls RV-311 from a PC or CLC-IPU
C86-0763	KE-DS 9R INTERFACE CABLE	\$118.00	Connects IA-V32 to CLC-IPU
C86-0764	KE-DS 15 INTERFACE CABLE	\$118.00	Connects multiple IA-V32 units

FP-510 GRAPHICS PRINTER

		UP	COMMENT
C83-0102-001	FP-51 O KIT FOR PC	\$5,250.00	FP-510, centronics I/F board and software utility set for PC DOS & Windows
C83-0102-002	FP-510 KIT FOR MAC	\$5,250.00	FP-510, RS-232C I/F board and software utility set for Mac, cable
C86-0431	GPIB INTERFACE BOARD	\$315.00	
C86-0432	IB-FP12 INTERFACE BOARD	\$365.00	Centronics I/F board
C86-0433	IB-FP13 INTERFACE BOARD	\$365.00	RS-232C I/F board
C88-0012-201	IK-8C STD. INK CARTRIDGE	\$63.00	
C88-0013	IK-8C HIGH DENSITY INK CARTRIDGE	\$86.00	
C88-0091-001	FP-70LE ROLL PAPER	\$51.00	

SOFTWARE

SWK-0005-000	PROFESSIONAL FP FOR MAC	\$200.00	
SWK-0009-000	COLOR-OUT FOR MAC	\$120.00	Comes with C83-0102-002
SWK-001 0-000	WINDOWS 3.0 DRIVER SOFTWARE	\$120.00	Comes with C83-01 02-001

RC-250 CAMERA ACCESSORIES

		U P	COMMENT
C86-0661-001	AS-C25 ACTION SET	\$80.00	Telephoto lens and grip
C86-0671	WIDE CONVERTER	\$70.00	Wide angle lens requires AS-C25
D29-0090-PKG	MULTI-ANGLE LENS SET	\$139.00	AS-C25 & wide converter
C86-0651-001	AV-C25 A/C COUPLER	\$35.00	
C86-0681	MF-C25 MACRO FRAME	\$70.00	Camera stand for macro requires AS-C25
C86-0113	LONG-PLAY POWER PACK	\$260.00	External power supply, uses AA batteries for extended DC operation
086-0422	F-301 RF UNIT	\$80.00	Connects to A/C coupler for RF output
C86-0641-001	KE-M2P MINIPLUG PIN CABLE	\$10.50	
C86-0161-001	KE-PIN CABLE	\$11.70	
C86-0112	MINI-LCD /LONG PLAY KIT	\$460.00	Includes Long-play battery pack and a mini color LCD-monitor

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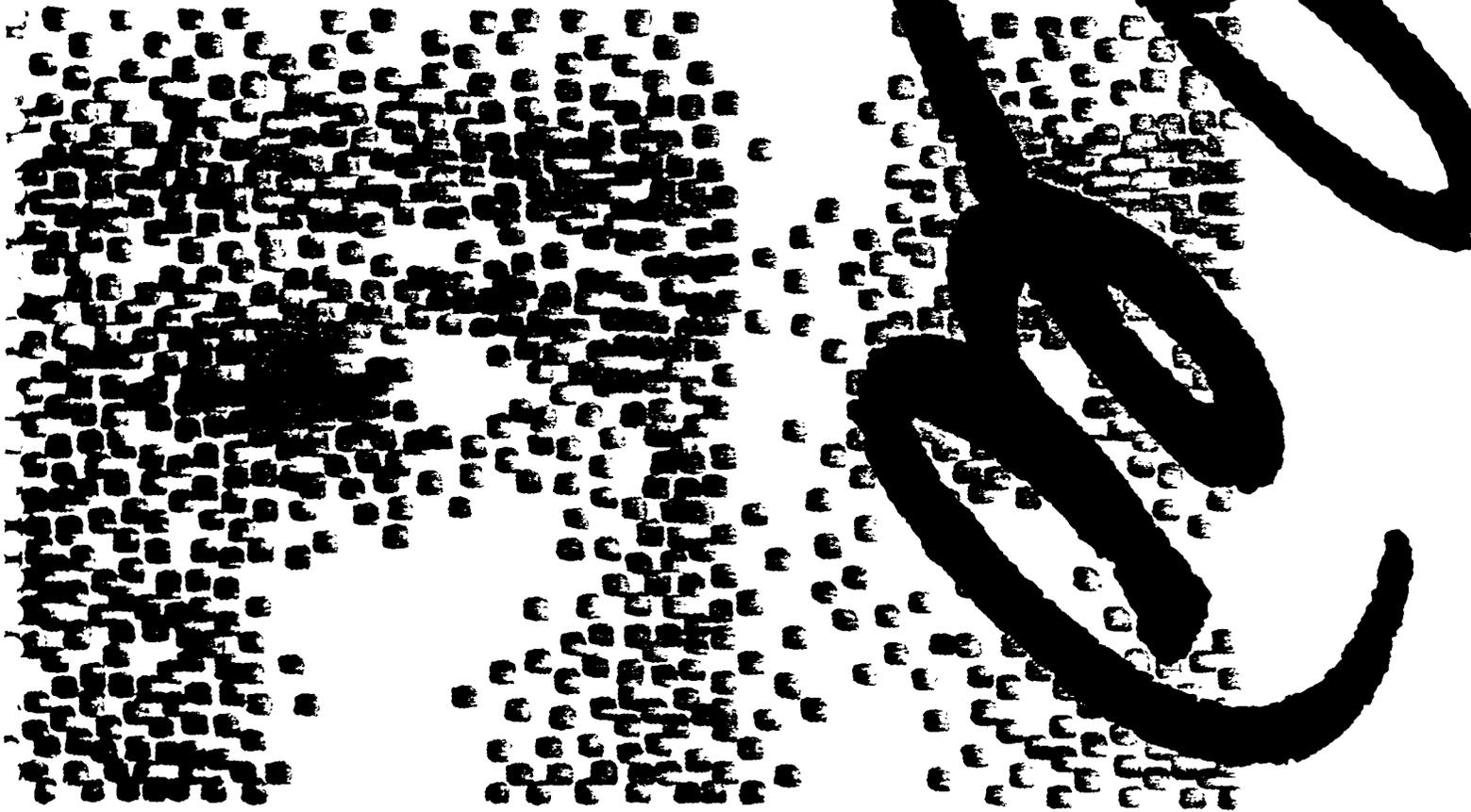
Versions

ComputerEyes

Family of

Video Digitizers

Digital Vision, Inc.



C O M P U T E R E Y E S T '

Digit

Current models

ComputerEyes/RT is a no-compromise, powerful, real-time color video frame grabber. Fast 1/30th second image grab makes capturing moving subjects (or from running video tape of five TV) a snap. The high resolution and full 24 bit color capabilities are easily software controlled for a fast, accurate, powerful board that handles like a pussycat.

ComputerEyes/Pro is aimed at the budget-minded color (or b/w) imager. Video sampling done by a scanning technique wherein the image data is squired over a period of a few seconds. While this requires the subject to be fairly stationary while being captured, it yields virtually the same high resolution and 24-bit palette as the /RT, yet at substantially lower cost.

The ComputerEyes/RT Monochrome version is a perfect fit for two markets: black-and-white end-user applications, where its ability to easily generate high quality gray-scale image files makes it a popular and economical choice; and industrial applications, such as machine vision and security, where it offers real time capture, multiple inputs, and excellent software development support.

The 24-bit palette

When selecting a color video digitizer, full 24-bit (16.7 million colors) color depth should be a very important consideration for many reasons:

- PC graphics, while currently standardized on 256-color VGA displays, is poised to explode into more colors. Some of the newest generation HiColor VGA cards offer 32-bit (32,000-color) or full 24-bit displays.
- Even from current 256-color VGA systems, ComputerEyes 24-bit files can be saved to disk for non-display applications such as printing, slide-making, or image analysis.
- The 24-bit image data provides plenty of data.

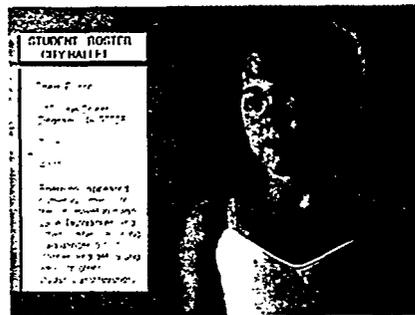
Capture Real-Life

Images From Any

Video Source With

Digital Vision's

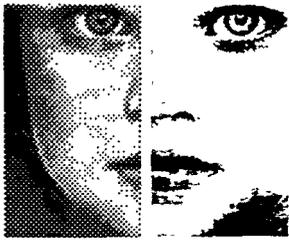
Video Digitizers,



The Family

Meet the **ComputerEyes family of video digitizers!** Introduced around the time of the first PC's, the line has grown and matured over the years to continually offer the best image capture value to all users, for all applications,

All models are built with ease of operation as a primary design consideration. Simple hardware installation (just plug the board into any slot) and menu-driven user-friendly software gets you up and capturing images in no time. There's no fuss, no conflicts, no learning curve; no additional monitors, memory, or special cameras are needed. ComputerEyes video digitizers are truly **Plug, point- and capture products.**



Specs.



ComputerEyes/RT

The ultimate in real-time color capabilities

- Fast 1/30th second image frame grab allows moving images to be easily captured with no distortion
- 768K image RAM and 32K color look-up table on-board
- Live-action preview directly on the VGA monitor
- NTSC composite or S-Video inputs (PAL version also available)
- Capture resolution - 512 x 512 pixels
- Full 24bit (16.7 million color) image capture; accurate, instantaneous reduction to 8-bit 256-color or gray-scale modes
- Supports VGA, Super-VGA, HiColor (32,000 color), and true-color (24bit) displays
- Display styles color, dithered color, false color, true gray, dithered, and high contrast
- All common image file formats supported: PCX, Targa TGA, GIF, JPEG, Deluxe Paint, Splash, gray-scale and color TIFF, others
- Animation files saved as AutoDesk FLI, IBM MOO, SNP and Video For Windows AVI; sound can be simultaneously captured and saved as Sound Blaster VOC
- DOS and Windows control software included
- Optional developer's package for incorporating capture routines within an application
- System requirements IBM PC/XT/AT/286/386/486 or compatible or PS/2 25/30/40, 640K RAM, VGA graphics capability
- List Price - \$399.95

ComputerEyes/Pro

A value-packed color capture board

- *NTSC composite* or S-Video inputs (PAL version also available)
- Capture speeds from 1.5 to 24 seconds
- Capture resolution up to 640 x 480
- Full 24bit (16.7 million color) image capture; accurate on-the-fly reduction to 256 colors

- Continually-updating preview mode on VGA monitor to frame and focus subject
- Smooth 8-bit gray scale capture
- Display modes: EGA, VGA, Super-VGA (at **640 x 480 x 256-colors**)
- Supports all common image file formats Paintbrush PCX, Targa TGA, GIF, Deluxe Paint, Splash, gray-scale and color TIFF, others
- DOS and Windows control software included
- Optional developer's package for incorporating scanning routines within an application
- System requirements: IBM PC/XT/AT/286/386/486 or compatible or PS/2 25/30/40, 640K RAM, VGA graphics capability
- List Price - \$299.95

ComputerEyes/RT Monochrome

A versatile real-time b/w board

- **Single 8-bit** bus card, 6" length
- Fast 1/30th second image grab
- Accepts NTSC or PAL video inputs
- Four video inputs, software selectable
- Captures 512 x 512 video samples at 8 bits (256 gray levels) per pixel
- Many display styles - high contrast, gray scale, dithered, false color
- Saves images in all popular image file formats - TGA, PCX, TIFF, and others
- Optional developer's package available for incorporating capture routines within an application
- System requirement IBM PC/XT/AT/286/386/486 or compatible or PS/2 25/30/40, 640K RAM, VGA graphics capability
- List Price - \$299.95

Ordering Information

ComputerEyes is available through most major channels or direct from Digital Vision, Inc. at (800) 346-0090.

Digital Vision, Inc.
270 Bridge Street
Dedham, MA 02026
(617) 329-5400



Digitize Reality.

allow the ComputerEyes software to very accurately select the best 256 VGA colors for a captured image.

- And new image compression standards (such as JPEG) will shortly allow everyday use of 16- and 24-bit images that are today considered too large to easily manage.

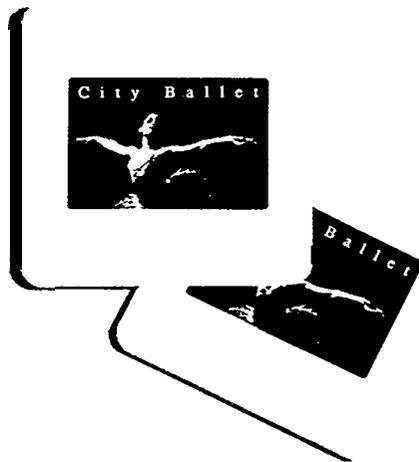
The ComputerEyes 24-bit color capabilities will allow you to grow with the industry for many years to come.

Editing *your images*

While the ComputerEyes system software includes many image enhancement features, captured images can be further modified using any of the popular paint or image editing packages. Images are compatible with all of the standards: PC Paintbrush, Tempra, picture Publisher, Deluxe Paint, Splash!, CoLoRix, etc.

Printing and publishing *your images*

Unlike flatbed or hand scanners, the range of subjects that can be captured from video is limited only by the imagination. Subjects can be big or small, round or flat- whatever a video camera can be pointed at can be captured. For publishing and printing, ComputerEyes images are saved in files compatible with PageMaker,



Ventura, WordPerfect etc.

Laser printer output can be very good. Linotronic output at 1270 dpi or higher, to paper or film, can yield outstanding professional-quality printed images.

CineMaker animation capture

ComputerEyes/RT also comes with the CineMaker capture software that works with the color /RT model to capture sequential frames or movies. CineMaker will allow the capture of animations of up to 4000 frames at up to 18 frames per second, depending on the PC. These software movies are saved as standard formats such as AutoDesk Animator FLI, to be used with other multimedia applications. CineMaker also supports all Sound Blaster and compatible audio boards for simultaneous capture and playback of sound with animations. VGA and SuperVGA software players for the animations are also included - a great multimedia tool.

Presenting *your images*

putting images onto slides for your next presentation is a snap with a picture-perfect 16 million colors available. Or for on-screen demonstrations, programs such as Tempra Show or JBM Storyboard can help organize your

images into a dazzling display.

with local and mail-order service bureaus offering economical slide-making services and printing to Linotronic printers, truly professional results are readily available to all users.

Industrial applications - an OEM imaging solution

If you're looking for a cost effective imaging device around which to design an application, the new monochrome ComputerEyes/RT version offers lots of industrial features, with a design to last years into the future.

So whether it's picture databases or parts inspection, desktop publishing or printing custom T-shirts; whether your needs are gray-scale or color, fast or slow, you won't find more capable or economical image capture devices than ComputerEyes.



Digital Vision, Inc.



Digital Vision, Inc.
 270 Bridge Street
 Dedham, MA 02026
 (617) 329-5400
 (617) 329-6286 Fax

Digital Vision Pricing Schedule

September 1, 1993

Part No.	Description	List Price
IBM PC Products		
FCEIBF	ComputerEyes/RT.....	\$399.95
FCEIBG	ComputerEyes/RT PAL.....	\$399.95
FCEIBH	ComputerEyes/RT Monochrome.....	\$299.95
FCEIBT	ComputerEyes/LPT Color NTSC.....	\$399.95
FCEIBU	ComputerEyes/LPT Color PAL.....	\$399.95
FCEIBR	ComputerEyes/Pro Color.....	\$299.95
FCEIBL	ComputerEyes/Pro Color PAL.....	\$299.95
FTEXXN	TelevEyes/Pro NTSC.....	\$799.95
FTEIBN	TelevEyes VGA-to-TV NTSC.....	\$299.95
FTEIBP	TelevEyes VGA-to-TV PAL.....	\$299.95
FCAIBT	TelevEyes Terminator.....	\$19.95
FTPIBM	Tempra GIF Software.....	\$29.95
Macintosh Products		
FCEMCF	ComputerEyes/RT SCSI Color.....	\$599.95
FCBMC2	SCSI Cable -25-50.....	\$24.95
FCBMC5	SCSI Cable -50-50.....	\$24.95
FCBMCT	SCSI Terminator - 50 Pin.....	\$24.95
FCEMCR	ComputerEyes/Pro Color.....	\$399.95
FCEMCL	ComputerEyes/Pro Color PAL.....	\$399.95
FCEMCM	ComputerEyes b/w.....	\$249.95
FTEXXN	TelevEyes/Pro NTSC.....	\$799.95
FTEMCN	TelevEyes Mac-to-TV NTSC.....	\$299.95
Apple Iigs Products		
FCE2GC	ComputerEyes Color.....	\$249.95
Apple II, II+, Iie, Iigs Products		
FCE2EM	ComputerEyes.....	\$129.95
FEN2EE	Enhancement Software.....	\$24.95
FEN2ES	Iigs support software.....	\$19.95
Atari ST Products		
FCESTM	ComputerEyes b/w.....	\$149.95
FCESTP	ComputerEyes b/w (PAL).....	\$149.95

Ordering Information

ComputerEyes and related products are available through most major channels or direct from Digital Vision at (800) 346-0090.

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APPENDIX D: ESP USER'S MANUAL

Basic Building Blocks

The four building blocks used by systems developed in TEAM-UP are Menus, Applications, Reports and Utilities.

Menus allow the user to select other menus, applications, reports or utilities. Menus can be one or more pages long and include a help screen to give additional information about special keys. The options on the menu are available by typing a number. These numbers also provide quick access to any part of the database. In order to make correspondence about reports simple, the menu option number is stamped on the upper right corner of each report. Similarly, the entire system has a version date stamped on the first page of the main menu. These menu option numbers provide quick and easy access to options and, at the same time, allow the user to convey a concrete picture of their needs to the developers.

Applications contain data. Each application is made up of two main areas, the application screen and the corresponding one-liner screen. The application screen will contain all the data fields. The one-liner screen is designed to give an overview of the data; for each record, one line of key data is displayed. The control key followed by a letter allows users to perform operations such as (E)nter, (U)pdate, (F)ind, (D)elete and (P)rint data. Other control keys allow users to perform special tasks, such as selecting data from a pop-up window. Entering the application and using these operations may be governed by various security levels. The control keys available are listed in the application help screens.

Reports allow users to print out the information in different formats and allow the user to select all or part of the data. Reports are selected from a menu by typing the number listed. In most cases, there will be prompts for the destination and data filters. Normally the destination can be the screen, printer or file. The data filters vary, but leaving these prompts blank always selects the whole data set.

Utilities allow the user to select options such as change password, report writer, system security, terminal setup and import system.

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Installation of ESP

The ESP program will create six directories on the destination drive. The version of ESP that will be loaded on your machine is a demo version. The demo version will be limited in the number of records that can be loaded in each application. The six directories will be: \TEAMYARD, \TEAMYARD\PNTBID, \TEAMYARD\TRACE, \TEAMYARD\APPLIST, \TEAMYARD\RPTLIST, and \TEMP. Also, sample *.lzh files will be loaded in the root directory.

Please follow the next several steps in loading the ESP program.

1. Make sure that your config.sys file contains the command "FILES =20" or greater.
2. Place the Disk in the A: or B: drive and type the following on the D: drive if you wish to place ESP on drive D:

B:INSTALY D B

This command will install the ESP program on Drive D from source disk placed in drive B. You may place ESP on drive C:, D:, E:, F:, G:, H:, I:, J:, or K:.

3. Typing "ESP" in the \TEAMYARD directory will call the ESP program.
4. Currently there are 4 levels of security set for ESP. The different levels of security are invoked by typing respective usernames. The usernames are PROD (production), ENTRY (data entry), MGR (shop manager), and SUPER (supervisor). Type a username at the TEAM-UP sign-on menu to enter ESP. NO PASSWORD IS REQUIRED AT THIS POINT.

Note: The system will require about 5 meg of hard disk memory. You should have 512K of conventional memory and a 486 personal computer for best results, but TEAM-UP will run on a 8088 with 256k of ram if needed.

TEAM-UP searching is quite extensive. You may search in any field. Highlighted fields are key fields and will search quicker. Key fields also allow the user to order a search by the key field by placing a space in the first position of the key field. All numeric fields can be totalled on the one liner by hitting a CTRL T in the appropriate field. A CTRL Q will allow searches by match phrase, GT, GE, EQ, LE, LT, Null, and Not Null. Searches are invoked by typing the required search criteria in the fields and hitting enter. The general commands mentioned above are the same for all applications. The manual will explain all of this much further, but these are the basics.

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USER INTERFACE

Main Menu Organization and Use

To view each page of the menu, press [Page Down] or [Page Up]. All options on the menu are available from any page. Simply type the number and press the [Return] key. The escape key, [ESC], allows the user to exit the application or takes the user back to a previous application.

```

      E C O N O M I C S   O F   S H I P Y A R D   P A I N T I N G
      L A B O R   D A T A   A P P L I C A T I O N   M E N U

LABOR DATA APPLICATIONS

1. MASS LABOR ENTRY ( INDIVIDUAL)  11. REWORK/ABNORMAL COND . MASTER
2. LABOR DATA                      12. LABOR ADJUSTMENT CODE MASTER
3. EMPLOYEE MASTER                  13. NON-VALUE TIME MASTER
4. ZONE MASTER                      14. WORK ORDER MASTER
5. HULL MASTER                      15. LEADMAN MASTER
6. EVENT MASTER                    16. TRADE CODE MASTER
7. COMPARTMENT MASTER              17. SHIFT MASTER
8. OPERATION MASTER                18. MASS LABOR ENTRY (HULL)
9. DEPARTMENT MASTER              19.
10. COMPANY DATA                  20. RESEARCH PROJECT DISCLAIMER!

777. VERSION INFO  888. SIGNON MENU  999. SIGNOFF
  •*** PGDH FOR APPLICATION MENU (CONT. ) •***
V931101
                                F1 HELP

```

```

      A P P L I C A T I O N   M E N U   ( C O N T . )

PAINT DATA APPLICATIONS          BID SHIP APPLICATIONS

21. PAINT SYSTEM MASTER           31. PAINT SYSTEMS/CMPT TYPE DATA
22. MANUFACTURER MASTER           32. SUPPLEMENTAL PAINT SYSTEM DATA
23.                                33. CHARGE RATE MASTER
24.                                35.
25.                                36.
26.                                37.
28.                                38.
29.                                39.
                                   40.

888. SIGNON MENU  999. SIGNOFF
  **** PGDN FOR Application MENU (CONT. ) ****
                                F1 HELP

```

APPLICATION MENU (CONT.)

COMPARABLE SHIP APPLICATIONS

MISC APPLICATIONS

- | | |
|--------------------------------|-----------------------------------|
| 41. MINS/SQFT DATA | 51. COMPARTMENT TYPE MASTER |
| 42. GENERAL LABOR DATA | 52. |
| 43. SUPPLEMENTAL LABOR DATA | 53. SOFTWARE CHANGE REQUESTS |
| 44. SUPPLEMENTAL MATERIAL DATA | 54. DATABASE VERSION INFORMATION |
| 45. | 55. SYSTEM AUTO INCREMENT NUMBERS |
| 46. | 56. CHARGE NUMBER MASTER |
| 47. | 57. WORK SPEC MASTER |
| 48. | |
| 49. | 58. |
| 50. | 60. |

8 8 8 . S I G N O N M E N U . 9 9 9 . S I G N O F F

**** PGDH FOR REPORT MENU ****

F1 HELP

REPORT MENU

LABOR DATA MASTER REPORTS

BID EST/MISC MASTER REPORTS

- | | |
|----------------------------------|-----------------------------------|
| 81. EMPLOYEE MASTER | 91. BID ESTIMATE SUMMARY |
| 82. ADJUSTMENT CODE MASTER | 92. |
| 83. HULL MASTER | 93. OPEN SOFTWARE CHANGE REQUESTS |
| 84. ZONE MASTER | 94. VERSION MASTER |
| 85. COMPARTMENT MASTER | 95. PAINT MASTER |
| 86. OPERATION MASTER | 96. COMPARTMENT TYPE MASTER |
| 87. DEPARTMENT MASTER | 97. MANUFACTURER MASTER |
| 88. REWORK\ ABNORMAL COND MASTER | 98. EVENT MASTER |
| 89. NON-VALUE TIME MASTER | TRADE CODE MASTER |
| 90. LEADMAN MASTER | 100. MANPOWER PLANNING ESTIMATE |

~ 8 8 8 . S I G N O N M E N U . 9 9 9 . S I G N O F F

*** PGDN FOR REPORT MENU (CONT.) ****

F1 HELP

REPORT MENU (CONT.)

BID SHIP MASTER REPORTS

COMPARABLE SHIP MASTER REPORTS

- | | |
|--|-------------------------------------|
| 101. COMPARTMENT DATA MASTER | 111. MINS/SQFT MASTER |
| 102. SUPPLEMENTAL PAINT SYSTEMS MASTER | 112. GENERAL LABOR MASTER |
| 103. | 113. SUPPLEMENTAL LABOR DATA MASTER |
| 104. | 114. SUPPLEMENTAL MATERIAL MASTER |
| 105. | 115. |
| 106. | 116. |
| 107. | 117. |
| 108. | 118. |
| 109. | 119. |
| 110. | 120. |

888. SIGNON MENU 999. SIGNOFF

**** PGDN FOR REPORT MENU (CONT.) ****

SEL

F1 HELP

REPORT MENU (CONT.)

LABOR REPORTS

- | | |
|------------------------------------|--------------------------------------|
| 121. OPERATION SUMMARY | 131. OPERATION SUMMARY BY SHIFT |
| 122. FIRST CHARGE SUMMARY | 132. COMPARTMENT SUMMARY/CNPT FILTER |
| 123. LAST CHARGE SUMMARY | 133. LATE WORK BASED ON SCDL FINISH |
| 124. PROGRESS SUMMARY | 134. OPEN LATE WORK BY SCDL FINISH |
| 125. EMPLOYEE WEEK SUMMARY | 135. SCHEDULED WORK BY SCDL START |
| 126. OPERATION YTD SUMMARY | 136. SCHEDULED WORK BY FRCST START |
| 127. OPERATION YTD SUMMARY | 137. COMPARTMENT SUMMARY/DATE FILTER |
| 128. EST UPDATE WORKSHEET, ALL WOS | 138. WORK ORDER SUMMARY BY SHIFT |
| 129. NORK ORDER MASTER | 139. HULL OPN LT WRK w/8 UK LK AHEAD |
| 130. OPEN WOS 3 UK PAST FORECAST | 140. OPN LT WRK W/8 UK LK AHEAD |

888. SIGNON MENU 999. SIGNOFF

**** PGDN FOR REPORT MENU (CONT.) ****

SEL

F1 HELP

REPORT MENU (CONT.)

LABOR REPORTS (CONT.)

- | | |
|--|---------------------------------------|
| 141. EST UPDATE WRKSHT, CHRGD TO WOS | 151. CLOSED WORK ORDERS BY CLOSE DATE |
| 142. PROGRESS EST BY LEADMAN | 152. CMPT SUMMARY FOR CLOSED WOS |
| 143. CLOSED WOS PROGRESS SUMMARY | 153. CHARGE NUMBER MASTER |
| 144. CLOSED WOS WRT CLOSE DATES | 154. WORK SPEC MASTER |
| 145. OPEN WORK WRT EVENT | 155. SKILLS AND ABILITIES |
| 146. OPEN & PLANNED WORK WRT EVENT | 156. PHYSICAL PROGRESS |
| 147. MNPWR PLNNG EST OPEN LATE W/ 8 UK | 157. |
| 148. MNPUR PLNNG INTGRTD HULL W/ 8 UK | 158. |
| 149. MNPUR PLNNG OPN WRK WRT EVENT | 159. |
| 150. MNPUR PLNNG WOS WRT EVENT U/CLOSE | 160. |

8 8 8 . S I G N O N M E N U . 9 9 9 . S I G N O F F

•*** PGDN FOR UTILITY MENU

F1 HELP

UTILITY MENU

UTILITIES

- | | |
|----------------------|------|
| 181. CHANGE PASSWORD | 191. |
| 182. REPORT WRITER | 192. |
| 183. SYSTEM SECURITY | 193. |
| 184. TERMINAL SETUP | 194. |
| 185. IMPORT SYSTEM | 195. |
| 186. | 196. |
| 187. | 197. |
| 188. | 198. |
| 189. | |
| 190. | 200. |

8 8 8 . S I G N O N M E N U 9 9 9 . S I G N O F F

•*** PGDN FOR APPLICATION MENU ****

F1 HELP

Control Keys

Throughout the applications there are various control keys which perform special tasks. The control keys available are listed in each help screen. To use a control key, hold down the control key and press the letter.

Help Screens and System Help

A one-page help screen is available from menus and applications by pressing the help key, [F1]. System help is available by placing the cursor in the home position and pressing [F1].

Error and Warning Messages

During the process of entering data, the user may request a database operation which is invalid. When this happens, a warning or error message is displayed at the bottom of the screen. For most of these messages, a bell sounds. In many cases, the operation requested is a valid operation but there is one or more fields which are missing or incorrect. The following are some of the more common errors that the user may encounter.

CTRL-F: No Records found! The database tried to find matching records but either no records match or no records exist. Try the operation again with different data.

CTRL-E: Duplicate records. The record cannot be entered because a record already exists in the database which matches the record you tried to enter. See the explanation of application screens for the list of fields which combine to make a record unique.

CTRL-E.U: Mandatory! The field which the cursor is positioned on is a mandatory field and must have data before an update or enter will work.

Date outside normal range! Continue? Y/N A warning message appears if the date entered is not within a specified range of the system date. The message, "Record not processed!" appears if you select "N."

CTRL-D: First Delete Rec(s) in related app XX! The record being deleted is linked to a record in a related application. The current record may not be deleted until all links to it have been deleted. The menu option number of the related application is listed (XX). Search for the unique fields of the current record in the related application.

Technical Support

In the event that additional support is needed for ESP, please call Insight Industries and ask for ESP Technical Support, (608) 348-8815.

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Report Generation

Report Types

There are two types of reports, master reports and major reports. Master reports print the information stored in a single application; major reports use the database links to access multiple applications and print information which matches the data filters. Each report has a report number which appears in the upper right corner.

Prompts

When reports are generated, the first prompt is the destination Screen, Printer or File. Type "S" for screen, "F" for file and either "O", "1" or "2" for printer. Selecting "P" will display a printer menu which lists the selections by number, instead of continuing immediately. After the destination prompt, there may be data filter prompts. These prompts are for typing the phrases and partial phrases which need to match against data in the application. Leaving the data filters blank selects all of the records in the application(s).

In the event that the default printer selections do not meet the users needs, additional printers can be added via option 184. Unique printer codes can be entered to handle all types of printers.

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Utilities

Password Change

The password change utility allows users to change their password from the menu. All users are asked to change their initial password the first time they enter the system.

Report Writer

The Report Writer option allows users with the security MGR or SUPER access TEAM-UP's Report Writer. The Report Writer can be used to develop reports in addition to the ones that can be chosen from the main menu. The Writer also allows existing reports to be altered if so desired. Reports can also be used to update date due to the fact that the Report Writer has an update feature. This can be very useful when updating large amounts of records that fit a particular search criteria. Please see Appendix E for further details.

System Security

The System Security option will allow the SUPER account to update account security or add new accounts. Please see Appendix E for further details.

Terminal Setup

The Terminal Setup option will allow the SUPER account to update the configuration file so that it matches unique printer and monitor settings.

Import System

The Import System option allows the SUPER account to develop import routines that will load the raw data into existing applications. The option can be used to load new records or update existing records. Please see Appendix E for further details.

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EMPL#: The employee identification number of the records that are being entered.

DATE: The date that the work was performed.

HULL The vessel identification number for which the work was performed.

WO#: The work order number identifying the work performed.

OPER: The activity performed.

HOURS: The regular hours worked. Regular hours must be less than or equal to 8.

OT: The number of overtime hours worked. OT hours must be less than 12 hours. Regular hours plus overtime hours must be less than 16 hours.

ADJ: The adjustment code refers to the type of labor that has been performed, dirty pay, double time, etc.

NV: The instance where a worker must wait for an event beyond his/her control before beginning or resuming the assigned task.

RWAB: The rework code when work must be performed a second time. This field also covers the circumstance where an abnormal condition has occurred. Abnormal conditions only occur the first time work is performed. Abnormal conditions negatively affect the time it takes to perform a task.

TOTAL: The total hours of the records on the screen.

ADJ: The adjustment code refers to the type of labor that has been performed, dirty pay, double time, etc.

NV: The instance where a worker must wait for an event beyond his/her control before beginning or resuming the assigned task.

RWAB: The rework code where work must be performed a second time. This field also covers the circumstance where an abnormal condition has occurred. Abnormal conditions only occur the first time work is performed. Abnormal conditions negatively affect the time it takes to perform a task.

TOTAL: The total hours of the records on the screen.

Labor Data

```
F LLBR

                                LABOR DATA

SHIFT:  - .                      _____ .   W
EMPL#:  - .                      _____ .   W
CHARGE DATE:  / / .              _____ .
HULL:    - .                      _____ .   W
WORK ORDER:  _____ .         _____ .   W
COMPARTMENT:  _____ .        _____ .
OPERATION:  - .                   _____ .   W
REG_HRS:  - .                      _____ .
OT:       - .                      _____ .
NV_TIME:  - .                      _____ .   W
RWAB:    - .                      _____ .   W
ADJ CODE:  - .                      _____ .   W

                                F1=HELP  ESC=EXIT

CTRL: F=FIND ,U=UPDATE, E=ENT,D=DEL, K=SHOW
```

The Labor Data application is the primary application for storing detailed cost data. Records entered in the Mass Labor Application or the Multiple Labor Application are stored in the Labor Data application.

SHIFT: One of three 8 hour periods each work day, 1,2, or 3.

EMPL#: The employee identification number of the records that are being entered.

CHARGE DATE: The date that the work was performed.

WEEK ENDING: The week ending date of the work performed. Currently the week ending date is considered to be each Sunday. The week ending is calculated from the Charge Date.

WORK ORDER: The work order number identifying the work performed.

COMPARTMENT: The compartment number is automatically entered according to the work order. The link between work order and compartment number is established in the Work Order application.

OPERATION: The activity performed.

REG HRS: The regular hours worked. Regular hours must be less than or equal to 8.

OT: The number of overtime hours worked. OT hours must be less than 12 hours. Regular hours plus overtime hours must be less than 16 hours.

NV TIME: The instance where a worker must wait for an event beyond his/her control before beginning or resuming the assigned task.

RWAB: The rework code where work must be performed a second time. This field also covers the circumstance where an abnormal condition has occurred. Abnormal conditions only occur the first time work is performed. Abnormal conditions negatively affect the time it takes to perform a task.

ADJ CODE: The adjustment code refers to the type of labor that has been performed, dirty pay, double time, etc.

Employee Master

F LEMPL

EMPLOYEE MASTER

EMPL#: _____

LAST_NAME: _____

INITIALS: _____

DEPT: _____

SHIFT: _____

TRADE CODE: _____

SENIORITY DATE: ___/___/___ SENIORITY DATE SORT#: _____ (AUTOFILL)

LEADMAN#: _____

CHK#: _____ (AUTOFILL)

W
W
W
W

SKILL/ ABILITY	GRIND: - (GRD)	RESPIRATOR FIT, HALF MASK: - (HMR)
	EPOXY: - (EPX)	RESPIRATOR FIT, FULL FACE: - (FFR)
	ASBESTOS: - (ABS)	RESPIRATOR FIT, AIR FEED: - (AFR)
	TROWEL: - (TRL)	RESPIRATOR_ROOM: - (RRM)
	LEAD: - (LED)	PAINT ISSUE_ROOM: - (PIR)
	SECURITY: - (SEC)	CONDO LIFT: - (CNL)
	SPRAY: - (SPY)	WIRE SPRAY ALUMINUM: - (WSA)
SPRAY AIRLESS: - (SPA)		DAMPENING TILE: - (DMT)
		PERMANENT LIMITS: - (PML)

F1=HELP ESC=EXIT

CTRL:F=FND,U=UPDATE,E=ENT,D=DEL,K=SHOW,

F LEMPL

EMPLOYEE MASTER (CONT)

COMMENTS: _____

F1=HELP ESC=EXIT

CTRL:F=FND,U=UPDATE,E=ENT,D=DEL,K=SHOW,

The **Employee Master** application stores all pertinent data about each employee that will have data entered in ESP. An employee must first be entered into the employee application before his/or her records will be allowed in the system.

EMPL#: The employee identification number of the records that are being entered.

LAST-NAME: Last name of the employee.

INITIALS: First, middle and last initials of the employee.

DEPT: Primary Department that the employee is assigned.

SHIFT:_ primary shift that the employee is assigned.

TRADE CODE: Primary worker type classification.

SENITORITY DATE Hire date of employee.

LEADMAN#: Primary leadman whom employee is assigned.

CHK#: Last character of employee number.

SKILL AND ABILITY: The skill and ability fields accept a “Y” or blank.

COMMENTS: **The comments field is a free form field for any appropriate comments** pertaining to an employee.

Zone Master

The screenshot shows a terminal window titled "F LZONE" and "ZONE MASTER". The interface includes three input fields: "HULL: ____.", "ZONE: ____.", and "NAME: _____". Below these fields, the text "F1=HELP ESC=EXIT" is displayed. At the bottom left, the control key definitions are listed: "CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL". At the bottom right, the time and date are shown as "4:37:47p".

The **Zone Master** application stores all valid zones. A zone may be tied to a compartment or a work order.

HULL: The vessel identification number for which the work was performed.

ZONE. The zone can be any logical identifier Used in systematically breaking a ship into manageable areas of work. A section can also be substituted for zone. Zone can apply to exterior or interior spaces.

NAME: A brief description of the zone.

DESCRIPTION. A brief description of the event.

SCHEDULE DATE: The date when the event is supposed to take place.

Compartment Master

```
F LCCHPT
                                COMPARTMENT MASTER
                                _____

HULL: _____
CMPT#: _____ (XX-XXX-XX-X) SCDL_CMPT#: _____ CUPTNO: W
NAME: _____
ZONE: _____ W
TYPE: _____ W
OH_SQFT: _____
BH_SQFT: _____
DK_SQFT: _____
TTL_SQFT: _____ (CALCULATED) PHYSICAL PROGRESS % CURR: ___ cum:

PAINT-S: / / _ (PAINT COMPLETE SCHEDULED)
PAINT-A: ' / - / _ (PAINT COMPLETE ACTUAL)
GIS: - / - / _ (GENERAL Inspection SCHEDULE)
GIA: - / - / _ (GENERAL INSPECTION ACTUAL)

                                FI=HELP ESC=EXIT

CTRL:F=FINO,U=UPDATE, E=ENT, D= DEL, K=SHOW                                4:38:19p
```

The **Compartment Master** application stores all valid compartments for a specific hull. Compartment numbers may follow the XX-XXX-XX-X format or they can be derived by the shipyard such as EXTERIOR, HOLD, MAIN, ETC.

HULL. The vessel identification number for which the work was performed.

CMPT#: The Unique compartment number used to identify an area of the ship.

SCDL CMPT#: This field can be used to enter the compartment number as found in the shipyard's system files. It can then be transferred into the format XX-XXX-XX-X.

CMPTNO: Each compartment is assigned a compartment number within a zone. This is the unique compartment number used to identify an area of the ship. It is uniquely tied to the work order number. The CMPTNO is the position 5 and 6 of the work order.

NAME: A brief description of the compartment.

ZONE: The zone can be any logical identifier used in systematically breaking a ship into manageable areas of work. A section can also be substituted for zone. Zone can apply to exterior or interior spaces.

TYPE: The type of compartment such as wet space, machinery space, etc. The number of types of compartments is dependent upon how many clearly different levels of outfitting are present. The number of types can range from one to many.

Note: It is important that the user be consistent in identifying the number of sqft. If sqfl includes sqft for stiffening then it should always include sqft for stiffening. It is recommended that straight sqft be utilized. In other words, a 10'x10' area would equate to 100 Sqfi.

OH-SOFT The sqft of overhead in a compartment.

BH-SOFT: The bulkhead sqft in a compartment.

DK-SOFT: The deck sqft in a compartment.

TTL-SOFT: The total sqft in a compartment. The total sqft will be automatically calculated.

CURR: The current physical progress percentage.

CUM: The cumulative physical progress.

PAINT-S: The date that a compartment is scheduled to be completely painted.

PAINT-A: The actual date that a compartment is completely painted.

GIS: The date that a compartment is scheduled to be inspected.

GIA: The actual date that a compartment is inspected.

Operation Master

F LOPER	OPERATION MASTER
OPERATION#: __.	
NAME: _____.	
EXTENDED DESCRIPTION: _____	
TRADE CODE: __. _____.	W
F1=HELP ESC=EXIT	
CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL	

The **Operation Master** application stores the valid activities. Example activities may be painting, brush painting, spraying, etc.

OPERATION: The activity performed.

NAME: A brief description of the operation.

EXTENDED DESCRIPTION: A detailed description of the operation. Any peculiarities should be identified.

TRADE CODE: Primary worker type classification. Trade codes can be tied to certain pay category.

Department Master

F LDEPT	DEPARTMENT MASTER
DEPT #: ..	
DEPARTMENT NAME: _____	
F1=HELP ESC=EXIT	
CTRL:F=FIND,U=UPOATE,E=ENTER,D=OEL	4:38:41p

The **Department Master** application maintains the valid departments. 99 departments may be entered. Alpha characters are valid but not recommended.

Company Data

```

F LCODATA
                                COMPANY DATA
                                _____
COMPANY: _____
ADDRESS1: _____
ADDRESS2: _____
CITY: _____
STATE: ____
ZIP CODE: _____
PHONE: ____-____-____
FAX: ____-____-____

                                F1=HELP  ESC=EXIT

CTRL: F=FIND, U=UPDATE
                                4:39:02p

```

The **Company Data** application

The Company Data application maintains the header information used on the Tier II report. The company data also provides the company name which is stamped in the upper left-corner of every report.

Rework/Abnormal Condition Master

```

F LREWORK
                                REWORK / ABNORMAL CONDITION MASTER
                                _____
ABNORMAL CONDITION/ REWORK: ____
DESCRIPTION: _____

                                F1=HELP  ESC=EXIT

CTRL: F=FIND, U=UPDATE, E=ENTER, D=DEL
                                4:39:10p

```

The **Rework/Abnormal Condition Master** application maintains the codes to be used to identify rework and abnormal conditions. Abnormal conditions can only occur the first time work is performed. An abnormal condition will negatively affect the time it takes to perform a task. Rework codes should only be used for work that is performed a second time.

Labor Adjustment Code Master

```
F LADJ
          ADJUSTMENT LABOR CODE MASTER
          ADJ CODE: _ .
          DESCRIPTION: _____
          F1=HELP ESC=EXIT
          CTRL:F=FIND,U=UPDATE, E=ENTER,D=DEL
          4:39:19p
```

The **Labor Adjustment Code Master** application maintains the types of labor that has been performed. The labor code may refer to dirty pay, double time, etc.

Non-Value Time Master

```
F NVTIME
          NON-VALUE TIME MASTER
          NV-TIME: _ .
          DESCRIPTION: _____
          F1=HELP ESC=EXIT
          CTRL: F=FIND ,U=UPDATE, E=ENTER,D=DEL
          4:39:33p
```

The **Non-Value Time Master** application stores Non-Value Time codes. Non-Value Time is recorded only when a worker must wait for some event beyond his/her control before beginning or resuming the assigned task.

Work Order Master

```

F LWO
                                WORK ORDER MASTER
                                _____

HULL: _____ W
CHARGE: _____ WORK SPEC: _____ W
WORK ORDER: _____
DESCRIPTION: _____
EVENT: _____ W
ZONE: _____ (AUTOFILL) _____ W
CMPT#: _____ W
LEADMAN: _____ W
EAC: _____ (ORIGINAL E.A.C.-NOT CALCULATED FROM SUB-TASKS)
PREP: _____ MSK SPRY: _____ UNMSK CLN: _____
BRSH: _____ BLST: _____ OTHER: _____
EST REMAINING: _____ (HRS ABOVE E.A.C.)
SCHEDULED S_START: _____ S_START WK ENDING: _____ (CALCULATED)
SCHEDULED S_FINISH: _____ S_FINISH WK ENDING: _____ (CALCULATED)
FORECAST F_START: _____
FORECAST F_FINISH: _____
ACTUAL RELEASE: _____
CLOSE DATE: _____

                                F1=HELP ESC=EXIT

                                OW
  
```

The **Work Order Master** application maintains all the valid work packages that employees can charge time towards.

HULL: The vessel that a particular work order is valid.

CHARGE: The CHARGE identifies a Particular task or type of work. Example interior prep or exterior paint.

WORK SPEC: The Work Spec numbers are used to designate subdivisions of charges.

WORK ORDER: The Work Order can be treated as a non-intelligent number. Characters or numbers can be used to differentiate work order numbers. If the user wishes, the positions of the work order can take on meaning. If the 2,3 & 4 positions are filled with the first 3 characters of the zone and the 5 and 6 position are loaded with the 2 character compartment number, upon entry the appropriate zone and compartment number will be automatically brought in from the compartment master application.

DESCRIPTION: A brief description of the work order.

EVENT: A major milestone during the construction of the vessel.

ZONE: A portion of the ship determined by a logical breakdown of the ship's components.

CMPT#: The identifying number assigned to each compartment.

LEADMAN. The primary leadman responsible for the work order.

EAC: The number of hours originally estimated to complete the work order. The EAC is not the total of the sub-operations.

PREP: The number of hours anticipated to complete the coating preparation work.

MSK-SPRY: The number of hours estimated to mask and spray the work order package.

UNMSK-CLN: The number of hours estimated to unmask and clean the work order package.

BRSH: The number of hours estimated to brush paint the work order package.

BLST: The number of hours estimated to blast the work order package.

OTHER: The number of hours estimate for other work to complete the work order package.

Note: Sub-operations may be marked complete by placing a “Y” next to the hours estimate field.

EST REMAINING: The number of hours believed to be remaining to complete the work.

SCHEDULED S-START: The scheduled start date.

S START WK ENDING: The scheduled start week ending. This is a calculated field.

SCHEDULED S-FINISH: The scheduled finish date.

S FINISH WK ENDING: The scheduled finish weekending. This is a calculated field.

FORECAST F-START: The forecast start date. The forecast start date can be revised.

FORECAST F-FINISH: The forecast finish date. The forecast finish date can be revised.

ACTUAL RELEASE: The actual date that the work order is released to the Paint Department to start their work.

CLOSE DATE: The date the work order is officially closed.

Leadman Master

```
F LLEAD
                                LEADMAN MASTER
                                _____
LEADMAN#:  ____
EMPL#:    _____
                                W
                                F1=HELP  ESC=EXIT
CTRL:F=FND,U=UPDATE,E=ENT,D=DEL,K=SHOW,
                                4:39:51p
```

The **Leadman Master** application is used to maintain a list of all valid leadmen. The leadman# should not be confused with the employee number.

Trade Code Master

```
F TCODE
                                TRADE CODE MASTER
                                _____
TRADE CODE:  ____
DESCRIPTION:  _____
                                F1=HELP  ESC=EXIT
CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL
                                4:39:59p
```

The **Trade Code Master** application stores valid trade codes for the Paint Department. A trade code refers to the type of labor an employee is assigned to perform. This application is directly tied to Report 100. No updates are allowed due to the Report 100 dependency. If the user feels that additional trade codes are needed, program changes will be required. Please consult with the program developers to address the needed changes.

Shift Master

```
F LSHI FT
                                SHIFT MASTER
                                SHIFT: -.
                                DESCRIPTION: _____
                                F1=HELP ESC=EXIT
                                CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL
                                4:41 06p
```

The **Shift Master** application valid shifts. In general there will only be three shifts entered in this application but different companies may wish to describe them differently. The main purpose of this application is to provide a list of valid shift codes for the Labor Data application.

Paint System Master

```
F BPAINT
                                PAINT MASTER
                                TYPE: ____
                                NAME: _____
                                MFR: _____
                                SQFT_PER_GALLON: ____ ( @ 1 MIL DFT)
                                PRICE_PER_GALLON: ____
                                W
                                CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL
                                4:55:48p
```

The **Paint System Master** application stores the paint typically used by the shipyard. The Paint Master application data is used during the bid estimating process. The data stored in the Paint Master application will be used to calculate total amount of paint required and its respective cost.

TYPE: The paint code to be used to identify a particular paint.

NAME: A brief description of the paint.

MFR: The manufacturer of the paint.

SOFT-PER-GALLON The theoretical coverage @ 1 mil DFT.

PRICE-PER-GALLON The purchase price of one gallon of the paint.

Manufacturer Master

```
F BHFR

                PRODUCT MANUFACTURER

ID_NUMBER: _____. (AUTO FILL)
NAME: _____
ADDRESS1: _____
ADDRESS2: _____
CITY: _____
ST: _____
ZIP: _____
DAY PHONE: ____-____-____. EXT: ____
EMERGENCY: ____-____-____
FAX#: ____-____-____

                F1=HELP  ESC=EXIT

CTRL:F=FIND,U=UPDATE,E=ENTER,D=DEL                                4:55:56p
```

The **Manufacturer Master** application stores the manufacturers from whom the shipyard purchases products. Each record contains data specific to an individual manufacturer.

Paint Systems/Cmpt Type Data

```
F BPNTSYS

                PAINT SYSTEMS BY COMPARTMENT

HULL: _____.
CMPT#: _____
PAINT TYPE: _____
SURFACE: _____. (D=DECK, B=BULKHEAD, O=OVERHEAD)
DFT: _____. (MILS)

                ADD X% MORE GALS FOR STIFFENING: ____

                F1=HELP  ESC=EXIT

CTRL:F=FIND,U=UPDATE,E=ENT,D=DEL,K=SHOW                                4:56:04p
```

The **Paint Systems/Cmpt Type Data** application is where data concerning a ship that the company is bidding should be loaded. This information will be provided via a specification or drawing from the potential customer. In some cases, the paint systems will be provided by paint vendors. Bid estimate data must be entered under the bid ship hull number.

HULL: The hull refers to a bid ship hull.

CMPT#: The compartment must be a valid bid ship compartment.

PAINT TYPE: The paint type can be chosen from the Paint Master Application.

SURFACE: The surface will either be the bulkhead(B), overhead(O) or the deck(D).

DFT: The number of roils anticipated. Different coats can be summed or entered as individual coats.

x% The percent more gallons to add to account for the additional paint that will be necessary to address stiffening on bulkheads, decks or overheads.

Supplemental Paint System Data

```
F BSUPPNT
                                     SUPPLEMENTAL PAINT MASTER
HULL: _____ W
TYPE: _____ W
AREA: _____
SQFT: _____
DFT: ____ (MILS)

F1=HELP ESC=EXIT

CTRL:F=FIND ,U=UPDATE ,E=ENT,D=DEL,K=SHDU 4:56:12p
```

The **Supplemental Paint** System Data application should be used to account for paint that is used for special circumstances, such as fire retardant paint, anti-sweat paint, etc. When entering the data, the total sqft that is expected to be covered should be totaled and entered as one figure. Bid estimate data must be entered under the bid ship hull number.

HULL: The bid ship hull number.

TYPE: Type of paint used.

AREA: A brief description of where the paint will be applied.

SQFT: The total sqft anticipated to be covered.

DFT: The number of roils estimated to be applied.

Charge Rate Master

```
F BRATE
                                     CHARGE RATE MASTER
                                     _____
                                     INSIDE_RATE: _____.
                                     OUTSIDE_RATE: _____.

                                     F1=HELP  ESC=EXIT

CTRL: U=UPDATE                                     4:56:18p
```

The **Charge Rate Master** application maintains the burdened and unburdened rates for performing work in the shipyard. These rates will be used while generating bid stage estimates.

Mins/Sqft Data

```
F CMPSQFT
                                     MINS/SQFT MASTER
                                     _____
                                     HULL: _____.
                                     CMPT_TYPE: _____.
MINS PER SQFT WO_REWORK: _____. SQFT PER HOUR WO_REWORK: _____.
MINS PER SQFT W_REWORK: _____. SQFT PER HOUR W_REWORK: _____.
IMAGE AVAILABLE: _____.

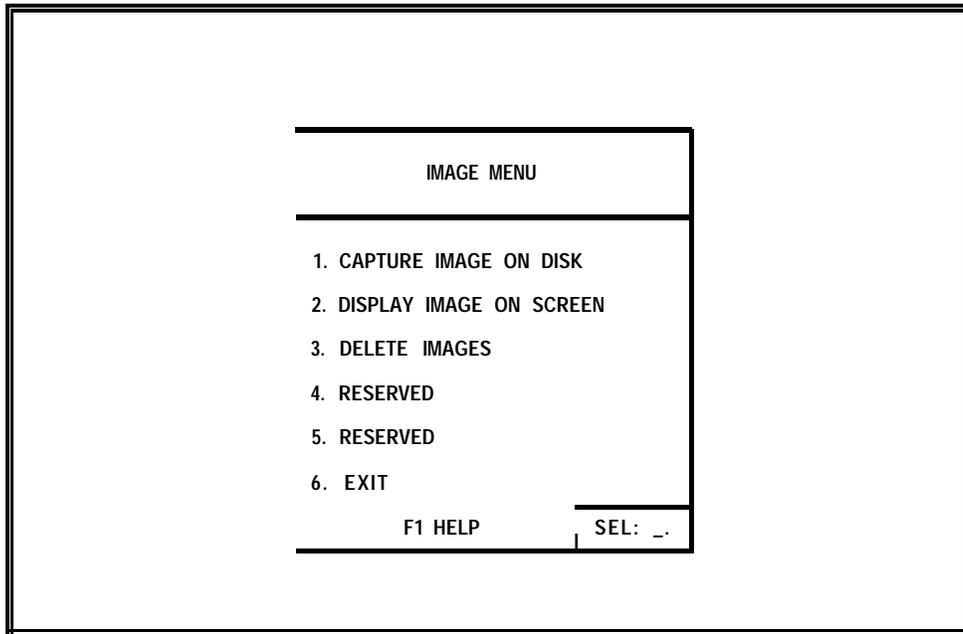
                                     F1=HELP  ESC=EXIT

CTRL: F=FIND ,U=UPDATE, E=ENT,D=DEL,K=SHDW       4:58:19P
```

The **Mins/Sqft Data** application refers to the minutes per sqft that it will take to perform particular painting tasks. For example, it may take 66 minutes per sqft to paint a machinery space. In general, in this case the 66 mpsqft includes time to clean the space, prepare the space for painting, paint the space, and clean up the space. The mpsqft data refers to comparable ship data. SQFT/hr will be calculated when entered.

The image available field will contain a “Y” if an image or images are available to view. In order to traverse to the Image menu, a CTRL Y must be pressed.

Image Menu



The **Image Menu** can be called from the Min/SQFI' application. The Image Menu allows the user to capture new pictures, display captured pictures delete unnecessary pictures. When capturing new images, the user will be provided the ability to preview the pictures coming from the digital camera prior activating the capturing task. All pictures will be stored in a packed format. This process eliminates white space from the files and thus reduces the memory necessary to store the images.

General Labor Data

```
F CGENLBR  
  
GENERAL LABOR MASTER  
  
HULL: _____ W  
GENERAL LABOR HOURS WO_REWORK: _____  
GENERAL LABOR HOURS W_REWORK: _____  
AVERAGE HOURLY CHARGE RATE: _____  
  
F1=HELP ESC=EXIT  
  
CTRL: F=FIND,U=UPDATE,E=ENT,D=DEL,K=SHOW 4:58:27p
```

The **General Labor Data** application refers to the total hours spent on the contract that can be attributed to the mins/sqft data. The General Labor Data should be entered with respect to the comparable ship.

Supplemental Labor Data

```
F CSUPLBR  
  
SUPPLEMENTAL LABOR MASTER  
  
HULL: _____ W  
SUPPLEMENTAL LABOR DESCRIPTION: _____  
SUPPLEMENTAL LABOR HRS WO_REWORK: _____  
SUPPLEMENTAL LABOR HRS W_REWORK: _____  
  
F1=HELP ESC=EXIT  
  
CTRL: F=FIND,U=UPDATE,E=ENT,D=DEL,K=SHOW 4:58:34P
```

The **Supplemental Labor Data** application refers to the hours spent performing operations that are not economically feasible to directly attribute to a particular compartment type. For example, touch-up throughout, sandblasting small parts, sandblasting assemblies, would be considered supplemental labor. Bid estimate data must be entered under the comparable hull number.

Supplemental Material Data

F CSUPMAT		SUPPLEMENTAL MATERIAL MASTER	
HULL: ___	_____		n
AREA: _____			
COST: _____			
F1=HELP ESC=EXIT			
CTRL: F=FOUND, U=UPDATE, E=ENT, D=DEL, K=SHOW			4:58:40P

The **Supplemental Material Data** application refers to materials other than paint that are used by the Paint Department for example blast grit, brushes solvent, etc. The user may choose not to identify any supplemental material. This is entirely up to the user and the circumstances of the shipyard. Total dollar figures should be entered. Bid data must be entered under the comparable ship hull number.

COST: Cost should be entered as actual dollars at the time of the contract. Do not account for inflation or standard of living increases.

Compartment Type Master

F CCHPTP		COMPARTMENT TYPE MASTER	
CMPTTYPE: ___			
NAME: _____			
F1=HELP ESC=EXIT			
CTRL: F=FOUND, U=UPDATE, E=ENTER, D=DEL			4:58:47p

The **Compartment Type Master** application is used to store compartment types that will be used during the bid estimating process. Each compartment in the Master Compartment application will require a compartment type. Bid estimating factors will be based on compartment types.

Auto Inc System Numbers

```
F AUTO#S
                                AUTO INC SYSTEM NUMBERS
SOFTWARE CHANGE REQUEST# SCR#: _____.
                                MANUFACTURER: _____.
                                TIMER: _____.
IMAGE MENU IN USE: __.
IMAGE STORAGE DIR: _____. (FORMAT=Xcolon\)
IMAGE TEMP DIR: _____. (FORMAT=Xcolon\TEMP\)
                                F1=HELP   ESC=EXIT
CTRL: U=UPDATE
                                                                4:58:53p
```

The **Auto Increment System Master** application is an application that maintains all identification numbers that are sequentially assigned by the ESP program. It is an application that only the system manager and the ESP manager should be allowed to access.

SCR#: The next available software change request number.

MANUFACTURER: The next available manufacturer number.

TIMER: A number between 1 and 9000 that adjusts the processing time that prompts remain on the screen waiting for input.

IMAGE MENU IN USE: The lock that is used for the image load option. If accidentally locked by a person on a LAN, the lock can be opened by erasing the "Y".

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APPENDIX E: SYSTEM SPEC MANUAL

Application Listings

Application listings are an auto-generated printout of the TEAM-UP database design specifications. They provide field sizes, field types, application screens and other features. When combined with the report listings and procedural language, the application listings provide a complete description of the database. Since all of the data in the database is stored in applications, it is very useful to know the format of these applications.

In order to save space in the printed manual, the application listings have been provided in a file format. Once ESP has been installed from the demo disk, the application listings will be located in the DESTINATION DRIVE\TEAMYARD\APPLIST directory. The user can print them at his or her convenience.

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Report Listings

Report listings are auto-generated by the TEAM-UP report listing option. They provide documentation of the data printed by the report, the data filters used by the report, the links used by the report and other features. Since the reports sort and print the data in a consistent format, the report listings can be useful reference tools. In the event that there are questions about how report results have been calculated, the report listing will provide the formulas used.

In order to save space in the printed manual, the report listings have been provided in a file format. Once ESP has been installed from the demo disk, the report listings will be located in the DESTINATION DRIVE:\TEAMYARD\RPTLIST directory. The user can print them at his or her convenience.

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Procedural Language

The procedural language is what makes the database one coherent, useable system. The procedural language both performs tasks and provides the functionality in almost every application. Most of the work it does is invisible to the user, unless it encounters an error in an operation requested by the user. It performs such tasks as error checking, creating hidden keys which act as links, displaying pop-up windows, providing menu options and many other tasks. The procedural language listings should be referenced when the user wishes to better understand the workings of a control function. The procedural language files have no extension.

Many of the applications have the same features available. In order to conveniently use the same code for many applications, part of the code is placed in include files. The include files are somewhat like external functions or procedures. They allow read only passing of text parameters and are evaluated at compile time. They are pieces of procedural code which can be used in any application. The include files all have a .inc extension.

In order to save space in the printed manual, the procedural files have been provided in a file format. Once ESP has been installed from the demo disk, the procedural files and include files will be located in the DESTINATION DRIVE:\TEAMYARD\PNTBID directory. The user can print them at his or her convenience.

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Traceability Matrix

The Traceability Matrix lists all database items, as well as all references to the database items. In the event that a variable may be changed, these reports provide the ability to view how the items are used in applications, procedural language and reports.

If the database is being reviewed for possible changes, the reports provided by the traceability tool allow the developer to analyze the potential impact of the changes to the procedural language, reports and applications.

In order to save space in the printed manual, the traceability reports have been provided in a file format. Once ESP has been installed from the demo disk, the traceability reports will be located in the DESTINATION DRIVE:\TEAMYARD\TRACE directory. The user can print them at his or her convenience.

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Database Access Levels

There are four levels of access to the ESP database system, and they are based on the needs of the user. Each level provides a distinct level of accessibility to the different features and applications. The levels are: PROD=production, ENTRY=data entry, MGR=manager, and SUPER= Supervisor.

The levels of access are just four of nine integrated levels which the TEAM-UP database language provides. They can be modified if the need arises. Every username will have one of these levels associated with it.

The first level, PROD, provides access to the applications but does not allow update, enter or delete operations.

The second level, ENTRY, allows enter, update and delete operations to all of the major and link applications but only the find operation in master applications.

The third level, MGR, provides enter, update and delete access to all master and support applications.

The last level, SUPER, provides access to the database design tools and the ability to update the system variables.

All levels of accessibility allow the user to print reports. The accessibility levels correspond to TEAM-UP Security levels 1, 3, 7 and 9. Most users should be given the PROD security level, level 1. The System Security section provides more information on adding users.

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System Security

Introduction

Security is an integral part of the TEAM-UP environment; however, it is only as good as the management behind the security.

Initial entry into TEAM-UP is through a sign-on procedure. The user is recognized by a username and a password. Once identified, the user is granted or denied access to various functions within TEAM-UP based on authorizations assigned by the system manager.

Security will take on various forms:

1. group security
2. menu security
3. function security
4. item security

These levels allow management to build a “tree” type structure of security. The further out on the limb a user is, the fewer processes he can perform. Conversely, the closer the user is to the trunk of the tree the more authority he will have. A system is made up of many trees. Each tree trunk becomes a group, the menus provide the limbs, branches allow functions within applications (enter, update, delete, etc.); finally, that “leaves” numeric hierarchy levels to control screen item access.

Any user with authority to access System Security can change groups, add and delete users, alter passwords and adjust security levels.

AUTHORIZATION INTO SECURITY SHOULD BE RESTRICTED TO THE SYSTEM MANAGER AND PERHAPS ONE OR TWO OTHER TRUSTWORTHY USERS.

The Security Menu

TEAM-UP's Security Menu lists four activities. The first two enable the system manager to enter, delete or modify user and application security. The third and fourth activities generate report listings of users and application groups.

Users

Select Set User Security to manipulate user security levels. There is no limit to the number of users. More than one person can sign on by using the same username/password from any station in a network environment.

The security information on each user is stored collectively in the file TEAMUP.USR. Destruction of this file will render your system useless.

The first forty users in the system are displayed at the top of the screen upon entry into User Security. If more than forty users currently have access, [PG UP] and [PG DN] may be used to scroll through the list. Choose a user by moving the highlight over the username and [RET]. If adding a new user to the system, type the username and [RET]. This will present the Security Maintenance information at the bottom of the screen.

Cursor movement within this screen from option to option is accomplished via [TAB], [ARROWS], [HOME] and [END] keys. The [RET] key will save all changes. The [ESC] key will abort the maintenance process with no changes made. The [DEL] key will delete the user from Security, and [INS] will allow another user's parameters to be duplicated (see Copy a User).

Add a User

Since entry to the TEAM-UP system is via username and password, each person who uses the system must be assigned a username and password. After selecting Team Menu choice #4 and entering System Security, type the username of the new user and [RET].

Copy a User

An added user often requires the exact security parameters as an existing user. To copy a user, press [INS] at the Security Maintenance screen and use the [ARROW] keys to move the highlight to the user whose security parameters you wish to copy. Press [RET] and the parameters will be copied. This does NOT copy the password. Make any other changes and exit with a [RET] to save your work. The new user will now be a part of the system.

Caution: Pressing [ESC] will exit security and current work will be lost.

Delete a User

Select the user. When the Security maintenance screen for that user is displayed, press [DEL] and confirm the prompt by typing a Y. The user will be deleted from the system.

Username

A Username is any string of eight or less characters.

Password

A Password is any string of eight or less characters or simply a [] (space) if you do not wish to assign a password.

Each user in the system has a unique password. This password is entered on the Security Maintenance screen and is never again displayed in a readable form. [????????] will display when a password is entered. The password is stored in an encrypted form so it will not be accessible/readable from the operating system level.

The password is not echoed to the screen at sign-on time. Should a user forget his password, a new password must be assigned.

Change a Password

Select the user whose password you want to change from the list at the top of the Security Maintenance screen. Press the [TAB] key to the password option and enter the new password. Press [RET] to save the changes.

Typing TEAMPASS from the operating system prompt is an alternative method of changing a password. This program allows any user to change his password without entering Security. The program will ask for username, old password and new password. A user can include this executable program on a Procedural Language menu.

Autoload Application

Autoload Application allows a user to be placed automatically into a Data Manager application after sign-on. Type the name of the application within the brackets to use this feature.

NOTE: *If Autoload Application contains the name of an application and the next feature, Autoload Menu Path is NOT used-the system merely highlights the first application on the list displayed.*

Autoload Menu Path

Autoload Menu Path takes the user from the sign-on screen to whatever place in the system an entered "dot" path specifies. Enter the "dot" path designator within the brackets to use this feature.

Terminal Init File (TIF)

Use of the Terminal Init File is optional. Setting up a .TIF file requires special programming in hexadecimal and a good understanding of the terminal hardware. It is something only experienced computer users should attempt.

Each user may have a special Terminal Initialization File that is stored as username.TIF and will allow each user to program their own function keys. When the user signs on, the file is read and whatever information it contains is sent to that user's terminal.

What one must realize is that establishing a TIF file is NOT a function of TEAM-UP. The user must create this file by using a DOS utility such as DEBUG. The file should be given the username as the file name with an extension of TIF. TEAM-UP merely provides for the TIF's drive letter to indicate its existence and location.

To establish the TIF TEAM-UP location, place the drive letter indicating the directory containing the file within the brackets.

User's Security Level

Each user in the system will have a numeric security level from 0 to 9. The default level for a new user is 0 (zero), the lowest possible level.

The User's Security level is compared with the security level assigned to any application or application function within TEAM-UP. In order to be allowed access to or perform a function on an application, the user level must be equal to or greater than the level assigned to the application or application function.

User's ID Number

The User's ID number is used to stamp records when using Record Security. If you do not need to use Record Security, [TAB] past this entry. If necessary, enter a number between 0 and 9999.

When the application's Record Security is active, the user ID number is stamped "invisibly" on each record entered by the user. After a record is stamped, ONLY THAT USER (or other user with the same user ID or a higher security level) can retrieve that record from the application. The User's ID number need not be unique if you wish more than one user to see certain records. Remember, even if two or more user's ID numbers are the same, their respective security levels may allow or disallow certain program functions.

User Group Membership

Group membership by user is established on the third screen of user security. To access this screen, press the [PG DN] key.

To add a user to a group, see Add a User to a Group.

The Trunk

Group Security

Group Security is the highest level of security in the TEAM-UP environment. Both the user and application must be members of at least one identical group before access is allowed. By

default, all users and all applications are members of all groups. Therefore, if you do not need to use this feature, you can ignore its existence.

CLGROUPS.EXE, a utility program, can be used to reset Group security membership to its default value (when installed) for all users and all applications. Operation of this program is fully documented in the Utility Programs section. Access to the program should be carefully controlled as it could be used to totally defeat Group security.

The information on Groups is stored in the file TEAMUP.GRP. This file should be backed up periodically by the System Manager.

Group Philosophy

The philosophy behind Groups is to provide the ability to segment applications into areas of responsibility, i.e. administration, sales, personnel, etc. These segments, or “trunks”, become the groups under which applications will operate. For example, under the administration group you may have applications for appointments, budgets, forecasting, etc. The sales group might contain order entry, inquiries, customers or daily sales stats. In the personnel department there would be employee records, payroll or insurance.

TEAM-UP’s System Security permits the establishment of Groups throughout its environment. When an application is created, one of the featured processes (Group) allows you to define what group(s) the application will belong to. You can create an application’s Group that **MUST** intersect with System Security’s Group in order for the application to be accessed by the user. Users with identical Security Levels can therefore be unable to access each other’s applications for the simple reason that they don’t belong to the same Group.

Remember, System Security establishes the Groups for the TEAM-UP environment. Each application defines its group membership(s).

Setting Group Security

Group Security is accessed by pressing [PG DN] from the security maintenance screen. The user is presented with a screen listing the names of all groups within the system.

The user you are currently working with is a member of all groups that are highlighted. By default, ALL users and ALL applications are members of ALL Groups when originally entered into the system.

Press Press [P D DN] again to save Group Security.

Add a Group

Groups are entered into the system through the second screen of User Security. To add a Group, choose any username. From the User Security maintenance screen press the [PG DN] key to reach the Group security window. Move the pointer(>) with the [ARROW] key until the first blank line is reached and enter the name of the Group. Group names are 1 to 15 characters in length, including blanks.

To SAVE your entries press the [PG DN] key. Exiting with [ESC] causes all changes to be lost.

NOTE: All users are automatically members of this new Group unless the user has been previously removed from any group.

ANY APPLICATION OR USER WHO IS NOT TO BE A MEMBER OF THIS GROUP MUST BE INDIVIDUALLY REMOVED.

Delete a Group

Once created, a Group CANNOT be deleted. It may, however, be renamed by overwriting with a new name. If deleting a Group is necessary, remove all user members and all application members of the Group which will leave it null.

Caution! Any new users or new applications are automatically members and must be removed from this Group.

NOTE: Deleting all groups from an application renders that application inaccessible except through the Application Security Menu selection of Security.

Add User to a Group

All users, when entered into Security, are automatically members of all Groups. If you have removed a user from a Group, that user can be restored to membership in the Group.

Enter System Security, choose that user and [PG DN] to reach the Group Security window. Place the (>) next to the proper Group name and press the [INS] key. A highlighted Group name indicates the user is a member of that Group.

Exit and save by pressing [PG DN].

Delete User from a Group

Enter System Security, choose that user and [PG DN] to reach the Group Security window. Place the (>) next to the proper Group name and press the [DEL] key. The highlight over the Group name will disappear and the user is no longer a member of that Group. Once removed

from a group, however, the user will no longer be added when a new group is created. The user is considered a “limited access user”. The system manager must add such users individually.

Exit and save by pressing [PG DN].

The Limbs

Menu Access

At sign-on time, entering a correct username and password presents the user with the TEAM MENU. Access to the components of this menu is granted or denied to the user by the parameters established for that user in System Security. Entering a Y for the corresponding menu selection allows the user access to that part of TEAM-UP. An N denies access to the user and the user will see an asterisk (*) in place of the menu selection.

Access to DATA MANAGER	[Y]
Access to ACCOUNTANT	[Y]
Access to Text Editor	[Y]
Access to System Security	[Y]
Access to Operating System	[Y]

Access to Data Manager

Users granted access to Data Manager will be allowed to view the Data Manager Menu. Access to each menu selection may be granted or denied to the user by entering a Y or N next to the prompt that corresponds to the Data Manager Menu selections. A response of N causes the corresponding selection to appear as an asterisk (*) on the Data Manager Menu.

Data Manager - Access Data

Responding with a Y to Access Data allows the user to view all applications permitted by Group and Security Levels. (Security Levels are discussed later in this section). The functions that a user can perform on individual applications are controlled by the various Function Securities assigned within the application.

Data Manager - Report Data

Responding with a Y to Report Data allows the user to view all applications permitted by Group and Security Levels. Access to the various reports under an application is a function of the security level assigned in each Report and the Print Security level assigned within the application.

Data Manager - Import Data

Responding with a Y to Import Data allows the user to view all applications permitted by Access Data. Granting access allows the user to move data from external ASCII or DIF formats into an application.

Data Manager - Design

Responding with a Y to Design permits a user to select Design Applications (selection 4) from the Data Manager Menu and enter a second menu. The user is given the individual design functions of Create/Change, Define, Enlarge, etc. Granting Design Applications Menu capabilities allows the user to view the same applications as Access Data and perform only those design functions which were granted under Security.

Data Manager - Maintain

Responding with a Y to Maintain permits a user to select Maintain Applications (selection 5) from the Data Manager Menu and enter a second menu. The user is given the individual maintenance functions of Enlarge, Reindex, Reorganize, Copy, Delete, Etc. Granting Maintain Menu capabilities allows the user to view the same applications as Access Data and perform only those maintenance functions which were granted under Security.

Accountant

This is a separately purchased package that is accessed from the TEAM Menu. Access to this package, if purchased, gives the user access to a complete transaction-oriented, integrated accounting package.

Text Editor

Access to the Text Editor allows a user to create and alter any text file on the system.

The Branches

Application Security

Each application in the TEAM-UP environment is secured in two ways: 1) through Group Membership Security and 2) through a Security Level assigned to the application itself and individual security levels or the various functions performed against the application. Security can even be given to data items.

Group Security is reviewed earlier in this reference section.

The second type of security, discussed in the following paragraphs, applies to the various functions performed against an application. It is based on the assigned user security level and the assigned application security level. Each application has a Master Security level, Security levels for the various functions and Security levels for each data item. The default for each type of security upon the creation of an application is 0.

Master security and Function security for an application can be set or changed in Design Applications, Create/Change or System Security, Set Application Security. Item security for a particular data item can be set or changed in Design Applications, Define. When a user attempts to execute a function (Find, Update, Enter, etc.), its security value is compared against the User's Security level. If an individual User's Security level is less than the security level for that function, that function is unavailable and will not execute.

Master Security

Master Security is used to determine which users can access an application. A User's Security level must be greater than or equal to an application's Master Security for that user to have access to the application. If the User's Security level is less than the application Master security, the list of applications displayed to that user will NOT include the application.

Function Security

The Function Security levels for an application control who can perform functions on the application. The functions Find, Enter, Update, Delete, Print and Batch each have their own security by application. A user can be denied the right to perform any of these functions by setting security higher than the User's Security level.

If an individual User's Security level is less than the function security, the function will not be performed and the message "Command Not Allowed" is displayed on the screen.

NOTE: If records are being processed indirectly as a related application through the Procedural Language, the Security is not checked.

Audit Security

Audit Security allows records that are deleted or changed by an operator whose User security level is less than the functional Audit Security level to remain invisibly in the application's data file until assigned to another location or removed by the Remove Records function.

The number of Audit Records contained in an application can be seen via Maintain Applications, Show Status.

Record Security

Record Security is a functional security option that can be turned on or off in the Create/Change portion of Design Applications.

Records, as they are entered, will be stamped with the User's ID Number of the user entering the record if Record Security is turned ON.

The Leaves

Item Security

Item Security allows a user to access items in a single application on an item-per-item basis. It controls whether or not a user will see a particular item. If an individual User's Security level is less than a particular item's security level, that item will NOT appear on the user's screen, thus protecting sensitive data areas.

Item Security applies to the Tab Skip option found in Design Applications, Define. If the User's Security level is less than a particular item's Tab Skip security level, the cursor will NOT stop on that item. The user can see the information on the screen, but he may not change it.

Miscellaneous

Terminal Keyboard Lockout

TEAM-UP provides a keyboard lock to protect access when an authorized user leaves the computer for a short period of time. To lock an IBM or IBM compatible keyboard, press the [ALT] and [F2] keys simultaneously. Other keyboards maybe programmed during INSTEAM. Unless the NEXT key is part of the unlock sequence, TEAM-UP will beep whenever any key is pressed while the keyboard is locked.

To unlock the keyboard, press [ALT] and [F2] simultaneously. Type your password EXACTLY AS IT WAS TYPED WHEN YOU FIRST SIGNED ONTO TEAM-UP, followed by [RET].

Data File Encryption

Additional security can be applied to any application in the form of data file encryption. When a file is in an encrypted form, data is not recognizable from the operating system level. It can only be viewed through TEAM-UP by a user with proper security authorization. The Encrypt function is activated through the Design Applications Menu.

Error Recovery

Loss of the file TEAMUP.USR could cause loss of User Security definitions. The System Manager should make backup copies of this file after every change has been made to a user's security access authorization. Use the most recent backup copy to restore access to your system should the active TEAMUP.USR file be destroyed. The File TEAMUP.USR can be restored from the original W-UP distribution disks should no other alternative be available. Access to TEAM-UP will then be restricted to the username and the password PASSWORD. All users will have to be redefined.

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Access Data Operations

Introduction

Data Manager's Access Data section is the driving force of TEAM-UP; all other areas of the product provide support. In this area information is retrieved, changed, deleted and entered. Access Data uses a screen-oriented Query-By-Example method of data entry and retrieval. Its operation is so intuitive that most people can learn it in minutes.

Access Data Operations

All screen and keyboard handling is pre-programmed; however, a Procedural Language is available so an application developer can describe custom processes that must occur for any given operation. Very sophisticated custom processes can exist for an application without the end user's knowledge or concern.

In a typical application development scenario, the custom Procedural Language process requires between 5 and 20 percent of the total effort. The remaining 80 to 95 percent is consumed by those functions that are already programmed and fully tested in TEAM-UP.

Screen Definition

There are two basic display modes when accessing Data Manager applications:

- * Full Screen mode
- * Oneliner mode

Full Screen Mode

Each application can contain up to 255 pages of information in the Full Screen Mode. Each page contains a Command area, a Message line and a Free Form Application area. The Command area of Access Data's screen is the ten characters in the upper left corner of the screen. This area contains two pieces of information:

- * Actual command letter followed by a blank space
- * Name of the application

Access Data's single letter commands are phonetically easy to remember. The most frequently used commands are:

- F for Find
- E for Enter
- U for Update
- D for Delete

Other commands that are used less often, but are equally important:

C for Calculate
P for Print

O for Oneliner
B for Batch

R for Report

The name of an application must be eight characters or less in length. This name is originally defined by the application developer and is used to identify that application. The Message line is the last line on the screen. This line displays error messages, selected item information, current page number and time of day. The Data Block is a template of item names and data areas used to enter record selection criteria, display application data and enter new or changed data.

The display of individual items can be suppressed for specific levels of users through the implementation of User Security Levels and Item Security Levels. This enables sensitive information to be stored in records without the operator's knowledge.

A basic application item is represented as an item name ending in a colon (:) with areas for data display represented by underscores (_) and terminated with a period (.). The colon and the period can be changed in all applications by the TEAM-UP INSTEAM utility. Individual applications can be changed via Design Applications, Create/Change, Options.

The Oneliner Mode

This mode is automatically activated when any data retrieval or Find operation does not result in an exact match with the selection criteria. The Oneliner screen displays selected record items, one record to a line, with up to 20 records on a page. There are two Oneliner screens:

* Standard Oneliner screen

* Alternate Oneliner screen

The items displayed on the Standard Oneliner screen are defined by the application developer using the Define Items function. The items displayed on the Alternate Oneliner screen can be defined and redefined by the operator from within Access Data. The process requires two keystrokes, as explained in The Oneliner Operations [0] section.

Access Data Keyboard Controls

Cursor Movement

Cursor Movement within an application in Access Data is accomplished through the use of the ARROW keys, the [TAB], [BTAB], [BSPCE], [PAGE UP] and [PAGE DOWN] keys.

From the Full Page Mode . . .

Movement from Page to Page; Movement from Page to Page only occurs for applications that have more than one page. The PAGE UP] key causes the preceding page to be displayed with the cursor in the first item position. If the first page is displayed when the PAGE UP] key is

pressed, the last page appears. If the cursor is in the home position and the [BTAB] key is pressed, the preceding page is displayed with the cursor located in the data area of the last item on the screen. The PAGE DOWN key causes the next page to be displayed with the cursor in the first item position. If the last page is displayed when the PAGE DOWN] key is pressed, the first page is then displayed. If the cursor is in the data area of the last item on the screen and the [TAB] key is pressed twice, the next page is displayed with the cursor in the first item on the screen.

Movement to the Home Position; Press the [HOME] key to move the cursor to the first position of the command area. Press the [HOME] key twice from any page of an application and the system returns to page one.

Movement from Item to Item; The [TAB] and [BTAB] are the primary keys used to move the cursor from item to item. The cursor does not stop in the data area of those items where a tab skip has been defined. Press the [TAB] key and the cursor moves to the next available item. If that item is on the next page, the cursor will position itself directly after the last item on the page and wait for another [TAB] to go to the next page. [BEG LN] and [LN] keys may be used to move to the beginning of an item and the end of an item, respectively. Press the [TAB] key and the cursor moves to the previous available item. If that item is on the preceding page, the page change occurs automatically.

If the cursor is in the first data position of the item and the [LEFT ARROW] is pressed, the cursor moves to the first data position of the item immediately to the left or the last item on the previous line. If the item is the first item on the page, the cursor moves to the home position. If the [UP ARROW] is pressed, the cursor will travel as vertically as possible from item to item. If the cursor is in the last data position of the item and the [RIGHT ARROW] is pressed, the cursor moves to the first data position of the item immediately to the right or the first item on the next line. If the item is the last item on the page, the cursor will position itself directly after the last item and wait for a [RIGHT ARROW] or [TAB] to go to the next page. If the [DN ARROW] is pressed, the cursor will travel as vertically downward as possible from item to item.

Movement within an Item's Field; The ARROW keys are used to move the cursor around the data area of an item without changing the data displayed. If the item's data spans more than one line, the [UP ARROW] and the [DOWN ARROW] keys move the cursor from line to line.

From the Oneliner Mode . . .

The Oneliner Mode is operational only during a Find operation.

Movement from Page to Page; The Oneliner mode supports scanning through application data records that meet specified search criteria. Since more than one page of records can meet this criteria, it is necessary to move from page to page within the Oneliners. The [PAGE DOWN] key causes the next page of records, sorted in ascending order, to be displayed. The [PAGE

UP] key causes the preceding page of records to be displayed in descending order. The [ACT] or [END] keys repeat the previously selected page movement, providing the cursor is in the HOME position.

Movement from Record to Record: The [TAB] or [DN ARROW] keys move the cursor from the home position to the left of the first displayed Oneliner record, then from the first to the second, etc., and from the last back to the home position. The [BTAB] or [UP ARROW] keys operate like the [TAB] key except cursor movement is reversed.

Oneliner Mode Operations

- * Enter an application name or menu path in the first 12 positions of the command area and press [ACT] to change from one application to another.
- * Press [ESC] to redisplay the screen which contains the selection criteria.
- * Tab or backtab to the left of a oneliner and press [ACT] or [END] to display the full screen of the selected record.
- * Use a Oneliner activity (see this section - The Oneliner Operations).
- * Invoke an Alternate Order of items displayed in the oneliners (see this section - The Oneliner Operations).
- * When the message ' [ACT] for more oneliners' is displayed, press [ACT] to display more records on the oneliner screen.
- * If the message 'Search completed' appears, press [ACT] to re-display the full screen containing the selection criteria.

Activate Commands

Access Data commands are activated in one of two ways:

- * The [ACT] key. When this key is pressed, the command in the upper left corner of the screen is initiated. TEAM-UP, when installed, is configured to use the [RET] key as the [ACT] key. Keyboards can be re-configured as desired via the INSTEAM program.
- * **Control keys represented by ^ ([CTRL]). For example, ^E directs the user to hold down the [CTRL] key and simultaneously press the letter [E]. A 'E activates the Enter command, REGARDLESS OF WHAT COMMAND SHOWS IN THE COMMAND AREA OR WHERE THE CURSOR IS LOCATED ON THE SCREEN! The control [CTRL] key overrides any command letter that is presented in the command area. The user can reduce processing time by using ^F for Find, ^E for Enter, ^U for Update, ^D for Delete, ^C for Calculate, ^B for Batch, ^P for Print, ^R for Report or any other control keys that have been defined by the application developer.**

Selecting an Application

An application can be selected from the application list displayed upon initial entry to Access Data or upon exiting a displayed application. As with other areas of TEAM-UP, access to any application can be limited with the use of Group Security, as well as User Security level and Application Master Security level.

From the Application List

At the Application List, use the [TAB], [BTAB], ARROW, etc., keys to highlight the desired application and press [ACT] to activate the selection. If more applications are available than can be shown on one screen, the [PAGE UP] and PAGE DOWN] keys will scroll through the available list to find the appropriate application.

From an Access Data Help Page

With either the System Help Page or an Application Help Page displayed, press [ACT] to reactivate a previously selected application.

From Another Application

Place the cursor in the home position, type the name of the desired application and press [ACT]. Users may also exit Access Data and select the application from the Application List.

Requesting Help

User-definable help is available at the system level and at the application level. The System Help Page contains general information about the operation of Access Data. The Application Help Page contains information about the operation of a specific application.

The System Help Page

Place the cursor in the home position and press the [HLP] key. Return to the previously selected application by pressing [RET].

An Application Help Page

With the application selected, place the cursor anywhere in the data block area and press the [HLP] key. Return to the previously selected application by pressing [RET].

Working with the Application

Clearing the Application Form

Place the cursor in the home position and press [RET]. All item data areas will be cleared to underscores. This should be done before initiating a Find or Enter operation. The [DEL OEL] or ^Z (zap) function may be used to: (1) clear the entire record if performed from the HOME position or (2) erase from the position of the cursor to the end of the record.

[B] - The Batch Operation

A Batch operation is performed when similar changes are made to large numbers of records. The procedure is as follows:

- * Describe the operations you wish to perform by using the Procedural Language.
- * Enter the record selection criteria in the same manner as described for the Find operation (see the Find operation, below).
- * Activate the Batch operation by pressing [ACT] with a B in the home position or by using a ^B from anywhere on the screen.
- * TEAM-UP then Finds a record and updates it using the Batch Procedural Language.

If the Batch program has NOT been made part of the application, the Batch process does not make any changes to the application. Remember, TEAM-UP will check the program before execution and any discrepancy will halt the procedure. If, when the Batch command is activated, the second position of the command area is blank, then each record found which satisfies the specified selection criteria is automatically Updated without any operator intervention. However, if the second position of the Batch command area contains an underscore (_), TEAM-UP asks the operator to confirm each record's Batch Update operation before it takes place.

EXAMPLE B_PARTS

When this mode is in operation, TEAM-UP Finds a record that meets the selection criteria, displays the Oneliner version of that record and waits for an operator response. If the response is:

- * Y - The record is updated, a new record is found and another prompt is issued.
- * N - The record is NOT updated, a new record is found and another prompt is issued.

This process continues until all records in the application that satisfy the selection criteria have been processed. The Batch process can be canceled at any time by pressing the [ESC] key.

NOTE: When the cancel capability is exercised, those records that have already been processed remain updated. The ability to use the Batch operation can be secured using user security level and application Batch security.

[C] The Calculate Operation .

The Calculate command can be activated by pressing [ACT] with a C in the home position or by using a 'C from anywhere on the screen. The Calculate or Read Only operation causes the processing of an application's Procedural Language to take place but NO changes will be entered in any files. This command can be used even if a record has not been previously found. It is generally used by an operator to determine if the keyed data entry is correct before an Enter or Update command is used.

[D] The Delete Operations

The Delete Operation can be performed from either the Full Screen or Oneliner mode. The Delete Record operation does not cause an associated PL program to be executed unless it contains a test for the Delete Operation. If Audit Security is not active on an application, the indexes that point to the selected records are removed and the space it occupies is recaptured for use during a subsequent Enter command. If Audit Security is active on an application, the selected records are marked as inactive, its indexes are removed and the data remains in the record for audit purposes. These inactive records can be removed with the Remove Records function. The ability to Delete can be secured using User Security levels and Application Delete security.

Full Screen Delete; In this mode, the Delete command can be activated by pressing [ACT] with a D in the home position or by typing a 'D from anywhere on the selected record screen. Upon completion of the operation, Access Data responds with the message:

* Record Deleted

NOTE: IF A RECORD IS ACCIDENTALLY DELETED, THE USER CAN IMMEDIATELY REINSTATE IT USING THE ENTER COMMAND..

Oneliner Screen Delete; To delete records in the Oneliner mode:

- * Place a D or X next to each record you wish to delete.
- * Move the cursor to the home position.
- * Press [RET].

If a D is placed next to a record, that record will be Deleted. If an X is placed next to a record, that record will be Printed and then Deleted. You can use a D on one or more records and an X on other records at the same time. You can even add a P for Print Record, if necessary (see Print Operations below).

[E] *The Enter Operation*

The Enter Operation can be activated by pressing [ACT] with an E entered in the home position and the cursor positioned in the data block area or by typing a ^E from anywhere on the screen. Entering records can be accomplished by:

- * Typing in the data
- * Finding a similar record and modifying the data

The Enter operation is a transaction, and it causes an application's PL program, if it exists, to be executed. After the execution of the PL program, the data is added to the application's data file and indexes are created so the record can be found the next time an appropriate Find operation is performed. Upon completion of the Enter Operation, Access Data responds with the message

- * Record Entered

The ability to enter records maybe secured by using User Security levels and application Enter security.

[F] *The Find Operation*

The Find Operation can be activated by pressing [ACT] with an F entered in the home position and the cursor positioned in the record or by using a ^F from anywhere on the screen. When the Find command is executed, Access Data goes into a searching mode looking for records whose data matches the specified selection criteria (see Setting Selection Criteria, below). If the search Finds a single record that exactly matches the specified criteria, Access Data exits the search mode and displays the record in the Full Screen display mode. If a PL program exists for this application and it contains a reference to the Find Operation, the PL program is executed prior to the data display. If the search does not Find an exact match, the Oneliner Screen display mode is activated and displays the found records. The operator must then control the search by moving from page to page on the Oneliner Screen and selecting the desired record.

After a record is selected and before the data is displayed, all of the record's PL code for OPER('F') is executed. The searching process may be ended at any time by pressing [ESC]. The Find Operation may be secured using User Security Levels and application Find security. Searching TEAM-UP's innovative Query-By-Example can be learned in minutes. Simply move the cursor to the item which contains the data in question, type the known information and let Access Data Find the records.

For example, enter the CUSTOMER application, move the cursor to the Key Item State, type FL and press [RET]. Access Data enters the Oneliner mode and displays all customers in the state of Florida.

Specifying the Order of the Search; Always place selection criteria in at least one Key item. If this is not done, W-UP will assume the first key item positioned on the screen as the valid sequence for the search and tells Access Data the display order. To help the operator remember which items are Key Items, Key Item names may be displayed using a unique attribute, e.g. Reverse Video. If information is placed in more than one Key Item, THE ORDER OF THE SEARCH WILL BE BY THE LAST KEY ITEM WHICH CONTAINS SEARCH DATA!!!

EXAMPLE: If the selection criteria JAC is placed in the Key Item City, then only those records where the city name begins with JAC are examined to see if they meet the other selection criteria.

The application might contain 10,000 records, but if only 3 of them contain cities that started with JAC, Access Data will only examine 3 records for a match. If you type a space followed by AC, e.g., “ AC” in the City Key Item, all 10,000 records will be examined.

To search for information which has no relationship to a Key Item, type a space, which is a “global” selection criteria, in any Key Item. All records in the application are searched in order by that Key. Item. Placing a space in one Key Item, with no other selection criteria present, allows searching through all records in an application.

Setting Selection Criteria During a Find Operation, information displayed in the first 100 item data areas is treated as selection criteria. That is, only those records which contain information that exactly matches the data on the screen are found and displayed. Items 101 through 1000 require special qualifiers (see Special Search Qualifiers, below). The letter case of the selection criteria does not matter; i.e. A =a, B =b. You may enter selection criteria into as many item data areas as necessary for the search to be qualified. Unless special action is taken, the comparison between selection criteria and record data is an equal comparison.

- * Character data is compared on a character by character basis from left to right.
- * Numeric data is compared by the numeric value rather than their placement within the item.

[Q] Special Search Qualifiers

Within Access Data, nine Special Search Qualifiers or relational operators are available for use in finding records. Any single search may use Special Search Qualifiers on up to 50 different data items. EQ, equal to, is the default value with the following other qualifiers available:

GE greater than or equal to	GT greater than
LE less than or equal to	LT less than
NE not equal to	MP match phrase (alphabetic data only)
NL null	NN not null

To invoke a Special Search Qualifier Operation on a particular item, move the cursor to that item's data area and press ^Q. Each time you press ^Q, a different highlighted qualifier is displayed on the message line at the bottom of the screen. You may toggle or rotate through all nine qualifiers by repeatedly pressing ^Q. The last qualifier displayed for an item is the one that is used when the Find Operation is activated.

To initiate a search using Special Search Qualifier Operations:

- * Use ^Q to toggle to the desired search qualifier.
- * Type your selection criteria.
- * Enter any other selection criteria and activate the Find command.

If the record or records searched for exist and a single exact match is not found, Oneliners are displayed matching the selection criteria with the Special Search Qualifier. Incorrect individual search qualifiers may be corrected by:

- * Moving the cursor to the item which contains the incorrect qualifier.
- * Press ^Q to toggle to the correct qualifier.
- * Re-initiate the Find.

Multiple searches with minor variations in the criteria and qualifiers may also be initiated using this method. Special Search Qualifiers may be used in conjunction with the Alternate Oneliner Screen and Oneliner Totals. Clear the application form to erase selection criteria and Special Search Qualifiers.

[T] Totaling Numeric Items

The contents of up to 20 numeric and/or money items may be summed during a search operation. The result is displayed only on the Oneliner or Alternate Oneliner screen and that result reflects the contents of all records examined since the beginning of the search. Totals are cumulative from one oneliner screen to the next.

To identify the items from which summations should be generated:

- * Place the cursor in the desired item.
- * Press ^T.

The highlighted word TOTAL appears on the Message line only if that item is a numeric or money item.

To activate a summation search process:

- * Identify the items you wish to have totaled with the ^T.
- * Enter the selection criteria.
- * Initiate a find operation.

The items identified for summation with the associated Totals are displayed on the bottom of the Oneliner screen, though the items themselves need not appear on the oneliner. A total can be run on virtually any numeric item contained within the first 100 items. The sum reflects the data contained in each of the records displayed to the Oneliner screen during this search, i.e. the Totals displayed at the bottom of the subsequent screens include all Totals for the records from the preceding screens. In this manner, a running total for the search is displayed on each screen. Oneliner Totals take precedence over the display of Oneliners; therefore, if you request 20 totals and the Oneliner screen is set to display 20 records, only 10 oneliners are actually displayed to make room for the 10 lines of Totals. To remove an item from the summation process:

- * Move the cursor to that item's data area.
- * Press ^T.

^T adds an item to the summation process if it is not already in that process and removes it if it is. To clear the entire summation process:

- * Move the cursor to the home position.
- * Press [ACT].

NOTE: While in the Oneliner mode, moving backwards, i.e. [PAGE UP], through the Oneliner screens, turns off the Total operation.

Oneliner Totals may be used in conjunction with Special Search Qualifiers and Alternate Oneliner Screens.

The Oneliner Operations

Changing the number of records displayed on a Oneliner Screen:

- * Move the cursor to the home position.
- * Type the letter O for Oneliner, followed by a [SPACE], followed by the number of records you wish to display on each Oneliner screen.
- * Press the [ACT] key.

EXAMPLE: O 20 - causes a maximum of 20 records to be displayed on the Oneliner screen.
O 5- causes a maximum of 5 records to be displayed on the Oneliner screen.
O 0 - causes the Full Screen to be displayed in the Oneliner mode.
[PAGE UP] and [PAGE DOWN] can be used to scroll from record to record.

[0] Alternate Oneliner Screen

The Alternate Oneliner Screen is available for use, but has no predefined form. Once the Oneliner Display is defined for an application, that definition remains in effect until it is temporarily modified by the Alternate Oneliner Process. This process is activated by pressing ^O with the cursor on an item. Continue to press ^O for each item desired on the Alternate Display. The items will be presented, from left to right, according to selection sequence. Remember the maximum character display is restricted to 73 characters; however, you may make changes to the Alternate Oneliner screen whenever you desire.

Define the Alternate Items on the Oneliner Display

Alternate Oneliner definitions must be accomplished while in the Full Screen display mode. To define the Alternate Oneliner screen:

- * Move the cursor to the data item you wish to see on the Alternate Oneliner screen.
- * Press ^O for Oneliner to add that item to the Alternate screen.

The highlighted word ONE displays on the Message line to indicate that this item is on the Alternate Oneliner screen. To remove an item from the Alternate Oneliner screen:

- * Move the cursor to that item.
- * Press ^O.

Any change to the Alternate Oneliner screen automatically sets that screen version for the next search operation. Alternate Oneliner Screens may be used in conjunction with Special Search Qualifiers and Oneliner Totals.

Switch to Alternate Oneliner Screen

While in the Oneliner screen, press [^O] to change the screen display from the Standard Oneliner screen to the Alternate Oneliner form.

Switch to Standard Oneliner Screen

While in the Oneliner screen, press [^O] to change the screen display from the Alternate Oneliner screen to the Standard Oneliner form.

Record Zoom-UP and Return

TEAM-UP provides a special Zoom-UP feature to display the full page of a record while remaining in the Oneliner mode. To activate a Record Zoom-UP:

- * Initiate a Find Operation to produce Oneliners.
- * Place the cursor beside the desired oneliner record and press the [ACT] or [END] key.

The full record will Zoom-UP for display. An operator has all functions available (enter, update, delete, etc), with one addition. When processing of the selected record is completed, the [END] key will return the operator to the same Oneliner Screen to continue with his work.

[P] The Print Operations

The Print Operation can be performed from either the Full Screen mode or the Oneliner mode. The ability to use a Print Operation can be secured using User Security Levels and Application Print Security.

Full Screen Print

Print to a Local Printer: The Print command can be activated by pressing [ACT] with a P entered in the home position and the cursor positioned in the data block of the screen or by typing a ^P from anywhere on the screen.

Print to a Spooled Printer: In multi-user systems, many users make use of the same printer. Such systems have a network program usually referred to as a Spooler. The Spooler accepts print requests from each user and places the data in a special file, one file for each user. These special files are called spool files. From there, another program actually prints the information contained in the spool files, one file at a time, to the printer. If your network has more than one printer on line, the user may choose the printer by returning to the home position and entering:

* P [space] Printer #

To determine the printer number, refer to the INSTEAM program TEAM-UP expects the spooler program to be active. To despool, press [HOME], enter a 'P' in the command area and [ACT]. The print spool file is held active and not printed until:

- * A Print command is issued entering [HOME] P [ACT],
- * A new printer is selected, [HOME] P{space} PRINTER# or
- * You exit Access Data.

Oneliner Print

In the Oneliner Mode:

- * Place a P, O or X next to each record you wish to print.
- * Move the cursor to the home position.
- * Press [ACT].

If you place a P next to a record, that record will be printed. If you place an O next to the record, that oneliner will be printed. If you place an X next to a record, that record will be

printed and then deleted. You may use a P on one or more records and an X on other records at the same time. You can even use a D for Delete Record if necessary.

[R] The Report Operation

The Report Operation is a combination of the Find and the Print operations and is used for Ad-hoc reporting. Access Data reports are displayed in whichever Oneliner screen mode is active-Standard, Alternate or Full Screen. They can be sent to the screen or to the screen and to the printer. During a Report Operation, you may not select a record for further processing. A Report Operation can be stopped at any time by pressing [ESC].

Report to the Screen

- * Select the appropriate Oneliner mode.
- * Enter the desired selection criteria.
- * Activate the report with a ^R or by pressing [ACT] with an R entered in the HOME position of the Command area and the cursor placed in the data block of the screen.

NOTE: If the Alternate Oneliner mode is active, records will be printed in that display format. Otherwise, the Standard Oneliner format will be used. If the number of oneliners to display is set to zero, the report function will present full screens of each record.

During the Report process, if you desire to temporarily stop the display, press the space bar. The display stops and holds until you press another key. If Totals for numeric items are defined, those Totals are displayed for the Report. If the number of records displayed on the Oneliner screen is greater than zero, then the report is displayed in either the Alternate or Standard Oneliner screen format. If the wrong format is displayed, use ^O to change it. If the number of records displayed on the Oneliner screen is set to zero, then a Full Screen is displayed. In multi-page applications, the page from which the Report was initiated is displayed.

Report to the Printer/Spooler

The Report to the Printer/Spooler is very similar to the Report to Screen operation. It is activated by:

- * Placing an underscore in the second position of the command area following the R.
- * Activating a Report Operation by pressing [ACT] with the cursor positioned in the data block.

Information will be sent to both the printer/spooler and to the screen.

[U] The Update Operation

To use the Update Operation:

- * Select the record you wish to change.
- * Make the appropriate changes on the screen.
- * Activate the command with a ^U or by placing a U in the home position, positioning the cursor in the data block and pressing [ACT].

If Audit Security is activated, then the old copy of the selected record is marked as inactive, its indexes are removed, the data remains in the file for audit purposes and a new record is Entered. These inactive records can be removed with the Remove Records function. This operation is a transaction and it activates whatever Procedural Language programs exist for the application. The ability to use the Update Operation may be secured using User Security Levels and application Update security.

IMPORTANT TECHNICAL NOTES: The TEAM-UP UPDATE command is performed in three steps:

- * A record's keys are removed from the Index (.TIR) file.
- * The data is "overlaid" into the data file (.TDR) where the original record was located.
- * The key items are reinserted into the .TIR in their proper positions.

Exit Access Data

Place the cursor in the home position on the Full Screen and press [ESC]. The Application List is displayed. You may also type a menu path at the home position and press [ACT].

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Import/Export Data

Import Screen

IMPORT DATA, selection 3 on the Data Manager Menu, is a facility used to transfer records from a data file to a TEAM-UP application, whether the data file resides within TEAM-UP or within some other Data Base Manager. When changing from an old database management system to TEAM-UP, export those data files from the old database to a data file, and then import to a TEAM-UP application.

IMPORT DATA supports several different types of data files, the two most popular being ASCII files and DIF files. There is a limit of 1000 fields per imported ASCII or DIF file. There is no limit on the size of the actual field.

Importing ASCII Files

American Standard Code for Information Interchange Files, or ASCII Files, are files that contain readable text. They can be delimited in several different ways, such as fields delimited by commas and alphanumeric fields enclosed in quotes:

`"Mary Smith",,"ABC Corp",556,"NY"`

Fields may also be delimited by a user-defined character:

`Mary Smith; ABC Corp;556;NY`

Fields may even be delimited by a carriage return and line feed (CR/LF):

`Mary Smith
ABC Corp
556
NY`

ASCII fields may be delimited by length. Each field is delimited by a specific length and each record is delimited by CR/LF:

`Mary Smith ABC Corp NY
Don Jones Zero Freeze Inc. PA`

These files should not have any imbedded control codes, such as those used by word processing programs to format style sheets, paragraph limits, etc.

Importing DIF Files

Data Interchange Format files or DIF Files can be directly imported to TEAM-UP applications. DIF files have a standard file format used by most spreadsheet programs. The data fields, or vectors, in a DIF file can be assigned by the user to the data items or sequentially assigned by IMPORT DATA.

Importing from Matching Applications

Data from a matching application can be used to Enter and/or Update records in a TEAM-UP application, facilitating information exchange from separate offices or separate locations. This is easily accomplished once the applications are set up correctly.

The matching applications' .TPR (profile) and .TDR (data) files must be identical. To make sure the .TPR is an exact copy, use the TEAM-UP COPY function. Send the copy to another directory or location to prevent overwriting the original.

If a need arises to modify the main application in CREATE/CHANGE, the version numbers will change. The applications will no longer match. Import the data from the matching application before making any changes. After modifying the main application, recopy it to have a matching application.

Setting up an IMPORT Description

Select the application receiving records from the Available Application List:

STATES ORDER INVENTORY

Application name: STATES

- 1- Import using file description
- 2- Describe file to imported
- 3- Exit Import Data

Enter the drive:name of the description file

[STATES] : STATEDSC

Enter the drive:name of the file to be imported

: STATES.DAT

1- Import Using File Description

Use this selection if the import description already exists. After selecting 1 by typing or highlighting the number, press [RET]. You will be prompted for the description file. At that prompt, type the drive letter where the description resides if other than the default drive, and type in the name of the description file. The extension (.uld) need not be entered.

At the next prompt, type the drive letter other than the default drive. Enter the name of the file to be imported. You will not be prompted to describe the type of import but will go directly to the processing screen. If you need to change an existing import description, choose selection 2- describe file to be imported.

2- Describe File to be Imported

Use this selection if the import description does not exist or you wish to change an existing description. Select choice number 2 by typing or highlighting the number and pressing [RET]. You will be prompted for the description file. At that prompt type the drive letter if other than the default drive, and enter the name of the description file. It is not necessary to enter the .uld extension. At the next prompt, type the drive letter if other than the default drive, and enter the name of the file to be imported. This information is not needed unless you will IMPORT immediately.

3- Exit Import Data

Use this selection to exit import.

After selecting number 2 the following prompts will be displayed:

- 1- Enter as new records
 - 2- Update existing records
 - 3- Enter if new record, else Update
- Which action should this import take []

- 1- Enter as new records
Select if entering new records and not updating.
- 2- Update existing records
Select if updating existing records and not entering new records. After selecting number 2 you will be prompted for the search key item name. If this key allows duplicates, you will be asked if you want to update the first or all occurrences of this key.
- 3- Enter if new record, else Update
Select if entering a new record or updating an existing record. If this key allows duplicates, an error message will be generated. Enter another search key item name that does not allow duplicates.

After selection, the following prompts will be displayed:

- 1- ASCII file, fields delimited by comma, fields may be enclosed in quotes
 - 2- ASCII file, fields delimited by a user defined character
 - 3- ASCII file, fields delimited by CR/LF
 - 4- ASCII file, fields have a specific length
 - 5- DIF file
 - 6- Matching application
- Which type of data file is being imported []
Enter the number of fields in the data file to be imported []

Selections 1 through 5 will prompt for the number of fields contained in the IMPORT file. Enter the total number of fields contained in the incoming record, even if all fields are not being assigned to TEAM-UP data items.

IMPORT allows an input mask to define a date format for any date field being imported. If a mask is not specified, IMPORT will assign one based upon whether or not the incoming date field is delimited. The delimiters are described in the INSTEAM utility and include such characters as /, -, etc.

- 1- Use IMPORT's best guess
 - * Dates with delimiters assumed to be in the assigned format.
 - * Dates without delimiters assumed to be in YYMMDD or YYYYMMDD.
- 2- Enter an input mask to define date format
 - * Type MM for month, DD for date, and YY for year in the sequence of the data along with the delimiting characters (if applicable).

After selecting the date mask TEAM-UP will prompt for field assignments. Use this method of entry when the fields in the incoming data file are in the same order as the items in the receiving TEAM-UP application. IMPORT automatically skips comment items and non-stored data items when making the assignments. If your response is yes, TEAM-UP will sequentially assign each incoming field to your data file as in the example below:

Fld#	Len	Assign to item	T/E
1	0	0 State	T

The Fld# refers to the field order in the incoming data file. In the above example, the first field in the incoming data file will be assigned to the STATE item in the TEAM-UP application. The T/E selection gives you the option to Truncate or Error. If a T is entered, the receiving item will be truncated if the receiving field is smaller than the incoming data. If an E is entered, and the receiving item is not large enough to contain the incoming field, the record will not be entered but will be sent to an Error file. If the data file is delimited by field length, use the Len selection to specify field length.

If your response to the prompt:

Do you want field assignments done for you? (Y/N)

was NO, then the above example would have dashes under each selection and you will have to assign each field. Use this method of entry when the fields in the incoming data file are not in the same order as the items in the receiving TEAM-UP application or if some incoming fields will not be assigned. To assign the fields to the TEAM-UP items, use the FIELDS selection.

Print Screen

Save

Saves the import description without exiting IMPORT. TEAM-UP will automatically add a .uld extension to the description file name when it is saved.

Run

Imports using the current description. After making this selection there will be a prompt:

OK to proceed (Y/N)

If the response is YES, there will be a screen similar to the one below:

```
Processing...
Records entered: 46
Records updated: 0
Empty records: 0
Errors:          0
-----
Total processed: 46
```

Exit

Leaves import and saves the description.

Quit

Quits Import; does not save description.

View

Views the incoming data file. Use the arrow keys to page up and down and to move left and right in the data file displayed at the bottom of the screen. The HOME key will place the cursor

at the beginning of the file, and the END key will place the cursor at the end of the file. This is just to view the file, not edit it. This is useful in making sure the description was set up properly. You can check the number of fields and make sure the assignments are correct.

Fields

Assigns incoming fields to TEAM-UP items. After you select this, use the tab or arrow keys to move to and from selections. Use the [F1] key to get a pull down list of items in the application. Select the desired item by highlighting and pressing {RET}. Alphanumeric items default to truncate and numeric items default to error, but this can be changed. If the delimiter is by the length of each field, the length selection will be displayed with a 00 default, so you must enter the correct length of each item. If a field in the incoming data file is not going to be assigned, enter a dash in that field.

Use the [LN INS] key to drop assignments down one line. The [LN DEL] key will delete the current assignment and move all following assignments up one line.

Proc

Changes the type of process (delete, enter, update), delimiters, number of fields or date mask.

Error File

During the import process, all records are checked for security and data validation before they are entered by IMPORT DATA. Any record that fails the check will be sent to an error file with an error message indicating the failure. Error files have the extensions .ERR, .ER1, .ER2, etc.

You can edit this error file using the TEXT EDITOR to correct the errors and delete the error messages. After making the corrections, import the edited error file.

Possible IMPORT Errors:

- ** Error; Disk became Full
- ** Error: Attempt to enter Duplicate Key
- ** Error: Record not found for Update
- ** Error: Data Record too Large to Import
- ** Error: Incoming Data too Long for Receiving Item
- ** Error: Incorrect structure of incoming data file

Export

If you have a TEAM-UP application and wish to download the data to a file, you have two options: Use a Report or Use the Copy Function

Using the REPORTER

The Reporter can create a report that, when generated, will send all or selected records in an application to a delimited ASCII or DIF file.

You may delimit the file by entering the delimiter in the report body when setting up the report. If you do not elect to do so, the reporter will delimit the file with commas and enclose non-numeric fields in quotes.

To allow the Reporter to delimit the report, overlap all data items to make certain that no empty spaces exist between items.

After adding the items and upon exiting the report body, you will be prompted whether or not to allow blank lines to be printed. Respond with a NO.

Set Miscellaneous Parameters so that the number of lines to print is the same as the number of lines per page.

Using the Copy Function

Using the COPY function to download all the records in an application to an ASCII or DIF file.

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Report Data

Definition of a Report

A report is defined as an account of something seen, done or studied. Reports generated within TEAM-UP compile and account for all information stored in the application items tagged by the report's designer as being pertinent to the current topic.

Reports have an infinite number of formats. Resumes, letters, invoices and inventory lists are all reports and they all have one thing in common. They state facts. To introduce you to the basic components of a report, the following paragraphs will dissect a resume and label its parts.

In our example, a designer is preparing a resume for a specific job. He includes all available information that will make the resume informative and concise. He also formats the resume in whatever fashion will make it the most attractive and the easiest to read.

The resume's writer will place his name, address and telephone number at the top of the first page of his resume. This area is known as a Report Header and it contains the topic of discussion. All information contained within the resume or report consists of Report Bodies.

The major sections of the resume could be entitled Education, Desired Occupation and Employment History. Report Data refers to these titles as Sub Report Breakpoints. The text beneath them is known as a Report. Each paragraph constitutes a Data Block. Summary paragraphs at the end of each section are known as Report Summaries.

JOHN DOE'S RESUME (Report Header)

DOE, JOHN (Page Header)

EDUCATION

(Report Breakpoint)

|

(Data Block)

|

Desired Occupation

(Report Breakpoint)

|

TOTAL YEARS EXPERIENCE = 21.2

(Formula, Summation)

In conclusion,...

(Report Summary)

As a close to my resume,...

(Report Summary)

Each data block within the report is X number of lines in depth and X numbers of characters in width. The depth and width of the data block constitute its parameters.

The information contained within each data block is chosen by the designer based upon Selection Criteria. The order in which the data is listed, e.g. from year to year, is the data's Sort Order.

If the designer wishes to add the number of years spent working in one discipline, such as engineering, he may perform a Summation or create a Formula. Each previous job will be reviewed, and all years spent in engineering will be summed. The total could be inserted in the Sub Report Summary under the Sub Report Breakpoint entitled Employment History.

A Page Header containing the designer's name or other information may be placed at the top of a page. Page Summaries can contain information such as page numbers or running totals. Page Summaries will appear at the bottom of the page.

Remember, the italicized words given in the previous paragraphs are the key words used in the report generation process.

Report Data - An Overview

The TEAM-UP Reporter allows the user to create either simple or complex, multi-level reports. The creation process is consistent with TEAM-UP's menu prompted philosophy. Reports may be generated to a screen, a printer or a file. Report designs can be created, changed, evaluated or removed (deleted) as user needs dictate.

Optional operator responses at the time of report execution allow variable input for record selection without requiring expertise on the part of the operator.

Reports designed for a specific application are not restricted to the data contained in that application. Up to nine (9) other data bases can be involved to accommodate data sharing and record updating.

TEAM-UP's reporter has many special features. "windows" allow the operator to check item spelling, printer attributes and formulas for special calculations. Operators can take advantage of the ability to condition output in the same printed position via the "If" statement.

The basic philosophy behind the Report Generator is the presentation of data in a pre-formatted and orderly manner. Headings, dates, page numbering, sub-totals, labels, summary totals, etc., may be used to provide continuity. This data is the result of all activity Occurring within Access Data. These records are simply retrieved, manipulated and printed by the reporter. Of course, "printing" is not the only option. TEAM-uP provides screen display reports and reporting to disk files in ASCII format, with or without delimited characters. This data can be exported to other software packages for use in spread sheets or use in mail-merge processes.

Accessing Report Data

To access Report Data, choose menu selection number 2 on the Data Manager Menu or use the dot-pathing method (1 .2) from anywhere in Data Manager. The user is greeted upon entry with the applications list and a prompt for an Application name. Only those applications authorized by Security are shown.

The system displays the names of all reports currently defined for that application after application selection. These 16 reports (.TRO through .TRF) are tracked by TEAM-UP's Control File. This limit is NOT a limit on the number of reports any given application can have. It is the limit on those which can be tracked by TEAM-UP's Report Data module. To access a report not tracked by TEAM-UP, you must know the name of the file in which the report definition is stored. When prompted for the report, enter the file name with its three character extension. The Reporter will validate the file as a report and continue. If the file does not exist, a new report will be created with the currently selected application as the major application. Any report can be accessed in this manner, even reports for other applications.

To select the report, highlight the report name or type the report name at the prompt. Press [RET] to confirm the selection.

Report Operations Menu

Report Operations are performed after selecting a report. The above screen is presented if a selected report already exists. If you are creating a new report, see this section - Report Design.

Select a Report Menu option by highlighting the desired option or by typing the first letter of the menu option (G, D, E, P or R) at the selection prompt. Confirm the choice by pressing [RET]. Press [RET] again to initiate the default value of Yes or No shown.

The Evaluate (E) option has two additional confirmation prompts:

- (A) - Evaluates all reports for an application
- (S) - Evaluates all reports in the system

G - Generate

Once the choice to generate (execute) a report is confirmed, TEAM-UP checks:

- * If the user security is less than the Print security in the main application, the system will not allow report generation.
- * If the user security is less than this report's internal report generation security (Design, Miscellaneous Parameters, Set Security later in this section), the system will not allow report generation. This security additionally limits users who may have application Print security but whose security level is below the generation security level from executing this report.
- * If any application from which the report draws data has changed, you are told that an Evaluate is necessary and the report list is re-displayed.

If System Security permits access and the selected report does not require evaluation, the following message may be displayed:

- * Where do you wish the report (S =screen, P =printer, F =file) [S]

The system has the value S in brackets as a default. Pressing [RET] tells the system to send the report to the SCREEN. If you type P, the report is sent to the PRINTER.

NOTE: If a printer is not associated with the terminal, the system will pause as DOS waits for the printer. Data loss will NOT occur.

Typing F sends the report to a FILE. With this option, the system prompts for a file name to which the report can be written. YOU MUST USE A FILE NAME THAT IS NOT ALREADY IN EXISTENCE. Also, you can specify the drive and DOS path if you want the file placed somewhere other than on the default drive. Precede the file name with the drive designator followed by a colon, e.g. drive:\path\filename.

You may enclose non-numeric items in quotes and insert a comma after all but the last item of a line. This is useful in creating delimited files for Basic programs, Mail Merge processes or Spreadsheets. Two or more delimited files can be joined and imported through the Import Data

module to create new applications. Respond to the prompt according to your output requirements.

If the report you are generating has multiple sort items defined, an extra file sort is required before the report can be generated. The following message may be displayed:

* On which drive should temporary sort files be placed: [@]

The @ in brackets indicates the default drive. If you wish to place the temporary sort files on other than the default drive, type the TEAM-UP drive letter at the prompt.

NOTE: You may only use drives that are defined in the .PTH (path) file.

If the first sort item defined for the Report Order is a key item and its sort sequence is ascending, the following message may be displayed:

* Enter start key value for key ITEM NAME:

Type the lowest key value for which data is to be included in the report. The wording may be changed when generating the report. How to do this will be discussed later in this section.

EXAMPLE If your key item is Zip_Code and you type a value of 20000, your report will include only those records whose zip code is equal to or greater than 20000. If your key item is State and you type an N, your report will start with those records whose state name begins with N.

After answering this question, another prompt may be displayed:

* Enter stop key value for key ITEM NAME:

Type the highest key value for which data is to be included in the report. Given the previous example, a value of T will cause all records with a State value of N through T to be included in the report.

NOTE: Start and stop values take precedence over Record Selection criteria (defined in this section under Report Design, Record Selection).

If a [RET] is pressed without an entry for start value, records are included starting with the first record in the file. If a [RET] is pressed without an entry for the stop value, records are included beginning with the selected start value and ending with the last record in the file. To include all records in the file, press [RET] at the start and stop value prompts.

At this point, all User Prompts are answered. If prompts were defined for the report in the Record Selection portion of Report Design, you will be asked to enter a value. The system

begins the report generation process after all prompts are answered. Messages pertaining to record selection and sort functions appear on the screen. Upon completion, the report will be sent to the chosen destination.

Reports sent to the screen will be displayed one screen at a time. Pressing any key continues the display. At the end of the report, the following message will appear:

* Report generation complete, [RET] to continue

Pressing [RET] takes you back to the Application Report List screen.

D - Design

Reports must be created or changed when an application is changed or when data content or formatting become obsolete. If the user security is less than this report's internal report change security, the system will not allow report changes (see this section - Design, Miscellaneous Parameters, Set Security). After clearing security and selecting Design, TEAM-UP will load the Report Design module for the selected report. This process is discussed at length later on in this section under Design.

E - Evaluate

A report is automatically evaluated when created or when certain changes are made. The evaluation process checks each part of the report to be sure that the report will be able to perform all operations correctly and locate all data. It does not check the validity of the user's data. When applications that are accessed by a report are changed, it is necessary to re-Evaluate the report.

When you generate a report, TEAM-UP automatically detects changes and displays a message directing you to Evaluate that report. In most cases, Evaluation will permit the generation of a report. However, any fatal errors will have to be corrected before the report can be generated.

P - Print Summary

This menu selection produces a detailed summary of the report description. The Print Summary is self-explanatory. The summary may be output to a screen or a printer. You may include a description of each item in each block.

R - Remove Reports

The Remove option allows you to delete reports. If the user security is less than this report's internal report change security, the system will not allow report removal. If your user security allows you to remove this report, you are asked for confirmation of the Remove option. By

typing [Y] [RET], all references to the report and the associated report file will be removed from the system.

Creating New Reports

Type the name of the report you wish to create at the prompt for report name and press [RET]. The name can be a maximum of sixteen (16) characters in length, including spaces, but it must be unique to this application.

After entering the report name, you are given the option of copying an existing report form. Enter [E] for an existing report. This report form may be used as the basis for creating the new report. If an appropriate format does not exist, enter [N] for a new report form. By selecting a new [N] report form, you will create the report from scratch. Enter a text description of the report. You may describe the report, using a maximum of 110 characters, or leave the description blank and continue by pressing the [RET] key. If the new report is being defined from an existing report, select the model from the above list of reports. Use the [ARROW] keys to highlight the desired report and [RET].

The Report Design Module is then loaded to allow processing report definitions.

Design Menu

The Report Design Menu is the vehicle through which you design new reports or change the attributes of existing reports. This menu appears as the result of preliminary activities described on the previous pages.

The Report Design Menu is divided into four major sections:

- * **REPORT CONTROL**
- * **PRINT DESCRIPTION**
- * **SUB REPORT DESCRIPTION**
- * **MISCELLANEOUS**

Report Control

Menu selections within this section allow you to define the criteria necessary to sort and select the data you wish to report. You may also edit the relationships established between the main and related applications used in the report.

Application: APP NAME REPORT ORDER Report: REPORT NAME

CURRENT	LEN ORD	OLD	LEN ORD
1 -	undefined	1 -	undefined
-	redefined	-	undefined
2 -	undefined	2 -	undefined
4 -	undefined	4 -	undefined
5 -	redefined	5 -	undefined
6 -	undefined	6 -	undefined
7 -	undefined	7 -	undefined
8 -	undefined	8 -	undefined
9 -	undefined	9 -	undefined

Enter desired process:

A=Add, C=Change, D=Delete, [ESC] =exit

1- Report Order

Report Data Selection #1, Report Order, allows you to determine the sequence (ascending or descending) in which the data will be presented when the report is generated. The items defined as sort items need not be key items. Up to nine sort items can be chosen and each item may have a total length of up to 110 characters. If the total length exceeds 110 characters, only the first 110 characters are sorted and the remaining characters are truncated.

No file sort is needed if only one sort item is selected, and it is a key item to be sorted in ascending order. If no sort items are defined, the report is presented in ascending order by the first key defined for the main application.

An extra file sort is required if any one of the following conditions are true:

- * more than one sort item is defined
- * the key item is to be sorted in descending order
- * the single sort item is not a key item

If any of the above conditions are true, the following message is displayed:

- * Report requires file sort

File sorts require extra time and disk space because temporary files are created during report generation. The order in which the sort items are defined is important. Sort item number 1 is the first item sorted. It is the priority item. Items are sorted in order until the sort is completed. When multiple items are sorted, the file sorting process is quicker if the first item specified is a key item sorted in ascending order.

Enter your sort items on the Report Order screen. Enter the length or number of characters from left to right and the order (ascending or descending) that the item(s) are to be sorted.

The screen is divided into two sections. The left section shows the CURRENTLY defined items, while the right side shows the previous sort definition. The right side is used to facilitate “temporary” report changes. Copy the information from the right side to the left side if you wish to reinstate the prior sort order.

During the sort definition process, you can (A)dd, (C)hange and (D)elete sort items. To begin the definition process, type the letter corresponding to the process you wish to initiate.

Add Sort Items

If Add is selected, the system prompts for the Application item name. The application name is already displayed. If this application contains the item you wish to sort, type the item name exactly as it appears in the application or press [HLP] to window the application’s items. Windowed items are selected by highlighting the item of choice via the [ARROW] keys, pressing [RET] to select it and pressing [RET] to confirm your decision.

If the item is in a related application, you must change the default application name by over-typing the related application name, followed by a period. Type the item name directly after the period or use the windowing technique as described above.

Once a valid item name is entered, the system prompts for the number of characters for this item to use in the sort. At the prompt, type the numeric value if it is different from the default value contained in brackets. The default is the total length of that item as defined by the application. If a value less than the total length can be used to sort, enter the length of the significant characters. Using a value less than the total value reduces the amount of space taken by the temporary sort files. A value of zero will not sort data.

Sorting on a value of zero allows the user to utilize start/stop key prompts without actually sorting on that item. After entering the sort length, choose the sort order. Enter either an A for ascending or a D for descending. The default value is ascending order.

Change Sort Items

The Change option is similar to the Add option; however, you are prompted for the number of the sort item to be changed. Enter the number corresponding to the sort item to be changed or press [RET] to choose the default number displayed. When a sort item is changed, the left block displays the new sort item and the right block displays the sort item before it was changed.

Delete Sort Items

Choosing the Delete option displays a prompt for the number of the sort item to be deleted. Enter the number corresponding to the desired sort item to be deleted or press [RET] to choose the default number displayed. If there is only one sort item, the left block will be empty and the right block will contain the sort item that was deleted. If more than one sort item is defined, as sort items are deleted, the remaining sort items move up in order of priority.

2 - **Record Selection**

Application: APP NAME	RECORD SELECTION	Report: REPORT NAME
LOGIC -		
1		
2		
3		
4		
5		
6		
7		
8		
9		

Enter desired process:

A=Add, C=Change, D=Delete, [ESC]=exit

Selection #2, Record Selection, is used to choose the application records for the report. This is done by specifying conditions and criteria under which a record should be included. Selection criteria are used to limit the amount of information included in the report.

You may specify up to nine sets of conditions. The format of a condition can be any one of the following:

- * a data item compared to a character (Literal) string
- * a data item compared to a data item (Data value)
- * a data item compared to a Formula
- * a data item compared to a User Prompt
- * a data item compared to a String Memory Variable
- * a data item examined for the occurrence of a given character string (MP - Match Phrase) anywhere within the item.

Possible conditional operators are:

EQ = equal
NE = not equal

LE = less than or equal
LT = less than

GE = greater than or equal
GT = greater than

MP = match phrase

Comparisons are character by character matching for the number of characters in the shortest item or character string for alphabetic data types.

After the initial conditions have been defined, the second line on the screen shows the Logical relationship of the conditions defined (Logic Line).

Operand 1	Operator	Operand 2
1 CUST.Zip	EQ	OLDCUST.Zip
2 CUST.Zip	GT	50000
3 CUST.state	NE	New York
4 CUST.Contract	MP	Expired

The available options for defining Record Selection criteria are:

- A to ADD a condition,
- c ... to CHANGE an already defined condition or
- D... to DELETE a condition.

Add . . . Selection Criteria

If you select A for ADD, the system checks to see if this is the first condition defined. If it is not the first condition, you are prompted for a logical operator. The logical operators are AND and OR. These conditions are represented within the Logic Line as the following symbols:

& = AND ! = OR

Logical operators are used to define the relationship between a new condition and all preceding conditions. Logical operators have equal priority and are scanned from left to right. The priority is altered by the use of parentheses. Press the [INS] key to use the Insert mode to position the cursor in the Logic Line. Add punctuation, numbered conditions and/or delete where needed. See Edit Selection Criteria later in this section for more details.

Next, identify the data type you wish to use for the first operand of the condition. The possible selections are

- L = LITERAL string of data
- E = DATA VALUE or application data item
- F = FORMULA
- P = USER PROMPT which is a reporter request to the operator at the time of report execution
- V = STRING MEMORY VARIABLE value using the SMV(x,y) form

Most often, the first operand will be the contents of an application item, and the system will default with type [E] or Data Value. If this choice is consistent with the condition being established, press [RET] to accept the default. If not, enter the appropriate letter and press [RET].

A data type E requires the item name for the application from which records are to be selected. The prompt:

* Enter APPLICATION. Item_name - CUST.

contains the application name of the main application followed by a period. Enter the item name. If the record selection takes place from a related application, backspace over the application name and enter the correct name.

If you use an application other than the main application and that application has not been previously defined for this report, the system prompts for a definition of its relationship to known applications (see Edit Relationships in this section).

The “pull down” item name feature can be used for selecting items from the main application or any other application for which the Edit relationship has been established. You can utilize the “pull down” item name feature by pressing the assigned [HLP] key (see Special Features further on in this section). If the data type is not E, i.e. L, F, P or V, see below.

After the first operand is entered, the system prompts for a relational operator such as:

EQ (Equal)	LE (Less than or Equal)	GE (Greater than or Equal)
NE (Not Equal)	LT (Less Than)	GT (Greater Than)
MP (Match Phrase)		

Press [RET] to accept the default or type the appropriate letters followed by [RET]. Once the desired operator is entered, the prompt for entering the second operand is displayed. Enter the second operand in the same manner as the first operand. If the data type entered is an L, enter the string LITERAL (text) you wish compared to the other operand. This string can be up to 110 characters in length.

NOTE: Use L(literal)s to compare null fields by typing an underscore as the value of the literal. For numeric comparisons, enter the number as the value of the literal.

If the data type entered is F, enter the FORMULA whose resultant will be compared to the other operand (see Formula Structures under Special Features in this section). If the data type entered is P, enter the string literal (text) which will be used to PROMPT the operator when executing the report. User Prompts can be identified on the Record Selection screen as those literals beginning with a “?”. (TEAM-UP inserts the question mark to differentiate between formulas, literals and prompts.)

The values resulting from the operator's response to the prompt can be printed anywhere in the report. The form of the referenced value is the letter "P" followed by #... for strictly numeric values or !... for alphanumeric values.

NOTE: Any formatted item (date, time, phone, etc.) is considered an alphanumeric value because the numeric data contains imbedded characters (l, :, -).

The #or ! symbol is followed by a numbered position (1 through 18) that the prompt occupies on the screen. The naming of these prompts is consistent with the layout of the record selection screen: left side (first operand), right side (second operand) and nine possible logic entries (2 x 9 = 18). The number is determined by counting from top to bottom and left to right for each prompt. As a result, the value of the prompt can be used anywhere in the structure of the report and represented as a "formula" for computation or for printing.

If the data type entered is a V, the system will prompt for the starting location for the comparison data within the string memory VARIABLE. A second prompt will ask for the length of the data at that SWV location.

EXAMPLE: If SMV(1,8) contains a pre-determined date for processing reports listed on a menu, then record selection criteria in each report dependent upon this date would have an automatic variable entry for processing simply by virtue of the operator's report choice. The record selection would be made automatic without intervention or prompting at the time of report execution, allowing multiple report executions to occur without being prompted for the date.

Change Selection Criteria

If you select C for change, the first prompt requires identification of the condition being changed. Press [RET] to choose the default or enter the number of the condition you wish to change and press [RET]. The Change process is very similar to the Add process with the exception that the current values are shown after each prompt. Press [RET] to leave the current value unchanged. To change the value, over-type the displayed value and press [RET]. Use the [BKSPCE] key to erase unwanted data.

Delete Selection Criteria

If you select D for delete, the system prompts for the number of the condition to be deleted. Enter the number followed by [RET] to delete the condition.

Multiple Selection Criteria

The following describes the way selection criteria are evaluated. The Reporter looks at each record and tests it against the selection criteria in order to decide which records will be included in the report.

Selection Criteria	Test Results
1 o r 2	If either of these conditions is true, record is selected.
1 a n d 2	Both conditions must be true for the record to be selected.
1 O R 2 A N D 3	1 =(true), 2 =(false), 3 =(true); then record is selected. 1 =(false), 2 =(true), 3 =(true); then record is selected.
(1 & 2) ! 3	1 =(true), 2 =(true), 3 =(false); record NOT selected. 1 =(true), 2 =(true), 3 =(false); then record is selected.
(1 ! 2) & 3	1 =(false), 2 =(false), 3 =(true); then record is selected. 1 =(true), 2 =(true), 3 =(false); then record is NOT selected.

(The NOT (-) command is available for building selection criteria logic.)

Edit Selection Criteria

You can edit the Logic line, as it appears at the top of the screen, for the selection criteria defined. By using the [INS] key, the Logic line is brought to the lower portion of the screen for editing.

NOTE: The numbered criteria from 1 to 9 can be entered in any order. The logic used to determine record selection is based purely on the numbered items found in the Logic line. In fact, all nine criteria can contain some logical comparison. Yet, if not included in the logic line, that criteria item will NOT be considered when record selection is made.

The arrow keys can be used to move back and forth across the line. Over-type to change a logical operator. For additional editing, the [INS], [DEL] and [DEL EOL] (^Z) keys are also functional. You can insert parenthesis around conditions to change the priority of evaluation and to impose a specific order for selection. All operations contained within parenthesis are performed first; then operations not within parenthesis are performed to arrive at a final result.

To exit the edit Logic line session, press the [RET] key to record any changes and the new edited version of the logic line appears at the top of the screen. If you do not wish to save your changes, exit by pressing [ESC].

3- Edit Relationships

This selection allows you to change application relationships. Application relationships exist when data is “pulled” from another application and included with the main application data for

which the report is written. Changes in an application's structure from time to time may dictate this type of alteration.

Application: PROJSTAT EDIT APPLICATION RELATIONS Report: LOG PRINT

REMOTE	Rel Type	SOURCE
1 - RESULTS.TASK#	2	PROJSTAT.TASK#
2 - ASSTN.TASK#	2	PROJSTAT.TASK#
3 - HOLD.TASK#	0	PROJSTAT.TASK#

dit which relation, [ESC] to exit: [1]

If relationships were previously defined, the process will present a screen showing a list of nine possible entries. It shows the related application whose data is being pulled and the key item used for record retrieval. The main application item used to link the applications is also displayed. In the center of the window is the RELATION TYPE (Rel Type) which establishes any conditions pertaining to the link.

Enter the relationship number that you wish to change. Prompts are presented for operator response and are explained in detail in this section under Establishing Relationships Between Applications.

Print Description

This is the heart of TEAM-UP'S Report Data manager. Descriptions of report content and format are developed within this section.

Reports are composed of blocks of information. You may use these blocks in any combination you choose. Think of each block as a separate area that when pasted together makes a report page. Each block may be as wide as 250 columns and have up to 99 lines. Those blocks which are utilized and contain defined data are presented upon report generation. If a block contains no data, it is not printed.

The seven Report Data blocks are as follows:

- | | |
|-----------------------------------|------------------|
| (1) Report Header | (2) Page Header |
| (3) Sub-Report Breakpoint Header | (4) Report Body |
| (5) Sub-Report Breakpoint Summary | (6) Page Summary |
| (7) Report Summary | |

The Sub-Report areas (3 and 5), in combination with the Report Body, are explained in more detail under Sub-Report Description.

You may use these blocks in various combinations. A simple report may only contain a Report Header block, followed by a Report Body block. On the other hand, complex reports may be composed of a number of different Header blocks, a Report Body block and one or more Summary blocks.

The pre-defined processing and print order of each Report block is as seen above. The only exception involves the combination of Sub-Report Breakpoint Header, Report Body and the Sub-Report Breakpoint Summary. If a block is not used, Report Data simply processes the next block that contains defined data.

Printing Scenario

The Report Data module checks for selection criteria and required sorts upon report generation. Once these processes are completed the actual printing or writing to a file begins.

- (1) . . . If a Report Header is defined, it is presented.

NOTE: This block can be created on the first page of the report or as a banner on every page.

- (2) . . . If a Page Header is defined, it is presented at the top of every page in the report.

- (3) . . . If a Sub-Report Breakpoint(s) is defined, all Sub-Report Breakpoint Headers will be presented on the first pass only. On subsequent changes in the breakpoint values, only the Breakpoint Header associated with the changed Breakpoint value will be presented, allowing multiple levels of “Sub- Reports” or subtotal group headers to be presented.

- (4) . . . If a Report Body is defined, then the body block will be presented for each record from the application that is selected for processing.

- (5) . . . If a Sub-Report Breakpoint Summary is defined, only the Breakpoint Summary associated with a changed Breakpoint value will be presented to allow multiple levels of “Sub-Reports” or subtotal groups to be presented.

EXAMPLE: Blocks defined for (3), (4) and (5) above will continue to be processed until a new page is sensed. For example, if a departmental sales report is prepared to show each department and its assigned sales personnel, the department number could be defined as the breakpoint value. Whenever the department number changes (as records are processed) a “break” occurs in the value. The break is sensed by the reporter and the appropriate Breakpoint Summary is presented. When the Summary block is complete, the Breakpoint Header for the record which caused the break will be

presented. Then, all Body blocks (each salesman) for the new department would be presented:

```

*****
...      Report Header      ...
...      Page Header       ...
Dept 1 ... Breakpoint Header ...
Slsm 1 ... Body             ...
Slsm 2 ... Body             ...
Slsm 3 ... Body             ...
Dept 1 ... Breakpoint Summary ...
Dept 2 ... Breakpoint Header ...
Slsm 4 ... Body             ...
Slsm 5 ... Body             ...
Slsm 6 ... Body             ...
Dept 2 ... Breakpoint Summary ...
*****

```

(6) ... If a Page Summary is defined and the report generator senses the end of the available print space (minus the amount of data contained in the Page Summary block), then the Page Summary block will be presented before moving to the next page of output.

(7) ... If a Report Summary is defined and all records selected for processing are read, the Report Summary block will be presented before ending the report.

NOTE: If NO Page Summary block is defined, the Report Summary will be presented immediately following the last Body or Breakpoint Summary block processed. If a Page Summary exists, then the Report Summary will be presented on the next full page.

Application: APP	REPORT BODY	Report: REPORT NAME
------------------	-------------	---------------------

*-----10-----20-----30-----40-----50-----60-----70-----

5
 10

Enter desired process:

Line number [0]
 Starting character position . [0]
 Data type []

A=Add, C= Change, D=Delete, K=Copy, [ESC] = exit

Editing Print Description

Enter the editing mode by selecting Report header, Page header, Report body, etc. You will be presented with a grid showing 10 lines and 76 columns where data can be defined. This is not the limit to the block size. You may move from item to item and scroll the block right, left, down or up as needed:

Key	Movement
[- - >]	Moves to next item
[< - -]	Moves to preceding item
[R]	Scrolls right 40 columns
[L]	Scrolls left 40 columns
[PG DN]	Scrolls block down 5 lines
[PG UP]	Scrolls block up 5 lines

The cursor is presented following the prompt:

* Enter desired process:

The possible responses are found in the lower left of your screen:

A = Add	to add something to the screen
C = Change . . .	to change something already defined on the screen
D = Delete . . .	to delete something seen on the screen
K = Copy	to copy an existing value seen on the screen to another location on the screen
[ESC]=Exit . . .	end the processing of this block and return to the Design Menu.

Enter one of these responses and the system will provide the necessary prompting to allow you to direct various data to the screen. Default values are given within the brackets. These values can be accepted by pressing [RET]. Enter a different value by over-typing the default selection and pressing [RET]. Use the [BKSPCE] key to correct entries while the cursor is still located between the brackets. Once you move on to the next prompt, you cannot move back to the previous prompt. Use the [ESC] key to cancel the operation and start again.

Adding, Changing and Copying Block Data

Information of various data types may be located anywhere within a block. Placement of data consists of choosing the desired operation: Add, Change or Copy.

Add is chosen by depressing the letter "A" (no [RET] needed) and is used to place a new item on the screen. Change is chosen by depressing the letter "C" (no [RET] needed) and is used to alter an existing screen value by changing the [default] values. These values are displayed

in sequence by pressing the [RET] key. Copy is chosen by depressing the letter “K” (no [RET] needed) and is used to duplicate the existing highlighted value. Simply change the line number and/or starting character position and any other values as necessary.

Once a process has been chosen, the location within the block is required:

- * Select the line number within that block where you wish the data to appear

The location is not critical. Screen data can be moved to any location that is visually acceptable. Use the grid to estimate the proper position. Refer to the Special Features part of this section for specific instructions. If you place data on line 3 and line 5 of a block, when the block is printed, line 1 and 2 will be blank, line 3 will contain data, line 4 will be blank and line 5 will contain data.

Remember, when a block is printed, the report generator looks for the last line of the block that contains data and prints everything contained in the block from line one to that last line. Also, note that the block will print in the designated printing order--report header, page header, body, etc.

- * Select the Starting Character Position for the data

In most cases, this corresponds to the column number of your printer. If your printer prints an 80 column print line and you choose a Starting Character Position of 40, then the data will start in approximately the middle of your page. If the Starting Character Position exceeds the width of the print line defined, the data will wrap to the next line.

Data items can be overlapped to provide the suppression of trailing spaces following an item’s data. For example, visualize names as separate items. The last name item must overlap the first name item (from right to left) so that the first name is printed for only the length of the data present in the first name item.

EXAMPLE To print the first name and last name overlapped and including a “blank” as a separator:

- position First_name in column 1
- position a literal blank in column 2
- position Last_name in column 3

On the screen it will look like this:

F LLLLLLLLLLLLLLLLL

The letter “F” is the first letter of the item First_name, the blank is in position 2 and the letter “L” is the first letter of the item Last_name. As a result, rather than defining the items separately and according to their individual item lengths,

FFFFFFFFFFFF LLLLLLLLLLLLLLLLLL

and seeing the printing of the name as,

John Jones

it would appear as,

John Jones

This technique is useful when generating a report (exporting) to an ASCII file. Not only can the trailing spaces of each item be trimmed to conserve disk space, but any delimiters required by the receiving software can be inserted and overlapped just as the literal space was used in the above example.

After deciding where the data is to be placed in the block, a choice must be made as to data type:

* Identify data type

VARIOUS DATA TYPES:

L = Literal: Literals are simply alphanumeric characters. For example, a heading within the Report Header may consist of a literal string of characters: CUSTOMER OPEN ORDER LISTING.

E = Data value: Data values are application items that are stored in one of the applications included in the report. For example orDER.Customer is the customer’s name on the order record.

If “E” is selected, you will be prompted to:

* Enter APPLICATION. Item_name -

This is followed by the name of the last application referenced during this report definition process:

* ORDER

Type the item's name or use the "Pull Down" feature by pressing the [HLP] key. The Pull Down feature will function whenever the system prompts you for input of an item name.

The display characteristics of the type "E" data value are as follows:

- An alphanumeric item will be represented by the first letter contained in the item. This letter will completely fill the space allocated on the screen for that item.
- A numeric item will display as a string of 9's. If precision decimal positions are used, the decimal will be seen. If the money type is used, the \$ sign displays.

A = Auto Increment An Auto Increment is a numeric value. It has an Initial Value and an amount to be Incremented or added on, after each use. It is most often used for page or line numbering. For example, if an auto increment cell is found in the Page Header, it will be incremented each time the Page Header block is processed. If it is found in the Report Body, it will be incremented for each record selected for processing.

D = Date: This data type will produce the current System Date in its defined position.

F = Formula: Formulas are the results of arithmetical operations of which only the resulting value is printed. They can be expressions that are evaluated to produce a specific result or conditioned by the familiar "IF" statement so alternate output data can be generated in the same location of the block. Report Data allows formulas so data can be manipulated as records are being processed for printing, thus reducing the amount of data that must be stored in a record. Formulas are very similar to numeric expressions in the Procedural Language.

Rules of Thumb for Creating Formulas

A formula statement can be up to 110 characters in length. A formula statement may NOT end in a semicolon. You may use the assignment operator (: =) if you wish to print and/or temporarily store the result of the formula for subsequent calculations or future printing.

Formulas can be located in the same line number and character position in a block. They will be processed in the order in which they were added to the block, i.e. from the top of the block (as they were entered) from left to right and from top to bottom. This is particularly useful if you want different output to be presented in the same location based on an "IF" condition, e.g. dunning messages on invoices for 30, 60 and 90 days would be different but placed in the same relative position in the block.

The formula can be assigned a Print Attribute of "12" (hidden) to prevent the results from being seen when the block is presented.

Formula Types

There are two different types of formulas that can be used throughout Report Data: numeric formulas and text formulas.

Numeric formulas evaluate to produce a number and can contain any of the following:

- * Numeric data items; types 2, 3, 6 and 7
- * Constants; no commas or \$ signs
- * Operators; * / + -
- * Parentheses; up to 50 levels of nesting
- * Memory Variables; %0 to %29 (See Memory Variables this section)
- * Date functions that evaluate to a number (See Date Functions this section)
- * User prompts defined as (P#) numeric (See this section, Record Selection, User Prompts)
- * String Memory Variables defined as SMV(x, y) or SMV#(x, y) (See this section, Using the SMV)

Text formulas evaluate to produce literal strings and can contain any of the following:

- * Date functions that evaluate to strings (See this section, Date Functions)
- * User prompts defined as (P!) alphanumeric (See this section, Record Selection, User Prompts)
- * String Memory Variables defined as SMV! (x, y) (See this section, Using the SMV)

NOTE: The user is cautioned to pay strict attention to how the various functions are combined so that numeric formulas always contain expressions that evaluate to numeric values and text formulas contain only expressions that evaluate to literal strings.

Special Formula Features

The “IF” conditional formula is of the IF THEN ELSE format. You may attach up to 255 “IF THEN ELSE” statements in the same character location. Only 110 characters are allowed, but individual formulas can be “stacked” on top of each other. The processing priority is first entered, first served.

Formulas may contain logical operator. The use of the AND, OR and NOT can be very useful within a formula. The form must be abbreviated (to conserve space) as follows:

Operator	Symbol to Use
AND	&
OR	!
NOT	- (tilde)

The test for NO data within an application item or the Null condition is another valuable feature. The formula format is identical to that of the Procedural Language:

* If Null(Apname.Iname) then

Blocks may be exited from anywhere within the block. This is accomplished by conditioning the Exit command:

* If (condition) then Exit

If this test is true, the block will not process further data, from the location of the Exit command to the end of the block.

String Memory Variables (SMV) are usable within the Reporter. The function allows the retrieval of data FROM the SMV and the storing of formula and assignment (: =) results INTO the SMV.

In order for the Reporter to properly handle the characteristics of a given item (i.e., numeric/alphanumeric) and treat it correctly, an additional symbol is added to its form. The “#” sign indicates numeric data and the “!” point indicates alphanumeric data. If neither symbol is used, the contents referenced is assumed numeric. The formula would look something like this:

```
%5 := SMV#(3,4) * Order.Qty
If SMV!(x,y) = 'Paid' then . . . .
If Order.Stat = 'Cancel' then SMV(12, 10) := SMV(12, 10) + Order. Amount
```

```
FORMULA      %3 := Order.Qty * 1.5
EXAMPLES:    (Order.Cost +100) / Cust.Num_itms
              (Order.No + %2) * (Cust.No + %1)
              p!1 <--- prints the contents of first user prompt found on the Record
              Selection screen . . . possibly the start date of the report.
              If Order.Stat = 'Cancel' then 'THIS ORDER WAS CANCELED:'
              . . . this would print in columns 1-24 and order. Can_date . . . would
              be defined to start printing in position 26.
              If Null(Order.Phone) then 'NO PHONE!'
              If %A >= 30 & %A <60 then Cntrl.Message1 Else
              If %A >= 60 & %A < 90 then Cntrl.Message2 Else
              If % A>= 90 & %A , 120 then Cntrl.Message3
```

When a formula is entered, the system checks for errors. If an error is detected, the cursor will be placed over the error and an appropriate error message will be displayed. Editing functions such as [DEL] and [INS] are active for changing or correcting formulas.

* **Printer Attribute;** This defines the manner in which your printer will format this particular data. Enter the corresponding printer attribute number from the selection at the bottom of the screen.

NOTE: Printer attributes 1 through 7 must be defined in INSTEAM, and your printer must support each attribute used.

Attribute numbers 8 to 11 are for Custom Print Attributes. These are also defined in INSTEAM and are concerned with special custom attributes supported by your printer.

Attribute number 12, Hidden, prohibits data visibility when the block is processed.

* **Print Format;** This selection pertains to the way in which items appear within the data area. Special TEAM-UP Print Formats will give reports a polished look. The formats available are as follows:

FOR NUMERIC DATA TYPES:

G=General; This format prints the data exactly as it is stored. This is the way you see the data in the Access Data section of Data Manager.

,=Comma; This format prints numeric values with commas inserted. For example, a value of 123456 prints as 123,456.

\$ = Money; This format Places the designated money character set by INSTEAM to the far left of the item data area and places blanks between the money character and the first whole number. For example, a value of 144.04 with an item length of ten is seen as: \$ 144.04.

F=Float\$; This format places the designated money character set by INSTEAM immediately preceding the first whole number and inserts the designated thousand separator. For example, a value of 1144.04 with an item length of eleven is seen as: \$1,144.04.

*** = Pad \$;** This format is identical to \$=Money except that the spaces between the money character and the first whole number would be filled with the asterisks. This is what is commonly known as check protection. For example, a value of 144.04 with a field length of nine, prints as: \$**144.04.

% =Percent; This format multiplies the numeric item by 100 and places the percent (%) sign to the right. For example, a value of 0.05 prints as 5% and a value of 0.0006 prints as 0.06%.

FOR ALPHANUMERIC DATA TYPES:

L=Left justified; Left Justified is the normal default value. Data is presented exactly as the item is placed in the block.

C = Center justified; The data is centered in its designated area. For example, if an item has a starting character position of one, is 40 characters in length and the data stored in the item consists of 20 characters, then there would be 10 characters to the left and 10 characters to the right of the 20 characters of data when presented.

R = Right justified; The last character of an item's data is placed to the far right of the item's designated character position in the block.

N = Not Justified; Data may be placed randomly within the data block. The report generator will not alter the designer's placement of data.

* Field Length; When specifying a data type of "E, F or V", the system will display the default value length of an item and prompt for a response. Press [RET] to define the entire length of an item. To change the displayed length, type a different value, then [RET].

* Precision; For type "E and F" numeric items, an additional prompt will ask for decimal precision. Whole numbers can be reported with precision and decimal numbers can be presented without their decimal values.

Questions at Conclusion of Block

At the conclusion of data entry and after depressing the [ESC] key to exit the block definition, you are asked several questions that describe the manner in which you want the block to be processed.

* Enter printer attribute for this Block

The numbered options (from 1 to 11) associated with this step are identical to the previously discussed options for the Print Attribute of a block item. The number selected determines the code sent to your printer just before this block is to be printed. The number is canceled after the block is printed. Print attributes of data items within the block may override this attribute or work in conjunction with it, depending on which attribute you use and how your printer handles these attributes. Consult your printer manual to gain an understanding of how various attributes interact.

* Should blank data lines be printed

The key word in this prompt is data. If any block line contains only null data items, the print line will not be processed. This eliminates blank lines in the output.

EXAMPLE: If you defined three lines to be printed in the block--line 1 = Name, line 2 = Address, line 3 = City--and a record is selected that has no data entered for Address, it can print in one of two ways:

Summary Block Capabilities

Summary blocks have special capabilities not available in other blocks. They are unique in that, when an application item is defined in the block, the summary will perform the appropriate calculations based on which summary block contains the item. For example, if an item is defined in the Page Summary block, the value of the item will be considered for each record chosen for processing and the proper summary results will be presented when the Page Summary is processed. If the item is defined in the Report Summary area, then the summary results would be accumulated and presented when the Report Summary block is processed.

The results of some predefined types of calculations can be defined and performed as each record is processed. The available arithmetical computations are:

* A =Average

* M=Min (minimum)

* C =Count

* X= Max (maximum)

* S =Summation

* D=Data

Numeric application data items can be averaged, counted or summed They can report minimum or maximum values. Count and Data functions may be performed on any type of data item.

NOTE: The computations are performed on the specified data item each time a record is processed REGARDLESS OF WHETHER THE SPECIFIED ITEM IS PRINTED IN THE REPORT BODY BLOCK.

If an item is placed in the Summary block, but not in the Report Body block, the Summary block computation will contain the results of all records processed. The number of records included in the calculation depends on which Summary block is used.

The Predefined Computations

Average: While adding or changing an item in a summary block, choose the letter A when prompted for what type of calculation. This causes the average value of the data contained in the specified application item to be printed when the summary block is processed. The Average is calculated based on each record processed. This prompt is returned if 'E' was entered at the prompt: Identify Data Type.

Count: While adding or changing an item in a summary block, choose the letter C when prompted for what type of calculation. This causes the Count to start at zero, increment by 1 for each occurrence of the specified application item and print the count when the summary block is processed.

Summation: While adding or changing an item in a summary block, choose the letter S when prompted for what type of calculation. This causes the Sum of the data contained in the specified application item to be printed when the summary block is processed. The Summation is calculated based on each record processed.

Minimum; While adding or changing an item in a summary block, choose the letter M when prompted for what type of calculation. This causes the smallest value of the data found in the specified application item to be printed when the summary block is processed. The Minimum is calculated based on each record processed.

Maximum; While adding or changing an item in a summary block, choose the letter X when prompted for what type of calculation. This causes the largest value of the data found in the specified application item to be printed when the summary block is processed. The Maximum is calculated based on each record processed.

Data; While adding or changing an item in a summary block, choose the letter D when prompted for what type of calculation. This causes the value of the data contained in the specified application item to be printed when the summary block is processed AND IS THE VALUE OF THAT ITEM FROM THE LAST RECORD PROCESSED.

NOTE: If Sub Report Summaries are involved, the D=Data type summary item is the data from the record processed prior to the break point occurring (see later discussion on SUB REPORT DESCRIPTION, Sub report summary).

7- Page Summary

The Page Summary block, if defined, is the last block to be printed on each page. If the block contains two lines, then the last two lines printed on each page would be those defined here. Use the page summary to include page numbers utilizing the auto increment data type. You may also position page totals into pre-defined areas of a pre-printed form such as an invoice. All totals, averages, etc., are calculated on a page-by-page basis. However, any type of data may be placed in the block.

Remember that TEAM-UP keeps track of the number of lines printed and knows when to stop to allow sufficient space at the bottom of the report to process the Page Summary.

8- Report Summary

The Report Summary is the last block processed for a report. It functions very much like the Page Summary block except that all totals, averages, etc., reflect every record processed during the entire report. If a Page Summary is defined, the Report Summary will be printed on the following page.

Sub Report Description

This part of TEAM-UP's Report Data Operations gives the user sophisticated reporting capabilities by allowing the report to be broken down into sub-parts that match the report order (Design menu selection #1). These sub-reports are controlled by naming the corresponding application item used in Report Order under the corresponding Sub report Breakpoint (Design

menu selection #9). For each defined Sub report Breakpoint, you may have a corresponding Sub report Header and a Sub report Summary. You can use the Header, the Summary or both.

9- Sub Report Breakpoint

Subdivisions of a report are defined through sub report breakpoints. The function of adding, changing and deleting breakpoints is essentially the same process as Report Order. To Add or Change sub report breakpoints, name the item by typing it or pulling from the help list. Tell TEAM-UP how many characters of the item are required to detect a “break” or change in the item’s value. To Delete a breakpoint item indicate its number from 1 to 9. In most cases, the selections in Report Order and Sub report Breakpoint are exactly the same, as it is customary to break reports into parts (or sub-totals) in the same order in which they are sorted. After establishing the Sub report Breakpoints, you will be able to design a Sub report Header and a Sub report Summary for each breakpoint defined.

10 - Sub Report Header

Before you enter the Sub report Header block, you are presented with a screen that displays the breakpoints that were defined in the Sub report Breakpoint selection #9. You may have a Sub report Header for each of these breakpoints; however, you need not have any at all.

To choose a header’s breakpoint, type the appropriate number of that item and press [RET]. The block grid, which is identical to all previously discussed blocks, shows the possible row and column positions for data as well as the Add, Change, Delete and Copy options. The header block prints each time the defined Sub report Breakpoint changes. After entering the pertinent data and answering the prompts previously discussed under Questions at Conclusion of Block, you are prompted for:

* Should this block be printed at the top of a page

This question allows the Sub report Header block to be printed at the top of a new page EACH TIME THE DESIGNATED BREAKPOINT ITEM DATA CHANGES. You may also enter a number between 1 and 9. This will cause the system to check the remaining printable lines on the page and group the data blocks accordingly.

II - Sub Report Summary

From the screen displaying the defined breakpoints (Design menu #9), choose the breakpoint to which this summary belongs. This block prints each time the breakpoint item data changes. Any type of data can be placed in this block. As this is a Summary block, data values can be averaged, summed, counted, etc. After entering the pertinent data and answering the prompts previously discussed under Questions at Conclusion of Block, you are prompted for:

* Should this summary be printed at the bottom of the page

Answering YES to this question will place this block's information at the bottom of the printed page, emulating the page summary function. Whenever this summary is printed, a page summary will not be printed on that page. This allows the printing of two different page summaries, depending on the placement of the report.

EXAMPLE: Application = SALES
Report Order = Region_number
Sub report Breakpoint = Region_number
Data = Region_name; CHICAGO & NEW YORK

The following takes place:

- * The Sub report Header prints when the first record containing CHICAGO is encountered.
- * Then, a Report Body block prints for each record where CHICAGO is the region.
- * When the first record containing NEW YORK is encountered, the Sub report Summary defined for Region_number (if there is one) will process. Upon its completion the Sub report Header for Region_number will print containing the data from the NEW YORK record which caused the "break" to occur in the breakpoint item.. .Region_number.
- * Then, a Report Body block prints for each record where NEW YORK is the region.
- * Etc.

Miscellaneous

This section contains a number of important Report Data capabilities of a general nature.

12- Change Report Name

Any report name may be changed by using the Change report name Design menu selection. Report names are limited to 16 characters in length (including blanks). Choose this selection and enter the new name at the prompt. Press the [ESC] key to abort your choice.

13- Change Report Description

The description of a report may be changed through this Design menu selection. Report descriptions consist of any ASCII character that can be typed and limited to 110 characters in length. Enter your new description at the prompt or press [ESC] to abort this menu choice.

14- Update Printed Record

This feature of the reporter allows application data items to be updated after a record has been processed during report generation.

The item to be updated maybe in the main application OR IN A RELATED APPLICATION. The item may be updated with:

* literal string * another data item * formula * date * SMV value

Applications may be updated as the records are being reported. An example is updating an order application to prevent duplicated processing after an invoice has been printed. Up to nine (9) data items can be updated each time a record is processed. Updating can be controlled through formulas, if used.

NOTE: KEY ITEMS CANNOT BE NAMED AS AN ITEM TO UPDATE!

(A)dding, (C)hanging and (D)eleting is performed in an identical manner throughout the Report Data module. Press [ESC] to exit process.

15- Miscellaneous Parameters

This menu selection allows you to set special parameters for a report. These parameters includex

- * security
- * overall page and label size definitions
- * special pre-defined generation parameters
- * report generated processing prompts for the operator

I - Set Security

Each application created by TEAM-UP has security levels (0-9) for limiting the various functions performed against the application. Printing is an application function that can be limited based on the operator's security level. However, a user's security level must be equal to or greater than the application's Print security in order for the operator to print the report, either from the Access Data screen or the Reporter.

The Reporter can enforce security on a report in two different ways. The reporter can: (1) verify a number between 0 and 9 when prompted for Security level required to change this report and (2) verify a number between 0 and 9 when prompted for Security level required to generate this report. The change security level also applies to the right to delete a report.

A user's security level must first be equal to or greater than the application's functional PRINT security level to list the application's reports, AND second, be equal to or greater than the

Report's Change or Generate security levels to operate within the Report Data module on the named application's reports. It is possible for two users to have access to an application's reports. However, based on their security levels, one user could be limited on which reports he could execute or change.

2- *Set Page/Label Size*

You may use Report Data to generate mailing Labels or regular printed reports. Your response to the prompt

* Will this report be generating labels

will determine whether you are queried for label or page parameters.

Page Parameters

* Enter MAXIMUM # of lines that will fit on a page. . . [66]

The default is 66 lines; however, you can enter any number from 1 to 255. Adjust this number to fit any form you may be using.

* Enter the desired number of lines to print per page . [60]

This number should always be less than or equal to the maximum # of lines per page above. The default is 60 lines. The difference between the maximum number of lines per page and this parameter will be divided in half to provide automatic top and bottom page margins. Adjust this number to your needs.

* Maximum line length of your printer [80]

This number should be less than or equal to your printer setup. When this length is reached, any characters remaining to be printed on the line are wrapped to the next line. The internal auto wrap feature forces a right margin when printing long text.

NOTE: IF THE NEXT PROMPT FOR THE NUMBER OF CHARACTERS IN THE LEFT MARGIN IS TO CONTAIN ANYTHING OTHER THAN A ZERO, THAT VALUE NEEDS TO BE ADDED TO THIS MAXIMUM LINE LENGTH TO PREVENT WORD WRAP.

* Enter the number of characters in the left margin . . [0]

The default setting is zero and causes the data to be printed exactly as placed in the blocks. Using a number greater than zero forces a left margin, offsetting the data in the blocks from left to right by that amount. Also, by using a number such as 10 and setting your printer maximum

line length for 10 to 15 characters narrower than your paper, you can print data with right and left margins.

* Use Form feeds or Spacing to find top of form (F/S) . [S]

The default for this prompt is “S” for Spacing, which counts the number of lines processed per page and issues the appropriate number of lines to reach the top of the next page. **IT IS RECOMMENDED THAT YOU USE THE DEFAULT UNLESS** block printer attributes that cause various blocks to print in different numbers of lines per inch are being used. If the Form feed option is used, you will need to do a bit of experimenting. This option is provided for those with special printing requirements.

* Pause on page break (for single sheet report) [N]

The default for this prompt is “N” for No. This means that continuous forms are being used. Change this value to “Y” for individual form feed.

* Should form feed be sent at end of print. [Y]

The default for this prompt is “Y” for Yes and assumes continuous forms are being used and the paper advance is appropriate.

NOTE: The printing of labels usually does not require a form feed upon completion.

Label Parameters

When you respond with Y to the prompt:

* Will this report be generating labels

you are asked for a different set of parameters than when choosing N.

This option can be used to generate mailing labels. Multiple labels are permitted provided the characters-per-line limit of 255 is not exceeded. If the data on a line exceeds the length of the label, then the data is truncated. **THE INTERNAL AUTO WRAP FEATURE IS NOT INVOKED.**

Report Body blocks are generally used to produce labels. However, there are special provisions that allow combining Page reporting and Labels into one report.

* How many labels across each page [1]

This can be any number, but remember the 255 character limit mentioned above.

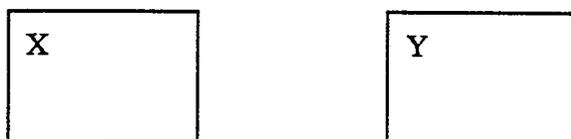
* How many lines from top of one label to top of next . [10]

This can be any number. If using continuous form, use a printer ruler to determine the correct number.

* How many characters wide is each label. [40]

This is the number of characters from the starting position of the first label to the starting position of the next label. Again, use your printer ruler to help determine the number of characters.

For example, if you have two labels as shown below:



The number of characters starting at the X in the first label up to, but not including, the Y in the second label is used to determine the character width for each label.

* Which line of the label should text be started on . . [1]

This option eliminates the need for the Body block to be designed (or aligned) line by line relative to the position each printed label line. If the label size being used allows ten printed lines and only six lines are necessary, do not begin line definition on line 3 to center the label. Define all six lines and use this parameter to start printing on line 3--leaving lines 1 & 2 and 9 & 10 blank.

* Should blank lines in text to be printed [N]

The default is N for No. Using the default gives a neat, professional look to labels. It eliminates the printing of any lines which contain "blank" data and pulls up any following lines.

* Do you want to print on only part of the page [N]

The default is N for No and should be used if all the report does is print labels. If Y is chosen, the reporter visualizes the report as having Headers and/or Summaries as well as Labels--or data printed in the form of labels. The following description illustrates this choice:

- 1- The Sub report Breakpoint item is the Order_number.

2- *The* top part of the invoice is defined in the Sub report Breakpoint Header and will print at the top of new page when a new order number is read.

This would include sold_to and ship_to name & address, dates, customer_number order_number, invoice_number, what was ordered and the amounts with totals.

3- After the Sub report Breakpoint Header prints, the Body block would be processed.

Since our report is defined as generating labels, then the Body block is treated as labels.

4- Each record printed in the Body block is from another application that contains a single record for each serialized TEAM-UP system that is to be shipped with the order.

Each serial number shipped will print on the lower half of the invoice from left to right, top to bottom. Thus, allowing more items to print than if they were simply listed in a column.

* Should form feed be sent at end of print. [Y]

The default for this prompt is “Y” for Yes and assumes that a printer form advance is appropriate when the job is complete.

3- *Set Generate Parameters*

Defining report generation parameters from this selection “allows an operator to bypass the generation prompts. Any or all of these parameters maybe assigned an execution default value; i.e. a value that is preset during report design so prompting during report generation is not needed. When the default for a prompt is not changed and remains a dash [-], it causes that prompt to be displayed when the report is generated and will require a response from the operator.

During the design process, the prompts are as follows:

* Enter the drive for temporary sort files, if needed . [-]

Reports requiring a sort utilize a number of temporary files that are associated with the sort. By placing a drive designator in response to this prompt, you are assured that these files will be placed on a drive with sufficient space.

* Enter the destination of this Report (-, S, P, F). . . . [-]

The responses are: S = Screen P = Printer F = File

Selecting S or P will not require prompts other than those explained below. If the report is to be sent to a file, additional prompts will be presented:

* Enter the filename this report should be placed in. . []

The form used to type the filename should include the TEAM-UP drive letter if the desired drive is not the default drive. (EXAMPLE A:Test.exp; an ASCII file named Test.exp will be exported from the TEAM-UP reporter to the A drive.)

NOTE: Data is NOT APPENDED to an existing file. The file is actually re-created and re-written each time.

HOWEVER, THIS IS ONLY TRUE WHEN THE FILENAME IS DESIGNATED DURING THIS DEFINE PROCESS. IF THE [] (NO FILE NAME GIVEN) REMAINS AS THE FILENAME, THE OPERATOR HAS THE DUTY TO NAME THE EXPORTED FILE WHICH CANNOT BE AN EXISTING FILE AND, THEREFORE, WILL PROTECT FILES FROM BEING DESTROYED.

SPECIAL NOTE: If a file name is given at this prompt, the only valid way to remove any future reference to the file is to respond with a dash (-) when asked for the file name. This will return the default value to the appropriate []. A SPACE CANNOT BE USED!

* Enclose non-numeric fields in quotes and insert a comma after all but the last field of a line (n/y).[Y]

This is equivalent to delimiting data. TEAM-UP provides an automatic division between data items as they are selectively reported.

EXAMPLE: To export customer data from the CUSTOMER application, the items are defined as follows:

Define in	Item Name	Lgth.
Col 1 =	Customer_number	-> 4
Col 2 =	Customer_name	-> 12
Col 3 =	Customer_address	-> 15
Col 4 =	Customer_balance	-> 7

The first and subsequent data records are written to the exported ASCII file (delimited or "Y") as follows:

1001, "John Jones", "123 Main St", 350.00, etc.

However, if the data needs to be delimited by a different method, then the report creator has to insert the needed “delimiters” during the definition of the appropriate block. Using the same application, let’s see how this works:

Col 1 = Customer_number
Col 2 = ‘:’ . . .a literal colon to separate data items
Col 3 = Customer_name
Col 4 = ‘:’
Col 5 = Customer_address
Col 6 = ‘:’
Col 7 = Customer_balance
Col 8 = ‘*’ . . .an asterisk to mark the end of a record

The data records are written to the exported ASCII file as follows:

1001:John Jones: 123 Main St:350.00*

Finally, if delimiting is not requested OR designed, the exported record will look like this:

100 IJohn Jones123 Main St350.00

To keep trailing blanks from being trimmed, DO NOT OVERLAP THEM! Like this:

Define in	Item Name	Lgth.
Col 1	= Customer_number	-> 4
Col 5	= Customer_name	-> 12
Col 17	= Customer_address	-> 15
Col 32	= Customer_balance	-> 7

Then the data records are written to the exported ASCII file as follows:

1001John Jones 123 Main St 350.00<4> <12> <15> <7>

General Note

THE PROCESS OF WRITING A DOS FILE FROM THE REPORTER WILL TAKE ON THE FOLLOWING CHARACTERISTICS:

1. Each record written will end with a carriage return/line feed character.
2. The DOS end-of-file marker, ^Z, will be present.

* Should the generation of this report be abortable . . [Y]

If you choose Y (Yes), the operator can abort the report generation process by pressing the [ESC] key. If you choose N (No), the operator will NOT be able to abort the report generation process by pressing the [ESC] key.

NOTE: Men using Update Printed Record (see this section, Design Menu option 14- Update Printed Record), Your report should probably not be aborted.

0=None	1 =Underline	2 =Italics	3= Sub
4= Super script	5=Expanded	6= Compressed	7=Bold
8-11 =Custom	12=Hidden		

* Enter the printer setup sequence for this report. . . [0]

This is a sequence sent to the printer before report generation begins. It will remove the necessity to define the printer setup sequence for each individual item or an entire block. If the report needs to be totally compressed, indicate here and the entire report will be printed in compressed mode.

Enter the number corresponding to the desired attribute as defined in INSTEAM.

* Negative number display: 0 = -NN, 1 = NN-, 2 = (NN)

The default print format for negative numbers is: -123.45. If, however, there is a need to print such numbers in the standard accounting form, then the answer [2] would allow the following print format: (123.45).

HINT: When defining the allocated block space (FIELD LENGTH) for negative items, provide one additional space to accommodate the minus sign and two additional spaces to accommodate the parenthesis.

4- Set Start/Stop Key Prompts

* Utilize start and stop keys, if possible [Y]

The response to this prompt is Y or N. It is directly related to the Design Menu choice #1 - Report Order. When the first sort item under Report Order is a key, using the start and stop keys hastens the generation process. The range of records which will be processed based on the Record Selection Criteria will be narrowed.

EXAMPLE: The generation of a report from the application STATES has State as the first sort item. Using Florida as the start value and New York as the stop value causes all the records prior to Florida and after New York to be skipped. This means that only the records from Florida up to and including New York have the selection criteria applied to them.

If possible, respond with Y (Yes) to speed up the generation process as described above. A response of N causes the selection criteria to be applied to each record in the application and no further questions will be presented for response at this prompt. If the decision is made to utilize Start and Stop key values, you will be requested to respond to the following:

* Prompt for start key [Y]

If the answer is Yes, the operator will be requested to respond to a prompted message before report generation begins. The response can be any value typed or an SMV location.

* Message for the start key []

If no message is typed, then the system will provide its own message to the operator. However, if a special message is desired, type the request in your own words. If the answer is No:

* Default value for start key []

This value will appear as if a message was presented. It can be any value typed or an SMV location.

THE VALUE WILL ALREADY BE SET WITHIN THE REPORT DESIGN AND THE OPERATOR NEED NOT RESPOND TO ANY REQUEST.

* Prompt for stop key [Y]

If the answer is Yes, the operator, before report generation begins, will be requested to respond to a prompted message. The response can be any value typed, the word START to use the start key value or an SMV location:

* Message for the stop key []

If no message is typed, the system will provide its own message to the operator. However, if a special message is desired, type the request in your own words. If the answer is No:

* Default value for stop key []

This value will appear as if a message was presented. It can be any value typed, the word START to use the start key value or an SMV location.

THE VALUE WILL ALREADY BE SET WITHIN THE REPORT DESIGN AND THE OPERATOR NEED NOT RESPOND TO ANY REQUEST.

5-Exit

The Exit selection will allow you to return to the Design Menu.

Special Features

This section contains some of the Special Features mentioned in other areas of Report Data documentation.

Pull Down Items

There is NO need to memorize application item names when working in Report Generator. Whenever you need to enter an item name a “pull down” list of all the items in the main or related application is available.

To use the “pull down” list, position the cursor after the period following the application name and press the [HLP] key. When the items are displayed, pressing the [ARROW] or [TAB] keys moves the highlight from one item to another. Move the highlight over the desired item and press [RET] to select that item. To confirm your selection press [RET] again. Use the [ESC] key to cancel your selection.

User Prompts/Runtime Variables

In the Record Selection option of the Design Menu, you may enter messages that prompt the operator for a reply rather than entering a specific constant value for a test condition. The user’s response to this message is taken as the operand to use in performing the Record Selection, providing for variable input as opposed to built-in, fixed values. For more details, see Record Selection under the Design Menu.

Date Formulas & Functions

Dates are defined within TEAM-UP’s INSTTEAM program. They can be either: mm/dd/yy or dd/mm/yy. The date references on the following pages indicate one of the forms specified above. What form you choose will not influence how you use the Date functions; TEAM-UP handles that internally.

A Formula is an expression that can be evaluated to achieve a specific result. Report Data allows formulas so your data can be manipulated as the data is being processed for printing. Text formulas evaluate to produce literal strings and can contain special date functions to produce specially formatted reports. Date functions are used for conversions of dates between their numeric form and their literal form. Their numeric value can be in either an application item or the system date (SDATE).

Special Date functions that return numeric values are:

DAYS(date)	DAYS('01/31/85') ---> 2588
DATE(numeric expression)	DATE('2588') ----> 01/31/85
DATE(DAYS(SDATE) + 10) -->	SDATE = 01/31/85 then DATE would equate to 02/10/85
DOW(date)	DOW('01/31/85') --> Thursday
MONTH(date)	MONTH('01/31/85') ----> January
DAY(date)	DAY('01/31/85') --> 31
YEAR(date)	YEAR('01/31/85') --> 1985
RULE: If year > = 78, returns 19xx if year < 78, returns 20xx.	
MONTHN(date)	MONTHN('01/31/85') ----> 1
SYEAR(date)	SYEAR('01/31/85') --- >85

Memory Variables

There are 30 numeric memory variables that maybe used for each report. A memory variable is like a scratch pad used to store intermediate calculations during the running of a report. These variables are manipulated through the use of formulas and are identified by a % (percent) sign followed by a number from 0 to 29. Thus, the variables are %0, %1, . . . %29. These variables are available for use in any of the blocks, but are NOT STORED FROM ONE REPORT GENERATION PROCESS TO THE NEXT.

All Memory variables are initialized to zero at the start of the report generation process. You can manipulate these variables in a number of ways as your report processes. Use of a hidden print attribute will enable the formula and its results to be invisible. To print the contents of a variable, it must be defined in a formula and NOT hidden.

Establishing Relationships Between Applications

TEAM-UP's Report Data manager allows you to merge or join, data from up to 10 applications- the main application and nine related applications. Each report associated with an application can contain data from 10 different applications. The main application is the one under which you find the report listed.

Related applications are those that are brought into the report by establishing a "link" (common data item such as customer number, invoice number, etc.) from one application to a key item in another. During the report definition process, you will be prompted for an item name:

* Enter APPLICATION. Item_name - ORDER.

If the application name displayed is accurate, the item name can be typed or pulled down. However, if the data required is to come from some other application or from a different record in the same application, you may use the [BKSPCE] key to erase the displayed application name. Type the appropriate application name followed by a dot (period) and the item name:

* Enter APPLICATION.Item name - CUSTOMER. ADDRESS

If data from a different record within the same application is needed, you can create another link to the main application, thus treating it as though it were a related application. Append an @ sign to the end of the application name to distinguish between different links (e.g. apname@, apname@1). This procedure can be used to create multiple links to any application accessed by the report. If the relationship between the two applications has NOT been established, you will be prompted for the relationship:

* Define Application Relations

Assume NO relationship has yet been established and that our applications areas follows. The ORDER application does not contain the customers address as stored data. It must retrieve the address data from the CUSTOMER application when printing invoices. The common “link” is the customer number. For this example, the screen display prompts are in small print and the responses are in BOLD print and underlined.

The prompts and responses are:

* Enter the application that CUSTOMER links to: ORDER

This is similar to the Access command within the Procedural Language.

* Enter item name from ORDER. Cust#

This is equivalent to the Keydata command within the Procedural Language. It is looking for the data from the main application that will be used to retrieve (link to) the CUSTOMER application.

Literals or SMV locations can be used as the KEYDATA. To specify a literal, enter it enclosed in single quotes where you would normally enter an item name. To specify an SMV location, enter SMV(N,N) at the prompt, where N is a number stating the offset or length. Although these data types do not come from an application, you must still specify a source application at the above prompt. Use the main application as the source.

The SMV() form of KEYDATA allows the user to do dynamic joins as the report is generated. Formulas elsewhere in the report can be set up to assign the needed data to the SMV location.

Since Record Selection is the only report function performed before the link or join is done, this is the appropriate place for this action to occur. Add the formula as though it were selection criteria and remove its reference from the logic line.

* Enter KEY item name from CUSTOMER. Cust#

This is equivalent to the Key command within the Procedural Language. It is looking for the KEY Item in the CUSTOMER application that the Keydata is to match.

* Enter the type of relationship [0]

0 = 1 or more	1 = 0 or more	2 = o n l y 1
3 = 0 or more w/null	(Add 4 for partial)	

There are actually 8 different choices which can be made 0 - 3 and 4 - 7.

When processing related applications it is necessary to know under what conditions the related records will or will not be found. The response to this prompt will be:

0 - if at least one or more related records will be found for each processed main application record.

If no record is found, the record from the source application will be included in the report.

1- if none, one or more than one related record will be found for each processed main application record (also see #3 below).

If no record is found, a null record is supplied by the reporter.

2- if there will be only one related record found for each processed main application record.

If no record is found, a null record is supplied by the reporter.

3- if none, one or more than one related record will be found for each processed main application record.

If no record is found, a null record is supplied by the reporter. If a record is found, all duplicates are read and included in the report. Once they are all located, one more null record is supplied by the reporter.

This type of relationship is helpful when Record Selection is being utilized to exclude certain records in the related application. If all related records are excluded, this also excludes the main record. If this is not desirable, you can use this relationship type to add a null record to the

found records and then add selection criteria to insure that the null record is included in the report, thus ensuring that the main record will also be included.

EXAMPLE. Logic 1 ! 2
1 INVOICE.Printed NE Y 2 INVOICE.Inv# EQ -

Condition 1 excludes all printed invoices. Condition 2 includes invoices where the invoice number is null. The logic line (1 ! 2) provides for the inclusion of the recorded set if the invoice has not been printed or the invoice number is null.

Choices 4,5, 6, & 7 indicate that the entire key item data may not match and that a partial key match is sufficient for record selection. This is what is meant by Add 4 for partial. It is the same as 0 - 3, only the number four is added to 0, to 1, to 2 and to 3 for the partial key value to be acceptable.

Now the relationship between ORDER and CUSTOMER is fully established. Any future reference to the CUSTOMER application will NOT produce any additional prompts. Once the relationship has been set, enter the application name and item name at the required position.

To change established relationships, see the Design Menu choice #3, Edit Relationships.

Creating Reports for Applications in Use

Reports for inaccessible applications can be developed by following the instructions listed below:

1. Copy the application's .TPR file to a temporary application name using the COPY function. Throughout this procedure, the original application will be referred to as AP. 1 and the temporary application will be referred to as AP.2.
2. Design the new report in AP.2 using the instructions given in this reference section. Test the report's integrity by enlarging the application, adding data and running the report. The report is now ready when AP. 1 is available.
3. Use the COPY function to copy only the report.
4. Use the DOS COPY command to copy the new report into AP. 1's report directory.
5. After copying the report back to AP. 1, use TEAMUP's RENAME function to rename AP. 1 to a temporary application name. The message 'WILL DELETE .TXR AND .TBO' will be displayed. Don't worry, these files will be re-generated when you evaluate later in this procedure.
6. Now that you have renamed the application, rename it back to the "original" AP. 1 application name. This will take care of the application names inside the new report.
7. Evaluate the new report and any batch and transaction PL's if they exist.
8. Use TEAM-UP's DELETE function to delete the AP.2 application.

New reports can be created for an application (apl) from an existing report from another application (ap2) by performing step 3 through 7 above.

Miscellaneous

Here are a few additional miscellaneous facts that can be helpful in Report Data:

- * Consideration of the Start and Stop values of key items takes place before Record Selection.
- * Record selection process occurs before Sorting.
- * Making a change to an application in the Create/Change or Define portion of Data Manager necessitates an evaluation of all reports that access that application.
- * The maximum number of defined auto increment cells is 40 per report.
- * The maximum number of pre-set computations for all Summary blocks is 40 per report. For example, 2 in Breakpoint Summary, 5 computations in Page Summary and 1 in Report Summary, equals a total of 8 computations used. These computations consist of either a SUM, an AVERAGE, a MINIMUM or a MAXIMUM.

Glossary

APPLICATION A collection of work processes and data that combine to accomplish a specific group of tasks such as payroll or inventory control.

ASCENDING ORDER Ordered from lowest to highest value. Numeric 0 to 9, and alphabetic A to Z.

ACCESS: The operation of seeking, reading and writing data from the disk.

ALPHA ITEM: A data item that may only contain characters A through Z.

ALPHANUMERIC ITEM: A data item that may contain any printable character.

ASCII: An acronym for American Standard Code for Information Interchange. This is the code used on all microcomputers.

ATTRIBUTE A descriptive characteristic assigned to a particular item. This characteristic controls how the item is displayed on the video monitor. Attributes can be reverse video, underline, color, etc.

AUTOLOAD: The process of automatically placing the user in a preselected place within the TEAM-UP system at sign-on time.

BACKUP: The process of copying an application's files, etc., to another disk as insurance against possible failure or loss of the original.

BATCH PROCESSING: A technique by which large amounts of data can be processed. Usually used when a similar change must be made to many records, such as adding 10% to the retain value of inventory items.

BLOCK: A portion of a report.

BREAKPOINT: The point at which the sub-report data value changes. A breakpoint is said to have occurred when the contents of the breakpoint data item changes from one record to the next.

CALCULATE: To perform a predefined arithmetic computation.

CHARACTER: A symbol that can be input from the keyboard. A character can be a letter, number, special symbol or blank space.

COLUMN: A number that indicates the starting horizontal position on either the video monitor or the printer. Columns increase from left to right, with one character occupying each column position.

COMMAND: An instruction given to the computer to carry out a specific function such as ^E to Enter a record.

COMMAND LANGUAGE Same as Procedural Language. See **PROCEDURAL LANGUAGE**.

COMMAND LINE The first ten positions in the upper left hand corner of the Access Data screen.

COMMENT ITEM Strings that are displayed on the screen only for the purpose of information. No data is stored in this type of item.

CONDITION A restriction or limitation that is applied to an operation such as selection of records.

CONSTANT: A value that does not change during an operation. Constants can be literal strings or numeric values.

CONTROL KEY: A key that when depressed in conjunction with another key that assigns a different function to the second key. The Control key is designated by ^. Access Data interprets ^E to mean Enter a record.

CTRL Reference to the Control Key. See **CONTROL KEY**.

CURSOR. The visible marker on the video monitor that indicates the current position.

CURSOR ADDRESSING: A technique of moving the cursor to a specific point on the screen. There are two types of cursor addressing—direct and relative. Only terminals that use direct cursor addressing can run TEAM-UP.

CURSOR DRIVEN: The cursor controls the next place on the screen where the user can enter data.

COPY: To make an exact duplication of a file or application on a different disk drive.

DATA CASE: Data can be written in capital letters or lowercase letters.

DATA FIELD: A grouping of related characters such as Name, Address, etc.

DATA FILE The file holds all the data entered for a given application. This file has the name of the application and the extension .TDR. Free record space in this file is kept track of and reused by TEAM-UP.

DATA ITEM: Has a name and data associated with its data field which is stored in a record of the data file.

DATA REDUNDANCY: A problem when for operational reasons, or to overcome DBMS deficiencies, data must be duplicated in two or more applications. TEAM-UP has the ability to selectively eliminate Data Redundancy. See NON-STORED DATA ITEM.

DBMS: The acronym for a Database Management System.

DECIMAL PLACE The number of digits to the right of the decimal point. TEAM-UP allows a maximum of four decimal places.

DEFAULT: An option that was automatically assigned by TEAM-UP or previously assigned by an operator. This value can be left as is or changed.

DEFAULT DRIVE The drive from which you executed the present program.

DELETE: To remove a record that is stored in an application.

DELIMITER: A character used to set off or identify to the computer a specific value. Usually used to separate data fields in a report sent to a file which will be read by another program.

DESCENDING ORDER: Items ordered from highest to lowest value. Alphabetic items from Z to A, numeric items from 9 to 0.

DESIGN To lay out the format of an application in Create/Change.

DIF FILES: Data Interchange Format files; a standard file format which can be read and written by most spreadsheet programs. This format can also be read by the optional Import Data program.

DIRECTORY: The catalog of files kept by the operating system on the disk.

DISK BALANCING: Maintaining your disk in such a way that there is room to extend applications and have space for temporary files. It can also refer to moving files which have a high activity rate to different disks to improve performance.

DOS: An acronym for a Disk Operating System.

DRIVE: An indicator that tells the location of a particular file. The operating system drive tells the physical location of the drive to the computer. The drive indicator used in the TEAM-UP Path file is a logical indicator. The TEAM-UP Path file connects that drive indicator with a particular network server, disk drive and directory.

DYNAMIC: Subject to change at any time.

END OF FILE: EOF, a specific character that is written as the last character in a file to signify the end of data.

ENCRYPTION: Changing the data in a file in such a way that it is no longer meaningful without reversing the process. This protects the data from being read at the operating system level.

ENTER: A function that takes the data written to the screen by the operator in Access Data and makes that data part of an application data file.

ESC: Symbol for the escape key.

ESCAPE KEY: The key TEAM-UP interprets as a “stop whatever is in progress” request.

EXPRESSION Any valid combination of data items and/or constants to form a result.

EXTENSION Refers to the three characters that follow the period in a file name. The extension, by convention, is used to signify the type of file.

EXTRACTED DATA: Data that is pulled from a related application.

FIELD: A subdivision of a record. The data associated with an item name. A stored or non-stored data item that can contain data values.

FIELD NAME Same as item name.

FIELD TYPE: Same as item type.

FILE A collection of related data records stored together on the disk.

FILE MAINTENANCE Work done on a file to keep it in usable condition. Maintenance can be enlarging a file, making backup copies, etc.

FILE NAME: The name assigned to a collection of related records. The file name has two parts. In TEAM-UP the first part is the application name with which the file is associated and the second part, the extension, signifies the type of file.

FIND: To locate a record/records in an application that meet the stated conditions.

FORM FEED: A printer command that causes the printer to advance to the top of the next page.

FUNCTION A particular process to be completed by the computer. Functions are automatically invoked in TEAM-UP.

FUNCTION LINE See **COMMAND LINE**.

FULL ALPHA: Data item field must be completely full with only the characters A to Z.

FULL NUMERIC: Data item field must be completely full with only numeric data.

FULL MONEY: Data item field must be completely full with only numeric characters and a \$ sign.

HOME POSITION Upper left corner of the screen.

IMPORT: To move data into a TEAM-UP application from a foreign source file such as DIF files and ASCII files.

INDEX FILE: TEAM-UP uses the Index file to rapidly find information in sorted order. This file is maintained automatically and dynamically with every change made in the data file.

ITEM: The elements that make up an application record. An Item has a name with which it is to be referred. It may or may not be associated with a data field. There are three types of items: comment items, stored data items and non-stored data items.

ITEM DATA: Same as field.

ITEM LENGTH: The maximum number of characters that the item field can hold. Item length is the number of underscores assigned in Create/Change.

ITEM NAME: The name associated with a particular item by which you identify that item in TEAM-UP.

ITEM TYPE A characteristic that controls the kind of characters that can be placed in a field. There are seven different types of items in TEAM-UP.

INTERFACE The interaction between the user and the computer or between two computer programs.

KEY: Same as key item.

KEY ITEM: An application's Key Items are represented in the Index File, and thus a specific record can be found rapidly by the data contained within this item.

KEYSTROKE: Depressing a key on the keyboard; this initiates sending a unique code to the computer.

LITERAL An expression that is to be taken at face value. A literal can be any sequence of alphanumeric characters contained within single quote (') marks.

LOGON To sign-on and gain access to TEAM-UP as a valid user.

LOGICAL RECORD: The occurrence in the data file that represents one specific representation of the data stored there.

MAINTAIN: See FILE MAINTENANCE.

MAINTENANCE FLAG: A flag set by TEAM-UP to ensure that certain operations are performed on an application before it is accessed.

MEMORY VARIABLE: A numeric variable to which any value can be assigned.

MENU: A list of options.

MENU-DRIVEN: A system whereby the user selects the process to be carried out by means of options.

MENU PATH: A TEAM-UP capability which allows experienced users to bypass the menus and go directly to the process they wish to perform.

MESSAGE LINE: The last line on the Access Data screen where messages are written.

MILITARY DATE: A date in the form 11-NOV-95.

MONITOR: The video display. Also known as CRT.

MULTI-USER ENVIRONMENT: A system such as a Local Area Network in which more than one user can simultaneously access and change information in the same application. Special versions of TEAM-UP are available which operate in this environment and maintain data integrity at all times. Even though many users can be looking at the same record, no user will ever be able to change a record if it does NOT exist on the file exactly as it existed when it was originally displayed.

NON-STORED DATA ITEM: The data assigned by a Procedural Language program to a non-stored data item is displayed on the screen by Access Data, but it takes no space in the

application data file. This concept allows applications to be created which limit data redundancy.

NULL: Empty. A data item that contains no data.

NUMERIC ITEM: An data item that can only contain numbers. Only numeric items can be used in computations.

ONELINER: Preselected data items that are written to the screen, one record per line, whenever an Access Data Find operation selected more than one record.

ON-LINE A transaction that is carried out in real-time by direct access to the data storage device. All entries to a file take place immediately. TEAM-UP is always on-line.

ONELINER TOTALS: The ability to sum numeric fields during a Find operation and display the total in Access Data. The operator dynamically specifies which fields on which to sum.

OPERAND: The data element in a statement.

OPERATOR A symbol that expresses the relationship between two items. Operators are used in comparisons (e.g. <, >, =) and arithmetic computations.

OPERATING SYSTEM: The program that controls the hardware. TEAM-UP is a well behaved program that runs under the operating system.

OUTPUT The moving of data from the computer to the screen or printer.

PARAMETER: A specific value that is assigned to a variable to allow an operator to direct the outcome of a predefined process.

PASSWORD: A specific sequence of eight or less characters that verifies the identity of a user.

PATH: The method of searching to locate a specific file on the disk.

PHONIC ENCODING: A method of encoding so that names that sound alike will be found with the same search.

PRECISION The number of places to the right of the decimal.

PRINT: To send output to the assigned output device.

PRINT QUEUE A place set aside on the disk by the operating system to hold output sent to a printer for printing at a later time.

PRINTER CONFIGURATION See **TERMINAL**.

PROCEDURAL LANGUAGE: The series of commands that are available to use for batch processing or interactive transaction processing of applications.

PROGRAM: An ordered series of instructions that direct the computer to perform as specific task.

PROMPT: A descriptive phrase displayed on the screen that tells the operator that the computer is awaiting a specific input.

QUERY: To extract specific information from a database by means of stating limiting conditions.

RECORD: One complete group of items from an application. This group is treated as a unit.

RELATIONAL DATABASE SYSTEM: A system in which data stored in different files can be linked to form a meaningful relationship. Data redundancy is avoided by the linking mechanism.

REPORT. A written output of data from one or more applications.

REINDEX: To build a new index file. This is required as a result of changing the key status of a item.

RENAME: To change the name of an application.

REORGANIZE: To rearrange the data in an application data file after a change has been made in Create/Change.

RETURN KEY: Signals the computer that you are ready to proceed.

ROW: A horizontal division of the screen. Most screens have 24 or 25 rows where information can be displayed. Synonymous with line.

SECURITY LEVEL: A number between 0 and 9 that is assigned to a user, to an application and to the functions performed against an application. These levels are compared to grant or deny access to various parts of the system.

SEARCH: To examine a series of records for those that meet the selection criteria.

SEARCH QUALIFIERS: The values entered in specific fields, against which records will be compared to limit the number of records found and displayed.

SELECTION CRITERIA: A logical statement that is used to limit the number of records.

SOURCE FILE: A program that is written in a computer language. It must be translated into another form before the computer can actually understand the commands.

STRING: A sequence of characters, usually enclosed in single quotations.

SUB-DIRECTORY: A directory that is below the root directory in a DOS directory structure. See your DOS manual for additional information.

SUB-REPORT: A small portion of the whole report that pertains to a particular section of information.

SYNTAX: The lexical order of a language. Similar to grammar.

SYSTEM MANAGER: The person responsible for the security provisions of TEAM-UP.

TEMPLATE: A mask that is placed over a data record to give it meaning and order.

TERMINAL CONFIGURATION: Setting up the TEAM-UP program so that it can correctly communicate with your particular computer or terminal.

TOGGLE: To switch between two or more states, e.g. the [INS] key switches between insert on and insert off.

TRANSACTION: An event that causes some work to be performed and some change to be made to an application. The Access Data commands Enter, Update and Delete all cause transactions to occur against the application.

TRUNCATE To cut off data that will not fit in a particular field. All data is truncated from the right.

UPDATE: To change one or more values stored in a record.

USER ID NUMBEER: A number assigned a user in System Security that will allow that user to uniquely stamp all records that he enters. This number is used to prevent one user from seeing another user's data records.

USERNAME: The name that uniquely identifies a TEAM-UP user and that user's authorization codes.

WILDCARD: Used in a search qualifier to indicate that any value should be accepted. Access Data treats a space as a wildcard.

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